



# 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](http://www.iecex.com)

Certificate No.: IECEx UL 12.0035X Issue No: 3 Certificate history:  
Status: **Current** Page 1 of 4 [Issue No. 3 \(2016-09-30\)](#)  
Date of Issue: **2016-09-30** [Issue No. 2 \(2015-05-08\)](#)  
[Issue No. 1 \(2014-01-30\)](#)  
[Issue No. 0 \(2013-03-15\)](#)

Applicant: **BEI Sensors, Industrial Encoders Division**  
1461 Lawrence Drive  
Thousand Oaks, CA 91320  
**United States of America**

Equipment: **Optical Encoders, H20, HS20, H25, HS25, HS35, and HS45**  
*Optional accessory:*

Type of Protection: **Intrinsic safety "ia"**

Marking: Ex ia IIB/IIC T4 Ga  
  
-40°C ≤ Ta ≤ +85°C

*Approved for issue on behalf of the IECEx  
Certification Body:*

Paul T. Kelly

*Position:*

Principal Engineer - Global Hazardous Locations

*Signature:  
(for printed version)*

*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](#).

Certificate issued by:

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





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Manufacturer: **BEI Sensors, Industrial Encoders Division**  
1461 Lawrence Drive  
Thousand Oaks, CA 91320  
**United States of America**

Additional Manufacturing location(s):  
**Custom Sensors & Technologies de Mexico S.A. de C.V.**  
Avenida Produccion 2181  
Parque Industrial Internacional Tijuana  
Tijuana, Baja California 22425  
Mexico

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:

<b>IEC 60079-0 : 2011</b> Edition:6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-11 : 2011</b> Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-26 : 2006</b> Edition:2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga

*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:

[US/UL/ExTR12.0044/03](#)

#### Quality Assessment Report:

[US/UL/QAR09.0004/06](#)      [US/UL/QAR15.0002/01](#)



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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

Models H20, HS20, H25, HS25, HS35, and HS45 optical encoders are powered by associated apparatus. Typical applications of an encoder includes measuring distance travelled for a cut to length operation, measuring the position of a work table through a screw ball, determining relative position, direction and speed of travel in a bi-directional conveyor belt and encoding the position and velocity of a rack and pinion. The encoder disc interrupts the light as the encoder shaft is rotated.

See Annex for Nomenclature details.

### SPECIFIC CONDITIONS OF USE: YES as shown below:

The main enclosures of these encoders contain aluminium. The encoder shaft can be aluminium alloy for models HS20 and HS25. Care must be taken to avoid ignition hazards due to impact or friction.

The encoders must be installed in accordance with Control Drawing No. 08292-001.

To reduce the risk of ignition due to electrostatic discharge, the enclosures of the encoders must be connected to earth ground.

To prevent excessive heating caused by friction of shaft seals and bearings of the product beyond the Temperature Code ratings, each model shall be operated within the constraints as shown below:

<b>Model</b>	<b>Maximum RPM</b>	<b>Bearing Life (REVS)</b>
H20	5,000	1.5 x 10 <sup>9</sup>
HS20	4,000	7.5 x 10 <sup>9</sup>
H25	5,000	10.0 x 10 <sup>9</sup> (At 10% Rated Load)
HS25	4,000	7.5 x 10 <sup>9</sup>
HS35	4,000	7.5 x 10 <sup>9</sup>
HS45	4,000	5.0 x 10 <sup>12</sup>



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

Issue 1: Updated entity parameters.

Issue 2: An alternate manufacturing location was added.

Issue 3: Updated Label and Manual drawings with new address. Typo corrections and updated construction drawings.

### **Annex:**

[Annex to IECEx UL 12.0035X Issue 3.pdf](#)

Model Nomenclature:

This certificate covers the following models:

H20, HS20, H25, HS25, HS35 and HS45.

The nomenclatures for the models are as follows:

H20	X	X	X	X	X	X	EX	X
I	II	III	IV	V	VI	VII	VIII	IX

I - Basic model number: H20, HS20, H25, HS25, HS35 or HS45.

II - Housing type: D, E, F, CF, DB, DC, EB or EC.

- D - Square flange with mounting holes in each corner
- E - Round flange with a groove around the OD used with special clips (servo housing)
- F - Housing type for HS25, HS35 and HS45
- CF - Special H25 housing with a bolted adapter. Produces larger diameter mounting flange.
- DB and DC - Two square flange H20 housings with different pilot diameters.
- EB and EC - Two round or servo housings for H20 with different pilot diameters.

Bore size (Hollow shaft encoders): 25 to 200.

Shaft diameter (H20 and H25 encoders): 25, 37, 39.

Tether (Hollow shaft encoders): R1 to R99.

Face mount (H20, H25 encoder): F1 to F99.

Shaft Seal: SS, BS

III - Resolution – 1 to 80,000-T16

IV - Output channels : A, AB, ABZ, AZ, AC, ABC, AZC, ABZC

A - Square wave output with the number of pulses equal to the encoder resolution

B - Square wave output with phase shifted by 1/4 cycle

Z - Marker pulse

C - Complimentary outputs of each A, B and/or Z

V - Output type determines Group: 5V/V, 5V/OCR and 5V/OC are Group IIC. 9V/OC is Group IIB.

VI - Single or dual electronics\*: SMXX or DMXX

SMXX – Single termination where XX indicates connector size

DMXX – Dual termination where XX indicates connector size

VII - Termination type

VIII - EX denotes intrinsically safe

IX - Special features

\*NOTE: Dual Channel models cannot utilize the 9V/OC version circuit boards. All other combinations of circuit boards are allowed for the dual channel models.