DANIMEX - EXPLOSION PROTECTED CERTIFICATION

Danimex™
WHEN YOU NEED TO TALK

TEMPERATURE CLASSIFICATION

MINING		
Group I	Methane / Firedamp (537°C) Coal Dust (150°C)	
SURFACE INDUSTRY		
Classification	**Ignition temperature of GAS / VAPOUR**	**Maximum applicable surface Temperature of certified EQUIPMENT**
T1	Ignition Temp. ≤ 450°C	300°C ≤ Surface Temp. < 450°C
T2	300°C < Ignition Temp. < 450°C	200°C ≤ Surface Temp. < 300°C
T3	200°C < Ignition Temp. < 300°C	135°C ≤ Surface Temp. < 200°C
T4	135°C < Ignition Temp. < 200°C	100°C ≤ Surface Temp. < 135°C
T5	100°C < Ignition Temp. < 135°C	85°C ≤ Surface Temp. < 100°C
T6	85°C < Ignition Temp. < 100°C	Surface Temp. < 85°C

SELECTION OF EQUIPMENT

	SURFACE INDUSTRY	
	Allowed Equipment	**Area Classification**
Zones	Only intrinsic safety "ia" (and double protected	Zone 0
	Zone 0 equipment d, e, m, p, q, ib Any equipment with multiple certification of above techniques. e.g. Ex de	Zone 1
	Zone 1 equipment n (e.g. n, nR, nC, nL, nZ, etc.)	Zone 2
Gas Groups	I	Not for surface application
	IIA, IIB, IIC	IIA
	IIB, IIC	IIB
	IIC	IIC
Temperature Classes	T1, T2, T3, T4, T5, T6	T1
	T2, T3, T4, T5, T6	T2
	T3, T4, T5, T6	T3
	T4, T5, T6	T4
	T5, T6	T5
	T6	T6
Ambient Temperature	If no ambient temperature is indicated on the equipment, it may be used in -20°C to 40°C (default) ambient.	Limiting ambient temperature as defined in area classification documents.
	Alternative ambient temperature marked in equipment. See marking /certificate of equipment.	

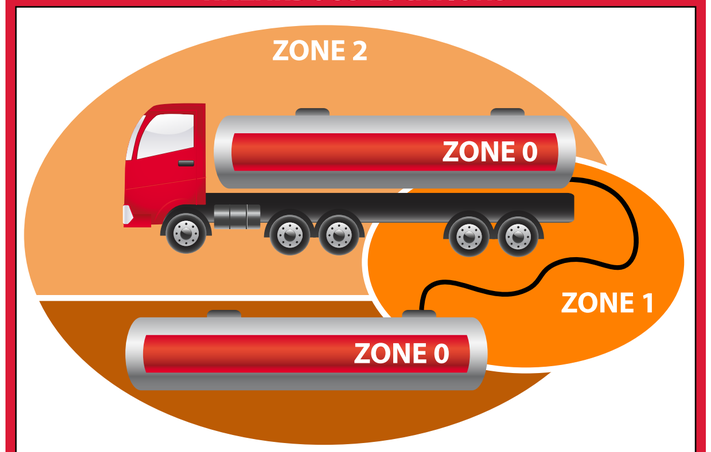
GAS GROUPS

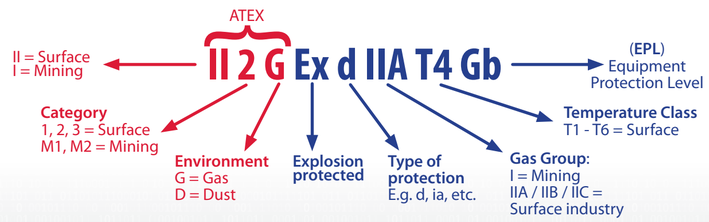
AREA	GROUP (GAS / VAPOUR) (SANS / IEC /ATEX)	Mining Ignition Energy (MIE)	EXAMPLES
SURFACE	IIC	20μJ - 60μJ	Hydrogen, Acetylene
	IIB	60μJ - 180μJ	Ethylene
	IIA	180μJ and higher	Propane
MINING	I	200μJ	Firedamp/ Methane and coal dust in mines

All 'Danimex' radios and solutions are certified at: Ex ia I T4 Ma & Ex ia IIC T4 Ga

*all kits include: 1x radio, 1x battery, 1x antenna and 1x charger

CLASSIFICATIONS OF HAZARDOUS LOCATIONS





MOTOTRBO DP2000e SERIES

KIT Part numbers*:
IS-SA-VHF DP2400e
IS-SA-UHF DP2400e
IS-SA-VHF DP2600e
IS-SA-UHF DP2600e

MOTOTRBO DP4000e SERIES

KIT Part numbers*:
IS-SA-VHF DP4801e
IS-SA-UHF DP4801e

TETRA MTP3000 SERIES

KIT Part numbers*:
IS-SA-TETRA MTP3500
IS-SA-TETRA MTP3550

ZONES AND EPL LEVELS

AREA	SUBSTANCE	Zones (SANS / IEC / ATEX)	EPL Levels	Rule of Thumb	Examples
SURFACE	GASES AND VAPOURS	0 (ATEX Category 1)	Ga	Gas/ Vapours atmosphere **continuously** present or for **long periods** in the explosive concentration **(1000 hrs. + per year)**	Inside vessels and pipes. (Zone 0 is not found in open air)
		1 (ATEX Category 2)	Gb	**Intermittently** present during **normal** operations in the explosive concentration **(10 to 1000 hrs. per year)**	Typically small volumes around specific point / sources of release. Sample points regularly opened (e.g. once a day) inside enclosed spaces.
		2 (ATEX Category 3)	Gc	Gas / Vapour atmospheres present in the explosive concentration during **abnormal** circumstances **(0.1 to 10 hrs. per year / 0.5 hr. per event)**	80% of hazardous locations. Sample points irregularly opened (e.g. once in two weeks)
MINING	**Coal Mine hazardous locations:** Typically 180m from working face, return airways and battery charging rooms. Zone 1 area when the gas concentration does not exceed 1.4% methane / firedamp in air. **(EPL = Mb)** Zone 0 area when the gas concentration exceeds 1.4% methane /firedamp in air. **(EPL = Ma)** (Often 1.2%) Gas concentration in excess of 0.5% gas (methane / firedamp) in general body of air. **(EPL = Mb)** **Hard Rock mine hazardous location:** in excess of 0.5% gas (methane /firedamp) in general body of air. **(EPL = Mb)** NB. Gases/ Vapours other than firedamp/ methane that may be present are to be additionally considered.				

DESCRIPTION OF EX TECHNIQUES

NAME / STANDARDS (PRINCIPLE)	SYMBOL	ZONE	EXAMPLE	DESCRIPTION (TYPICAL)
FLAMEPROOF IEC/SANS 60079-0/1 (Containment)	d, db da	1, 2 0, 1, 2	Protection of switchgear motors, control Electronics etc.	A robust enclosure with specifically designed joints to prevent the internal ignition transmitting to the outside gas/ vapour
INCREASED SAFETY IEC/SANS 60079-0/7 (No sparking/ limitation of hot surface temp.)	e, eb	1, 2	Luminaries, junction boxes, connection facilities of motors and switches etc.	A technique with strict requirements for construction and limitation of surface temperature.
NON SPARKING IEC/SANS 60079-15 (No sparking/ limitation of hot surface temp.)	N, n, nA, nC, etc.	2	Luminaries, junction boxes motors, electronics etc.	A technique with strict requirements for construction and limitation of surface temperature.
INTRINSIC SAFETY IEC/SANS 60079-0/11 (Energy limited sparking and limitation of surface temp.)	ia ib ic	0, 1, 2 1, 2 2	Process control instrumentation, handheld equipment e.g. gas sensors, multi meters etc.	A technique restricting the level of energy in circuits to below the ignition energy of the gas. It achieves this under defined faults in the electronics. Surface temperatures of components considered.
PRESSURIZATION IEC/SANS 60079-0/2 (Exclusion of gas from incendive components)	p, pX pY, pZ	1, 2	Analyser houses Analyser panels	Gas / vapour excluded from enclosure when flammable gas surrounds enclosure. OR Continuous dilution of internal release of flammable gas/ vapour to below LEL.
ENCAPSULTION IEC/SANS 60079-0/18 (Exclusion of gas from incendive components)	m ma mb mc	1, 2 0, 1, 2 1, 2 2	Mostly Electronics circuits e.g. Ballasts in luminaries, power supplies etc.	Exclusion of gas / vapour from ignition source.
SAND FILLING IEC/SANS 60079-0/5 (Exclusion of gas from incendive components restricting explosion)	q	1, 2	Mostly Electronic circuits e.g. Ballasts in luminaries fuses etc.	A technique with typically no internal free space separating the atmosphere and the ignition source.
DOUBLE PROTECTION IEC/SANS 60079-0/26 (Surface) EN 50303 (Mining)	e.g. Ex d I / Ex qe [ia] I	0, 1, 2	Sand filled power supply with increased safety connections located in a flameproof box. Output energy intrinsically safe.	The use of multiple (two) techniques (or two fault tolerant)

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