

HAZARDOUS AREAS

GROUPING OF ELECTRICAL APPARATUS FOR POTENTIALLY EXPLOSIVE ATMOSPHERES

GROUP I: ELECTRICAL APPARATUS FOR MINING, TYPIFIED BY THE GAS METHANE (FIREDAMP)

GROUP II: ELECTRICAL APPARATUS FOR SURFACE INDUSTRY

Group II may be further divided into three gas groups:

IIA - Representative Gas Propane

IIB - Representative Gas Ethylene

IIC - Representative Gas Hydrogen

Gas Group IIC covers the most hazardous gases and as such, apparatus marked IIC may be used in IIA and IIB applications.

CLASSIFICATIONS

	GAS	DUST	
ZONE	0	20	Zone in which an explosive atmosphere is constantly present, or present for long periods. (Rough guide: hazard present for more than 1000 hours/year).
ZONE	1	21	Zone in which an explosive atmosphere is likely to occur in normal operation. (Rough guide: hazard present between 10 & 1000 hours/year).
ZONE	2	22	Zone in which an explosive atmosphere is not likely to occur in normal operation and if it occurs it will exist only for a short time. (Rough guide: hazard present for less than 10 hours/year).
Guidance in the classification of hazardous areas is given in BS EN 60079-10-1:2009, IEC79-10.			

PROTECTION CONCEPTS

STANDARD IEC/EN		CODE		PROTECTION CONCEPT	ZONE	
GAS	DUST	GAS	DUST		GAS	DUST
60079-0	61241-0			General Requirements		
60079-1		Ex d		Flameproof	1	
	61241-1		Ex tD	Enclosure		20/21/22
60079-2	61241-2	Ex p	Ex pD	Pressurised	1	21/22
60079-5		Ex q		Powder Filled	1	
60079-6		Ex o		Oil Filled	1	
60079-7		Ex e		Increased Safety	1	
60079-11	61241-11	Ex ia	Ex iaD	Intrinsic Safety	0	20
		Ex ib	Ex ibD		1	21
60079-15		Ex nA		Non Sparking	2	
		Ex nL		Energy Limited		
		Ex nR		Restricted Breathing		
		Ex nC		Enclosed Break		
		Ex nP		Pressurisation		
60079-18	61241-18	Ex ma	Ex maD	Encapsulation	0	20
		Ex mb	Ex mbD		1	21

*In some countries the methods of protection a & q are allowed in Zone 1.

TEMPERATURE CLASS

Explosion protected electrical apparatus must be designed and tested to ensure that the maximum surface temperature of any part(s) of the products are below the ignition temperature of the explosive atmosphere concerned. Group II electrical apparatus is divided into temperature classes according to the maximum permissible surface temperature of the apparatus. The preferable classification of temperatures is given in the table on the right.

Unless otherwise specified the maximum ambient temperature is taken to be 400°C.

TEMPERATURE CLASS	MAXIMUM SURFACE TEMPERATURE (DEGREES CELSIUS)
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85