

# GME700

## Extractive Laser Gas Analyzer



Installation  
Operation  
Maintenance



## Document information

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### Described Product

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### Product

Product name: GME700  
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### Warranty Information

Specified product characteristics and technical data do not serve as guarantee declarations.

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## Glossary

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**CAN Bus:** Control Area Network. A field bus

**Field bus:** An industrial communication system connecting a variety of implements such as analyzers, measuring sensors, actuators and controlled by a control unit.

**PROFIBUS:** Field bus communication protocol

**OPC:** Openness, Productivity, Collaboration. Standardized data interface (OPC Foundation™).

**Span gas:** Test gas with a concentration of about 75% of the full scale limit.

## Warning Symbols

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Hazard (general)



Hazard by electrical voltage



Hazard by explosive substances/mixtures



Hazard by noxious substances



Hazard by toxic substances



Hazard through laser beam



Hazard by high temperatures or hot surfaces

## Information Symbols

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Information on use in potentially explosive atmospheres



Important technical information for this product



Important information on electric or electronic functions



Nice to know



Supplementary information



Link to information at another place

## Warning Levels / Signal Words

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### **DANGER**

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

### **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.

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**GME700**

# **1 Important Information**

Main safety information  
Intended use  
Responsibility of user

## 1.1

**Main safety information**

Short summary of important safety information.

**Danger: Danger through defective device**

The GME700 is likely to be unsafe when it:

- Has been penetrated by moisture.
- Has been stored or operated under irregular conditions.

When safe operation is no longer possible:

- ▶ Put the GME700 out of operation, separate all connectors from the power supply and secure against unauthorized start-up.

**Warning: Hazards through electrical voltages**

- ▶ Pay careful attention to power supply connections.
- ▶ Do not interrupt protective conductor connections.

**Warning: Hot surfaces when housing open**

Beware of hot surfaces of the measuring cell when opening the GME700 housing.

**Warning: Eye injuries possible due to laser radiation**

- ▶ Observe all information on the subject of laser radiation in these Operating Instructions.

## 1.2

**Intended use**

## 1.2.1

**Purpose of the device**

The GME700 is a single or dual component analyzer for continuous gas measurement. The sample gas is taken at a sampling point and fed through the analyzer (extractive measurement).

**Warning: Do not use the GME700 for pressures above 500 hPa**

The device is not suitable for pressures above 500 hPa. The system supplier, installer or operator must take external measures to ensure this pressure cannot be exceeded.

**Warning: Do not use the GME700 for explosive/unstable gases**

The device may not be used for explosive or unstable gases.

**Warning: Additional measures for toxic or dangerous gases**

The operator must take additional measures for toxic or dangerous gases depending on the risk.



**NOTICE:** The device may only be used in rooms protected against humidity, temperature and condensation. See the specifications in "Technical Data", → p. 43, 8.2



### 1.3 Responsibility of user

#### 1.3.1 Designated users

The GME700 may only be operated by skilled technicians who, based on their technical training and knowledge as well as knowledge of the relevant regulations, can assess the tasks given and recognize the hazards involved.

#### 1.3.2 Correct use

- ▶ Use the device only as described in these Operating Instructions. The manufacturer bears no responsibility for any other use.
- ▶ Perform the prescribed maintenance work.
- ⊗ Do not remove, add or modify any components to or on the device unless described and specified in the official manufacturer information. Otherwise
  - The device could become dangerous.
  - Any warranty by the manufacturer becomes void.

#### 1.3.3 Special local conditions

- ▶ In addition to these Operating Instructions, follow all local laws, technical rules and company-internal operating directives applicable at the respective device installation location.

#### Retention of documents

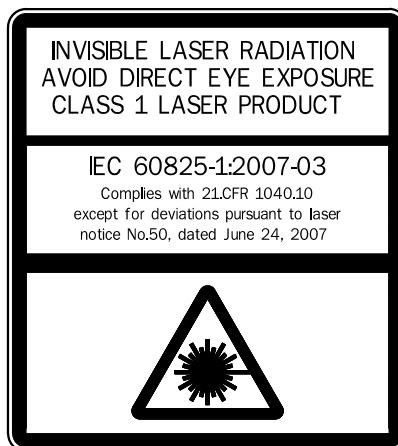
These Operating Instructions and the additional User Manual and the technical documentation of the temperature controller WATLOW, EZ-Zone™ PM (0600-0058-0001 Rev B)

- ▶ Must be available for reference.
- ▶ Must be conveyed to new owners.

#### 1.3.4 Laser warning sign

The GME700 uses an invisible laser with **LASER CLASS 1**. The laser beam is not accessible during normal operating or maintenance mode.

Fig. 1 The GME700 laser warning sign is located on the sender/receiver unit



**Warning: Opening the GME700 housing**

Never open the device housing during normal operating mode. If this is however necessary, observe the following:

- ▶ Always switch the GME700 analyzer off! Otherwise this could result in dangerous exposure to radiation.
- ▶ Observe the laser protective regulations in accordance with IEC 60825-1 (current issue)!

1.3.5

**Recycling****Warning: The reference cell contains a small quantity of components being measured**

Never open a reference cell!

**GME700**

## **2 Product Description**

Product identification  
Device design  
Measured components  
Interfaces

2.1 **Product identification**

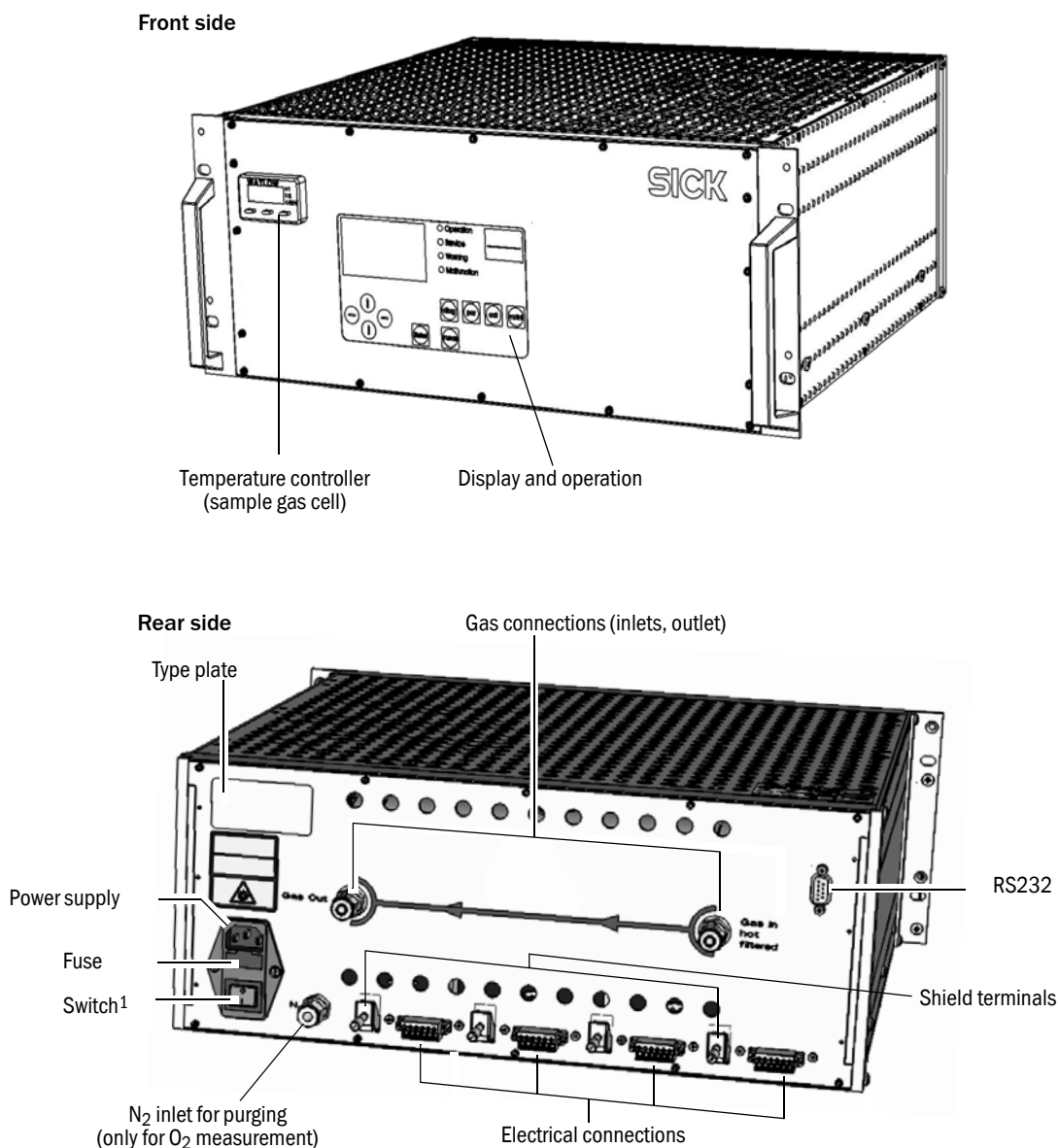
Product name:	GME700
Manufacturer:	SICK AG Erwin-Sick-Str. 1 · D-79183 Waldkirch · Germany

**Type plate**

The type plate is located on the rear side of the housing.

2.2 **Device design**

Fig. 2 GME700 analyzer in detail



<sup>1</sup> Note: When integrated in a system, the switch must remain accessible or be supplemented with an additional circuit-breaker switch. The grounding cable must be connected.

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The GME700 laser gas analyzer is used to continuously monitor e.g., industrial combustion plants or exhaust air from factory workshops.

The device operates based on the extractive principle, i.e. the gas is taken from the gas channel by a sampling probe and fed to the analyzer via a gas line. Gas conditioning measures must prevent contamination or condensation in the measuring cell.



**Warning: Do not use the GME700 for pressures above 500 hPa / 7.25 psi**

The device is not suitable for pressures above 500 hPa / 7.25 psi. The system supplier, installer or operator must take external measures to ensure this pressure cannot be exceeded.



**Warning: Do not use the GME700 for explosive/unstable gases**

The device may not be used for explosive or unstable gases.



**Warning: Additional measures for toxic or dangerous gases**

The operator must take additional measures for toxic or dangerous gases depending on the risk.

The analyzer comprises the following components:

- Control unit with display and keypad
- Temperature controller for the sample gas cell
- Built-in temperature and pressure measurement
- Detectors
- Multi-path gas cell
- Optics and electronics unit

2.2.1 **Measured components**

Measured components: (One component per device)	<ul style="list-style-type: none"> <li>• HF</li> <li>• NH<sub>3</sub> or NH<sub>3</sub>/H<sub>2</sub>O</li> <li>• HCl or HCl/H<sub>2</sub>O</li> <li>• O<sub>2</sub></li> </ul>
--	---

2.2.2 **Interfaces**

Standard	
Analog and digital signals	<ul style="list-style-type: none"> <li>• 3 analog outputs (0 ... 20 mA)</li> <li>• 3 digital outputs (relay, 48 V AC/DC)                             <ul style="list-style-type: none"> <li>- Malfunction</li> <li>- Maintenance request</li> <li>- Function test</li> </ul> </li> <li>• 1 digital output of the temperature controller                             <ul style="list-style-type: none"> <li>- Measuring cell temperature</li> </ul> </li> <li>• 2 digital inputs (relay)                             <ul style="list-style-type: none"> <li>- Maintenance switch</li> <li>- Check cycle</li> </ul> </li> </ul>
Serial interface	<ul style="list-style-type: none"> <li>• RS232 service interface</li> </ul>

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# GME700

## 3 Installation

Scope of delivery  
Installing the 19" analyzer unit

### 3.1 Scope of delivery

- 19" analyzer unit with integrated display, keypad and temperature controller

### 3.2 Installing the 19" analyzer unit



**NOTICE:** The device may only be used in rooms protected against humidity, temperature and condensation. See the specifications in "Technical Data", → p. 43, 8.2

#### 3.2.1 Fitting

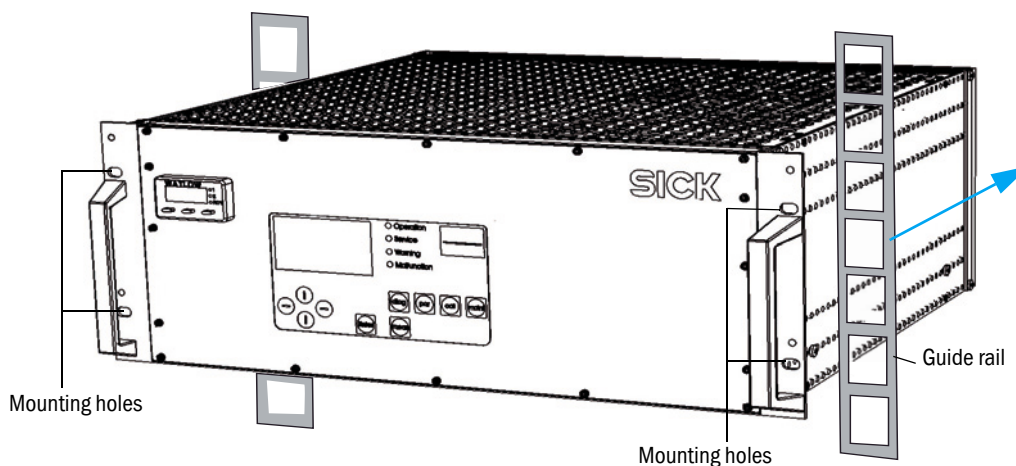


**Caution: Risk of overheating when the GME700 is installed in a system cabinet**

Provide sufficient ventilation to prevent overheating when the GME700 is installed inside a closed control cabinet.

- ▶ Install a ventilator or cooling unit in the control cabinet.
- ▶ Observe specifications for ambient temperatures (0 ... 50 °C). → »Technical Data« (p. 43)
- ▶ Only fit the device horizontal and in the direction shown in Fig. 3

Fig. 3 Installing the GME700 analyzer

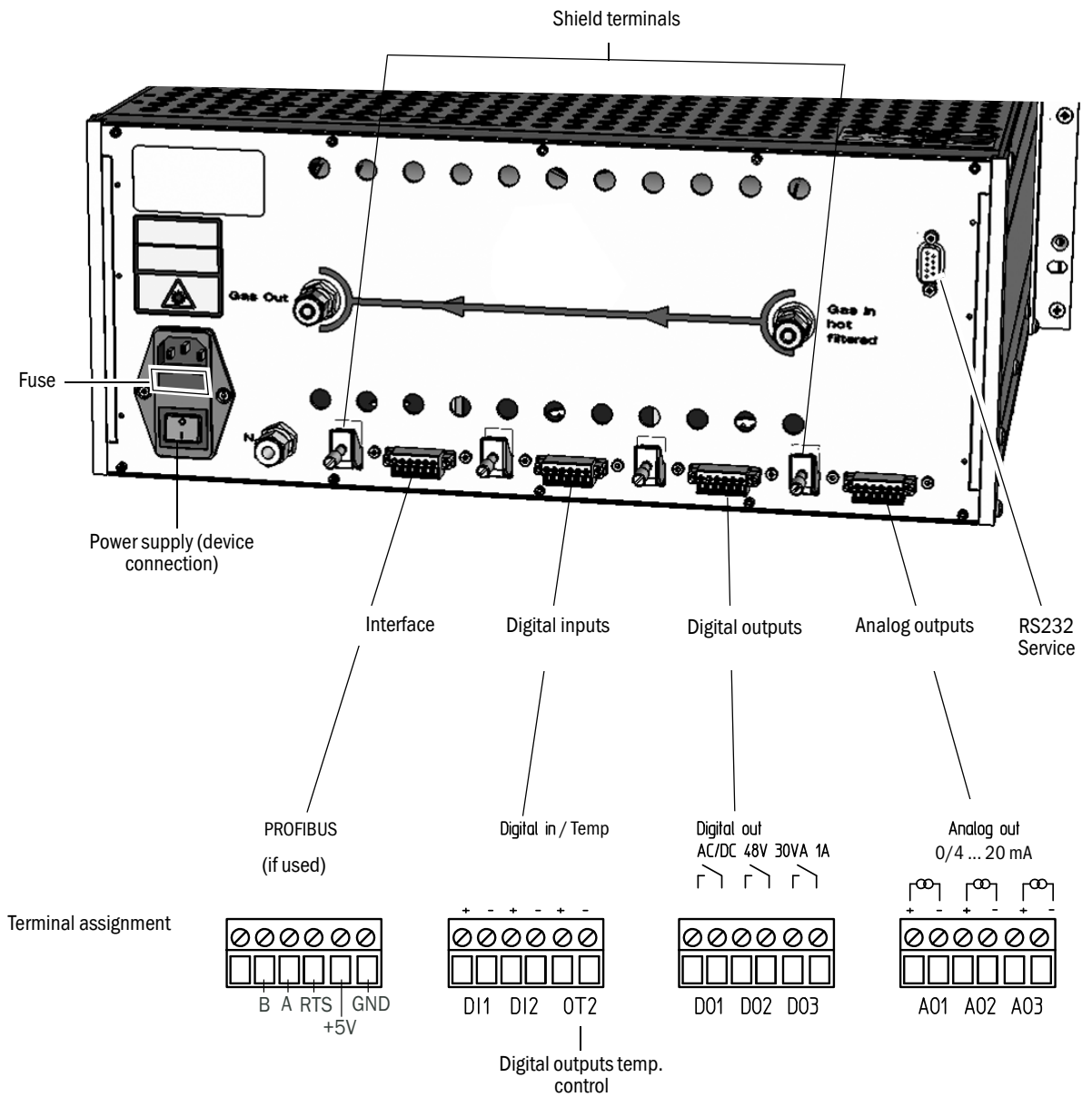


- ▶ Install the 19" unit:
  - ▶ Position the unit onto the installation location as shown in Fig. 3, e.g., in a system cabinet, and fasten it to the front panel.
  - ▶ Tighten the screws on the front panel securely, e.g. on the guide rails.
  - ▶ Connect the device to the protective ground.



### 3.2.2 Electrical connections

Fig. 4 Electrical connections on the analyzer rear side




- ▶ Connect the inputs and outputs properly.
- ▶ Connect the PROFIBUS and, if necessary, the RS232 interface.
- ▶ Connect the power cable to the device mains connector. Always make completely sure connection has been made to the protective ground.



**NOTICE: Always use the correct mains cable.**

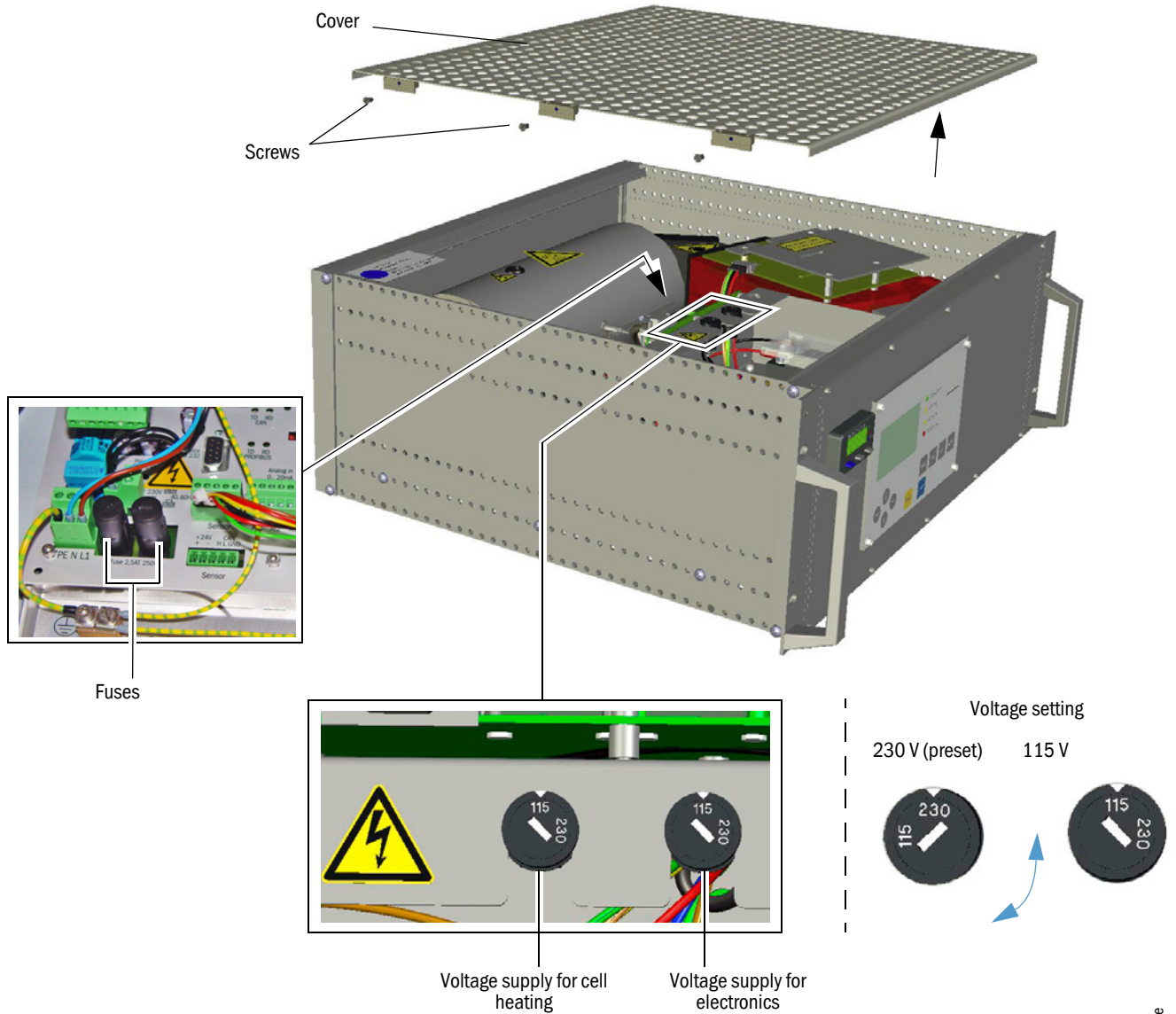
Do not use a mains cable with inadequate rating instead of the proper mains cable.


3.2.2.1 230 V or 115 V power supply




**Warning: Supply voltage setting**  
 Check the connection values for power supply before switching on!  
 The voltage selector is set to 230 V when delivered.→ Fig. 5  
 Technical details on power supply → p. 43, §8.2

Fig. 5 Power supply setting





**Warning: Endangerment of electrical safety**  
 ► Switch the voltage supply off before opening the device.



**Warning: Risk of burns through the cell heating**  
 ► Let the device cool down before opening.

- Unscrew the screws on both sides of the housing and take the cover plate off.

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- ▶ Use a screwdriver to set the voltage selectors for the electronics of the evaluation unit and the cell heating to the correct position, e.g. 230 V or 115 V.
- ▶ Screw the cover back on.

## 3.2.3

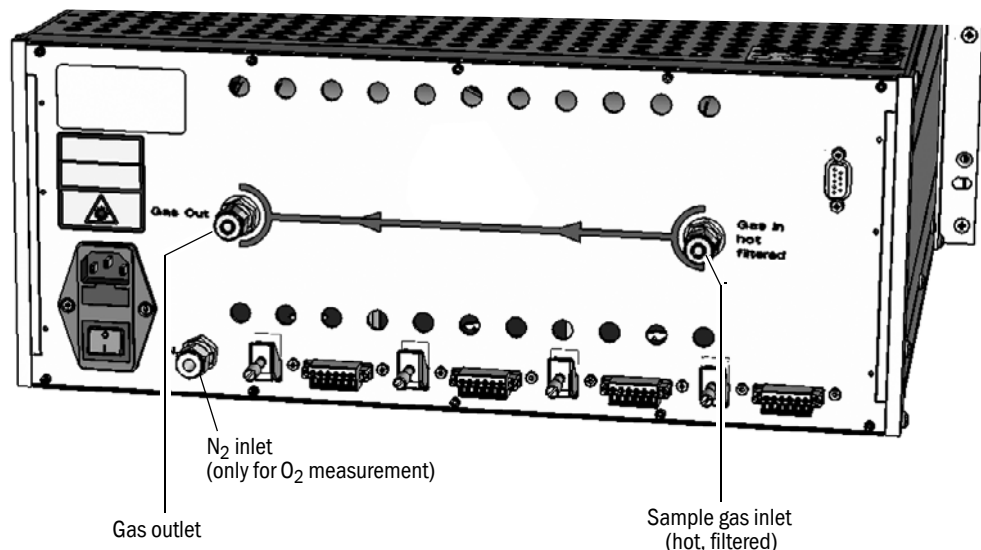
**Gas connections****Warning: Hot connections (gas inlet/gas outlet)**

The following conditions must be met for sample gas supply to ensure reliable measured data and trouble-free operation of the GME700:

- Oil-free, dust-filtered (according to technical standards for extractive measuring devices)
- Heated (typically 180 °C / 356 °F), otherwise risk of contamination on the mirror optics
- Observe the sign on the gas inlet „Hot filtered gas inlet“
- ▶ Condition the gas before feeding to the analyzer.

Fig. 6

Gas connections on the rear side of the analyzer housing



- ▶ Connect the end of the gas sampling line to the sample gas inlet (6 mm gas connection).
- ▶ Connect the exhaust gas line to the gas outlet (6 mm gas connection) to lead off the exhaust gas from the gas analyzer.  
Observe the following for longer exhaust gas lines:
  - ▶ Avoid condensation so that nothing can flow back into the cell.
  - ▶ Use lines with inner diameters of at least 10 mm when there is a risk of crystallization.
  - ▶ Use lines with inner diameters of at least 10 mm for lines longer than 5 m.
  - ▶ Protect the gas outlet line against frost.

*Only for O<sub>2</sub> measurement*

- ▶ Connect the N<sub>2</sub> supply to the N<sub>2</sub> inlet.



**Warning: Do not feed the sample gas until the GME700 analyzer has heated up to its correct temperature.**

- ▶ Wait at least 15 minutes for the heating-up phase to finish after switching the analyzer on. → p. 26
- ▶ Always purge the measuring cell before the cooling phase.  
→ »Purging the sample gas cell« (p. 30)



**Caution: Separate valve for sample gas feed**

A valve must be fitted to protect the measuring cell. This valve serves to switch the sample gas feed to air or N<sub>2</sub>

- As long as the measuring cell temperature has not been reached.
- or
- As soon as the voltage supply is interrupted.



**NOTICE: Make sure the power isolating switch is accessible.**

An additional disconnecting device is mandatory when the power isolating switch is difficult to access or cannot be accessed when connecting the equipment after installation.

# GME700

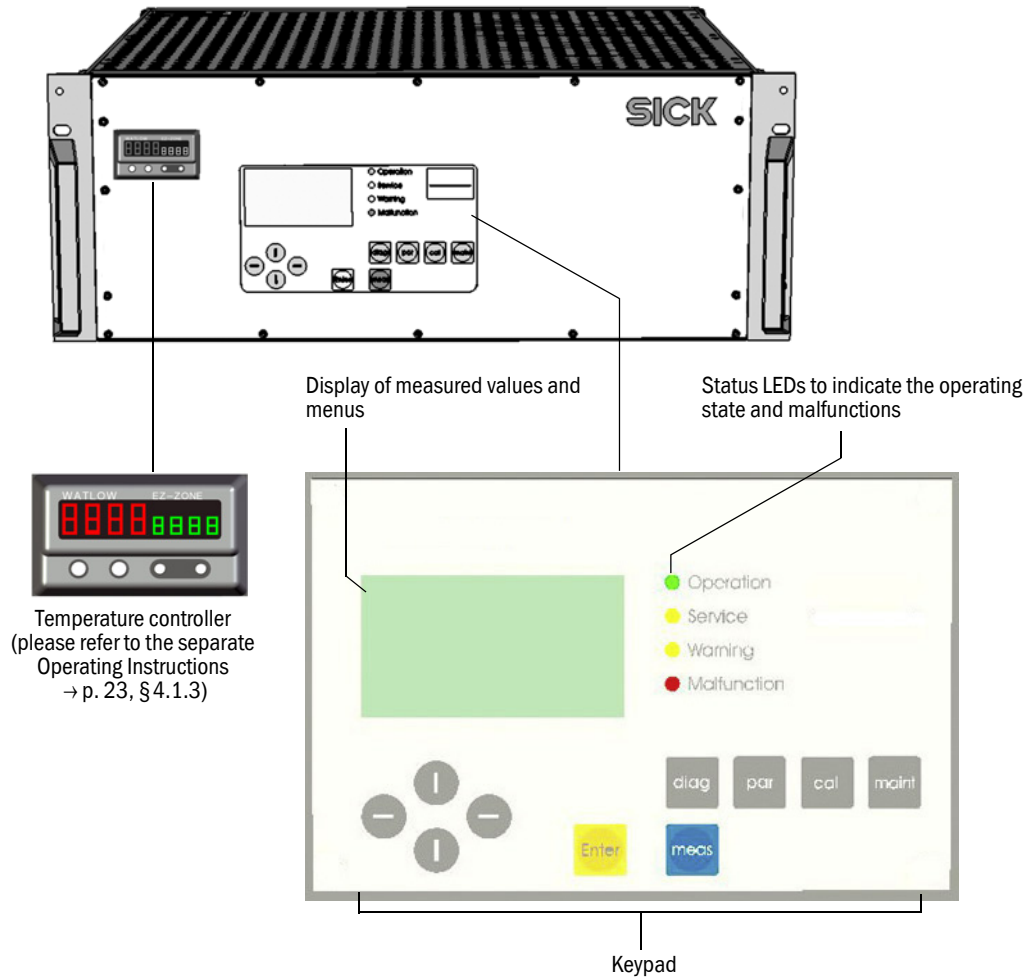
## 4 Start-up

Operating elements  
Menu structure for configuration  
Start-up step by step






## 4.1 Operating elements

The control panel of the analyzer serves displaying, entering, and configuring system parameters and control functions. The control panel with display, status LEDs and keypad is located on the front side of the housing.

Fig. 7 Displays and controls on the control panel

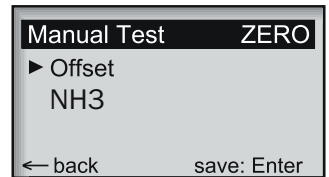


4.1.1 **Function buttons with menu overview**


	<b>Measuring mode</b>	Current measured values: Depending on device version
	<b>Diagnosis</b>	Current error messages (plain text) Current warnings (plain text) Displays diagnosis values
	<b>Parameters</b>	Sets/displays system component parameters Displays serial number and software version (system components) Not used
	<b>Calibration/ settings</b>	Sets the zero point, e.g. during start-up
	<b>Maintenance</b>	Checks analog outputs, relay outputs and digital inputs System cold start Resets parameters to factory settings

4.1.2 **Display**

- Currently selected operating mode (e.g. parameter mode) or command overview shown as heading.
- Four lines for submenus, plain texts or specific settings (values)
- Function line:  
 ← back: To return to a higher menu level: **Press ←**.  
 save: Enter. To enter a menu option or confirm an input: **Press Enter**.  
 select: To select a value: **Press Enter**.  
 ↑ (↓) When a variable is selected that requires a numeric input:  
 Press ↑ (↓) to select the value for each digit.  
 Password: When prompted for a password: Enter **1 2 3 4** with ↑ (↓) .



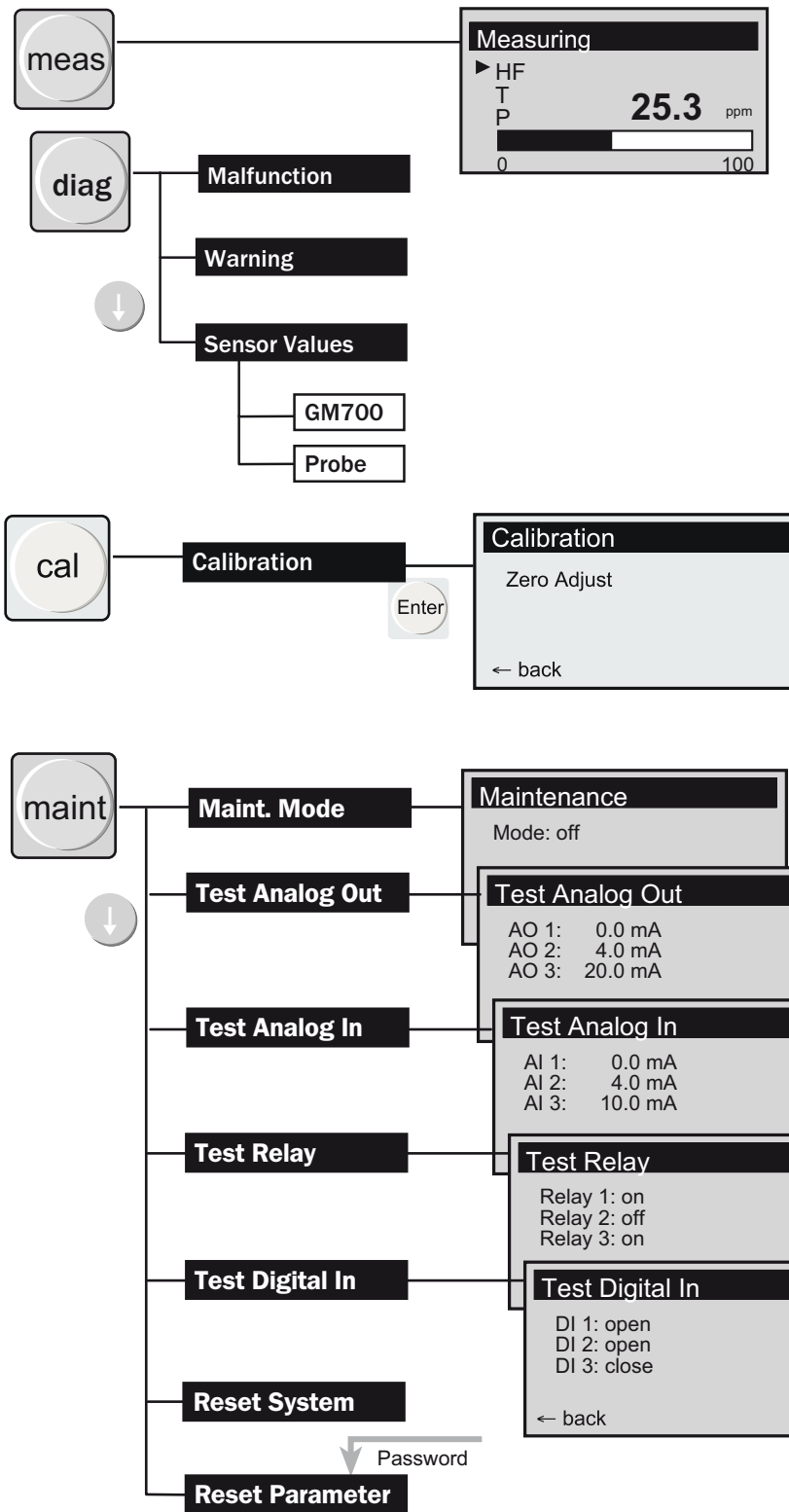
4.1.3 **Temperature controller**

 Please read the separate manual for the temperature controller EZ-Zone™ PM from WATLOW (0600-0058-0001 Rev B).

- The parameters for the temperature controller are set for the PT100.
- Max. cell temperature of 200 °C / 392 °F
- Limited to 230 °C / 446 °F by the over-temperature switch.

## 4.2 Menu structure for configuration

Fig. 8 Menu structure of GME700/Part 1



### Measuring mode

Measuring mode  
Measured components:  
e.g. HF, NH<sub>3</sub>, O<sub>2</sub>, HCl

### Diagnosis

- Plain-text error messages
- Plain-text warning messages
- Current monitoring messages of the sensor (amplification settings, built-in temperature controller, etc.).
- 

### Zero adjustment

Zero adjustment  
Activation of zero adjustment (requires zero gas, e.g. instrument air, nitrogen)

### Maintenance mode

Maintenance: on/off  
Measuring mode stopped

Test analog output:  
Output of a configurable current value

Test analog input:  
Displays the connected current value

Test relay outputs:  
Relay switchover

Test digital inputs:  
Displays current status

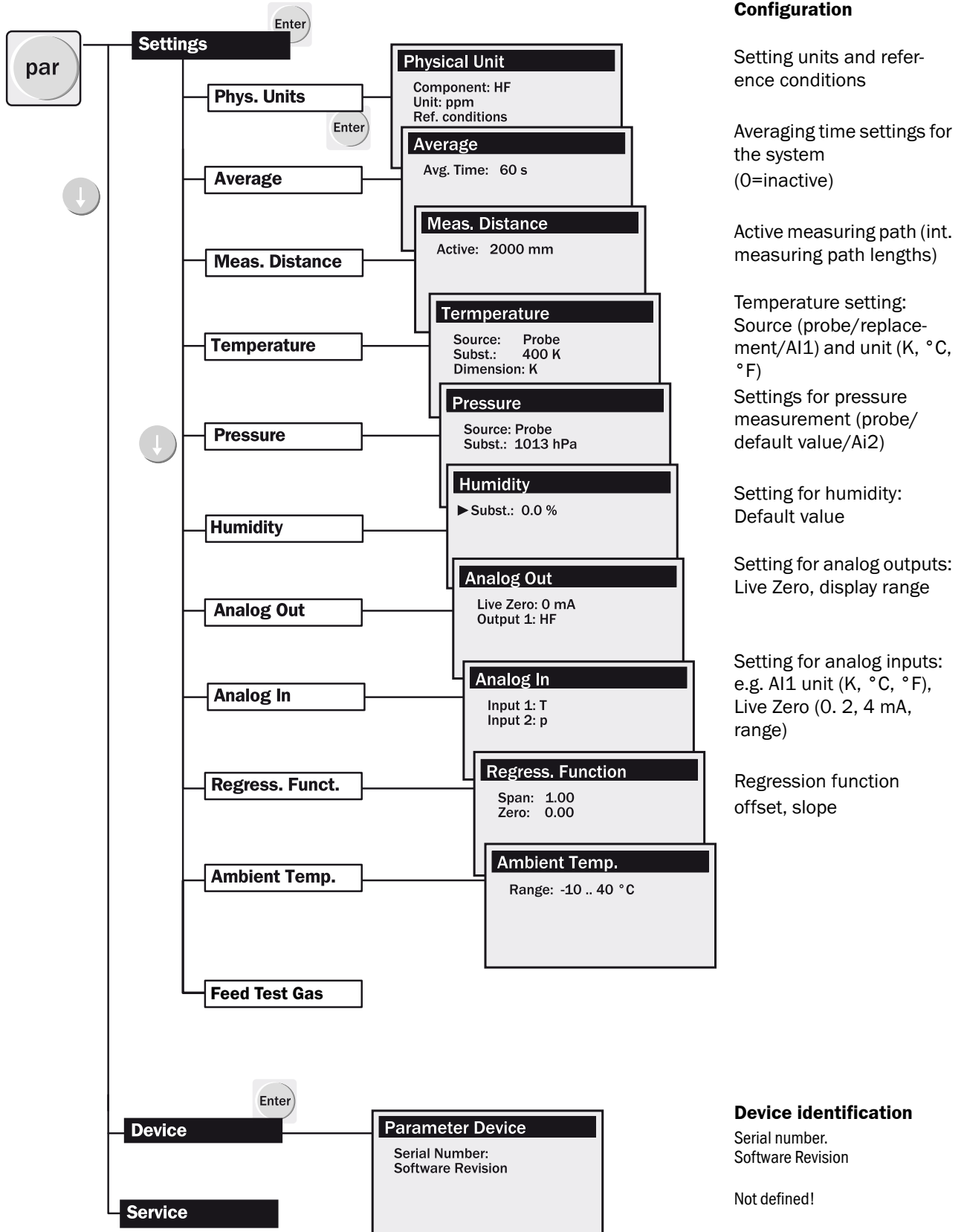
System restart

Reset parameters: Factory settings  
**Attention:** All settings will be overwritten!

Subject to change without notice



Fig. 9 Menu structure GME700/Part 2



Subject to change without notice

### 4.3 Start-up step by step



**Warning:** Do not feed sample gas to the GME700 analyzer until it has reached its correct heating-up temperature.

- ▶ Wait at least 15 minutes for the heating-up phase to finish after switching the analyzer on.
- ▶ Never feed gas through the unheated measuring cell. The optics can be contaminated and would have to be exchanged by a trained Service technician.

#### 4.3.1 Switching on the analyzer

- ▶ Switch on the power supply for the GME700.
- ▶ The indicator on the temperature controller (“LO”) stays on until the correct operating temperature is reached.

Digital outlet OT2 switches over as soon as the operating temperature is reached.

#### 4.3.2 Settings

- ▶ Use the temperature controller to set the operating temperature for the sample gas cell to the recommended (typical) value of 180 °C / 356 °F.
  - Highest temperature value: 200 °C / 392 °F



- ▶ Always set temperature values higher than the dew point.



- ▶ Please observe the separate Operating Instructions “Temperature controller EZ-Zone™ PM from WATLOW (0600-0058-0001 Rev B)”.

- ▶ Configuration/control → Fig. 4.2 cont'd.
- ▶ Press "meas" to start measuring mode.  
The analyzer starts measuring.
- ▶ Check display on the control panel.
  - ▶ Use the menu overview (→ p. 24, § 4.2) to check the plausibility of the measured values shown on the display.
  - ▶ If malfunction or warning messages are shown on the display:  
→ »Troubleshooting on the operating panel« (p. 35)



**Caution:** For malfunction messages output on the temperature controller, please refer to the separate Operating Instructions “Temperature controller EZ-Zone™ PM from WATLOW (0600-0058-0001 Rev B)”.

- ▶ If the cause of the malfunction messages cannot be cleared with the available information, please contact our Customer Service.

### 4.3.3 Operating state

During actual operation, the following states can be shown on the display of the operating panel:

### 4.3.4 Setting the ambient temperature

State in the 1 <sup>st</sup> text line	Description
<b>INIT</b>	Initializing the operating panel
<b>INITIALISATION</b>	Initializing the SR-unit
<b>SIGNAL_ADJUST</b>	Adjusting the amplification for transmission changes
<b>MEASURING</b>	Measuring operation
<b>MEASURING LL</b>	Measuring mode, laser wavelength tracking active
<b>MEASURING LD</b>	Measuring mode, laser wavelength tracking completed
<b>MAINTENANCE</b>	Maintenance mode (no measurement)
<b>DOWNLOAD</b>	Download new software (only for Service)
<b>CCY [ZERO]</b>	Check cycle triggered <ul style="list-style-type: none"> <li>• Periodical or</li> <li>• Manual via control unit or digital signal</li> </ul>

On the evaluation unit:

- ▶ Select the correct ambient temperature to allow the heater of the SR-unit to stabilize the optics temperature:
- ▶ Activate **Parameter mode**.
- ▶ Select **Settings**, then menu option **Ambient Temp**.
- ▶ Select the temperature range according the Table below that matches the ambient conditions at the installation location.

Possible ambient temperature ranges		
Degrees Celsius [°C]	Degrees Kelvin [K]	Degrees Fahrenheit [°F]
-40 ... 15	233 ... 288	-40 ... 59
-30 ... 25	243 ... 298	-22 ... 77
-20 ... 35	253 ... 308	-4 ... 95
-10 ... 45	263 ... 318	14 ... 113
0 ... 50	273 ... 323	32 ... 122

The GME700 analyzer automatically determines the appropriate temperature for the optics heater.



# GME700

## 5 Shutdown

Shutting down the analyzer

## 5.1 Shutting down the analyzer



**Warning:** Purge the sample gas cell when using corrosive or damp gases (e.g. HF, HCl)

- ▶ Always purge the sample gas cell with air or N<sub>2</sub> for about 5 minutes before shutting the analyzer down.

### 5.1.1 Purging the sample gas cell

- ▶ Connect N<sub>2</sub> or air supply to the gas connection.
- ▶ Close off after about 5 minutes.
- ▶ Disconnect and remove all connections and lines, electrical and gas, to prevent gas entering the cell again.
- ▶ Store the analyzer well protected for the next measuring task.

**GME700**

## **6 Maintenance**

Preventative maintenance

## 6.1

**Preventive maintenance****Caution: Perform regular maintenance on the sample gas conditioning**

Correct and faultless operation of the GME700 analyzer requires regular maintenance of all components (e. g. sample gas line, filters) of the sample gas conditioning.

- ▶ Refer to the separate literature/documentation of these components.
- ▶ When opening the device is necessary:

**Warning: Endangerment of electrical safety**

- ▶ Switch the voltage supply off before opening the device.

**Warning: Hazard through laser beams**

- ▶ Always switch the GME700 analyzer off before opening the device! This could result in dangerous exposure to radiation.

Contamination of the measuring cell is the most probable cause when the device is indicating a low signal.

Please refer to the separate document for a description on disassembling the device and the cell.

**Caution: Cleaning the cell**

- ▶ Never touch or wipe the gold coated surface of the mirror.
- ▶ Rinse with clean water, ethanol or isopropanol. An ultrasonic bath can also be used. Avoid any mechanical damage to parts.
- ▶ Rinse again with clean demineralized water after using small amounts of detergent.
- ▶ Dry with nitrogen or clean instrument air.
- ▶ Allow to dry completely before reassembly.



**GME700**

## **7 Clearing Malfunctions**

Integrated monitoring and diagnosis system  
Messages on the operating panel

## 7.1 Integrated monitoring and diagnosis system

The GME700 analyzer is equipped with an integrated system that constantly monitors the operating state. If deviations from normal operating conditions occur, appropriate messages are generated and logged in the device for subsequent evaluation.

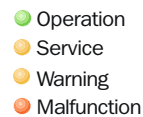
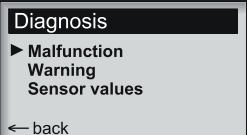
Attention: Stored messages are only kept as long as the cause exists or as long as the device is switched on.

Messages for both system components are categorized into error messages and warning messages depending on the anticipated effects:

- Warning messages are generated if the measurement results are not (yet) directly affected by the change in the system state. Nevertheless, it is important that the cause(s) be investigated and corrected, e.g. by means of maintenance measures, to avoid further malfunctions and damage to the device in particular.
- Error messages are generated when measuring operation is no longer possible or no longer reliable.

These warning and error messages are stored in the integrated message memory of the evaluation unit.

## 7.2 Messages on the operating panel

Component/Tool	Signals	Remark
Operating panel 	<ul style="list-style-type: none"> <li>• <b>Warning LED</b> goes on!</li> </ul>	Functional impairment on system that will not directly lead to corrupt measured values.
	<ul style="list-style-type: none"> <li>• <b>Malfunction LED</b> blinks</li> </ul>	Functional impairment on system that can lead to system failure or restricted function.
Diagnosis mode (Error Table)	Error Table ► Call menu <b>Malfunction</b>	Plain-text message(s) for errors that have occurred to localize and clear the problem. ► See "Troubleshooting Table".
Diagnosis mode 	Warning Table ► Call menu <b>Malfunction</b>	Plain-text messages for existing warnings
	<b>Output</b> for serious malfunction (malfunctions, error message) <ul style="list-style-type: none"> <li>• Relay 1 inactive<sup>1)</sup></li> </ul>	Group malfunction



<sup>1)</sup> The relay is active during normal operation (no malfunctions), i.e. the contact is closed.

### 7.2.1 Procedure

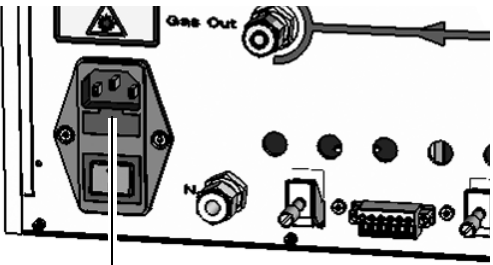
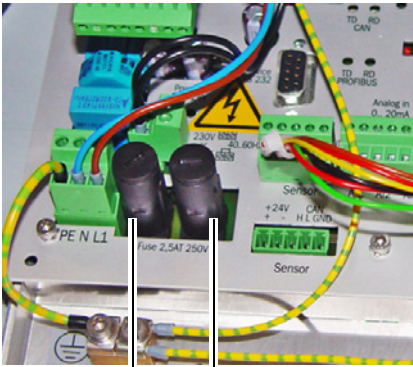
If a warning or malfunction is signaled, first call up pending error messages in the Error menu. Then localize the possible cause and clear the malfunction; see Troubleshooting Table.

7.2.2

**Troubleshooting on the operating panel**

	<p><b>Warning: Endangerment of electrical safety</b></p> <p>▶ Switch the voltage supply off before opening the device.</p>
	<p><b>Warning: Hazard through laser beams</b></p> <p>▶ Always switch the GME700 analyzer off before opening the device! This could result in dangerous exposure to radiation.</p>

Error indication	Possible cause	Clearance
<ul style="list-style-type: none"> <li>• <b>Malfunction LED</b> blinks; (<b>Warning LED</b> may go on)</li> <li>• Relay 1: <b>Group malfunction</b></li> </ul>	Plain-text error messages indicate possible causes	<p>▶ Start <b>Diagnosis mode (diag)</b>:</p> <ul style="list-style-type: none"> <li>- Call up menu <b>Malfunction</b> (or <b>Warning</b>)</li> </ul> <p>Check and clear the specified malfunction.</p>
Evaluation unit not responding	<ul style="list-style-type: none"> <li>• Power supply on operating panel defective</li> </ul>	<p>▶ Check power supply on all system components:</p> <ul style="list-style-type: none"> <li>- If necessary, provide power supply on site</li> <li>- If necessary, check/reconnect connections on the system components</li> </ul>
	<ul style="list-style-type: none"> <li>• Incorrect operating voltage</li> </ul>	<p>▶ Check operating voltage set on the operating panel:</p> <ul style="list-style-type: none"> <li>- If necessary, change setting</li> </ul>
	<ul style="list-style-type: none"> <li>• Defective fuse</li> </ul>	<p>▶ Check fuse on power connection (→ p. 17, Fig. 4) or electronics unit (see below):</p> <ul style="list-style-type: none"> <li>- If necessary, replace fuse</li> </ul>
	<ul style="list-style-type: none"> <li>• No defect localized yet</li> </ul>	<p>▶ Disconnect all system components from the power supply and reconnect one at a time</p> <p>▶ Check CAN bus line from operating panel to SR-unit</p>
	<ul style="list-style-type: none"> <li>• Error occurs again</li> </ul>	▶ Replace the last component connected, contact Service
	<ul style="list-style-type: none"> <li>• 24V/5V supply defective</li> </ul>	▶ Check 24V/5V supply, replace evaluation unit or electronic board module; contact Service
	<ul style="list-style-type: none"> <li>• Inconsistent data detected in parameter memory</li> </ul>	<p>▶ Press Enter to restart the system; the factory parameter settings are then active;</p> <p>▶ If necessary, reconfigure the parameters</p> <p>▶ If the same error message appears again, replace the processor board of the control unit, contact Service.</p>

 <p>Fuse (rear side)</p>	<p>Fuses (2 x 6A3 250 V)</p> <ul style="list-style-type: none"> <li>▶ Check and, if necessary, replace the fuses in the power connection on the rear side of the housing.</li> <li>▶ Open the housing cover</li> <li>▶ Check and, if necessary, replace the fuses in the electronics unit.</li> </ul>
 <p>Fuse 1 Electronics unit</p> <p>Fuse 2 Electronics unit</p>	<p>Power supply (fuses 2 x 6A3 250 V)</p> <ul style="list-style-type: none"> <li>▶ Check the indicator for the 24 V/5 V supply in the electronics unit</li> <li>▶ If these indicators only light up when the connector has been removed, check the cabling first.</li> <li>▶ If no error is found, connect the system components one by one</li> </ul>

## 7.2.3

## Error messages on the operating panel

Error message	Component/possible causes	Clearance
<b>DSP: BOOT ERROR</b> DSP...Digital Signal Processor	Error during start process	<ul style="list-style-type: none"> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>DSP: INV PARA</b>	<ul style="list-style-type: none"> <li>• Incompatible software in the SR-unit</li> <li>• Invalid values entered</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check software version, contact Service if necessary</li> <li>▶ Correct erroneous values</li> </ul>
<b>DSP: NO RESP</b>	Electronics communication problem (SR-unit)	<ul style="list-style-type: none"> <li>▶ Restart device. <ul style="list-style-type: none"> <li>– Press <b>maint</b> to activate maintenance</li> <li>– Trigger menu <b>Reset System</b> or switch device off and on again</li> </ul> </li> <li>▶ If not successful: Contact Service</li> </ul>
<b>EEPROM: CONTROL</b>	Invalid microcontroller parameters (SR-unit)	<ul style="list-style-type: none"> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>EEPROM: LASER</b>	Invalid laser parameters	<ul style="list-style-type: none"> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>FIT: DIV BY 0</b>	Error during signal evaluation <ul style="list-style-type: none"> <li>• Incorrect parameter values</li> <li>• Hardware defective</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check parameter <b>measuring distance</b>, <b>substitute</b> for <b>temperature</b> and <b>pressure</b>.</li> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>FIT: NO CONV</b>	Error during signal evaluation: <ul style="list-style-type: none"> <li>• Incorrect parameter values</li> <li>• Hardware defective</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check parameter <b>measuring distance</b>, <b>substitute</b> for <b>temperature</b> and <b>pressure</b>.</li> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>FIT: S MATRIX</b>	Error during signal evaluation: <ul style="list-style-type: none"> <li>• Incorrect parameter values</li> <li>• Hardware defective</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check parameters <b>measuring distance</b>, <b>substitute</b> for <b>temperature</b> and <b>pressure</b> and correct if necessary</li> <li>▶ Restart device; see above</li> <li>▶ Press <b>maint</b> to activate maintenance</li> <li>▶ Trigger menu <b>Reset System</b> or switch device off and on again</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>Incompatible device</b>	Incompatible software (SR-unit)	<ul style="list-style-type: none"> <li>▶ Check software version</li> <li>▶ Contact Service</li> </ul>
<b>INIT: NO LINE</b>	No absorption line found	<ul style="list-style-type: none"> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>LD: PELT ERROR</b> <b>LD...laser diode</b>	Temperature measurement on Peltier element defective: <ul style="list-style-type: none"> <li>• Possible hardware defect</li> </ul>	<ul style="list-style-type: none"> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>LD: TEMP ERROR</b>	Laser wavelength adjustment outside allowed range <ul style="list-style-type: none"> <li>• Absorption line “lost”</li> <li>• Laser diode defective</li> </ul>	<ul style="list-style-type: none"> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>

<b>MEAS: M PLAUS</b>	Measuring results from measuring channel not plausible: <ul style="list-style-type: none"> <li>• Incorrect parameter values</li> <li>• Strong signal interference</li> <li>• Hardware defect</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check parameters <b>measuring path, substitute for temperature and pressure</b></li> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>MEAS: R PLAUS</b>	Measuring results from measuring channel not plausible: <ul style="list-style-type: none"> <li>• Incorrect parameter values</li> <li>• Strong signal interference</li> <li>• Hardware defect</li> </ul>	<ul style="list-style-type: none"> <li>▶ Restart device; see above</li> <li>▶ If not successful: Contact Service</li> </ul>
<b>MEAS: REF CONC</b>	Gas concentration in reference cell too low	<ul style="list-style-type: none"> <li>▶ Exchange reference cell</li> <li>▶ Contact Service</li> </ul>
<b>Sensor communication</b>	SR-unit not connected correctly	▶ Check CAN connection and repair if necessary
<b>SIG: DARK VALUE</b>	Dark values of receiver element too high: <ul style="list-style-type: none"> <li>• Possible hardware defect</li> </ul>	▶ Contact Service
<b>SIG: K HIGH</b>	Monitoring channel signal too high	▶ Contact Service
<b>SIG: K LOW</b>	Monitoring channel signal too low	▶ Contact Service
<b>SIG: M HIGH</b>	Measuring channel signal too high	▶ Contact Service
<b>SIG: M LOW</b>	Measuring channel signal too low: Hardware defect	<ul style="list-style-type: none"> <li>▶ Cell contaminated</li> <li>▶ Contact Service</li> </ul>
<b>SIG: R HIGH</b>	Reference channel signal too high	▶ Contact Service
<b>SIG: R LOW</b>	Reference channel signal too low	▶ Contact Service

## 7.2.4

**Warning messages for the sender/receiver unit**

Warning message	Component/possible cause	Clearance
FIT: LINEPOS	Deviation of absorption line position: <ul style="list-style-type: none"> <li>Line not adjusted perfectly during initializing process</li> </ul>	<ul style="list-style-type: none"> <li>▶ Wait until the warning message disappears after a few minutes</li> <li>▶ Restart device.</li> <li>▶ Activate Maintenance mode with <b>maint</b></li> <li>▶ Trigger menu item <b>Reset System</b> or</li> <li>▶ If not successful, contact Service</li> </ul>
MEAS: REF CONC	Gas concentration in reference cell too low; measurement still possible	<ul style="list-style-type: none"> <li>▶ Plan and prepare reference cell replacement</li> </ul>
DEV: TEMP	Optic of SR-unit out of allowed temperature range: <ul style="list-style-type: none"> <li>Warm-up phase after switching on</li> <li>Ambient temperature too high</li> </ul>	<ul style="list-style-type: none"> <li>▶ Wait until the temperature has stabilized</li> <li>▶ Select different ambient temperature range, → p. 27, §4.3.4</li> <li>▶ Cool device accordingly.</li> </ul>





# GME700

## 8 Specifications

Approvals  
Technical Data  
Dimensions

## 8.1 Approvals



### 8.1.1 Compliances

The technical version of this device complies with the following EU directives and EN standards:

- EC Directive RL 2006/95/EC
- EC Directive RL 2004/108/EC
- EMC Directive 2004/108/EC
- Safety Requirements Electrical Equipment EN 61010-1
- Electrical Equipment for Measurement EN 61326-1

Validity data: 04.09.2013

### 8.1.2 Electrical protection

- Insulation: Protection class 1 in accordance with EN 61010-1.
- Insulation classification: Overvoltage category in accordance with EN 61010-1.
- Contamination: The device operates safely in an environment up to degree of contamination 2 in accordance with EN 61010-1 (usual, not conductive contamination, moisture condensation).

## 8.2

**Technical Data**

Measured data	
Measured components	NH <sub>3</sub> , HF, HCl, H <sub>2</sub> O, O <sub>2</sub>
Measuring principle	TDLS (Tunable Diode Laser Spectroscopy)
Measuring range	Min. <span style="float: right;">Max.</span>
• NH <sub>3</sub>	0 ... 25 <sup>1)</sup> ppm <span style="float: right;">0 ... 5000 ppm</span>
• NH <sub>3</sub> /H <sub>2</sub> O	0 ... 25 <sup>1)</sup> ppm/0 ... 3 vol% <span style="float: right;">0 ... 5000 ppm/0 ... 20 vol%</span>
• HF	0 ... 5 <sup>1)</sup> ppm <span style="float: right;">0 ... 2000 ppm</span>
• HCl	0 ... 5 ppm <span style="float: right;">0 ... 3000 ppm</span>
• HCl/H <sub>2</sub> O	0 ... 5 <sup>1)</sup> ppm/0 ... 25 vol% <span style="float: right;">0 ... 3000 ppm/0 ... 100 vol%</span>
• O <sub>2</sub>	0 ... 7 <sup>1)</sup> vol % <span style="float: right;">0 ... 25 vol%</span>
Accuracy	< 2 % ... < 4 % of measuring range (application dependent)
Linearity	< 1%
Setting time t <sub>90</sub>	Depending on gas supply, average < 360 s

<sup>1)</sup> Depending on respective application condition and device version

Device data	
Dimensions ( W x H x D)	483 (19") x 420 x 176.5 (4 RU) mm → »Technical Data« (p. 43)
Weight	Approx. 12.5 kg
Sample gas volume flow	0 ... 20 l/min Depending on application and response time required
Gas connection	<ul style="list-style-type: none"> <li>6 mm Swagelok (1/4" with adapter) for 6/4 mm stainless steel/nickel piping or PTFE/PVDF tubing</li> </ul> N <sub>2</sub> purging for O <sub>2</sub> measurement: <ul style="list-style-type: none"> <li>6 mm Swagelok (1/4" with adapter) for 6/4 mm stainless steel/nickel piping or PTFE/PVDF tubing</li> </ul>
Sample cell	
Heater temperature	Up to 200 °C / 392 °F
Measuring volume	290 ml, optimized flow rate

Interfaces	
Analog output	3 outputs: 0/4 ... 20 mA 6-pin terminal (PhoenixContact)
Digital outputs (relay)	<ul style="list-style-type: none"> <li>3 outputs: 48 V AC/DC; 6-pin terminal (PhoenixContact or Sub-D) (malfunction, maintenance request, function test)</li> <li>1 separate output (OT2 voltage level) of temperature controller</li> </ul>
Digital inputs (relay)	<ul style="list-style-type: none"> <li>2 inputs: 0/4 ... 20 mA; 6-pin terminal (PhoenixContact or Sub-D) (maintenance switch, check cycle)</li> <li>1 separate output (OT2 voltage level) of temperature controller</li> </ul>
Serial interface	RS232; 9-terminal Sub-D PROFIBUS DP (option)

Ambient conditions	
Ambient temperature	0 ... +50 °C / 32...122 °F
Storage temperature	-40 ... +55 °C / -40...131 °F
Relative humidity	0 ... 85 % (non-condensing)
Sample gas temperature	Up to 200 °C / 392 °F
Sample gas pressure	±600 ... 1200 hPa / 8.70...17.40 psi (or controlled via sample extraction system)
Protection class	IP 20 <sup>1)</sup>

1) EN 60529

Electrical installation	
Fuse (power supply)	2 x 6.3 A fusible cutout 2 x 2.5 A fusible cutout on control unit
Voltage supply	230 V AC or 115 V AC; 50/60 Hz
power consumption	500 VA max.
Power supply	Device plug (shockproof plug)



**Warning: Risk of explosion with overpressures > 0.5 bar**

The GME700 is not suitable for use in sample gas conditions in which the overpressure is higher than 0.5 bar.



8.4 **Spare Parts**

Table 1 Spare parts, specific for measuring components

Spare part	Part No.			
	O <sub>2</sub>	NH <sub>3</sub>	HF	HCl
Spare parts set, laser diode module	2034526	2055984	2034777	2043533
Detector, measuring channel	2046671	2055987	2046670	2046672
Detector, monitoring channel	2034525	2055985	2034776	2043535
Detector, reference channel	2043570	2055985	2034776	2043535
Optic carrier	2034522	2030720	2034774	2043540
Reference cell	2034545	2030717	2043571	2042905
Electronic board, heater	2034523	2055983	2030735	2043541
Electronic board, processor	2034541	2030737	2034778	2042707

Table 2 Spare parts, unspecific for measuring components

Spare part	Part No.
Electronic board, measurement p/T	2032767
Electronic board, evaluation unit	2044504
Sample cell	
Measuring cell, complete	2073345
Adjustment mirror	2046314
Seals	2046582
Heating cartridges	2046675
Batteries and fuses	2046674
Accessories	
Swagelok connector 6 mm SS with 19 micron filter	5314339
Swagelok connector 90° 6 mm/6 mm, stainless steel	5318368
Adapter 1/4", 6 mm	5320186

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