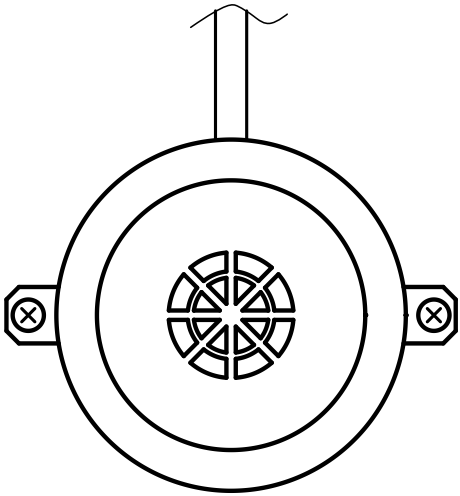
GSK2 Sensor

Technical Specifications and User Manual

- Electronic oxygen (O_2) sensor
- Part of industrial and commercial detection systems
- Suitable for residential areas, laboratories, and various technical facilities (non-hazardous environments)
- Conversion of gas concentration to current signal 4 to 20 mA
- Powered via current loop



The GSK2 sensor is an electronic device designed for monitoring oxygen (O_2) concentration in air. Its primary use is in residential areas, laboratories, and various industrial environments requiring continuous O_2 concentration monitoring. The output is an industry-standard 4–20 mA current loop. GSK2 sensors are connected to a control system (control computer or evaluation unit), to which they transmit a proportional signal representing the measured concentration. The sensor uses a two-wire connection, and the output signal corresponds to the current drawn by the sensor.

The electronics board contains two adjustable elements for setting the base current level and calibration to the correct gas concentration. The sensor's electronics are housed in a plastic enclosure for fixed mounting using two screws.

Technical Specifications

Measured gas	Oxygen
Detection range	0 to 30% vol.
Output signal	4 to 20 mA
Expected sensor lifespan	More than 2 years

Adjustment accuracy	±1%
Measurement drift	< 5% / year
Warm-up time	up to 30 seconds
Response time T90	up to 30 seconds
Recovery time	up to 60 seconds
Connection method	2-wire
Operating environment	Non-hazardous
Temperature range	5 to 40 °C
Ambient humidity range	20 to 90% RH
Electronics protection rating	IP20
Weight	approx. 100 g
Dimensions without mounts	ø56 x 30 mm
Power supply voltage	12 to 30 V DC
Storage temperature	10 to 30 °C / non-condensing humidity
Maximum storage time	1 year
Sensor connection	2-wire cable; for >5 m use shielded cable
Designed according to	EN 60079-29-1 ed.2

Limitations of Use

The GSK2 sensor is intended for O_2 detection in standard atmospheric conditions. In environments with specific chemicals, the sensor may be subject to poisoning. Consult the manufacturer before using in such environments. The sensor is intended for normal, non-aggressive environments. Elevated CO_2 levels in the air may increase the sensor's sensitivity to oxygen.

Function Description

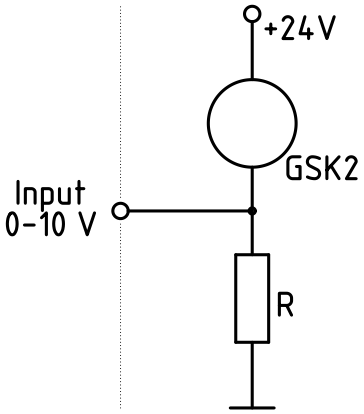
The GSK2 sensor uses an electrochemical sensor to detect oxygen. At normal atmospheric O_2 concentration (20.9%), the electronics draw 15.2 mA from the power supply. When O_2 concentration drops, the current decreases; when it increases, the current rises. The control system can calculate the O_2 concentration c using the measured current I as follows:

$$c[\%] = \frac{15}{8} \left(I[\mathrm{mA}] - 4 \right) .$$

The sensor does not react instantaneously to sudden changes in concentration. Time is needed for gas diffusion into the sensor's electrolyte.

GSK2 Sensor Connection

The sensor is connected to the system as a standard 4–20 mA two-wire transmitter. For systems with current-input terminals, it can usually be connected directly. If only voltage inputs are available, a suitable resistor must be added.



The resistor value should be calculated using Ohm's law. For 0–10 V inputs, a 500 Ohm resistor is suitable (e.g., two 1 kOhm resistors in parallel). Voltage drop across the resistor must be taken into account.

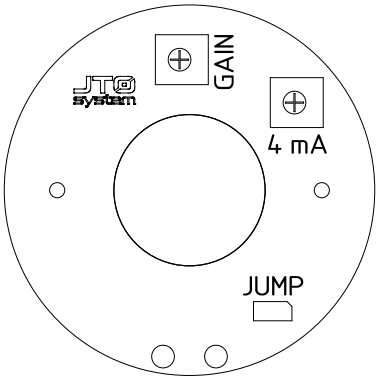
Sensor Output and Power Supply

The output wires are non-polar. The positive supply may be connected to either terminal.

Supply voltage must remain within specified limits. Deviations can lead to measurement errors or damage to the electronics.

Control and Indication Elements

The sensor electronics board includes the following control elements:



Trimmer "4 mA"	Sets the output current at zero oxygen concentration
Trimmer "GAIN"	Sets output current when exposed to atmospheric O_2 concentration
Jumper "JUMP"	Disconnects input. A current meter can be connected here for calibration.

Sensor Placement

Install the sensor at a height appropriate for the intended purpose. For personal safety, position it near typical breathing level.

Gas Concentration

Exceeding maximum gas concentration limits the current to approx. 25 mA. After such exposure, stabilization to normal values takes additional time. Presence of other gases may affect the output signal.

GSK2 Sensor Installation and Inspection

Installation Procedure

The GSK2 sensor connects via two wires. Mechanically secured with 2 screws. Position does not affect function. Avoid dust blocking the enclosure's front holes. Keep the area dry and clean.

Mark the mounting position and drill holes. Do not use irreversible methods (rivets, nail guns, etc.).

Check power supply voltage with a voltmeter before powering the sensor.

Sensor Installation

- Attach the sensor using the supplied screws.
- Measure and cut the cable to required length.
- Strip wire ends and connect to terminals. Polarity does not matter.
- Perform a functional check after installation.

GSK2 Sensor Inspection

Ensure stable conditions. Let the sensor warm up for 15 minutes before testing.

Functional Test

Check response to reduced O_2 by exhaling into the sensor opening. Within 60 seconds, signal should drop. System should respond accordingly. Ventilate the sensor in clean air for at least 15 minutes afterward.

Calibration Gas Test

To verify zero point, use known gas mixture. Pure nitrogen (N_2) or carbon dioxide (CO_2) can be used to simulate 0% O_2.

Calibration Procedure

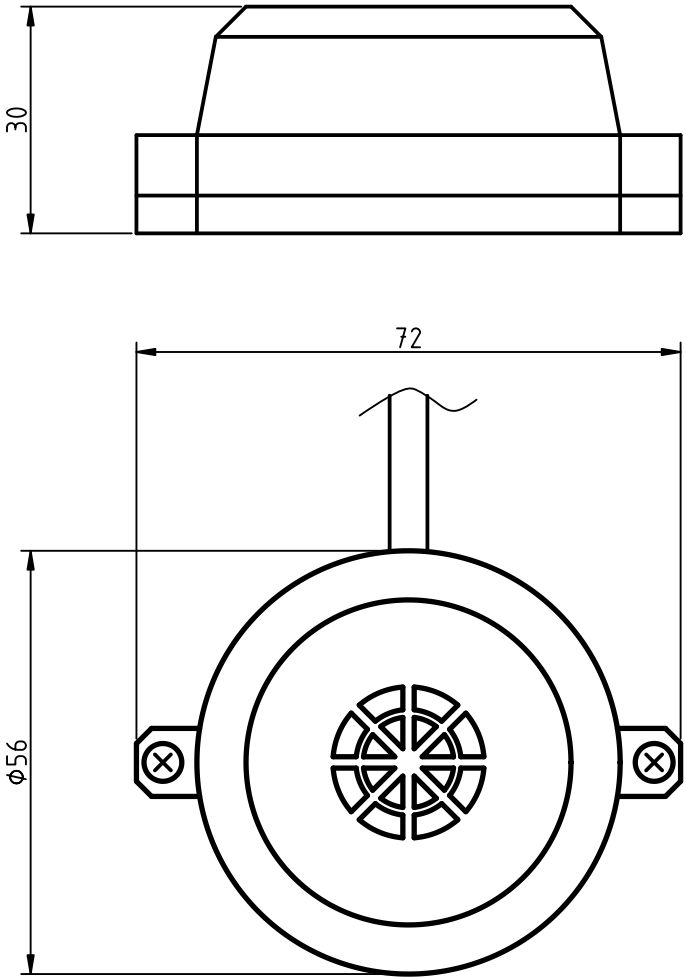
- Loosen side screws and remove the lid.
- In fresh air (20.9% O_2), the current should be 15.2 mA. Adjust using "GAIN" trimmer if needed.
- Apply pure N_2 or CO_2 to the sensor using a regulator and diffuser (0.5 l/min).
- After 60 seconds, adjust output to 4 mA using the "4 mA" trimmer.
- Ventilate the sensor for at least 5 minutes afterward.

- If values cannot be adjusted, return the sensor for inspection.

Unless regulations state otherwise, calibration is recommended at least once per year. For harsher conditions (high humidity, temperature), test every 6 months. Functional tests may be done, e.g., every 2 months, depending on use.

Sensor Accessories

- Plastic wall plug Ø6 – 2 pcs
- Screw 3x25 – 2 pcs



Service

Warranty and post-warranty service or technical support is available from the manufacturer.

If the device is taken out of service, it must be disposed of in an environmentally friendly manner – i.e., by handing it over to an authorized e-waste disposal company.

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