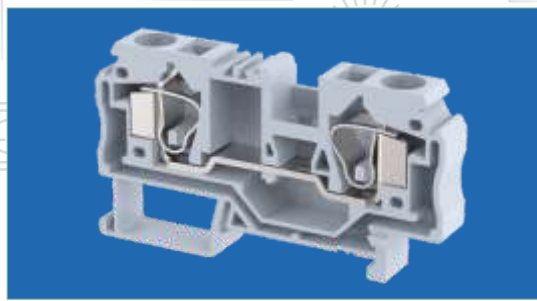
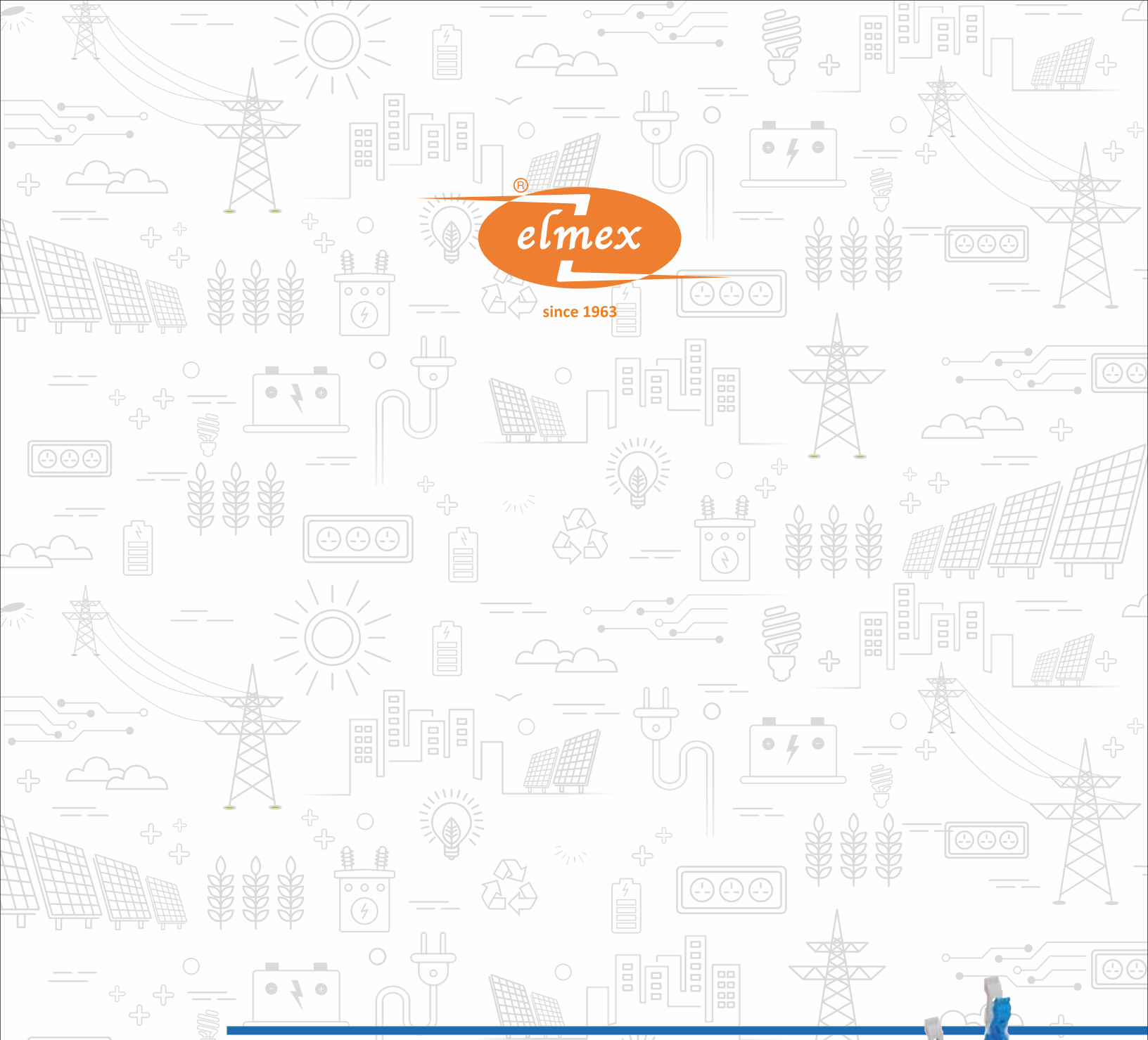




since 1963



Solutions For
Oil & Gas Industry

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INTRODUCTION



'elmex' has distinction of being the first manufacturer in India to make DIN Rail Mounted Terminal Blocks as an import substitute component nearly five and half decades ago. Since then 'elmex' has improved and perfected termination technology to suit Indian applications encompassing industries like Power, Cement, Telecom, Railways, Process and the like. Application requirement and termination solutions are typical to an industry. While 'elmex' provides Termination solutions for all the Industries as mentioned above, offers Terminal Blocks for use in Explosive Atmospheres.

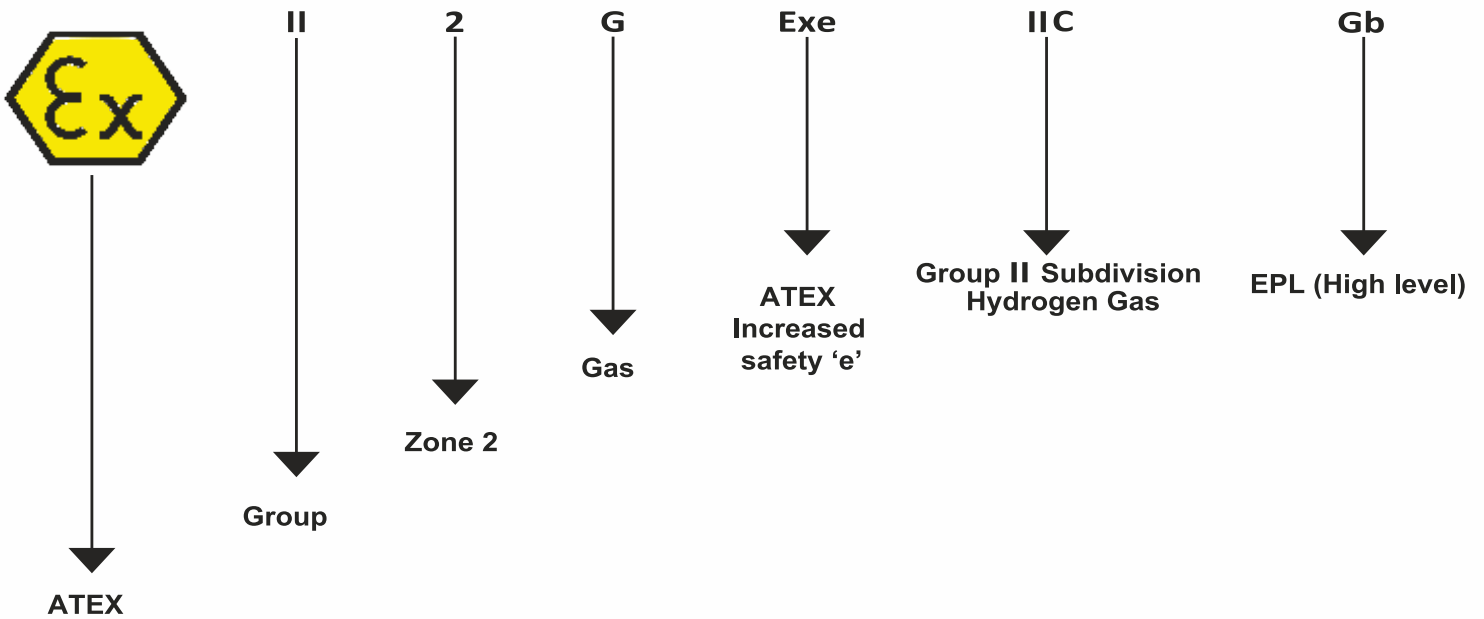
INTRODUCTION



Safety requirements are of paramount importance in industries as the slightest spark or arc can cause an explosion, which can lead to heavy loss of resources. In order to avert such undesirable situations, it is necessary that safety precautions as applicable at various stages of manufacturing in the plant are taken and in place. One of the safe practices is to make the right kind of termination that does not produce an arc or spark and does not heat-up to a level that can ignite surrounding explosive atmospheres. *elmex* terminal blocks are designed, constructed and tested for the safe working requirements as specified in product standard **EN 60079-7** for **increased safety 'e'** and **EN 60079-11** for **Intrinsic safety 'I'**.

ATEX TERMINAL BLOCK MARKINGS

Sr. No.	Description
1	EXPLOSIVE ATMOSPHERES
2	ATEX DIRECTIVES
3	ATEX CERTIFICATION PROCESS
4	ATEX PROTECTION METHODS
5	ELMEX RANGE OF ATEX TERMINAL BLOCKS
6	ATEX CERTIFICATE

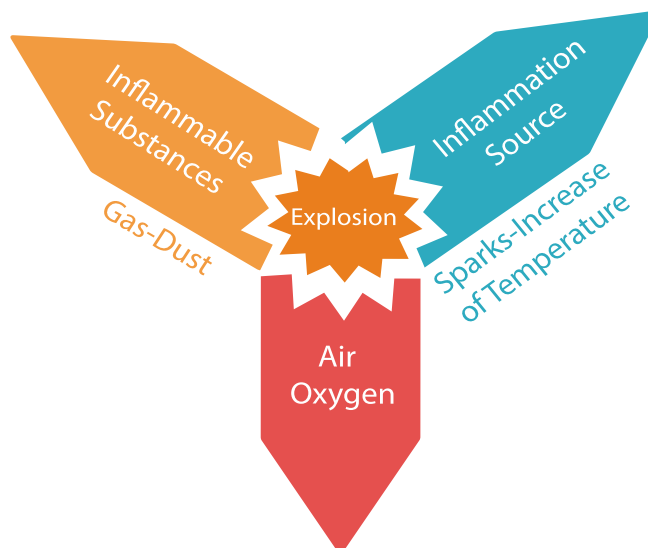


1. EXPLOSIVE ATMOSPHERES

What causes an explosion?

Explosion takes place when the following three conditions co-exist:

- **Inflammable substances** (in the form of liquid such as petrol, diesel, fuel, oil, chemicals, solvents etc.; in the form of inflammable dust such as coal dust, sugar, wood dust, flour etc. and in the form of inflammable gas such as methane, butane, propane, acetylene, vinyl chloride, hydrogen etc.)
- **Source of ignition or inflammation** i.e. arc, or spark or high temperature
- **Oxygen in air**



Industries where explosive atmospheres exist

Risk of fire or explosion is high in certain industries which either produce or use in their processes inflammable materials like inflammable liquid, inflammable dust or inflammable gas.

Indicative list is as under and it is not exhaustive; there could be many others.

- **Refineries**
- **Petrochemicals & chemical industries**
- **Food industries / Sugar industries**
- **Mines and mining industries**
- **Offshore installations**

1. EXPLOSIVE ATMOSPHERES



REFINERIES



FOOD INDUSTRIES / SUGAR INDUSTRIES



PETROCHEMICALS



MINES & MINING INDUSTRIES



OFFSHORE INSTALLATION

2. ATEX DIRECTIVES

ATEX Directive is a term generally referred to as two European Directives for controlling explosive atmospheres, describing what kind of work environment and what types of equipments are allowed in potentially explosive atmospheres.

The two **ATEX Directives**, one for the manufacturer and the other for the user of the equipment are mentioned below :

- **ATEX Equipment Directive 2014/34/EU: Equipment and protective systems intended for use in potentially explosive atmospheres**
- **ATEX Workplace Directive 1999/92/EC : Minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres**

Directive applicable to '*elmex*' terminal blocks is the equipment Directive 2014/34/EU. This Directive is generally referred to as **ATEX 95** and it focuses on the duties of manufacturers.

An explosive atmosphere for the purposes of Directive 2014/34/EU is defined as a mixture :

- a) of flammable substances in the form of gases, vapours, mists or dusts ;
- b) with air ;
- c) under atmospheric conditions,
- d) In which after ignition, the combustion spreads to the entire unburnt mixture [it has to be noted that sometimes, (mainly with dust), the whole quantity of the combustible material is not always consumed by the combustion].



An atmosphere, which could become explosive due to local and/or operational conditions, is called a potentially explosive atmosphere. Products, falling under the **Directive 2014/34/EU**, are specially designed for this potentially explosive atmosphere only.

It is important to note that products are not covered by Directive 2014/34/EU where they are intended for use in or in relation to mixtures which might potentially be explosive but one or more of the defining elements (a) to (d) above are not present.

For Example:

A product within a potentially explosive mixture without the presence of air is not in scope of the Directive. Special processes of this type requires equipment that has been specially designed for the risks, as equipment for use in potentially explosive atmospheres may pose an ignition hazard for mixtures under non-atmospheric conditions.

2. ATEX DIRECTIVES

As per ATEX Directive, hazardous areas are classified in consideration of the following:

■ **Location:** This is classified in two groups :-

Group 1 for Mines and

Group 2 for places other than Mines

■ **Equipment Class:** This is further categorization of the above Groups. The categories are as under:

Mines : Category M1 & M2

Other Places: Category 1, 2 & 3

■ **Zone :** Explosive atmospheres are classified depending on the type (Gas or Dust) of explosive atmospheres and its duration of occurrence as defined in the standard.

They are as under :

Gas (G)

Dust (D)

What are hazardous areas?

Hazardous area (on account of explosive gas atmospheres) : An area in which an explosive gas atmospheres is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of equipment.

Non-Hazardous area (on account of explosive gas atmospheres) :

An area in which an explosive gas atmosphere is not expected to be present in quantities such as to require special precautions for the construction, installation and use of equipment.

Zones

As mentioned before, hazardous areas are classified into zones based upon the frequency of the occurrence and duration of an explosive gas atmosphere as follows :-

Zone 0: An area in which an explosive gas atmosphere is present continuously or for long periods or frequently.

Zone 1: An area in which an explosive gas atmosphere is likely to occur in normal operation occasionally

Zone 2: An area in which an explosive gas atmosphere is not likely to occur in normal operation but if it does. occur, will persist for a short period only.

2. ATEX DIRECTIVES

Various Sources have tried to place time limits on these zones and the most common values used are as under :-

Zone 0 : Explosive atmosphere for more than 1000 hrs. per year

Zone 1 : Explosive atmosphere for more than 10 but less than 1000 hrs. per year

Zone 2 : Explosive atmosphere for less than 10 hrs. per year but still sufficiency likely as to require control over ignition sources

Details as explained above are tabulated below for ready reference and inference

EN 60079-0		Directive 2014/34/EU		EN 60079-10-X
EPL Group	Group	Equipment Group	Equipment Category	Zones
Ma	I	I	M1	NA
Mb			M2	
Ga	II	II	1G	0
Gb			2G	1
Gc			3G	2
Da	III		1D	20
Db			2D	21
Dc			3D	22

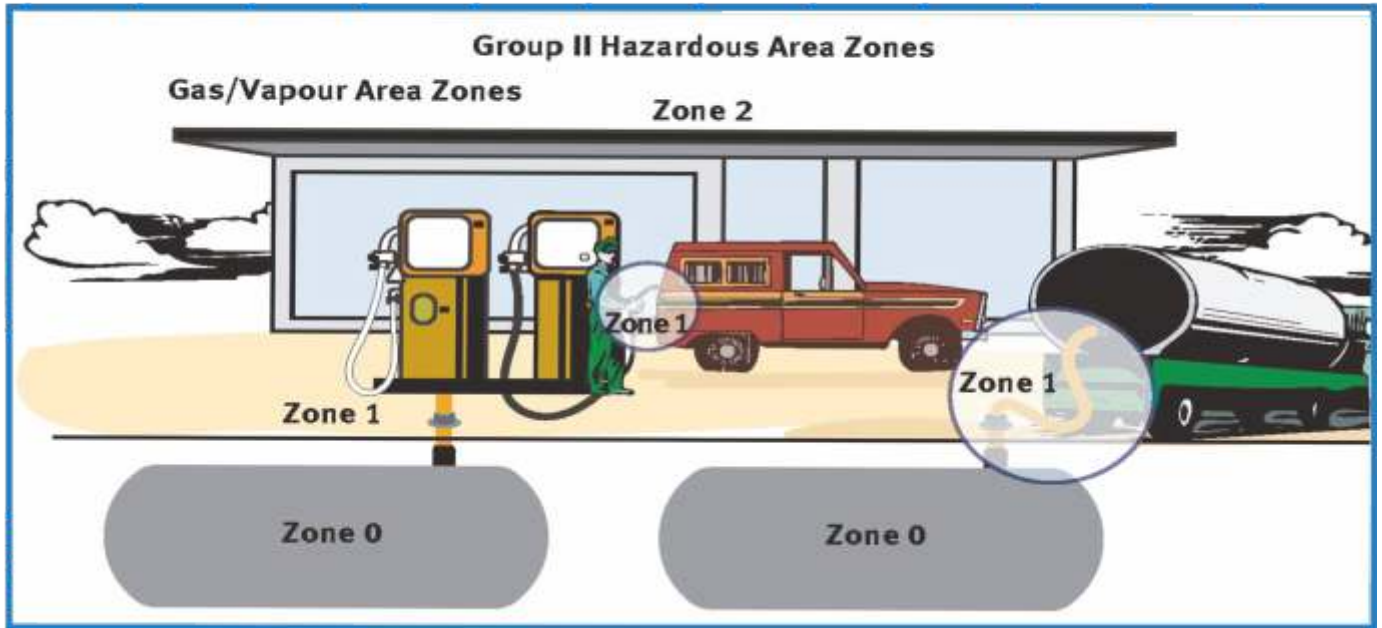
M denotes Mines

G denotes Gas

D denotes Dust

2. ATEX DIRECTIVES

Example of Zone Classification



Zone 0 : Petrol vapour - air mixture is always present within the underground tank, above the liquid surface level. Thus, in this area, an explosive gas atmosphere is present continuously or for long periods.

Zone 1 : While re-filling the underground tank or the vehicle, petrol vapour - air mixture which is explosive is present in areas of the underground tank lid and the vehicle tank lid. But explosive gas atmospheres are not continuously present in these areas.

Zone 2 : This is the area where explosive gas atmosphere in the form of petrol vapour - air mixture is unlikely to occur and if it occurs, it is for a short period only.

3. ATEX CERTIFICATION PROCESS

ATEX Certification process comprises of two types of Certification

The EC Type of Examination Certificate: This certification indicates that the products covered in certification meet the requirements of applicable standards for particular types of protection as well as the validity of the technical construction file established by the manufacturer and the assessment of **EHSRS - Essential Health and Safety Requirement** as listed in **ATEX Directive**

Product Quality Assurance Notification: This certification refers to a Quality System Audit or assessment of the production or product quality assurance system established by the organization. The certification indicates that products covered in **EC Type Examination** shall continue to meet the type examination requirements as per **ATEX Directive**.

Inspection or Audit for Product Quality Assurance Notification is carried out by a Notified Body as decided by the respective member state. These notified bodies are given unique numbers by which they can be readily identified.

The Product Quality Assurance Notification has validity for three years and the manufacturer’s quality system is subject to **periodic audit every year**. In addition, **whilst the notified body** has various responsibilities under the Directive, the manufacturer (or authorized representative) always remains responsible for the compliance of the equipment.



4. ATEX PROTECTION METHODS

There are different types of protection methods which are to be implemented so that equipment and electrical components can be used in potentially explosive atmospheres.

Applicable ATEX standards and basic safety principles are summarized as under for certain protection methods.

ATEX Standard and Protection Method	Safety Principle
EN/IEC 60079-1 - Flameproof enclosures “d”	Explosion is contained within explosion-proof enclosure
EN/IEC 60079-2- Pressurized enclosures “p”	The entry of a surrounding atmosphere into the enclosure of the electrical apparatus is prevented by maintaining a protective gas, inside the enclosure, at a higher pressure than the surrounding atmosphere
EN/IEC 60079-7- Increased Safety “e”	Protection to give increased security against possibility of excessive temperatures and of the occurrence of arcs and sparks in normal service or under specified abnormal conditions
EN/IEC 60079-11-Intrinsic safety “I”	Reduction of energy to so low level that even Arc or Sparks cannot Ignite explosive atmospheres. In other words, an intrinsically safe system is one in which energy levels are so low they cannot cause explosion
EN/IEC 60079-15- Type of protection “n”	This protection prevents sparks or any exceeding surface temperature from occurring itself in normal situation

There are other protection methods also as mentioned below :

EN/IEC 60079-5-Powder filling “q”

EN/IEC 60079-6-Oil immersion “o”

EN/IEC 60079-18-Encapsulation “m”

4. ATEX PROTECTION METHODS

01

'elmex' Terminal Blocks are evaluated and certified for increased safety “e” type of protection “n” and intrinsic safety “i”

02

'elmex' Terminal Blocks certified to the above referred standards are constructed to comply with more stringent technical requirements as compared to other standards applicable to terminal blocks

03

'elmex' increased safety Terminal Blocks find application mainly with flame - proof enclosures “d”

04

Intrinsic protection is a common method of protection in instrumentation and control circuits. It is the only protection method that can be applied in Zone 0 or Zone 20, where the presence of explosive atmospheres is permanent. Generally, terminal blocks or components used in intrinsically safe circuits are in blue colour

05

It is necessary that terminal blocks for use in explosive atmospheres are installed after requisite understanding about its operating, installation and normal service conditions as recommended by the manufacturer

06

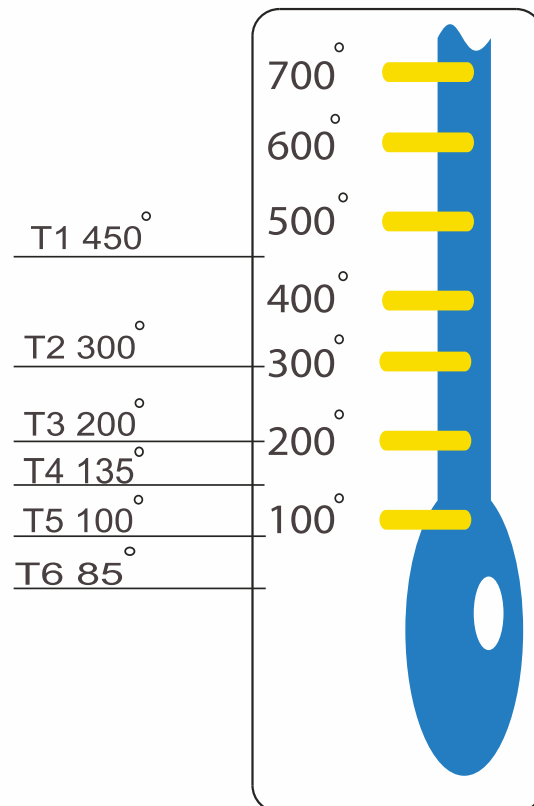
'elmex' Terminal Blocks are certified for the most severe temperature class T6 for which the maximum surface temperature limit is 85 degrees C.

4. ATEX PROTECTION METHODS

Table given below shows maximum surface temperature limits for Group II electrical equipment

Classification of maximum surface temperatures for Groups II Electrical Equipment

Temperature Class	Maximum Surface Temperature Degree C.
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85



5. ATEX TERMINAL BLOCKS

'elmex' Terminal Blocks are certified for Group II application which is intended for use in places with an explosive gas atmosphere other than mines susceptible to firedamp and are suitable for an ambient temperature range of - 20 to +40°C and temperature class T6.

Electrical equipment of Group II is subdivided according to the nature of the explosive gas atmosphere for which it is intended.

Group II Subdivisions

IIA - Typical Gas is Propane

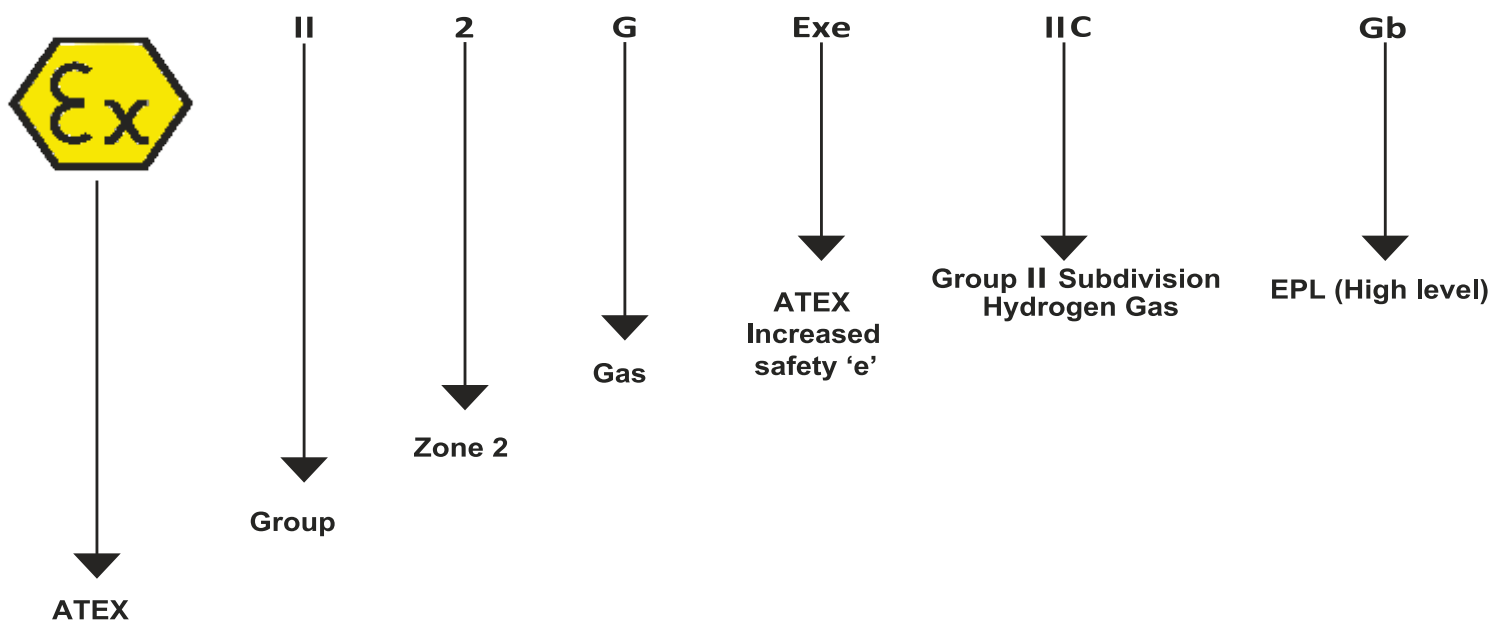
IIB - Typical Gas is Ethylene

IIC - Typical Gas is Hydrogen

This subdivision is based on the minimum ignition current ratio of the explosive gas atmosphere in which the equipment may be installed.

Group IIC is the most severe gas group. Gases in this group can be ignited easily.

Elmex Terminal Blocks are certified for Gas Group IIC.



5. ATEX TERMINAL BLOCKS

elmex TERMINALS FOR HAZARDOUS AREAS (ATEX) 

RATINGS FOR ATEX

Terminal	Rated Voltage	Maximum Rated Current	Conductor Size (sq. mm)			Torque
			Rated c/s	Flexible	Rigid	
KUT 2.5	400 V	20 A	2.5	0.5 - 2.5	0.5 - 4	0.5 Nm
KUT 4	500 V/400 V G 32	32 A	4	0.5 - 4	0.5 - 6	0.5 Nm
KUT 6	630 V/400 V G 32	41 A	6	0.5 - 6	0.5 - 10	0.8 Nm
KUT 10	500 V/ 250 V G 32	57 A	10	1.5 - 10	1.5 - 16	1.2 Nm
KUT 16	630 V/500 V G 32	76 A	16	6.0 - 16	6.0 - 25	1.2 Nm
KUT 25	630 V/500 V G 32	101 A	25	6.0 - 16	6.0 - 25	2.3 Nm
KUT 35	630 V/500 V G 32	125 A	35	10 - 35	10 - 35	3.0 Nm
KUT 50	1000 V	150 A	50	16 - 50	16 - 70	8.0 Nm
KUT 95	1000 V	232 A	95	25 - 95	25 - 120	20.0 Nm
ET 4	....	....	4	0.5 - 4	0.5 - 4	0.5 Nm
ET 6	....	....	6	1.5 - 6	1.5 - 10	0.8 Nm
ET 10	....	....	10	1.5 - 10	1.5 - 16	1.2 Nm
ET 16	....	....	16	6.0 - 16	6.0 - 25	1.2 Nm
ET 35	....	....	35	6.0 - 35	6.0 - 35	3.0 Nm
ET 50	....	....	50	16 - 50	16 - 50	8.0 Nm
KU2D 4	250 V	21 A	2.5	0.5 - 2.5	0.5 - 4	0.4 Nm
KU2D4S	250 V	21 A	2.5	0.5 - 2.5	0.5 - 4	0.4 Nm
KUDD 4	250 V	21 A	2.5	0.5 - 2.5	0.5 - 4	0.4 Nm
DU3D 4	200 V	18 A	2.5	0.2 - 2.5	0.2 - 4	0.5 Nm
DUSD 4	200 V	18 A	2.5	0.2 - 2.5	0.2 - 4	0.5 Nm
KULT 4	750 V	32 A	4	0.5 - 4	0.5 - 6	0.5 Nm
KULT 6	750 V	41 A	6	0.5 - 6	0.5 - 10	1.4 Nm
KULT 1	1000 V/630 V-TS32	57 A	10	1.5 - 10	1.5 - 16	1.5 Nm
KUT 2.5 N	800 V	20 A	2.5	0.5 - 2.5	0.5 - 4	0.4 Nm
KUT 4N	630 V	24 A	4	0.5 - 4	0.5 - 4	0.5 Nm
KUT 6N	630 V/ 500 G-32	35 A	6	0.5 - 6	0.5 - 10	0.8 Nm

5. ATEX TERMINAL BLOCKS

elmex TERMINALS FOR HAZARDOUS AREAS (ATEX) 

RATINGS FOR ATEX

Terminal	Rated Voltage	Maximum Rated Current	Conductor Size (sq. mm)			Torque
			Rated c/s	Flexible	Rigid	
KUT10N	630 V/500 V G 32	57 A	10	1.5 - 10	1.5 - 16	1.2 Nm
ETN 4	....	....	4	0.5 - 4	0.5 - 4	0.5 Nm
ETN 6	....	....	6	0.5 - 6	0.5 - 10	0.8 Nm
ETN 10	....	....	10	1.5 - 10	1.5 - 16	1.2 Nm
KAT M3	630 V	20 A	2.5	0.5 - 2.5	0.5 - 2.5	0.5 Nm
KAT M4	630 V	57 A	10	0.5 - 10	0.5 - 10	1.2 Nm
KAT M5	630 V/500 V G 32	76 A	16	0.5 - 16	0.5 - 16	2.0 Nm
KBT M4	630 V/500 V G 32	57 A	10	0.5 - 10	0.5 - 10	1.2 Nm
KBT M5-15	630 V/500 V G 32	57 A	16	0.5 - 16	0.5 - 16	2.0 Nm
KBT M6	800 V/630 V G 32	76 A	25	6 - 25	6 - 25	2.5 Nm
OAT 2.5	800 V/630 V G 32	20 A	2.5	0.5 - 2.5	0.5 - 2.5	0.5 Nm
OAT 6	630 V/400 V G 32	28 A	6	0.5 - 6	0.5 - 6	1.5 Nm
KUDF 4	420 V	5 A	2.5	0.5 - 2.5	0.5 - 4	0.4 Nm
KUDDF 4	420 V	5 A UT/20 A LT	2.5	0.5 - 2.5	0.5 - 4	0.4 Nm
KUF 10	750 V	10 A	10	0.5 - 10	0.5 - 10	1.4 Nm
KUFH 4	750 V	5 A	4	0.5 - 4	0.5 - 6	0.5 Nm
UBDF 4	750 V	4 A	4	0.5 - 4	0.5 - 6	0.5 Nm
KLTD M4	800 V/630 V G 32	32 A	6	0.5 - 6	0.5 - 6	1.2 Nm
OAT 6T	500 V	20 A	6	0.5 - 6	0.5 - 6	1.5 Nm
KUTSD 6	400 V	35 A	6	0.5 - 6	0.5 - 10	1.4 Nm
KULTD 6	550 V*	32 A	6	0.5 - 6	0.5 - 10	1.0 Nm
KUTD 10	630 V/ 400 V G 32	61 A	10	1.5 - 10	0.5 - 16	1.2 Nm
DPBB 50	1000 V	150 A	50	10 - 50	10 - 50	3.0 Nm
DPBB 70	1000 V	192 A	70	10 - 70	10 - 70	3.0 Nm
DPBB 120	1000 V**	250 A	120	25 - 120	25 - 120	6.0 Nm

* Without test probes

** With partition plate

5. ATEX TERMINAL BLOCKS

'elmex' TERMINALS FOR HAZARDOUS AREAS (ATEX) 

RATINGS FOR ATEX

Terminal	Rated Voltage	Maximum Rated Current	Conductor Size (sq. mm)			Torque
			Rated c/s	Flexible	Rigid	
EBT 2.5	....	....	2.5	0.2 - 2.5	0.2 - 4	0.5 Nm
EBT 4	....	....	4	0.5 - 4	0.5 - 6	0.5 Nm
EBT 6	....	....	6	1.5 - 6	1.5 - 10	1.2 Nm
EBT 4TWIN	....	....	4	0.2 - 4	0.2 - 6	0.5 Nm
SUT 4	320 V	24 A	2.5	0.5 - 2.5	0.5 - 4	0.5 Nm
NET 4	250 V	32 A	4	0.2 - 4	0.2 - 4	0.5 Nm
MBT 4	400 V	24 A	2.5	0.2 - 2.5	0.2 - 4	0.5 Nm
PET 4	400 V	30 A	4	0.2 - 4	0.2 - 4	0.5 Nm
DST 2.5	500 V	20 A	2.5	0.5 - 2.5	0.5 - 2.5	N.A
DST 4	500 V	24 A	4	0.5 - 4	0.5 - 4	N.A
DST 6	630 V	35 A	6	0.5 - 6	0.5 - 6	N.A
DST 10	630 V	45 A	10	1.5 - 10	1.5 - 10	N.A
SCT 2.5	630 V	20 A	2.5	0.5 - 2.5	0.5 - 2.5	N.A
SCT 4	630 V	24 A	4	0.5 - 4	0.5 - 4	N.A
DCT 2.5 - 1x2	630 V	15 A	2.5	0.5 - 2.5	0.5 - 2.5	N.A
DCT 2.5 - 2x2	630 V	15 A	2.5	0.5 - 2.5	0.5 - 2.5	N.A
MCT 2.5	400 V	20 A	2.5	0.5 - 2.5	0.5 - 2.5	N.A
MCT 2.5P4	400 V	20 A	2.5	0.5 - 2.5	0.5 - 2.5	N.A
MCT 4	400 V	24 A	4	0.5 - 4	0.5 - 4	N.A
KU2D4S	275 V	21 A	2.5	0.5 - 2.5	0.5 - 4	0.4 Nm
CST 70	800 V***	192 A	70	10 - 70	10 - 70	6 Nm
CST 185	800 V***	353 A	185	10 - 185	10 - 185	14 Nm

*** With end plate

6. ATEX CERTIFICATE



DNV

[1] **EU-TYPE EXAMINATION CERTIFICATE**

[2] Component Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

[3] EU-Type Examination Certificate Number: **Presafe 19 ATEX 14368U** **Issue 1**

[4] Component: **Terminal Blocks**

[5] Manufacturer: **Elmex Electric Private Limited**

[6] Address: **134/135, G.I.D.C, Industrial estate Por, Raman
Gamdi Vadodara – 391 243,
Gujarat, INDIA.**

[7] This component and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] DNV Product Assurance AS, notified body number 2460, in accordance with Article 17 and Article 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this component has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in confidential reports listed in item 16.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with: **EN 60079-0:2018 and EN 60079-7: 2015**

Where additional criteria beyond those given here have been used, they are listed at item 16 in the Schedule.

[10] The sign "U" placed behind the certificate number indicates that this certificate should not be confounded with certificates issued for equipment or protective systems. This partial certification may be used as a basis for certification of an equipment or protective systems.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified component in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this component. These are not covered by this certificate.

[12] The marking of the component shall include the following:





Date of issue:
2021-04-29





Ståle Sandstad
For DNV Product Assurance AS
The Certificate has been digitally signed.
See www.dnv.com/digital/signatures for info.

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DNV Product Assurance AS, Veritasveien 3, 1363 Høvik, Norway, Tel +47 67 57 88 00, www.dnv.com

ICP-4-5+1-ATEX-F3, rev 1
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