



STAHL

The technique of pressurized apparatus EEx p offers for many applications a practical and economical solution to protect single electrical components or complete assemblies in a potentially explosive atmosphere.

EEx p Control Panels Pressurized Apparatus

- Explosion protection to
 - CENELEC
 - IEC
- Can be used in Zone 1 and Zone 2
- Meets standards
 - EN 50 014
 - EN 50 016
 - EN 50 018
 - EN 50 019
 - EN 50 020
- The range includes
 - complete control and distribution panels to the pressurized protection standard EEx p
 - empty enclosures for equipment to the EEx p protection standard, complete with fitted components including control device, air supply and pressure monitoring unit
 - individual components protected to pressurized standard EEx p
- Pressurized apparatus
 - with leakage compensation
 - with continuous circulation of protective gas

Zone 1 and Zone 2

Function of pressurized apparatus EEx p

An enclosure which needs to be explosion protected is purged with inert gas. Thus an overpressure is built up and maintained during operation. This positive pressure prevents entry of surrounding explosive gases and vapours into the enclosure which, together with oxygen from the air, would create an explosive atmosphere.

There are two different kinds of EEx p protection:

- pressurization with leakage compensation and
- pressurization with continuous circulation of inert gas.

In the following description only the type of protection with leakage compensation is described. Since pressurized protection is only justified if, in addition to explosion protection, heat extraction is needed due to high energy losses from the installed electrical equipment.

Pressurization with leakage compensation

Operation of pressurized equipment can be divided into three phases:

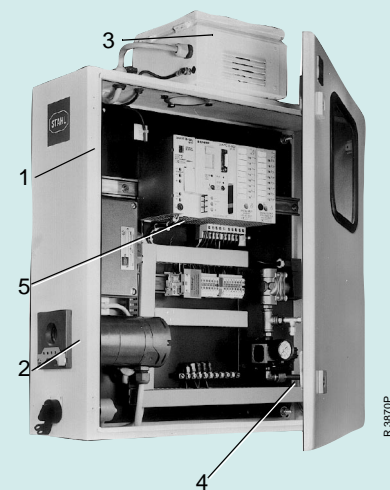
- the preparatory phase
- the purging phase
- and
- the actual operational phase.

The preparatory phase starts with energizing the control unit. Inert gas flows via the air supply unit (ASU) into the enclosure of the installation which is to be protected. Thus, positive pressure builds up in the enclosure, the orifice plate is raised, and inert gas flows through the orifice plate into the open. Through the differential pressure switch of the protection unit (PU), the positive pressure of the gas in the enclosure and the gas flow through the orifice plate is transmitted to control unit 8218 via the protection unit differential pressure switch. Thus, the purging phase is initiated.

During the purging phase the installation is being prepared for the actual operational phase. The enclosure is purged with air or inert gas to expel any potentially explosive gas/air mixture. The quantity of protective gas required for purging must be at least five

times the volume of the free space in the enclosure. The required quantity of inert gas must be selected at control unit 8218 and is also controlled by it. The purging process is controlled by the protection unit (PU) flow control switch (FSL).

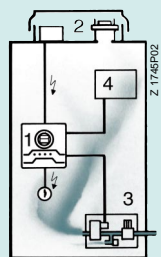
After the purging phase is complete, the solenoid valve will be closed, thereby stopping the flow of gas into the enclosure. The internal pressure of the enclosure will drop and the orifice plate will close. Now the actual operational phase begins. A positive pressure must be maintained in the interior of the protected enclosure which prevents dangerous gases or vapours from entering it and coming into contact with arcing electrical components. The installation can now be operated without any danger. Pressure loss will be compensated by a by-pass solenoid valve. Should the internal pressure of the enclosure fall below the value preset at the pressure regulator (PSL), the installation will be de-energized.



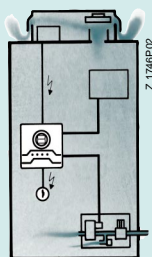
Components of an EEx p control unit

1. Control panel with ingress protection IP 65
2. Control unit 8218 with integral electronic monitors and indicating lights
3. Pressure control protection unit fitted with orifice plate, flow control switch, and pressure control switch
4. Air supply unit with pressure regulator, solenoid valve and fine control valve
5. Pressurized equipment EEx p protected controls

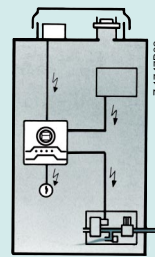
Operation of pressurized equipment



Preparatory phase:
Inert gas flows into the enclosure, internal pressure in enclosure rises.



Purging phase:
The positive pressure inside the enclosure causes the orifice plate to open. The inert gas purges the enclosure.



Operating phase:
The pressure in the enclosure prevents ingress of explosive atmospheres

- 1 Control unit 8218
- 2 Protection unit with:
2a orifice plate
2b differential pressure switches
- 3 Air supply unit with solenoid valve
- 4 Pressurized equipment