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## 6.8 Conditions of use

Whilst type of protection 'e' has features in common with type of protection 'n', it is, in many respects, more stringent (e.g. in the case of motors lower temperature rises are specified and special overload protection is required to avoid excessive temperatures under all conditions including stalling).

This type of protection is used mainly for terminal and connection boxes, control boxes for installing Ex-components (which have a different type of protection), squirrel-cage motors, light fittings, etc. (Figure 6.8).

Apparatus with type of protection 'e' may be used in Zone 2 gas and vapor risks with any type of enclosure, which is suitable for the environment, provided it is permitted in the respective equipment standards.

Apparatus with type of protection 'e' may also be used in Zone 1 gas and vapor risks provided that:

- The enclosures of live bare parts and insulated parts are to degrees of protection IP 54 and IP 44 respectively as a minimum, except that where there is a likelihood of harmful gases and vapors entering the enclosure in quantities likely to cause deterioration of the insulation, the enclosure of insulated parts shall also be to IP 54 as a minimum.
- In the case of motors, the methods of control of the rotor and stator winding temperatures are strictly in accordance with the above standards. The devices used for temperature control, whether of the current-dependent or temperature-detector type shall be of high quality and shall be regularly tested.

Apparatus with type of protection 'e' is marked with a temperature class ( $T_1$ – $T_6$ ) and shall not be installed where flammable materials are used which have ignition temperatures below the maximum for that class.

Although apparatus with type of protection 'e' is suitable for use in all gases and vapors, provided account is taken of surface temperature considerations, it is sometimes used in combination with parts which have some other form of protection (e.g. switches which are *flameproof*), in which case attention shall be paid to any gas or vapor grouping of the parts with the other forms of protection.

No modification, addition or deletion shall be made to apparatus with type of protection 'e' without the written permission of the certifying authority (such permission shall be obtained through the manufacturer of the apparatus) unless it can be verified that such change does not invalidate the certification.

Apparatus with type of protection 'e' is suitable for use in dust risks and in combined dust and gas/vapor risks, provided that the additional precautions specified for use in dust atmosphere are complied with. When selecting apparatus special care shall be taken to ensure that the apparatus and its component parts are constructed so as to guard against electrical and mechanical failure in the intended conditions of use. Particular attention shall be given to the need for weather-proofing and protection against corrosion.

Fluorescent light fittings have no moving parts and can be constructed and certified Ex 'e' (Figure 6.9). The starters for this type of light are current-sensitive switches and therefore cannot normally be included. The starter is encapsulated, certified Ex 'm' and given a component approval for use in a given Ex 'e' certified design.

Instrumentation loops are not usefully accommodated within this method. The enclosures are often purchased as junction boxes for use on IS circuits because they are robust and reliable as proven by the Ex 'e' testing. The Ex 'e' certification is not used and should be removed from the box because it can cause confusion over how circuits are protected.