Protection for explosive atmosphere

- Electric actuators working in explosive atmosphere require a specific enclosure protection submitted to dedicated certification.
- According to market areas, there exists several types of explosion proof certifications:
  - European ATEX
  - International IECEx
  - US NEMA 7 & 9
  - Customs Union for Belarus, Kazakhstan and Russia
  - INMETRO for Brazil
  - CQST for China...

Focus on ATEX European Directive

The European directive 94/9/CE states the conditions to be met for equipment items used under potentially explosive atmosphere. It classifies the installation areas according to groups and categories:

**Ex de**

**OR**

Equipment with electric connection in increased safety "e" (tight terminal box). The remaining parts of the electric equipment are in explosion proof "d" enclosure.

Explosion proof actuator. **Ex de**

http://www.gpsactuator.com/
Protection by explosion proof enclosure. Connection is achieved inside the enclosure. Enclosure is resistant to internal explosion without flame path.

Explosion proof actuator. **Ex d**

**II B**

**Group I** : Equipment for underground mining.

**Group II** : Equipment for explosive atmosphere other than mining.

**A**: butane, propane,...

**B**: ethylene,...

**C**: hydrogen, acetylene

**T4**

Maximum surface temperature.

$T_1 = 450 \, ^\circ\text{C}$

$T_2 = 300 \, ^\circ\text{C}$

$T_3 = 200 \, ^\circ\text{C}$

$T_4 = 135 \, ^\circ\text{C}$

$T_5 = 100 \, ^\circ\text{C}$

$T_6 = 85 \, ^\circ\text{C}$

Our explosion proof products have been designed for use in GROUP II, Category 2 G (D) areas. These products shall, among other requirements, undergo a CE type examination corresponding to the sections of the CENELEC standards EN 60079, 61241, 13463

applicable for each product.

BERNARD CONTROLS can offer different levels of protection such as: Ex de, Ex d, IIB, IIC, T4, T5, T6.

Focus on North American standards: NEMA ratings

<table>
<thead>
<tr>
<th>NEMA Class</th>
<th>Group</th>
<th>Division</th>
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<tr>
<td>7</td>
<td>I  Combustible gases and vapours</td>
<td>1</td>
<td>Maximum surface temperature.</td>
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<td>Group B: Hydrogen</td>
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<td>Group C: Ether, Ethylene,...</td>
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<td>Group D: Butane, Propane,...</td>
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<td>9</td>
<td>II  Combustible dusts</td>
<td>2</td>
<td>Abnormal conditions</td>
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<td>Group E: Metal dust</td>
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<td>Group F: Coal dust</td>
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<td>Group G: Flour and other dusts</td>
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<tr>
<td></td>
<td>T1 = 842 °F</td>
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<td>T2 = 572 °F</td>
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<td>T3 = 392 °F</td>
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<td>T4 = 275 °F</td>
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<td>T5 = 212 °F</td>
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<td>T6 = 185 °F</td>
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Explosion proof actuator **NEMA 7 or NEMA 9**