Moisture Analyzer

Excellence HS153

METTLER TOLEDO

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1 Introduction

Thank you for purchasing a Halogen Moisture Analyzer from METTLER TOLEDO.

Your Moisture Analyzer is fast and reliable. It offers a high level of operating convenience and useful functions to facilitate determination of the moisture content of your samples.

Behind your instrument stands METTLER TOLEDO, a leading manufacturer of not only balances and scales for the lab and production, but also analytical measuring instruments. A customer service network covering the entire globe with well trained personnel is your service at all times, whether you are choosing accessories or require guidance for a specific application to ensure optimum utilization of your instrument.

Your Halogen Moisture Analyzer is used for determining the moisture content of almost any substance. The instrument works on the thermogravimetric principle. At the start of the measurement the Moisture Analyzer determines the weight of the sample, the sample is then quickly heated by the integral halogen heating module and the moisture vaporizes. During the drying process the instrument continually measures the weight of the sample and displays the reduction in moisture. Once drying has been completed, the moisture or solids content of your sample is displayed as the final result.

Of decisive importance in practice is the rate of heating and even heating of the surface of the sample. In comparison with conventional infrared heating or the drying oven method, for example, the halogen heating module of your instrument needs a shorter time to reach its maximum heating power. It also allows use of high temperatures, an additional factor in shortening the drying time. Uniform heating of the sample material ensures good repeatability of the drying results and makes it possible to use a smaller amount of sample.

The Moisture Analyzer conforms with all common standards and directives. It supports stipulations, work techniques and result records as demanded by all international quality assurance systems, e.g. GLP (Good Laboratory Practice), GMP (Good Manufacturing Practice). The instrument has a CE declaration of conformity and METTLER TOLEDO as the manufacturer has been awarded ISO 9001 and ISO 14001 certification. This provides you with the assurance that your capital investment is protected in the long term by a high product quality and a comprehensive service package (repairs, maintenance, servicing, adjustment service).

Finding More Information

▶ www.mt.com/hxhs

Software version

These operating instructions are based on the initially installed firmware (software) version V1.20.

1.1 Conventions and Symbols Used in these Operating Instructions

Key and button designations are indicated by a picture or text in square brackets (e.g. [**Save**])

These symbols indicate an instruction:

▶   prerequisites

1   steps

2 …

⇨   results

2 Safety Information

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) for important information about the product.
Note	(no symbol) for useful information about the product.

Warning Symbols

	General hazard		Electrical shock
	Hot surface		Inflammable or explosive substance
	Toxic substance		Acid / Corrosion

2.2 Product Specific Safety Notes

General Safety Information

Your instrument meets the state of the art technology and complies with all recognized safety rules, however, certain hazards may arise in extraneous cirmumstances. Do not open the housing of the instrument: It does not contain any parts which 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.

Always operate and use your instrument only in accordance with the instructions contained in this manual. The instructions for setting up your new instrument must be strictly observed.

If the instrument is not used according to these Operating Instructions, protection of the instrument may be impaired and METTLER TOLEDO assumes no liability.

Intended Use

Your Moisture Analyzer is used for determining the moisture in samples. Use the instrument exclusively for this purposes. Any other type of use and operation beyond the limits of technical specifications without written consent from Mettler-Toledo AG, is considered as not intended.

Moisture determination applications must be optimized and validated by the user according to local regulations. Application-specific data provided by METTLER TOLEDO is intended for guidance only.

 It is not permitted to use the instrument in explosive atmosphere of gases, steam, fog, dust and flammable dust (hazardous environments).

Staff Safety

The moisture Analyzer may be operated only by trained personnel who are familiar with the properties of the samples used and with the handling of the instrument.

In order to use the instrument, you must have read and understood the operating instructions. Keep the operating instructions for further reference.

Never make any modifications or constructional alterations to the instrument and use only original spare parts and optional equipment from METTLER TOLEDO.

Protective Clothing

It is advisable to wear protective clothing in the laboratory when working with the instrument.

A lab coat should be worn.

A 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

Your instrument is supplied with a 3-pin power cable with an equipment grounding conductor. Only extension cables which meet this relevant standards and also have an equipment grounding conductor may be used. Intentional disconnection of the equipment grounding conductor is prohibited.

CAUTION

The Halogen Moisture Analyzer works with heat!

a) Ensure sufficient free space around the instrument to avoid heat accumulation and overheating (approx. 1 m free space above the heating module).

b) The vent over the sample must never be covered, plugged, taped over or tampered with in any other way.

c) Do not place any combustible materials on, under or next to the instrument since the area around the heating module may be hot.

d) Exercise caution when removing the sample. The sample itself, the sample chamber, the draft shield and any sample vessels used may still be very hot.

e) During operation, you should never open the heating module itself as the ring-shaped heating reflector or its protective glass can reach 400 °C! If you have to open the heating module e.g. for maintenance, disconnect the instrument from the power supply and wait until the heating module has cooled down completely.

f) No modifications must be made within the heating module. It is particularly dangerous to bend any components or remove them or to make any other changes.

Certain samples require special care!

With certain types of samples, there is a possibility of danger to personnel or damage of property. Please note that the user always has the responsibility and liability for damage caused by use of any types of samples!

CAUTION

Fire or Explosion

- Flammable or explosive substances.
- Substances containing solvents.
- Substances which evolve flammable or explosive gases or vapors when heated.

a) In cases of doubt, perform a careful risk analysis.

b) Work at a drying temperature that is low enough to prevent the formation of flames or an explosion.

c) Wear protective goggles.

d) Work with small amounts of sample.

e) **Never leave the instrument unattended!**

WARNING

Substances which contain toxic or caustic components

Toxic gases produced during drying could cause irritations (eyes, Skin, breathing), illness or death.

– Such substances may be dried only in a fume cupboard.

CAUTION

Corrosion

Substances which evolve corrosive vapors when heated (e.g. acids).

– Work with small amounts of samples as the vapor can condense on cooler housing parts and cause corrosion.

3 Design and Function

In order to work with your Moisture Analyzer, you need to familiarize yourself with the instrument layout, drying unit, graphical user interface of the touch screen as well as the terminal.

3.1 Overview

3.1.1 Drying Unit

Description of the components and the external connectors on the back of the drying unit (Weighing unit with heating module).

1 Sample chamber
2 Sample pan handler
3 Sample pan holder
4 Leveling screw
5 Level indicator
6 Draft shield element
7 Contacts for temprature adjustment kit(optional)
8 Power contacts for halogen lamp
9 Temperatur sensor
10 Heating module (with termal overload protection)
11 Handles for opening the sample chamber
12 Inspection window and vent
13 Fan
14 Dust filter (optional)
15 Power line fuse
16 Power supply socket
17 Kensington slot for anti-theft purposes
18 Humidity sensor connection (n.a.)
19 Fastening for terminal stand (optional)
20 System connection (terminal cable)
21 Aux 2 connection (n.a.)
22 Aux 1 connection (n.a.)

Connectivity

System connection	Interface for the communication between terminal and drying unit.
Power supply socket	Power supply inlet socket for the country-specific power cable. The socket has a built in fuse compartment containing a replacement fuse.

3.1.2 Terminal

Description of the connections at the terminal (Input and output unit with interfaces).

1 WVGA color display (touch screen)
2 Foot
3 USB Host connection
4 Faceplate
5 USB Host connection
6 USB Device connection
7 RS232C connection
8 Ethernet RJ45 connection (n.a.)
9 System connection (terminal cable)
10 Memory Card slot for SD Card

Connectivity

System connection	Interface for the communication between terminal and drying unit.
RS232C connection	RS232C interface for connecting the instrument to a peripheral device (e.g. printer or a PC with a 9-pin male connector).
USB Host connection	USB interface for connecting a peripheral device to the instrument (e.g. memory stick up to 32 GB). Type A Socket.
USB Device connection	USB interface for connecting the instrument to a peripheral device with an USB host connection (e.g. PC). Type-B socket.
Memory Card slot	The memory card slot fits Secure Digital Memory Cards. SD and SDHC types as well as sizes up to 32 GB are supported. You can use it as an external storage device e.g. to store measured results. **Note** SDXC types are not supported.

3.1.3 Keys on Terminal
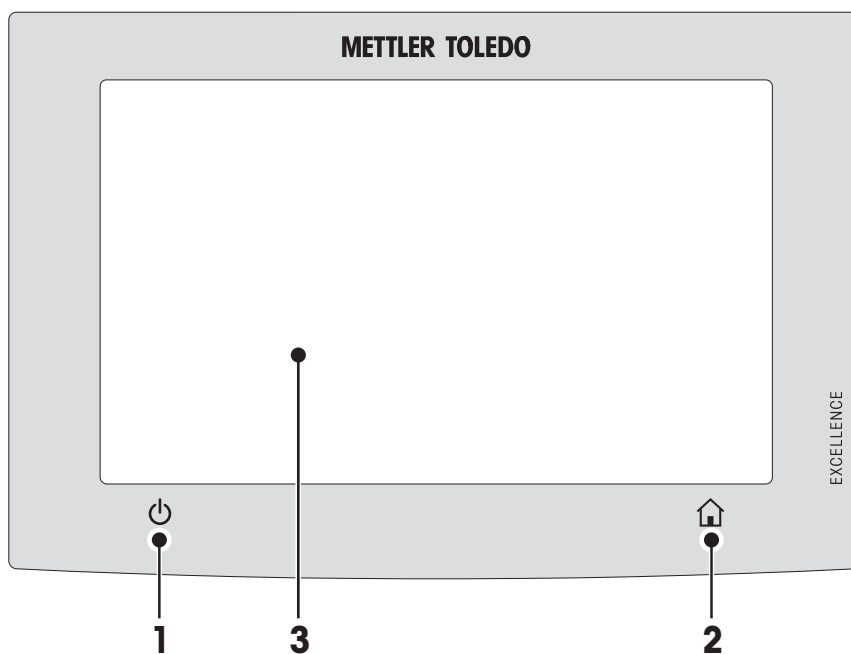
1	⏻	To switch on or off (standby operation) the instrument. **Note** Do not disconnect the instrument from the power supply except if you will not be using the instrument for an extended period.
2	⌂	**Home** To return from any menu level, or other window to the user home screen.
3		Touch screen area.

3.2 User Interface

The colored touch screen is a touch-sensitive WVGA monitor. The touch screen not only displays information, it also allows you to enter commands by touching certain areas on its surface: You can choose the information displayed on the screen, change terminal settings or perform certain operations on the instrument.

Only those elements which are available for the current dialog appear on the display.

Buttons on the Touch Screen

Buttons are software elements on the touch screen (Soft keys).

CAUTION

Do not touch the touch screen with pointed or sharp objects!

This may damage the touch screen.

3.2.1 User "Home" Screen

The user **Home** screen is the main screen and appears after startup or login of the instrument. All screens of the user interface c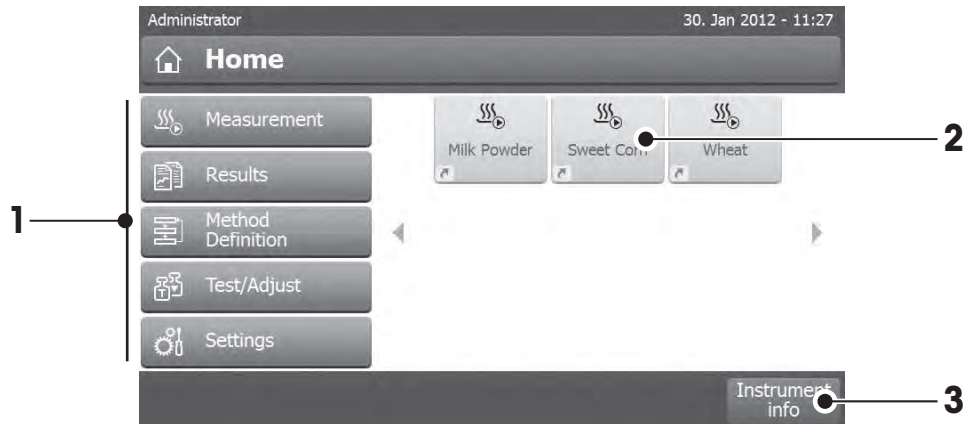an be accessed from the home screen. Returning to the **Home** screen is possible from all other screens of the user interface by pressing the [⌂] key or tapping the [**Home**] button.

	Name	Explanation
1	**Measurement**	**Start measurement**
		Prerequisite: Method is defined and all necessary settings are made.
		For further information **see** My First Measurement (page 29) and Measurement (page 76).
	Results	**Show results**
		Under this menu item, all measurement results can be displayed, printed or exported. For further information **see** Results (page 80).
	Method Definition	**Define, edit or delete a method**
		All actions using in a drying method, can be defined under this menu item. Description of the menu item **see** Method Definition (page 61).
	Test/Adjust	**Adjust or test the instrument**
		Under this menu item, the integrated balance and the heating module can be adjusted or tested. Description of the menu item **see** Test/Adjust (page 53).
	Settings	**Define general settings**
		All settings of the system can be defined, e.g, system settings, user management or user preferences. These settings are usually made during installation of the instrument. Description of the menu item **see** Settings (page 32)
2		**User shortcuts**
		User-specific shortcuts for frequently used methods. Shortcuts are saved in the user profile. How to create shortcuts **see** Using Shortcuts (page 78).
3	**Instrument info**	Shows general info about the instrument like type, serial number, software version.

3.2.2 Basic Elements on Touch Screen

The graphical user interface consists of the following basic elements.

Screen Areas and their Elements
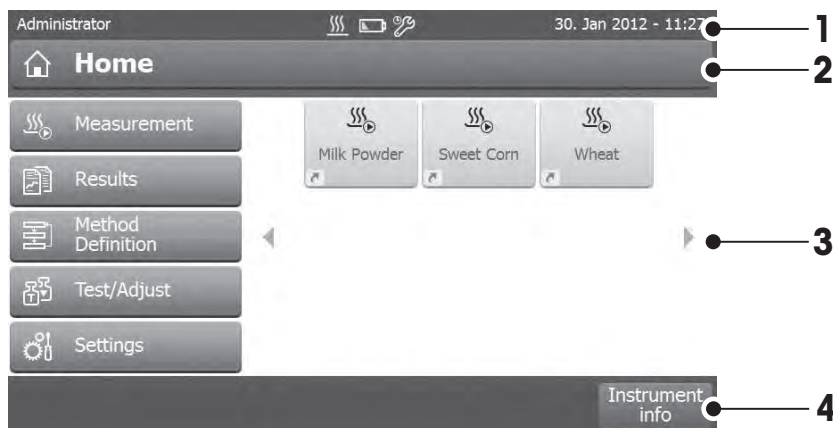
	Name	Explanation
1	Status Bar	The status bar contains the user name, status icons as well as date and time. **See** Status Message Icons (page 16).
2	Title Bar	The title bar contains elements for the user's orientation and information, as well as for special functions. **See** Title Bar Icons (page 16).
3	Content Area	The content area is the main working area of the menus and the applications, content depends on application or performed action. The content area also shows graphic illustrations such as the curve diagram of a data set (e.g. drying curve).
4	Action Bar	The action bar contains action buttons for triggering the actions which are required and available in the current dialog (e.g. **Back**, **->0/T<-**, **Print**, **Save**, **Delete**, **OK**). **See** Action Bar Buttons (page 16).

3.2.3 Icon and Buttons

3.2.3.1 Status Message Icons

Status messages are displayed by means of small icons in the status bar. For the most important messages **see** Status Messages (page 91).

By tapping the symbols, the explanation of the symbols will appear in a separate window.

3.2.3.2 Title Bar Icons

The title bar icons only appear when they are active. The icons which appear in the title bar, are listed with their function below:

	Explanation
⤤	Create a shortcut and add it to your user home screen. Edit or remove an existing shortcut **see** Using Shortcuts (page 78).

3.2.3.3 Action Bar Buttons

The action bar contains action buttons for triggering any of the actions which are required and available in the current dialog (e.g. **Back**, **->0/T<-**, **Print**, **Save**, **Delete**, **OK**). There are up to six action buttons available for a work step. The functions of these buttons are self explanatory and therefore not discussed further.

3.2.4 Input Dialogs

3.2.4.1 Entering Text and Numbers

The keyboard dialog allows you to enter characters including letters, numbers and a variety of special characters. The country-specific layout of the keyboard is in accordance with the selected language, **see** Regional Settings (page 35).

	Name	Explanation
1	Input field	
2	Explanation field	The maximum number of characters allowed is indicated.
3	Shift	You can enter lower and upper case letters by toggling ⇪. Switch the keyboard by tapping the corresponding button in the action bar, for entering numbers, special characters or letters

− Confirm with [**OK**] (To exit keyboard tap [**Cancel**]).

	Function
⇪	Shift-Lock
⌫	Delete last character
←	Cursor left
→	Cursor right

Note
It is also possible to place cursor directly in input field by tapping the respective position.

3.2.4.2 Entering Numerical Values

The numerical keypad dialog allows you to enter numerical values.
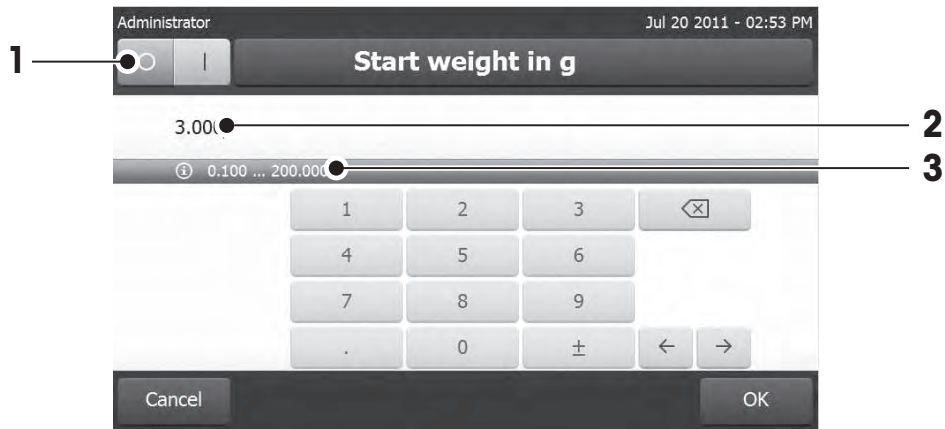
	Name	Explanation
1	Switch	If a switch appears, located on the left side in the title bar; it must be switched on for the entry of a value: O = **OFF**, I = **ON**
2	Input field	
3	Explanation field	The valid input range is indicated.

– Confirm with [**OK**].
  To exit keypad, tap [**Cancel**].

	Function
⌫	Delete last character
←	Cursor left
→	Cursor right

3.2.4.3 Changing Date and Time

This dialog (Picker view) allows you to set the date and time by picking from the built-in calendar/clock.
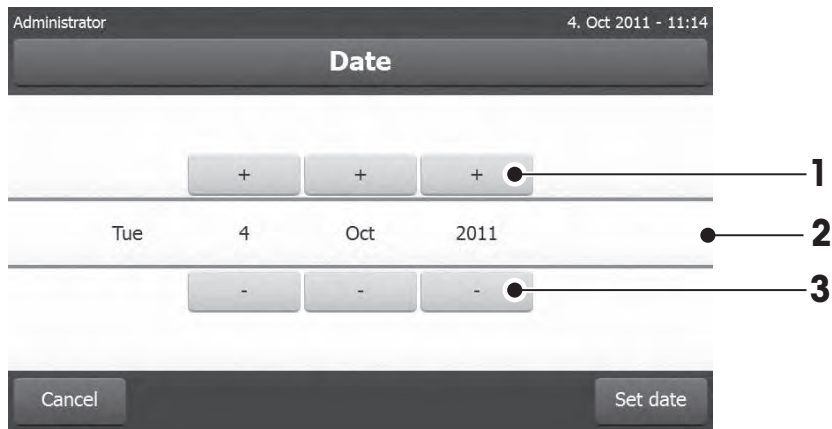
	Name	Explanation
1	Pick button	Pick button upwards (input control)
2	Explanation field	Current value
3	Pick button	Pick button downwards (input control)

– Confirm with [**Set date**]. (To exit without changing, tap [**Cancel**].)

3.2.5 Lists and Tables

Simple list view

Basic elements of a simple list including a content title. If necessary, the content area can be scrolled vertically and can be arranged in a different order.
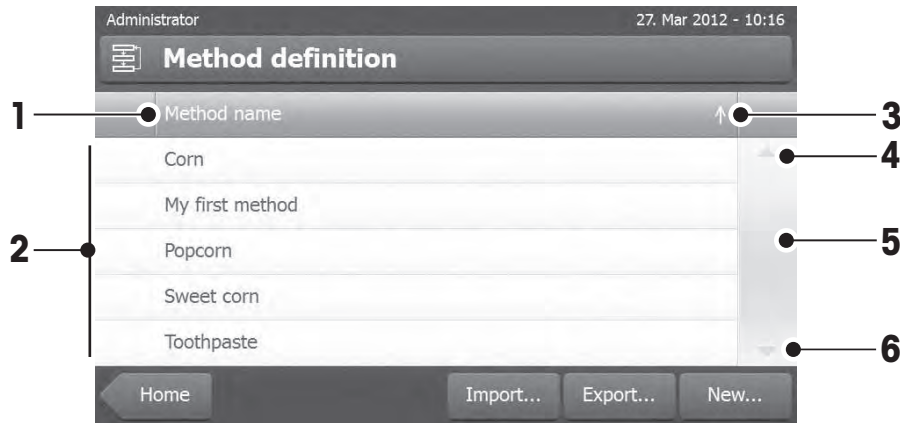
	Name	Explanation
1	Content title	
2	Content area	
3	Arrow icon	[↓] Showing the list in ascending order. [↑] Showing the list in descending order.
4	Scrollbar	Scrolling up
5		Scroller
6		Scrolling down

Further types of lists:
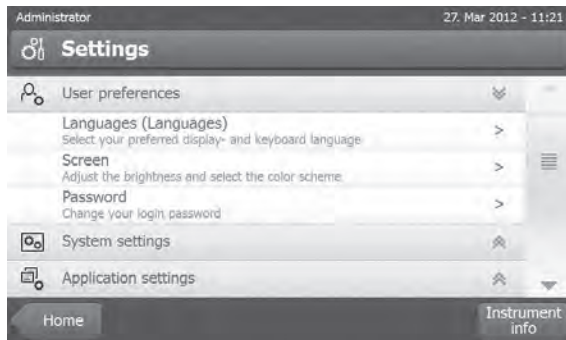
Accordion panels can be opened or closed by tapping [⌃].
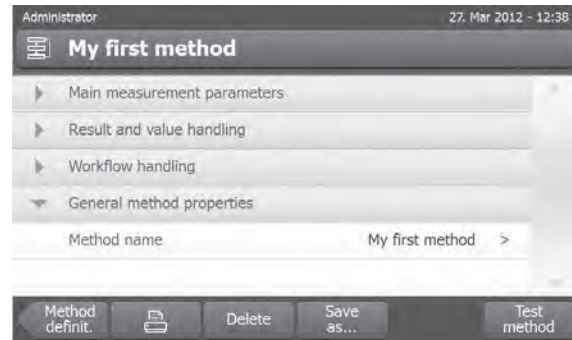
Closable panels can be opened or closed by tapping [>].

3.2.6 Work Screen

The work screen is used for performing main tasks e.g. measurements.
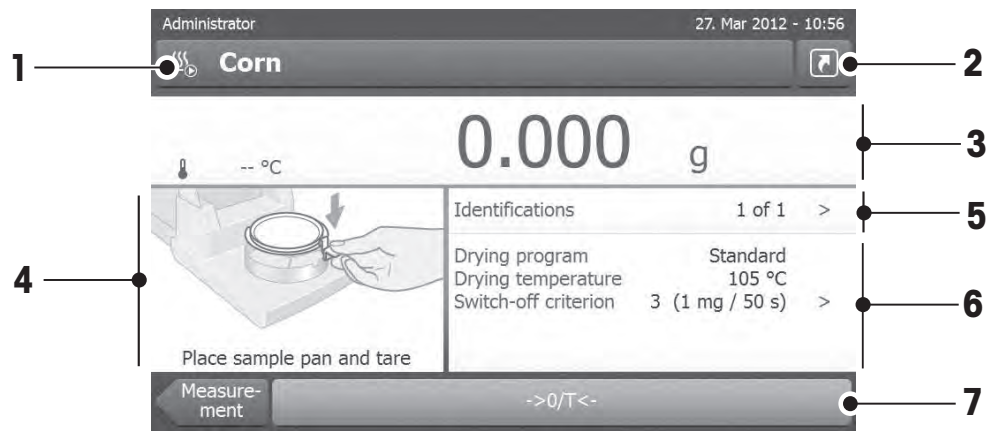
	Name	Explanation
1	Name field	Name of current Method
2	Shortcut button	Adding/editing a shortcut to the home screen for this method
3	Value panel	Displays the current measured values of the work process
4	Graphics panel	E.g. graphical illustrations of the drying curves, instructions for the user for performing tasks, and weighing-in aid
5	ID panel	Identifications (IDs) appear after tapping the ID panel for entering or editing values (comments). ID panel appears only if identification input is activated in the menu.
6	Parameter panel	Displays the parameters of the current work process. A detailed overview of the method parameters appears after tapping the parameter panel.
7	Action buttons	Depending on the current context
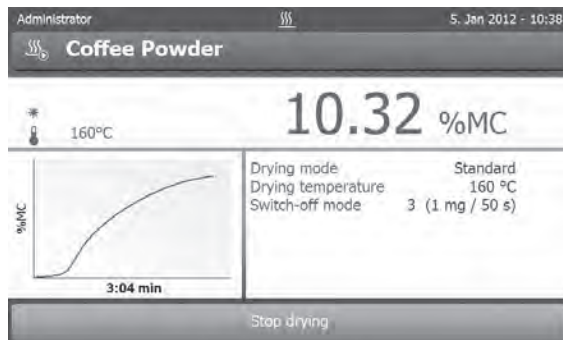
Measurement in progress

3.2.7 Graphics View
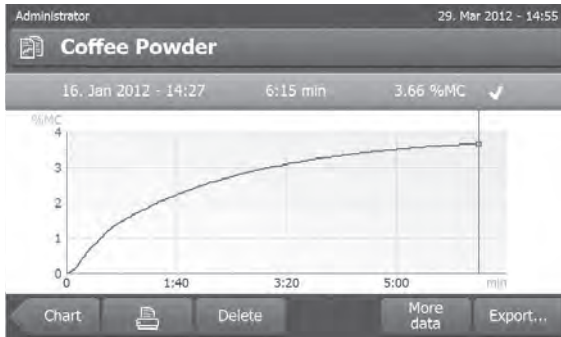
Graphical view of single measurement
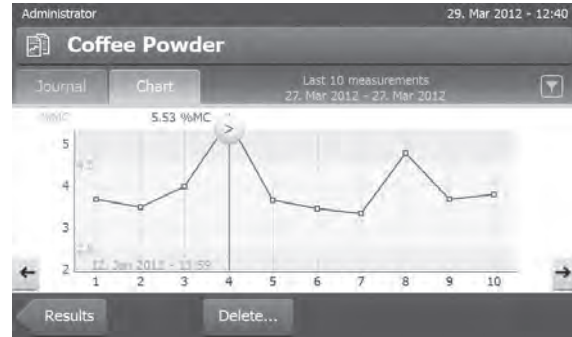
Chart view of series of measurements

For further information **see** Graphical Evaluations of Measurement Results (page 80)

4 Installation and Putting into Operation

In this section you will find information how to put your new instrument into operation.

4.1 Scope of Delivery

Open the package and remove drying unit, terminal and the accessories. Check the completeness of the delivery. The following accessories are part of the standard equipment of your new Moisture Analyzer:

- 80 aluminum sample pans
- 1 sample handler
- 1 sample pan holder
- 1 specimen sample (circular, absorbent glass fibre filter)
- 1 draft shield
- 1 power cable (country specific)
- 1 Terminal cable (Interface Terminal – drying unit)
- 1 Operating instructions
- 1 Application brochure «Guide to Moisture Analysis»
- 1 Production certificate
- 1 Declaration of conformity

Remove the packaging from the instrument. Check the instrument for transport damage. Immediately inform your METTLER TOLEDO representative if you have any complaints or parts are missing.

Note

Store all parts of the packaging. This packaging guarantees the best possible protection for the transport of your instrument.

4.2 Location

Your Moisture Analyzer is a precision instrument. An optimum location guarantees accuracy and dependability. Make sure that the following environmental conditions are met:

- Operate the instrument only indoors and at an altitude of less than 4000 m above sea level.
- Before switching on the instrument, allow all its parts to reach room temperature (+5 to 30°C).
  Make sure that the relative humidity is between 20% and 80% and non-condensing conditions are met.
- The power plug must be easily accessible.

- Firm, horizontal location as free from vibrations as possible.
- Avoid direct sunlight.
- No excessive temperature fluctuations.
- No powerful drafts.
- Surroundings as free from dust as possible.
- Sufficient clearance around the instrument to allow warm air to dissipate.
- Sufficient distance from heat-sensitive materials in the vicinity of the instrument.
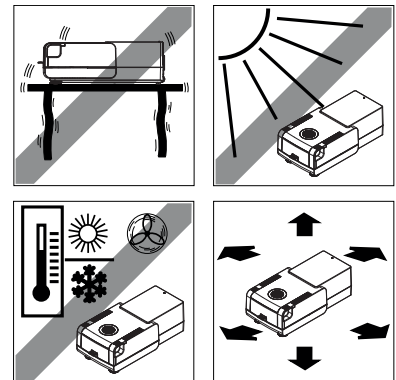
WARNING

Substances which contain toxic or caustic components

Toxic gases produced during drying could cause irritations (eyes, Skin, breathing), illness or death.

– Such substances may be dried only in a fume cupboard.

4.3 Connecting Instrument

WARNING

Risk of electric shock

a) Use only the 3-pin power cable with equipment grounding conductor which was supplied with your instrument.

b) Only an 3-pin grounded outlet for connecting your instrument must be used.

c) Only extension cables which meet this relevant standards and also have an equipment grounding conductor may be used.

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

Attention

- First, check whether the voltage printed on the type plate of the drying unit matches your local line voltage. If this is not the case, on no account connect the drying unit to the power, but contact your METTLER TOLEDO sales representative or dealer.

  Two different versions of drying units with country-specific power cable are available (110 V AC or 230 V AC).

- The power plug must be always accessible.
- Before operating, check all cables for damage.
- Guide the cables so that they cannot become damaged or interfere with the measuring process.

Connecting the Terminal to the Drying Unit

▶ Drying unit and terminal are at the final location.

1 Connect one end of the supplied terminal cable to the system connection socket on the terminal, **see** Terminal (page 12).

2 Screw the connector firmly.

3 Connect the other end to the system connection socket on the drying unit, **see** Drying Unit (page 11).

4 Screw the connector firmly.

Connecting the Drying Unit to the Power Supply

▶ Terminal – drying unit interface is connected.

1 Connect one end of the power cable to the power supply socket on the drying unit, **see** Drying Unit (page 11).

2 Connect the other end to the power line outlet.

4.4 Setting up Drying Unit
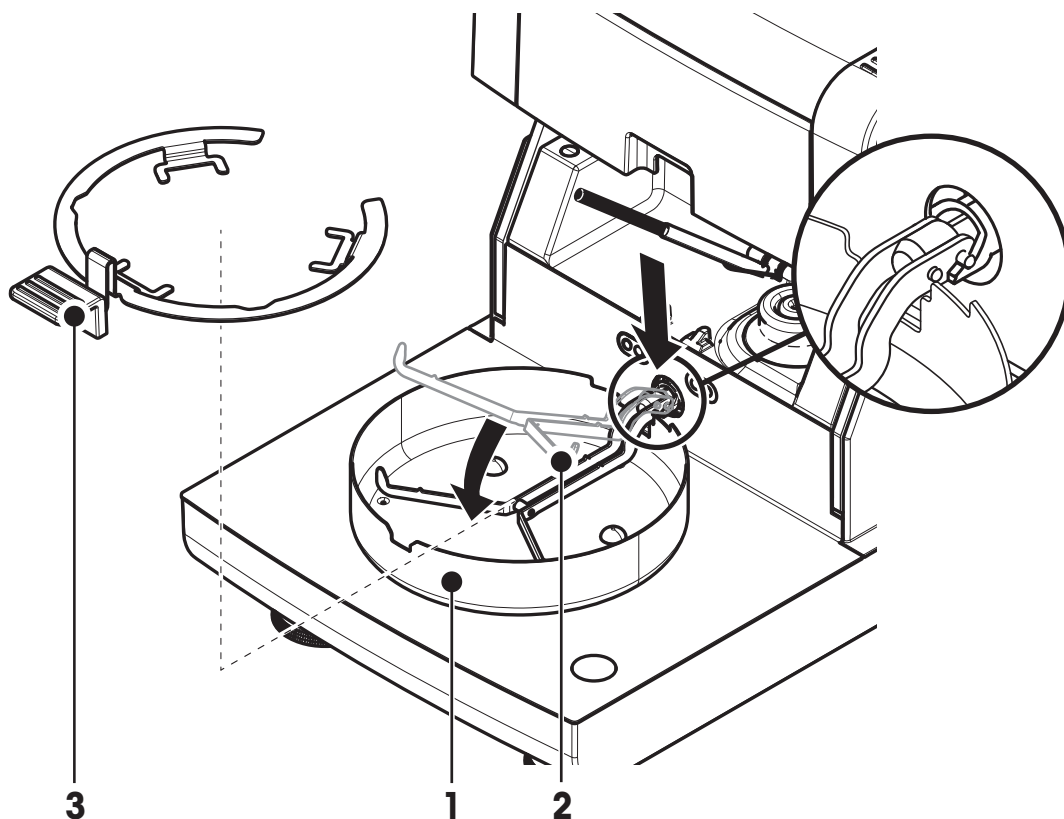
▶ Terminal and drying unit are connected.

1 To switch on the Instrument, press [⏻].

2 Open the sample chamber.

3 Place the draft shield element (1). Only one position is possible.

4 Insert the sample pan holder (2) carefully. Check that the sample pan holder is hooked correctly.

5 Insert the sample pan handler (3).

Note

When putting into operation for the first time or if the instrument is disconnected from the power over a longer period, leave the instrument connected to the power supply for at least 5 hours to allow the built-in recharge-able battery to charge up! This battery ensures that the date and time are not lost when the instrument is dis-connected from the power. This battery can not be replaced by the user. Please contact a METTLER TOLEDO representative.

4.5 Leveling Drying Unit

Exact horizontal positioning and stable installation are prerequisites for repeatable and accurate results. To compensate for small irregularities or inclinations (±2 %) at the location, the instrument must be leveled.

For exact horizontal positioning, the drying unit has a level indicator (level) and 2 leveling screws. When the air bubble in the level indicator is exactly in the center, the instrument is standing perfectly horizontally. To level it, proceed as follows:

1   Position your Moisture Analyzer at the selected location.

2   Turn the two leveling feet until the air bubble is in the center of the level indicator.

L = left foot
R = right foot
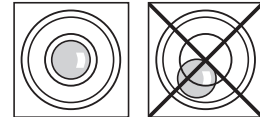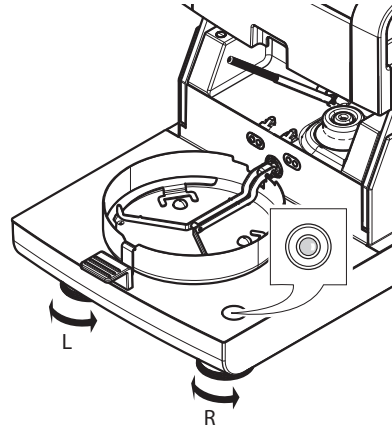
Air bubble at	"12 o'clock"	turn both feet clockwise
Air bubble at	"3 o'clock"	turn left foot clockwise, right foot counterclockwise
Air bubble at	"6 o'clock"	turn both feet counterclockwise
Air bubble at	"9 o'clock"	turn left foot counterclockwise, right foot clockwise
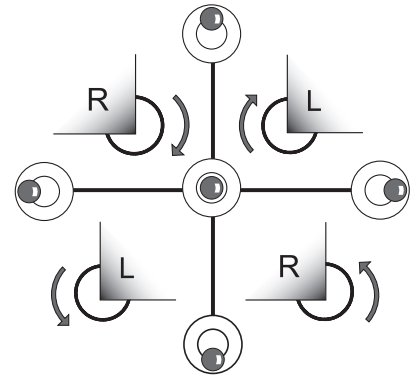
Note
The drying unit should be re-leveled each time its location is changed.

Leveling the drying unit with optional stand for terminal mounted.
Stand for terminal **see** Accessories and Spare Parts (page 100).

▶   The drying unit is positioned at the selected location.

1   To loose the clamps for the safety feet of the stand, turn them outwards.

2   Level the drying unit as previously described.

3   To lock the clamps for the safety feet, turn them inwards as far as they will go.
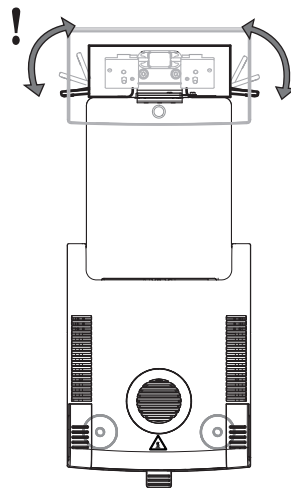
4.6 Anti-theft Device

For protection against theft, your drying unit is fitted with a Kensington security slot for an anti-theft device. To find a suitable anti-theft cable **see** Accessories and Spare Parts (page 100).
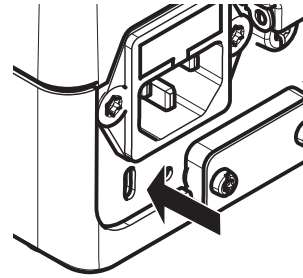
4.7 Setting Reading Angle of Terminal

– To change the reading angle, fold out the two tilt feet.

4.8 Setting Date and Time

Navigation: Home > **Settings** > **System settings** > **Regional Settings**

When you put your new instrument into operation for the first time, you should enter the current date and time. These settings are retained even if you disconnect your instrument from the power supply.

Note
Various languages are available for the dialog with your instrument and can be selected in the menu:
Navigation: Settings > **User preferences**, **see** User Preferences.

Set the current date

▶ **Regional Settings** is selected.

1 Tap **Date**.

2 Set day, month and year.

3 Confirm with [**Set date**].

Set the current time

▶ **Regional Settings** is selected.

1 Tap **Time**.

2 Set Hours and minutes.

3 Confirm with [**Set time**].

Note
For changing the format for date and time, **see** Regional Settings (page 35).

4.9 Adjustment

To obtain accurate measuring results, it is necessary to adjust the integrated balance as well as the heating module.

Adjusting is necessary:

- before the instrument is used for the first time.
- at regular intervals.
- after a change of location.

The following adjustment options are possible:

- Balance adjustment with external weight (accessory).
- Temperature adjustment with temperature adjustment kit (accessory).

For more information to perform these operations **see** Test/Adjust (page 53).

5 My First Measurement

After you have successfully put your new Moisture Analyzer into operation for the first time, you can immediately perform your first measurement. In doing so, you will become familiar with the instrument.

Use the supplied specimen sample (absorbent glass fiber filter) for your first measurement to determine the moisture content. During your first measurement the instrument operates with the factory settings.

Switch on

▶ The instrument is connected to the mains.

– To switch on, press [⏻].

Create a method

1 Tap **Method Definition**.

⇨ **Method Definition** menu appears.

2 To define a new method, tap [**New...**].

⇨ The keypad appears.

3 Enter a name for your first method e.g. **My first method**.

4 Confirm with [**OK**].

5 To store your new method with factory settings, tap [**Save**].

6 Tap [**Home**].

⇨ User home screen appears.

Select the method for measuring

1 Tap [**Measurement**].

⇨ The methods list is displayed.

2 Tap **My first method**.

⇨ The work screen of the method **My first method** appears.

3 Open the sample chamber.

Placing sample pan

▶ The display now prompts you to load the empty sample pan and tare the balance.

1 Place the empty sample pan in the sample pan handler.

2 Place the sample pan handler in the sample chamber. Ensure that the tongue of the pan handler fits exactly in the slot of the draft shield element. The sample pan must lie flat in the pan holder.

Note
We advise you to work with the sample pan handler at all times. The pan handler is ergonomic, automatic positioning, safe and provides protection against possible burns due to the hot sample pan.

Taring the balance

1   Close the sample chamber.

⇨ The instrument tares the balance (**Starting mode**: **Automatic**).

2   After taring, open the sample chamber.

Start measuring

1   Place the specimen sample in the sample pan.

2   Wet the specimen sample with a few drops of water.

3   Close the sample chamber.

⇨ The drying process starts automatically.
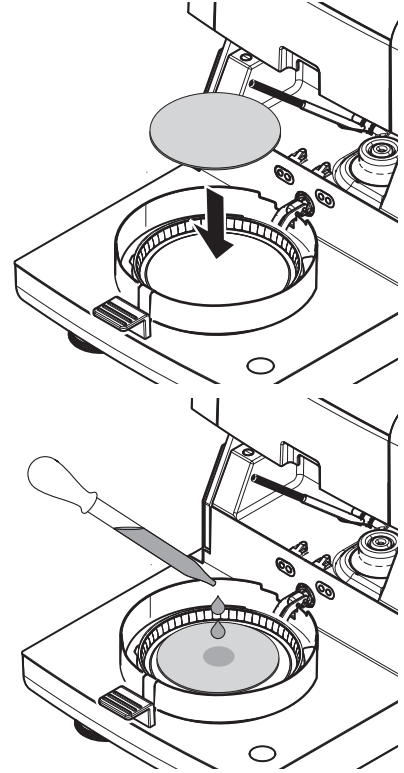
Drying process

You can follow the measurement process on the display, **see** Work Screen (page 21).

- The drying process is continuously displayed graphically.
- The current temperature in the heating module is displayed as well as the elapsed drying time and the current drying value.
- The display shows the selected settings.
- The drying process can be aborted by tapping [**Stop drying**].

At the end of the drying process you can read the moisture content of your sample on the display. If you have defined the control limits in the method, passed, warned or failed status is shown.

⚠ **CAUTION**

Danger of burns

Sample, sample pan and sample pan holder may still be hot.

Remove Sample

▶ The drying process is completed.

1 Open the sample chamber.

2 Carefully remove the sample pan handler from the sample chamber.
Note
To remove the sample pan from the handler, lift the pan slightly from below and pull it sideways out of the handler.

3 • To perform a further measurement with the current method, tap [**Next Sample**].
• To perform a measurement with a new method, tap [**Methods**].
• To return to the home screen, press [⌂].
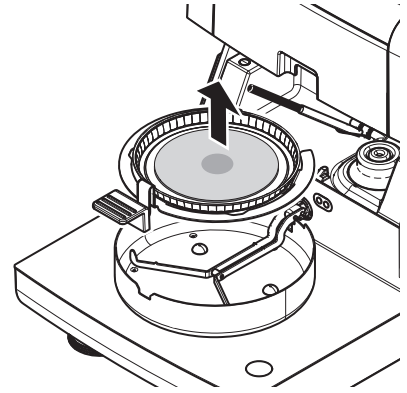
Congratulations!

You have just performed your first measurement with your new Moisture Analyzer. In the following sections you will find more information about the extensive functions of this instrument.

6 Settings

Navigation: Home > Settings

In this section you will find information how to define the general settings of your instrument.

Menu structure

Main menu	Submenu	Further information
User preferences	Languages	**see** Languages (page 33)
	Screen	**see** Screen (page 33)
	Sound	**see** Sound (page 33)
	Password	**see** Password (page 34)
System settings	Regional Settings	**see** Regional Settings (page 35)
	Peripherals	**see** Peripherals (page 35)
	Default settings	**see** Default Settings (page 36)
	Touch screen adjustment	**see** Touch Screen Adjustment (page 37)
Application settings	Identifications management	**see** Identifications Management (page 39)
	Print and output management	**see** Print and Output Management (page 39)
Quality management	Test / Adjustment settings	**see** Test / Adjustment settings (page 41)
User management	Groups	**see** Groups (page 44)
	Users	**see** Users (page 46)
	Account policies	**see** Account Policies (page 47)
System and data management	Export / Import	**see** Export / Import (page 48)
	Back up / Restore	**see** Back up / Restore (page 49)
	Reset	**see** Reset (page 50)
	Update	**see** Update (page 50)

6.1 User Preferences

This menu item defines the basic settings for each user. This settings are stored under the active user profile and apply when working within this profile. When a user profile is called up (login user account), the relevant settings are loaded automatically. **See** User Management (page 44).

You can define the following parameters:

Menu item	Explanation	Further Information
Languages	Defines your preferred display and keyboard language.	**see** Languages (page 33)
Screen	Defines the brightness and the color scheme of the display	**see** Screen (page 33)

6.1.1 Languages

Select your preferred language for operating the terminal.
Factory setting: Generally, the language of the destination country (if available) or English is set.

You can define the following parameters:

Parameter	Explanation	Values
Display language	Defines user-specific screen language.	**English** | **Deutsch** | **Italiano** | **Français** | **Español** | **Português** | **Polski** | **Magyar** | **Český** | **Русский** | **日本語** | **中文** | **한국어/조선말**
Keyboard language	Defines user-specific layout of the Keypad.	**English** | **Deutsch** | **Italiano** | **Français** | **Español** | **Português** | **Polski** | **Magyar** | **Český**

6.1.2 Screen

You can define the following parameters:

Parameter	Explanation	Values
Brightness	Defines user-specific brightness of the display.	10…100 % (80 %)*
Color scheme	Defines user-specific display color scheme.	**Blue*** | **Green** | **Orange** | **Grey**

* Factory setting

6.1.3 Sound

You can define the following parameters:

Parameter	Explanation	Values
Sound	Activate / deactivate of audible feedback and adjust the volume. Audible feedback: • when tapping a button. • upon measurement completed. • when an error message appears.	**OFF*** | **ON** | 0…100 % (50 %)*

6.1.4 Password

Navigation: Home > **Settings** > **User preferences** > **Password**

In this menu item you can change the user password. It is also possible to create a password for protection or to deactivate the password protection.

You can define the following parameters:

Parameter	Explanation	Values
Password	Change an existing or create a new password. **OFF** = no password protection.	**OFF** | **any**

6.2 System Settings

Navigation: Home > **Settings** > **System settings**

This menu item defines the basic settings for the system. The system settings apply to the entire system and therefore to all user profiles and applications.

You can define the following parameters:

Menu item	Explanation	Further Information
Regional settings	Defines the settings of date & time and keypad country options.	**see** Regional Settings (page 35)
Peripherals	Defines the configuration of printers and other devices.	**see** Peripherals (page 35)
Default settings	Defines the default settings of your instrument.	**see** Default Settings (page 36)
Touch screen adjustment	Adjusts the touch screen.	**see** Touch Screen Adjustment (page 37)

6.2.1 Regional Settings

Navigation: Home > **Settings** > **System settings** > **Regional Settings**

This menu item defines the settings of date & time.

You can define the following parameters:

Parameter	Explanation	Values
Date	Sets the date of the clock of the instrument.	**Day** I **Month** I **Year**
Time	Sets the clock time of the instrument.	**Hours** I **Minutes**
Date format	Defines the date format. D = Day M = Month Y = Year	**D. MMM YYYY*** I **MMM D YYYY** I **DD.MM.YYYY** I **MM/DD/YYYY** I **YYYY/MM/DD** I **YYYY-MM-DD**
Time format	Defines the time format. M = Minutes	**24:MM*** I **12:MM** I **24.MM** I **12.MM**

* Factory setting

Note

Date and time of a connected printer will be ignored. Date and time of instrument is relevant.

6.2.2 Peripherals

Navigation: Home > **Settings** > **System settings** > **Peripherals**

In this menu item you can configure one printer and one host connection.

Remote clients

The **MT-SICS** host connection (remote client) is enabled by default and only usable with the METTLER TOLEDO specific protocol MT-SICS.

MT-SICS commands and functions can be transmitted via the RS232 interface (COM1 port) or the USB device interface (COM4 port). The use of the USB device interface requires the installation of an USB device driver on the PC, **see** Installing USB Device Driver (page 106).

Commands and further information please refer to the Reference Manual **MT-SICS Interface Commands for Halogen Moisture Analyzers** downloadable from the internet.

▶ www.mt.com/hxhs

Printers

No printer is installed by default. To install a printer:

1 Tap [**New...**]

    ⇨ **Peripheral type** list appears.

2 Select device.
    Note
    Currently supported devices from METTLER TOLEDO with preset parameters:
    • **RS-P42 Strip Printer**
    • **RS-P25 Strip Printer**
    • **LabX Direct Moisture**

3 Set the parameters.

4 To store the settings, tap [**Save**].

5 To activate the interface, tap [**ON**].

    ⇨ Status changes from **Disabled** to **Enabled**.

Note

- A printer or host connection can also be deleted.
- For printer settings **see** Recommended Printer Settings (page 105).
- For defining the printouts **see** Print and Output Management.

You can define the following parameters:

Parameter	Explanation	Values
Device Name	Defines a name for the device.	**any**
Device Port	Defines the device port. **COM1**: RS232 / **COM4**: USB Device (Driver required) **Note** It is possible to use an USB-to-Serial adapter. If such an adapter is connected, these devices are shown as e.g.**SOU1**, **SOU2** (SOU stands for serial over USB)	**COM1*** ǀ **COM 4**
Baudrate	Defines the speed of the data transmission (date transfer rate / Baud rate).	**1200** ǀ **2400** ǀ **4800** ǀ **9600*** ǀ **19200** ǀ **38400** ǀ **57600** ǀ **115200**
DataBits	Defines the number of data bits.	**7** ǀ **8***
Parity	Defines the variant of parity bit.	**None*** ǀ **Odd** ǀ **Even**
StopBits	Defines the stop bits of the transmitted data.	**1 StopBit*** ǀ **2 StopBits**
Flow Control	Defines the type of flow control (Handshake).	**None** ǀ **Hardware** ǀ **Xon/Xoff***

* Factory setting

6.2.3 Default Settings

Navigation: Home > **Settings** > **System settings** > **Default settings**

Define the default settings of your instrument.

You can define the following parameters:

Menu item	Explanation	Further Information
Default languages	Defines a default display and keyboard language.	**see** Default Languages (page 37)
Default screen settings	Defines the default brightness and color scheme.	**see** Default Screen Settings (page 37)

6.2.3.1 Default Languages

Select the default language for operating the terminal. Factory setting: Generally, the language of the destination country (if available) or English is set.

You can define the following parameters:

Parameter	Explanation	Values
Default display language	Defines default screen language.	**English**	**Deutsch**	**Italiano**	**Français**	**Español**	**Português**	**Polski**	**Magyar**	**Český**	**Pусский**	日本語	中文	한국어/조선말
Default key-board language	Defines default layout of the keyboard.	**English**	**Deutsch**	**Italiano**	**Français**	**Español**	**Português**	**Polski**	**Magyar**	**Český**

6.2.3.2 Default Screen Settings

You can define the following parameters:

Parameter	Explanation	Values
Brightness	Defines default brightness of the display.	10…100 % (80 %)*
Color scheme	Defines default display color scheme.	**Blue***	**Green**	**Orange**	**Grey**

* Factory setting

6.2.4 Touch Screen Adjustment

If the alignment of the touch-sensitive areas of the screen correspond not exactly with the position of the buttons e.g. after a software update was performed, then you can solve this error by executing this function.

⚠ **CAUTION**

Do not touch the touch screen with pointed or sharp objects!

This may damage the touch screen.

► Menu **System settings** appears.

1 Choose **Touch screen adjustment** and tap [**Start**].

⇨ Adjustment screen appears.

2 Touch and hold a touch screen stylus (resistive) on the center of the target until it moves to the next position on the screen.

3 Repeat this procedure until a message appears (**New calibration settings have been measured**).

4 Tap the screen to confirm or wait for 30 seconds to cancel (time-out).

⇨ A message box appears.

5 To store the setting, tap [**OK**].

Note

- Tap the center of the target as exact as possible otherwise the process has to be repeated several times.
- Make sure not to touch any other locations on the screen and the fix key areas while doing this adjustment.
- Make sure not to touch the screen with your hand.
- Ensure minimum viewing angle.
- The adjustment process cannot be aborted.
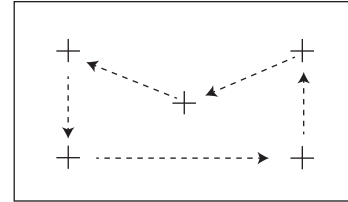
6.3 Applications Settings

You can define the following parameters:

Menu item	Explanation	Further Information
Identifications management	Defines identifications and their use in order to comment measurements.	**see** Identifications Management (page 39).
Print and output management	Defines the default settings for the printouts.	**see** Applications Settings (page 39).

6.3.1 Identifications Management

Identifications (ID) contain descriptive text for individual measurements, which enables samples to be easily allocated to specific tasks or customers. This feature allows you to define identifications in order to comment measurements, such as company id, id badge, id sample. In the ID panel on the work screen, the values (comments) can be entered or changed before measurement, **see** Work Screen (page 21). IDs have an impact on all measurements, regardless of methods. The IDs are included on printouts or can be exported to a PC.

Menu structure

Main menu	Submenu	Further information
Identifications usage	**Identifications input**	**see** below
	Clear input after measurement	
Identifications	no submenu	

You can define the following parameters:

Parameter	Explanation	Values
Identifications input	Defines the method for entering comments. **ON** = activates ID panel on work screen. **Free input** = the IDs appear after tapping on the ID panel (work screen) for entries or changes of values (comments). **Guided input** = each ID is displayed individually in order of definition (ID1 to ID10) before measurement, to make entries or changes of values (comments).	**OFF***	**ON**	**Free input**	**Guided input**
Clear input after measurement	Defines the ID whose value (comment) is deleted after measurement.	**OFF***	**ON**	ID selection: □	☑	
Identifications	Defines general identifications in order to comment measurements. + = New identifications (max. 10 IDs, 1…20 characters) - = Remove identifications (selectable)	+	−

* Factory setting

6.3.2 Print and Output Management

If a printer is connected and activated, results can be automatically printed out. The interim values are printed out in the pre-selected intervals and the final results are logged at the completion of the measurement. The printout contains information to the instrument, time, date as well as the method and results, depending of the protocol. The level of detail depends on the selected type of printout (short, standard) and the activated protocol items (settings or method), **see** Information on Printouts (page 82).

Note

- The definitions in this menu item are the default settings for the printouts. These parameters are displayed at every initialization of a Printout and can be modified again.
- The setting for printout language in this menu item has no impact on test or adjustment printouts, **see** Print and Output Settings (page 43).
- Not all languages are compatible with any printer, and also depending on the settings of the printer, **see** Recommended Printer Settings (page 105).
- For installing and defining a printer **see** Peripherals (page 35).

You can define the following parameters:

Parameter	Explanation	Values
Printout type	Selects a detailed printout or in a short form.	**Standard*** | **Short**
Printout language	Defines the language for general printouts. **Note** No impact on test or adjustment printouts.	**English** | **Deutsch** | **Italiano** | **Français** | **Español** | **Português** | **Polski** | **Magyar** | **Český**
Print results automatically after measurement	Print results automatically after measurement if activated.	☐ (deactivated)* | ☑ (activated)
Include intermediate results to printout	Defines the time intervals at which interim results are transferred to the printer.	**OFF*** | **10 s** | **30 s** | **1 min** | **2 min** | **10 min**

* Factory setting

6.4 Quality Management

In this menu you can define all settings related to the adjustment and Test of the instrument. Periodic adjustments or tests ensure accurate measurement results.

You can define the following parameters:

Menu item	Explanation	Further Information
Test / Adjustment settings	Defines the equipment for adjusting and the workflow for testing or adjusting.	**see** Test / Adjustment settings (page 41)

6.4.1 Test / Adjustment settings

This section describes all the menu options available for defining the parameters relating to the adjustment and testing of your instrument.

For performing test and adjustments **see** Test/Adjust (page 53).

Menu structure

Main menu	Submenu	Further information
Equipment	**Test weight 1**	**see** Equipment (page 41)
	Test weight 2	
	Temperature kit	
Test settings	**Weight test - external**	**see** Test Settings (page 42)
	Temperature test	
Adjustment settings	**Weight adjustment - external**	**see** Adjustment Settings (page 42)
	Temperature adjustment	
Print and output settings	**Printout language**	**see** Print and Output Settings (page 43)
	Print results automatically after test/adjustment	

6.4.1.1 Equipment

This menu item defines the equipment needed for weight adjustment, weight test, temperature adjustment or temperature test.

Note
For performing temperature adjustment or temperature test, you need the optional temperature adjustment kit, **see** Accessories and Spare Parts (page 100).

Test Weight 1 and Test Weight 2

You can define the following parameters:

Parameter	Explanation	Values
Temperature kit name	Defines a name that is in an easily recognizable form as an alternative to the ID. A name should be unique and unambiguous.	any
Nominal weight	Defines the nominal weight in grams.	30.000…150.000 g (100 g)*
Identification	Defines the identification (ID) of the weight. The ID of the weight is provided on the Weight Certificate. The ID may contain your company specific identification number. This ID is stored in the adjustment or test history and shows up on the printouts.	any

* Factory setting

Temperature Adjustment Kit

You can define the following parameters:

Parameter	Explanation	Values
Temperature kit name	Defines a name that is in an easily recognizable form as an alternative to the ID. A name should be unique and unambiguous.	any
Identification	Defines the identification (ID) of the Temperature kit. The ID is provided on the Certificate. The ID may contain your company specific identification number. This ID is stored in the adjustment or test history and shows up on the printouts.	any

6.4.1.2 Test Settings

Navigation: **Home** > **Settings** > **Quality management** > **Test / Adjustment settings** > **Test settings**

Weight test external

You can define the following parameters:

Parameter	Explanation	Values
Test weight	Selects the predefined **Test weight**. **Test weight 1** / **Test weight 2** = defined in the menu item **Equipment**	**Test weight 1** | **Test weight 2**
Tolerance	Defines the measuring tolerance of the weight.	0.0001…0.1000 g (0.0010 g)*

* Factory setting

Temperature test

You can define the following parameters:

Parameter	Explanation	Values
Temperature kit	Shows the name of the **Temperature kit** which was defined in the menu item **Equipment**.	none
Temperature 1	Enables or disables the lower test temperature.	**OFF** | **ON** (100 °C)*
Tolerance	Defines the tolerance of the test temperature.	1…5 °C (3 °C)*
Temperature 2	Enables or disables the upper test temperature.	**OFF** | **ON** (160 °C)*
Tolerance	Defines the tolerance of the test temperature.	1…5 °C (3 °C)*

* Factory setting

6.4.1.3 Adjustment Settings

Navigation: **Home** > **Settings** > **Quality management** > **Test / Adjustment settings** > **Adjustment settings**

Weight adjustment external

You can define the following parameters:

Parameter	Explanation	Values
Test weight	Selects the predefined **Test weight**. **Test weight 1** / **Test weight 2** = defined in the menu item **Equipment**	**Test weight 1** | **Test weight 2**

Temperature adjustment

You can define the following parameters:

Parameter	Explanation	Values
Temperature kit	Shows the name of the **Temperature kit** which was defined in the menu item **Equipment**.	none

6.4.1.4 Print and Output Settings

Navigation: Home > **Settings** > **Quality management** > **Test / Adjustment settings** > **Print and output settings**

This menu item allows you to set specific printer functions for test or adjustment printouts.

- The setting for printout language in this menu item has impact on test or adjustment printouts only. For setting the general printout language, **see** Print and Output Management (page 39).
- Not all languages are compatible with any printer, and also depending on the settings of the printer, **see** Recommended Printer Settings (page 105).
- For installing and defining a printer **see** Peripherals (page 35).

You can define the following parameters:

Parameter	Explanation	Values
Printout language	Defines the printout language for test or adjustment printouts.	**English** | **Deutsch** | **Italiano** | **Français** | **Español** | **Português** | **Polski** | **Magyar** | **Český**
Print results automatically after test/adjustment	Activated or deactivated function.	☑ (enabled)* | ☐ (disabled)

* Factory setting

6.5 User Management

The security system of the instrument is based on a "Users and Groups" concept. Every real user of the instrument should be represented by a user account on the instrument which holds particular settings of the respective user. Every user belongs to a particular group and inherits the access rights assigned to that group.

You can define the following parameters:

Menu item	Explanation	Further Information
Groups	Defines groups and their access rights.	**see** Groups (page 44)
Users	Defines the user accounts.	**see** Users (page 46)
Account policies	Set default startup user.	**see** Account Policies (page 47)

6.5.1 Groups

In this menu you can create, delete, or edit user groups and define their access rights.

Four predefined groups are available. The default group with all access rights is administrator. The administrator group can not be edited or deleted. All other groups can be edited or deleted.

Predefined groups	Default access rights						
	User Preference settings	System settings	Edit Methods	Run Tests	Run Adjustments	Quality management	User and data management
Administrator	☑	☑	☑	☑	☑	☑	☑
Supervisor	☑	☑	☑	☑	☑	☐	☐
Quality Manager	☑	☑	☐	☑	☑	☑	☐
Operator	☑	☐	☐	☐	☐	☐	☐

Creating a new group

▶ Menu **Groups** selected.

1 Tap [**New…**].

2 Enter the name of the new group and confirm with [**OK**]. Name should be unique and unambiguous.

3 Edit the properties of the new group.

Deleting a group

▶ Menu **Groups** selected.

1 Select the group you wish to delete.

2 Tap [**Delete**]. Confirm the message box.

Note
The Administrator group as well as groups with assigned users cannot be deleted, **see** Users (page 46).

Editing a group

▶ Menu **Groups** selected.

1 Select the group you wish to edit.

2 Edit the group parameters. Store the settings with [**Save**].

You can define the following parameters:

Parameter	Explanation	Values
Group properties	Name and (optional) description of the group. Name should be unique and unambiguous.	**any**
Access rights	Defines the access rights to menus or operations.	**User Preference settings | System settings | Edit Methods | Run Tests | Run Adjustments | Quality Management | User and data management**
Group members	Displays the users assigned to this group (no editing can be done here, the assignment is done when setting up or editing a user).	**none**
History	Displays the date and time of the last modifications made to this group (no editing here).	**none**

Influence of access rights

Access rights	Impact on
User Preference settings	**User preferences** **Navigation: Home** > **Settings** > **User preferences** **See** User Preferences (page 33)
System settings	**System settings** **Navigation: Home** > **Settings** > **System settings** **See** System Settings (page 35)
Edit Methods	**Method definition** **Navigation: Home** > **Method definition** **See** Method Definition (page 61)
	Application settings **Navigation: Home** > **Settings** > **Application settings** **See** Applications Settings (page 39)
Run Tests	**Tests** **Navigation: Home** > **Test/Adjust** > **Tests** **See** Tests (page 57)
Run Adjustments	**Adjustments** **Navigation: Home** > **Test/Adjust** > **Adjustments** **See** Adjustments (page 53)
Quality management	**Quality management** **Navigation: Home** > **Settings** > **Quality management** **See** Quality Management (page 41)
User and data management	**User management** **Navigation: Home** > **Settings** > **User management** **See** User Management (page 44)
	System and data management **Navigation: Home** > **Settings** > **System and data management** **See** System- and Data Management (page 48)
	Deleting results **See** Graphical Evaluations of Measurement Results (page 80)

Note

- If password protection is mandatory requirement, the access right **User Preference settings** must be disabled.
- If a user does not have the appropriate access rights, the respective navigation elements are not shown (on Home screen) or are disabled (greyed out).

6.5.2 Users

Navigation: Home > Settings > User management > Users

In this menu you can create, edit, or delete user accounts.

Attention

Important note for the Administrator password.
We recommend that you note down your administrator password and keep it in a safe place. If you forgot the password for the default administrator access, it is not possible to regain access to the moisture analyzer. In this case contact your METTLER TOLEDO representative.

Creating a new user account

Note
The user account name must be unique.

▶   Menu **Users** selected.

1   Tap [**New...**].

2   Enter the name of the new user account and confirm with [**OK**].

3   Edit the properties of the new user account.

Editing an existing user account

▶   Menu **Users** selected.

1   Select the user account you wish to edit.

2   Select menu **User properties**.

3   Edit the user account parameters.

4   To store the settings, tap [**Save**].

You can define the following parameters:

Parameter	Explanation	Values
User name	Name of the user account. Name should be unique and unambiguous.	**any**
Full name	Full name of the user (optional).	**any**
Description	Descriptive text for the user account (optional).	**any**
Account active	Activate or deactivate the user account. Inactive user accounts are not available for login.	☐ (deactivated)* | ☑ (activated)
Password	Create a new or change an existing password. **OFF** = no password protection.	**OFF*** | **ON** | **any**
Group	Assign the user account to a particular group.	**available groups**

* Factory setting

Note
- To view the date and time of last modification made to a user account, select the respective account and tap [**History**].
- If password protection is mandatory requirement, the access right **User Preference settings** must be disabled, **see** Groups (page 44).

Deleting a user account

▶   Menu **Users** selected.

1   Select the user account you wish to delete.

2   Tap [**Delete**]. Confirm the message box.

Note
You cannot delete the Administrator account or the account that is currently active.

6.5.3 Account Policies

In this menu you can set the default startup user.

You can define the following parameters:

Parameter	Explanation	Values
Default startup user	Select the default user account for login at startup.	**OFF** | **ON*** | **available user accounts**

* Factory setting

Note

If a non-standard user logs out, the default startup user profile is automatically activated.

6.6 System- and Data Management

Navigation: Home > **Settings** > **System and data management**

This menu item allows you to export or import settings and methods to or from an external USB storage device, as well as to restore the system (depending on the user rights).

Menu structure

Main menu	Submenu	Further information
Export / Import	**Export settings and methods to external storage devices...**	**see** Export / Import (page 48)
	Import settings and methods from external storage device...	
Back up / Restore	**Back up your system on external storage device...**	**see** Back up / Restore (page 49)
	Restore your system from selected back up...	
Reset	no submenu	**see** Reset (page 50)
Update	**Update your instrument software**	**see** Update (page 50)

Note for using USB memory sticks

- Memory sticks up to 32 GB are supported.
- Recommended formatting: FAT32 (NTFS not supported).
- Max. cluster size: 32 KB.
- Max. file size: 32 MB.
- Make sure that the stick is fully inserted.
- Make sure that the write protection is deactivated if present.

6.6.1 Export / Import

Navigation: Home > **Settings** > **System and data management** > **Export / Import**

This menu item allows you to export or import settings and methods to or from an external storage device. These data can be transferred to other instruments of the same type and can be useful to configure multiple instruments with the same specifications.

Note

- Software Version must be equal or higher.
- Data transfer from HX models to HS models is limited. Features which are not supported by HS models cannot be imported, e.g. Step drying or high resolution.
- Export / import of methods can also be performed from the menu **Method Definition**.

Export settings and methods to external storage devices...

You can define the following parameters:

Parameter	Explanation	Values
File name	Defines the name of the new data file.	**any**
Location	Finds the location on the storage device.	**Browse and select**
Export selection	Defines the data for export. **Note** - **User management and user preferences** contains: User management settings, user preferences - **System, application and QM settings** contains: System settings, application settings, quality management settings	**All*** | ☑ **User management and user preferences** | ☑ **System, application and QM settings** | ☑ **Methods**

* Factory setting

▶ An external storage device is connected e.g. memory stick.

▶ Settings are made.

– To start, tap [**Export**].
  To abort, tap [**Cancel**].

Import settings and methods from external storage device...

You can define the following parameters:

Parameter	Explanation	Values
Import from file	Defines the data to be imported.	**Browse and select**
Location	Shows the location of the import file.	–
Import selection	Defines the data for import.	**All*** | ☑ **User management and user preferences** | ☑ **System, application and QM settings** | ☑ **Methods**

* Factory setting

▶ Import settings and methods from external storage devices – is selected.

▶ An external storage device is connected e.g. memory stick.

1 Tap **Browse and select**

   ⇨ **Import from file** appears.

2 Select Device and import file.

   ⇨ Full menu of Import settings and methods from external storage devices appears.

3 Tap Import selection and select the data for import if needed.

4 To start, tap Import button and follow the instructions in the message window.
  To abort, tap [**Cancel**].

6.6.2 Back up / Restore

Navigation: Home > **Settings** > **System and data management** > **Back up / Restore**

This menu item allows you to create a recovery point of the system and to store them on an external storage device. We advise you to create a recovery point of the system regularly. So you are able to restore the system with all data in fault.

Attention

● After restoring, the system is in backup status. That means, that newer data such as settings, methods or results are lost.

● Restore is only possible on the same instrument as the back up was carried out.

Backup

You can define the following parameters:

Parameter	Explanation	Values
File name	Defines the name of the new data file.	**any**
Location	Finds the location on the storage device.	**Browse and select**

Procedure:

▶ An external storage device is connected e.g. memory stick.

▶ **Back up your system on external storage device...** – is selected.

1 Define the name of the new data file.

2   Define the location on the storage device.

3   To confirm, tap [**OK**].

4   To start, tap [**Backup**].
     To abort, tap [**Cancel**].

Restore

You can define the following parameters:

Parameter	Explanation	Values
Restore from file	Finds the location on the storage device and selects the file for restoring.	**Browse and select**

Procedure:

▶   **Restore your system from selected back up...** – is selected.

▶   An external storage device is connected e.g. memory stick.

1   Tap **Restore from file...** (**Browse and select**).

     ⇨ Storage device appears.

2   Select the file for restoring.

3   To start, tap [**Restore**].
     To abort, tap [**Cancel**].

     ⇨ Confirmation window appears.

4   Confirm with [**Restore**].

⇨   The system will restore the data and then perform a restart. Wait until the system has completely started up again.

6.6.3 Reset

Navigation: Home > **Settings** > **System and data management** > **Reset**

This menu item allows you to reset the Instrument to factory settings. Date, time, weight and temperature adjustments/history are not affected.

⚠ **CAUTION**

Data loss after system reset.

After resetting, the instrument is in state as delivered. That means, that all data such as settings, methods or results are lost.

− We recommend you, first save the appropriate data on an external storage device, **see** Export / Import (page 48) and Back up / Restore (page 49).

You can define the following parameters:

Parameter	Explanation	Values
Reset	Resets the instrument to factory settings.	**none**

6.6.4 Update

Navigation: Home > **Settings** > **System and data management** > **Update**

Note

This function is not available with approved instruments. For update, contact your METTLER TOLEDO representative.

METTLER TOLEDO is continuously improving its instrument firmware (software) for the benefit of customers. So that the customer can benefit quickly and easily from further developments, METTLER TOLEDO makes the latest

firmware versions available on the Internet. The firmware made available on the Internet has been developed and tested by Mettler-Toledo AG using processes that meet the guidelines of ISO 9001. Mettler-Toledo AG does not, however, accept liability for consequences that might arise from using the firmware.

Operating Principle

If you register on the following METTLER TOLEDO website, you will find all relevant information and updates for your instrument:

www.mettler-toledo-support.com

Update Procedure

	CAUTION
⚠	**Data loss after system update.** During update of the system, the existing data such as settings, methods or results are migrated. It may happen that data are lost or the update fails. – We advise you, first create a recovery point of the system on an external storage device, **see** Back up / Restore (page 49).

For each software update, the following steps must be performed:

Step 1 Backup system data.
See Back up / Restore (page 49), procedure **Backup**.

Step 2 Execute software update (see below).

Step 3 Restore system data if needed.
See Back up / Restore (page 49), procedure **Restore**.

Execute software update

This menu item allows you to update the Instrument.

You can define the following parameters:

Parameter	Explanation	Values
Update from file	Finds the location on the storage device and selects the file for updating.	**Browse and select**

▶ Back up of the system data is already performed.

1 Insert USB stick with software for update.

2 Select **Home** > **Settings** > **System and data management** > **Update**.

⇨ **Update** screen appears.

3 Tap **Update from file**. **Browse and select** the software update package file on the USB stick.

4 Tap [**Update**]

⇨ Screen Confirm Software Update appears.

5 Read the Information on the screen.
– If an update is needed, tap [**Update**].
– If the software is up-to-date, tap [**OK**].

6 Wait until the software update is completely finished, i.e. the system returned to the home screen (the instrument might reboot up to twice in between).
Attention
Do not remove the USB stick before the instrument has completely restarted.

Also see

- Touch Screen Adjustment (page 37)

7 Test/Adjust

Navigation: Home > Test/Adjust

This function offers you to adjust or test the integrated balance and the heating module. For the relevant settings **see** Test / Adjustment settings (page 41).

Menu structure

Main menu	Submenu	Further information
Adjustments	Weight adjustment - external	**see** Weight Adjustment - External (page 53)
	Temperature adjustment	**see** Temperature Adjustment (page 54)
	Adjustment Printouts	**see** Adjustment Printout Examples (page 56)
Tests	Weight test - external	**see** Weight Test - External (page 57)
	Temperature test	**see** Temperature Test (page 57)
	Test Printouts	**see** Test Printout Examples (page 59)
History	no submenu	**see** History (page 60)

7.1 Adjustments

Navigation: Home > Test/Adjust > Adjustments

In this menu item you can adjust the balance as well as the heating module of your instrument. For relevant settings **see** Test / Adjustment settings (page 41).

Attention

- To obtain accurate results, the balance must be adjusted at the point of use under measuring condition in order to match the gravitational acceleration at its location. The instrument must be connected to the power supply for approximately 60 minutes in order to reach operating temperature before adjusting. Adjusting is necessary:
  - before the instrument is used for the first time.
  - after a change of location.

- We advice you to wait at least 30 minutes after a drying operation (or previous heating module adjustment) before performing the adjustment.

7.1.1 Weight Adjustment - External

Navigation: Home > Test/Adjust > Adjustments > Weight adjustment - external

This function allows you to adjust the balance using an external weight. We recommend to use certified weights so that full traceability is guaranteed.

Perform this function as follows:

▶ Test weight and Adjustment settings are defined.
  see Test / Adjustment settings (page 41)

1 Have required test weight ready.

2 Tap the item **Weight adjustment - external**.

  ⇨ The adjustment screen appears.

3 Clear sample pan holder and tap [**Start adjustment**].
  Note
  We recommend not to use a pan.

  ⇨ The required value flashes and prompts you to load the weight, e.g. "100.00 g".

4   Load the required test weight in the center of sample pan holder.

⇨ The balance indicates the adjustment process, "————" appears.

5   When the display flashes "**000.00**" remove the test weight.

⇨ The balance is adjusted and ready to use for further measurements. The display shows the adjustment results. The results can be printed out by tapping [🖶]

Note

▶ After a timeout the error message appears **Weight out of range. The adjustment has been aborted.** The adjustment was not executed.

1   Confirm with [**OK**].

2   Remove the test weight for unloading.

3   Repeat the adjustment.

7.1.2 Temperature Adjustment

Navigation: Home > **Test/Adjust** > **Adjustments** > **Temperature adjustment**

This function allows you to adjust the temperature control of the heating module. You need the optional Temperature Kit for performing this function, **see** Accessories and Spare Parts (page 100). To learn when an adjustment of the heating module is necessary, **see** Notes on Adjustment of Balance and Heating Module (page 104). We advise you to wait at least 30 minutes after a drying operation (or previous heating module adjustment) before performing the adjustment.

Note

• The duration of the temperature adjustment is 30 minutes. (15 minutes for each measuring temperature).

• The sample chamber must be less than 50 °C before a further adjustment or test can be done.

• It is also possible to perform a test first, and then to transform the test into an adjustment if required. Only possible for tests conducted with 2 temperatures, **see** Temperature Test (page 57).

• For temperature adjustment settings **see** Adjustment Settings (page 42).

CAUTION

Danger of burns

Sample chamber may still be hot.

– Cool down instrument before setting up.

▶ Adjustment settings are defined, **see** Adjustment Settings (page 42).

– Tap menu item **Temperature adjustment**.

⇨ Work screen **Temperature adjustment** appears.

Setting up Drying Unit

▶ Have required **Temperature kit** ready.

▶ Instrument is on

▶ Sample chamber is open.

▶ Instrument is cooled down.

1 Remove sample pan handler (with pan) (1).

2 Remove sample pan holder (2).

3 Contact areas (3) should be clean. Clean them if needed.
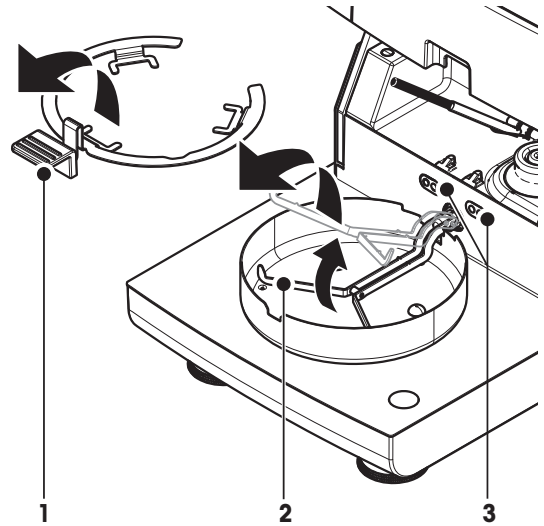
− Insert **Temperature kit** (4).
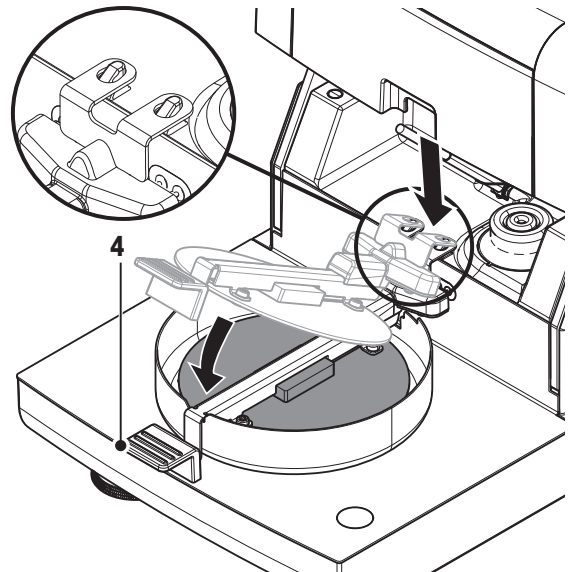
Start adjustment

▶ **Temperature kit** is inserted.

1 Tap [**Start adjustment**].
   Note
   The adjustment process takes 30 minutes.

   ⇨ The instrument starts the adjustment process. The screen shows the current temperature and the remaining time.

   ⇨ The instrument heats up to the target temperature 1 for determining the predefined lower temperature.

   ⇨ After 15 minutes, the instrument adjusts the lower temperature and continues with the process.

   ⇨ The instrument heats up to the target temperature 2 for determining the predefined upper temperature.

   ⇨ After 15 minutes, the instrument adjusts the upper temperature and concludes the adjustment.

2 • To print out the results, tap [🖶].
   • To display or print out the results of previous adjustments, tap [**History**].
   • To return to the home screen, tap [🏠].

3 After cooling down, remove **Temperature kit** and set up drying unit for measurement.

See History and Setting up Drying Unit (page 25)

Note

Your calibrated temperature adjustment kit can be re-calibrated. Please contact your local METTLER TOLEDO representative for more information.

7.1.3 Adjustment Printout Examples

Weight adjustment external

```
-WEIGHT ADJUST EXTERNAL-

    14.10.2011   11:51

METTLER TOLEDO
Halogen MoistureAnalyzer

Type              HS153
SNR(Drying Unit)   2345
SNR(Terminal)      6788
SW(Drying Un     0.60.09
SW(Terminal)     4.20628

User name  Administrator

Weight ID
              ECW-100/1
Nominal Weight
            100.000 g
Cell temperature
              25.20 °C
Adjustment        done

Signature

.......................

---------- END ---------
```

Temperature adjustment

```
-TEMPERATURE ADJUSTMENT-

    14.10.2011   11:51

METTLER TOLEDO
Halogen MoistureAnalyzer

Type              HS153
SNR(Drying Unit)   2345
SNR(Terminal)      6788
SW(Drying Unit)  0.60.09
SW(Terminal)     4.20628

User name  Administrator

Temp Kit ID     MT-414/A
Temp1 target      100 °C
Temp1 actual       97 °C
Temp2 target      160 °C
Temp2 actual      162 °C
Adjustment        done

Signature

.......................

---------- END ---------
```

7.2 Tests

In this menu item you can check the adjustment of the balance as well the temperature of the heating module. For relevant settings **see** Test / Adjustment settings (page 41).

7.2.1 Weight Test - External

This function allows you to test the balance using an external weight. Perform this function as follows:

▶ Test weight and Adjustment settings are defined.
  see Test / Adjustment settings (page 41)

1 Have required test weight ready.

2 Open sample chamber.

3 Tap the item **Weight test - external**.

  ⇨ The adjustment screen appears.

4 Clear sample pan holder and tap [**Start test**].
  Note
  We recommend not to use a pan.

  ⇨ The required value flashes and prompts you to load the weight.

5 Load the required test weight.

  ⇨ The balance indicates the adjustment process, "————" appears.

6 When the display flashes "**000.00**" remove the test weight.

⇨ When the test process is done, the display shows the test results and indicates whether the test is passed or failed according to defined tolerances. The results can be printed out by tapping [🖶].

Timeout

▶ After a timeout of 75 seconds the error message appears **Weight out of range. The test has been aborted.** The test was not executed.

1 Confirm with [**OK**].

2 Repeat the test.

7.2.2 Temperature Test

This function allows you to test the temperature control of the heating module. You need the optional Temperature Kit for performing this function, **see** Accessories and Spare Parts (page 100). To learn when an test of the heating module is necessary, **see** Notes on Adjustment of Balance and Heating Module (page 104). We advise you to wait at least 30 minutes after a drying operation (or previous heating module adjustment) before performing a test.

Note

• The duration of the temperature test is 15 minutes for each measuring temperature.

• The sample chamber must be cooled down below 50 °C before a further adjustment or test can be done.

• It is possible to perform a test and then subsequently to transform the test into an adjustment if required. This is only possible for tests conducted with temperatures 1 and 2.

• Temperature test settings **see** Test Settings (page 42).

Setting up the Drying Unit for temperature test

Same procedure as for temperature adjustment, **see** Temperature Adjustment (page 54).

CAUTION

Danger of burns

Sample chamber may still be hot.

− Cool down instrument before setting up.

Performing temperature test

▶ Test settings are defined, **see** Test Settings (page 42).

▶ Setting up the drying unit for temperature testing has been carried out.

1 Tap menu item **Temperature test**.

⇨ Work screen **Temperature test** appears.

2 Tap [**Start test**].
  Note
  The testing process takes 15 minutes for each temperature (depending on the settings).

  ⇨ The instrument starts the testing process. The screen shows the current temperature and remaining time.

  ⇨ The instrument is heating up to the target temperature 1 for determining the predefined lower temperature.

  ⇨ After 15 minutes, the instrument displays and stores the measured lower temperature and continues with the process.

  ⇨ The instrument is heating up to the target temperature 2 for determining the predefined upper temperature.

  ⇨ After 15 minutes, the instrument displays and stores the measured upper temperature.

  ⇨ The test is done and indicates whether the test has passed or failed according to defined tolerances.

3 Decide if an adjustment is needed.

4 • To return to the menu **Tests**, tap [**Tests**].
  • To print out the results, tap [🖨].
  • To display or print the results at any time, tap [History].
  • To return to the home screen, press [🏠].

5 After cooling down, remove temperature adjustment kit and set up drying unit for measurement, **see** Setting up Drying Unit (page 25).

7.2.3 Test Printout Examples

Weight test external

```
--WEIGHT TEST EXTERNAL--

    14.10.2011   11:51

METTLER TOLEDO
Halogen MoistureAnalyzer

Type              HS153
SNR(Drying Unit)   2345
SNR(Terminal)      6788
SW(Drying Unit)  0.60.09
SW(Terminal)     4.20628

User name  Administrator

Weight ID
              ECW-100/1
Nominal Weight
            100.000 g
Actual      100.001 g
Difference    0.001 g
Tolerance   +/- 0.002 g
Cell temperature
            23.83 °C
Test          passed

Signature

........................

---------- END ---------
```

Temperature test

```
----TEMPERATURE TEST----

    14.10.2011   11:51

METTLER TOLEDO
Halogen MoistureAnalyzer

Type              HS153
SNR(Drying Unit)   2345
SNR(Terminal)      6788
SW(Drying Unit)  0.60.09
SW(Terminal)     4.20628

User name  Administrator

Temp Kit ID     MT-414/A
Temp1 target     100 °C
Temp1 actual      99 °C
Temp1 tolerance
              +/- 2 °C
Temp2 target     160 °C
Temp2 actual     159 °C
Temp2 tolerance
              +/- 2 °C
Test          passed

Signature

........................

---------- END ---------
```

7.3 History

Navigation: Home > **Test/Adjust** > **History**

The instrument always records all test or adjustment operations that have been made and saves them in a memory which is specially protected against power failure (limited to the last 50 records per history selection).

Note
Aborted adjustments or tests will not be saved.

When the History is selected, a list appears with the history selection as follows:

- **Weight test history**
- **Weight adjustment history**
- **Temperature test history**
- **Temperature adjustment history**

The following information is displayed:

Weight test history

Weight test external	
Calibration weight identification	
Nominal weight	g
Actual weight	g
Difference	g
Tolerance	g
Temperature	°C

Weight adjustments history

Weight adjustment external	
Calibration weight name	
Calibration weight identification	
Nominal weight	g
Temperature	°C

Temperature adjustment/test history

Temperature adjustment		Temperature test	
Adjustment kit identification		Adjustment kit identification	
Temperature 1	target - actual	Temperature 1	target - actual
Temperature 2	target - actual	Temperature 2	target - actual
		Free temperature	target - actual
		Tolerances for each temperature	°C

The selected individual results can be printed out by tapping [🖨].

8 Method Definition

Navigation: Home > **Method definition**

What is a method?

Methods simplify and accelerate your daily work. A method contains all settings for measuring the moisture content of a particular sample (substance). It can be recalled by tapping a measurement button or a shortcut and your instrument immediately operates with the corresponding settings.

The **optimal setting of parameters and the drying time** depends on the type and size of the sample and the desired accuracy of the measurement result. The exact parameters can only be determined experimentally, **see** How to Obtain Best Results (page 104). Your Instrument helps you to determine the settings.

Method definition

This function offers you to define new methods and to change, delete, export or import existing methods depending on the user rights. It allows you to store up to 99 individual methods.

All parameters using in a drying method, can be defined under this menu item.

Note

- In most cases it is sufficient to set **Main measurement parameters**.
- You will find more information about defining methods in the delivered application brochure «Guide to Moisture Analysis» or **see** How to Obtain Best Results (page 104).

Prerequisite

The parameter menu appears only if a method already exists and is selected in the method definition dialog or create a new method.

Menu structure

Main menu	Submenu	Further information
Main measurement parameters	**Drying program** (including temperature and switch-off criteria)	**see** Settings of Drying Program (page 63)
	Display mode	**see** Settings of Display Mode (page 68)
	Start weight	**see** Settings of Start Weight (page 70)
Result and value handling	**Control limits**	**see** Control limits (page 71)
Workflow handling	**Starting mode**	**see** Starting Mode (page 73)
General method properties	**Method name**	**see** Method name (page 74)

Defining a new Method

Note

A method name can only exist once.

▶ **Method definition** is selected.

1 Tap [**New...**].

   ⇨ The keypad appears.

2 Enter a name for the new method. Name should be unique and unambiguous.1 to 30 characters are possible (including spaces).

3 Confirm with [**OK**].

   ⇨ The parameter menu for the new method appears.

4 Set the desired parameters e.g. **Main measurement parameters**.

5 To store the method, tap [**Save**].

Editing an existing method

▶ **Method definition** is selected.

1 Tap the method in the list you want to edit.

   ⇨ The parameter menu for the selected method appears.

2 Edit the desired parameters e.g. **Main measurement parameters**.

3 To store the method, tap [**Save**].

Copying an existing method

▶ **Method definition** is selected.

1 Tap the method in the list you want to copy.

   ⇨ The parameter menu of the desired method appears.

2 Tap [**Save as...**].

   ⇨ The keypad appears.

3 Enter a new name for the copied method. Name should be unique and unambiguous.1 to 30 characters are possible.

4 To store the method, tap [**Save**].

Removing an existing method

Note

All results of this method are also removed.

▶ **Method definition** is selected.

1 Tap the method in the list you want to remove.

   ⇨ The parameter menu of the desired method appears.

2 Tap [**Delete**].

   ⇨ A message box appears.

3 Confirm with [**Delete**].

⇨ The desired method is removed.

   Note

   A possible shortcut to this method is not removed.

For removing shortcuts **see** Using Shortcuts (page 78)

8.1 Main Measuring Parameters

Navigation: Home > **Method Definition** > **Method name** > **Main measurement parameters**

These parameters are relevant for measuring and must be determined for all samples. Most samples can be determined with these parameters.

You can define the following parameters:

Menu item	Explanation	Further Information
Drying program	Defines the drying program which is best suited for the specific sample. (including temperature and switch-off criteria)	**see** Settings of Drying Program (page 63)
Display mode	Defines the type of value for displaying and printing.	**see** Settings of Display Mode (page 68)
Start weight	Defines a start weight so that the samples always have approximately the same weight .	**see** Settings of Start Weight (page 70)

8.1.1 Settings of Drying Program

Navigation: Home > **Method Definition** > **Method name** > **Main measurement parameters** > **Drying program**

This function offers you different predefined drying programs for optimum matching of the drying characteristics to the sample used. Furthermore, the drying temperature, switch-off criterion as well as the start weight can be set. Carry out a test measurement for determining the appropriate switch-off criterion, if you do not know the behavior of the sample. For carry out a test measurement **see** Test a Method (page 75).

Note
You will find more information about defining methods in the delivered application brochure «Guide to Moisture Analysis».

You can define the following parameters:

Parameter	Explanation	Values
Drying program	Defines the drying program which is best suited for the specific sample.	**Standard*** | **Rapid** | **Gentle** |

* Factory setting

Further information:

- **Standard** drying **see** Setting Standard drying (page 63)
- **Rapid** drying **see** Setting Rapid drying (page 64)
- **Gentle** drying **see** Setting Gentle drying (page 65)

8.1.1.1 Setting Standard drying
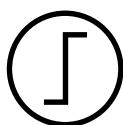
Standard drying

This drying program is set in the factory and is suitable for most samples. The sample is heated to the drying temperature.

Factory setting
Drying temperature = 105 °C, **Switch-off criterion** 3 = 1 mg / 50 s

You can define the following parameters:

Parameter	Explanation	Values
Drying tempera-ture	Defines the drying temperature.	40…230 °C
Switch-off crite-rion	Defines the criterion when the instrument should end the drying.	**1 (1 mg / 10 s) |** **2 (1 mg / 20 s) |** **3 (1 mg / 50 s)* |** **4 (1 mg / 90 s) |** **5 (1 mg / 140 s) |** **Timed… |** **Free (mg / s)… |** **Free (% / s)…**

Setting the Drying Temperature

Navigation: Method Definition > Name of method > **Main measurement parameters** > **Drying temperature**

In this menu item you can set the final drying temperature.

Note:
The admissible input range for the drying temperature is indicated.
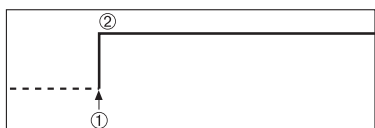
1 Start of drying
2 Final temperature

Setting Switch-off criterion
 see Settings of Switch-off Criterion (SOC) (page 66)

8.1.1.2 Setting Rapid drying
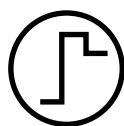
Rapid drying

This drying program is primarily suitable **for samples with a moisture content over 30%**. Following the start, the selected temperature is exceeded by 40% for 3 minutes (however, is possible up to maximum 230°C) to compensate for the cooling due to vaporization and accelerate the drying process. The drying temperature is then lowered to the set value and maintained.

Factory setting
Drying temperature = 105 °C, **Switch-off criterion** 3 = 1 mg / 50 s

You can define the following parameters:

Parameter	Explanation	Values
Drying tempera-ture	Defines the drying temperature.	40…230 °C
Switch-off crite-rion	Defines the criterion when the instrument should end the drying.	**1 (1 mg / 10 s) |** **2 (1 mg / 20 s) |** **3 (1 mg / 50 s)* |** **4 (1 mg / 90 s) |** **5 (1 mg / 140 s) |** **Timed… |** **Free (mg / s)… |** **Free (% / s)…**

* Factory setting

Setting the Drying Temperature

Navigation: Method Definition > Name of method > **Main measurement parameters** > **Drying temperature**

In this menu item you can set the final drying temperature.

Note:
The admissible input range for the drying temperature is indicated.

1 Start of drying
2 Final temperature

Setting Switch-off criterion

8.1.1.3 Setting Gentle drying

Gentle drying

This drying program is suitable for the gentle drying of **substances which tend to form a skin** (e.g. substances containing sugar or volatile substances). With this program the temperature is continuously increased and attains the selected drying temperature **only after the elapse** of the so-called ramp time. The «ramp», i.e. the time that should elapse between the start of drying and attainment of the final temperature can be pre-set.

Factory setting
Drying temperature = 105 °C, **Ramp time** = 3:00 min,
Switch-off criterion 3 = 1 mg / 50 s

You can define the following parameters:

Parameter	Explanation	Values
Drying temperature	Defines the drying temperature.	40…230 °C
Ramp time	Defines the time in minutes that should elapse between the start of drying and attainment of the final temperature for **Gentle** drying.	0…480 min
Switch-off criterion	Defines the criterion when the instrument should end the drying.	**1 (1 mg / 10 s)** | **2 (1 mg / 20 s)** | **3 (1 mg / 50 s)*** | **4 (1 mg / 90 s)** | **5 (1 mg / 140 s)** | **Timed...** | **Free (mg / s)...** | **Free (% / s)...**

* Factory setting

Setting the Drying Temperature

Navigation: Method Definition > **Method name** > **Main measurement parameters** > **Drying programGentleDrying temperature**

In this menu item you can set the desire final drying temperature.
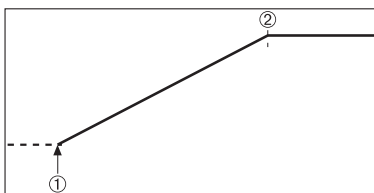
1 Start of drying
2 Final temperature

Setting the ramp time

Navigation: Method Definition > Method name > Main measurement parameters > Drying programGentle > Ramp time

In this menu item you can define the **Ramp time**, i.e. the time that should elapse between the start of drying and attainment of the final temperature. The ramp is started once the temperature reaches 50 °C.
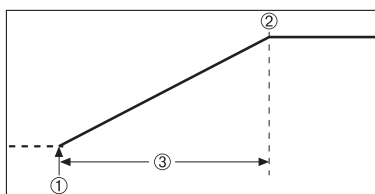
1 Start of drying
2 Final temperature
3 **Ramp time**

Setting Switch-off criterion
see Settings of Switch-off Criterion (SOC) (page 66)

8.1.1.4 Settings of Switch-off Criterion (SOC)

Navigation: Home > Method Definition > Method name > Main measurement parameters > Drying program

This function offers you different switch-off criteria. A switch-off criterion defines when the instrument should end the drying or should start the next step ("Step drying"). Switch-off criteria ensure that measurements are finished in the same condition (weight loss per time) every time, ensuring repeatable measurements.

Note
Accurate results require same start weights, **see** Settings of Start Weight (page 70).

You can define the following parameters:

Parameter	Explanation	Values
Switch-off criterion	Defines the criterion when the instrument should end the drying.	**1 (1 mg / 10 s)** | **2 (1 mg / 20 s)** | **3 (1 mg / 50 s)*** | **4 (1 mg / 90 s)** | **5 (1 mg / 140 s)** | **Timed...** | **Free (mg / s)...** | **Free (% / s)...**

* Factory setting

- Weight loss per unit of time (5 preprogrammed settings)
- Free switch-off criterion (2 different settings)
- Timed switch-off

Weight loss per unit of time

This switch-off is based on a weight loss per unit of time. As soon as the mean weight loss is less that a preset value during a specified time, the instrument considers drying as complete and automatically discontinues the measurement process.

Note
The switch-off criterion is inactive during the first 30 sec.

The following 5 preprogrammed settings are available

Switch-off criterion	Δ g	Δ t	Description
1	1 mg	10 s	This setting is suitable for fast measurements to determine a trend.
2	1 mg	20 s	This setting is suitable for quick drying samples.
3	1 mg	50 s	This is the **factory setting**. It is suitable for most kind of samples.

Switch-off criterion	Δ g	Δ t	Description
4	1 mg	90 s	This setting is suitable for samples which dry moderately quickly or for samples with higher accuracy requirements.
5	1 mg	140 s	This setting is suitable for samples which dry very slowly (trapped moisture, skin formation) or for samples with very low moisture content e.g. plastics. Not suitable for very temperature sensitive samples.

The graph below exemplifies the mode of operation of the switch-off operation (not to scale).
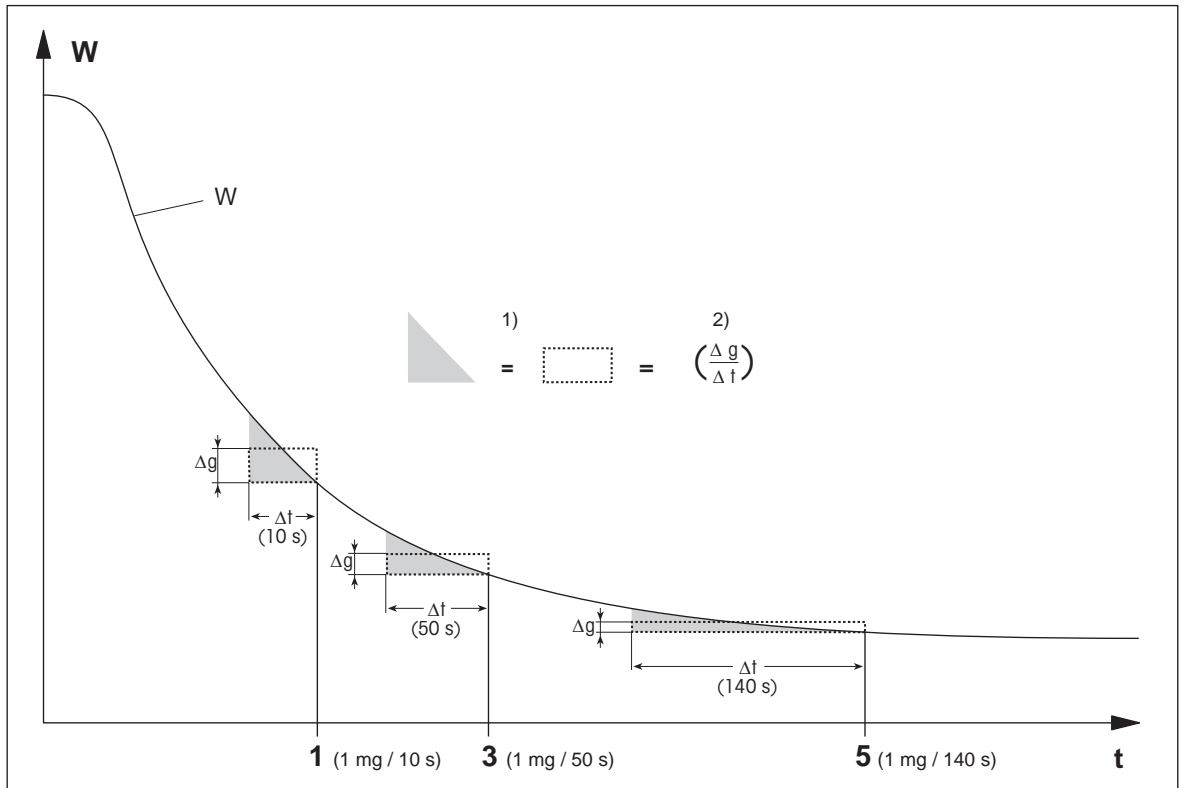
t	=	time		1)	=	equal area
W	=	weight of sample		2)	=	mean weight loss per unit of time
1, 3, 5	=	switch-off criteria shown as an example				

Free switch-off criterion

The free switch-off criterion is based on a user-defined mean weight loss per unit of time.

The following 2 settings are available:

- **Switch-off criterion** > **Free (mg / s)...** (weight loss per unit of time)
- **Switch-off criterion** > **Free (% / s)...** (weight loss in percent per unit of time)

Timed switch-off

With this switch-off criterion the measurement lasts until the present drying time has elapsed. The display provides you with continuous information in the drying time.

Performing Test measurements

For performing test measurements to determine a correct switch-off criterion, **see** Test a Method (page 75).

8.1.2 Settings of Display Mode

With this function you can select the desired type of result display. You also define what type of values are printed on the records.

You can define the following parameters:

Parameter	Explanation	Values
Display mode	Defines the type of value for displaying and printing.	**%MC*** | **%DC** | **%AM** | **%AD** | **g**| **g/kg MC** | **g/kg DC** | **−%MC**

* Factory setting

- **%MC** – Moisture Content (calculated value)
- **%DC** – Dry Content (calculated value)
- **%AM** – ATRO Moisture Content (calculated value)
- **%AD** – ATRO Dry Content (Wet weight, calculated value)
- **g** – Weight in Grams
- **g/kg MC** – Moisture Content (calculated value)
- **g/kg DC** – Dry Content (calculated value)
- **−%MC** – Moisture Content (negative value, calculated value)

Note

Calculated values are indicated with an asterisk in the display.

Detailed information:

%MC – Moisture Content

The moisture content of the sample is displayed (and printed out) as a percentage of the wet weight (WW = initial weight = 100 %). This is the **factory setting**.

During the measuremnet the value is constantly displayed in percent and as a graphical drying curve. The measured value is marked by "%MC" (Moisture Content, e.g. 11.35 %MC) also for the printed results.

$$MC = \frac{WW - DW}{WW} \cdot 100\ \%$$

MC = Moisture Content [0…100 %]
WW = wet weight
DW = dry weight

%DC – Dry Content

The dry content of the sample is displayed (and printed out) as a percentage of the wet weight (WW = initial weight = 100 %).

During the measuremnet the value is constantly displayed in percent and as a graphical drying curve. The measured value is marked by "%DC" (Dry Content, e.g. 88.65 %DC) also for the printed results.

$$DC = \frac{DW}{WW} \cdot 100\ \%$$

DC = dry content [100…0 %]
WW = wet weight
DW = dry weight
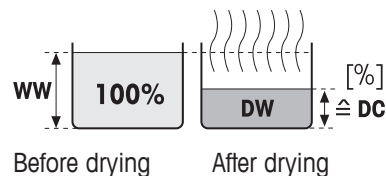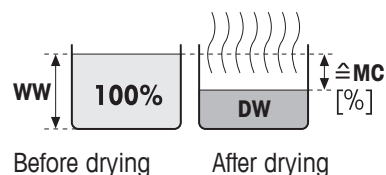
%AM – ATRO Moisture Content [1]

The moisture content of the sample is displayed (and printed out) as a percentage of the dry weight (DW = final weight = 100 %)

During the measuremnet the value is constantly displayed in percent and as a graphical drying curve. The measured value is marked by "%AM" (ATRO Moisture Content, e.g. 255.33 %AM) also for the printed results.

$$AM = \frac{WW - DW}{DW} \cdot 100\ \%$$

AM = ATRO moisture content [0…1000 %]
WW = wet weight
DW = dry weight
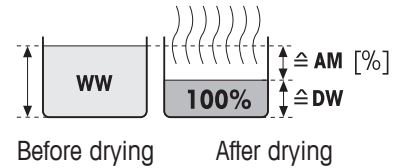
%AD – ATRO Dry Content (Wet weight)[1]

The wet weight of the sample is displayed (and printed out) as a percentage of the dry weight (DW = final weight = 100 %)

During the measuremnet the value is constantly displayed in percent and as a graphical drying curve. The measured value is marked by "%AD" (ATRO Dry Content, e.g. 312.56 %AD) also for the printed results..

$$AD = \frac{WW}{DW} \cdot 100\ \%$$

AD = ATRO dry content [100…1000 %]
WW = wet weight
DW = dry weight
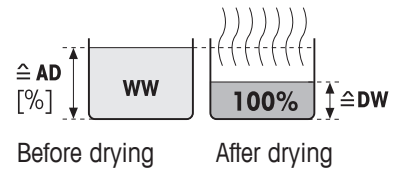
[1] Comment on the ATRO display mode

If the current measured value in the ATRO display mode is greater or less than the predefined limit value (i.e. greater than 999.99 %AD or less than −999.99 %AM), the ATRO result values are limited to 999.99%.

g – Weight in Grams

The weight of the sample is displayed (and printed out) in grams. With this setting, the Moisture Analyzer is used as a precision balance.

During the measuremnet current weight is constantly displayed in grams.

g/kg MC – Moisture Content

The moisture content of the sample is displayed (and printed out)in g/kg of the wet weight (WW = initial weight = 1000 g/kg).

During the measuremnet the current measured value is constantly displayed in percent and as a graphical drying curve. The measured value is marked by "g/kg MC" (Moisture Content, e.g. 11.35 g/kg MC) also for the printed results.

$$MC = \frac{WW - DW}{WW} \cdot 1000\ g/kg$$

MC = Moisture Content [0…1000 g/kg]
WW = wet weight
DW = dry weight
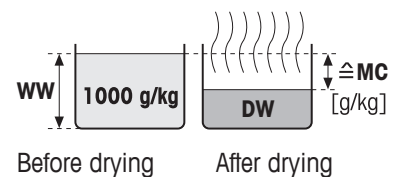
g/kg DC – Dry Content

The dry content of the sample is displayed (and printed out) in g/kg of the wet weight (WW = initial weight = 1000 g/kg).

During the measuremnet the current measured value is constantly displayed in percent and as a graphical drying curve. The measured value is marked by "g/kg DC" (Dry Content, e.g. 88.65 g/kg DC) also for the printed results.

Before drying   After drying

$$DC = \frac{DW}{WW} \cdot 1000 \text{ g/kg}$$

DC = dry content [1000…0 g/kg]
WW = wet weight
DW = dry weight
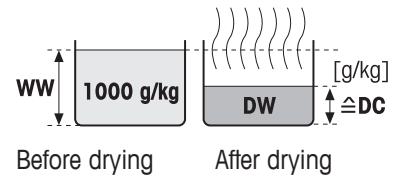
–%MC – Moisture Content

The moisture content of the sample is displayed (and printed out) as a percentage of the wet weight (WW = initial weight = 100 %).

During the measuremnet the value is constantly displayed in percent and as a graphical drying curve. The measured value is marked by "-%MC" (Moisture Content, e.g. -11.35 -%MC) also for the printed results and shown as a negative value.

Before drying   After drying

$$MC = -\frac{WW - DW}{WW} \cdot 100 \text{ %}$$

MC = Moisture Content [0…100 %]
WW = wet weight
DW = dry weight
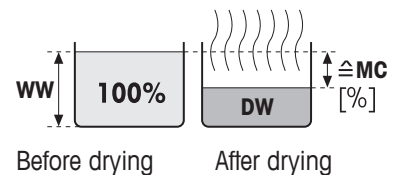
8.1.3 Settings of Start Weight

Navigation: Home > Method Definition > Method name > Main measurement parameters > Start weight

The start weight affects both the duration of the measurement as well as the accuracy of the results. A small weight results in a shorter duration of the measurement but will decrease the accuracy of the result. With this function you can define a start weight so that the samples are approximately of equal weight thus improving the repeatability of the measurements. The weighing-in aid assists you in weighing-in the sample. At most of the samples the target weight is in the range of 2–5 g (plastics 30 g). We recommend to cover the whole surface of the sample pan with a thin uniform layer of sample.

You can define the following parameters:

Parameter	Explanation	Values
Start weight	Defines a start weight so that the samples always have approximately the same weight .	**OFF***	**ON** (0.100…200.000 g)
Start weight tolerance	Defines the tolerance of the **Start weight**. 10 %, recommended for sample weights up to 5 g.	1…25 % (10 %)*
Weigh-in aid	Defines monitoring of target weight and tolerance. **Passive** = tolerance is displayed. **Active** = tolerance is monitored. If the startweight is out of tolerance, the measurement cannot be started.	**Passive***	**Active**

* Factory setting

8.2 Result and Values Handling

Navigation: Home > **Method Definition** > **Method name** > **Result and value handling**

You can define the following parameters:

Menu item	Explanation	Further Information
Control limits	Defines the acceptable range for measuring results in the unit of the selected display mode.	**see** Control limits (page 71)

8.2.1 Control limits

Navigation: Home > **Method Definition** > **Method name** > **Result and value handling** > **Control limits**

With this function you can set warning and intervention limits for the quality and process monitoring. You can also set limits for distinguish passed or failed.

You can define the following parameters:

Parameter	Explanation	Values
Control limits	Defines the acceptable range for the measuring results in the unit of the selected display mode. **OFF** = no limits applied.	**OFF*** | **ON**
T1+ (Upper warning limit)	Defines the upper warning limit in the selected unit of the display mode. Measurement passed with warning (**!**). Value range in ATRO mode (%AD, %AM) up to 1000.	**OFF*** | **0.01…100.0** (1000)
T1- (Lower warning limit)	Defines the lower warning limit in the unit of the selected display mode. Measurement passed with warning (**!**). Value range in ATRO mode (%AD, %AM) up to 1000.	**OFF*** | **0.01…100.0** (1000)
T2+ (Upper intervention limit)	Defines the upper intervention limit in the unit of the selected display mode. Measurement failed (X). Value range in ATRO mode (%AD, %AM) up to 1000.	**OFF*** | **0.01…100.0** (1000)
T2- (Lower intervention limit)	Defines the lower intervention limit in the unit of the selected display mode. Measurement failed (X). Value range in ATRO mode (%AD, %AM) up to 1000.	**OFF*** | **0.01…100.0** (1000)

* Factory setting

Setting the limits

Limits		1	2	3	4	5	6
T2+ (Upper intervention limit)	(X)	●	●	Off	●	●	Off
T1+ (Upper warning limit)	(!)	Off	Off	Off	○	○	Off
T1- (Lower warning limit)	(!)	Off	Off	Off	○	Off	○
T2- (Lower intervention limit)	(X)	●	Off	●	●	Off	●

(✓)   Measurement is within the warning limits: passed (displayed in green)

(!)   Measurement is between the warning limits and the intervention limits: passed with warning (displayed in yellow)

(X)   Measurement is outside the intervention limit: failed (displayed in red)

Control limits is off = no limits applied (displayed in blue)

Testing the limits

See Test a Method (page 75).

8.3 Workflow Handling

With this functions you can define the workflow for the measurement

You can define the following parameters:

Menu item	Explanation	Further Information
Starting mode	Defines how the sample chamber is operated.	**see** Starting Mode (page 73)

8.3.1 Starting Mode

In this menu you can choose whether the sample chamber performs automatic or manual functions (e.g. tare, stop drying).

You can define the following parameters:

Parameter	Explanation	Values
Starting mode	Defines how the sample chamber is operated.	**Automatic*** | **Manual**

* Factory setting

Automatic

Your instrument is set in the factory to the automatic operating mode. This mode can be used for most kind of samples. When closing the sample chamber, the weight of the sample is recorded and the measurement is started.

Manual

We advise you to use the manual operating mode for samples which contain readily volatile substances. In contrast to the automatic operating mode, in the manual operating mode the sample chamber does not automatically close when the [**Start drying**] button is tapped. However, the initial weight (wet weight) important for the determination of the moisture content is recorded. In the manual operating mode you have time for further preparation of the sample (e.g. mixing with quartz sand or even distribution of the sample) while weight losses due to evaporation during the preparation time are measured from the outset. As soon as the sample is ready for drying, close the sample chamber. As soon as the automatic sample chamber is closed, drying starts. In the manual operating mode you can open the sample chamber during a drying operation e.g. in standby mode. In contrast to the automatic mode, drying will not be stopped but simply interrupted until the automatic sample chamber is closed again.

8.4 General Method Properties

Navigation: Home > **Method Definition** > **Method name** > **General method properties**

8.4.1 Method name

Navigation: Home > **Method Definition** > **Method name** > **General method properties** > **Method name**

You can define the following parameters:

Parameter	Explanation	Values
Method name	Renaming a method. Name should be unique and unambiguous.	**any**

8.5 Test a Method

Test a method

This function allows you to test the settings during the definition phase of a method. Testing is possible at any time. Test measurements are recorded in the journal and marked as test results. If you wish to work with the switch-off criterion «weight loss per unit of time» and are not familiar with the behavior of the sample, the test measurement will help you select the suitable setting. For more information about switch-off criteria, **see** Settings of Switch-off Criterion (SOC) (page 66).

The diagram illustrates the progress of a drying. The points at which the individual switch-off criteria were reached (1-5) are marked.
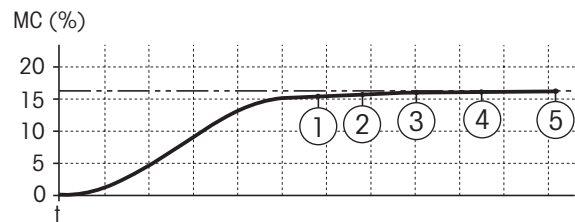
During this measurement, the measured values are recorded the switch-off criteria 1 to 5 and maybe one of a free-defined switch-off criterion. The measurement terminates after the defined time (default 30 minutes). Note that the start weight affects the switch-off criterion. The test time can also be switched off. In this case the measurement terminates after reaching the predefined switch-off criterion. Nevertheless, all switch-off criteria are recorded.

By comparing the measured values with values of a reference method e.g. drying oven and the standard deviation, you can define the appropriate parameter settings. For more information see the application brochure «Guide to Moisture Analysis».

Carry out all measurements under **Home** > **Method Definition** > **Method name** > **Tests** before releasing a method. The results of test measurements are specifically marked.

Attention
Before releasing the method, check if the determined switch-off criterion is set.

Performing a Test measurement

You perform a test measurement just like any other measurement. How to perform the measurement **see** Measurement (page 76).

Changing the test time

▶ Work screen for testing is displayed.

1 Tap **Test time** in the work screen.

   ⇨ **Test time in min** appears.

2 Confirm with **OK**.

Displaying the parameter

▶ Work screen for testing is displayed.

– Tap the parameter in the work screen.

⇨ The parameter list appears.

Printing results of the determined switch-off criteria

For a printout example , **See** Information on Printouts section «Special events».

Displaying results of the determined switch-off criteria

See Graphical Evaluations of Measurement Results

9 Measurement

This function offers you to perform a measuring using previously defined methods. After choosing the measurement method, the measurement process can be started. The work screen guides you step by step through the measuring process.

The following functions are available:

- On the work screen, you can create a shortcut. This allows you to start a method directly from the home screen.
  See Using Shortcuts (page 78).
- After completion of a measuring you can perform a further measuring with same method by tapping [**Next Sample**] or with an other method by tapping [**Measurement**].
- For graphical evaluations of measurement results tap [**Results**]. If you have defined the control limits in the method, passed, warned or failed status is shown.
  See Results (page 80).
- A detailed overview of the method parameter can you call up by tapping the parameter panel.
  See Work Screen (page 21).

9.1 Performing a Measurement

You are now familiar with all the parameters of your instrument and have defined all values for your sample. The instrument is now ready for the determination of your samples. In this Section you will learn how to perform measurements and how to stop the measurement process.

Switching on

▶ The instrument must be connected to the power supply for approximately 60 minutes in order to reach operating conditions.

1 To switch on the Instrument, press [⏻].

2 Log-in with your password, if needed.

Selecting method for measurement

1 Tap **Measurement**.

⇨ The methods list is displayed.

2 Select the method to determine your sample.

⇨ The work screen of the method appears.

3 Open the sample chamber.

Placing sample pan

▶ The display now prompts you to load the empty sample pan and tare the balance.

1 Place the empty sample pan in the sample pan handler.

2 Place the sample pan handler in the sample chamber. Ensure that the tongue of the pan handler fits exactly in the slot of the draft shield element. The sample pan must lie flat in the pan holder.

Note
We advise you to work with the sample pan handler at all times. The pan handler is ergonomic, automatic positioning, safe and provides protection against possible burns due to the hot sample pan.

Taring the balance

1 Close the sample chamber.

⇨ The instrument tares the balance (**Starting mode**: **Automatic**).

2 After taring, open the sample chamber.

Starting measurement

▶ After taring, the display prompts you to add the sample to the sample pan.

1 Add the sample to the sample pan. If you have defined a start weight, weigh the sample using the weighing-in aid.

2 Close the sample chamber.

3 Tap [**Start drying**].

⇨ The drying process starts.
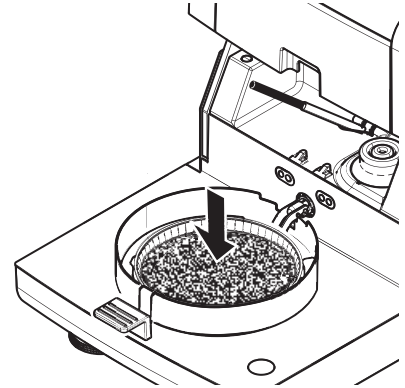
Drying process

You can follow the measurement process on the display, **see** Work Screen (page 21).

• The drying process is continuously displayed graphically.

• The current temperature in the heating module is displayed as well as the elapsed drying time and the current drying value.

• The display shows the selected settings.

• The drying process can be aborted by tapping [**Stop drying**].

At the end of the drying process you can read the moisture content of your sample on the display. If you have defined the control limits in the method, passed, warned or failed status is shown.

Removing Sample

CAUTION

Danger of burns

Sample, sample pan and sample pan holder may still be hot.

▶ The drying process is completed.

▶ The sample chamber is open.

1 Carefully remove the sample pan handler from the sample chamber.
Note
To remove the sample pan from the handler, lift the pan slightly from below and remove it from the handler.

2 • To perform a further measurement with the current method, tap [**Next Sample**].
• To perform a measurement with a new method, tap [**Measurement**].
• To return to the home screen, press [🏠].
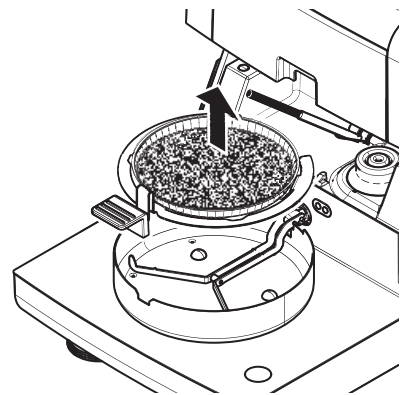
Stop drying

When you stop the measuring process by tapping [**Stop drying**], you can chose between two possibilities:

- **Abort without saving**
  Abort without saving of any data collected until now.
- **Abort measurement and save data**
  Already sampled data are stored and an entry will be made in the results. The result is marked as aborted.

Adding a comment

At the end of a measurement you can add a comment to the result of the measurement. This comment is stored in the measurement result and can be printed. A comment can only be entered before leaving the current measurement.

1   To create a comment, tap [**Note**].

   ⇨ The keyboard dialog appears.

2   Enter a comment.

3   Confirm with [**OK**].

9.2   Work with Weighing-in Aid

The weighing-in aid can be defined for each method and facilitates weighing in of the sample to a target value. This is particularly necessary if you require all the samples of a method you wish to process to have same weight in order to improve the repeatability of the measurement results. In addition, the weighing-in aid can be set as active so that the drying process cannot be started if the weight of sample is outside the set tolerance. You are therefore compelled to weigh-in the correct quantity of sample. If all sample weighed are within tolerances then this will improve the repeatability. The weighing-in aid is available only if start weight has been activated. For further information **see** Settings of Start Weight (page 70).
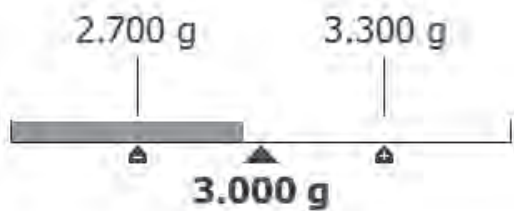
Icon	Function
▲ (–)	Lower weight limit (tolerance range)
▲	Target weight
▲ (+)	Upper weight limit (tolerance range)

9.3   Using Shortcuts

Navigation for managing shortcuts: **Home** > **Measurement** > **Method name** > [⬀]

Shortcuts allow you to start methods directly from the home screen. Shortcuts are user-specific, i.e. each individual user can have his own shortcuts for the most common tasks.

You can define the following parameters:

Parameter	Explanation	Values
Shortcut name	Defines a name for the shortcut. It is recommended to choose a short name because only approx. 8 characters are displayed on the shortcut. Name should be unique and unambiguous.	**any**
Method name	Shows the name of the method. The name of the method is the target of the shortcut and can not be changed.	**none**

Defining a shortcut

▶ Menu **Measurement** is activated.

▶ The method is selected.

1 Tap [⤢].

⇨ Window **My shortcuts** appears.

2 Tap **Add a shortcut to my home for this method...**. (To abort, tap [**X**].)

⇨ **New shortcut** appears.

3 To enter a name for the shortcut if needed, tap **Shortcut name**.
Note
It is recommended to choose a short name because only approx. 8 characters are displayed on the shortcut. Name should be unique and unambiguous.

4 Confirm with [**OK**].

5 To store the setting, tap [**Save**].
To abort, tap [**Cancel**].

⇨ The shortcut is added to the home screen.

Editing a shortcut

▶ The method is selected.

1 Tap [⤢].

⇨ Window **My shortcuts** appears.

2 Tap **Edit this shortcut...**. (To abort tap [**X**].)

⇨ **Shortcut properties** appears.

3 To edit the name of the shortcut, tap **Shortcut name**.

4 Confirm with [**OK**].

5 To store the setting, tap [**Save**].
To abort, tap [**Cancel**].

Removing a shortcut

▶ The method is selected.

1 Tap [⤢].

⇨ Window **My shortcuts** appears.

2 Tap **Edit this shortcut...**. (To abort, tap [**X**].)

⇨ **Shortcut properties** appears.

3 To remove the shortcut, tap [**Remove**].

⇨ A message window appears.

4 Confirm with [**Remove**]. (To abort, tap [**Cancel**].)

⇨ The shortcut is removed from the home screen.

10 Results

10.1 Graphical Evaluations of Measurement Results

Navigation: Home > **Results**

This function allows you to manage and evaluate measurement results.

1

3

2

4

5a

5b
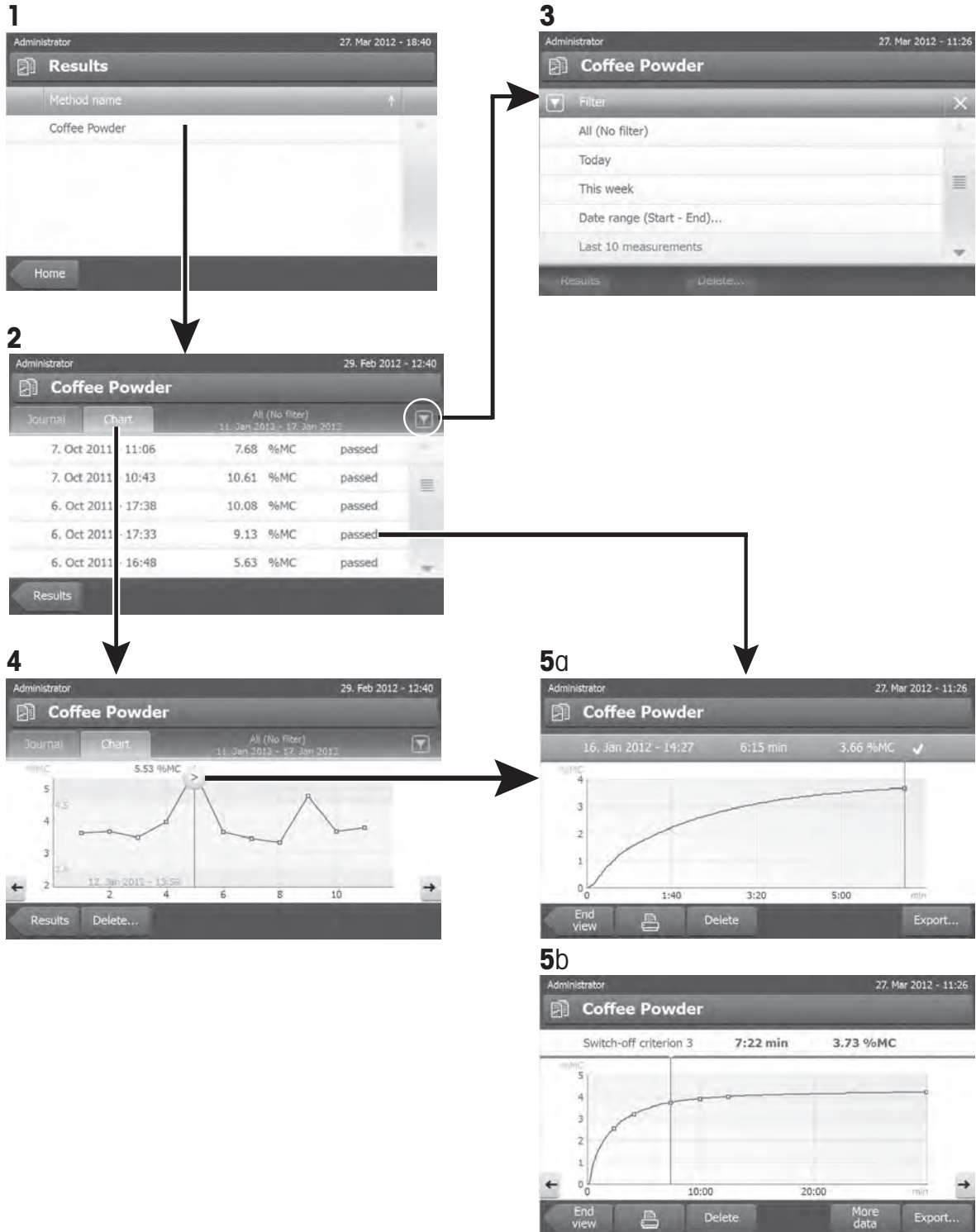
1 Method list

– Tap the method you want to evaluate.

⇨ The journal view appears.

2 Journal view

The journal view allows you to start different graphical evaluations from a measurement series. You can perform the following functions:

– To start **filter function**, tap [▼].

⇨ The filter menu appears.

– To start **chart view**, tap [**Chart**].

⇨ The chart view of the series of measurement appears (4).

– To start **graphic view**, tap a measurement result.

⇨ The graphic view appears (5).

3 Filter menu

The filter function allows you to evaluate the measurement series according to various criteria. You can select the following criteria:

• **All (No filter)**
• **Today**
• **This week**
• **Date range (Start - End)...**
• **Last 10 measurements***
• **Last 20 measurements**

– Tap [**X**] to close filter menu.

* Factory setting

4 Chart view

This view allows you to display the results of a series of measurements depending on the filter settings. If you have defined the control limits in the method, they are diagramed in the results.

The ⊙ marked measuring point is displayed with date, time, and the measurement result. You can perform following functions:

– To jump forward to the next measurement result, tap [->].

– To jump backwards to the previous measurement result, tap [<-]. Alternatively, tap directly on the desired measurement point.

– To recall the full measurement curve of the corresponding measurement, tap [⊙].

5a Graphics view

With this function you can display a graphical view of the detailed results of a single measurement. If you have defined the control limits in the method, passed, warned or failed status is shown, **see** Control limits (page 71).

You can perform the following functions:

Printing result

– To print the result, tap [🖶].

Exporting result

– To export the result, tap [**Export**].

See Exporting Results (page 84).

Deleting result

– To delete this measurement result, tap [**Delete**] (depending on user rights).

More data

– To display more measurement data, tap [**More data**]

5b Displaying results of test measurements

For test measurements **see** Test a Method (page 75).

This view allows you to display the results of the determined switch-off criteria. Each criterion is marked as a measuring point and displayed with its result. You can perform following functions:

– To jump forward to the next measurement result, tap [->].

– To jump backwards to the previous measurement result, tap [<-]. Alternatively, tap directly on the desired measurement point.

Also see

• Exporting Results (page 84)

10.2 Information on Printouts

The illustrations in this chapter show examples of a standard measurement printout (factory setting) and a short measurement printout. The level of detail on the printouts depends on the selected settings in the menu.

Structure of the standard printout type

```
-MOISTURE DETERMINATION-

METTLER TOLEDO
Halogen MoistureAnalyzer

Type              HS153
SNR(Drying Unit)
            B206684647
SNR(Terminal)
            B206684647
SW(Drying Unit)    1.10
SW(Terminal)       1.20

Method name         NEG
Drying prog    Standard
Drying temp      105 °C
Switch Off    3(1mg/50s)
Display mode        %MC
Start weight        OFF
Control limits      OFF
Start mode    Automatic

User name  Administrator

Start weight   0.487 g
Total time     0:22 min
Dry Weight     0.470 g

Moisture content
               0.017 g

End result     3.29 %MC

Note

Signature

.......................

   14.10.2011    12:01

---------- END ---------
```

Structure of the short printout type

```
-MOISTURE DETERMINATION-

METTLER TOLEDO
Halogen MoistureAnalyzer

Type              HS153
SNR(Drying Unit)
            B206684647
SNR(Terminal)
            B206684647
SWK(Drying Unit)   1.10
SWT(Terminal)      1.20

Method name         NEG
Drying prog    Standard
Drying temp      105 °C
Switch Off    3(1mg/50s)

User name  Administrator

Start weight   0.487 g
Total time     0:22 min
End result     1.79 %MC
Note

   14.10.2012    12:01

---------- END ---------
```

Special events

The **sample chamber was opened and closed** during drying process. When the sample chamber is open, drying is interrupted and then continued when the chamber is closed.

```
01:00 min       2.26 %MC
01:20 min         opened
01:28 min         closed
02:00 min       3.49 %MC
```

The **drying process has been aborted** by tapping [**Stop drying**] and the measurement result at the time of the abort is not recorded as it could be wrong.

```
 01:00 min      2.26 %MC
 02:00 min      3.49 %MC

ABORTED

 14.10.2011    12:01
```

Printing the test measurement

During the test measurement a record is printed which explains exactly when and with what measurement result each switch-off criterion was reached.

```
Switch-off crit. 3
  Time          01:21 min
  Dry weight     3.385 g
  Moisture content
                 0.53 %MC
```

10.3 Exporting Results

Results can be exported to an external storage device e.g. memory stick. This data in CSV format can be imported into e.g. MS Excel for further evaluations.

Note
Results cannot be imported in a Moisture Analyzer.

Single result export

You can define the following parameters:

Parameter	Explanation	Values
File name	Defines the name of the new data file.	**any**
Location	Finds the location on the storage device.	**Browse and select**
File type	Defines the type of the data file.	**csv***

* Factory setting

Multiple result export

You can define the following parameters:

Parameter	Explanation	Values
File name prefix	Defines the name of the new data file. Date and time are automatically added by the system.	**any**
Location	Finds the location on the storage device.	**Browse and select**
Export selection	Custom selection of multiple results for the export from selected measurements. The selection can be made via the filter function.	Selection: ☐ ⏐ ☑
Export content	Defines the content of the multiple results export. **Summary export (one file, no intermediate values)**: Results as summary report in one file. **Multiple export (one file per measurement)**: Results with intermediate measurement values as separate files with the same layout as for the single result export.	**Summary export ⏐ Multiple export**
File type	Defines the type of the data file.	**csv***

* Factory setting

Note

- **Summary export**
  - The summary export contains method parameters and the end results per measurement. The intermediate values are not exported.
  - If the method has step drying, the summary export also includes the results per step.
  - If the test measurement was executed, then the summary export also includes the results for each switch-off criteria reached during the test measurement.
- **Multiple export**
  - The multiple export contains method parameters, method data, intermediate values and end results per measurement.
  - Each measurement is exported as a single file.

Procedure

▶ Result is activated.

▶ An external storage device is connected e.g. memory stick.

1 To start, tap [**Export**]
   ⇨ **Export Results** appears.
2 Tap **Location** > **Browse and select**.
   ⇨ **Location** appears.
3 Select location for file and confirm with [**OK**].
4 Enter new file name, if needed.
5 To start export, tap [**Export**].

11 Maintenance

WARNING

Risk of electric shock

The instrument must be disconnected from the power supply, before cleaning or other maintenance work to be performed.

Note

- The thermal overload protection can not be reset by the user.
- The halogen lamp can not be replaced by the user.

In such cases, contact your METTLER TOLEDO representative.

11.1 Cleaning

CAUTION

Danger of burns

The interior parts of the heating module as well as the parts in the sample chamber could be very hot.

- Wait until the heating module has cooled down completely.

To obtain precise measurement results, we recommend you to clean the temperature sensor and the protective glass of the halogen lamp regularly. Please note the following directions for cleaning your instrument.

General

Your Moisture Analyzer is made from high quality, resistant materials and can therefore be cleaned with a commercially available, mild cleaning agent e.g. isopropanol.

Attention

- Use a lint-free cloth for cleaning.
- Ensure that no liquids enters the interior of the instrument.
- **Heating Module**
  Clean the exterior of the heating module with a mild cleaning agent although the housing is extremely rugged and resistant to solvents.
- **Terminal**
  On no account use cleaning agents, which contain solvents or abrasive ingredients, as this can result in damage to the terminal overlay.
- Never open the housing of the instrument – they contain no components, which can be cleaned, repaired or replaced by the user.

Note
After the temperature sensor or the protective glass have been cleaned, we recommend adjusting the heating module using the temperature adjustment kit, **see** Temperature Adjustment (page 54).

11.1.1 Sample Chamber

▶ Sample chamber is open.

1 Remove the sample pan handler (1), the sample pan holder (2) and the draft shield (3) for cleaning.

2 Carefully remove any deposits from the black temperature sensor (4).

1 2 3 4
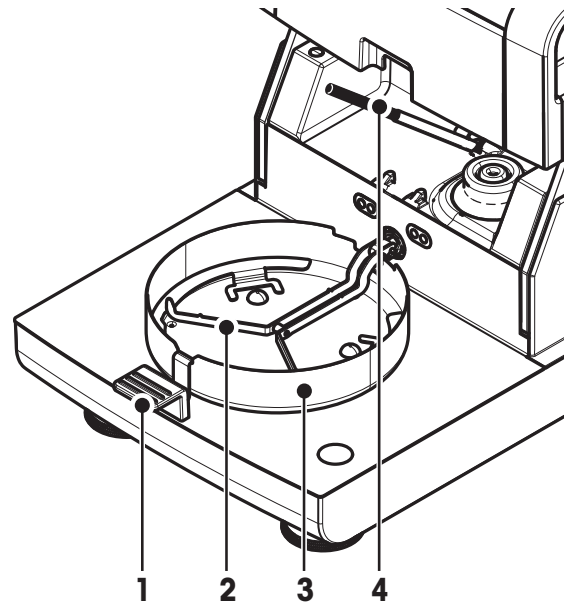
11.1.2 Heating Module

3

2

4

1
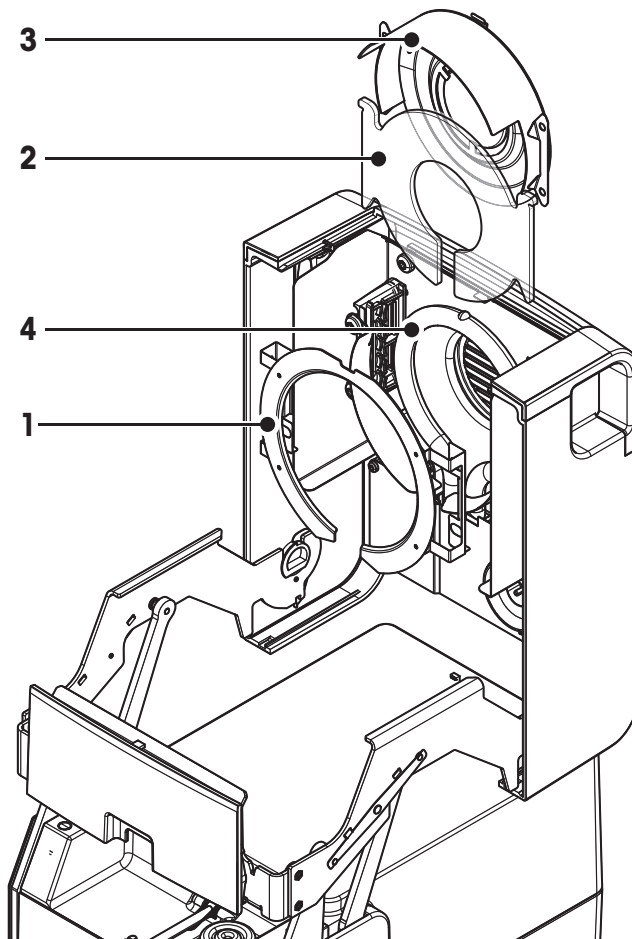
1 Reflector ring
2 Protective glass
3 Reflector with inspection window glass
4 Halogen lamp

To clean the protective glass, the reflector as well as the reflector ring, you should first open the heating module.

Attention

Avoid touching the round halogen lamp. If you have to remove any splashes, deposits, or spots of grease from the halogen lamp, it is advisable to use a weak organic solvent such as, for example ethanol. Ensure that the lamp is cool. **Do not remove the halogen lamp!**

Opening heating module for cleaning

▶ Sample chamber is open.

1 Inside, there is a locking device on each side. Push both outwards (together) for unlocking.
Note
Do not hold the module while unlocking it.

⇨ The upper part has been unlocked on both sides.

2 Open the heating module.
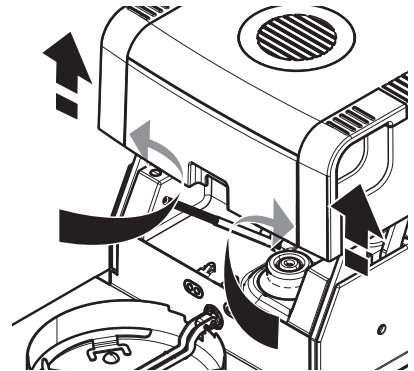
Removing reflector ring for cleaning

Note

For cleaning the protective glass, removing the reflector ring is not mandatory.

▶ Heating module is open.

1 On both sides and at the same time, pull the two lugs outwards.

2 Unhook the ring and remove it from the bracket.
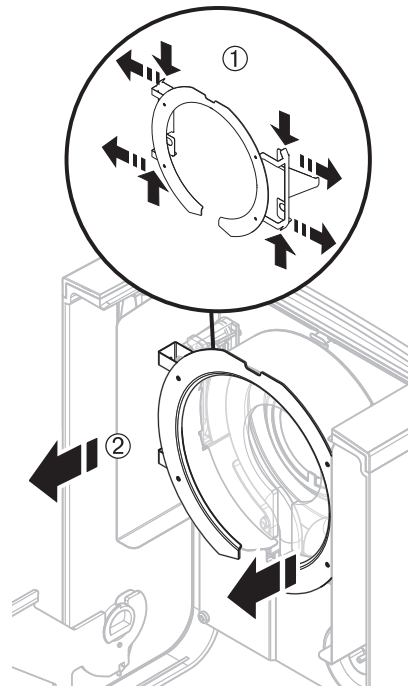
Removing reflector with inspection window glass for cleaning

▶ Reflector ring is removed.

1 To unlock, pull the spring clip forwards.

2 Pull out the reflector upwards off the bracket.
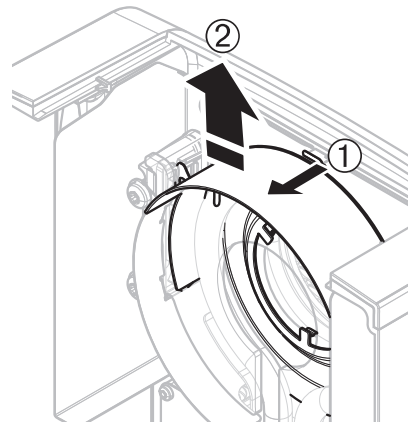
Removing protective glass for cleaning

▶ Reflector is removed.

− Pull out the protection glass upwards off the bracket.
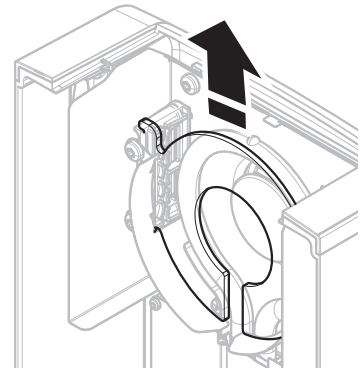
Reassembling after cleaning

Reassemble all parts in the opposite order.

▶ All parts are cleaned.

1 Insert the protective glass.

2 Insert the reflector with inspection window glass (until it clicks).
Note
The lamp must be located in front of the reflector. Do not touch the lamp with your fingers.

3 Insert the reflector ring.
Attention
Observe the correct position! Assure that the ring is properly fitted.

4 Close the heating module (until it clicks).
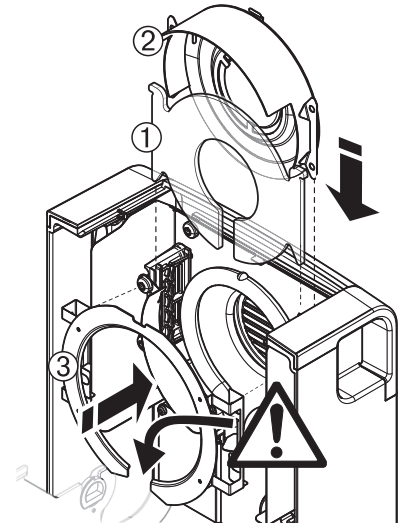
11.1.3 Fan Grill

The air inlet of the fan is located at the rear of the instrument and its exterior should be cleaned from time to time to free it from any dust deposits.

11.2 Dust Filter

If you use the Moisture Analyzer in a dusty environment with an dust filter, check the filter at regular intervals. Replacement Filters **see** Accessories and Spare Parts (page 100).

− Replace the filter, if needed.
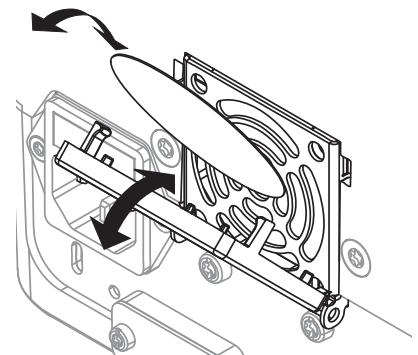
11.3 Replacing Power Line Fuse

> **CAUTION**
>
> **Safety risk or damage of the instrument**
>
> Do not use a fuse of a different type or rated value, or short out (bridge) the fuse, because this can put your safety at risk and damage the instrument!

If the display of your terminal remains dark after switching on, in all probability the power line fuse of the drying unit is blown.

The power line fuse is located on the back of the drying unit. To change the fuse, proceed as follows:

1   Pull out the power cord.

2   Slide out the fuse holder (1) with a suitable tool such as a screwdriver.

3   Remove the fuse (3) and check its condition.

4   If the fuse is blown, replace the fuse with one of the same type and the same rated value (5 x 20 mm, T6.3H 250 V).
    Note:
    A spare fuse is located in the holder (2).
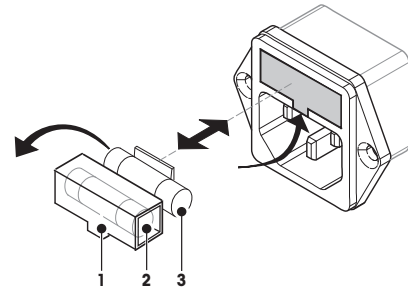
Fuse **see** General Technical Data (page 94)

11.4 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.

12 Troubleshooting

Errors can occur during operation of your instrument. This section describes how you can rectify these errors.

12.1 Error Messages

Most error messages appear in plain text directly in the respective application, and usually accompanied by a text describing how to correct the error. Error messages of this type are self-explanatory and therefore are not mentioned below. The following error messages can appear instead of the weighing result.

Error Message	Cause	Rectification
Weight display		
	Overload – The weight on the pan exceeds the weighing capacity of the balance.	– Reduce the weight of the sample.
	Underload – Sample pan holder is missing.	– Insert sample pan holder. If needed, reboot the system by disconnecting and connecting to the mains.
0.0000	**Weight display flashes / Out of zero range** – When the instrument was switched on or upon zeroing, one or more limits were exceeded. The usual reason for this message to appear is when there is a weight on the weighing pan when the balance is switched on.	– Remove the weight.
Adjustment		
Unstable weight.	**No stability** during adjustment.	• Ensure ambient conditions and an optimum location. • Take care that no part of the sample or the sample pan touches the draft shield or the sample pan handler. • Ensure that the sample pan holder is correctly installed as well as not defect. • Highly volatile substances in the sample also prevent a stable weighing result being detected since the sample is continuously losing weight.
Weight out of range.	Either **no weight**, or the **wrong weight**, has been placed on the sample pan during adjustment. (This message is also displayed if you do not remove the weight when prompted to do so by the instrument.)	– Repeat the adjustment process and load the required adjustment weight.

12.2 Status Messages

Status messages are displayed by means of small icons in the status bar of the display. For further information **see** Status Message Icons (page 16). The status icons indicate the following:

	Cause	Rectification
⠸⠸⠸ (hot surface icon)	Hot surface Indicates that the temperature inside the sample chamber is over approximately 50°C. The parts in the sample chamber and the sample itself can be very hot and there is a risk of burns.	The status icon will disappear as soon the temperature inside the sample chamber is less than approximately 50°C.
(battery icon)	The battery in your instrument must be replaced. This battery ensures that the date and time are not lost when the instrument is disconnected from the power supply.	– Contact your METTLER TOLEDO representative as soon as possible. ⇨ A service technician will change the battery.
(wrench icon)	Your instrument is due for servicing.	– Contact your METTLER TOLEDO representative as soon as possible to have a technician service your instrument.

12.3 What to Do if…

Symptom	Countermeasure
Display remains dark after switching on	• Ensure that the terminal is properly connected to the drying unit. • Ensure that the instrument is connected to the power supply and the power is actually supplied. • Check the power line fuse of the drying unit and replace if necessary, **see** Replacing Power Line Fuse (page 90). • If the problem persists, contact a METTLER TOLEDO representative.
Keys and buttons do not respond	• Reboot the system by disconnecting and connecting to the mains. • If the problem persists, contact a METTLER TOLEDO representative.
Printer that is connected does not print	• Ensure that the printer is on and enabled in the menu. **See** Peripherals (page 35) • Check the printer settings. **See** Recommended Printer Settings (page 105).
Incorrect characters are printed	• Change the bit/parity setting of the printer and the instrument to **8/NO**. • Check if both instruments have the same baud rate setting, **see** Peripherals (page 35). • Use the correct character sets, **see** Recommended Printer Settings (page 105).
Measurement takes too long	• You have selected an unsuitable switch-off criterion, **see** Settings of Switch-off Criterion (SOC) (page 66). • An excessive amount of sample can also be the cause of slow drying, likewise samples which tend to form a skin which hinders vaporization. Perform a measurement at higher temperature. • Enlarge the surface of the sample, e.g. by crushing or grinding. • Use absorbent glass fiber filters for liquids. • If the sample is very temperature sensitive and decomposes, reduce the temperature. • If measuring is unstable, check correct positioning of pan, sample handler, sample, draft shield or sample holder.
Instrument does not heat after the start	• Halogen lamp is defective or the heating module is overheated and the thermal overload protection has switched off the heating. In case, contact your METTLER TOLEDO representative.

Symptom	Countermeasure
Measurement results are not repeatable	• Support on which the instrument is standing is not sufficiently stable. Use a stable support.
	• Surroundings are very unstable (e.g. vibrations, air draft, humidity). Provide better environmental conditions.
	• Sample has more or less moisture between sampling and starting the drying process.
	• Sample is not evenly dispersed on the pan.
	• Start weight has not always the same value.
	• Samples are not homogeneous, i.e. they have different compositions. The more inhomogeneous a sample, the larger the amount of sample needed to obtain a repeatable result.
	• Selected drying time is too short for the "Timed switch-off" criterion. Extend the drying time or select a suitable switch-off criterion "Weight loss per unit of time".
	• Sample does not become completely dry (e.g. owing to skin formation). Dry the sample with the aid of glass fiber discs.
	• Selected temperature is too high and the sample has oxidized or decomposed. Lower the drying temperature.
	• Sample boils and the splashed drops continuously change the weight. Lower the drying temperature.
	• Granulation is not homogeneous or too large.
	• Insufficient heating power because the protective glass of the halogen lamp is dirty. Clean the protective glass, **see** Cleaning (page 86).
	• Temperature sensor is contaminated or faulty. Clean the temperature sensor, **see** Cleaning (page 86).
	• If the problem persists, contact a METTLER TOLEDO representative.

13 Technical Data

13.1 General Technical Data

Drying Unit

Heating Module	Halogen ring-shaped radiator
Temperature range	40–230 °C
Temperature step	1 °C
Temperature programs	standard, rapid, gentle

Balance

Maximum capacity	150 g
Readability	1 mg
Minimum sample weight	0.1 g
Weighing technology	Monobloc
Adjustment	External weight

Moisture Content

Readability	0.01%
Repeatability (sd) with 2 g sample	0.05%
Repeatability (sd) with 10 g sample	0.01%

Materials

Drying Unit

Housing	Plastic, PBT, Crastin SO653-GB20
Inspection window grill	Plastic, PEEK-HT G22 (UL94-V0)
Protective glass	Glass ceramics
Halogen lamp	Quartz glass
Reflector	Stainless steel, X2CrNiMo17-2 (1.4404)
Reflector bracket	Plastic, PEEK-HT G22 (UL94-V0)
Draft shield, interior bottom plate	Stainless steel, X2CrNiMo17-2 (1.4404)

Terminal

Top housing	EN ZL-ZnAl4Cu1 (EN Zl-0410)
Bottom housing	PA12 GB30

Protection and Standards

Overvoltage category	Class II
Degree of pollution	2
Standards for safety and EMC	see Declaration of Conformity (part of standard equipment)
Range of application	for use in dry interior rooms

Environmental Conditions

Height above sea level	up to 4000 m
Ambient temperature range	5 °C to 40 °C
Relative air humidity	10% to 80% at 31 °C, linearly decreasing to 50 % at 40 °C, noncondensing

| Warm-up time | At least 60 minutes after connecting the instrument to the power supply; when switched on from standby, the instrument is ready for operation immediately. |

Power Supply

110 V AC Version	100 V–120 V, 50/60 Hz, 4 A
230 V AC Version	220 V–240 V, 50/60 Hz, 2 A
Voltage fluctuations	-15%+10%
Power load	max. 450 W during drying process
Power line fuse	5 x 20 mm, T6.3H 250 V

Interfaces

Drying Unit	1x System (Terminal – drying unit)
Terminal	• 1 x RS232C (9-pin socket)
	• 2x USB Host (Type A socket), USB 1.1 Supported memory sticks up to 32 GB
	• 1x USB Device (Type B socket), USB 1.1
	• 1x Slot for memory cards SD/SDHC up to 32 GB (SDXC not supported)

Hardware

Drying unit

Sample chamber opening/closing	manual
Leveling	2 leveling screws
Sample pan	Ø 90 mm
Thermal overload protection	Bimetallic-element switch in heating module
Dimensions (w x h x d)	199 x 139 x 428 mm **See** Dimensions (page 97)
Weight, ready to measure	6.8 kg

Terminal

Display	WVGA color display, resistive touch-sensitive
Reading angle	Adjustable, 2 folding feet
Dimensions (w x h x d)	200 x 63.5/79.5 x 134.5 mm **See** Dimensions (page 97)
Weight	1.2 kg

13.1.1 Explanatory note to periodic inspections in accordance with EU Directive 2001/95/EC

This instrument is provided with a 3-pin plug. The earth conductor is led into the instrument and connected to the bottom and the rear panel. The other accessible metal parts are not connected to the earth conductor. These parts are reinforced insulated and must not be connected to the earth conductor according to current European standards.

The earth connection must be checked on the metallic rear panel.
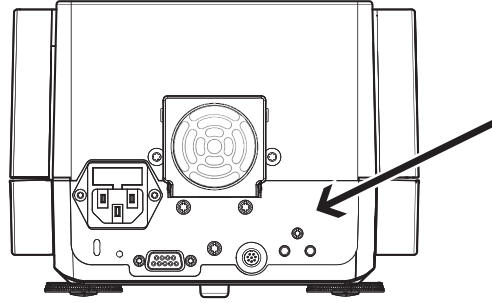
Further information about conformance of this instrument can be found in the Declaration of Conformity which is coming with the product or can be downloaded from the internet.

▶www.mt.com/hxhs

13.2 Dimensions

(all dimensions in mm)

Drying Unit
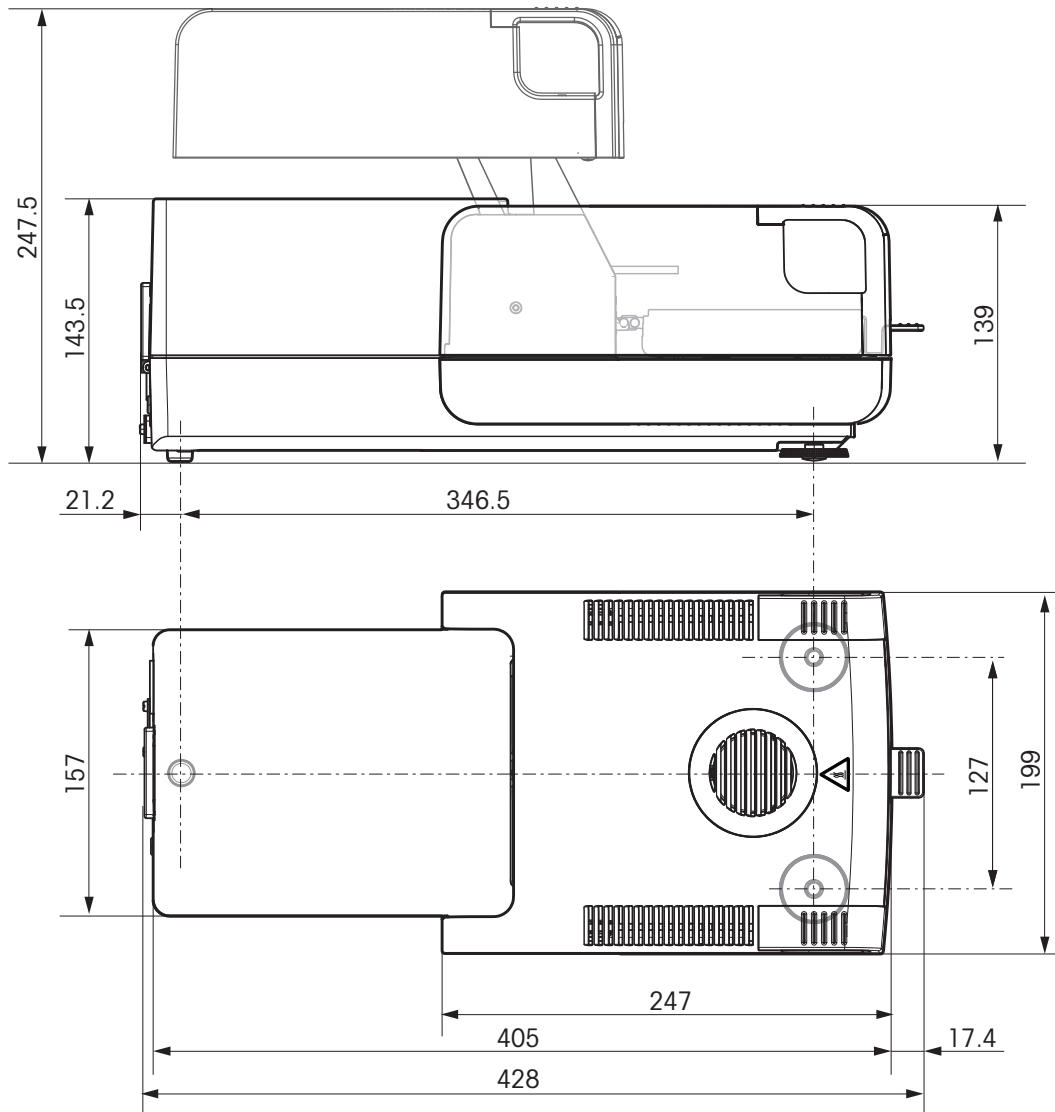
Terminal
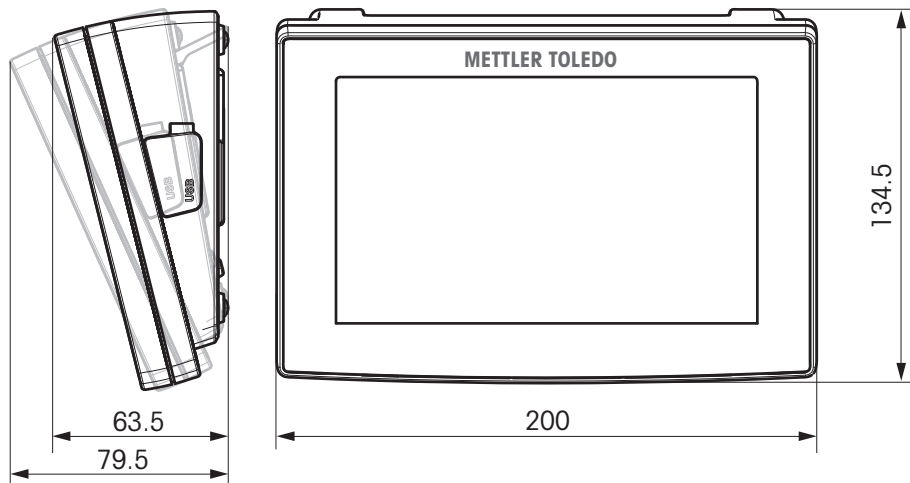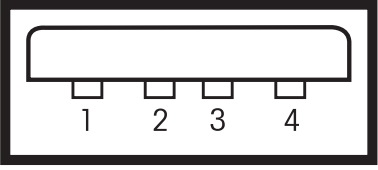
13.3 Interfaces Specification
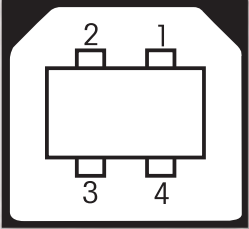
13.3.1 RS232C

Schematic	Item	Specification
	Interface type	Voltage interface according to EIA RS-232C/DIN66020 CCITT V24/V.28)
	Max. cable length	15 m
	Signal level	Outputs: +5 V … +15 V (RL = 3–7 kΩ) −5 V … −15 V (RL = 3–7 kΩ) Inputs: +3 V … +25 V −3 V … -25 V
	Connector	Sub-D, 9-pole, female
	Operating mode	Full duplex
	Transmission mode	Bit-serial, asynchronous
	Transmission code	ASCII
	Baud rates	600, 1200, 2400, 4800, 9600, 19200, 38400 (software selectable)
	Bits/parity	7-bit/none, 7-bit/even, 7-bit/odd, 8-bit/none (software selectable)
	Stop bits	1 stop bit
	Handshake	None, XON/XOFF, RTS/CTS (software selectable)
	Power supply for 2nd display	+ 12 V, max 40 mA (software selectable, 2nd display mode only)
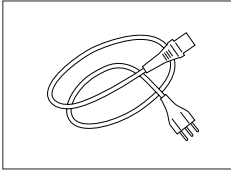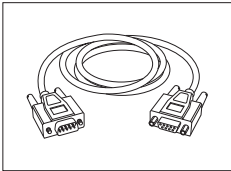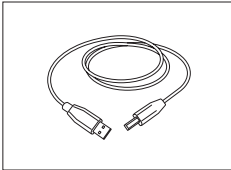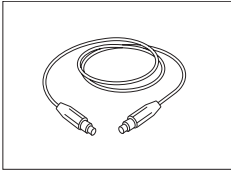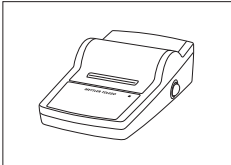
13.3.2 USB Host

Schematic	Item	Specification	
	Standard	In conformity with USB Specification Revision 1.0/1.1	
	Speed	Full speed 12 Mbps (requires shielded cable)	
	Power usage	Max. 500 mA	
	Connector	Type A	
	Pin assignment	1	VBUS (+5 V DC)
		2	D- (Data -)
		3	D+ (Data +)
		4	GND (Ground)
		Shell	Shield

13.3.3 USB Device

Schematic	Item	Specification
	Standard	In conformity with USB Specification Revision 1.1
	Speed	Full speed 12 Mbps (requires shielded cable)
	Function	CDC (Communication Device Class) serial port emulation
	Power usage	Suspended device: Max 10 mA
	Connector	Type B

1	VBUS (+5 VDC)
2	D– (Data –)
3	D+ (Data +)
4	GND (Ground)
Shield	Shield

14 Accessories and Spare Parts

Description	Part No.

Power supplies

Country-specific 3-Pin power cable with grounding conductor.

Description	Part No.
Power cable AU	00088751
Power cable BR	30015268
Power cable CH	00087920
Power cable CN	30047293
Power cable DK	00087452
Power cable EU	00087925
Power cable GB	00089405
Power cable IL	00225297
Power cable IN	11600569
Power cable IT	00087457
Power cable JP	11107881
Power cable TH, PE	11107880
Power cable US	00088668
Power cable ZA	00089728

Cables for RS232C interface

Description	Part No.
RS9 – RS9 (m/f): connection cable for PC, length = 1 m	11101051

Cables for USB interface

Description	Part No.
USB (A –B) connection cable for connection to PC, length = 1 m	12130716

Cables for terminal

Description	Part No.
Terminal cable, length = 0.68 m	30003971

Printers

Description	Part No.
RS-P25 printer with RS232C connection to instrument	11124300
Paper roll, set of 5 pcs	00072456
Paper roll, self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
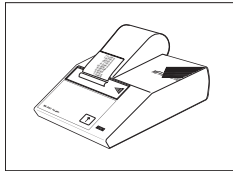
	RS-P42 printer with RS232C connection to instrument	00229265
	Paper roll, set of 5 pcs	00072456
	Paper roll, self-adhesive, set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975

Sample Pans
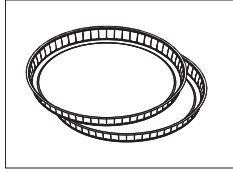
	Aluminum sample pan, HA-D90, set of 80 pcs	00013865
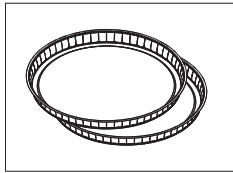
	Professional aluminum sample pan, extra strong, set of 80 pcs	11113863
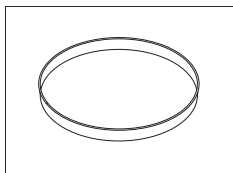
	Stainless steel reusable sample pan 6 mm, DA-DR1, set of 3 pcs	00214462

Adjustment Parts
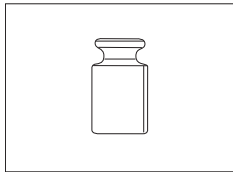
	Certified adjustment weight, 100 g (F1)	11119531

	OIML / ASTM Weights (with calibration certificate) see **www.mt.com/weights**	
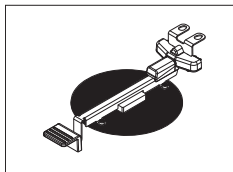
	HX/HS Temperature adjustment kit, certified	30020851

	SmartCal™, Moisture Analyzer Reference Substance	
	cSmartCal™, certified, 12 tests	30005793
	cSmartCal™, certified, 24 tests	30005791
	SmartCal™, 12 tests	30005792
	SmartCal™, 24 tests	30005790

Anti-theft devices
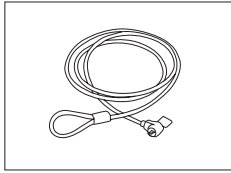
	Steel cable	11600361

Miscellaneous
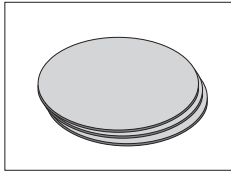
	Glass fiber filter (for Liquids), set of 100 pcs	00214464
	Dust filter, set of 50 pcs	30020838
	Protective cover for Terminal	30003957
	Transport case	30020836
	Stand for terminal	30018474
	Printer holder for mounting on the stand for terminal.	30066692
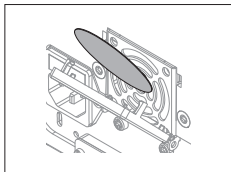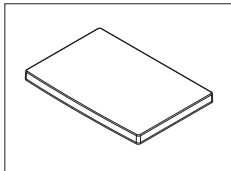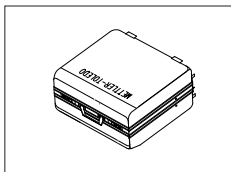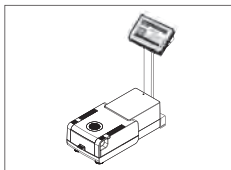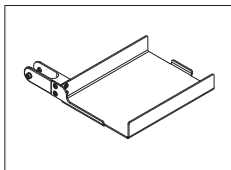
Spare Parts
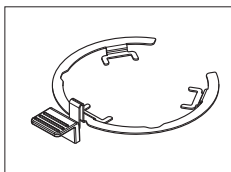
	Sample pan handler	30020852
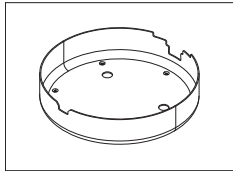
	Draft shield	30007150
	Sample pan holder	11148108
	Reflector without inspection glass	11148330
	Inspection glass for reflector	11148421
	Reflector ring	30006700
	Protective glass	11148416
	Leveling foot	11106323
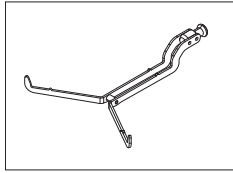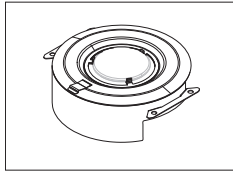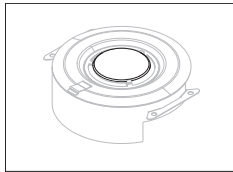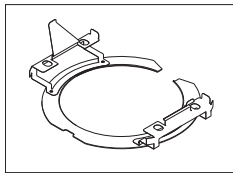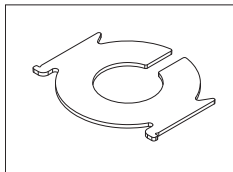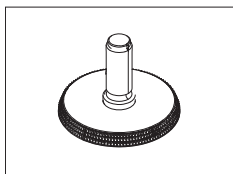
15 Appendix

15.1 How to Obtain Best Results

In this Section you will find important information on how to obtain optimum results. You will discover which parameters influence the measurement process and how you can optimize the settings of your instrument to achieve the best measurement results.

15.1.1 Measurement Principle of Halogen Moisture Analyzer

Your instrument performs measurements based on the **thermogravimetric principle**, i.e. the moisture is determined from the weight loss of a sample dried by heating.
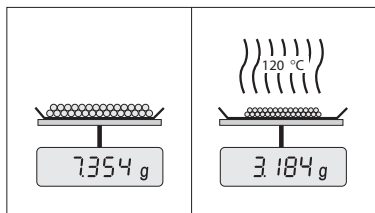
In principle, your instrument thus comprises two instruments: An analytical balance and a heating module. In contrast to other thermogravimetric methods (drying oven, infrared, microwave), the Halogen Moisture Analyzer operates with halogen heating technology. This ensures fast heating of the sample and thus guarantees rapid availability of the measurement results.

Irrespective of the measurement method, a correct preparation of the sample and the correct choice of the following measurement parameters improve the quality of the measurement result:

- Sample size
- Drying temperature
- Switch-off mode
- Drying time

Attention
Inappropriate setting of these parameters can cause the results to be incorrect or misleading. For this reason, check that the results for each type of sample are what might reasonably be expected.

You will find detailed information on the relationships between these parameters in the delivered application brochure «Guide to Moisture Analysis» or **see** Accessories and Spare Parts (page 100).

In practice not only the quality of the measurement results, but also the speed of the measurement process is important. Thanks to its drying principle (heat generated by a halogen radiator), the Halogen Moisture Analyzer is very fast. You can increase the speed even further through optimum setting of the instrument, e.g. using the **Drying programRapid**.

The optimum drying temperature and the drying time are dependent on the nature and size of the sample and on the desired accuracy of the measurement results. These can be determined only by experiment. The Halogen Moisture Analyzer supports you in this task: It offers result recording of test measurements in the menu **Method Definition**.

15.1.2 Notes on Adjustment of Balance and Heating Module

The balance and the heating module in your drying unit can be adjusted using the appropriate accessories, **see** Accessories and Spare Parts (page 100). The heating module and the balance can also be tested (to check the adjustment). The user can define a test weight or the test temperature, together with permissible tolerances for this test. A test report can be printed out showing the test result has passed or failed.

A Moisture Analyzer is typically used in place of or in addition to the drying oven method. In an oven heat energy is transferred by the flow of air, which establishes an equilibrium between the sample temperature and the ambient temperature. This is not the case in a Moisture Analyzer. The actual sample temperature primarily depends on the specific absorption properties of the sample (dark samples absorb more heat), which can change during the measurement process. There can also be differences between the temperature at the surface of the sample and the temperature inside the sample. The heat output is therefore not dependent on the true sample temperature but instead is regulated by a temperature sensor underneath the halogen heating module.

For the reasons explained above, the sample temperature will be slightly different than the temperature shown on the instrument display. By regularly testing or adjusting the drying unit, you will ensure a consistent and reproducible heat output for the entire lifetime of your instrument.

Note:

- METTLER TOLEDO offers an adjustment service – please contact your METTLER TOLEDO representative.
- We recommend to adjust the instrument exclusively under operating conditions.
- After the temperature sensor or the protective glass have been cleaned, we recommend adjusting the heating module using the temperature adjustment kit, **see** Accessories and Spare Parts (page 100). For the procedure for testing or adjusting the drying unit (balance/heating module), **see** Test/Adjust (page 53).

15.1.3 Optimum Sample Preparation

Preparation of the sample is decisive for the speed of the measurement process and the quality of the measurement results.

Note:
Basic rules for the preparation of your sample:
The amount of sample you select should be as small as possible and only as large as necessary.

Excessive amounts of sample require more time for drying and thus prolong the measurement process. If the amount of sample is too small, the measurement result may possibly not be representative of the true moisture content. The following always holds: The greater the inhomogeneity of the sample, the larger the amount of sample needed to obtain a repeatable result .

Distribute the sample evenly over the sample pan

You thus increase the surface area of the sample and facilitate heat absorption. The base of the pan should be evenly covered.

With liquid, fat-containing, melting and highly reflecting samples, you should use the sample with the glass fiber filter available as optional equipment, **see** Accessories and Spare Parts (page 100). This also applies to samples which form a skin on their surface when heated. The glass fiber filter ensures even and rapid heat distribution and prevents the formation of a skin on the sample surface.

15.1.4 Further Information on Moisture Determination

You will find further information on the moisture determination, the importance of the parameters and the preparation of the samples in the delivered application brochure «Guide to Moisture Analysis» dealing with moisture determination, **see** Accessories and Spare Parts (page 100).

Useful tips and a variety of example methods (comparison between Halogen Moisture Analyzer results and the oven drying method) can be downloaded from:

▶ www.mt.com/moisture
▶ www.mt.com/moisture-methods
▶ www.moisture-guide.com

If you require information on specific applications, your METTLER TOLEDO Customer Service will be pleased to help you.

Attention
Moisture determination applications must be optimized and validated by the user according to local regulations. Application-specific data provided by METTLER TOLEDO is intended for guidance only.

15.2 Recommended Printer Settings

English, German, French, Spanish, Italian, Polish, Czech, Hungarian

Printer			
Model	**Char Set**	**Auto baudrate**	**Balance feature**
RS-P25	IBM/DOS	Off	Disable

Printer			
RS-P42	IBM/DOS [1]	—	—

Instrument / Printer				
Model	**Baudrate**	**Bit / Parity**	**Stop Bits**	**Handshake**
RS-P25	9600	8/NO	1	Xon/Xoff
RS-P42	1200	8/NO	1	Xon/Xoff

Brazil Portuguese

Printer			
Model	**Char Set**	**Auto baudrate**	**Balance feature**
RS-P25	IBM/DOS	Off	Disable
RS-P42	— [2]	—	—

Instrument / Printer				
Model	**Baudrate**	**Bit / Parity**	**Stop Bits**	**Handshake**
RS-P25	9600	8/NO	1	Xon/Xoff
RS-P42	— [2]	— [2]	— [2]	— [2]

[1] Printer settings not available.

[2] Required font for this language not available.

15.3 Installing USB Device Driver

For transmitting MT-SICS commands via USB Device interface, a driver needs to be installed on the connected PC. You can find the USB driver installer for download on the METTLER-TOLEDO website:

▶ www.mettler-toledo-support.com

Requirements

- PC with Microsift Windows® operating system (Windows 32-Bit & 64-Bit: Windows 2000, Windows XP, Windows Vista, Windows 7)
- Internet connection and Web browser (e.g. MS Internet Explorer)
- PC to instrument USB connection cable.

Installing USB Driver

Navigation: www.mettler-toledo-support.com > **login** > **Customer Support** > **HS153/HX204 Moisture Analyzers**

1 Click USB Driver.

2 Click USBDriverInstaller.exe.

3 Click [Run] to install (recommended) or [Save] to download.

4 Click [Run]

5 Click [Next] and follow the installer's instructions.
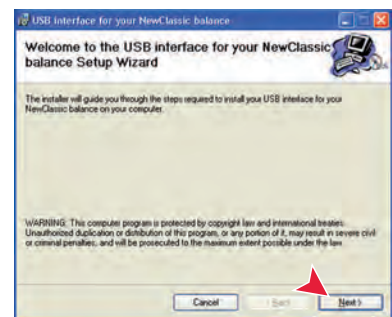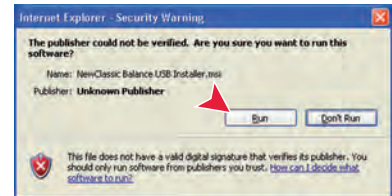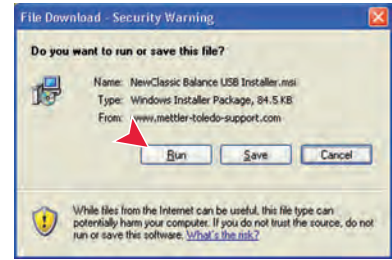
Installing Instrument

1 Switch off moisture analyzer

2 Connect the moisture analyzer to the preferred USB Port on the PC.

3 Switch the moisture analyzer on.

4 Follow the instructions of the wizard and install the software automatically (recommended).
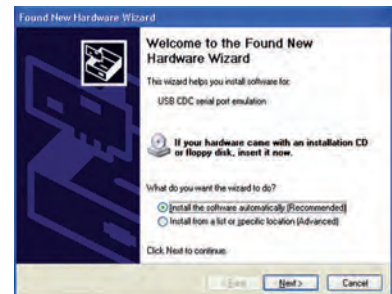
Note

The wizard appears again for each USB port, either on your PC or if another moisture analyzer is connected.

Attention

Do not click [Cancel] as for the connected USB port, it might not be possible anymore to perform the installation process.

15.4 Third Party License/Notice

This section contains Third Party Software Notices and/or Additional Terms and Conditions for licensed third party software components included within SOFTWARE PRODUCT.

This SOFTWARE PRODUCT is based in part on the work of:

- **Qwt project**

  For user's guide **see** http://qwt.sf.net

  For LGPL license V2.1 **see** http://www.gnu.org/licenses/old-licenses/lgpl-2.1.html

- **KompexSQLite**

  For LGPL license V3 **see** http://www.gnu.org/licenses/lgpl.txt

- **Qt library 4.8**

  For LGPL license V2.1 **see** http://qt-project.org/doc/qt-4.7/lgpl.html

  For GPL license V3 **see** http://qt-project.org/doc/qt-4.7/gpl.html

- **decNumber**

  For ICU license V3.68 **see** http://source.icu-project.org/repos/icu/icu/trunk/license.html

- **Simpleini**

  For MIT license **see** http://www.opensource.org/licenses/mit-license.php

16 Index

GWP® – Good Weighing Practice™

The global weighing guideline GWP® reduces risks
associated with your weighing processes and helps to
• choose the appropriate balance
• reduce costs by optimizing testing procedures
• comply with the most common regulatory requirements

▶ **www.mt.com/GWP**

www.mt.com/hxhs

For more information

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