

Ex Equipment for use in Explosive Gas/Vapour Explosive

1. Protection Concepts						5. Other Standards			6. Temperature Class	
Electrical	Ex Symbol	Category	Typical Zone(s)	EN/IEC Standard	Basic Concept of protection	EN/IEC 60079-19	Repair and Overhaul	Maximum surface temperature	T Class	
General	-	-	-	EN/IEC 60079-0	General requirement	EN/IEC 60079-17	Inspection & Maintenance	450°C	T1	
Optical Radiation	Op is Op pr, Op sh,	1G 2G 3G	0,1,2 1,2 1 or 2 (See standard)	EN/IEC 60079-28	is: Inherently safe protected. pr: Mechanical protected. sh: Interlock/shutdown.	EN/IEC 60079-14	Electrical installation	300°C	T2	
Increased safety Type 'n' (Non sparking)	e nA	2G 3G	1,2 2	EN/IEC 60079-7 EN/IEC 60079-15	No arcs, sparks or hot surfaces. Minimum IP 54.	IEC 61892-7	Offshore installation	200°C	T3	
Flameproof	d	2G	1,2	EN/IEC 60079-1	Contain the explosion, quench the flame.	EN/IEC 60079-10-1	Area Classification	135°C	T4	
Powder filled	q	2G	1,2	EN/IEC 60079-5	Quench the flame	7. Zone vs Category vs EPL (Explosion Protection Level)				
Intrinsic safety Intrinsic safety Intrinsic safety Simple apparatus	ia ib ic	1G 2G 3G	0,1,2 1,2 2 0,1,2	EN/IEC 60079-11 EN/IEC 60079-11 EN/IEC 60079-11 EN/IEC 60079-11	Limit the energy of sparks and Temperatures	Zone	Category	EPL	100°C	
Pressurized (2007) Pressurized Pressurized Pressurized Pressurized/artificially ventilated room Type 'n' (restricted breathing) Type 'n' (simple pressurized) Encapsulation Encapsulation Oil immersion	p px py pz px, py, pz, pv nR nP ma mb o	2G 2G 2G 3G 2G&3G 3G 3G 1G 2G 2G	1,2 1,2 1,2 2 1,2 2 2 0,1,2 1,2 1,2	EN/IEC 60079-2 EN/IEC 60079-2 EN/IEC 60079-2 EN/IEC 60079-2 EN/IEC 60079-13 EN/IEC 60079-15 EN/IEC 60079-15 EN/IEC 60079-18 EN/IEC 60079-18 EN/IEC 60079-6	Keep the flammable gas out	0	1G	Ga	85°C	
1	1G, 2G	Ga, Gb	2	1G, 2G, 3G	Ga, Gb, Gc	8. Gas Group (IEC 60079-20-1)				
Non-electrical						Gas group	Equipment	Typical Gas/Vapour		
General requirement	h	-	1,2	EN 13463-1 ISO 80079-36	Low potential energy	IIA	IIA, IIB, IIC	Hydrocarbon gas, methane, propane.		
Constructional safety	c h	2G	1,2 1,2	EN 13463-5 ISO 80079-37	Ignition hazards eliminated by good engineering methods	IIB	IIB, IIC	Ethylene, Propan-1-ol (n-propyl alcohol), Hydrogen sulfide.		
Flow restricted enclosure	fr	3G	2	EN 13463-2	Relies on tight seals, closely matched joints and tough enclosures to restrict the breathing of the enclosure	IIC	IIC	Hydrogen, acetylene and carbon disulfide. Most severe group. Eg. Battery rooms, acetylene rooms, paint stores, etc		
Flameproof enclosure	d db, dc	2G	1,2 1,2	EN 13463-3		9. Hazardous Area (Zones) (IEC 60079-10-1)				
Control of ignition sources	b h	2G	1,2 1,2	EN 13463-6 ISO 80079-37	Control equipment fitted to detect malfunctions					
(Never published) Pressurization	pxb, pyb, pzc		1,1,2	EN 13463-7	Enclosure is purged and pressurized to prevent ignition sources arising	10. Ingress Protection (IP) (IEC 60529)				
Liquid immersion	k h	2G	1,2 1,2	EN 13463-8 ISO 80079-37	Enclosure uses liquid to prevent contact with explosive atmospheres	First Numeral	Second Numeral			

2. Documents of Conformity (ATEX)				
Category	Zone	Electrical-equipment	Non-electrical	Assemblies
1G	0	-EU Type examination certificate - Quality Assurance Notification	- EU Type examination certificate - Quality Assurance Notification	EU Declaration of Conformity and Instructions to the "modular system" as a whole. It must be clear which the parts that form the modular system are, and how they are to be selected to form a compliant assembly.
2G	1	- EU Type examination certificate - Quality Assurance Notification	- Self-certifying or Type examination certificate - Must submit technical documentation to a Notified body for storage	
3G	2	- Self-certifying	- Self-certifying or Type examination certificate	
Safe		- If naturally ventilated area Category 3G. - If live after ESD Category 2G required. (except emergency eqm in LQ) see 61892-7		

Important! EU declaration of conformity and instruction manual required for all

Protection against solid objects	Protection against water
0-No special protection	0-No special protection
1-Objects > 50 mm diameter (e.g. part of a 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-Spray water up to 60° from the vertical.
4-Objects > 1,00 mm diameter (e.g. wire)	4-Sprayed water from all directions
5-Dust protected	5-Water jets
6-Dust tight	6-Powerful water jets
	7-Temporary submersion to a depth of 1m.
	8-Extended submersion to a depth >1m.
	9-High pressure and temperature water-jet (80°C)

3. Certificate number and marking (Electrical)

Presafe 13ATEX123
 → Continuous number
 → Following ATEX
 → Year certificate issued
 → Name of the Notified Body issued the certificate

IECEx NEM 10.0008
 → Continuous number
 → Year certificate issued
 → Name of the Certification Body issued the certificate
 → Following IECEx

Presafe 14ATEX124X → Certificate with special condition for safe use. See instruction manual or certificate
IECEx NEM 10.0009X

Presafe 15ATEX125U → Component certification. Button, Terminal ...
IECEx ULD 05.0008U → Empty enclosure having certificate marked with "U" shall not be used to install.

Ex d e IIC T5 Gb
 → Equipment protection level.
 → Maximum temperature (100°C)
 → Gas group
 → Type of protection. Increased safety.
 → Type of protection. Flameproof.

Ex db [ia] IIC T5
 → Maximum temperature (100°C)
 → Gas group
 → Associated apparatus. Energy limitation inside equip.
 → Type of protection with EPL. Flameproof enclosure.

[Ex ia] IIC → Associated apparatus. Not suitable for hazardous area.
 Note: For associated apparatus not suitable for hazardous area, temperature class is not included.

4 Marking (Non-electrical)

Ex h IIC T4 Ga
 → Equipment protection level
 → Temperature class
 → Gas group
 → Protection concept

11. Identification of Repaired Equipment

R IEC 60079-19
 Repairer's Name: _____
 Ref No.: _____
 Date: _____

In accordance with certificate documentation and/or manufacturer's specification.

R IEC 60079-19
 Repairer's Name: _____
 Ref No.: _____
 Date: _____

In accordance with the type of protection standards but not the certificate documentation.

12. Example of Marking Label for Ex Equipment

Electrical Equipment

Manufacturer and address → Ex supplies AS Oslo street 30, Norway

Ex Marking code → Ex ia IIB T4 Ga

Special ambient temperature range → -30°C ≤ T_{amb} ≤ 50°C

Safety parameters → Ui: 6V Ii: 130 mA Pi: 1W Ci: 1µF Li: 1mH

Type: AB70 Sensor S/N P1295/2010 → Model number and serial number

ATEX marking → **Ex ia IIB T4 Ga**

Nemko 10ATEX1234 → ATEX Certificate Number

IECEx NEM 10.1234 → IECEx Certificate Number

Non-Electrical Equipment

Manufacturer and address → Ex supplies AS Bergen Street 1233, Norway

Ex Marking → **Ex ia IIC T5 Gb**

Type: AB60 Pump Serial N 1234 Year 2015 → Model number, serial number and year

Technical file: 108112 → Technical file reference number