



## Ex p protection concept for hazardous area

The protection principle of „overpressure“ according IEC/EN Norm 60079-2

## Ex p protection concept for hazardous area

For more than 20 year experience, BARTEC “proven **EX**pertise”

### Pressurized encapsulation protection concept

#### Device protection through pressurized encapsulation

The protection principle of “overpressure” is regulated by the IEC/EN Standard 60079-2.

The idea of pressurized encapsulation is to use a protective gas to purge equipment and to maintain pressurization in such a way that any combustible gas from the atmosphere cannot penetrate into equipment protected by pressurization.

This means that a safe area is created and monitored within potentially explosive areas. Industrial components, for example, can be used in Ex p devices without separate Ex certification.

#### How does pressurized encapsulation work?

The operation of Ex p equipment resembles a safe sequence control unit. After starting the Ex p equipment, purging (purging phase) is conducted which flushes out any accumulated gaseous flammable media.

The purging of the Ex p equipment depends on the volume and the flow rate achieved. During this time, the Ex p control unit monitors the set flow rate.

After purging, an operating phase is initiated in which the internally installed industrial components of the Ex p equipment can be activated and operated. During this time, the Ex p control unit constantly monitors the internal pressure. Leakage losses of the pressurized enclosure are compensated so that the internal pressure remains constant.

The Ex p equipment can be operated in the operating phase as long as a positive overpressure is maintained in the Ex p equipment or the operator actively deactivates it.

In the event of a fault in the protective gas supply, e.g. failure of the protective gas, the internally installed industrial components are automatically deactivated.

## Pressurized encapsulation and its distribution to the Ex zones

The pressurized encapsulation is divided into three protection levels: pxb, pyb and pzc,

whereby "pxb" is pressurized encapsulated equipment with a device protection level of "Gb" or "Db". It protects normal industrial components which can be operated in zone 1/21 due to the pressurized enclosure;

"pyb" is pressurized encapsulated equipment with the device protection level "Gb" or "Db". It protects components which correspond to the device protection level "Gc" or "Dc". The protection level "pyb" therefore permits the operation of approved components of zone 2/22 in zone 1/21;

"pzc" is pressurized encapsulated equipment with the device protection level "Gc" or "Dc". It protects normal industrial components that can be operated in Zone 2/22 due to the pressurized enclosure.

## Pressurized protection offers a variety of advantages

- Large and geometrically sophisticated enclosures
- Simple conversion of a non-Ex application into an Ex application
- Heat-generating components can be protected more easily than with comparable protection concepts
- Weight saving in comparison to other types of protection
- Externally comparable to a normal electrical cabinet
- Increase of the service life of internal components due to the used dry and clean protective gas
- The internal overpressure prevents the penetration of impurities
- User-friendly and easy to install
- Permanent system status information and low maintenance requirements

### Further information

- Overview "Basic concepts for explosion protection"  
<https://www.bartec.de/en/downloads/safety-academy/ex-protection.pdf>
- Marking of ATEX / IECEx electrical explosion protected equipment  
[https://www.bartec.de/en/downloads/safety-academy/ExPoster\\_elektrisch\\_2019\\_e.pdf](https://www.bartec.de/en/downloads/safety-academy/ExPoster_elektrisch_2019_e.pdf)