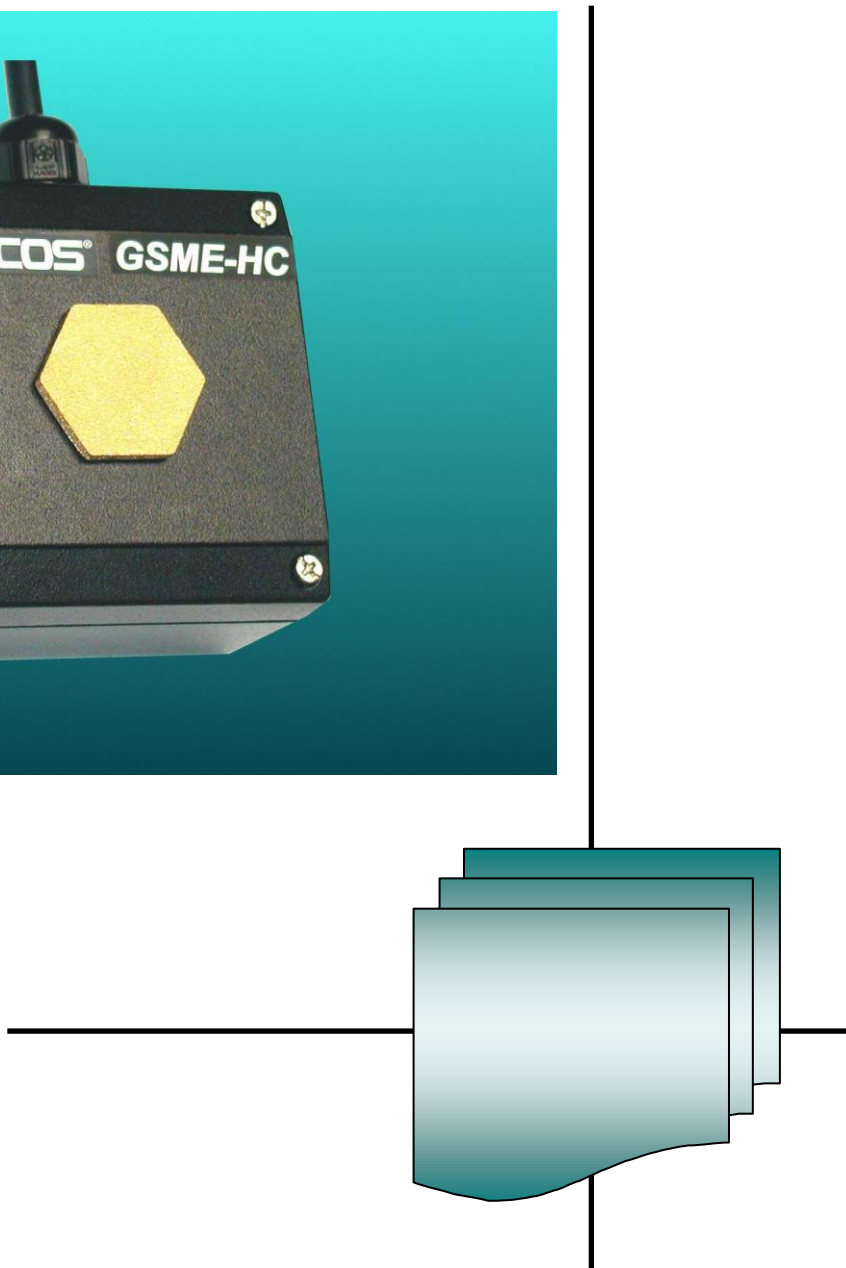




# Gas Sensor Fire Detector GSME-Ex

## Installation, Description and Operation Manual



## Content

1	Instructions .....	3
1.1	General.....	3
1.2	Specifications (Standards) .....	3
1.3	General Safety Instructions: .....	3
1.4	Safety-relevant Regulations .....	4
1.5	Intended Application .....	4
1.6	Qualification of the Operating Personnel .....	5
1.7	Warning Notes and Symbols.....	5
2	Technical Introduction .....	6
3	Applications .....	7
4	Technical Data .....	8
5	Set-up.....	9
5.1	Power Supply .....	9
5.1.1	Power Supply with ADICOS BMZ 30 or MBUS-Master .....	9
5.1.2	Supply with Power Supply Unit NT V40 – 3A.....	10
5.2	M-Bus.....	10
5.3	Limit Value Contact .....	11
5.4	Interface to other Fire Alarm Panels .....	11
5.5	Detector Heating .....	12
5.6	Instructions for Operation in Areas with Combustible Dust.....	13
6	Planning and Installation .....	14
6.1	Concept and Planning .....	14
6.2	Installation .....	14
7	Initial Operation .....	16
7.1	Bus Addressing .....	16
7.2	Power Switch-on .....	16
8	Function References and Tests .....	17
8.1	LED-Display .....	17
8.2	Verification of the wiring .....	17
8.3	Replacing a Unit.....	18
8.4	Starting Phase.....	18
8.5	Test of the Gas Sensitivity.....	19
9	Failures.....	19
9.1	List of Failures.....	20
10	Maintenance .....	20
10.1	Exchange/Revision Frequency.....	21
10.2	Maintenance and Repair in Areas with Combustible Dust .....	21
11	Attachment.....	22
11.1	Cable Assignment for the Gas Sensor Unit GSME – Ex.....	22
11.2	Cable Assignment with Siemens Sigmasys module .....	22
11.3	Cable Assignment with Siemens FDnet module .....	22
11.4	Cable Assignment with BOSCH LSNI module.....	22

## 1 Instructions

### 1.1 General

An automatic fire detection system together with the ADICOS detectors is responsible for the safe detection of fires in the early starting phase already. The selection of the correct detectors and careful determination of their installation positions are of great importance. Detailed instructions are given in the project planning documentation. The information provided there mainly refers to the VdS Specification Form 2095 01/93 „Specifications for Automatic Fire Detection System, Planning and Installation“- we do not claim completeness. As a rule the VdS Specifications of the respectively valid version apply.

### 1.2 Specifications (Standards)

Aside from the generally applicable Specifications (DIN VDE 0100, etc.) the following Standards and Specifications are to be considered:

- DIN VDE 0180
- DIN VDE 0845
- DIN VDE 0800
- DIN VDE 0833
- DIN VDE 14675
- VdS 2095
- Connection Requirements of the Responsible Fire Department
- Constructional Restrictions of the Local Constructional Planning Authority.

### 1.3 General Safety Instructions:

Basic Instructions:

The detectors of the ADICOS series are produced and tested according to the state of the art, the up-to-date quality standard and the valid safety-technical rules and regulations. They have left the factory in perfect safety-technical condition. To maintain this condition and to ensure safe operation the operator (owner) has to consider the instructions and warnings listed in the installation and operation manuals.

As a matter of principle only electricians or electric specialists are allowed to work at the electrical installation, as they have to be capable to

- assess the assigned tasks,
- recognize potential sources of danger and
- take adequate safety precautions.

Modifications or changes of the unit are only permitted if agreed with the manufacturer.

Only original spare parts and accessories authorized by the manufacturer are permitted for use and are required to ensure safety. If other parts are used the manufacturer is no longer liable.

The operational safety of the supplied systems is only guaranteed if applied in accordance with the regulations. The limit values stated in the technical data are not to be exceeded.

## 1.4 Safety-relevant Regulations

The regulations for safety and accident prevention for the specific field of application have to be complied with during installation, initial operation, service and maintenance.

The following special regulations are to be followed (we do not claim, that all applicable regulations are included):

VDE (Association of German Electrical Engineers) – Regulation:

- VDE 0100  
Regulations for the construction of power plant with a nominal voltage of up to 1000V
- VDE 0113
- Electric installations with electronic equipment
- EN50281  
Electrical equipment for application in areas with combustible dust
- **Explosion Protection Directives 89/686/EEG and 94/9/EEG**  
**The valid Explosion Protection Directives 89/686/EEG and 94/9/EEG in connection with the PSA (Personal Protection Directives) have to be considered for installation and initial operation.**

Fire Protection Regulations

Accident Prevention Regulations

## 1.5 Intended Application

The ADICOS detectors and components have been constructed in accordance with approved safety regulations. Nevertheless dangers for life and limb of the users or third persons may occur.

The detectors are only to be used if they are in perfect technical condition and are applied according to their intended use.

Faults, which may have an influence on safety, have to be eliminated immediately.

The detectors of the ADICOS series are exclusively intended for the recognition of fires in the starting phase by detecting the different gaseous components developing during a fire, reporting and forwarding them in cooperation with suitable central fire detection systems. A different application or an application exceeding this purpose is considered as a **not intended use**.

The manufacturer is not liable for damages caused by unintended or unauthorized application or improper use of the fire detectors. The user is the sole bearer of the risk.

For **intended use** the following is to be considered

- compliance with the operating manual,
- compliance with the service intervals stated in the chapter **service and maintenance**.

**Not intended use** includes

- use of the detectors for gas metrological tasks,
- use of not Ex-approved detectors in identified Ex-areas

## 1.6 Qualification of the Operating Personnel

Only especially **qualified personnel** is allowed to operate this installation – i.e. persons who

- are familiar with the initial start- up and the operation of the installation.
- are qualified either by reading and understanding the operation manual or by education or instruction,
- are familiar with the Accident Protection Regulations.



**The customer has to comply with the VDE regulations when installing the system.**

## 1.7 Warning Notes and Symbols

In this operation manual the following names and symbols are used for very important information:



**This sign points out risks endangering persons when carrying out the respective activity.**



**This sign points out dangers for objects, i.e. damage of the system control respectively the system.**



**This sign points out the danger of a possible electric shock. These situations may lead to endangering persons and objects (i.e. damage of the system control respectively the system).**



**The hand with the extended index finger indicates where to find additional information and hints.**

Please read carefully all safety references in this operation manual and consider them when working with the system.

Children and public are not allowed to have access to these appliances.

Please store this operation manual carefully and make it available to every user.

## 2 Technical Introduction

The ADICOS Fire Gas Detection Units GSME–Ex for the recognition of smoldering and open fires may be used as single units or in a network for monitoring large areas.

Aside from the connection to the ADICOS Fire Alarm Panel BMZ 30, it is possible to integrate the units in fire detection systems of external manufacturers – in which case the evaluation as well as alarm and fault display is carried out by the central fire detection system. Therefore the GSME can be equipped with a respective interface to be integrated directly (SIEMENS, BOSCH) or the connection has to be carried out with relay contacts.

A further option is the networking of all installed systems via a system wide simple 2-wire bus system. With aid of this system all operation conditions and parameters of the units are transmitted to a central computer. With the installed ADICOS Central Software the conditions of the entire system and of the individual units are displayed. Comfortable tools are available for the initial operation and service work. All operation data, service data and alarm and fault conditions are recorded and stored in the background into protocols and graphic data.

The voltage supply of the fire detectors is 24 - 40 V DC. We recommend a 40 V DC supply for larger wiring distances. It is mandatory to consider the voltage loss at the supply lines!



**Please read the installation and operation manual before installation and initial operation of the units or the total system. Understanding the operating principle and the interfaces within the fire detection system of the units makes it easier to eliminate faults in case of false installation or in case of malfunctions caused by unfavorable marginal conditions.**

The smoldering fire is detected because of the released characteristic fire gases CO, H<sub>2</sub>, hydrocarbons or nitrogen oxide (within the ppm range).

For this purpose the units have to be installed in the area in which the smoldering gases spread under the marginal conditions prevailing in the plant (air flow, etc.).

Depending on the type of detector two to three high-sensitive gas sensors serve for the detection of smoldering fires. They are installed in a sintered metal housing, which is protected from dust and water. A controller guided heating system regulates the optimal operation temperature of each sensor. The signals of all sensors are recorded by a micro-controller and are converted into a fire detection parameter with a special algorithm.

Tested in endurance tests (over a period of several years) in power plants the design of the GSME detectors suppresses influences of humidity, airflow loads and dust. Together with the special evaluation procedure this provided for an explicit reduction of false alarms in spite of the high sensitivity and the respective early detection of smoldering fires.

The calculated fire detection parameter respectively the conditions “alarm” and “failure” can be reported via various interfaces.

### 3 Applications

The ADICOS Fire Gas Detectors GSME Ex serves for the detection of smoldering and open fires. The selective sensing of smoldering fires is based on the principle of recognizing fire-characteristic gas emissions.

	<b>L2-Type</b>	<b>L3-Type</b>	<b>HC-Type</b>	<b>F-Type</b>	<b>FR-Type</b>
<b>Sensors (Target Gases)</b>	CO H2	CO H2 KW/NOx	CO KW/NOx KW(phenol.)	CO (filter) H2 KW/NOx	CO (filter, regenerative) H2 KW/NOx
Coal conveyor belts	Yes (only smoldering coal dust)	Yes	Yes	Yes	Yes
Coal bunker (partially open)			Yes	Yes	Yes
Wood conveyor (ventilated, partially open)			On request	Yes	Yes
Wood silo, Closed wood conveyors					Yes probably with detector heating
Biomass Applications				On request probably with int. heating	On request probably with int. heating
Recycling / Waste Reprocessing				Yes	Yes

#### Required Add-Ons




	<b>Spray Water Protection</b> (tube in front of sintered metal filter)	<b>Detector Heating</b> (Chapter Fehler! Verweisquelle konnte nicht gefunden werden.) (integrated heating, power consumption max. 10 VA)
Continuous or frequent dew	Yes	Yes
Wet cleaning with jet of water	Yes	
High dust load in combination with air flow or humidity	Yes	
Adhesive dust	Yes	On request

**4 Technical Data**

<b>DC-Supply</b>	24 VDC (20 – 40V)
<b>Power Consumption</b>	2 VA (3 VA after switch-on)
<b>Group of Equipment</b>	II, Category 1D
<b>Unit Category</b>	SELV
<b>Temperature Range</b>	-20°C ... +60 °C
<b>Relative Humidity</b>	20 – 99% (not condensing)
<b>Housing:</b>	
	coated aluminum housing Die cast aluminum (corrosion resistant)
<b>Dimensions (H,W,L)</b>	60, 100, 100 mm
<b>Weight:</b>	0,6 kg
<b>Protection Type</b>	Ex II 1 D / IP 6X
<b>Surface Temperature</b>	< 100°C limited by Temperature Fuse 98°C
<b>Installation</b>	On the surface
<b>Electric Connection</b>	Standard length pre-assembled special cable Cable coding for: - power supply - limit value contact - M-Bus

**Tests:**

- **VDS** – Test report of January 7, 1994  
„The detectors are able to detect very slowly spreading brown coal dust smoldering fires with extremely little smoke development and fires as specified in the standard DIN EN 54, Part 9.“
- **EMC** Certification according to 89/336/EG dated February 4, 1997
- **ATEX** Certification according to 94/9/EG dated March 10, 2004

		<b>GTE - Elektronik Germany</b> 41747 Viersen , Helmholtzstr. 38-40	
Typ	GSME-HC-Ex	S.N.	GS.03.HC 573
		Bj.	2003
DMT 03 ATEX E 050			
			
		<b>0158</b>	
VA	2	V	20 ... 40 DC
		Fuse	Temp. 98°C
IP	6X	°C	-20 ≤ t <sub>amb</sub> ≤ +50
		A.N.	2005042



**5 Set-up**

All components including the sensor system are accommodated in an explosion-protected die cast housing (Protection Type IP6X). The 3-colored condition display is underneath an explosion-protected light cover at the side of the unit. If the units are connected to the M-bus network system, all measuring values and operational conditions like alarm and fault as well as certain internal condition parameters for the fault diagnosis of all units can be displayed and recorded on a central computer. A remote diagnosis of the manufacturer and service support of all units within the network is possible via modem. A cable with a conductive surface firmly installed in the unit is used as feeding lines. The length of these feeding lines can be adapted to customer requirements.

Every detector is equipped with a special connection cable for the Ex-area. The connection of the detectors to the supply and reporting lines is realized with a branching box.



If the connection of the detectors is in the Ex-area, only Ex-authorized distributor boxes with suitable cable passages are to be used. These can be purchased as standard components from Ex-System Manufacturers..



Alternatively it is possible to make the connection outside of the Ex-area provided the required cables are long enough. In this case the ADICOS standard connection box can be used.

**5.1 Power Supply**

The units work at operation voltages of 20 - 40 V<sub>DC</sub>. We recommend a controlled DC power supply for example ADICOS NT V40-3A.

After switching on the power the green operation LED first blinks for several minutes (duration depending on detector type) in cycles of one second, then it is permanently illuminated.

Wire Pair	Color	Signal
1	White	Power Supply 20 ... 40V DC (reverse polarity protection)
1	Black	

The GSME-Ex detectors can be operated in two modes concerning the power supply:

**5.1.1 Power Supply with ADICOS BMZ 30 or MBUS-Master**

In this operation mode the power supply is carried out with aid of the 2-wire M-Bus. The bus line is connected to the power supply connectors in this case. This type of wiring evokes the least effort concerning the installation. However in case of long distances

between BMZ/MBUS-Master and detectors as well as between the detectors it is required to use sufficient cable diameters.

	<b>L2-Type</b>	<b>L3/HC-Type</b>	<b>F-Type</b>	<b>FR-Type</b>
Maximum number of detectors	15	12	10	8

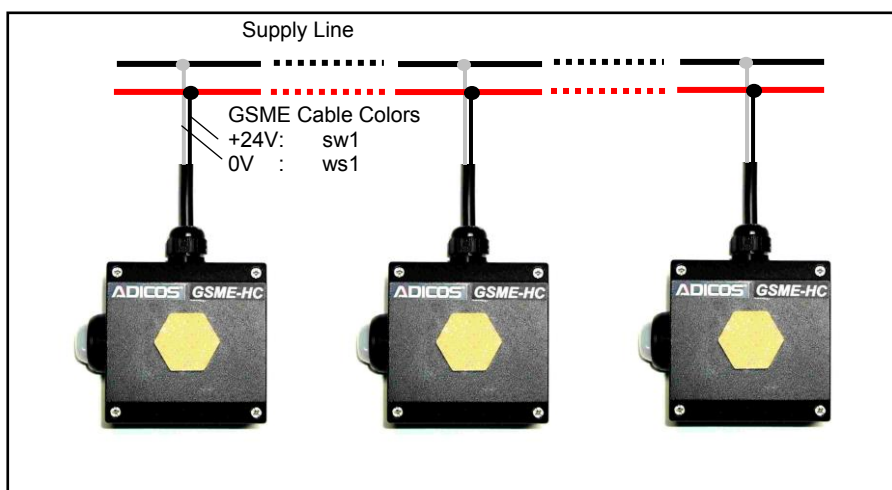
With aid of repeaters the number of detectors can be raised of the same amount. This operation mode is not allowed in case the GSME detectors are equipped with an internal heating module.

### 5.1.2 Supply with Power Supply Unit NT V40 – 3A

To supply the detectors one ore more separate power supply units are connected to the GSME detectors. In this case the communication between detectors and BMZ-30/M-Bus Master is carried out with aid of the M-Bus.

	<b>L2-Type</b>	<b>L3/HC-Type</b>	<b>F-Type</b>	<b>FR-Type</b>
Maximum number of detectors	30	30	30	20

Aside from the ADICOS NT V40-A3 the GSME can be supplied by other voltage supplies with a higher output power. Therefore probably a higher number of detectors could be connected.



Schematic Diagram: Parallel Power Supply 24- 40 VDC

## 5.2 M-Bus

The ADICOS service bus M-Bus has the following function:

- Documentation of detector data, alarms or failures
- Data logging and visualization of sensor values
- Setting and optimization of sensitivity of the detectors
- Service like functional tests or troubleshooting

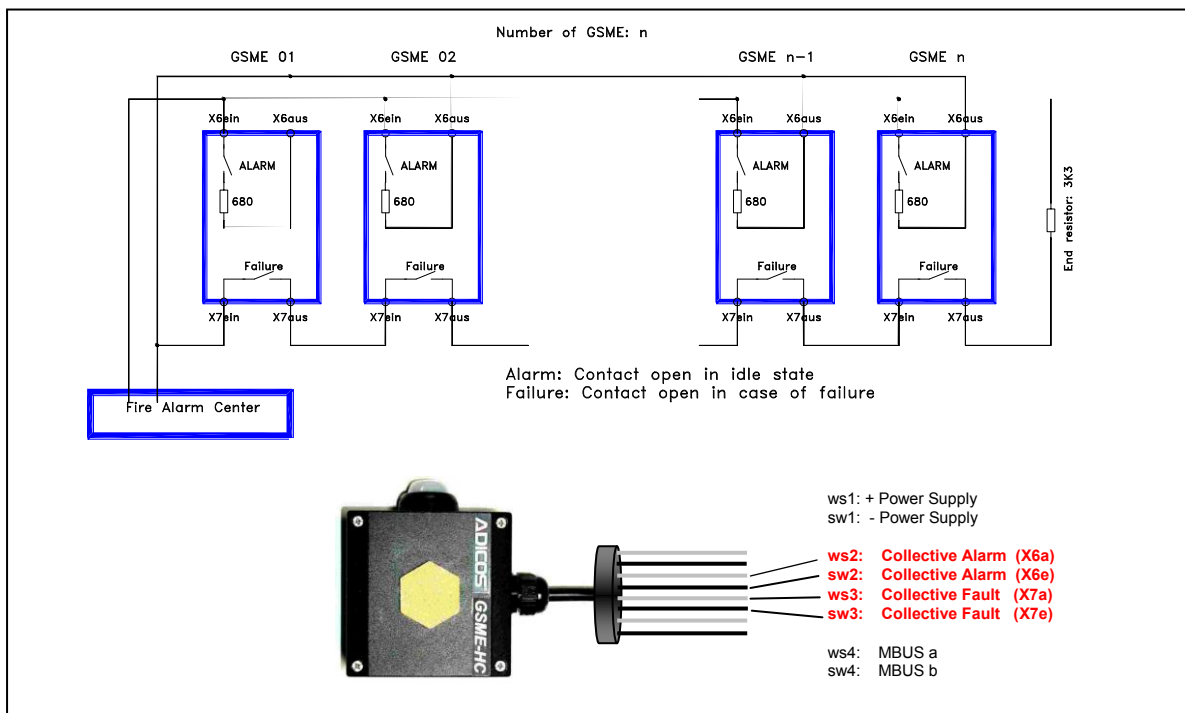
Wire Pair	Color	Signal	Power Supply by M-Bus Master	Supply by separate voltage supply unit
1	white	Supply Voltage	Connection to M-Bus Master or BMZ-30	Connection to power supply unit
1	black			
4	white	MBUS	Not connected	Connection to M-Bus Master or BMZ-30
4	black			

### 5.3 Limit Value Contact

The connectors for the potential-free limit value contacts can be found in the detectors connection cable. The wiring is carried out based on the following diagram:

Wire Pair	Color	Signal	Limit Value Contact
2	white	Relay output X6a	Alarm, make contact*
2	black	Relay output X6e	Alarm, make contact*
3	white	Relay output X7a	Failure, break contact
3	black	Relay output X7e	Failure, break contact

\* In series with 680 Ohm resistor, max. 0,4 VA or 25 mA



### 5.4 Interface to other Fire Alarm Panels

The GSME-Ex detectors can be equipped with an interface device, in order to integrate the units directly into fire alarm systems of other manufacturers. The interface is electrical isolated and has to be pre-assembled ex factory.

In case the add-on interface is recognized by the GSME detector (programming is carried out factory-provided), the red alarm LED of the detector is controlled by the

reset output of the interface module. In case of an alarm the fire panel sets the detector's LED. The LED is switched off as soon as the alarm indication at the fire panel is reset.

Currently the following interfaces are available:

Wire Pair	Color	Siemens SIGMASYS	Siemens FDnet	BOSCH LSNi
2	white	a (in)	FDnet (+)	LSN a in
3	black	b (in)	FDnet-A (-)	LSN b1 in
2	black	a (out)	FDnet (+)	LSN a out
3	white	b (out)	Fdnet-B (-)	LSN b2 out

Further information for the connection to other fire panels please refer to the technical information of the respective manufacturer.

## 5.5 Detector Heating

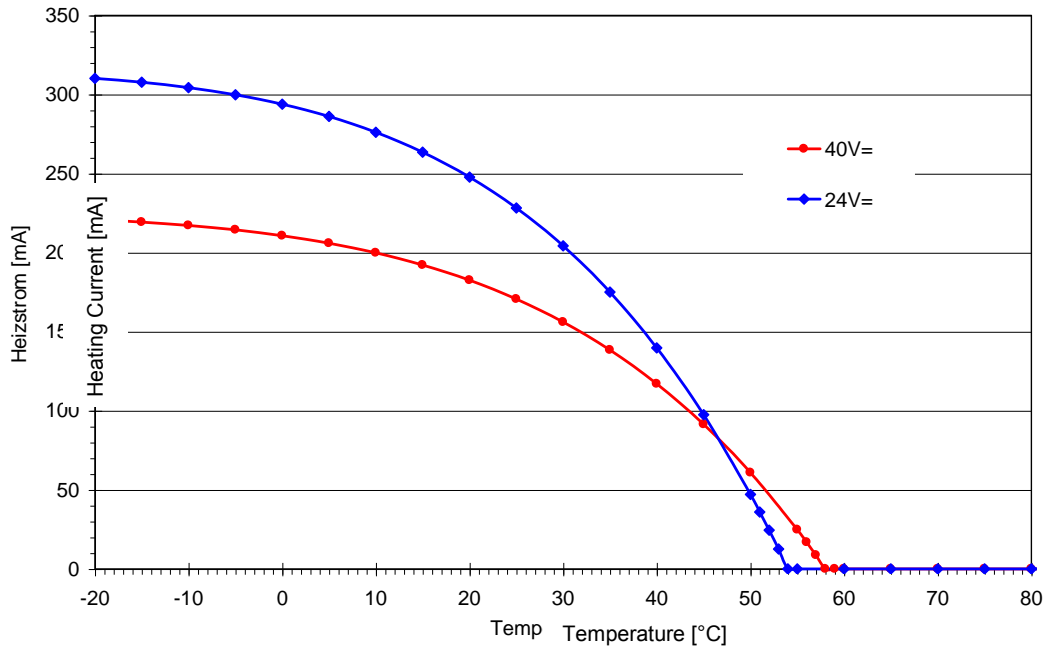
The detector heating prevents the sintered metal filter of the ADICOS detectors from blocking by water. In case of continuous dew humidity can be pulled inside the filter with aid of the capillary effect. As a consequence the gases cannot reach the sensors. Dew can be prevented in case the detector's surface is warmer than the ambient air. The detector's service life is increased especially in biomass application, where corrosive effects could occur.

The GSME detectors can be factory-provided equipped with a heating. This component is installed between the detectors main board and the top cover of the housing. It is electrically connected with aid of a multi-pin connector. The detector heating is monitored by the detector's temperature fuse as well as the internal temperature regulation.

With aid of the M-Bus service tools the heating can be switched on or off. The heater power depends on the ambient temperature. The additional power consumption is approximately 7 VA. The heating is switched off at 55 °C in case of freezing. Depending on the installation situation it increases the temperature of the housing by 5 – 10 °C. Therefore dew cannot affect the detectors.

Based on the power supply two type of detector heatings are available. For detectors supplied by a battery-buffered power supply unit a 24 Vdc type can be integrated. For units supplied with aid of the M-Bus or the ADICOS NT-V40A3 unit, a 40 Vdc type is available.

The detector heating is pre-assembled ex works. For this reason the type of heating has to be specified in case of an order, to ensure the correct function. It is possible to retrofit existing detectors (hardware revision > 2005) with a heating. However for this modification the detectors have to be sent to GTE.



### 5.6 Instructions for Operation in Areas with Combustible Dust



Combustible dust can be ignited by electrical equipment in many ways like for example sparks, surface temperature, discharges etc. To avoid the risk of ignition the following measures have to be complied with:

- The temperature of those surfaces where dust might settle has to be limited.
- Functional components with electrical sparks or increased temperature are to be kept in a dust-proof housing.
- All other ignition sources are to be avoided.
- Protective conductor and equipotential bonding  
 The ADICOS detectors are SELV – Units (Operation Voltage = 24V). Only power supply units complying with VDE 0110 are to be used for the voltage supply (i.e. ADICOS Power Supply Unit NT V40-A3)

If the equipment has to be protected against other environmental conditions (i.e. water), these protective measures are not to impair the suitability of the housing. The protection against combustible dust is only guaranteed, if the unit is operated within its design limits and in accordance with the technical specifications.

## 6 Planning and Installation

### 6.1 Concept and Planning

During the conception of installations an easy accessibility has to be considered for test, maintenance and cleaning purposes. Cables have to be installed in a way that they are not subject to friction effects evoked by moving dust and thus electrostatically charged.

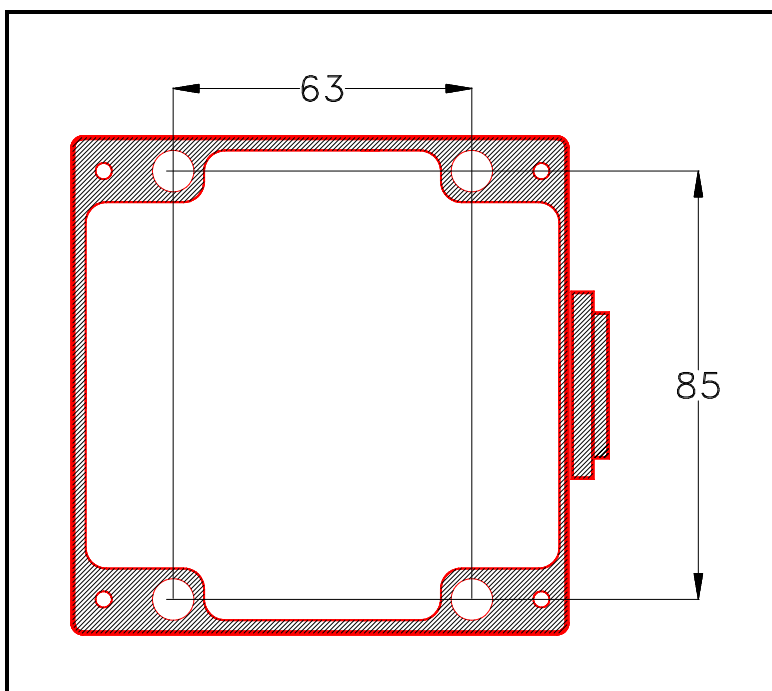
All electronic circuits have to be equipped with a device to ensure the electrical separation of all conductors excluding the ground wire. Such devices should be integrated for any secondary circuit, this means for any incoming power source. A respective symbol should be installed directly at the separation device in order to allow an identification of the belonging circuit.

For any installation drawings including the following details should be available:

- Classification and dimensions of the dust explosive areas. The information should include the type of ex zone and the size of the dust layer in case it extends 5 mm.
- Type of explosion proved equipment and their marking with sufficient information for maintenance
- Type, details and arrangement of the wiring

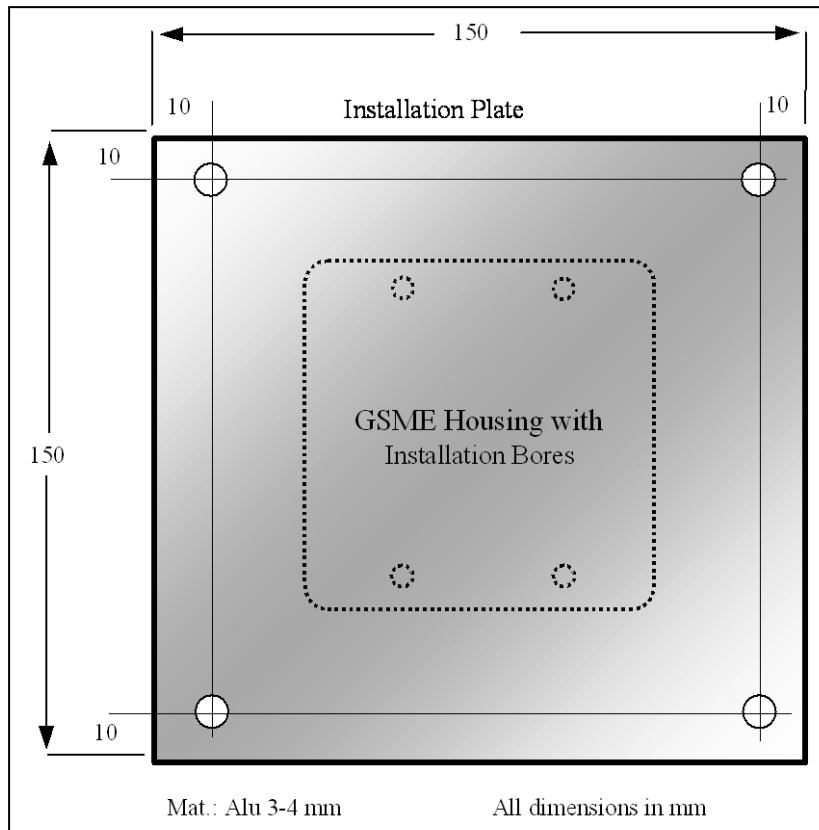
### 6.2 Installation

The aluminum housing of the GSME unit has four installation bores, which can be reached after removal of the housing lid.



Dimensions: Installation bores of the GSME Unit

With the aid of these installation bores the unit can be mounted directly or on an installation plate adapted to the respective location. A standard installation plate is an available accessory.



The following pre-conditions are required for the installation:

- The installation position has to be directly accessible and visible.
- The airflow and the contained gases in case of a smoldering fire have to be able to reach the sensor head.
- The thermal currents caused by heat source or sun radiation have to be considered.
- Convection caused by vents or waste heat of machines has to be considered.
- Consider the traveling direction of conveyor belts
- Permitted ambient temperature -10°C to +50°C
- Installation not in direct vicinity of power current units, heat and vibration sources

The suitable installation positions have to be selected considering marginal conditions like extreme electromagnetic interference sources, vibrations etc. and most of all the flow criteria of the expected smoke gases. With the aid of smoke generators the flow conditions at the application location and the installation positions can be determined.



**The fire characteristic value (gas, smoke, etc.) has to reach the detector point of origin of fire in order to be able to release an alarm.**

**In most cases the propagation path determines the reaction times.**

## 7 Initial Operation

If the GSME unit are used with a bus-system for central monitoring and interfaces to a central fire detection system, we recommend testing the reliability performance of the bus systems before initial operation of the units. In case of perfect operation of the bus systems the initial operation of the total system is simplified by the extended control and diagnosis ability of the central computer system.

### 7.1 Bus Addressing

If the GSME detectors within a bus system are connected with a central computer and/or the BMZ-30 to control the operation parameters, a bus address has to be assigned to every unit (1-255 possibilities). The setting is carried out by the factory and can – if necessary – be changed later with a software tool. Generally the bus address results from [Serial Number MODULO 256]\*.

\* Remainder when dividing by 256 (here the Low-Byte)

### 7.2 Power Switch-on

After the above-mentioned adjustments the GSME unit can be switched on. After the power has been switched on the unit runs through an initialization and a self-test phase (3-10 min.), which is shown by blinking of the green LED in cycles of one second. During the initialization phase no alarm conditions are supplied.

In case of low voltage longer period of time the settings of the GSME in the EEPROM might be lost. The GSME therefore reports a failure to indicate this condition.

*You can check by the behavior of the alarm-LED when switching on the power, if the alarm LED of the GSME unit is set with aid of a fire panel. In case the detector is equipped with an interface module the alarm-LED is operated for approximately 8 seconds.*

If an additional central computer is installed the ADICOS Central Software can be invoked (see operation manual for the central fire detection software GSME).

This program provides for the comfortable set-up of the BMZ and integration and test of every individual unit with the central computer. When registering the individual units the perfect function and communication is tested. In case of faults the respective unit cannot be integrated in the current list.

During the activation phase it is also possible to test the central fire detection system with the central software. For this purpose the central computer software initiates an artificial alarm or an artificial fault in the selected GSME unit and the reaction is tested at the fire detection system. If the display at the central fire detection system is as expected, the alarm or the fault can be reset.

Standard setting upon delivery is *medium sensitivity*. This setting can be checked when registering and changed if required – provided the marginal conditions of the operation position permit this. As a rule a change of the sensitivity setting will have to be carried out after a longer operation period, particularly if the pattern of the ‘fire probability’ is to close at the trigger limit (50%) of the alarm and thereby the probability of false alarm becomes too high.



## 8 Function References and Tests

### 8.1 LED-Display



In the ADICOS detectors of the Ex-version the multi-color LED display is installed behind an Ex-authorized cover. This causes a minor restriction of the radiation angle. When installing the detectors, please make sure that the display is visible.

#### a) Operation-LED:

- |                   |   |
|-------------------|---|
| Green:            | Power Supply on   |
| Green (blinking): | The unit is in the initialization phase and cannot detect an alarm yet. (For 3 minutes after switch-on or reset). |

#### b) Alarm-LED (red):

- *constantly lit:*  
If the alarm output is carried out via the fire alarm center, the alarm LED is set and reset via the BMZ.
- *blinking:*  
If the alarm is reported to the BMZ by the GSME, but the feedback of the BMZ to the GSME is missing, the alarm LED blinks.

#### c) Fault-LED (yellow):

The fault LED displays internal fault of the unit:

- Controller defective
- EEPROM defective or programming false
- Heating voltage of the sensors exceeding the permitted range
- Sensor measuring voltages exceeding the permitted range
- Error in the calculation of the various variables

If connected to the bus system the type of fault can be verified with the aid of various software tools.

### 8.2 Verification of the wiring

If the networking was realized in accordance to the specification, the total wiring can be tested as follows:

#### a) Resistance Measurement

At the location of the central computer (end of the physical circuit of the bus) the resistance of the complete bus wiring can be measured with the aid of a resistance-measuring device, as long as no GSME unit has been connected. The measured resistance is to be  $\infty$ .

The individual lines (parallel connected) can now be short-circuited individually and one after the other at the respective end. This has to be displayed on the resistance-

measuring device at the end of the physical circuit of the bus. Then the test for short-circuit or interruption of the bus wires is complete.

#### b) Voltage Measurement

After the connection of the MBus master every detector has to be supplied with a bus voltage of between 34 and 40 V. This voltage can be measured with a simple multiple purpose measuring device.

### 8.3 Replacing a Unit

If a fault cannot be eliminated locally, the unit should be replaced.

- The replacement of a unit can be carried out during operation. During the replacement temporary fault messages will occur at the alarm system and the central computer system.
- Switch off the unit by separating it at the feeding line in the distribution box. All other units are still in the operating mode.
- Remove unit with installation plate - if there is one. It is not required to open the unit.
- Connect the replacement unit at the feeding line in the distribution box. Unit starts operation.



***When replacing a unit the directives of explosion protection have to be considered. This means the GSME have to be completely disconnected (if required with special tools) and tested outside the area with explosion hazard.***

***Besides the explosion hazard has to be eliminated by cleaning of the respective area.***

***In addition the operator's corporate explosion protection regulations must be recognized.***



***To avoid collision of bus addresses please note:***

- ***New address is unused within the existing system, or:***
- ***Change the address of existing detector to other available, or***
- ***Change address of new detector to an available address.***

### 8.4 Starting Phase

After starting operation the units are ready to give alarm after an initialization phase of approximately 3 minutes.

It is recommended to check the fire detection parameters and possibly the sensor data at the central computer (if connected) after an operating period of 14 days. Depending on the environmental conditions the sensitivity of the individual units has to be adapted to the local conditions of the respective installation positions. These adjustments can easily be carried out from the central computer. (See Operation Manual Central Software GSME-ZSW).

In the protocol file you can check all events of every individual unit in the past.

## 8.5 Test of the Gas Sensitivity

The GSME units are delivered ex works in balanced, ready for use condition. With the aid of the gas test unit GTL 100 the GSME can be tested for its responsiveness and capability within the scope of the specified test of the fire detection system. (See Operation Manual Test Unit GTL 100).

If no alarm is triggered during the test gas load, the detector has to be replaced and returned to the manufacturer for testing and remanufacturing

In regular intervals expert personnel has to carry out function tests of the fire detection systems in accordance with the Guidelines of the Association for Property Insurances VdS2095 and with the Standards EN 54, DIN 57833, and VDE 0833/1.

This includes the following tests:

1. Proof of the responsiveness of the fire detector
2. Proof of the function of the complete system (co-operation of all components)
3. Proof of the function during acceptance test



***The GTL-100 is not allowed in dust explosive zones 20 or 21. To test the unit the GSME-Ex detector has to be uninstalled in order to be tested outside the area with explosion hazards. As an alternative the explosion hazard has to be eliminated for example by cleaning the surrounding during shutdown.***

## 9 Failures

The lifetime of the GSME unit is limited by the sensors and is based on the experiences made in power plants for a period of more than 5 years. The operating life of the gas sensors will be dependent on the environmental conditions (gas pollution). In case of sensor-damaging gases the lifetime may be reduced.

Sensor-damaging gases include especially the siloxanes, which are released when working with silicones.

In case of a connected central computer all sensor data and measuring values are constantly recorded. The measuring values can be displayed in form of graphics for freely selectable periods. There are changing background loads caused by different gas combinations for every application. These are also recorded. This enables an expert to confirm the satisfactory operation of the sensors by checking the fluctuation. This, however, does not replace the specified function tests, which are to be carried out in accordance with the valid guidelines for fire detection systems.

## 9.1 List of Failures

Fault	Cause of Fault	Elimination
Operation LED off	Power supply off Fuse has responded	Switch-on power over-voltage (> 40 V) or unit defective
No communication  A unit does not respond All units do not respond	False addressing  Bus wire defective or BMZ BUS final stage defective or bus master defective	Assign correct or conflict-free address  Bus wire defective Replace BMZ Bus master defective Check connection of RS232 PC bus master
Fault LED on	Internal fault	The fault type can be determined by expert personnel with the aid of service software
False alarms	GSME defective Sensitivity too high	Replace unit. Check fire detection parameter or sensor signals at the central computer and change sensitivity or parameterization.

## 10 Maintenance

The GSME units do not contain expendable or non-repairable parts. Therefore a respective service is not required. The regular test according to the VdS guidelines is sufficient.

In case a detector doesn't release an alarm during the test, pre-set alarm thresholds in combination with the signal readings have to be examined. In case

The detection time depends on the type of detector as well as the sensitivity settings:

	Min. detection time	Max. detection time
GSME-L3 / HC	20 sec.	60 sec.
GSME-F / FR	10 sec.	30 sec.

In case the GSME are tested outside their installation position, an initialization within the changed surrounding is required. This means the detector has to be reset and the initialization time (see chapter 7.2) has to be passed.

Improper cleaning of the sintered metal filter has to be prevented, because the filter's pores could be occluded. In case pollution is recognized it is required to apply procedures to keep adhesive dust, water or oil away from the filter.

In case of dry dust a complete occlusion of the sintered metal filter was not recognized so far. The detection is not affected negatively in case of a partial pollution of the filter. A pollution of 99% of all pores means an increase of 10 seconds concerning the detection times.

## 10.1 Exchange/Revision Frequency

The GSME detectors are designed to operate in areas with extreme conditions. However after several years of operation time adverse effects concerning the function could happen. This is mainly caused by gases, which are toxic concerning the integrated sensors, or corrosion effects.

Effects	Consequence	Operation of the detector
Ageing	- Change of sensor resistance - Decline of sensitivity - Changes in the sensitivity to other gases	> restricted > restricted > yes (false alarms possible)
Toxic gases	- Decline of sensitivity - loss of sensitivity for gases - increase of sensitivity to other gases	> restricted > no > yes (false alarms possible)
Pollution/corrosion of the filter	- Occlusion - Composition of gases	> no > yes (false alarms possible)

For this reason a revision of the detectors after 5 years of service life is recommended. GTE has a special maintenance service in this case:

- Test of the detector for statistical matters
- Cleaning of housing and filter
- Exchange of electronic parts
- Upgrade to the recent firmware
- Calibration and test

## 10.2 Maintenance and Repair in Areas with Combustible Dust

Only expert personnel familiar with the concept of the ignition protection type is permitted to carry out testing, maintenance and repair in areas with the risk of dust explosion.

## 11 Attachment

### 11.1 Cable Assignment for the Gas Sensor Unit GSME – Ex

Signal	Description	Wire Color / No.
Power Supply 20...40V <sub>DC</sub>	reverse polarity protection	SW 1
		WS 1
Limit Value Contact X6e	Alarm make contact	SW 2
Limit Value Contact X6a	Alarm make contact	WS 2
Limit Value Contact X7e	Failure break contact	SW 3
Limit Value Contact X7a	Failure break contact	WS 3
M-BUS a	reverse polarity protection	SW 4
M-BUS b		WS 4

### 11.2 Cable Assignment with Siemens Sigmasys module

Signal	Description	Wire Color / No.
Power Supply 20...40V <sub>DC</sub>	reverse polarity protection	SW 1
		WS 1
Siemens BMZ Input B	see Siemens manual	SW 3
Siemens BMZ Input A	see Siemens manual	WS 2
Siemens BMZ Output B	see Siemens manual	WS 3
Siemens BMZ Output A	see Siemens manual	SW 2
M-BUS a	reverse polarity protection	SW 4
M-BUS b		WS 4

### 11.3 Cable Assignment with Siemens FDnet module

Signal	Description	Wire Color / No.
Power Supply 20...40V <sub>DC</sub>	reverse polarity protection	SW 1
		WS 1
FDnet-A (-)	see Siemens manual	SW 3
FDnet (+)	see Siemens manual	WS 2
FDnet-B (-)	see Siemens manual	WS 3
FDnet (+)	see Siemens manual	SW 2
M-BUS a	reverse polarity protection	SW 4
M-BUS b		WS 4

### 11.4 Cable Assignment with BOSCH LSNi module

Signal	Description	Wire Color / No.
Power Supply 20...40V <sub>DC</sub>	reverse polarity protection	SW 1
		WS 1
LSN b1 in	see BOSCH manual	SW 3
LSN a in	see BOSCH manual	WS 2
LSN b2 out	see BOSCH manual	WS 3
LSN a out	see BOSCH manual	SW 2
M-BUS a	reverse polarity protection	SW 4
M-BUS b		WS 4

Your local Adicos consultant:

d.s.f. GmbH  
Spessartstr. 11  
63263 Neu - Isenburg  
Telefon: +49 (0)6102 / 7890 - 0  
Telefax: +49 (0)6102 / 7890 - 40  
E-Mail: [info@dsf-gmbh.de](mailto:info@dsf-gmbh.de)