



Overview



PGU-OEM H₂ with Devanathancell

Potentiostat/Galvanostat

- Two modules in one enclosure:
 1. one with higher current for charging
 2. one with higher resolution for hydrogen measurement
- High resolution interface: 24 bit data acquisition, 26 bit scan resolution (330 nV)
- Communication via USB or Ethernet
- Main Power 115 V/230 V
- In combination with a Devanathan cell a system for measuring hydrogen permeation through a (steel) plate can be established.

Description

The **PGU-OEM-H₂** consists of two modules in one enclosure. It is predesigned for the use with our double cell for investigation of the hydrogen permeation. One module is for the charging side while the other one is responsible for the hydrogen permeation measurement. The idea of this design is the double galvanic isolation of the modules and the low noise setup by reducing cables and other parts which can catch disturbance from the environment. This is very important for hydrogen permeation measurement. Any leakage current between the devices on additional ways than via the electrochemical cell distorts the measurement result. By testing materials that are high resistant against hydrogen permeation for example, the expected permeation current is in a range of 5...10nA. Any leakage current could be higher if it is present.

The devices include a built-in measuring and automation system, the EcmWin measuring software and the evaluation software EcmView. The modules can also work complete separate for different experiments. For hydrogen permeation measurement, the devices are managed by the software. It manages the start/stop of the galvanostat when permeation will be undershot /exceed. So a permeation measurement can be predefined and run completely automatic. This method can be cycled and run as long as necessary.

The connection to the computer is established via USB or Ethernet. The measuring module works with 24 bit A/D converters while the scanner works with 26 bit (step size 330nV).

Technical details

Output parameter	
Compliance voltage	± 12V
Polarisation ranges	Potentiostat: ± 10V Galvanostat: ± 100mA / ± 2000mA
Current ranges	10 steps from 100 mA to 100 pA / 2000 mA to 10 nA
Resolution	1 nA = 10000 mV in 1 nA range, 0.1 pA = 1 mV 10 nA = 10000 mV in 10 nA range, 1 pA = 1 mV
Supply parameter	
Supply voltage	230 V AC, 100-240V, 47-63 Hz.
Supply current	1.6A
General parameter	
Modes	Potentiostat and Galvanostat
Impedance analyzer	optional
Electrode connections	2, 3,4 Electrode (CE, RE, WE, WE-Sense)
Floating mode	Yes
Electrometer input impedance RE	10 ¹³ Ω
Bandwidth	50kHz
ADC	24 bit, max. resolution 1 μV
DAC	26 bit at ±10 V → 330 nV steps
Resolution of setvalue	< ±1 mV, ±0,02 %
Resolution of measurements	< ±1 mV, ±0,02 %
Sample rate	Standard 200 Hz at 24 bit, 1 kHz at 18 bit
Interface	Ethernet/ USB
Software	EcmWin, EcmView
Methods	OCP, hold experiments, reversed scan cyclic voltammetry, chronoamperometry, sequence measurement with battery charging and discharging functions, measurement current density versus time, current density versus potential, H ₂ -method
Additional inputs	none
Additional outputs	none