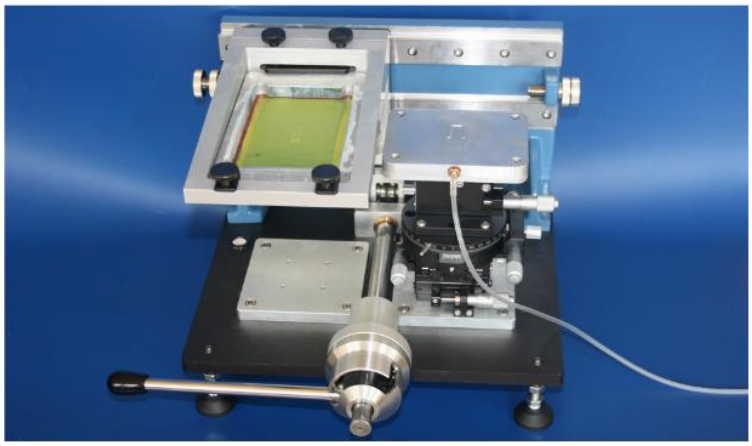
CATALOGUE 2016

BVT Technologies, a.s.



BVT Technologies

Contact us for more information
E-mail: info@bvt.cz
Tel.: +420 563 034 298
www.bvt.cz
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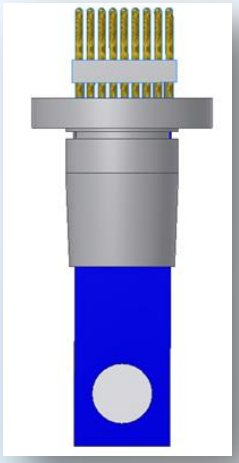
NEW PRODUCTS

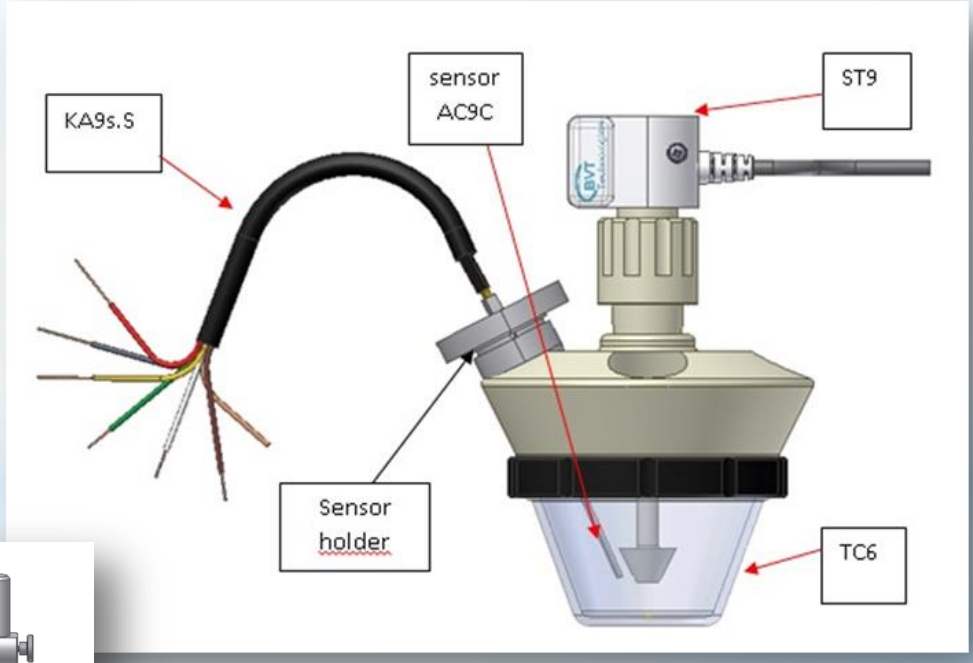
Arrangement for measurement with multiarray electrode

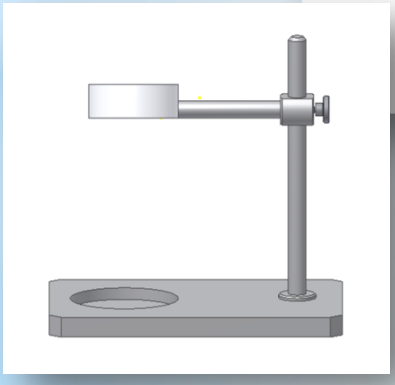
AC9C **electrochemical sensor** with an array of **8 working electrodes and 1 common reference electrode**. It is used as a biosensor substrate **for multi-analyte detection**. A connector is integrated at the end of the sensor. **Different enzymes can be put on the working electrodes** of the sensor.



Sensor holder

The electrodes can be made of **variety of materials (Au/Pt, Au, Pt, Ag, C). Materials are applied by screen printing or sputtering.**

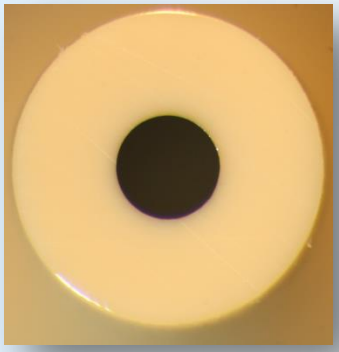




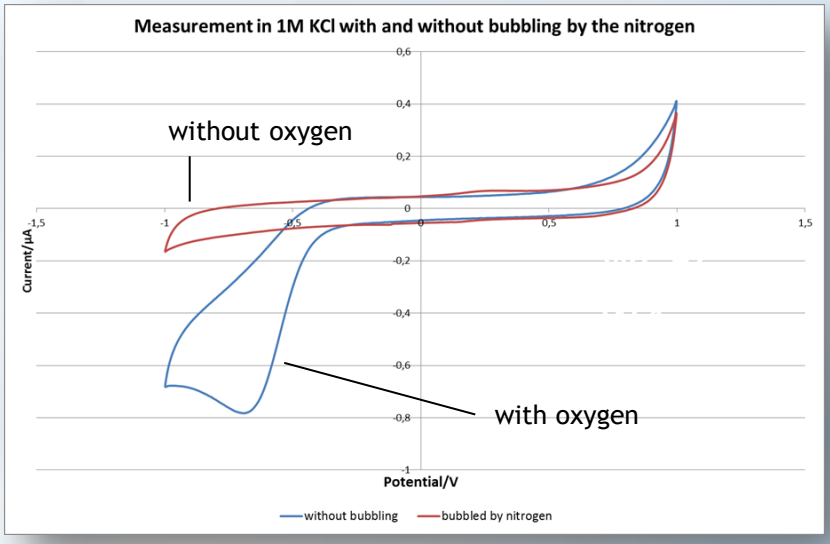
Universal stand for TC6

The construction of stirrer assures **the optimum mass transport with minimum hydrodynamic noise in revolution range 10 - 1300 rpm**. Stirrer is produced from **high quality PEEK material which is chemically resistant**.

Glassy carbon electrode WCEc.W4



- ✓ **Roughness better than 1 micrometer**
- ✓ working classic electrode (WCE) with the NJ 10/13.
- ✓ **It can be inserted in TC4, TC5, TC6 glass cells.**
- ✓ Standard cable length **WCEc.W4c** is 1.5 m.
- ✓ Connecting wires (or banana plugs) - red



Capacity at the zero voltage	
	WCEc.W4
I_c (U_0) (A) *	4,395· 10^{-8}
scan rate (V/s)	0,1
C_c (F) *	**4,40· 10^{-7}**
scan rate (V/s)	-0,10
I_a (U_0) (A) *	-4,49· 10^{-8}
C_a (F) *	**4,49· 10^{-7}**

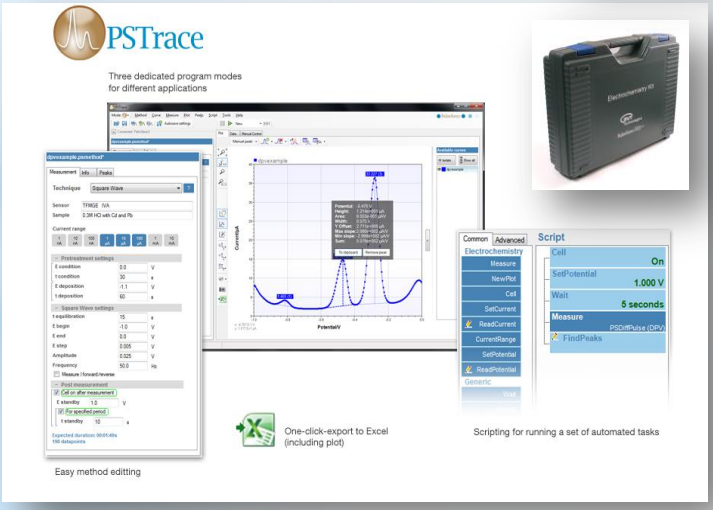
c* catodic, a anodic

Differential resistance	
	WCEc.W4
U_{1c} (V) *	0,05
I_{1c} (A) *	4,36· 10^{-8}
U_{2c} (V) *	0,4
I_{2c} (A) *	5,50· 10^{-8}
dR_c (Ω) *	**3,07· 10^7**
U_{1a} (V) *	0,05
I_{1a} (A) *	-4,303· 10^{-8}
U_{2a} (V) *	0,4
I_{2a} (A) *	-3,20· 10^{-8}
dR_a (Ω) *	**3,18· 10^7**

Starter kit for **Electrochemistry (SK4E)**

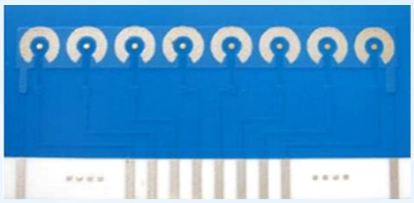
The kit consists of:

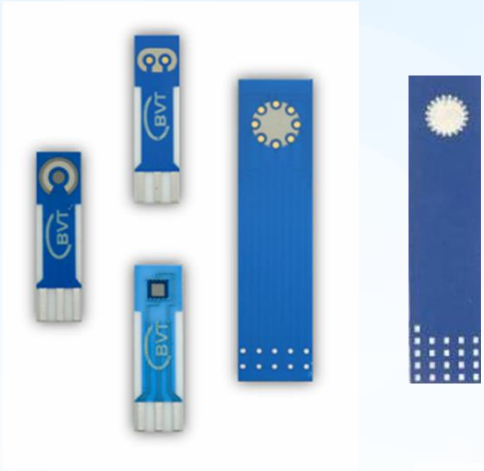
- **EmStat Blue** (potentiostat with integrated Bluetooth) or **PalmSens 3 EIS**
- **TC4 cell** (a glass cell with 5 openings) **with 3 stoppers** (for the glass cell)
- **stirrer ST1** (controlled via the PalmSens3 EIS, designed for TC4)
- **BVT classic electrodes** or **screen printed electrodes (with connector)**

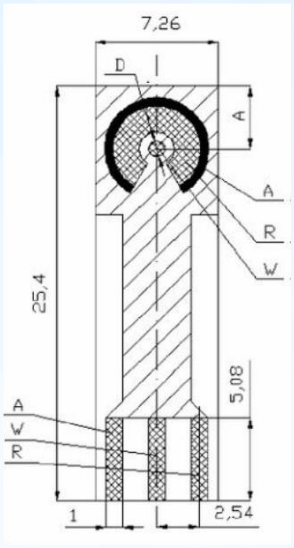


With this set of electrochemical equipment all you need to start your electrochemical experiments are chemicals and solutions. With the functional, convenient and high quality equipment of BVT and the portable, economical and easy to use research grade potentiostats of PalmSens. The SK4E enables you to carry out many educational and practical electrochemical measurements.

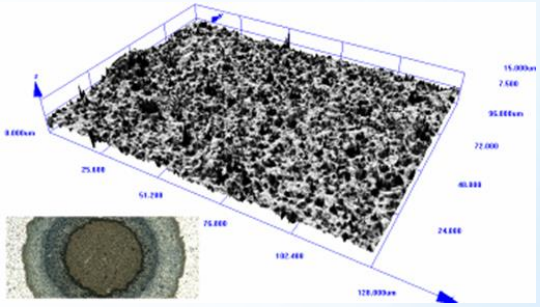
ELECTROCHEMICAL SENSORS



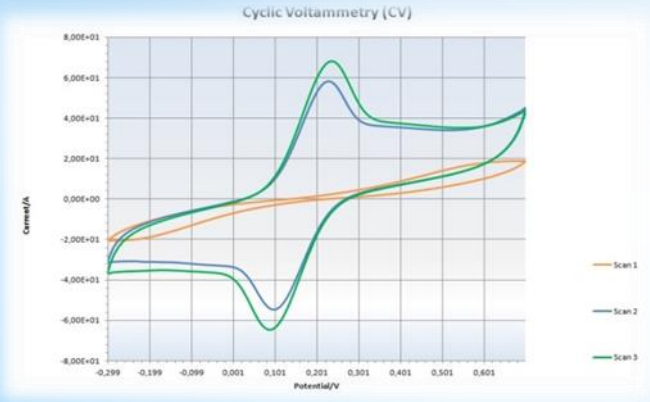




DIFFERENT MATERIALS ON WE
We can offer you not only – **Au/Pt, Au, Pt, Ag, C** but Ni, Cu, and other materials in **1 or 2 mm diameter of WE** as well



BIOSENSORS
We can offer you sensor **with immobilized AChE** (for detection of organophosphorous and carbamate pesticides, toxic and neurotoxic gases,...), **GOD** (for glucose measurements), **LOC** (for lactate measurement)



Usage in measurement of:
- Basic electrochemical and bioelectrochemical techniques (H_2O_2; $Fe(CN)_6/Fe(CN)_6$…)
- Glucose
- Toxicity caused by pesticides
- Enzyme activity
- Ferro – Ferricyanide couple

HIGH-PURITY MATERIAL ON WE
We can provide polished working electrode – AC1P or insert a high-purity material on WE (99,9%). The WE can be applied by sputtering.

ELECTROCHEMICAL SENSORS

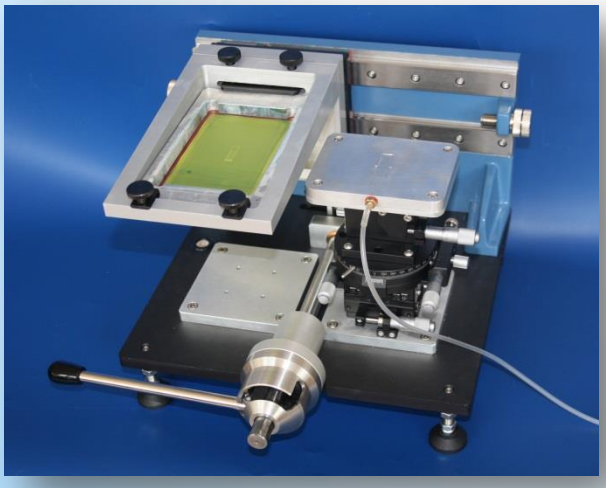
MEASUREMENT OF SMALL VOLUMES
We offer you the **AC1 sensor with integrated microreactor (MAC)** for measurements of volumes of 20 µl in a closed system
- SENSOR with microreactor
- patent applications PV 2009-22
- small volume and reactor size means that the diffusion can assure equilibrium of concentration in the solution
- when using toxic materials there is minimum contamination risk
- the volume is not changed during measurement by exaporation (the system can be closed)
- it allows to mix its content by shaking

CONDUCTOMETRIC SENSORS
CC1 – the band 150 um, the gap 200 um
CC2 – the band 50 um, the gap 50 um
CC3 – the band 20, 10 um, the gap 20, 10 um

TEMPERATURE SENSING INTEGRATION
All sensors can be equipped with heating and temperature sensors are also offered with Temperature sensing element
Thermistor (must be calibrated) x **Pt 1000**
(response in agreement with the ISO standards)

DIFFERENT TYPE OF STRUCTURE OR DIMENSION
We can produce sensors according to your demands

OWN SENSOR MODIFICATION
Manual Screen Printer



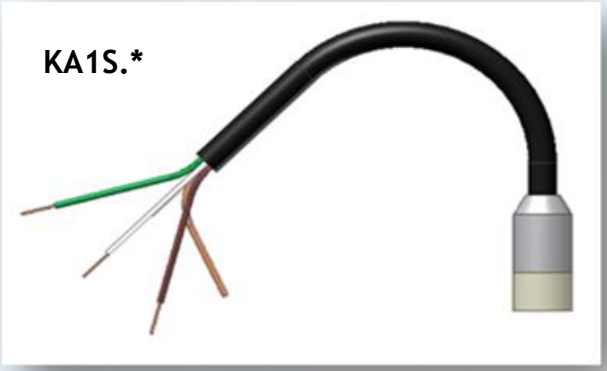
X axis adjustment 0…10 mm resolution 10 µm
Y axis adjustment 0…10 mm resolution 10µm
Angle adjustment 0…360° fine angle adjustment 0… 15° resolution 1°
Height adjustment 0…10 mm resolution 10µm
Repeatability of position adjustment 10 µm
Dimensions: 350 x 250 x 300 mm

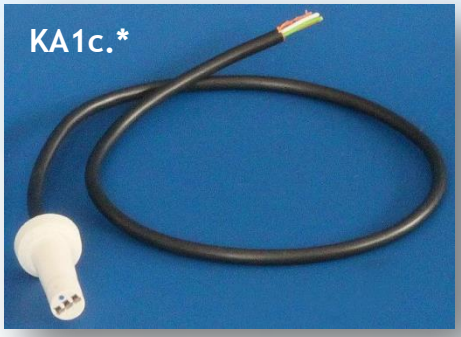
Clamping vacuum table for AC1 customer design
Screen and squeegee

We offer **training in device use.**

CONNECTORS

SIMPLE CONNECTOR FOR ELECTROCHEMICAL SENSORS
The connector **enables the use of the biosensor** based on the substrates AC1, AC4, AC11, AC13, AP1, CC1, CC2 and TS1 **in glass BVT vessels TC2, TC3, TC4, TC5 and TC6.**





STIRRER

- **optimum mass transport**
- **minimum hydrodynamic noise**
- **supply voltage 3 V and current max 100 mA**
- **enable to use it as USB device.**
- **revolutions range: 10 - 1300 rpm**

CLASSIC ELECTRODES

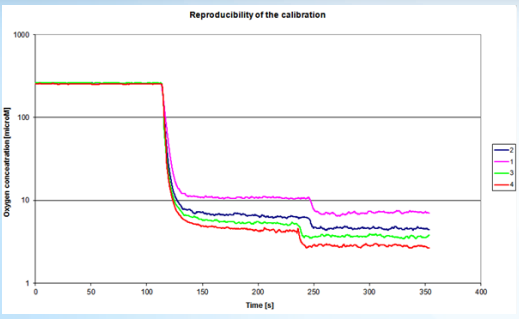
The Working, Auxiliary and Reference (counter) electrodes, are electrodes used in a three electrode electrochemical system for voltammetric analysis.

All electrodes are equipped with NJ 10/13 which enables their use in standard chemical apparatuses. All electrodes are in size approx 40 x ø 6 mm. Their reduced size enables to use small amount of chemicals.

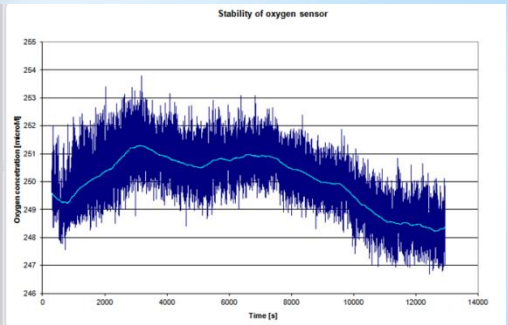
WCE is a glass rod with a Pt or Au wire inside. The electrode ends with polished active surface of 1 or 2 mm^2.
ACE is a glass rod with platinum wire or foil at the end.
RCE is a glass hollow tube with silver or silver covered by silver/silver chloride wire inside. Glass frite is at the end of electrode creating liquid junction. The tube is hollow with the hole in the wall for inserting KCl solution. Hole is covered by a rubber band

Miniature Oxygen Electrode

The miniature oxygen electrode consists of a chemically resistant PEEK body, platinum electrode, silver reference electrode and membrane holder. The platinum electrode is melted in glass. The membrane holder with electrolyte is attached by thread. Oxygen electrode (OE) is designed for mounting in side opening NJ 10/13 of electrochemical glass cells (TC4, TC5, TC6).



Response to Na_2SO_3 addition



Long term stability

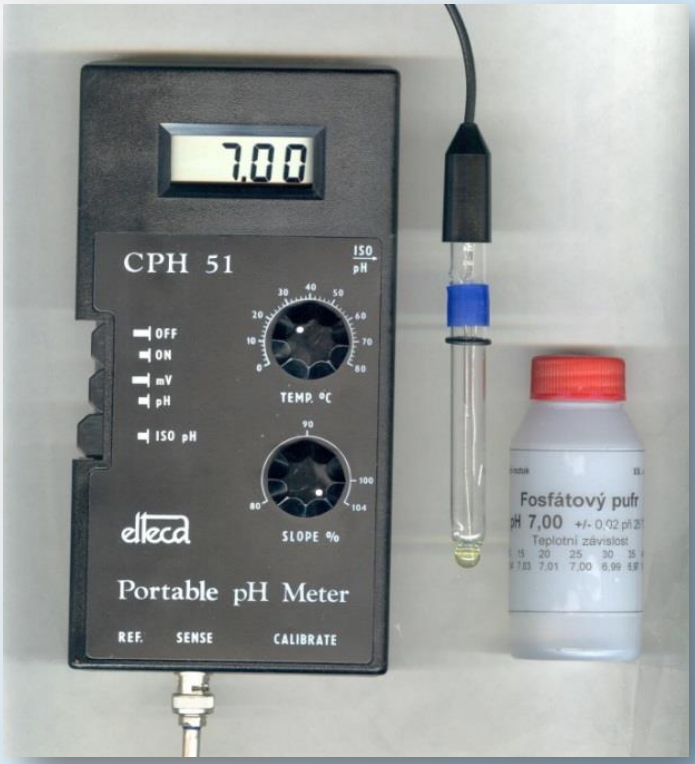
ISE and pH Electrodes

ISE electrodes allow direct measurements of **Ammonium, Lithium, Sodium, Calcium, Fluoride, Nitrate, Potassium and Barium. They are produced in standard dimensions diameter of 12 mm and with a lenght of 100 mm.**
ISEs enable routine analyses in agriculture and food processing, soil analysis, environmental analysis, tribotechnical analysis and explosives and pyrotechnical mixtures analysis. They can be used for water, pot-, waste-, boiler-, mineral-, and well water samples, They can be applied in research laboratories, biochemical process control, chemistry and other educational laboratories, and many others.

Electrodes are applicable to all commonly used measuring apparatuses, with internal resistance above $10^9\Omega$. Coaxial cable with BNC connector. The work with ion selective electrodes is time effective, requires only a small amount of chemicals, therefore, it is cost-effective.
Standard cable length of Ion Selective electrode is 1.5 m

pH Electrodes are traditionally, for a very long period of time, nearly a century, successfully used sensors for potentiometric determination of H^+, respective H_3O^+ activity, expressed in commonly used pH units. These measurements are, perhaps, done in all fields of research, development, process, and in other human activities

Electrodes are applicable to all common measuring apparatus with inner resistance of 109 ▫or more. Standard electrical connecting element is 0,8 to 1 mt. coaxial cable, specially low noise, with BNC connector.



GLASS CELLS

Hand made glass cells for electrochemical measurements which enable measurements with miniaturised BVT classic electrodes. The cells have a lid with NJ openings (NJ 10/13, NJ 12/10) – to fix electrodes or stirrer in the cell.

Types of glass cells:

TC2, TC3 – termostated by external thermostat

TC4 – conic openings, termostated by MT1

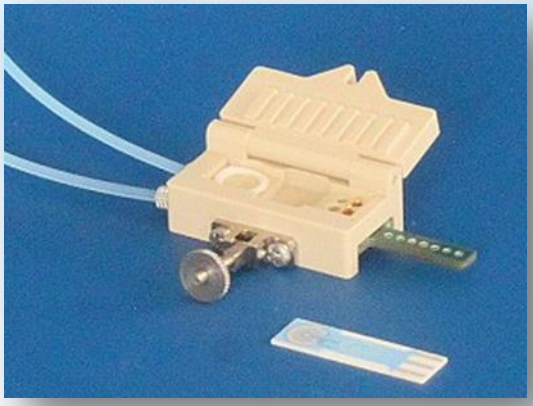
TC5 – conic openings, termostated by external thermostat

TC6 – conic openings, **easily washable**

NEW TYPES OF STOPPERS
for prevention of solution **evaporation, for bubbling, for dosing** by tubes or for measurments in an inert atmosphere.

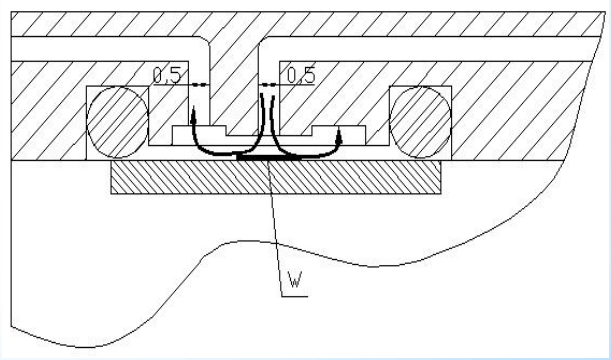
FLOW CELLS

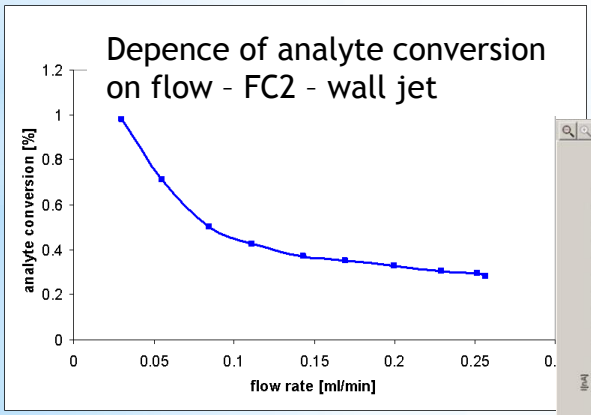
The flow cell enables the use of AC1, AP1, CC1 sensor in a flow through arrangement. The sensor is inserted into the slit of the cell and tightened by closing of the door. The cell ensures the wall-jet flow around the working electrode and it is optimised so that no air bubbles cumulate in the cell. The cell also contains the contact and output cable.



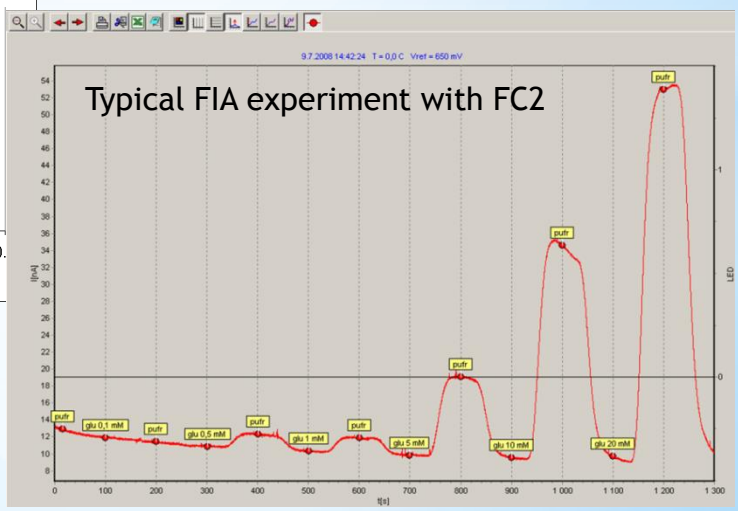
Cell Material

FC2, FC3 - Polymetylmetacrylate
FC4 – high quality chemically resistant Polyether ether ketone (PEEK) FC4 – micro fluidic connectors permitting a fully compatible connection to chromatography tubing





We offer flow cells on demand of customers.



LINEAR AND PERISTALTIC PUMPS

The linear pump LP.* designed for extremely **small applications**. It can be used in hand-held devices. The main advantage is **no pulsation** and **easy connection** with syringe piston. The pump can supply liquid through flow cells FC2/FC3.

- ✓ Portable device
- ✓ Hand-held usage
- ✓ Pulse free flow
- ✓ Low power application
- ✓ Flow rate: 0,1 - 250 µl/min
- ✓ USB seriál port for computer control
- ✓ Ability to start / stop pump
- ✓ Independent of PC connection
- ✓ Accuracy 2,5 %

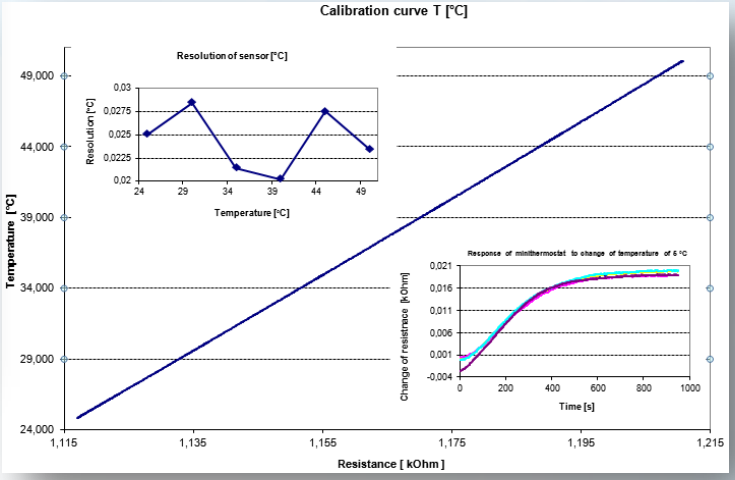
Peristaltic pumps – one or two channels

- Designed for extremely small applications such as medical or military applications
- Hand-held device
- The pulsation is minimized for flow cell FC2, FC4
- Tubing with required diameter should be specified by customer: 0,127 mm, 0,254 mm, 0,504 mm, 0,750 mm or 1,016 mm

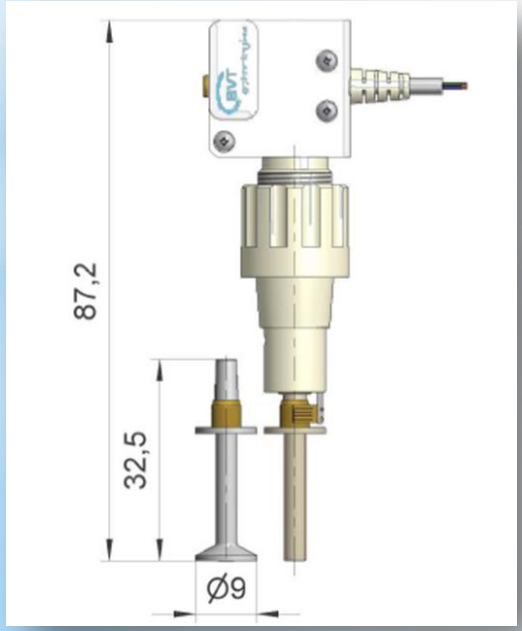
- Consumption: typical 100 mA
- USB seriál port for computer control
- Ability to start / stop pump
- Independent of PC connection
- Supply: Low power application - USB or battery operation

Minithermostat

- allows temperature control in range: -9,9°C and max. temperature: 59,9 °C
- technical parameters
- supply: 12V
- for TC4, TC6



Mini Rotating Disc Electrode



- optimum mass transport
- minimum hydrodynamic noise
- consists of TC4 glass cell, control electronics and SW
- enable to use it as USB device
- revolutions range: 10 - 1300 rpm

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