

For Europe: CENELEC / ATEX Directive

Gas Group
 Temperature
 Classification
 ATEX

Typical material	Apparatus group	Max. surface temperature	T- Class	CE Marking Directive	Basic requirements
Methane	I Mining (M1/M2)	450°C	T1	Low Voltage Directive	Electrical safety of equipment, voltage ranges 50-1000AC, 75-1500 DC
Propane	IIA	300°C	T2		
Ethylene	IIB Surface	200°C	T3	EMC Directive	Electromagnetic emissions and immunity
Hydrogen	IC Applications	135°C	T4	Machinery Directive	Mechanical and electrical safety
Acetylene	IIC	100°C	T5		
All Gases	II	85°C	T6	Atex Directive	Hazardous Area Equipment (mandatory from 1st July 2003 Currently accepted)

EEx ed IIB T4



**** 4 Digit body number

Protection Concepts	Symbol	Zone	Standard	How it works	Category
Increased Safety	Ex e	1 & 2	EN 50019	No arcs, sparks or hot surfaces	2
Non-sparking	Ex nA	2	EN 50021		3
Flameproof	Ex d	1 & 2	EN 50018	Contain the explosion and quench flame	2
Enclosed Break	Ex nW	2	EN 50021		3
Quartz/Sand Filled	Ex q	1 & 2	EN 50017		2
Intrinsic Safety	Ex ia	0,1 & 2	EN 50020	Limit energy of sparks; limit the temperature	1
	Ex ib	1 & 2	EN 50039		2
Energy Limitation	Ex nL	2	EN 50021		3
					2
Pressurised	Ex p	1 & 2	EN 50016	Keep the flammable gas away from any	2

Simplified Pressurisation	Ex nP	2	EN 50021	away from any hot surfaces and ignition Capable equipment	3
Encapsulation	Ex m	1 & 2	EN 50028		2
Oil Immersion	Ex o	1 & 2	EN 50015		2
Restricted breathing	Ex nR	2	EN 50021		3
Special	Ex s	0*,1&2	EHSR (ATEX)	Any Proven Method	1,2&3
		* Label must indicate Zone 0			

Classification	Criteria For Zone	ATEX Marking	
Zone 0	Flammable material always present or for long periods (e.g.1000 hours or more per year)	G	Category 1 Equipment
Zone 20		D	
Zone 1	Flammable material present in normal operation (e.g. 10-1000 hours/year)	G	Category 2 Equipment
Zone 21		D	
Zone 2	Flammable material present for short periods only (e.g. less than 10 hours/year)	G	Category 3 Equipment
Zone 22		D	

For North America

PROTECTION METHODS

INTRINSICALLY SAFE

Ex ia IIC T4

(Method of protection)

Class I, Division 1

(Area Classification)

Groups A, B, C and D

(Gas Grouping)

T4

(Temperature Code)

North America		North America, CENELEC (Europe) and IEC (International)		
Method of Protection	Division	Method of Protection	Zone	Code Letter CENELEC/IEC
Intrinsic Safety	1 or 2	Intrinsic Safety	0, 1 or 2	ia
Explosion-Proof	1 or 2		1 or 2	ib
Pressurization	1 or 2	Flame-Proof	1 or 2	d
Non-Incendive Circuits	2			
*Specifically Assessed Equipment			Pressurization	1 or 2
		Increased Safety	1 or 2	e

(*No excessive Heat Generating Devices or Ignition-capable Arcing / Sparking Devices)

AREA CLASSIFICATION

	CONTINUOUS HAZARD	INTERMITTENT HAZARD	HAZARD UNDER ABNORMAL CONDITIONS
NORTH AMERICA (CEC/NEC)	Division 1		Division 2 or Zone 2
	Zone 0	Zone 1	
CENELEC/IEC	Zone 0	Zone 1	Zone 2

HAZARDOUS LOCATIONS GAS GROUPS

TYPICAL GAS HAZARD	NORTH AMERICA CEC SECTION 18, NEC ARTICLE 500	CENELEC/IEC CENELEC, EN 50014, IEC 79-0
ACETYLENE	A or IIC	IIC
HYDROGEN	B or IIC	IIC
ETHYLENE	C or IIB	IIB
PROPANE	D or IIA	IIA
METHANE	Group D (gaseous mines) or I	I

