



Moisture Analyser

European Catalogue Numbers:

611-2317	MOISTURE ANALYSER 60G/0.01, LCD
611-2318	MOISTURE ANALYSER 160G/0.001, LCD
611-3233	MOISTURE ANALYSER, MB64 60G/0.0001, LCD
611-3293	MOISTURE ANALYSER 60G/0.0001, LCD MB64 CERT.
611-3294	MOISTURE ANALYSER 60G/0.001, LCD + CERT.

User Manual

Version 1 Issued 14/04/15
Soft. Th_3.xx



Legal Address of Manufacturer

Europa

VWR International bvba
Researchpark Haasrode 2020
Geldenaaksebaan 464
B-3001 Leuven
+ 32 16 385011
<http://be.vwr.com>

Country of origin

Italy

Intended use

Moisture balances can be used for quality check in laboratory, food and beverages industry, material industry, etc...

INDEX

1	INSTALLATION INSTRUCTIONS	2
2	STORAGE CONDITIONS.....	4
3	PREPARING THE BALANCE TO WORK.....	5
4	KEYBOARD AND DISPLAY	6
5	INPUTS AND OUTPUTS	7
	5.1 Rear side and bottom side of the balance model Moisture Analyser	7
6	WEIGHING.....	8
	6.1 Stand By	8
	6.2 Simple weighing.....	8
7	CALIBRATION.....	9
	7.1 External calibration balances	9
8	TARE FUNCTION	11
9	HOW TO SET BALANCE'S FUNCTIONS	12
	9.1 Measure units	12
	9.2 Serial function	13
	9.3 Transmission speed selection.....	15
	9.4 Service	16
	9.5 Autozero function.....	18
	9.6 Filters selection.....	19
	9.7 Stability function	20
	9.8 Display Contrast regulation	21
	9.9 Display Backlight setup	22
	9.10 Selection of working mode with Tablet	23
	9.11 Calibration Mode	24
10	HOW TO SET HEATER'S FUNCTIONS	25
	10.1 Measure Function.....	25
	10.2 Prg Set Function	32
11	RS232 INTERFACE FEATURES	34
	11.1 General features.....	34
	11.2 Connecting the balance to PC.....	34
	11.3 Transmission format when in PC connection mode	35
	11.4 Connection of the balance with the serial printer.....	36
	11.5 Print formats on paper with serial printer.....	36
12	CONNECTORS POSITION (REAR).....	37
13	ERROR CODES	38
14	MAINTENANCE AND CARE	38
15	QUICK GUIDE TO BALANCE PARAMETERS SETTINGS	39
16	QUICK GUIDE TO THE USE OF THE BALANCE'S PROGRAMS.....	40
17	BALANCE TECHNICAL FEATURES	41
18	HEATER TECHNICAL FEATURES.....	41
19	OPTIONAL ACCESSORIES	42
20	TECHNICAL SERVICE	42
21	WARRANTY	43
22	COMPLIANCE WITH LOCAL LAWS AND REGULATIONS	43
23	EQUIPMENT DISPOSAL	43

1 Installation instructions



WARNING:

Please follow carefully these steps for installing and use the new balance before starting your work routine. A way of use of the instrument different from this user manual will not guarantee the instrument's safety anymore. Keep this manual in a safe place.

Please follow these indications to avoid problems and to grant a safe use of moisture analyzer:

- Use the moisture analyzer exclusively for the moisture determination of samples. Every incorrect use of this instrument may create danger for safety of persons and may cause damages at the instrument or at other objects.
- Do not use the instrument in areas where there is danger of explosions; also make the instrument work only respecting the environment conditions as reported in this manual.
- If this material is used in plants or in environment conditions that require strict safety conditions, please respect the instructions of the directives regarding the installation of this material currently existing in your country.
- This instrument must be used only by qualified personell, who knows the features and characteristics of the sample under test.
- Before starting to work with the instrument for the first time, please check that voltage is the same of your electric mains.
- To get the instrument free from tension, remove the power supply cable.
- Place straight the power supply cable so that to avoid contact with the very hot surfaces of the instrument.
- Use only extension cables that are conform to normatives and that are equipped of a protection conductor.



Attention, protection against heat

- Respect the distance and the free space around the instrument to avoid an accumulation of heat in the instrument and the over heating of the instrument itself:
 - 20 cm around the instrument
 - 1 m upon the instrument
- Do not place flammable materials upon, below or near the instrument since the heater warms the surrounding area.
- Remove the samples carefully, the heater and the dishes for samples may be still very hot.

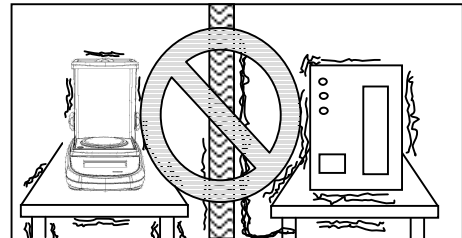
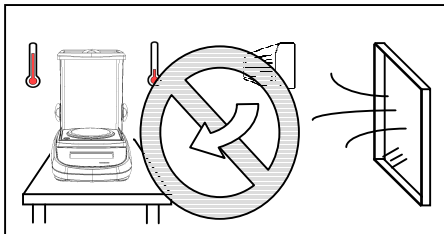


Danger for persons or objects when working with particular samples: Fire Explosion

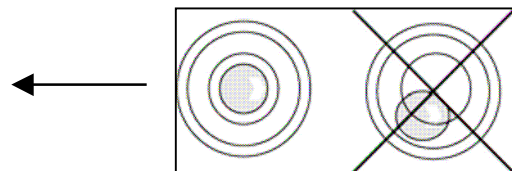
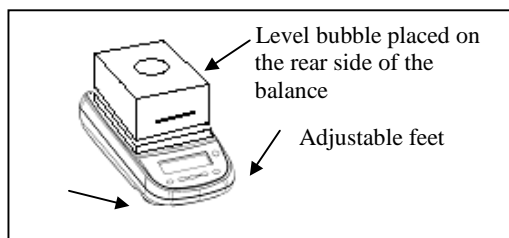
- Flammable or explosive substances
- Substances that contain solvents
- Substances that during drying emit gas or flammable explosive vapors

- **Remove** the balance and the calibration weight from package and verify if there are any visible damages to the instrument

- **Do not install** the balance in a place with air flows, heavy thermic changes and vibrations.
- **The humidity rate** of the balance environment must be between 45% and 75%



- **Place** the weighing pan and the support pan on the balance (see section 3).
- **Level** the balance using the level bubble and levelling feet located underneath the case



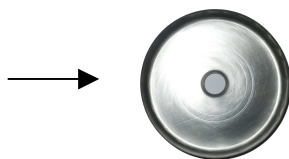
- **Connect** the power supply to the connector 2 place on the rear side of the balance and the cable of the heater on the right connector placed on the rear side of the heater (see sec. 5).
- **Connect** the power supply and the cable of the heater to an electric plug near the instrument, **that must be easily accesible**; after few seconds the balance will switch on by itself.
- **From switch on wait for 30 minutes** and then calibrate the balance using the calibration weight (if supplied), following the instructions (sec. 7)
- **Calibrate** the balance each time that it is moved from one place to another.
- **Check** periodically the calibration of the balance.
- **It is reccomended** not to let fall too heavy objects on the balance's pan, to avoid damaging the balance.
- **Service** must be effected by qualified personell and the spare parts used must be original. In order to comply with this it is necessary to call the reseller where the balance has been bought.

2 Storage conditions

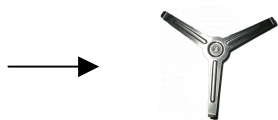
- **Storage temperature** +5 °C...+40°C
- **Storage humidity** 45% - 75%.
- **Keep the balance's package** in the event that the balance must be sent to the service center, remove all cables and accessories to avoid any damage during transportation.
- **Keep the balance far** from extreme temperature and humidity, and avoid violent shocks.

3 Preparing the balance to work

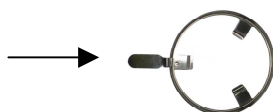
Stainless pan protection with ventilation stopper



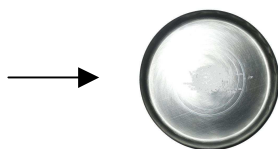
Underpan



Pan extractor



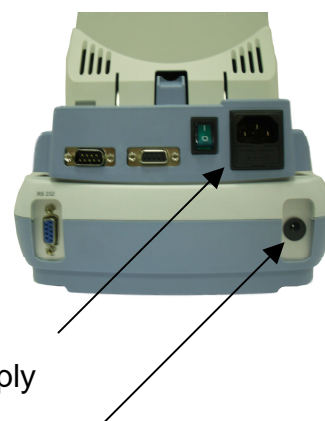
Pan for the sample



1. Insert stainless pan protection.
2. Insert underpan on the cone of weigh.
3. Insert pan extractor
4. Put the pan for the sample.



1) 15 poles M/F cable for connection balance-heater

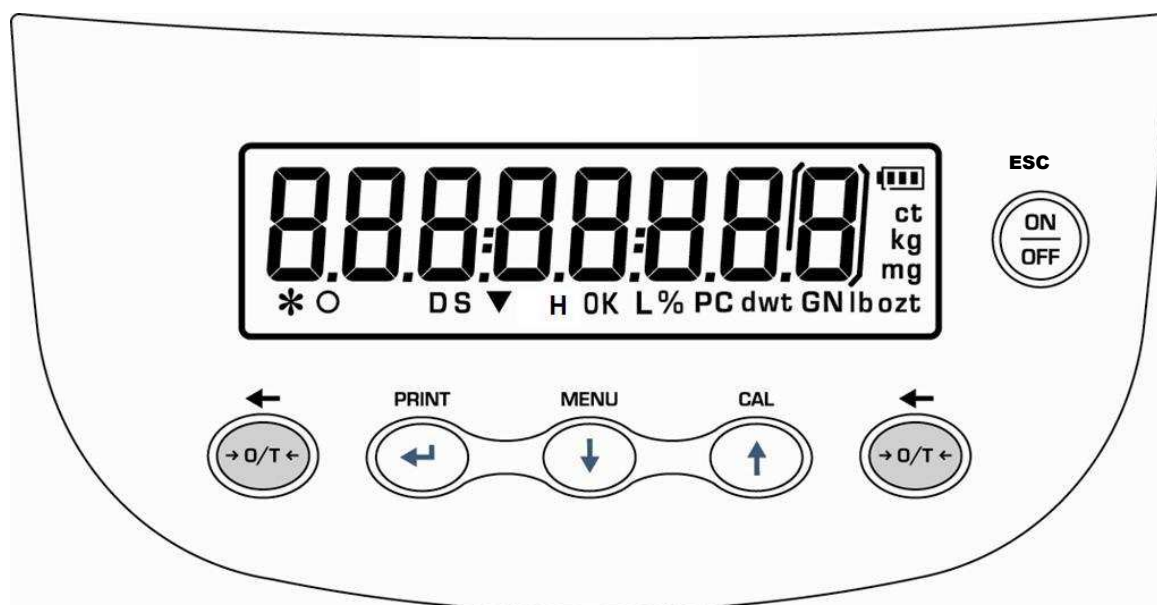


2) Heater power supply

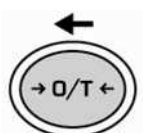
3) Balance power supply

1. Connect the heater to balance by using the proper 15 poles M/F cable.
2. Plug the heater.
3. Plug the balance.

4 Keyboard and display



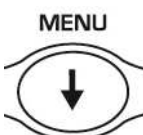
Standby (OFF) or power on (ON) button
Escape function button (ESC).



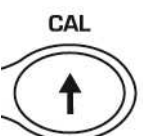
TARE or zero button .



Selection CONFIRM or SEND data to printer button.



Balance setup MENU button, to set balance's parameters.



Balance CALIBRATION button.

* Stability indicator

O Zero indicator

% Percentage weighing

|||| Battery charge indicator

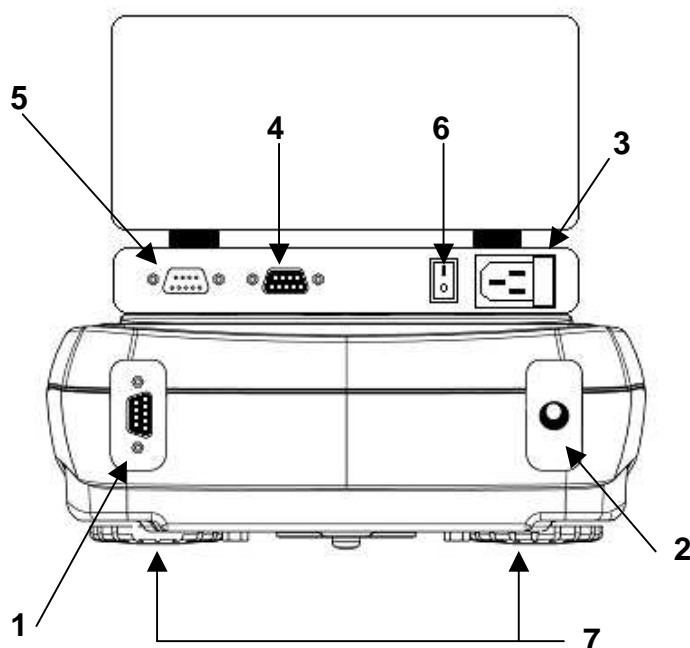
▼ Insert data mode

H Heater is working

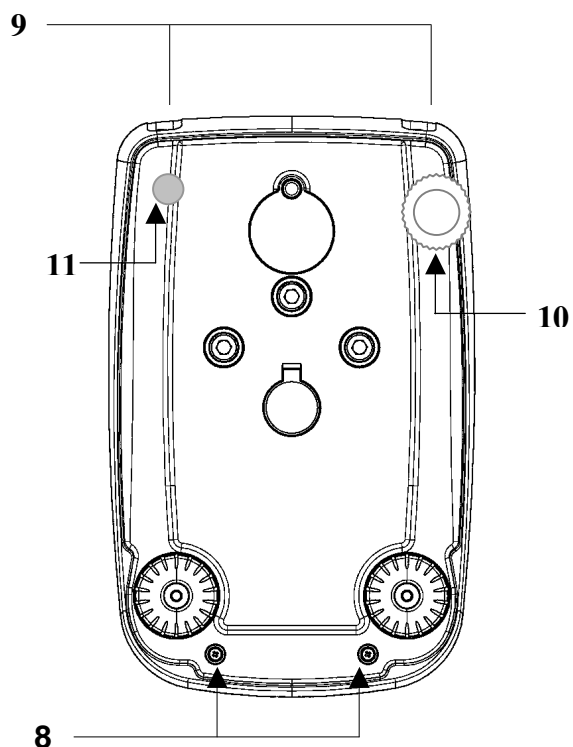
g Measure unit

5 Inputs and outputs

5.1 Rear side and bottom side of the balance model Moisture Analyser



1. **CONNECTOR 1**
Connect balance to heater.
2. **CONNECTOR 2**
Balance's power supply.
3. **CONNECTOR 3**
Heater's power supply
4. **CONNECTOR 4**
9 pin RS232 Interface for PC and printer
5. **CONNECTOR 5**
Connect heater to balance.
6. **SWITCH I/O** to switch on/off the heater
7. **ADJUSTABLE FEET**



8. **N°2 closing screws of the balance**
9. **N°2 closing screws of the balance:** first remove the screws remove adjustabel rear feet(11) and fixed rear feet(10).
10. **Adjustable rear feet**
11. **Fixed rear feet**

6 Weighing

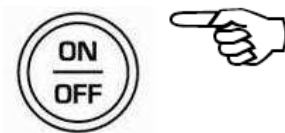
After having connected the balance to AC outlet, it will perform an internal circuits test, therefore that the balance will set itself in stand-by mode.



6.1 Stand By

From “**STAND BY**” mode:

- Press **ON/OFF** button to bring balance to work conditions.
- Press again **ON/OFF** button to return to “**STAND BY**” condition.



6.2 Simple weighing

Place the sample to weigh on the pan and read the value of weight on the display as soon as the symbol ✱ (asterisk) of stability appears



7 Calibration

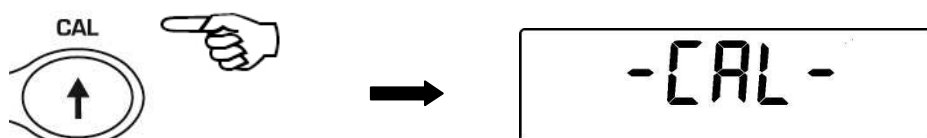
Electronic balances operate mass measurements making use of gravity (g). Difference of latitude in geographic areas and altitude will vary gravity acceleration value (g). Therefore, for accurate measurements, the balance must be adjusted to the local environment. This adjustment is accomplished by calibration function.

7.1 External calibration balances

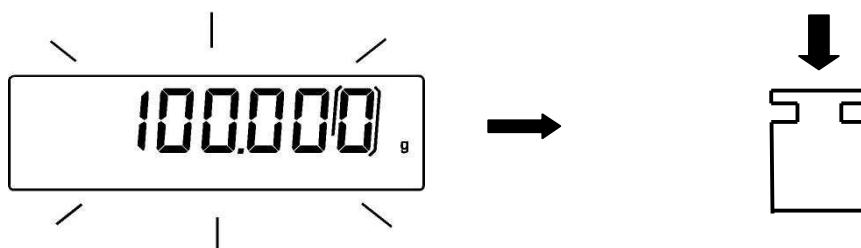
7.1.1 External calibration

Calibration is accomplished by pressing CAL button.

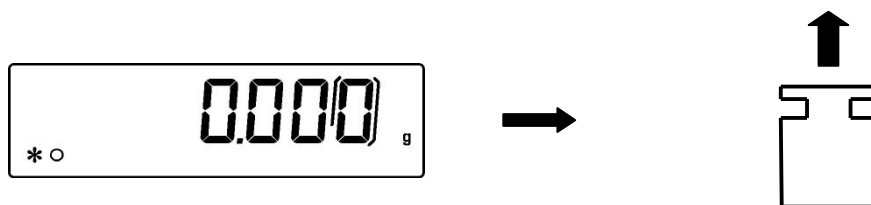
1. Press **CAL** button when pan is empty, "CAL" are displayed on the display..



2. When calibration weight value starts to flash, load the weight on the pan.



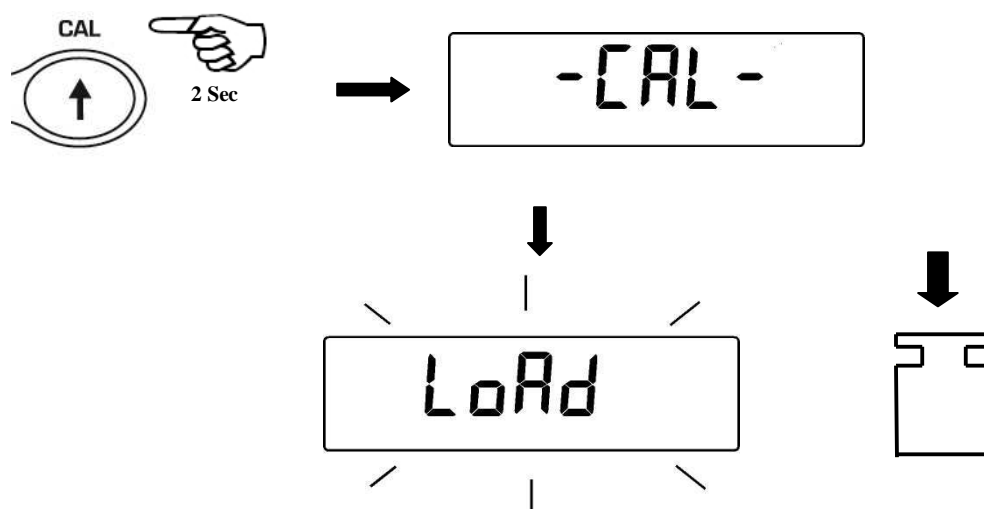
3. The display will stop flashing, indicating calibration weight value.
Once the calibration is effected will be shown the value of the calibrated wight and the current unit of measure.
4. Unload calibration weight from the pan.
The balance is ready for weighing operations



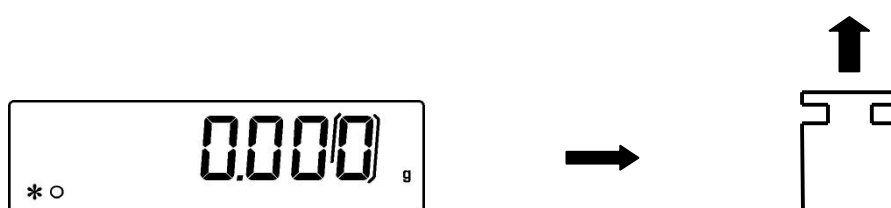
NOTE: if there is an interference during calibration process, an error message will be displayed.

Moreover, it is possible to calibrate the balance with a calibration weight higher than the one set by default:

1. Press and keep **CAL** button pressed with empty pan until the acoustic alarm stops, then release the button. On display it will be visualized the string **"-CAL-"**, followed by flashing string **"LOAD"**.



2. Load on the pan a weight equal higher or lower than default calibration weight, the balance will recognize it as valid weight if equal or higher than calibration weight as long as it is a whole number in comparison with the most meaningful digit of calibration weight.
e.g.: if calibration weight is 100g, it will be possible to calibrate the balance with values from 10g 20g, 30g up to the highest limit of balance weighing range.
The message **"LOAD"** on display will stop flashing, once calibration has been effected, the value of calibrated weight will be displayed.
3. Unload calibration weight. The balance is ready for weighing operations.



NOTE: if there is interference during calibration process, an error message will be displayed.

8 Tare function

1. Load the container on the pan. The display will show the weight



2. Press **O/T** button. “**O-t**” indication will be displayed



3. After reaching stability, the value “**0.000**” will be displayed. If the stability is not achieved, due to air flows or vibrations or other disturbs the “**O-t**” will remain displayed.



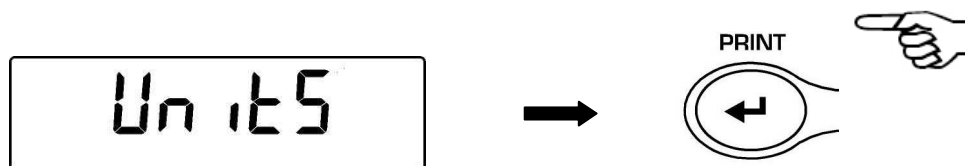
4. Load the objects to weigh in the container. Read net weight value on display



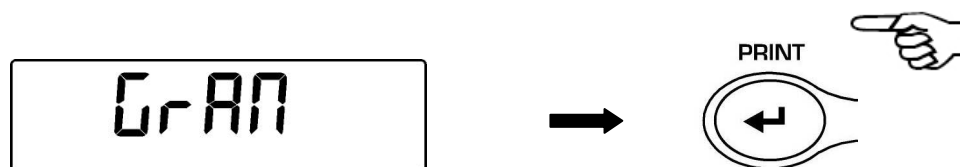
9 How to set Balance's functions

9.1 Measure units

From zero condition on display, press and keep pressed the MENU button until to buzzer sound stops, then release the button. The message "unitS" is displayed, then press PRINT button to confirm.



2. The message "GRAM" is displayed.

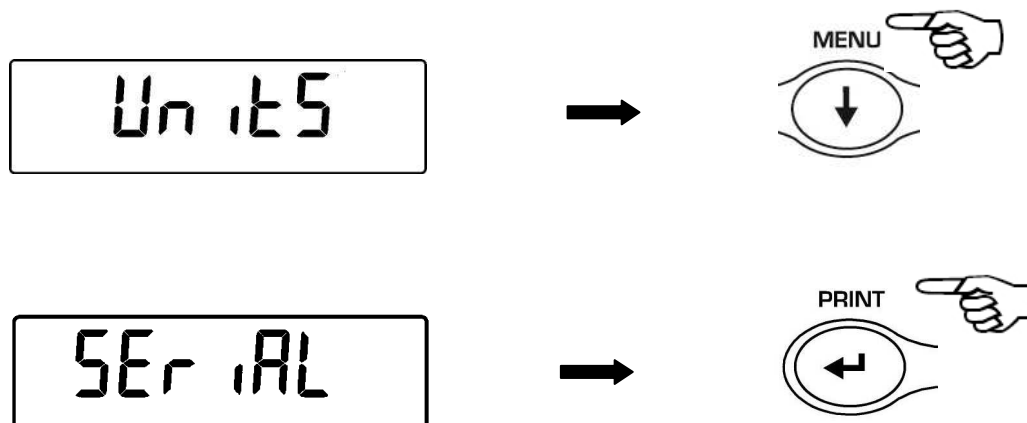


3. Press PRINT button to confirm

9.2 Serial function

This function allows you to select the different modes of data transmission.

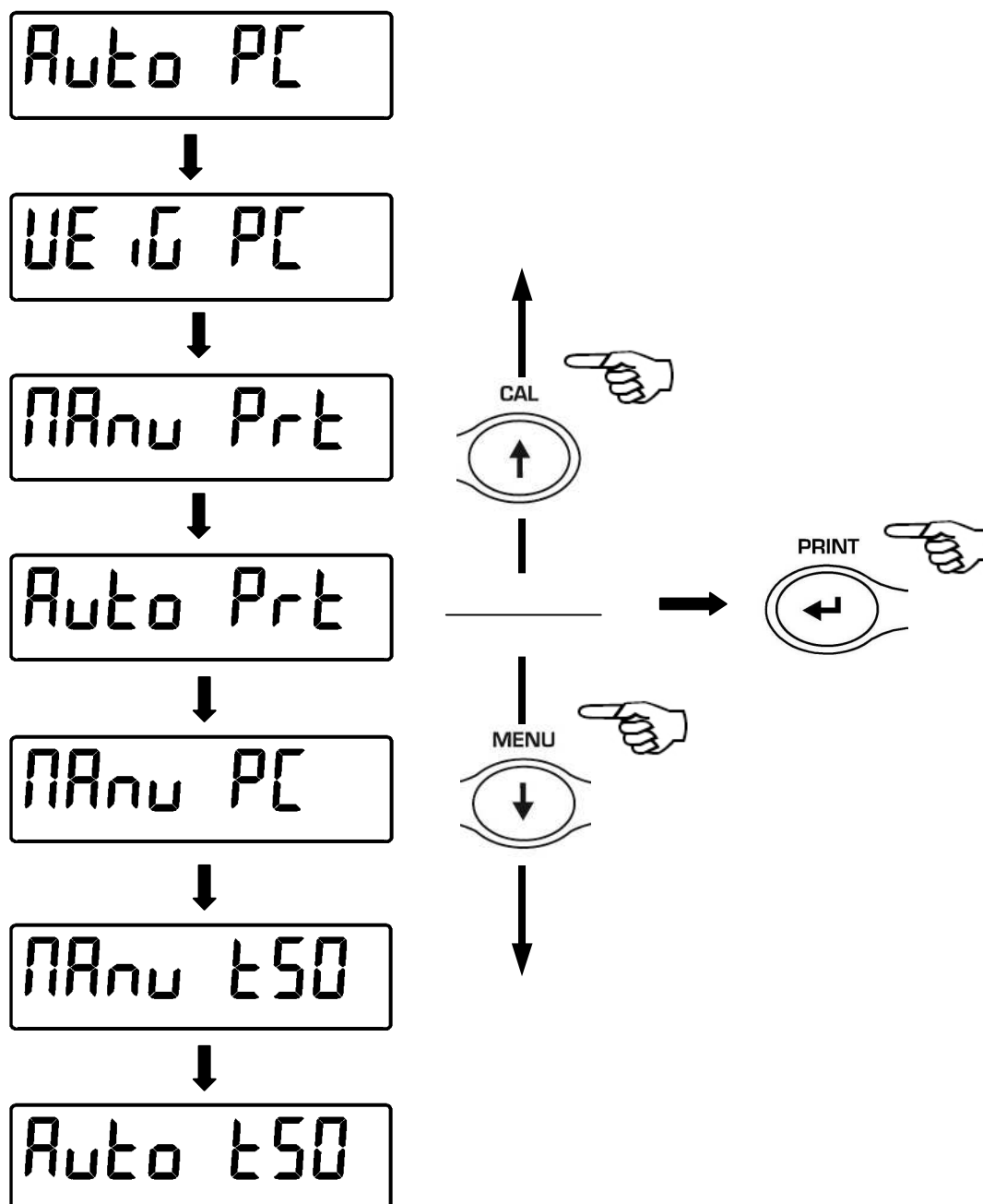
1. From zero condition on display, press and keep pressed the **MENU** button until to buzzer sound stops, then release the button. The message “**units**” is displayed, then press **MENU** button until the message “**Serial**” is displayed and confirm by pressing the **PRINT** button.



Transmission modes are the following:

Manu Prt	The print is accomplished only pushing the PRINT button.
Auto Prt	The print is accomplished automatically at the end of the test.
Manu Pc	The data are transmitted to the PC only after pressing the PRINT button.
Auto PC	The data are transmitted to the PC automatically at the end of the test.
Weig PC	The value of the weight is transmitted continuously to the PC.
Manu t50	Printing is done only by pressing the PRINT button. (for printer model TLP50).
Auto t50	Printing is done automatically at the end of the test (for printer model TLP50).

Pressing the MENU or CAL button scroll forward or backward the various methods of drying, select the one you want and confirm with PRINT button.



2. After selecting the desired mode press the MENU button to move to the next parameter or the CAL button to move to the previous one.

3. To exit the setup menu parameters, press the ON / OFF button.

4. The balance returns to normal weighing conditions

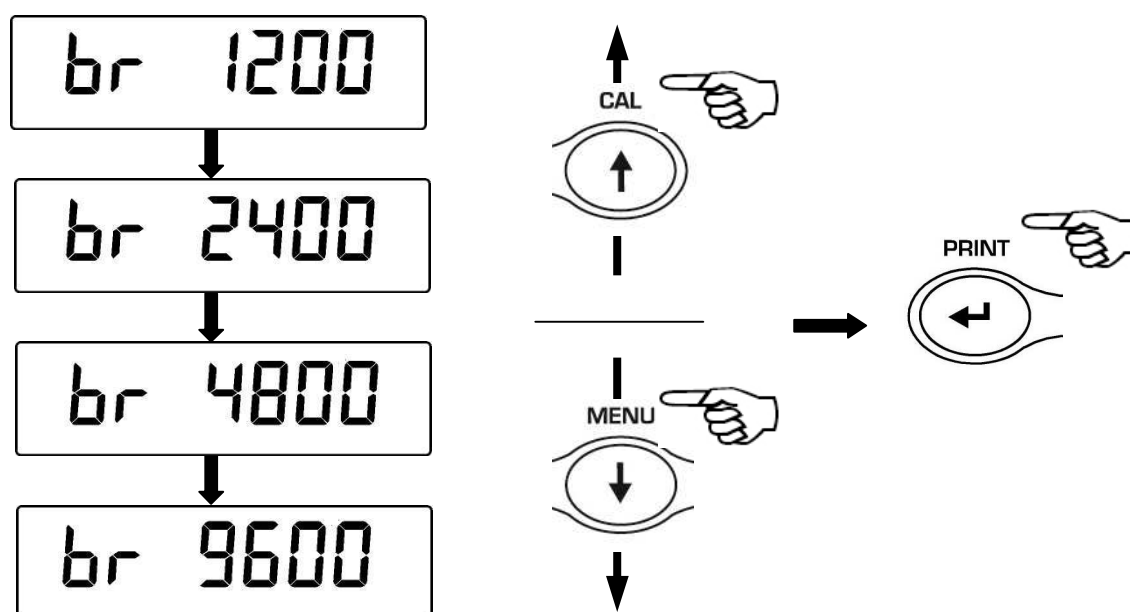


9.3 Transmission speed selection

1. From zero condition on display, press and keep pressed the **MENU** button until to buzzer sound off, then release the button. The message “**unitS**” is displayed, then press **MENU** button until the message “**BAUD RT**” is displayed and confirm by pressing the **PRINT** button.



2. Select serial data transmission speed (1200-2400-4800-9600 baud). Pressing **MENU** or **CAL** buttons it will be possible to scroll forward or backward trough the different transimission speeds, then confirm your choice by pressing **PRINT** button.

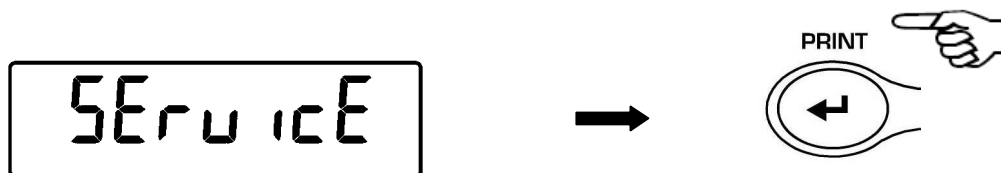


3. After having selected the transmission speed you wish, press the **MENU** button to go to next parameter or **CAL** button to go to previous one.
4. To escape from parameters setup menu, press the **ON/OFF** button
5. The balance will return to standard weighing condition



9.4 Service

1. From zero condition on display, press and keep pressed the **MENU** button until to buzzer sound stops, then release the button. The message “unitS” is displayed, then press **MENU** button until the message “Service” is displayed and confirm by pressing the **PRINT** button.

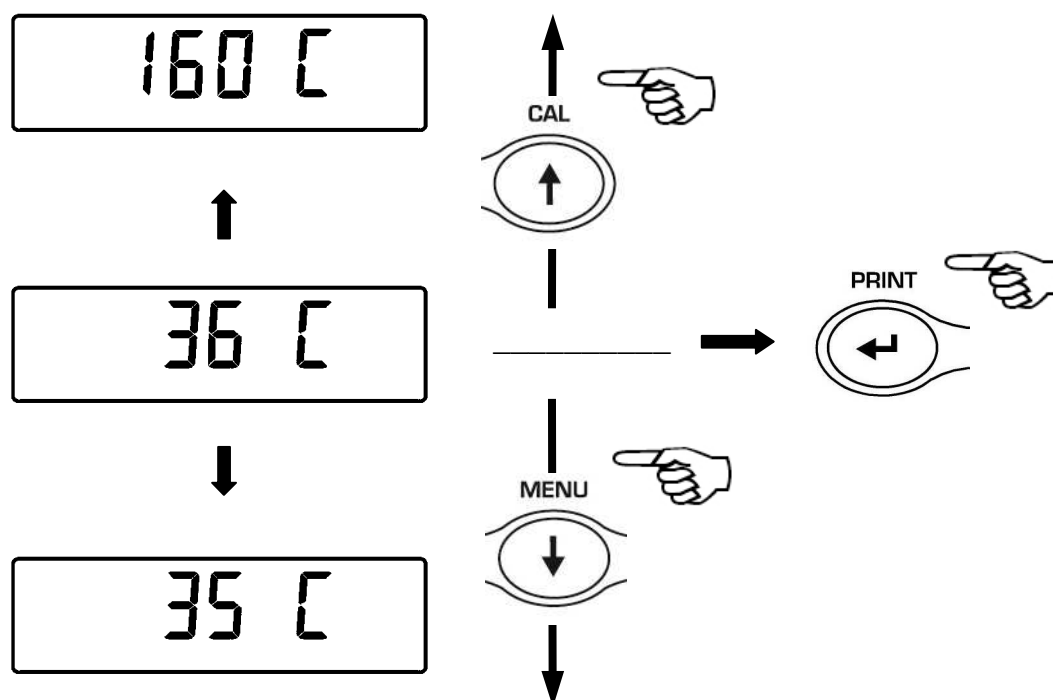


2. Verify the presence of the (optional) pan with the disc temperature sensor and attach the connector to the thermometer.



3. Confirm with **PRINT** button function of test temperature.

4. You can now set the desired temperature for the first test. First displayed value of 35°C that is the minimum value, use the **MENU** and **CAL** buttons to decrease / increase this value, then confirm the value by pressing the **ENTER** button.



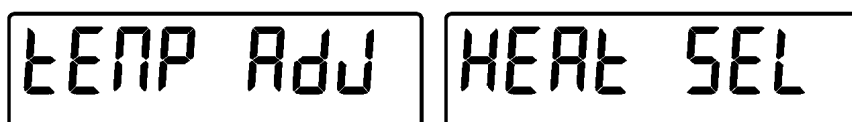
5. Now the heating cycle will start and the display will show the actual temperature value. The H symbol on indicates the heater is powered.



Once the value set is reached, leave the heater on for about 15 minutes, then compare the value on the display with the one detected by the external thermometer

To stop and exit the test mode, press the **ON/OFF** button.

The following menus are accessible only by technical staff:



THERMOMETER
SETTING

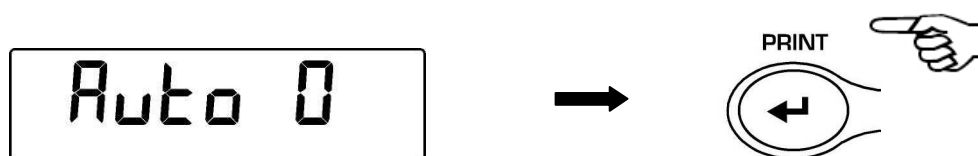
LIGHT
SELECTION

9.5 Autozero function

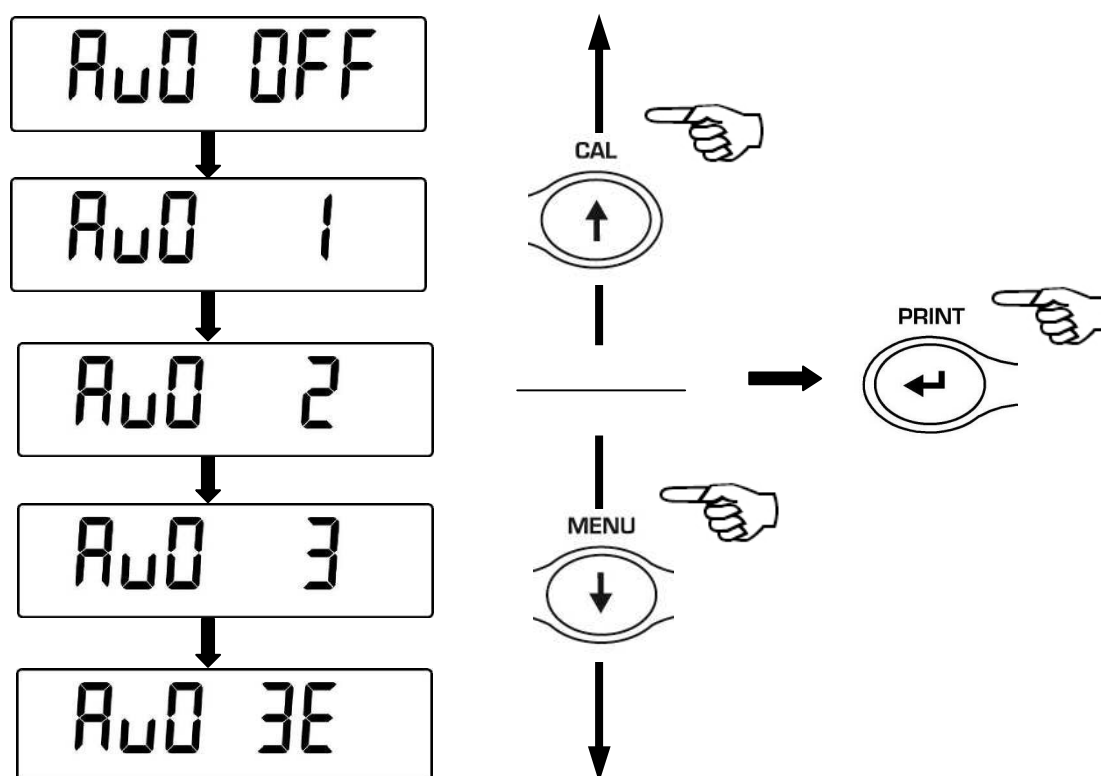
Autozero is an automatic correction of a possible zero drift.

- **Au0 OFF** = autozero disabled
- **Au0 1** = soft autozero
- **Au0 2** = medium autozero
- **Au0 3** = heavy autozero
- **Au0 3E** = heavy autozero over all range

1. From zero condition on display, press and keep pressed the **MENU** button until to buzzer sound off, then release the button. The message “**units**” is displayed, then press **MENU** button until the message “**AUTO 0**” is displayed, then press **PRINT** to confirm



2. Pressing **MENU** or **CAL** button it will be possible to scroll forward or backward through the different autozero levels, select the one you wish and confirm it by pressing the **PRINT** button



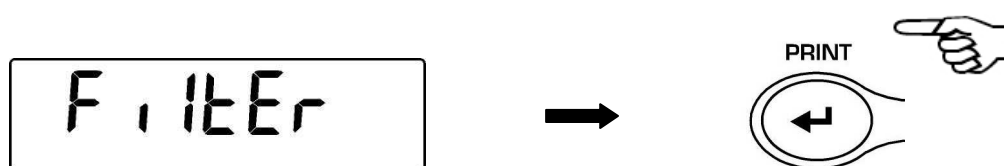
3. After having selected the autozero level you wish, press the **MENU** button to go to next parameter or **CAL** button to go to previous one.
4. To escape from parameters setup menu, press the **MENU** button until to buzzer sound off, then release the button.
5. The balance will return to standard weighing conditions.

9.6 Filters selection

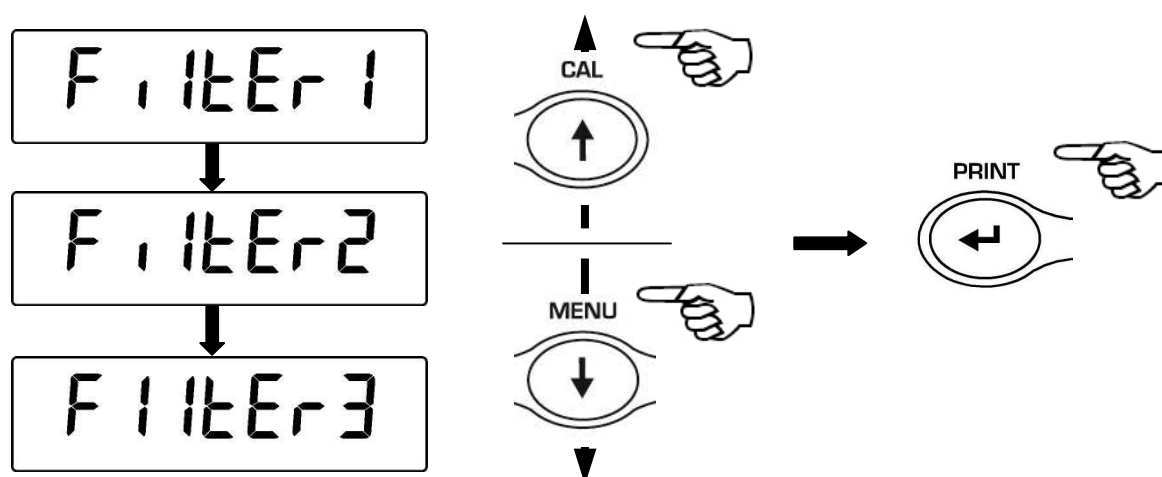
It is possible to adapt the balance to the different environment conditions thanks to the selection of three filters:

- **FILTER 1:** proportion of ingredients condition
- **FILTER 2:** stable conditions
- **FILTER 3:** unstable conditions

1. From zero condition on display, press and keep pressed the **MENU** button until to buzzer sound off, then release the button. The message “**units**” is displayed, then press **MENU** button until the message “**FILTER**” is displayed then confirm it by pressing the **PRINT** button



2. Pressing **MENU** or **CAL** button it will be possible to scroll forward or backward the different filtering levels, select the one you wish and then confirm it by pressing the **PRINT** button



3. After having selected the filtering level you wish, press the **MENU** button to go to next parameter or **CAL** to go to previous one.
4. To escape from parameters setup menu, press the **MENU** button until to buzzer sound off, then release the button.
5. The balance will return to standard weighing conditions



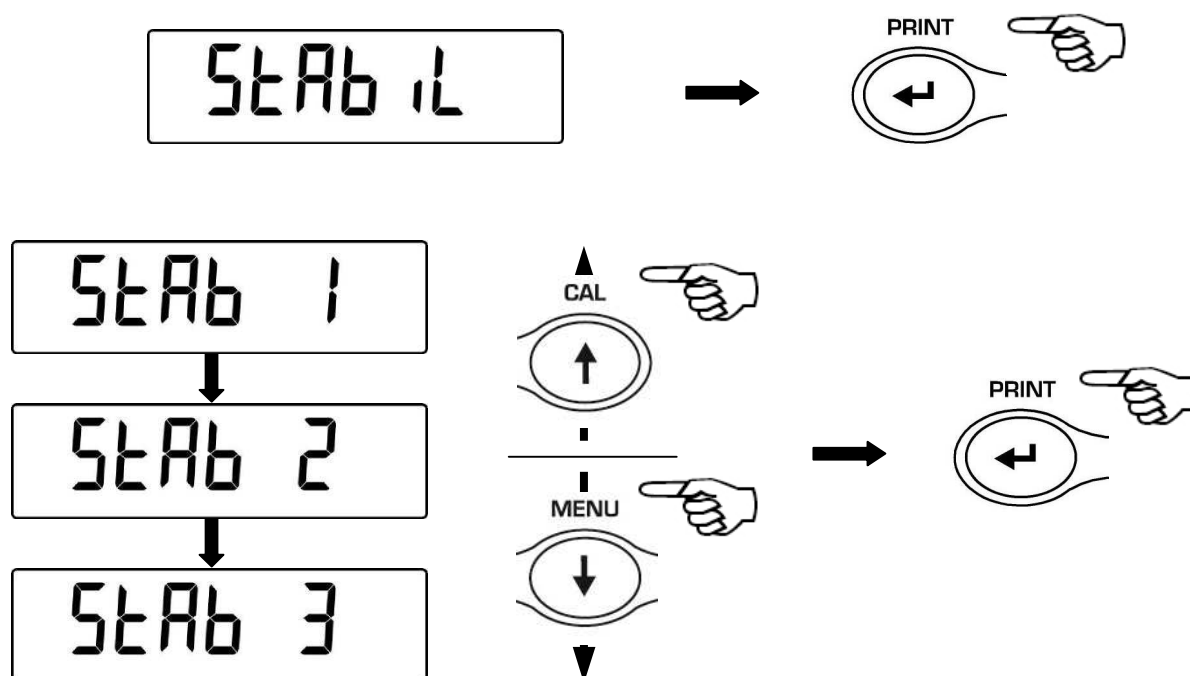
NOTE: It is suggested to use FILTER 1 when proportion of ingredients must be performed

9.7 Stability function

The stability symbol is displayed when the weight is stable inside a defined range

- **STAB 1** = for stable environments
- **STAB 2** = for not so stable environments
- **STAB 3** = for unstable environments

1. From zero condition on display, press and keep pressed the **MENU** button until to buzzer sound off, then release the button. The message “**unitS**” is displayed, then press **MENU** button until the message “**StAbiL**” is displayed, then confirm this by pressing the **PRINT** button.
2. Pressing **MENU** or **CAL** button it will be possible to scroll forward or backward the different stability levels, select the one you wish and then confirm it by pressing the **PRINT** button.



3. After having selected the stability level you wish, press the **MENU** button to go to next parameter or the **CAL** button to go to previous one.
4. To escape from parameters setup menu, press the **MENU** button until to buzzer sound off, then release the button.
5. The balance returns to normal weighing conditions.



9.8 Display Contrast regulation

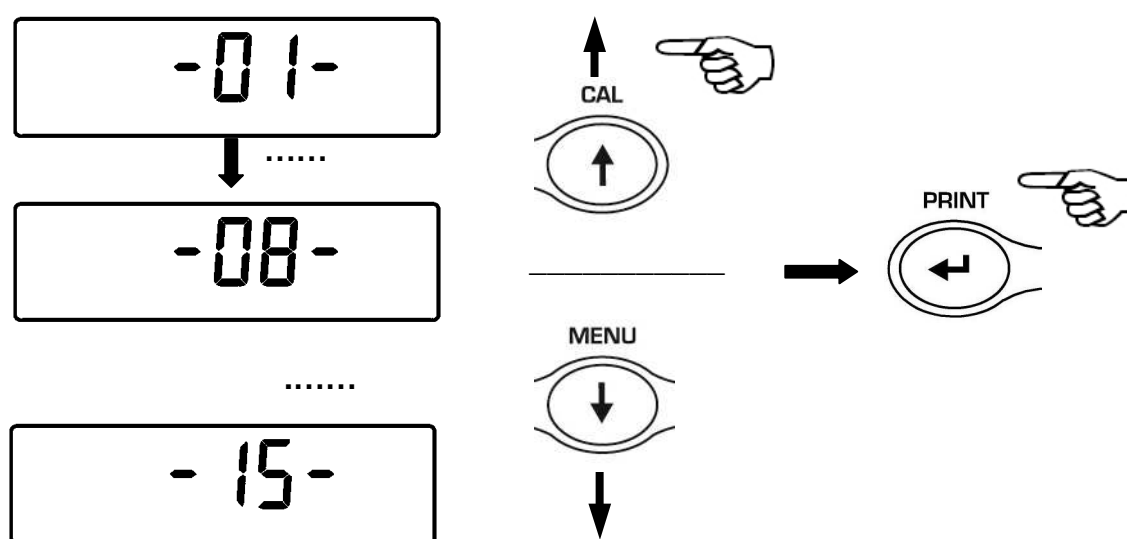
It is possible to regulate the contrast level of display to have a comfortable view of the indication at different angles of usage.

There are 15 different levels of regulation:

1. From zero condition on display, press and keep pressed the **MENU** button until the acoustic signal gets mute, then release the button. The message “**units**” is visualized, now press the **MENU** button repeatedly until the message “**contr**” is displayed and confirm this by pressing the **PRINT** button



2. Now, pressing the buttons **MENU** or **CAL** it is possible to increment or decrement the level of the display contrast; select the one desired and confirm by pressing the **PRINT** button.



3. After you have confirmed the contrast level desired, press the **MENU** button to go to the next parameter or the **CAL** button to go to previous one.
4. To escape from parameters setup menu, press the **MENU** button until the acoustic alarm gets mute, then release the button.
5. The balance returns to normal weighing mode



9.9 Display Backlight setup

The balance display is equipped with backlight to make the indication more visible also during low light conditions.

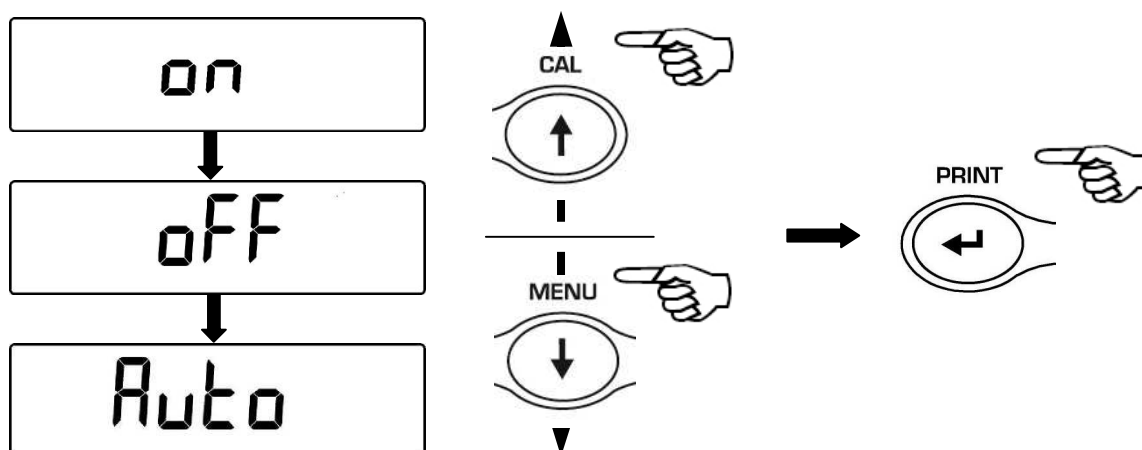
There are 3 working modes:

- **ON** = light always switched ON
- **OFF** = backlight always switched OFF
- **AUTO** = backlight automatically switched on during weighing operations

1. From zero condition on display, press and keep pressed the **MENU** button until the acoustic alarm gets mute, then release the button. The message “unitS” is displayed, then press **MENU** button until the message “bLt ”, then press the **PRINT** button to confirm this.



2. Pressing **MENU** or **CAL** button it will be possible to scroll forward or backward the different working modes, select the one you wish and then confirm it by pressing the **PRINT** button



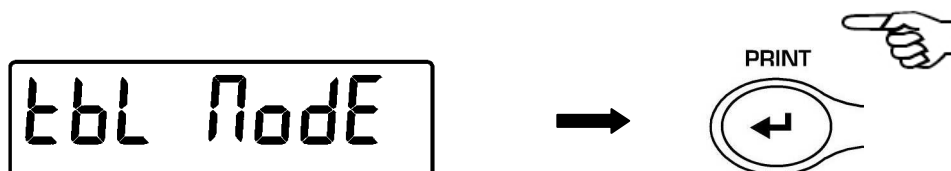
3. After having selected the backlight working mode you wish, press the **MENU** button to go to next parameter or the **CAL** button to go to previous one.
4. To escape from parameters setup menu, press the **MENU** button until the acoustic alarm gets mute, then release the button.
5. The balance returns to normal weighing conditions.



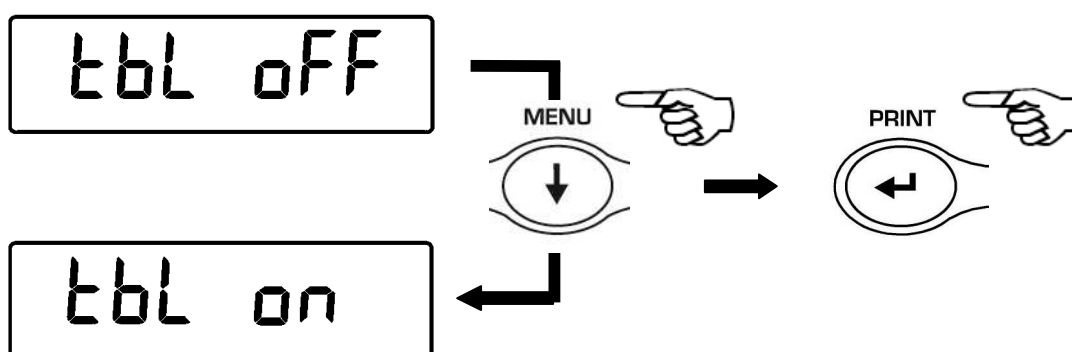
9.10 Selection of working mode with Tablet

Using the appropriate connection box, connect the tablet to the serial output of the balance.

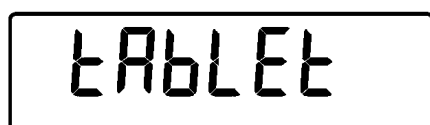
1. From condition of zero on display, press and hold the **MENU** button until the acoustic signal is over, then release the button. The message “**unitS**” is displayed, press the button **MENU** until the message “**TBL MODE**” is displayed and confirm pressing **PRINT** button



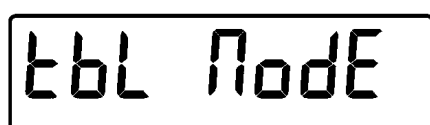
2. To choose the working mode with tablet, press the **MENU** button until you visualize the message “**TBL ON**”, then press **PRINT** to confirm



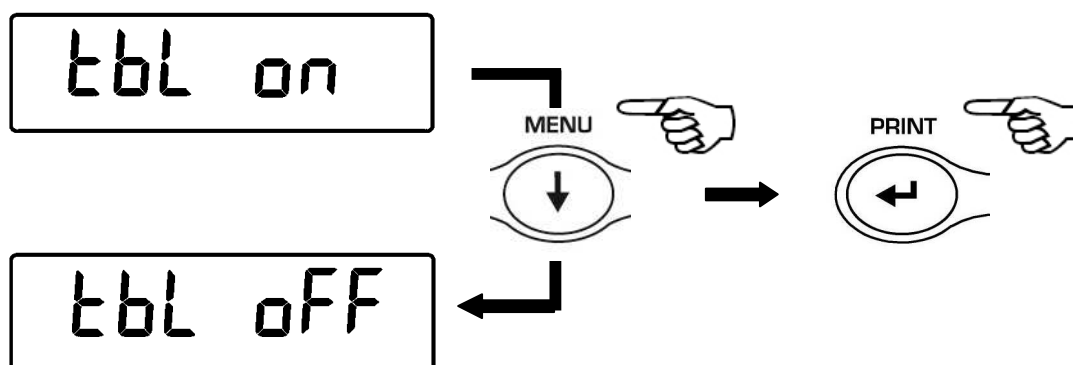
3. After you have chosen the mode “**TBL ON**” the balance will automatically restart and the message “**TABLET**” will appear on the display of balance. From this moment the interface device with the balance is the tablet.



4. To escape from “**TABLET**” mode, press the **MENU** button , then **PRINT** button.



5. Press the **MENU** button until you visualize the message "**TBL OFF**", then press **PRINT** to confirm the selection.

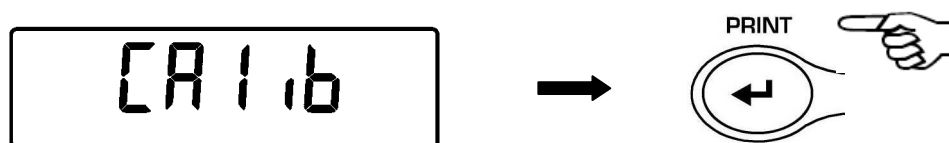


6. After you confirm with the **PRINT** button, the balance will restart automatically and will return to standard working mode.

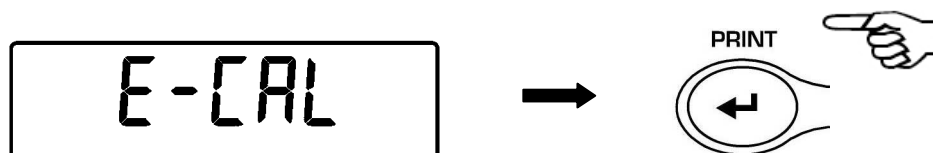
9.11 Calibration Mode

This balance can be calibrated only with external weight.

1. From condition of zero on display, press and hold the **MENU** button until the acoustic signal is over, then release the button. The message "**unitS**" is displayed, press the button **MENU** until the message "**Calib**" is displayed and confirm pressing **PRINT** button



2. The message "**E-Cal**" is displayed.



3. Confirm pressing **PRINT** button

10 How to set Heater's functions

Attention: The minimum amount of substance required to perform the analysis of moisture content depends on the resolution of the instrument:

- For models with a resolution of 0.01 g and 0.001 g is 500mg
- For models with resolution 0,0001g is 50mg

10.1 Measure Function

This function allows you to enter the selection of the drying method:

1. From condition of zero on display, press and hold the **MENU** button. The message "**Measure**" is displayed and confirm pressing **PRINT** button

PrG 1 Drying mode using the stored program 1

PrG 2 Drying mode using the stored program 2

PrG 3 Drying mode using the stored program 3

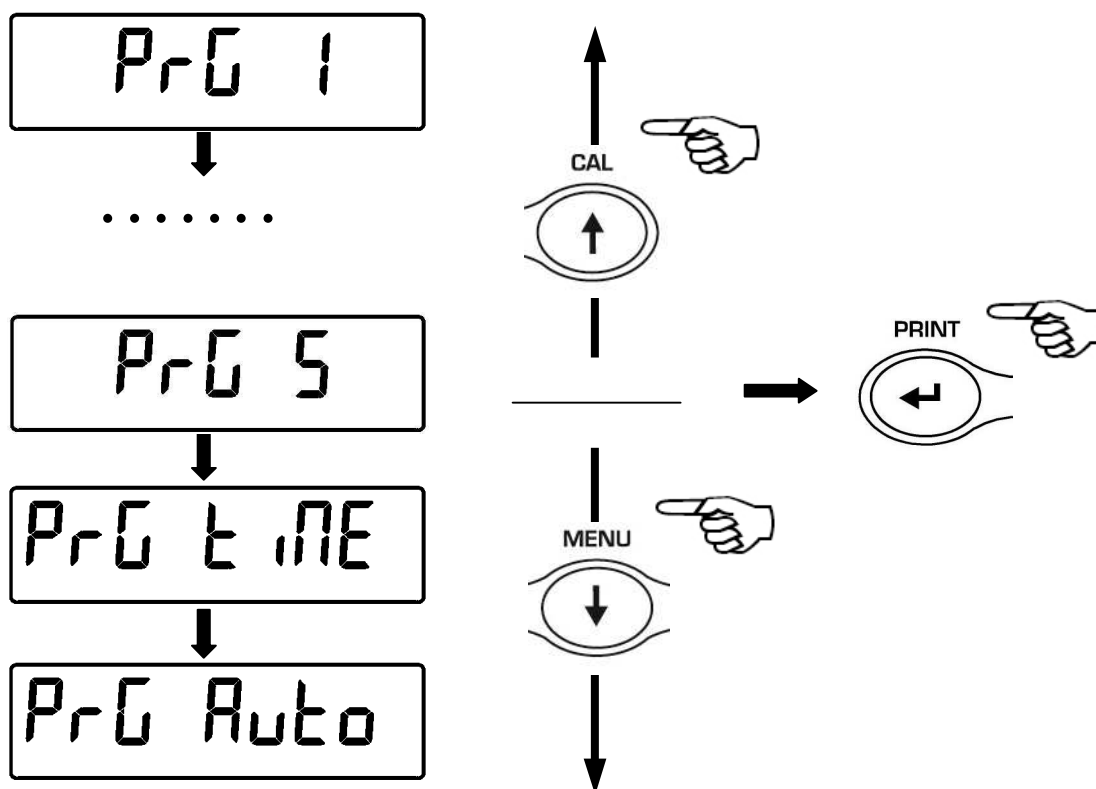
PrG 4 Drying mode using the stored program 4

PrG 5 Drying mode using the stored program 5

PrG time Time drying mode

PrG Auto Autostop drying mode

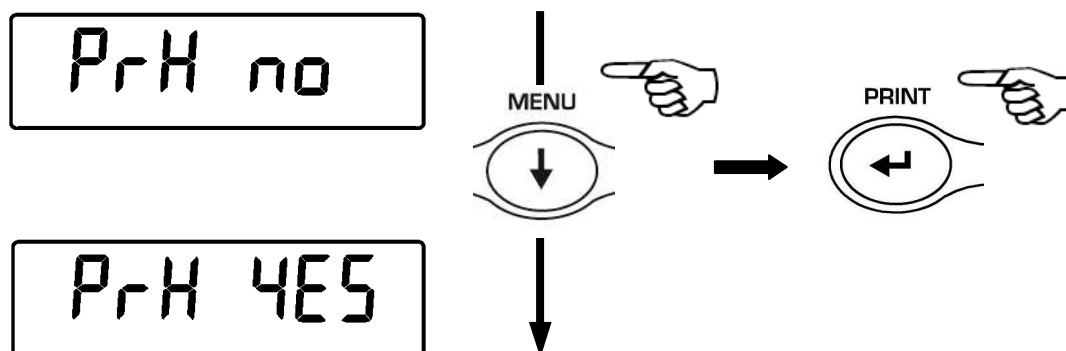
2. Pressing the **MENU** or **CAL** buttons to scroll forward or backward the different drying modes, then select the you choice and confirm it using the **PRINT** button.



10.1.1 Mode using a saved program

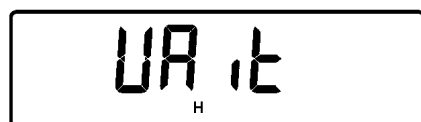
Selecting one of the modes PrG 1 PrG 2 PrG 3, PrG 4 PrG 5 it is possible to recall a drying program previously stored.

After selecting the desired program, press ENTER to confirm. You will read on display the following message:

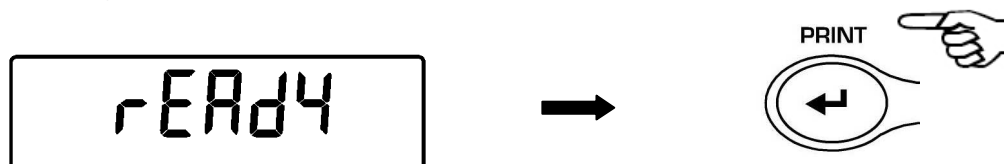


Use the MENU button to activate ("YES") or deactivate ("NO") the function of pre-heating of the heater. This function allows to bring and to keep the heater temperature to the value set before the start of the drying cycle. The choice will be kept memorized until the instrument is switched off.

If the function is activated after the ENTER button has been pressed, then the WAIT message will be displayed.



As the set temperature is reached, it will be maintained and the display will show the following message:

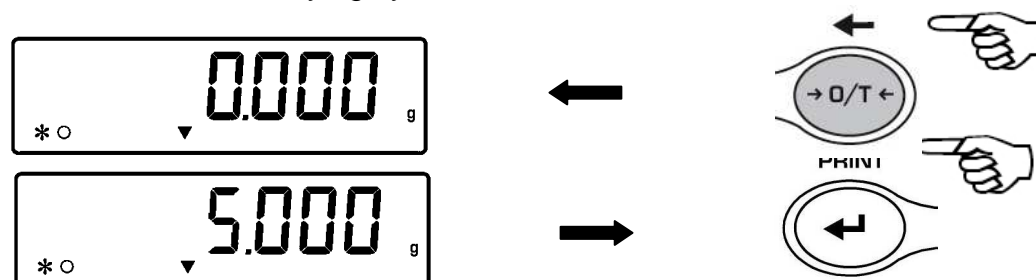


Press the ENTER button to go on

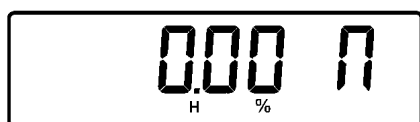
It is now visualized weight indication along with the symbol ▼.

If the function is disabled, after pressing the **ENTER** button to confirm the selection it will be directly displayed the weight value.

Effect the Tare if necessary and load the sample to examine, wait for stability and then press ENTER to let start the drying cycle.



During drying cycle it will be visualized the symbol H (=heater is working).



It is also possible to see the drying parameters pressing sequentially the MENU button:
It is possible to stop the cycle at any moment pressing the ON/OFF button.

Please read the section “Prg Set Function” to know how to store programs

10.1.2 PrG time mode

Selecting this drying mode it is possible to set the proper temperature and drying time values.



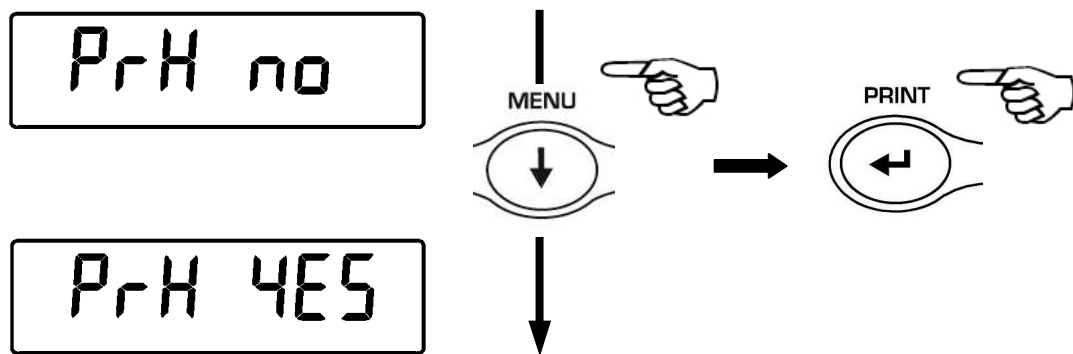
After you confirm the Prg TIME mode, it is first asked to set the duration of the cycle and then the value of drying temperature.



The time can be set from 1 to 99 minutes using the CAL and MENU buttons to increase or decrease the value of time, then confirm with the ENTER button.

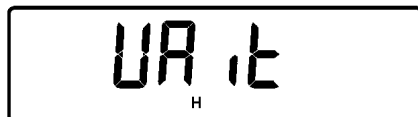


Set now the choosen temperature using the CAL and MENU buttons to increase and decrease the value of temperature, then confirm using the ENTER button.
The following message is then displayed:



Use the MENU button to activate ("YES") or deactivate ("NO") the function of pre-heating of the heater. This function allows to bring and to keep the heater temperature to the value set before the start of the drying cycle. The choice will be kept memorized until the instrument is switched off.

If the function is activated after the ENTER button has been pressed , then the WAIT message will be displayed.



As the set temperature is reached, it will be maintained and the display will show the following message:

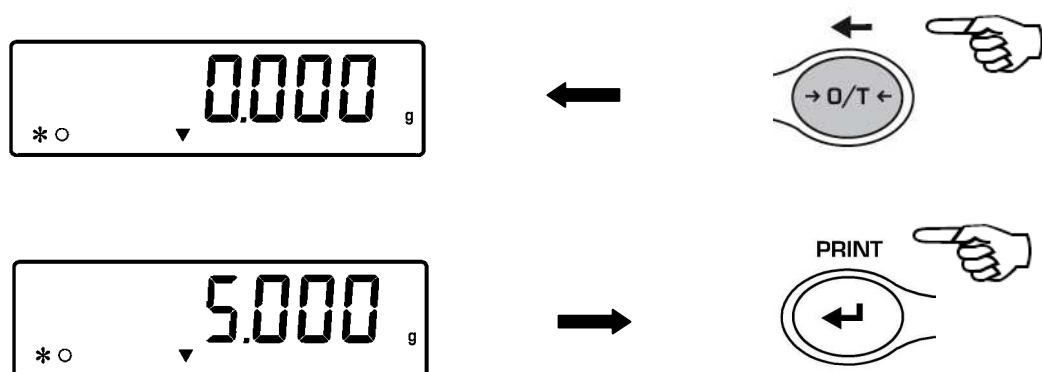


Press the ENTER button to go on.

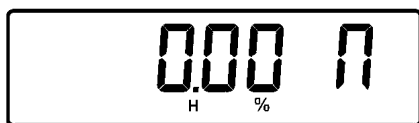
It is now visualized weight indication along with the symbol ▼.

If the function is disable ("NO") after pressing the **ENTER** button to confirm the selection it will be directly displayed the weight value.

Effect the Tare if necessary and load the sample to examine, wait for stability and then press ENTER to let start the drying cycle.



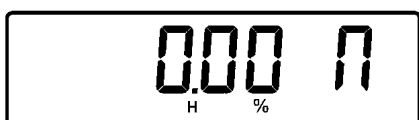
During drying cycle it will be visualized the symbol H (heater is working).



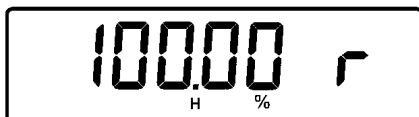
It is possible to stop the cycle at any moment pressing the ON/OFF button.

It is also possible to see the drying parameters pressing sequentially the MENU button:

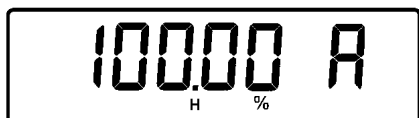
Percentual loss of moisture



Percentual dry residual



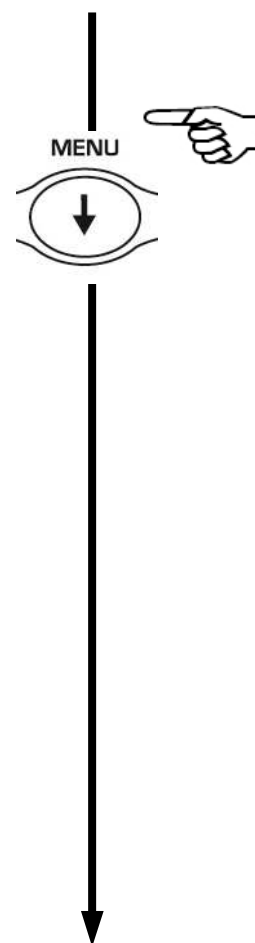
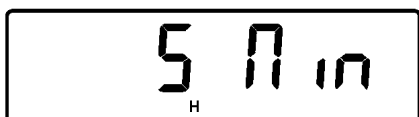
Ratio of initial weight/dry residual weight in percentual



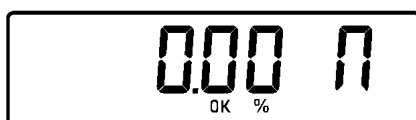
Actual temperature



Time remaining



At the end of the cycle the instrument will give out an acoustic signal for about 15 seconds and on the display it will be visualized the final value with the OK symbol (=cycle is finished).



Press the ON/OFF button to escape and to go to the next sample to examine.

10.1.3 PrG Auto Mode

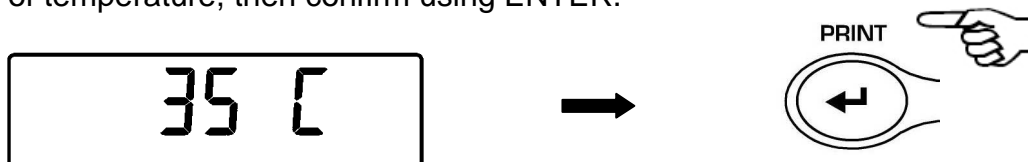
Selecting this mode it is possible to activate the automatic drying mode. Setting the value of temperature and the chosen value of minimum moisture loss (time interval 60sec), the balance will stop automatically the drying process when the moisture loss will go below the value setted by the user.



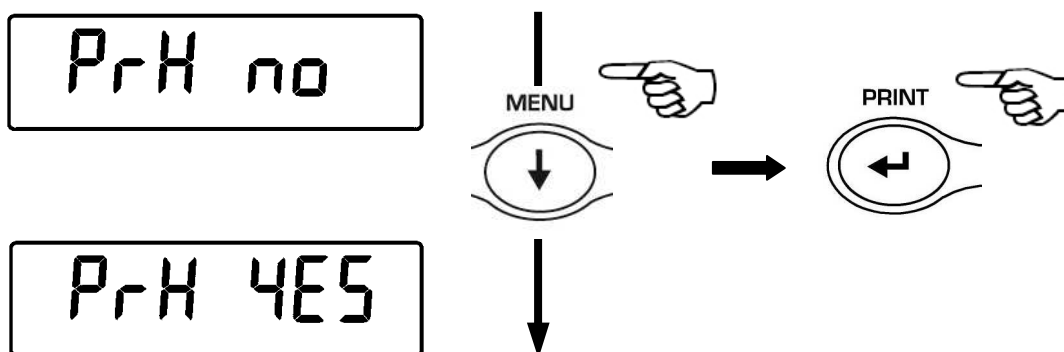
Insert the value of desired percentual minimum moisture loss in the range 0.1 – 9.9% , using the CAL and MENU buttons to increase and decrease this value, then confirm using ENTER.



Now set the proper chosen temperature using CAL and MENU to increase and decrease the value of temperature, then confirm using ENTER.

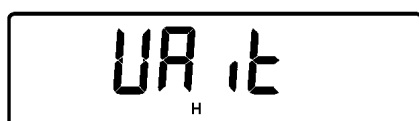


The following message will be displayed

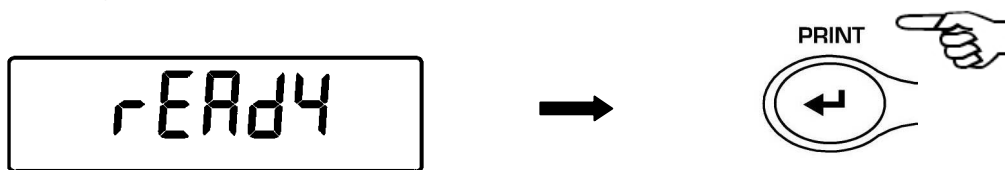


Use the MENU button to activate ("YES") or deactivate ("NO") the function of pre-heating of the heater. This function allows to bring and to keep the heater temperature to the value set before the start of the drying cycle. The choice will be kept memorized until the instrument is switched off.

If the function is activated after the ENTER button has been pressed , then the WAIT message will be displayed.



As the set temperature is reached, it will be maintained and the display will show the following message:

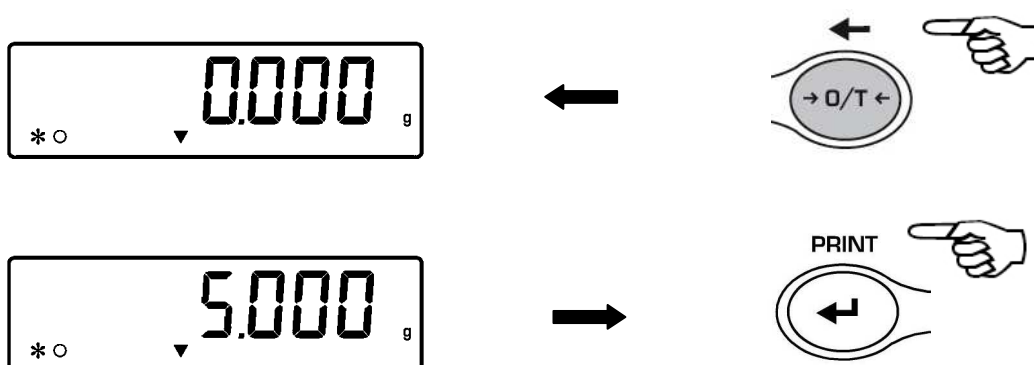


Press the ENTER button to go on.

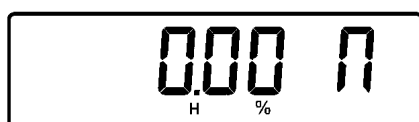
It is now displayed the weight indication along with the symbol: ▼ .

If the function is disabled after pressing the **ENTER** button to confirm the selection it will be directly displayed the weight value.

Effect Tare if necessary and load the sample to examine, wait for stability and press ENTER to let the drying cycle start.



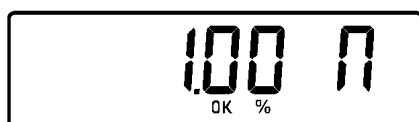
During drying cycle it will be visualized the symbol H (=heater is working).



It is possible to stop the cycle at any moment pressing the ON/OFF button.

During the drying cycle it is possible to see the drying parameters pressing sequentially the MENU button.

When the rate of moisture loss is below of setted valure, automatically the drying process is stopped and the buzzer soun will be for about 15 seconds, on the display it is visualized the analise result with the symbol OK (=cycle is finished).



Press the ON/OFF button to escape and to go to the next sample to examine.

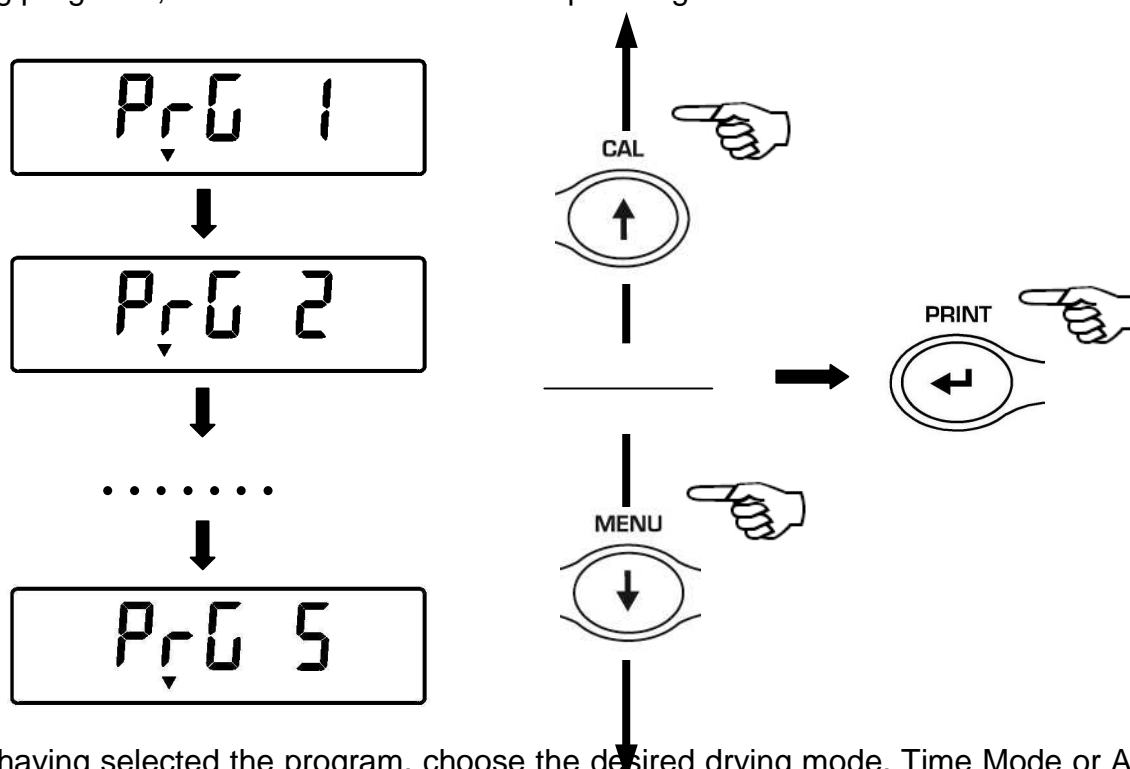
10.2 Prg Set Function

This function allows to store upto 5 different drying programs (Prg1, Prg2, Prg3, Prg4, Prg5)

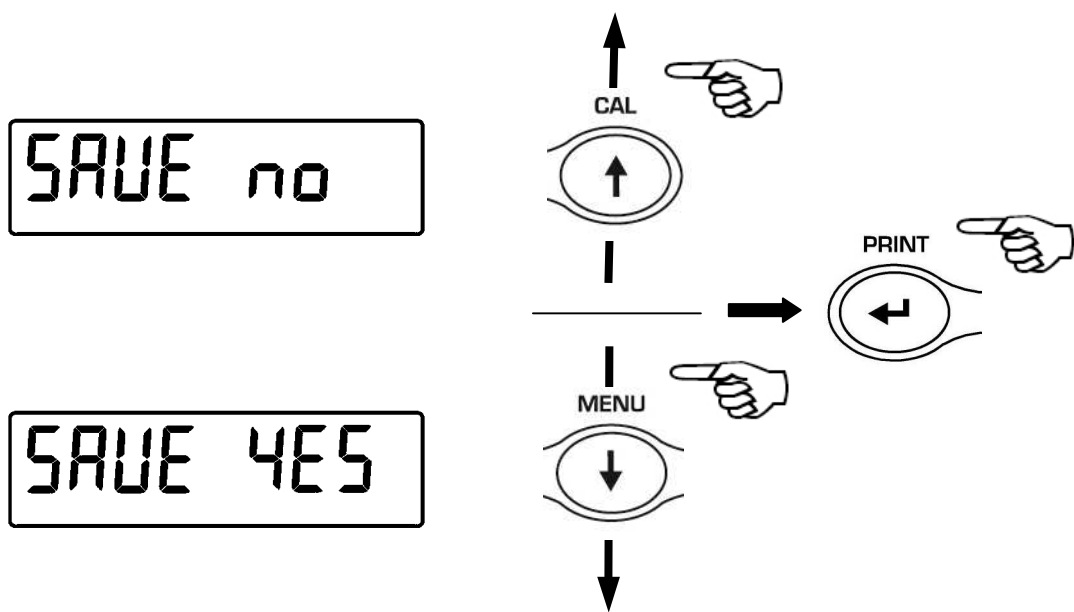
1. From condition of zero on display, press and hold the **MENU** button until the acoustic signal is over, then release the button. The message “**Measure**” is displayed, press the button **MENU** until the message “**Prg Set**” is displayed and confirm pressing **PRINT** button



2. It is displayed the program Prg 1 , press the MENU or CAL to scroll forward or backward the drying programs, then select the one desired pressing the PRINT button



3. After having selected the program, choose the desired drying mode, Time Mode or Auto Mode.
4. Depending on the choosen mode, insert drying parameters as described in the section 10.1.2 for the time mode, and in the section 10.1.3 for the automatic mode.
5. It is now asked if the data that has been set must be saved or not:



Use the MENU and CAL buttons to choose Yes or No. Then confirm with ENTER. Then the program is saved and the previous one is deleted. It is now possible to store another program or it is possible to escape from the programs menu using the ON/OFF button.

11 RS232 interface features

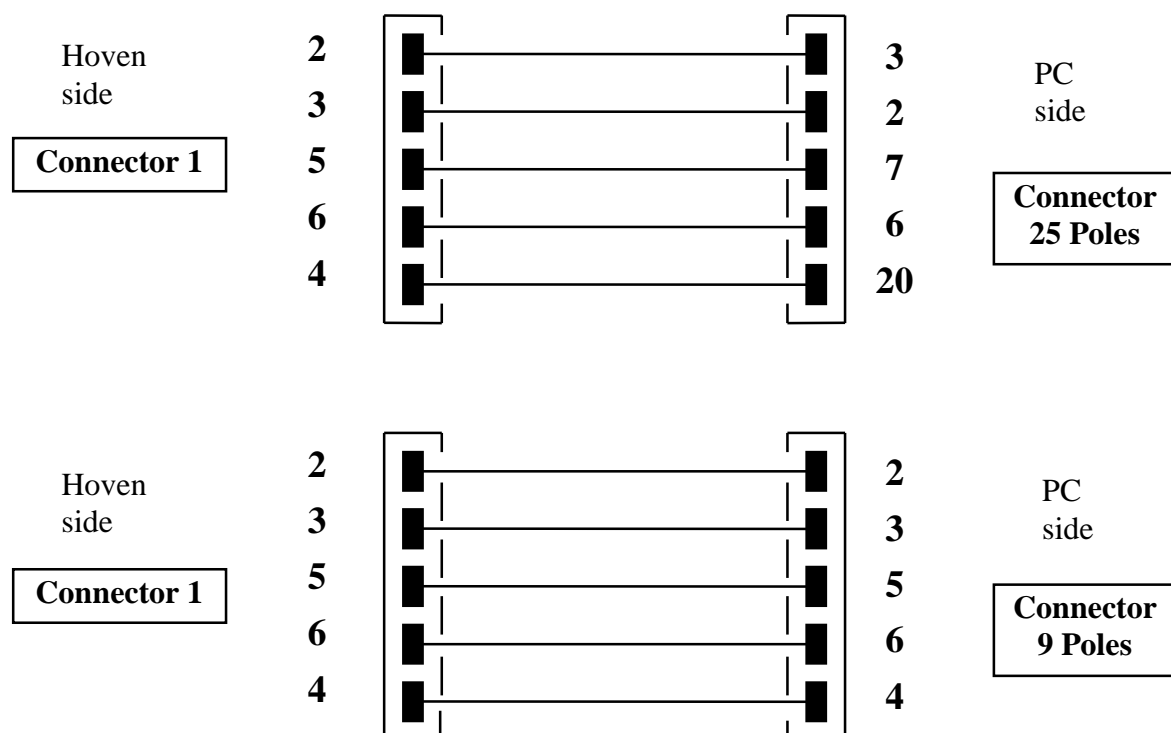
11.1 General features

The balance transmits the value visualized on its display using serial RS232C standard, allowing to print the value of weight and relative drying data to a PC monitor or to a serial printer. Both in the print to PC mode and in the print to Printer mode, it is possible to select the automatic transmission ("Auto") or manual transmission ("Manu") pressing the PRINT button(as described in section "Serial function"). Also, it can receive commands from PC when the balance is set in PC mode, always in RS232C format; this alloww you to perform all the operations usually accomplished with balance buttons through the keys of your PC keyboard. The speed of transmission and recepetion can be selected as previously described (section 9.1) at 1200, 2400, 4800, and 9600 baud. The characheter format is of 8 bit preceded by one bit of start and followed by a bit of stop. Parity is not applied.

N.B.: Serial data transmission is activated only after the drying cycle is entered, with the heater cover closed.

11.2 Connecting the balance to PC

For the transmission of the data, connect the connector 1 located behind the hoven to the serial port of the PC, as illustrated in the following drawing :



11.3 Transmission format when in PC connection mode

In the following table are shown the different transmission formats:

Weig PC

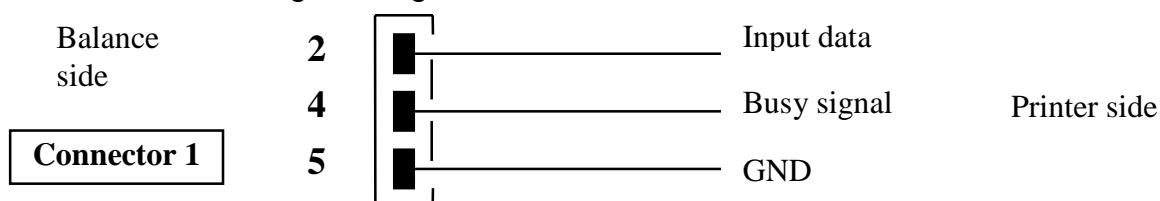
1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11	12	13	14	15
Sign	Value of weight								space	g	space	Stability	CR	LF

Manu PC / Auto PC in weight mode

1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11	12	13	14	15
Sign	Value of weight								space	g	space	Stability	CR	LF

11.4 Connection of the balance with the serial printer

To print the value of weight, connect a serial printer to the connector 1 of the balance as shown in the following drawing:



11.5 Print formats on paper with serial printer

Selecting the transmission mode to serial printer, the balance's serial output will be set to work with serial printers. To select the type of printer, refer to the section 9.2.

The connector to be used for the connection is the No. 1. (See Figure 1 next page)

If it is used the optional printer model TLP50 it is possible to print both in continuous module and in labels with the following formats :

Manu Prt/T50

12-02-2008	12:00
Temp.	130 'C
Time:	5 Min
W.Start	19.998 g

W.End:	19.994 g
Moist.:	0.02 %

Auto Prt/T50 At beginning of the cycle

12-02-2008	12:00
Temp.	130 'C
Time:	5 Min
W.Start	19.997 g

At the end of the cycle

12-02-2009	12:00
W.End:	19.986 g
Moist.:	0.05 %

12 Connectors position (rear)

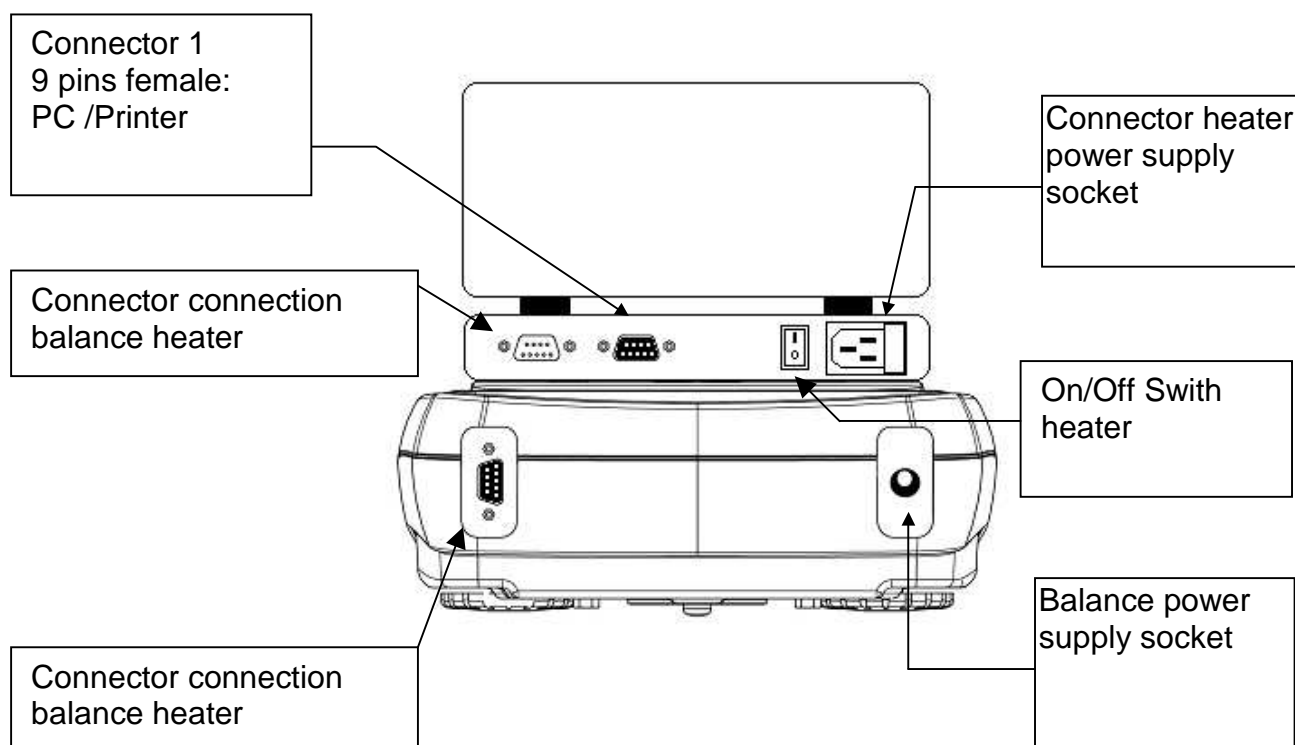


Fig. 1 Rear side of the balance

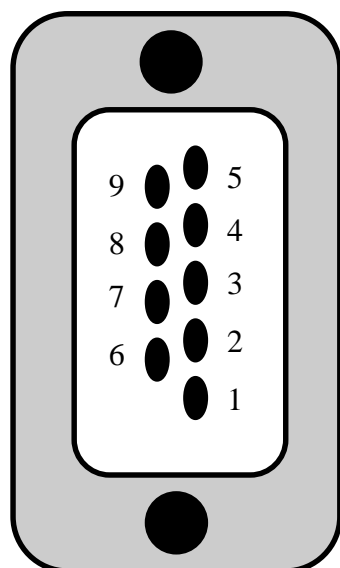


Fig. 2

CONNECTOR 1 PINS FOR KEYBOARD OR PC OR PRINTER

- pin 1 = Power +5V for keyboard
- pin 2 = Tx signal
- pin 3 = Rx signal
- pin 4 = busy signal
- pin 5 = Gnd
- pin 4-6 = connected to each other for connection to PC

Fig. 3

13 Error codes

- **ERR01:** the weight does not reach stability after a tare operation ⇒ Protect the balance from air flows or from vibrations of the working table.
- **ERR02:** impossible to start the calibration operation due to balance instability ⇒ Protect the balance from air flows or from vibrations of the working table.
- **ERR03:** calibration weight not correct or balance unstable ⇒ Calibrate with correct weight or protect the balance from environment disturbs.
- **ERR05:** print not allowed due to balance instability ⇒ Protect the balance from environment disturbs. .
- **ERR07:** error in insertion data.
- **ERR10:** the weight does not reach stability before start of dry ⇒ Protect the balance from environment disturbs.
- **ERR11:** weight of substance not enough ⇒ Increase quantity of substance .
- **“UNLOAD”:** weight loaded on the pan or pan not positioned properly ⇒ Remove the weight from the pan or position properly the pan and underpan.



- : Overrange condition ⇒ Unload the weights loaded on the pan.



- : Underrange condition ⇒ Place properly pan and underpan.

14 Maintenance and care

Regular maintenance of your balance guarantee accurate measurements.

- **Cleaning**

Before cleaning the balance unplug the power supply of the balance from the voltage supply of your room. Do not use aggressive cleaning product (as solvents or similar), use a humid towel with soft detergent, avoid liquids to penetrate inside the instruments during the cleaning. Wipe the balance with a soft towel. Parts of samples or powder can be removed using a brush or vacuum cleaner.

- **Safety checks**

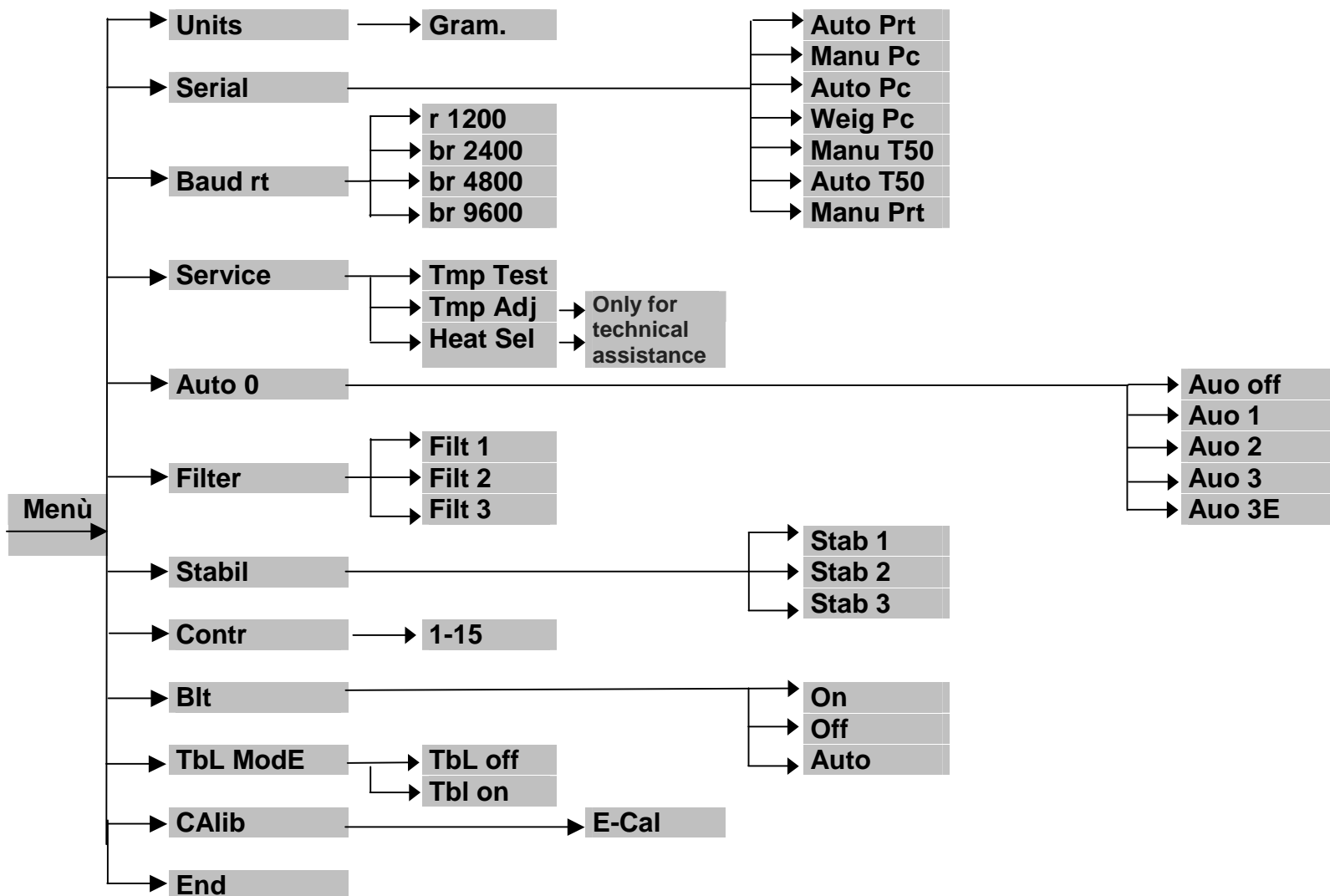
Safety of the instrument is no more guaranteed when:

- balance power supply is clearly damaged
- balance power supply is not working anymore
- balance power supply is stored for long time in hard environment conditions.

In these instances refer to the assistance center where specialized technician will make reparations to bring back the instrument in the safety conditions eventually.

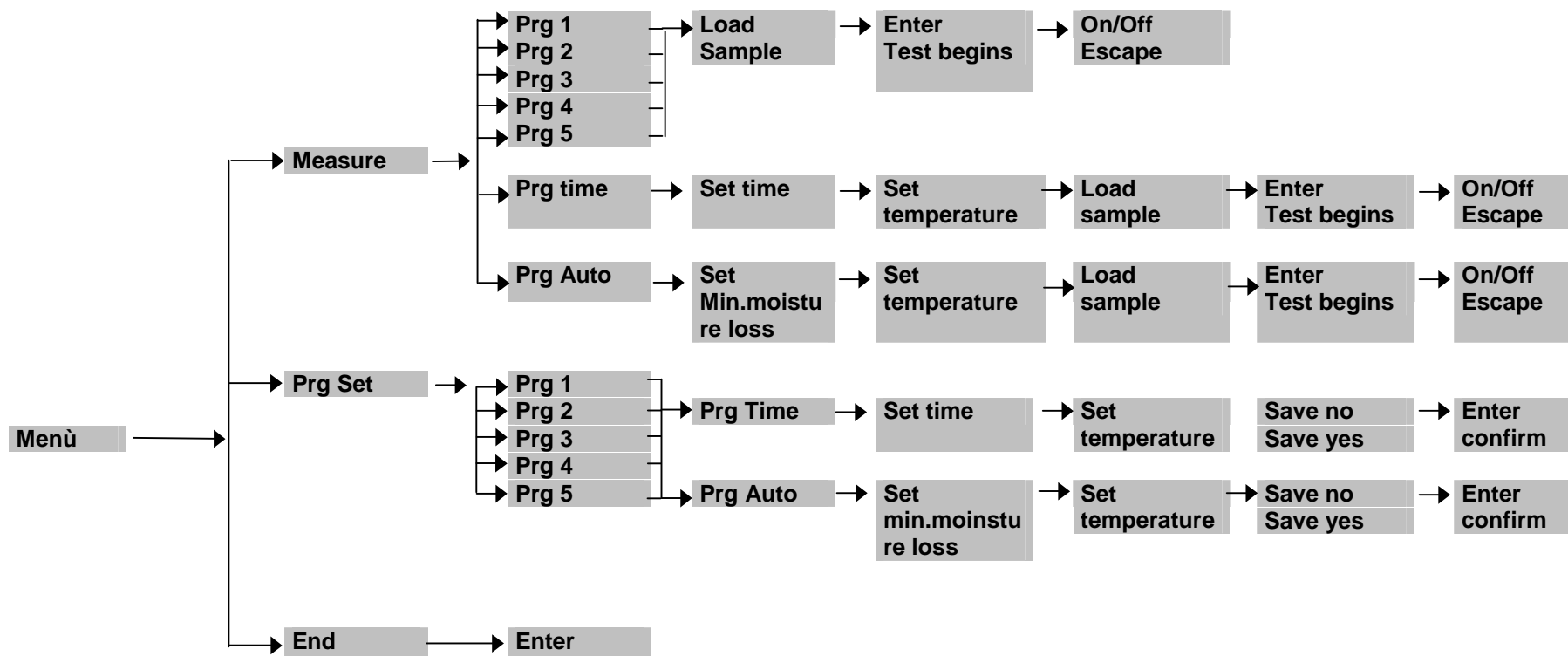
15 Quick guide to balance parameters settings

- To enter the balance parameters setup menu, press and keep pressed the **MENU** button until the acoustic alarm is over.
- Use then the **MENU** button to go to next parameterer, use the **CAL** button to go to previous and the **PRINT** button to cofirm the choice.
- To escape from menu, press the and keep pressed the **MENU** button until the acoustic alarm is over



16 Quick guide to the use of the balance's programs

- To enter the menu of balance programs press the **MENU** button.
- Then use the **MENU** button to go to the next parameter, use the **CAL** button to return to previous parameter, use the **PRINT** button to confirm your selection.
- To escape from the menu press and keep pressed the **MENU** button until the acoustic sound is over.



17 Balance Technical features

All the models listed all only for internal use.

Maximum altitude using limit: 4000m.

Pollution level: 2.

Overvoltage category: II

Power supply included L version:	INPUT: Switching 100-240Vac~ 50/ 60Hz, OUTPUT: 9V DC 1000mA, Max absorbed power 9VA.
Power supply included M version:	INPUT: Switching 100-240Vac~ 50/ 60Hz, OUTPUT: 24V DC 5 50mA, Max absorbed power 13.2VA
Enviroment condition adaption:	Selectable filters
Autozero:	Selectable from Menu
Serial output:	RS232C
Operating temperature range:	+5°C - +35°C

18 Heater technical features

Access to samples room: cover with wide opening angle

Temperature working range: 35 – 160 °C, that can be set with steps of 1°C

Switch-off method: automatic or at time that can be set from 1 to 99 minutes with steps of 1 minute

Heating: halogen lamp

Power supply tension: 230V 50Hz or 110V 60Hz (at request)

Absorbed power: 400 VA

Fuse: 250V 5A dimensions 5X20m

19 Optional Accessories

ACCESSORIES	
Code	DESCRIPTION
611-3136	Tablet System for moisture analyser . Includes Tablet, Tab-box, support, Application. USB version.
611-3137	Tablet System for moisture analyser. Includes Tablet, Tab-box, support, Application. BLUETOOTH version.
630-1485	TLP-50 Serial Printer, with date/time (connection cable included)
630-1486	TLP-50 Serial Printer, with date/time (connection cable included) Interface UK
611-2794	DPP-250 Serial Printer (can work also with batteries, connection cable included)
611-2793	BLUETOOTH printer DPP-250-BT (works also w/ battery) for Tablet system
630-1488	Roll of paper for TLP-50 printer
611-2795	Roll of paper for DPP250 printer
611-2786	RS232/USB CONVERTER
611-2787	Serial cable 9pins M/M for serial output printer/PC
611-2788	80 pcs TEST pans for ThermoBalance i-Thermo, diam.100mm, thickness 0.5mm

20 Technical service

Web Resources

Visit the VWR's website at www.vwr.com for:

- Complete technical service contact information
- Access to VWR's Online Catalogue, and information about accessories and related products
- Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. www.vwr.com.

21 Warranty

VWR International warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

22 Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorizations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorization, unless any refusal is due to a defect of the product.

23 Equipment Disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste. Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment. For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

Austria

VWR International GmbH
Graumanngasse 7
1150 Wien
Tel.: 01 97 002 0
Fax: 01 97 002 600
E-mail: info@at.vwr.com

Belgium

VWR International bvba
Researchpark Haasrode 2020
Geldenaaksebaan 464
3001 Leuven
Tel.: 016 385 011
Fax: 016 385 385
E-mail: customerservice@be.vwr.com

Czech Republic

VITRUM VWR s. r. o.
a VWR International Company
Pražská 442
CZ - 281 67 Stříbrná Skalice
Tel.: +420 321 570 321
Fax: +420 321 570 320
E-mail: info@cz.vwr.com

Denmark

VWR - Bie & Berntsen
Transformervej 8
2730 Herlev
Tel.: 43 86 87 88
Fax: 43 86 87 90
E-mail: info@dk.vwr.com

Finland

VWR International Oy
Valimotie 9
00380 Helsinki
Tel.: 09 80 45 51
Fax: 09 80 45 52 00
E-mail: info@fi.vwr.com

France

VWR International S.A.S.
Le Périgares – Bâtiment B
201, rue Camot
94126 Fontenay-sous-Bois cedex
Tel.: 0 825 02 30 30 (0,15 € TTC/min)
Fax: 0 825 02 30 35 (0,15 € TTC/min)
E-mail: info@fr.vwr.com

Germany

VWR International GmbH
Hilpertstraße 20a
D - 64295 Darmstadt
Freecall: 0800 702 00 07
Fax: 0180 570 22 22*
Email: info@de.vwr.com
*0,14 €/Min. aus d. dt. Festnetz

Hungary

VWR International Kft.
Simon László u. 4.
4034 Debrecen
Tel.: (52) 521-130
Fax: (52) 470-069
E-mail: info@hu.vwr.com

Ireland / Northern Ireland

VWR International Ltd /
VWR International (Northern Ireland) Ltd
Orion Business Campus
Northwest Business Park
Ballycoolin
Dublin 15
Tel.: 01 88 22 222

Fax: 01 88 22 333
E-mail: sales@ie.vwr.com

Italy

VWR International PBI S.r.l.
Via San Giusto 85
20153 Milano (MI)
Tel.: 02-3320311/02-487791
Fax: 800 152999/02-40090010
E-mail: info@it.vwr.com
info@internationalpbi.it

The Netherlands

VWR International B.V.
Postbus 8198
1005 AD Amsterdam
Tel.: 020 4808 400
Fax: 020 4808 480
E-mail: info@nl.vwr.com

Norway

VWR International AS
Haavard Martinsens vei 30
0978 Oslo
Tel.: 02290
Fax: 815 00 940
E-mail: info@no.vwr.com

Poland

VWR International Sp. z o.o.
Limbowa 5
80-175 Gdansk
Tel.: 058 32 38 200 do 204
Fax: 058 32 38 205
E-mail: labart@pl.vwr.com

Portugal

VWR International -
Material de Laboratório, Lda
Edifício Neopark
Av. Tomás Ribeiro, 43- 3 D
2790-221 Camaxide
Tel.: 21 3600 770
Fax: 21 3600 798/9
E-mail: info@pt.vwr.com

Spain

VWR International Eurolab S.L.
C/ Tecnología 5-17
A-7 Llinars Park
08450 - Llinars del Vallès
Barcelona
Tel.: 902 222 897
Fax: 902 430 657
E-mail: info@es.vwr.com

Sweden

VWR International AB
Fagerstagatan 18a
163 94 Stockholm
Tel.: 08 621 34 00
Fax: 08 621 34 66
E-mail: kundservice@se.vwr.com

Switzerland

VWR International GmbH
Lerzenstrasse 16/18
8953 Dietikon
Tel.: 044 745 13 13
Fax: 044 745 13 10
E-mail: info@ch.vwr.com

Turkey

Pro Lab Laboratuvar Teknolojileri Ltd.Şti.
a VWR International Company

Orta Mah. Cemal Gürsel Caddesi
Ördekcioglu İşmerkezi No.32/1
34896 Pendik - Istanbul
Tel.: +90216 598 2900
Fax: +90216 598 2907
Email: info@pro-lab.com.tr

UK

VWR International Ltd
Customer Service Centre
Hunter Boulevard - Magna Park
Lutterworth
Leicestershire
LE17 4XN
Tel.: 0800 22 33 44
Fax: 01455 55 85 86
E-mail: uksales@uk.vwr.com

Australia

VWR International, Pty Ltd.
Unit 1/31 Archimedes Place
Murarrie, Queensland 4172
Tel.: 1300 727 696
Fax: 1300 135 123

China

VWR (Shanghai) Co., Ltd
2nd Floor, Building 4,
Lane 998, Halei Rd,
Zhangjiang Hi-tech Park
Shanghai, 201203
Tel.: +86-21-5898 6888
Fax: +86-21-5855 8801
E-mail: info_china@vwr.com

India

VWR Lab Products Private Limited
135/12, Brigade Towers, 2nd Floor
Front wing, Brigade Road,
Bengaluru, India – 560 025
Tel.: +91-80-41117125/26 (Bengaluru)
Tel.: +91-2522-647911/922 (Mumbai)
Fax: +91-80-41117120
E-mail: vwr_india@vwr.com

New Zealand

Global Science - A VWR Company
241 Bush Road
Albany 0632, Auckland
Tel.: 0800 734 100
Fax: 0800 999 002
E-mail: sales@globalscience.co.nz

Singapore

VWR Singapore Pte Ltd
18 Gul Drive
Singapore 629468
Tel.: +65 6505 0760
Fax: +65 6264 3780
E-mail: sales@sg.vwr.com

**GO TO VWR.COM FOR THE LATEST
NEWS, SPECIAL OFFERS AND
DETAILS OF YOUR LOCAL VWR
DISTRIBUTOR**
