

General information

European ATEX Directives

The ATEX Directives harmonize safety rules in line with the free trading principles of the European Community.

Responsibilities are split between the manufacturers and end users. Manufacturers have to comply with the “Essential Health and Safety Requirements” of the Products Directive 2014/34/EU and end users must prepare an Explosion Protection Document based on risk assessments of their “work places” and “work equipment” to fulfil the “minimum requirements” listed in the Worker Protection Directive 1999/92/EC.

ABB low voltage motors for explosive atmospheres comply fully with the ATEX Product Directive.

According to the regulations, low voltage motors for explosive atmospheres are exempted from the Low Voltage Directive, the EMC Directive and the Machinery Directive.

IECEX System

The IECEX System is a certification system which verifies compliance with IEC (International Electrotechnical Commission) standards relating to safety in explosive atmospheres. It covers equipment, service facilities and personnel competencies and conformity mark licensing system.

Created in September 1999, the System aims “to facilitate international trade in equipment and services for use in explosive atmospheres, while maintaining the required level of safety...” (source: IECEX website, www.iecex.com). It is a voluntary system which provides an internationally accepted means of proving that products and services are in compliance with IEC standards. The voluntary and international aspects of the IECEX System differentiate it from certification under ATEX, for example, which is mandatory but applies only within the European Economic Area.

The IECEX System comprises global certification programs for both equipment and service facilities.

IECEX certification involves – in addition to product tests - assessment of quality control procedures and testing plans, audits of manufacturing plants, and routine on-going surveillance and inspections.

In addition, IECEX has established a comprehensive set of operational documents and procedures to develop a single internationally standardized approach to Ex testing and certification.



The approach includes:

- A standardized “IECEX way of Ex Testing and Certification”. There is a single set of operational procedures, and Ex test procedures are always applied in the same way.
- A dedicated Technical and Operational Secretariat to maintain operations. Ex test procedures are evaluated and monitored on a centralized basis.

Who is responsible for the certification work?

A manufacturer needing to have equipment certified under the IECEX System can apply to an IECEX Competent Body (ExCB) in any member country. At present there are more than 30 IECEX member countries. The ExCB performs or coordinates the activities of certification.

A quality assessment of the manufacturer is undertaken by the ExCB itself, and the auditor issues an IECEX Quality Assessment Report (QAR).

Type testing of product samples is performed on behalf of the ExCB by an IECEX Assessment and Testing Laboratory (ExTL). On completion of its work the ExTL’s assessment engineer prepares an IECEX Test Report (ExTR).

The ExTR is then submitted to the ExCB for endorsement. Based on the QAR and ExTR, the ExCB then issues the Certificate of Conformity (CoC). The CoC provides internationally accepted

verification that the equipment in question is in compliance with the relevant IEC standards. Once formally issued by the ExCB, both the ExTR and QAR are registered on the IECEX Internet site. This provides verification that an ExTR and QAR exist for the product and manufacturer.

How do I know if a motor is IECEX certified?

IECEX certified motors show the certification number on their rating plate, for example: "IECEX LCI 05.0008". In this case "LCI" indicates that the IECEX certificate was issued by LCIE, an IECEX approved Certification Body in France.

In addition, IECEX certificates are issued in electronic form and are publicly available on the IECEX website. They can therefore be viewed and printed by anyone with access to the Internet. See "Certificates & Licences" at www.iecex.com.

IECEX certification is particularly useful in certain markets. In Australia, New Zealand, and Singapore, for example, IECEX certificates are accepted, but not all IEC certificates are accepted. Certain other countries, including Russia, China and Korea, are prepared to accept ExTRs as a basis for their own national certificates. There are also many countries that are willing to accept products covered by current IECEX certificates, even though the countries in question are not members of the IECEX Management Framework.

IECEX Conformity Mark License

The IECEX Conformity Mark System was introduced in 2008. IECEX Conformity Mark Licenses are issued by approved Certification Bodies in IECEX participating countries.

The IECEX Conformity Mark shows that a product has been granted an IECEX Certificate of Conformity. IECEX Certification confirms that the product has the appropriate protection for use in explosive atmospheres and that it has been manufactured under systems subject to ongoing surveillance by Certification Bodies. It is recognized in all the countries participating in the IECEX System, and it also means that the product can be supplied to the market without the need for additional tests.

ABB has been granted IECEX Certification for a wide range of low and high voltage motors, and these can therefore display the IECEX Conformity Mark. The hazardous area protection types provided by these motors include

- Flameproof Ex d, Ex de
- Non-sparking Ex nA
- Increased safety Ex ec
- Dust protection Ex t

The IECEX Conformity Mark License will considerably enhance ABB's ability to market its products

globally. It complements ABB's existing ATEX and other approvals.

Benefits of IECEX System for end users

A significant advantage of IECEX is that vendor certificates are available for inspection on the IECEX website. End users can therefore confirm the validity of IECEX certificates at any time - which is not possible with ATEX, for example. This increases end user confidence that the motor vendor will be committed to maintaining the necessary quality systems.

Under the quality based IECEX certification approach the interpretation of the standard is shared throughout the 30 participating countries and individual interpretations by Notified Bodies are not allowed. Another advantage of IECEX is that the Certificate of Conformity also covers EPL (equipment protection level) "c", see table on next page.

Which ABB motors and generators are IECEX certified?

All motors listed in this catalogue are IECEX certified, except motor types M3HP and M3AA in frame sizes 71 to 80.

Compliance on basis of recently updated standards

In complying with the ATEX 95 directives, ABB follows the requirements of recently updated IEC and EN standards. Otherwise ABB follows the requirements of the IEC standards shown in the relevant certificates.

Main standards for explosive atmospheres:

| | |
|------------------|---|
| IEC/EN 60079-0 | Equipment - General requirements |
| IEC/EN 60079-1 | Equipment protection by flameproof enclosures "d" |
| IEC/EN 60079-7 | Equipment protection by increased safety "e" |
| IEC/EN 60079-15* | Equipment protection by type of protection "n" |
| IEC/EN 60079-31 | Equipment dust ignition protection by enclosure "t" |
| IEC/EN 60079-14 | Electrical installations design, selection and erection |
| IEC/EN 60079-17 | Electrical installations inspections and maintenance |
| IEC/EN 60079-19 | Equipment repair, overhaul and reclamation |
| IEC 60050-426 | Equipment for explosive atmospheres |
| IEC/EN 60079-10 | Classification of hazardous areas (gas areas) |
| IEC 60079-10-1 | Classification of areas - Explosive gas atmospheres |
| IEC 60079-10-2 | Classification of areas - Combustible dust atmospheres |

* Moved to IEC/EN 60079-7 in 2015 revision.

Equipment protection levels (EPLs)

The latest revisions of the IEC and EN standards introduce the concept of "equipment protection levels", which identify products according

to the ignition risk they might cause. A motor's EPL therefore indicates its inherent ignition risk, regardless of its protection type. This makes the selection of equipment for different zones easier. EPLs also enable a true risk assessment approach, where the potential consequences of a possible explosion are taken into consideration. Please refer to the table on the next page for more information about EPLs and EPL markings.

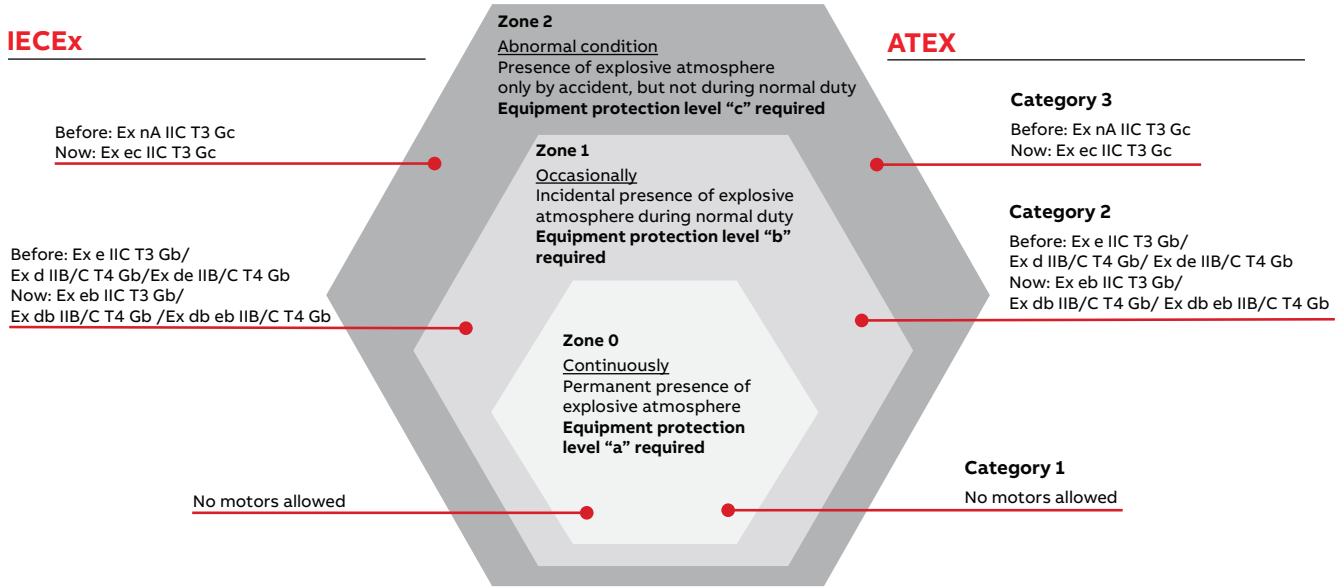
New markings introduced

The latest revisions of the standards IEC/EN 60079-7 and IEC/EN 60079-1 have introduced some new markings for equipment suitable for locations where there is a potential risk of gas present. The non-sparking protection method is no longer used on rotating electrical machines, instead have two levels on increased safety protection been introduced in edition 5 of IEC/EN 60079-7. One higher level of protection with EPL Gb that technically corresponds to the old Ex e, an a new lower level with EPL Gc that corresponds to Ex nA as previously defined in IEC/EN 60079-15.

Further have also several levels of protection been introduced in edition 7 of IEC/EN 60079-1 for flame proof protection. These two changes does affect the markings used both flameproof, increased safety and non-sparking equipment for group II as shown in table below. Product certificates are updated gradually to show new markings, during the transition period may both old and new markings be used in parallel depending type and size of motor.

| Old way of marking | Old protection method | New way of marking | New protection method | Zone | ATEX category |
|---------------------------|------------------------------|---------------------------|------------------------------|-------------|----------------------|
| Ex e IIC T3 Gb | Increased safety | Ex eb IIC T3 Gb | Unchanged | 1 (or 2) | 2G |
| Ex nA IIC T3 Gc | Non-sparking | Ex ec IIC T3 Gc | Increased safety | 2 | 3G |
| Ex d IIB/C T4 Gb | Flameproof | Ex db IIB/C T4 Gb | Unchanged | 1 (or 2) | 2G |
| Ex de IIB/C T4 Gb | Flameproof | Ex db eb IIB/C T4 Gb | Unchanged | 1 (or 2) | 2G |

Zones - IECEx and ATEX



Note: Based on traditional relationship between EPL`s and zones.

There are systems in place worldwide to classify explosive atmospheres by zones, according to the risk posed by explosive gas ("G") or dust ("D").

Classification of explosive atmospheres according to CENELEC and IEC

The following standards define areas according to the presence of gas or dust in the atmosphere:

- IEC/EN 60079-10-1 Gas
- IEC/EN 60079-10-2 Dust

| Standard IEC 60079-0 EN 60079-0 Group | EPL | Protection level | Installation Zone acc. to IEC 60079-10-x EN 60079-10-x Zones | ATEX Directive 2014/34/EU Equipment group | Equipment category | Main motor protection types |
|---------------------------------------|-----|------------------|--|---|--------------------|--|
| I (Mines) | Ma | very high | NA | I (Mines) | M1 | NA |
| | Mb | high | | | M2 | |
| II (Gas) | Ga | very high | 0 | II (Surface) | 1G | NA |
| | Gb | high | 1 | | 2G | Ex d/Ex de Ex p, Ex db, Ex db eb, Ex p, Ex eb (Ex e) |
| | Gc | enhanced | 2 | | 3G | Ex ec (Ex nA) |
| III Dust | Da | very high | 20 | | 1D | NA |
| | Db | high | 21 | | 2D | Ex tb IP 65 |
| | Dc | enhanced | 22 | | 3D | Ex tc IP 65/IP 55 |