IECEx Operational Document

IEC System for Certification to Standards relating to Equipment for use in Explosive Atmospheres

Operational Document - Guidance on the preparation of IECEx Equipment Certificates and Reports covering more than one identifiable item of equipment

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

IEC SCHEME FOR CERTIFICATION TO STANDARDS FOR ELECTRICAL EQUIPMENT FOR EXPLOSIVE ATMOSPHERES (IECEx System)

Operational document No. IECEx OD 034

Title: Operational Document - Guidance on the preparation of IECEx Equipment Certificates and Reports covering more than one identifiable item of equipment

Introduction

This IECEx Operational Document provides the guidance for preparing IECEx Certificates covering more than one identifiable item of Equipment.

Document History

Date	Summary
2009 03	**Edition 1**
2015 07	**Edition 2.0** This edition was published to reflect a proposal based on ExTAG/322/CD as agreed at the 2014 ExTAG meeting via discussion on ExTAG/346/R. This edition also includes edits suggested from the review of ExMC/995/CD

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Guidance on the preparation of IECEx Certificates and Reports covering more than one identifiable item of equipment

1.   Pre-amble

Divergent practices between IECEx Certification Bodies in respect of the number of different products that can be covered on a single certificate have potential implications for the easy management of certificates. These include the frequency of raising the issue level of a certificate, the listing of ExTR documents on the certificate for each new technical issue and a direct influence on the cost recovery of the scheme.

There is also the facility for certificates to refer to further documents (for example manufacturer provided reports or drawings) which are not directly controlled within the IECEx Scheme, or publicly available, for basic details of equipment within a range covered by a certificate.

The purpose of this Operational Document is to provide a standardised approach for the preparation of IECEx Certificates and Reports covering more than one identifiable item of equipment.

A further point to note is the importance of being able to match the list of models covered by a certificate with the specific model reference as listed or displayed on each product produced. This is particularly important during installation, maintenance and repair.

2.   Purpose of Certificates

Certificates are used by different people for different reasons. The following is intended to capture all major uses:

i)   By potential purchasers, to search the IECEx Database for a suitable product

ii)   By the purchaser, to satisfy local regulatory bodies and insurers regarding an installation

iii)   By the manufacturer, to satisfy local regulatory authorities regarding compliance of a product

iv)   By the manufacturer, to satisfy his insurer regarding steps taken to avoid product liability claims (however expressed in different countries)

v)   By the manufacturer, as a marketing aid

vi)   By the manufacturer, to identify which products are covered by the certificate

vii)   By the certifier, to identify which products are covered by the certificate

viii)   By the IECEx Scheme, to promote the scheme

ix)   By the IECEx Scheme, as a source of revenue

x)   By the manufacturer, purchaser, installer and user of the equipment to transfer specific information needed for installation and use

For most of these purposes, except perhaps items iv) and v), the ideal situation is a one-to-one correspondence between each discrete design of equipment and its certificate, i.e. one certificate covering one product type. However, it is acknowledged that certification can be an expensive process and that costs can be saved by covering more than one discreet design (in other terms, a range of equipment) on a single certificate. Hence there is often a need to compromise whereby logical ranges of equipment are adequately described and covered in a single certificate.

Unless the extent of the range is limited by logic, it would be possible to have a single certificate covering the entire output of a particular factory including, perhaps, junction boxes, luminaires and solenoid valves. Such a certificate would be unlikely to satisfy any of the purposes of a certificate except, maybe, item iv) above.

3.   Content of Certificate

IECEx OD 011-2 contains suggestions for the content of the boxes headed "Electrical Apparatus" and "Equipment".

IECEx OD 011-2 further suggests that if there is insufficient space then the words "Refer to Schedule" can be inserted.

This may be valid on some extreme occasions but certainly does not assist fulfilment of any of the purposes listed above.

OD 011 Part 2 "Electrical Apparatus" is the effective title of the certificate (which will be the principle search item in the database) should be as clear and succinct as possible. A generalised description, for example, "An enclosure containing various items of control equipment", would not allow the reader of the certificate to judge what is actually within the scope of the certificate. This does not preclude using the word "Range" in the title, but the rest of the title should put at least an approximate limit on the range.

OD 011-2 "Equipment" refers to "…. *the detailed information is entered to clearly describe what is covered by the IECEx CoC*".

At this point sufficient information must be given such that it is clear whether or not a given physical object is likely to be the subject of the certificate. The complete constructional details are only given in the manufacturer's drawings, listed within the ExTR, but the written description in the certificate should not leave room for doubt with regard to the coverage of the certificate. This would include, for example, details of all principal ratings of products within a certified range.

A generalised description, for example,

"*An enclosure containing various items of control equipment*"

would not enable the reader of the certificate to judge what is actually within the scope of the certificate.

Conversely, the following description example,

> *"An Ex d control station comprising a rectangular enclosure with plain flanged bolted lid, size A x B x C mm, containing up to 7 relays, 4 transformers, 2 contactors, …… together with associated rail mounted terminals. The lid is provided with up to 4 pushbutton actuators, ….. , and up to 2 windows for internally mounted displays. Maximum rating 250 V, 10A. Drilled and tapped holes are provided for the accommodation of up to 6 M20 suitable Ex d cable glands separately certified as equipment (not as a component)"*

is totally clear and meets all required purposes.

In this case, stating the maximum number of each internal item allows the manufacturer to substitute similar devices and/or omit some of the internal items, so that the product may fulfil a similar, but non-identical, function, whilst still clearly providing the necessary traceability between the certificate and the product.

4. Certification of Ranges of equipment

The principle of the "logical range" should be central to all decisions regarding the range of equipment permitted on a single certificate.

"Range" certification can be properly applied to similar products where a principal part of the descriptive material relating to the explosion protection method remains constant. Thus a family of twin and single tube fluorescent luminaires in the same basic form of enclosure is logical, but to extend the certificate to cover both "overtube" and "diffuser" styles of enclosure would not be appropriate. A single design of housing containing appropriate control gear for three different types of high power discharge lamps, together with different reflectors to match the optical needs of the different lamp forms would form a logical range.

The "principal part of the descriptive material remaining constant" does not necessarily mean that common components need be used throughout. For example, a logical range of Ex 'e' enclosures to be certified empty as Components might all be different sizes, but they would have common features for lid fastening, gasket retention and for mounting through the base. Alternative materials (for example high temperature gaskets) would be available throughout the range.

4.1 Modular Ranges

For complex modular equipment a different approach may be needed. For example, consider an equipment range comprising of a number of electrical chassis or racks with in-built power supply that can be fitted with inter-changeable modules with different functions e.g. communications module, separate measurement modules (RTD or pressure transducers). It is not appropriate to have such a range of chassis with a range of modules included on a single certificate.

In this example, a certificate would be required for each chassis/power supply. This certificate could include any chassis variants based on the logical range principle set out

above. A further certificate would be required for <u>each</u> type of module. Modules which shared the same electronic circuits and the same function (e.g. only differing in output parameters) could also be grouped under the same module certificate as a logical range. The rational for a separate certificate for the chassis and modules is that they may be used in different combinations or sold separately as spare parts or upgrade modules.

4.2   Problems with "extended" Ranges

All certificates for products having an extended production life go through a process of change as the product line matures. This may be by reason of changed availability of manufacturing parts (particularly electronic components) or by improvements in design or adaptations to suit customer requirements. Each change requires a new edition of the certificate, together with the associated ExTR (either full or abbreviated, depending on the extent of the modifications).

The broader the range of equipment on a single certificate, the greater the number of changes that will occur. This becomes particularly complex when a change only applies to a very restricted part of the range. After a series of such changes, the certificate will have grown extensively in the number of pages, only some of which will now apply to any one individual product. Such a certificate becomes very difficult for the manufacturer, certifier and customer alike to manage in a sensible way.

Ideally, the logical range should be such that changes to the certificate are likely to apply to all products listed on it.

The whole purpose of component certification is to facilitate the certification of actual equipment such that it can be meaningful and yet relatively quick and cost effective to produce. For example by obtaining a component certificate for an Ex 'e' or an Ex 'd' enclosure the manufacturer can readily obtain a new certificate for each principle build that satisfies all the objectives described earlier. Neither vague initial certification (that effectively leads to self-certification by the manufacturer) nor endless additions to a single certificate satisfy these requirements.

Certified components assembled in, or being parts of a certified apparatus, shall be defined in the descriptive documents to the certificate with specification of manufacturer, type, ratings, Ex-code and certificate reference

The number of "New Issues" to an IECEx Certificate needs to be controlled in a sensible and practical manner, sufficient to enable easy traceability and identification of products that are covered by certification. Where doubt or confusion may arise, then the issuing of a new certificate should be considered.

5.   References for Ratings

It should not be necessary to refer to "private" documents to establish basic ratings of products. Simple ratings may be given in the text of the description, or even in the headline of the equipment title.

Where more complex ratings are assigned (for example the terminal parameters for intrinsically safe equipment), it is appropriate for them to be detailed in the "additional information" field or in an Annex.

Because of the difficulty of formulating tabulated or table text in the HTML text blocks, it is possibly advantageous to use an Annex.

6. Length of Descriptive Text

In order to ensure that satisfactory prints can be made of on-line certificates it is desirable that the basic description should not cause the text block to expand as this will result in the physical printed pages not matching the page number printed on them.

If an extended description is necessary, an abbreviated description should be provided at the Equipment Description of the Certificate along with either

   a) an indication to the document reference for the manufactures instructions within the equipment description field of the Certificate,

or

   b) a reference in the equipment description field to be given in the full description on the 'additional information' page or in an Annex to the Certificate.

Therefore the description in the Certificate can be kept short because the manufacturer's instructions are also referenced to in the Certificate, as required by IECEx 02, Clause 8.1.3. that according to IEC 60079-0 the instructions are to contain all the information that is required and helpful for a safe use of the equipment.

Although there will be a few exceptions, if the description of a "range" of products needs to extend beyond a single additional HTML page, or two pages in an Annex, it is probable that the range is too extensive for a single certificate.