Pick&Place module

2.1014.0X10

Product information

8.1014.8001EN / 2021-07-23

Metrohm

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Technical Communication
Metrohm AG
CH-9100 Herisau

This documentation has been prepared with great care. However, errors can never be entirely ruled out. Please send comments regarding possible errors to the address above.

Disclaimer

Deficiencies arising from circumstances that are not the responsibility of Metrohm, such as improper storage or improper use, etc., are expressly excluded from the warranty. Unauthorized modifications to the product (e.g. conversions or attachments) exclude any liability on the part of the manufacturer for resulting damage and its consequences. Instructions and notes in the Metrohm product documentation must be strictly followed. Otherwise, Metrohm's liability is excluded.

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1 Overview

1.1 Pick&Place module – Product description

The Pick&Place module is a component for the analysis of samples in an OMNIS Sample Robot Pick&Place. Up to 4 Pick&Place modules can be installed per OMNIS Sample Robot.

The Pick&Place module takes up sample beakers for the analysis. Used sensors are cleaned or parked in the storage beaker of the Pick&Place module between analyses. Depending on the version, an integrated magnetic stirrer or a rod stirrer is used.

NOTICE

Installation of the Pick&Place module

As a basic rule, the installation of the Pick&Place module is carried out by the regional Metrohm representative.

1.2 Pick&Place module – Product versions

The product is available in the following versions:

Table 1 Product versions

Article number	Designation	Version feature
2.1014.0010	Pick&Place module	without magnetic stirrer
2.1014.0110	Pick&Place module	with integrated magnetic stirrer

1.3 Pick&Place module – Overview

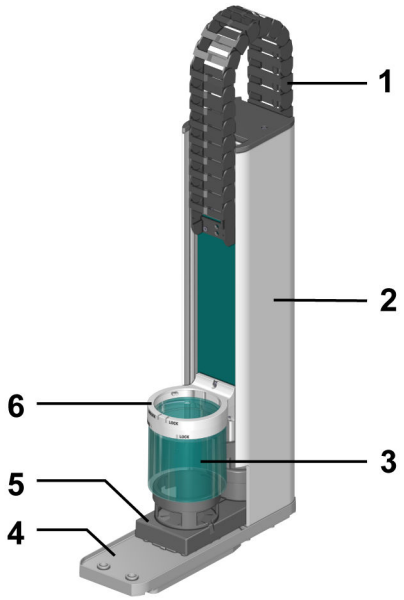

Figure 1 Front – Pick&Place module

1	**Guide chain**	**2**	**Lift tower**
3	**Safety shield**	**4**	**Collection tray**
5	**Slide**	**6**	**Titration head holder**

The slide *(1-**5**)* positions the sample beaker under the titration head. The titration head contains sensors, dosing tips, cleaning accessories and occasionally a rod stirrer or homogenizer.

A titration head that fits the sample beaker can be inserted in the titration head holder *(1-**6**)*. At both slide positions *(1-**5**)* (front and rear), the titration head holder *(1-**6**)* with the lift tower *(1-**2**)* can be moved downwards so that the safety shield *(1-**3**)* encases the sample beaker.

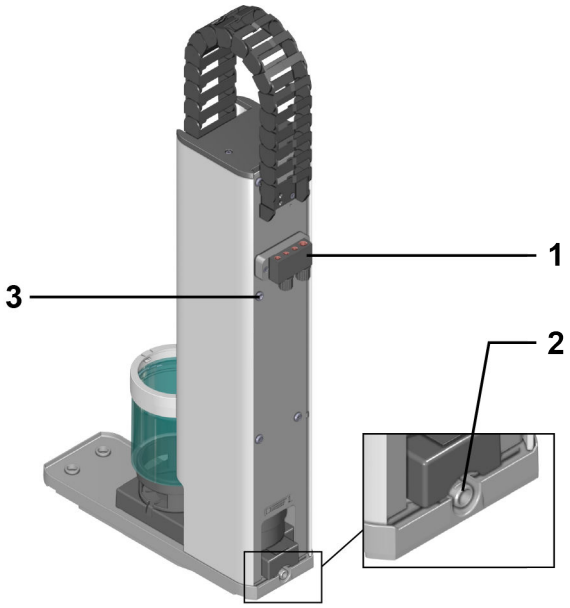

Figure 2 Rear – Pick&Place module

1	**Distributor**	**2**	**Drain nozzle**
3	**Grounding socket**		

Rinsing tubing and aspiration tubing is connected to the distributor *(2-**1**)*.

A tubing with a tubing adapter is connected to the drain nozzle *(2-**2**)*. This tubing will route any liquid that escapes via the drain channel into the waste canister. In case of an error, this protects the Pick&Place module from damage.

The grounding socket *(2-**3**)* is used to ground the buret tip or a Pt rod that is immersed in solution. The tubing connector (6.1808.030) is necessary for connecting the buret tip.

Option for working with a homogenizer (Polytron PT 1300 D)

A homogenizer (Polytron PT 1300 D) can be inserted in the titration head for homogenization of the sample.

See also

Grounding socket (chapter 3.7, page 14)

1.4 Symbols and conventions

The following formatting may appear in the documentation:

*(5-**12**)*	Cross-reference to figure legend The first number refers to the figure number. The second number refers to the product part in the figure.
1	Instruction step Numbers indicate the order of the instructions steps.
Method	Names of parameters, menu items, tabs and dialog windows
File ► New	Menu path
[Continue]	Button or key

1.5 Further information

The Metrohm Knowledge Base *https://guide.metrohm.com* always provides the current version of this document. Further instructions, leaflets, release notes etc. may be available, depending on the product. You can directly access the required information or the associated PDF document using the full-text search function and filters.

1.6 Accessories

Up-to-date information on the scope of delivery and on optional accessories can be found on the Metrohm website. Download this information as follows:

Downloading the accessories list

1. Go to *https://www.metrohm.com*.
2. Enter the article number of the product (e.g. **2.1001.0010**) into the search field.

   The search result is displayed.
3. Click on the product.

   Detailed information regarding the product is shown on various tabs.

4 On the **Included parts** tab, click the link to download the PDF.

The PDF file with the accessories data is loaded.

NOTICE

Metrohm recommends downloading the accessories list from the Internet and keeping it for reference purposes.

2 Safety

2.1 Intended use

Metrohm products are used for the analysis and handling of chemicals.

Usage therefore requires the user to have basic knowledge and experience in handling chemicals. Knowledge regarding the application of fire prevention measures prescribed for laboratories is also mandatory.

Adherence to this technical documentation and compliance with the maintenance specifications make up an important part of intended use.

Any utilization in excess of or deviating from the intended use is regarded as misuse.

Specifications regarding the operating values and limit values of individual products are contained in the "Technical specifications" section, if relevant.

Exceeding and/or not observing the mentioned limit values during operation puts people and components at risk. The manufacturer assumes no liability for damage due to non-observance of these limit values.

The EU declaration of conformity loses its validity as soon as modifications are carried out on the products and/or the components.

2.2 Responsibility of the operator

The operator must ensure that basic regulations on occupational safety and accident prevention in chemical laboratories are observed. The operator has the following responsibilities:

- Instruct personnel in the safe handling of the product.
- Train personnel in the use of the product according to the user documentation (e.g. install, operate, clean, eliminate faults).
- Train staff on basic occupational safety and accident prevention regulations.
- Provide personal protective equipment (e.g. protective glasses, gloves).
- Provide suitable tools and equipment to carry out the work safely.

The product may be used only when it is in perfect condition. The following measures are required to ensure the safe operation of the product:

- Check the condition of the product before use.
- Remedy defects and malfunctions immediately.
- Maintain and clean the product regularly.

2.3 Requirements for operating personnel

Only qualified personnel may operate the product. Qualified personnel are persons who meet the following requirements:

- Basic regulations on occupational safety and accident prevention for chemical laboratories are known and complied with.
- Knowledge of handling hazardous chemicals is present. Personnel have the ability to recognize and avoid potential dangers.
- Knowledge regarding the application of fire prevention measures for laboratories is available.
- Safety-relevant information is communicated and understood. The personnel can operate the product safely.
- The user documentation has been read and understood. The personnel operate the product according to the instructions in the user documentation.

2.4 Safety instructions

2.4.1 Danger from electrical potential

Contact with electrical potential can cause serious injuries or death. To avoid danger from electrical potential, observe the following:

- Operate the product only if it is in perfect condition. The housing must also be intact.
- Only use the product with the covers fitted. If covers are damaged or missing, disconnect the product from the energy supply and contact the regional Metrohm service representative.
- Protect live components (e.g. power supply unit, power cord, connection sockets) against moisture.
- Always have maintenance work and repairs on electrical components carried out by a regional Metrohm service representative.
- Disconnect the product from the energy supply immediately if at least one of the following cases occurs:
  - The housing is damaged or open.
  - Live parts are damaged.
  - Moisture penetrates.

2.4.2 Danger from biological and chemical hazardous substances

Contact with biological hazardous substances may cause poisoning from toxins or infections from microorganisms. Contact with aggressive chemical substances may cause poisoning or chemical burns. To avoid danger from biological or chemical hazardous substances, observe the following:

- Label the product according to regulations if it is used for substances that have a potential for chemical hazards and are generally subject to the Hazardous Substances Ordinance.
- Wear personal protective equipment (e.g. protective glasses, gloves).
- Use exhaust equipment when working with vaporizing hazardous substances.
- Dispose of hazardous substances in accordance with regulations.
- Clean and disinfect contaminated surfaces.
- Only use detergents that do not cause any unwanted side reactions with the materials to be cleaned.
- Dispose of chemically contaminated materials (e.g. cleaning material) in accordance with regulations.
- Proceed as follows in case of a return shipment to Metrohm AG or a regional Metrohm representative:
  - Decontaminate the product or product component.
  - Remove the labeling for hazardous substances.
  - Create a declaration of decontamination and enclose it with the product.

2.4.3 Danger from highly flammable substances

Using highly flammable substances or gases may cause fires or explosions. To avoid danger from highly flammable substances, observe the following:

- Avoid ignition sources.
- Use protective grounding.
- Use exhaust equipment.

2.4.4 Danger from leaking liquids

Leaking liquids may cause injuries and may damage the product. To avoid danger from leaking liquids, observe the following:

- Check the product and its accessories for leakages and loose connections.
- Replace leaking parts and connecting elements without delay.
- Tighten loose connecting elements.
- Do not loosen tubing connections under pressure.
- Do not remove aspiration tubing under pressure.
- Carefully pull the ends of the tubing out of the containers.
- Carefully let liquids from tubing drain into suitable containers.
- Insert the buret tips completely into the containers.
- Remove and dispose of leaked liquids in accordance with regulations.
- If you suspect that liquid has penetrated the instrument, disconnect the instrument from the energy supply. Then have the instrument checked by a regional Metrohm service representative.

2.4.5 Danger during transport of the product

Chemical or biological substances may be spilled during the transport of the product. Parts of the product may fall down or may be damaged. There is a risk of injury from chemical or biological substances and pieces of broken glass. To ensure safe transport, observe the following:

- Remove loose parts (e.g. sample racks, sample vessels, bottles) before transport.
- Remove liquids.
- Lift and transport the product with both hands on the base plate.
- Lift and transport heavy products only according to instructions.

2.4.6 Dangers due to automated motion sequences

Product parts that move automatically (e.g. robot arm) can cause injuries due to crushing or clamping. To avoid the risk of injury, observe the following:

- Do not reach into the working area of the products during the work process.
- Install and use the protective devices enclosed with the product during the work process.
- Do not bypass the installed protective devices.

2.5 Design of warning messages

There are 4 hazard levels for warning messages. The following signal words are used for classifying the hazard levels in warning messages:

- **DANGER** indicates a hazardous situation which, if not avoided, will result in serious injury or death.
- **WARNING** indicates a hazardous situation which, if not avoided, could result in serious injury or death.
- **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE** indicates a hazardous situation which, if not avoided, could result in property damage.

Warning messages differ in design (color and warning sign) depending on the hazard level:

DANGER

Type and source of danger

Consequences when not observing the notice: An irreversible injury that may result in death is very probable.

- Measures to avoid the danger

WARNING

Type or source of danger

Consequences when not observing the notice: A serious injury that may result in death is probable.

- Measures to avoid the danger

CAUTION

Type or source of danger

Consequences when not observing the notice: A minor to moderate injury is probable.

- Measures to avoid the danger

2.6 Meaning of warning signs

This documentation uses the following warning signs:

Table 2 Warning sign according to ISO 7010

Warning sign	Meaning
	General warning sign
	Warning of electrical voltage
	Warning of hand injuries
	Warning of sharp object

Warning sign	Meaning
	Warning of hot surface
	Warning of biological hazard
	Warning of toxic materials
	Warning of flammable materials
	Warning of corrosive substances
	Warning of optical radiation
	Warning of laser beams

Depending on the intended use of the product, the corresponding warning sign stickers must be placed on the product.

3 Technical specifications

3.1 Ambient conditions

Nominal function range	+5 to +45 °C	at max. 80% relative humidity, non-condensing
Storage	+5 to +45 °C	

3.2 Pick&Place module – Energy supply

Nominal voltage	24 VDC	internal
Power consumption	max. 30 W	
Protection		
Internal fuse	1.5 ATH	cannot be replaced by the user

3.3 Pick&Place module – Dimensions

Measurements

Width	92 mm
Height	746 mm
Depth	289 mm

Weight

Without magnetic stirrer	4.0 kg
With magnetic stirrer	4.4 kg

3.4 Pick&Place module – Housing

Materials

Lid	PBT	poly(butylene terephthalate)
Back panel	1.4301	stainless steel, coated
Base	PBT	poly(butylene terephthalate)
Enclosure	PP	polypropylene

IP degree of protection	IP 20

3.5 Modules – Connectors specifications

Energy supply		internally via MDL
MDL	Metrohm Device Link	4 internal connectors

3.6 Magnetic stirrer – Specifications

OMNIS product version		with attached magnetic stirrer
Adjustment range for rotational speed	+1 to +15	Rotation in counter-clockwise direction (seen from above)
	–1 to –15	Rotation in clockwise direction (seen from above)
Rotational speed change per step	120 rpm	
Maximum rotational speed	1,800 rpm	
Stirring bar lengths	8, 12, 16, 25, 30 mm	

3.7 Grounding socket

For potentiometric measurements in media of low conductivity, e.g. in organic solvents, high-ohm measuring chains such as pH electrodes take up interference voltages that originate from coupled electrostatic and electromagnetic fields. Particularly high field strengths occur during friction on isolators such as plastic floors, plastic clothing or similar. These conditions often occur in a normal lab environment. This electrostatic charge is discharged again over time, which happens more quickly when the humidity is high.

In these cases, it is often helpful to ground the solution or the titration vessel. An alternative is the use of a differential amplifier. In order for the solution to be allowed to be grounded, the measuring inputs have to be galvanically separated. This is the case for almost all Metrohm instruments.