

ELECTROCHEMICAL SENSOR

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

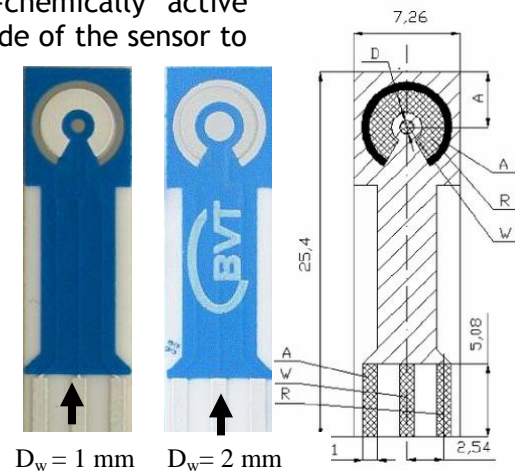
Description

The sensor is formed on a corundum ceramic base. On to this surface the working, the reference and the auxiliary electrodes are applied. The working and the auxiliary electrodes are made of variety of materials. At the end of the sensor there is a contacting field which is connected with the active part by the silver conducting paths which are covered by a dielectric protection layer. A bio-chemically active substance can be immobilised 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 corresponds to the ISO standard) is used as the temperature sensor.

Physical Parameters

Dimensions:

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



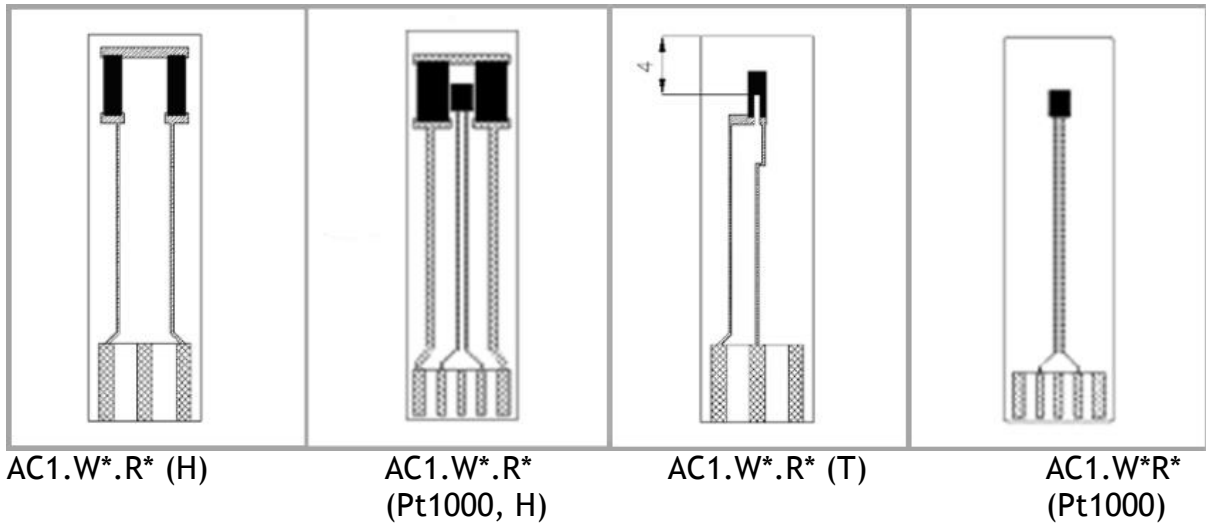
A = 4.00 ± 0.05 mm
 D = 1.00 mm or 2.00 mm

Electrode Materials are defined by:

AC1.W*.R* (*)

The asterisk is replaced by the appropriate number or letter.

A - Amperometric sensor or electrode	R - Reference electrode material
C - Corundum ceramic base	S - Silver
1 - Sensor group reference number	1 - Silver / Silver Chloride
W - Working electrode material	2 - Silver covered by AgCl
S - Alloy of Gold and Platinum	(*) - Additional Technical specification
1 - Pure Gold	H - Heating of the sensor
2 - Pure Platinum	T - Temperature sensing element
3 - Pure Silver	
4 - Graphite	



Heating parameters:

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

Thermistor:

- 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)				✓

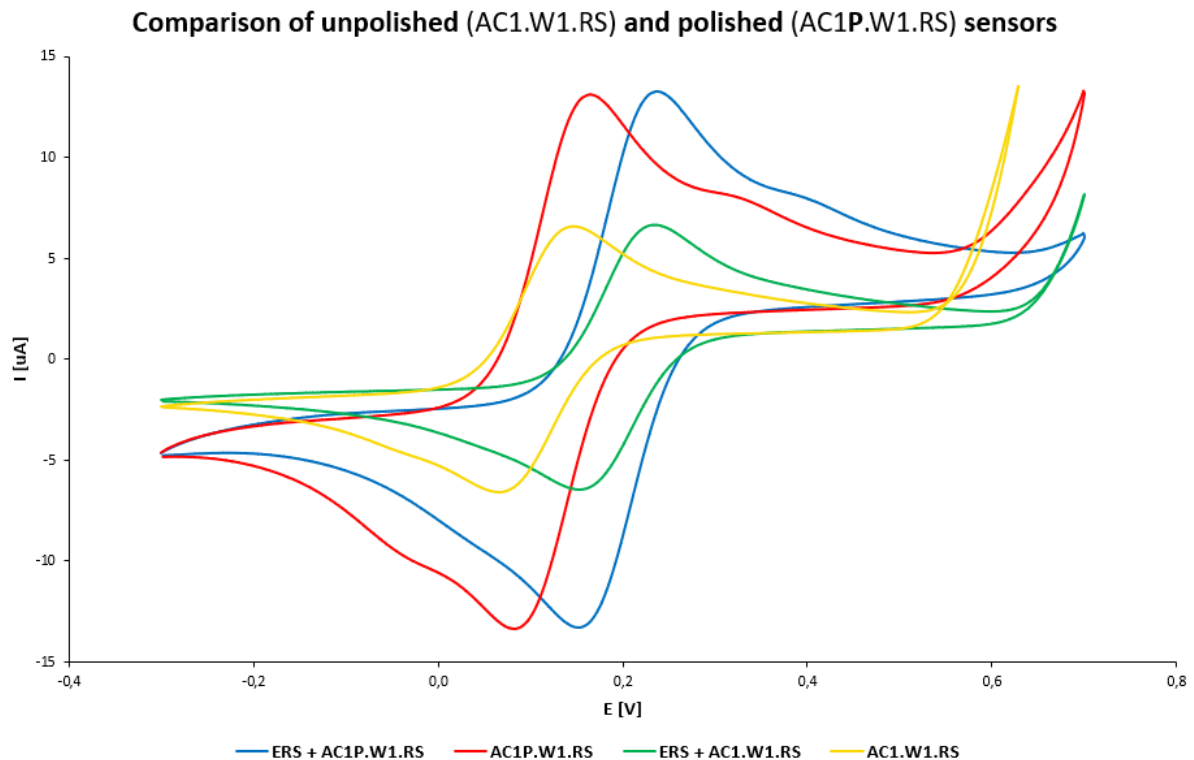
Recommended Accessories

- 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



Measurement specification:

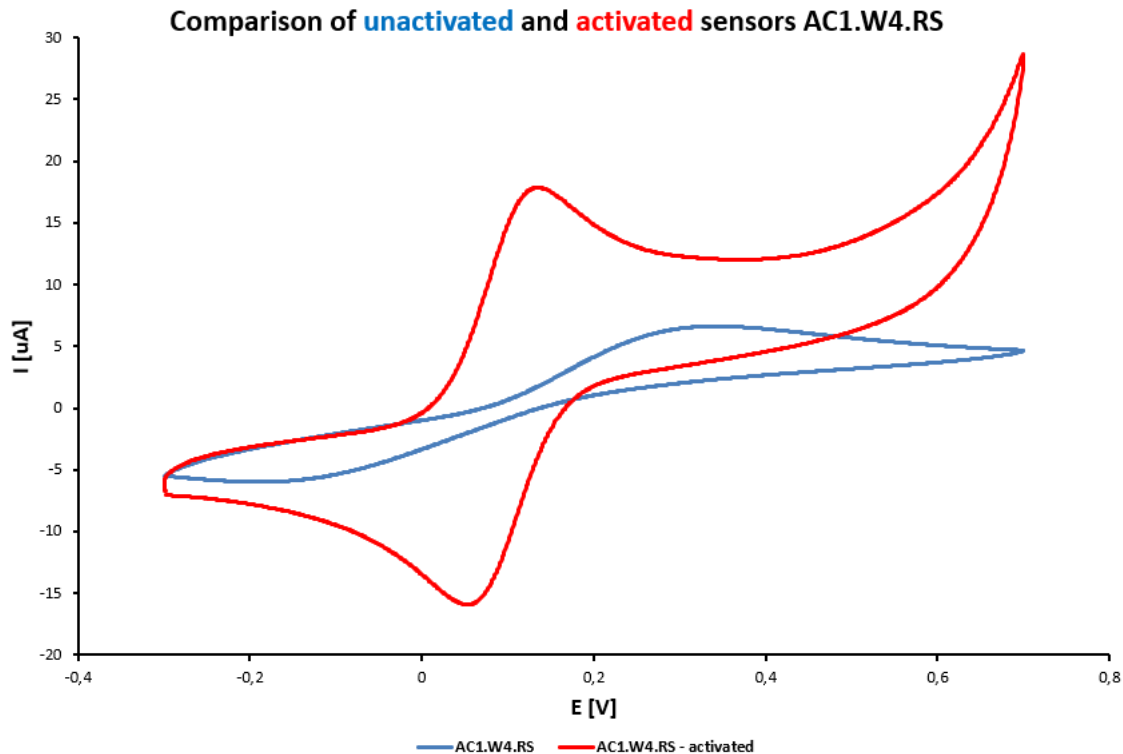
- Scan rate: 50 mV/s
- Temperature: 20 °C
- Working electrode: sensor AC*.W1.R*
- 1. Measurement with ERS (external reference system)
 - Reference electrode: RCEc.RS.R5 (external Ag/AgCl electrode (filled with 1M KCl))
 - Auxiliary electrode: sensor AC4.W1
- 2. Measurement with sensor
 - The sensor's internal auxiliary and reference electrodes were used

Chemicals:

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

Activation

Sensors AC1.W4.R* must be activated before usage. We offer unactivated version of AC1.W4.R* sensors. Activated version is produced on your demand also.



Measurement specification:

- Scan rate: 50 mV/s
- Temperature: 20 °C
- Sensors: AC1.W4.RS, AC1.W4.RS.a (activated sensor AC1.W4.RS)

Chemicals:

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

Related patents

PV 1994-864 (13.04.1994) utility design no. 6113/94

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 - 20 sensors
- All order quantities are to be in multiples of 20 e.g. 20, 40, 60, 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.W2.R1
- 200 pieces - AC1.W3.RS (H)