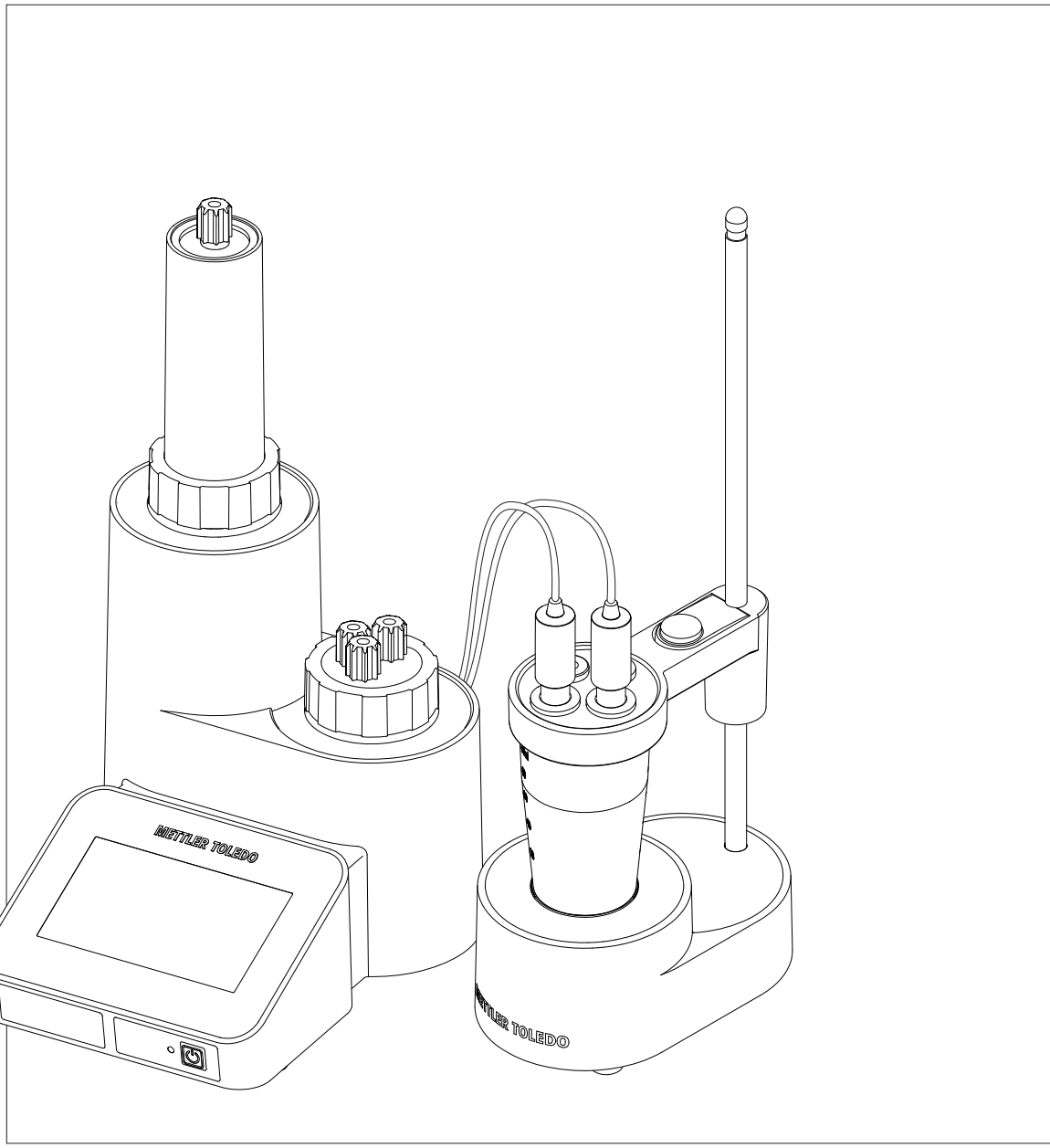
Operating Instructions

# EasyPlus™ Analyzer

## Easy Na




METTLER TOLEDO

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# 1 Introduction

The Sodium Analyzer has been especially designed for simplicity in the determination of sodium in food product using the standard addition technique. Just add your sample and ionic strength adjustment (ISA) solution then start your measurement. No calibration of the system is needed. Save operator time with reduced efforts in sample preparation and calibration.

Increase productivity with fast measurements of your samples. The Sodium Analyzer is modern with a small footprint for use in a wide variety of sodium determination applications. The instrument has been developed primarily for the use in Food and Beverage Labs. The Sodium Analyzer perfectly combines simple, easy-to-understand operation with high precision and reliability. Thanks to the App-oriented user interface and the built-in know-how, operation could not be any simpler or more intuitive. The Sodium Analyzer can be controlled by touch screen and all measured data can be stored in the PC Software EasyDirect.

All main functions can be started directly from the home screen on the touch screen via Longclick™ on the corresponding App, which makes routine use extremely simple. The integrated, proven algorithm specifically designed for $Na^+$ determination delivers highly accurate and repeatable results and is dedicated to determining directly the harmful sodium in Food and Beverage products.

Find out more and visit us on:

www.mt.com/SodiumAnalyzer

If you have any additional questions, METTLER TOLEDO is always available to assist you.

# 2 Safety Notes

## 2.1 Definition of signal warnings and 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 severe injuries or death if not avoided. |
| **CAUTION** | for a hazardous situation with low risk, resulting in damage to the device or the property or in loss of data, or minor or medium injuries if not avoided. |
| **Attention** | (no symbol)<br>for important information about the product. |
| **Note** | (no symbol)<br>for useful information about the product. |

**Warning symbols**


General hazard


Electrical shock


Toxic substance


Inflammable or explosive substance


Acid / Corrosion

## 2.2 Product Specific Safety Notes

Your instrument represents state-of-the-art technology and complies with all recognized safety rules, however, certain hazards may arise in extraneous circumstances. Do not open the housing of the instrument; it does not contain any parts that can be maintained, repaired or replaced by the user. If you ever have problems with your instrument, contact your authorized METTLER TOLEDO dealer or service representative.

**Intended use**

This instrument is designed to be used in analytical laboratories and is suitable for the processing of reagents and solvents.

The use therefore requires knowledge and experience in working with toxic and caustic substances as well as knowledge and experience working with application-specific reagents, which may be toxic or hazardous.

The manufacturer shall not be held liable for any damage resulting from incorrect usage divergent to the operating instructions. Furthermore, the manufacturer`s technical specifications and limits must be adhered to at all times and in no way exceeded.

**Location**

The instrument has been developed for indoor operation and may not be used in explosive environments.

Place the instrument in a location which is suitable for the operation, protected from direct sunlight and corrosive gases. Avoid powerful vibrations, excessive temperature fluctuations and temperatures below 5 °C and above 40 °C.

**Protective Clothing**

It is advisable to wear protective clothing in the laboratory when working with hazardous or toxic substances.

A lab coat should be worn.

Suitable eye protection such as goggles should be worn.

Use appropriate gloves when handling chemicals or hazardous substances, checking their integrity before use.

**Safety notes**

**WARNING**

**Risk of electric shock**

Use only 3-pin grounded electrical outlet and extension cables to connect the instrument.

a) Only 3-pin grounded electrical outlet and extension cables for connecting your instrument must be used.

b) Intentional disconnection of the equipment grounding conductor is prohibited.

**WARNING**

**Risk of corrosion**

Leaks in tubing connections and loose titration vessels are a safety risk.

a) Tighten all connections well by hand, avoid applying excessive force to tubing connections.

b) Always test the titration vessel for firm seating in the titration head.

**WARNING**

**Flammable solvents**

All relevant safety measures must be observed when working with flammable solvents and chemicals.

a) Keep all sources of flame away from the workplace.

b) When using chemicals and solvents, comply with the instructions of the producer and the general lab safety rules.

**WARNING**

**Chemicals**

All relevant safety measures are to be observed when working with chemicals.

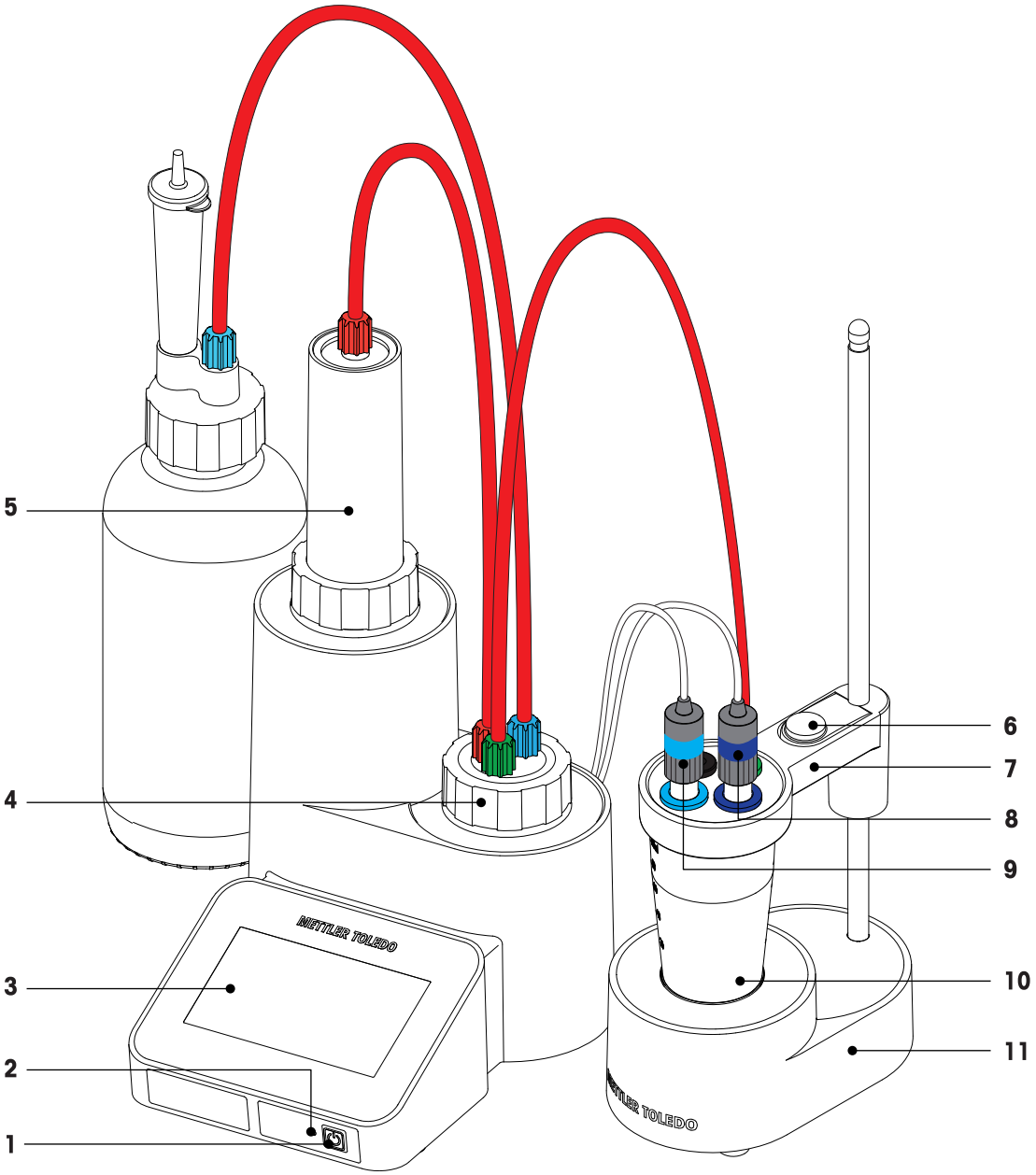
a) Set up the instrument in a well-ventilated location.

b) Any spills should be wiped off immediately.

c) When using chemicals and solvents, comply with the instructions of the producer and the general lab safety rules.

# 3 Design and Function

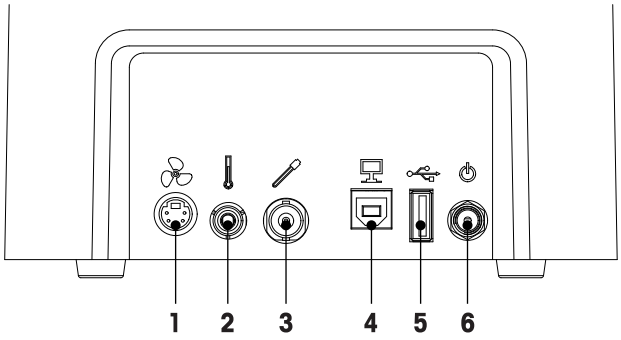
## 3.1 Overview




| | | | |
|---|---|---|---|
| **1** | On/Off button | **2** | Status LED |
| **3** | Touch screen | **4** | Valve |
| **5** | Burette | **6** | Release button |
| **7** | Analyzer head Na | **8** | DX222-Na (Na-ISE sensor) |
| **9** | DX205-SC (Reference sensor) | **10** | Beaker |
| **11** | Stirrer (EasyStir) | | |

## 3.2 Connections on the instrument

**Rear view**

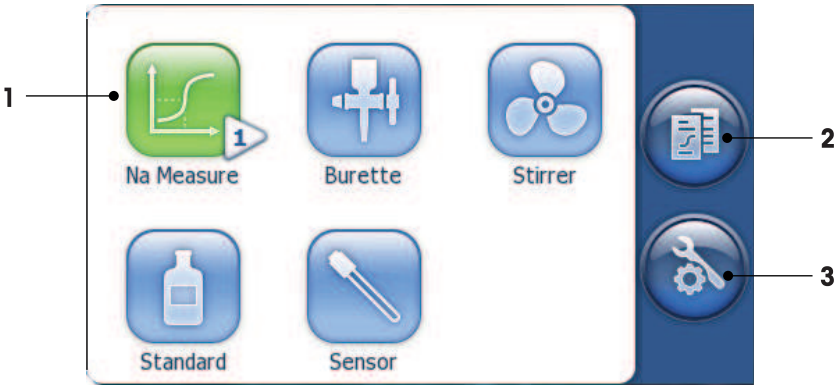



| | | | |
|---|---|---|---|
| **1** | Socket for stirrer<br>(Mini-DIN) | **2** | Socket for temperature sensor<br>(RCA - Cinch) |
| **3** | Socket for sensors | **4** | USB B interface for PC connection<br>(EasyDirect PC Software) |
| **5** | USB A interface for printer and balance | **6** | DC socket for power supply |

## 3.3 User interface

### 3.3.1 Home screen

The home screen is the main screen and appears after startup of the instrument. Tap and hold any of the home screen apps (except Standard) to start the last analysis without further navigation (LongClick™).




| | | | |
|---|---|---|---|
| **1** | **Functional Apps:**<br>Apps for various functions. | **2** | **Results**:<br>Select this menu item to display the results of the previous analysis. |
| **3** | **Setup & Tools**:<br>Select this menu item to make changes to the system settings and to perform diagnostics. | | |

### 3.3.2 Icons and buttons

Tap this menu item to return to the home screen.

Tap this menu item to go back to the previous screen.

Tap this menu item to start an action.

Tap this menu item to stop a running action.


Tap the arrows to page through parameter sets.

Tap the help icon to change to help mode. Then tap any of the parameters to get a specific help description.

Tap this icon to accept and close any entry screen.

Tap this icon to reject and close any entry screen.

Tap this icon to print parameters or results.


Tap this icon on a parameter screen to change the parameter set. Parameter set with number two is active in this example.


Indicates which analysis will be started when you tap and hold an app (LongClick™). Parameter set with number two is active in this example.

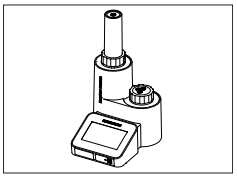
# 4 Putting into operation

Before getting started, please make sure you have received all parts listed in the section scope of delivery.

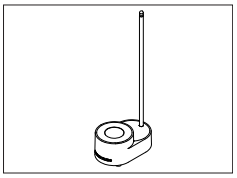
Read the following sections carefully for a correct and faultless installation.

## 4.1 Scope of Delivery

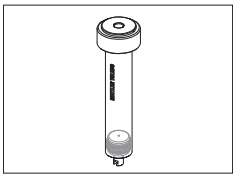
Check the completeness of the delivery. The following accessories are part of the standard equipment of your new instrument:



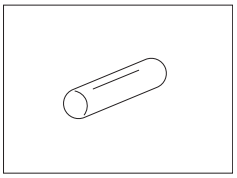
Sodium Analyzer



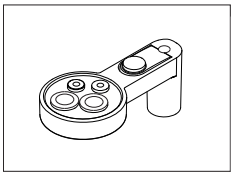
EasyStir



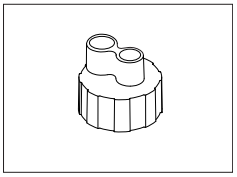
Burette 10 mL



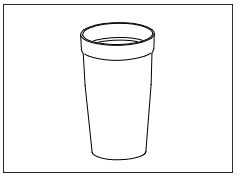
Magnetic stirrer bar



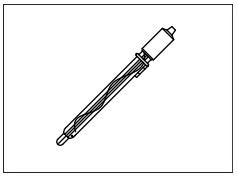
Analyzer head Na



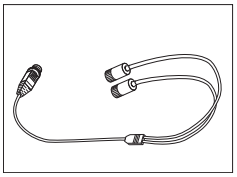
Bottle head incl. flat seal



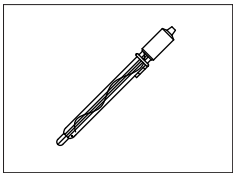
Beaker PP (100 mL, 10 pcs.)



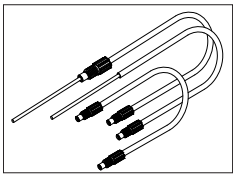
DX222-Na (Na-ISE sensor)



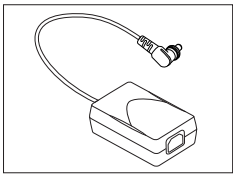
Cable reference sensor Na



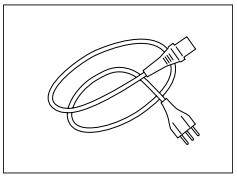
DX205-SC (Reference sensor)



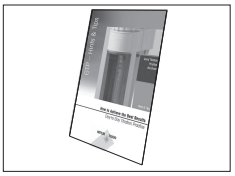
Tubing set instrument



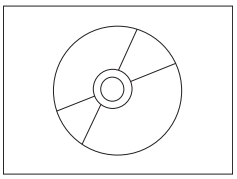
AC/DC power adapter



Country specific power cable



Application brochure



EasyDirect Titration Trial Version

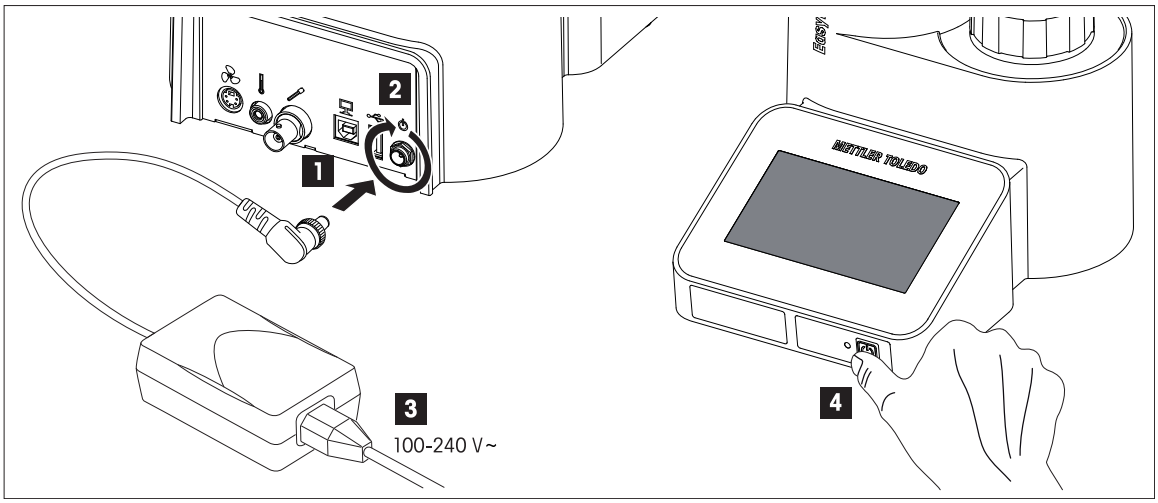
## 4.2 Installing power supply

The instrument is supplied with a universal AC adapter. The AC adapter is suitable for all line voltages in the range of 100 to 240 V, 50/60 Hz.

**Attention**

- Before installing, check cables for damage.
- Only 3-pin grounded electrical outlet and extension cables for connecting your instrument must be used.
- Ensure the cables are arranged so that they cannot be damaged or interfere with the operation.
- Take care that the AC adapter does not come into contact with liquids.
- The power plug must be accessible at all times.

**Procedure**




1 Connect the plug of the AC adapter with the DC socket of the instrument.

2 Secure the plug by firmly tightening the knurled nut.

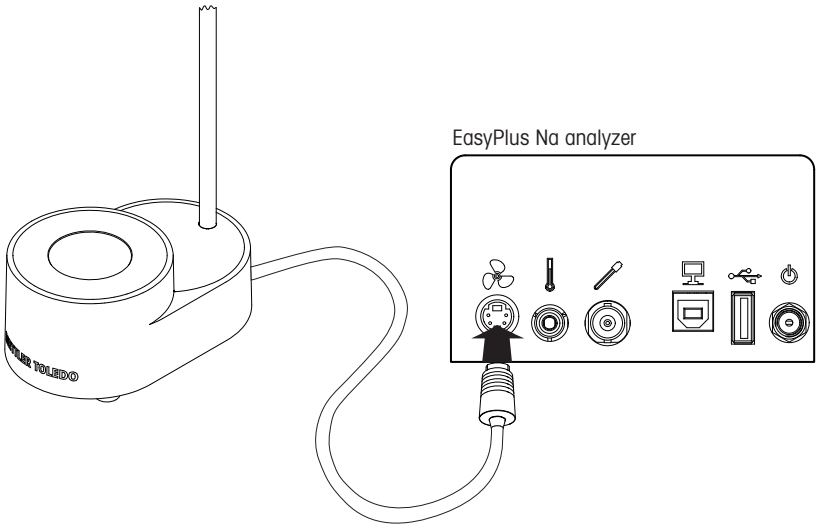
3 Connect the 3-pin grounded power cable to the AC adapter and then connect the power cable to the electrical outlet.

4 Push the **On/Off** button to switch on the instrument. The LED next to the button flashes as the system starts up and then remains permanently lit.

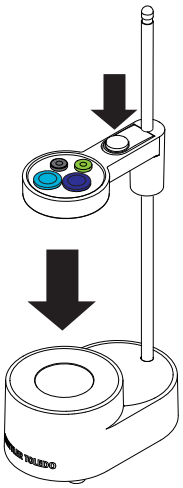
## 4.3 Installing EasyStir

This stirrer is powered by the instrument and will automatically be switched on/off according to the settings.

1 Connect EasyStir to the instrument stirrer socket, observing the arrow on the connector (arrow must be top-side).

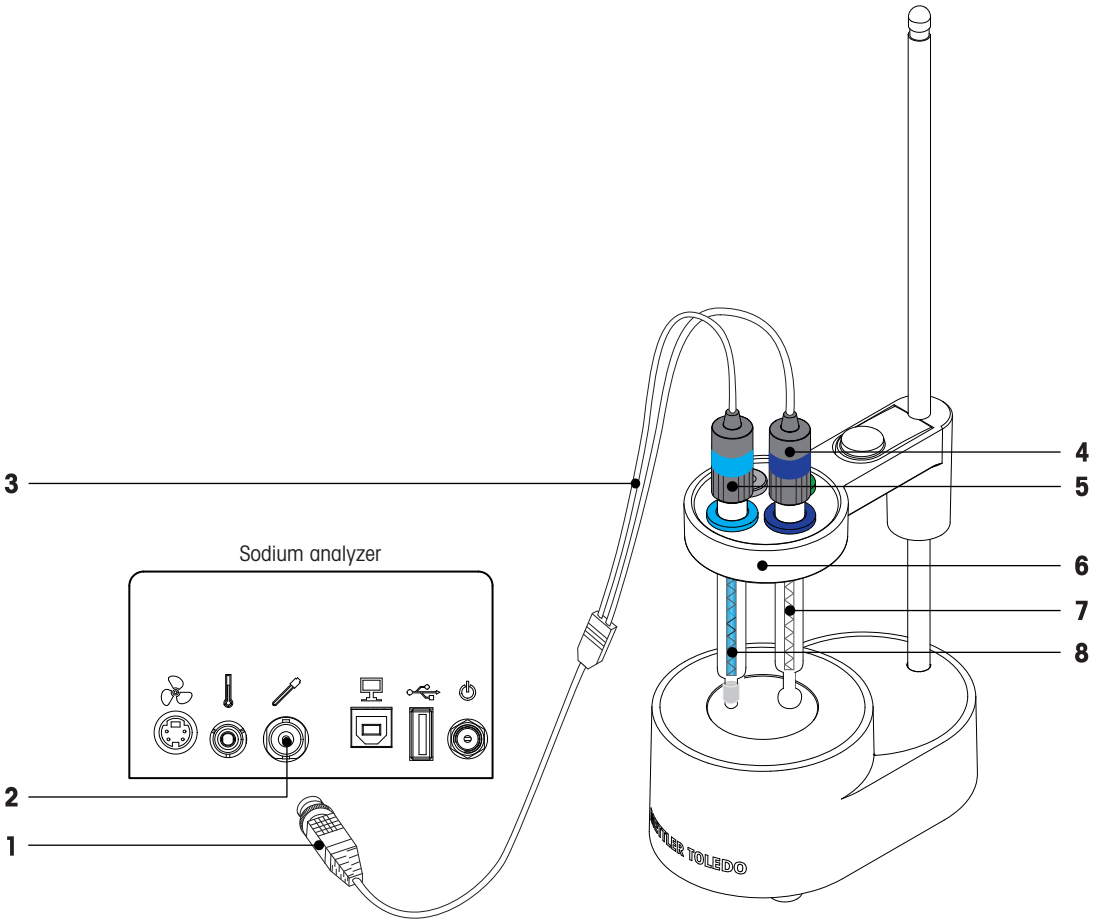



2 Push the blue release button to install the analyzer head on stirrer rod.



## 4.4 Installing sensors

The Easy Na works with two sensors, a reference sensor (DX205-SC) and a Na-ISE sensor (DX222-Na). Both sensors need to be installed and connected to the instrument as follows:




| | | | |
|---|---|---|---|
| **1** | BNC plug | **2** | Socket for adapter cable for sensors |
| **3** | Reference sensor | **4** | Plug for Na-ISE sensor (dark blue-colored) |
| **5** | Plug for Reference sensor (cyan-colored) | **6** | Analyzer head Na |
| **7** | DX222-Na (Na-ISE sensor) | **8** | DX205-SC (Reference sensor) |

1 Insert Reference sensor into the cyan-colored rubber ring of the Analyzer head Na.

2 Insert Na-ISE sensor into the dark blue-colored rubber ring of the Analyzer head Na.

3 Connect the cyan-colored plug to the Reference sensor.

4 Secure the plug by firmly tightening the knurled nut.

5 Connect the dark blue-colored plug to the Na-ISE sensor.

6 Secure the plug by firmly tightening the knurled nut.

7 Connect the BNC plug to the socket for adapter cable for sensors, observing the nuts on the BNC plug.

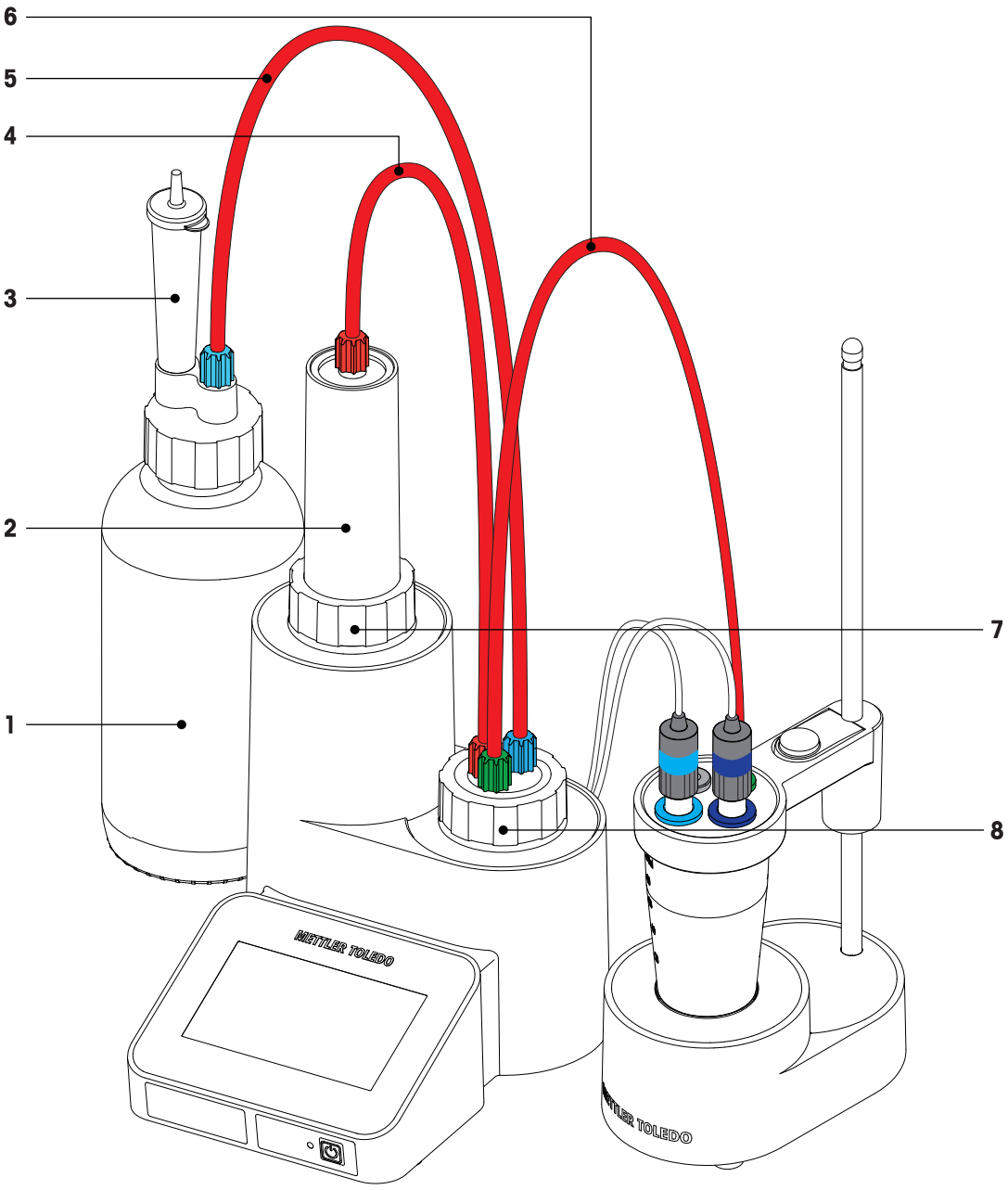
8 Secure the BNC plug by turning the knurled nut a 1/4 turn.

## 4.5 Installing tubes

**Note**

**The tube connectors of the tubes are marked in different colors (green, red, cyan).**

An incorrect connection may lead to a malfunction!




| | | | |
|---|---|---|---|
| **1** | Standard bottle | **2** | Burette |
| **3** | Drying tube | **4** | Tube burette-valve |
| **5** | Suction tube for standard | **6** | Tube titration |
| **7** | Cap nut burette | **8** | Cap nut valve |

1 Screw the cap nut valve on tightly.

2 Screw the cap nut burette on tightly.

3 Connect Suction tube for standard to standard bottle and the cyan-colored valve inlet.

4 Connect burette-valve tube to burette and the red-colored valve inlet.

5 Connect titration tube to the green-colored valve outlet and the green-colored rubber ring on the Analyzer head Na.

6 Screw on all tube connectors tightly.

7 Ensure that all tubes are firmly connected.

## 4.6 Installing printer & balance

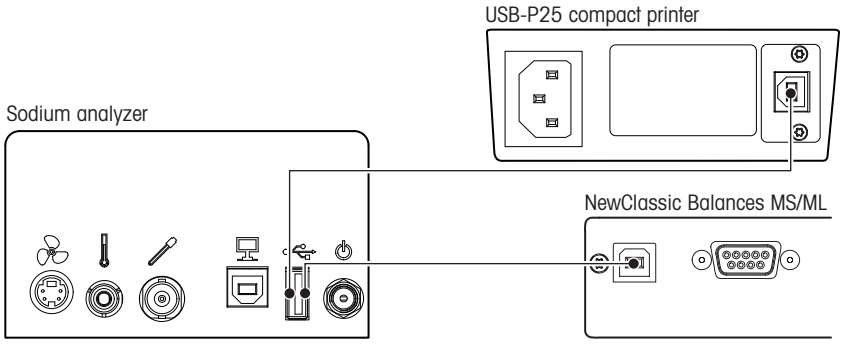
Printers and balances can be connected to the USB interface found on the back of the instrument. Printers and balances are recognized automatically when connected. They can be used immediately by the instrument without any special settings.

**Supported devices**

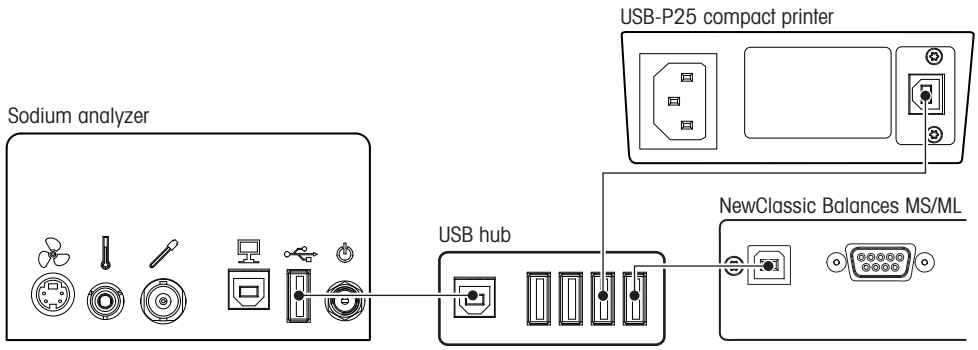
| Manufacturer | Type | Model |
|---|---|---|
| METTLER TOLEDO | Balance | MS/ML (NewClassic) |
| METTLER TOLEDO | Printer | USB-P25 |

A standard USB-hub can be used if more than one device is to be connected to the USB port of the instrument.

**Connecting printer or balance:**




**Connecting printer and balance, using a hub:**



# 5 Setup & Tools

**Setup & Tools**

Select this menu item on the home screen to make changes to the system settings and to perform diagnostics.

## 5.1 Settings

Navigation: **Setup & Tools** > **Settings**

On tab **Settings** you can define general settings such as date-/time format, temperature unit or blank value.
On tab **System information** you will find general information about the instrument`s hardware and software.

## 5.2 Language


Navigation: **Setup & Tools** > **Language**

Defines the user interface language.

## 5.3 Diagnostics

Navigation: **Setup & Tools** > **Diagnostics**

Performs diagnostics for the peripheral devices and the printer.

**Available functions**

**Peripheral check**

A connection test of the available peripheral devices is performed.

**Printer check**

A test printout is generated on the connected printer.

## 5.4 Toolbox

Navigation: **Setup & Tools** > **Toolbox**

This screen contains different tools for maintaining the firmware, adjusting the screen or performing a factory reset.

**Available functions**

**Factory reset**

This function will reset all data and settings of the instrument.

**FW Update**

This function will update the firmware of the instrument. The following firmware can be updated:

- **FW instrument**: This is the application firmware.
- **FW mainboard**: This is the firmware of the micro-controller.

**Adjust screen**

This function will start the touch screen adjustment.

Adjustment of the touch screen is necessary when your touch screen responds inaccurately e.g. after a firmware update has been performed.

# 6 Functional Apps on homescreen

## 6.1 Na Measure

**Na Measure**

Select this menu item to define analysis parameters and to start a measurement

**Parameters**

Only the most important parameters are listed here. To obtain additional information on all other parameters, you may refer to the online help by clicking [?] on the instrument.

| Parameters | Description | Values |
|---|---|---|
| **Potential diff. dE** | Defines the targeted potential difference for each standard addition. Standard will be added until the potential difference is reached. Please make sure that (dE) x (**No. of additions**) is between 30 and 60 mV. Please refer the application notes to obtain a suggestion on the optimum values for your sample. | **1.0 - 60.0** |
| **Analysis type** | Selects the type of the analysis. For most applications **Direct** can be used. If your sample preparation contaminates your solution with $Na^+$ (e.g. acid hydrolysis), determine the blank value first and use **Blank compensated** afterwards to obtain more accurate results. | **Direct** \| **Blank determination** \| **Blank compensated** |
| **Control** | Definition of internally fixed parameters for the value acquisition. | **Normal** \| **Fast** \| **Cautious** \| **User defined** |
| **Sampling** | Select this option to choose the way the sample is prepared for the analysis.<br>**Direct**<br>Preparation of the sample directly in the beaker. Note: For solid samples, the sample volume is not taken into account (V_solvent = V_water + V_ISA). This sample preparation type is therefore recommended for solid samples which do not dissolve in the solvent. Liquid samples are assumed to be soluble in the solvent and, therefore, the sample volume is taken into account (V_solvent = V_water + V_ISA + V_sample).<br>**Aliquot incl. ISA**<br>Select "Aliquot incl. ISA" if you create a dilution solution with your sample, water and ISA. Take a known amount (aliquot) out of your dilution solution and put it in the analysis beaker.<br>**Aliquot excl. ISA**<br>Select "Aliquot excl. ISA" if you create a dilution solution with your sample and water (without ISA!). Take a known amount (aliquot) out of your dilution solution and put it in the analysis beaker. Then add the ISA directly to the beaker. | **Direct** \| **Aliquot incl. ISA** \| **Aliquot excl. ISA** |
| **Multiple determination** | This option will calculate the mean value and standard deviation (relative and absolute) in the samples. Maximum number of samples: 5. | **Yes** \| **No** |
| **Report** | **None**<br>No Report is printed at the end of the analysis.<br>**Short**<br>A summary is printed at the end of the analysis.<br>**Long**<br>A full report is printed at the end of the analysis. | **None** \| **Short** \| **Long** |

## 6.2 Burette

**Burette**

Select this menu item to rinse the burette or to dispense a defined quantity of standard. Change the burette size according the actual installed burette.

**Properties**

| Parameters | Description | Values |
|---|---|---|
| **Burette size** | Select the size of burette you are using. The standard size of the burette is 10 mL. The adaption of a 20 ml burette is also possible. | **10 mL** \| **20 mL** |

**Actions**

| Parameters | Description | Values |
|---|---|---|
| **Rinse** | Define the rinse cycles of the burette. A maximum of 3 rinse cycles is normally sufficient. | **1 - 20** |
| **Dispense** | Define the dispensing volume of the burette. | **0.1 - 100.0** |

## 6.3 Stirrer

**Stirrer**

Select this menu item to switch the stirrer on or off at a definable stirring speed.

| Parameters | Description | Values |
|---|---|---|
| **Stir speed** | Select the required stirrer speed. | **Low** \| **Medium** \| **High** \| **Maximum** |

## 6.4 Standard

**Standard**

Select this menu item to define the standard properties.
It is possible to define 3 standards **(S1, S2, S3)**.

**Parameters**

| Parameters | Description | Values |
|---|---|---|
| **Standard type** | The normally used standard is $Na^+$ (Sodium). Defining a user-specific standard name is also possible. | **Sodium** \| **User defined** |
| **Actual concentration** | Enter the **Actual concentration** of $Na^+$ of the used standard. | **0.01 - 400'000.00** |

## 6.5 Sensor

**Sensor**

Select this menu item to view the sensor properties and to start a sensor conditioning.
In the two tabs **Properties\|Conditioning** you will find the sensor properties and the parameters to execute a sensor conditioning. If no temperature sensor is defined for the conditioning, the system settings are taken into account for temperature compensation (Global temperature).

**Properties**

| Parameters | Description | Values |
|---|---|---|
| **Sensor** | Name of the measuring half-cell. The Mettler Toledo DX222-Na is part of delivery. | - |
| **Reference sensor** | Name of the reference electrode. The Mettler Toledo DX205-SC is part of delivery. | - |

| | | |
|---|---|---|
| **Temperature sensor** | Define whether you are working with a temperature sensor or not. Mettler Toledo TEMPERATURE PROBE NTC 30K is optional available.<br>Please note that temperature sensor must be activated if the temperature sensor is connected. | **On** \| **Off** |
| **Cond. Date/Time** | Shows the date and time of the last sensor conditioning. | - |
| **Cond. result** | Shows the status of the last sensor conditioning. | - |

**Sensor conditioning**

We recommend that daily sensor conditioning is performed before starting measurements.

**See also**

- Performing sensor conditioning (page 24)

# 7 Operation of the instrument

**Note**

**Risk of spilling harmful chemicals!**

While working on the instrument wear safety goggles, a lab coat and suitable gloves at any time!

**Attention:**
Before starting any measurements with the instrument please ensure the startup procedure has been completed. Read the following sections carefully for a correct and faultless analysis.

## 7.1 Used standards

**Recommended ISA solution 1 M**

- Ideally, prepare the solutions in a hood or a well-ventilated room.
- ISA (Ionic strength adjuster) solution is added to the preconditioning solution, to the standard sodium solution as well as to the sample solution.
- The final ISA-concentration in the analysis beaker should be 0.5 M ISA.

1 Prepare a 1'000 mL volumetric flask filled with approximately 140 mL deion. $H_2O$ ($dH_2O$).

2 Add 724 mL 0.5 M HCl and agitate to mix.

3 Add 140.15 mL concentrated diisopropylamine (DIPA, 99.5 %).

4 Fill $dH_2O$ up to the 1'000 mL volumetric mark. The DIPA will dissolve slowly under intensive agitation.

**Note**

- The ratio of standard or sample to ISA should be 1:1.

**Standard sodium solution with 0.5 M ISA**

The standard solution 2'000 ppm Na Std. with 0.5 mol/L DIPA is prepared as follows:

1 Use 5.084000 g NaCl for 1 L of solution.

2 Dissolve the solution in a volumetric flask using 400 mL $dH_2O$ + 500 mL 1 M ISA (see above).

3 Fill with $dH_2O$ up to the volumetric mark 1000 mL.

The standard solution 5'000 ppm Na Std within 0.5 mol/L DIPA is prepared as follows:

1 Use 12.71000 g NaCl for 1 L solution.

2 Dissolve the solution in a volumetric flask using 400 mL deion $H_2O$ + 500 mL 1 M ISA (see above).

3 Fill with $dH_2O$ up to the volumetric mark 1000 mL.

**Note**

- The ratio of standard or sample to ISA should be 1:1.

**Electrolyte for the reference sensor**

– Use 0.5 M ISA solution.

## 7.2 Sample preparation

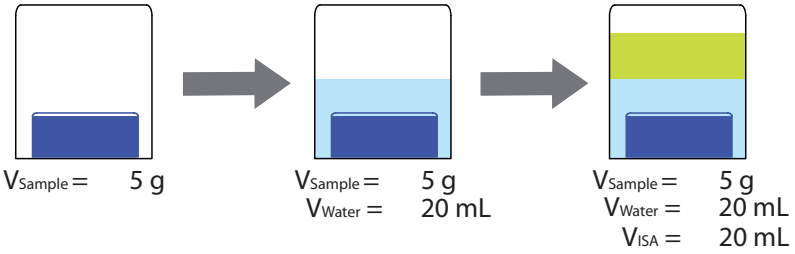
You can prepare samples in different ways. The used values in the descriptions are only for example.

**Analysis type Direct:**

1 Add 5 g (solid sample) or 10 mL (liquid sample) into the analysis beaker.

2 Add 20 mL of water.

3 Add 20 mL of 1 M ISA.

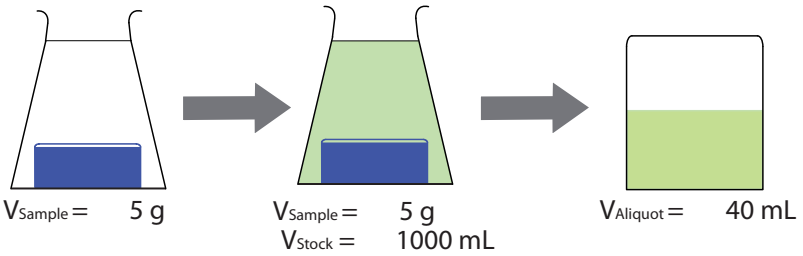



**Analysis type Aliquot incl. ISA:**

1 Add 5 g (solid sample) or 10 mL (liquid sample) into a volumetric flask.

2 Fill up to the volumetric mark e.g. 1000 mL with 0.5 M ISA.

3 Take out 40 mL aliquot and fill in the analysis beaker.



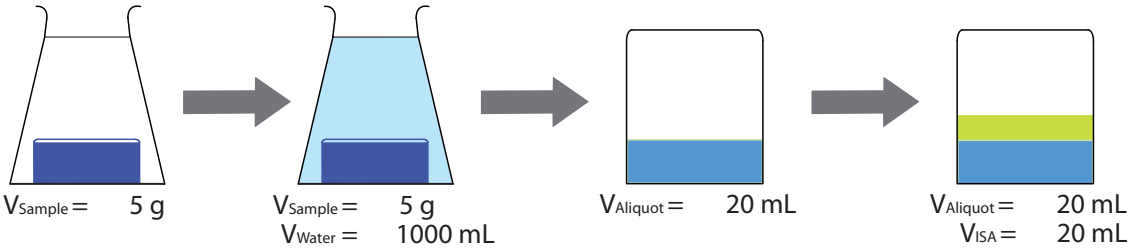

**Analysis type Aliquot excl. ISA:**

1 Add 5 g (solid sample) or 10 mL (liquid sample) into a 1000 mL volumetric vessle.

2 Fill up with water exactly to the volumetric mark of 1000 mL.

3 Take out 20 mL aliquot and fill in the analysis beaker.

4 Add 20 mL of 1 M ISA.




**Note**

- Detailed information about specific applications can be found in our application brochure which is part of the delivery.

## 7.3 Performing sensor conditioning

**Note**

**Damage to the Sensors!**

The Na-ISE sensor and the reference sensor will be damaged if they are allowed to dry out.

Make sure that both sensors are kept in liquid at all times.

For detailed information see the sensor manuals.

Before starting your daily measurements, the sensors have to be conditioned. The sensor conditioning is a pre-conditioning with an internal test to check that the sensor values are stable. The instrument measures the voltage and verifies that the value is stable over a minimum time of 60 s (The maximum deviation of the measured values is 0.1 mV). Sensor conditioning will stop automatically when the sensors are ready to use. If the sensor values are not stable, sensor conditioning will stop automatically after 30 min with the result = failed.

1 Remove the Reference sensor from the Analyzer head Na.

2 Check by hand that the diaphragm moves smoothly. Rinse diaphragm with distilled water.

3 Open the rubber cap of the filling aperture and fill up the Reference sensor with electrolyte solution (0.5 M DIPA-HCL-ISA).

⇨ The rubber cap must be open during sensor conditioning and measurements!

4 Put the Reference sensor back into the Analyzer head Na.

5 Put the Reference sensor into a beaker with $Na^+$ solution (including ISA).

⇨ Make sure the diaphragm is fully immersed into the conditioning solution.

6 Make sure the Na-ISE sensor is immersed into the conditioning solution.

7 Tap [▶] to start sensor conditioning.

⇨ Sensor conditioning will normally take about max. 5 min and stops automatically.

⇨ Tap [■] at any time to stop sensor conditioning.

⇨ A timeout will be set automatically after 30 min (result = failed).

⇨ **Result** = **Passed**, the sensors are ready for use (Threshold = 0.1 mV).

⇨ **Result** = **Failed**, please check the sleeve diaphragm and the electrolyte level of the reference sensor. Make sure no air bubbles are inside the electrolyte of the reference sensor. Check the cable connections and repeat sensor conditioning.

**Note**

- We recommend that a daily sensor conditioning is performed before starting measurements.

## 7.4 Performing an analysis

**Attention**

- Before performing an analysis, ensure that all tube connections are firmly tightened.
- Make sure that the analysis tube is directed into an analysis beaker that is a multiple of the volume of the burette.
- Rinse the burette and tubes with the function **Burette**. Perform this function each day before the first analysis is run.

**Note**

- Rinse the burette until no more air bubbles are present in the tube connections. Air bubbles may effect the measurement results!

### 7.4.1 Single determination

▸ The sample is prepared and added to the beaker.

▸ The magnetic stirrer bar is placed in the beaker.

- ▸ All parameters for the method are checked and defined. **Multiple determination** = **No**.

1 Place the beaker on the center of the stirrer unit.

⇨ Verify that the magnetic stirrer bar is turning correctly.

2 On the home screen, tap and hold [ ] to start the analysis.

⇨ You will be prompted if any parameters are required by the analysis.

3 Follow the instructions on the screen. With the progress of the measurement, the displayed curve is automatically rescaled so that the entire measurement is visible.

⇨ The result screen is displayed.

**Note**

- Tap [ ] to stop the measurement for early data transfer. The actual results will be shown in the menu **Results**
- Tap [ ] to stop the measurement without storing data.
- If an error occurs, measurement will stop immediately.

### 7.4.2 Multiple determination

- ▸ The sample is prepared and added to the beaker.
- ▸ The magnetic stirrer bar is placed in the beakers.
- ▸ All parameters for the method are checked and defined. **Multiple determination** = **Yes**.

1 Place the beaker on the center of the stirrer unit.

⇨ Verify that the magnetic stirrer bar is turning correctly.

2 On the home screen, tap and hold [ ] to start the analysis.

⇨ You will be prompted if any parameters are required by the analysis.

3 Follow the instructions on the screen. With the progress of the measurement, the displayed curve is automatically rescaled so that the entire measurement is visible.

⇨ When the first analysis is finished, the result screen is displayed with the two options **Last sample**|**Overview**.

4 Prepare the next sample and place the beaker on the stirrer.

5 Tap [ ] to start the next analysis and follow the instructions on the screen.

⇨ Repeat these steps for a maximum of 5 samples.

6 To end the series before the maximum of 5 samples is reached, tap [ ]

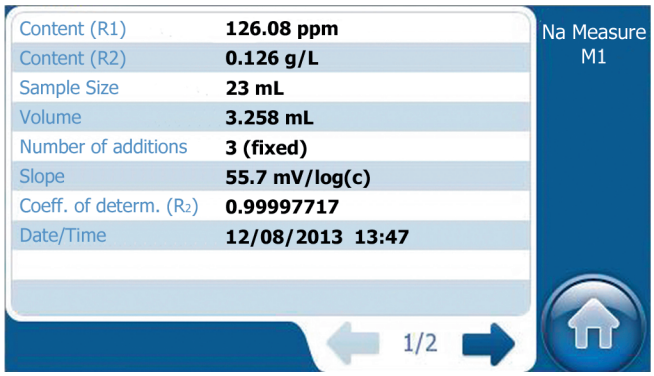
⇨ The result screen is displayed with the options **Last sample**|**Overview**. The results of the last sample and the overview including the statistical data for the sample series are displayed.

**Note**

- Tap [ ] to stop the measurement for early data transfer. The current results will be shown in the menu **Results**
- Tap [ ] to stop the measurement without storing data. Accumulated data will automatically be excluded from the statistics.
- If an error occurs, measurement will stop immediately and accumulated data will also automatically be excluded from the statistics.

## 7.5 Results

### Results of a single determination




All available results for the sample are shown.

| | |
|---|---|
| **Content(R1)** | Entered value in **Calculation 1** |
| **Content(R2)** | Entered value in **Calculation 2** |
| **Sample size** | Entered value in **Sample size** (mL)<br>Only for **Sampling** = **Aliquot incl. ISA/Aliquot excl. ISA**:<br>The sample size is the amount of sample in the dilution volume. |
| **Sample size in aliquot** | Only for **Sampling** = **Aliquot incl. ISA/Aliquot excl. ISA**:<br>The sample size aliquot is the amount of the sample which is currently in the measuring beaker. |
| **Volume** | Total volume of the standard added to the sample. |
| **Number of additions** | Number of additions performed.<br>**Fixed**<br>Terminated according to additions in method<br>**Manual**<br>Manually terminated additions [✔] |
| **Slope** | When measuring sodium ions, the slope factor at 298 K (25°C) has a value of 59.16 mV. This is termed the Ideal Slope Factor and means that for each tenfold change in Sodium concentration, an ideal measuring system will sense a mV change of 59.16. The measurement of slope factor gives an indication of the performance of the sensor. |
| **Coeff. of determ. ($R^2$)** | $R^2$ denotes the strength of the relationship between the concentration (logarithmic) and the mV signal and indicates how well data points fit the linear regression. $R^2$ represents the percent of the data that is the closest to the line of best fit. For example, if $R^2 = 0.950$, this means that 95% of the total variation in y can be explained by the linear relationship between x and y. |
| **Date/Time** | Date and time of the displayed analysis-results. |

**Results of a multiple determination**


The results of the individual samples are displayed as well as the statistics (Average, absolute and relative standard deviation). By tapping on the individual sample, all available results for the respective sample are shown. If two calculations are defined in the method type, tap on the bottom bar (1) to get all statistics listed.

Tap this icon to exclude a result from the statistics.

Tap this icon to include a result, which was previously excluded.

Results of stopped or erroneous analyses are excluded automatically.

# 8 Maintenance

**Note**

**Risk of spilling harmful chemicals!**

While cleaning the instrument, wear safety goggles, a lab coat and suitable gloves at any time!

**Note**

**Before maintaining any parts of the instrument, the following safety precautions must be observed:**

Rinse and empty the burette, valve and tubes using $dH_2O$.

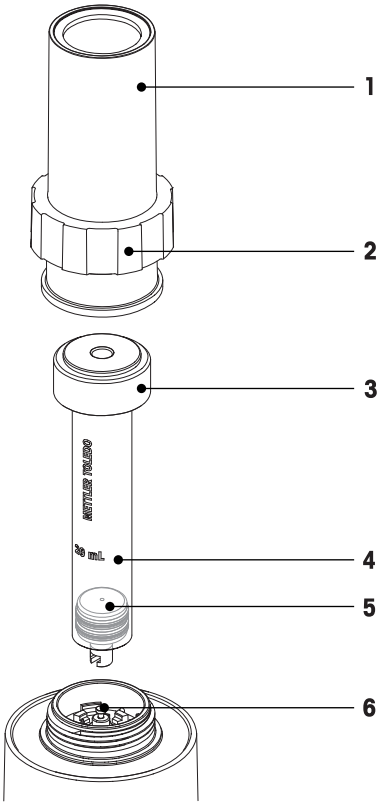
Switch off the instrument and unplug the AC adapter from the instrument.

## 8.1 Maintaining and changing the burette

**Note**

**Damage to the O-rings!**

Do not pull the piston out of the glass cylinder, reinserting the piston will damage the O-rings!




**1** Burette cover
**2** Cap nut
**3** Burette cap
**4** Glass cylinder
**5** Piston
**6** Piston rod

**Disassembling the burette cylinder**

- The burette, valve and tubes are rinsed and emptied.
- The AC adapter is unplugged from the instrument.

1 Unscrew the connection tube on top of the burette cap and clean the connections with a tissue.

2 Unscrew the blue cap nut.

3 Lift off the burette cover including cap nut.

4 Carefully lift the glass cylinder, until you are able to slide off the burette from the piston rod.

⇨ The burette can now be exchanged or reused.

**Assembling the burette cylinder**

– Reassemble the burette in reverse order.

## 8.2 Cleaning the burette parts

Depending on the frequency of usage, you should clean the burette cylinder, piston, valve and tubing relatively often. It is important to use high quality ethanol for the cleaning procedure.

1 Depending on the contamination caused by the standard, rinse cylinder, valve and tubes with deionized $H_2O$ then with ethanol.

2 Dry the parts with oil-free compressed air.

**Note**

- Never place O-rings in organic solvents.
- Never attempt to remove any crystals in the cylinder by scratching with a hard object. Pipe cleaners or Q tips™ are more suitable.
- Never put the parts in a drying oven with a temperature higher than 40 °C.
- Replace the burette if the piston leaks or is badly scored at the edge. Pay special attention to crystal formation between the seals of the piston if you work with certain solutions.

## 8.3 Maintaining the valve

**Cycle counter**

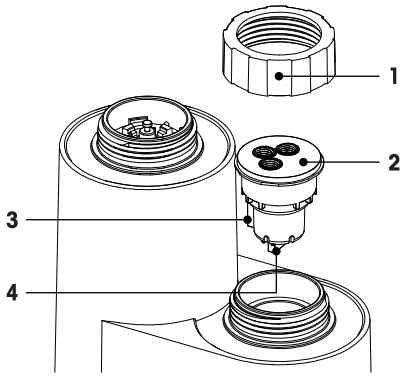
The instrument permanently counts the cycles of the valve. When the life time of 5000 cycles is reached, a message box will open. At this time it is recommended that the valve is exchanged. It is possible to reset the cycle counter manually by using the function **Reset cycles valve** in the menu **Setup & Tools**. Use this function only if the valve has been replaced before reaching 5000 cycles.

– Tap [**Reset cycles**] to reset the valve cycles to 0 (when you have exchanged the valve).
- or -
Tap [**Continue**] to continue working with the valve.

The counter can be viewed at any time in:

**Setup & Tools** > **Settings** > **No. cycles valve**.

**Disassembling the valve**




**1** Cap nut
**2** Valve
**3** Guide
**4** Driver bar

▸ The burette, valve and tubes are rinsed and emptied.

▸ The AC adapter is unplugged from the instrument.

1 Unscrew the tube connections on top of the valve and clean the tube connections with a tissue.
**Note** Ensure that all tube connections are unscrewed before losing the cap nut!

2 Unscrew the cap nut, holding the valve.

3 Remove the valve.

⇨ The valve can now be exchanged or reused.

**Assembling the valve**

1 Insert the valve, observing the correct positions of the driver bar and the guide.

2 Fasten the cap nut.

3 Clean the tube connections with a tissue.

4 Screw the tube connections to the valve.

## 8.4 Transporting the instrument

Note the following instructions when transporting the instrument to a new location.

- The burette, valve and tubes are rinsed and emptied.
- The AC adapter is unplugged from the instrument.

1 Remove all tube connections from burette and valve.

2 Remove all cable connections from the instrument.

3 Remove the burette as described above.

⇨ The instrument is ready to be transported.

**Procedure if the burette and valve cannot be emptied**

**Note**

**Risk of spilling harmful chemicals!**

Do not remove any tubes attached to the burette or valve. Harmful chemicals may leak during transport.

1 Remove all cable connections from the instrument.

2 Carefully remove the burette as described above, without removing the tube.

3 Carefully remove the valve as described above, without removing any tubes.

4 Place burette and valve in a suitable container for storage or further handling.

⇨ The instrument is ready to be transported.

## 8.5 Cleaning the housing

**Note**

**Damage to the instrument!**

Ensure that no liquid enters the interior of the instrument.

Wipe off any spills immediately.

The housing is made of Polypropylene (PP GF30). This material is sensitive to certain acids and organic solvents, such as toluene, xylene and methyl ethyl ketone (MEK).

– Clean the housing of the instrument using a cloth dampened with water and a mild detergent.

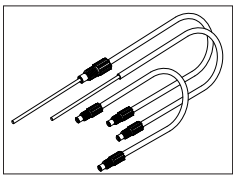
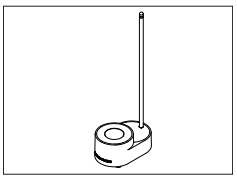
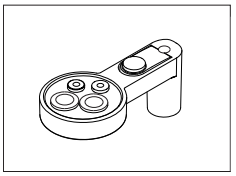
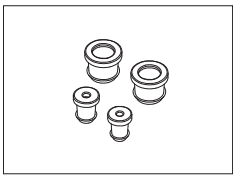
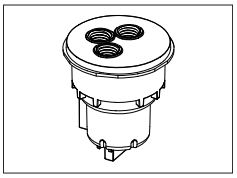
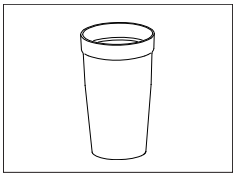
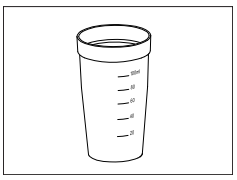
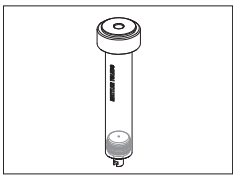
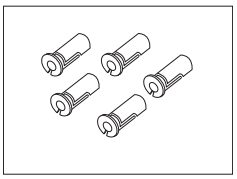
## 8.6 Disposal

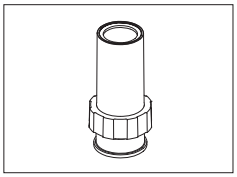
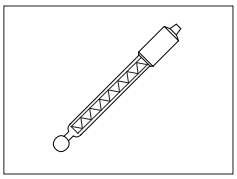
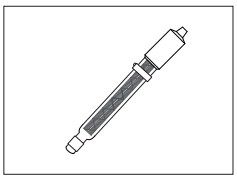
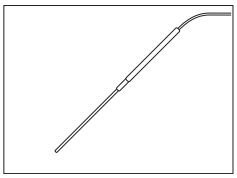
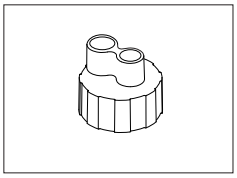
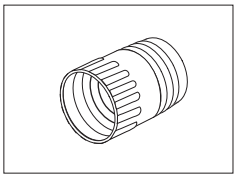
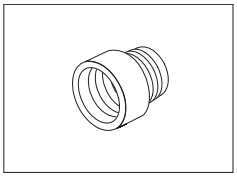
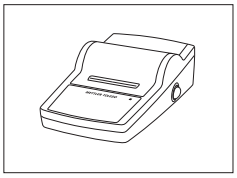
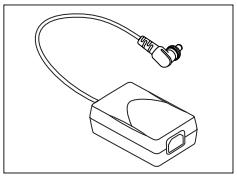
In conformance with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

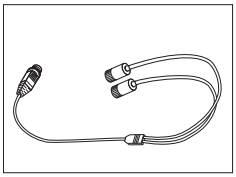
Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to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

Thank you for your contribution to environmental protection.

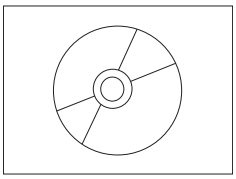
# 9 Accessories

| | Description | Order number |
|---|---|---|
|  | Tubing set instrument | **30065464** |
|  | EasyStir GT | **30065467** |
|  | Analyzer Head Na | **30079612** |
|  | Insert set Analyzer head Na | **30079618** |
|  | Valve | **30042860** |
|  | Glass titration vessels, 100 mL<br>(set of 20 pcs.) | **101446** |
|  | Titration vessels polypropylene, 80 mL<br>(set of 120 pcs.) | **51109388** |
|  | Burette 10 mL<br>Burette 20 mL | **30043900**<br>**30043901** |
|  | Siphon tips (5 pcs.) | **23240** |

| | | |
|---|---|---|
|  | Burette cover set | **30057633** |
|  | DX222-Na | **30079616** |
|  | DX205-SC | **30066675** |
|  | Temperature probe NTC 30K | **51300164** |
|  | Bottle Head incl. flat seal | **30060023** |
|  | Bottle adapter<br>Merck, Germany<br>Fisher, USA | <br>**23774**<br>**23787** |
|  | Bottle adaptor China (D34) incl. flat seal<br>Bottle adaptor China (D28.5) incl. flat seal<br>Bottle adaptor India incl. flat seal | **30079456**<br>**30060026**<br>**30060024** |
|  | USB-P25 compact printer (including USB-cable) | **USB-P25** |
|  | AC/DC power adapter | **51105795** |



Cable Reference sensor Na **30079614**



EasyDirect Titration Trial Version **30096988**

# 10 Technical Data

**Sodium Analyzer**

| | | |
|---|---|---|
| **Interfaces** | USB A | USB full / low speed |
| | USB B | USB full / low speed |
| **Stirrer output** | Voltage | 0 - 9 V DC |
| | Socket | 4-pin Mini-DIN |
| **Sensor mV Input** | Measuring range | ± 2000 mV |
| | Socket | BNC |
| **Temperature Input** | Sensor type | NTC 30 KΩ at 25 °C |
| | Measuring range | 0 - 100 °C |
| | Socket | Cinch (RCA) |
| **Touch screen** | Display | 4.3 inch color, 480 x 272 pixel |
| | Input Technology | Full-coverage touch screen |
| **Ambient conditions** | Ambient temperature | 5 °C - 40 °C |
| | Relative humidity | Max 80% (non condensing) at 31 °C, linearly descending to 50% at 40 °C |
| | Overvoltage category | Class II |
| | Pollution degree | 2 |
| | Range of application | For indoor use only |
| | Maximum operating altitude | Up to 2000 m |
| **Dimensions** | Width | 170 mm |
| | Depth | 220 mm |
| | Height | 350 mm |
| **Weight** | Instrument | 1850 g |
| | Stirrer | 800 g |
| **Power rating instrument** | Input voltage | 24 V ⎓ |
| | Input current | 1.25 A |
| **Power rating AC adapter** | Line voltage | 100 - 240 V ~ ±10 % |
| | Input frequency | 50/60 Hz |
| | Input current | 0.8 A |
| | Output voltage | 24 V ⎓ |
| | Output current | 1.25 A |
| **Materials** | Housing | PP GF30 |
| | Metal parts | Stainless steel |
| | Touch screen cover | Polyester |

**EasyStir**

| | | |
|---|---|---|
| **Stirrer motor** | Motor type | DC |
| | Voltage | 0 - 9 V DC |
| | Cable connection | 4-pin Mini-DIN |
| **Materials** | Housing | PP GF30 |
| | Metal parts | Stainless steel |

# 11 Declaration of Conformity

## EC - DECLARATION OF CONFORMITY

EG-Konformitätserklärung

**KD-Nr.: 30065475** **Doku-Nr.: 20120038**

The undersigned, representing the following manufacturer
Die Unterzeichnenden vertreten das folgende Unternehmen

CE

**Mettler-Toledo AG (MTANA)**
**Sonnenbergstrasse 74**
**CH-8603 Schwerzenbach, Switzerland**

herewith declares that the product
hiermit deklarieren wir, dass das Produkt

**Titrator/Analyzer**
**EasyPlus Easy Pro (EasyPlus xxxxx - Series)**
**For additional types, see page type code**
**For optional equipment, see page accessories**

certified model: **--**
Modell für Eichprüfung

is in conformity with the provisions of the following EC directives (incl. all applicable amendments)
mit den folgenden EG-Richtlinien (Inkl. Änderungen) übereinstimmt

**2006/95/EC** Low voltage (LVD)
**2004/108/EC** Electromagnetic compatibility (EMC)

and that the standards have been applied.
und die Normen zur Anwendung gelangten.

Last two digits of the year in which the CE marking was affixed: **13**
Die letzten zwei Zahlen des Jahres der Erst-CE-kennzeichnung des Produkts mit dem CE Zeichen.

CH-8603 Schwerzenbach
11.01.2013

Chris Radloff
General Manager GBA Analytical

Christian Walter
Manager Strategic Business Unit Anachem

References of standards for this declaration of conformity, or parts thereof:
Harmonized standards of Europe and Switzerland:

Safety standards:

**IEC/EN61010-1:2010**

EMC standards (* Emission; ** Immunity):

**IEC61326-1:2005 / EN61326-1:2006 (class B *)**
**IEC61326-1:2005 / EN61326-1:2006 (Industrial requirements **)**

Metrological standards:

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Environmental standards:

**--, --, --**

Standards for Canada, USA and Australia:

**CAN/CSA-C22.2 No. 61010-1-12**
**UL Std. No. 61010-1 (3rd Edition)**

**FCC, Part 15, class A (Declaration) ***
**AS/NZS CISPR 11 *, AS/NZS 61000.4.3 ****

released: 05.06.2012 / CR Seite 1 von 3 printed: Jan. 2013

# EC - DECLARATION OF CONFORMITY

EG-Konformitätserklärung

**KD-Nr.: 30065475** **Doku-Nr.: 20120038**

**Type code**
Typenschlüssel

other types of same construction:
andere Typen/Modelle mit der gleichen Konstruktion:

| | |
|---|---|
| EasyPlus Easy Pro | Tested type |
| EasyPlus Easy pH, EasyPlus ET18 | Titrator General pH |
| EasyPlus Easy Cl, EasyPlus ET28 | Titrator General Cl |
| EasyPlus Easy Ox, EasyPlus ET38 | Titrator General Ox |
| EasyPlus Easy Pro, EasyPlus ET58 | Titrator General Pro |
| EasyPlus Easy KFV, EasyPlus ET08 | Titrator Karl Fischer |
| EasyPlus Easy Na | Analyzer Sodium |

EasyPlus ETy8 – Series is similar to EasyPlus Easy xxx Series, except software/initial language.

**Remarks**
Bemerkungen:

# EC - DECLARATION OF CONFORMITY

EG-Konformitätserklärung

**KD-Nr.: 30065475** **Doku-Nr.: 20120038**

**Accessories**
Zubehör und Optionen

CE

EasyPump
Sensors
Temperature sensor
External stirring unit

**To protect your product's future:**
METTLER TOLEDO Service assures the quality, measuring accuracy and preservation of value of this product for years to come.

Please request full details about our attractive terms of service.

**www.mt.com/sodiumanalyzer**
For more information

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Fax +41 (0)44 806 73 50
www.mt.com


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