# IECEx Marking Scheme for Explosion Protected Equipment [GAS]

| Gas Groups | | |
|---|---|---|
| IIA | IIB | IIC |
| **Permitted Equipment Group** | | |
| IIA, IIB, IIC | IIB, IIC | IIC |

| Temperature Class | Maximum Surface Temperature | Permitted Temperature Classes |
|---|---|---|
| T1 | 450 °C | T1 to T6 |
| T2 | 300 °C | T2 to T6 |
| T3 | 200 °C | T3 to T6 |
| T4 | 135 °C | T4 to T6 |
| T5 | 100 °C | T5 to T6 |
| T6 | 85 °C | T6 |

| **Use of the Operating Equipment** | |
|---|---|
| No X or U | No restrictions on operating the |
| With X | Specific conditions of use apply to the equipment as dictated by the certificate. |
| With U | Denotes a Component Certificate. Conformity is certified when used in an overall equipment |

GAS Ex db eb IIB T4 Gb IECEx ExCB 11.1234X

DUST Ex tc IIIB T120 °C Dc IECEx ExCB 11.1234X

| **Applicable Zones for Use** | | |
|---|---|---|
| Zone 0/20<br>Zone 1/21<br>Zone 2/22 | Zone 1/21<br>Zone 2/22 | Zone 2/22 |

Note: Dust Groups and Dust temperature Classifications are not shown on this page.

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| **IECEx Protection Concepts** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Protection concept | Principle of Protection | Applicable Flammable Materials | Example Applications | Very High Protection | High Protection | Enhanced protection | Standards |
| General Requirements | - | Gases, Vapours (G) and Dusts (D) | All Applications | - | - | - | IEC 60079-0 |
| Flameproof Enclosure | Propagation of an explosion inside to the outside is excluded | Gases and Vapours (G) | Control Stations, Motors, Fuses, Switchgear | Ex da | Ex db | Ex dc | IEC 60079-1 |
| Increased Safety | Avoidance of arcs, sparks and excessive temperature | Gases and Vapours (G) | Junction and Connection Boxes, Enclosures, Motors | - | Ex eb | Ex ec | IEC 60079-7 |
| Protection by enclosure | Explosive dust atmosphere keep at a distance from the ignition source | Dusts (D) | Junction and Connection Boxes, Enclosures, Motors | Ex ta | Ex tb | Ex tc | IEC 60079-31 |
| Intrinsic Safety | Limitation of energy as well as arcs and temperature | Gases, Vapours (G) and Dusts (D) | Measurement and Control Technology, Sensors, Actuators | Ex ia | Ex ib | Ex ic | IEC 60079-11<br>IEC 60079-25 |
| Pressurization | Explosive atmosphere kept at a distance from the ignition source | Gases, Vapours (G) and Dusts (D) | Switch and Control Stations, Motors, Computers | - | Ex pxb, Ex pyb | Ex pzc | IEC 60079-2 |
| Encapsulation | Explosive atmosphere kept at a distance from the ignition source | Gases, Vapours (G) and Dusts (D) | Coils for Motors or Relays, Solenoids | Ex ma | Ex mb | Ex mc | IEC 60079-18 |
| Liquid Immersion | Explosive atmosphere kept at a distance from the ignition source | Gases and Vapours (G) | Transformers, Relays, Control Stations | - | Ex ob | Ex oc | IEC 60079-6 |
| Powder Filling | A propagation of an explosion inside to the outside is excluded | Gases and Vapours (G) | Capacitors, Relays, Transformers | - | Ex q | - | IEC 60079-5 |
| Enclosed Construction<br>Restricted Breathing | Protection principles adapted for Zone 2 | Gases and Vapours (G) | Zone 2 Applications | - | - | Ex nC<br>Ex nR | IEC 60079-15 |
| Inherent Safe Optical Radiation | Limitation of optical energy radiating in the explosive atmosphere | Gases, Vapours (G) and Dusts (D) | Optical Devices, Laser Scanners, Light Barriers | Ex op is | - | - | IEC 60079-28 |
| Protected optical radiation | Explosive atmosphere is kept distant from source | Gases, Vapours (G) and Dusts (D) | Fibre-Optic Systems | - | Ex op pr | - | IEC 60079-28 |
| Optical system with interlocking | Explosive atmosphere is kept distant from source | Gases, Vapours (G) and Dusts (D) | Fibre-Optic Systems | - | Ex op sh | - | IEC 60079-28 |