

# Purge Panel for Hazardous Area



Purging and pressurizing systems are one of the most versatile explosion protection methods. These Systems are based on the principle that in Zone 1 or 2, Division 1 or 2, the gas mixture in the ambient atmosphere, which may ignite under certain circumstances, is removed from the housing by an initial Purge process. After the purge phase, sufficient compressed air or inert gas is supplied to compensate for leaks from the enclosure. This permanent overpressure, achieved using compressed air or inert gas, prevents any potentially explosive atmosphere in the ambient air from entering the enclosure.

During the rapid exchange purge phase, an internal pressure of approximately 3.5 - 12 mbar (1.3" to 5.0" Water Column) is achieved. During operation, this internal pressure reaches 0.6 - 3 mbar (0.3 to 1.2" Water Column).

The pressurizing system is particularly suitable for installing equipment that is not approved for use in hazardous areas. Once installed in a purge panel, it can then be used directly in the hazardous area.

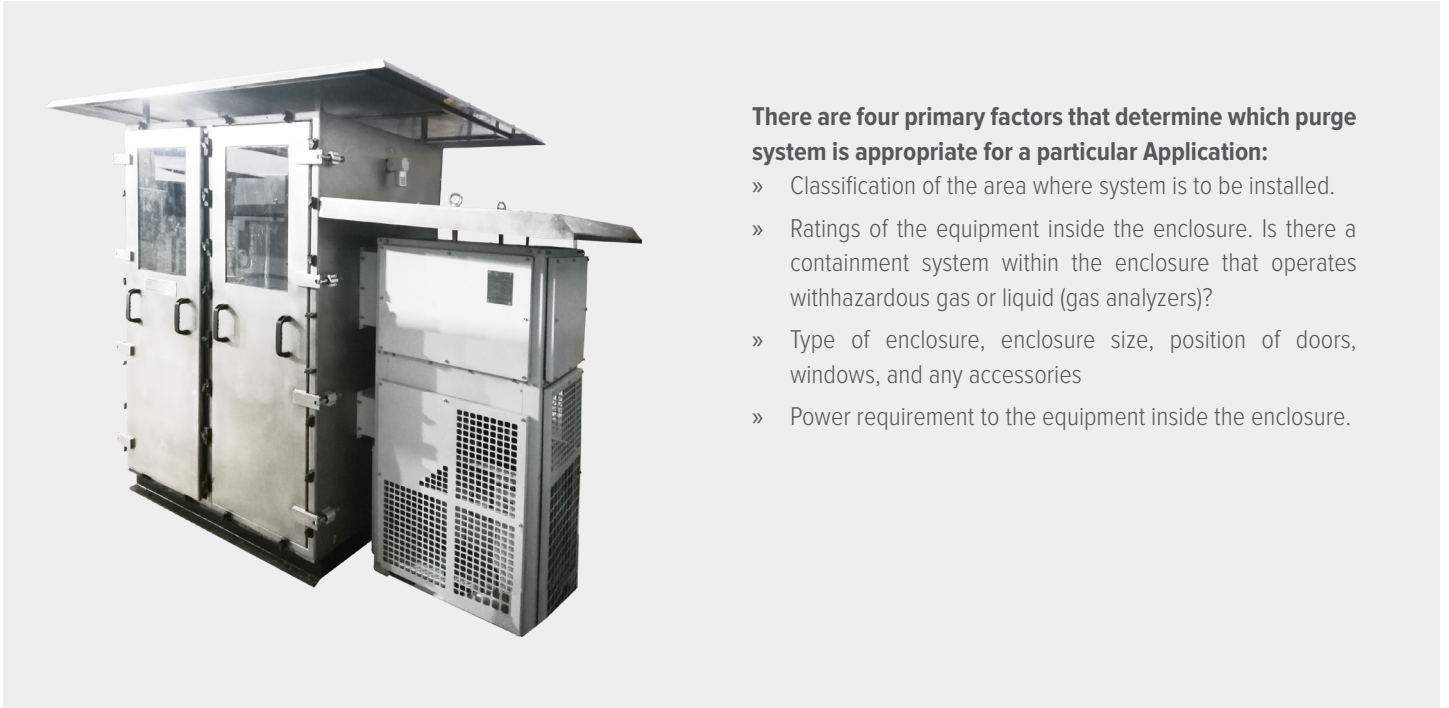
## FEATURES

- » Purge Panel have pressure withstanding capacity as per design.
- » HC accumulation are taken care
- » Moisture free purge is desired
- » Electrostatic discharge is one of the major features.
- » Various sizes for accommodating various equipments.
- » Purge Panel with Ex-AC certified for IP65

## PURGE/PRESSURIZATION V/S. EXPLOSION-PROOF

- » Explosion-proof enclosures are well known for their size, weight, and price as a means of protection. Another disadvantage is they allow for the explosion to happen but contain it within itself, provided all bolts are torqued down properly
- » Purge/pressurization can take in standard enclosures and make them safe for installation in hazardous areas as a means of protection, and, unlike explosion-proof, it does not allow for an explosion to occur.
- » The disadvantage of purge/pressurized enclosures is their operation requires constant air or other inert gas sources. Also, for very small enclosures such as instrument housings, there is a cost advantage in using explosion-proof, but in any enclosures over 1 cubic foot, purge/pressurization will have the advantage.





**There are four primary factors that determine which purge system is appropriate for a particular Application:**

- » Classification of the area where system is to be installed.
- » Ratings of the equipment inside the enclosure. Is there a containment system within the enclosure that operates with hazardous gas or liquid (gas analyzers)?
- » Type of enclosure, enclosure size, position of doors, windows, and any accessories
- » Power requirement to the equipment inside the enclosure.

### 1. AREA CLASSIFICATION

The area classification determines the type of purge system needed. For Zone 1/Division 1 areas, the equipment inside the enclosure determines whether an Ex px / Type X system (equipment rated for general -purpose) or an Ex py / Type Y system (equipment rated for Zone 2/Division 2) can be used.

### 2. EQUIPMENT RATINGS

The rating of the equipment inside the enclosure becomes important in evaluating which purge system to use in Zone 1 / Division 1 area. If the Zone 1/Division 1 area contains at least one general-purpose component, an Ex px / Type X system is required. If all devices in the enclosure are rated for Zone 2 / Division 2, then an Ex py / Type Y system can be used. Special conditions exist for enclosures such as gas analyzers and chromatographs that contain flammable gas.

Another consideration is for analyzers that are taking in a hazardous gas or liquid, examining it, and then putting it back into the process. Because there is a potential for leakages of this hazardous material inside the enclosure, dilution or the use of inert gas may be required. Some conditions may require the Zone 2 / Division 2 area to use an Ex px / Type X system because of the type of leakage.

Refer to EN60079-2 / IEC61241-4 / NFPA 496 2008 for more information.

### 3. ENCLOSURE SIZE

The size of the enclosure determines the size of the purge system. How the system is mounted depends on the position of doors, windows, and cable entrances.

The size of the enclosure is determined by the free volume within the enclosure. Normally, the equipment mounted inside the enclosure cannot be subtracted from the free volume. The volume of the enclosure is required in determining the purge time, which is based on 4 volume changes for N.A. (North American) standards and 5 volume changes for IEC and EN standards, and the flow rate of protective gas through the enclosure. If a motor is being purged, then the requirement for N.A., IEC, and EN, standards is 10 volume changes.

However, the stator of the motor can be subtracted from the free volume of the enclosure.

### 4. POWER REQUIREMENT

For Ex px / Type X systems, the control unit operates the power disconnect to the enclosure. If the power requirement for the enclosure exceeds the contact ratings on the control unit, a control relay must be added. If the control relay is located in a hazardous area, it must be rated for that hazardous location. After the purging pressure to the enclosure drops below the minimum required value, then the enclosure power must be disconnected and cannot be engaged until after a successful purge and the enclosure is pressurized.

For Ex Pz, py / Type Z, and Y systems, power to the enclosure can remain on if an alarm is activated indicating loss of pressure. If an alarm is not used, then the power to the enclosure must be disengaged.