User Manual

Coulometric KF Titrator

C10S/C20S/C30S

METTLER TOLEDO

Table of Contents

1 Introduction

Thank you for choosing a METTLER TOLEDO Coulometric KF Titrator. The Coulometric KF Titrator is an easy-to-operate instrument for coulometric Karl Fischer titrations.

About this document

This document provides you with the information you need to get started with your METTLER TOLEDO titrator.

 For a comprehensive description of the instrument and its functions, refer to the Operating Instructions, supplied as PDF file on the CD.

The instructions in this document refer to titrators running firmware version 5.2.0 or higher.

If you have any additional questions, contact your authorized METTLER TOLEDO dealer or service representative.

▶ www.mt.com/contact

Conventions and symbols

 Refers to an external document.

Note for useful information about the product.

Elements of instructions

- Prerequisites
1 Steps
2 …
  ⇨ Intermediate results
⇨ Results

2 Safety information

- Read and understand the information in this User Manual before you use the instrument.
- Keep this User Manual for future reference.
- Include this User Manual if you pass on the instrument to other parties.

If the instrument is not used according to the information in the Operating Instructions or if it is modified, the safety of the instrument may be impaired and Mettler-Toledo GmbH assumes no liability.

For a comprehensive description of the instrument and its functions, refer to the Operating Instructions, supplied as PDF file on the CD.

2.1 Definition of signal words and warning symbols

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results.

Signal words

WARNING   for a hazardous situation with medium risk, possibly resulting in death or severe injury if not avoided.

NOTICE   for a hazardous situation with low risk, resulting in damage to the instrument, other material damage, malfunctions and erroneous results, or loss of data.

Warning symbols

Electrical shock

2.2 Product-specific safety notes

Intended use

This instrument is designed to be used in laboratories by trained staff. The instrument is suitable for the processing of reagents and solvents.

Any other type of use and operation beyond the limits of technical specifications without written consent from Mettler-Toledo GmbH is considered as not intended.

Responsibilities of the instrument owner

The instrument owner is the person that uses the instrument for commercial use or places the instrument at the disposal of the staff. The instrument owner is responsible for product safety and the safety of staff, users and third parties.

METTLER TOLEDO assume that the instrument owner provides the necessary protective gear, appropriate training for the daily work and for dealing with potential hazards in their laboratory.

Safety notes

⚠ **WARNING**

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death.

1 Only use a METTLER TOLEDO power cable and AC adapter designed for your instrument.
2 Connect the power cable to a grounded power outlet.
3 Keep all electrical cables and connections away from liquids.
4 Replace damaged power cables and AC adapters immediately.

NOTICE
Danger of damaging the touch screen with pointed or sharp objects!
Pressing on the touch screen with pointed or sharp objects may damage it.
– Operate the touch screen by applying gentle pressure with the pad of your finger.

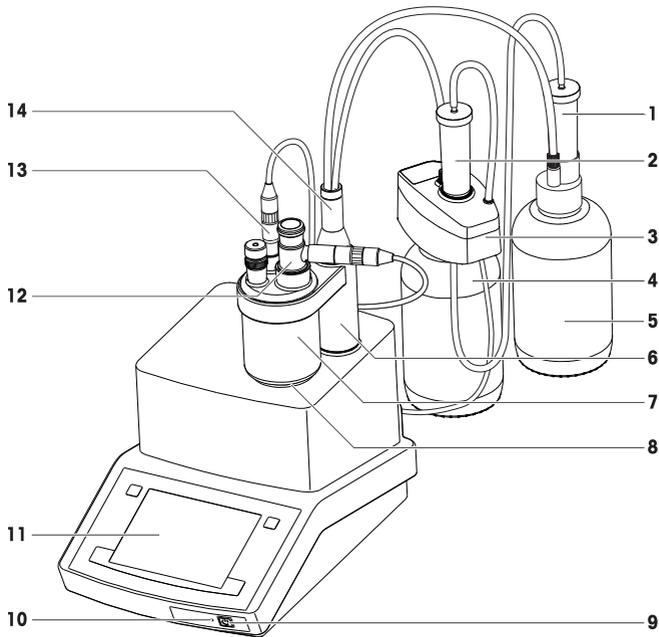| **NOTICE** |
|---|
| **Danger of damage to the instrument due to incorrect parts!** |
| Using incorrect parts with the instrument can damage the Instrument or cause the instrument to malfunction. |
| – Only use parts supplied with the instrument, listed accessories and spare parts from METTLER TOLEDO. |

3 Design and Function

3.1 Instrument

3.1.1 Overview

1	Solvent bottle drying tube[1]	**8**	Internal magnetic stirrer
2	Waste bottle drying tube	**9**	Power button
3	Solvent manager [2]	**10**	Indicator light (LED)
4	Waste bottle [2]	**11**	Touch screen
5	Solvent bottle [3]	**12**	Generator electrode
6	Titration arm	**13**	Double platinum pin electrode
7	Measuring cell	**14**	Extraction adapter and park sleeve [1]

[1] Component of the optionally available reagent changing set

[2] Not available with standard equipment of C10SD and C10SX

[3] Not available with standard equipment

3.1.2 Rear panel connections
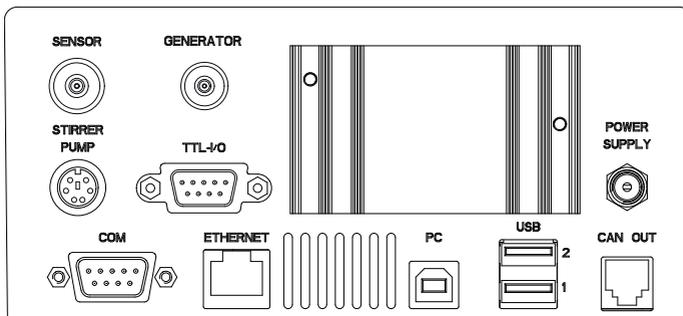
| Socket	Use	Example
SENSOR	Measuring electrode	DM143-SC
GENERATOR	Generator electrode	Generator electrode with diaphragm
STIRRER PUMP	Stirrer/pump	Solvent manager/stirrer
TTL-I/O	Sample changer/homogenizer	Stromboli/homogenizer via TBox
POWER SUPPLY	AC adapter	AC adapter
COM	Balance	XS analytical balance
ETHERNET	Network	Link to LabX PC software via USB interface
PC	PC connection via USB	Link to LabX PC software via USB interface
USB 1	Printer/barcode reader/memory stick/USB hub/sample changer	USB-P25 compact printer/ InMotion KF
USB 2	Printer/barcode reader/memory stick/USB hub/sample changer	Barcode reader/InMotion KF
CAN OUT	CAN connection	For service use

3.1.3 Terminal
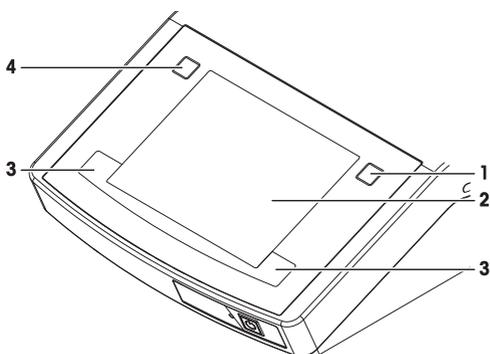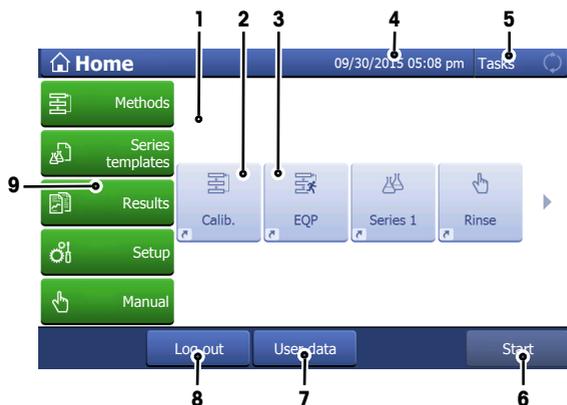

Nr.	Name	Function
1	Info button	Accesses the interactive online help for the content of the current dialog.
2	Touch screen	Displays information and can be used to enter information.

Nr.	Name	Function
3	Home button	Returns you to the home screen from any menu position.
4	**Reset** button	Ends all tasks that are currently running.

3.2 User interface

3.2.1 Home screen

|	Name	Explanation
1	**Shortcut area**	Shows indirect and direct shortcuts for frequently used methods. Shortcuts are saved in the user profile and can be defined, changed and deleted by the user.
2	**Indirect shortcut**	An indirect shortcut opens the window **Start analysis** of the method.
3	**Direct shortcut**	A direct shortcut starts the method without opening the window **Start analysis**.
4	**Status bar**	The status bar contains the current menu item, user name as well as date and time.
5	**Instrument status**	Shows the current working status of the instrument. **Blue** No measurement running **Green** Measurement running
6	**Start**	Switch to direct measurement (quick start for the defined standard measurement of this instrument).
7	**User data**	Opens a window with information about the currently logged in user.
8	**Log out**	Directly log out the current user. The window **Login** opens after logging out.

Coulometric KF Titrator

	Name	Explanation
9	**Menus**	**Methods** Create and handle methods for every measurement type.
		Series templates Open the menu for series templates for every method available on the instrument.
		Results Display all measurement results, print out or export them. Visit detail information about every single result.
		Setup Define all system settings in this menu, e.g,, hardware settings, user management or user preferences. These settings are usually made during installation of the instrument.
		Manual Display the manual operations available on the instrument.

3.2.2 Keypads

Alphabetic keypad
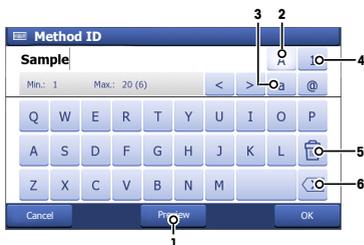
Numeric keypad

- Tap (1) to see how your input looks like.
- Tap (2) for capital letters.
- Tap (3) for lowercase letters.
- Tap (4) to switch to a numeric keypad and (2) to turn back to alphanumeric.
- Tap (5) to delete all entered letters or numbers.
- Tap (6) to delete the last entered letter or number.

- Tap (1) to delete all entered numbers.
- Tap (2) to delete the last entered number.

3.2.3 Menu Structure

Methods

The menu **Methods** has no submenus.

Series templates

The menu **Series templates** has no submenus.

Results

The menu **Results** has the following submenus.

- **All results**
  Statistics
- **Samples**
- **Add result**
- **Recalculate**
- **Undo all**

Setup

The menu **Setup** has the following submenus.

Menu level 2	Menu level 3
User settings	**Language**
	Screen
	Audio signal
	Shortcuts
	Keyboard
Values (only C30S)	**Blanks** (only C30S)
	Auxiliary values (only C30S)
Hardware	**Sensors**
	Pumps
	Peripherals
	Titration Stands
Global settings	**System**
	User management
	Analysis and resources behavior
	Reagent Control (only C30S)
Mainten. & Service	**MT-Service**
	Import / Export
	Reset to factory settings
	Titrator firmware history
	Board firmware
	Terminal
	Board data
	Update
	Delete Mettler method template (only C30S)

Manual

The menu **Manual** has the following submenus.

- **Stirrer**
- **Sensor**
- **Pump**

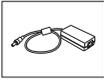## 4 Installation

Standard equipment for the titrator types varies. For this reason, installation steps may vary.

4.1 Standard equipment

4.1.1 Scope of delivery

Description		Order number	C10S D	C10S X	C20S D	C20S X	C30S D	C30S X
	Coulometric KF Titrator	–	●	●	●	●	●	●

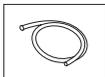| Description		Order number	C10S D	C10S X	C20S D	C20S X	C30S D	C30S X
	External power supply (100…240 Volt)	–	•	•	•	•	•	•
	Power cable (country-specific)	–	•	•	•	•	•	•
	Protective cover for touchscreen	51105567	•	•	•	•	•	•
	Coulometer measuring cell	51108732	•	•	•	•	•	•
	Mounting bolt (for titration beakers / measuring cell)	51108752	•	•	•	•	•	•
	Stopper (PTFE) with septum	51108741	•	•	•	•	•	•
	Septum (12 pcs)	51108740	•	•	•	•	•	•
	Generator electrode **with** diaphragm incorporating straight drying tube	51108751	•	–	•	–	•	–
	Generator electrode **without** diaphragm incorporating straight drying tube	51108753	–	•	–	•	–	•
	Cable for generator electrode	51107830	•	•	•	•	•	•
	Dual platinum pin electrode, DM143-SC	51107699	•	•	•	•	•	•
	Triaxial SC LEMO cable, 72 cm	51109183	•	•	•	•	•	•
	Holder	23960	•	•	•	•	•	•
	Magnetic stirrer bar	51191159	•	•	•	•	•	•
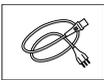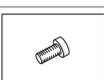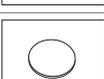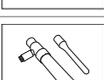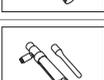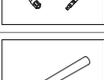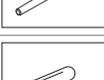
Description		Order number	C10S D	C10S X	C20S D	C20S X	C30S D	C30S X
	Seal (titration stand drying tube)	51107492	•	•	•	•	•	•
	Solvent Manager set with: • Silicone tube, 850 mm • Silicone tube, 170 mm • Drying tube with cover • 2 flat seals	51105600	–	–	•	•	•	•
	Draining tube	23936	•	•	•	•	•	•
	Clear glass bottle, 1 L	30079610	–	–	•	•	•	•
	Molecular sieve, 250 g	71478	•	•	•	•	•	•
	Silicone grease	71300	•	•	•	•	•	•
	Syringe, 1 mL	–	•	•	•	•	•	•
	Injection needle, 80 x 0.8 mm	–	•	•	•	•	•	•
	CD Titration User Documentation	30297239	•	•	•	•	•	•
	User Manual	–	•	•	•	•	•	•
	Memo Card	–	•	•	•	•	•	•
	Test report	–	•	•	•	•		
	EC declaration of conformity	–	•	•	•	•	•	•
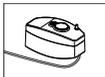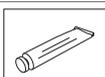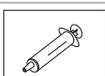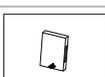
4.1.2 Unpack the titrator

1 Remove the titrator (and accessories) from the protective packing material.
2 Store the packing material for later transport over long distances.

3   Check if you received all parts listed in the scope of delivery.

4   Inspect the parts visually for flaws or damage.

5   If parts are missing or damaged, report it immediately and file a freight claim if needed.

4.1.3 Position the titrator

The instrument has been developed for indoor operation in a well-ventilated area. The following site requirements apply:

- The ambient conditions are within the limits specified in the technical data.
- No powerful vibrations
- No direct sunlight
- No corrosive gas atmosphere
- No explosive atmosphere
- No powerful electric or magnetic fields

4.1.4 Connect the titrator to the power supply

⚠ **WARNING**

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death.

1   Only use a METTLER TOLEDO power cable and AC adapter designed for your instrument.

2   Connect the power cable to a grounded power outlet.

3   Keep all electrical cables and connections away from liquids.

4   Replace damaged power cables and AC adapters immediately.

NOTICE

Danger of damage to the AC adapter due to overheating!

If the AC adapter is covered or in a container, it is not sufficiently cooled and overheats.

1   Do not cover the AC adapter.

2   Do not put the AC adapter in a container.

The titrator is operated using an AC adapter. The AC adapter is suitable for all supply line voltages ranging from 100…240 V AC ±10 % and 50-60 Hz.

1   Install the cables in such a way that they cannot be damaged or interfere with operation.

2   Insert the plug of the power cable in the socket of the AC adapter.
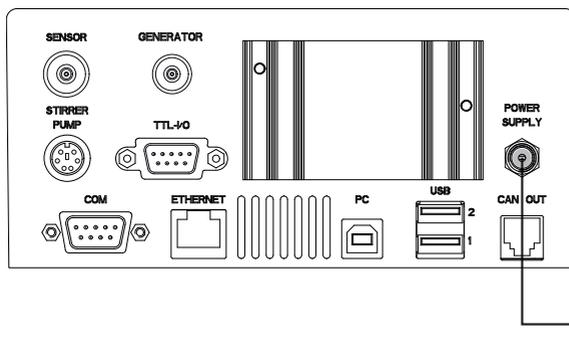
3   Insert the plug of the AC adapter in the **POWER SUPPLY** socket at the back of the titrator.

4   To secure the connection at the titrator, screw the plug connector firmly into place.

5   Insert the plug of the power cable in a grounded power outlet that is easily accessible.

4.1.5   Disconnect the titrator from the power supply

■ The titrator has shut down.
1   Pull the plug of the power cable out of the power outlet.
2   Pull the plug of the AC adapter out of the **POWER SUPPLY** socket at the back of the titrator.

4.1.6   Assemble titration stand and measuring cell

The titration arm can be pivoted in both directions.

1   Slide the magnetic stirring rod (8) carefully into the measuring cell (7).
2   Place the measuring cell (7) in the titration stand (10) and fasten it with the mounting bolt (9).
3   Lightly grease microsections with the silicone grease supplied.
4   Place the stopper (5) with septum (4) in one of the openings of the measuring cell (7).
5   Place the measuring electrode (2) in one of the openings of the measuring cell (7).
6   Place the generator electrode (3) in the biggest opening of the measuring cell (7).
7   Fill the drying tube (1) with molecular sieve and place it in the generator electrode (3).
8   Place the holder (6) for the tip of the suction tube in the opening of the titration stand (10).
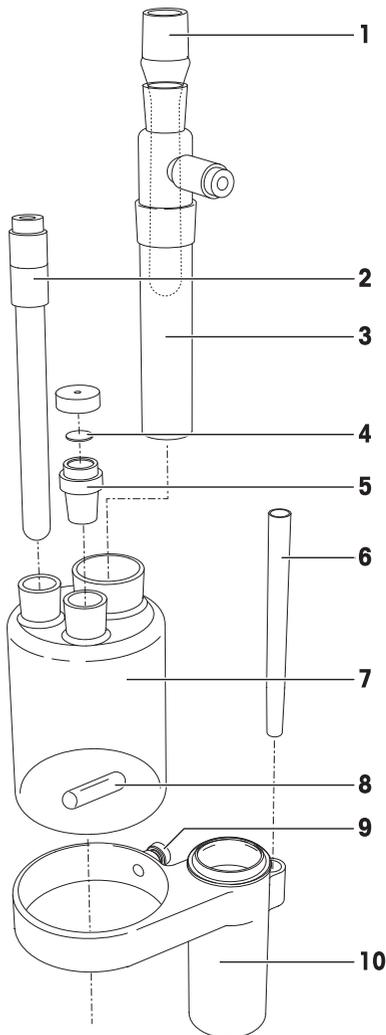
4.1.7   Connect the electrodes

The connection cables for the measuring and generator electrodes have different sized plug connectors on the device side. The cable for the generator electrode has a blue plug for the purposes of differentiation.

- No task is running on the titrator

1 To connect the generator electrode, plug the triaxial cable with the blue plug connector into the **GENERATOR** socket on the rear of the titrator.

2 To connect the measuring electrode, plug the triaxial cable with the gray plug connector into the **SENSOR** socket on the rear of the titrator.
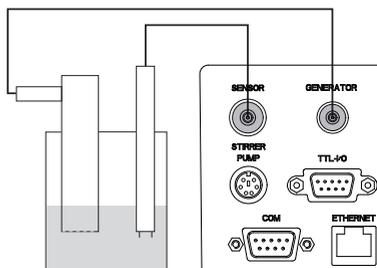
4.1.8 Assemble the waste bottle

1 Place the flat seal (7) on the opening of the bottle.

2 Screw the solvent manager (5) onto the bottle.

3 Loosen the threaded sleeve (3) on the solvent manager (5).

4 Push the thin end of the suction tube (1) through the threaded sleeve (3), so that it is just below the screw top.

5 Tighten the threaded sleeve (3).

6 Fill a drying tube (4) with molecular sieve.

7 Press the drying tube (4) into the appropriate opening of the solvent manager.

8 With a silicone tube (167 mm) (2), connect the drying tube (4) of the bottle to the appropriate adapter of the solvent manager.

9 To ensure that the system has no leaks, check all tubes and closing points for firm seating.
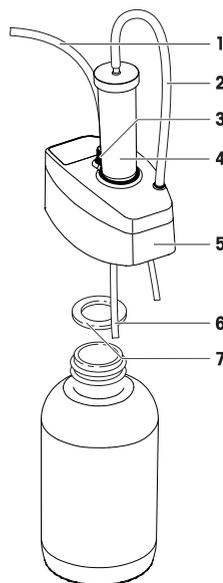
4.1.9 Connect the solvent manager to the titrator

1 Shut down the titrator.

2 Plug the cable supplied with the solvent manager into the **STIRRER PUMP** socket on the rear of the titrator.

3 Start up the titrator.

⇨ The titrator automatically detects the solvent manager.

4.1.10 Exchange the solvent manually

- The solvent manager is installed on the waste bottle.

1 To extract exhausted solvent, remove the stopper (3) and push the free end of the suction tube (1) through the available opening and down to the bottom of the measuring cell (5).

2 To park the suction tube (1), place the free end of the suction tube (1) in the park sleeve (2) on the titration stand (4).

3 Add fresh solvent manually.
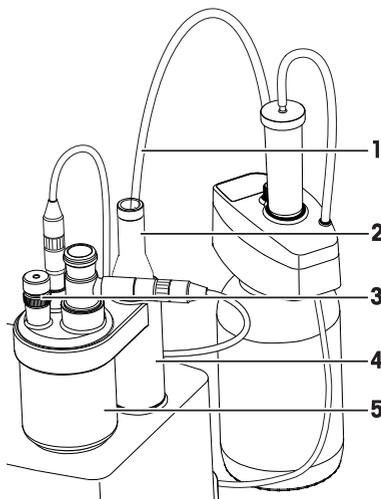
4.2 Optional equipment

4.2.1 Assemble the solvent bottle

1 Place the flat seal (4) on the opening of the bottle (5) and screw the screw top (3) onto the bottle.

2 Loosen the threaded sleeve (2) on the screw top (3).

3 Push the dispensing tube through the threaded sleeve (2) and the screw top (3) and down to the bottom of the bottle.

4 Tighten the threaded sleeve (2).

5 Fill a drying tube (1) with a molecular sieve and press the drying tube (1) into the screw top (3) of the bottle (5).

6 Connect the drying tube of the screw top to the appropriate connection of the solvent manager.

7 Press the park sleeve into the opening on the titration stand.

8 To ensure that the system has no leaks, check all tubes and closing points for firm seating.
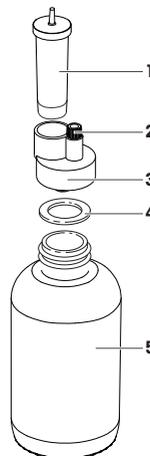
4.2.2 Connect the solvent bottle

- The solvent manager (5) is installed on the waste bottle (7).
- The optional reagent exchange set (3, 4) is installed on the solvent bottle (6).

1. Connect the drying tube (3) to the solvent manager (5).
2. Remove the stopper (9) from the measuring cell (8).
3. Place the draining adapter (2) in the available opening of the measuring cell (8).
4. Push the free end of the dispensing tube (1) through one of the openings of the draining adapter (2) into the measuring cell (8).
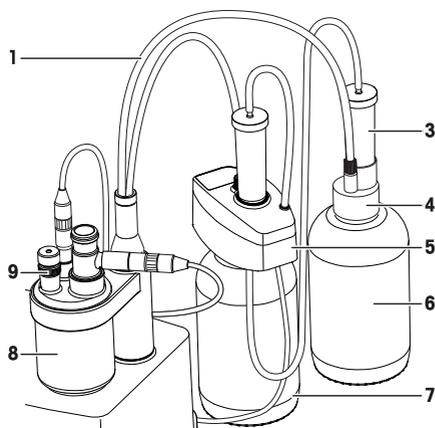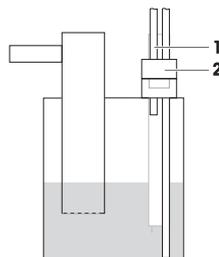
See also

- 🔖 Assemble the waste bottle ▶ Page 15
- 🔖 Assemble the solvent bottle ▶ Page 16

4.2.3 Exchange the solvent automatically

- The solvent manager is installed on the waste bottle.
- The optional reagent exchange set is installed on the solvent bottle.

1. Remove the stopper from the measuring cell.
2. Place the draining adapter (2) in the available opening of the measuring cell.
3. Push the free end of the suction tube (1) through one of the openings of the draining adapter (2) and down to the bottom of the measuring cell.
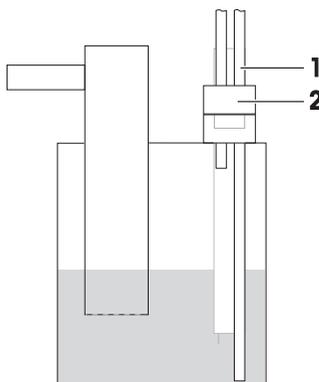
5 Operating the instrument

5.1 Start up the titrator and shut down the titrator

The power button is fitted with an LED and mounted on the front of the titrator. The LED indicates the operating status.

Start up the titrator

– Press the power button (2).
  ⇨ The titrator starts up and detects connected devices.
  ⇨ The LED (1) flashes as the system starts up.
  ⇨ The titrator is ready for use when the LED (1) remains permanently lit.

1 2
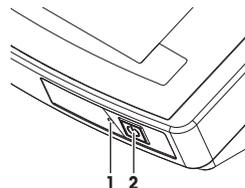
Shut down the titrator from the touch screen

– Tap **Home** > **Log out** > **Shut down**.
  ⇨ The titrator stops running tasks and shuts down.
  ⇨ The LED (1) flashes as the system shuts down, which can take up to 60 seconds.
⇨ When the LED goes out, the titrator has shut down. The built in AC adapter and the control circuit for the power button are energized. The rest of the titrator is no longer energized.

Shut down the instrument using the power button

– Press the power button for less than 1 second.
  ⇨ The titrator stops running tasks and shuts down.
  ⇨ The LED (1) flashes as the system shuts down, which can take up to 60 seconds.
⇨ When the LED goes out, the titrator has shut down. The built in AC adapter and the control circuit for the power button are energized. The rest of the titrator is no longer energized.

Shut down of the instrument in emergency situations

– Pull the plug of the power cable out of the power outlet.

5.2 Running a coulometric Karl Fischer titration

The following chapters show how to perform a simple coulometric Karl Fischer titration. You need the optional reagent exchange set to fill the measuring cell as it is described in this example.

Chemicals

For this titration you need the chemicals listed below.

• 1% KF standard solution (sample)
• Karl-Fischer reagent

5.2.1 Preparation

■ The titrator is installed.
■ The titration stand is installed and the measuring cell is assembled.
■ The measuring electrode and generator electrode are connected.
■ The solvent manager is installed on the waste bottle and connected to the titrator and the measuring cell.
■ The optional reagent exchange set is installed and the solvent bottle is connected to the measuring cell.
■ A USB printer is connected to port "USB1" or "USB2" of the titrator and configured.
1 Pivot the titration arm so the measuring cell is positioned over the internal magnetic stirrer.
2 To ensure that the system has no leaks, check all tubes and closing points for firm seating.
3 Tap **Setup** > **Hardware** > **Titration Stands** > **KF stand**.
  ⇨ The dialog **Titration stand parameters** opens.

4 Set **Stirrer output** to **Internal stirrer** and tap **Save**.

5 Tap **Manual** > **Pump**.

   ⇨ The dialog **Pump** opens.

6 Set **Action** to **Fill**.

7 Make sure **Reset counter** is activated.

8 Tap **Start**.

   ⇨ Reagent is pumped into the measuring cell.

9 To prevent the reagent from overflowing, watch the amount of reagent and tap **Stop** if too much reagent is added.

⇨ The measuring cell is filled with reagent.

5.2.2 Performing the coulometric KF titration

The following is a brief description of the sequence involved in a coulometric KF titration. The analysis process is described as an example for the following sequence steps:

- Pretitration
- Standby
- Sample analysis.

5.2.2.1 Configure the method

▪ The titrator is prepared as described in [Preparation ▶ Page 18].

1 Tap **Methods** > **New** > **Standard method template** > **KF Coul**.

   ⇨ A list of method functions appears.

2 Tap **Sample**.

   ⇨ The dialog **Sample (KF)** is opens.

3 Tap **Sample**.

4 Set **Entry type** to **Weight** and tap **OK**.

5 Tap **OK**.

   ⇨ A list with of method functions appears.

6 Tap **Save**.

5.2.2.2 Create a direct shortcut

1 Tap **Start**.

   ⇨ The **Start analysis** window opens.

2 Tap **AddToHome**.

   ⇨ The **Shortcut parameters** window opens.

3 Enter a name for the shortcut in **Description**.

4 Activate **Immediate start**.

5 Tap **Save**.

⇨ The home screen with the new shortcut opens.

5.2.2.3 Start the pretitration

1 To ensure that the system has no leaks, check all tubes and closing points for firm seating.

2 Select the shortcut on the home screen.

   ⇨ The system performs the pretitration to remove any water from the reagent.

   ⇨ As soon as the continually determined drift value falls below a defined value, the system automatically switches to **Standby** mode and the **Start sample** button is active.

5.2.2.4 Perform the analysis

▪ The system is in **Standby** mode.

1 Fill a syring with 1% KF standard solution, place it on a balance and tare the balance.

2   Tap **Start sample**.

⇨ You are prompted to add the sample.

3   Inject approx. 0.5 to 1.0 mL of the 1% KF standard solution into the measuring cell.

4   Place the syring on the balance and note the sample weight.

5   Enter the sample weight on the touch screen and tap **OK**.

⇨ The analysis starts.

⇨ Once the titration is complete, the **Results** dialog is displayed. The dialog shows **R1**, the water content.

5.3 Stopping an analysis

Stop method directly on the measurement screen

1   Tap **Stop analysis** (1) to stop the current analysis.

⇨ A dialog opens where you have to confirm the stop.
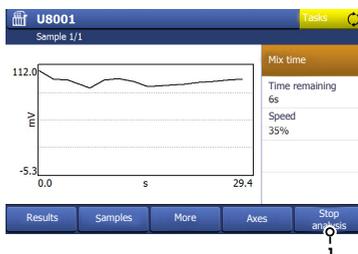
Stop method in the dialog More KF functions

2   Tap **More** (1) to enter the dialog **More KF functions**.

⇨ Depending on the measurement status, you will find different opportunities in this dialog.

3   Tap **End series** to end the current series.

4   Tap **Stop method** to stop the current method.

⇨ A dialog opens where you have to confirm the stop.

5   Tap **Back** to exit the dialog **More KF functions**.
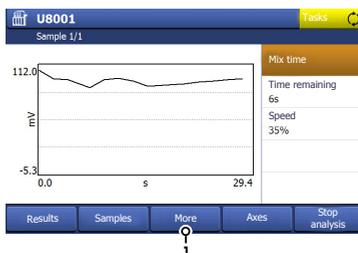
6 Transporting the titrator

If you transport the titrator over long distances, use the original packaging.

1   Empty all tubes.

2   Empty the measuring cell.

3   Shut down the titrator.

4   Unplug the titrator.

5   Remove all cable connections.

6   Remove the measuring cell from the titration stand.

7   Remove all tubes

8   Move the titrator to the new location.

7 Care and maintenance

7.1 Cleaning

Housing of the titrator

1   Unplug the titrator.

2   Clean the housing of the titrator using a cloth moistened with alcohol.

Titration stand

1   Remove the measuring cell.
2   If installed, remove the park sleeve and clean it.
3   Clean the titration stand.
4   Reinstall measuring cell and park sleeve.

Measuring cell

1   Empty the measuring cell.
2   Remove stopper, measuring electrode and generator electrode.
3   Rinse the measuring cell thoroughly with methanol.
4   If needed, remove remaining depositions with a laboratory washing liquid.
5   Dry the measuring cell with a lint-free cloth.
6   Leave the measuring cell to dry for several hours at 70...80 °C in a drying oven.
7   Lightly grease microsections with the silicone grease supplied.

Generator electrode

1   Empty the generator electrode.
2   Rinse the generator electrode thoroughly with methanol.
3   Dry the generator electrode with a lint-free cloth.
4   Leave the generator electrode to dry for several hours at 70...80 °C in a drying oven.

Dirty diaphragm

1   Place the generator electrode in a suitable solvent (ideally methanol) for several hours.
2   Dry the generator electrode with a lint-free cloth.
3   Leave the generator electrode to dry for several hours at 70...80 °C in a drying oven.

7.2 Maintenance

Mettler Toledo recommends that a preventive maintenance and calibration certification is done at least once a year through your local Mettler Toledo Service Organization.

Weekly

- Check if the pins of the dual platinum pin electrode are bent. If the pins are bent, gently straighten them.
- Check if the pins of the dual platinum pin electrode are black. If the pins are black, clean them.

Before periods of inactivity

- Unplug the titrator.
- Empty the measuring cell.
- Empty all tubes.
- Remove the measuring cell from the titration stand.

8 Disposal

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

9 Technical data

Power supply	Input voltage	100–240 V~ ±10 %
	Input frequency	50–60 Hz
	Primary connection socket	3 pin, IEC C14
	Power consumption	36 VA
	Connected load	24 V DC ⎓ 1.25 A
	Secondary connection plug	2 pin, DC plug
Dimensions	Width	210 mm
	Depth	340 mm
	Height	291 mm (with titration stand)
		312 mm (ready-to-operate device)
	weight	3.3 kg
Materials	Titrator housing	Crastin® PBT
	Cover sheet	PET
	Protective cover	Copolymer
	Chassis	Stainless steel
	Titration stand	Crastin® PBT
	Dispensing tube / extraction tube	FEP
	Air tubes	Silicone
	O-ring (screw top)	EPDM
	O-ring (threaded ring)	FEP / silicone
	Sealing ring (bottle)	PTFE / silicone
	Seal (dispensing tube / extraction tube)	PTFE
	Connecting piece	Polypropylene
Ambient conditions	Ambient temperature	+5 °C – 40 °C
	Relative humidity	Max. 80 % (non-condensing) at 31 °C, linear fall to 50 % at 40 °C
	Use	In interior spaces
	Overvoltage category	II
	Pollution degree	2

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Power Management

The devices have a power management system which prevents the titrator from switching off unexpectedly in the event of a power overload. Tasks which would cause a power overload, because a number of pumps, stirrers and burette drives are already in use, cannot be started at all. A notification brings the start attempt to the attention of the user. It is advisable, if possible, to connect pumps and stirrers directly to sample changers or other devices which have their own power supply, such as a TBox, instead of to the titrator itself.

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METTLER TOLEDO Service assures
the quality, measuring accuracy and
preservation of value of this product
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