Solenoids Valves in Hazardous Areas

Not all of these methods are applicable to solenoid protection, the more commonly used are listed below.

1. Flameproof

This form of protection entails enclosing the coils in a robust enclosure which will contain an internal explosion should it occur and prevent its transmission to the surrounding atmosphere.

2. N-Type Protection (Non-incendive)

Generally applied to non-sparking electrical equipment such as a solenoid coil which will not get abnormally hot even if the armature is locked out.

3. Encapsulation

This involves enclosing the coil and any associated electrical components in a compound so as to prevent the ignition of a surrounding explosive atmosphere.

4. Intrinsically Safe

Intrinsic safety is a technique that achieves safety by limiting the electrical-spark energy (and surface temperature) that can arise in hazardous area circuits to levels that are insufficient to ignite an explosive atmosphere.

An intrinsically safe system consists of a certified Intrinsically safe interface which passes signals to and from the process (hazardous area) but limits the energy (that is voltage and current) that can reach the hazardous area under fault conditions.

The interface is usually mounted in the safe area and can be either a shunt diode safety barrier or a galvanic isolator.

In the hazardous area ‘simple’ or ‘non-energy storing devices’ (switches, thermocouples & LED’s) can be used without certification but ‘Energy-storing’ equipment such as solenoid valves must be designed so as to prevent this energy escaping and of necessity need to be of sufficiently low power to operate within the constraints of the IS signal.

5. Special Protection

Special protection offers combination of one or more methods of protection and in the case of solenoids these are usually ‘e’ and ‘m’, where the coil is encapsulated, has over temperature protection and the terminals are approved under the increased safety requirement.