

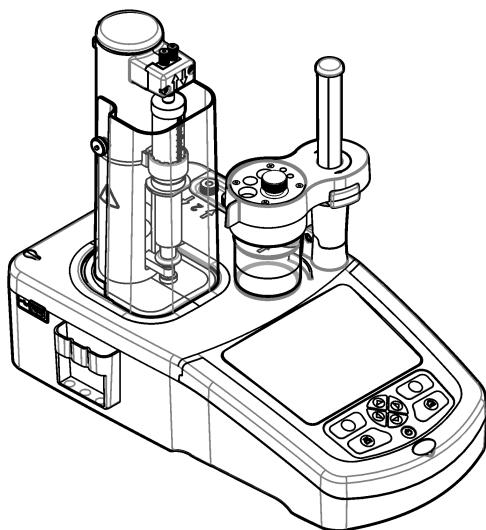


DOC022.52.93082

# TitraLab® KF1000 series workstations

02/2025, Edition 12

**User Manual**





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# Section 1 Specifications

Specifications are subject to change without notice.

| Specification                   | Details                                                                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Dimensions (W x D x H)          | 22 x 40 x 36 cm (8.7 x 15.7 x 14.2 in.)                                                                                           |
| Weight                          | 4 kg (8.8 lb)                                                                                                                     |
| Power requirements              | Instrument: Input 24 VDC, 2.5 A<br>External power supply: Input 100–240 VAC, 50–60 Hz, 1.5 A, Class I; output 24 VDC, 2.5 A 60 VA |
| Main supply voltage fluctuation | ±10% of nominal voltage                                                                                                           |
| Altitude                        | 2,000 m (6,562 ft) maximum                                                                                                        |
| Operating temperature           | 15 to 35 °C (59 to 95 °F)                                                                                                         |
| Relative humidity               | 20 to 80%, non-condensing                                                                                                         |
| Storage temperature             | –5 to 40 °C (23 to 104 °F)                                                                                                        |
| Overvoltage category            | II                                                                                                                                |
| Pollution degree                | 2                                                                                                                                 |
| Environmental conditions        | Indoor use                                                                                                                        |
| Certifications                  | Safety: IEC/EN 61010-1, UL/CSA C22.2 61010-1<br>EMC: IEC/EN 61326-1                                                               |
| EMC requirements                | This product is intended to be used in a domestic or basic electromagnetic environment.                                           |
| Warranty                        | 1 year (EU: 2 years)                                                                                                              |

# Section 2 General information

In no event will the manufacturer be liable for damages resulting from any improper use of product or failure to comply with the instructions in the manual. The manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation. Revised editions are found on the manufacturer's website.

## 2.1 Safety information

The manufacturer is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

If the equipment is used in a manner that is not specified by the manufacturer, the protection provided by the equipment may be impaired. Do not use or install this equipment in any manner other than that specified in this manual.

### 2.1.1 Use of hazard information

|                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------|
| <b> DANGER</b>                        |
| Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury. |

## ⚠ WARNING

Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

## ⚠ CAUTION

Indicates a potentially hazardous situation that may result in minor or moderate injury.

## NOTICE

Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

### 2.1.2 Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol on the instrument is referenced in the manual with a precautionary statement.

|                                                                                  |                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | This symbol, if noted on the instrument, references the instruction manual for operation and/or safety information.                                                                                                 |
|  | This symbol indicates that a risk of electrical shock and/or electrocution exists.                                                                                                                                  |
|  | This symbol indicates the presence of devices sensitive to Electro-static Discharge (ESD) and indicates that care must be taken to prevent damage with the equipment.                                               |
|  | Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems. Return old or end-of-life equipment to the manufacturer for disposal at no charge to the user. |

### 2.1.3 EMC compliance

## ⚠ CAUTION

This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

#### CE (EU)

The equipment meets the essential requirements of EMC Directive 2014/30/EU.

#### UKCA (UK)

The equipment meets the requirements of the Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091).

#### Canadian Radio Interference-Causing Equipment Regulation, ICES-003, Class A:

Supporting test records reside with the manufacturer.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de classe A répond à toutes les exigences de la réglementation canadienne sur les équipements provoquant des interférences.

#### FCC Part 15, Class "A" Limits

Supporting test records reside with the manufacturer. The device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. The equipment may not cause harmful interference.
2. The equipment must accept any interference received, including interference that may cause undesired operation.

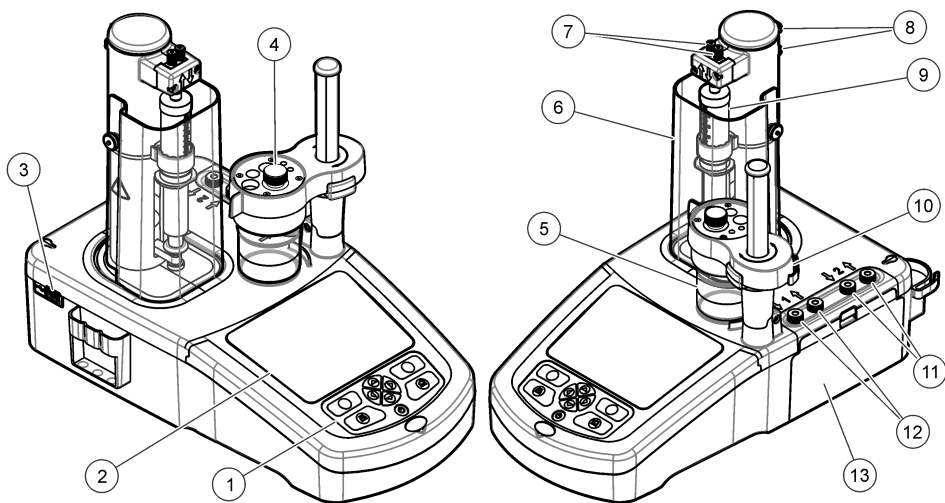
Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their expense. The following techniques can be used to reduce interference problems:

1. Disconnect the equipment from its power source to verify that it is or is not the source of the interference.
2. If the equipment is connected to the same outlet as the device experiencing interference, connect the equipment to a different outlet.
3. Move the equipment away from the device receiving the interference.
4. Reposition the receiving antenna for the device receiving the interference.
5. Try combinations of the above.

## **2.2 Product overview**

The instrument operates with digital and analog sensors to do potentiometric (AT1000 series) and volumetric (KF1000 series) titration. Measurement applications are installed on the instrument to automate the measurement process. Refer to [Figure 1](#). Instructions show on the display when user intervention is required.

Figure 1 Product overview



|                         |                            |                                  |
|-------------------------|----------------------------|----------------------------------|
| 1 Keypad                | 6 Syringe protection cover | 11 Pump 2 input/output (waste)   |
| 2 Display               | 7 Syringe input/output     | 12 Pump 1 input/output (solvent) |
| 3 USB port <sup>1</sup> | 8 Tube clips               | 13 Pump access cover             |
| 4 Sample stopper        | 9 Syringe                  |                                  |
| 5 Beaker                | 10 Sensor holder           |                                  |

Table 1 Instrument configuration

| Model  | Syringes | Pumps |
|--------|----------|-------|
| KF1121 | 1        | 2     |

2.3 Instrument connections

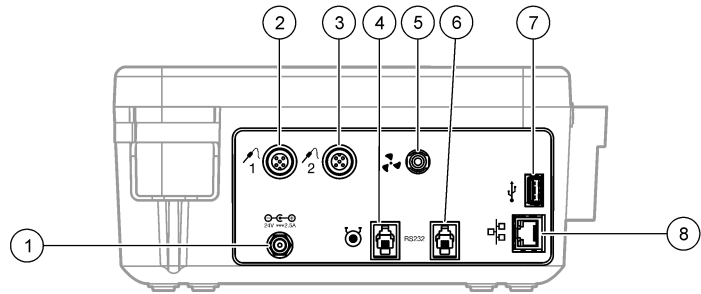
**⚠ DANGER**

Electrical shock hazard. Externally connected equipment must comply with an applicable country safety standard (e.g., IEC 60950-1 or IEC 62368-1 for IT equipment) and the circuit intended to be connected to the equipment shall not exceed the SELV (safety extra low voltage) safe level.

<sup>1</sup> A second USB port is found on the rear of the instrument, but the instrument recognizes only one USB storage device connection at a time.



Use the USB port on the side of the instrument for the USB applications key supplied with the instrument. Use the USB port on the rear of the instrument to connect to a printer, mouse, keyboard or a USB hub.

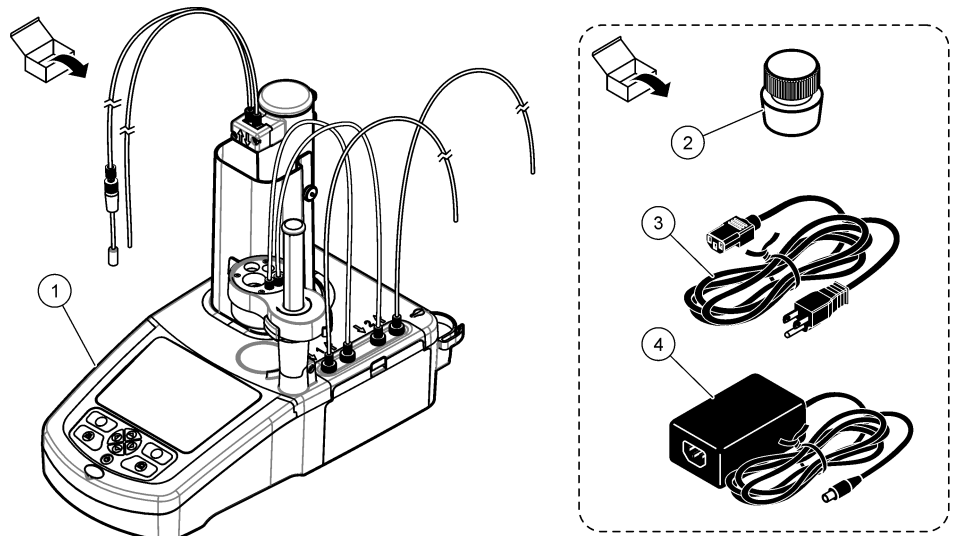


|                                   |               |                 |
|-----------------------------------|---------------|-----------------|
| 1 24 V external power supply port | 4 Not used    | 7 USB port      |
| 2 Sensor 1 port                   | 5 Not used    | 8 Ethernet port |
| 3 Sensor 2 port                   | 6 Serial port |                 |

2.4 Product components

Make sure that all components have been received. Refer to the packing list in the box. If any items are missing or damaged, contact the manufacturer or a sales representative immediately.

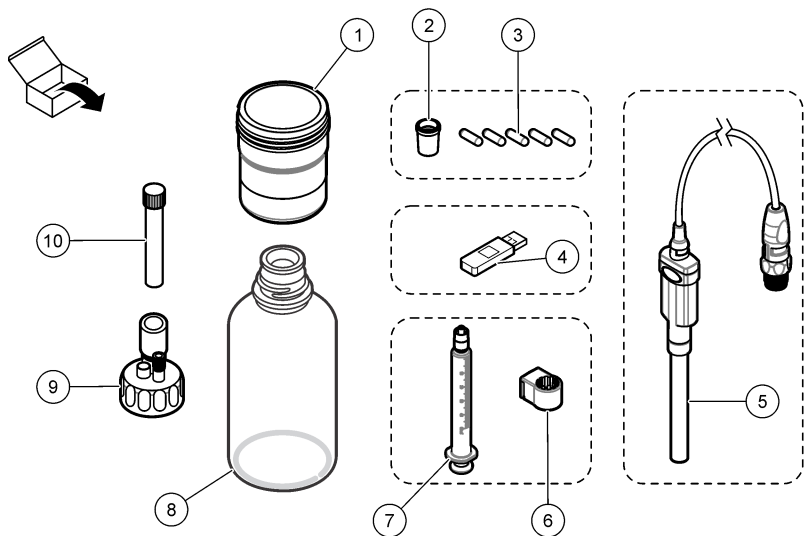
Figure 2 Contents of the instrument box



**Note:** For identification, the outlet tube from the syringe is fitted with a blue marker.

|                  |                |
|------------------|----------------|
| 1 Instrument     | 3 Power cord   |
| 2 Sample stopper | 4 Power supply |

**Figure 3 Contents of the application box**



|                                 |                                                             |
|---------------------------------|-------------------------------------------------------------|
| 1 KF standard beaker            | 6 Syringe holding ring                                      |
| 2 KF white PTFE conical adapter | 7 Syringe                                                   |
| 3 Magnetic stir bars            | 8 Glass bottle                                              |
| 4 USB applications key          | 9 Bottle caps (3 x GL45)                                    |
| 5 Sensor                        | 10 Desiccant cartridges (3x, filled with a molecular sieve) |

Section 3 Installation

**CAUTION**

Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

**NOTICE**

This is a class A product. There may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted as well as radiated disturbances. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

**NOTICE**

Network and access point security is the responsibility of the customer that uses the wireless instrument. The manufacturer will not be liable for any damages, inclusive however not limited to indirect, special, consequential or incidental damages, that have been caused by a gap in, or breach of network security.

3.1 Installation guidelines

- This instrument is for indoor use only.
- The plug of the mains supply cord or the input connector of the external power supply must be easily accessible so the power can be disconnected quickly in an emergency.
- Protective earth ground (PE) connection is required.

- Keep the instrument away from temperature extremes, including heaters, direct sunlight and other heat sources.
- Put the instrument on a stable and level surface in a well ventilated place.
- Make sure that there is at least 15 cm (6 in.) of space on all sides of the instrument to prevent electrical parts from overheating.
- Do not operate or keep the instrument in dusty, damp or wet locations.
- Always keep the surface of the instrument and all accessories dry and clean.

## 3.2 Connect to AC power

| ⚠ CAUTION                                                                         |                                                                                                                                         |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|  | Electrical shock and fire hazards. Make sure that the supplied cord and non-locking plug meet the applicable country code requirements. |

| ⚠ WARNING                                                                         |                                                                                        |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|  | Fire hazard. Use only the external power supply that is specified for this instrument. |

| ⚠ WARNING                                                                         |                                                                            |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------|
|  | Electrocution hazard. Protective Earth Ground (PE) connection is required. |

1. Connect the power cord to the power supply.
2. Connect the power supply to the instrument (refer to [Instrument connections](#) on page 6).
3. Connect the power cord to an electrical outlet.

## 3.3 Install the syringe

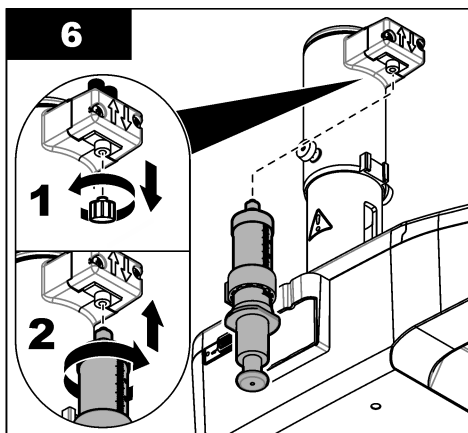
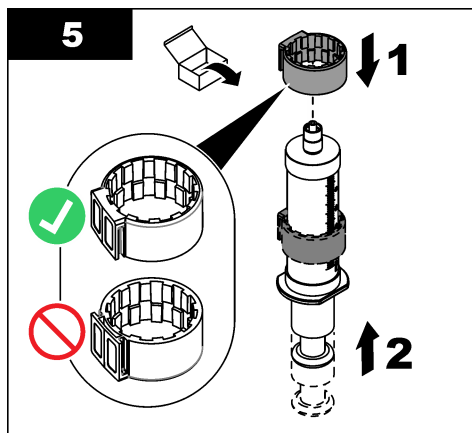
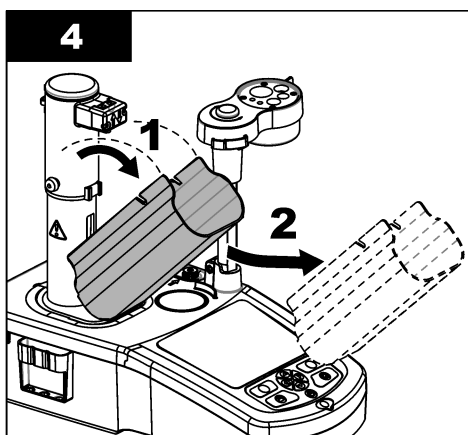
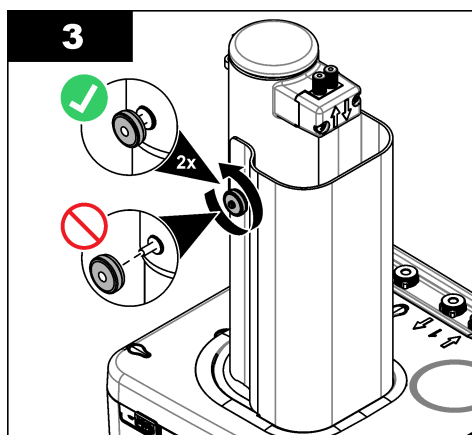
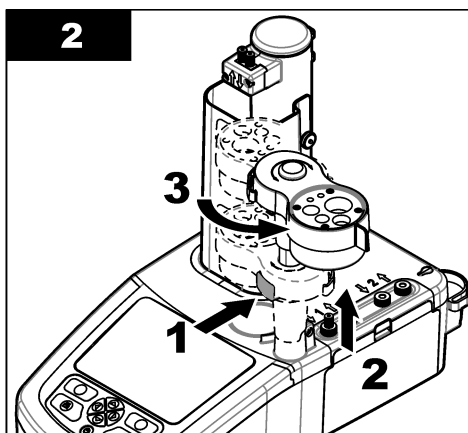
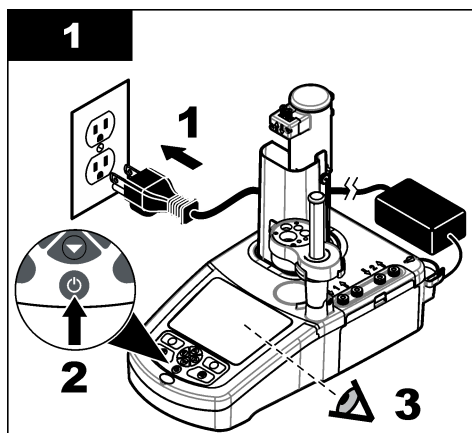
Before syringe installation, set the instrument power to on. Push the power button on the front of the instrument. Make sure that the startup sequence shows on the display. The syringe holder lowers to its operating position.

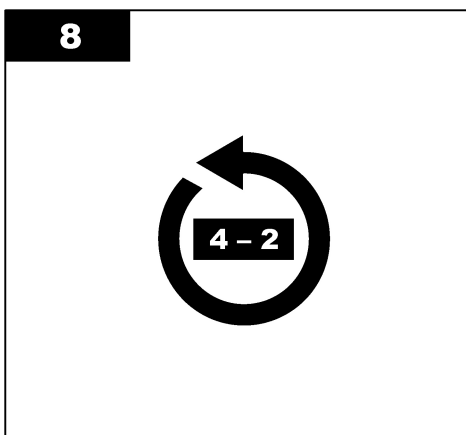
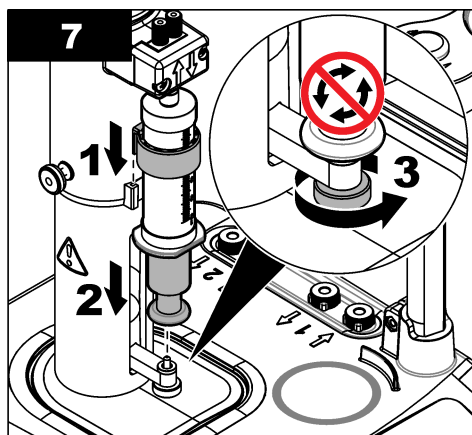
**Note:** Ignore any warning messages related to missing applications that show on the display.

The sensor holder has two positions: one over the magnetic stirrer and the second at 180° to the right. Move the sensor holder away from the instrument to the second position.

Install the syringe. Refer to the illustrated steps that follow.

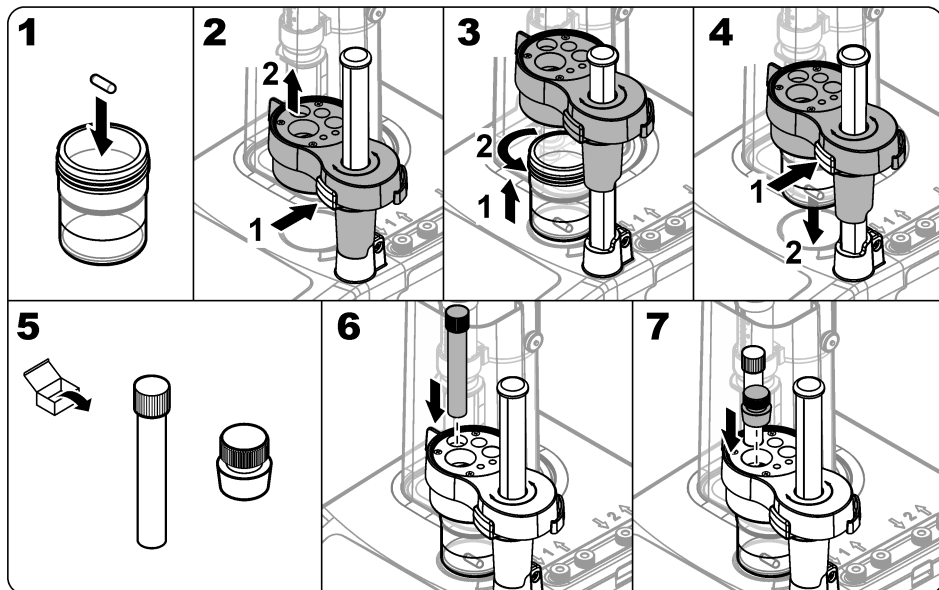
| NOTICE                                                                                                                                    |  |
|-------------------------------------------------------------------------------------------------------------------------------------------|--|
| In step 6, tighten the syringe using the metallic part at the top. Do not hold the glass section of the syringe. Do not tighten too much. |  |





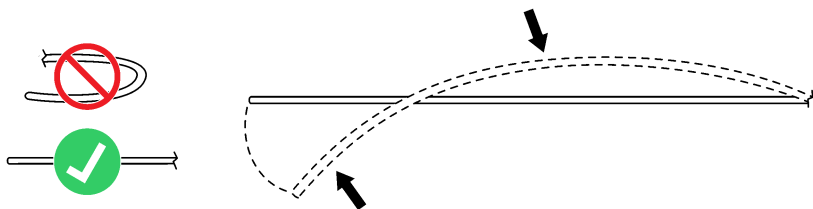
### 3.4 Install the sensor holder accessories

Add the stir bar to the beaker, and then attach the beaker to the sensor holder. Install the desiccant cartridge and the sample stopper. Refer to the illustrated steps that follow.



### 3.5 Prepare the tubes

Remove any bends in the end of the tubes.



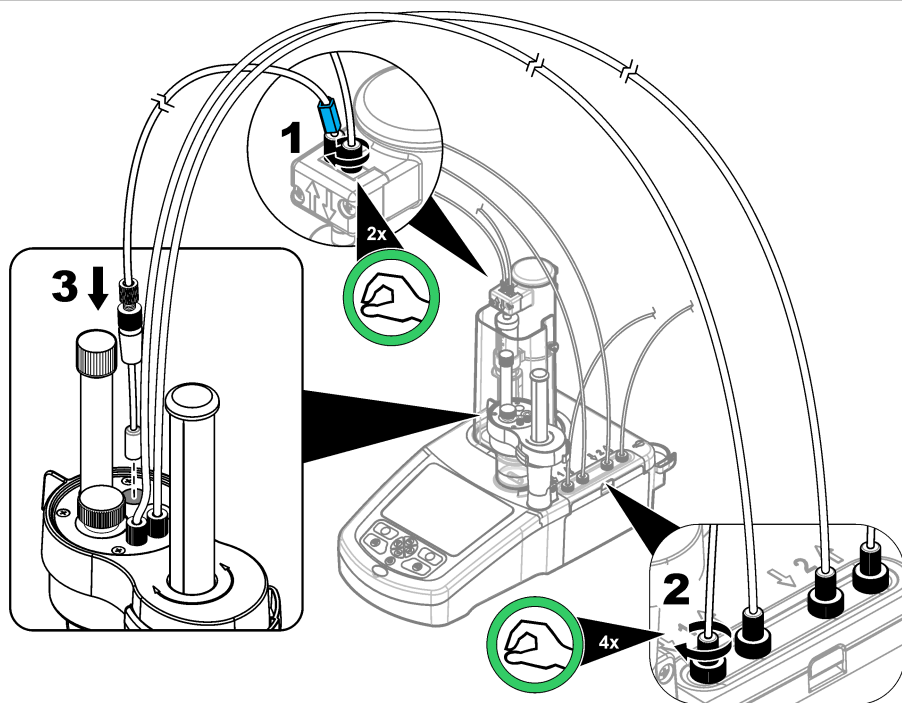
### 3.6 Connect the tubes

Arrow symbols identify the inlet and outlet ports for the syringe and the pump connections. The “up” arrow is the outlet port. The “down” arrow is the inlet port. Turn the tube connectors on the inlet and outlet ports of the syringe and pump until they click.

The suction tube that drains into the waste bottle must be installed on the bottom of the beaker for good drainage.

#### NOTICE

The diffusion tip and tube holder on the outlet tube, are pre-installed at the optimal positions. Do not change the position of the diffusion tip or the tube holder.



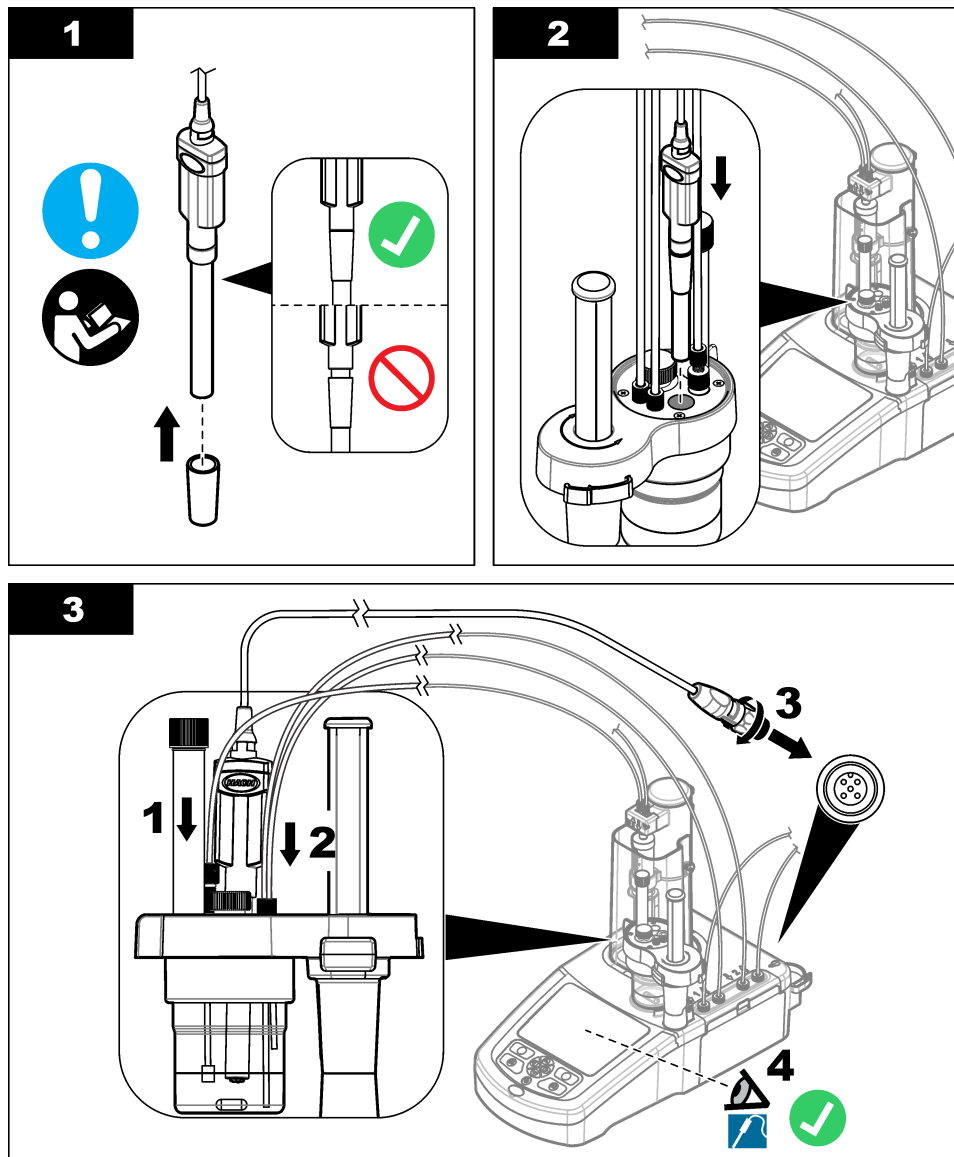
### 3.7 Install the sensor

#### 3.7.1 Connect the sensor

Use a conical adapter to hold the sensor tightly in the sensor holder. Make sure the conical adapter is installed correctly. This makes sure of a secure water-tight fitting in the sensor holder and the tip of the sensor will be in the correct position in the beaker.

Connect the sensor to an available sensor port on the rear of the instrument. After the sensor is connected, make sure that the sensor icon shows in the banner at the top of the display.

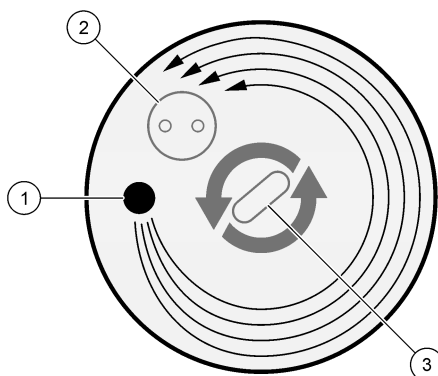
Refer to the illustrated steps that follow.



### 3.7.2 Check the titrant tube and sensor installation

The titrant must be added where there is most turbulence and as far away from the sensor to allow the reagent time to react. Check that the titrant tube and the sensor are positioned correctly. Refer to [Figure 4](#), where the arrows show the direction of the sample flow.

**Figure 4 Titrant tube and sensor positions**



|                |          |                     |
|----------------|----------|---------------------|
| 1 Titrant tube | 2 Sensor | 3 Magnetic stir bar |
|----------------|----------|---------------------|

### 3.8 Install the titrant and the reagent

| ⚠ CAUTION |                                                                                                                                                                                                                                       |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols. |
| ⚠ CAUTION |                                                                                                                                                                                                                                       |
|           | Chemical exposure hazard. Dispose of chemicals and wastes in accordance with local, regional and national regulations.                                                                                                                |

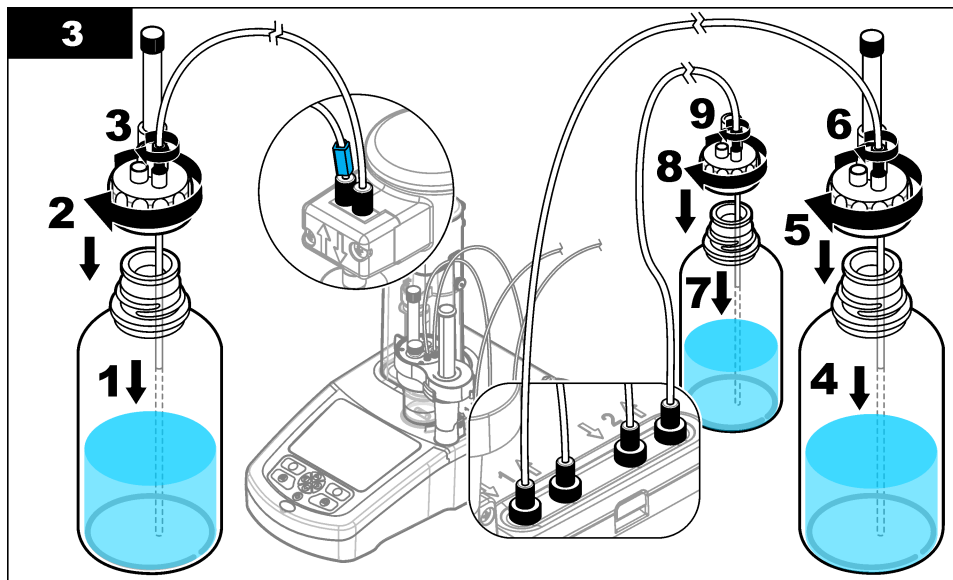
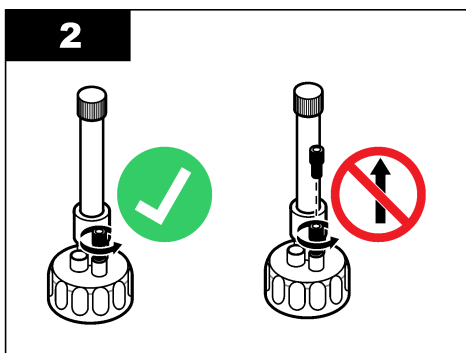
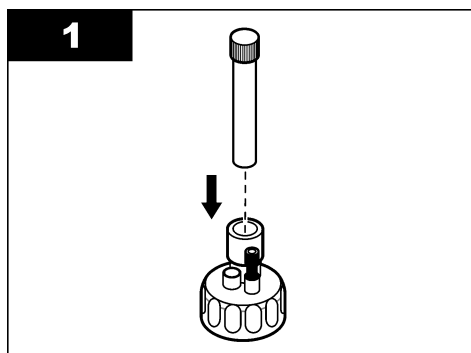
Put a filled desiccant cartridge into the adapter on the titrant and solvent bottle caps.

**Note:** The molecular sieve in the filled cartridges must be regenerated regularly depending on the humidity of the laboratory. Refer to [Regenerate the molecular sieve](#) on page 35.

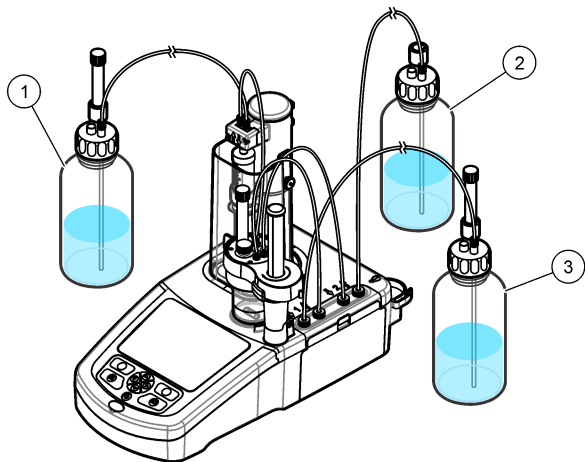
Loosen the tube connector on the bottle cap. Push the inlet tube through the connector. Make sure that the end of the tube is at the bottom of the bottle. Tighten the connector on the bottle cap.

Pump 1 is used to fill the measurement cell with solvent. Pump 2 is used to empty the measurement cell. Refer to the illustrated steps that follow.





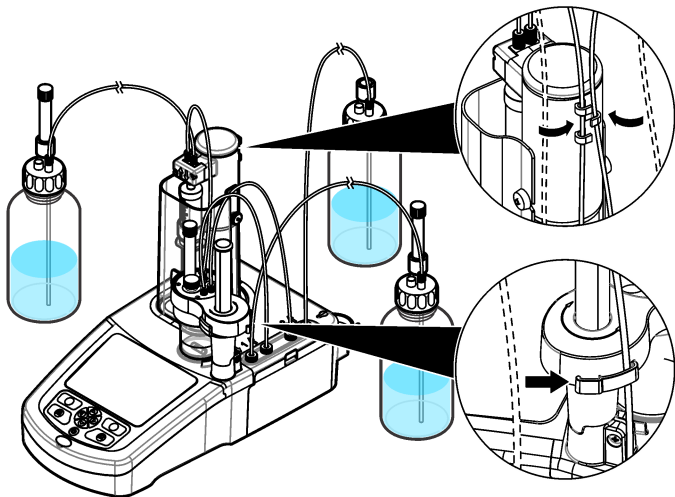
**Figure 5 Bottles identification**



|           |           |
|-----------|-----------|
| 1 Titrant | 3 Solvent |
| 2 Waste   |           |

**3.9 Tidy the work area**

Attach the tubes to the instrument with the clips on the electrovalve and the sensor holder. Refer to the illustrated steps that follow.



**Section 4 Install accessories**

**4.1 Install a balance**

This accessory is used to automatically send accurate weights to the instrument. The balance is a laboratory type balance and uses the RS232 communication protocol with no flow control. When a balance is connected, the window shown at the end of a titration that lets users enter a weight, shows the value from the balance.

The balance automatically sends the weight and unit to the instrument in textual format:

- Messages end with <LF>, <CR> or <LF+CR>
- The numeric value of the weight must be transmitted before the unit of weight
- Allowed units of weight are g, mg and kg
- The unit of weight specifies the end of the data string used by the instrument
- Space characters are ignored

1. Set the RS232 parameters on the balance to:

- 9600 baud
- no parity
- no handshake
- 8 data bits
- 1 stop bit

2. Connect the balance to the serial port on the rear of the instrument (refer to [Instrument connections](#) on page 6) using an applicable cable.

3. From the home screen, select **Settings > Options** and make sure that the **Balance** option is checked.

## 4.2 Install the syringe verification kit

The optional syringe verification kit enables the verification of the dispensing system based on the ISO8655 standard. The test adds different volumes of liquid on a vessel put on a balance. The weights are used to calculate the real volume added. The real volume is compared with the nominal volume. The results are used to calculate the error in the volume added and the syringe precision. There are three verification modes available:

- Fully automated—The balance is connected to the instrument. The system makes the additions and calculates the results.
- Partially automated—The balance is not connected to the instrument. The user does the balance readings and the system calculates the results.
- Dispense only—The system only makes the additions. The user does the balance readings and calculates the results.

The syringe verification kit includes all of the necessary items: dispensing tips, tubes, syringe holder, pipette holder, support stand, software key and label with the license number. Make sure to keep the label with the license number. A license key is necessary to enable the syringe verification option on the instrument. The first time the option is selected, the instrument shows the MAC address and the Firmware version. Send the MAC address, firmware version and the license number to the manufacturer or a sales representative to get the license key.

**Note:** The license key is only necessary when the option is selected for the first time.

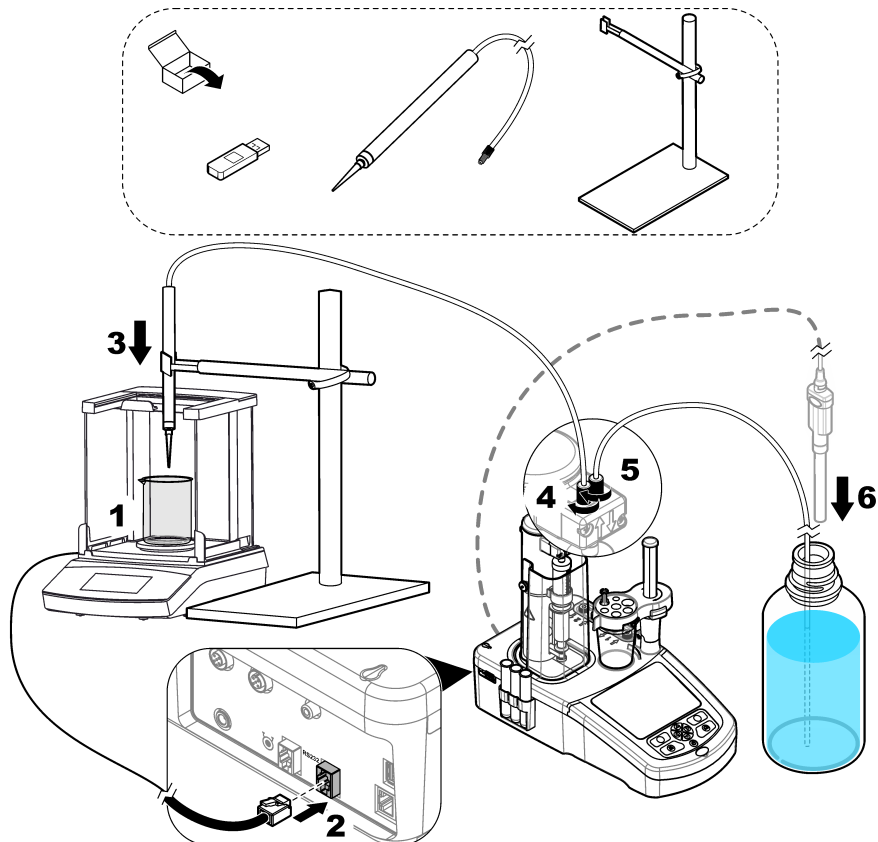
### Items to collect:

- Analytical balance with resolution 0.1 mg, repeatability 0.2 mg and uncertainty 0.2 mg
- Temperature sensor
- Deionized water "quality 3" (ISO 3696)

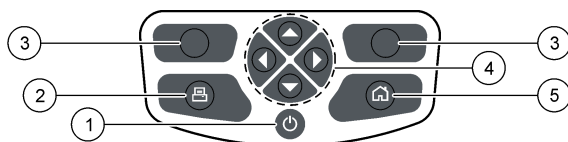
Prepare the syringe verification kit as follows:

1. Put an empty beaker on the balance. Refer to the illustrated steps that follow.
2. For the fully automated mode, connect the balance to the instrument.
3. Install the support stand near the balance. Put the pipette tip adapter above the beaker on the balance.
4. Connect the tube from the pipette holder to the syringe outlet port.
5. Connect the tube from the water bottle to the syringe inlet port.

- Note:** The temperature setting is necessary for the fully automated and partially automated modes. The dispense only mode does not adjust the temperature.



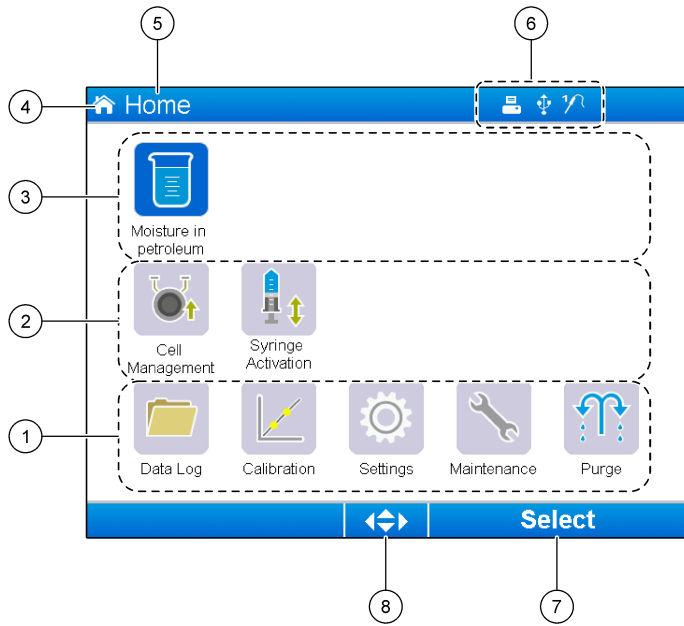
## 5.1 Keypad



|           |                   |            |
|-----------|-------------------|------------|
| 1 Power   | 3 Selection keys  | 5 Home key |
| 2 Printer | 4 Navigation keys |            |

| Key                         | Description                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power                       | Sets the instrument power to on or off. Push the key for 2 seconds to set the power to off.                                                                                                                                                                                                                                                         |
| Printer                     | The printer key only operates if a printer is connected to the instrument. Sends the data currently shown on the display to a connected printer when pushed. A sound is heard if the current display cannot be printed. A graph is automatically printed at the end of the measurement, if the option is selected ( <b>Settings &gt; Options</b> ). |
| Selection keys (contextual) | Used to select options shown above them in the footer bar. The options available are applicable to the current operation (e.g. calibration, measurement, etc.).                                                                                                                                                                                     |
| Navigation keys             | Scrolls through menus and data, enter numbers and letters, enter checkbox settings and set options for the syringe and the pump.                                                                                                                                                                                                                    |
| Home                        | Push this key at any time to go directly to the home screen. A sound is heard if the key is disabled (e.g. during a calibration or measurement).                                                                                                                                                                                                    |

## 5.2 Home screen



|                                                             |                                                                |
|-------------------------------------------------------------|----------------------------------------------------------------|
| <b>1</b> Available options from this screen                 | <b>5</b> Screen name                                           |
| <b>2</b> A second row of available options from this screen | <b>6</b> Information icons (refer to <a href="#">Table 2</a> ) |
| <b>3</b> KF applications                                    | <b>7</b> Option available by pushing the selection key below   |
| <b>4</b> Screen icon                                        | <b>8</b> Arrow keys available for use in the screen            |

[Table 2](#) shows the information icons that can be shown in the header bar.

**Table 2 Information icons**

| Icon                                                                             | Description                                                                                                                               |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|  | A printer is connected to the instrument                                                                                                  |
|  | A USB key is connected to the instrument                                                                                                  |
|  | A sensor is connected to sensor port 1                                                                                                    |
|  | A sensor is connected to sensor port 2                                                                                                    |
|  | The data log file is full. Refer to <a href="#">Manage the data log</a> on page 32 for the options available to manage the data log file. |

### 5.3 Menu structure

The three primary menus are shown in [Table 3](#), [Table 4](#) and [Table 5](#).

**Table 3 Home menu**

| Option                                                                                              | Description                                                      |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|  Cell management    | Use the pumps to fill or empty the measurement cell              |
|  Syringe activation | Make sure that the syringe is working correctly                  |
|  Data log           | Manage the data log file                                         |
|  Calibration      | Electrode and titrant calibration procedures                     |
|  Settings         | See the table entry below                                        |
|  Maintenance      | See the table entry below                                        |
|  Purge            | Remove air from the syringe, and from the syringe and pump tubes |

**Table 4 Settings menu**

| Option                                                                                               | Description                                                     |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
|  Applications       | Manage the installed applications                               |
|  Operators          | Set up and manage the instrument operators                      |
|  Date & Time        | Set the date and time                                           |
|  Brightness         | Adjust the display brightness                                   |
|  Sounds             | Set the sound on or off for specific operations                 |
|  Language           | Set the operating language                                      |
|  Network            | Give a name to identify the instrument                          |
|  Info              | Show instrument and attached hardware information               |
|  Restore defaults | Set the instrument to the default configuration                 |
|  Options          | Set the operating parameters                                    |
|  Security         | Set a password and specify which options are password protected |

**Table 5 Maintenance menu**

| Option                                                                                                     | Description                                                                          |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  Syringe activation        | Make sure that the syringe is working correctly                                      |
|  Pump activation           | Make sure that the pump is working correctly                                         |
|  Stirring activation       | Make sure that the stirrer is working correctly                                      |
|  Syringe management        | Replace the syringe or change the syringe volume                                     |
|  Pump cassette replacement | Replace the pump cassette for installed pumps                                        |
|  Reagent replacement       | Use this option when replacing reagents                                              |
|  Maintenance schedule      | Manage the maintenance tasks                                                         |
|  Maintenance summary      | See the number of days remaining on specified devices before maintenance is required |
|  Syringe verification    | When enabled, starts the syringe verification procedure.                             |

## Section 6 Startup

| ⚠ CAUTION                                                                          |                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols. |
| ⚠ CAUTION                                                                          |                                                                                                                                                                                                                                       |
|  | Chemical exposure hazard. Dispose of chemicals and wastes in accordance with local, regional and national regulations.                                                                                                                |



## ⚠ CAUTION

Personal injury hazard. Never use the instrument without the syringe cover installed.

### 6.1 Configure the instrument

1. From the home screen, select **Settings**. Refer also to [Menu structure](#) on page 20.
2. Select an option, then push **Select**.

| Option                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applications</b>     | Changes (refer to <a href="#">Change the application settings</a> on page 31), makes copies, exports and removes application data. Make sure that the duplication function does not make more than five applications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Operators</b>        | Adds, changes and removes operators.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Date + Time</b>      | Sets the instrument date and time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Brightness</b>       | Sets the brightness of the display.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Sounds</b>           | Sets the sound options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Language</b>         | Sets the language.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Network</b>          | Give a name to the instrument. If a printer is connected, this name is printed on the hard-copy output. Restart the instrument if the name is changed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Info</b>             | Shows information about the instrument and the attached hardware.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Restore Defaults</b> | Sets the instrument to the default configuration. The restored settings are: <ul style="list-style-type: none"><li>• The language is set to English</li><li>• All password security is removed</li><li>• The security password is set to 0000</li><li>• No sound on: Key press, Information and Analysis results OK</li><li>• Sound on: Instrument ready, Instrument switch off, Errors and Analysis results not OK</li><li>• The application parameters view is set to basic mode</li><li>• Sets the syringe to empty when the instrument is set to off</li><li>• The temperature display unit is set to °C</li><li>• No automatic cell conditioning</li><li>• No automatic cell levelling</li><li>• No print of the measurement curve</li><li>• No balance is connected</li><li>• The default stirring is set to 10%</li><li>• The user is set to "Default user"</li></ul> |

| Option          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Options</b>  | <p>Sets the following options:</p> <ul style="list-style-type: none"> <li>• Set the application parameters view to expert or basic mode</li> <li>• When the instrument is set to off, sets the syringe to empty into the titrant bottle</li> <li>• Changes the temperature display unit</li> <li>• Set the cell standby parameter (refer to <a href="#">Cell standby</a> on page 24)</li> <li>• Prints the measurement curve if a printer is connected</li> <li>• Specify if a balance is connected</li> </ul> <p><b>Note:</b> When the instrument is set to on, the application parameters view is always set to basic mode. Changes made to application data with the instrument in expert mode are kept.</p> |
| <b>Security</b> | <p>Change the password. Specify which of these options are password protected:</p> <ul style="list-style-type: none"> <li>• Settings (all items except Info)</li> <li>• Maintenance schedule and summary</li> <li>• Delete data log</li> <li>• Export data log</li> <li>• Electrode calibration</li> <li>• Titrant calibration</li> <li>• Sample volume calibration</li> <li>• Syringe verification test</li> </ul>                                                                                                                                                                                                                                                                                             |

### 3. Push **Back**.

#### 6.1.1 Cell standby

Make sure that the measurement cell is prepared before selecting an application, because the cell standby starts automatically.

Cell standby dries the measurement cell automatically using a regulated addition of the titrant as defined in the application. When the cell standby option is active:

- Cell standby starts automatically as soon as an application is selected from the home screen
- The stirring speed is the speed specified for the application
- Cell standby information is shown at the bottom of the application start screen
- After the weight of the sample is validated at the end of the measurement procedure, the cell conditioning automatically starts again
- Cell standby continues until the next sample is selected and a new measurement procedure starts
- If the **Cell management** option is selected at the end of the measurement procedure, cell standby is paused and starts again when the cell management procedure completes
- The measurement procedure starts when **Start** is selected. If the cell is dry, cell conditioning is not needed and the user is asked to add the sample. If the cell is not dry, cell conditioning starts

## 6.2 Install the applications

Use the supplied USB key to install the applications. The instrument can install a maximum of five applications. The installed applications are shown on the top line of the display.

If any errors occur during installation, refer to [Troubleshooting](#) on page 40.

1. Push **Home** to go to the main menu.
2. Connect the USB key to the USB port on the side of the instrument. The applications on the USB key show on the display.
3. Push the arrow keys to highlight and select an application to install. Push the left or right arrow key to select it. Do this step again to select additional applications to install.
4. Push **Import** to install the selected applications.

5. Push **OK** to complete the installation. The installed applications show on the home screen.  
*Note: To install more applications, push **Home** to go to the home screen, then remove the USB key and reconnect it.*

## 6.3 Prepare the instrument for measurement

1. From the home screen, select **Purge**. All attached devices are listed.
2. Select **All elements** to purge all the attached devices, or select one device to purge. Push **Select**. Air is removed from the device and filled with liquid from the bottle.
3. Push **OK** when the operation has completed.
4. Make sure that there are no air bubbles in the device. Do step 2 again if there are any air bubbles.
5. Select the next device to purge if individual devices are being selected.
6. Push **Exit** when all the tubes are filled with reagent and the device has no air bubbles.  
*Note: If a few small air bubbles can be seen on the inner wall and/or piston of the syringe, they can be left without affecting system performance.*

## Section 7 Standard operations

### ▲ CAUTION



Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

### ▲ CAUTION



Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols.

### ▲ CAUTION



Chemical exposure hazard. Dispose of chemicals and wastes in accordance with local, regional and national regulations.

### ▲ CAUTION

Personal injury hazard. Never use the instrument without the syringe protection cover in place.

### ▲ CAUTION

Chemical exposure hazard. Never remove the stir bar from the beaker before the end of a titration.

## 7.1 Calibration

### 7.1.1 Calibrate the titrant

1. Make sure that the glass beaker, the sensor holder and all related parts are clean and dry. Put a magnetic stir bar into the beaker.
2. Attach the beaker to the sensor holder. Make sure that the beaker fits tightly into the sensor holder.
3. Read the related "Application Note" from the USB applications key for more instructions.
4. Fill the beaker with the applicable amount of solvent. Refer to the application note and [Cell management](#) on page 33 to adapt the volume where applicable. Make sure that there is no liquid spill. Make sure that the initial level is enough so that the sensor is correctly installed in the sample. Do not put too much solvent in the beaker.

5. From the home screen, select **Calibration**.
6. If more than one application contains a titrant calibration method, push the up and down arrow keys to highlight the application to use, then push **Select**.
7. Calibration information shows on the display. If necessary, select an icon for more information or to change some data.

| Option             | Description                                                          |
|--------------------|----------------------------------------------------------------------|
| <b>Information</b> | Shows more information about the calibration.                        |
| <b>Operator</b>    | Changes the operator ID. Select from a list of applicable operators. |

8. Make sure that the icon at the bottom of the display  is highlighted. Do the instructions that show on the display adjacent to this icon. Make sure that the tubes and sensor are correctly aligned.
9. Push **Start** to start the calibration. Calibration data shows on the display.
10. If the default stirring speed needs to be adjusted, push the up and down arrow keys to increase or decrease the speed.  
*Note: This adjustment only applies to the current operation. The standard default stirring speed for the application is not changed.*
11. The cell drift threshold, stability bar, sample temperature and measurement duration are shown at the bottom of the display. The stability bar shows the stability of the signal and ranges in color from red (unstable), through yellow, to green (stable). The cell drift value is shown in the middle of the display. These messages can be displayed under the cell drift value:

| Message                      | Description                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Excess of water</b>       | The measurement cell contains too much water. Titrant continues to be added until the cell is dry. |
| <b>Excess of titrant</b>     | The measurement cell contains too much titrant. No more titrant is added.                          |
| <b>Risk of cell overflow</b> | The measurement cell is full and there is a risk of liquid spill. The procedure stops.             |

*Note: The stability bar or these messages are displayed at the bottom of the display during the calibration procedure.*

12. Two options are available during the cell conditioning procedure:

| Option      | Description                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stop</b> | Aborts the measurement and no results are calculated. If selected during the <b>Replicate Sample</b> option, then all data in the series is lost.                                                                            |
| <b>Skip</b> | Stops the cell conditioning and goes directly to the next step in the procedure. Results are then calculated from measurement data available before <b>Skip</b> is selected. Results can be less accurate using this option. |

13. Weigh the standard in its container and write down the result.
14. When the cell conditioning is complete add the standard. Remove the sample stopper and put the correct amount of standard into the beaker with an applicable utensil. Make sure that all of the standard is put into the center of the beaker and that none of it spills onto the walls of the beaker.
15. Put the sample stopper back into the sensor holder. Make sure that the sample stopper fits tightly into the sensor holder.
16. Weigh the empty sample container and subtract this value from the weight of the standard in its container (refer to step 13). The result is the exact weight of the sample analyzed. Write down this value.
17. Push **Start** to start the moisture content analysis. Calibration data shows on the display.  
*Note: The moisture content analysis will start automatically after the addition of sample if the **Injection Autodetect** parameter is set to **Yes**.*

18. If the default stirring speed needs to be adjusted, push the up and down arrow keys to increase or decrease the speed.

**Note:** Changing the default stirring speed can effect the measurement result.

19. Two options are available during the calibration procedure:

| Option      | Description                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stop</b> | Aborts the calibration and no results are calculated. If selected during the <b>Replicate Sample</b> option, then all data in the series is lost.                                                                      |
| <b>Skip</b> | Stops the calibration and goes directly to the next step in the procedure. Results are then calculated from calibration data available before <b>Skip</b> is selected. Results can be less accurate using this option. |

20. When the calibration is complete, enter the exact weight of the sample analyzed (refer to step 16). If necessary, push the arrow keys to change the value shown on screen. Push **Select** to accept the value.

21. When the calibration is complete, push the left and right arrow keys to see the different calibration views.

22. Push **Reject** or **Continue**.

| Option          | Description                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reject</b>   | Rejects the calibration. Select <b>Cancel</b> to go back to the result display or <b>Confirm</b> to reject the calibration. If this is the first calibration, select <b>Confirm</b> to reject the calibration and use the default or previous calibration values. If this is a <b>Replicate Standard</b> calibration, select <b>Confirm</b> to reject only the current calibration in the series.                           |
| <b>Continue</b> | Select from one of these options: <ul style="list-style-type: none"><li>• <b>Replicate Standard:</b> Do the calibration again using the same standard</li><li>• <b>Save &amp; Exit:</b> Keep the calibration results and exit the calibration procedure</li><li>• <b>Reject &amp; Exit:</b> Reject the calibration results and use the default or previous calibration values, and exit the calibration procedure</li></ul> |

## 7.2 Get a sample measurement

Use this option to get sample measurements with one of the installed applications.

1. Make sure that the glass beaker, the sensor holder and all related parts are clean and dry. Put a magnetic stir bar into the beaker.
2. Attach the beaker to the sensor holder. Make sure that the beaker fits tightly into the sensor holder.
3. Read the related "Application Note" from the USB applications key for more instructions.
4. Fill the beaker with the applicable amount of solvent. Refer to the application note and [Cell management](#) on page 33 to adapt the volume where applicable. Make sure that there is no liquid spill. Make sure that the initial level is enough so that the sensor is correctly installed in the sample. Do not put too much solvent in the beaker.
5. From the home screen, select the measurement application, then push **Select**.
6. If the **Cell standby** option has not been selected (refer to [Cell standby](#) on page 24), continue at step 8.
7. The cell standby operation starts. The stirring speed is that specified for the application and cannot be changed. The stability bar and the cell drift value are shown at the bottom of the display. The stability bar shows the stability of the signal and ranges in color from red (unstable), through yellow, to green (stable). The cell drift value can be replaced by these messages:

| Message                | Description                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------|
| <b>Excess of water</b> | The measurement cell contains too much water. Titrant continues to be added until the cell is dry. |

| Message                      | Description                                                                            |
|------------------------------|----------------------------------------------------------------------------------------|
| <b>Excess of titrant</b>     | The measurement cell contains too much titrant. No more titrant is added.              |
| <b>Risk of cell overflow</b> | The measurement cell is full and there is a risk of liquid spill. The procedure stops. |

*Note: These messages can be displayed under the cell drift value in the middle of the display during the cell conditioning procedure. The stability bar or these messages are displayed at the bottom of the display during the measurement procedure.*

- Application information shows on the display. If necessary, select an icon for more information or to change some data.

| Option             | Description                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Information</b> | Shows more information about the application.                                                                                                                                                                                                                                                                                                                 |
| <b>Operator</b>    | Changes the operator ID. Select from a list of applicable operators.                                                                                                                                                                                                                                                                                          |
| <b>Sample</b>      | Sample Name: Change the specified name of the sample.<br>Type: Push the left and right arrow keys and select the sample type ( <b>Sample</b> , <b>QC</b> or <b>Define blank</b> ) to be used for the measurement. If <b>Define blank</b> has been selected before, two more sample types are available ( <b>QC with blank</b> and <b>Sample with blank</b> ). |

- Make sure that the icon at the bottom of the display  is highlighted. Do the instructions that show on the display adjacent to this icon. Make sure that the tubes and sensor are correctly aligned.
- Push **Start** to start the measurement. Measurement data shows on the display.
- If the **Cell standby** option has been selected (refer to **Cell standby** on page 24), and the measurement cell is dry, cell conditioning is not needed and the procedure continues at step 15.
- If the default stirring speed needs to be adjusted, push the up and down arrow keys to increase or decrease the speed.  
*Note: Changing the default stirring speed can effect the measurement result. Any adjustment only applies to the current operation. The standard default stirring speed for the application is not changed.*
- The cell drift threshold, stability bar, sample temperature and measurement duration are shown at the bottom of the display. The stability bar shows the stability of the signal and ranges in color from red (unstable), through yellow, to green (stable). The cell drift value is shown in the middle of the display. These messages can be displayed under the cell drift value:

| Message                      | Description                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Excess of water</b>       | The measurement cell contains too much water. Titrant continues to be added until the cell is dry. |
| <b>Excess of titrant</b>     | The measurement cell contains too much titrant. No more titrant is added.                          |
| <b>Risk of cell overflow</b> | The measurement cell is full and there is a risk of liquid spill. The procedure stops.             |

*Note: The stability bar or these messages are displayed at the bottom of the display during the measurement procedure.*

- Two options are available during the cell conditioning procedure:

| Option      | Description                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stop</b> | Aborts the measurement and no results are calculated. If selected during the <b>Replicate Sample</b> option, then all data in the series is lost.                                                                            |
| <b>Skip</b> | Stops the cell conditioning and goes directly to the next step in the procedure. Results are then calculated from measurement data available before <b>Skip</b> is selected. Results can be less accurate using this option. |

- Weigh the sample in its container and write down the result.

16. When the cell conditioning is complete add the sample. Remove the sample stopper and put the correct amount of sample into the beaker with an applicable utensil. Make sure that all of the sample is put into the center of the beaker and that none of it spills onto the walls of the beaker.
17. Put the sample stopper back into the sensor holder. Make sure that the sample stopper fits tightly into the sensor holder.
18. Weigh the empty sample container and subtract this value from the weight of the sample in its container (refer to step 15). The result is the exact weight of the sample analyzed. Write down this value.
19. Push **Start** to start the moisture content analysis. Measurement data shows on the display.  
*Note: The moisture content analysis will start automatically after the addition of sample if the **Injection Autodetect** parameter is set to **Yes**.*
20. If the default stirring speed needs to be adjusted, push the up and down arrow keys to increase or decrease the speed.  
*Note: Changing the default stirring speed can effect the measurement result.*
21. Two options are available during the measurement procedure:

| Option      | Description                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stop</b> | Aborts the measurement and no results are calculated. If selected during the <b>Replicate Sample</b> option, then all data in the series is lost.                                                                      |
| <b>Skip</b> | Stops the measurement and goes directly to the next step in the procedure. Results are then calculated from measurement data available before <b>Skip</b> is selected. Results can be less accurate using this option. |

22. When the measurement is complete, enter the exact weight of the sample analyzed (refer to step 18). If necessary, push the arrow keys to change the value shown on screen. Push **Select** to accept the value.
23. If the **Cell standby** option has been selected (refer to **Cell standby** on page 24), the standby operation starts again automatically.
24. Push the arrow keys to see the different measurement views or push **Next** for the options that follow:

| Option                  | Description                                                                                                                                                                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Replicate sample</b> | Use this option to start the same titration on the same sample. This is used to study the repeatability by successively analyzing several parts of the same sample. At the end of each measurement, a window shows the average value, the standard deviation and the relative standard deviation. |
| <b>New sample</b>       | Use this option to start the same titration on a new sample. No standard deviation or relative standard deviation measurements will be done.                                                                                                                                                      |
| <b>Cell management</b>  | Use this option to fill or empty the measurement cell using the pumps. Refer to <b>Cell management</b> on page 33.                                                                                                                                                                                |

25. Push **Exit** to go back to the home screen.

### 7.3 Get a sample measurement (cell standby option selected)

Use this option to get sample measurements with one of the installed applications, with the cell standby option (refer to **Cell standby** on page 24) selected.

1. Make sure that the glass beaker, the sensor holder and all related parts are clean and dry. Put a magnetic stir bar into the beaker.
2. Attach the beaker to the sensor holder. Make sure that the beaker fits tightly into the sensor holder.
3. Read the related "Application Note" from the USB applications key for more instructions.
4. Fill the beaker with the applicable amount of solvent. Refer to the application note and **Cell management** on page 33 to adapt the volume where applicable. Make sure that there is no

liquid spill. Make sure that the initial level is enough so that the sensor is correctly installed in the sample. Do not put too much solvent in the beaker.

- From the home screen, select the measurement application, then push **Select**.
- The cell standby operation starts. The stirring speed is that specified for the application and cannot be changed. The stability bar and the cell drift value are shown at the bottom of the display. The stability bar shows the stability of the signal and ranges in color from red (unstable), through yellow, to green (stable). The cell drift value can be replaced by these messages:

| Message                      | Description                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Excess of water</b>       | The measurement cell contains too much water. Titrant continues to be added until the cell is dry. |
| <b>Excess of titrant</b>     | The measurement cell contains too much titrant. No more titrant is added.                          |
| <b>Risk of cell overflow</b> | The measurement cell is full and there is a risk of liquid spill. The procedure stops.             |

***Note:** These messages can be displayed under the cell drift value in the middle of the display during the cell conditioning procedure. The stability bar or these messages are displayed at the bottom of the display during the measurement procedure.*

- Application information also shows on the display. If necessary, select an icon for more information or to change some data. The cell standby operation continues.

| Option             | Description                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Information</b> | Shows more information about the application.                                                                                                                                                                                                                                                                                                                 |
| <b>Operator</b>    | Changes the operator ID. Select from a list of applicable operators.                                                                                                                                                                                                                                                                                          |
| <b>Sample</b>      | Sample Name: Change the specified name of the sample.<br>Type: Push the left and right arrow keys and select the sample type ( <b>Sample</b> , <b>QC</b> or <b>Define blank</b> ) to be used for the measurement. If <b>Define blank</b> has been selected before, two more sample types are available ( <b>QC with blank</b> and <b>Sample with blank</b> ). |

- Make sure that the icon at the bottom of the display  is highlighted. Do the instructions that show on the display adjacent to this icon. Make sure that the tubes and sensor are correctly aligned.
- Push **Start** to start the measurement. If the cell is dry, cell conditioning is not needed and the procedure continues at step 12. If the cell is not dry, cell conditioning starts. Measurement data shows on the display.
- If the default stirring speed needs to be adjusted, push the up and down arrow keys to increase or decrease the speed.  
***Note:** Changing the default stirring speed can effect the measurement result. Any adjustment only applies to the current operation. The standard default stirring speed for the application is not changed.*
- Two options are available during the cell conditioning procedure:

| Option      | Description                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stop</b> | Aborts the measurement and no results are calculated. If selected during the <b>Replicate Sample</b> option, then all data in the series is lost.                                                                            |
| <b>Skip</b> | Stops the cell conditioning and goes directly to the next step in the procedure. Results are then calculated from measurement data available before <b>Skip</b> is selected. Results can be less accurate using this option. |

- Weigh the sample in its container and write down the result.
- When the cell conditioning is complete add the sample. Remove the sample stopper and put the correct amount of sample into the beaker with an applicable utensil. Make sure that all of the sample is put into the center of the beaker and that none of it spills onto the walls of the beaker.
- Put the sample stopper back into the sensor holder. Make sure that the sample stopper fits tightly into the sensor holder.



15. Weigh the empty sample container and subtract this value from the weight of the sample in its container (refer to step 12). The result is the exact weight of the sample analyzed. Write down this value.
16. Push **Start** to start the analysis. Measurement data shows on the display.  
*Note: The analysis will start automatically after the addition of sample if the **Injection Autodetect** parameter is set to **Yes**.*
17. If the default stirring speed needs to be adjusted, push the up and down arrow keys to increase or decrease the speed.  
*Note: Changing the default stirring speed can effect the measurement result.*
18. Two options are available during the measurement procedure:

| Option      | Description                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stop</b> | Aborts the measurement and no results are calculated. If selected during the <b>Replicate Sample</b> option, then all data in the series is lost.                                                                      |
| <b>Skip</b> | Stops the measurement and goes directly to the next step in the procedure. Results are then calculated from measurement data available before <b>Skip</b> is selected. Results can be less accurate using this option. |

19. When the measurement is complete, enter the exact weight of the sample analyzed (refer to step 18). If necessary, push the arrow keys to change the value shown on screen. Push **Select** to accept the value.
20. The cell standby operation starts again automatically. Push the arrow keys to see the different measurement views.
21. Push **Next** for the options that follow:

| Option                  | Description                                                                                                                                                                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Replicate sample</b> | Use this option to start the same titration on the same sample. This is used to study the repeatability by successively analyzing several parts of the same sample. At the end of each measurement, a window shows the average value, the standard deviation and the relative standard deviation. |
| <b>New sample</b>       | Use this option to start the same titration on a new sample. No standard deviation or relative standard deviation measurements will be done.                                                                                                                                                      |
| <b>Cell management</b>  | Use this option to fill or empty the measurement cell using the pumps. Refer to <a href="#">Cell management</a> on page 33.                                                                                                                                                                       |

22. Push **Exit** to go back to the home screen.

## 7.4 Change the application settings

### NOTICE

The applications installed on the instrument have been pre-defined to optimize the measurement process. Changing these default application parameters will have an effect on the measurement process and measurement results. Only qualified personnel should change these parameters or use the instrument in **Expert mode**. Refer to the application note before changing any parameters.

### NOTICE

In **Basic mode** changes to parameters are secure. In **Expert mode** changes to parameters are not secure and can cause the application to run incorrectly.

Refer to [Change application parameters](#) on page 51 for a list of parameters that can be changed in basic and expert mode.

Refer to [Sample name](#) on page 32 for special features on the sample name.

1. From the home screen, select **Settings**.
2. Select **Applications** followed by **Edit**.
3. If more than one application is installed, choose an application to change from the installed list and then push **Edit**.

4. Push the left and right arrow keys to jump to the previous or next parameter group. Push the up and down arrow keys to scroll through the application parameters in the parameter group.
5. The **Edit** key is only available when a parameter can be changed. Push **Edit** to change the parameter. Enter the new details or select from a list.  
*Note: A description of the selected parameter is shown on the bottom of the display.*

#### 7.4.1 Sample name

The two wildcard characters ? (question mark) and \* (asterisk) can be used to automatically increment the sample name.

Use the question mark character to increment the name using an integer. For example, where **Water** is the name of the sample:

- Select **Settings > Applications > Edit** and change the sample name to **Water ?**
- The sample name for the first measurement is **Water 1**
- The sample name for the next measurement is **Water 2**, etc.
- The integer value is always set back to 1 when the instrument is set to off

Use the asterisk character in the name to increment the name using the instrument date and time in **YYMMDDHHMMSS** format. For example, where **Water** is the name of the sample:

- Select **Settings > Applications > Edit** and change the sample name to **Water \***
- The sample name for the first measurement made on 27th February 2015 at 15:30:25 is **Water 150227153025**
- The sample name for the next measurement made on 28th February 2015 at 16:32:47 is **Water 150228163247**, etc.
- The value is not reset when the instrument is set to off

Use both characters in the name to increment the name using an integer and the instrument date and time. For example, where **Water** is the name of the sample:

- Select **Settings > Applications > Edit** and change the sample name to **Water ? \***
- The sample name for the first measurement made on 27th February 2015 at 15:30:25 is **Water 1 150227153025**
- The sample name for the next measurement made on 27th February 2015 at 17:01:27 is **Water 2 150227170127**, etc.
- The integer value is always set back to 1 when the instrument is set to off

## 7.5 Manage the data log

To select data to view, delete or export, specify data filters

1. From the home screen, select **Data log**.
2. Select an option, then push **Select**.

| Option                 | Description                                                                                                                                                                                                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View data log</b>   | Views measurement data. Select individual lines of data to view more content.                                                                                                                                                |
| <b>Export data log</b> | Exports measurement data from the system to an external device. Preview data selection before it is exported. Make sure that an external device is connected to the instrument (e.g., a USB key, external hard drive, etc.). |
| <b>Delete data log</b> | Removes measurement data from the system. Previews data selection before it is removed.                                                                                                                                      |

3. Specify the data selection parameters. Push the left and right arrow keys to make a selection. Push the up and down arrow keys to select an option.

| Option             | Description                        |
|--------------------|------------------------------------|
| <b>Result type</b> | Sets the type of result available. |

| Option             | Description                      |
|--------------------|----------------------------------|
| <b>Application</b> | Sets the available applications. |
| <b>Date</b>        | Sets the date range.             |
| <b>Operator</b>    | Sets the available operators.    |

- If **View data log** was the selected option, push **View** to see the selected data.
  - Push the up and down arrow keys to select a line of data and push **Detail** to see more data
  - If only one **Application** is selected push the up and down arrow keys to select a line of data and push **Detail** to see more data, or push the left and right arrow keys to see related graphs
- If **Export data log** or **Delete data log** was the selected option, push **Preview** to see the selected data, then push **Export** or **Delete** to start the procedure.

## 7.6 Purge

Use this procedure to remove air bubbles from the system. Refer to [Prepare the instrument for measurement](#) on page 25 for instructions.

## 7.7 Cell management

Use this option to fill or empty the measurement cell with the pumps. These procedures stop automatically after a pre-determined time. The time remaining is shown against **Security time** on the display.

- From the home screen, select **Cell management**.
- Push the left and right arrow keys to make a selection.

| Option                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fill cell (pump 1)</b>  | Use this option to fill the measurement cell with reagent from pump 1.                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Empty cell (pump 2)</b> | <div style="background-color: #FFD700; text-align: center; padding: 5px;"><b>⚠ CAUTION</b></div> <div style="border: 1px solid black; padding: 5px;">Chemical exposure hazard. Before selecting this option, examine the level of liquid in the waste bottle. Make sure that there is enough space in the bottle for all of the liquid from the measurement cell.</div> <p>Use this option to empty the measurement cell with pump 2.</p> |
| <b>Stop pumps</b>          | Use this option to stop the <b>Fill cell</b> and <b>Empty cell</b> procedures.                                                                                                                                                                                                                                                                                                                                                            |
| <b>Stir</b>                | Use this option to start or stop the magnetic stirrer. This option can also be used when the <b>Fill cell</b> and <b>Empty cell</b> procedures are operating.                                                                                                                                                                                                                                                                             |

- Push **Exit** to go back to the home screen.

## Section 8 Maintenance

| <b>⚠ CAUTION</b>                                                                                                                     |                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
|                                                   | Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document. |
| <b>NOTICE</b>                                                                                                                        |                                                                                                              |
| Do not disassemble the instrument for maintenance. If the internal components must be cleaned or repaired, contact the manufacturer. |                                                                                                              |

## 8.1 Maintenance schedule

Table 6 shows the recommended schedule of maintenance tasks. Facility requirements and operating conditions may increase the frequency of some tasks.

**Table 6 Maintenance schedule**

| Task                                                                                                                                                                                                                                               | 1 day | 7 days | 12 months | 24 months |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-----------|-----------|
| Clean the instrument on page 34. Also do this procedure immediately after any liquid spills on the instrument.                                                                                                                                     | X     |        |           |           |
| Clean the sensor on page 34.                                                                                                                                                                                                                       |       | X      |           |           |
| Regenerate the molecular sieve on page 35                                                                                                                                                                                                          |       | X      |           |           |
| Examine all tube connections for leaks and damage. Replace as necessary. Refer to <a href="#">Replacement parts and accessories</a> on page 45 for part numbers and to <a href="#">Replace the tubes</a> on page 34.                               |       | X      |           |           |
| Replace the syringe. Refer to <a href="#">Syringe management</a> on page 36.                                                                                                                                                                       |       |        | X         |           |
| Replace the Viton O-ring in the measurement cell. Refer to <a href="#">Replacement parts and accessories</a> on page 45 for part numbers.                                                                                                          |       |        | X         |           |
| Replace syringe electro-valve block. Refer to <a href="#">Replace the syringe electro-valve block</a> on page 35.                                                                                                                                  |       |        |           | X         |
| Examine the syringe connections and inlet and outlet tubes for leaks and damage. Replace as necessary. Refer to <a href="#">Replacement parts and accessories</a> on page 45 for part numbers and to <a href="#">Replace the tubes</a> on page 34. |       |        | X         |           |
| Replace the pump cassettes. Refer to <a href="#">Pump cassette replacement</a> on page 36.                                                                                                                                                         |       |        | X         |           |
| Examine the pump connections and inlet and outlet tubes for leaks and damage. Replace as necessary. Refer to <a href="#">Replacement parts and accessories</a> on page 45 for part numbers and to <a href="#">Replace the tubes</a> on page 34.    |       |        | X         |           |
| Examine the bottle caps and connections for leaks and damage. Replace as necessary. Refer to <a href="#">Replacement parts and accessories</a> on page 45 for part numbers.                                                                        |       |        | X         |           |

## 8.2 Clean the instrument

### NOTICE

Never use flammable or corrosive solvents to clean any part of the instrument. Use of these solvents can degrade the environmental protection of the instrument and may void the warranty.

Clean the exterior surface with a moist cloth or with a mixture of water and mild detergent. Dry with a soft cloth.

## 8.3 Clean the sensor

Obey the cleaning instructions given in the documentation supplied with the sensor, and any other instructions given in the application note.

## 8.4 Replace the tubes

After installing a new tube, make sure that it is correctly installed by turning the tube connectors on the inlet and outlet ports of the syringe or pump until they click. Refer also to [Connect the tubes](#) on page 12.

## 8.5 Regenerate the molecular sieve

It is recommended to regenerate the molecular sieve weekly, but this will vary depending on the humidity of the laboratory. A humidity indicator, such as color changing silica gel crystal, can be used to show when regeneration is necessary.

To regenerate the molecular sieve, dry it in an oven at a temperature of 300 °C (572 °F) for at least 4 hours. When cool, it can be kept in a glass bottle with an airtight seal.

## 8.6 Replace the syringe electro-valve block

**⚠ DANGER**

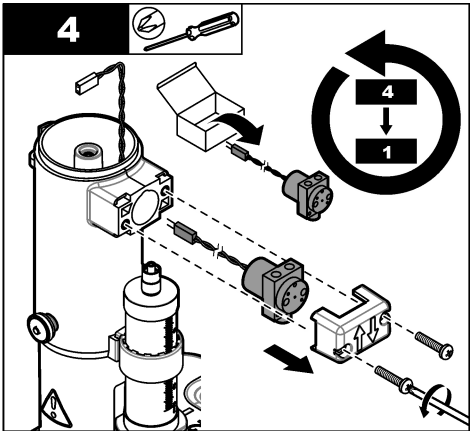
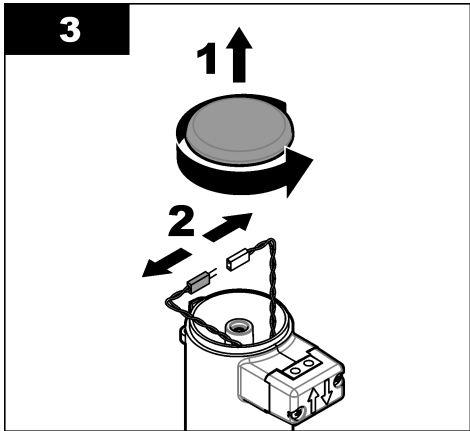
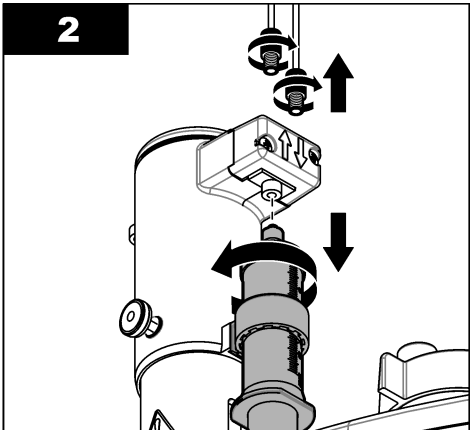
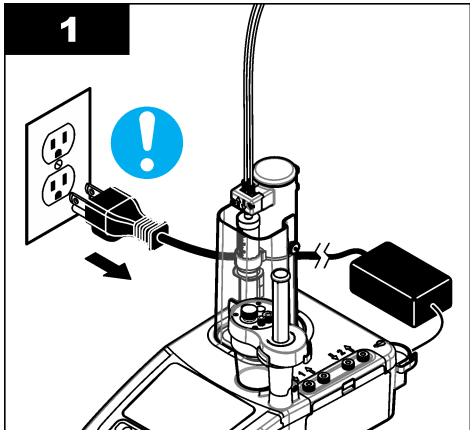


Electrocution hazard. Remove power from the instrument before this procedure is started.

**NOTICE**

It is recommended that this procedure is only done by a qualified service engineer.

Refer to the illustrated steps that follow.



## 8.7 Maintenance menu

Select **Maintenance** from the home screen.

Refer also to [Table 5](#) on page 22.

### 8.7.1 Syringe activation

Do a check of the syringe. Make sure the syringe fills and empties correctly.

1. From the maintenance menu, push **Syringe activation**. Push the arrow keys to select an option.

| Option                 | Description                                                                                                                             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fill</b>            | Fills the syringe with titrant solution. The process stops automatically when the syringe is full.                                      |
| <b>Empty to bottle</b> | Discards the contents of the syringe into the titrant bottle.                                                                           |
| <b>Empty to beaker</b> | Discards the contents of the syringe into the beaker. Make sure that the tube from the outlet port of the syringe is inside the beaker. |
| <b>Stop</b>            | Stops the operation.                                                                                                                    |

### 8.7.2 Pump activation

This option only applies to instruments with pumps installed. Do a check of the pump. Make sure the pump fills and empties correctly.

1. From the maintenance menu, push **Pump activation**. Push the up and down arrow keys to select an option.

| Option       | Description                                                                                                                                          |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Start</b> | Starts the pump. The reagent is pumped through the tubes into the beaker. Make sure that the tube from the outlet port of the pump is in the beaker. |
| <b>Stop</b>  | Stops the operation.                                                                                                                                 |

Push **Toggle** to change to the second pump or to operate all pumps.

### 8.7.3 Syringe management

Use this option to replace the syringe, or change the syringe volume.

1. From the maintenance menu, push **Syringe management**.

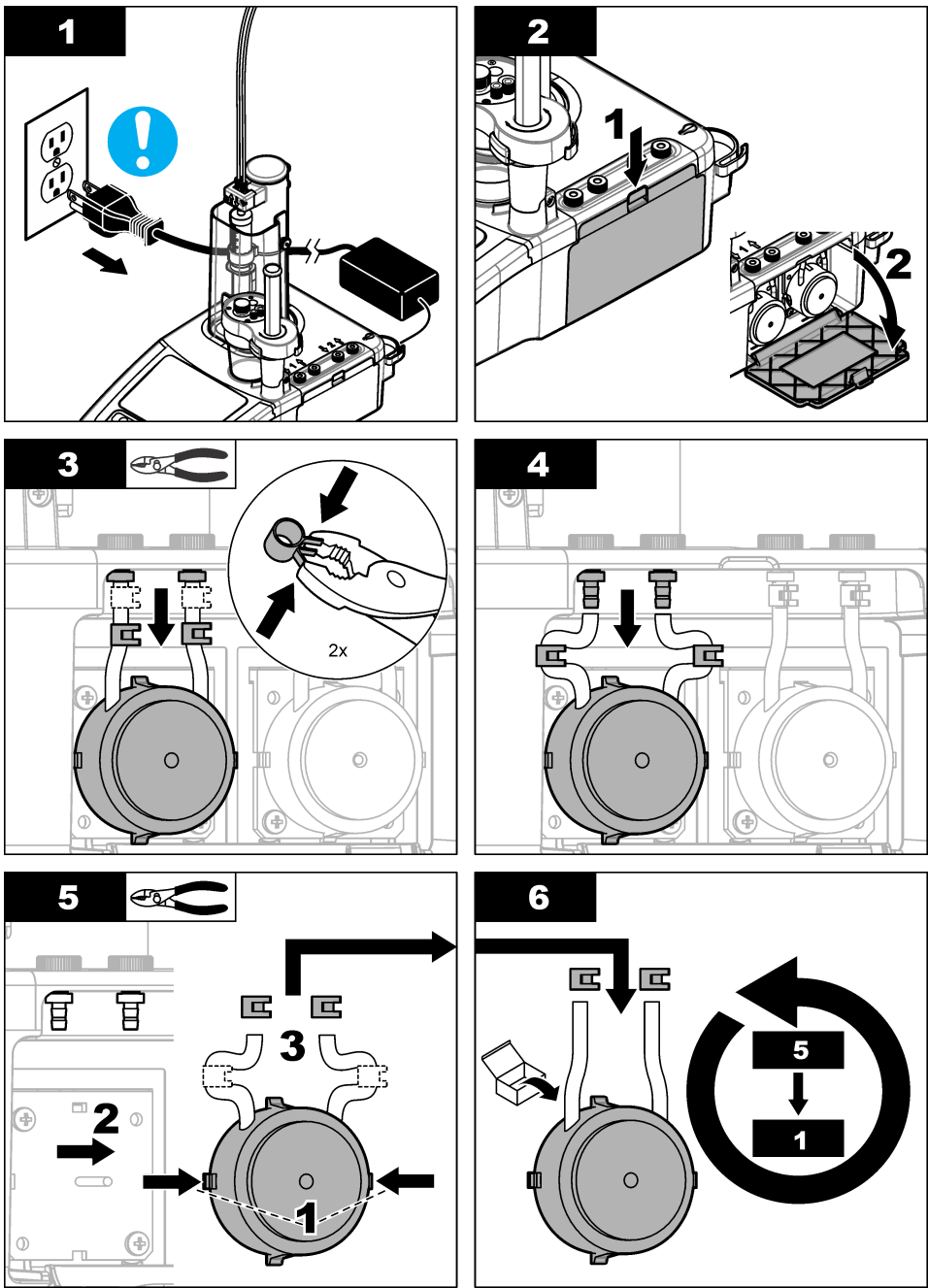
| Option                       | Description                                                                                                                                                                                                                                                                         |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syringe replacement</b>   | If two syringes are installed, select the syringe to replace. Select to discard the contents of the syringe into the titrant bottle or the beaker, and then obey the instructions on the display. Refer also to <a href="#">Install the syringe</a> on page 9 for the installation. |
| <b>Syringe volume change</b> | If two syringes are installed, select the syringe to change. Select the new syringe volume.                                                                                                                                                                                         |

### 8.7.4 Pump cassette replacement

| ⚠ DANGER                                                                           |                                                                                          |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|  | Electrocution hazard. Remove power from the instrument before this procedure is started. |

This option only applies to instruments with pumps installed.

To replace the pump cassette, refer to the illustrated steps that follow and obey the instructions on the display.



### 8.7.5 Syringe verification

Use the syringe verification option to examine the syringe accuracy based on the ISO 8655 standard. For the best results, follow the procedure in the application note supplied with the syringe verification kit.

Make sure to fully rinse the syringe with methanol dry before the test to remove titrant. Make sure to fully rinse the syringe with methanol dry after the test to remove water.

**Note:** A license key is necessary to enable the syringe verification option on the instrument. Contact the manufacturer or a sales representative to get a license key.

1. From the home screen, select Settings, then push **Select**.
2. From the settings screen, select Options, then push **Select**.
3. Push the left or right arrow key to select the expert mode, then push **Done**.
4. From the home screen, select Maintenance, then push **Select**.
5. From the maintenance screen, select Syringe verification, then push **Select**.

**Note:** When the option is selected for the first time, enter the license key.

6. Push the up and down button to select and change the syringe test options.

| Option               | Description                                                                                                                                                                                                                                                                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syringe</b>       | Selects the syringe. Used when there are two syringes.<br>Shows the syringe information: syringe number and volume.                                                                                                                                                                                                                                               |
| <b>Operator</b>      | Selects the operator ID                                                                                                                                                                                                                                                                                                                                           |
| <b>Configuration</b> | Sets the test settings: test volume and number of replicates. The total dispensed liquid for the test shows when the two parameters are set.<br><b>Note:</b> Make sure to use the applicable beaker and balance for the test based on the amount of total dispensed liquid.<br>A field to write the test conditions is available in the test conditions settings. |
| <b>Start</b>         | Starts the syringe verification procedure.                                                                                                                                                                                                                                                                                                                        |

7. Push Start to start the syringe verification procedure. Follow the procedure supplied with the syringe verification kit.
8. To cancel the syringe verification test and not save data to the data log, push Stop.
9. To cancel the syringe verification test and save the syringe verification results for fully tested volumes to the data log, push Skip.
10. When the test is complete Pass or Fail shows. Push the left or right arrow to show the results for the different volumes. Push the up and down arrow to show more results data for the selected volume.

### 8.7.6 Other maintenance options

1. Select an option, then push **Select**.

| Option                     | Description                                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>Stirring activation</b> | Do a check of the magnetic stirrer. Push the up and down arrow keys to increase or decrease the stirring speed. |
| <b>Reagent replacement</b> | Use this option to replace the reagents. Obey the instructions on the display.                                  |



| Option                      | Description                                                                                                                                             |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Maintenance schedule</b> | See the list of maintenance tasks. Push <b>Edit</b> to change the default value.                                                                        |
| <b>Maintenance summary</b>  | See the number of days remaining for maintenance tasks. After doing a task, push <b>Reset</b> to set the number of days remaining to the default value. |

## 8.8 Storage and transportation

### 8.8.1 Prepare the instrument for short-term storage

| ▲ CAUTION                                                                         |                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols. |

| ▲ CAUTION                                                                         |                                                                                                                        |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|  | Chemical exposure hazard. Dispose of chemicals and wastes in accordance with local, regional and national regulations. |

Use this procedure if storing the instrument overnight or over a weekend.

1. Carefully clean the measurement cell using an applicable organic solvent to dissolve any residue and oil.
2. Fill the measurement cell with a new working medium.
3. Add titrant to the working medium until it becomes brown in color.
4. Check that the measurement cell is tightly installed.
5. Check the position of all the elements in the sensor holder.
6. Make sure that there is sufficient molecular sieve in the desiccant cartridges.
7. Set the instrument power to off.

### 8.8.2 Prepare the instrument for long-term storage

| ▲ CAUTION                                                                          |                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols. |

| ▲ CAUTION                                                                           |                                                                                                                        |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|  | Chemical exposure hazard. Dispose of chemicals and wastes in accordance with local, regional and national regulations. |

Use this procedure if storing the instrument for more than a week.

1. Remove the sensor from the sensor holder and disconnect it from the sensor port on the rear of the instrument.
2. Clean the sensor. Refer to [Clean the sensor](#) on page 34.
3. Put the sensor in a storage tube that contains a storage solution. Refer to the sensor documentation for storage instructions.
4. From the home screen, select **Maintenance > Syringe activation** and empty the contents of the syringe.

- Carefully clean the measurement cell using an applicable organic solvent to dissolve any residue and oil. From the home screen, select **Cell management** to **Fill** and **Empty** the measurement cell.
- Set the instrument power to off.
- Carefully remove the tubes from the titrant and reagent bottles. Seal the bottles with the original bottle cap.
- Flush the pump and syringe tubes with ethanol.
- Remove the measurement cell and the sensor holder accessories (refer to [Install the sensor holder accessories](#) on page 11). Clean the parts with ethanol and dry with an applicable towel.
- Install the glass measurement cell back onto the sensor holder for storage.
- Empty the waste bottle and flush with ethanol.
- If the molecular sieve from the desiccant cartridges is to be used again, keep it in an applicable area.

### NOTICE

Make sure that all the parts and accessories, including the desiccants, are fully dry before starting the instrument after a period of long-term storage. This is especially true for the measurement cell. Flush the pump and syringe tubes with ethanol.

## 8.8.3 Prepare the instrument for shipment

- Refer to [Prepare the instrument for long-term storage](#) on page 39.
- Put the instrument and the necessary accessories in a package with all the packaging materials.
- Ship the instrument at a temperature  $-5$  to  $40$  °C ( $23$  to  $104$  °F) and relative humidity up to 80%.
- Make sure that the storage location for the instrument does not have dust, condensation or chemical evaporation.

## Section 9 Troubleshooting

Refer to the following tables for problem messages and possible causes and solutions.

**Table 7 Measurement**

| Error/Warning            | Description                                                       | Possible solution                                                           |
|--------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Measurement unstable     | The measurement from the sensor is not stable                     | Make sure that there are no bubbles around the sensor element or junction   |
| Measurement out of range | The sample concentration is outside the sensor measurement limits | Adjust the sample preparation to be inside the sensor measurement range     |
|                          |                                                                   | Use a different sensor with a more applicable measurement range             |
| Temperature out of range | The sample temperature is outside the sensor measurement limits   | Adjust the sample temperature to be inside the sensor measurement range     |
|                          |                                                                   | Use a different sensor with a more applicable measurement range             |
|                          |                                                                   | Make sure that the sensor is operating correctly                            |
| Cell cond. skipped       | The cell conditioning has been stopped manually by the user       | Refer to the application note for best practices and do the titration again |
| Analysis skipped         | The titration has been stopped manually by the user               | Refer to the application note for best practices and do the titration again |

**Table 7 Measurement (continued)**

| Error/Warning                                                                                                                                                                             | Description                                                                                                                               | Possible solution                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Equiv. point not found                                                                                                                                                                    | The titration fails to determine the equivalence point                                                                                    | Refer to the application note for best practices and do the titration again                                                           |
|                                                                                                                                                                                           |                                                                                                                                           | Adjust the equivalence point detection value for the application (refer to <a href="#">Change application parameters</a> on page 51)  |
|                                                                                                                                                                                           |                                                                                                                                           | Contact technical support                                                                                                             |
| Out of range                                                                                                                                                                              | The computed result is outside the accepted limits                                                                                        | Refer to the application note for best practices and do the titration again                                                           |
|                                                                                                                                                                                           |                                                                                                                                           | Adjust the result minimum and maximum values for the application (refer to <a href="#">Change application parameters</a> on page 51)  |
| Equation calc. error                                                                                                                                                                      | An equation variable is unknown (e.g. the ordinate of the equivalence point is unknown or the volume of the equivalence point is unknown) | Make sure that all the equation variables are available (refer to the application note for the equation description and values)       |
| Titrant calibration has expired                                                                                                                                                           | A titration has been done with an expired titrant calibration date                                                                        | Calibrate the titrant and if necessary adjust the calibration frequency (refer to the application note for the recommended frequency) |
| The titrant used by an application has been modified and this application became incompatible with applications already installed. Please go to application management to solve the issue | The application data has been changed and the application cannot be used                                                                  | Remove the application or change the titrant to a titrant that is already installed                                                   |
| System error                                                                                                                                                                              | A system error causes the titration to stop (e.g. a sensor has been disconnected or the volume of reagent is too low)                     | Make sure that all the system elements are connected and working correctly (refer to <a href="#">Maintenance menu</a> on page 36)     |
| Max. vol. reached                                                                                                                                                                         | The titration is stopped because the supplied volume of reagent is more than the maximum quantity                                         | Refer to the application note for best practices and do the titration again                                                           |
|                                                                                                                                                                                           |                                                                                                                                           | Adjust the maximum volume stop point for the application (refer to <a href="#">Change application parameters</a> on page 51)          |
| Max. time reached                                                                                                                                                                         | The titration is stopped because the elapsed time is more than the maximum time                                                           | Refer to the application note for best practices and do the titration again                                                           |
|                                                                                                                                                                                           |                                                                                                                                           | Adjust the maximum time for the application (refer to <a href="#">Change application parameters</a> on page 51)                       |
| Water content= ###<br>Max. time reached, Excess of water                                                                                                                                  | When the maximum time setting completes the titration, there is too much water in the cell.                                               | Adjust the titrant concentration.                                                                                                     |
|                                                                                                                                                                                           |                                                                                                                                           | Add less sample.                                                                                                                      |
|                                                                                                                                                                                           |                                                                                                                                           | Increase the Max time setting.                                                                                                        |
| Water content= ---<br>Excess of titrant                                                                                                                                                   | During all of the titration, the potentials of the titration curve are in the "excess of titrant" area.                                   | Examine the cell.                                                                                                                     |
|                                                                                                                                                                                           |                                                                                                                                           | Examine the electrode.                                                                                                                |
|                                                                                                                                                                                           |                                                                                                                                           | Contact technical support                                                                                                             |

**Table 7 Measurement (continued)**

| Error/Warning                           | Description                                                                                                     | Possible solution                                                                                                                                    |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| No titrant information                  | There is no description of the titrant                                                                          | Install the application again                                                                                                                        |
| No measure received                     | No measurement can be done                                                                                      | Make sure that the sensor is correctly connected to the instrument                                                                                   |
|                                         |                                                                                                                 | Disconnect the sensor and connect it again                                                                                                           |
|                                         |                                                                                                                 | Change the sensor if no measurement is received using the <b>Live Measure</b> option (refer to <a href="#">Other maintenance options</a> on page 38) |
| The stirrer does not operate            | The stirrer does not automatically start when the measurement starts.                                           | Make sure that the stirrer configuration is set correctly. Identify if the applicable stirrer is selected in the Settings>Options menu.              |
| Printer: communication error            | The red LED on the printer flashes to show that the printer is in error mode. There is no paper in the printer. | Replace the paper roll in the printer. Refer to the printer documentation.                                                                           |
| Burette fails to deliver                | Syringe cannot deliver any reagent                                                                              | Contact technical support                                                                                                                            |
| Burette fails to fill                   | Syringe cannot be filled with reagent                                                                           | Contact technical support                                                                                                                            |
| Burette failed to read delivered volume | Syringe cannot calculate the delivered volume of reagent                                                        | Contact technical support                                                                                                                            |
| System failure                          | Operational failure                                                                                             | Contact technical support                                                                                                                            |

**Table 8 Calibration**

| Error/Warning           | Description                                                                                                                                                                         | Possible solution                                                                                                                                     |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| No titrant to calibrate | There is no method to calibrate the titrant into the application. If more than one application is installed, there is no method to calibrate the titrant into all the applications. | The titrant cannot be calibrated with the current application. Refer to the related application note to find if the titrant calibration is available. |
|                         | The titrant calibration has been deactivated (Basic or Expert mode: Active = No)                                                                                                    | Activate the titrant calibration (Active = Yes)                                                                                                       |

**Table 9 USB storage device**

| Error/Warning                                                                                 | Description                                         | Possible solution                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exporting {application name} - access forbidden to the applications folder on USB flash drive | Error when exporting data to the USB storage device | Make sure that the USB storage device is correctly installed and the USB icon can be seen in the header bar (refer to <a href="#">Table 2</a> on page 20)                                                         |
|                                                                                               |                                                     | Remove the USB storage device and make sure the USB icon is no longer seen in the header bar, then install the device again and make sure that the icon can be seen (refer to <a href="#">Table 2</a> on page 20) |
| Exporting {application name} - read only access to the applications folder on USB flash drive | The USB storage device is read only                 | Unlock the storage device or use another one                                                                                                                                                                      |

**Table 9 USB storage device (continued)**

| Error/Warning                                                                                                  | Description                                                                                                                                  | Possible solution                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exporting {application name} - error during writing. Verify USB flash drive is not full                        | Error when exporting data to the USB storage device                                                                                          | Make sure that the USB storage device has enough available space or use another one                                                                                                                                                                             |
| USB flash drive is not installed. Install and export applications again                                        | The instrument cannot find a USB storage device                                                                                              | Make sure that the USB storage device is correctly installed and the USB icon can be seen in the header bar (refer to <a href="#">Table 2</a> on page 20)                                                                                                       |
|                                                                                                                |                                                                                                                                              | Remove the USB storage device and make sure the USB icon is no longer seen in the header bar, then install the device again and make sure that the icon can be seen (refer to <a href="#">Table 2</a> on page 20)                                               |
| Application {application name}: maximum number of applications is reached                                      | The maximum number of applications for each line has been reached when copying applications to the instrument from the USB storage device    | Remove any unwanted applications, then push the <b>Home</b> key to return to the home screen. Remove the USB storage device and make sure the USB icon is no longer seen in the header bar, then install the device again and import the new application again  |
| Application {application name}: requires at least one titrant that cannot be installed                         | The titrant needed by the application cannot be installed on the instrument because the applications currently installed use another titrant | Remove all installed applications, then push the <b>Home</b> key to return to the home screen. Remove the USB storage device and make sure the USB icon is no longer seen in the header bar, then install the device again and import the new application again |
| Application {application name}: requires too many titrants for this instrument model configuration             | The instrument has a single syringe and the application needs a two syringe instrument                                                       | Change to a two syringe instrument                                                                                                                                                                                                                              |
| Error while saving application {application name}                                                              | Error when copying from the USB storage device to the instrument memory                                                                      | Contact technical support                                                                                                                                                                                                                                       |
| Unable to read applications from device. Applications have been removed, please load them from USB flash drive | While updating the application tiles on the display, an installed application has been detected as corrupt                                   | Remove the corrupt application and try to load it again                                                                                                                                                                                                         |
| Application {application name} corrupted                                                                       | The selected application file is invalid                                                                                                     | Try to load the original application file again, or contact technical support for a replacement file                                                                                                                                                            |
| Application {application name} incompatible with hardware                                                      | The hardware does not support the application                                                                                                | Change to a compatible instrument                                                                                                                                                                                                                               |
| Application {application name} (too new model)                                                                 | This selection is not allowed because the instrument software only supports older application files                                          | Update the instrument software                                                                                                                                                                                                                                  |
| Application {application name} (untrusted)                                                                     | This selection is not allowed because the application has not been authenticated                                                             | Contact technical support to get an authenticated application file                                                                                                                                                                                              |
| Application {application name} (obsolete)                                                                      | The selection is allowed. When the application is exported, it will automatically update to the latest version                               | The automatic update will set the new application parameters to the default values. It is not recommended to use an obsolete application, but to install the latest version                                                                                     |

**Table 9 USB storage device (continued)**

| Error/Warning                                       | Description                                                                                                             | Possible solution                                                                                                                                |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Application {application name} (syringe to replace) | The selection is allowed but the syringe recommended in the application file is not the one installed on the instrument | Change the installed syringe to the one recommended by the application (refer to <a href="#">Syringe management</a> on page 36)                  |
| Error while serializing data                        | Error when creating a file on the USB storage device                                                                    | Change or format the USB storage device and try the export again                                                                                 |
| Cannot write to USB mass storage                    | USB storage device is not installed                                                                                     | Remove the USB storage device and make sure the USB icon is no longer seen in the header bar, then install the device again try the export again |
|                                                     | USB storage device is corrupt                                                                                           | Change or format the USB storage device and try the export again                                                                                 |

**Table 10 Data updates**

| Error/Warning                                                       | Description                                       | Possible solution                                              |
|---------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------|
| Edit user failed. Be sure that name {user name} is not already used | The update to the operator name cannot be done    | Check that the name is not already used                        |
| Fail to save the modification of the application                    | The update to the application data cannot be done | Try again, if the problem continues, contact technical support |
| Impossible to remove application {application name}                 | The application cannot be erased                  | Try again, if the problem continues, contact technical support |
| Error while deleting data                                           | The data cannot be erased                         | Try again, if the problem continues, contact technical support |

**Table 11 Battery**

| Error/Warning                | Description                                                               | Possible solution                                                                                                                        |
|------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Battery voltage low          | Battery voltage is below 2.2 V. The date and time are no longer available | Contact technical support                                                                                                                |
| Realtime clock has been lost | The date and time are no longer available                                 | Set the date and time again. If the date and time are not available the next time the instrument is set to on, contact technical support |

**Table 12 Balance**

| Error/Warning                                                | Description                                                                                                 | Possible solution                                                                                                                                     |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Format of message received from the balance is not supported | The data received from the balance is not compatible with the format of messages accepted by the instrument | Configure the balance to be compatible with the format of messages accepted by the instrument (refer to <a href="#">Install a balance</a> on page 16) |
| No connection with balance                                   | The instrument is not receiving data from the balance                                                       | Check the balance cable is installed correctly                                                                                                        |
| The measurement received is out of range                     | The weight sent by the balance is not in the acceptance limits                                              | Adjust the sample. Adjust the acceptance limit for the application                                                                                    |

**Table 13 Syringe verification**

| Error/Warning                                                | Description                                                                                                                              | Possible solution                                                                                                                                                                                                                               |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Format of message received from the balance is not supported | The data received from the balance is not compatible with the format of messages accepted by the instrument (fully automated mode only). | Configure the balance to be compatible with the format of messages accepted by the instrument (refer to <a href="#">Install a balance</a> on page 16)<br>Make sure that the weight measurement is stable and did not get to the maximum weight. |
| No connection with balance                                   | The instrument is not receiving data from the balance (fully automated mode only).                                                       | Make sure that the balance cable is installed correctly.                                                                                                                                                                                        |
| Temperature sensor not detected                              | The instrument is not receiving data from the temperature sensor (fully and partially automated modes only)                              | Make sure that the temperature sensor is installed and connected correctly.                                                                                                                                                                     |
| Incorrect input value                                        | The input value is out of range (fully and partially automated modes only).                                                              | Make sure that the syringe verification configuration values are correct.                                                                                                                                                                       |
| No operator recorded                                         | The operator value is not defined on the syringe verification screen.                                                                    | Set an operator on the syringe verification configuration.                                                                                                                                                                                      |
| Serialization error                                          | There was an error during the results export.                                                                                            | Remove the USB storage device and make sure the USB icon is no longer seen in the header bar, then install the device again try the export again. Try again, if the problem continues, contact technical support.                               |
| USB mass storage writing error                               | Error when exporting data to the USB storage device                                                                                      | Make sure that the USB storage device is correctly installed and the USB icon can be seen in the header bar (refer to <a href="#">Table 2</a> on page 20).                                                                                      |

## Section 10 Replacement parts and accessories

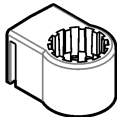
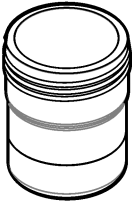
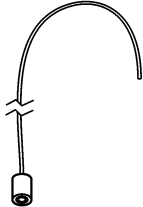
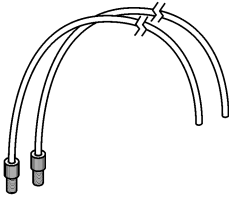
### ⚠ WARNING



Personal injury hazard. Use of non-approved parts may cause personal injury, damage to the instrument or equipment malfunction. The replacement parts in this section are approved by the manufacturer.

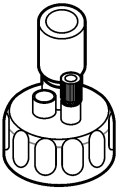
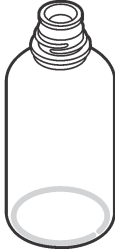
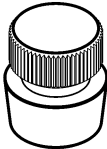
**Note:** Product and Article numbers may vary for some selling regions. Contact the appropriate distributor or refer to the company website for contact information.

**Table 14 Replacement parts and accessories**

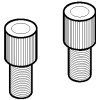
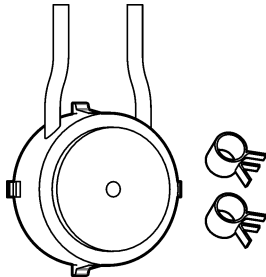
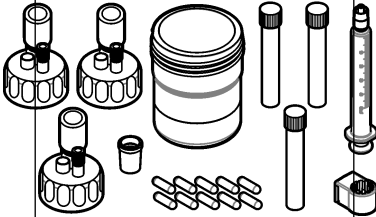
|                                                                                     | Description                                    | Item no. |
|-------------------------------------------------------------------------------------|------------------------------------------------|----------|
|    | Syringe 5 mL, glass                            | LZE101   |
|    | O-ring for 5 mL syringe                        | LZE105   |
|    | Glass beaker, 150 mL                           | LZE110   |
|   | Delivery tubing with anti-diffusion tip        | LZE113   |
|  | Set of tubes (2x) for pump, suction & delivery | LZE115   |



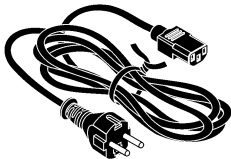
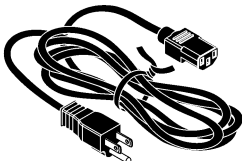
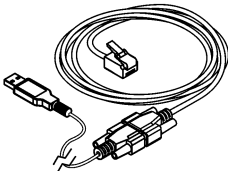
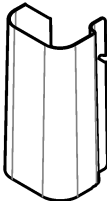
**Table 14 Replacement parts and accessories (continued)**

|                                                                                     | Description                                | Item no. |
|-------------------------------------------------------------------------------------|--------------------------------------------|----------|
|    | Bottle stopper GL45                        | LZE117   |
|    | Glass bottle, 1L                           | LZE119   |
|    | Desiccant tube filled with molecular sieve | LZE121   |
|   | Conical adapter                            | LZE183   |
|  | Stopper 20 mm, KF cell                     | LZE123   |

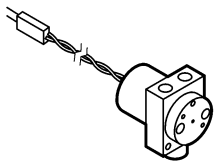
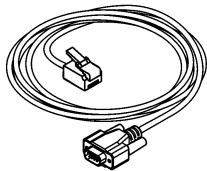
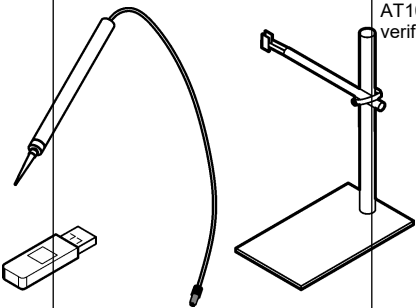
**Table 14 Replacement parts and accessories (continued)**

|                                                                                    | Description                             | Item no. |
|------------------------------------------------------------------------------------|-----------------------------------------|----------|
|   | Tube fitting (2x)                       | LZE124   |
|    | Spare pump cassette                     | LZE126   |
|   | Magnetic stir bar, PTFE, 20 x 6 mm (5x) | LZE136   |
|   | Set of accessories, 5 mL syringe        | LZE140   |
|  | Power supply (without power cable)      | LZE144   |

**Table 14 Replacement parts and accessories (continued)**

|                                                                                     | Description              | Item no. |
|-------------------------------------------------------------------------------------|--------------------------|----------|
|    | Power cable (EU)         | YAA080   |
|    | Power cable (US)         | XLH055   |
|    | Power cable (UK)         | XLH057   |
|   | RS-232 adapter cable     | LZE145   |
|  | Syringe protection cover | LZE156   |

**Table 14 Replacement parts and accessories (continued)**

|                                                                                   | Description                                     | Item no.        |
|-----------------------------------------------------------------------------------|-------------------------------------------------|-----------------|
|  | Electro-valve block and connector               | LZE165          |
|  | RS-232 cable for balance connection to TitraLab | LZE196          |
|                                                                                   | Thermo-Drucker USB printer                      | LQV161.99.10000 |
|   | AT1000/KF1000 syringe volume verification kit   | LZE228          |

**Table 15 Electrodes and electrode accessories**

| Description                                                 | Item no.        |
|-------------------------------------------------------------|-----------------|
| MTC301, platinum combined electrode, 1 m cable              | MTC30101        |
| MTC306, silver combined electrode, 1 m cable                | MTC30601        |
| MTC695, Pt-Pt electrode, 1 m cable                          | MTC69501        |
| PHC705, pH probe, red rod, glass, general purpose, standard | PHC70501        |
| PHC725, pH probe, glass                                     | PHC72501        |
| PHC805, pH probe, glass, general purpose                    | PHC80501        |
| CDC401 conductivity probe, standard, 1 m cable              | CDC40101        |
| ISECa calcium combined selective                            | LZW9660C.97.002 |
| Legacy adapter                                              | LZV662          |
| OPT300 photocolorimetric probe                              | E71T001         |

**Table 15 Electrodes and electrode accessories (continued)**

| Description                                                  | Item no. |
|--------------------------------------------------------------|----------|
| PTM450, NP photolorimetric titration module, without power   | X61T005  |
| pHG311-9 pH electrode, pH 0-14, FX                           | E11M004  |
| pHG301-9 pH electrode, glass                                 | E11M001  |
| REF251 reference electrode, red rod, double junction, banana | E21M001  |
| CL114 cable FX/COAX/1m/BNC                                   | A94L114  |
| REF361 reference electrode, Ag/AgCl, reverse sleeve, FX      | E21M003  |
| Adaptor BNC male to banana                                   | LZE184   |
| REF451 reference electrode, calomel, double junction, FX     | E21M005  |
| ISE25Cu-9 ion selective, copper, FX                          | E41M006  |
| CL111 cable FX/COAX/1m/banana                                | A94L111  |

## Appendix A Change application parameters

### NOTICE

The applications installed on the instrument have been pre-defined to optimize the measurement process. Changing these default application parameters will have an effect on the measurement process and measurement results. Only qualified personnel should change these parameters or use the instrument in **Expert mode**. Refer to the application note before changing any parameters.

### NOTICE

In **Basic mode** changes to parameters are secure. In **Expert mode** changes to parameters are not secure and can cause the application to run incorrectly.

### NOTICE

The **Active** parameter is available to change in some parameter groups. It specifies if the method should be used during the analysis. Changing this from **Yes** to **No** means that the method will not be used which will have an effect on the measurement process and measurement results.

### NOTICE

The **Hide result** parameter (e.g. R2 hide, R3 hide, etc.) is available to change in some parameter groups. It specifies if the result is shown on the display. Changing this from **Yes** to **No** means that the calculated measurement result will not be shown. This will not have an effect on the measurement process and measurement results.

The parameters available for change can be different for each instrument configuration and the application being edited. The parameters marked with an "x" are available for change.

**Table 16 Application**

| Parameter         | Description                                                 | Basic mode | Expert mode |
|-------------------|-------------------------------------------------------------|------------|-------------|
| Name              | Name of the application                                     | x          | x           |
| Advisable syringe | The application has been designed with this type of syringe |            |             |

**Table 17 Sample**

| Parameter | Description          | Basic mode | Expert mode |
|-----------|----------------------|------------|-------------|
| Name      | Name of the sample   | x          | x           |
| Amount    | Amount of the sample | x          | x           |

**Table 17 Sample (continued)**

| Parameter   | Description                                      | Basic mode | Expert mode |
|-------------|--------------------------------------------------|------------|-------------|
| Unit        | Unit of the sample                               |            | x           |
| Min. amount | Minimum permitted sample amount                  |            | x           |
| Max. amount | Maximum permitted sample amount                  |            | x           |
| Resolution  | Number of decimals to show for the sample amount |            | x           |

**Table 18 QC**

| Parameter | Description    | Basic mode | Expert mode |
|-----------|----------------|------------|-------------|
| Name      | Name of the QC | x          | x           |

**Table 19 Blank**

| Parameter   | Description              | Basic mode | Expert mode |
|-------------|--------------------------|------------|-------------|
| Description | Description of the blank | x          | x           |

**Table 20 Electrode**

| Parameter                     | Description                                                                                       | Basic mode | Expert mode |
|-------------------------------|---------------------------------------------------------------------------------------------------|------------|-------------|
| Type                          | Type of measurement electrode                                                                     |            |             |
| Part of name                  | Part of the name used to identify matching electrodes if the preferred electrode is not connected |            |             |
| Recommended electrode         | Recommended electrode to be used for this analysis                                                |            | x           |
| Working mode                  | Specify if the probe is used in imposed voltage/current (AC or DC)                                |            | x           |
| Current (sample analysis)     | Set the value of the imposed current during sample analysis                                       |            | x           |
| Current (titrant calibration) | Set the value of the imposed current during titrant calibration                                   |            | x           |

**Table 21 Titrant**

| Parameter                    | Description                                                       | Basic mode | Expert mode |
|------------------------------|-------------------------------------------------------------------|------------|-------------|
| Name                         | Name of the titrant                                               |            | x           |
| Titration concentration      | Nominal concentration of the titrant                              |            | x           |
| Resolution                   | Number of decimals of the nominal concentration of the titrant    |            | x           |
| Real concentration           | Real concentration of the titrant used for result calculation     | x          | x           |
| Resolution                   | Number of decimals of the real concentration of the titrant       |            | x           |
| <b>Titration calibration</b> |                                                                   |            |             |
| Active                       | Select <b>No</b> to skip this method during titration calibration | x          | x           |
| Calibration frequency        | Recommended frequency of titration calibration (0 = no reminder)  | x          | x           |
| Stirring speed               | Speed of the stirrer during titration calibration                 | x          | x           |

**Table 21 Titrant (continued)**

| Parameter                    | Description                                                                  | Basic mode | Expert mode |
|------------------------------|------------------------------------------------------------------------------|------------|-------------|
| <b>Incremental addition</b>  |                                                                              |            |             |
| Delay                        | Stirring time before the titration starts                                    | x          | x           |
| Injection autodetect         | Automatic start after the detection of the sample injection                  | x          | x           |
| End point                    | Ordinate of the end point                                                    |            | x           |
| Proportional band            | Proportional band of the PID regulation                                      |            | x           |
| Drift threshold              | Drift value below which the cell is considered as dry                        | x          | x           |
| Max. addition speed          | Maximum speed for titrant addition on titration regulation                   |            | x           |
| Min. titr. duration          | Set the minimum titration duration                                           | x          | x           |
| Max. titr. duration          | Set the maximum titration duration                                           | x          | x           |
| <b>Titration calculation</b> |                                                                              |            |             |
| Resolution                   | Maximum number of decimals to show for the real concentration of the titrant |            | x           |
| Titrant cal. limit check     | Activate the titrant calibration result boundary check                       |            | x           |
| Min. titrant conc.           | Minimum value of the real concentration of the titrant                       |            | x           |
| Max. titrant conc.           | Maximum value of the real concentration of the titrant                       |            | x           |
| Standard name                | Name of the standard                                                         | x          | x           |
| Standard amount              | Amount of standard to be used for titer determination                        | x          | x           |
| Resolution                   | Maximum number of decimals for the amount value of the standard              | x          | x           |
| Min. amount                  | Minimum amount of the standard                                               | x          | x           |
| Max. amount                  | Maximum amount of the standard                                               | x          | x           |
| Concentration                | Concentration value of the standard                                          | x          | x           |
| Resolution                   | Number of decimals for the concentration value of the standard               |            | x           |

**Table 22 Methods**

| Parameter                        | Description                                                 | Basic mode | Expert mode |
|----------------------------------|-------------------------------------------------------------|------------|-------------|
| <b>Analysis titration method</b> |                                                             |            |             |
| Stirring speed                   | Speed of the stirrer during the titration                   | x          | x           |
| Measured parameter               | Parameter measured by the probe                             |            |             |
| <b>Addition</b>                  |                                                             |            |             |
| Delay                            | Stirring time before the titration starts                   | x          | x           |
| Injection autodetect             | Automatic start after the detection of the sample injection | x          | x           |
| End point                        | Ordinate of the end point                                   |            | x           |
| Proportional band                | Proportional band of the PID regulation                     |            | x           |
| Drift threshold                  | Drift value below which the cell is considered as dry       | x          | x           |
| Max. addition speed              | Maximum speed for titrant addition on titration regulation  |            | x           |

**Table 22 Methods (continued)**

| Parameter                    | Description                                       | Basic mode | Expert mode |
|------------------------------|---------------------------------------------------|------------|-------------|
| Min. titr. duration          | Set the minimum titration duration                | x          | x           |
| Max. titr. duration          | Set the maximum titration duration                | x          | x           |
| <b>Titration calculation</b> |                                                   |            |             |
| Result x (Rx) name           | Name of the result                                | x          | x           |
| Rx max. resolution           | Maximum number of decimals to show for the result |            | x           |
| Rx hide                      | The result is not shown if <b>Yes</b> is selected | x          | x           |
| Rx limit check               | Activate the sample result boundary check         |            | x           |
| Rx min.                      | Minimum permitted result value                    |            | x           |
| Rx max.                      | Maximum permitted result value                    |            | x           |
| Rx QC min.                   | Minimum permitted QC result value                 |            | x           |
| Rx QC max.                   | Maximum permitted QC result value                 |            | x           |
| Rx unit                      | Unit of the result                                | x          | x           |

## Appendix B Frequently asked questions

**Table 23 Application files**

| Question                                                                                                                                                                  | Cause                                             | Procedure                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Why can't I load any applications                                                                                                                                         | Wrong file placement on the USB storage device    | Make sure that the file path on the USB storage device is correct                                                                                                                   |
|                                                                                                                                                                           | The user is not in the home screen                | Push the <b>Home</b> key to make sure that you are in the home screen before connecting the USB storage device                                                                      |
| Why is the instrument not recognizing the applications USB storage device, even though I have removed and reconnected the device and I see the USB icon in the header bar | Reconnecting the device has been done too quickly | Remove the device and wait until the icon disappears from the header bar, then push the <b>Home</b> key to make sure that you are in the home screen before reconnecting the device |

**Table 24 Mechanical**

| Question                                                             | Cause                                           | Procedure                                                                                                                                                         |
|----------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| How can I remove an air bubble that is trapped on top of the syringe | Air bubbles are trapped in the syringe          | Select the <b>Purge</b> option on the instrument to purge the syringe of air bubbles (refer to <a href="#">Prepare the instrument for measurement</a> on page 25) |
| Why is titrant leaking along the sealing above the electrovalve      | The tubes have not been correctly installed     | Turn the tube connector until a "click" is heard                                                                                                                  |
| Why is titrant leaking along the sealing below the electrovalve      | The syringe has not been installed tight enough | Make sure that the syringe is installed correctly                                                                                                                 |
|                                                                      | The electrovalve is leaking                     | Change the electrovalve as described in <a href="#">Replace the syringe electro-valve block</a> on page 35                                                        |



**Table 24 Mechanical (continued)**

| Question                                                                                                                   | Cause                                               | Procedure                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| On my two pump instrument, using the <b>Pump activation</b> option, why is the reagent not being delivered into the beaker | The procedure is not being done on the correct pump | Select the <b>Pump activation</b> option on the instrument, and <b>Toggle</b> the pumps to make sure that the correct pump is being used |
|                                                                                                                            | The active pump is not the correct pump             | Change to expert mode and change the name of the pump                                                                                    |
|                                                                                                                            | The pump is defective                               | Change the pump as described in <a href="#">Pump cassette replacement</a> on page 36                                                     |

**Table 25 Password**

| Question                                             | Procedure                 |
|------------------------------------------------------|---------------------------|
| How can I retrieve my password to access expert mode | Contact technical support |





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