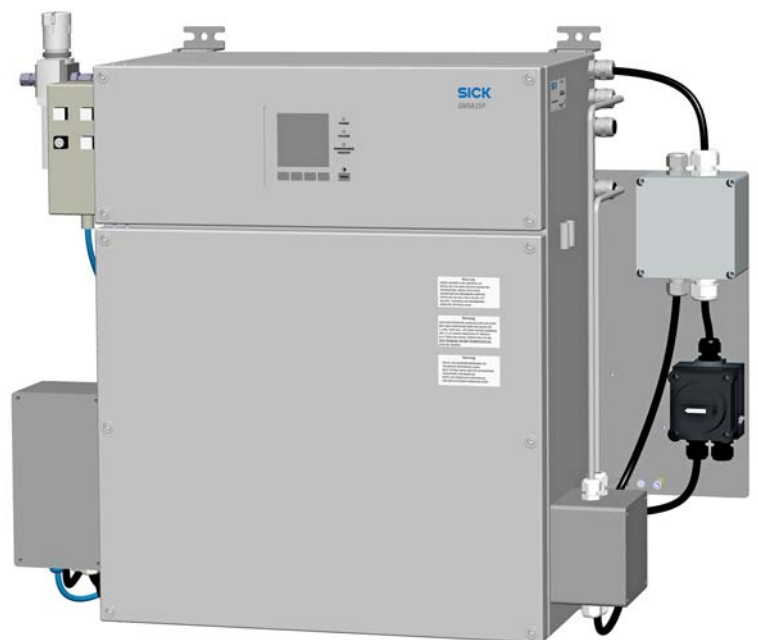


## SUPPLEMENTARY OPERATING INSTRUCTIONS

# GMS815P-PS-2G / GMS815P-PS-3G Enclosures for GMS800 Series



Description  
Installation  
Technical data



GMS815P-PS-2G

## Document Information

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### Described Product

Product name: GMS815P-PS-2G/-3G (product variants with pressurized enclosure system)  
Basic device: GMS800 Series gas analyzers

### Document ID

Title: Supplementary Operating Instructions  
GMS815P-PS-2G/-3G  
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## Glossary

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**AC** Alternating Current  
**IP.XY** International Protection (also: Ingress Protection); degree of protection of a device according to IEC/DIN EN 60529. The digit *X* designates protection against contact and impurities, *Y* protection against moisture.

## Warning Symbols

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Hazard (general)



Hazard in potentially explosive atmospheres



Hazard by explosive substances/mixtures



Hazard by toxic substances

## Warning Levels / Signal Words

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### WARNING

Risk or hazardous situation which *could* result in severe personal injury or death.

### CAUTION

Hazard or unsafe practice which *could* result in personal injury or property damage.

### NOTICE

Hazard which *could* result in property damage.

## Information Symbols

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Information on product characteristics with regard to protection against explosions



Important technical information for this product



Important information on electric or electronic functions



Supplementary information



Link to information at another place

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# GMS815P-PS-2G/-3G

## 1 Important Information

Product description  
Main information  
Additional information

## 1.1 Main hazards

### Health risks through dangerous sample gases

- ▶ → “GMS800 series” Operating Instructions

### When shutting down



#### **WARNING: Risk of explosions**

- ▶ Do not open the enclosure when an explosive atmosphere is present.
- ▶ Wait at least 60 minutes after disconnecting from the mains voltage before opening the enclosure.
- ▶ Observe the safety information on the enclosure.

## 1.2 Main operating information

### Before start-up

- ▶ Make sure the internal mains switch is switched on (→ p. 22, Fig. 4).
- ▶ Close the enclosure tight.
- ▶ *If the enclosure is deformed or damaged:* Do not put the GMS800 into operation and secure against unauthorized start-up.

### Start-up/operation

- ▶ Carry out start-up and shutdown in accordance with the Operating Instructions delivered with the pressurized enclosure system.
- ▶ Do not open the enclosure during operation.
- ▶ *Before shutting down:* Purge the sample gas path with a dry neutral gas to prevent condensation in the measuring system.
- ▶ *Service information:* Always wait at least 30 seconds between single switch-on actions (cooling time for the switch-on current limiter).

### In hazardous situations

- ▶ Switch-off the emergency switch or main switch of the host system.
- ▶ *If liquid has penetrated the enclosure:* Shut the GMS800 down immediately and disconnect mains voltage at external source.



- The GMS800 is switched off automatically should the protective gas feed fail.
- Pressurized enclosure parameters → p. 35, §6.8

1.3

### Safety during installation and repairs

- ▶ Only use the Enclosure GMS815P-PS-2G/-3G in potentially explosive atmospheres when permitted according to the zone, explosion group and temperature class specifications (refer to the type plate → p. 10, §2.1).
- ▶ Observe and follow the “special requirements” of the approval (→ p. 8, §1.5).
- ▶ Observe and follow the Operating Instructions delivered with the pressurized enclosure system as well.
- ▶ Only allow skilled persons having knowledge of the relevant rules and regulations for potentially explosive atmospheres to carry out installation, start-up, maintenance and test – e.g.:
  - Range specification
  - Ignition protection types
  - Installation regulations, e.g. “Regulation concerning electrical equipment in hazardous areas (ElexV)”
- ▶ Only have the device repaired by the manufacturer or by trained and authorized skilled persons.
- ▶ Do not make any unauthorized modifications to the device.

1.4

### Additional documentation/information

This document supplements the Operating Instructions “GMS800 Series”. It extends these Operating Instructions with technical information on the Enclosures GMS815P-PS-2G and GMS815P-PS-3G.

- ▶ Observe the Operating Instructions delivered with the “GMS800 Series”.



The “GMS800 Series” Operating Instructions also specify all further documents belonging to the individual device.



**NOTICE:**

- ▶ Pay primary attention to any individual information delivered.

**Other documents delivered**

Operating Instructions for the pressurized enclosure system	▶ Observe during start-up and shutdown.
Operating Instructions for the main switch	▶ Observe when installing the mains connection (→ p. 19, §3.5.3).
Operating Instructions for the Zener barriers [1]	▶ Observe when installing intrinsically safe signal connections.

[1] Only for versions with intrinsically safe signal connections (→ p. 24, §3.9)

## 1.5 Application limitations

### 1.5.1 Approval conditions for the Enclosure GMS815P-PS-2G

*Extract from the approval document:*

1. The volume flow of sample gas on the system must be restricted to maximum 100 dm<sup>3</sup>/h.
2. – Sample gases must not be combustible,  
*or*  
– sample gas concentrations must always be maximal 25% of the LEL,  
*or*  
– sample gases can be combustible but not explosive; the oxygen part must be below 2% by volume and less than 80% of the upper explosion limit.
3. Sample gas lines connected must be checked for leak tightness and strength using 1.5 times the maximum allowable pressure.
4. Wait at least 60 minutes after disconnecting from the mains voltage before opening the enclosure (refer to the warning information).
5. Observe manufacturer's Operating Instructions especially with regard to the resistance of the relevant seal materials and gas lines against the sample gases.

### 1.5.2 Approval conditions for the Enclosure GMS815P-PS-3G

*Extract from the approval document:*

1. – Sample gases must not be combustible,  
*or*  
– sample gas concentrations must always be maximal 25% of the lower explosion limit (LEL).
2. Sample gas lines connected must be checked for leak tightness and strength using 1.5 times the maximum allowable pressure.



# GMS815P-PS-2G/-3G

## 2 Product Description

Product variants

Characteristics

Options

## 2.1

**Product identification**

These Supplementary Operating Instructions are only valid for Enclosure GMS815P-PS-3G and Enclosure GMS815P-PS-2G.

- ▶ Observe the product identification on the type plate.

**Type plate**

The type plate is located on the right side of the enclosure. The product name of the enclosure is shown on the type plate.



Information on the type plate → Operating Instructions “GMS800 Series”.

**Overview of the enclosures of model GMS815**

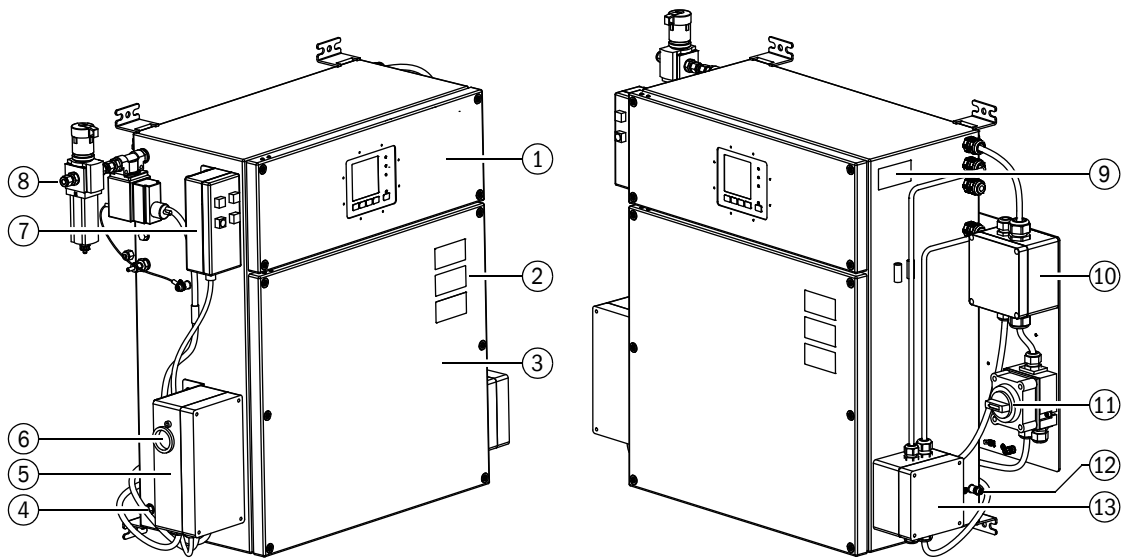
Product name	Main feature
GMS815P	Standard version (degree of protection IP 65)
GMS815P-3G	Vapor-proof leak tightness, approved for Category “3 G” potentially explosive atmospheres
GMS815P-PS-3G	With pressurized enclosure system, approved for Category “3 G” potentially explosive atmospheres
GMS815P-PS-2G	With pressurized enclosure system, approved for Category “2 G” potentially explosive atmospheres

## 2.2 Product characteristics

### 2.2.1 Common characteristics

- Designed for wall mounting indoors
- Gas analyzer enclosure with two sections separated gas-tight
- Pressurized enclosure system on the gas analyzer enclosure

Fig. 1 Enclosure GMS815P-PS-2G (similar: GMS815P-PS-3G)



Component	Information
1 Gas analyzer enclosure, top section	Contains the power supply unit, operating unit, I/O module
2 Safety information	→ p. 28, § 4.2
3 Gas analyzer enclosure, bottom section	Contains the Analyzer module, Gas module
4 Bonding load connection	→ p. 19, § 3.5.2
5 Pressurized enclosure system	
6 Protective gas outlet	→ p. 16, § 3.3.2
7 Operating unit of the pressurized enclosure system	Only for Enclosure GMS815P-PS-2G [1]
8 Protective gas inlet	→ p. 16, § 3.3.1
9 Type plate	→ p. 10, § 2.1
10 Power relay	For mains voltage
11 Main switch	→ p. 19, § 3.5.3
12 Bonding load connection	→ p. 19, § 3.5.2
13 Interface box	→ p. 20, § 3.7.1
- Sample gas connections [2]	→ Operating Instructions for GMS800 series gas analyzers
- Option: [2] Span gas connection or connection for second sample gas path or purge gas connection for an Analyzer module	→ Operating Instructions for GMS800 series gas analyzers or Supplementary Operating Instructions of the Analyzer module

[1] → Operating Instructions of the pressurized enclosure system

[2] On the underside of the gas analyzer enclosure (not shown)

## 2.2.2

**Differing features**

- Usable in potentially explosive atmospheres in the particular zone, explosion group and temperature class specified on the type plate (→ p. 10, §2.1).
- Limitations on product variants to be maintained vary when measuring combustible gases (→ p. 8, §1.5).
- The interface box (→ p. 11, Fig. 1) is always fitted on the Enclosure GMS815P-PS-2G and is an option for the Enclosure GMS815P-PS-3G.



► *If the Enclosure GMS815P-PS-3G does not have an interface box fitted:*  
Maintain the requirements in accordance with EN 60079-2 “Explosive atmospheres – Part 2: Equipment protection by pressurized enclosure “p”” /Section 7.



- Function of the interface box → p. 20, §3.7.1
- It may be necessary to use the interface box due to the planned operating conditions.

## 2.2.3

**Options**

- Intrinsically safe signal connections
- Interface box (*only for GMS815P-PS-3G*)
- Version for temperature class “T6” (*in preparation*)

## 2.3

**Function of the pressurized enclosure system****Purpose**

The pressurized enclosure prevents an explosive atmosphere being created inside the enclosure. To this purpose, the gas analyzer enclosure is filled with a protective gas. Apart from that, it also ensures the gas pressure inside the gas analyzer enclosure is higher than the ambient air pressure.

**Safety functions**

- The enclosure is pre-purged automatically before start-up. The mains supply for the gas analyzer is first switched on afterwards.
- The mains supply of the gas analyzer is switched off automatically should the pressurized enclosure not be in the correct operating state (malfunction).

**Functionality during operation**

The pressurized enclosure system functions in “leakage compensation” operating mode: A certain protective gas pressure is created in the gas analyzer enclosure after pre-purging has completed. If the protective gas pressure drops below the minimum pressure set, protective gas feed is activated until the rated pressure is reached again.

On the Enclosure GMS815P-PS-2G, a certain amount of protective gas leaks out of the gas analyzer enclosure through the protective gas outlet. This means the protective gas feed is activated often to restore the pressure. This creates a more or less permanent protective gas flow with the required flowrate.

# GMS815P-PS-2G/-3G

## 3 Installation

Cable installation

Assembly

Connections



- ▶ Let skilled persons with the necessary technical knowledge carry out the installation (refer also to → p. 7, § 1.3).
- ▶ Observe and maintain the regulations and specifications of the associated approval.

### 3.1 Safety information

#### 3.1.1 Safety during transport and assembly



**CAUTION: Risk of injuries**

The weight of the enclosure can cause injuries when the device is not lifted in an ergonomical way.

*During transport and assembly:*

- ▶ Consider the weight of the enclosure before lifting (→ p. 33, §6.3).
- ▶ Call in further personnel as assistants as required.



**CAUTION: Risk of injuries**

There is a risk of injuries should the enclosure drop down due to the weight of the device and through hard, protruding enclosure parts.

*During transport and assembly:*

- ▶ Wear safety shoes. Use non-slip gloves.
- ▶ Handle the device carefully and safely. Secure during transport. Avoid falls and collisions.
- ▶ Call in further personnel as assistants as required.



**NOTICE: Risk of damage**

- ▶ Do not use gas connections and cable inlets as lifting points.



**NOTICE: Risk through transport safety devices**

- ▶ Remove transport safety devices before start-up (→ p. 15, §3.2.3).  
Otherwise electronic components can overheat during operation.

#### 3.1.2 Protection against dangerous sample gases

*If the sample gas can be dangerous to health, combustible and/or corrosive:*

- ▶ Make sure no dangerous situations can arise should a gas leak occur.
- ▶ Check
  - whether a gas detector must be installed at the installation location
  - whether the enclosure must be purged continuously with a neutral gas during operation (with monitoring the discharged purge gas as required).
 Install appropriate additional devices as necessary.
- ▶ Check gas paths regularly for leak tightness.

## 3.2 Assembly

### 3.2.1 Ensuring ambient conditions

#### Quiet running

- ▶ Protect the device against heavy jolts and vibrations (limit values → p. 33, §6.4).

#### Temperature

- ▶ Avoid enclosure exposure to direct sunlight.
- ▶ Maintain the allowable ambient temperature during operation (→ p. 33, §6.4).

#### Humidity

- ▶ Choose a dry installation location free from frost.
- ▶ Prevent moisture condensation – inside the device as well.
- ▶ Maintain the allowable relative air humidity (→ p. 33, §6.4).

#### Corrosive atmospheres

*When the atmosphere at the installation location can contain corrosive gases:*

- ▶ Install the Enclosure GMS815P-PS-2G/-3G in an outer housing (e.g. closed cabinet).  
Purge the outer housing with a protective gas.

### 3.2.2 Fitting the enclosure

- ▶ Secure the enclosure on a structure that can safely carry the weight of the enclosure.
- ▶ Fit the enclosure so that the underside of the gas analyzer enclosure is more or less horizontal (allowable offset → p. 33, §6.4).



- Dimensions → p. 32, §6.1
- Weight → p. 33, §6.3

### 3.2.3 Removing transport safety devices

- 1 Open the upper section of the gas analyzer enclosure (→ p. 22, §3.8.1).
- 2 Take the foam inserts out of the enclosure.
  - ▶ *Recommendation:* Keep the foam inserts and use these every time the device is transported.
- 3 Close the upper section of the gas analyzer enclosure again carefully; pay attention to leak tightness (enclosure seal, screws on front door).

### 3.3 Gas connections

#### 3.3.1 Feeding protective gas

The pressurized enclosure system requires a permanent supply of a protective gas.

- ▶ Feed the protective gas via the protective gas connection (→ p. 11, Fig. 1).
- ▶ Type and feed parameters of the protective gas → p. 35, § 6.8.1

#### 3.3.2 Discharging protective gas

- ▶ Make sure the protective gas can flow out of the protective gas outlet without opposing pressure → p. 11, Fig. 1.
- ▶ Only allow the protective gas to escape into the surrounding area when it is ensured that the escaping protective gas does not cause
  - a suffocation risk for persons
  - a poisoning risk when the internal sample gas path has a leak.



**CAUTION: Risk of suffocation**

Inert gas escapes permanently out of the protective gas outlet (gas free of oxygen). Considerably more inert gas escapes during pre-purging. There is a risk of suffocation for people in the area when inert gas enriches the surrounding air.

- ▶ *If the protective gas can cause a risk of suffocation:* Discharge the escaping protective gas at a safe location.



**WARNING: Hazard through an internal gas leak**

If the internal sample gas path has a leak, the protective gas being discharged contains an unknown concentration of sample gas.



- ▶ *If the sample gas can be dangerous (e.g. dangerous to health or combustible):* Discharge the escaping protective gas at a safe location.



- Connection for Enclosure GMS815P-PS-2G: Thread G 1"
- Connection for Enclosure GMS815P-PS-3G: Thread G 3/4"



### 3.3.3 Feeding sample gas

- ▶ Observe the basic information and safety information concerning feeding sample gas:

Information	Described in document
Function of sample gas connections	"GMS800 Series" Operating Instructions
Specifications for sample gas feed	Supplementary Operating Instructions for the Analyzer modules fitted

- ▶ The approval requirements have priority (→ p. 34, §6.5).



- Gas connection positions → p. 32, §6.1
- Technical details for gas connections → p. 34, §6.5

### 3.3.4 Feeding purge gas to an Analyzer module (option)

*Only valid for versions with purge gas connections for an Analyzer module*

- ▶ Feed the required purge gas via the "purge in" gas connection and discharge the purge gas via the "purge out" gas connection as described in the Supplementary Operating Instructions of the Analyzer module.
- ▶ Feed and discharge purge gas so that the purge gas pressure in the enclosure is not above 15 mbar (approval condition).
- ▶ Use nitrogen (techn.) as inert gas.

### 3.4 Cable installation (general information)

#### 3.4.1 Using suitable cables

- ▶ The mains cable must comply with standard IEC 60227 or IEC 60245.
- ▶ Only use cables approved for use in the potentially explosive atmosphere involved.
- ▶ Only use cables with suitable outer diameters (→ Table 1).
- ▶ Fit connected cables fixed, i.e. fasten cables along the whole length.

Table 1 Cable diameters

Device component	Cable inlets	Suitable for cables with outer diameter
Mains switch/mains connection	All	7 ... 12 mm <sup>[1]</sup>
Interface box	Small version	5 ... 10 mm
	Large version	6 ... 12 mm

[1] Further technical requirements on the mains cable → p. 34, §6.6.

#### 3.4.2 Closing off cable inlets correctly



The cable inlets are sealed when delivered.

- ▶ Seal all cable inlets “vapor-proof” (almost gas-tight) before start-up.
- ▶ Only open those cable inlets to be used for installing cables. Keep the plugs. Refit the original plug when a cable inlet must be closed again afterwards.



The cable inlets are part of the approval.

- ▶ Do not replace cable inlets with a different type of cable inlet.

### 3.5 Main electrical connection

#### 3.5.1 Preparing mains connection

- ▶ Safety information for mains connection → Operating Instructions “GMS800 Series”
- ▶ Install an external mains fuse → Operating Instructions “GMS800 Series”
- ▶ Install an external mains switch → Operating Instructions “GMS800 Series”



The internal mains switch can be useful during service work. The internal mains switch should not be used during operation.

#### 3.5.2 Establishing potential equalization (earth)

- ▶ Connect a bonding lead connection (→ p. 11, Fig. 1) directly to the main potential (earth).

#### 3.5.3 Connecting the mains connection

- 1 Open the housing of the main switch (→ p. 11, Fig. 1).
- 2 Connect the mains cable to the mains connection terminals in the main switch housing.
- 3 Seal the cable inlet securely (→ p. 18, §3.4.2).
- 4 Close the main switch housing securely.



Detailed information on connecting the mains cable → Operating Instructions of the main switch



- Mains switch in gas analyzer enclosure (for Service only) → p. 22, Fig. 4
- The switch-on current is maximum 4 A (electronic switch-on current limiter).

### 3.6 Alarm signal of the pressurized enclosure system

The pressurized enclosure system activates an alarm signal when it is interrupted. The alarm signal can be reported via a relay switching contact.

- *Enclosure GMS815P-PS-2G*: The alarm switching contact connections are in the control unit of the pressurized enclosure system (→ Pressurized Enclosure System Operating Instructions).
- *Enclosure GMS815P-PS-3G*: Switching contact relay “Operating current circuit 2” is available in the control unit of the pressurized enclosure system.
  - ▶ Configure the pressurized enclosure system so that the alarm signal activates this switching contact (→ Pressurized Enclosure System Operating Instructions).
  - ▶ Connect the alarm signal lines to this switching contact.

### 3.7 Signal connections (I/O) in the interface box

– Only valid for versions with interface box –



- Signal connections for versions without interface box → p. 22, §3.8
- Function of signal connections → “I/O module” Supplementary Operating Instructions.

#### 3.7.1 Function of the interface box

Signal connections of the gas analyzers are not directly available on the I/O modules in the enclosure but in the interface box (→ p. 21, Fig. 2). Not all signal connections can be used with the interface box but just 16 signal lines (standard terminal assignment → p. 21, Fig. 2). Each signal line in the interface box runs via a relay switching contact. If the pressurized enclosure system is not ready for operation or is interrupted, the relay switching contacts in the interface box are open, i.e. the signal lines are interrupted.

#### 3.7.2 Connecting signal cables in the interface box

- ▶ Connect all signal lines in the interface box.
  - Terminal assignment → p. 21, Fig. 2
  - Connection terminals → p. 21, Fig. 3
- ▶ Function of signal connections → “I/O module” Supplementary Operating Instructions.
- ▶ *For versions with intrinsically safe signal connections (option)*: Observe the information on intrinsically safe signal connections (→ p. 24, §3.9).

Fig. 2 Interface box: Standard terminal assignment

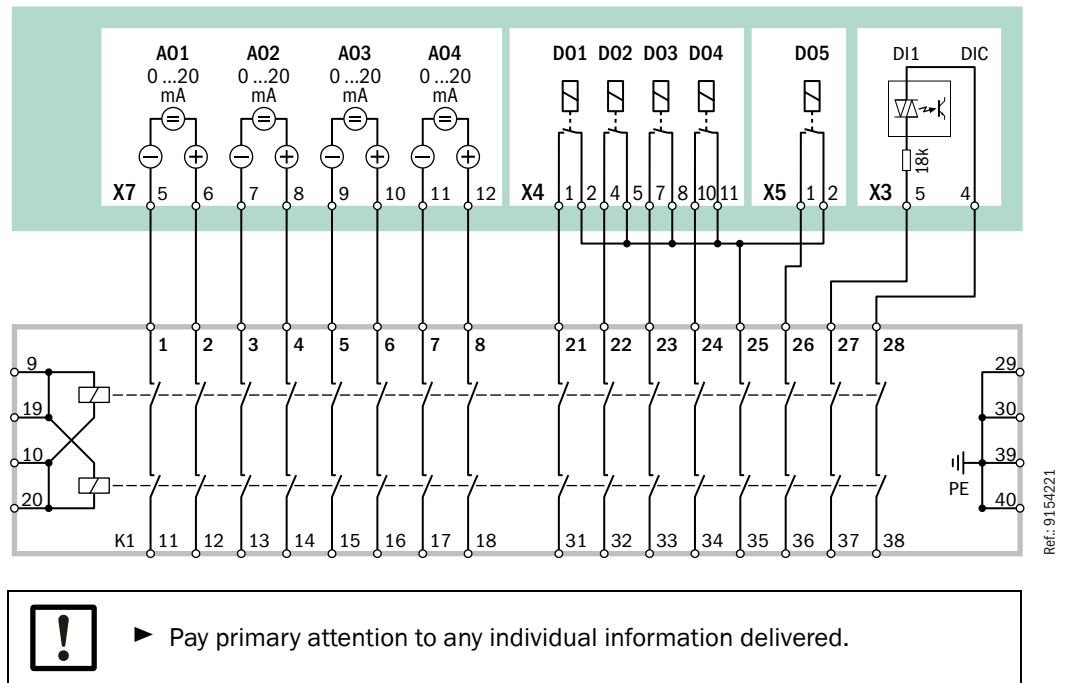
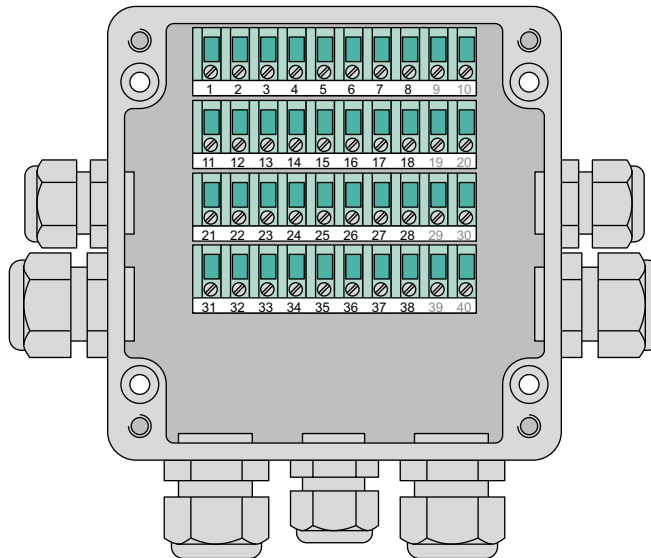


Fig. 3 Interface box: Connection terminals



### 3.8 Signal connections (I/O) in the gas analyzer enclosure

Only valid for Enclosure GMS815P-PS-3G without interface box

#### 3.8.1 Opening the gas analyzer enclosure

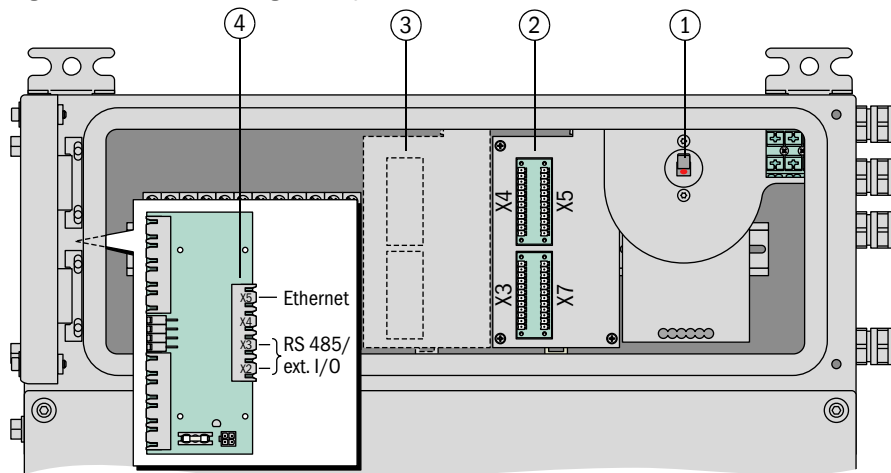
**WARNING: Health risks**  
*Before opening the enclosure:*

- ▶ Interrupt every gas feed to the GMS800 apart from the purge gas feed (when present).
- ▶ Switch the mains supply to the GMS800 off at an external source.
- ▶ Separate the GMS800 from all external voltages (e.g. signal lines). Exception: Connections to intrinsically safe power circuits can remain connected.
- ▶ *If the GMS800 measures gases dangerous to health and it is not sure whether the internal gas paths are gas-tight: Take protective measures against escaping gas (e.g. breathing protection, suctioning off).*

- 1 Loosen both screws of the top enclosure door (suitable wrench in scope of delivery).
- 2 Open the top enclosure door.

Fig. 4

Signal connections in the gas analyzer enclosure



- 1 Internal mains switch (for Service only)
- 2 I/O module (signal connections)
- 3 Second I/O module (option); alternatively: Intrinsically safe signal connections (→ p. 24, §3.9)
- 4 Interfaces

#### 3.8.2 Installing signal cables on the gas analyzer enclosure

- ▶ Lead the signal cables into the gas analyzer enclosure through a free cable inlet.
- ▶ Lead the signal cables out of the potentially explosive atmosphere and connect somewhere outside the potentially explosive atmosphere.

**!**

- ▶ Use cables with outer diameter 6...14 mm for the cable inlets of the gas analyzer enclosure.
- ▶ Use suitable cables (→ p. 18, 3.4.1).
- ▶ Seal cable inlets correctly after installation (→ p. 18, 3.4.2).

### 3.8.3 Establishing signal connections (I/O) in the gas analyzer enclosure

The standard version has a built-in I/O module. A second I/O module can be fitted (option).

- ▶ Position of signal connections → p. 22, Fig. 4.
- ▶ Function of signal connections → “I/O module” Supplementary Operating Instructions.
- ▶ Intrinsically safe signal connections (option) → p. 24, §3.9

**NOTICE:**

Electrostatic discharges can severely damage electronic components.

- ▶ *Before touching electrical connections and internal components:* Earth your body and tools used to discharge electrostatic charges.

*Recommended method:*

- ▶ *If the protective conductor is connected:* Touch a blank metal part of the enclosure.
- ▶ *Otherwise:* Touch a different blank metal surface that is connected to the protective conductor or has safe contact to the earthing.

### 3.8.4 Connecting the interfaces (as required)



Function of interfaces → Operating Instructions “GMS800 Series”

*To use an interface:*

- ▶ Connect the interface cable to the corresponding interface in the gas analyzer enclosure (→ p. 22, Fig. 4).
- ▶ Connect the interface cable somewhere outside the potentially explosive atmosphere.

### 3.9 Intrinsically safe signal connections (option)

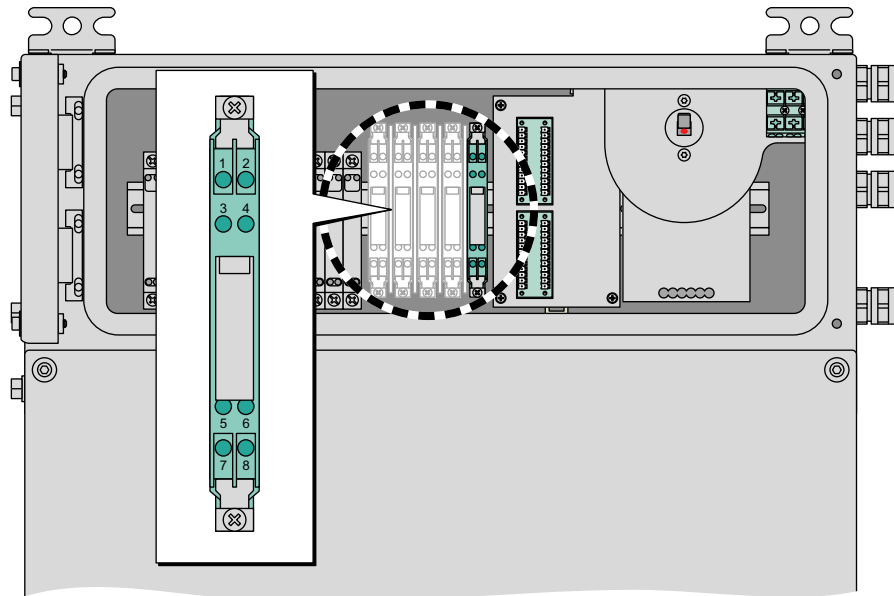
Only valid for the GMS815P-PS-3G with intrinsically safe signal connections.

#### 3.9.1 Technical layout of the intrinsically safe signal connections

When desired, some of the analog outputs, digital inputs and digital outputs can be realized as intrinsically safe signal connections. Additional modules are fitted for this purpose (Zener barriers). All intrinsically safe connections can be configured according to customer requirements.

- Terminal assignment → Individual information delivered with the device
- Technical information on intrinsically safe signal connections → Operating Instructions of the Zener barriers

Fig. 5 Zener barriers for intrinsically safe signal connections



#### 3.9.2 Special technical data for intrinsically safe signal connections

Signal connection	Parameter	Specification
Analog outputs [1]	Maximum voltage on connection terminals:	13 V
	Allowable load:	0 ... 200 Ω
Digital inputs	Maximum voltage on connection terminals:	26.5 V
Digital outputs	Internal resistance:	300 Ω

[1] Observe information on zero potential (→ p. 25, § 3.9.4)



### 3.9.3 Installation information for intrinsically safe signal connections

#### Cable installation

- ▶ Connect each signal cable for intrinsically safe signal connections to one built-in additional module (→ p. 24, Fig. 5).
- ▶ Install the signal cables in compliance with EN 60079-11 (“Explosive Atmospheres - Part 11: Equipment protection by intrinsic safety “i””).
- ▶ Maintain electronic limit values (→ p. 25, §3.9.4).
- ▶ Install all components of a signal circuit intrinsically safe.



**WARNING: Risk of explosions**

Intrinsically safe installations must maintain a certain clearance from other electrical equipment (specifications see EN 60079-11).

- ▶ Lay intrinsically safe signal cables so that the required safety distance to equipment not intrinsically safe is ensured everywhere.

### 3.9.4 Electronic alarm settings for intrinsically safe signal connections

Intrinsic safety of the connected intrinsically safe signal circuit is only ensured when the power circuit, including cables, maintains the limit values specified below.



**CAUTION: Lower limit values could possibly be applicable**

Lower limit values could be applicable for the individual application case. The composition of the explosive atmosphere is decisive here.

- ▶ Determine the highest allowable limit values for the individual application case using the European standard EN 60079-0 “Explosive atmospheres. Equipment. General requirements”.
- ▶ *If this results in limitations:* Note these limitations (e.g. in this document) and consider during installation.



The Zener barriers used for analog outputs each have 2 channels. One channel is normally used for each analog output. In this case, the analog outputs of a single Zener barrier have a common negative pole (integrated in the Zener barrier) which means they are not separated potential-free from each other.

#### Limit values for intrinsically safe analog outputs

Parameters of the intrinsically safe power circuit	Allowable value	
	Channel 1/Channel 2	Combined
Total inductivity $L_A$	$\leq 1.5 \text{ mH}$	$\leq 0.37 \text{ mH}$
Total capacity $C_A$	$\leq 580 \text{ nF}$	$\leq 580 \text{ nF}$
$L_A/R_A$	$\leq 61 \mu\text{H}/\Omega$	$\leq 30 \mu\text{H}/\Omega$

#### Limit values for intrinsically safe digital inputs and digital outputs

Parameters of the intrinsically safe power circuit	Allowable value
Total inductivity $L_A$	$\leq 4.1 \text{ mH}$
Total capacity $C_A$	$\leq 83 \text{ nF}$
$L_A/R_A$	$\leq 54 \mu\text{H}/\Omega$

## 3.10

**Sealing the enclosure**

*After installing the connections:*

- ▶ Seal all cable inlets correctly (→ p. 18, §3.4.2).
- ▶ Seal all enclosure openings, doors and covers tight.

# GMS815P-PS-2G/-3G

## 4 Start-up/Shutdown

Checks before start-up

Start procedures

## 4.1

**Start-up****Before start-up: Ensure the prerequisites are fulfilled**

- ▶ Internal mains switch is switched on (→ p. 22, Fig. 4).
- ▶ Enclosures are sealed tight (front doors, cable inlets, enclosure openings).
- ▶ Permanent protective gas feed is ensured.
- ▶ Pressurized enclosure system is configured correctly.

**Measures during initial start-up**

- ▶ Observe the Operating Instructions of the pressurized enclosure system and make all necessary settings (parameters → p. 35, §6.8).

*Example:*

- ▶ Set the pre-purge time so that the minimum purge amount is ensured.

**Start-up procedure**

- 1 Activate the mains supply:
  - ▶ *Either:* Switch the mains switch on the Enclosure GMS815P-PS-2G/-3G on (→ p. 22, Fig. 4).
  - ▶ *Or:* Activate the mains supply at an external source (e.g. main switch).
- »» The pressurized enclosure system now performs an automatic procedure:
  - a) The Enclosure GMS815P-PS-2G/-3G is purged with protective gas (pre-purge).
  - b) Then the mains supply of the GMS800 is activated.
- 2 Wait until the GMS800 is ready for operation (→ “GMS800 Series” Operating Instructions).

**NOTICE: Risk of damage**

The Enclosure GMS815P-PS-2G/-3G has an electronic switch-on current limiter that must cool down after each switch-on.

- ▶ Wait at least 30 seconds between single switch-on actions.
- Otherwise the built-in switch-on current limiter could become defective.

## 4.2

**Shutdown****Shutdown procedure**

- 1 Carry out the preparations for shutdown (→ “GMS800 Series” Operating Instructions).
- 2 Shut the device together with the pressurized enclosure system down as described in the Operating Instructions of the pressurized enclosure system.

**After shutdown****WARNING: Risk of explosions**

- ▶ Do not open the enclosure when an explosive atmosphere is present.
- ▶ Wait at least 60 minutes after disconnecting from the mains voltage before opening the enclosure.
- ▶ Observe the safety information on the enclosure. → p. 11, Fig. 1

# GMS815P-PS-2G/-3G

## 5 Maintenance

Function test of the pressurized enclosure system  
Leak tightness checks

## 5.1 Function test of the pressurized enclosure system

### Recommendation

- ▶ Check the protective function of the pressurized enclosure system in more or less half-yearly intervals.

### Procedure

- 1 Keep the GMS800 in operation.
- 2 Secure connected locations and devices:
  - ▶ Inform any connected stations.
  - ▶ Secure or deactivate connected devices (e.g. measured value recording).
  - ▶ Passivate/deactivate connected signaling units (alarm signaling, status signaling).
- 3 Interrupt protective gas feed.
- 4 Check whether the GMS800 is switched off automatically afterwards.

#### *If this is the case:*

- 1 Start protective gas feed again.
- 2 Check whether the GMS800 starts automatically again.

*If this is the case:* The check was successful.

#### *If this is not the case:*

The check was not successful.

- 1 Shut the GMS800 down (switch main switch off).
- 2 Inform skilled persons to have the system repaired.

## 5.2 Leak tightness checks



The specified leak tightness checks are part of the approval conditions (→ p. 8, § 1.5).

### 5.2.1 Leak tightness check of the sample gas lines

*If the sample gas path was opened during maintenance work:*

- ▶ Check the leak tightness of the connected sample gas lines after the maintenance work.

*If it is suspected that the sample gas path could become leaky during operation (e.g. due to special sample gas properties):*

- ▶ Check the leak tightness of the connected sample gas lines in regular intervals.



Leak tightness check procedure → “GMS800 Series” Operating Instructions

### 5.2.2 Leak tightness check of the purge gas paths

*Only valid for versions with purge gas connections (→ p. 17, §3.3.4)*

- ▶ Check the leak tightness of purge gas paths at least once a year.
- ▶ Check in the same manner as for leak tightness of sample gas lines (procedure → “GMS800 Series” Operating Instructions).

# GMS815P-PS-2G/-3G

## 6 Technical Data

Dimensions

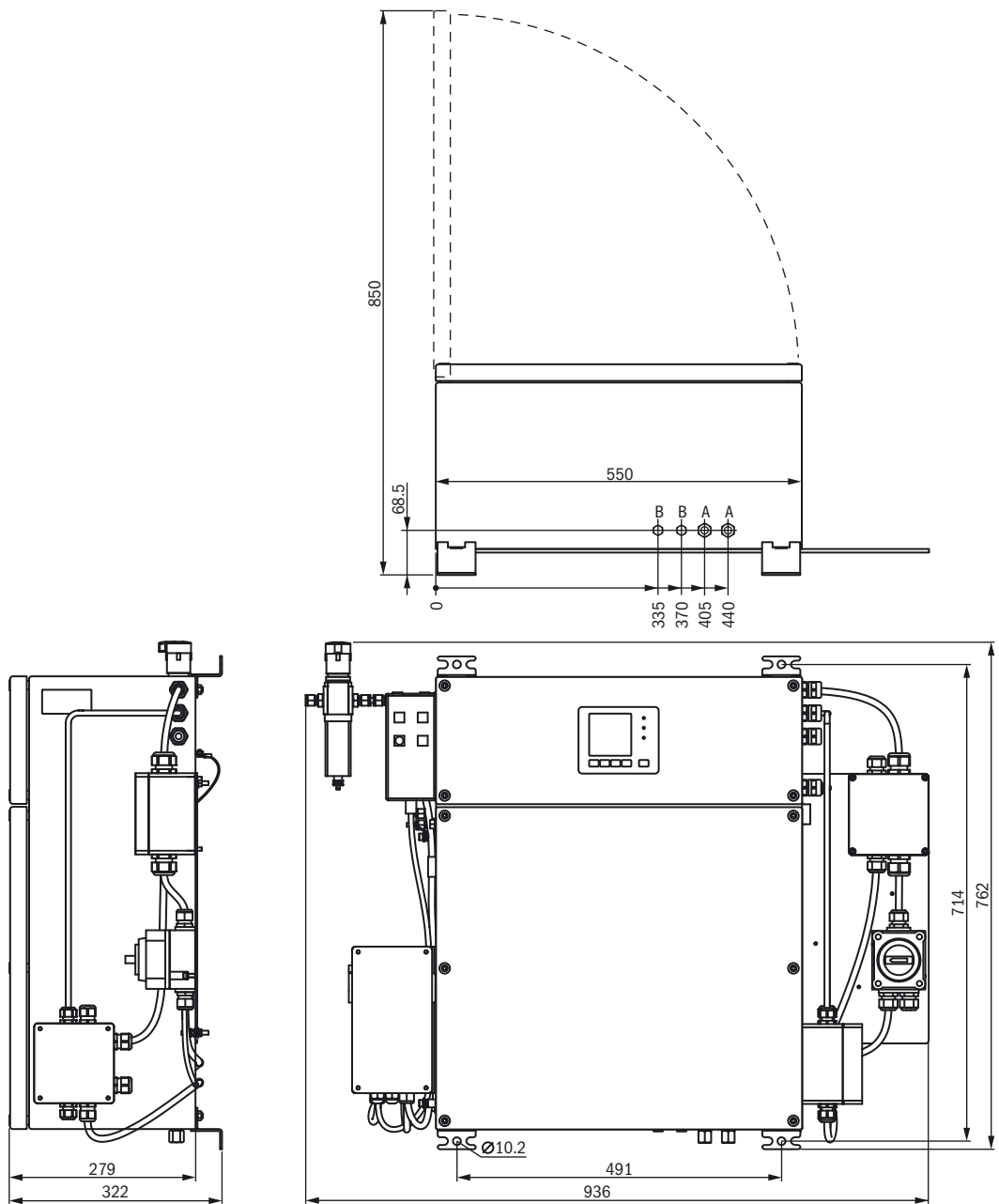
Approval

Ambient conditions

Gas connections type

Electrical specifications

6.1 **Dimensions**



- A Sample gas connection
- B Opening 12 mm + screw plug; option: Gas connection for span gas or a second sample gas path or for purge gas for an Analyzer module

Subject to change without notice



6.2

## Approvals

### Approval for Enclosure GMS815P-PS-2G

Approval type:	EU Type Examination Certificate
Certificate number:	TÜV 10 ATEX 555433 X
Device identification:	→ p. 10, § 2.1
Special conditions:	→ p. 8, § 1.5.1

### Approval for Enclosure GMS815P-PS-3G

Approval type:	Declaration of Conformity
Certificate number:	TÜV 10 ATEX 555946 X
Device identification:	→ p. 10, § 2.1
Special conditions:	→ p. 8, § 1.5.2

6.3

## Enclosure specifications

Design	
- Gas analyzer enclosure:	Closed steel sheet enclosure, split vertically, 2 front doors, degree of protection IP 65
- Other enclosure:	Closed plastic enclosure
Dimensions:	→ p. 32, § 6.1
Weight:	55 ... 57 kg (depending on equipment)
Highest surface temperature:	348 K (75 °C / 167 °F)

6.4

## Ambient conditions

Atmospheric influences:	Only for use indoors
Allowable contamination:	Degree of contamination 3 [1]
Fitting position (allowable offset):	→ Supplementary Operating Instructions for the Analyzer Modules fitted
Geographic height at installation location:	
Ambient air pressure:	
Allowable oscillations (amplitude): [2]	0.035 mm in range 5 ... 59 Hz
Allowable vibrations (acceleration): [2]	5 m·s <sup>-2</sup> in range 59 ... 160 Hz
Jolts:	≤ 15 g over 11 ms [3]
Relative humidity:	10 ... 95%, non-condensing
Ambient temperature during operation:	+5 ... +40 °C (41 ... 113 °F)
Transport /storage temperature:	-10 ... +70 °C (14 ... 158 °F)

[1] Dry and wet contamination that can be electrically conductive

[2] Observe DIN 15267-3, DIN EN 60068-2-26; as well as specifications for built-in Analyzer modules

[3] Shock test in accordance with DIN EN 60068-2-27

6.5

## Gas connections

### Protective gas connections

Connection	Designation	Suitable for
Inlet:	Swagelok 8 mm	Metal tube with 8 mm outer Ø
Outlet for Enclosure GMS815P-PS-2G:	Thread G 1"	Screw fitting
Outlet for Enclosure GMS815P-PS-3G:	Thread G 3/4"	Screw fitting

### Sample gas connections

Connection	Designation	Suitable for
Standard:	Swagelok 6 mm	Metal tube with 6 mm outer Ø
Option:	Swagelok 1/4"	Metal tube with 1/4" outer Ø

### Approval conditions for sample gas feed

Parameter	Allowable value
Sample gas pressure in enclosure:	-500 ... +1000 hPa (-0.5 ... +1.0 bar)
Sample gas volume flow:	Max. 100 dm <sup>3</sup> /hour

### Approval conditions for purge gas feed for an Analyzer module

Parameter	Allowable value
Maximum purge gas pressure in enclosure:	15 hPa (15 mbar)



- Protective gas connection position → p. 32, §6.1
- Protective gas feed parameters → p. 35, §6.8
- Sample gas connection positions → p. 32, §6.1
- Sample gas connections function → "GMS800 Series" Operating Instructions
- Other specifications for sample gas → Supplementary Operating Instructions for the Analyzer module fitted

6.6

## Mains connection

Mains voltage	
- Enclosure GMS815P-PS-2G:	120 V AC ± 10% or <sup>[1]</sup> 230 V AC ± 10%
- Enclosure GMS815P-PS-3G:	115 V AC ± 10% or <sup>[1]</sup> 230 V AC ± 10%
Mains frequency (AC):	47 ... 63 Hz
Allowable overvoltages:	Transient overvoltages in supply network must not exceed Overvoltage Category II according to IEC 60364-4-443
Power input:	50 VA / max. 300 VA
Internal mains fuses	
- Primary:	6.3 A (not exchangeable) <sup>[2]</sup>
- Secondary:	10 A (exchangeable fusible cutout) <sup>[3]</sup>
Required connection cable	
- Conductor cross-section:	≥ 0.75 mm <sup>2</sup>
- Version:	IEC 60227 or IEC 60245

[1] Depending on device version; refer to type plate for appropriate value (→ p. 10, §2.1)

[2] Replace the power supply unit after triggering

[3] F1 on the "fuse board" - spare part: "ET fuse F10A0", Part No. 2062251.

## 6.7 Electrical safety

Protection class:	Protection class I [1]
Electrical safety:	Tested according to EN 61010-1 Low Voltage Directive 2006/95/EC
Transformer:	Safety transformer according to EN 61558 (VDE 0570)
Electromagnetic compatibility:	In accordance with EN 61326-1, EN 61326-2-1, EN 61000-6-2, EN 61000-6-4 and Directive 2004/108/EC

[1] VDE 0411 Part 1 / IEC 348

## 6.8 Pressurized enclosure parameters

### 6.8.1 Protective gas

Composition:	N <sub>2</sub>
Inlet temperature:	5 ... 40 °C
Minimum feed pressure (primary pressure):	
– Enclosure GMS815P-PS-2G:	1000 hPa (1.0 bar)
– Enclosure GMS815P-PS-3G:	1700 hPa (1.7 bar)
Maximum feed pressure (primary pressure):	6900 hPa (6.9 bar)
Minimum volume flow (continuous purging):	47 dm <sup>3</sup> /hour (780 cm <sup>3</sup> /min)

### 6.8.2 Enclosure parameters

Enclosure data	
Free volume:	90 dm <sup>3</sup>
Minimum overpressure:	80 Pa (0.8 mbar)
Maximum overpressure:	1500 Pa (15 mbar)
Enclosure leak rate:	60 dm <sup>3</sup> /hour
Pre-purging (during start-up)	
Minimum volume (pre-purge amount):	540 dm <sup>3</sup>
Minimum volume flow:	4320 dm <sup>3</sup> /hour
Minimum duration (pre-purge time):	7.5 minutes
Maximum overpressure:	6.9 bar

### 6.8.3 Pressurized enclosure system setting for Enclosure GMS815P-PS-2G

Pressurized enclosure system used: Gönheimer F850S

F850S parameters	Setting
Valve control:	Proportional valve (P-valve)
Operating mode:	Leakage compensation (purging not continuous)
Purge amount:	540 dm <sup>3</sup>
Nominal pre-purging pressure:	13 mbar
Minimum pre-purging volume flow:	1.2 dm <sup>3</sup> /s
Maximum pressure during operation:	15 mbar
Minimum pressure in operation:	2,5 mbar
Monitored minimum value (limit value for automatic switch-off) [1]	2.0 mbar

[1] Signal pressure for warning message via a signal contact can be set separately

## 6.8.4

**Pressurized enclosure system setting for Enclosure GMS815P-PS-3G**

Pressurized enclosure system used: Gönzheimer F840

F840S parameters	Setting
Purging:	Yes
Purging method:	Auto no
Output function A1:	Ex-protection OK
Output function A2:	Ex-protection OK [1]
A1 control direction A1:	Normally open (no)
A2 control direction A1:	Normally open (no)
Purge time:	7.5 minutes
Volume:	<i>No value</i>
Minimum pre-purging pressure:	7 mbar
Minimum pressure in operation:	0.8 mbar
Maximum pressure during operation:	15 mbar

[1] Options: Signal pressure. alarm

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