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## Coulometric Hydrogen Generator G 200

A microprocessor-operated device for the stepless *online* generation of hydrogen standard solutions with integrated degassing module.

**Accurate - Comfortable – Fast – Ideal for sensor calibration**



Nearly all measuring instruments and sensors for the determination of dissolved hydrogen have to be calibrated. But the usual calibration with standard solutions, produced by bubbling hydrogen into an aqueous solution, has some disadvantages. On the one hand, it is problematically to get really 100 per cent saturated solutions, because supersaturation or undersaturation of the solution is simply possible and difficult to identify without any calibration-free determining methods. On the other hand, a one-point-calibration is uncertain for a lot of sensors and analytical methods. Furthermore, the consumption of chemicals (H<sub>2</sub> from the pressure gas cylinder or H<sub>2</sub>-generation from HCl/Zn by means of a Kipp gas developer) is not economically and the difficult handling is not reliable.

The above mentioned problems could be avoided, if the hydrogen standard solutions are generated electrochemically. The coulometric Hydrogen Generator G 200 allows

the stepless and dynamic *online* generation of standard solutions within a range of 0,3 µg/l to 500 µg/l with a high accuracy and reproducibility at various flow. The standard solutions are produced in the generator directly without any dilution. An additionally check up of the generated standard solution is not necessary. The reason for this is, that the coulometric generation is a calibration-free method based on the Law of Faraday. The direct electrochemical generation of hydrogen standard solutions leads to very homogeneous standards and supersaturations or undersaturations can be excluded. Because the *online* generation of H<sub>2</sub> standard solutions requires degassed carrier solutions, the G 200 includes a degassing module serving for a constant continuous quality of the carrier solution. Costs for any chemicals or pressure gas cylinders can be saved too.

# Technical Data

Dimensions (LxWxH):	220 mm x 160 mm x 250 mm
Power supply:	230 V AC, power supply unit included
Flow rate:	1 ... 2 ml/min (others on request)
Concentration range:	0,3 ... 500 $\mu\text{g/l H}_2$
Accuracy:	$\pm 0,25 \%$ (without consideration of the pump device and provided that gas- and metal ion-free carrier solutions are used)
Efficiency of degassing:	e.g. residual oxygen content: $< 35 \mu\text{g/l}$
Start phase:	1. degassing phase: approx. 20 minutes 2. first concentration adjustment time: approx. 25 minutes (depends on breaks of the generator and on the volume of the flow through system) reduced start phase possible by simultaneous starting of 1. and 2.
Time for concentration change:	approx. 5 minutes
Calibration points per hour:	10
Capacity of the drying substance:	approx. 4 working days (colour changes from blue to red)
Electrode capacity:	no limit (Recycling of the electrode surface is necessary, if unsuitable carrier solutions are used, or if the device is stored without any liquid over a long time)

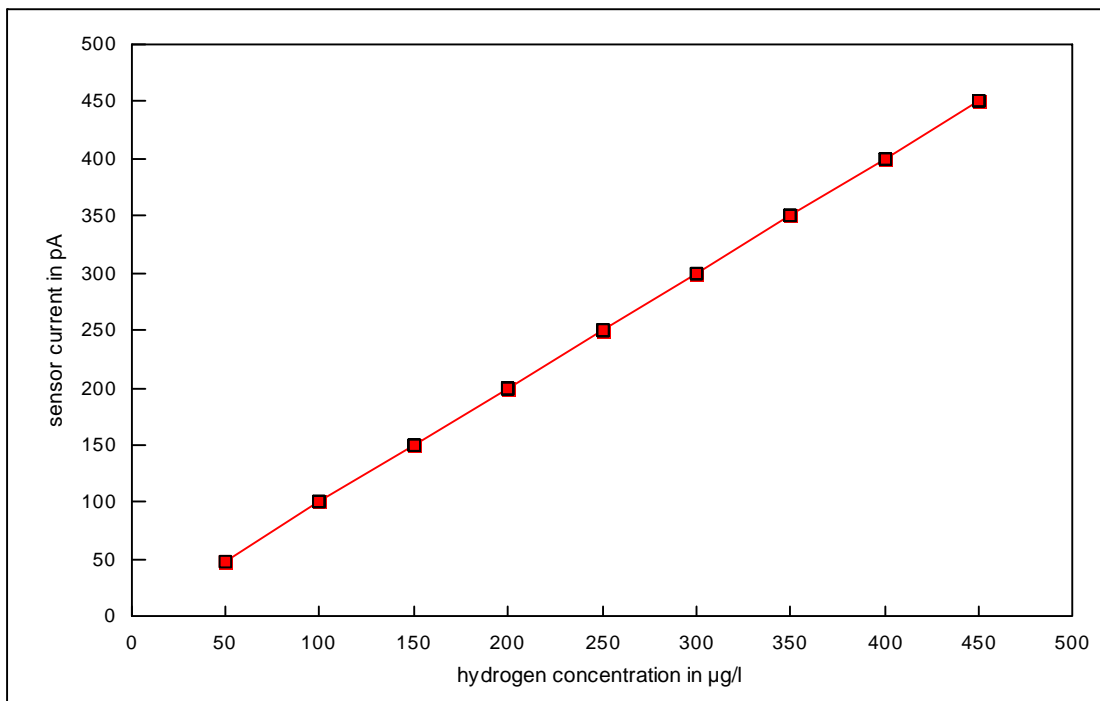


Fig.: Generation of  $\text{H}_2$  standard solutions in 0,02 N NaOH with the electrochemical  $\text{H}_2$ -Generator G 200, Check up of the standard solutions with the amperometric hydrogen micro-sensor.