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DR 3900

USER MANUAL

2/2025 Edition 13

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Section 1 Specifications

These are subject to change without notice!

Performance specifications	
Display mode	Transmittance (%), Absorbance and Concentration
Source lamp	Halogen lamp
Wavelength range	320–1100 nm
Wavelength Accuracy	± 1.5nm (wavelength range 340–900 nm)
Wavelength reproducibility	± 0.1 nm
Wavelength resolution	1 nm
Wavelength calibration	Automatic
Wavelength selection	Automatic, based on method selection
Scanning speed	≥ 8 nm/s (in steps of 1 nm)
Spectral bandwidth	5 nm
Photometric measuring range	± 3.0 Abs (wavelength range 340–900 nm)
Photometric accuracy	5 m abs at 0.0–0.5 abs 1% at 0.50–2.0 Ext
Photometric linearity	< 0.5% to 2 Abs ≤1% at > 2 Abs with neutral glass at 546 nm
Stray light	< 0.1%T at 340 nm with NaNO ₂
Data log	2000 readings (Result, Date, Time, Sample ID, User ID)
User programs	100
Physical and environmental specifications	
Width	350 mm (13.78 in)
Height	151 mm (5.94 in)
Depth	255 mm (10.04 in)
Mass	4200 g (9.26 lb)
Ambient operating requirements	10–40 °C (50–104 °F), maximum 80% relative humidity (without condensate formation)
Ambient storage requirements	–40–60 °C (–40–140 °F), maximum 80% relative humidity (without condensate formation)
Additional technical data	
Power connector via external power supply	Input: 100–240 V/50–60 Hz Output: 15 V/40 VA
Interfaces	Use only shielded cable with maximum length of 3 m: 2x USB type A 1x USB type B Use only shielded cable (for example STP, FTP, S/FTP) with maximum length of 20 m: 1x Ethernet
Housing rating	IP40 (excluding interfaces and power supply)
Protection class	Class I

Specifications

Performance specifications	
Altitude	2000 m
Pollution degree	2
Overvoltage category	II
Environmental conditions	Indoor use only
Power supply	External power supply

2.2 Overview of product

The DR 3900 is a VIS spectrophotometer with a wavelength range of 320 to 1100 nm. The instrument is delivered with a complete series of application programs and supports several languages.

The spectrophotometer DR 3900 contains the following programs and operating types:

- Stored programs (pre-installed tests)
- Barcode Programs
- User Programs
- Favorites
- Single Wavelength
- Multi Wavelength
- Wavelength Scan
- Time course

The DR 3900 Spectrophotometer provides digital readouts in direct concentration units, absorbance or percent transmittance.

When selecting a user-generated or programmed method, the menus and prompts serve to direct the user through the test.

This menu system can also generate reports, statistical evaluations of generated calibration curves and to report instrument diagnostic checks.

⚠ WARNING

Electrical and fire hazards.

Only use the supplied benchtop power supply LZV844.

Only qualified experts may perform the tasks described in this section of the manual, while adhering to all locally valid safety regulations.

3.1 Unpack the instrument

The DR 3900 Spectrophotometer comes packaged with the following items:

- DR 3900 spectrophotometer
- Dust cover
- USB dust cover, fitted as standard
- Benchtop power supply with power cord for US, GB.
- Cell adapter A.
- Light shield, fitted as standard in the DR 3900
- Operator RFID tag (not available on all models)
- Basic operating instructions DR 3900, operating instructions LINK2SC

Further information, detailed user manuals and documentation are available on the website of the manufacturer.

Note: *If any of these items are missing or damaged, please contact the manufacturer or a sales representative immediately.*

3.2 Operating environment

Observe the following points to allow the instrument to function normally and give a long operating life.

- Position the instrument securely on a flat surface taking care to remove any objects from under the device.
- The ambient temperature must be 10–40 °C (50–104 °F).

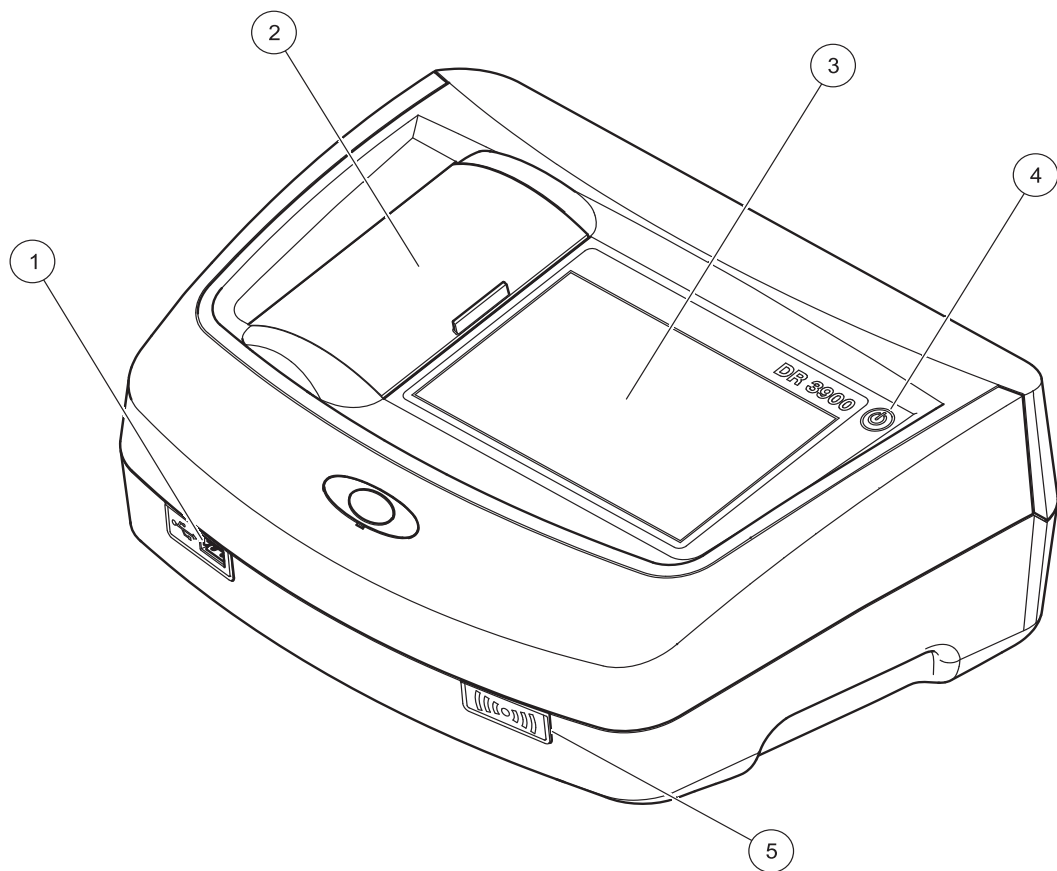
NOTICE

Protect the instrument from extreme temperatures from heaters, direct sunlight and other heat sources.

- The relative humidity should be less than 80%; moisture should not condense on the instrument.
- Leave at least a 15 cm clearance at the top and on all sides for air circulation to avoid overheating of electrical parts.
- Do not use or store the device in extremely dusty, humid or wet places.
- Keep the surface of the instrument, the cell compartment and all accessories clean and dry at all times. Immediately remove splashes or spilt materials on or in the instrument (refer to [Section 7](#)).

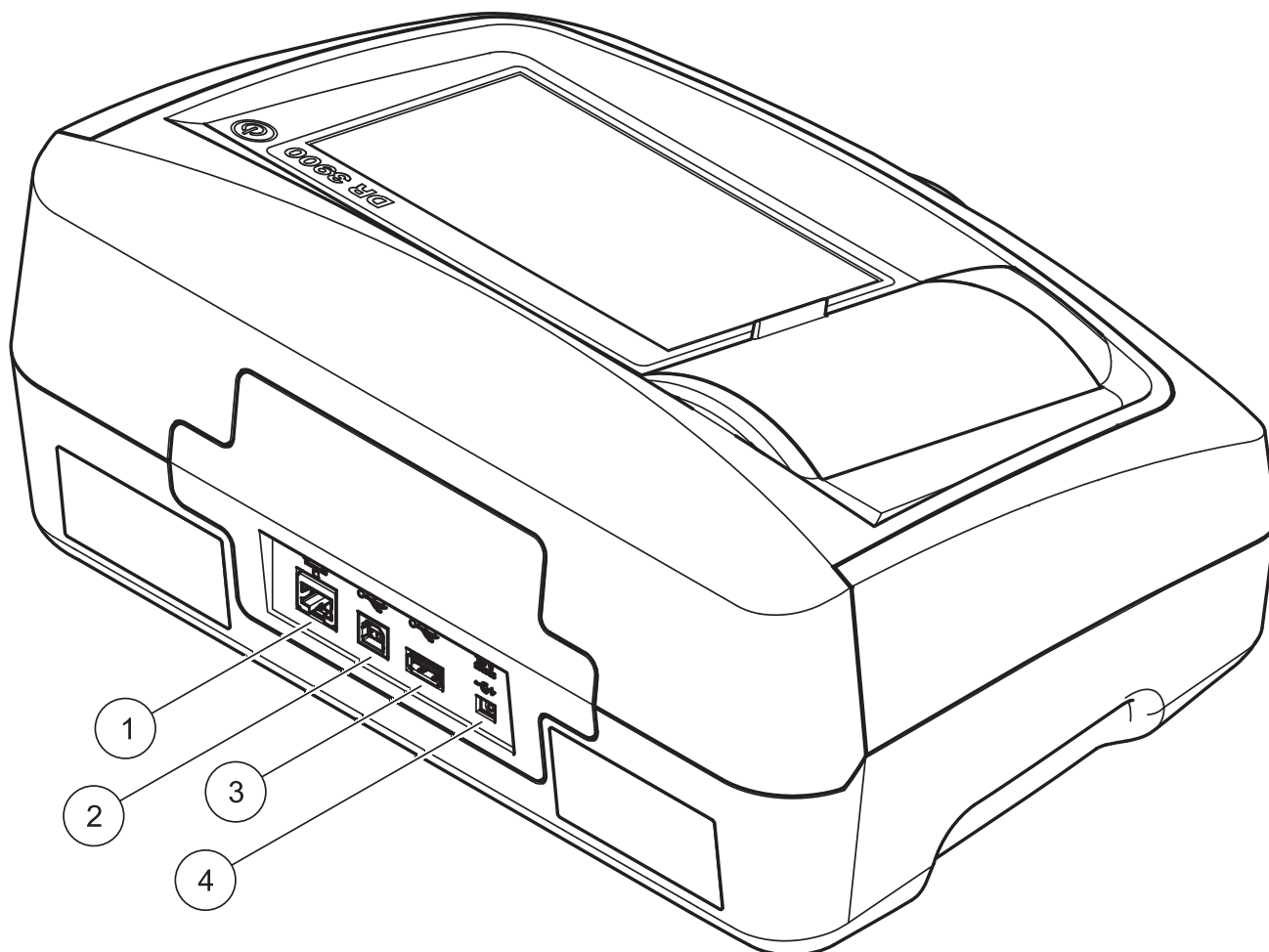
3.3 Front and back view

Figure 1 Front view



1	USB port type A	4	On/off switch
2	Cell compartment cover	5	RFID module (not available on all models)
3	Touch screen		

Figure 2 Back view



1	Ethernet port	3	USB port type A
2	USB port type B	4	Connection for benchtop power supply

3.4 Power connections

⚠ WARNING

Electrical and fire hazards.
Only use the supplied benchtop power supply LZV844.

1. Connect the power cable to the benchtop power supply.
2. Plug the benchtop power supply cable into the back of the instrument ([Figure 2, page 17](#)).
3. Insert the power cable plug into a mains socket (100–240 V~/50–60 Hz).
4. Turn on the power button next to the display to turn on the power supply ([Figure 1, page 16](#)).

3.5 Interfaces

The DR 3900 features three USB ports and one Ethernet port as standard, located on the front and rear sides of the instrument ([Figure 1](#) and [Figure 2, page 17](#)).

The USB type A ports are used for communications with a printer, USB memory stick or keyboard. A USB memory stick can be used to update the instrument software.

The USB type B port is used for communications with a PC. The optional Hach Data Trans software (refer to [Section 9, page 135](#)) must be installed on the PC for data transfer.

A USB hub may be used to connect several accessories at a time.

Note: *USB cables must not be longer than 3 m.*

These USB ports permit data to be exported to a printer or PC and also allow the instrument software to be upgraded (refer to [section 6.8.2, page 111](#)). The Ethernet port supports real-time data transfer in local networks, LIMS systems or SC controllers. Only use a shielded cable (e.g. STP, FTP, S/FTP) with a maximum length of 20 m for the Ethernet port.

3.6 Cell compartments, cell adapters and light shield

3.6.1 Cell compartments and adapters

The DR 3900 has two cell compartments ([Figure 3](#)). Only one cell type at a time can be used for a reading.

Cell compartment (1) for:

- 13 mm and 16 mm round cells

Note: *Cell compartment (1) contains barcode detection for cells/vials.*

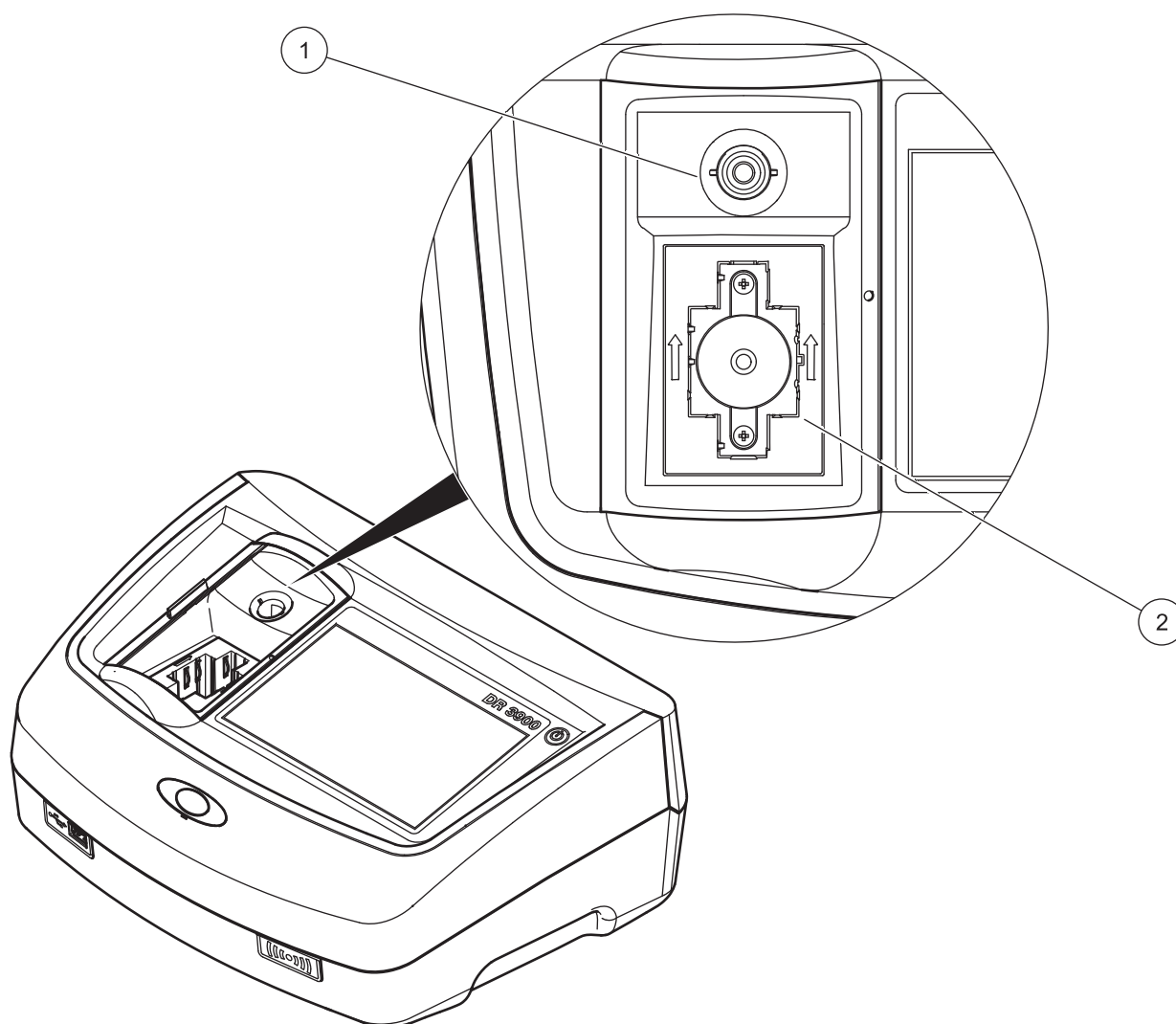
Cell compartment (2) for:

The following cell types can be used in cell compartment (2).

- Without cell adapter A, 50-mm cells, 1-inch rectangular cells and 1-inch flow cells can be used directly in cell compartment (2).
- With cell adapter A: 10 mm rectangular cells, 1-inch round cells and AccuVac® vials.

Note: *These cells **must** be inserted using cell adapter A.*

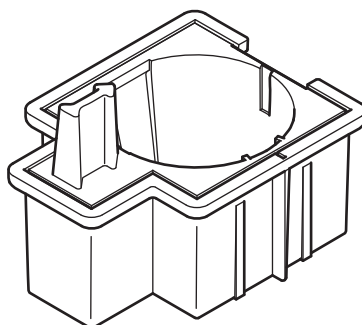
Figure 3 Cell compartments



1 Cell compartment for round cells (1)

2 Cell compartment for rectangular cells (2)

Figure 4 Cell adapter



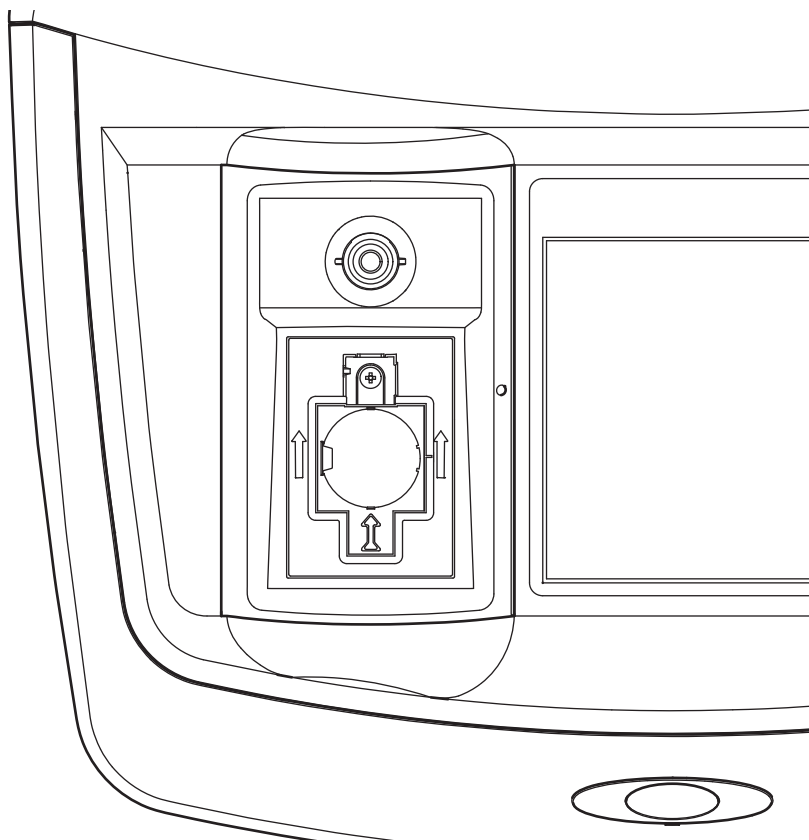
Cell adapter A: 10-mm rectangular cells/1-inch round cell

3.6.2 Installation of cell adapter

1. Open the cell compartment.
2. Place the cell adapter into cell compartment (2) so that the arrow on the cell adapter points to the rear ([Figure 5](#)).

Note: The arrow on top of the cell adapter indicates the direction of the light beam path.

Figure 5 Installation of a cell adapter



3.6.3 Use of the light shield for measurements

The light shield ([Figure 6](#)) prevents disruptive exposure to light when 13 mm or 16 mm round cells are used in the cell compartment (1).

Insert the light shield into cell compartment (2) before performing measurements in cell compartment (1).

The instrument is shipped with the light shield installed. Remove the light shield before using cell compartment (2).