

Minera Ex

Oil-immersed transformers
for hazardous areas



Schneider
Electric

> Minera Ex - Oil-immersed transformers for hazardous areas up to 60 MVA - 36 kV

Personnel and equipment safety are of utmost importance when designing substations or planning equipment upgrades. For hazardous areas with risks of explosion, specific electrical equipment is required to meet the level of safety necessary to protect your installations.

The Schneider Electric solution

Based on decades of field-tested experience in electrical generation and distribution for both offshore and onshore installations, Schneider Electric has adapted transformers that offer safety solutions for Zone 1 and Zone 2 applications that are in accordance with the latest ATEX and IEC-EX standards.

With the ATEX and IEC-EX certified, ignition-free, liquid immersed transformers, Schneider Electric brings a cost-effective solution that assures the highest safety standards for your personnel and equipment. These transformers offer you the best technology and best after-sales support with full compliance to national and international standards.

Our standard Zone 1 and Zone 2 liquid immersed transformer is available as:

- Three phase units (single phase available on request);
- Ratings up to 60 MVA, 36 kV and 50/60 Hz (higher ratings/voltage level available upon request);
- Hermetically sealed or conservator;
- Ground-mounted;
- Naturally cooled (ONAN) or forced air (ONAF) on request;
- With normal, low noise or very low noise levels.



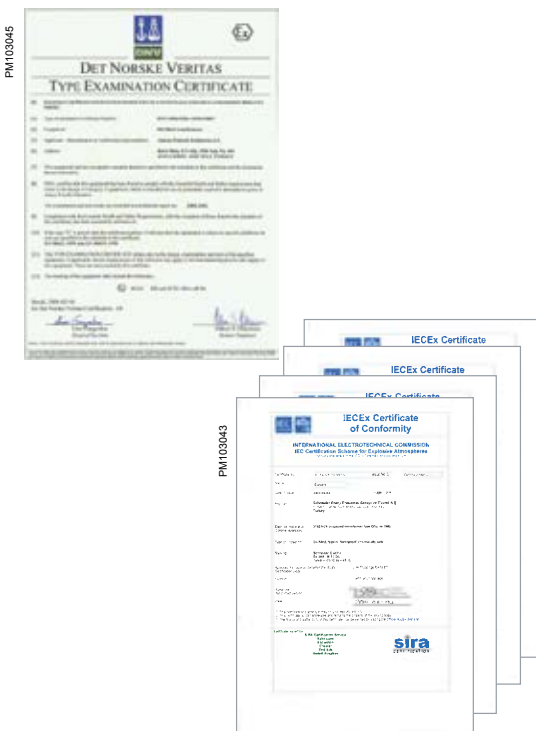
> What is a zone 1 and zone 2 environment?

Either on-shore or off-shore, this is an area with an explosive gas atmosphere that can expect explosions though only occasionally and when they do occur, will only last for a short period.

The following table contains an overview of the zones and allocation of equipment (equipment category according to 94/9/EC) for the relevant zones.

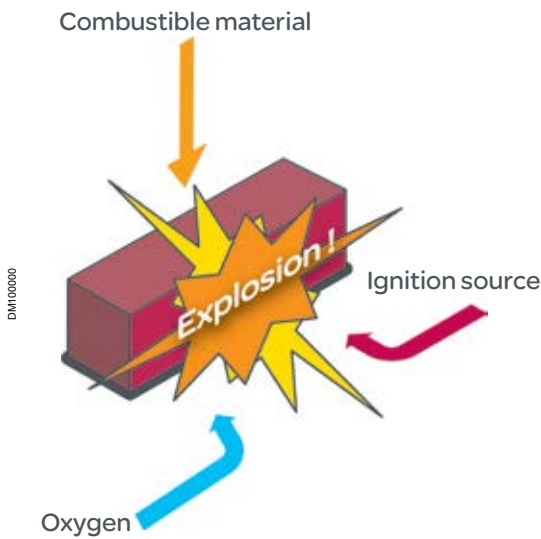
Gases, Vapours, Mists	Dusts	Definition (94/9/EC) explosive atmosphere is present:
Zone 0 → Category 1G	Zone 20 → Category 1D	Continuously or long-term or frequently
Zone 1 → Category 2G	Zone 21 → Category 2D	Occasionally
Zone 2 → Category 3G	Zone 22 → Category 3D	Infrequently or short period

G = Gases, D = Dusts



For full certificates, please visit the IECEx site: www.iecex.com

> Principle of explosion and ignition



How do explosions occur?

An explosion is any uncontrolled combustion wave. Most manufacturing and processing industries generate potentially explosive atmospheres using substances ranging from solvents to baking flour. An explosion can be produced due to the combination of fuel, an oxidizer (such as the oxygen in the air) and a source of ignition energy.

What can cause ignition?

Keeping in mind that every material has an Autogenous Ignition Temperature (AIT) at which it will ignite spontaneously, some of the more common ignitors are Accessory contacts, Bushing live parts, Liquid leakage, Sparks, Arcs and Other electrical live parts.

What can we do to avoid ignition?

- By using special terminal boxes;
- By avoiding non-essential accessories;
- By using ex-type cable boxes and glands;
- By using intrinsically safe relay.

> The risk points

Defining your precise and specific risk points before designing your transformer is of key importance. While all precautions are taken into account when dealing with Zone 1 and Zone 2 equipment, particular attention must be paid to:

- Design and assembly of each transformer component;
- HV terminals (porcelain or plug-in type bushings);
- HV cable box if any;
- LV terminals (porcelain bushings or bus-bar);
- LV cable box;
- Cable glands, gasket selection, wiring cables, accessories, terminal boxes;
- Maximum temperature of the transformer.

For special applications which need air forced cooling, Schneider Electric can offer a set of fans with ATEX and IEC-EX certification. Schneider Electric's R&D team is constantly seeking to find new, improved solutions to make your work areas safer for your personnel and equipment. Designs and accessories are in compliance with IEC 60079-0/EN50014 and IEC 60079-6/EN 50015.

> Customer benefits

- ✓ **Reliable and safe**
- ✓ **Ignition-free**
- ✓ **ATEX and IEC-Ex certified**
- ✓ **Tailor-made solutions**
- ✓ **Cost effective**
- ✓ **Compact**



PM102314



Make the most of your energySM

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