

NFPA 496 TYPE Z COMPLIANT PURGE & PRESSURIZATION

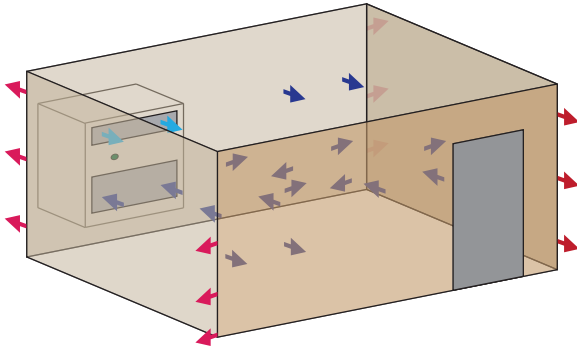


Figure 1. Typical Use of Backup Blower for Purge/Pressurization. Under normal operation, one set of blowers is operating, taking air from the outside and circulating it through area.

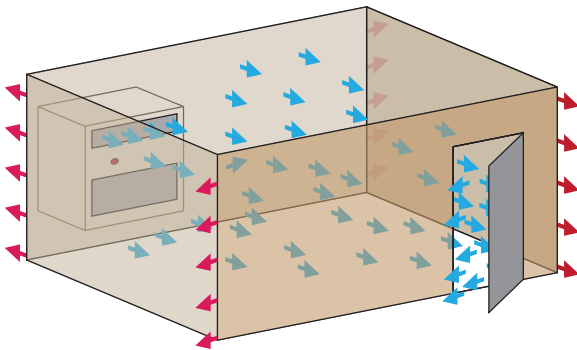


Figure 2. Typical Use of Backup Blower for Purge/Pressurization. During purge, all blowers are active and the return air disengaged, which forces protective air into the area until repressurization is achieved.



Figure 3. A Specific Systems Purge & Pressurization Unit

PRODUCT APPLICATION

To ensure compliance with National Fire Protection Association (NFPA) standards listed in Section 496 and the National Electric Code (NFPA Section 70), Specific Systems manufactures Purge and Pressurization Units. These units can be purchased as stand-alone units or as additional options on other industrial units.

NFPA defines pressurization as “The process of supplying an enclosure with a protective gas with or without continuous flow at sufficient pressure to prevent entrance of a flammable gas or vapor, a combustible dust, or an ignitable fiber” (NFPA 496 3.3.8). In the case of pressurizing a room or building, NFPA adds the protective gas as “air” that is “essentially free of contaminants or foreign matter” and that “contains no more than trace amounts of flammable vapor or gas” (NFPA 496 7.2).

Purging is defined as “the process of supplying an enclosure with a protective gas at a sufficient flow and positive pressure to reduce the concentration of any flammable gas or vapor initially present to an acceptable level.” To put it simply, before an area can be pressurized, it must be purged of the current air.

Pressure must be maintained at a level of at least 25 Pa (0.1 in. of water) with all openings closed, and must “provide a minimum of 0.305 msec (60 ft/min) through all openings capable of being opened.”

Generally, if the area requires purge and pressurization, it will require protective gas to be pulled from a minimum of 25' above ground level. In some instances, a chemical filter option may also be recommended in order to enhance the area’s indoor air quality.

Figures 1 and 2, above left, give an example of the Specific Systems InPac series. These units feature built-in dual backup blowers that act as accessory fans during the purge of an area. During normal operation (Figure 1), the area is sealed, but the unit pressurizes the room, forcing protective gas into the area, and out through tiny cracks, crevices, and seams. Figure 2 shows abnormal operation, in this case a door left open. After 2 seconds of a pressurization drop below a preset level (usually 0.7 in. of water), return air is disengaged and the accessory blowers automatically turn on, forcing potentially hazardous air out of the area.

When determining the need for a purge and pressurization system, three key characteristics of the area must be taken into account: **size** and **classification** of the area to be pressurized, and **power requirement** to the area.

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Size

Size of the area is a major factor in determining the correct capacity of the unit required, and also how the unit shall be mounted. In some instances, it may be desirable to place the unit on the roof of the building, where in others, space considerations may make a wall-mount unit more economical. When determining the size of the area, one must include any space below a raised floor or above a dropped ceiling.

Classification

Classification refers to the hazardous area classifications defined in the National Electric Code (NFPA 70, Article 500). The NFPA devised a system whereby areas are rated based on their relationships to ignitable gases or dusts. Class I, Division 1 areas have the highest rating, with explosive or flammable gases being prevalent in the area under normal work conditions. Class II, Division 1 is similar, with the presence of ignitable fibers or dust instead of gases.

Division 2 and Zone 2 are those areas where ignitable gases or dust are unlikely to be present during the course of normal operations, but may escape under abnormal conditions (such as the rupture of a barrel or malfunction of equipment).

There are three levels of pressurization, Types X, Y, and Z. Type Z pressurization is defined by the NFPA as reducing the classification within the protected enclosure from Division 2 or Zone 2 to unclassified.

Power Requirement

According to the NFPA, the pressurized area must include a way of indicating failure to maintain positive pressure. This indicator can be visual or aural, and must meet the specifications stating that it is safe to use in the area in which it is placed.

PRODUCT DESCRIPTION

All of Specific Systems InPac and PPU series units meet NFPA requirements for installation in Class I or II, Division 2 or Zone 2 areas. InPac and PPU series units feature explosion proof electronics housing boxes and intrinsically safe electronics

	Class I	Class II
Division 1 / Zone 1	Ignitable Concentrations of Flammable or Combustible Gases are present or exist under normal circumstances	Ignitable Concentrations of Flammable or Combustible Fibers or Dust are present or exist under normal circumstances
Division 2 / Zone 2	Ignitable Concentrations of Flammable or Combustible Gases are present or exist only under abnormal circumstances	Ignitable Concentrations of Flammable or Combustible Fibers or Dust are present or exist only under abnormal circumstances