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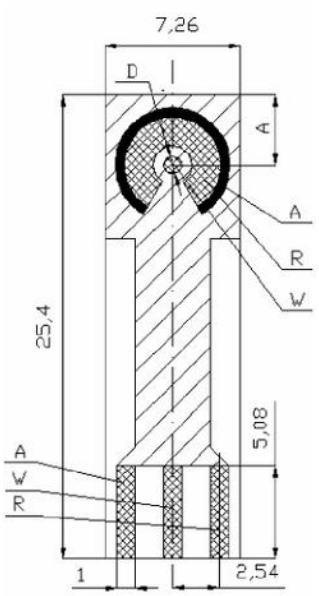
Glucose Oxidase BIOSENSOR

Type: AC1.GOD

Description

Glucose Oxidase (GOD) from *Aspergillus Niger* is immobilized on the active surface of a working electrode of amperometric substrate AC1.W2.RS. The diameter of the immobilized bioactive membrane is 2 mm and the mean applied activity is 1 unit/mm^2.



Physical parameters

Dimensions:
Weight: 0.5 gms
Length: 25.40 mm
Width: 7.26 mm
Thickness: 0.63 mm

A = 4.00 mm
D_W = 1.00 mm

Electrode Materials are defined by:

AC1.W2.RS

W ... Working electrode – pure platinum
R ... Reference electrode – silver
(Detailed description of sensor: datasheet **AC1.W*.R* (*)**)

Enzymatic membrane containing cca 1 IU of GOD enzyme is immobilized on the working electrode surface.

Unit definition Glucose Oxidase (GOD) from *Aspergillus Niger*:

- ß-D-Glucose:oxygen 1-oxidoreductase
- Sigma – type X-S
- One unit will oxidize 1.0 µmole of ß-D-glucose to D-gluconolactone and H_2O_2 per min at pH = 5.1 at 35°C, equivalent to an O_2 uptake of 22.4 µl per min.

Connector types for AC1.GOD sensors range

	KA1	KA1.S	KA1.C	KA4
AC1.GOD	✓	✓	✓	✓

Evaluation Unit

- PalmSense

Sensor Usage

- Measurement of ß-D-Glucose concentration in liquid samples (from 0 °C to 45 °C)

Expiration

- 12 months at temperature 4 - 7°C (fridge)

Storage

- Before use, store the sensors in a dry state in the fridge in the original box with silica gel.
- Once the sensors have been used in liquid solutions, they must not be allowed to dry out (the active membrane of the biosensor swells in the liquid and its subsequent drying can damage the sensor)!
- When reusing GOD sensors after measurement, it is possible to store them, for example, in a test tube with a 0.01 M PBS buffer of pH 7.2 or in a physiological solution - bacterial contamination can be prevented by adding sodium azide to the storage solution (content 0.05%).

Measurement

- Measuring method amperometry at applied potential +650 mV.
- Measuring principle - the enzyme Glucose oxidase (GOD) catalyzes the reaction between ß-D-Glucose and oxygen, forming D-gluconolactone and hydrogen peroxide. The resulting hydrogen peroxide is decomposed by the working platinum (Pt) electrode of the AC1.W2.RS sensor, and can be quantified according to the current response.

$$\beta - D - Glucose + H_2O + O_2 \xrightarrow{Glucose\ oxidase\ (GOD)} D - gluconolactone + H_2O_2$$

$$H_2O_2 \xrightarrow{working\ Pt\ electrode\ (applied\ potential\ +650\ mV)} 2H^+ + O_2 + 2e^-$$

Transport

- Sensors are delivered in thermoboxes keeping low temperature when ambient temperature may exceed 40 degrees Celsius.

Ordering information

- The order reference: AC1.GOD
- Minimum order quantity – 20 sensors
- Orders in multiples of 20
- Delivery time for standard AC1.GOD sensors is 4 weeks from receipt of order
- Delivery time for non-standard AC1.GOD sensors depends on final technical specification of order

Examples of Order

- 100 pieces – AC1.GOD

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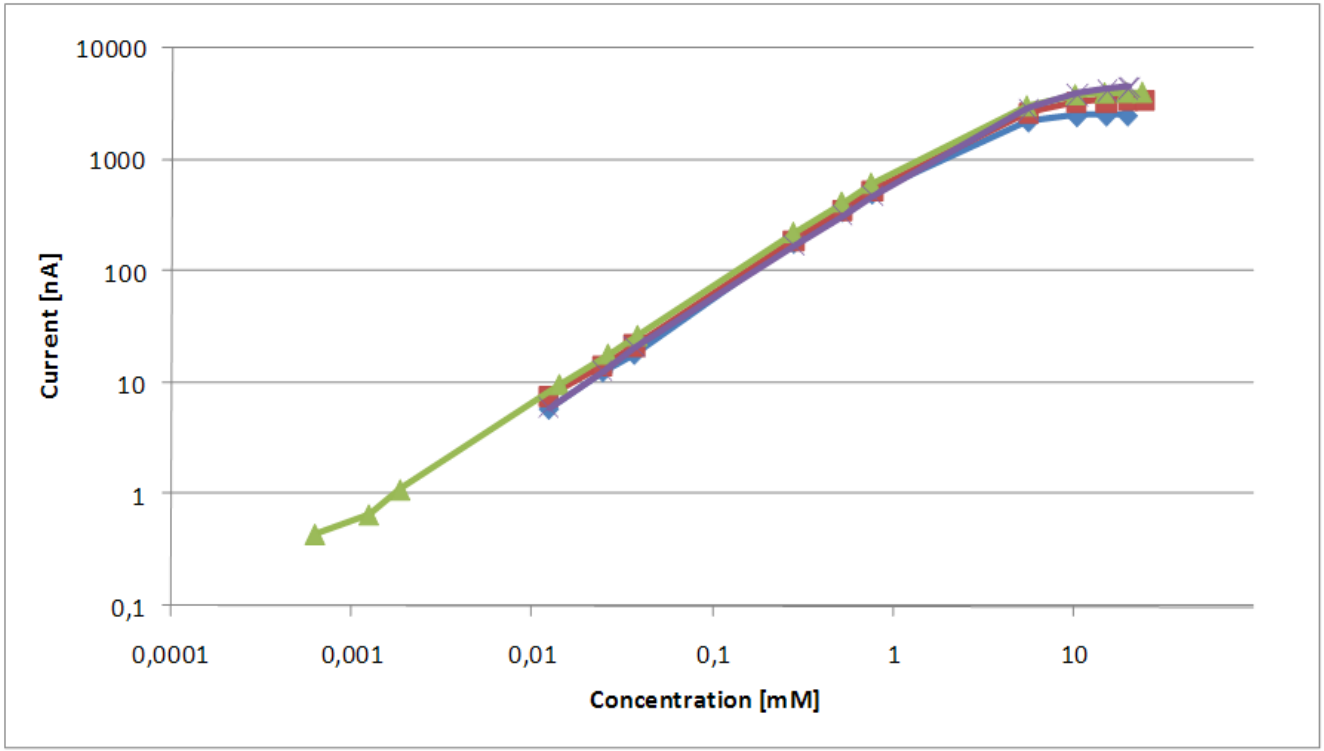
Electrochemical measurement of glucose using AC1.GOD sensor with immobilized glucose oxidase enzyme - example of a Calibration curve



- When measuring, pH and temperature have a great influence - a higher temperature increases the activity of the GOD enzyme and thus higher sensor responses are achieved. As the temperature increases, however, the concentration of dissolved oxygen in the solution, which is an important co-substrate of the enzyme reaction, decreases (this may lead to earlier saturation of the enzyme).
- In general, the rule is that at a lower temperature the sensor has smaller responses, but the calibration curve of the sensor is linear in a wider area; on the other hand, at a higher temperature, the sensor has higher responses, but the calibration curve of the sensor is linear in a shorter range.

Note: to guarantee the correctness of the measurement, the customer should perform a calibration of the GOD sensor before measurement. The response of the GOD sensor is dependent on temperature, pH and sample composition.