



Exp, pressurized systems

ATEX approved



Principle, requirements and recommendation

STAHL

ELECTROMACH



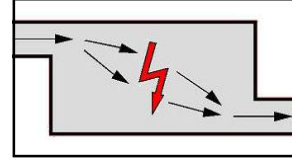
Exp, explosion protected systems

The principle of a pressurized apparatus

The entry of a surrounding atmosphere into the enclosure of the electrical apparatus is prevented by maintaining a protective gas, inside the enclosure, at a higher pressure than the surrounding atmosphere.

The overpressure is maintained either with or without a continuous flow of the protective gas.

Pressurized apparatus "p"
EN/IEC 60079-2
EN 50016



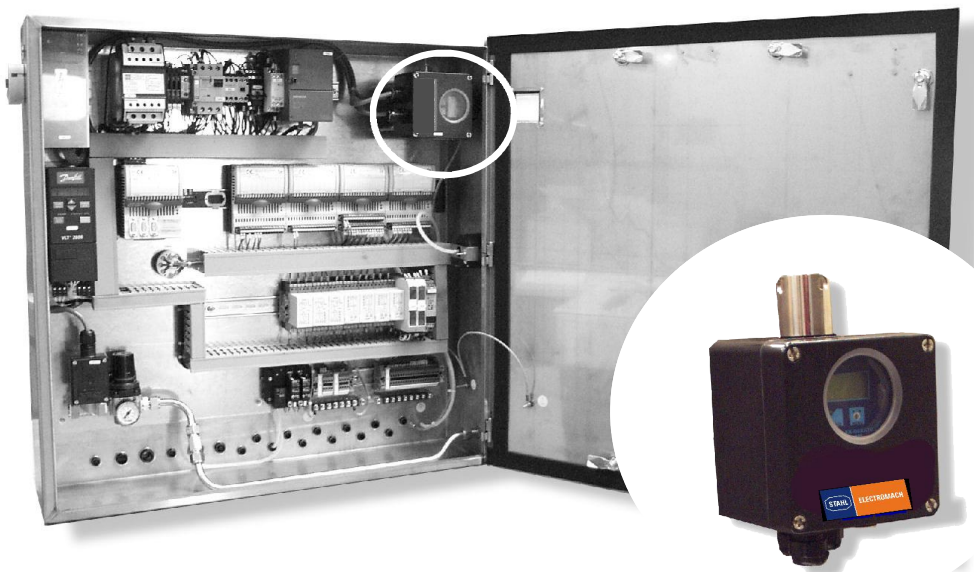
Application

Control panels for the installation of large (non-ex) equipment, diagnostic equipment, PC's etc.

Why to buy an Exp system from an ATEX certified manufacturer?

According to the ATEX 137, the end user is always responsible for the safety of the installation. For an Exp installation, many standards can be applicable: EN 50014, EN50016 („p“), EN 50018 („d“), EN 50019 („e“) and the EN 50020 („i“).

An ATEX certified manufacturer is expected to have the necessary knowledge to fulfil all the requirements to build an Exp installation according to the applicable standards.



Requirements Exp system:

A zone 1 Exp system must comply with EN 50016 (EN/IEC 60079-2) and each system must be certified by a notified body before putting into operation.

A zone 2 Exp system must comply with EN/IEC 60079-2. The test procedure is identical to zone 1 or a five-time-volume purging test has to be done. A zone 2 system can be supplied with a manufacturers declaration.

For a zone 21 or zone 22 Exp system the IEC 61241-4 is applicable. In comparison with zone 1 and zone 2 systems, pre-purging is not allowed for dust explosion protection, as the swirling of the dust layers could produce a more hazardous explosive atmosphere. A zone 21 system must be certified by a notified body before putting into operation. A zone 22 system can be supplied with a manufacturers declaration.



ATEX certified Exp explosion protected systems must comply with following requirements:

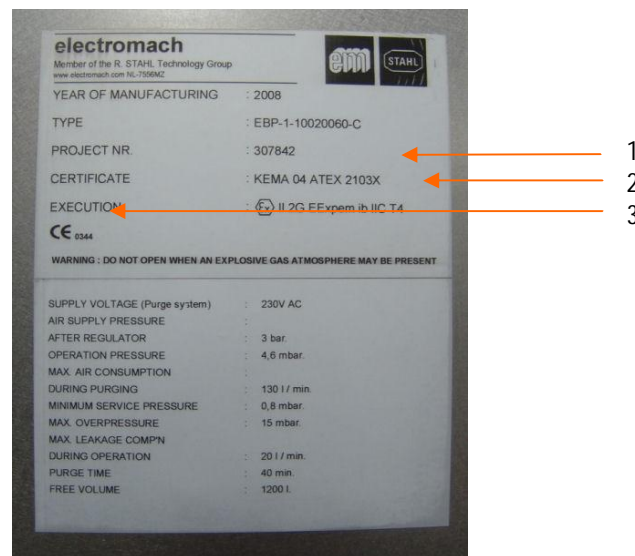
- All front mounted components to be certified according to EN 50014 (EN/IEC 60079-0).
- The mounting of internal components is restricted to the requirements as mentioned in the EN 50014 (EN/IEC 60079-0), EN 50016 (EN/IEC 60079-2) and EN 50020 (EN/IEC 60079-11).
- The test procedure for Exp systems has to be done according to the EN 50016 (EN/IEC 60079-2). For example: an overpressure test, leakage compensation test, pressurization test, verification minimum overpressure test, etc.

How to recognize an ATEX certified EExp system zone 1 and 21:

A few points to recognize whether an Exp system has been built according to the ATEX directive 94/9/EG (ATEX 95) or not:

1. A certificate number must be mentioned on the type label of a zone 1/zone 21 installation.
2. On the type label of the system an ATEX code should be marked: Ex II 2 G/D....
3. The type label of a zone 1/ zone 21 installation is marked with a CE mark followed by 4 number digit. This number indicates the notified body (e.g. KEMA is 0344). In case this number fails, it is not allowed to put the installation in operation in a zone 1 area. This number can be issued only by a notified body, like: PTB, DMT, KEMA, etc.

Every system should be accompanied by an EC declaration of conformity and a well written manual according to the ATEX directive.



Recommendation:

Because the owner of the installation is responsible only for the safety of an installation, it is important for him to know a supplier is a qualified supplier for hazardous area panels Exp. By demanding an ATEX workshop notification for Exp he can easily verify this.

A supplier having this notification means, that the notified body has proved and accepted the quality system from the manufacturer of hazardous area products.

Solutions Electromach can deliver according to international standards		
EN 50016	"p"	Zone 1
EN/IEC 60079-2	"px" "py" "pz"	Zone 1 Zone 1 to Zone 2 Zone 2
IEC 61241-4	"pD"	Zone 21 to 22



Description Exp systems

Zone 1

Zone 1 pressurized control panels are suitable for an operation temperature of -30°C to $+60^{\circ}\text{C}$. Supply voltage standard 230 VAC, optionally available 24 VAC, 110 VAC, 120 VAC, 12 VDC and 24 VDC, The unit consists of:

1. Pressure control unit complete with digital indicator and air outlet. The air outlet is standard provided with an explosion proof air/spark particle barrier.
2. Air supply unit, air inlet connection 3/8"G.
3. Control of the pressure inside the cabinet; it compensates automatically the air leakage of the panel.

The empty enclosure is ATEX certified. A „U“-certificate issued by KEMA (notified body) will be supplied as well as an installation and start-up manual. Before putting into service in a zone 1 area, the panel must be certified by a notified body (e.g. PTB, DMT, KEMA, etc.). Electromach is authorized to certify on behalf of KEMA and can supply a complete equipped panel with an ATEX EC-type examination certificate.

Zone 2

Zone 2 pressurized control cabinets are suitable for an operating temperature of -30°C to $+60^{\circ}\text{C}$. Supply voltage is standard 230 VAC, optionally available 24 VAC, 110 VAC, 120 VAC or 12 VDC and 24 VDC. The unit consists of:

1. Pressure control unit complete with digital indicator without air outlet.
Warning: before starting up the system, verify if the area is non-hazardous by means of gas detection.
2. Air supply unit which must be manually set to compensate air leakage of the panel, air supply connection 3/8"G.

Optionally we can supply the control unit with an air outlet and purge valve to allow automatic start-up function and automatic air leakage compensation (this is mandatory for EN/IEC 60079-2).

The empty enclosure is built in accordance with ATEX. A manufacturers declaration will be supplied as well as an installation and start-up manual.

Zone 21/22

A zone 21/22 pressurized control panel is identical as described under zone 2. For zone 21 an ATEX „U“-certificate will be supplied, issued by KEMA (notified body).

Before putting into service in a zone 21 area, the panel must be certified by a notified body (e.g. PTB, DMT, KEMA). Electromach is authorized to certify on behalf of KEMA and can supply a complete equipped panel with an ATEX EC type examination certificate.

For zone 22 we will supply a manufacturers declaration.



Compressor control system for F.P.S.O. executed in Exp (Ex p de (ia)(ib) IIB T3



Dimensions

The EBP series, pressurized control cabinets for wall mounting type

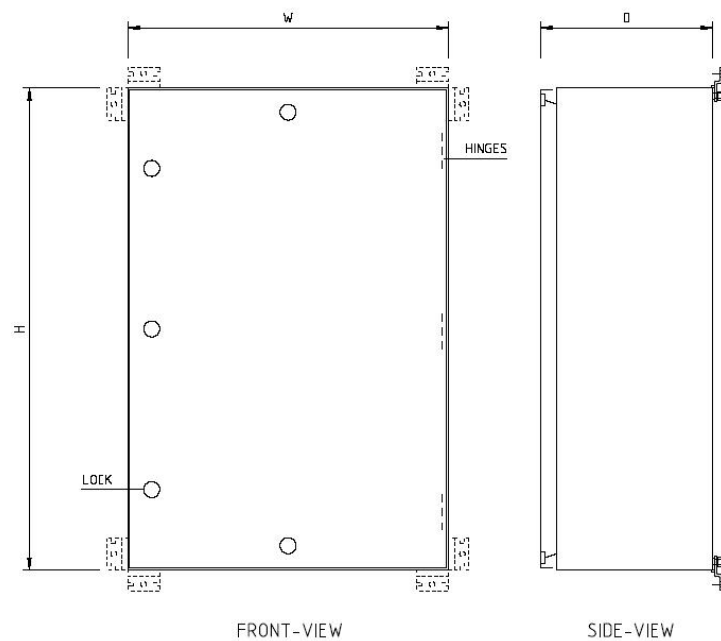
The EBP series wall mounting enclosures are fully equipped for Exp application including ATEX „U“-certificate or manufacturers declaration (depending on type of zone ordered). Protection class is max. IP 65. The cabinet is provided with hinged door and inside with steel mounting plates of 2,5mm, electro galva-nised. The unit will be supplied complete with Exp pressurizing unit including installation and start-up man-

Wall mounting Type	Sizes WxHxD	Stainless steel 316L		Sheet steel epoxy powder painted	
		Zone 1	Zone 2/21/22	Zone 1	Zone 2/21/22
EBP - . - 406021 .	400x600x210 *				
EBP - . - 606021 .	600x600x210 *				
EBP - . - 608021 .	600x800x210 *				
EBP - . - 608030 .	600x800x300				
EBP - . - 608040 .	600x800x400				
EBP - . - 808040 .	800x800x400				
EBP - . - 8010021 .	800x1000x210 *			**	**
EBP - . - 8010040 .	800x1000x400 *				
EBP - . - 8012030 .	800x1200x300				
EBP - . - 8012040 .	800x1200x400 *				
EBP - . - 8014030 .	800x1400x300			***	***
EBP - . - 8014040 .	800x1400x400			***	***
EBP - . - 8016030 .	800x1600x300			***	***

1 = zone 1
2 = zone 2
21 = zone 21
22 = zone 22

A = Sheet steel epoxy powder painted RAL 7032 and removable gland plate at bottom
C = Stainless steel 316L

* Standard size, delivery time within 1 week
** Depth is 260 mm in stead of 210 mm
*** Not available in sheet steel



Dimensional drawing, cabinets for wall mounting



Dimensions

The EBP series, pressurized control panels, freestanding type

Freestanding purge panel, on top provided with 4 lifting lugs (can also be used for fixing rain/sun). With hinged front door including key cylinder lock with L-style handle and automatic door catch. Panel will be complete with mounting plate of 3 mm galvanized steel.

Free standing with 100 mm plinth			
Type	Size: W xHxD	Zone 1	Zone 2/21/22
Material: sheet steel epoxy powder painted for outdoor use			
EBP - . - 8018040A	800x1800 (+100) x400		
EBP - . - 10018040A	1000x1800 (+100) x400		
EBP - . - 6018050A	600x1800 (+100) x500		
EBP - . - 8018050A	800x1800 (+100) x500		
EBP - . - 6018060A	600x1800 (+100) x600		
EBP - . - 6020060A	600x2000 (+100) x600		
EBP - . - 8020060A*	800x2000 (+100) x600		
EBP - . - 8020080A	800x2000 (+100) x 800		
Material: stainless steel 304			
EBP - . - 8018040B	800x1800 (+100) x400		
EBP - . - 10018040B	1000x1800 (+100) x400		
EBP - . - 6018050B	600x1800 (+100) x500		
EBP - . - 8018050B	800x1800 (+100) x500		
EBP - . - 6018060B	600x1800 (+100) x600		
EBP - . - 6020060B	600x2000 (+100) x600		
EBP - . - 8020060B	800x2000 (+100) x600		
EBP - . - 8020080B	800x2000 (+100) x800		
Material: stainless steel 316L			
EBP - . - 8018040C	800x1800 (+100) x400		
EBP - . - 10018040C	1000x1800 (+100) x400		
EBP - . - 6018050C	600x1800 (+100) x500		
EBP - . - 8018050C	800x1800 (+100) x500		
EBP - . - 6018060C	600x1800 (+100) x600		
EBP - . - 6020060C	600x2000 (+100) x600		
EBP - . - 8020060C*	800x2000 (+100) x600		
EBP - . - 8020080C	800x2000 (+100) x800		

A = Sheet steel epoxy powder painted RAL 7035 and removable gland plate at bottom
 B = Stainless steel 304
 C = Stainless steel 316L

1 = zone 1
 2 = zone 2
 21 = zone 21
 22 = zone 22

* Standard sizes, delivery time within 1 week

Options for freestanding type:

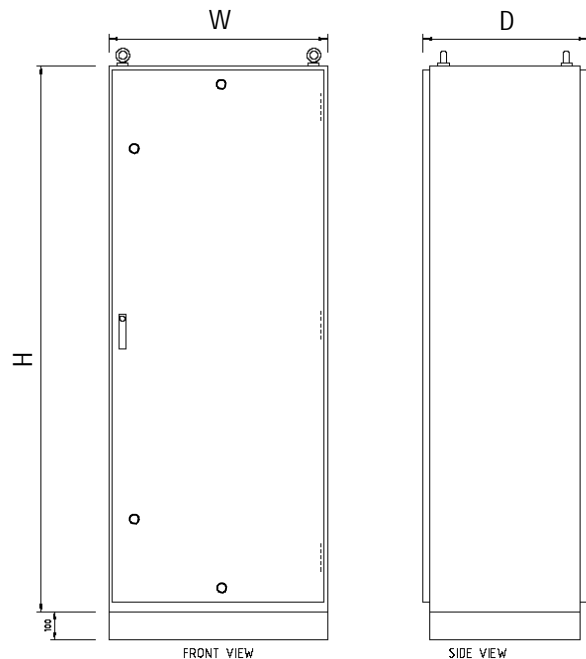
Rain/sun cover 400mm overlap

- Sheet steel epoxy powder painted
- Stainless steel 316L

Any size hinged window for instruments

- Sheet steel epoxy powder painted
- Stainless steel 304
- Stainless steel 316L

Dimensional drawing, freestanding type



Options for wall mounting cabinets as well as freestanding panels:

- Supply voltage 24 VAC / 110 VAC / 120 VAC / 24 VDC / 12 VDC
- Control unit installed inside the enclosure
 - for zone 1 and 2
 - for zone 21 and 22
- Air inlet unit installed inside the enclosure
- Pressure valve for continuous purging (e.g. to cool in case of high temperature, only zone 1 and 2)
- Temperature sensor for controlled purging (in case of high heat dissipation, only zone 1 and 2)
- Air outlet and purge valve for automatic start-up and air leakage compensation (only for zone 2, mandatory for EN/IEC 60079-2)
- Electronic control of air pressure inside the panel and leakage compensation (only for zone 21 and 22)
- By-pass switch
- By-pass switch with remote control function for purge control unit
- Y-cable for connection between temperature sensor and remote key
- Explosion proof air/spark particle barrier (only for zone 2; is standard for zone 1)
- Rain cover for air outlet (only zone 1 and 2) (in case of outdoor use when purge unit is installed outside the panel)

- ATEX EC examination certificate (for zone 1) in house test in our workshop
- ATEX EC examination certificate (for zone 21) in house test in our workshop
- Cabinet complete with all apparatus installed and wired according to customer specification inclusive EC certificate and functionally tested
- On request we can supply any other size of purge panel
- Cut outs for operating knobs and windows
- Cable gland entries
- ATEX examination at customer location



ATEX notification

Certification

ATEX certified:

KEMA 05ATEX2123U (empty enclosure)

⊕ II 2 G, Ex p dem [ia][ib] IIC or Ex p dem ib IIC

KEMA 04ATEX2103 (complete system)

⊕ II 2 G, Ex p ...IIC T5 ... T3

(The overall Ex-classification depends on the built-in (Ex-) components)

Electrical parameters:

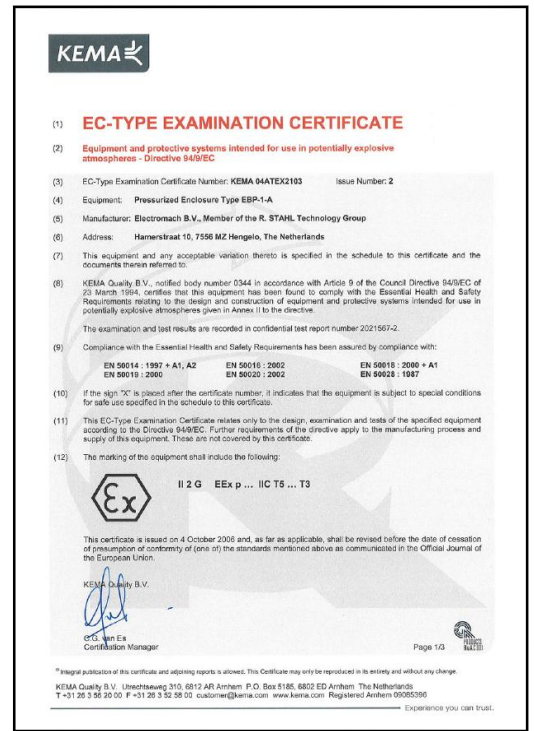
Rated voltage : max. 11kV

Rated current: max. 1250 A

Nominal conductor cross section: max. 300 m²

Ambient temperature: -20°C ... + 40°C (standard)

-30°C ... + 60°C (optional, depends on the used components)



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