




## Marking and Documentation

<b>thuba</b>		thuba Ltd. CH-4015 Basel Switzerland
CE 0102		II 2G
Ex d [ja Ga] IIC T6 Gb		
PTB 09 ATEX 013		
Leistung Puissance Power	3.6 kVA	/
Spannung Tension Voltage	3 x 400 Volt	
Strom Courant Current	5.2 A	
Typ Type Type	EXd/	- 625
Nummer Numéro Number	4688	2009



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In Europe the placing on the market of equipment and protective systems intended for use in potentially explosive atmospheres is carried out according to Directive 94/9/EC (ATEX 95).

In addition to the CE marking, further markings are required by the directive. In order to be able to understand these markings, it is necessary to distinguish strictly between the markings according to the directive and the markings according to the standards of the series IEC/EN 60079.

According to Directive 94/9/EC (Annex III), an EC-Type Examination Certificate is issued after successful completion of a conformity assessment procedure.

The certificates according to the IECEx scheme (<http://iecex.iec.ch/>) and in North America (for example UL: <http://www.ul.com/global/eng/pages/>) can generally only be called up online.

**1. Marking**

*1.1 Directive 94/9/EC*

1.1.1 Equipment in potentially explosive atmospheres

All equipment and protective systems shall be marked legibly and indelibly with the following minimum details:



Figure 1: Markings according to Directive 94/9/EC

- 1 Name and address or the registered trademark of the manufacturer (This must correspond with the address in the certificate)
- 2 CE marking (in accordance with the requirements of Directive 94/9/EC)
- 3 The control number of the notified body responsible for the supervision of the quality assurance system.

Notified bodies	
0102	Physikalisch-Technische Bundesanstalt PTB, Germany
0158	DEKRA EXAM GmbH, Germany
0032	TÜV NORD CERT GmbH, Germany
0035	TÜV Industrie Service GmbH, Germany
0637	IBExU, Institut für Sicherheitstechnik, Germany
0344	KEMA Quality B.V, The Netherlands
0080	INERIS, France
0081	LCIE Laboratoire Central des Industries Electriques, France
0086	BSI Product Services, Great Britain
0402	SP Swedish National Testing and Research Institute, Sweden

Conformity assessment authorities (Notified bodies)	
0408	TÜV, Austria
0600	EECS Electrical Equipment Certification Service, Great Britain
0518	SCS Sira Certification Service, Great Britain
0163	LOM, Spain
0722	CESI, Italy
0537	VTT Industrial Systems, Finland
0539	UL International DEMKO, Denmark
0470	NEMKO, Norway
0575	Det Norske Veritas AS, Norway
0637	IBEXU, Germany
1180	BASEEFA, Great Britain
1258	Electrosuisse SEV, Switzerland
1725	FM Approvals Ltd, Great Britain

Table 1: Conformity assessment authorities (Notified bodies)

- 4 The specific marking for the prevention of explosions
- 5 The equipment group II and, in conjunction with the marking that indicates the category, the letter “G” for areas in which explosive atmospheres due to gases, vapours, or mists mixed with air are present, or the letter “D” for areas in which dusts can form explosive atmospheres

Category	Gas (G)	Dust (D)
1	Zone 0	Zone 20
2	Zone 1	Zone 21
3	Zone 2	Zone 22

Table 2: Categories

#### 1.1.2. Associated apparatus

Associated apparatus (for example, with intrinsically safe outputs) shall be installed in a safe area outside the hazardous area (for example, in the central control room or in a flameproof control unit). With associated apparatus, the category in the marking is put in round brackets.



Figure 2: Marking according to Directive 94/9/EC

### 1.1.3 Categories

#### 1.1.3.1 Category 1

Category 1 comprises equipment that is designed to be capable of functioning in conformity with the parameters set down by the manufacturer and of ensuring a very high level of protection.

Equipment in this category must ensure the requisite level of protection, even in the event of rare incidents relating to the equipment, and shall, therefore, feature such means of protection that,

- in the event of the failure of one means of protection, at least one independent second means of protection provides the requisite level of protection,
- or, in the event of two faults occurring independently of each other, the requisite level of protection is assured.

#### 1.1.3.2 Category 2

Category 2 comprises equipment that is designed to be capable of functioning in conformity with the parameters set down by the manufacturer and of ensuring a high level of protection.

The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring equipment faults or disturbances which normally have to be taken into account.

#### 1.1.3.3 Category 3

Category 3 comprises equipment that is designed to be capable of functioning in conformity with the parameters set down by the manufacturer and of ensuring a normal level of protection.

Equipment in this category ensures the requisite level of protection during normal operation.

## 1.2 IEC/EN Standards

### 1.2.1 Explosive gas atmospheres

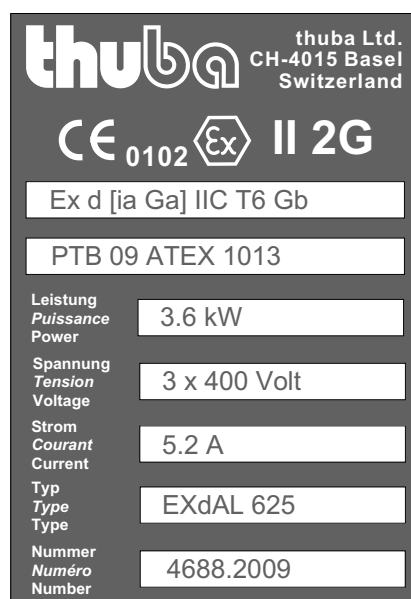


Figure 3: Type label

- 1 The code for the notified bodies, the year and the certificate number (Exception: in accordance with Directive 94/9/EC, the designation “ATEX” is inserted between the year and the certificate number.)

1 — PTB 08 ATEX 1013

- 2 The complete Ex marking, for example, Ex de IIC Gb (previously EEx de IIC). If several types of protection are applied, these are given in alphabetical order)

Ex d IIC T5 Gb

2
3
4
5
6

- 3 Types of protection for explosive gas atmospheres

Electrical apparatus for explosive gas atmospheres			
EPL	Standards IEC/EN		Type of protection
	60079-0		General requirements
Ga	60079-11	ia	Intrinsic safety
	60079-18	ma	Encapsulation
	60079-26		Construction, test and marking of Group II electrical apparatus EPL Ga (Zone 0)
	60079-28	op is	Protection of equipment and transmission systems using optical radiation
Gb	60079-1	d	Flameproof enclosures
	60079-2	p, px, py	Pressurized enclosures
	60079-5	q	Powder filling
	60079-6	o	Oil immersion
	60079-7	e	Increased safety
	60079-11	ib	Intrinsic safety
	60079-18	mb	Encapsulation
	60079-25		Intrinsically safe systems
	60079-27		Fieldbus intrinsically safe concept (FISCO)
	60079-28	op is op pr op sh	Protection of equipment and transmission systems using optical radiation
Gc	60079-11	ic	Intrinsic safety
	60079-18	mc	Encapsulation
	60079-15	nA	Non sparking
	60079-15	nR	Restricted breathing enclosure
	60079-15	nL	Limited energy
	60079-15	nC	Equipment producing operational sparks
	60079-2	pz	Pressurized enclosures
	60079-28	op is op pr op sh	Protection of equipment and transmission systems using optical radiation

Table 3: Types of protection gas

4 Equipment groups

Equipment groups (Gas)	
IIA	Acetone, ethane, benzene, petrol, butane, propane, methane
IIB	Ethylene, town gas
IIC	Hydrogen, acetylene

Table 4: Equipment groups

5 Temperature classes

Temperature class	Ignition temperature of gas or vapour	Permissible temperature class of equipment
T1	> 450 °C	T1 – T6
T2	> 300 °C	T2 – T6
T3	> 200 °C	T3 – T6
T4	> 135 °C	T4 – T6
T5	> 100 °C	T5 – T6
T6	> 85 °C	T6

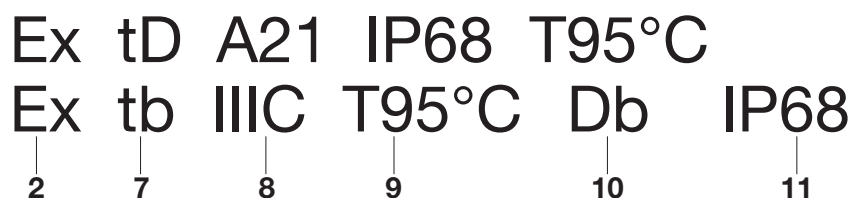
Table 5: Temperature classes

6 Equipment protection levels

Zone	Equipment Protection Level (EPL)
0	Ga
1	Gb and Ga
2	Gc, Gb and Ga

Table 6: Equipment protection levels

1.2.2 Explosive dust atmospheres



7 Types of protection for dust

Electrical equipment for use in areas with combustible dust			
EPL	Standards IEC/EN		Type of protection
	60079-0		General requirements
Da	60079-31	ta	Protection by enclosure
	61241-11	iaD	Protection by intrinsic safety
	60079-18	ma	Protection by encapsulation
Db	60079-31	tb	Protection by enclosure
	61241-11	ibD	Protection by intrinsic safety
	60079-18	mb	Protection by encapsulation
	61241-4	pD	Type of protection “pD”
Dc	60079-31	tc	Protection by enclosure
	60079-18	mc	Protection by encapsulation
	61241-4	pD	Type of protection “pD”

Table 7: Types of protection dust

## 8 Equipment groups

Equipment groups (dust)	
IIIA	fibres
IIIB	non-conductive dust
IIIC	conductive dust

Table 8: Equipment groups

## 9 Surface temperature

The ascertained maximum surface temperature must not exceed the following values:

- The specified maximum surface temperature or
- The ignition temperature of a layer of dust or a cloud of a specific, designated combustible dust, see IEC/EN 60079-0, Section 5.3.2.3

## 10 Equipment protection levels

Zone	Equipment Protection Level (EPL)
20	Da
21	Db and Da
22	Dc, Db and Da

Table 9: Equipment protection level

## 11 IP degree of protection (IEC/EN 60079-31, Table 1)

Level of protection	IIIC	IIIB	IIIA
ta	IP6X	IP6X	IP6X
tb	IP6X	IP6X	IP5X
tc	IP6X	IP5X	IP5X

Table 10: Level of protection

IP	First numeral (against penetration of solid foreign objects / prevention of access to hazardous parts)	Second numeral (against penetration of water with harmful effects)
4	≥ 1,0 mm diameter	splashing water
5	dust-protected	water jets
6	dust-tight	powerful water jets
7		temporary immersion water
8		continuous immersion in water

Table 11: IP degree of protection

## 12 Additional designations “X” and “U”, if required

Additional designation X

# BVS 08 ATEX E 048 X

If special conditions are to be observed during the installation of equipment, an “X” is added to the certificate number. For the person installing the equipment, this means that the operating instructions issued by the manufacturer are to be read carefully and the instructions relating to the safe operation of the equipment are to be followed.

Additional designation U (component)

## PTB 08 ATEX 1012 U

The additional designation “U” shows the user that the apparatus in question is an incomplete piece of electrical apparatus that cannot be used by itself.

This additional designation is added in the case of components such as enclosures, terminals, micro switches, etc., as these can only be certified as complete equipment after fitting or assembly.

- 13** If necessary, the restricted or extended ambient temperature range (if not stated on the type label, the ambient temperature range is  $-20$  to  $40$  °C)

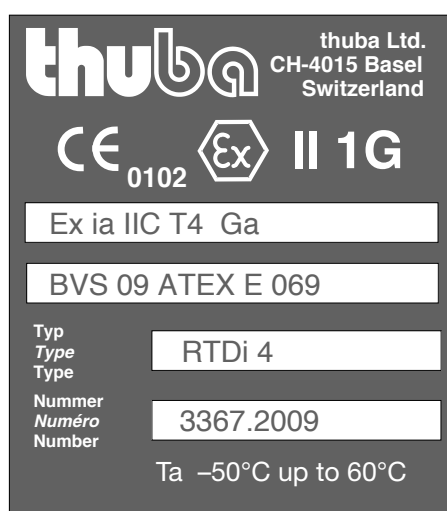


Figure 4: Ambient temperature

The ambient temperature is often not specified, although the equipment is installed in a location where the ambient temperature regularly falls below  $-20^{\circ}\text{C}$  or rises above  $40^{\circ}\text{C}$ .

- 14** Designation of the series and type
- 15** Serial number or year of production, if required  
Additionally, and if required, all essential information and instructions relating to the safe use of the equipment (including warning notices according to IEC/EN 60079-0) shall be affixed.
- 16** The following additional information is necessary for motors:
- Ratio of the starting current to the rated current  $I_A/I_N$
  - Tripping time  $t_E$  of motors in the type of protection Increased Safety
  - Response time of the temperature monitor  $t_A$  for the inherent thermal protection

## 17 Warning marking

### Warning marking to IEC/EN 60079-0

	Reference	WARNING marking
a)	6.3	WARNING – AFTER DE-ENERGIZING, DELAY Y MINUTES BEFORE OPENING (Y being the value in minutes of the delay required)
b)	6.3	WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT
c)	18.2	WARNING – DO NOT OPERATE UNDER LOAD
d)	18.4 b), 19 21.2 b) 21.3 b)	WARNING – DO NOT OPEN WHEN ENERGIZED
e)	20.1 b)	WARNING – DO NOT SEPERATE WHEN ENERGIZED
f)	20.1 b)	WARNING – SEPARATE ONLY IN A NON-HAZARDOUS AREA
g)	7.4.2 g)	WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS
h)	18.4 2) 21.2 2) 21.3.2	WARNING– LIVE PARTS BEHIND COVER - DO NOT CONTACT

### Warning marking to IEC/EN 60079-1

	Reference	Caution or warning marking
20.2(a)	11.3	“CAUTION – USE FASTENERS WITH YIELD STRESS $\geq$ (VALUE)”, where the (value) is determined by the application testing
20.2(b)	13.3.4	“WARNING – DO NOT SEPARATE WHEN ENERGIZED”
20.2(c)	17.1.1, 17.2.2 17.2.3	“WARNING – DO NOT OPEN WHEN ENERGIZED”
20.2(d)	E.3.2	“WARNING – DO NOT OPEN WHEN AN EXPLOSIVE GAS ATMOSPHERE IS PRESENT”

### Warning marking to IEC/EN 60079-2

Clause or subcase	Recommended warning (similar wording is permitted)
5.3.6	WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT
7.7 c)	WARNING – Power shall not be restored after enclosure has been opened until enclosure has been purged for ___ minutes at a flow rate of ___.
7.9 d)	WARNING – PROTECTIVE GAS SUPPLY VALVE – FOLLOW INSTRUCTIONS BEFORE CLOSING
15	WARNING – DO NOT OPEN ANY DOOR OR COVER FOR xxx MINUTES AFTER REMOVING POWER

### Warning marking to IEC/EN 60079-7

Item	Reference	WARNING Marking
a)	4.9.3 a)	WARNING – DO NOT OPEN WHEN NON-INTRINSICALLY SAFE CIRCUITS ARE ENERGIZED
b)	4.9.3 b)	WARNING – DO NOT OPEN WHEN ENERGIZED
c)	4.9.3 c)	WARNING – NON-INTRINSICALLY SAFE CIRCUITS PROTECTED BY INTERNAL IP30 COVER
d)	5.7.1.2	WARNING – SEPARATE ONLY IN A NON-HAZARDOUS AREA
e)	5.7.7	WARNING – DO NOT TRANSPORT THROUGH A HAZARDOUS AREA
f)	9.1	WARNING – DO NOT CHARGE IN A HAZAROUS AREA
g)	9.2.1	WARNING – REFER TO THE INSTRUCTION MANUAL FOR BATTERY CHARGING

## Warning marking to IEC/EN 60079-11

Item	Reference	WARNING Marking
a)	7.4.1	WARNING – USE ONLY YYYYY BATTERIES (where Y is the cell manufacturers name and the type number of the cell or battery)
b)	7.4.7	WARNING – DO NOT REPLACE BAGTTERY WHEN AN EXPLOSIVE GAS ATMOSPHERE MAY BE PRESENT
c)	7.4.8	WARNING – DO NOT CHARGE THE BATTERY IN HAZARDOUS LOCATION

## Warning marking to IEC/EN 60079-15

	Reference	Warning marking
a	19.4	WARNING – DO NOT REMOVE OR REPLACE FUSE WHEN ENERGIZED
b*	20.1 b)	WARNING – DO NOT SEPARATE WHEN ENERGIZED
c*	22.5.2.8	WARNING – SEPARATE ONLY IN A NON-HAZARDOUS AREA
d	35.2	WARNING – DO NOT CHARGE IN A HAZARDOUS AREA
e	35.2	WARNING – DO NOT USE PRIMARY CELLS
* Identical to the warning markings in IEC 60079-0		

## 1.2.3 Associated apparatus

Associated apparatus shall be installed in the safe area outside the potentially explosive atmosphere. The type of protection (in the majority of cases Intrinsic Safety) and the equipment protection level are usually put in square brackets and are followed by the gas group.

The second specific feature is that the markings for associated apparatus do not include a temperature class.

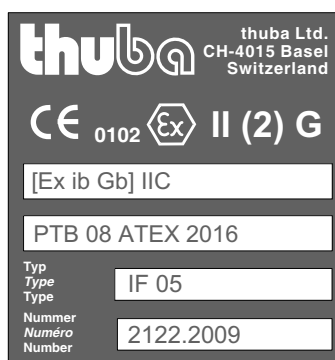


Figure 5: Type label for associated apparatus

## 1.3 IECEx scheme

CE 0102 Ex II 2 G II 2 D		thuba Ltd. CH-4015 Basel Switzerland	
Typ: ML 70d 55 833	50-400 Hz	4725.2008	
BVS 07 ATEX E 164 X	110-240 VAC/DC	PL55 Watt	
IECEx BVS 08.0014 X	Ex d IIC T5 Gb	T <sub>amb</sub> -20 up to +60°C	
	Ex t IIIC T95°C Db	IP 68	
		thuba Ltd. CH-4015 Basel Made in Switzerland +41 61 307 80 00 www.thuba.com	

Figure 6: Type label to IECEx Scheme

The certificates are normally only available online. The marking of equipment is carried out in accordance with Section 1.2 and complies with the

specifications of the IEC series of standards 60079.

The certificate number is made up of the identification code IECEx and the code for the notified body followed by the year and the consecutive certification number.

## 1.2 North America



Figure 7: Type label to UL

### National Electric Code (USA)

Class	Division	Group
Class I	Division 1 Division 2	Group A Acetylene
		Group B Hydrogen
		Group C Ethylene
		Group D Propane
Class II	Division 1 Division 2	Group E Metal Dust
		Group F Coal Dust
		Group G Grain Dust
Class III		Fibers

Table 12: Class and division

NEC 500	NEC 505
Division 1	Zone 0
	Zone 1
Division 2	Zone 2

Table 13: Division and zones

In North America the certificates (for example, UL-listed or UL-recognized) are available online. In addition to the UL logo, the testing authority (notified body) issues an alphanumeric code that is unique to the manufacturer and the product group.

## 2. Operating instructions

It is obligatory for explosion-protected equipment that has been placed on the market to be supplied with operating instructions (and, in certain cases, with supplementary documentation).

In most cases the operating instructions, or at least the part relating to the safety aspects, are reviewed and evaluated by the testing or conformity assessment authority (notified bodies).

Basically, the operating instructions shall – in compliance with the directive – include the following details:

- Intended use
- Conformity with standards
- Specification sheet
- Installation
- Putting into service
- Maintenance
- Servicing and upkeep
- Testing of operability
- Troubleshooting
- Appropriate safety



Figure 8: Operating instructions

It makes sense if the manufacturer not only provides the user with the operating instructions but, at the same time, also with the test certificate. This allows the user to compare the characteristics listed in the certificate with the operating instructions.

Often only sparse information from the manufacturer is available, which would not allow the installation of equipment. If, for example, the data for intrinsically safe or associated equipment is not available, it is not possible to verify the conformity of the interconnection (IEC/EN 60079-14, Paragraph 12.5.2).

### 3. Documents for the placing on the market according to Directive 94/9/EC

#### 3.1 EC Declaration of Conformity

In accordance with Directive 94/9/EC, in addition to the certification described above and the marking and the operating instructions, the placing on the market of equipment for use in potentially explosive atmospheres also requires the Declaration of Conformity. In the declaration of conformity the manufacturer declares at his sole responsibility that the apparatus/equipment complies with the listed directives (explosion protection, electromagnetic compatibility, machinery directive, etc.) and the listed standards

(with title and number, as well as date of issue). In order to be able to issue the declaration of conformity or to place the explosion-protected apparatus on the market, the manufacturer shall be in possession of the “Notification of the recognition of production quality assurance” or the “Notification of the recognition of product quality assurance”.

In case of doubt, the user is well advised to ask the manufacturer for copies of these notifications. Unfortunately products are being placed on the market illegally because the respective notification is missing. The EC Declaration of Conformity should contain adequate information to make it possible to trace back the connection of all the equipment covered by it to the declaration and the certificate.

The EC Declaration of Conformity shall include the following minimum details

- Name and address of the manufacturer or his authorized representative, who issues the declaration

- Details relating to the product (name, type or model number and other important details)
- All relevant directives taken into account
- Precise, complete and explicit details on the reference standards or other normative documents (for example, national technical standards and specifications)
- All additional details that may be required (for example, quality, category), if applicable
- Date of issue of the Declaration of Conformity
- Signature and function or an equivalent designation of the authorized person
- The declaration that the manufacturer and, where applicable, his representative assume sole responsibility for the issue of the Declaration of Conformity.

 <b>Konformitätserklärung</b> Declaration of conformity Déclaration de conformité <b>BVS 07 ATEX E 164 X</b>	
<b>Wir / Nous / We,</b>  erkläre(n) in alleiniger Verantwortung, dass das Produkt / déclarons de notre seule responsabilité que le produit / bearing sole responsibility, hereby declare that the product	<b>thuba AG</b> Postfach 431 CH-4015 Basle Switzerland  Explosionsgeschützte Fluoreszenz-Mand und Messch non-ouchter Luminaires fluorescents antidéflagrants pour / éclairage de machines et pour basideuse Explosionsproof Fluorescent Hand- and Messch no Lamps Typ / Type / Type HL/ML... d . . . . .
auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder normativen Dokument(en) übereinstimmt / accord se rapporte à présente déclaration est conforme aux normes ou aux documents normatifs suivants / related to by this declaration is in conformity with the following standards or normative documents	Titl und/oder Nummer sowie Angabedatum der Norm(en) / titre et/ou no. et date de ces normes / title and/or no. and date of the standards
<b>Bestimmungen der Richtlinie</b> Désignation de la directive / provisions of the directive	
<b>94/9/EC:</b> Geräte und Schutzsysteme zur bestimmungsgemässen Verwendung in explosionsgefährdeten Bereichen <b>94/9/CE:</b> Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles <b>94/9/EC:</b> Equipment and protective systems intended for use in potentially explosive atmospheres	EN 50078-2:2006-07 EN 50078-1:2004-12 EN 50079-1-4:2004-07 EN 50079-1-7:2004-08 EN 51241-0:2006-12 EN 51241-1:2006-12 EN 51241-2:2006-08 EN 50299:2006-09 EN 50299:2001-11 EN 50299-1:2005-03 EN 50299-2:2005-03 EN 51347-1:2005-10 EN 51347-2:2005-08
<b>2004/108/EC:</b> Elektromagnetische Verträglichkeit <b>2004/108/CE:</b> Compatibilité électromagnétique <b>2004/108/EC:</b> Electromagnetic compatibility	EN 61000-6-2:2009-03 EN 61000-6-4:2007-08 EN 55032:2001-06 EN 55035:2009-04
Basel, March 6, 2006  Ort und Datum / lieu et date / place and day	Peter Thümpert Geschäftsführer / Chef / Entrepreneur PH thuba AG Postfach 431 CH-4015 Basle

Figure 8: EC Declaration of Conformity

Furthermore, if it is involved in the conformity assessment procedure, details relating to the notified body shall be included in the EC Declaration of Conformity. If more than one directive applies for the equipment or the protective system, the manufacturer or his authorized representative can, to all intents and purposes, combine all the declarations in a single document.

### 3.2 Presumption of conformity of harmonized standards

Directive 94/9 requires that manufacturers modify their products to conform with the “state of the art” on a regular basis. This means that not only manufacturers and operators, but also supervisory bodies are required to concern themselves with the changes to standards continuously. The list of harmonized standards is published regularly.

Link:

<http://ec.europa.eu/enterprise/newapproach/standardization/harmstds/reflist/atex.html>

The issued EC type examination certificates and conformity declarations are based on the legal basis of Directive 94/9/EC. The application of the harmonized standards entails the assumption that the respective provisions of the Directive for the fulfilment of the fundamental health and safety requirements for the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres in accordance with Annex II of the Directive are observed.

Although it has known of this procedure for years, the industry still finds it extremely difficult to accept and acknowledge this list. The Directive does not allow the application of standards if they have already been withdrawn. The replacement of the original series of standards EN 50014 by the series of standards EN 60079 not only saw the introduction of new numbers, but also the successful introduction of massive amendments compared to the preceding standards. The manufacturer is required to analyse the standards to be applied and decide whether his explosion-protected equipment is affected by the amendments. Depending upon the scope of the amendments, a supplement to an existing certificate or a new EC type examination certificate can be issued.

The period between the ratification of the “new” harmonized standard and the end of the presumption of conformity of the “old” harmonized standard allows the manufacturer enough time to adapt his production and to submit a sample that has been manufactured according to the new harmonized standard to the notified body. Here, the date specifications relating to validity in the preamble to the standard are no longer relevant. If a standard is included in the list of harmonized standards, the presumption of conformity prevails until such times when the date of the termination of the assumption of the presumption of conformity is publicized in the list. The manufacturer can normally reckon with a transition period of 12 to 18 months.

This must be sufficient to make the necessary arrangements for a correct placing on the market of products.

A lot of the manufacturers cannot do away with the previous certificates, as these numbers are listed in various catalogues and publications. This not only makes the work of operators more difficult, but also that of the inspection authorities. In the case of certificates issued on the basis of EN 50014 and for explosive dust atmospheres on the basis of EN 50281-1-1, it is necessary to check whether respective supplements according to the valid statements are available. More often than not, only individual pages of certificates change hands between manufacturers and operators, thus causing further uncertainty. Therefore, it is very important to not only review cover sheets, but complete documents.



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