

Quick Guide

Spectroquant® Prove

Spectroquant® Prove
Spectrophotometer 100 • 300 • 600



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For more information about the Spectroquant® Prove
please visit:
www.sigmaaldrich.com/spectroquant

For our Operating Manual please visit:
www.sigmaaldrich.com/spectroquant

For more information about the technical videos please
visit:
www.sigmaaldrich.com/photometry

1 Safety

This Quick Guide contains basic instructions that you must follow during the commissioning, operation and maintenance of the spectrophotometer. Consequently, all responsible personnel must read this Quick Guide carefully before working with the meter. Keep this Quick Guide in the vicinity of the meter.

Safety instructions

Safety instructions in this operating manual are indicated by the warning symbol (triangle) in the left margin. The signal word (such as "CAUTION") indicates the danger level. The following warning symbols are used:

Symbols	Description
	WARNING Hazardous area (general). The xenon lamp (UV/VIS) emits radiation in the ultraviolet region, which may cause damage to the eyes. Never look directly in the radiation of this light source without wearing proper eye protection. Protect your skin from the direct exposure to UV light.
	WARNING Dangerous electrical voltage.
	WARNING Signifies instructions that must be followed precisely in order to prevent serious dangers to personnel.
	CAUTION Signifies instructions that must be followed precisely in order to avoid minor injuries to personnel or damage to the instrument or the environment.
	CAUTION This is a cautionary notice with a warning symbol drawing your attention to the risk of (limited) harm to personnel.
	NOTE Signifies a notice drawing your attention to special characteristics.
	REFERENCE Used to indicate references to other documents.

Please pay attention to the separate safety instructions leaflet (part of delivery scope) and read it carefully.

1.1 Intended Use

The intended use of the spectrophotometer consists exclusively of the carrying out of photometric measurements according to this operating manual. Observe the technical specifications of the cells in the operating manual.

Any other use is considered to be unauthorized. The spectrophotometer was developed for performing water analyses in the laboratory.

2.1 Scope of Delivery

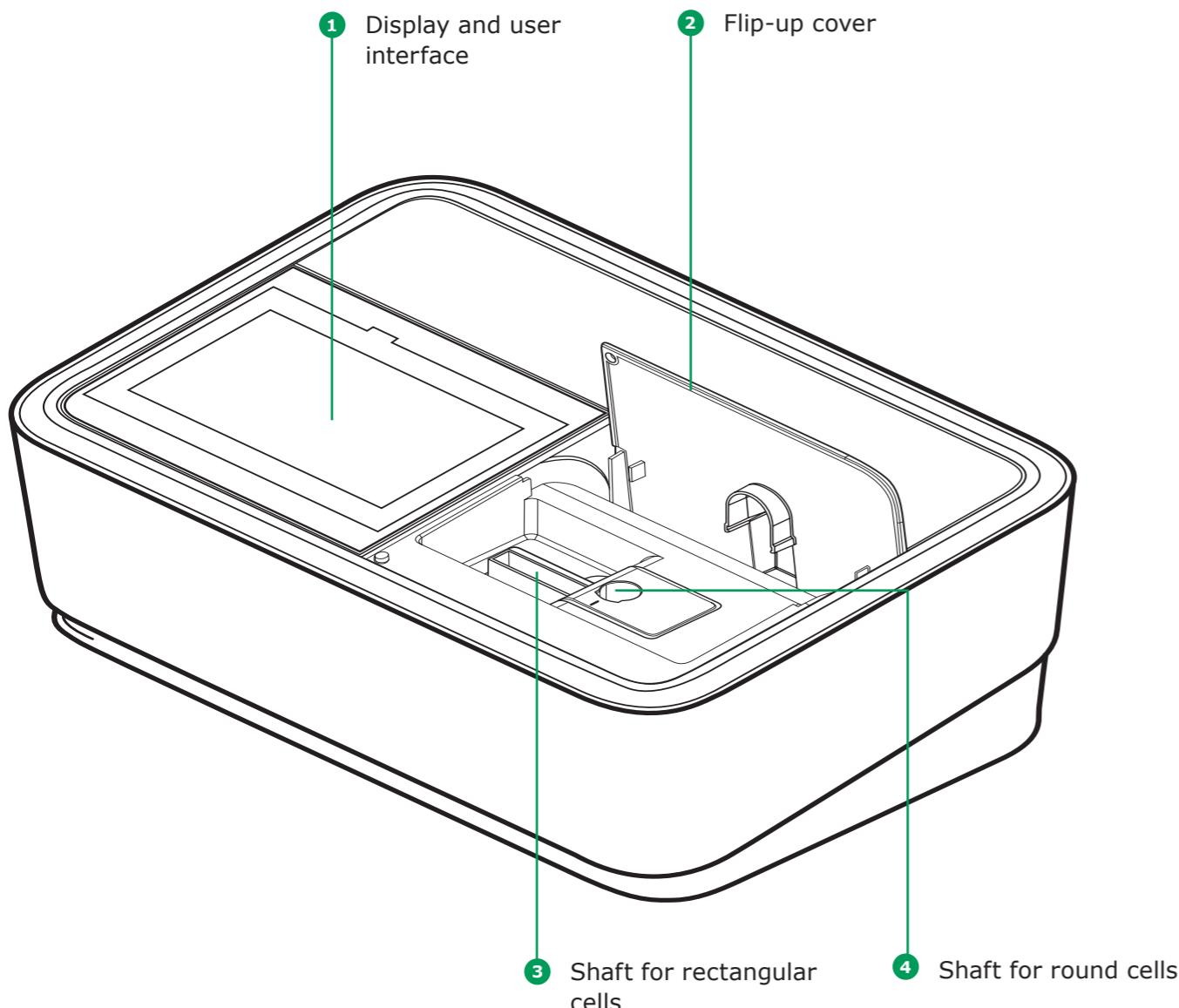
- Spectrophotometer
- Power adapter
- Power connectors (3 pieces)
- Dust cover
- Zero cell
- Quick Guide (A4 format)
- Safety instructions
- Certificate of final inspection

2.2 Overview of the Instrument**Packaging**

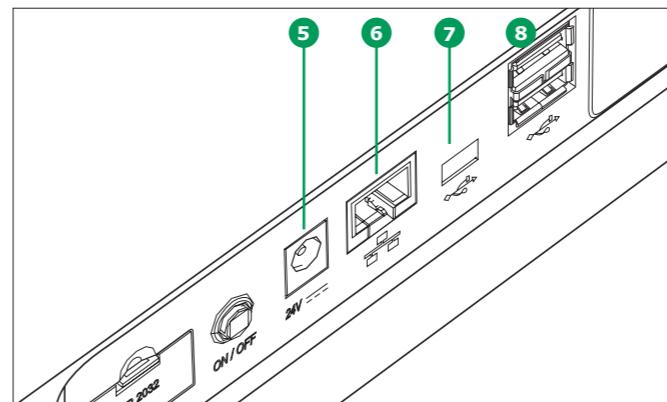
The spectrophotometer is shipped in protective transport packaging.

CAUTION

Retain the original packaging including the inner packaging to protect the instrument against hard knocks if it has to be transported. Please note that damage caused by improper transport voids all warranty claims.

Front of the instrument**2.3 Display and User Interface****NOTE**

The entire display is touch-sensitive. Make selections using a fingertip or special touch pen. Do not touch the display with sharp objects (e.g. the tip of a ballpoint pen).

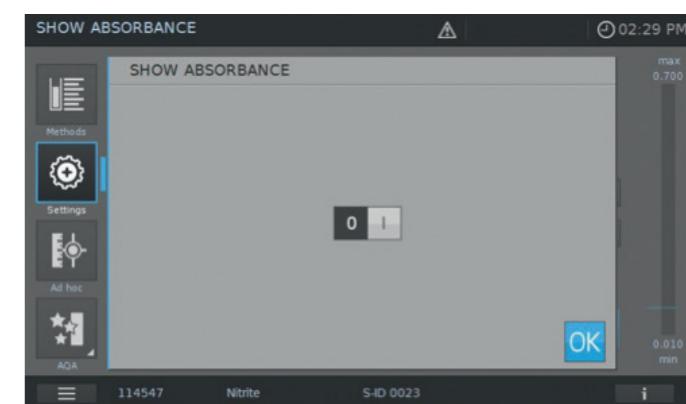
**Ports at the rear of the instrument**

- ⑤ Socket for plug-in power supply unit
- ⑥ LAN port
- ⑦ USB Mini B port
- ⑧ USB-A ports

NOTE

All connections comply with SELV.

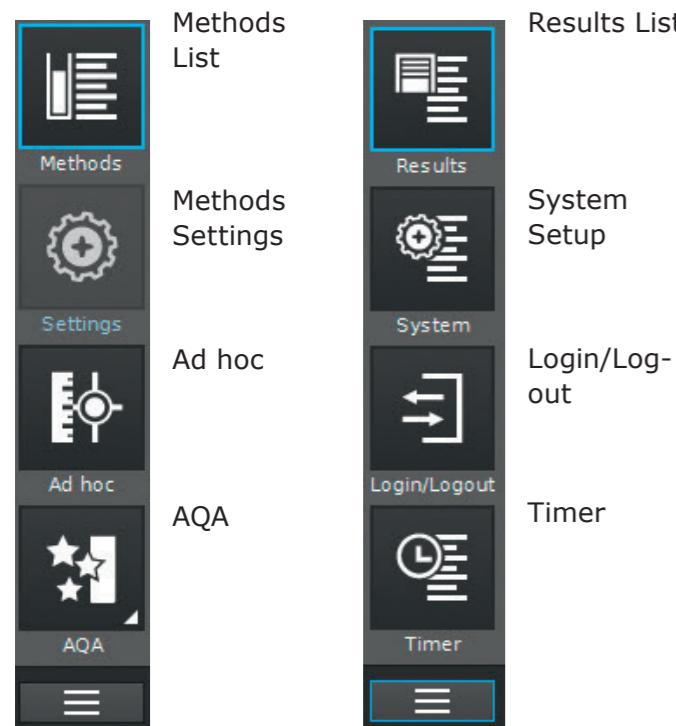
- Do not place objects on the display, as doing so may scratch it
- Touch buttons, words or symbols to select them
- Scrollbars are provided to assist quick movement through long lists
- Touch the arrow in the scrollbar to scroll upwards or downwards through the list
- Following selection, the item is activated immediately
- Touching a main button outlines it in blue
- Selecting an item inverts it (with dark text being shown on a light background)
- Selecting a text inverts it (with dark text being shown on a light background), e.g. method-specific settings for concentration mode "Show Absorbance"
- "0" is OFF, "1" is ON – the active selection is displayed light grey with dark figure, in this case the Show Absorbance is ON



1

Main menu navigation

The main menu is always visible on the left: It consists of two pages with four smart icons each. To switch between the two pages push  at the bottom on the left.

**NOTE**

The menu selected is always outlined in blue.

NOTE

Action buttons like "Start", "Save", "Print" give the following touch feedback:

 **Normal**
Remains static

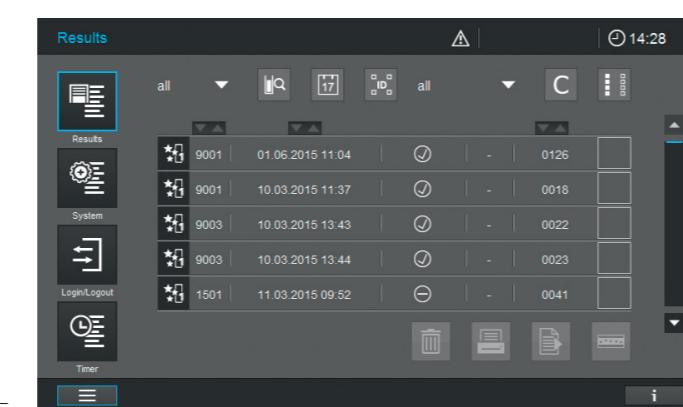
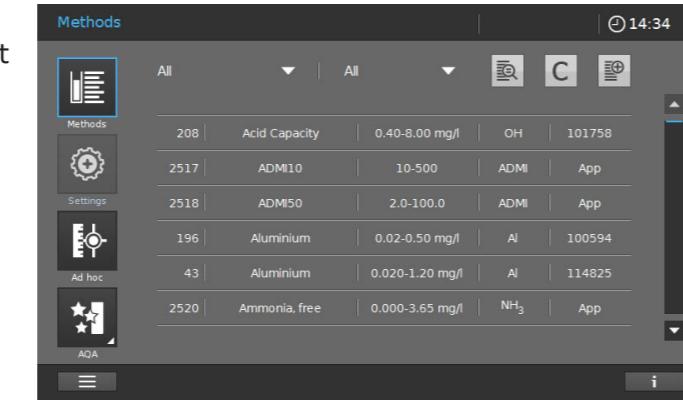
Active fields are always shown in bright color.

Pressed fields invert the color as long as the chosen action is performed.

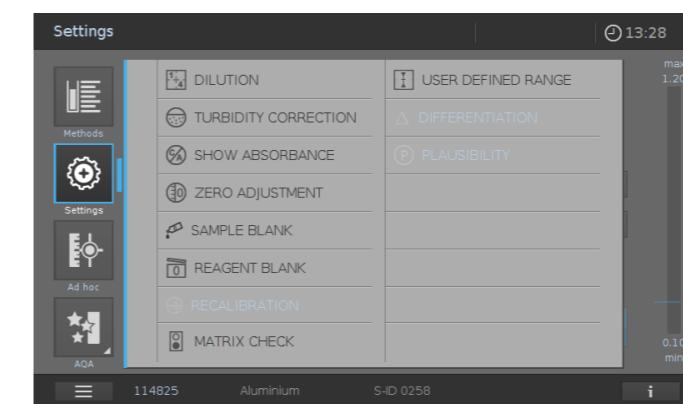
 **Disabled**
Draws 30 % of the normal state

Inactive, disabled fields show faint color.

"Methods" and "Results" are the most often used modes and they are at the top of the main menu navigation.

**NOTE**

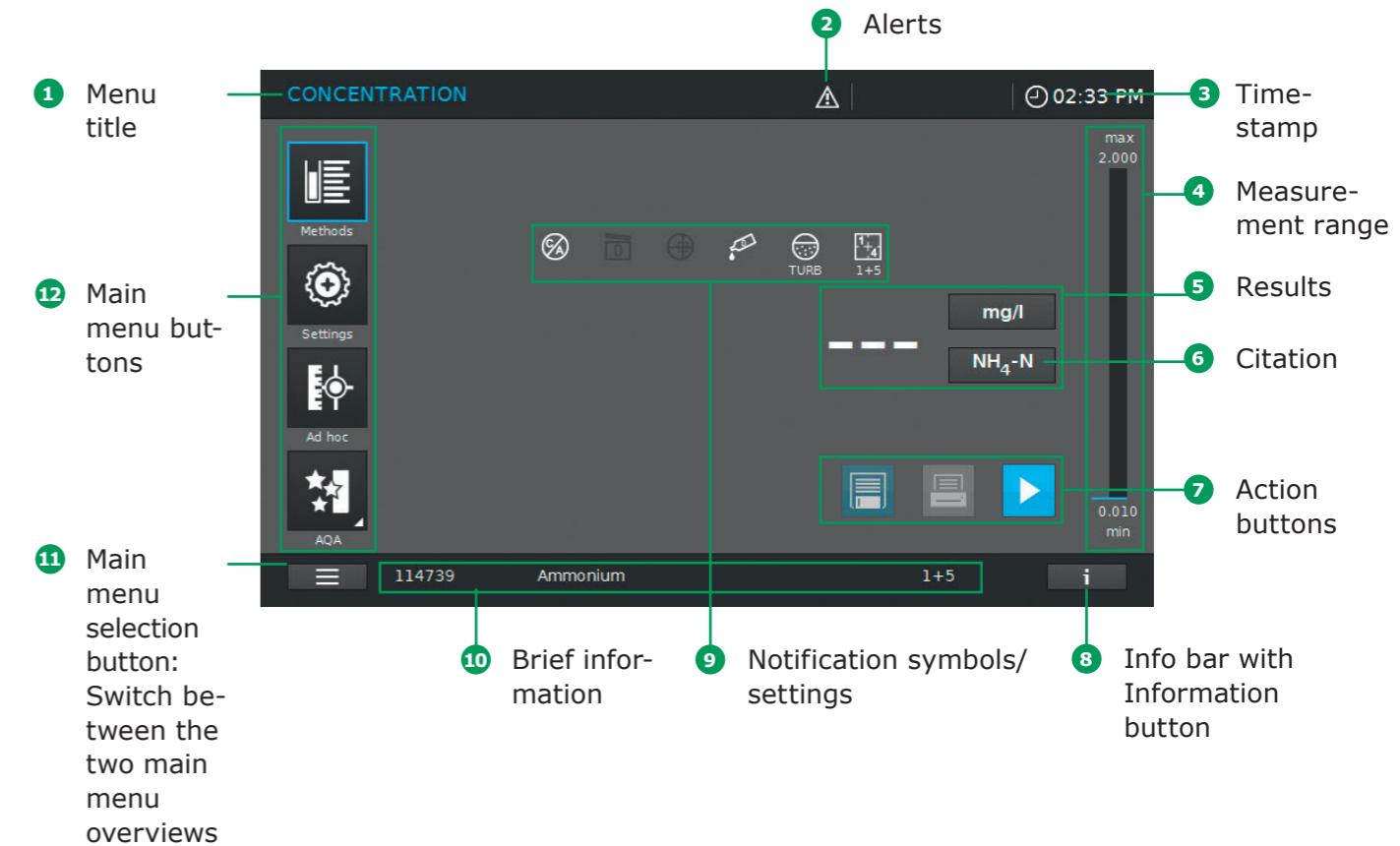
The main menus "Settings (Method Settings)", "Ad hoc", "AQA", "System (Instrument Settings)", "Login/Logout", "Timer" open up a submenu. Example "Settings":



To leave these, the submenu has to be closed by touching the main menu button again, in this case:



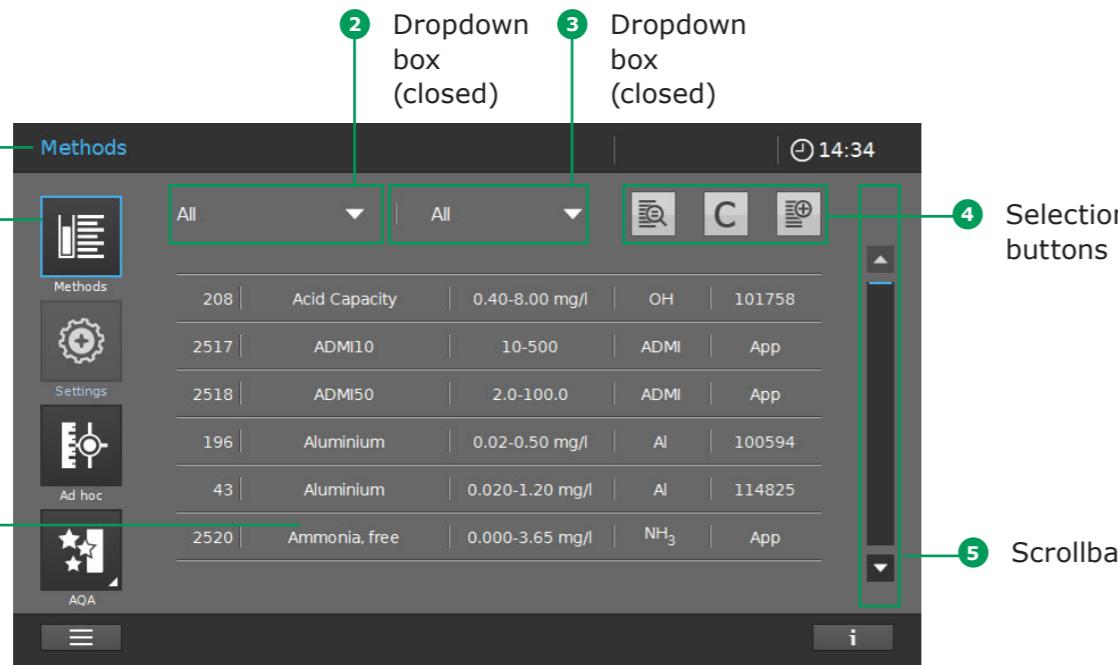
The main menu "Methods" comprises two main overview panels arranged as shown below: the Concentration Measurement Overview and the Method List Overview.

Screen layout concentration measurement overview

1

Screen layout method list overview

1 Menu title
2 Focuses selected main menu button
3 Name of method



4 Selection buttons

5 Scrollbar

Overview of main buttons

Buttons	Description
	Method list List of all methods, irrespective of mode
	Settings This button is used to activate method-specific settings (e.g. sample dilution, turbidity correction, zero adjustment, sample blank, reagent blank)
	Ad hoc For performing measurements (absorbance/transmission, spectrum, kinetics) Allows measurements to be performed without the need to create methods
	Absorbance/Transmission Mode Ad hoc submenu: perform absorbance or transmission measurements
	Spectrum Mode Ad hoc submenu: record spectrum Method list: create methods -> Spectrum Mode
	Kinetic Mode Ad hoc submenu: perform kinetic measurement Method list: create methods -> Kinetic Mode
	AQA Overview and list of all Analytical Quality Assurance (AQA) modes
	AQA Status 1&2 AQA submenus: Status display of the period of validity and the outcome (passed/failed)
	AQA1 AQA submenu: List of AQA1 methods
	AQA2 AQA submenu: List of AQA2 methods
	Pipette check AQA submenu: List of pipette-checking methods
	Result list List of all stored results
	System setup This button is for optional instrument settings (e.g. date, time, updates etc.)
	Login/logout Log users in and out
	Timer list List of stopwatch functions

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6 Name of method

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Overview of action & selection buttons

Action & Selection Buttons	Description
	Start button Start an action (e.g. measurement)
	Start zero Start zero adjustment for a method
	OK
	Save
	Stop
	Close
	Logout User logout
	Search method
	Search/results list Search function, search criterion: method name, method number or item number
	Filter cancellation button Cancel all set filter options
	Edit For editing parameters
	Create method
	Print Print to pdf (USB device) or printer
	Export button All selected results are exported to an external memory device as .csv file
	Import button Updates/Methods are imported from an external memory device into the instrument
	Delete The selected items are deleted

3 Getting Started

3.1 General Notes on Handling

The Spectroquant® Prove spectrophotometer is an optical precision instrument. It should always be handled with care, especially when in mobile use. Always protect the instrument from conditions that could damage the mechanical, optical and electrical components. Please note the following in particular:

- The temperature and humidity during operation and storage must be within the limits specified in the "Technical Data" section (see the [Operating Manual](#))

The instrument must never be exposed to the following:

- Extreme dust, humidity and moisture
- Intense light and heat
- Fumes that are corrosive or contain high concentrations of solvents

In addition take care of the following:

- For measuring, the instrument must be placed on a flat surface
- Spilled liquid or other material should be removed immediately (see the [Operating Manual](#))
- If a cell has broken in the cell holder, the cell holder should be cleaned immediately (see the [Operating Manual](#))
- The cover should always be closed when the spectrophotometer is not in use
- When the spectrophotometer is being transported, the cell compartment must be empty

3.2 Initial Setup

Proceed as follows:

- Connect the power adapter (see section 3.2.1)
- Switch on the spectrophotometer (see section 3.2.2)
- Set the language (see section 3.2.3)
- Set the date and time (see section 3.2.4)
- Run the self-test (see section 3.2.5)

NOTE

For our Operating Manual please visit:
www.sigmaaldrich.com/spectroquant

For more information about the technical videos please visit:
www.sigmaaldrich.com/photometry

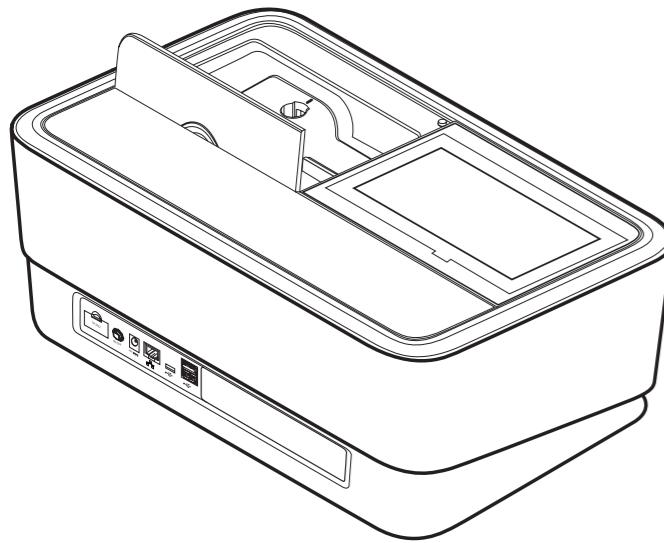
3.2.1 Connecting the Power Supply

Power is supplied through the power adapter provided. The power adapter supplies the spectrophotometer with the required voltage and type of current (24 V DC).

 **CAUTION**

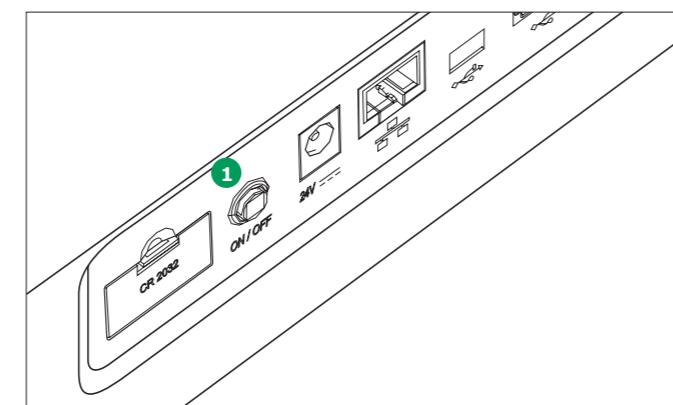
The line voltage at the user location must fulfil the specifications stated on the power adapter (the specifications are also indicated in the Operating Manual). Only ever use the 24 V power adapter provided. Please note that damage caused by using a different power adapter than the one supplied voids all warranty claims.

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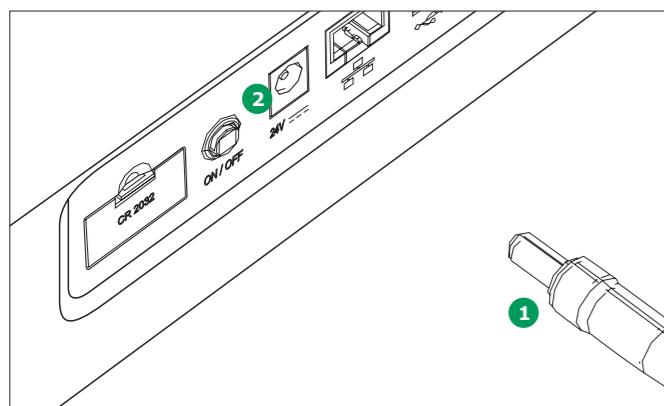


3.2.2 First Power-on

After switching on the spectrophotometer for the first time you are automatically guided through the language, date and time setup procedures.

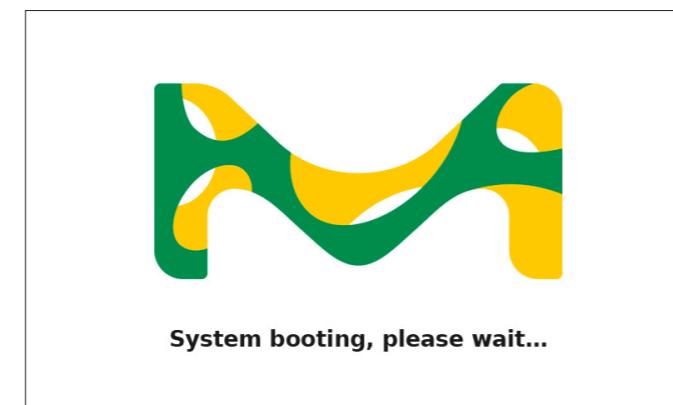


1. Press the ON/OFF button 1. The spectrophotometer gives an audible signal (beep) and starts booting for approximately 2 minutes. You will see the following display:



Connecting the power adapter:

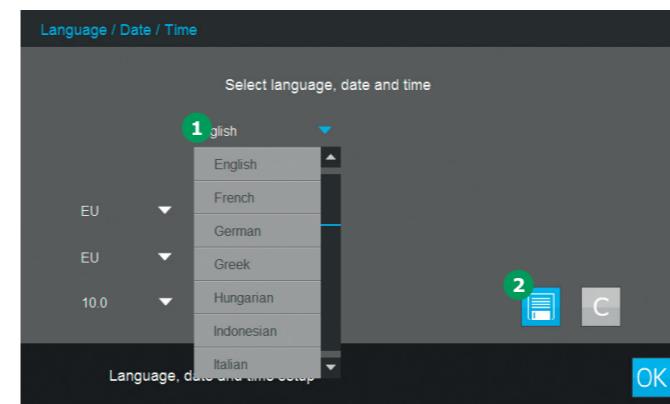
1. Connect the miniplug 1 of the power adapter to the socket 2 of the spectrophotometer.
2. Connect the power adapter to a wall socket.



2. The display switches to language setup (see section 3.2.3).

3.2.3 Language Setup

The software supports several languages. When you switch on the spectrophotometer for the first time, a list of language options is automatically displayed after the boot procedure.



1. Select the desired language 1.
2. Tap on the Save button 2 to confirm.

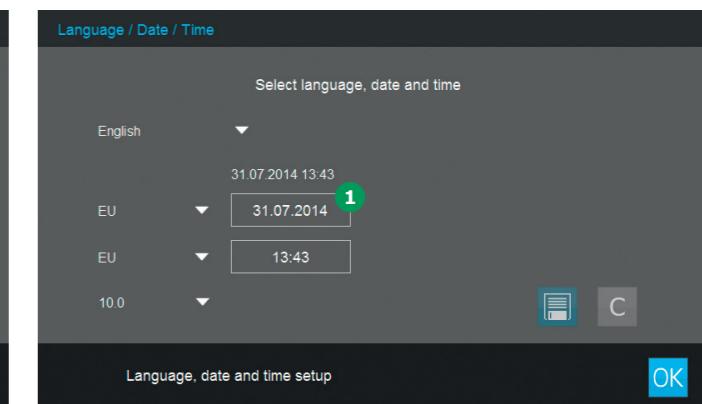
NOTE

The saving process of changing the language requires some seconds.

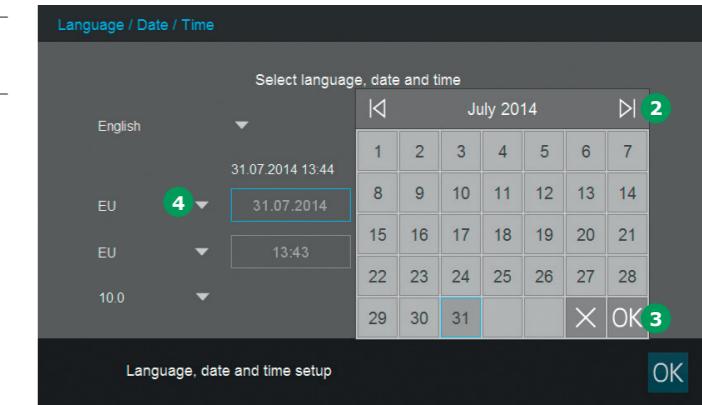
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3.2.4 Date, Time and Country-specific Settings

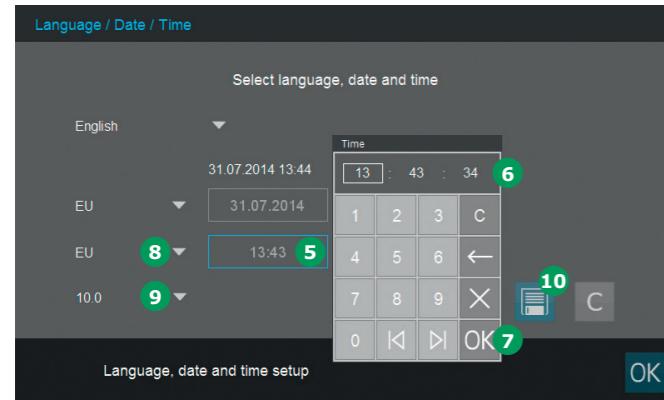
During initial setup, having set the language option you are automatically guided through the date and time setup procedure.



1. Tap on the Date format button 1.
2. The calendar view pops up 2. You can now enter the date.



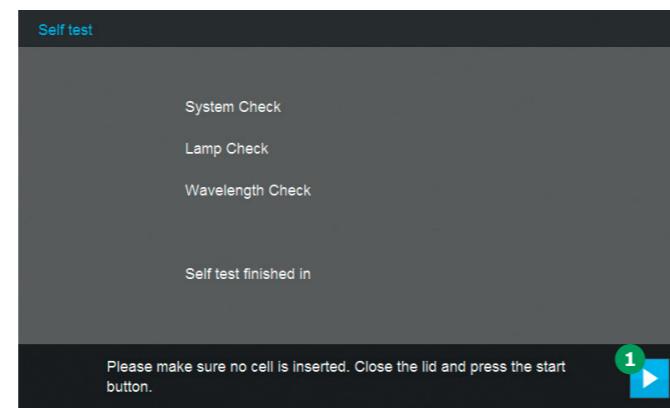
3. Tap on OK 3 to confirm.
4. Tap on the Arrow button 4 to choose the country-specific basic date setting. The date format can be set and displayed for EU and US.



- Tap on the Time format button 5. The numeric key panel 6 pops up. Now you can enter the time.
- Tap on OK 7 to confirm.
- Tap on the Arrow button 8 to choose the country-specific basic time setting. The time format can be set and displayed for EU and US.
- Tap on the Arrow button 9 to choose the decimal separator "."/"," used in your country.
- Tap on the Save button 10 to confirm.

3.2.5 Self-test

Following language, date and time setup the spectrophotometer performs a self-test.



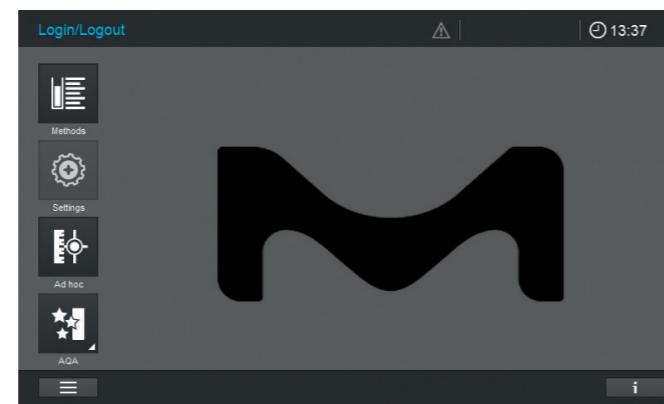
- Remove all cells and close the cell compartment cover.
- Start the self-test with the Start button 1.
- The spectrophotometer performs the self-test.

Self-test

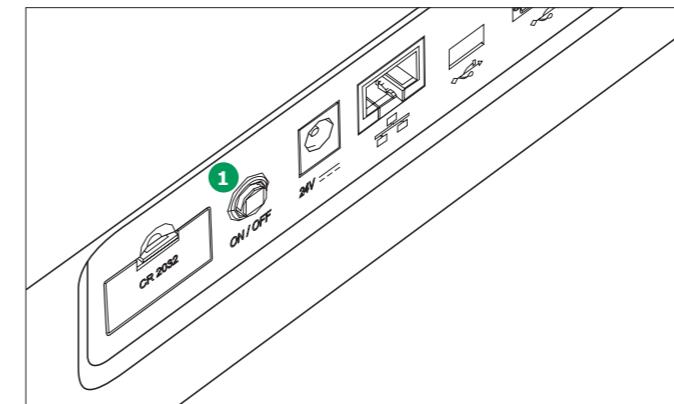
The self-test covers:

- Checks on memory, processor, internal interfaces, filter and lamp
- A calibration of the wavelength

When the self-test has ended, the display shows the main menu.

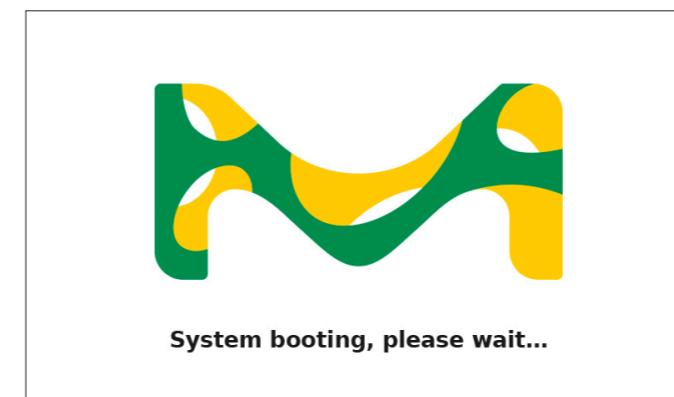


4.1 Switching the Spectrophotometer On or Off



Switching on

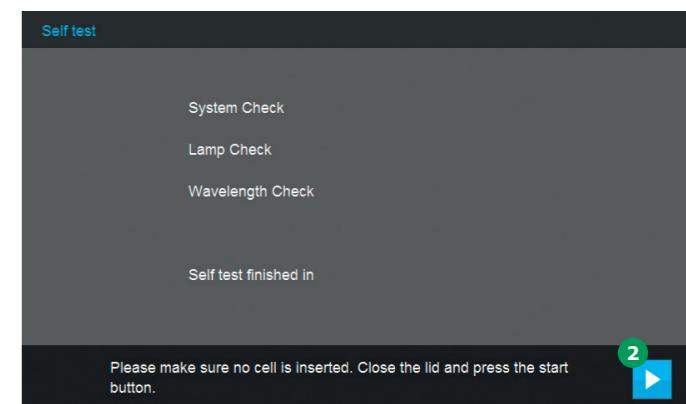
- Press the ON/OFF button 1. The spectrophotometer gives an audible signal (beep) and starts booting for approximately 2 minutes. You will see the following display:



- After the booting process the screen shows the self-test dialog.

Starting the self-test

- Remove all cells and close the cell compartment cover.



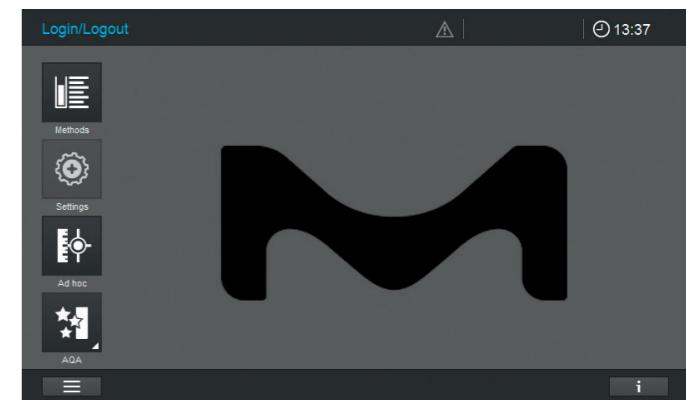
- Start the self-test with the Start button 2.
- The spectrophotometer performs the self-test.

Self-test

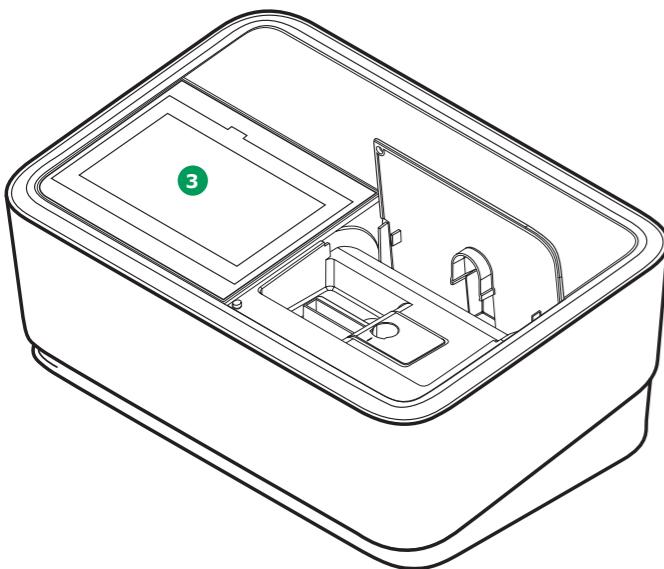
The self-test covers:

- Checks on memory, processor, internal interfaces, filter and lamp
- A calibration of the wavelength

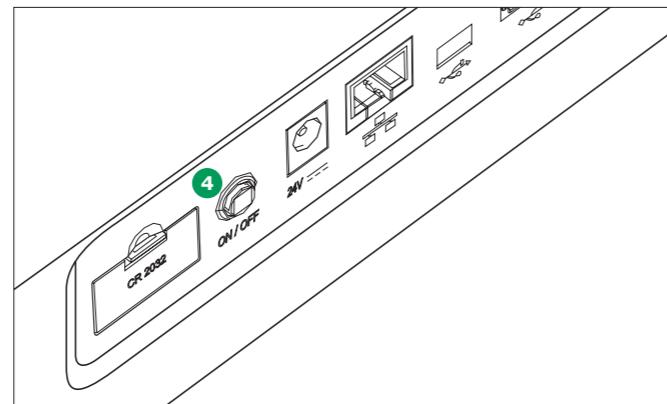
When the self-test has ended, the display shows the main menu.



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Energy-saving mode – display**Switching off**

Press the ON/OFF button ④ to switch the spectrophotometer off.

**NOTE**

The spectrophotometer automatically switches off the backlight of the display ③ when no button has been tapped within a period of 10 minutes. The backlight is switched on again with the next tap.

The button functions are activated only following a further tap.

NOTE

You can set a user-defined time for this function (please see the Operating Manual for detailed instructions).

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**4.2 System Setup**

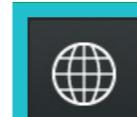
General instrument setup is carried out in the "System" menu.

**Buttons****Description****Information**

This submenu displays the following information about the device:
Software/method versions, device class, lamp counter and serial number

**Interface**

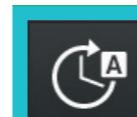
This submenu displays the following settings options and standard settings:
Audible signals – ON, Backlight – 100 %, Print to pdf – ON

**Region**

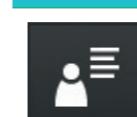
This submenu displays the following settings options and standard settings:
Language, date, time and country zone EU/US, decimal separator – ":" (dot or comma)

**Quality**

This submenu displays the following settings options and standard settings:
Quick zero – OFF, AQA1 and AQA2 lock – OFF, Zero Adjustment expiry – ON (interval: 7 days), Use expired reagents – OFF, Service reminder – ON

**Automation (Setup 4)**

This submenu displays the following settings options and standard settings:
Energy saving mode – ON (10 minutes), Auto Power off – OFF, Auto log off – OFF, Auto store – ON, Auto print – OFF, Sample ID popup – OFF

**User management**

This submenu displays the following settings options and standard settings:
Activation of user management and administrator settings, User login required – OFF

**Service**

This submenu displays the following settings options:
Various service functions such as backup, restore, export of log or system data and import of methods

**Update**

This submenu displays the option for performing software and method updates

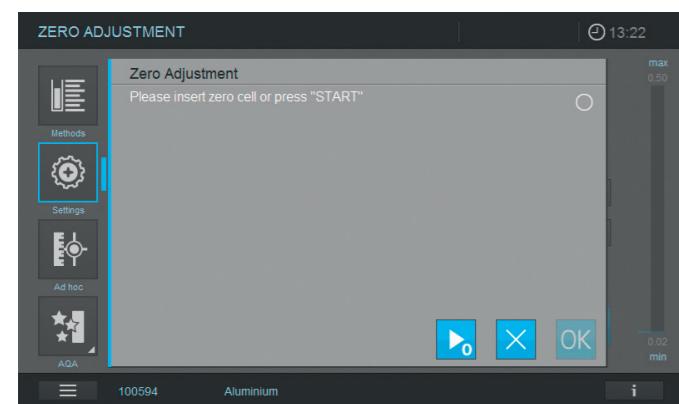
Buttons	Description
	Network This submenu displays the setting options for connecting the Prove device with a network
	Prove Connect This submenu displays the settings options for connecting the Prove device with the Prove Connect software (the Prove Connect software is optionally available, order Nos. Prove Connect to LIMS Y110860001 and Prove Connect to Dashboard Y110850001)

Please see the Operating Manual for detailed information on the buttons and their functions.

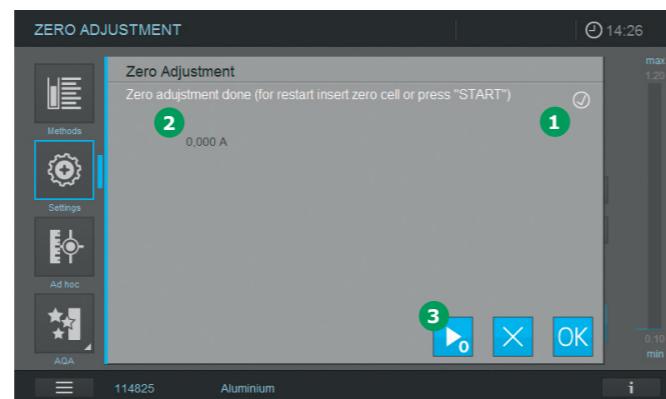
4.3 Zero Adjustment for Preprogrammed Methods

A zero adjustment must be performed for each cell type. The zero adjustment for concentration methods is stored within the spectrophotometer separately for each cell type. The period of validity of the zero adjustment for concentration methods can be edited in the System settings. When a zero adjustment has already been performed for the inserted cell type and the selected method, the date of the most recent zero adjustment is displayed in the info line.

When a zero adjustment is required, following screen will pop up:



1. Insert the zero cell according to cell type. Zero adjustment starts automatically and, if the zero adjustment is passed, a tick ① appears in the status display field for the Zero adjustment. In the case of a method which only measures the sample at a single wavelength the absorbance of the Zero value ② is also displayed.
2. With a cell inserted, the zero adjustment can be repeated manually by tapping on the Start zero button ③.
3. Tapping on the OK button accepts the zero adjustment value for the method.
4. The screen changes to show the concentration measurement screen (see page 7).
5. The instrument is ready to start measuring the sample.



NOTE

The instrument provides a Quick Zero function. With this the zero adjustment is performed for all wavelengths which are used with all Spectroquant® test kits. This function can be activated via "System (Instrument settings)" – "Quality".

4.3.1 Notes on Zero Adjustment Zero adjustment with round cells

- Only use clean, scratch-free round cells and distilled water. The minimum filling level is 20 mm. A ready zero cell is contained within the scope of delivery of the spectrophotometer
- A ready zero cell can, in principle, be used for an indefinite period of time. We recommend, however, that you regularly check the zero cell for visible contamination and scratches and refill or exchange it if necessary (at least every 24 months)
- Insert the round cell until it touches the bottom of the round cell compartment

Zero adjustment with rectangular cells

- With rectangular cells, zero adjustment must be carried out using the same cell type (manufacturer and cell material [e.g. optical glass, quartz glass, plastic]) as the one that will be used for measurement. This is important because cells of different manufacturers have different absorption characteristics. When changing the cell type, repeat the zero adjustment with the new type
- Prior to zero adjustment, clean the rectangular cell and fill it with distilled water. The minimum filling level is 20 mm
- Rectangular cells always have to be inserted in the cell compartment with the same orientation for measurement and zero adjustment (e.g. cell inscription always on the left side)
- Insert the rectangular cell until it touches the bottom and left edge of the holder. The opaque sides of the rectangular cell must point to the front and rear

4.3.2 When to Repeat the Zero Adjustment?

We recommend that you repeat the zero adjustment in the following cases:

- If the spectrophotometer was subject to mechanical stress such as strong shock or transport
- If the ambient temperature has changed by more than 5 °C since the last zero adjustment
- At least once a week. The interval to repeat a zero adjustment is set in the instrument to 7 days. You can change this under "System (Instrument Settings)"
- If a new cell type (different manufacturer, different glass type) is used
- Basically, each time you want to measure with the highest possible accuracy

NOTE

If an interval to repeat a zero adjustment is set you will be prompted to repeat it after the interval has passed. You can also repeat a zero adjustment by selecting a method, then touching the "Settings" icon. Choose "Zero adjustment" and insert a zero cell to start the measurement.

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4.4 Measurements

The spectrophotometer can be used to perform the measurements listed below.

Type of Measurement	Description
Concentration	<ul style="list-style-type: none"> Preprogrammed methods that can be executed using Spectroquant® test kits or self-prepared reagents User-programmed methods
Absorption / transmission	<ul style="list-style-type: none"> Single-wavelength measurements for establishing the absorbance or transmission of solutions Multiple-wavelength measurements for establishing the absorbance or transmission of solutions
Spectrum	<ul style="list-style-type: none"> Programmed methods for establishing the absorbance or transmission of solutions over a defined wavelength range
Kinetics	<ul style="list-style-type: none"> Programmed methods for establishing the absorbance or transmission of solutions over a defined period
Quality checks	<p>Instrument supported analytical quality assurance:</p> <ul style="list-style-type: none"> Instrument check (AQA 1) Method-specific system check – preprogrammed for all Spectroquant® standards (AQA 2) Pipette volume control (PipeCheck) Check interferences from foreign substances (MatrixCheck)

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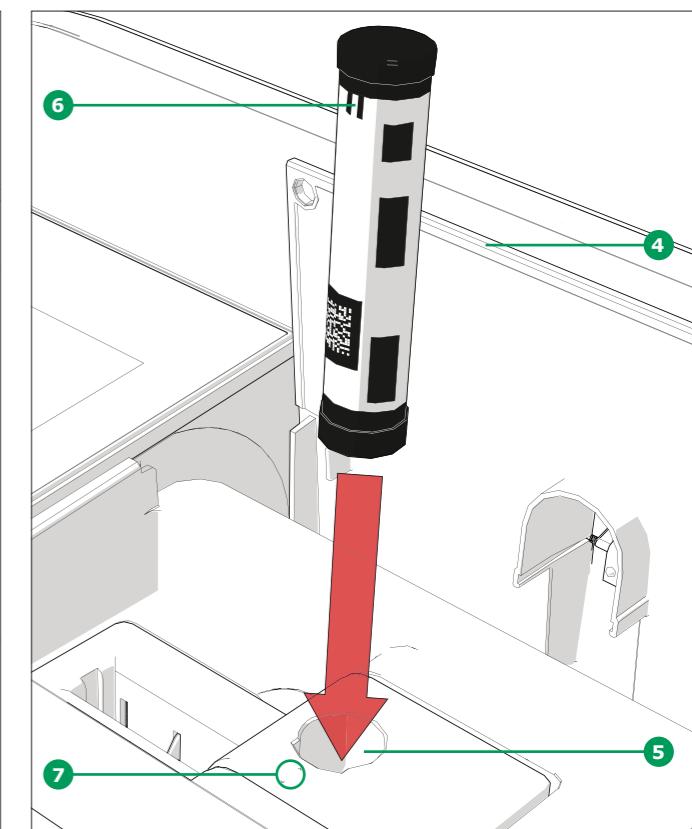
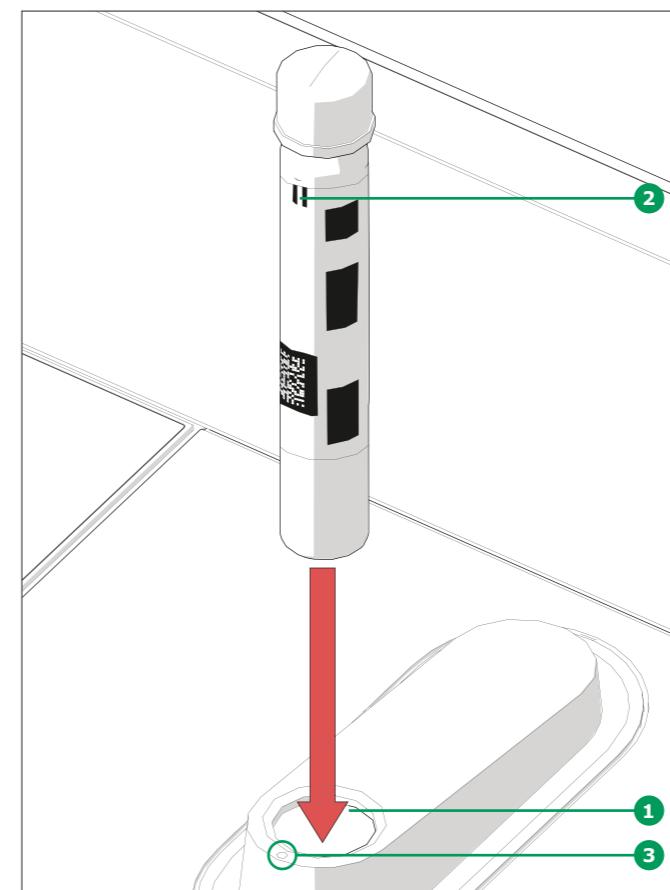
5

4.4.1 Performing a Measurement

Measurements can be performed using rectangular cells of various path lengths (10, 20, 50 mm/100 mm Prove 600) and Spectroquant® round cells. Insert cells as follows to start the measurement:

Measuring with a round cell with closed lid

Measuring with rectangular cells with open lid:
insert AutoSelector



- Insert the barcoded Spectroquant® round cell through the opening 1, ensuring that the white position mark 2 on the cell is aligned with the positioning mark on the spectrophotometer 3
- Measurement starts automatically, and the measurement result is displayed in the concentration measurement overview (see page 7)

- Open the flip-up cover 4 by pushing it back with your fingers
- Insert the AutoSelector vertically into the cell compartment 5, ensuring that the white position mark 6 on the AutoSelector is aligned with the positioning mark on the spectrophotometer 7
- The photometer is ready to measure

NOTE

If the barcode cannot be read, please [see the Operating Manual](#).

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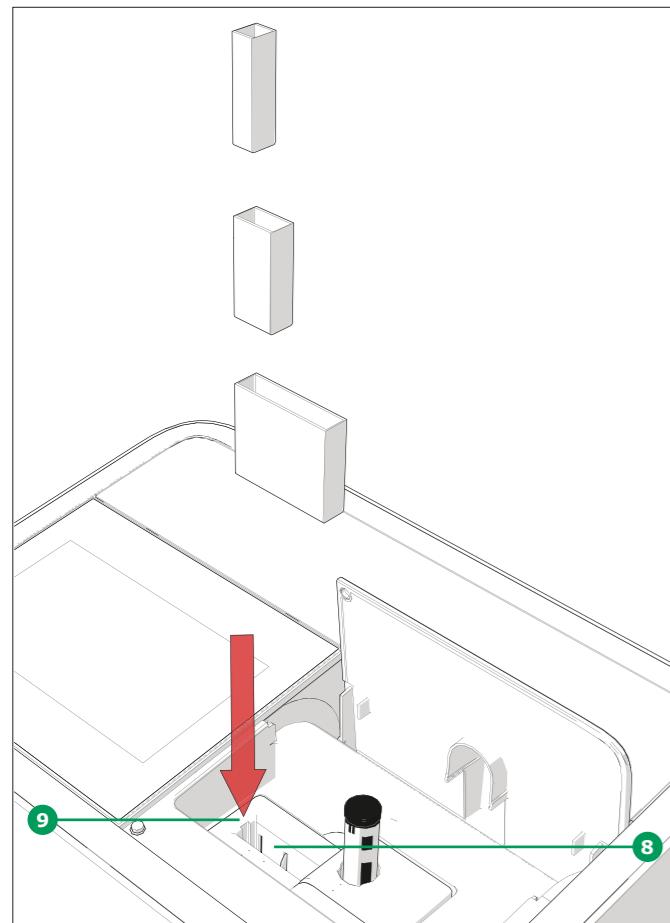
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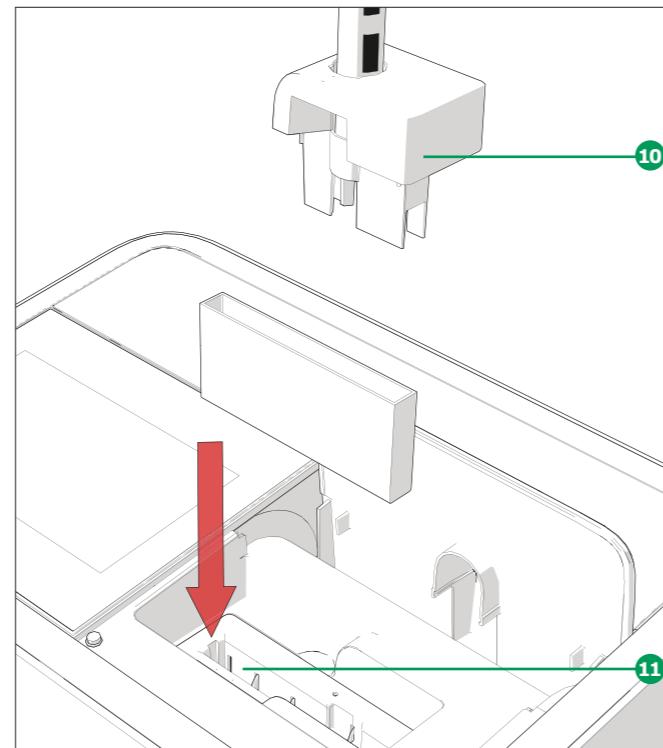
5

Measuring with rectangular cells with open lid:
Insert rectangular cells (10, 20, 50 mm)



- Insert the rectangular cell vertically into the cell compartment 8, ensuring that the cell is flush against the left side of the cell holder 9 at all times
- Measurement starts automatically, and the measurement result is displayed in the concentration measurement overview (see page 7)

Measuring with rectangular cells with open lid:
Insert 100 mm rectangular cells (Prove 600)

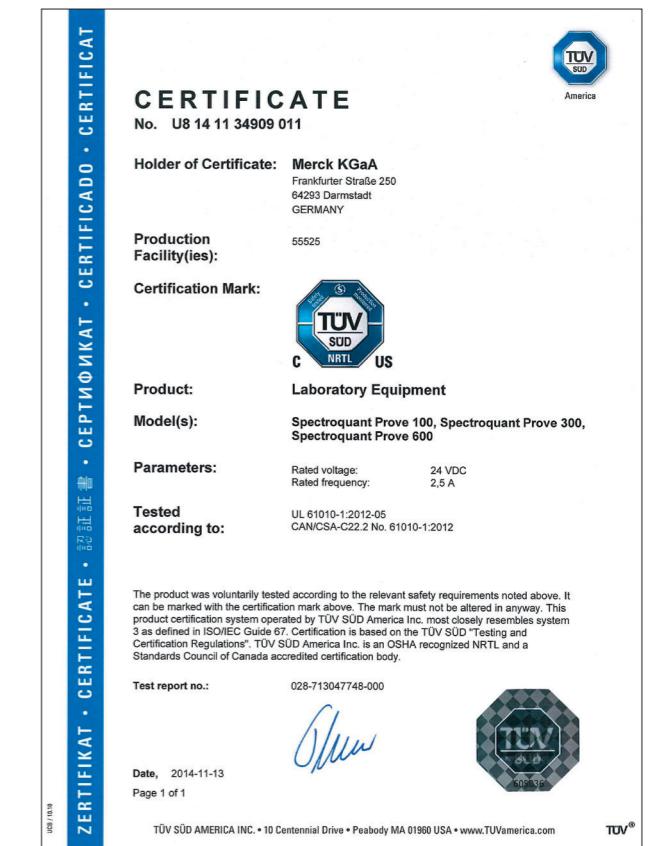


- Remove the top of the round cell compartment including the AutoSelector 10
- Insert the 100 mm rectangular cell vertically into the cell holder 11. Make sure that you hold it with both hands on the small edges while inserting it carefully
- Measurement starts automatically, and the measurement result is displayed in the concentration measurement overview (see page 7)

NOTE

Please see Analytical Procedures and Appendices for detailed measurement procedures.

5.1 Certificates



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5.2 Warranty

In addition to any other rights provided by local law which shall not be limited herewith, the manufacturer provides an additional limited worldwide warranty for a period of 12 months from the date of shipment, that the spectrophotometer is free from any defects that are due to faulty material or workmanship unless otherwise noted in the product manual. This warranty does not apply to consumable products such as the halogen lamp.

2

The spectrophotometer must only be opened, adjusted or repaired by specialist personnel authorized by the manufacturer. Noncompliance invalidates any warranty claims.

3

Keep the original packing including the inner packing to protect the instrument against hard shocks if it has to be shipped. Note that damage caused by improper transport voids all warranty claims.

4

In case of a warranty claim please contact the technical customer service of your local supplier to get further information about the required documents and possibilities of warranty service (e.g. replacement, repair) if a warranty claim is approved.

5

5.3 Accessories

Description	Order No.
Halogen lamp module for Spectroquant® Prove 100	1.74010.0001
Case for Spectroquant® spectrophotometer Prove 100 300 and 600	1.73020.0001
Rectangular cells 10 mm (1 pack = 2 pcs)	1.14946.0001
Rectangular cells 20 mm (1 pack = 2 pcs)	1.14947.0001
Rectangular cells 50 mm (1 pack = 2 pcs)	1.14944.0001
Semi-microcells 50 mm (1 pack = 2 pcs)	1.73502.0001
Rectangular cells quartz 10 mm (1 pack = 2 pcs)	1.00784.0001
Empty cells 16 mm Ø (1 pack = 25 pcs) with screw cap	1.14724.0001
Zero Cell (1 pack = 1 pc)	1.73503.0001
Rectangular cell 100 mm	1.74011.0001
Prove Connect to LIMS Unlimited License	Y110860001

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Supelco®

Analytical Products

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