

MOTORS FOR HAZARDOUS AREAS

Types of Motors

The following are the main groups of motors used in hazardous locations, but not all situations are covered. Should you have an application not covered by the following, please refer to one of our sales offices.

EX d - flameproof motors for industrial use
Ex e - increased safety motors
Ex n - non-sparking motors
D.I.P. - dust ignition proof motors

Compliance to standards

All motors suitable for use in hazardous areas are manufactured/modified in strict accordance with the conditions required by the relevant standards and the issued Certificate of Compliance, and are fully tested prior to despatch by the manufacturer.

Selection of motors for use in Hazardous Areas

There are a number of defined hazardous areas covering gases and dusts. It is therefore strongly recommended that all relevant SABS 0108 Standard be consulted prior to final selection of the motor.

Hazardous Areas

Many gases, vapours and dusts which are generated, processed, handled and stored in industry are combustible. When ignited they may burn rapidly and with considerable explosive force if mixed with air in the appropriate proportions.

Areas where gases, vapours, dusts and fibers occur in dangerous quantities are classified as HAZARDOUS. Classification of areas are:-

gases, vapours, mists	Class I
dusts	Class II

Gas groupings are further defined for either:-

coal mining (methane)	Group I
other industries	Group II

With Group II gases, they are further subdivide into sub-groups IIA, IIB, IIC, depending upon the ignition point of the gas.

ZONAL CLASSIFICATION is also required where explosive gas atmospheres are present and they indicate the probability, of the presence of a flammable, combustible or explosive material, the extent, dimension and shape of the hazardous areas, together with the volume in which the hazardous material can be expected. There are three zones:-

ZONE 0 - An area in which an explosive gas atmosphere is continuously present or is present for long periods of time.

ZONE 1 - An area in which an explosive gas atmosphere is likely to occur in normal operation.

ZONE 2 - An area in which a gas atmosphere is not likely to occur in normal operation and if it does occur, it will exist for a short period only.

Temperature Classification

Hot surfaces can cause ignition of gases, vapours and dust, therefore it is necessary to ensure that the maximum surface temperature of equipment introduced into a hazardous area does not exceed the ignition temperature for the gas, vapour or dust in the hazardous area.

Group I Gases - Maximum Surface Temperature 150° C

Group II gases and Class II dusts are given a Temperature Class (T) based on the maximum surface temperature of the equipment.

Temperature Classes are:-

T1 - 450° C
T2 - 300° C
T3 - 200° C
T4 - 135° C
T5 - 100° C
T6 - 85°

Note: For Ex d flameproof apparatus the external surface is the measured surface. For other types of protection (e.g. Ex e) internal surfaces are of equal importance if the explosive atmosphere has access to them.

Explosion proof motors Ex e, Increased safety

Standard three-phase motors

These motors are certified to Ex e and can fit a wide range of products as shown throughout the catalogue. These motors are certified to Ex e Class 1, Zone 1 protection. The certificate covers gas groups IIA, IIB and IIC, temperature classification T3 and enclosure protection Ip66.

The Standard complied with is AS2380.1:1989. This Standard means the motors are also suitable for Ex n and DIP applications.

Electrical and Mechanical Specification

Voltage:	Up to 500 Volts
Insulation:	Class 'F'
Enclosure:	Totally enclosed, fan-cooled
Degree of Protection:	Up to IP66
Frequency:	50 or 60Hz

Limiting Temperature

The Temperature of an external or internal surface to which the surrounding atmosphere has access, shall not exceed the LIMITING TEMPERATURE specified.

Range

It is possible variations will arise in the kW/frame size/r.p.m., from one manufacturer to another from that normally referred to in normal motor standards.

Fans for Ex d and Ex e applications

Fans for Ex d and Ex e applications, or indeed any hazardous application, can be constructed of special materials and incorporate special features.

Anti-static impellers and earthing leads are just some of the features we can provide.