

# MARKING OF ELECTRICAL EQUIPMENT FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERE



CLASSIFICATION OF EQUIPMENT					
Flammable material	Conditions	Hazardous classification	Equipment group acc. to IEC 60079-0	Equipment protection level "EPL" acc. to IEC 60079-0	Equipment category acc. To 94/9/EC
Methane carbon dust (mines)	Operation where there is a risk of explosion		I	Ma	M1
	Disconnection where there is a risk of explosion		I	Mb or Ma	M2 or M1
Gases and vapors	Presents continuously or for long periods or frequently (1000 hour/year)	Zone 0	II	Ga	1G
	Occasional in normal operation of equipment (10 hour/year 1000)	Zone 1	II	Gb or Ga	2G or 1G
	Occasional in abnormal operation of equipment (10 hour/year)	Zone 2	II	Gc or Gb or Ga	3G or 2G or 1G
Dusts	Presents in form of cloud continuously or for long periods or frequently	Zone 20	III	Da	1D
	Occasionally forms a cloud in normal condition	Zone 21	III	Db or Da	2D or 1D
	Occasional forms a cloud in abnormal condition	Zone 22	III	Dc or Db or Da	3D or 2D or 3D

CLASSIFICATION OF GASES AND VAPORS						
Gases and Vapors grouping			Ignition temperature of environment	Temperature class	Maximum surface temperature of equip-	permissible temperature class of equipment
II A	II B	II C				
ammonia, methane, ethane, propane	town gas, acrylonitrile	hydrogen	Ti 450 °C	T1	450 °C	T1 to T6
ethyl alcohol, cyclohexane, n-butane	ethylene, ethylene oxide	acetylene	300 °C Ti 450 °C	T2	300 °C	T2 to T6
gasoline, n-hexane	ethylene glycol, hydrogen sulphide		200 °C Ti 300 °C	T3	200 °C	T3 to T6
acetaldehyde	ethyl-ether		135 °C Ti 200 °C	T4	135 °C	T4 to T6
			100 °C Ti 135 °C	T5	100 °C	T5 to T6
		sulphide of carbon	85 °C Ti 100 °C	T6	85 °C	T6

DUST GROUPING	
Marking	Dust
III A	Combustible fibers, flying
III B	Non-conductive dust
III C	Conductive dust

NOTIFIED BODIES OF ATEX		
Code number	Notified Body	Country
0102	PTB	GERMANY
0163	LOM	SPAIN
0344	KEMA	NETHERLAND
0518	SIRA	UK

Ex. CERTIFICATE CONDITIONS	
Marking	Conditions
Without	Equipment can be used without restriction
X	Special condition of use
U	Partial certification for component

INGRESS PROTECTION (IP)	
Code BS EN 60529 (IEC 60529)	
First digit	Second digit
0- No special protection	0- No special protection
1- Objects > 50 mm diameter (e.g. part of hand)	1- Vertically dripping water
2- Objects > 12.5 mm diameter (e.g. finger)	2- Vertically dripping water when enclosure tilted by 15°
3- Objects > 2.5 mm diameter (e.g. tool)	3- Sprayed water up to 60° from the vertical
4- Objects > 1 mm diameter (e.g. wire)	4- Sprayed water from all directions
5- Dust protected	5- water jet
6- Dust tight	6- Powerful water jet
	7- Temporary submersion to a depth of 1m
	8- Extended submersion to a depth > 1m

**Gas** CE 0163 II 2G Ex d IIB+H2 T4 GB LOM 15 ATEX 3011 U IP 66

**Dust** CE 0163 II 2D Ex tb IIIC T 100°C Db LOM 15 ATEX 2014

PROTECTION CONCEPT								
Application	Flammable material	Principle	Type of protection	Symbol	a: very high level of protection	b: high level of protection	c: enhanced level of protection	Standard
any applications	Gases, Vapors, Dusts		general requirements		-	-	-	IEC EN 60079-0
Control station, Motors, Fuses, switchgear	Gases, Vapors	propagation of an explosion inside to the outside is excluded	flameproof enclosure		-	Ex d/ Ex db	-	IEC EN 60079-1
Junction box, lighting, motors	Gases, Vapors	avoidance of arcs, sparks and excessive temperature	increased safety		-	Ex e/ Ex eb	-	IEC EN 60079-7
Junction box, lighting, motors, switchgear, plugs	Dusts	explosive dust atmosphere keep at a distance from the ignition source	protection by enclosure		Ex ta	Ex tb	Ex tc	IEC EN 61241-1 IEC EN 60079-31
measurement and control technology, automation technology	Gases, Vapors	limitation of energy as well as arcs and temperature	intrinsic safety		Ex ia	Ex ib	Ex ic	IEC EN 60079-11 IEC EN 60079-25 IEC EN 60079-27
switchgear, motor, analyzer, computer	Gases, Vapors	explosive atmosphere keep at a distance from the ignition source	pressurization			Ex px Ex py	Ex pz	IEC EN 60079-2
	Dusts					Ex pb	Ex pc	IEC EN 61241-4
coil of motors or relay, solenoid valve, connection system	Gases, Vapors	explosive atmosphere keep at a distance from the ignition source	encapsulation		Ex ma	Ex mb	-	IEC EN 60079-18
	Dusts						-	-
transformer, relay control station, magnetic contactor	Gases, Vapors	explosive atmosphere keep at a distance from the ignition source	oil immersion		-	Ex o/ Ex ob	-	IEC EN 60079-6
capacitor, transformers, relays	Gases, Vapors	propagation of an explosion inside to the outside is excluded	powder filling		-	Ex q/ Ex qb	-	IEC EN 60079-5
all applications for zone 2	Gases, Vapors	all protection principles for zone 2	"n" type of protection				Ex nA	IEC EN 60079-15
							Ex nC	
							Ex nR	
							Ex nL	