Complete Your Architecture
Application Technique

Intrinsic Safety in Class I Div 1 Hazardous Locations

Cost-effective Alternatives for Simple Devices

Customer Need and Component Solution

Installation of traditional Type 7/9 bolted enclosures for simple devices (for example, push button stations, resistance temperature detectors [RTDs], thermocouples) into a Class I Div 1 environment is a common, but costly, task. Although these enclosures can be necessary for power/switch-gear applications, there are more cost-effective alternatives using simple devices that can meet standards and application requirements.

**Concept A:** Hazardous Environment rated Brand X model is a great solution for Division 1 hazardous environments. However, the panel designer must follow explosion proof (Ex ‘d’) ratings requirements. This requires use of conduit fitting, tubes, seals, drains, breathers, etc., in addition to interfacing with a properly rated junction box that is installed in the hazardous environment. This is a costly implementation.

**Concept B:** The 800H push button is a great solution for unclassified environments. Even though the 800H-2HA4R is not rated for use in hazardous environments, because mechanical contacts (non-energy storing devices) are referred to as a Simple Apparatus by the NEC, this allows use of push buttons (mechanical contacts) in hazardous environments when used with an intrinsic safety protection method. The Intrinsic Safety Barrier (Isolator) acts as a medium between the programmable logic controller (PLC) and push button station, limiting energy to the apparatus to create an intrinsically safe circuit. This method takes advantage of more simple cable routing methods and is cost effective.

**Concept C:** Brand Z RTD temperature sensors with no hazardous ratings can not normally be used in those environments. But, because RTDs (non-energy storing devices) are referred to as Simple Apparatus by the NEC, they may be used in hazardous environments with an intrinsic safety protection method. The Intrinsic Safety Barrier (Isolator) acts as a medium between the PLC and RTD sensor, limiting the energy to the apparatus to create an intrinsically safe circuit that is permitted by the NEC and approval agencies. This method takes advantage of more simple cable routing methods and is cost effective.
Summary

Bulletin 937 Intrinsic Safety modules are an economical solution for implementing simple devices within Class I Div 1 locations. These modules provide a medium between the PLC and simple device to limit electrical energy to safe levels within the hazardous environment. Intrinsic Safety Modules (Associated Apparatus) can be used with mechanical contacts or other simple devices (Simple Apparatus) that do not store or release energy in a circuit to provide intrinsic safety protection in hazardous environments.