Metrohm Autolab
Microcell HC

Integrated system for conductivity measurements

Metrohm
Autolab


AUTOLAB
designed by rhd instruments
Microcell HC
20.0
20.0
Ack
Mode
AUTOLAB
rhd instruments
flexible cell solutions

Conductivity determination as you like it

Are you studying the **conductivity of liquid, polymer or solid electrolytes?**

No doubt you are concerned with the **cost** and **safety** of your **high value samples** and the **time** it takes for **preparation**. Maybe you are thinking about **automating your measuring routines** but don't have the right setup.

You may or may not need **active temperature control**.

Metrohm Autolab and our partner **rhd** have accessories that allow you to create the right **workstation**. Whatever your requirement we have the accessories to meet your need for **efficient, accurate conductivity measurements** no matter what your lab setup.

Typical applications

- Determination of the conductivity of liquid, polymer or solid electrolytes via impedance spectroscopy
- Analysis of temperature dependent conductivity values using Arrhenius- and VFT-methods
- Investigation of ion transport in porous media like anode and cathode materials for batteries and supercapacitors

Typical experimental setup and method

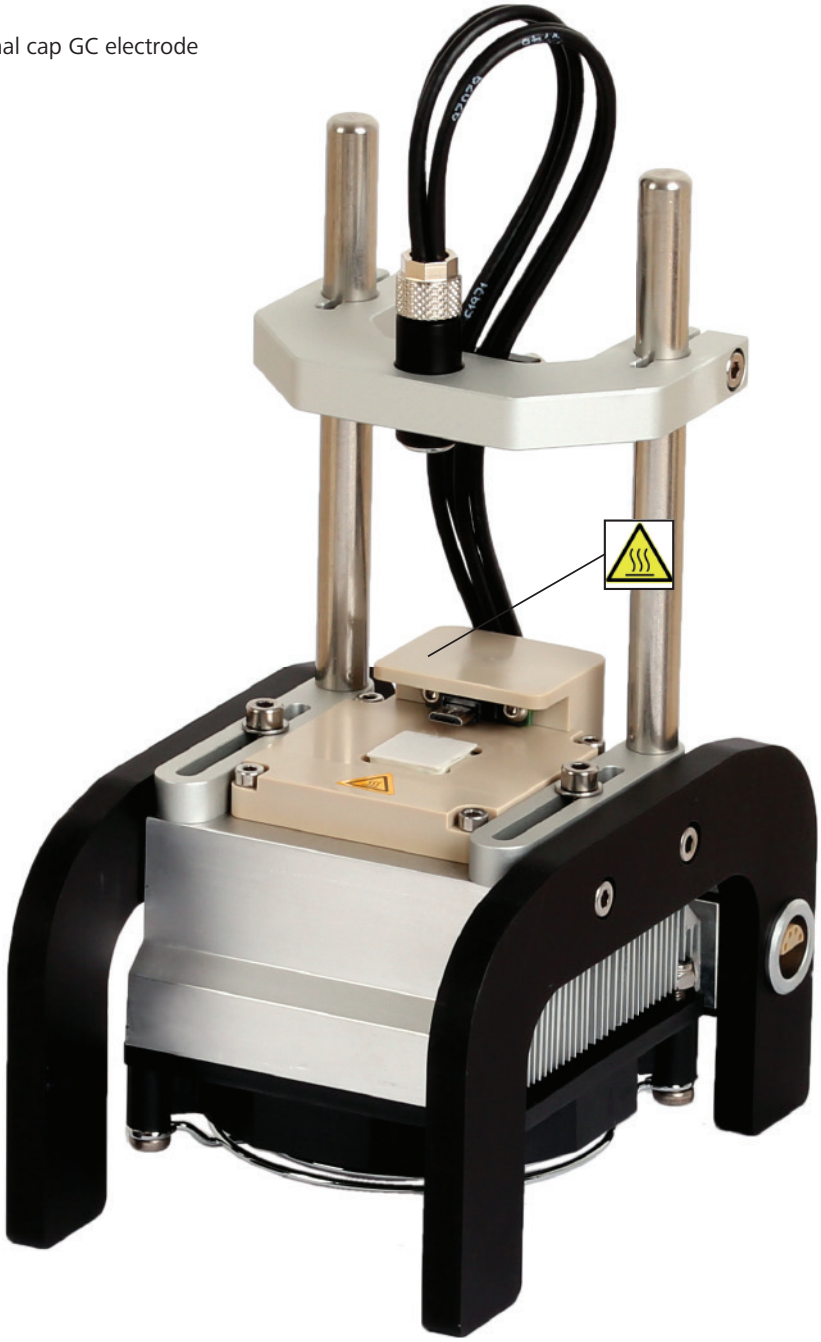
- Two-electrode setup
- Sample temperature is adjusted via NOVA software
- Impedance spectra are recorded (usually DC potential at OCP and using a small AC amplitude)

Autolab Microcell HC setup with PGSTAT204.

Conductivity - Active Temperature Control

Plug and play for **active temperature control** with the Autolab Microcell HC Conductivity Workstation which includes:

- Autolab PGSTAT204
- Autolab Microcell HC cell holder
- Temperature controller
- Measuring cells
  - TSC 1600 closed with additional cap GC electrode
  - TSC battery standard
- Cleaning and polishing kit



Optional accessory

rhd cooling box for low temperature measurements or below dew point.

Also includes all necessary cables, heat sink compound, serial connection kit, adaptor box BNC.
One item each as outlined.

Benefits of the Autolab Microcell HC

Conductivity with active temperature control

With the Autolab Microcell HC create more homogeneous thermal conditions:

- With **precision temperature control**, accuracy within 0.1˚C, the **Autolab Microcell HC** allows you to easily **fine-tune** your **temperature requirement** and assures **accurate reproducibility**.
- **Save time** when running experiments with the **quick heating Microcell HC**. The **Peltier - element** based temperature control ensures **precise** and **quick** adjustment of the **sample temperature**.
- **Monitor** the **temperature and progress** of your experiment with the **real-time** temperature display on the front of your Autolab Microcell HC.
- **Improve** experiment **efficiency** with the **Microcell HC standard cell cap** which has 4 working electrodes with 4 independent connector cables. You have **4 opportunities** to achieve a **successful measurement** without compromising your cell.
- **Autolab Microcell HC's cable relief bridge** and **high quality connectors** give **stability** and **support** to your experiment to ensure the **best measurement conditions**.

Experimental Evolution

- Autolab Microcell HC's **generous temperature range^** allows you to **validate** and **evolve** your experiments.
- The **Autolab Microcell HC** gives you the **flexibility** to **broaden** your **experimental horizons** with **exchangeable electrode tips** and **diverse electrode materials**.

Features
• Precision **temperature measurements**
• Time-saving **reproducibility**
• **Reduced** sample preparation time and sample costs

* -40°C to 100°C depending on measuring cell, set up and ambient temperature.

Specially Designed Cells For An Integrated System

- All cells **designed** for the **Autolab Microcell HC system** are made of **high quality materials:**
  - Gold or nickel plated thermoblock with Pt100 temperature sensor
  - Produced with PEEK for optimal chemical compatibility
- The **Autolab Microcell HC** with 1mL (1g) sample size saves you time on sample preparation and money with reduced sample costs.
- When working with **sensitive or dangerous** samples the **Autolab Microcell HC** is the choice for **safety**. Our system is **integrated** with our **airtight sealable measuring cells**.
- Simple to seal cell **also avoids evaporation, condensation (freezing)**, and **contamination**.
- Click and go! You have certainty that your **sample** is **positioned correctly** for accurate data collection with the Autolab Microcell HC **double click cell connector** feature.

Specifications	Microcell HC
• Temperature range	-40 °C - 100 °C
• Temperature accuracy	+/- 0.1 °C
• Temperature control rate	Peltier technique, up to 60 °C/minute
• Interface	Serial
• Minimum sample volume*	1mL

Features
• **Sample protection** with airtight and sealable cells
• Small sample size for **time and cost saving**
• **Made of robust high quality** materials

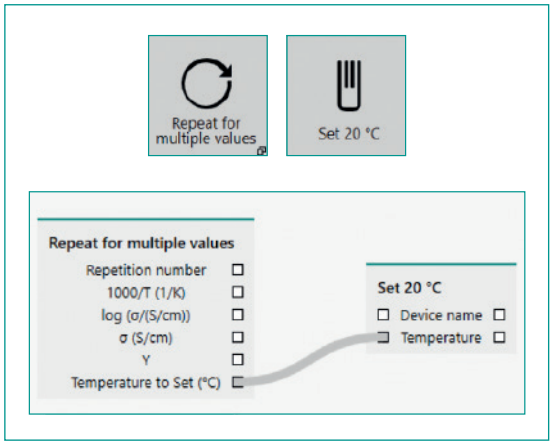
TSC 1600 Closed

TSC Battery

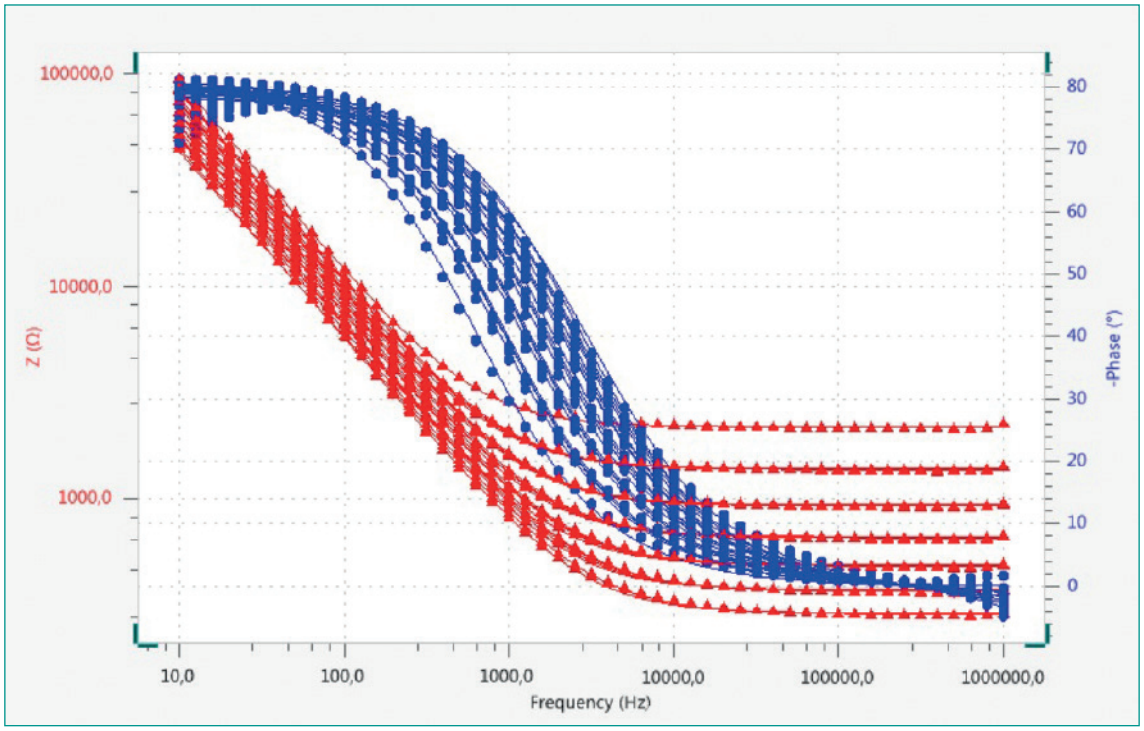
* A smaller sample size 70 µl is possible with a TSC 70 closed.

Automated Temperature Measurements with NOVA

- **Temperature controller** from the **Autolab Microcell HC** is **integrated** in the **NOVA software**.
- Work with the **NOVA interface** to **link temperature control** and **logging** with the EC measurement.
- Create more **efficient workflows** with **NOVA** and the **Autolab Microcell HC** by **automating** variable temperature testing procedures.
- With **NOVA** you can **store temperature data** with the **electrochemical data** to avoid lost information and **facilitate analysis**.



Commands from the NOVA software.



Temperature – dependent impedance spectroscopy measurement: Determination of an electrolyte's conductivity

Small and Powerful Autolab PGSTAT204

PGSTAT204 Specifications	
• Electrode connections	2, 3, and 4
• Potential range	+/- 10 V
• Compliance voltage	+/- 20 V
• Maximum current	+/- 400 mA (10A with Booster 10A)
• Current ranges	100 mA to 10 nA, in 8 decades
• Potential accuracy	+/- 0.2%
• Potential resolution	3 µV
• Current accuracy	+/- 0.2%
• Current resolution	0.0003% (of current range)
• Input impedance	> 100 GOhm
• Potentiostat bandwidth	1 MHz
• Computer interface	USB
• Control software	NOVA

The PGSTAT204 is the natural partner for the **Autolab Microcell HC** for conductivity measurements:

- A compact instrument which can be **expanded** at any time with **one additional** module, for example the **electrochemical impedance spectroscopy** module (FRA32M).
- **Analog and digital inputs/outputs** are available to control other external devices or record external signals.
- Interfaces with the **NOVA software** for a wide variety of techniques including **temperature control procedures**.

FRA32M Specifications	
• Frequency range	10µHz – 1 MHz
• Frequency resolution	0.003%
• AC amplitude	0.2 mV to 0.35 V rms In potentiostatic mode 2 mV to 3.5 V rms (optional)

Essential Conductivity - without temperature control

If active temperature control is not necessary for the execution of your electrochemical experiments, and you perform these solely at the room temperature, in air-conditioned rooms, or with other accessories consider the **Passive Cell Holder**. You can have the benefits of the Microcell system without temperature control.

The **Passive Cell Holder** has the same functional features as the Microcell HC Cell Holder:
Any cell size can be used with the **Passive Cell Holder** with **height adjustable** and **easy-slide stand rod**.

Essential Conductivity Workstation includes:

- Passive Cell Holder
- Measuring cells
  - TSC 1600 closed with additional cap GC electrode
  - TSC battery standard
- Cleaning and polishing kit

Passive Cell Holder

Dedicated to research

Metrohm Autolab sets the standard for electrochemistry instrumentation. Over 30 years ago, we created the first commercially available digital potentiostat/galvanostat that was completely computer controlled. Today our NOVA software is the most powerful electrochemistry software on the market.

Metrohm Autolab creates instruments that are suitable for most application areas including: corrosion, energy, environmental, sensors, and solar. Our customers may not always be electrochemists, but they are engaged in fundamental and applied research harnessing the power of electrochemistry for further understanding. They are driven to understand and improve electrochemical processes with the ambition to deliver new materials with superior properties and future possibilities.

With an Autolab potentiostat/galvanostat and NOVA software there are no limits to where your research can go.

Reliability

- Metrohm Autolab's **integrated testing process** ensures that each component is **traceable and tested individually** after installation in the instrument.
- Metrohm Autolab instruments undergo up to **405 quality checks** during the manufacturing process.
- Our installed instruments average **99%** uptime in the first **5 years of installation**.*

Versatility

- **Metrohm Autolab** instruments are the **workhorses** of **electrochemical research** delivering the **requirements of most application areas** with our range of **instruments, modules and accessories.**
- **Modular instruments** allow you to **change and expand** the **functionality** of your instrument.
- **Specialist modules can be installed** to provide additional electrochemical measurements and possibilities as your research progresses.

Superior Service

- Metrohm Autolab provides an **industry-leading 3 year warranty** for all its instruments, modules and instrument accessories.
- Our **dedicated distribution** and **service network** provide a **fast response** for sales and service, usually within **48 hours.**
- Our colleagues are **people you can trust** to understand your requirements and **provide solutions** to **support your research objectives**.

Powerful software

- NOVA is the **powerful data acquisition** and **analysis software** that powers your experiment.
- **Essential procedures** and **multiple analysis options** are built-in with the ability to **modify** and **create** your own.
- NOVA helps **maximize your laboratory throughput** with useful features that put the **focus** on **safety** and **production**.

3 year
instrument warranty

Metrohm Autolab is a member of the Metrohm Group, manufacturers of high-precision instruments for chemical analysis.

*Based on European markets most widely sold instrumentation.

Subject to change
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Dedicated to research

www.metrohm.com/electrochemistry

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