

The ATEX Guide:

Help for customers, equipment owners and system manufacturers

1. Units and apparatus for application in areas with potentially explosive atmosphere

The owner of equipment or an apparatus to be used in areas with a potentially explosive atmosphere is required to assess whether explosive atmospheric conditions exist, and determine the probability of the risk (EC directive 99/92/EC). Then the owner needs to classify the respective facilities into zones.

On the other hand, the manufacturers of “ explosion-protected” equipment and components are required to classify these into categories. These categories mirror the requirements for the different zones. Equipment in a certain category is suitable/required for use in the corresponding zone.

An explosive atmosphere is a mixture with air of flammable gases, vapours, mists or dusts. To address different ignition sources and the required protective measures, differing zones have been defined for gases (including vapours, mists) and dust. The following table lists the different zones and the corresponding ATEX equipment categories:

Gases		Dusts	
Owner/user	Manufacturer	Owner/user	Manufacturer
Zone 0	Category 1G	Zone-20*	Category-1D*
Zone 1	Category 2G	Zone 21	Category 2D
Zone 2	Category 3G	Zone 22	Category 3D

**According to EN 14986 Zone 20 or category 1 D are not admissible for blowers.*

EN 1127-1 defines various zones, in which a hazardous amount of potentially explosive atmosphere may exist or develop.

The standard EN 14986 for the mechanical section of the blower allows the application of Elektror's products also in areas with potentially explosive atmosphere. This standard has replaced the VDMA guidelines 24169 - Part 1 and 2, which is no longer valid since 07-01-2003 and were valid only in Germany until that date.

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If the explosive atmosphere consists of a mixture with air of flammable or ignitable gases, mists or vapours, one of the following zone definitions may apply:

Zone	Description based on EN 1127-1
0	includes areas in which an explosive atmosphere consisting of a mixture with air of flammable gases, vapours or mists is present continuously or for long periods or frequently
1	includes areas in which an explosive atmosphere consisting of a mixture with air of flammable gases, vapours or mists is likely to occur occasionally
2	includes areas in which an explosive atmosphere consisting of a mixture with air of flammable gases, vapours or mist is not likely to occur in normal operation but, if it does occur, will persist for a short period only

If the explosive atmosphere consists of a mixture with air of flammable or ignitable dusts, one of the following zone definitions may apply:

Zone	Description based on EN 1127-1
20	includes areas in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, or for long periods or frequently
21	includes areas in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur occasionally
22	includes areas in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only

Elektor does not offer devices for zone 0/20.

This information refers to equipment for group II, that is, equipment that is not suitable for operation under firedamp or mining conditions.

2. Temperature classes

Flammable gases, vapours and mists are classified by their ignition temperatures. Be sure to take note of this when using equipment in areas with potentially explosive mixtures.

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The temperature classes explain the highest admissible surface temperature for the equipment.

Temperature class	Highest admissible surface temperature of equipment	Ignition temperatures of flammable substances
T1	450 °C	> 450 °C
T2	300 °C	> 300 °C < 450 °C
T3	200 °C	> 200 °C < 300 °C
T4	135 °C	> 135 °C < 200 °C
T5	100 °C	> 100 °C < 135 °C
T6	85 °C	> 85 °C < 100 °C

The Elektror standard is to supply all of its products for temperature class T3. Applications for temperature class T4 are possible in some cases upon special request.

Glow temperatures:

The glow temperature of a dust deposit is the lowest temperature of a heated surface that will cause ignition of a dust layer of 5 mm resting on it.

The owner of a device or equipment is required to determine in writing the ignition or glow temperatures in his explosion protection document.

Type of ignition protection e: Increased safety (see EN 50019)

To achieve this type of ignition protection the manufacturer has taken measures, which prevent with an increased degree of safety unacceptably high temperatures and sparks or electrical arcs on the internal or the external parts of electrical equipment whose normal operation does not involve high temperature, sparks or arcs.

Type of ignition protection d or de: Flameproof Enclosure (see EN 50018)

To achieve this type of ignition protection, those parts of electrical equipment which could ignite an explosive atmosphere are located inside an enclosure which can withstand the pressure of an explosion of the explosive mixture inside, and which prevents the transmission of the explosion to the explosive atmosphere surrounding the enclosure. For type "de" explosion protection the terminal box is designed with increased safety (see above).

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The equipment group II for type of ignition protection “d” or “de” is further subdivided into the ignition sub-groups IIA, IIB, and IIC (see EN 50018 for flameproof enclosure).

For equipment with drives that are suitable exclusively for operation in conjunction with a frequency converter only type “d” or “de” ignition protection is admissible.

As standard, Elektror supplies products with type “e” ignition protection. Applications for type “de” explosion protection are possible in some cases upon special request.

3. Standards and directives

An equipment owner or system manufacturer may use the following list of ATEX-related standards and directives to gather guidelines for performance of a risk analysis or for definition of zones. We do not claim that the information provided is complete.

European regulations (converted into national laws):

- Directive 92/95/EEC General product safety
- Directive 99/92/EC Explosion protection directive for employers
- Directive 98/37/EC Machinery directive
- Directive 94/9/EC Explosion protection directive (ATEX 95)

Link: www.europa.eu.int, www.mybeuth.de

Standards, excerpt only:

Standards are subject to change. The following listing is published for information purposes only and possibly does not represent the current status. Claims cannot be based on this listing.

- DIN EN 1127-1 Explosion prevention and protection, basic concepts and methodology
- DIN EN 13 463-1 Non-electrical equipment for potentially explosive atmospheres
- EN 14 986 Design of fans working in potentially explosive atmospheres
- DIN EN 60 079-14 Electrical apparatus for explosive gas atmospheres
- DIN EN 61 241-14 Electrical apparatus for use in the presence of combustible dust

Link: www.mybeuth.de

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4. Application aids and organisations

The following is a list of general application aids as well as a list of organisations to which our customers and inquirers may turn for more information. We do not claim that it is complete.

Comparable organisations exist in the individual member states of the EU.

Application aids:

- Die Betriebssicherheitsverordnung – eine Umsetzungshilfe (aid for application of the operational safety regulations - applicable in Germany only)
Überwachungsbedürftige Anlagen, Explosionsschutz, Arbeitsmittel (controlled equipment, explosion protection, apparatus)

Published by:

Staatliches Amt für Arbeitsschutz Essen (State council for occupational safety, Essen, Germany)

Ruhrallee 55, 45138 Essen, www.stafa-essen.nrw.de

Zentrum für Umwelt und Energie der Handwerkskammer Düsseldorf (Centre for environmental protection and energy of the chamber of commerce, Düsseldorf, Germany)

Mülheimer Str. 6, 46049 Oberhausen, www.hwk-duesseldorf.de/uzh

Niederrheinische Industrie- und Handelskammer Duisburg (Chamber of industry and commerce for the lower Rhine area, Duisburg, Germany)

Mercatorstr. 22-24, 47051 Duisburg, www.ihk-niederrhein.de

Organisations:

- TÜV Produktservice GmbH
Gottlieb-Daimler-Str. 7
70794 Filderstadt
Tel.: + 49 (0) 711 70 05 29 5
Fax: + 49 (0) 711 70 05 58 7
www.tuev-sued.de
- IBExU
Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
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Tel.: + 49 (0) 37 31 38 05 0

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www.ibexu.de

- EXAM BBG Prüf- und Zertifizier-GmbH
Dinnendahlstr. 9
44809 Bochum

Tel.: +49 (0) 23 43 69 60
Fax: +49 (0) 23 43 69 61 11

<http://www.bg-exam.de>
- Physikalisch-Technische Bundesanstalt (PTB) (Federal physical-technical institute)
Bundesallee 100
D-38116 Braunschweig


Tel.: + 49 (0) 5 31 59 23 00 6
Fax: + 49 (0) 5 31 59 23 00 8

www.ptb.de
- Intertek GmbH
Nikolaus-Otto-Str. 13
70771 Leinfelden-Echterdingen

Telefon: + 49 (0) 711 27311 - 0
Telefax: + 49 (0) 711 27311 - 559

www.intertek.de

5. ATEX units by Elektor

	Gas:	category 2G/3G, zone 1/2		
	Dust:	category 2D/3D, zone 21/22		
	Installation type:	B	C	D
	Model range			
	RD	X	X	X
	ND	X	X	X
HRD FU*	X	X	X	

**Certified motor frequency converter unit for separate operation of the frequency converter (installed in control cabinet).*

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Notes:

This listing reflects the current state of developments by Elektror. Units for zones 1/21 (category 2G/2D) are under way.

The above mentioned units may also be operated when they are permanently connected to a system on the intake and the pressure end (installation type D). In such cases, however, the same zone definition must apply inside and outside the unit!

In addition to the sources and links listed above our Customer Support is pleased to answer your queries, contact us via support@elektror.com.