

User Manual

Thermo scale

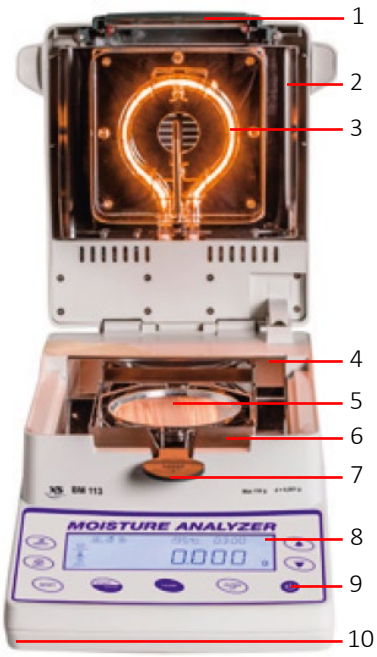
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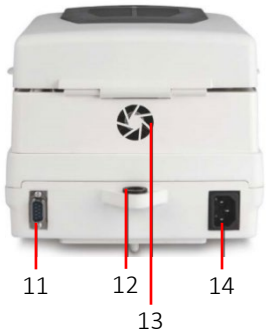
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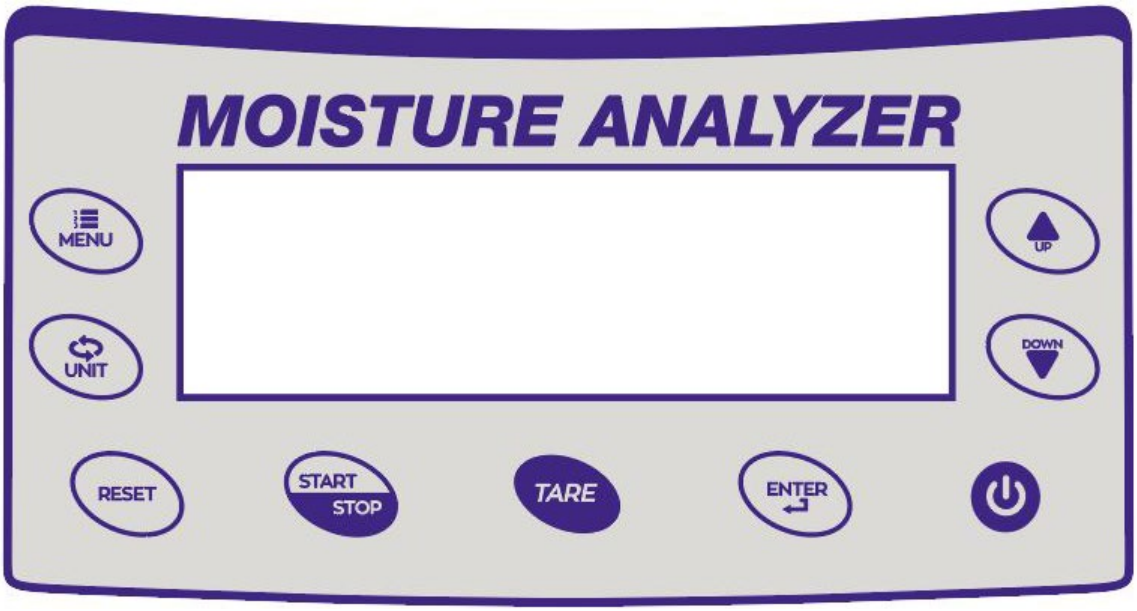
1. Thermo scale overview

1 Front panel
2 Heating hood
3 Halogen lamp
4 Thermal shield
5 Aluminium pan
6 Wind protection
7 Bracket for pan removal
8 Display
9 Keypad
10 Adjustable feet
11 RS232 data transmission
12 Bubble level
13 Ventilation fan
14 Power supply



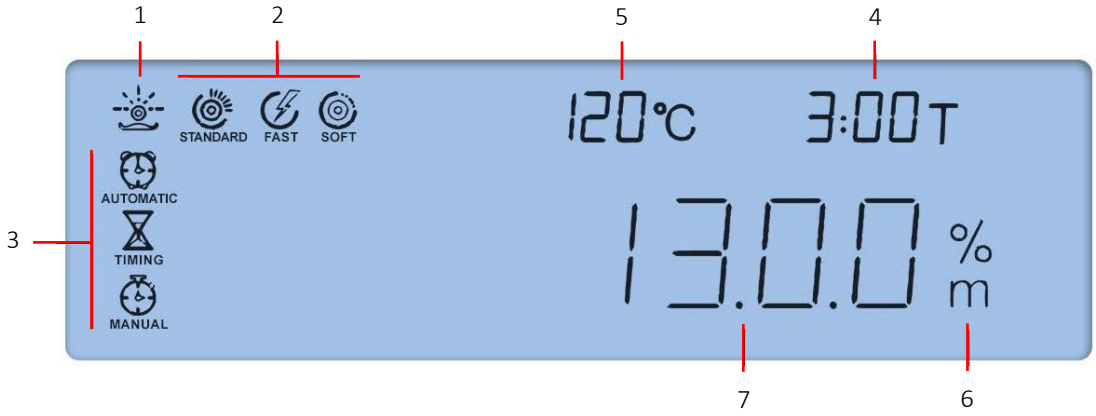


2. Keypad



MENU	Entering the cycles menu
UNIT	Select weighing unit
RESET	Short pressure: back in measurement Long pressure: calibration of the scale
START STOP	Starting and stopping the heating cycle
TARE	Tare key
ENTER	Confirming and saving settings
	Switching ON/OFF the thermo scale
	UP: increasing and selecting the parameter - switching on the backlight DOWN: decreasing and selecting parameter - switching off the backlight

3. Display

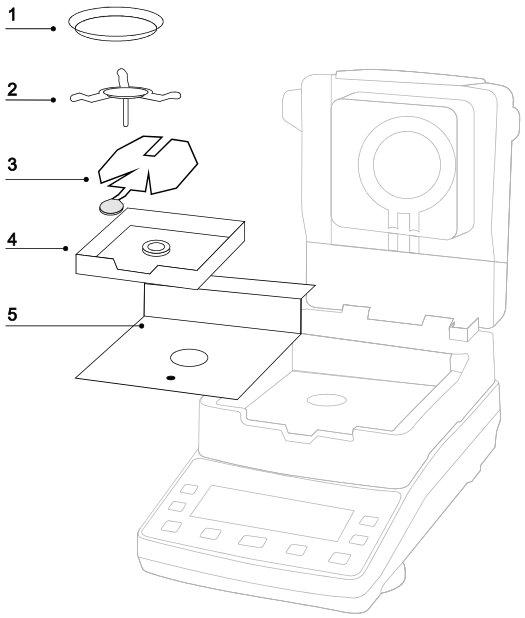


1			Drying process activated
2	Heating profiles	STANDARD	Standard drying
		FAST	Fast drying
		SOFT	Slow drying
3	Switch off criteria		Automatic switch-off
		TIMING	Set time switch-off
		MANUAL	Manual switch-off
4	Time passed		
5	Actual temperature		
6	% Humidity		
7	Subtotal		

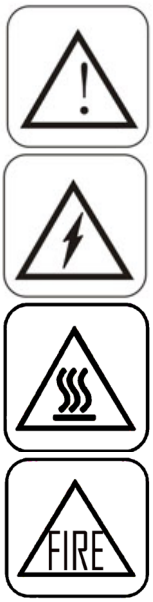
4. Installation

Install the thermo scale as illustrated.
The order of assembly is 5-4-3-2-1:

1. Aluminium pan
2. Triangular screw
3. Bracket for pan
4. Wind protection
5. Stainless steel plate



5. Safety instructions



Please read the steps below carefully before using the thermo scale:

- the instrument is designed for testing samples, any improper operation may cause personal injury and damage to equipment;
- plug the thermo scale into the power supply, in accordance with the instructions provided;
- ensure that the power cable does not interfere with the operation of user;
- do not use the thermo scale in dangerous, damp or unstable environments;
- disconnect the power supply before cleaning the thermo scale;
- maintain sufficient space around the instrument and at least 1 m from the top of the thermo scale;
- during special tests, wear all necessary protective equipment;
- do not change instrument components and other aspects;
- maintenance of this equipment must be carried out by factory-authorised professional technicians;
- do not place flammable materials around the thermo scale;
- do not touch the lamp when it is operating;
- pay particular attention to hazardous samples;
- flammable and explosive materials: the testing of flammable and explosive materials will produce flammable gases or vapours;
- toxic and corrosive substances: keep toxic or corrosive samples in a well-ventilated environment.

Recommendations:

1. wait 30 minutes after switching on before carrying out a calibration;
2. do not close the cover with the calibration weight on the plate, the risk is to break the lamp.

Unpacking and checking:

Carefully remove the packaging, the plastic bag surrounding the thermo scale and set it in the indicated and suitable work space.

Setting requirements:



Stable work table
No vibrations

Stable room
temperature

Ventilated room

6. Switching On/Off

1. Connect the thermo scale to the power supply;
2. switch on the thermo scale by pressing the ON/OFF key;
3. the display will light up and the thermo scale will do a self-test;
4. wait until the basic configuration 0,000 g is displayed;
5. wait 30 minutes before using the thermo scale.

7. Weighing calibration

The calibration of the thermo scale weighing is not necessary to determine the correct percentage of moisture in the sample because it makes a measurement by relative comparison: the instrument calculates the percentage of moisture by making the difference between the mass before and after drying.
The thermo scale, however, will also need to be calibrated if provided for in the analysis procedure.

Procedure:

- hold the RESET key down and do not release it until "- cal -" appears on the display; "100,000 g" will flash. Then set the mass on the weighing pan. The display will show "= = = = = =";
- when "100,000 g" is displayed, remove the weight. "= = = = = = = =" will be displayed again. Then wait for the display to show "0,000 g". The calibration is completed.

8. Sample preparation

Solid sample:
Set the dusty or granular samples uniformly on the sampling plate. Crush coarse samples using a mortar or grinder. Avoid overheating when grinding the sample, as this can cause moisture loss.



Liquid sample:
For liquids, tablets or melt samples, a fiberglass filter is recommended. The fiberglass filter has the following advantages:



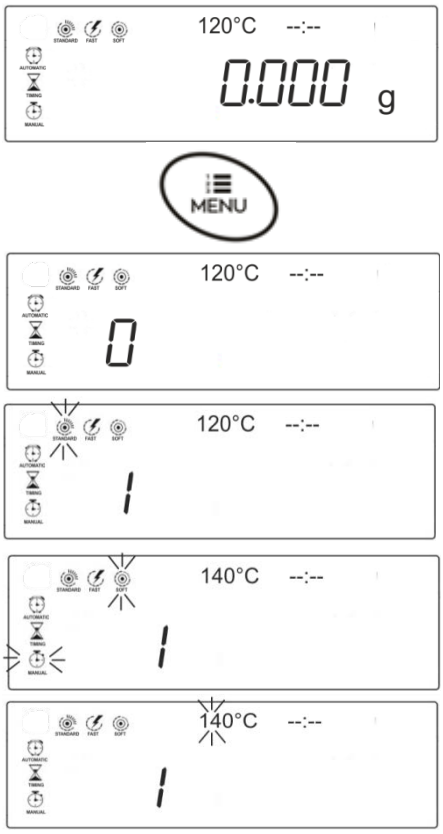
- homogeneous distribution through capillary attraction;
- no formation of droplets;
- Fast evaporation due to superior and homogeneous surface area.

9. Setting parameters

Setting the drying parameters:
the device offers a wide variety of options to adapt a drying method to the sample.
Three heating profiles (standard drying, fast drying, slow drying) and three shutdown criteria (time setting, automatic, manual) can be selected.

Setting the drying method:
15 different drying cycles can be set, which can be simply recalled and started, according to the identified number (0-F).

1. Press the MENU key, the display will show "0";
2. using the indicators ▲▼ select a program;
3. press ENTER to confirm;
4. the heating profile will start flashing;
5. using the indicators ▲▼ select the required profile;
6. press ENTER to confirm;
7. the shutdown criteria will start flashing;
8. using the indicators ▲▼ select the required criteria;
9. press ENTER to confirm;
10. the drying temperature will start flashing;
11. using the indicators ▲▼ select the temperature;
12. press ENTER to confirm;
13. press START/STOP to start the cycle.

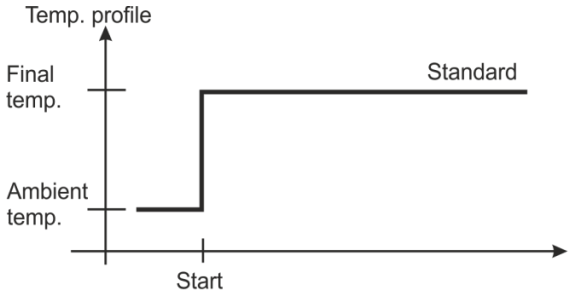


Notes: Memory location 0 is provided for factory settings. (standard 120°C drying, automatic shutdown) and cannot be changed.

10. Heating methods

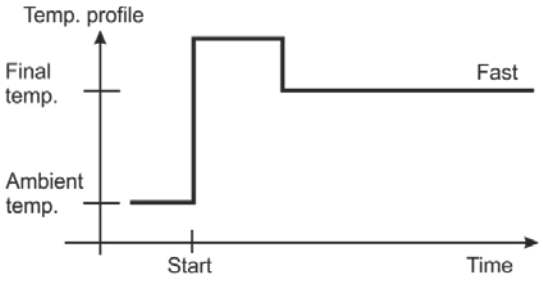
STANDARD drying STANDARD

This drying mode is the default setting, suitable for most samples. The test is performed at a user-set temperature, which remains constant throughout the set time.



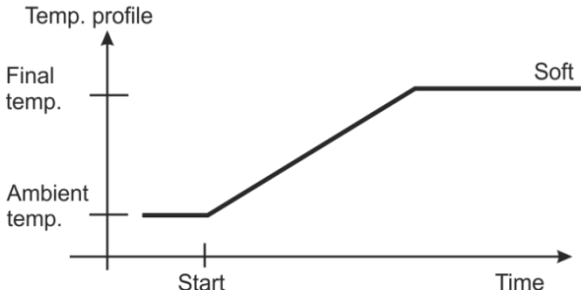
FAST drying FAST

This mode is suitable for samples with higher moisture content. The heating element acts by initially bringing the chamber temperature to a peak about 30 percent higher than the set temperature. Thereafter, the temperature stabilizes at the set value.



SOFT (slow) drying

This mode is suitable for low moisture contents, where it is easy for a crust to form on the sample if heated too fast, or even to burn. The temperature will start to rise slowly until it stabilizes. User selected test time.



11. Shutdown criteria

The shutdown criteria defines under which conditions the device should stop the drying process. Shutdown criteria save continuous checks and manual interruption of drying processes. They also ensure that measurements always end under the same conditions, thus providing repeatable measurements.

AUTO : The test automatically stops when weight loss of less than 2 mg in 45 seconds is recorded. The first 15 seconds after startup are not counted.

TIMING : The drying process continues until the time set by the user is reached.

MANUAL : The drying process ends when the user presses the STOP key.

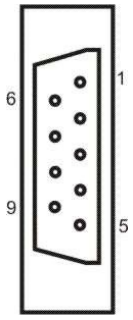
12. Error table

N.	Errori	Cause e soluzioni
1	*ERR----1*	Sample weight is less than 1 g, please put more than 1 g of sample, then repeat the test
2	*ERR----2*	The set temperature is less than 40 °C, please set a higher temperature
3	*ERR----3*	Test time is less than 30 seconds, please set a test time of more than 30 seconds
4	*ERR----4*	Problem in halogen lamp power supply
5	*ERR----5*	Slow drying time set less than 3 minutes, please set slow drying time more than 3 minutes
6	*ERR----6*	Temperature sensor fault

13. RS232 data transmission

Technical Data

Connection: 9 pin
Baud rate: 1200 / 2400 / 9600 selectable
Parity: 7 bit / 2 stop bit



Pin 3 – TxD
Pin 5 - GND

Impostazioni Baud rate

1. press the ON/OFF key, then immediately press the TARE key. The display shows the currently set Baud Rate;
2. using the indicators ▲▼ select the Baud rate;
3. press ENTER to confirm.





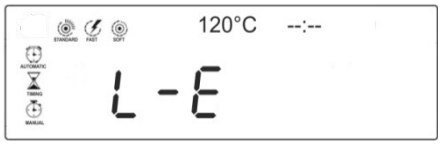
Printing

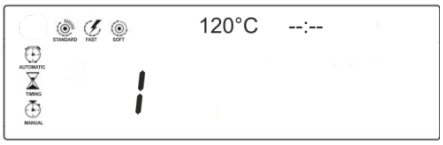
The thermo scale automatically stores the last 5 cycles performed (1 = most recent...5 = oldest).
To print the result, at the end of the cycle, press the MENU key and hold it down until PRINT appears.
The display will show the letters "L - E."
Press ENTER to confirm.
Use the indicators to select which of the last 5 cycles you want to print and confirm with the ENTER key to start printing.











14. Data sheet

Capacity	110 g
Resolution	0,001 g
Repeatability	0,15 %
Minimum weighing	0,008 g
Minimum test weighing	1 g
Calibration	External
Time control	Timing – Auto - Manual
Heating control	Standard – Fast - Soft
Time interval	1-99 minutes
Temperature range	40 – 199 °C
Pan size	Ø 90 mm
Lamp	Halogen lamp 400 W
Memory	15 programs
Data transmission	Serial RS-232
Overall dimensions	340 * 200 * 180
Net weight	9 Kg
Power supply	220 V – 50Hz

15. Application table (food samples)

Samples	Sample mass (g)	Drying temperature (°C)	Drying time ca. (min)	Moisture % ca.	Solid mass % ca.
Sliced pineapple	5	110	14,4	6,71	-
Milk bath	3	80	27,4	83,87	-
Blue-veined cheese	2	160	13,3	-	53,06
Beans	4,5	150	9,7	11,85	-
Butter	1,7	140	4,3	-	84,95
Corn flakes	2 - 4	120	5 - 7	9,7	-
River water	5	130	20	8	-
Sugar mass	2	155	7,6	34,07	-
Milk flakes	3 - 4	150	5,7	6,35	-
Dried beans	5 - 7	110	9,6	5,89	-
Dried peas	5,5 - 6	120	3	4,92	-
Dried carrots	5 - 7	110	10	6,21	-
Dried grain	8 - 10	160	5	0,26	-
Oat flakes	2,2	100	3,8	4	-
Hazelnuts	2,6	100	4,5	3,74	-
Peeled hazelnuts	1	160	5,5	6,45	-
Dog food	5	160	15	15,80	-
Yogurt	1	120	10	70,43	-
Instant coffee	5	140	17,3	9,32	-
Raw coffee beans	3	140	7	2,68	-
Roasted coffee beans	2 - 3	130	6 - 8	78,5	-
Coffee cream	3,5 - 4	120	8	8,53	-
Coffee seeds	2,5	105	4	3,45	-
Cacao	4 - 5	130	7,8	6,23	-
Cocoa beans	12 - 14	160	5	0,05	-
Limestone	2,5 - 3,0	130	5,8	12,46	-
Potato powder	3 - 4	106	7,5	6,9	-
Ketchup	2	120	18	74,44	-
Garlic powder	2	100	7,3	5,36	-
Lentils	4	135	5,4	12,49	-
Skimmed milk powder	4	90	5,5	3,67	-
Low-fat cheese	1,2	130	8	-	18,5
Corn starch	5	200	7,5	12,94	-
Almonds	2,5	100	5,3	4,19	-
Margarine	2,2	160	4	19,15	-
Mayonnaise	1	160	10	20,6	-
Flour	8 - 10	130	4,5	12,5	-
Milk	1	140	7,3	88	-
Mozzarella	1,5	160	11,1	-	45,78
Nougat mass	2,5	103	10	0,6	-
Noodle dough	0,55	160	5	12	-
Orange juice	1	140	10	88,89	-
Black pepper powder	2	85	8,8	7,97	-
Curd	1	140	7	-	18
Curd cheese	1,2	130	8	-	23
White rice	5	200	12,3	15,12	-
Red wine	3 - 5	100	15 - 20	97,4	-
Salt	5	200	10	0,08	-
Melted cheese	1,5	70	15	35,65	-
Chocolate	3	140	6	2,4	-
Chocolate powder	2 - 4	100	4	1,9	-
Lard	0,70	160	3,5	1,2	-
Mustard	2,5 - 3	80	19	-	34,69
Soy flour	4,6	95	4,9	4,8	-
Soy beans (granulated)	5	110	22,6	12,16	-
Sunflower seeds (burnt)	3 - 3,5	100	4	5,92	-
Sunflower seed oil	10 - 14	138	2	0,1	-
Spaghetti	3	105	15,1	10,63	-
Black tea	2	105	4	7,67	-
Green tea	5	120	9	3,76	-
Pasta	1,5	120	8	10,64	-
Walnuts	2,8	100	5,6	3,5	-
Sugar	4-5	138	10	11,9	-
Sugar beets	2	130	13,4	-	30,94



Electrical and electronic equipment with this symbol affixed may not be disposed of in public landfills. In accordance with the WEEE Directive 2012/19/EU, European users of electrical and electronic equipment have the option of returning used equipment to the Distributor or Manufacturer when purchasing new equipment.
Illegal disposal of electrical and electronic equipment is punishable by administrative fine.