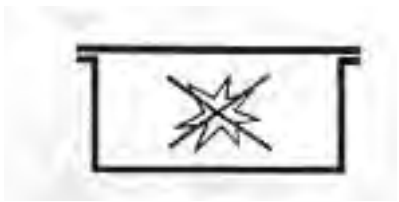
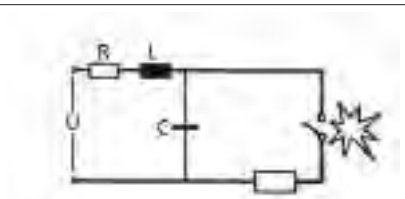
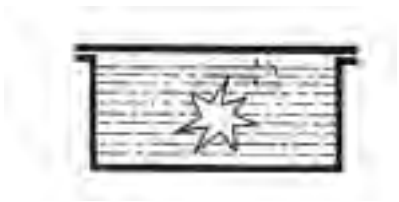
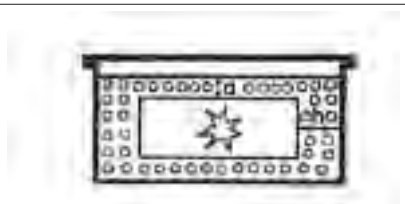
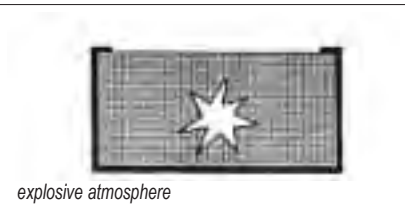
TYPES OF PROTECTION

The basic principle of explosion protection is the same worldwide. It is the prevention of flammable materials (gas, vapour, mist or dust) in dangerous quantities air (and oxygen) - sources of ignition, occurring at the same time. Areas, where the occurrance of explosive mixtures of flammable materials and air cannot be prevented by applying primary explosion protection, special measures for the prevention of ignition sources are to be taken. Special construction and installation requirements therefore apply to all electrical apparatus in hazardous locations. The following table shows the types of protection of European Standards and describes the customary allocations.

Type of protection to IEC Standard	***Basic Principle***	***Schematic***	***Applications***
flameproof enclosure d	*A type of protection in which the parts, which can ignite an explosive atmosphere are placed in an enclosure, which can withstand the pressure devel-oped during an internal explosion of an explosive mixture and which prevents the transmission of the explosion to the explosive atmospheres surrround-ing the enclosure.*		*Switchgear, control and indicating equipment control boards, motors, transformers, light fittings and other spark producing parts.*
increased safety e	*A type of protection in which measures are applied so as to prevent with a higher degree of security the possibility of excessive temperatures and of the occurrance of arcs or sparks in the interior and on the external parts of electrical apparatus, which does not produce them in normal service.*		*Terminal and connection boxes, control boxes housing Ex-modules (of a different type of protection) squirrel cage motors, light fittings*
pressurized apparatus p	*A type of protection in which the entry of a sur-rounding atmosphere into the enclosure of the electrical apparatus is prevented by maintaining inside the said enclosure a protective gas (air, inert or other suitable gas) at a higher pressure than that of the surrounding atmosphere. The overpressure is maintained either with or without continuous flow of the protective gas.*		*as above, but especially for large equipment and complete rooms*
intrinsic safety i	*A type of protection in which the electrical appara-tus contains intrinsically safe circuits, which are incapable of causing an explosion in the surround-ing atmosphere. A circuit of part of a circuit is intrinsically safe, when no spark or any thermal effect in this circuit, produced in the test conditions prescribed in the standard (which include normal operation and specific fault conditions) is capable of causing ignition.*		*Measurement and control equipment*
oil immersion o	*A type of protection in which the electrical appara-tus or parts of the electrical apparatus are immersed in oil in such a way that an explosive atmosphere, which may be above the oil or outside the enclosure cannot be ignited.*		*Transformers (only rarely used now)*
powder filling q	*A type of protection in which the enclosure of elec-trial apparatus is filled with a material in a finely granulated state so that, in the intended conditions of service, any arc occurring within the enclosure of an electrical apparatus will not ignite the surrounding atmosphere. No ignition shall be caused either by flame or by excessive temperature of the surfaces of the enclosure.*		*Transformers, capacitors, heater strip connection boxes, electronic assemblies*
moulding m	*A type of protection in which the parts which can ignite an explosive atmosphere are enclosed in a resin sufficiently resistant to environmental influ-ences in such a way that this explosive atmosphere cannot be ignited by either sparking or heating, which may occur within the encapsulation.*		*Only small capacity switchgear, control gear, indicating equipment, sensors*

NOTE: all AMPCO products are manufactured to IEC protection standards - d, e, m.