



Ex p Systems - Solutions for Pressurization

APEX, SILAS, APC, SPC and Applications



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PRESSURIZATION

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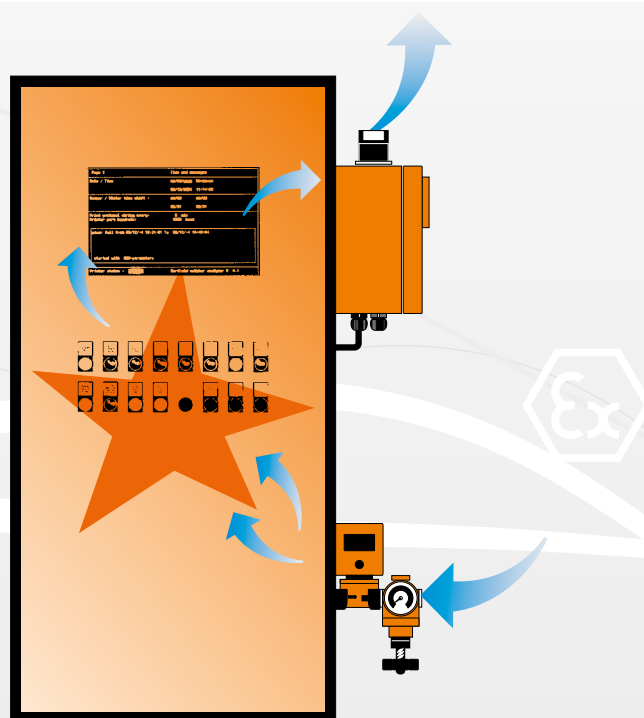
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Ex p PRESSURIZATION FOR ZONE 1, 2 AND 21, 22

There is an ever-increasing demand for complex automation functions for processes in the fields of chemicals, pharmaceuticals, oil and gas. What are needed are flexible, safe and low-maintenance solutions for measuring, controlling, regulating and visualization tasks, particularly in hazardous (potentially explosive) areas.

Control and switchgear systems, motors, drives and pumps, large displays and also industrial monitors are expected to be conveniently, safely and easily equipped for use.

Ex p pressurization is the ideal solution for a lot of applications. This technology allows standard devices to be converted for use in the Ex area, for Zone 1, 2 and 21, 22, with a high degree of flexibility and economic efficiency.



Principle

Electrical equipment creates overpressure in a sealed housing. The overpressure inside the housing ensures that explosive gases cannot enter the housing from outside. This creates a safe area inside the housing, in which non-explosion-protected electrical devices can be installed and operated safely. Any leakage losses which occur in the housing are compensated for by feeding in purge gas.

Types of ignition protection

The "pressurised enclosure" ignition protection type is divided into three protection levels: px, py and pz. The prevailing explosive atmosphere determines a particular device protection level (Gb [Zone 1], Gc [Zone 2] or Db [Zone 21], Dc [Zone 22]). The type of ignition protection is selected accordingly.

Ex pxb Non-Ex components can be installed inside the pressurised enclosure housing.

Ex pyb Only components which have been tested for Zone 2 as a minimum can be installed inside the pressurised enclosure housing.

Ex pzc Non-Ex components can be installed inside the pressurised enclosure housing.



THE KEY ADVANTAGES OF PRESSURISATION

■ CUSTOMIZED SOLUTIONS

We develop just the right Ex solution for the enclosure containing electrical apparatus: for devices, printers, operator terminals, controls, frequency converters, monitors and motors.

■ ALSO FOR XXL CABINETS

The pressurization is suitable for cabinets with a capacity of up to 6300 liters.

■ CONVENIENT FOR INSPECTIONS AND MAINTENANCE WORK

There is no problem in accessing fitted components during maintenance work. A purging process must be run through before the electrical apparatus may be put into operation again.

■ PROTECTS THE FITTED COMPONENTS

The constant supply of more purging gas prevents a build-up of heat and corrosion to the fitted components.

We are specialists in pressurized systems. BARTEC's Ex p system offers an innovative Ex solution for controlling and automating devices, machinery and systems in Zone 1, 2 and 22 comfortably and economically.

Non-explosion-proof control units and switchgear as well as complete automation systems are fitted into the cabinets depending on the application. Modern ready-to-operate Ex solutions – approved and certified to Directive RL 2014/34/EU and IECE – are created on the basis of the modular ATEX-certified APEX 2003 overpressure control unit.

Over the course of many years, BARTEC experts have gathered substantial experience in the manufacture of complete system automation solutions for use in hazardous areas.

This know-how forms the basis of the development of safe and economically efficient solutions starting with engineering, including production and procurement and extending to commissioning and approval processes.



Ex p CONTROL UNIT APEX ZONE 1

APEX Control units for use in Zone 1

The APEX control unit controls and monitors the purging and operating phases in Ex px solutions.

It has proven its worth over many years both in switchgear and also in analysing and operating systems. The control can be mounted either internally or externally. It is also possible to mount the purge gas outlet at a distance.

For special applications BARTEC also offers customised constructions of the modular APEX Control unit. BARTEC supplies both control units and also certified pressurised complete solutions for hazardous areas in Zone 1.



Use in Zone 1

ATEX, INMETRO, GOST-R Certification

SIL 2

Internal or external mounting

Easy operation

BARTEC offers the APEX control unit in a variety of standard versions to suit the various enclosure capacities:

APEX 2003.MV	remote mounting of the control unit for enclosures with internal capacities of up to 70 litres
APEX 2003.00	for enclosures with internal capacities of up to 700 litres
APEX 2003.002x	for enclosures with internal capacities of over 700 litres

There is a choice of digital or proportional valves to supply purge gas. The purging time is set on the APEX control unit by means of the rotary switch and the pressure switching levels are set by using the menu displayed in the sensor module. The flow is measured at the pressure monitor module by means of a differential pressure measuring procedure.



COMPLETE SOLUTION APC APEX PRESSURIZED CABINET

- TYP EX PX
- APPROVED FOR ZONE 1
- INTERNATIONAL AND NATIONAL APPROVALS
ATEX, IECEX, EX-TR
- EASY OPERATION
- AUTOMATED ACTIVATION
of the internal fitted components
- 5-TIMES PURGING
- CUSTOMIZED SOLUTIONS



An overview of the advantages of the APEX control unit

High level of safety

All APEX control units have a safety integrity level of SIL 2

LCD display

Displays the system pressure levels, purging time and settings on the sensor module

Status and system reports

2 freely programmable relays with 2 floating contacts each

LED status display

All important pressure switching levels and functions are indicated by LEDs

Bypass key switch

for maintenance work

Ex p CONTROL UNIT SILAS ZONE 2

SILAS control unit for use in Zone 2 and 22

The SILAS control unit controls and monitors the purging and operating phases in Ex px solutions.

This control unit has proven its worth over many years in switchgear and operating systems. The control unit can be mounted either inside or outside the apparatus. It is also possible to mount the purge gas outlet at a distance. This makes the SILAS system particularly flexible and versatile.

BARTEC supplies SILAS both as an individual control unit and also as a certified pressurised complete solution for use in hazardous areas in Zone 2 and 22.



Use in Zone 2 and 22

International approvals

ATEX, IECEx, KTL, INMETRO, GOST-R

Internal or external mounting

Easy operation

The control is flexible and can also be mounted with 2 purge gas outlets. This makes pressurization solutions possible for quite large control cabinets too.

Digital valves with integrated manual leakage loss compensation are available to supply purging gas. The purging time or pressure switching levels can be set by means of the pushbutton on the SILAS control unit. The values are shown on an integrated LCD display. A pressure sensor, which is fitted inside the SILAS control unit measures and monitors the internal pressure in the pressurized cabinet.



COMPLETE SOLUTION SPC SILAS PRESSURIZED CABINET

- TYP EX PZ
- APPROVED FOR ZONE 2 AND 22
- NATIONAL AND INTERNATIONAL APPROVALS
ATEX, IECEx, EX-TR
- EASY OPERATION
- AUTOMATED ACTIVATION
of the internally fitted components
- 5-TIMES PURGING
- CUSTOMIZED SOLUTIONS



Overview of the advantages of the SILAS control units

LCD display

Displays the system pressure levels, purging time and setpoints on the sensor module.

Status and system report

1 freely programmable alarm relay

LED status display

All important pressure switching levels and functions are indicated by LEDs

Bypass function

for maintenance work

Ex p MOTOR PURGE CONTROL SYSTEM MPC

MPC Motor Purge controller, the control unit for motors

The Motor Purge Control system controls and monitors the purging and operating phases of Ex p motors or large Ex p switchgear with a capacity inside the cabinet of more than 3,000 litres.

The control unit is based on the APEX control unit, which has been proven in use.

The MPC is available in a variety of versions to suit our customers' various applications and areas of utilisation.



MPV Motor Purge Valve

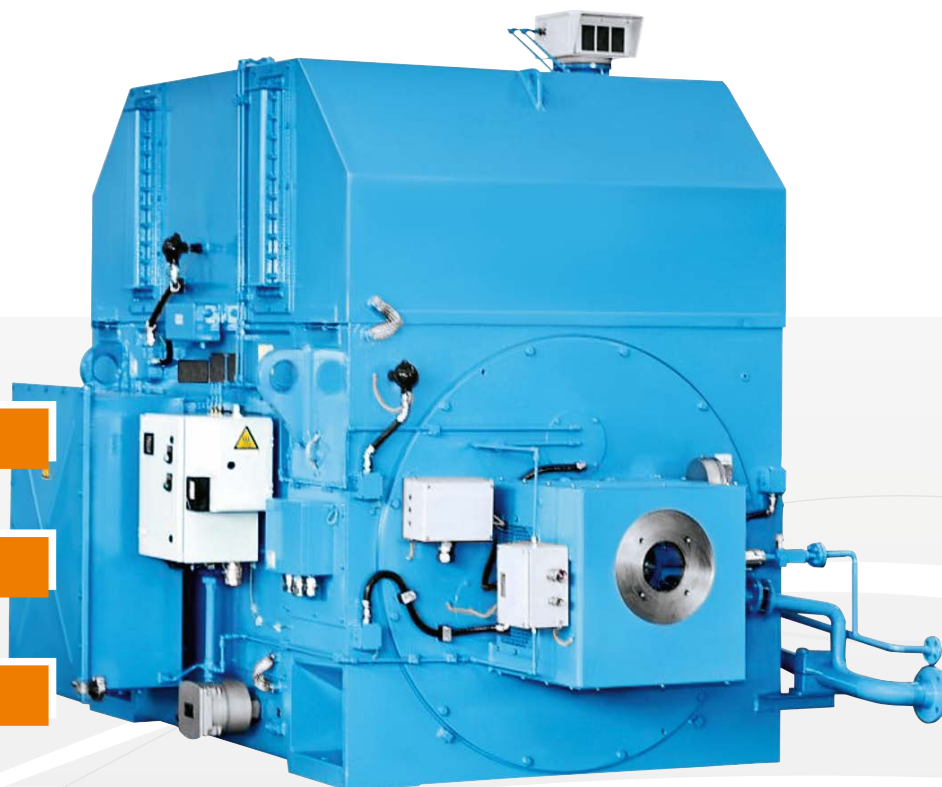
- Horizontal or vertical mounting possible
- Valve-controlled
- Separate outlet for the MPC system

MPC, 3G Motor Purge Controller

- Typ Ex pz
- Approved for Zone 2
- National and international approvals ATEX
- Easy operation
- Remote mounting

MPC, 2G Motor Purge Controller

- Typ Ex px
- Approved for Zone 1
- National and international approvals ATEX, IECEx, Ex-TR
- Easy operation
- Remote mounting



Use in Zone 1 and 2

International approvals

ATEX, IECEx, KTL, INMETRO, GOST-R

Internal or external mounting

Easy operation

An overview of the advantages of the MPC control units

LCD display

Displays the system pressure levels, purging time and setpoints on the sensor module.

Status and system report

1 freely programmable relay

LED status display

All important pressure switching levels and functions are indicated by LEDs

Indicator lamps

Display for purging and operation

Ex p EXAMPLES OF APPLICATIONS

Ex p PC and Monitor Solutions

Local Ex p PC solutions with the option of an integrated monitor and keyboard. On the front the user has a monitor, which is mounted behind a safety glass pane, and there is the option of a keyboard with an integrated trackball. The Ex p control system can be mounted either internally or externally. Extensions with additional control elements are possible.

To start operation, the customer starts the Ex p control and activates the purge gas supply. Once the purge time for the Ex p solution has expired, the Ex p control automatically activates the Ex p operator terminal. The data connection as well as the internal voltage supply for the monitors and also the internal non-Ex assemblies are started and the customer has the full range of functions at his disposal.



Explosion protection

Marking	II 2G Ex pxb IIC T4 Gb resp. II 3G Ex pzc IIC T4 Gc
Certification	BVS 11 ATEX E 144 (Zone 1) resp. BVS 11 ATEX E 145 (Zone 2)
Other approvals and certificates, see www.bartec.de	
Max. ambient temperature range	-20 °C > T _a < +60 °C, depending on the ambient temperatures for internal components
Approved for Zone	1 or 2

Technical data

Ex p configuration	Complete system with Ex p control
Purge time	Volume-dependent, min. 5-times purging
Material	Stainless steel or sheet steel painted

Electrical data

Supply voltage	AC 230 V, AC 115 or DC 24 V Automatic actuation
Data line	Automatic actuation

Ex p Human Machine Interfaces (HMI)

Local operator terminals with the option of additional operating elements.

On the front there is a touchscreen or operator panel such as e.g. SIEMENS MP/TP for the user.

The Ex p control system can be mounted either internally or externally.

To start operation, the customer starts the Ex p control and activates the purge gas supply. Once the purge time for the Ex p operator terminals has expired, the Ex p control automatically activates the HMI and data line.



Explosion protection

Marking	Ex II 2G Ex pxb IIC T4 Gb resp. Ex II 3G Ex pzc IIC T4 Gc
Certification	BVS 11 ATEX E 144 (Zone 1) resp. BVS 11 ATEX E 145 (Zone 2)
Other approvals and certificates, see www.bartec.de	
Max. ambient temperature range	$-20\text{ }^{\circ}\text{C} > T_a < +60\text{ }^{\circ}\text{C}$, depending on the ambient temperatures for internal components
Approved for Zone	1 or 2

Technical data

Ex p configuration	Complete system with Ex p control
Purge time	Volume-dependent, min. 5-times purging
Material	Stainless steel or sheet steel painted
Version	Optional stand Optional operating Elements operating panels

Electrical data

Supply voltage	AC 230 V, AC 115 or DC 24 V Automatic actuation
Data line	Automatic actuation

Ex p EXAMPLES OF APPLICATIONS

Ex p Printer

Printing in a hazardous environment. With the aid of a pressurized enclosure, it is possible to modify a standard office printer for use in an explosive atmosphere.

The enclosures are adapted specially to suit the printers that are used. They have a reduced-sized door to facilitate the removal of printouts. This door can be opened for 15 seconds in order to remove the printout. The advantage of this solution is that it prevents leakages through slits.

To put into operation, the customer starts the Ex p control and activates the purge gas supply. Once the purge time for the Ex p printer has expired, the Ex p control activates the printer and the data line automatically.



Explosion protection

Marking	II 2G Ex pxb IIC T4 Gb resp. II 3G Ex pzc IIC T4 Gc
Certification	BVS 11 ATEX E 144 (Zone 1) resp. BVS 11 ATEX E 145 (Zone 2)
Other approvals and certificates, see www.bartec.de	
Max. ambient temperature range	-20 °C > T _a < +60 °C, depending on the ambient temperatures for internal components
Approved for Zone	1 or 2

Technical data

Ex p configuration	Complete system with Ex p control
Purge time	Volume-dependent, min. 5-times purging
Material	Stainless steel or sheet steel painted
Fitted components	Laser printer Thermal transfer printer Customized printer

Electrical data

Supply voltage	AC 230 V, AC 115 or DC 24 V Automatic actuation
Data line	Automatic actuation

Ex p Control and Switchgear Cabinets

A pressurized enclosure allows customized control units which are used as standard in non-hazardous areas to be used easily and safely in hazardous areas.

Special customized components fitted in the front panel can be adapted for use in the hazardous area. Operating elements such as buttons or indicator lamps are replaced by tested and approved versions. The customized non-Ex control is inside. Sensor inputs and outputs can be made safe by means of Ex i barriers. It is also possible to mount operating panels, monitors, keyboards, horns or flashing lamps.

To put into operation, the customer starts the Ex p control and activates the purge gas supply. Once the purge time for the Ex p printer has expired, the Ex p control automatically activates the printer and the data line.



Explosion protection

Marking	Ex II 2G Ex pxb IIC T4 Gb resp. Ex II 3G Ex pzc IIC T4 Gc
Certification	BVS 11 ATEX E 144 (Zone 1) resp. BVS 11 ATEX E 145 (Zone 2)
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Electrical data

Supply voltage	AC 230 V, AC 115 or DC 24 V Automatic actuation
Data line	Automatic actuation

Optional accessories

Protective hoods
Support arm systems
Ex d contactor in div. switching capacities

Ex p EXAMPLES OF APPLICATIONS

Ex p Kundenspezifische Lösungen

Wir prüfen und bewerten spezielle Kundenanlagen auf die Möglichkeit der Modifizierung zum Einsatz in explosionsgefährdeter Umgebung:

- Bewertung mechanischer Explosionsschutz
- Auslegung Kundensystem
- Zertifizierung nach ATEX
- Dokumentation

On behalf of our customers, we plan, develop and produce tailor-made solutions for use in hazardous areas.

We have already very successfully adapted the following installations and systems for suitability for use in hazardous areas:

- MEASUREMENT SYSTEMS
- INDICATOR PANELS
- WATER ANALYSING SYSTEMS
- PAINTING ROBOTS
- CAMERA SYSTEMS
- REFRIGERATING MACHINES
- SERVO MOTORS



Explosion protection

Marking	II 2G Ex pxb IIC T4 Gb resp. II 3G Ex pzc IIC T4 Gc
Certification	BVS 11 ATEX E 144 (Zone 1) resp. BVS 11 ATEX E 145 (Zone 2)
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Max. ambient temperature range	-20 °C > T _a < +60 °C, depending on the ambient temperatures for internal components
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Technical data

Ex p configuration	Complete system with Ex p control
Purge time	Volume-dependent, min. 5-times purging
Material	Stainless steel or sheet steel painted
Fitted components	Laser printer Thermal transfer printer Customized printer

Electrical data

Supply voltage	AC 230 V, AC 115 or DC 24 V
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Customer request Specification sheet request for Ex p

Customer

BARTEC (to be completed by BARTEC employee)

Company	Sales employee
Street	Project name
Town/postcode	Request number
Country	Deadlines
Contact	Submission of quote
E-mail	Telephone

Documents provided

<input type="checkbox"/> Wiring diagrams	<input type="checkbox"/> Parts list
<input type="checkbox"/> Drawings	<input type="checkbox"/> Data sheets
<input type="checkbox"/> Other	

Area of application

<input type="checkbox"/> Zone 1 (2G)	<input type="checkbox"/> Outdoors
<input type="checkbox"/> Zone 2 (3G)	<input type="checkbox"/> Indoors
<input type="checkbox"/> Zone 21 (2D)	<input type="checkbox"/> Cleanroom
<input type="checkbox"/> Zone 22 (3D)	<input type="checkbox"/> Other:
<input type="checkbox"/> ATEX-certified	<input type="checkbox"/> IECEx-certified
<input type="checkbox"/> Explosion group:	
<input type="checkbox"/> Temperature class	<input type="checkbox"/> T4 <input type="checkbox"/> T6

Operating voltage

<input type="checkbox"/> 400 V AC	<input type="checkbox"/> 24 V DC
<input type="checkbox"/> 230 V AC	<input type="checkbox"/> Power consumption:
<input type="checkbox"/> 115 V AC	<input type="checkbox"/> Other:

Material and "pressurised cabinet" design

Housing size (mm): Width	x Height	x Depth
<input type="checkbox"/> V2A stainless steel (1.4301, AISI 304)		
<input type="checkbox"/> V4A stainless steel V4A (1.4401, AISI 316L)		
<input type="checkbox"/> Sheet steel, coating according to RAL:		
<input type="checkbox"/> Single-door		
<input type="checkbox"/> Two-door		
<input type="checkbox"/> Multi-door		

Temperatures

Internal power loss	W
Max. outdoor temperature	°C
Min. outdoor temperature	°C
Max. indoor temperature	°C
Min. indoor temperature	°C

Activation

<input type="checkbox"/> Direct activation via control unit, max. L/N, 5 A
<input type="checkbox"/> Indirect activation via Ex d contactor
<input type="checkbox"/> Activation from non-Ex zone
<input type="checkbox"/> Manual activation, for Zone 2 only

<input type="checkbox"/> Base, height:	mm
<input type="checkbox"/> Sun canopy	
<input type="checkbox"/> Lifting brackets	
<input type="checkbox"/> Viewing pane, size	W mm
	H mm
<input type="checkbox"/> Mounting plate provided	
<input type="checkbox"/> Wiring by BARTEC MGH	

Customer request Specification sheet request for Ex p

Interfaces used

Two-wire

PROFIBUS

Ethernet

Four-wire

PROFINET

Other:

Controls

HMI, Type:

x push-button(s)

Contact type:

x indicator light, colour:

x illuminated push-button(s)

Contact type, colour:

x key switch

Contact type:

x selector switch(s)

Contact type:

x Emergency stop

Contact type:

Cable glands

Quantity

Size

Ex i

Quantity

Size

Ex i

BARTEC

Your partner
for safety
technology.
Challenge us!

