IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx UL 16.0170X**

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Certificate history:
Issue 2 (2018-07-31)
Issue 1 (2017-09-13)
Issue 0 (2017-01-31)

Status: **Current**

Issue No: 3

Date of Issue: 2023-06-30

Applicant: **ELWOOD Corporation**
2701 North Green Bay Road
Racine, WI 53404
United States of America

Equipment: **Servo Motors, : M43X-XXXX-8XXX, M43X-XXXX-9XXX, M43X-XXXX-DXXX, M43X-XXXX-EXXX, M44X-XXXX-8XXX, M44X-XXXX-9XXX, M44X-XXXX-DXXX, M44X-XXXX-EXXX, M46X-XXXX-8XXX, M46X-XXXX-9XXX, M46X-XXXX-DXXX, M46X-XXXX-EXXX**

Optional accessory:

Type of Protection: **Flameproof "db"**

Marking: Ex db IIB T3 Gb

-20°C to +40°C

Approved for issue on behalf of the IECEx Certification Body: **Katy A. Holdredge**

Position: **Senior Staff Engineer**

Signature:
(for printed version)

Date:
(for printed version)

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 www.iecex.com or use of this QR Code.

Certificate issued by:

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096
United States of America

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Certificate No.: **IECEx UL 16.0170X**

Date of issue: 2023-06-30 Issue No: 3

Manufacturer: **ELWOOD Corporation**
2701 North Green Bay Road
Racine, WI 53404
United States of America

Manufacturing locations: **ELWOOD Corporation**
2701 North Green Bay Road
Racine, WI 53404
United States of America

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 equipment 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 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

This Certificate **does not** indicate compliance with 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 Reports:

US/UL/ExTR16.0196/00 US/UL/ExTR16.0196/01 US/UL/ExTR16.0196/02
US/UL/ExTR16.0196/03

Quality Assessment Report:

US/UL/QAR18.0005/03

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

These motors are total enclosed non-ventilated permanent magnet, servo specialty motors. The motors have a three-phase connection wound field. They are intended to be controlled by a pulse width modulated (PWM) variable frequency drive. The speed of the motor is varied by changing the frequency of the power supplied. The drive frequency and voltage are changed by rapid pulse width modulating of a bus voltage. The current waveform used is sinusoidal. The motors are rated for a 320 max or 640 max bus voltages.

The motors are brushless designs employing a feedback device that controls the motor rotation and shaft position. The motors are temperature limited with over temperature (OTL) devices installed in the windings. The OTL is an automatic resetting device and should be connected directly into a power disabling or latched (locked-out) type circuit that requires manual resetting.

An installation manual is provided specifying the power supply requirements, the PWM controller output and performance characteristics required, the resolver ratings, thermostat ratings and connections and the motor performance curves when held within the specified limits of operation

Please see Annex for additional information.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Motors are manufactured with permanently connected unterminated conductors and therefore marked with the X to indicate the need for appropriate protection of the free end of the conductors. The supplied lead seal is not sufficient for the protection method of the free end of the conductors. An IECEx conduit sealing device(s) complying with the requirements of IEC 60079-0 Ed. 7 and IEC 60079-1 Ed. 7 shall be supplied by the end user.
- If replacement of screws and/or locknuts that secure the front end bell to the stator assembly is necessary, they must be replaced with screws and locknuts having the following dimensions and minimum tensile strength.

Model No.	Dimension, screws	Material	Tensile Strength	Dimensions, nuts	Material	Tensile Strength
M43X	M4 x 0.7 x 16	Steel	174 KSI	M5	Steel	116 KSI
M44X	M5 x 0.8 x 16	Steel	174 KSI	M5	Steel	116 KSI
M46X	M5 x 0.8 x 25	Steel	174 KSI	M5	Steel	116 KSI

- If replacement of the tie bolts that secure the rear end bell and the motor cover to the stator assembly is necessary, they must be replaced with M5 x 0.8-6g tie bolts. The bolts must be made of steel and have a minimum tensile strength of 58 KSI. If replacement of lock nuts s necessary, they must be replaced with M5 x 0.8-6H lock nuts. The lock nuts must be made of steel and have a minimum tensile strength of 116 KSI.
- The motors must be excited with 3-phase sinusoidal currents in proper relationship to the motor’s generated voltage of back electromotive force at each rotor position. A pulse-width-modulated (PWM) current amplitude, frequency and phase for operation of the rotor within its specification. The PWM switching frequency is specified at a minimum of 3 kHz.
- Flameproof joints are not intended to be repaired, contact Elwood Corp. for information.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Issue 1: Updated instructions to latest revision level and removed IEC 60079-31 from this certificate

Issue 2: New motor models with designation M43X-XXXX-DXXX, M43X-XXXX-EXXX, M44X-XXXX-DXXX, M44X-XXXX-EXXX, M46X-XXXX-DXXX, M46X-XXXX-EXX and added an alternate motor construction.

Issue 3: Updated the Specific Conditions of Use and IEC 60079-0 to the latest edition. Added alternate Encoder models: EnDat 2.2/22 Encoder and EnDat 2.2/22 Single-Turn Encoder.

Annex:

Annex to IECEx 16.0170X Issue 3.pdf

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Annex to Certificate No.: IECEx UL 16.0170X

Issue No.: 3

TYPE DESIGNATION

M4	3	2	-	N	N	N	0	-	8	G	0	8	1A
I	II	III		IV	V	VI	VII		VIII	IX	X	XI	XII

I – Basic Designation

M4 – Square motor

II – Motor Frame

Given as 3, 4, or 6

III – Number of magnets (stack length)

Given as 1, 2, 3, 4, or 5

IV – Designation of speed

Given as a letter

V – Output Shaft and Flange Dimensions

Given as a letter

VI – Magnet Material

Given as a letter

VII – Brake

Given as a letter; 0 (zero) designates without brake

VIII – Explosion Protected by Flameproof Enclosure and Winding Voltage

Given as 8, 9, D or E

IX – Feedback Device

Given as a letter or number; 0 (zero) designates without feedback device

X – Secondary Feedback Device

Given as a letter; 0 (zero) designates without feedback device

XI – Connection method

Given as a letter or number

XII – (Optional) Factory Assigned Options

Two characters, given as a combination of letters or numbers

PARAMETERS RELATING TO THE SAFETY

M43: 230 or 460V, 5.7A, Continuous Duty or 5 seconds on 55 seconds off
M44: 230 or 460V, 8.7A, Continuous Duty or 5 seconds on 55 seconds off
M46: 230 or 460V, 23.6A, Continuous Duty or 5 seconds on 55 seconds off

MARKING

Marking has to be readable and indelible; it has to include the following indications: