

Purged/Pressurized Enclosures

Applications

Pressurization is generally used for equipment that cannot easily be protected by other means, either because it is too large to be made explosion-proof or too high powered to use intrinsic safety. A vast range of electrical equipment is regularly protected by this technique.

Principles of Operation

Pressurization is a method used in Class 1 hazardous locations to reduce the internal classification of an enclosure to a lower classification. In other words, pressurization (a technique that has previously been called purging) creates a less hazardous environment in a location which would otherwise be more hazardous.

There are three basic techniques used in the NFPA standard as follows:

- X Pressurization – Reduces an internal Division 1 to Non-Classified
- Y Pressurization – Reduces an internal Division 1 to Division 2
- Z Pressurization – Reduces an internal Division 2 to Non-Classified

Example: Pressurization applied to an instrument enclosure installed in a Class 1, Division 1 location using Z Pressurization techniques will reduce the internal classification from Division 1 to Non-Classified. This will allow equipment normally suitable only for a Non-Classified location to be used safely inside the enclosure.

Applied correctly using a suitable control system and pressurized enclosure, pressurization provides an equivalent degree of safety to explosion or intrinsic safety techniques.

Pressurization is simple. Clean, uncontaminated compressed air from a Non-Classified area (or inert gas) is admitted to the enclosure to keep the internal pressure at least 0.1 inches of water (0.25 mb) above the pressure outside. External flammable gas cannot enter the enclosure while it is pressurized.

Before power may be switched on, the enclosure must be purged to remove any flammable gas that might have entered the enclosure before it was pressurized.

Purging is the action of replacing the air inside an enclosure with air known to be free of flammable gases.

Zone 1

This classification includes areas or zones in which ignitable concentrations of flammable gases are likely to exist under normal operation conditions.

Zone 2

Includes equipment in which ignitable concentration of flammable gases or vapors are present only in abnormal situations or are not likely to occur in normal operation, and if they do occur, will exist only for a short period.

Refer to the latest edition of IEC 60079 or the NEC handbook for complete information.

Purging and Pressurization

Recommended enclosures for these applications are our NEMA Types 4, 4X & 12. With Type 12 enclosures, additional latches are recommended.

Most applications require a minimum enclosure pressure of 0.10 inches of water. In some cases, to protect against ignitable dust, 0.50 inches of water is required, and in rare situations as much as 2.5 inches of water is needed.

Enclosures are tested to withstand internal pressure of five (5) inches of water or 0.18 psi without permanent deformation and minimal loss of pressure.