Combustible Gas Sensor GS120

List of Contents:

1. General

This manual is intended to be an information document for service technicians. It brings a detailed description of the GS120 gas sensor. Further it provides information on its installation and setting.

1.1. Purpose

The product is designed for sensing, monitoring, and indication of leakage concentrations of combustible gases in residential, commercial, and light industry premises. GS120 responds to presence of natural gas, city gas, propane, or butane. Two stages (levels) of gas occurrence concentration are distinguished and signalled. Beside acoustic and optical signalling, two relays are available that can serve for control of automatic building protection.

2. GS120 Functions

2.1. General Description

The device responds to presence of combustible gases in two stages depending on gas concentration. The GS120 device is calibrated for the methane/air mixture as a standard. Sensitivity of the sensor to natural gas, city gas, propane and butane is higher therefore calibrating for methane is the optimum. After switching ON, the preparatory phase of the gas sensor warm-up begins. Green LED begins to flash, and one siren beep sounds. After 30 sec, the preparatory phase of the gas sensor warm-up is completed (the sensor does not provide any responses to gas or temperature during this time). The sensor warm-up preparatory phase is completed with two siren beeps. Green LED lights continuously during further operation.

2.2. Mode 1st Stage Gas (Relay 1) and 2nd Stage Gas (Relay 2)

Switch DP1/1 in OFF position and switch DP1/2 in OFF position. When 1st stage of gas concentration is reached relay No. 1 closes i.e. contacts 11-13, and blue LED flashes for a short time. Siren sounds with a short intermittent tone. Relay No. 1 switches based on the gas concentration at 1st stage.

When 2nd stage of gas concentration is reached relay No. 2 closes i.e. contacts 21-23, and red LED flashes with long intervals. Siren sounds with a long intermittent tone. Relay No. 2 switches based on the gas concentration at 2nd stage.

2.3. Mode Gas 1st Stage (Relay 1) and Temperature (Relay 2)

Switch DP1/1 in ON position, switch DP1/2 in OFF position. When 1st stage of gas concentration is reached relay No. 1 closes i.e. contacts 11-13, and blue LED flashes for a short time. Siren sounds with a short intermittent tone. Relay No. 1 switches based on the gas concentration at 1st stage.
When the temperature set with the trimmer is reached relay No. 2 closes i.e. contacts 21-23, and red LED flashes for a short time. Siren sounds with a short intermittent tone.
Temperature setting range is 20°-70°C. Switching temperature is set on the trimmer using a scale. Relay No. 2 switches based on the temperature set on the trimmer.

2.4. Mode Temperature (Relay 1) and Gas 2nd Stage (Relay 2)

Switch DP1/1 in OFF position and switch DP1/2 in ON position. When the temperature set with the trimmer is reached relay No. 1 closes i.e. contacts 11-13, and blue LED flashes for a short time. Temperature setting range is 20°-70°C. The switching temperature is set on the trimmer using the scale. Relay No. 1 switches based on the temperature set on the trimmer. Siren sounds with a short intermittent tone.

When 2nd stage of gas concentration is reached relay No. 2 closes i.e. contacts 21-23. Siren sounds with a long intermittent tone and red LED flashes with long intervals. Relay No. 2 switches based on the gas concentration at 2nd stage.

2.5. MEM Function (Memory)

If MEM (JP2) joint is interconnected then if a relay closes it remains closed after the failure has faded away. LED associated with given relay will continue flashing.
The relay can be opened with GS120 power switch OFF.

3. Construction

GS120 is placed in a plastic box having base 100x75 mm and height 40 mm. The box is designed for wall mounting using two screws. The electronics is installed on one PCB that is placed on the bottom of the plastic box.

3.1. Version GS120/230V

The electronics contains circuits for gas detection, a relay 12V, and is power supplied with 230V/50Hz. The power supply 230V/50Hz is transformed by an electronic transformer from the range 100V/AC to 240V/AC to the voltage 12V/DC.

3.2. Version GS120/12V

The electronics contains circuits for gas detection, a relay 12V, and is fed with the voltage 12V AC or DC. Wiring terminals are designed for 12V/DC or AC voltage.

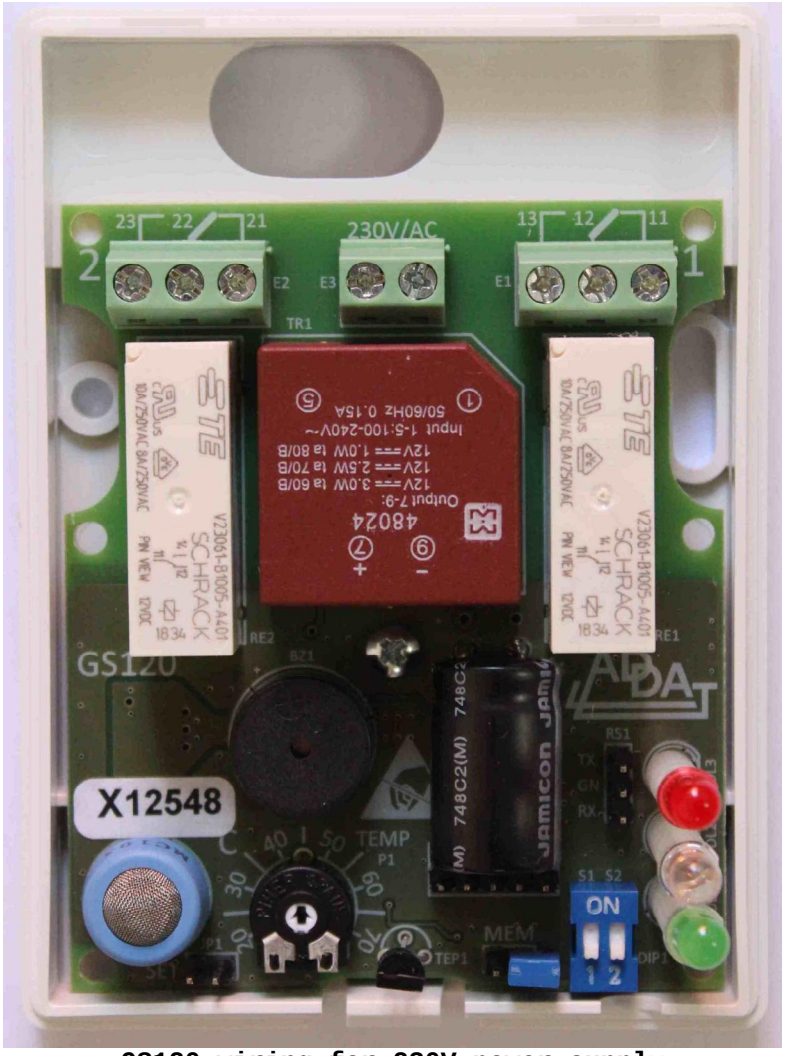
4. Montage and Electrical Installation

4.1. General Description

Attach GS120 to a wall using two screws and two dowels. In case of gases lighter than air (city gas, natural gas, …) the sensor should be installed under ceiling as close to the ceiling as possible. In case of gases heavier than air (propane-butane) install the sensor as close as possible to the floor.
Open the plastic cover and screw the plastic box base to the wall. Connect conductors (power supply, relay output). GS120 can be interconnected with a security system for evaluation of failures as for example AJK5. Shut the cover after installation. The installation is not allowed to be carried out by a person who does not possess relevant electrical qualifications.

As already mentioned above, GS120 is manufactured in two versions. The version GS120/12V is suitable for connection to the AJK6 (ADDAT) failure reporting central device. The advantage of GS120/12V is lower price, and possibility of interconnection with a small-cross-section cable (e.g. SYKFY 2x2x0,5).

4.2. Version GS120/230V



GS120 wiring for 230V power supply

4.3. Wiring GS120/12V

Wiring GS120 for 12V power supply

4.4. Testing GS120

The GS120 sensor can be tested using a cigarette gas lighter (release gas only, without flame). Remember that the sensor responds to a mixture of combustible gases plus air only. LEDs also light depending on closed relay contacts, blue LED corresponds to the relay No. 1, red LED corresponds to the relay No. 2 (for the mode according to 2.2).

5. Signalling and Failures

5.1. No Failure

If no gas concentration exceeding the defined limit is detected relevant relays are open. If a relay is selected as the output of the electronic thermostat and temperature is lower than the temperature set on the trimmer the relay is open, too.

5.2. Gas Leakage, Increased Temperature

If a gas concentration exceeding the defined limit is detected the relevant relay is closed. If a relay is selected as an output of the electronic thermostat and the temperature is higher than the temperature set on the trimmer the relay is closed.

Closed relay No. 1 with gas concentration at stage No. 1. activates the internal siren with a short intermittent tone.
Closed relay No. 2 with gas concentration at stage No. 2. activates the internal siren with a long intermittent tone.
Closed relay No. 1 or No. 2 with excessive temperature activates the internal siren with a short intermittent tone.

Be cautious in case of an alarm!
- **Do not use open fire - no smoking!**
- **Do not switch ON any electrical consumers!**
- **Avoid further gas leakage by shutting the inlet!**
- **Call an expert for repairs of gas consumers!**

- **Attention!!! GS 120 is not allowed to come into contact with fluids (e.g. coating materials for painting, volatile substances, thinners etc.)!**

6. Technical Parameters

Variants acc. to power supply	GS120/230V	GS120/12V
Power supply voltage	100V/AC to 240V/AC	12V/DC or AC(+/-10%)
Inactive consumption (typical)	0.8 W/230V/AC	0.7W/12V/DC
Max. consumption	1.5 W/230V/AC	1.3W/12V/DC
Sensor response time	after 30 sec from switch ON	
Calibration for 1st stage	0.44 % methane/air mixture **	
Calibration for 2nd stage	0.88 % methane/air mixture ***	
Detection of combustible gases	methane, natural gas, LPG	
Contact rating	0.5 A/250V resistive load	
Accuracy of setting	+/- 10 % nominal values	
Preparatory mode	30 sec	
Sensor temperature range	0°C to 60°C	
Terminal marking	12, 22 contacts	
	11, 21 NC contact	
	13, 23 NO contact	
Dimensions	74 x 100 x 40 mm	
Temperature trimmer setting range	20°C to 70°C	

** 10% of the methane explosion limit in air
*** 20% of the methane explosion limit in air

6.1 Sensor Calibration

The sensor has to be calibrated regularly at the manufacturer in order to maintain proper functioning. Calibration period is 12 months.

7. Example of Order Specification

GS120/230V ..... 1 pc
GS120 ..... 1 pc
*) Both specifications are identical

GS120/12V ..... 1 pc
**) Version for power supply purely 12V, refer to 4.3