HAZARDOUS AREAS · ATEX / IECEX MARKING

EX MARKING DECODER

دليل قراءة علامة Ex على معدات المناطق الخطرة

READ A MARKING IN SIX PARTS

II 2 G | Ex | db eb | IIC | T4 | Gb

- **II 2 G** ATEX: group II (surface), category 2, gas
- **Ex** explosion protected
- **db eb** protection types: flameproof with increased-safety terminals
- **IIC** gas group: safe for all gases incl. hydrogen
- **T4** surface stays below 135 °C
- **Gb** equipment protection level: Zone 1 and 2

PROTECTION TYPES (IEC 60079)

CODE	WHAT IT DOES	ALLOWED IN
d / db	Flameproof enclosure: contains an internal explosion	Zone 1, 2
e / eb	Increased safety: no sparks or hot spots in normal use	Zone 1, 2
ia / ib / ic	Intrinsic safety: energy too low to ignite	ia Zone 0; ib Zone 1; ic Zone 2
p / pxb, pyb, pzc	Pressurised: clean air or gas keeps the atmosphere out	Zone 1, 2
m / ma, mb, mc	Encapsulation in resin	ma Zone 0; mb Zone 1; mc Zone 2
ec / nA, nR	Non-sparking, restricted breathing (older n marks)	Zone 2
q, o	Powder filling, liquid immersion	Zone 1, 2
t / ta, tb, tc	Dust protection by enclosure	ta Zone 20; tb Zone 21; tc Zone 22

GAS AND DUST GROUPS

GROUP	TYPICAL SUBSTANCES	NOTE
IIA	Propane, petrol, diesel vapour, methane (surface)	Least demanding
IIB	Ethylene, town gas, hydrogen sulphide	Covers IIA
IIC	Hydrogen, acetylene, carbon disulphide	Covers IIA and IIB
IIIA	Combustible flyings (fibres)	Dust
IIIB	Non-conductive dust	Covers IIIA
IIIC	Conductive (metal) dust	Covers IIIA and IIIB

TEMPERATURE CLASSES

CLASS	MAX SURFACE TEMPERATURE
T1	450 °C
T2	300 °C
T3	200 °C
T4	135 °C
T5	100 °C
T6	85 °C

The class must be below the ignition temperature of the gas present. T4 suits most hydrocarbons; carbon disulphide needs T6.

ZONES, PROTECTION LEVELS AND EQUIVALENTS

ZONE	HAZARD	EPL	ATEX CATEGORY	US (NEC 500)
Zone 0	Gas present continuously or for long periods	Ga	II 1 G	Class I Div 1
Zone 1	Gas likely in normal operation	Gb	II 2 G	Class I Div 1
Zone 2	Gas only briefly, in abnormal conditions	Gc	II 3 G	Class I Div 2
Zone 20	Dust cloud continuously	Da	II 1 D	Class II Div 1
Zone 21	Dust cloud likely in normal operation	Db	II 2 D	Class II Div 1
Zone 22	Dust cloud only briefly	Dc	II 3 D	Class II Div 2

Ambient (Ta): without a Ta mark the equipment is rated −20 °C to +40 °C. Outdoors in Saudi Arabia ask for Ta +55 °C or +60 °C.

Higher covers lower: IIC equipment can be used where IIB or IIA is needed, T6 where T4 is needed, Gb in Zone 2.

X and U: a certificate number ending in X has special conditions of use; U is a component certificate, not a complete product.

Group I is for underground mines with firedamp (Ma, Mb), not for surface plants.

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For guidance: the area classification and the certificate decide the equipment.