

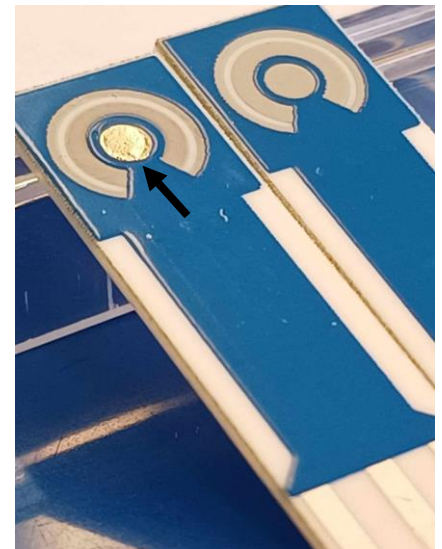
ELECTROCHEMICAL SENSOR WITH A WORKING ELECTRODE OF GUARANTEED PURITY

Type: AC1.GP.W*.R*.A* (*)

Description

The sensor is made on a corundum ceramic base. Working, reference and auxiliary electrodes are applied to this surface. Working, reference and auxiliary electrodes are made of different materials. At the end of the sensor there is a contact field that is connected to the active part by silver conductive paths that are covered with a dielectric protective layer. The working electrode of the sensor with a diameter of 2 mm is made of a material of guaranteed purity of up to 99.99 % - standard layer thickness 0.0125 mm (e.g. gold, platinum, silver, copper, iron, nickel, cobalt, chromium, tantalum, irridium, rhenium, magnesium, palladium, zirconium and others).

A bio-chemically active substance can be immobilized on the working electrode of the sensor to create a biosensor. All sensors can be equipped with heating and temperature sensing elements. Thermistor (must be calibrated) or Pt 1000 (the response correspor is used as the temperature sensor.



On the left sensor with WE with pure Platinum with a guaranteed purity of 99.95%, on the right for comparison sensor with WE with ordinary platinum paste.

Physical Parameters

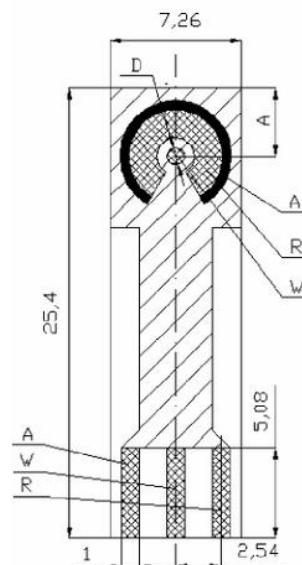
Dimensions:

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

A = 4.00 ± 0.05 mm
 D = 2.00 mm



$D_w = 2$ mm



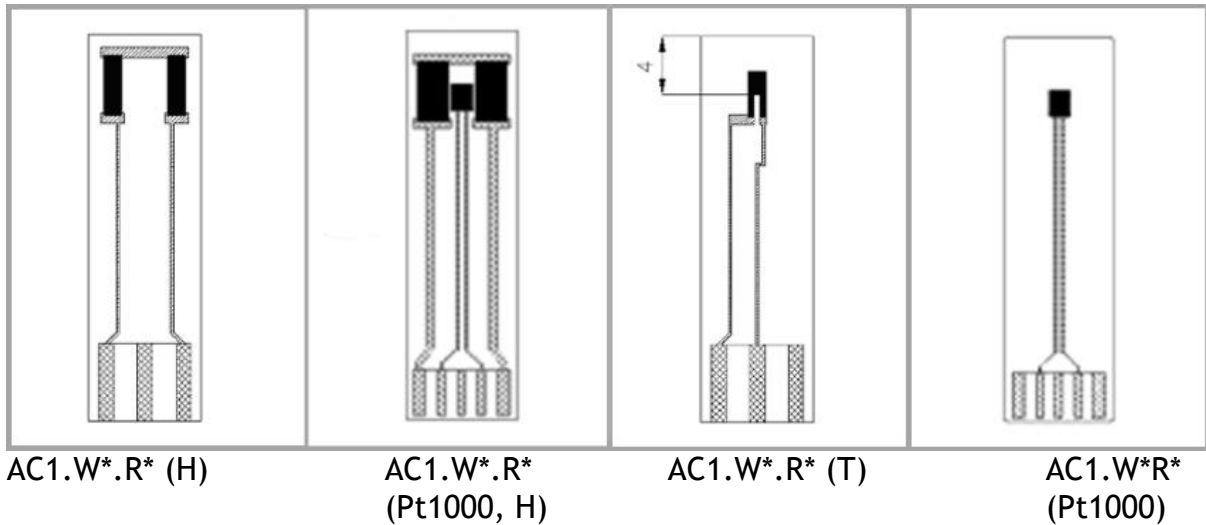
Electrode Materials are defined by:

AC1.GP.W*.R*.A* (*)

The asterisk is replaced by the appropriate number or letter.

AC - Amperometric sensor or electrode on corundum ceramic base	
AC1 - Sensor group reference number	
GP - Guaranteed purity	
A - Auxiliary electrode material (standard ink for screen printig)	R - Reference electrode material (standard ink for screen printig)
S - Alloy of Gold and Platinum	S - Silver
1 - Gold	1 - Silver / Silver Chloride
2 - Platinum	2 - Silver covered by AgCl
3 - Pure Silver	(*) - Additional Technical specification
4 - Carbon(Graphite)	H - Heating of the sensor
	T - Temperature sensing element
W - Working electrode material (standard layer thickness 0.0125 mm, guaranteed purity up to 99.99% depending on the selected material)	
Gold, Platinum, Silver, Copper, Iron, Nickel, Cobalt, Chromium, Tantalum, Irridium, Rhenium, Magnesium, Palladium, Zirconium and others	

**Selection of sensor electrode materials other than those listed above is possible upon agreement with the customer.*



Heating parameters:

Maximum voltage is 35 V and temperature approximately 500°C, resistance: 80 +/-10 Ohm.

Temperature sensing element:

- 1) resistance paste - resistance 160 Ohm, coefficient K= 6100 ppm/K
- 2) Pt1000

Evaluation units

- PalmSens
- eDAQ

Connector types for AC1 sensors range

	KA1	KA1.S	KA1.C	KA4
AC1.W*.R*	✓	✓	✓	✓
AC1.W*.R*(H)				✓
AC1.W*.R*(T)				✓

Recommended Accessories

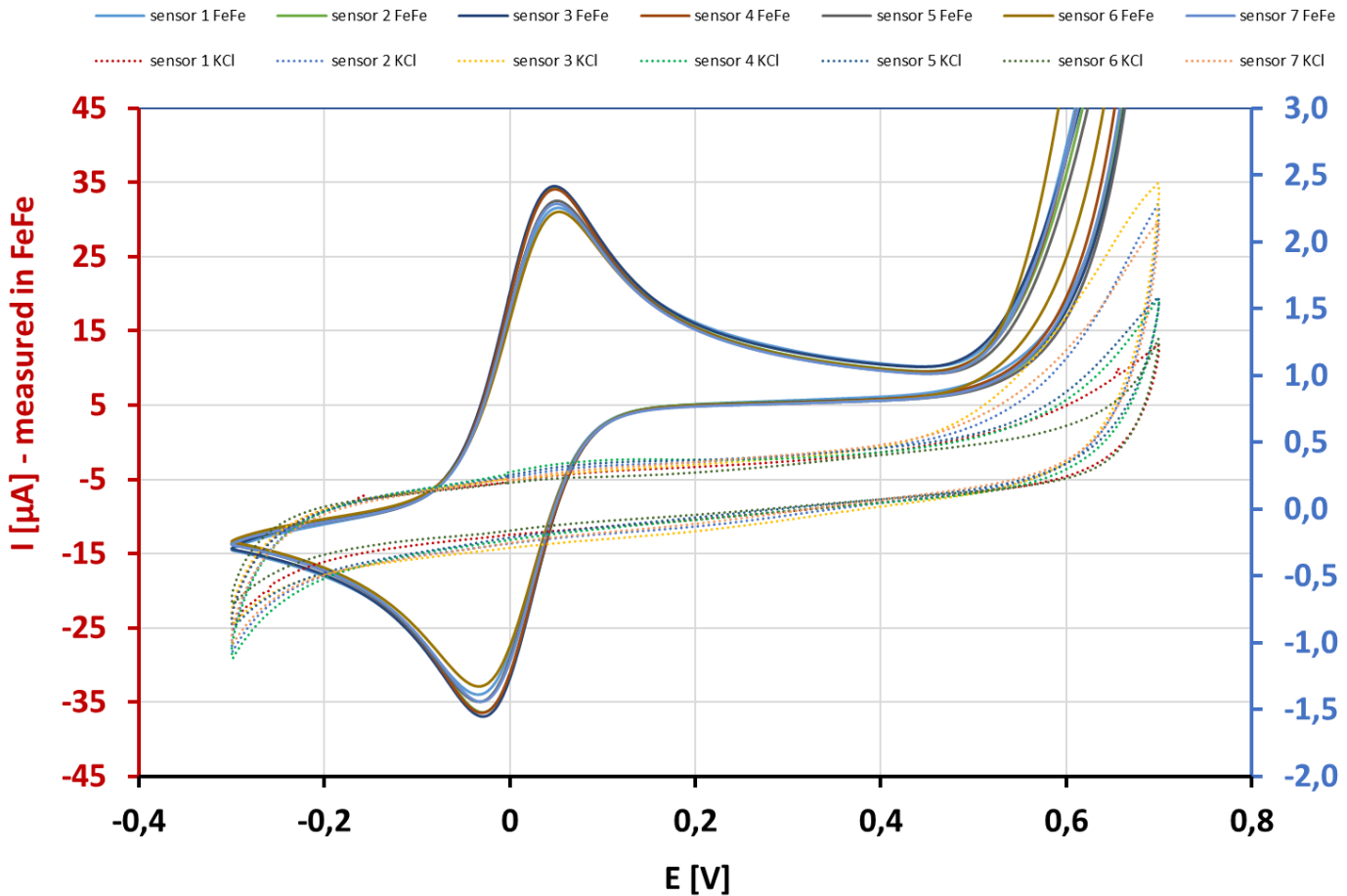
- FC2, FC4, TC4, TC5, TC6, MT

Sensor Usage

The specific range of sensors enables the measurement of basic electrochemical and bio-electrochemical techniques.

Typical Sensor Response

Example of response of 7 selected sensors with working electrode diameter from pure Platinum of guaranteed purity 99.95 % and diameter 2 mm, layer thickness 0.0125 mm.



Measurement specification:

- Cyclic voltammetry, scan rate: 50 mV/s, potential range: -0,3 to +0,7V
- Temperature: 20 °C
- Working electrode: sensor AC1.GP. W(Platinum 99.95%).R*.A2, $D_w = 2$ mm

Chemicals:

- 1 M KCl
- FeFe: 0.005 M $K_3[Fe(CN)_6]$ + 0.005M $K_4[Fe(CN)_6]$ in 0.2 M KOH

Measured with ERS (external reference system - stable)

- Reference electrode: RCEc.RS.R5
(external Ag/AgCl electrode (filled with 1M KCl))
- Auxiliary electrode: ACEc
(external Pt electrode)

Related patents

- US20080169191A1
- CZ2005294A3

References

- Jan Krejčí, Jan Prášek, Lukáš Fucik, Sameh Khatib, Edita Hejátková, Luboš Jakubka, Louisa Giannoudi, Screen-printed sensors with graphite electrodes – comparison of properties and physical method of sensitivity enhancement, *Microelectronics International*, 2004, Vol. 21 Issue: 3, pp.20-24, <https://doi.org/10.1108/13565360410549684>
- Andrew C. Barton, Stuart D. Collyer, Frank Davis, Davinia D. Gornall, Karen A. Law, Emma C.D. Lawrence, Daniel W. Mills, Suzy Myler, Jeanette A. Pritchard, Mark Thompson, Seamus P.J. Higson, Sonochemically fabricated microelectrode arrays for biosensors offering widespread applicability: Part I, *Biosensors and Bioelectronics*, Volume 20, Issue 2, 2004, Pages 328-337, ISSN 0956-5663, <https://doi.org/10.1016/j.bios.2004.02.002>.
- Jan Krejčí, Lucie Ježová, Radka Kučerová, Robert Plička, Štěpán Broža, David Krejčí, Iva Ventrubová, The measurement of small flow, *Sensors and Actuators A: Physical*, Available online 6 September 2017, ISSN 0924-4247, <https://doi.org/10.1016/j.sna.2017.08.050>.

Ordering information

- The order is specified by whole sensor description formula
- Minimum order quantity - 100 sensors
- All order quantities are to be in multiples of 20 e.g. 100, 120, 140, 160 etc.
- Delivery time for standard AC1 sensors is 4 weeks from receipt of order
- Delivery time for non-standard AC1 sensors depends on final technical specification of order (see customer screen printed electrode questionnaire)

Examples of Order

- 100 pieces - AC1.GP.W(Platinum 99.95%).RS.A2