

405-2010-003 EN40



Operating Manual

Fire Gas Detector GSME®



Fire Gas Detector GSME - Operating manual
Document revision: 405-2010-003 EN40
– Translation –

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Abstract

The *Advanced Discovery System* (in short: *ADICOS*) is used for early detection of fire scenarios in the industrial environment. It comprises different, independent detector units that enable interference-resistant fulfillment of the detection objective defined during planning via suitable layout and parameterization.

The detector units are connected using the *ADICOS M-Bus* to a central unit, which enables voltage supply and parameterization of every individual detector and which stores all sensor data for statistical analyses.

ADICOS GSME are fire detectors equipped with semiconductor gas sensors and an intelligent analysis electronics, which can detect open and hidden smoldering fires through monitoring of the concentration of typical fire gases and report them via the *ADICOS M-Bus* and integrated alarm relays to the central unit.

If available interface modules are used, *GSME* can also be integrated into the fire alarm systems of common manufacturers.

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1 About this manual

1.1 Objective

This manual describes the special requirements on installation, wiring, commissioning and operation of ADICOS detectors of the type "GSME". After commissioning, it is used as reference work in the case of faults.

It is exclusively addressed to knowledgeable specialist personnel (→ Chap. 2.3, *Personnel qualification*).

1.2 Explanation of symbols

This manual features a continuous structure for best possible comprehension. Here, the following labels are used.

Action objectives

Action objectives describe the result to be achieved by the subsequent instructions. Action objectives are presented in **bold font**.

Action instructions

Action instructions describe the activities to be performed in order to achieve the action objective previously mentioned. Action instructions are presented as follows.

► Individual action instruction

- 1 First of several sequential action instructions
- 2 Second of several sequential action instructions
- 3 etc.

Intermediate states

In the case of describable intermediate states or results, which are the result of action steps (e.g. displays, internal function steps, etc.), are presented as follows.

▷ Intermediate state

Warning signs

This manual uses the following information types.

**NOTE!**

This information type provides information directly important for further system operation.



CAUTION!

This information type signals a danger that can lead to damage to the detector.



WARNING!

This information type signals a danger that can lead to fatal or severe injuries.



DANGER!

This information type signals a danger that directly leads to fatal or severe injuries.

1.3 Abbreviations

This manual uses the following abbreviations.

Abbr.	Meaning
ADICOS	Advanced Discovery System
AAB	ADICOS Branching and Connection Box
BMZ	ADICOS Central Fire Alarm Panel BMZ-30
GSME	Gas Sensor Detector Unit
M4	Multi evaluation with 4 sensors
M-BM	ADICOS M-Busmaster
NT	ADICOS Power Supply NT V40-A3
FDnet	Field Device Network (fire alarm bus of SIEMENS fire alarm systems)
LSNi	Local Security Network (fire alarm bus of BOSCH fire alarm systems)
sb	slow-blowing (fuse)
TF	Test Fire
ESD	Electro Static Discharge
EF	Sensitivity Factor
HC	Hydrocarbons

1.4 Storing the manual

Store these instructions easily reachable and in direct vicinity of the detector to enable use as needed.

2 Safety instructions

ADICOS GSME ensure operational safety assuming proper installation, commissioning, operation and maintenance. For this purpose, it is absolutely required to completely read, understand and follow these instructions and the safety information contained.



WARNING!

Installation and operating errors can lead to fatal and severe injuries and damage to the industrial system.

– **Read and follow these instructions carefully!**

2.1 Intended use

ADICOS GSME are point-type fire gas detectors for the detection of fire scenarios in the industrial environment. They are exclusively intended for operation within ADICOS systems. In this context, the operating parameters described in Chap. 1, »About this manual« must be met. Any deviating use requires prior consultation with the manufacturer.

Compliance with this manual as well as all applicable country-specific provisions is also part of the intended use.



DANGER!

ADICOS GSME in their standard version may **not be installed in explosive atmospheres!**

Special GSME variants are available for operation within explosive atmospheres.

2.2 Standards and regulations

The safety and accident prevention regulations applicable for the specific application must be observed during detector installation, commissioning, test and maintenance.

The following standards and directives are of particular importance when handling fire alarm systems:

Regulation	Description
VDE 0100	Erection of Power Installations with Rated Voltages below 1000 V
VDE 0800	Telecommunications - General Concepts - Requirements and Tests for the Safety of Facilities and Apparatus
VDE 0833	Alarm Systems for Fire

Regulation	Description
VDE 0845	Protection of Telecommunication Systems Against Lightning, Electrostatic Discharges and Overvoltages From Electric Power Installations - Measures Against Overvoltages
VdS 2095	Guidelines for Automatic Fire Detection and Fire Alarm Systems - Planning and Installation
DIN 14675	Fire Detection and Fire Alarm Systems - Design and Operation
DIN EN 54-7	Fire Detection and Fire Alarm Systems - Part 7: Smoke Detectors - Point Detectors Using Scattered Light, Transmitted Light or Ionization

2.3 Personnel qualification

Any work on ADICOS systems may only be performed by qualified personnel. Persons, who can perform work on fire detection and alarm systems and recognize possible dangers based on their professional education, knowledge and experience as well as knowledge of the applicable provisions, are considered qualified persons.

**WARNING!**

Installation, commissioning, parameterization and maintenance may only be performed by authorized and respectively trained personnel!

2.4 Modification

**WARNING!**

Any form of unauthorized modifications or extensions is expressly prohibited!

- **In case of doubt, contact the manufacturer!**

2.5 Accessories and spare parts

**WARNING!**

Only original spare part and original accessories of the manufacturer may be used!

2.6 Handling outgassing adhesives, sealants and lubricants

**CAUTION!**

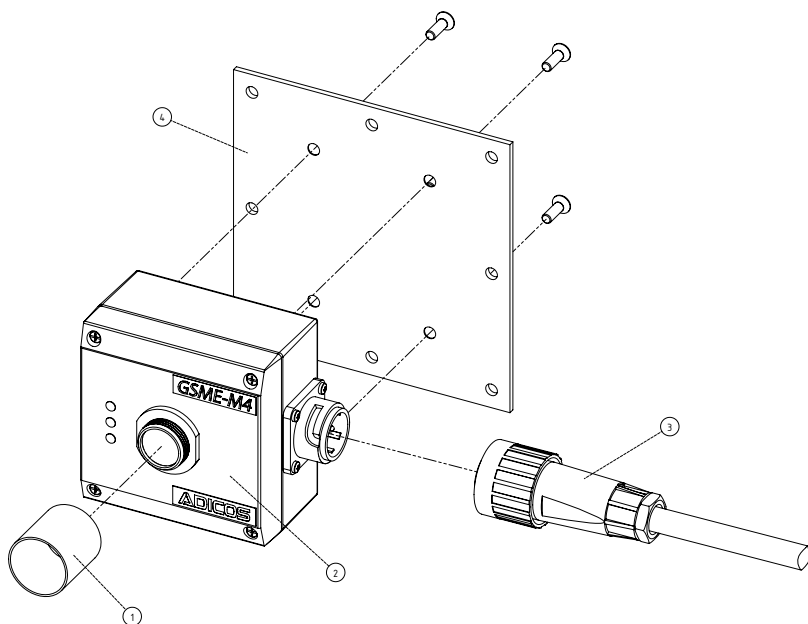
Silicone-containing hydrocarbons (siloxanes) damage the surface of the semiconductor gas sensors of the ADICOS GSME.

- **Do not use any outgassing adhesives, sealants, or lubricants (e.g., silicone) in the surroundings of the detector!**

3 Structure

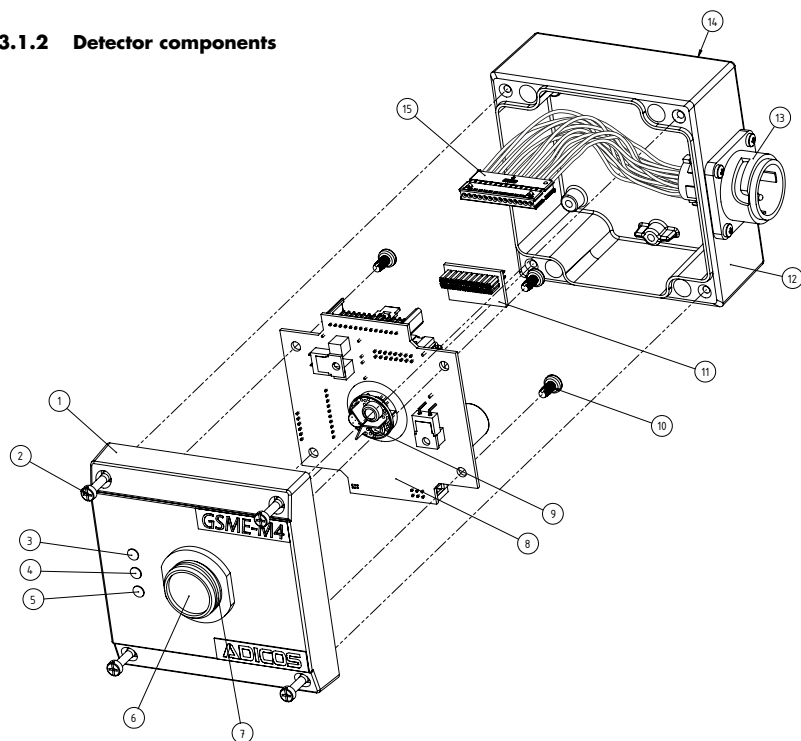
3.1 Overview

3.1.1 Detector and add-on parts



No.	Description
①	GSME spray protection <i>(optional)</i>
②	GSME-M4
③	ADICOS connection cable
④	ADICOS mounting plate <i>(optional)</i>

3.1.2 Detector components



No.	Description
①	Enclosure cover
②	Enclosure screws (4x)
③	Signal LED »Alarm«
④	Signal LED »Operation«
⑤	Signal LED »Fault«
⑥	Sintered metal filter
⑦	Screw connection for spray protection
⑧	Main circuit board
⑨	Semiconductor gas sensors
⑩	Circuit board screws (4x)
⑪	Configuration module
⑫	Lower enclosure part
⑬	Detector connection
⑭	M5 mounting thread (on rear side, not shown) (4x)
⑮	Connector for detector connection

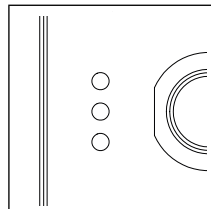
3.2 Display elements

Signal LEDs

For indicating operating conditions, three light pipes are recessed in the enclosure cover of the detector. They are used to visualize the signal LEDs located on the detector board.

The top signal LED »Alarm« is red, the center »Operation« is green and the bottom »Fault« is yellow.

For the function of the signal LEDs, see *Chap. 4.2, »LED signals«*.

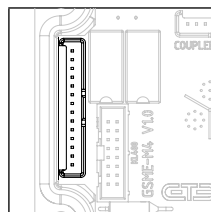


3.3 Circuit board connections

Slot "detector connection"

The *detector connection* slot is a coded, 14-pin connector on the left side of the detector board.

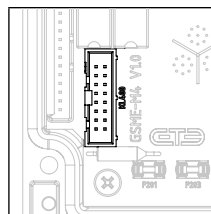
In the factory configuration, it is connected to the detector connection (Amphenol bayonet plug-in coupling) in the lower enclosure part.



Slot "configuration module"

The *configuration module* slot is a coded, 16-pin connector on the right side next to the detector connection slot and underneath the signal relay on the detector board.

Depending on the order configuration the slot is equipped with a configuration module, on which the resistors for the limit value contacts is defined.

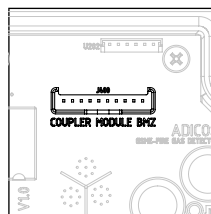


Slot "BMZ module"

The *BMZ module* slot is a coded, 10-pin connector above the gas sensors on the detector board.

Depending on the ordered configuration, it is equipped in the factory configuration with a BMZ board, which enables integration of the detector in external fire alarm systems.

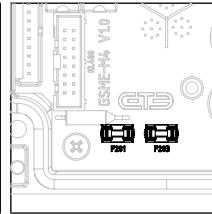
As an alternative, the pre-alarm module can be inserted here.



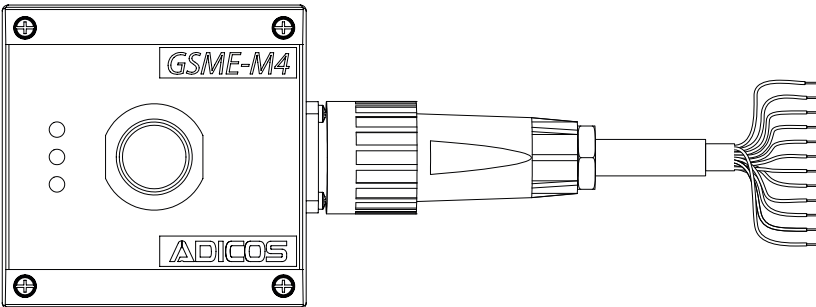
Slots "fuses"

There are two slots for fuses at the bottom left on the detector board. These are marked with labels F201 and F203.

In the factory configuration, the fuse slots are equipped with one slow burning 500 mA fuse each.



3.4 Cable assignment



Color	Signal	Signal limit contact
red	Operating voltage	
black	24 ... 40 V DC non-polarized	
yellow	Relay output X6 i	Alarm NO ¹
white	Relay output X6 o	Alarm NO ¹
brown	Relay output X7 o	Fault NC ¹
green	Relay output X7 i	Fault NC ¹
pink	Coupling module B-in	Auxiliary assembly (optionally in factory configuration)
blue	Coupling module A-in	
purple	Coupling module B-out	
gray	Coupling module A-out	
blue/red	M-Bus	
gray/pink	max. 40 V non-polarized	

¹ with series resistor

Coupling module option

Color	Signal	Siemens FDnet	BOSCH LSNi
pink	Coupling module B-in	FDnet-A (-)	LSN b1 in
blue	Coupling module A-in	FDnet (+)	LSN a in
purple	Coupling module B-out	FDnet-B (-)	LSN b2 out
gray	Coupling module A-out	FDnet (+)	LSN a out

Analog signal option

Color	Signal	Analog signal	Auxiliary relay
pink	Analog signal (non-polarized)	4 ... 20 mA	
blue	Analog signal (non-polarized)	4 ... 20 mA	Normally closed
purple	Analog signal	0 ... 5 V 0 ... 10 V	Normally open
gray	Analog signal	0 V	Common

3.5 Sintered metal filter and sensors

The sintered metal filter (→ Chap. 3.1.2) is the central element on the detector front. It is screwed into the enclosure cover and contains a continuous element made of sintered metal granules. The fire gases to be detected can diffuse through the pores of this sintered metal and reach the gas sensors located behind, while dust and moisture cannot penetrate the inside of the detector. Thus, the sensors are protected from environmental influences, but can be reached by fire gases.

3.6 Spray protection

The spray protection (→ Chap. 3.1.1) is a mechanical add-on for the ADICOS GSME. It is bolted onto the sintered metal filter and reduces the risk of condensation in the sensor area and offers a certain protection from drip and spray water in the installation environment.

4 Function

During operation, the ADICOS GSME monitors the signals of its gas sensors and triggers an alarm according to the set limit value combinations. If an ADICOS central unit (ADICOS BMZ-30, ADICOS M-Busmaster) is used, the detector transmits additionally all sensor and operating data to be displayed in the ADICOS service software via M-Bus (→ Chap. 4.5).

If the detector is connected to a central fire alarm panel (ADICOS BMZ-30 or external BMZ), the alarm display of the detector is controlled by the central fire alarm panel.

4.1 Detection

The ADICOS GSME is equipped with four semiconductor gas sensors, which can deliver six different detection signals depending on actuation and evaluation.

4.1.1 Detection variables and cross-sensitivities

Phys. sensor	Index	Detection variable	Cross-sensitivity
Sensor 1	0	Phenolic hydrocarbons (HC)	Hydrogen, alcohols
	4	Nitrogen oxides (NO _x)	Ozone, phenols
Sensor 2	1	Carbon monoxide (CO)	Hydrogen, alcohols
Sensor 3	2	Hydrogen (H ₂)	-/-
Sensor 4	3	Phenolic hydrocarbons (HC)	Ozone, amines
	5	Nitrogen oxides (NO _x)	Ozone, ammonia

The specified cross-sensitivities represent an exemplary selection. Cross-sensitivities must also be expected in the case of high concentrations of other gases.

Sum signals

To reduce cross-sensitivities, the ADICOS GSME (with respective configuration) calculates weighted sum signals for detection variables *nitrogen oxides* (NO_x) resp. *phenolic hydrocarbons* (HC) based on the signals from sensor 1 and sensor 4.

Phys. sensor	Index	Detection variable	Calculation
Sensor 1 + Sensor 4	9	Phenolic hydrocarbons (HC)	Weighted sum signal from sensor 1 (index 0) and sensor 4 (index 3)
Sensor 1 + Sensor 4	10	Nitrogen oxides (NO _x)	Weighted sum signal from sensor 1 (index 4) and sensor 4 (index 5)

4.1.2 Configuration and evaluation

The ADICOS GSME is characterized by its particular intelligence and flexibility during signal detection and evaluation. The detector electronics does not only investigate the concentrations of individual fire gases, but considers the relations of the detection concentrations as well. These relations are configured through limit value combinations. Every detector features two sets with five limit value combinations each.

In the factory configuration, every detector is equipped with a basic configuration of meaningful alarm parameters. At first, both parameters have identical default values. For this reason, one set of limit value combinations is described only in the following sections. The second parameter set is of particular importance, e.g., when a pre-alarm module is used (→ Chap. 3.1.1) and/or for day/night switching with BMZ30 (→ Chap. 7.2.5).

Basic configurations »Standard«, »Extended 1«, »Extended 2« and »Robust« are currently available. Depending on the application, an individual basic configuration is possible upon request. The following table shows the suitability of the basic configurations for typical detection objectives.

Typical detection objective	Basic configuration			
	Standard	Extended 1	Extended 2	Robust
Smoldering wood fire (TF2*)	✓✓✓	✓✓		☑
Smoldering cotton fire (TF3*)	✓✓✓	✓✓	✓✓	☑
Flaming PU fire (TF4*)	✓✓✓			
Flaming n-heptane fire (TF5*)	✓✓✓			
Smoldering lignite fire	✓✓	✓✓	✓	☑
Smoldering bituminous coal fire	✓✓			☑
Smoldering wood chip fire				
1. Ignition phase		✓✓	✓	
2. Propagation phase	✓✓	✓✓	✓✓	☑
3. Full ember	✓✓	✓✓	✓	☑
Smoldering plastic/rubber				
1. Phase: Steam				
2. Phase: Pyrolysis		✓	✓	
3. Phase: Ember	✓✓	✓✓	✓	☑

✓✓✓ Suitable (*tested per EN 54-7:2000)

✓✓ Suitable

✓ Suitable with low sensitivity

☑ Suitable within compact, non-vented enclosures (e.g., silos)

4.1.2.1 Basic configuration "Standard"

In the "Standard" basic configuration, the following limit values are set as default during factory configuration.

Index	Detection variable	Limit value combination				
		1	2	3	4	5
2	H ₂	5	10	0	5	0
9	HC	–	–	25	3	–
1	CO	40	20	20	15	5
10	NO _x	–	–	–	–	10

*The limit values approx. correspond to the concentrations in ppm for hydrogen and carbon monoxide. However, as the particles to be detected are often present as aerosols, the limit values should rather be considered as characteristics without dimensions. In addition, the function for automatic zero-point adjustment leads to a discrepancy between parameter and actual concentration.

Zero-point adjustment

To prevent incorrect displaying due to sensor aging, the "Standard" basic configuration features sliding zero-point adjustment of the sensor signals. However, the longtime constant of this zero-point adjustment of ≥ 6 also hides slowly increasing signal backgrounds.



WARNING!

Smoldering fires that develop over a timeframe of days, cannot be detected in the "Standard" basic configuration!

4.1.2.2 Basic configuration "Extended 1"

In the "Extended 1" basic configuration, the following limit values are set as default during factory configuration.

Index	Detection variable	Limit value combinations				
		1	2	3	4	5
3	HC	5	10	3	5	–
0	HC	–	–	5	3	–
1	CO	40	20	15	15	–
10	NO _x	–	–	–	–	–

4.1.2.3 Basic configuration "Extended 2"

In the "Extended 2" basic configuration, the following limit values are set as default during factory configuration.

Index	Detection variable	Limit value combinations				
		1	2	3	4	5
2	H ₂	50	20	0	3	–
9	HC	–	–	25	10	–
1	CO	20	80	20	30	–
10	NO _x	–	–	–	–	–

4.1.2.4 Basic configuration "Robust"

In the "Robust" basic configuration, the following limit values are set as default during factory configuration.

Index	Detection variable	Limit value combinations				
		1	2	3	4	5
2	H ₂	90	90	50	50	–
9	HC	–	–	10	20	–
1	CO	40	20	50	20	–
10	NO _x	–	–	–	–	–



WARNING!

The "Robust" basic configuration is exclusively suited for operation within closed, non-vented enclosures (e.g. silos or bunkers)! **The free volume within the enclosure should not exceed 10 m³!**

4.1.2.5 Basic configuration "Individual"

If an application environment requires limit value combinations deviating from the "Standard", "Extended" and "Robust" basic configurations, a set of individual limit value combinations can be programmed as factory configuration upon request. In such cases, the basic configuration is referred to as "Individual".

4.1.2.6 Customized configuration changes

Using the ADICOS service software, all limit values of the ADICOS GSME can be change independently from the delivered basic configuration. If the limit values of the basic configuration are replaced with freely selected limit values, an individual detector configuration is chosen.



WARNING!

Faulty limit value combinations can lead to complete ineffectiveness of the detector!

- **The detector parameters may only be changed by experienced specialist personnel!**
- **In case of doubt, contact the manufacturer!**

4.2 LED signals

The current operating condition of the detector is indicated by three signal LEDs on the front of the detector. The following table explains the illumination states.

LED	State	Function
green	flashing	Initialization /not ready for operation yet
	on	Normal operation
	off	Detector system off/detector, fuse, or cable defective
yellow	on	Detector fault
	off	Normal operation
with BMZ module:		
red	off	Normal operation
	on	Alarm to central fire alarm panel
	flashing	Detector alarm, however, without central fire alarm panel alarm
with pre-alarm module:		
red	off	Normal operation
	on	Alarm
	flashing	Pre-alarm
without BMZ module:		
red	off	Normal operation
	on	Alarm

4.3 Signal relays

The ADICOS GSME is equipped with two signal relays that signal the “Alarm” and “Fault” states. The “Alarm” signal relay is realized as normally open contact, the “Fault” signal relay as normally closed contact. The signal lines of the signal relays are integrated into the ADICOS connection cable (→ *Chap. 3.4*).

4.4 Detector heating

In the factory configuration, the ADICOS GSME is equipped with an integrated heating unit. It heats the detector enclosure and prevents condensation of ambient humidity. Depending on the ordered configuration, it is already activated with the basic configuration of the detector at the factory. During operation, detector heating can be switched on and off via the ADICOS service software. The power consumption of detector heating is up to 10 VA.

In the case of undervoltage, detector heating is switched off automatically. Once the undervoltage is corrected, heating becomes only active again after a detector reset.

Beyond that, the heating function is limited through enclosure temperature monitoring. If the set highest temperature (default: 40 °C) is exceeded, the heating unit switches off automatically, until the enclosure temperature is lowered again. In the case of a very high ambient temperature and high air humidity, it may thus be necessary to adjust the set limit temperature for the heating function accordingly.

4.5 ADICOS M-Bus

The ADICOS M-Bus is a proprietary two-wire data line, which is used to transfer all detector parameters as well as operating and detection data to the used central unit (ADICOS BMZ-30 / M-Busmaster). This data can be displayed and archived using the ADICOS service software. Beyond that, the parameters of any connected detector can be changed via the ADICOS M-Bus.

The M-Bus lines are integrated into the ADICOS connection cable (→ *Chap. 3.4*).

5 Installation



WARNING!

Improper installation of ADICOS detectors can lead to faults and failures of the detector system.

- **Installation work may only be performed by specialist personnel!** (→ Chap. 2.3, Personnel qualification)

5.1 Installation location



DANGER!

ADICOS GSME in their standard version may **not be installed in explosive atmospheres!**

- **Only use approved GSME variants for operation within explosive atmospheres!**



WARNING!

Arrangement and alignment of ADICOS GSME detectors are highly important for a reliable detection. Unfavorable placement can lead to complete ineffectiveness of the detector!

- **Only experienced specialist planners may define detector position and alignment!**

5.1.1 Protection aspects

The following aspects must be considered when selecting the installation location to ensure fault-free operation of the ADICOS GSME detector.

Temperature

The ambient temperatures at the planned installation location must not exceed and/or undercut the specified temperature range (→ Chap. 10) of the ADICOS GSME detector even in the worst-case scenario. Special attention must be paid to the waste heat of heating-up system components in the surroundings. Intensive solar irradiation should be avoided as well.

Condensation and contamination

The ADICOS GSME detector is basically suited for operation in dust-loaded environments (not in explosive atmospheres). In the case of condensation or permanent contact with damp or oil-containing dusts, the sintered metal filter can be clogged. This reduces the detectivity of the detector and can lead to ineffectiveness. In the case of condensation, detector heating and spray protection must be used. Beyond that, the sintered metal filter must be regularly checked for incrustation.

Moisture

If drip or spray water is to be expected in the planned installation environment, direct contact with the sintered metal filter must be prevented. This also applies in the case of regular building cleaning with water. Spray protection must be used in the case of moisture!

Vibration

Strong vibrations can damage the electronics of the ADICOS GSME detector. If strong vibration sources can be found in the surroundings of the planned installation location, the detector must be positioned such that it is protected from vibrations.

Sensor toxins

Silicone-containing hydrocarbons (siloxanes) can oxidize and thus damage the surface of the semiconductor gas sensors of the ADICOS GSME detector. No outgassing adhesives, sealants and lubricants (e.g., silicone) may be used in the surroundings of the detector.

Electromagnetic radiation

Electromagnetic radiation can impact the electronics of the ADICOS GSME detector. Do not mount the detector in the immediate surroundings of power current equipment. Use shielded cables only.

5.1.2 Detection aspects

The following aspects must be considered when selecting the installation location to ensure reliable and sensitive operation of the ADICOS GSME detector.

Building geometry and air flow

The way fire gases propagate depends on numerous factors and is far less intuitive as generally assumed. It is thus a particular challenge to ensure that the gas emissions of a smoldering fire reach the sensors of the detector in sufficient concentration within industrial systems with complex building geometry, possibly with ventilation systems and machines generating waste heat.

Thus, all influencing factors of the air flow within the building must be considered when defining the installation locations for ADICOS GSME detectors. It may be necessary to perform a fire test at the location of the expected fire source to identify these factors.

False variables

Different false variables can negatively impact the detector function and lead to false alarms and sensor aging. No exhaust gases e.g. from conveyor vehicles or fermentation gases from biological or thermal decomposition must be present at the planned installation location.

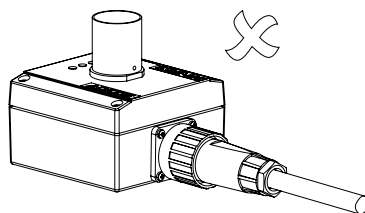
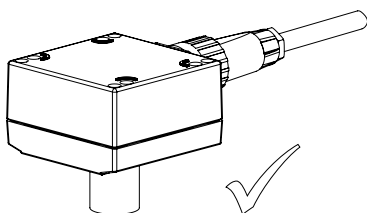
5.2 Installation orientation



CAUTION!

A sintered metal filter clogged with dust deposits reduces the detectivity of the detector and can lead to ineffectiveness! Water accumulation on the filter can damage the detector.

- **Mount the detector with the sintered metal filter pointing downward!**
- **Use spray protection if humidity is present!**



5.3 Mounting

The ADICOS GSME detector features four M5 threaded holes for mounting. They can be found on the rear of the enclosure.

Mounting the GSME

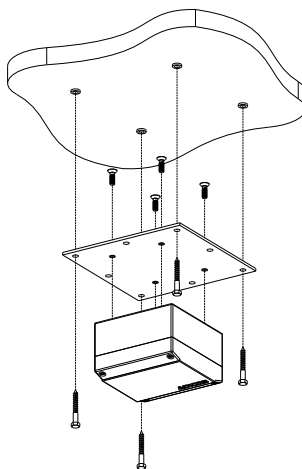
- 1 Bolt the ADICOS mounting plate (→ Chap. 11.1) using M5 countersunk screws (included in the scope of delivery of the mounting plate) on the rear of the detector enclosure

For ceiling mounting:

- 2 Drill four mounting holes arranged in a square at a distance of 130 mm
- 3 Press dowels into the mounting holes
- 4 Attach mounting plate including detector using suitable screws

For any other mounting location (e.g., gallows construction):

- 2 Bolt mounting plate including detector to the gallows construction using suitable M6 screws, nuts and lock washers



5.4 Wiring

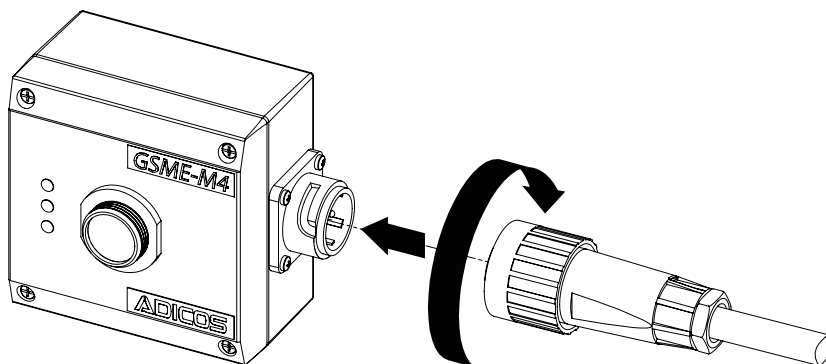


WARNING!

Improper installation of ADICOS detectors can lead to faults and failures of the detector system.

- **Wiring may only be performed by specialist personnel!**
(→ Chap. 2.3, Personnel qualification)
- **De-energize the entire detector system for any wiring!**
- **Use ADICOS connection cables only for connecting detectors as well as ADICOS branching and connection boxes!**

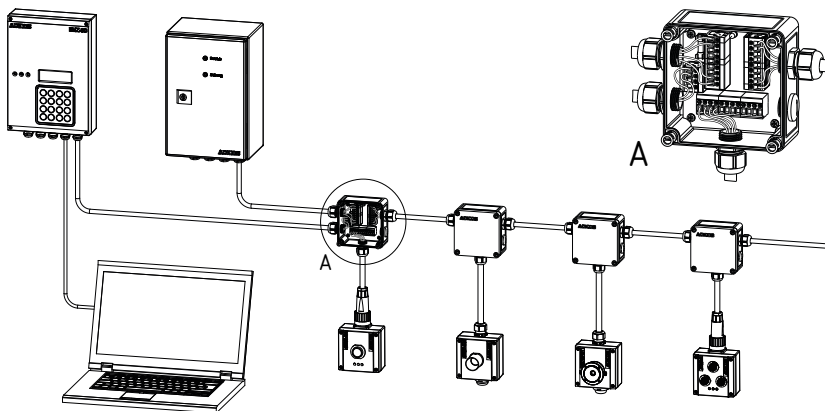
5.4.1 Connecting the GSME detector with the ADICOS connection cable



- 1** Push the bayonet plug-in coupling of the ADICOS connection cable against the detector connection
- 2** Carefully turn the entire bayonet plug-in coupling to find the correct orientation of the anti-rotation protection
- 3** Turn the bayonet ring of the coupling forcefully to attach cable

5.4.2 Connecting the ADICOS connection cable with the ADICOS AAB

Depending on the system and detector configuration, the specific wiring of the ADICOS connection cable and the ADICOS branching and connection box (ADICOS AAB) varies. The following procedure applies for all wiring variants.



Wiring the ADICOS AAB

- 1 Open the enclosure cover of the ADICOS AAB
- 2 Open the lower cable gland of the ADICOS AAB
- 3 Route the ADICOS connection cable through the lower cable gland into the ADICOS AAB
- 4 Connect the wires to the connection terminals of the ADICOS AAB according to the wiring diagram
- 5 Close the cable gland of the ADICOS AAB
- 6 Close the enclosure cover of the ADICOS AAB



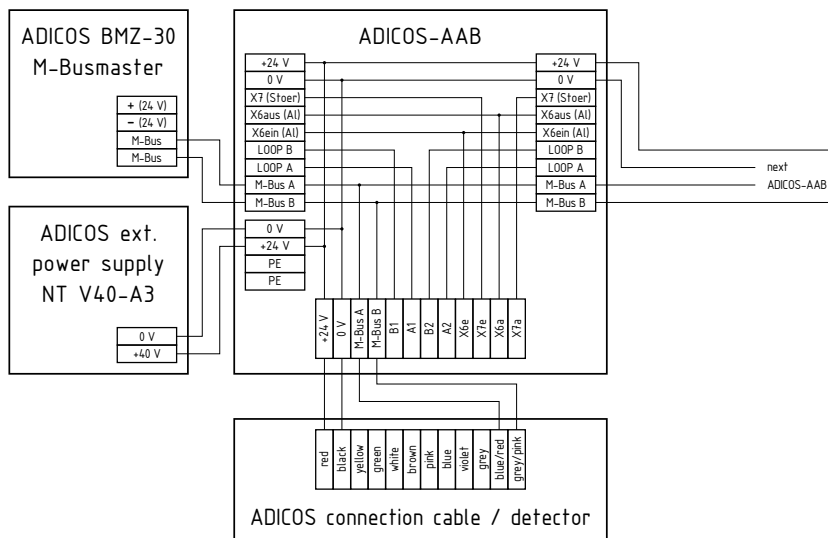
NOTE!

Further information on the installation of the ADICOS branching and connection box can be found in **GTE instructions no. 430-2410-001!**

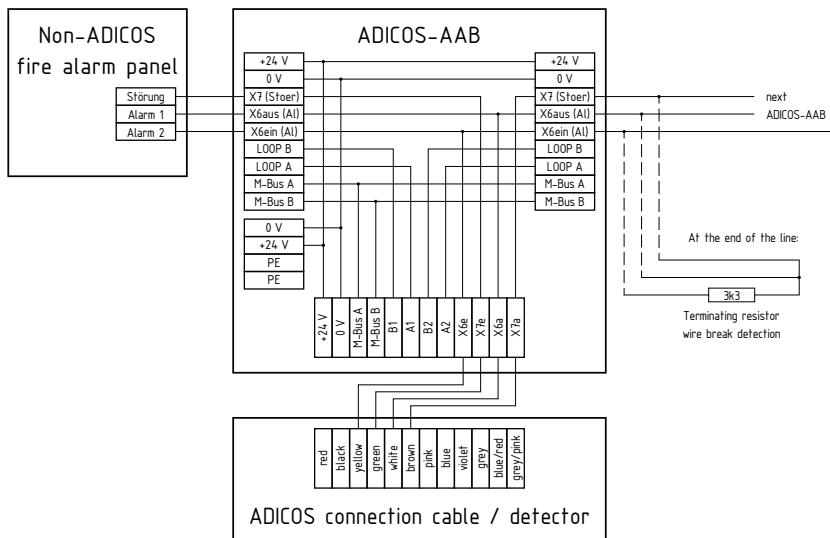
5.4.3 Wiring variants

Specific wiring of the detectors with the ADICOS branching and connection boxes varies depending on the system configuration. The following wiring diagrams outline the most frequent system configurations and/or wiring variants.

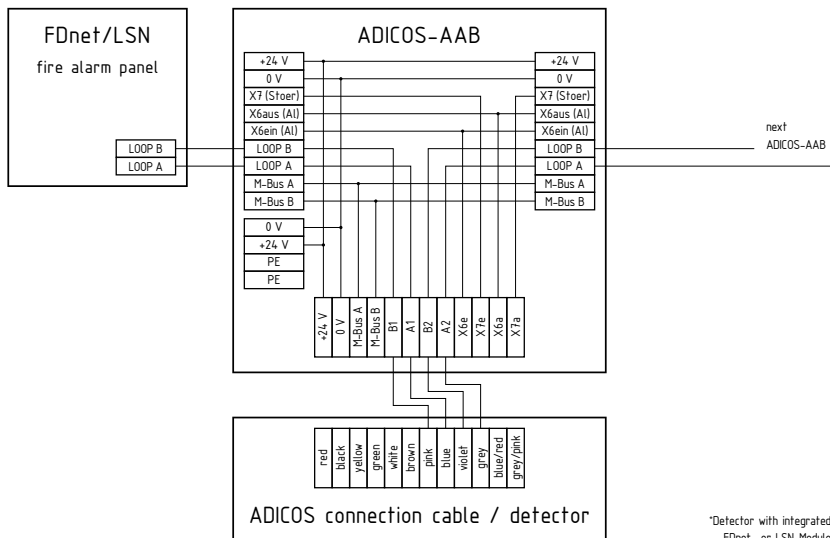
ADICOS BMZ / M-BM and external power supply



Limit value detection lines "Fault" and "Alarm"

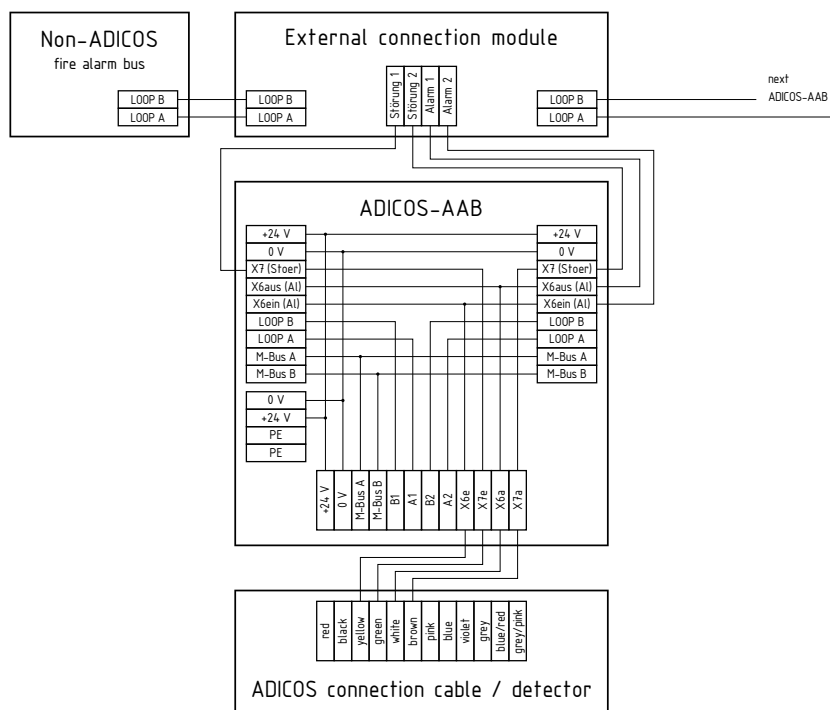


External fire alarm LOOP with LSN / FDnet (internal coupling module)

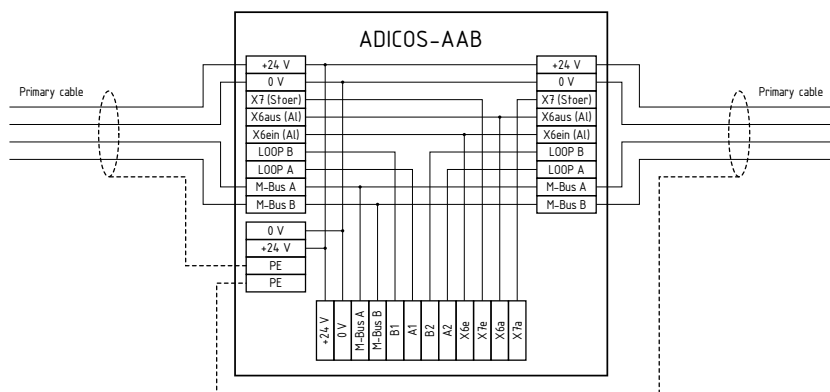


*Detector with integrated FDnet- or LSN-Module

External fire alarm LOOP with other bus (external coupling module)



Primary cable shielding



5.5 Retrofitting of BMZ modules



WARNING!

De-energize the entire detector system for any wiring **and secure against unintentional reactivation!**



WARNING!

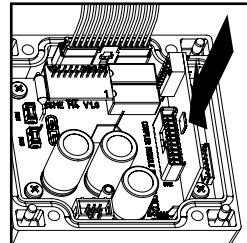
Detector electronics and BMZ modules are sensitive assemblies, which can be damaged on contact due to **electrostatic discharge**.

- **Apply ESD measures when working on the detector electronics!**
- **Do not touch electronic components!**

The electronics of the ADICOS GSME features a slot for BMZ modules. Depending on the ordered configuration, the detector electronics is populated with the necessary module in the factory configuration. However, BMZ module retrofits are required on site in special cases. In addition to the electrical installation, it must be observed that a configuration change of the detector using the ADICOS service software is usually also required to use the module functionalities.

Retrofitting the BMZ module

- 1** Using the PZ2 screwdriver, loosen the enclosure screws in the detector cover
The screws remain in the cover.
- 2** Carefully remove the enclosure cover with the detector electronics
The plug connector for detector connection remains connected.
- 3** Insert the BMZ module into the BMZ module slot on the detector board
- 4** Close the detector enclosure



5.6 Replacing the configuration module



WARNING!

De-energize the entire detector system for any wiring and secure against unintentional reactivation!



WARNING!

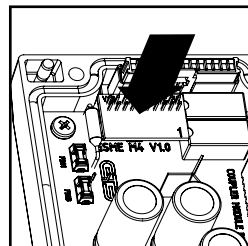
Detector electronics and BMZ modules are sensitive assemblies, which can be damaged on contact due to **electrostatic discharge**.

- **Apply ESD measures when working on the detector electronics!**
- **Do not touch electronic components!**

The configuration module is a compact electronics module, which is populated in the factory configuration in the *configuration module* slot of the detector. It is used to define the resistances of the signal limit contacts of the detector. Configuration modules must be replaced on site in special cases.

Replacing the configuration module

- 1** Using the PZ2 screwdriver, loosen the enclosure screws in the detector cover
The screws remain in the cover.
- 2** Carefully remove the enclosure cover with the detector electronics
The plug connector for detector connection remains connected.
- 3** Carefully pull off the old configuration module
- 4** Insert the new configuration module in the correct orientation into the configuration module slot on the detector board
- 5** Close the detector enclosure



6 Commissioning



DANGER!

ADICOS systems work with electricity that may lead to system damage and fire in the case of improper installation.

- **Prior to switching on, check that all detectors are properly mounted and wired!**
- **Commissioning may only be performed by qualified specialist personnel!**



WARNING!

The protection class of the ADICOS detectors indicated in the technical data is only ensured with a fully closed enclosure cover. on improperly closed detector can lead to false alarms and failure.

- **Prior to commissioning, make sure that all detectors of the system are fully closed!**



NOTE!

ADICOS detectors must not be commissioned individually. With commissioning of the central unit of the ADICOS system, all detectors start up automatically.



NOTE!

The ADICOS GSME remain in fault, until the start-up process is completed.

- ▶ Commission the ADICOS system per the instructions of the used central unit (ADICOS BMZ-30 / M-Busmaster)
- ▷ The approx. 5-minute start-up process starts automatically.
- ▷ The green signal LED »Operation« flashes.
- ▷ The yellow signal LED »Fault« illuminates continuously. The detector remains in fault, until the end of the start-up process.
- ▷ The detector electronics is initiated and all sensors are subsequently heated to operating temperature.
- ▷ Once the start-up process is completed, the signal LED »Operation« illuminates green continuously and the yellow signal LED »Fault« goes out.

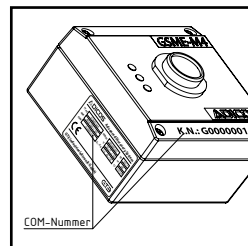
7 Operation

During operation, the detector monitors the fire gas concentrations captured by the sensors per its basic configuration and triggers an alarm, when the set alarm limit values are exceeded. The query interval of the sensors amounts to 30 seconds.

7.1 Software access

If an ADICOS central unit (BMZ-30, M-Busmaster) is used, detailed detector information can be called up via the ADICOS M-Bus. For this purpose, a service PC with the ADICOS service software connected to the ADICOS central unit is required.

Using the communication number (COM or K.N.) printed on the type plate and the front of the detector, a single view of the detector can be called up in the software. Within this single view, the concentration profiles of the gas sensors can be called up as chart, for example. The alarm thresholds of the detector can be adjusted here as well.

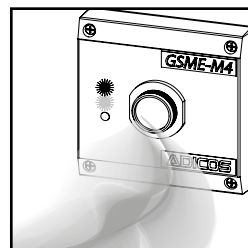


Detailed information regarding the use of the ADICOS service software as well as the specific approach to changing the detector settings is available upon request.

7.2 Alarm

If the gas concentrations detected by the detector sensors exceed the set alarm thresholds, the detector triggers an alarm. The internal alarm relay is activated and the red signal LED is illuminated (without BMZ module). The alarm result is relayed to the connected BMZ via the ADICOS M-Bus resp. fire alarm lines.

If an alarm delay (→ Chap. 7.2.3) is adjusted, the alarm state is only initiated, once the alarm condition is met over the set duration.



BMZ operation

If the detector is connected to a central fire alarm panel, the alarm result is transmitted to the central fire alarm panel via the BMZ module. The BMZ switches the detector in alarm state and the alarm relay as well as the red signal LED of the detector are switched on. If the BMZ does not switch the ADICOS GSME into alarm state, the red signal LED flashes.

7.2.1 Resetting the alarm

The ADICOS GSME remains in alarm state, as long as the alarm condition is met. The state is newly determined in every query cycle (30 seconds interval). As soon as the alarm condition is not met, the alarm state is automatically reset. Signal LED »Alarm« is only reset after a respective delay, if an alarm holding time (→ Chap. 7.2.2) is set.

If the alarm LED is controlled via central fire alarm panel, the alarm state can be reset via the alarm reset contact of the BMZ. Beyond that, an alarm can only be reset via a detector reset, which is expressly discouraged.

7.2.2 Alarm holding time

The alarm holding time is an optional parameter that can be adjusted via the ADICOS service software. If set, the signal LED »Alarm« is only reset after a respective delay after the alarm condition is not met anymore. By default, the alarm holding time amounts to approx. 7.5 minutes.

7.2.3 Alarm delay

The alarm delay is an optional parameter that can be adjusted via the ADICOS service software. If set, the alarm state is only triggered, if the alarm condition is met over the set minimum timeframe (in minutes).



WARNING!

Faulty parameterization of the alarm delay function can lead to ineffectiveness of the detector!

- **The detector parameters may only be changed by experienced specialist personnel!**
- **In case of doubt, contact the manufacturer!**

7.2.4 Pre-alarm

If the ADICOS GSME is equipped with a pre-alarm module and respectively configured, set 2 of the stored limit value combinations (→ Chap. 4.1) is automatically evaluated as trigger criterion for the pre-alarm. If the limit values from set 2 are exceeded, the pre-alarm module relay switches and the red signal LED »Alarm« flashes.

7.2.5 Day/night switching

If the ADICOS GSME is operated together with an ADICOS BMZ30, the day/night switching function can be used. If respectively parameterized via the ADICOS service software, the alarm evaluation then considers set 1 of the stored limit value combinations during day operation and set 2 during night operation only. This way, different alarm thresholds can be monitored by day and night. This is for example helpful, if interference due to vehicle exhausts or similar must be expected by day, which should not lead to an alarm.

8 Maintenance

The following maintenance measures must be performed in the specified cycle.

Measure	Cycle		
	daily	quarterly	yearly
Check for fault message via BMZ and/or software (→ Chap. 9, Fault)	✓		
Visual inspection for condensation on the detector enclosure (→ Chap. , Condensation and contamination)	✓ *		
Visual inspection for damage on detector, attachment and connection cable		✓	
Visual inspection for incrustation of the sintered metal filter (→ Chap. 8.1, Condensation and contamination)		✓	
Function test of the "Alarm" and "Fault" signal relays (→ Chap. 8.3, Function test of the signal relays)		✓	
Measurement of the supply voltage in the connection boxes (Permissible voltage range 20 ... 40 V)		✓	
Function test with ADICOS GTL-2 GSME tester (→ Chap. 8.4, Annual function test)			✓

* Within the first three months after commissioning

8.1 Condensation and contamination

Condensation on the detector enclosure, in particular in the area of the sintered metal filter, can lead to reduced sensitivity of the ADICOS GSME detector. If damp dusts form deposits on the detector, the sintered metal filter can become encrusted, which leads to reduced detectivity or even ineffectiveness of the detector.

For this reason, condensation must be avoided under any circumstances. In the case of condensation, switch on detector heating and use spray protection! In addition, the sintered metal filter must be checked for incrustation within the scope of quarterly maintenance as well as regularly within the first three months after commissioning.

8.2 Cleaning

In the normal case, the ADICOS GSME also works with heavy contamination. Dry dust can be removed using a vacuum cleaner as needed.



CAUTION!

The sintered metal filter can clog when coming in contact with water and dirt.

– **Clean the sintered metal filter dry only!**

8.3 Function test of the signal relays

The “Alarm” and “Fault” signal relays must be checked for function quarterly. For this purpose, they can be switched for test purposes via the ADICOS service software.



NOTE!

The function test of the signal relays triggers an alarm resp. fault state in the connected central fire alarm panel.

- **Switch the BMZ into inspection mode prior to the function test!**

8.4 Annual function test



CAUTION!

To ensure correct function of the detector, a test with the ADICOS GTL-2 tester is required.

- **Perform at least one test triggering per year with the GTL-2!**
- **Observe GTE instructions no. 430-2410-101!**



NOTE!

The function test of the detector triggers an alarm state in the connected central fire alarm panel.

- **Switch the BMZ into inspection mode prior to the function test!**

8.5 Detector replacement

The maximum service life of the sensors of the ADICOS GSME detector is limited to eight years. Depending on the aggressiveness of the usage environment, the sensitivity of the sensor can also decline earlier and make a detector replacement necessary.



CAUTION!

Replace ADICOS GSME detectors no later than eight years after commissioning!

The same information apply to detector replacement like for their initial installation (→ Chap. 5, Installation).

9 Fault

A fault of the ADICOS GSME is indicated by illumination of the yellow signal LED »Fault« as well as by deactivation of the »Fault« signal relay.

The following fault states and/or causes are recognized by the detector:

Fault	Description	Measure
Undervoltage/ power outage	Operating voltage drops below 20 V (including temporarily)	Check supply voltage; Check wiring; Use stronger or additional power supply; <i>Self-resetting</i>
Checksum ROM / EEPROM	The checksum is incorrect after a new start or reset.	<i>Detector replacement</i>
Heating temperature	One or several heating temperatures do not reach the target value.	Use detector insulation; <i>Self-resetting</i>
Test fault	A test fault was triggered using the ADICOS service software.	Cancel test fault using ADICOS service software
Sensor fault	The conductance of at least one sensor is exceeded resp. undercut.	<i>Detector replacement</i>
Start-up sequence	The detector always remains in fault, until the end of the start-up process.	<i>Self-resetting</i>

Use the ADICOS service software for a detailed analysis of the fault states!



CAUTION!

The ADICOS GSME does not offer automatic contamination detection for the sintered metal filter.

10 Technical data

General information		
Enclosure dimensions:	mm	100 x 100 x 62 (H x W x D)
Overall dimensions:	mm	100 x 120 x 71 (H x W x D)
Weight:	kg	0.63 kg
Enclosure:		Aluminum die casting, powder-coated
Electrical properties		
Voltage range:	V	20 ... 40
Power consumption:	VA	≤ 10
Internal fuse:	mA, sb	2 x 500
Detection properties		
Sensor combination:		CO — H ₂ — HC — NO _x
Response time:	s	< 30
Detection scenarios:		Smoldering fires per EN 54/7 Smoldering coal fires
Service life:	years	≤ 8
Environmental conditions		
Temperature range:	°C	-20 ... +50
Humidity range:	%	0 ... 99 (non-condensing)
Protection class:	IP	64

11 Appendix

11.1 ADICOS mounting plate

