Heat-Drying Moisture Analyzers

MS-74A(T)/MX-53A(T)
MF-53A/ML-53A

ISO 9000 CERTIFIED

Engineered for Accuracy. Designed for Usability.

A&D Company, Ltd.

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Accelerate Your Workflow with Intelligent Moisture Measurement

A&D's new series of moisture analyzers offer a powerful yet user-friendly solution for moisture measurement. With features such as smart temperature optimization, insightful feedback, and flexible program settings, they support reliable results across a wide range of applications and user experience levels.

From Essential to Advanced – Select What Fits

Six moisture analyzers—from high-end touchscreen to cost-effective reverse backlit LCD models—meet the demands of diverse applications and budgets.

Touchscreen models: MS-74AT and MX-53AT

Designed for users who demand both precision and usability, these models feature a 5-inch color touch screen with intuitive navigation, real-time graphical feedback, and advanced support tools. The screen responds to pressure, allowing operation even with thick gloves.

To accommodate users from various regions, the interface supports eleven languages including English, French, German, Italian, Dutch, Spanish, Portuguese, Russian, Korean, Chinese, and Japanese.

Reverse backlit LCD models: MS-74A, MX-53A, MF-53A, and ML-53A

Designed for users who prioritize cost-efficiency and core functionality, these models offer reliable performance with a simplified interface and excellent display visibility. With four models offering different levels of readability, the lineup supports not only high-precision tasks but also applications where moderate accuracy is sufficient.

Effortless operation – Precision and confidence built in

Straightforward moisture measurement with heat-drying technology

The heat-drying method offers a simple and safe approach to moisture analysis. Free from chemical reagents and complex procedures, it enables quick and reliable measurements with minimal training. Ideal for routine use, this method supports consistent results across many types of samples.

Soft-close cover

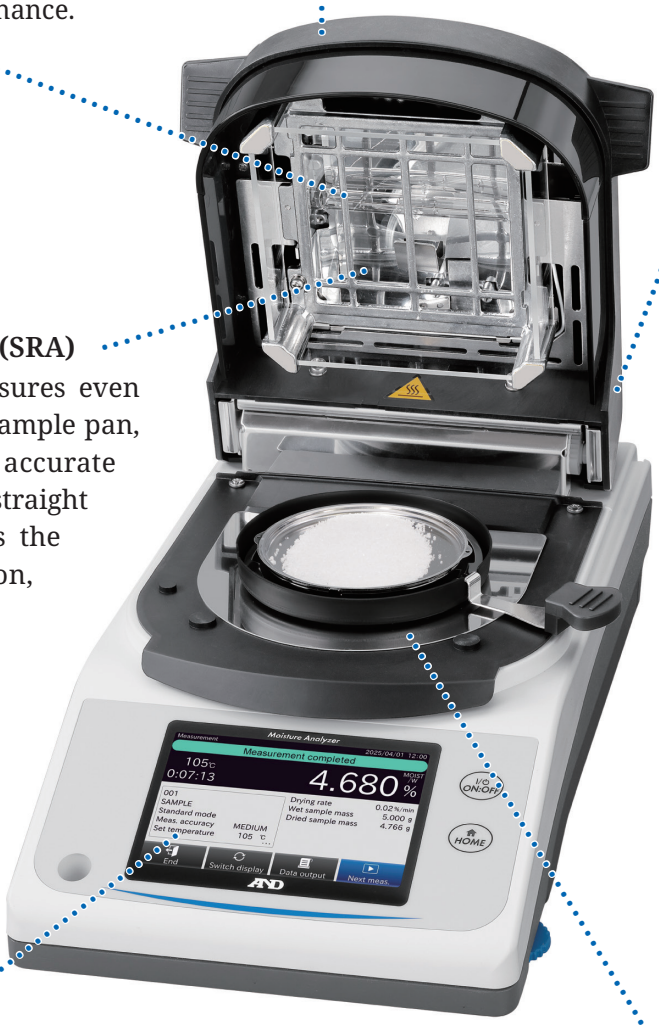
The heater cover is engineered to close gently and safely without impact even if released, ensuring your safety and operational comfort.

Halogen lamp as heater

A powerful 400 W halogen lamp can heat the sample pan area to 200 °C in under two minutes, enabling fast and efficient moisture measurement, with long service life for reduced maintenance.

Automatic tare/measurement start

When enabled, tare and measurement start are triggered automatically by simply closing the heater cover, streamlining operation.



Secondary Radiation Assist (SRA)

The heat-conductive glass ensures even heat distribution across the sample pan, supporting efficient and accurate measurement with a single straight halogen lamp. It also shields the lamp from contamination, making maintenance easier.

Real-time display

Changes in moisture content and drying rate (%/min) are constantly shown during measurement. The touchscreen models also display a real-time graph, making it easy to monitor progress at a glance.

High-precision weight sensor

The Super Hybrid Sensor (SHS), also used in analytical balances, ensures accurate and reproducible measurements with minimal sample quantities, reducing both cost and measurement time.

Preheating for consistent results

To reduce variability in repeated measurements, the preheating function warms the sample pan area before measurement begins. This helps stabilize thermal conditions, especially for the first measurement. The duration is user-selectable, up to 30 minutes.

= Available for the MS-74AT/MX-53AT (touchscreen models) only

From setup to evaluation – Precision made simple

Versatile measurement capabilities

Three measurement modes (Standard, Timer, and Custom), four heating patterns (Standard, Ramp, Step, and Quick), and five calculation units (moisture content based on wet weight, moisture content based on dry weight (Atro), solid content, ratio, and gram) provide the flexibility to handle a wide range of samples and applications. You can tailor the process to suit specific sample characteristics and analytical requirements.

Measurement modes

Standard mode	Streamlines setup by automatically configuring the sample weight range, termination value*1, and minimum display based on your selected accuracy level. You simply choose the heating pattern, temperature, and accuracy—High (priority on accuracy), Standard, or Low (priority on measurement time).
Timer mode	Measures moisture content by heating the sample for a fixed duration—from 1 to 480 minutes. The measurement ends automatically once the set time has elapsed.
Custom mode	Allows you to fine-tune measurement conditions, including the termination value*1. The measurement ends automatically when the set termination value is reached.

*1 Drying rate (%/min) threshold for ending measurement (as the sample dries, the drying rate decreases).

Heating patterns

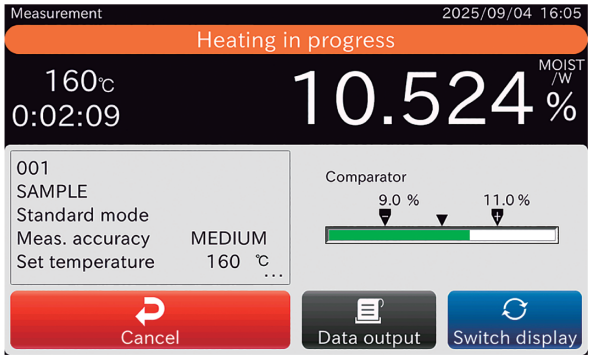
Standard	Ramp	Step	Quick
			
Maintains a constant drying temperature.	Gradually increases the drying temperature.	Uses two different drying temperatures.	Applies high temperature briefly at the start to shorten measurement time.

Level meter – Visual guidance for accurate sample placement

The level meter helps you place samples with confidence by showing the acceptable weight range (upper and lower limits) and the current load value. This visual feedback streamlines the workflow and supports consistent measurement setup.

Comparator function – Moisture content evaluation with clear thresholds

You can evaluate moisture content in three levels—HI, OK, or LO—by setting upper and lower limits from 0.0% to 999.9%. The judgment result is displayed on the screen and included in the output data. On the touchscreen models, a level meter provides a visual representation of the comparison status during measurement.



Level meter showing comparison status

Offset adjustment for consistent results

If needed, the displayed moisture content can be adjusted by applying a correction value to the actual measured result. This feature helps align measurements across multiple units or with historical data obtained under the same heating conditions. The correction value (±9.999%*2) is included in the output data, and on the touchscreen models, also in the measurement history.

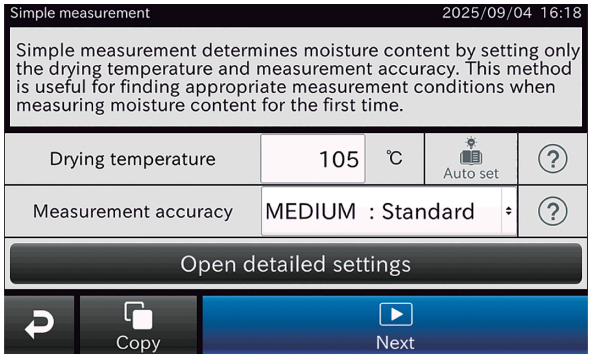
*2 Precision depends on the model's readability.

Define, save, repeat – Measurement aligned with your needs

Quick moisture analysis using Simple measurement

The Simple measurement function determines moisture content by setting only the drying temperature and measurement accuracy.*3 This method is especially useful when measuring moisture content for the first time to explore suitable measurement conditions or when quick setup is preferred.

*3 Additional settings can be configured from "Open detailed settings."

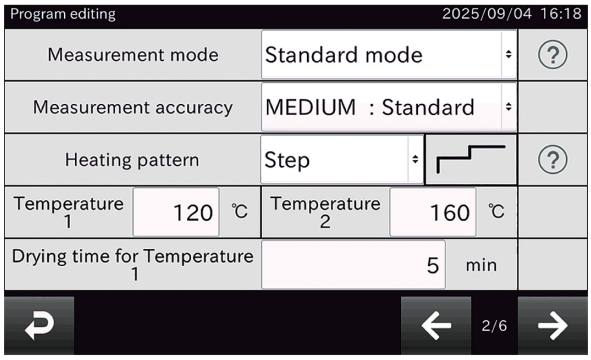


Simple measurement setup

Programmed measurement for recurring tasks with tailored settings

With the Programmed measurement function, you can save up to 300 sets of customized measurement conditions (200 for the reverse backlit LCD models). For frequently measured samples, saved programs can be instantly recalled, allowing measurement without the need to reconfigure settings.

These programs are stored under program numbers 1 to 300 (1 to 200 for the reverse backlit LCD models).



Programmed measurement setup

Preset programs – Built-in examples for various samples

From program number 301 onward (201 for the reverse backlit LCD models), the analyzer includes over a hundred preset programs that serve as examples of measurement conditions. These presets can be used as a starting point when measuring a new sample, or copied into the editable range (1–300) for customization to suit specific requirements.*4

*4 For the reverse backlit LCD models, preset programs must first be copied into the editable range (1–200) before they can be used for measurement.

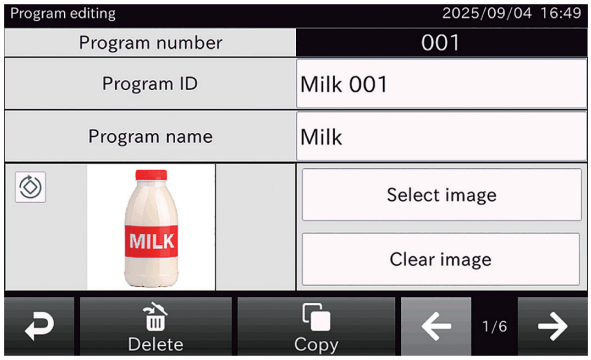
Selecting from preset programs

= Available for the MS-74AT/MX-53AT (touchscreen models) only

Flexible program identification and selection

In addition to a Program Number, each program can be assigned a Program ID (up to 16 characters*5) and a Program Name*6 (up to 20 characters), making it easier to identify and manage measurement conditions. Programs can be searched by number or name, and a custom image can also be linked to each program for intuitive selection.

Furthermore, up to eight shortcuts for frequently used programs can be added to the home screen for quick and easy access on the touchscreen models.



Assigning a custom image to a program

*5 Program ID is limited to 7 characters on the reverse backlit LCD models.
*6 Program Name is excluded from output data. The reverse backlit LCD models do not support Program Name.

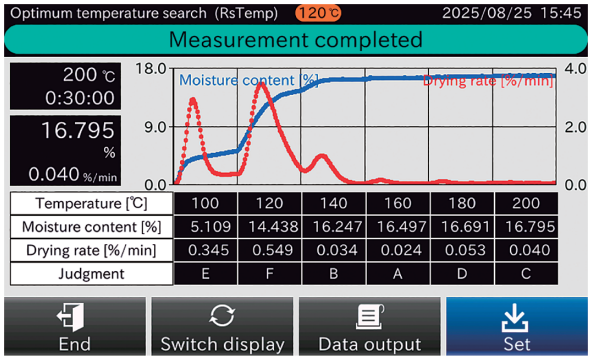
Smart guidance – Your shortcut to optimal measurement

Five measurement guide tools to support setup and accuracy

The following built-in tools help you determine appropriate measurement conditions for various samples. They are especially useful when working with new or unknown materials.

1. Optimum temperature search (RsTemp)

This tool quickly identifies the recommended drying temperature for a sample being measured for the first time. The temperature is automatically increased from 100 °C to 200 °C in 20 °C increments at 5-minute intervals (adjustable as needed), and changes in moisture content and drying rate are graphed in real time. Each temperature is rated from A to F based on drying performance. The temperature rated as A can be directly applied to the measurement condition settings.



Optimum temperature search results

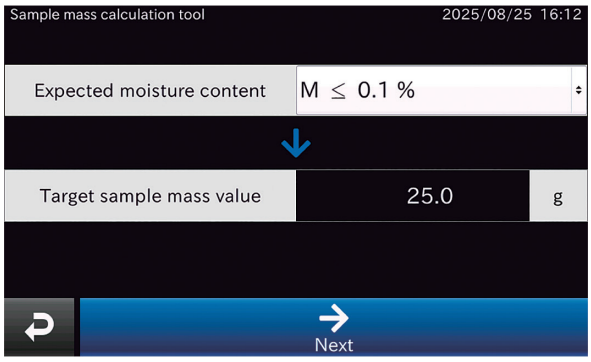
On the reverse backlit LCD models, a simplified version of this function is available. It displays numerical results only, and the starting temperature, temperature increment per step, and measurement duration per step are fixed.*7

*7 For graphical output and parameter adjustment, use the RsTemp program included in the free PC software WinCT-Moisture.

2. Sample mass calculation tool

This tool automatically calculates the required sample weight for accurate moisture measurement based on either the expected moisture content or actual measurement result. The calculated weight (±1 g as upper and lower limits) can be directly applied to the measurement condition settings.*8

*8 The measurement mode will automatically switch to 'Custom mode'.

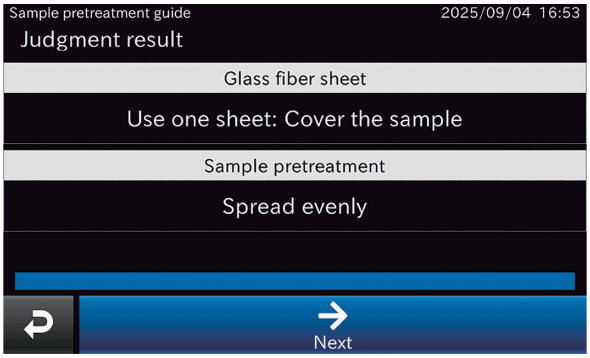


Calculated target sample mass value

= Available for the MS-74AT/MX-53AT (touchscreen models) only

3. Sample pretreatment guide

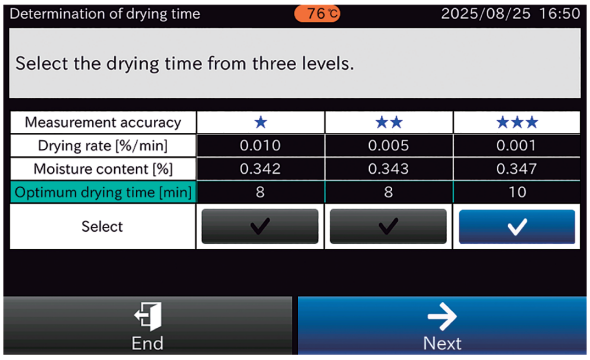
This tool provides tailored recommendations for appropriate use of glass fiber sheets and sample pretreatment methods based on the characteristics of the sample. These recommendations can be directly applied to the measurement condition settings for optimal measurement accuracy. When applied, relevant instructions will appear during measurement to guide you.



Recommendations based on sample properties

4. Automatic determination of drying time in Timer mode

This tool estimates the recommended drying time in Timer mode by performing a test heating. Based on the test data, the analyzer identifies optimal drying times corresponding to three levels of measurement accuracy. You can then select a suitable drying time according to the required accuracy and apply it directly to the measurement condition settings.



Optimal drying times at three accuracy levels

5. Measurement examples

This tool displays actual moisture content values and measurement conditions for samples previously measured with the analyzer. Over a hundred sample types are included, matching those available in the preset programs. It serves as a practical reference when you are unsure how to begin measurement with a new sample.

Note: The recommendations provided by the above tools are for reference only and do not guarantee accurate measurements.

Plastic measurement guide – Step-by-step support for low-moisture samples

This guide supports accurate moisture measurement of plastics (resins) with moisture content of 1% or less, addressing common challenges such as determining appropriate sample weight, drying temperature, and drying time. It provides a structured process to identify recommended measurement conditions, which can be directly applied to the measurement condition settings.

Step 1: Sample mass calculation tool

Refer to the explanation above.

Step 2: Plastic drying temperature search (PlTemp)

This function, dedicated to the plastic measurement guide, performs test heating at multiple temperature levels to identify the optimum temperature that does not cause visible changes—such as melting—in the sample. The sample is visually checked at each temperature step, and the test takes approximately 30 minutes.

Step 3: Automatic determination of drying time in Timer mode

Refer to the explanation above.

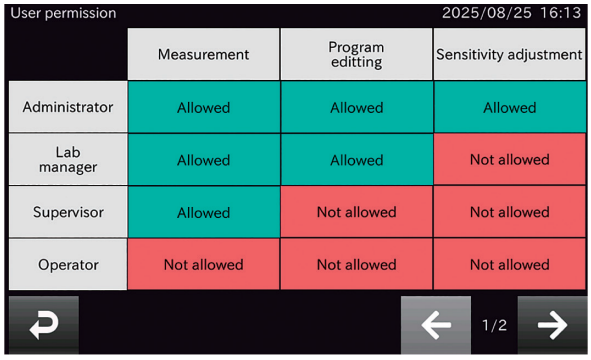
= Available for the MS-74AT/MX-53AT (touchscreen models) only

Advanced user access control

To prevent unauthorized changes to settings and data, users can be assigned to one of four access levels: Administrator, Lab Manager, Supervisor, or Operator. The Administrator can define the scope of user permissions for each level: measurement, program editing, sensitivity adjustment, change to settings, and date/time settings.*9

The administrator can register users as either Lab Managers or Supervisors, assigning each a user name and a password. Up to 100 users can be registered, including the administrator.*10

*9 Date/time settings are automatically disabled when change to settings is not permitted.
*10 Operators do not need a password.



Managing user rights and restrictions

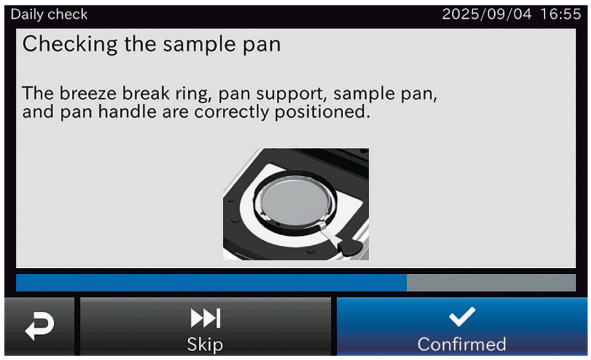
On the reverse backlit LCD models, password protection can be configured either for the administrator and up to ten additional users, preventing access by others, or for the administrator only, allowing anyone else to access the analyzer as a guest. In either case, non-administrator users are limited to performing measurements and selecting measurement programs.

Maintaining accuracy with checks and adjustments

For consistent performance and dependable results, the analyzers offer a range of functions—from daily checks to sensor and heater adjustments. These tools support stable operation, help detect potential issues early, and preserve measurement accuracy over time.

Daily-check function

To ensure the analyzer is ready for use, daily checks help confirm that there are no significant issues with the instrument or its surrounding environment. These quick inspections are recommended before starting work each day. A notification can be set to appear when the display is turned on.



Checking the sample pan during daily checks

Test sample measurement

This function verifies that moisture content measurement is performed accurately using a test sample with preset measurement conditions, including comparator upper and lower limits for pass/fail judgment. The test sample (sodium tartrate dihydrate, with a theoretical moisture content of 15.66%) is included as a standard accessory with the MS-74A(T)/MX-53A(T).

Sodium tartrate dihydrate (AX-MX-33)

= Available for the MS-74AT/MX-53AT (touchscreen models) only

Self-check function

The self-check function helps confirm that the analyzer is operating correctly by detecting issues in the electrical circuits and temperature control. It is useful when accurate measurement results are not obtained or when the operation appears abnormal. During the checks, a lamp turns on to indicate operation, and the process typically completes in about one minute.

Adjustment for weighing and heating accuracy

The analyzer offers adjustment functions for both the weight sensor and the heater. The sensitivity of the weight sensor can be adjusted using a 20 g or 50 g reference weight*[11], while the heater can be adjusted using a dedicated temperature adjustment kit (AX-MXA-43). The results of both adjustments can be output in a GxP-compliant format for documentation purposes.

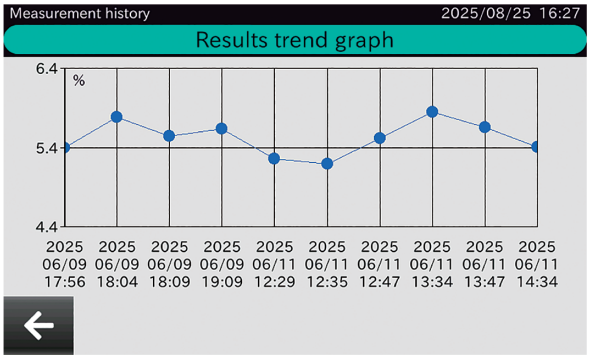
∗11 Use of a 20 g calibration weight (AD1603-20F1) is recommended.

Temperature adjustment kit (AX-MXA-43)

Comprehensive history management

The analyzer automatically stores up to 3,000 measurement results, including those from test sample measurements.*[12] Once the memory limit is reached, older data is overwritten in chronological order. By pressing the “Trend” button, you can view a graph of the last 10 measurements, making trend analysis quick and intuitive.

∗12 For the reverse backlit LCD models, a data memory function is available that stores up to 200 measurement results with date and time. All stored data can be output at once to a printer or PC.



Trend graph of recent measurements

The analyzer also records adjustment history for weight sensor sensitivity and heater temperature, operation history, and log-in/log-out history with date, time, and user name. Each type of history stores up to 1,000 records.*[13]

∗13 While only the latest 100 records can be viewed on the instrument, all data can be saved to a USB flash drive in CSV format.

Help and FAQ – Support at your fingertips

The analyzer features a built-in help function for quick access to operating instructions and explanations for getting started, measurement programs, and settings. The FAQ covers common topics such as samples, measurement conditions, results, and specifications. Quick answers reduce downtime and keep workflows moving.

Help menu for smooth operation

= Available for the MS-74AT/MX-53AT (touchscreen models) only

Other useful features that make a difference

Audible notification via buzzer

A buzzer sounds when measurement is complete so that you don't need to keep watching the analyzer.

GLP/GMP/GCP/ISO compliance

To support regulatory documentation, output data can include the manufacturer, model, serial number, device ID (7 characters set by the user), date/time, signature field, and other relevant information. Timestamping using an external device such as the AD-8129TH compact printer is also supported.

Weighing mode

The analyzer can also be used as a balance, making it especially convenient for weighing multiple samples before measurement. A level meter can be displayed to help you achieve the desired sample weight within preset limits.

Thermal analysis mode

This mode allows you to configure up to five stages of drying temperature and time, providing a simple and cost-effective way to observe thermal changes in the sample at different temperatures.

Auto power OFF

The analyzer can be set to enter power-saving mode after 10 minutes of inactivity. Automatic logout is also enabled when using the password lock function.

Communication interfaces and connectors

① **Power inlet**

② **RS-232C (D-Sub 9P)**

③ **USB (Type-C) for connection with a PC**

Using internal settings, you can toggle between Quick USB (HID) mode and Virtual COM (CDC) mode. Quick USB allows direct transmission of measurement data to PC applications such as spreadsheets, with a fixed NU2 format containing numeric values only. Virtual COM enables bi-directional communication using dedicated software such as WinCT-Moisture. A 2-meter USB cable is supplied as standard with the MS-74A(T)/MX-53A(T).

④ **Bluetooth®*14**

⑤ **Ethernet (TCP/IP)**

⑥ **USB (Type-A) for USB flash drives**

This interface allows connection of a USB flash drive for saving PDF reports for measurement results (including those from test sample measurements) and optimum temperature search (RsTemp) results. It also supports import/export of measurement programs and internal settings.

*14 The Bluetooth® function is currently enabled for the US, Canada and Japan only.

= Available for the MS-74AT/MX-53AT (touchscreen models) only

Specifications

Common

Heating technology	400 W halogen lamp with Secondary Radiation Assist (SRA)
Drying temperature range (near the sample pan)	30 to 200 °C (1 °C increments)
Heating patterns	Standard heating, Ramp heating, Step heating, Quick heating
Measurement modes	Standard mode, Timer mode, Custom mode
Calculation units	Moisture content based on wet weight, Moisture content based on dry weight (Atro), Solid content, Ratio, Gram
Operating environment	5 to 40 °C (41 to 104 °F), 85% RH or less (no condensation)
Sample pan size	Ø90 mm
External dimensions	215 (W) × 380 (D) × 176 (H) mm
Net weight	Approx. 6 kg (excluding accessories)
Power supply	AC 100–120 V / 3 A or AC 200–240 V / 1.5 A, 50/60 Hz
Power consumption	Max. 500 W

Touchscreen models

			MS-74AT	MX-53AT
Measurable sample weight range			0.1 to 71 g	0.1 to 51 g
Readability	**Moisture content**		0.001% 0.01% 0.1%	0.01% 0.1%
	Weight		0.0001 g	0.001 g
Reproducibility (standard deviation)	**Moisture content*i**	**Sample weights ≥ 5 g**	0.01%	0.02%
		Sample weights ≥ 1 g	0.05%	0.1%
	Weight		0.0002 g	0.001 g
Measurement program memory capacity			300 programs	
Measurement result memory capacity			3,000 results	
Display			5-inch WVGA, TFT LCD color touch screen (resistive type)	
Display language			English, French, German, Italian, Dutch, Spanish, Portuguese, Russian, Korean, Chinese, Japanese	
Communication interface			RS-232C (D-Sub 9P), USB (Type-A), USB (Type-C), Ethernet (TCP/IP), Bluetooth®*ii	
Standard accessories			Disposable aluminum pan × 100, Sample pan × 20, Glass fiber sheet (Ø86 mm) × 100, Test sample (sodium tartrate dihydrate, 30 g) × 1, USB cable (2 m, Type-A to Type-C) × 1, Sample pan handle × 2, Tweezers × 1, Spoon × 1, Display protection cover × 1, Main unit cover × 1, Cleaning brushes (large and small) × 1 each	

Reverse backlit LCD models

			MS-74A	MX-53A	MF-53A	ML-53A
Measurable sample weight range			0.1 to 71 g	0.1 to 51 g		
Readability	**Moisture content**		0.001% 0.01% 0.1%	0.01% 0.1%	0.05% 0.1% 1%	0.1% 1%
	Weight		0.0001 g	0.001 g	0.002 g	0.005 g
Reproducibility (standard deviation)	**Moisture content*i**	**Sample weights ≥ 5 g**	0.01%	0.02%	0.05%	0.1%
		Sample weights ≥ 1 g	0.05%	0.1%	0.2%	0.5%
	Weight		0.0002 g	0.001 g	0.002 g	0.005 g
Measurement program memory capacity			200 programs			
Measurement result memory capacity			200 results			
Display			Reverse backlit LCD (main characters: 11 segments, 17.8 mm height)			
Communication interface			RS-232C (D-Sub 9P), USB (Type-C)			
Standard accessories			Disposable aluminum pan × 100, Sample pan × 20*iii, Glass fiber sheet (Ø86 mm) × 100*iv, Test sample (sodium tartrate dihydrate, 30 g) × 1*iv, USB cable (2 m, Type-A to Type-C) × 1*iv, Sample pan handle × 2*iii, Tweezers × 1*iv, Spoon × 1*iv, Display protection cover × 1, Main unit cover × 1*iv, Cleaning brushes (large and small) × 1 each*iv			

***i** After preheating, the included test sample (approx. 5 g of sodium tartrate dihydrate) was measured at 160 °C using the standard heating pattern and standard mode (MEDIUM). After each measurement, the heater cover was left open and the unit was allowed to cool at room temperature for 15 minutes.
***ii** The Bluetooth® function is currently enabled for the US, Canada and Japan only.
***iii** For the MF-53A/ML-53A: Sample pan × 10, Sample pan handle × 1
***iv** For the MS-74A/MX-53A only.

Accessories

AX-MXA-30	Disposable aluminum pan, Ø90 mm (100 pcs)
AX-MXA-31	Sample pan, Ø90 mm (100 pcs)
AX-MX-32-1	Filtration glass fiber sheet, Ø70 mm (100 pcs) Recommended for liquid samples with strong surface tension.
AX-MXA-32-2	Glass fiber sheet, Ø86 mm (100 pcs)
AX-MX-33	Test sample – sodium tartrate dihydrate, 30 g (12 pcs)
AX-MX-34-120V	Halogen lamp (AC 100 to 120 V)
AX-MX-34-240V	Halogen lamp (AC 200 to 240 V)
AX-MXA-35	Sample pan handle (2 pcs)
AX-MX-36	Tweezers (2 pairs)
AX-MX-37	Spoon (2 pcs)
AX-MXA-38	Display protection cover (5 pcs)
AX-MXAT-38	Display protection cover for touch screen (5 pcs)
AX-MXA-39	Main unit cover
AD1603-20F1	Calibration weight (20 g), OIML Class F1
AX-MXA-43	Temperature adjustment kit
AX-KO7919-200	USB cable, 2 m (Type-A to Type-C)
AX-FST6.3A250V	Fuse (T6.3 A, 250 V)

Note: Some of the accessories listed above are also included as standard, depending on the model (refer to the specification tables for details).

WinCT-Moisture – Dedicated PC software for A&D's moisture analyzers

(available as a free download)

RsFig Graph moisture content trends in real time or from saved CSV data. Overlay multiple graphs to compare and optimize measurement conditions.

RsTemp Automatically identify recommended drying temperatures for new samples using test heating and real-time graphical feedback.

RsSetup*15 Centrally manage internal settings and measurement programs. Save, edit, and apply configurations as needed to streamline setup and reduce errors across multiple units.

*15 Not supported on previous series.

Demonstration videos available!

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*MXA-ADCC-00-PR1-259