The secret to streamlining your HazLoc applications

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What is a hazardous location?
Hazardous locations can broadly be defined as “areas that are at risk of being exposed to flammable or combustible gases, dusts, or vapors.” Hazardous locations exist virtually everywhere, across a wide array of industries – from oil and gas applications to wastewater treatment plants, pharmaceutical production, grain handling, and many more.

Potentially explosive areas in these industries are subject to stringent requirements that ensure the reliability and safety of electrical equipment installed within them. Equipment installed in a hazardous location (flammable or combustible atmosphere) must be approved for installation in these areas by a certified testing agency. This requirement includes switching components such as relays.

What’s the challenge?
For companies that do business globally, meeting the approval requirements of local authorities can be complicated. Different regions around the world implement their standards and regulations independently of one another.

Many pieces of equipment have global applications, but due to regional approval requirements, it is often the case that the equipment manufacturer must maintain several design variations, depending on where the equipment is shipped. Variations result in added complexity and costs because there are additional documentation and supply chain concerns. Multiple sets of drawings and approval documents must be maintained. Managing inventory and delivery of components becomes inherently more difficult to manage as the number of variations in parts increases.

Approval systems in North America
In the U.S. and Canada, hazardous locations are classified with the class/division system, similar to Europe's zone system. Classes (I, II, or III) define the general nature or properties of the hazardous material in the surrounding atmosphere.

- Class I: Flammable gases or vapors are present
- Class II: Combustible or conductive dusts are present
- Class III: Ignitable fibers are present

The division defines the probability of the material being present in an ignitable concentration. Division 1 refers to a high probability, while Division 2 presents a lower probability. Equipment approved for use in Division 1 locations can also be used in Division 2 locations, provided it is the same class and group.

The group (A-G) defines the type of hazardous material in the atmosphere. For example, Group A locations contain acetylene.

If a relay is rated as Class I, Division 2 (UL), this means it is equipped for use in North America in potentially explosive premises where flammable gases or vapors may be present, and an ignition or explosion is expected to occur only under abnormal conditions.

Approval systems everywhere else in the world
ATEX is the directive requiring certification for hazardous locations to European standards. Products used in Europe must meet the requirements set by The European Committee for Standardization.

In the case of potentially explosive areas, ATEX makes a distinction between areas with a danger of gas explosions and areas with a danger of dust explosions. Both are assigned to their respective standardized zones. Previously, these were defined in EN 60079-10 for gases and in EN 61241-10 for dusts. In transferring the EN 61241 series of dust-related standards into the EN 60079 series of standards, the classification of areas with a danger of gas explosions and those with a danger of dust explosions were maintained in EN 60079-10 Part 10-1 and Part 10-2.

Within the ATEX system, hazardous locations are also classified into zones defined by the frequency of occurrence. Zone 0 classifies areas with a constant or frequent risk of explosion, while Zone 1 operates with an occasional risk. Zone 2 includes locations where danger does not usually occur or is very brief.

The European Committee for Standardization has also created standard EN 11271. It contains basic information on explosion protection and provides support for both ATEX Directives (2014/34/EU and 1999/92/EC).

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IECEx regulates standards for applications used around the world to help facilitate the international trade of electrical equipment. If the product features IECEx approval, no further international approvals must be obtained to conform with standards, making the trade quicker and more cost-effective.

Relays that have multiple ratings simplify approval and document management. This also minimizes inventory counts, as fewer variations of the product would be needed.

What’s the solution?

Hazardous locations require stringent approval systems to ensure the reliability and safety of the equipment, including relays, used within them. The UL class/division system, ATEX, and IECEx approval systems have nuances that prevent them from being completely interchangeable, which can complicate matters for global businesses. To eliminate costs and inventory by producing region-specific design variations, a simple solution is to install products with multiple approval ratings.

Phoenix Contact’s PLC..EX line of relays offers the only slimline relays on the market today rated for all three hazardous location standards: Class I, Div. 2, ATEX, and IECEx. The PLC..EX range of products features many options including:

- Control from 12 V to 230 V
- Single-pole, double-throw (SPDT) and double-pole, double-throw (DPDT) options
- A unique 10 A SPDT relay
- Screw or Push-in connection (PT) technology

Because these relays are part of the robust and comprehensive PLC-INTERFACE relay portfolio, they are compatible with all PLC relay accessories such as bridging, markers, and system cabling adapters.

With just 24 part numbers, PLC..EX can cover thousands of hazardous location applications here in the U.S. and around the globe. For more information, please visit www.phoenixcontact.com/HazLocRelays