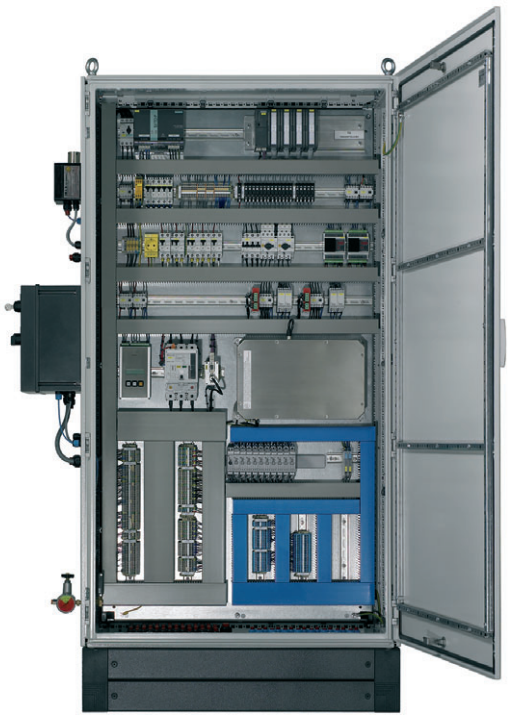
# Ex p Control Panels Pressurized Apparatus



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- Meets standards
  - EN 60079-0, EN 60079-2, EN 60079-7, EN 60079-11, EN 60079-18, EN 61241-0, EN 61241-1, EN 61241-4
- The range includes
  - complete control and distribution panels to the pressurized protection standard Ex p
  - empty enclosures for equipment to the Ex p protection standard, complete with fitted components including control device, air supply and pressure monitoring unit
  - individual components protected to pressurized standard Ex p
- Pressurized apparatus
  - with leakage compensation
  - with continous circulation of protective gas

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

| | ATEX | | | | | |
|---|---|---|---|---|---|---|
| Zone | 0 | 1 | 2 | 20 | 21 | 22 |
| For use in | | x | x | | | x |

WebCode ExpA

# Ex p Control Panels Pressurized Apparatus

## Function of Pressurized Apparatus Ex 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 overpressure 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 Ex p protection:
- pressurization with leakage compensation and
- pressurization with continuous circulation of inert gas

The pressurization with continuous circulation of inert gas is only allowed in gas explosive areas.

With this type of protection it is also possible that added to the explosion protection a part of the powerless of electrical equipment can be brought outside the cabinet.In the following description only the type protection with leakage compensation is described

## Pressurization with Leakage Compensation in Gas Areas

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 into the enclosure of the installation which is to be protected. Thus, overpressure builds up in the enclosure, the air outlet valve opens and inert gas flows through the air outlet valve of the control unit into the atmosphere. Now the purging phase is initiated.

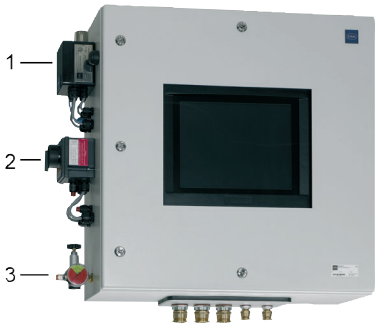
During the purging phase the installation is being prepared for the actual operational phase. The enclosure is purged with air or inert gas to expel any potentially explosive gas/air mixture. The quantity of protective gas required for purging is measured by a type test for each new cabinet.

The required quantity of inert gas must be selected at control unit and is also controlled by it. The purging process is controlled by the control unit.

After the purging phase is complete, the solenoid valve will be closed, thereby stopping the flow of gas into the enclosure. The internal pressure rises up to the defined value and the air outlet valve is closed.

Now the actual operational phase begins. The installation of standard electrical equipment is now connected to power. An overpressure 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 internal overpressure will be check by the control unit. The cabinet can be riskless used. 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 control unit, the installation will be de-energized (Zone 1) / an alarm signal will be send out (Zone 2).

## Components of an Ex p control station



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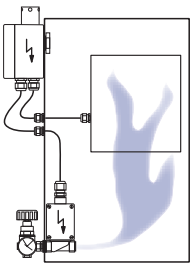
1. Control unit with overpressure sensor, flow sensor and air outlet
2. Main switch in Ex e enclosure (optional)
3. Air supply unit with pressure regulator and solenoid valve

## Operation of Pressurized Equipment in Gas Areas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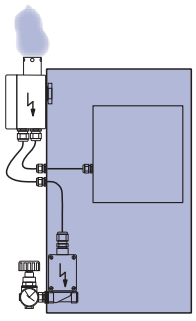
Preparatory phase:
Inert gas flows into the enclosure, internal pressure in enclosure rises.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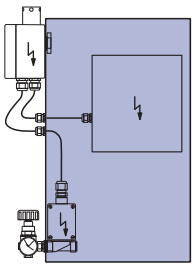
Purging phase:
The overpressure rises up to the defined value and the air outlet valve of the control unit opens. The inert gas purges the enclosure.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Operating phase:
The pressure in the enclosure prevents ingress of explosive atmospheres.

## Pressurization with Leakage Compensation in Dust Areas

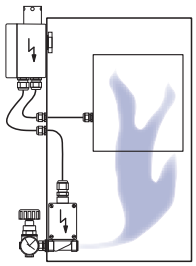
Operation of pressurized equipment can be divided into two phases:
- the preparatory phase and
- the actual operational phase

Before starting a pressurized cabinet, it must be checked that inside the enclosure there is no dust that can be dispersed.

The preparatory phase starts with energizing the control unit. Inert gas flows via the air supply unit into the enclosure of the installation which is to be protected. Thus, overpressure rises up to the defined value in the enclosure the solenoid valve will be closed, thereby stopping the flow of gas into the enclosure.
Now the actual operational phase begins. The installation of standard electrical equipment is now connected to power.

An overpressure must be maintained in the interior of the protected enclosure which prevents dangerous dust from entering it and coming into contact with arcing electrical components
The internal overpressure will be check by the control unit. The cabinet can be riskless used. 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 control unit, an alarm signal will be send out (Zone 22).

## Pressurization with Leakage Compensation in Dust Areas



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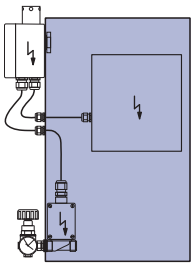
Preparatory phase:
Inert gas flows into the enclosure, internal pressure in enclosure rises.



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

## Scope of Delivery Ex p

The sheet steel and stainless steel enclosures can be used as single solution and cabinet combinations.
The range of enclosures starts at small wall mounting enclosures and rises up to huge free standing enclosures.It is additional possible to deliver complete Ex p container. A large number of components such as contactors, switches, instruments, PLCs etc. can be built into these Ex p enclosures.
Naturally, customer free issued parts can also be incorporated into the layout.
The equipment layout is designed by us to customers requirements. Cables can be brought into and out of the Ex p enclosure directly via cable glands (see catalogue chapter E10).

Additional mounting of control and display devices in the panel front is also possible
- switches, indication lamps
- control and motor switches
- ammeter, voltmeter
- counter display
- HMI-displays

and the use of windows and window flaps is possible.

If necessary we can add a release contactor mounted into a R.STAHL system enclosure. This can be placed inside or outside the Ex p enclosure.

## Ex-p-Control and Distribution Panels Planning Information

### Planing and installation

Planning and installation of explosion-protected control and distribution panels requires considerable experience and careful consideration in all planning and manufacturing processes. With the technical details we require from the customer we have to develop a technically perfect, economically reasonable solution, taking into account many national and international regulations and standards. Besides Ex-regulations EN 60079ff and EN 61241ff general regulations, especially DIN VDE 0100, EN 60204-1 and EN 60439-1, have to be observed when planning and construction control and distribution facilities.

### Fitting of devices

Commercial electrical apparatus of all sorts can be fitted into pressurized cabinets. Fitting of devices is subject to a "type test" which has to be done by a notified body. R.STAHL has so-called general construction certificates; so R.STAHL is authorized to build explosion-protected switchboards and distribution facilities for all common requirements. Each switchboard manufactured at R.STAHL has to undergo a routine check test, thus it is guaranteed that during manufacturing of the installation all regulations referring to explosion protection have been kept and that the installation is suitable to use in hazardous area.

# Ex p Control Panels Pressurized Apparatus

| Explosion Protection | |
|---|---|
| **Europe (ATEX)** | |
| Gas and dust | KEMA 04 ATEX 2103<br>control unit 8624: II 2 G Ex mb e ia [px] [ia] IIC T4<br>control unit 8625: II 2 GD Ex mb e ia [pz] [ia] IIC T4 T70°C IP65 |
| **Certifications and certificates** | |
| Certificates | ATEX, Belarus (operating licence) |

| Technical Data | |
|---|---|
| **Electrical data** | |
| Rated voltage | 24, 115, 230, 250 V AC, 48 ... 62 Hz<br>12, 24 V DC |
| Relay contacts | max. 3 A / 230 V AC 15<br>max. 6 A / 24 V<br>Higher switching capacity with external release contactor |
| **Ambient conditions** | |
| Ambient temperature range | -30 ... +60 °C |
| **Mechanical data** | |
| Material | |
| Enclosure material | Sheet steel painted Stainless steel V2A or V4A |
| **Mounting / Installation** | |
| Installation | In Zone 1, 2, 22 |
| Mounting location | Control unit: inside or outside possible<br>Air inlet group: inside or outside possible |
| Thread sizes | Pressurized air connection brass made R¼ inch<br>(Inert gas, air or available, min. 1.5 bar dynamic, max. 25.0 bar static)<br>Other thread sizes and material partly available |

**Accessories and Spare Parts**

| Designation | Description | Ordering code |
|---|---|---|
| Bypass key-operated switch | for maintenance to tide over the control unit | **on request** |
| Weather protection for air outlet | useful for outdoor installation to protect the air outlet, can not be expanded later on | **on request** |
| Additional air outlet valve | reduction of purging time with large enclosures | **on request** |
| Electronic temperature sensor | ventilation control with higher power losses | **on request** |
| Pressure reducer air supply unit 1.4571 | pressure reducer in stainless steel | **on request** |
| Ex p control unit Zone 1 with air inlet Type 8624 | complete unit; detailed description when ordering necessary | **on request** |
| Ex p control unit Zone 2 with air inlet Type 8625 | complete unit; detailed description when ordering necessary | **on request** |
| Ex p control unit Zone 22 with air inlet Type 8625 | complete unit; detailed description when ordering necessary | **on request** |