



# 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 LCI 04.0008X issue No.:3

Status: **Current**

Date of Issue: **2015-12-07**

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Certificate history:

Issue No. 3 (2015-12-7)

Issue No. 2 (2015-5-12)

Issue No. 1 (2011-6-29)

Issue No. 0 (2004-6-4)

Applicant: **ABB Oy Motors and Generators**  
P.O. Box 633  
Strombergin Puistotie 5A  
FIN-65101 VAASA  
**Finland**

Electrical Apparatus: **Three-phase AC motor - M3J\_ 355 ... ; M3K\_ 355 ... ; M4JP 355 ... ; M4KP 355...**  
Optional accessory:

Type of Protection: **Ex d, Ex de, Ex tb**

Marking: **Ex d I Mb**  
**Ex d or de IIB or IIC T3...T6 (\*) Gb**  
**Ex tb IIA or IIB or IIC T...°C (\*) Db**  
**IECEx LCI 04.0008X**  
(\*) = depending on motor type and model as specified in manufacturer specifications.  
**For complete marking see Annex 01.**

Approved for issue on behalf of the IECEx  
Certification Body:

Michel Equi

Position:

Certification officer

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:

**Laboratoire Central des Industries Electriques (LCIE)**  
**33 Avenue du General Leclerc**  
**FR-92260 Fontenay-aux-Roses**  
**France**

Documents relative to LCIE certification activities (Certificates, QARs, ExTRs) can be registered under the references "LCI" or "LCIE".



**LCIE**



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Manufacturer: **ABB Oy Motors and Generators**  
P.O. Box 633  
Strombergin Puistotie 5A  
FIN - 65101 VAASA  
**Finland**

Additional Manufacturing location  
(s):

<b>ABB Logistics Center Europe GmbH</b> Braukerweg 132 58706 Menden Germany	<b>ABB Sp.zo.o</b> Ul. Placydowska 95-070 Aleksandrow Lodzki Poland
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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 60079-1 : 2007-04</b> Edition: 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
<b>IEC 60079-31 : 2008</b> Edition: 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"
<b>IEC 60079-7 : 2006-07</b> Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*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*

IECEx ATR:  
**IECEx Test Report (ExTR) for issue 0 ; for issue 1**  
**IECEx Test Report (ExTR) for issue 2 ; for issue 3**  
**Quality Assessment Report**

File Reference:  
**60024597-518768-01 ; FR/LCI/ExTR11.0052/00**  
**FR/LCIE/ExTR15.0029/00 ; FR/LCIE/ExTR15.0150/00**  
**FR/LCI/QAR08.0003/05**



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## Schedule

### EQUIPMENT:

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

The equipment is an asynchronous motor with flameproof frame and either flameproof terminal box or increased safety terminal box of the model or type certified for the considered use. Stator frame and terminal box are also protected by enclosure "tb".

#### Motors of group I:

M3JM... for Ex d motors intended for use in mines susceptible for firedamp.

#### Motors of groups II and III:

M3JP... for Ex d / Ex t motors.

M3KP... for Ex de / Ex t motors.

M3JC... for Ex d / Ex t high speed motors.

M3KC... for Ex de / Ex t high speed motors.

M3KG... for Ex de / Ex t motors used as generators

M3JG... for Ex d / Ex t motors used as generators

M4JP... for Ex d / Ex t "premium" efficiency motors.

M4KP... for Ex de / Ex t "premium" efficiency motors.

The complete motor type designation is a combination of letters and numbers.

For instance: M3JP 355 SMA 4.

M3JP : Ex d / Ex t motors.

355 : shaft height in mm according to IEC 60072-1

SM: mounting dimensions in mm according to IEC 60072-1

A : output, as per length of active iron (A...D)

4: number of poles

Technical specifications are given in Annex 01.

### CONDITIONS OF CERTIFICATION: YES as shown below:

Indication of temperature of conductor at entry point and branching point when the temperature under rated conditions is higher than 70°C at the entry point or 80 °C at the branching point.

Operating ambient temperature range:

-20°C ≤ Ta ≤ +50°C for motors of group I

-55°C ≤ Ta ≤ +80°C for IIB gas group and group III

-55°C ≤ Ta ≤ +70°C for IIC gas group

Some flameproof joints dimensions are lower than maximum defined in table 1 and table 2 of IEC 60079-1. These manufacturing gaps are defined in the manufacturer dismantling and assembly guide N°3GZF500728-104.

In case of use with a frequency converter, the motors may be equipped with internal temperature protection to ensure the insulation class. The surface temperature class may also be protected by embedded thermal sensors. The motors must be supplied according to the manufacturer's specifications stated on the 2nd name plate to ensure the temperature class. The relevant instructions for use on variable frequency stated by the manufacturer have to be respected.

Ambient temperature between -20°C to -55°C is allowed without adding heating elements or other heating system.

The instructions of the manufacturer to minimize the risk from electrostatic discharge must be strictly respected.



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## EQUIPMENT(continued):

### Routine tests :

#### **Dielectric strength test:**

Each single increased safety terminal box shall be submitted to the dielectric strength test in accordance with the clause 7 of IEC 60079-7.

#### **Overpressure test:**

According to the schedule hereunder, a static overpressure test shall be carried out for at least 10 seconds without exceeding 1 minute :

Up to 4500 rpm						
Motor part :	Tam $\geq$ 20°C		Tamb $\geq$ 40°C		Tamb $\geq$ 55°C	
	Group IIB	Group IIC	Group IIB	Group IIC	Group IIB	Group IIC
Frame type SM/ML	exempted	exempted	exempted	18 bar	16 bar	19.5 bar
Frame type LK	exempted	exempted	exempted	18 bar	exempted	19.5bar
Endshield cast GJL 250	exempted	14 bar	15 bar	18 bar	16 bar	19.5 bar
Endshield cast GJS 400	exempted	exempted	exempted	exempted	exempted	exempted
Inner bearing cover	exempted	exempted	exempted	exempted	exempted	exempted
Intermediate plate	exempted	exempted	exempted	exempted	exempted	exempted
Terminal box - frame (small and tall)	exempted	exempted	exempted	exempted	exempted	exempted
terminal box - cover (small and tall)	exempted	exempted	exempted	exempted	exempted	exempted

Up to 10000 rpm						
Motor part :	Tam $\geq$ 20°C		Tamb $\geq$ 40°C		Tamb $\geq$ 55°C	
	Group IIB	Group IIC	Group IIB	Group IIC	Group IIB	Group IIC
Frame type SM/ML	exempted	exempted	exempted	20 bar	16 bar	21 bar
Frame type LK	exempted	exempted	exempted	20 bar	exempted	21 bar
Endshield cast GJL 250	exempted	15 bar	15 bar	20 bar	16 bar	21 bar
Endshield cast GJS 400	exempted	exempted	exempted	exempted	exempted	exempted
Inner bearing cover	exempted	exempted	exempted	exempted	exempted	exempted
Intermediate plate	exempted	exempted	exempted	exempted	exempted	exempted
Terminal box - frame (small and tall)	exempted	exempted	exempted	exempted	exempted	exempted
terminal box - cover (small and tall)	exempted	exempted	exempted	exempted	exempted	exempted



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

### Issue 1:

- Update according to the latest edition of standards.
- Addition of the dust protection by enclosure Ex t
- Addition of new motor models : M3JC 355 Ex d high speed motor, M3KC 355 Ex de high speed motors, M4JP Ex d premium efficiency motors, M4KP Ex de premium efficiency motor.
- Addition of use of frequency converters with embedded thermal sensors to ensure the temperature class.
- New bushing material.
- Addition of an optional grease collector.
- Increase of the maximal ambient temperature :
  - 55°C ≤ Ta ≤ +80°C for IIB gas group
  - 55°C ≤ Ta ≤ +70°C for IIC gas group

### Issue 2:

- Normative update according to IEC 60079-0:2011 Ed. 6.0.
- Addition of efficiency class IE3 and associated electrical characteristics.
- Addition of an improved connection method for flying leads.
- Addition of generator application and associated designations M3JG and M3KG.  
M3KG : motor Ex de / Ex t used as generator  
M3JG : motor Ex d / Ex t used as generator
- Addition of new manufacturing locations.

### Issue 3:

Addition of motors range type M3JM 355... intended for use in mines susceptible for firedamp.



## Annex 01 to Certificate IECEx LCI 04.0008X issue 03



### 1. Technical specifications:

Electrical parameters are the followings:

- Nominal rated voltages (DOL "Direct On Line" application): Three-phase 190 V up to 800 V (up to 1250 V for motors of group I).

Tolerances according to :

- EN/IEC 60034-1 for motors stamped in multi-voltages use (e.g. : 380 V – 400 V - 415 V)
- IEC 60038 for motor stamped at single voltage use (e.g. : 400 V / 690 V).
- Maximum nominal voltage with converter (VSD "Variable Speed Drive" application): 690 Vac.
- Frequency : 50 Hz or 60 Hz or variable frequency
- Duty: S1 or intermittent duty S2 to S10.

Electrical and mechanical variations are defined in the documents N° 3GZF500935-90 Rev. C and N° 3GZF500930-790 Rev. A.:

- Motors designed with same nominal flux within a tolerance of +/- 3%, and same frequency
- Output power other than listed
- Pole number between 2 and 20
- Power supply cable permanently connected (flying leads) or not permanently connected
- Closed N-end without fan is allowed (IC410)
- Thermal sensor for bearing certified Category 2
- Motors with designations M3KG and M3JG are used as asynchronous generators.

Ingress protection IP5X, IP54, IP6X or IP64 according to EN/IEC 60034-5.

### 2. Marking

ABB Oy Motors and Generators

Address: ...

Type: M3J\_355... or M3K\_355...  
or M4JP 355... or M4KP 355...

Serial number: ...

Ex d or de IIB or IIC T6...T3 (\*) Gb

Ex tb IIIA or IIIB or IIIC T...°C (\*) Db

OR

Type: M3JM 355...

Serial number: ...

Ex d I Mb

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IP5X, IP54, IP6X or IP64 (\*)

(\*) = depending on motor type and model as specified in manufacturer specifications.

- Ambient temperatures if different from -20°C/+40°C

- In case the temperature under rated conditions is higher than 70°C at the entry point or 80°C at the branching point of the conductors, the motor shall bear the warning:

**WARNING - SELECTION OF CABLES AND CABLE GLANDS - SEE MANUAL**

- The acronym "e" or "Ex e" on the terminal box of M3KP, M3KC, M3KG and M4KP motors.

- For the motors driven by converters a second name plate will be fixed on the motors mentioning the voltage, current and/or load conditions in function of the frequency range, as well as the relevant converter characteristics.

- Thermal sensors could be connected to intrinsic safety circuits "ia" or "ib". Depending on the kind of circuit, symbol related to the protection mode will be added to the marking.

- For IIC apparatus when the paint thickness is superior to the maximal values specified in table 8 of IEC 60079-0, and for dust application, the following warning is added :

**"WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS".**

For motors with Ex e terminals boxes : **"WARNING – DO NOT OPEN WHILE ENERGIZED"**

For motors with Ex d terminals boxes **"WARNING – AFTER DE-ENERGIZING DELAY 60 MIN. BEFORE OPENING"**

For dust application : **"WARNING – DO NOT OPEN WHEN AN EXPLOSIVE DUST ATMOSPHERE MAY BE PRESENT"**

The equipment shall also bear the usual marking required by the manufacturing standards applying to such equipment, such as electrical characteristics (Un...V, In...A, Pn...kW, F...Hz, rpm, Cos φ, efficiency class IE2 or IE3...).