User Manual

Cole-Parmer Symmetry

Balance Series UMA/MA

02-16-17 REV04

Contents

1. GENERAL INFORMATION

1.1 INTENDED USE

The balance precisely measures mass in laboratory conditions.

1.2 PRECAUTIONS

- Prior to use, it is highly recommended that you carefully read this User Manual and operate the balance as intended.
- Do not operate the touch panel using sharp-edged tools (e.g., knife, screwdriver, etc.).
- Place the load to be weighed in the center of balance's weighing pan.
- Do not exceed the balance's maximum capacity by placing loads that are too heavy in the weighing pan.
- Do not leave heavy loads on balance's weighing pan for a long period of time.
- If a balance needs to be decommissioned, it should be done in accordance with legal regulations.
- Do not use the balance in areas where explosions occur. The balance series not designed to operate in EX zones.

1.3 SUPERVISION OVER METROLOGICAL PARAMETERS

Metrological parameters of a balance need to be checked by an authorized user. Inspection frequency is qualified by the ambient conditions in which a balance is used, processes carried out and adopted quality management system.

1.4 WARRANTY CONDITIONS

A. Cole Parmer will exchange, replace or repair the existing balance for any damage that appears to be faulty by production or by construction within the 3-year warranty period.

B. Warranty is voided if:

- mechanical defects caused by inappropriate use:
    - defects of thermal and chemical origin,
    - defects caused by lightning, overvoltage in the power network
    - defects caused by water damage
    - or other random event
- overloading the mechanical measuring system
- installing another version of the operating system
- utilizing the balance contrary to its intended use
- repairs carried out by non-authorized service centers
- removing or destroying protective stickers which secure the balance's housing against unauthorized access

C. Warranty card must be filled out for warranty to be valid.

2. UNPACKING AND INSTALLATION

2.1 PLACE OF USE AND ASSEMBLING

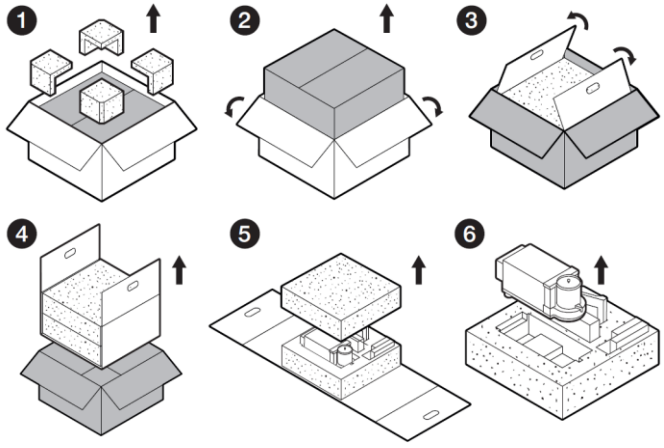
- The balance should be stored and used in locations free of vibrations and shakes, free of air movement and dust.
- Ambient air temperature should not exceed the range of: +10 °C ÷ +40 °C.
- Ambient relative humidity should not exceed 80%.
- During balance operation, ambient temperature in the weighing room should not change rapidly.
- The balance should be located on a stable wall console desk or a stable working table which is not affected by vibrations and distant from heat sources.
- Take special precaution when weighing magnetic objects, as part of the balance is a strong magnet. Should such loads be weighed, use under-pan weighing option, which removes the weighed load from area influenced by the balance's magnet. The hook for under-pan weighing is installed in balance's base.
- Keep all package element should your device be transported in the future. Remember that only original packaging can be used for shipping purposes. Prior to packing, uncouple any cables, remove any separable components (weighing pan, shields, inserts). Pack the device components into an original packaging. The original packaging protects the equipment against potential damage during transportation.

2.2 STANDARD DELIVERY COMPONENTS LIST

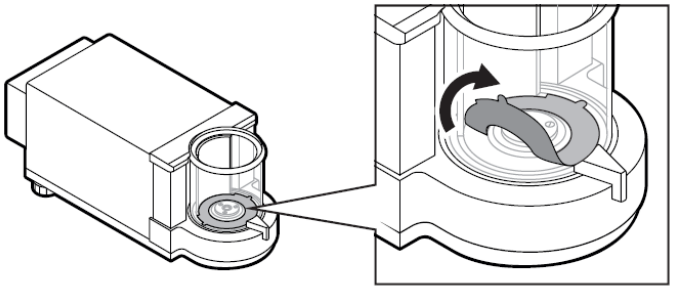
- Balance and components shown in Section 2.4 depending on balance model
- Warranty Card
- USB
    - User Manual
    - Balance USB Driver
    - RLAB Software
    - RLAB Software Manual

2.3 UNPACKING

Cut the adhesive tape. Take the device out of the packaging. Open the box, take the device components out of it (see image below)



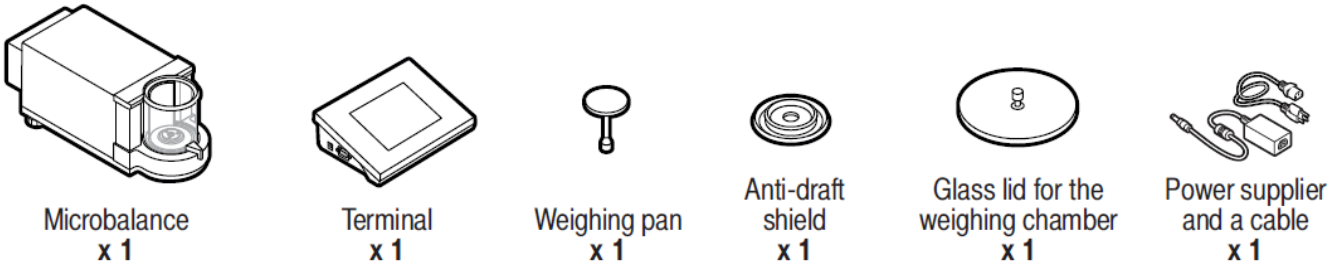
If there is a protective sticker on the base of the Anti-draft chamber, remove before fully assembling the device.



2.4 BALANCE ASSEMBLY

Model: UMA-T-2, MA-T-2, MA-T-2, MA-T-2, MA-T-2

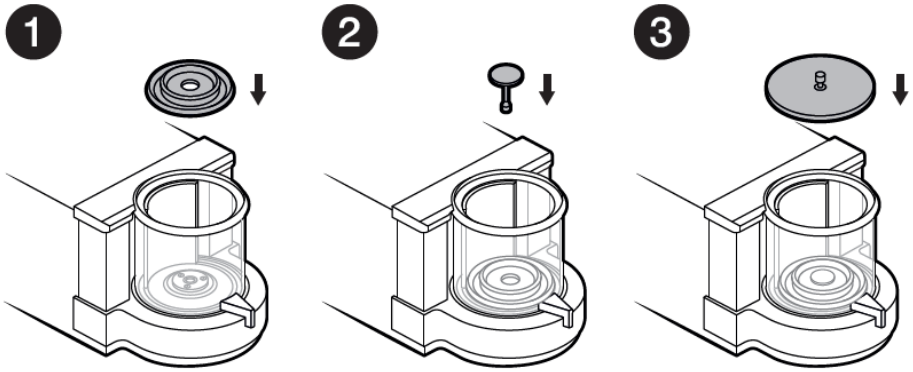
Components-



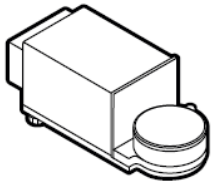
Installation-

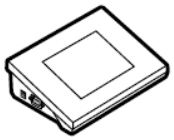
1) Carefully unpack the balance and then remove the plastic, cardboard, and foil packaging together with the protective pieces. Gently place the balance in its intended final location.

2) Install components following the diagram below:
   i. Anti-Draft Shield (1)
   ii. Weighing Pan (2)
   iii. Glass Lid (3)



Model: MA-T-5.F
Components-


Microbalance
x 1


Terminal
x 1


Cross-shaped holder
x 1


Weighing pan holder
x 1

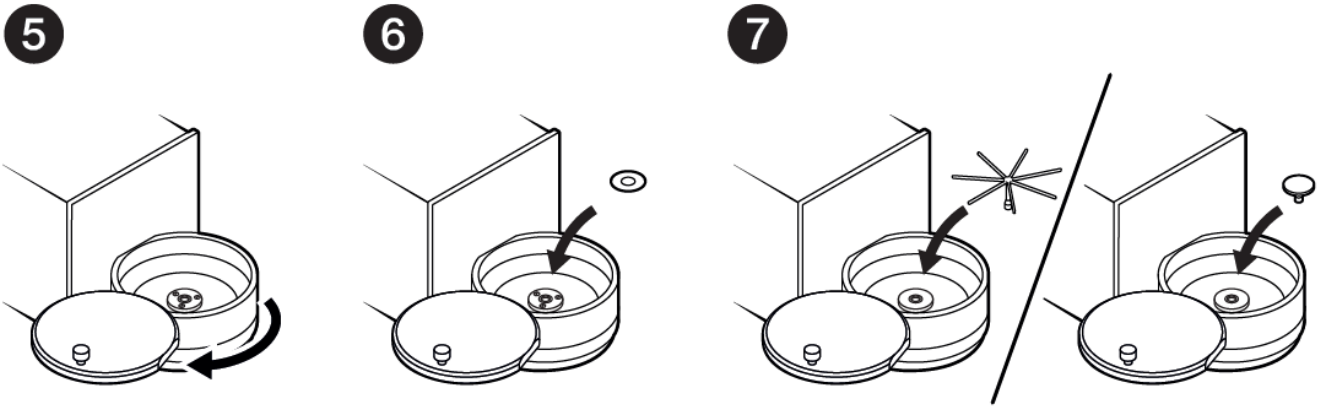

Centering ring
x 1


Power supplier and a cable
x 1

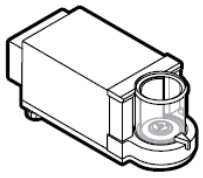
Installation:

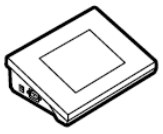
1) Carefully unpack the balance and remove the plastic, cardboard, and foil packaging together with the protective elements. Gently place the balance in its intended final location.

2) Install components following the diagram below:
   i. Centering Ring
   ii. Cross-shaped Holder OR Weighing Pan Holder



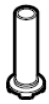
Model: MA-T-21.P
Componets-

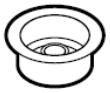

Microbalance
x 1


Terminal
x 1


Weighing pan
x 1


Anti-draft shield
x 1


Glass vessel
x 1


Evaporation ring
x 1


Glass lid with an opening
x 1

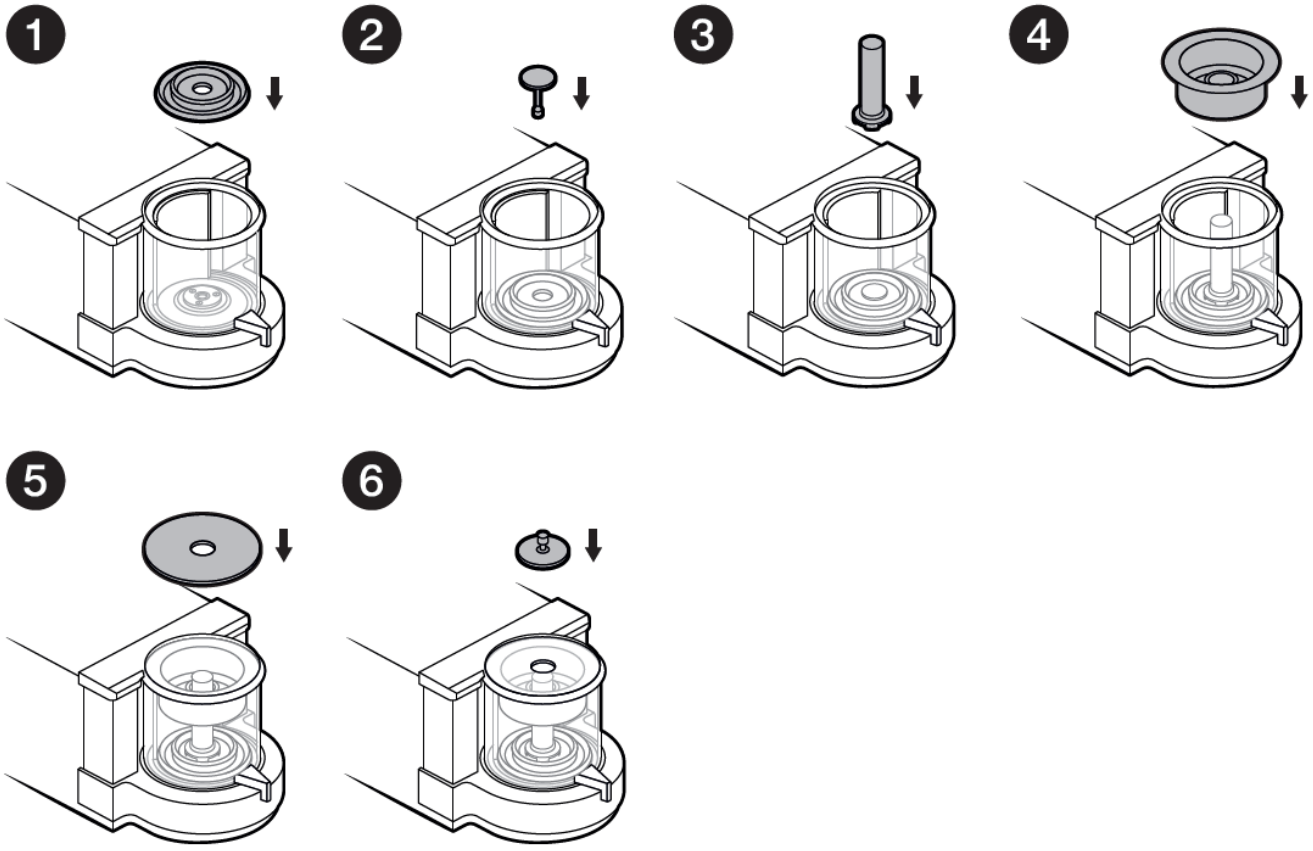

Additional glass lid
x 1


Power supplier and a cable
x 1

Installation:

1) Carefully unpack the balance and remove the plastic, cardboard, and foil packaging together with the protective elements. Gently place the balance in its intended final location.

2) Install components following the above diagram:
   i. Anti-Draft Shield (1)
   ii. Weighing Pan (2)
   iii. Glass Vessel (3)
   iv. Evaporation Ring for Pipette Calibration (4)
   v. Glass Lid with Opening (5)
   vi. Additional Glass Lid (6)



3) When the balance is ready to use, put the glass vessel on the pan and when the indication says the load is stable, press <TARE>.

2.5 POWERING THE DEVICE

The balance should be plugged into the outlet using the power adapter that comes as standard equipment. Plug the power adapter into the socket located at the back of the balance's housing.

- On plugging the balance into a power outlet, the red ON/LOAD light 

located on indicator's housing will light up.

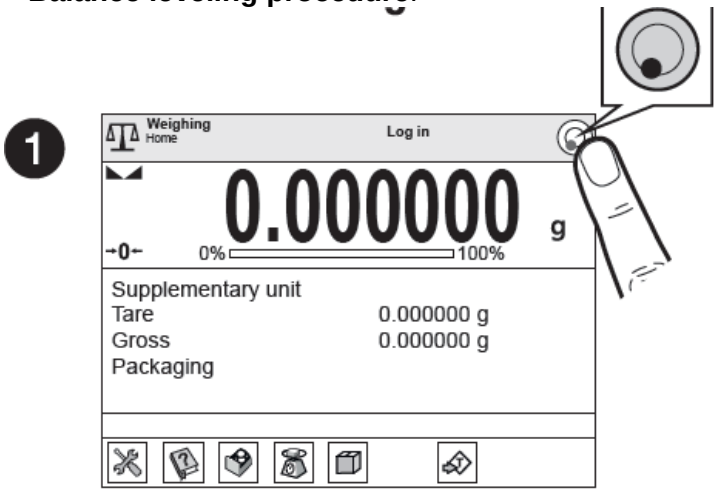
- Press the power button  located on the upper left section of terminal's overlay. Within a few seconds, the balance will start loading. The ON/LOAD light will flash while it loads.

- On completing the startup procedure, the home screen will appear.

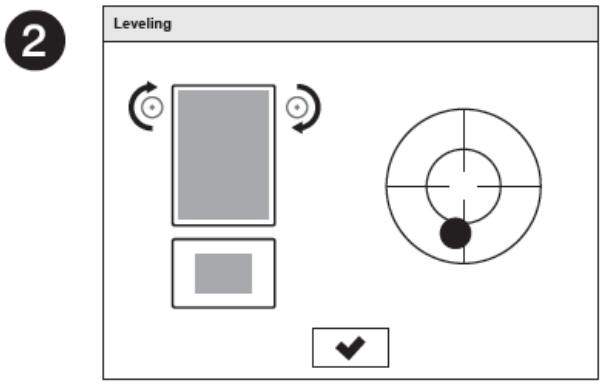
2.6 BALANCE LEVELING

The balance features an AutoLEVEL System that continuously monitors the balance's level status during its operation, which is shown in the upper right corner of balance's display. On detecting a change, the system indicates appropriate information on the display and/or signals an alarm. A new screen will appear for adjusting the plane of the scale.

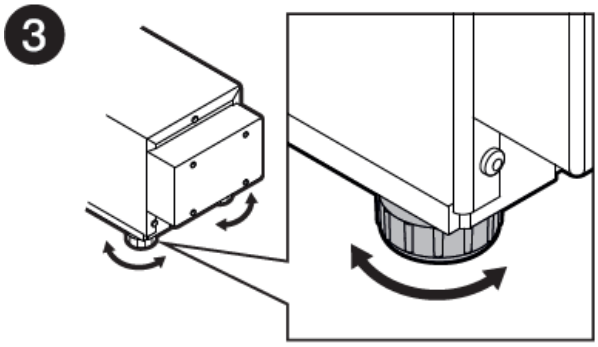
Balance leveling procedure:



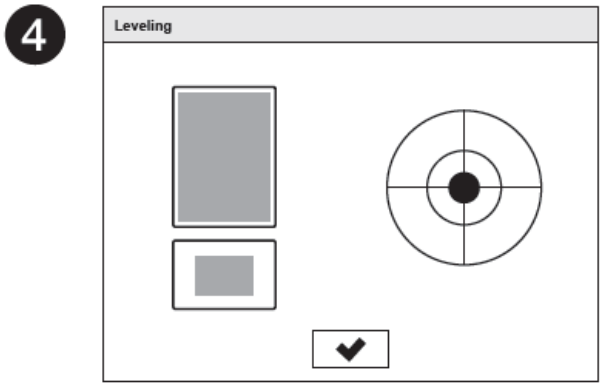
Press "Leveling" button.



Incorrect leveling screen.



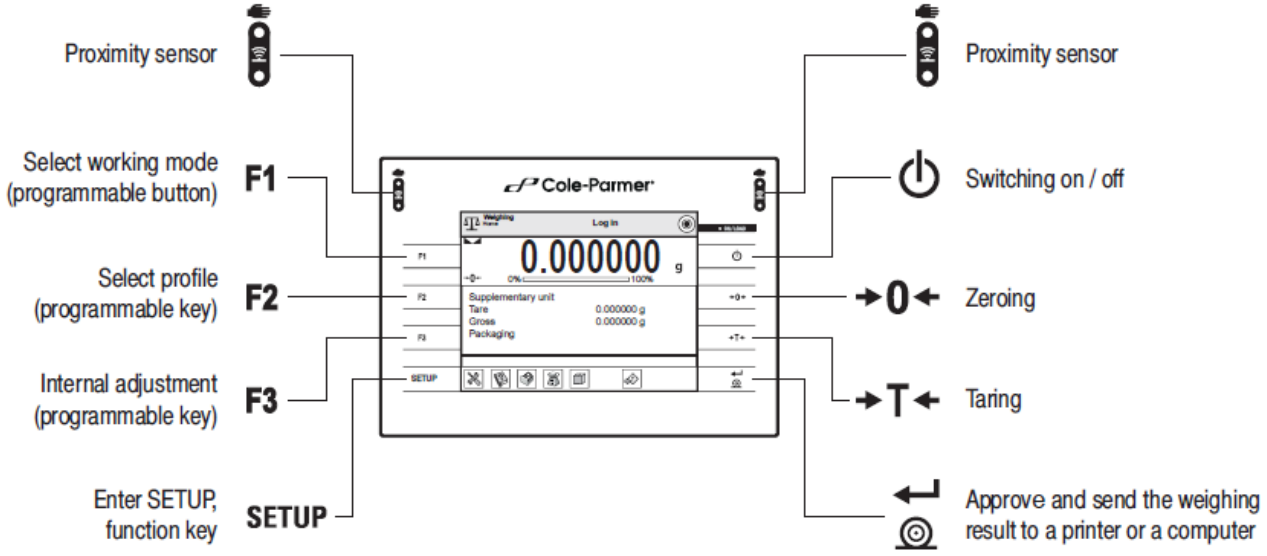
To level the balance turn its feet, keep turning the feet until an air bubble takes the central position.



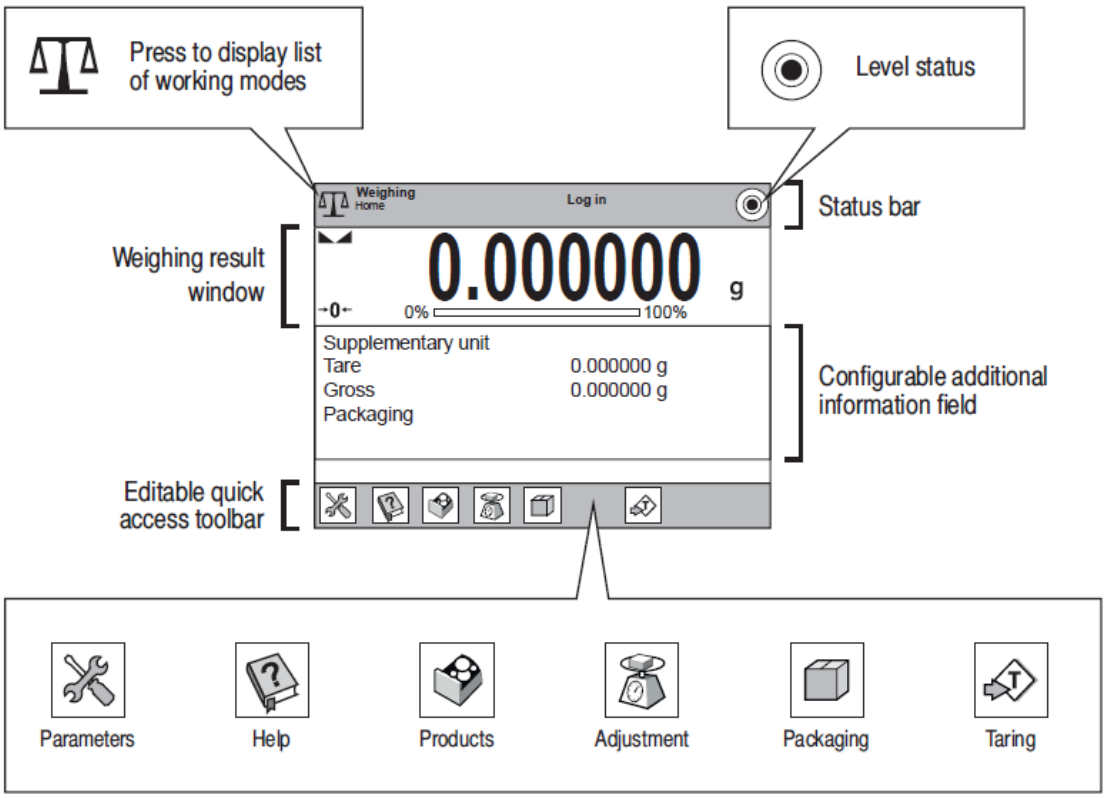
Balance has been leveled.

3 BALANCE CONTROL

3.1 BALANCE KEYBOARD



3.2 BALANCE HOME SCREEN

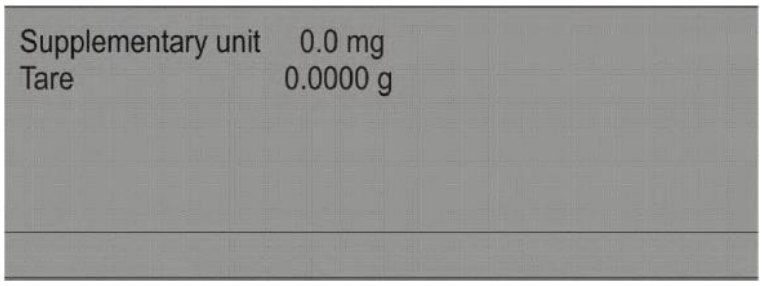


The main window of balance software can be divided into 4 sections:

- The upper part of the touch panel displays the active working mode, the logged- in operator, the date and time, if there is an active connection to a computer, and the current level status of a balance.

- Below this is the weighing window indicating the measurement result and the current measuring unit

- Next is a gray workspace area containing additional data on weighing process and activities.



- Below the workspace there is a set of quick access keys, the quick access keys change depending on the Working Mode:

The quick access keys are the following for the Weighing Mode-

 - Setup

 - Adjustment

 - Tare

 - Database of Products

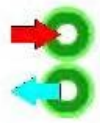
 - Print Data from Header

 - Print Data from Footer

The balance's main menu is divided into function groups. Each group comprises parameters grouped by their reference. A description of each menu group is provided further in this user manual.

List of groups - Parameters

The balance's main menu is accessed by pressing the <SETUP> function key or the <  > quick access key located in the bottom toolbar of the balance's display. This menu includes balance settings, functions, and profiles.

 ADJUSTMENT	 USERS	 PROFILES
 DATABASES	 COMMUNICATION	 PERIPHERALS
 INPUTS/OUTPUTS	 ACCESS LEVEL	 OTHERS
 UPDATE	 INFORMATION ON SYSTEM	 MOVIES

4 ADJUSTMENT

The balance features an automatic internal adjustment system that ensures measurement accuracy. The Adjustment menu contains functions for the balance adjustment process.

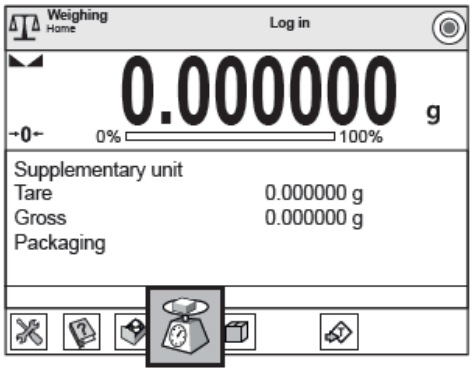
4.1 INTERNAL AUTOMATIC ADJUSTMENT

The internal adjustment process uses a weight built into the balance's housing. The "Internal adjustment" function key activates the automatic adjustment process. On its completion, the display shows a message box with the process status.

! *CAUTION*
Balance adjustment requires stable measurement conditions (free from breezes and vibrations), and the adjustment process has to be carried out with an empty weighing pan.

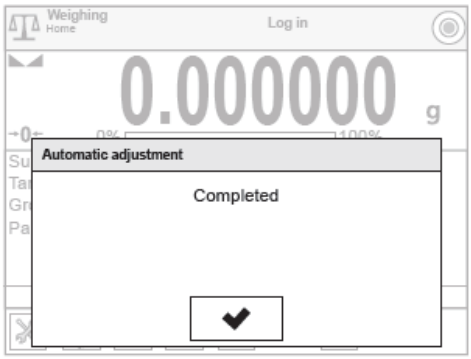
Adjustment Procedure:

1



Press "Adjustment" button.

2



Adjustment completed. Press ✔ button for confirmation

This menu option is used to select a factor for determining the start of the automatic adjustment process. Accessible options:

- None – automatic adjustment disabled
- Time – adjustment takes place in time intervals determined in the "Automatic adjustment time" menu
- Temperature – adjustment is triggered by temperature change only
- Both – adjustment is triggered both by temperature changes and time intervals

! *CAUTION*
Changing the settings of automatic adjustment is enabled only in balances that are not subject to conformity assessment or verification.

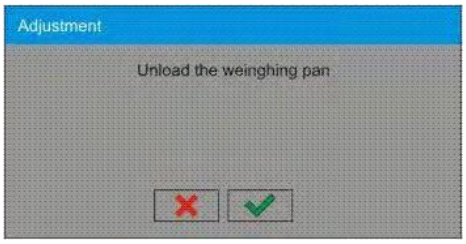
4.2 EXTERNAL ADJUSTMENT

External adjustment is done using an external weight with appropriate accuracy and mass for the balance's maximum capacity and readability. The process is semiautomatic; the process phases below are indicated on balance's display.

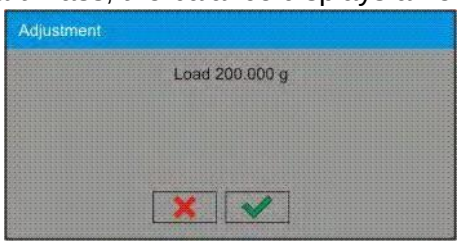
! *CAUTION*
External adjustment is available only in balances that are not subject to conformity assessment (verification).

Process course:

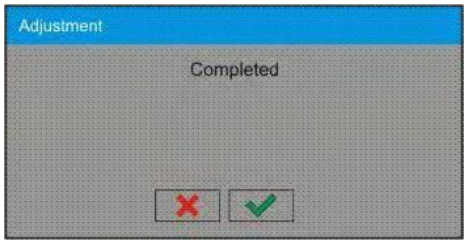
- Enter the Adjustment submenu and select External adjustment>.
- The balance will display the following message box:



- If there is a load on balance's weighing pan, unload it.
- Press the > key. The balance determines the start mass, which is indicated by "Start mass determination" on the display.
- On determining the start mass, the balance displays a new message box:



- Place the indicated weight or standard on the balance's weighing pan and press the > key
- On completing the adjustment procedure, the following is displayed:



- Confirm by pressing >, and the balance will return to weighing mode.

4.3 USER ADJUSTMENT

User adjustment can be done with an optional standard, whose mass ranges between 0.15 Max and Max. The adjustment procedure is compatible with the external adjustment process, but before beginning, a message box opens for entering the mass of the standard to be used for adjustment.

- *CAUTION:*
  User adjustment is available only in balances that are not subject to conformity assessment or verification.

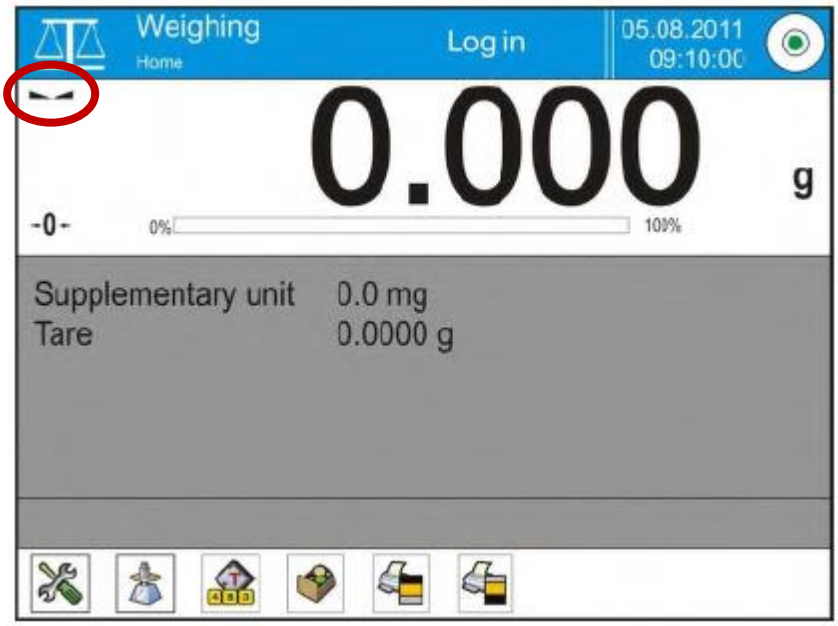
To start user adjustment, enter the Adjustment submenu and select  User adjustment>. Then follow the commands indicated on balance's display.

4.4 ADJUSTMENT TEST

The Adjustment test function enables users to compare the result of internal automatic adjustment with the value of the internal weight saved in the balance's factory parameters. This can determine a balance's sensitivity drift over time.

5 WEIGHING MODE

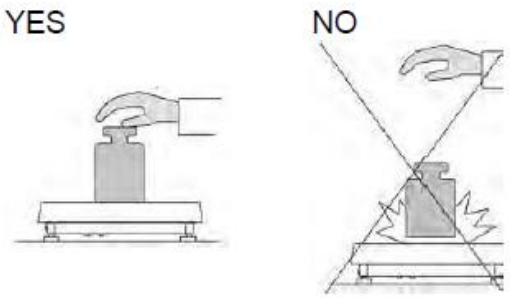
Load an object on the balance weighing pan. The stabilization of weighing result is indicated by a stability marker visible on the left side of balance display, read the measurement result.



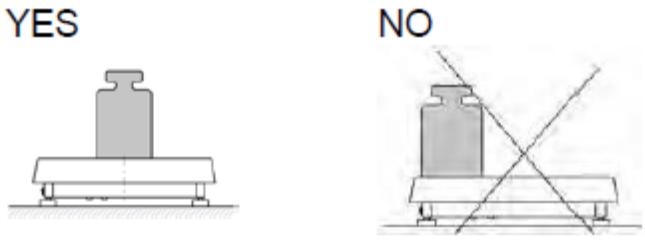
5.1 GOOD WEIGHING PRACTICE

To ensure long lasting use of a balance with correct and reliable measurements of weighed loads, follow the procedures below:

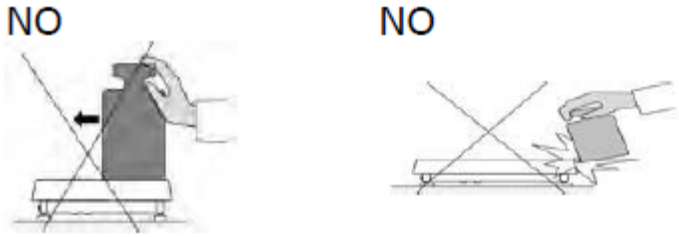
- Start the balance with no load on the weighing pan.
- Load the weighing pan carefully and avoid dropping it:



- Place weighed load in the center of the weighing pan:



- Avoid side loading, in particular side shocks:



5.2 UNITS

To change the weighing unit, press the weighing unit icon visible next to the value of measurement result, or by clicking the key (if displayed in an information section). Clicking the unit triggers its replacement, the clicked unit is replaced with the unit that is next on the list of available units. Another option for unit replacement is selecting a particular unit out of the unit's list, to view the list click key (if displayed in an information section).

Units List:

Unit	Denotation
gram	[g]
milligram	[mg]
kilogram	[kg]
carat	[ct]
pound	[lb]
ounce	[oz]
ounce Troy	[ozt]

pennyweight	[dwt]
Taele Hong Kong	[tlh]
Taele Singapore	[tls]
Taele Taiwan	[tlt]
Momme	[mom]
Grain	[gr]
Newton	[N]
Tical	[ti]

5.3 USER-DEFINED UNIT

A user can customize the start unit, supplementary unit, and two custom measuring units in their profile.

A custom measuring unit features:

- A multiplier
- A name (3 characters)

If a custom unit is designed, then its name is added to the list of accessible measuring units.

This menu additionally enables the value of gravitational acceleration force for the balance's place of use to be entered. This is obligatory should the balance be used to determine mass in [N].

5.4 BALANCE ZEROING

To zero out the mass indication, press the →0← > key.

The mass indication on the display should equal zero, and precise zero →0← and stability symbol should appear.

The zeroing process determines a new zero point to be recognized by the balance as precise zero. Zeroing is possible only when the display indicates that the balance is stable.

! *CAUTION*
Zeroing the display indication is possible only within ±2% of the instrument's maximum capacity. If the zeroed value is above ±2% of the maximum capacity, then the error message "Err2" will appear.

5.5 BALANCE TARING

To determine the net weight of an object, place its container or packaging on the balance's weighing pan. When the measurement result is stable, press the →T← > key.

The display should indicate mass equal to zero and the symbols NET and When the object and its packaging are removed from the instrument's weighing pan, the display will indicate the sum of the total tared mass with a minus sign.

The balance also enables a tare value to be assigned to a product in a database. Then, when the product is selected from the database, the data on the tare value for the specific product is automatically uploaded.

! *CAUTION*
Tareing negative values is impossible and the balance will respond with an error message. If this happens, zero out the balance and repeat the tareing procedure.

Manual tare determination

- Press the quick access key  to open the numeric keyboard on the display.
- Type in the desired tare mass and press the  key.
- The balance will return to weighing mode, and the display will show the entered tare value with the minus sign.

Deleting tare

The tare value indicated on the balance's display can be deleted by pressing the <ZERO> key on the balance's front panel or by using the programmable function key <Deactivate tare>.

PROCEDURE 1 for removing the tared load from balance's weighing pan

- Press the <ZERO> key.
- The NET marker will disappear, and a new zero point is determined.

PROCEDURE 2 for when the tarred load in on balance's weighing pan

- Press the <ZERO> key.
- The NET marker will disappear, and a new zero point is determined.
- If the tare value exceeds 2% of balance's maximum capacity, the display will show the error message –Err– (forbidden operation).

PROCEDURE 3 for when the tared load is on the balance's weighing pan or when removing the tared load

- Press the programmable key  Deactivate tare>.
- The NET marker will disappear.
- The display indicates the tare value.
- Press the  Restore tare> key to restore the last tare value.

5.6 WEIGH MODE SETTINGS

The balance allows setup of operating parameters (filters, value release and autozero function, deleting the last digit and other settings) separately for each working mode.

It enables customizing the instrument and utilizing its properties depending on your needs and expectations, or on specific requirements for selected working mode; as a result, the device operation is quick and easy.

Procedure

1. Touch the gray workspace area of the screen.
2. The display will show a menu: Settings, Keys, Information, Printouts, Profile.
3. Press one of available submenu options and select the setting to be changed.
    - Settings - additional options related to weighing mode Keys - quick access keys definitions
    - Information - additional data on weighing process that can be displayed on the home screen
    - Printouts - selection of printout type
    - Profile - selection of profile active during balance operation

The Settings menu contains supplementary data on weighing process, such as:

Tare mode

- SINGLE
  Stores the mass value in the balance's memory when the TARE key is pressed once; pressing it a second time determines a new tare value. Selecting a product or packaging with an assigned tare value automatically deleted the previously assigned tare value.

- SUM OF ACTIVE
  Totals the applied tare values for a product or packaging selected from a corresponding database. The tare value can be increased by manually entering it using balance's number pad. When the tare value for a product or packaging has been determined, the manually entered tare value is deactivated.

- SUM OF ALL
  Totals all introduced tare values.

- AUTOTARE
  Tares the first stable measurement result. The NET symbol flashes on the display. The operator can then determine the net mass of the weighed load. On removing the load from balance's weighing pan, and as the display returns to autozero, the software automatically deactivates tare value.

Automatic footer printout

Accessible options:

- MODE - *No* – manual footer printout
  Sum of measurements – print a footer when it exceeds the mass value set in the Threshold parameter
  Number of measurements – print a footer when carrying out a predefined batch of measurements set in the Threshold parameter

- THRESHOLD – set the value of threshold determining footer printout.
  For "Sum of measurements," the value is determined by measuring unit [g]; for "Number of measurements," the value is not measurable and is determined by the number of measurements in the batch.

Printout mode / printout release

- Function key PRINT/printout release (manual operation)
  - Never– printout deactivated
  - First stable – the first stable measurement is printed
  - Each stable– all stable measurements are set for printing
  - Each– printout of all measurements (stable and unstable). For verified balances, only stable measurement results are printable (setting “Each stable”)
- AUTOMATIC MODE
  - Never– printout deactivated
  - First stable – the first stable measurement result is recorded, and the record of the following measurement result takes place only on unloading the weighing pan, returning of the mass indication below the set threshold’s value, and placing another load on the balance’s weighing pan
  - Last stable – the last stable measurement recorded is accepted before taking the load off the weighing pan. The measurement is recorded on removing the load from the balance’s weighing pan and returning the mass indication below the set threshold’s value
- THRESHOLD
  - The mass value is obligatory for an automatic printout. Set in grams.

Printout

Type of printout related to a working mode. Printout takes place on pressing <PRINT> key on balance’s overlay.

Accessible options:

- STANDARD PRINTOUT
  Available printout content: HEADER, WEIGHING DATA, and FOOTER. Printout components marked as YES in the menu are printed when the printout activating function key is pressed.

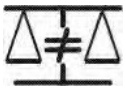
- NONSTANDARD PRINTOUT
  The database of printouts allows the selection one of the available nonstandard printouts visible in the PRINTOUTS menu. Operators can also design a unique printout, which is automatically added to the databases.

- AIR BOUYANCY COMPENSATION
  Parameters allowing the user to switch on the correction and enter data relating to density of the sample and to density of the air.
  Caution: Function operates only for weighing mode.

5 WORKING MODES- GENERAL INFORMATION

The balances feature the following working modes:

	**Weighing** The weight of a load is determined through an indirect measurement. A balance measures gravitational force that attracts the load. The result is processed to a digital format and displayed in a form of measurement result.
	**Parts counting** Based on a determined mass of a single part, it is possible to count several parts, assuming that the mass of a single part is determined with sufficient accuracy and that the following parts are equal in mass.
	**Checkweighing** Control of sample mass with applied thresholds. The user specifies the value of low threshold (LO) and high threshold (HI).
	**Dosing** The user specifies the sample's target mass to be obtained by pouring.
	**Percent Weighing** Control of percent ratio of a sample in relation to a reference standard. Obtained data provides a percent ratio on how the test sample differs from the accepted standard.
	**Density** Based on Archimedes principle, a balance determines density of solids and liquids. This mode requires the optional density determination kit.
	**Animal Weighing** Mass measurement takes place by using filters that dampen animal moves on a weighing pan, thus enabling obtaining a correct measurement result.
	**Formulation** By adding a sequence of ingredients, a user can prepare a mixture or formulation. Before mixing, the balance's software requires designing a formulation by specifying its ingredients and their mass.
	**Statistics** Completed measurements are used to calculate statistical data, such as Min, Max, deviation, etc.

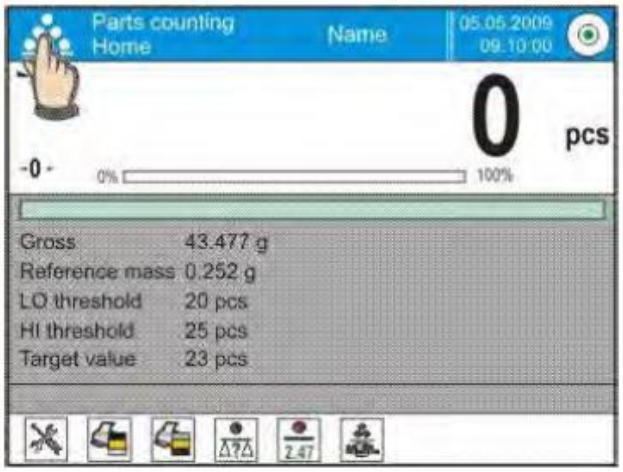
	**Pipette calibration** Calibration of pipettes according to procedures listed in ISO 8655 or according to user requirements.
	**Differential Weighing** Analysis of a mass sample's change over time.
	**Statistical Quality Control** This working mode is intended to carry out different types of product packing processes and is aimed at monitoring and/or controlling the packing process. It detects excess or lack of product quantity in a package.
	**Control of Prepacked Goods** This working mode is intended for CPG (Control of Prepacked Goods) processes in accordance with the regulation on prepacked goods. (mode not available in balance's standard version)
	**Mass Control** This working mode is intended to carrying out quick statistical control of samples in accordance with the requirements on a quality system and/or internal standards. (mode not available in balance's standard version)

The settings of separate working modes include special functions specific to a mode. They enable adapting a mode's operation to a user's individual needs. The special settings are activated on selecting a corresponding profile. A detailed description of special functions is provided while presenting each of working modes.

6.1 WORKING MODE SELECTION

Changing working mode:

- Press the name of the active working mode, displayed in the left corner of the upper bar.

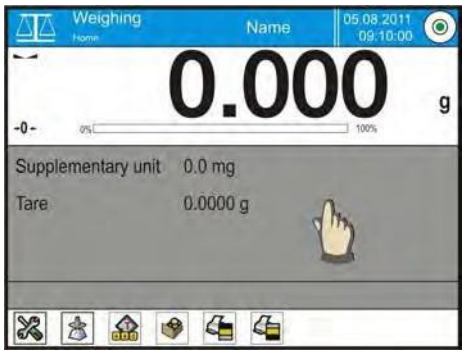


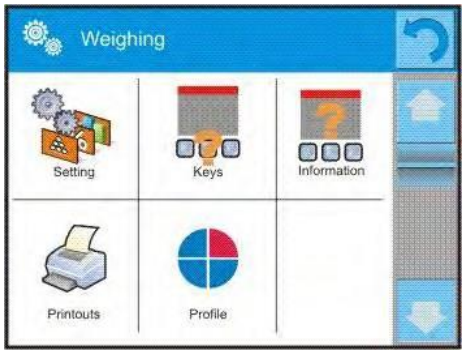
- A list of available working modes is displayed.
- Press the name of the desired working mode.

6.2 PARAMETER RELATED TO WORKING MODES

Each working mode has programmable parameters determining its function. To change these settings:

1. Press the gray workspace area.
2. The below menu is displayed:
   - Settings - additional options related to a working mode
   - Keys - defining quick access keys
   - Information - selecting information displayed in the workspace
   - Printouts - selecting type and content of a printout
   - Profile - selecting a profile to be active during balance's operation



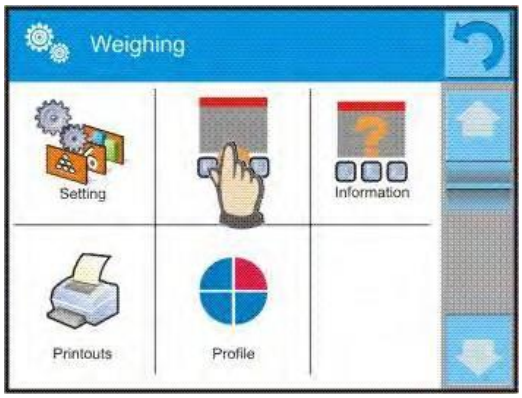


3. Press the desired menu item and select the area for modification.

6.3 QUICK ACCESS KEYS

A user can define up to seven quick access keys, which are displayed in the bottom bar.

On assigning a function to a specific key, a corresponding soft key appears in the bottom navigation bar of the main screen.



This quick access key can be customized for a user's most often used functions and processes.

7 PARTS COUNTING

The Parts counting working mode determines the quantity of small parts or objects each with equal mass. Counting is based on the mass of a single part, which is:

- Determined by a reference quantity of parts
- Acquired from a database of products, or
- Entered manually as a numeric value.

Working mode activating procedure

- While in the main window, press the > soft key in the upper bar of the display, which opens the Working modes submenu.

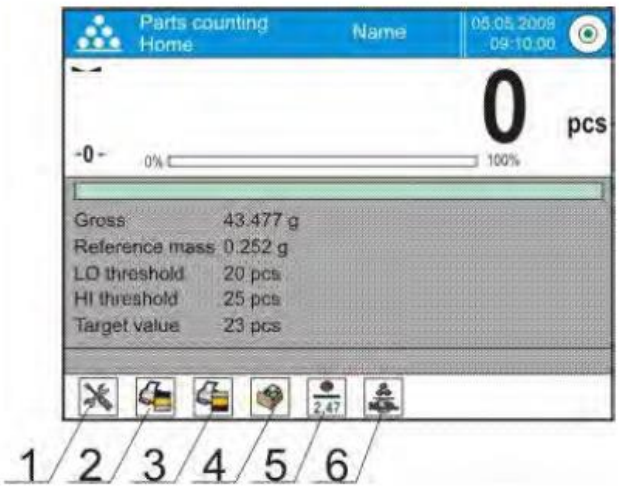
- Select the Parts counting> mode. The software automatically returns to the main screen and displays the symbol in the upper bar.

The gray workspace contains the following data:

- Gross
- Standard mass
- Low threshold
- High threshold
- Target value

On selecting the parts counting mode, the display contains the following quick access keys in the bottom bar:

1. Setup – access to balance's menu
2. Print header – print data declared in the header
3. Print footer – print data declared in the footer
4. Database of products – selection of products from corresponding database
5. Give mass of 1 part – editing field for entering the mass of a single part
6. Set mass of 1 part – set mass of a single part from optional number of parts, e.g., from 10 pcs, 20 pcs, 75 pcs, etc.

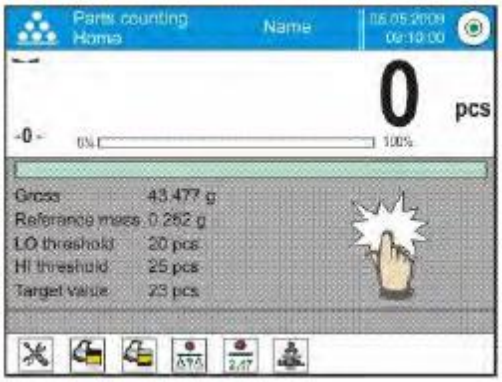


7.1 ADDITIONAL SETTINGS FOR PARTS COUNTING MODE

The additional settings allow the working mode to be adjusted for the user's needs and requirements.

Procedure:

- Press the gray workspace.
- The menu shows: Settings, Keys, Information, Printout, and Profile.
- Press the <Settings> key.
- The display indicates functions related to weighing and parts counting modes.



Parts counting mode features the following optional functions:

- **ACAI**, Automatic Accuracy Correction
- YES: mass of a single part is updated during counting process
- NO: mass of a single part is not updated

Means of operation of ACAI function:

1. When adding parts, the number of parts on the weighing pan has to be greater than it was previously.
2. When adding parts, the number of parts on the weighing pan must be less than twice the amount that was shown on the display before adding more.
3. The current quantity of parts must be within the □ 0.3 tolerance of the total value.
4. The measurement result has to be stabilized.

Minimum reference mass: 1 unit, 2 units, 5 units, 10 units—this is the minimum mass value of a single part. Unless this condition is met, the counting process cannot start.

Result control:

- YES—print and save only those measurements included within the low and high thresholds.
- NO—all measurements are printed and saved.

Other functions of the Settings menu:

- Tare mode
- Automatic footer printout
- Printout mode/Value release
- Printouts

7.2 PARTS COUNTING – QUICK ACCESS KEYS

Each working mode features a set of default quick access keys that are automatically displayed on mode activation. The set of keys can be modified by assigning other quick access keys to the bottom bar of the display. This process requires the appropriate operator's access level.

The user may additionally select special keys enabling quick access to the function for single part weight determination, where the weight is determined by means of a standard comprising:

- 5 pieces
- 10 pieces
- 20 pieces
- 50 pieces

7.3 SETTING STANDARD OR REFERENCE MASS BY ENTERING DETERMINED PART MASS

Procedure:

- Press the 

Give mass of 1 part> key, which opens the Reference mass editing window with an onscreen keyboard.

- Enter the value of a single part and accept it by pressing  . The balance returns to the  Parts counting working mode with the automatic accuracy correction function enabled.

Caution: If the single part mass is determined as lower than 0.1 of balance's reading unit, the balance displays the message "Value too low".

7.4 SETTING STANDARD OR REFERENCE MASS BY WEIGHING

Procedure:

- Place a container on the weighing pan and tare its mass.
- Press  Set mass of 1 part>, which opens the Reference quantity editing window with an onscreen keyboard.
- Insert desired value (the number of parts) and accept by pressing  , which displays a command: "Load: xx parts" where xx denotes the set value of the parts.
- Load the requested number of parts on the weighing pan. On stabilization of measurement result, (▬◢ symbol visible on the display), accept the mass by pressing  >.
- The software automatically recalculates the mass of a single part, moves to <  parts counting> mode, and displays the number of parts loaded on the weighing pan with unit **pcs**.

CAUTION!

- *The total mass of all parts loaded on the weighing pan must not exceed the maximum capacity (weighing range) of the balance.*
- *The total mass of all parts loaded on the weighing pan must not be lower than the value declared in parameter "Minimal reference mass." If this condition is not met, the balance displays the message "Too low sample mass."*

- *The mass of a single part must not be lower than 0.1 of the balance's reading unit. If this condition is not met, the balance displays the message "Too low part mass."*

7.5 ACQUIRING PART MASS FROM A DATABASE

A product record in the database has set of information that identifies it. One identifier is mass, which is used during the part counting process.

Procedure:

When in the  Parts counting working mode, press  Products database> key, and then select the desired product from the displayed list.

Enter standard (reference) mass in memory

To add a standard (reference) mass of a single part to the database of products:

- Press <Setup> followed by <Database>.
- In the Database of Products, press <Products>.
- Press the name of a product and edit data in field 5 Mass.
- Return to Parts counting mode.

If there are no data in the database:

- Press <Setup> key followed by <Database>.
- In the Database of Products, press  Add>.
- Accept the process of adding a new record in the database.
- Fill in the field referring to the product, including field 5 Mass.
- Return to Parts counting mode.

7.6 UPDATING PART MASS IN THE DATABASE

The predetermined mass of a single part can be assigned to a product in the database. This option is applied while using the ACAI (Automatic Accuracy Correction) function to determine part mass with high accuracy.

Procedure:

- Determine the mass of a single part.
- Press the  Database> key.
- Press and hold the name of the product whose mass is to be updated.
- A contextual menu is displayed.
- Select <Assign standard> and the reference mass is saved in a product record under entry "Mass."

7.7 PARTS COUNTING PROCEDURE

The first step in parts counting mode is obtaining data on the mass of a single part. Select one of the available options:

- Give the mass value of a single part (see part 16.3) and place parts on balance's weighing pan; the balance displays totaled parts.
- Set the mass of a single part from a given quantity of parts (see part 16.4.); the balance displays the ACAI function > symbol (if enabled). Place parts on balance's weighing pan, and the balance displays totaled parts.
- Acquire the mass of a single part from a database of products (see part 16.5.) by selecting a desired product record. Place parts on the balance's weighing pan, and the balance displays totaled parts.

Caution: All additional elements (e.g., packaging) have to be tarred before starting the parts counting process.

7.8 CHECKWEIGHING FUNCTION IN PARTS COUNTING MODE

The parts counting process can be aided by the checkweighing function, which controls whether indication is within set thresholds.

Checkweighing requires setting values of two thresholds:

- LOW threshold [min= … parts]
- HIGH threshold [max= … parts]

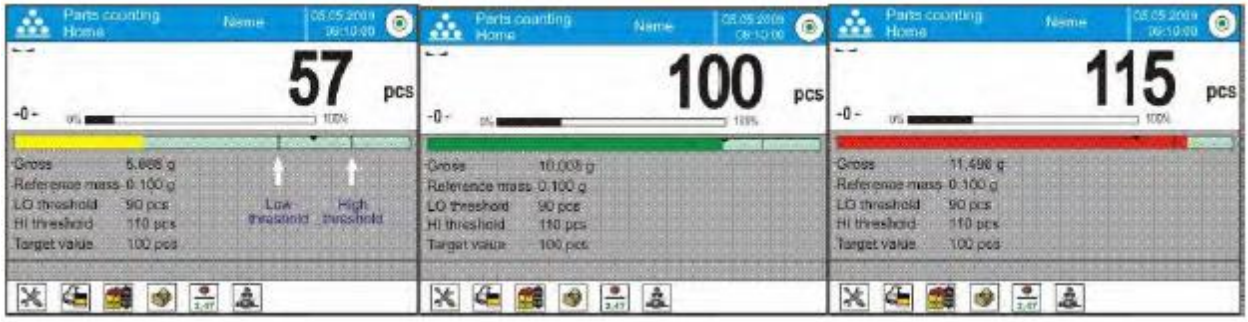
Enable the bar graph by setting it to YES, which displays the below ratio: CURRRENT NO. OF PARTS /CHECKWEIGHING THRESHOLDS.

Values of Low and High thresholds can be defined in the Database of Products while editing a product entry or using the quick access key Defining thresholds>.

Procedure:

- Touch the gray workspace and press <Information>.
- Set the Bar graph to YES and return to parts counting mode.
- Touch the gray workspace and press <Keys>.

- Assign <Checkweighing thresholds> to one of the quick access keys displayed in the bottom bar.
- Return to parts counting mode.
- Press the  Checkweighing thresholds> key, and enter values for LOW and HIGH thresholds, and return to parts counting mode.
- Under the measurement result, there is a bar graph. Its color corresponds to the status of the parts counting process.
  - Yellow: current number of parts is below the set value of Low threshold
  - Green: current number of parts is within the set value of thresholds
  - Red: current number of parts is above the set value of High threshold



7.9 DOSING FUNCTION IN PARTS COUNTING MODE

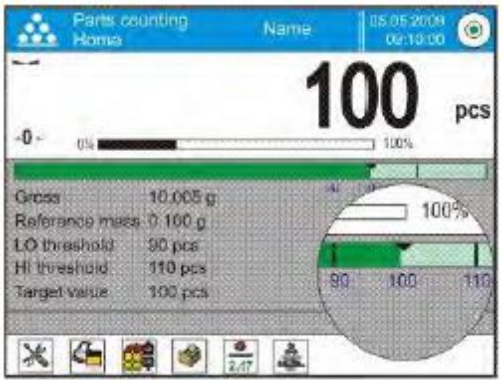
The parts counting process can be aided by the dosing function, which makes sure the indication does not exceed a set target value.

Dosing requires setting a target value, for instance 100 parts, and a percent tolerance from the target value. The target value is displayed as a bracket on a bar graph.

Defining the value of the target mass is performed using the quick access key < Target  Value>.

Procedure:

- Touch the gray workspace and press <Information>.
- Set the bar graph to YES and return to parts counting mode.
- Touch the gray workspace and press <Keys>.
- Assign “Target Value” to one of the quick access keys displayed in the bottom bar.
- Return to parts counting mode.
- Press the  Target Value> key and enter the number of parts recognized as the target value.
- If tolerance applies, set its value (0–100%)
- Under the measurement result, there is a bar graph containing:
  - The current number of parts on the weighing pan
  - The value of the Target Mass (indicated by a black marker)



Hint: The checkweighing and dosing functions can operate simultaneously in the parts counting mode. In such cases, the dosing tolerance is controlled by Lo and Hi thresholds of the checkweighing function.

8 CHECKWEIGHING

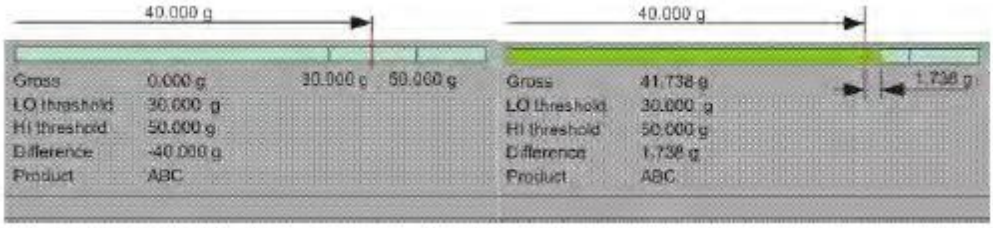
The LO OK HI Checkweighing working mode allows for controlling sample mass using low and high thresholds. Usually the mass indication is accepted as correct if it is between the thresholds' values.

Procedure:

- While in the main window, press the > soft key located in the upper bar of the display, which opens the Working modes submenu.
- Select LO OK HI Checkweighing> mode. The main screen appears with the symbol in the upper bar.

The gray workspace contains the following data:

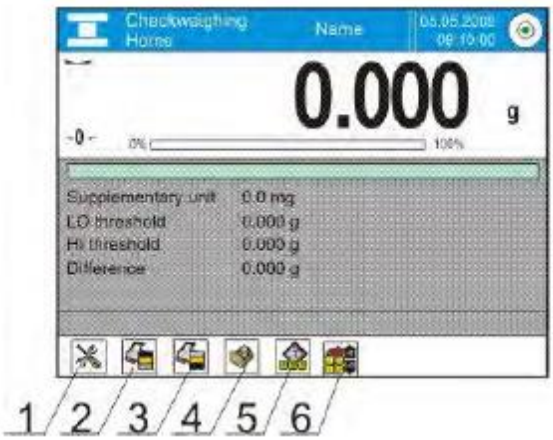
- Supplementary unit
- Low threshold
- High threshold
- Difference – denoting the "distance" of the current measurement result from the center of Lo-Hi section



On selecting the checkweighing mode, the display contains the following quick access keys in the bottom bar:

1. Setup – accessing balance's menu
2. Print header – printing data declared in the header
3. Print footer – printing data declared in the footer
4. Database of products – selecting products from corresponding database

5. Set tare – field for setting the numeric value of tare
6. Checkweighing thresholds – setting the values of Low and High thresholds



8.1 MAKING USE OF CHECKWEIGHING THRESHOLDS

To use checkweighing thresholds:

- Select Product  > for which Low and High thresholds have been already set.
- Enter the numeric value of thresholds  > if the thresholds are not referring to any product from a database.

PROCEDURE 1 – Selection of product from Database of Products

- Press the  Database of Products> quick access key.
- Using the list of products, select one to be weighed.
- The values of thresholds are displayed automatically in the gray workspace area.
- Under the measurement result, a bar graph is displayed. Its color corresponds to the current status of the mass:
  - Yellow: mass value below Low threshold
  - Green: mass value within set value of thresholds
  - Red: mass above set value of High threshold

PROCEDURE 2 – Manually entering checkweighing thresholds

- Press the  Checkweighing thresholds> quick access key
- Press the <Low Threshold> key and enter its value.
- Accept the set value by pressing the  > key.
- Press the <High Threshold> key and enter its value.
- Accept the set value by pressing the  > key.

Caution: The value of the High threshold has to be greater than the value of the Low threshold.

8.2 ADDITIONAL SETTINGS FOR PARTS COUNTING MODE

The additional settings enable adjusting the working mode to the user's needs. To access the setting:

- Touch the gray workspace area.
- The display shows the following menu: Settings, Keys, Information, Printout, and Profile.
- Press the <Settings> key.
- The display shows the following functions related to checkweighing:
  - Result control
  - Tare mode
  - Automatic footer printout
  - Printout mode/Value release
  - Printout

9 DOSING

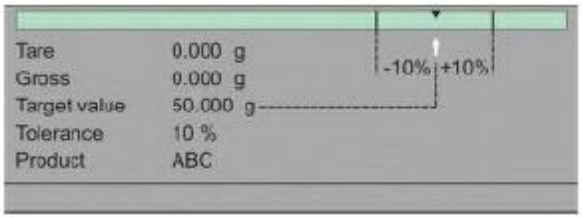
The Dosing working mode allows users to carry out the sampling process until obtaining a predefined target mass.

Working mode procedure

- Press the > soft key in the upper bar of the display, which opens the Working modes submenu.
- Select Dosing> mode. The software automatically returns to the main screen and displays the symbol in the upper bar.

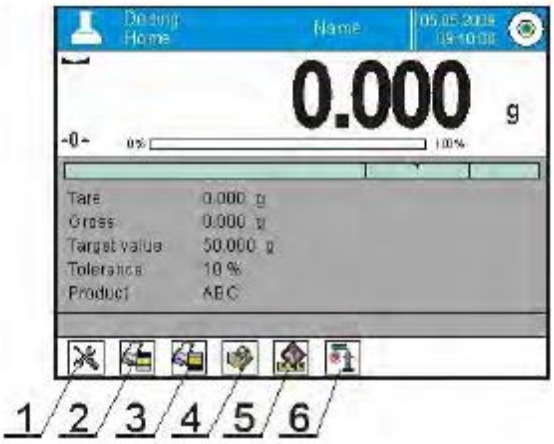
The gray workspace area contains the following data:

- Tare
- Gross
- Target value
- Tolerance – percent [%] value related to the target value
- Product



On selecting the dosing mode, the display contains the following quick access keys in the bottom bar:

1. Setup – accessing the balance's menu
2. Print header – printing data in the header
3. Print footer – printing data in the footer
4. Database of products – selecting products from the corresponding database
5. Set tare – field for setting numeric value of tare
6. Target value – declaring the target value for the dosing process

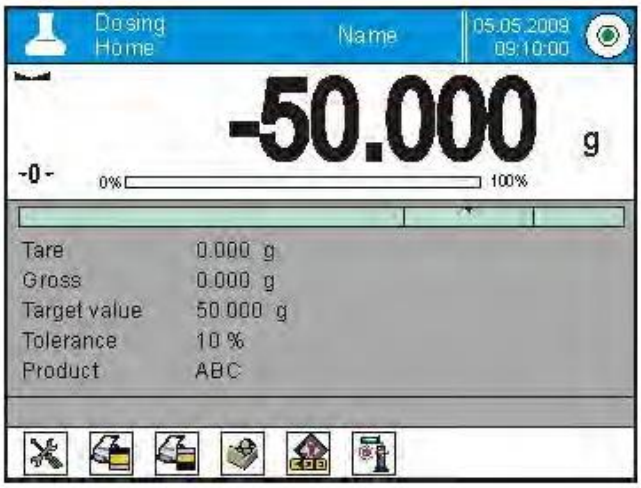


9.1 MAKING USE OF PRODUCTS DATABASE FOR DOSING OPERATION

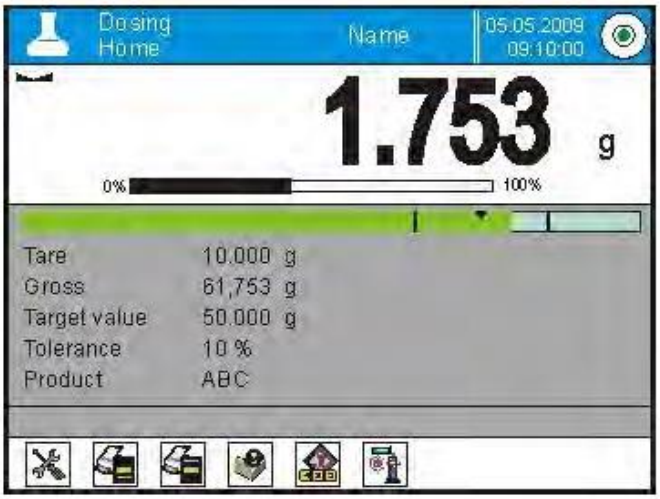
When weighing, it is possible to use the value of the target mass assigned to a product in the database or temporarily determine custom target values of mass. In the database of products, the target mass of a product is its mass field.

PROCEDURE 1 – Selection of product from database of products

- Press the  Database of Products> quick access key.
- Using the list of products, select one to be weighed.
- The target value and the tolerance value are displayed automatically in the gray workspace.
- The display shows the negative value of the target.

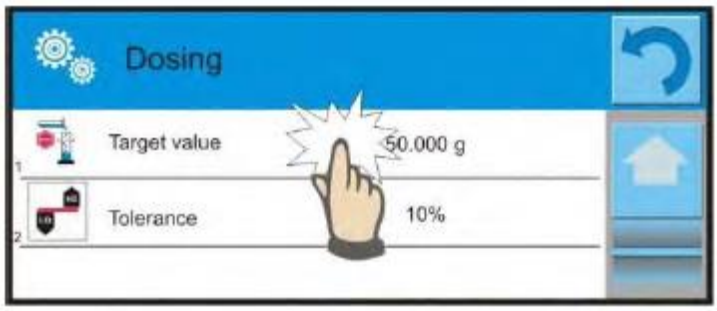


- Under the measurement result, there is a bar graph. Its color corresponds to the current status of mass :
  - Yellow: mass value below the Target Value – Tolerance
  - Green: mass value within the tolerance field: Target Value +/- Tolerance
  - Red: mass above the Target Value + Tolerance



PROCEDURE 2 – Manually entering the value of the target mass

- Press the  Target value> quick access key.
- On the next screen, give the target value and tolerance.
- Return to weighing.

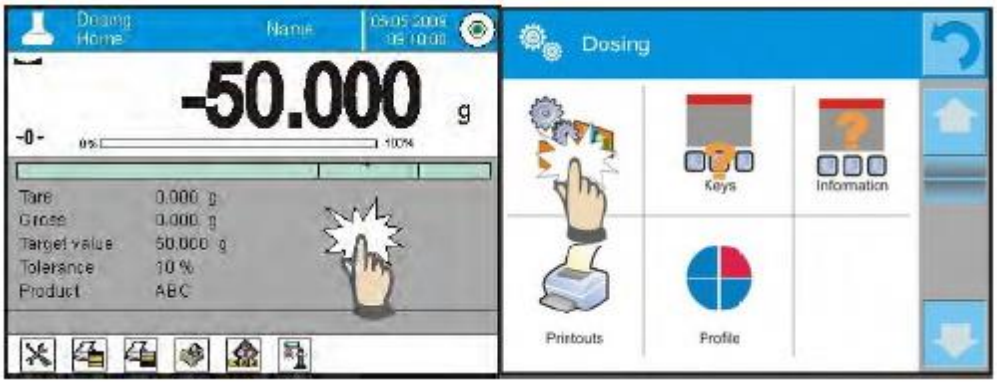


Caution: If the Target Value is acquired from the database of products, then the Target Value and Tolerance fields contain data referring to selected product. The data can be edited and modified.

9.2 ADDITIONAL SETTINGS FOR DOSING MODE

The additional settings enable users to adjust the working mode for their needs. To access the setting:

- Touch the gray workspace area.
- The display shows the following menu: Settings, Keys, Information, Printout, and Profile.
- Press the <Settings> key.
- The display shows the functions related to the dosing process: Result control, Tare mode, Automatic footer printout, Printout mode/Value release, Printouts.



10 PERCENT WEIGHING

The Percent Weighing working mode allows the user to compare the weighed load to a standard (reference). The process is expressed in a percentage [%].

Additionally, the percent weighing process can be aided by Dosing and Checkweighing processes. The supplementary modes and a bar graph are not enabled automatically.

Working mode procedure

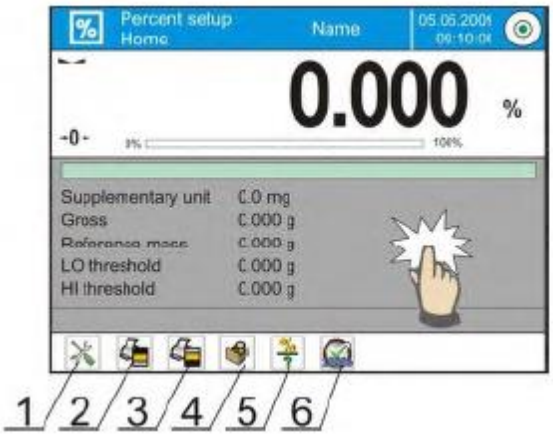
- While in the main screen, press the > soft key located in the upper bar of the display, which opens the Working modes submenu.
- Select the Percent Weighing> mode, and the software automatically returns to the main screen and displays the symbol in the upper bar.

The gray workspace area contains the following data:

- Supplementary unit
- Gross
- Reference mass (standard)
- Low threshold – percent [%] value of the standard (reference)
- High threshold – percent [%] value of the standard (reference)

The percent weighing mode displays the following quick access keys in the bottom bar:

1. Setup – accessing balance's menu
2. Print header – printing data in the header
3. Print footer – printing data in the footer
4. Database of products – selecting products from the corresponding database
5. Percent Weighing: setting the standard (reference)
6. Percent Weighing: setting to 100%



10.1 COMPARISON OF SAMPLE AND THE STANDARD

To compare samples to a mass standard:

- Give the mass of a standard using the < Give reference mass> soft key.
- Accept the mass loaded on the weighing pan as a reference mass using the < Set as 100%> soft key.
- Select a product from database of products, where the mass of a product entry is defined, using the Database of Products> soft key.

PROCEDURE 1 – Manual entry of a reference mass

- Press the Give reference mass> soft key.
- In the next screen, type in the value of reference mass and accept it by pressing the > key.
- All weighed products will be compared with the reference mass, and the display will indicate the difference between weighed objects in [%].

PROCEDURE 2 – Accept the currently loaded mass as standard (reference)

- Place a sample on the balance's weighing pan.
- When the measurement result is stable, press the Set as 100%> soft key.
- The display indicates 100.000%, the mass is accepted as the reference, and it is automatically saved in the standard (reference) field.
- Unload the sample from the balance's weighing pan.
- All subsequent samples weighed will be compared with the reference mass, and the display indicates the difference, expressed in [%], for each weighed sample in relation to the reference mass.

PROCEDURE 3 – Select a product from the database of products

- Press the Database of Products> soft key and select a product from the list to be weighed.

- The gray workspace area will automatically update its content with data on the reference mass.
- The mass of the weighed product is automatically entered in the reference mass field, which is activated by pressing the  soft key.
- The display indicates 0.00% (if the weighing pan is unloaded).
- All subsequent samples weighed are compared with the reference mass, and the display indicates the difference, expressed in [%], for each weighed sample in relation to the reference mass.

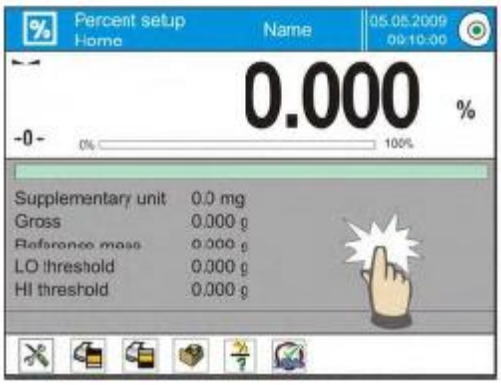
10.2 CHECKWEIGHING, DOSING FUNCTIONS IN PERCENT WEIGHING MODE

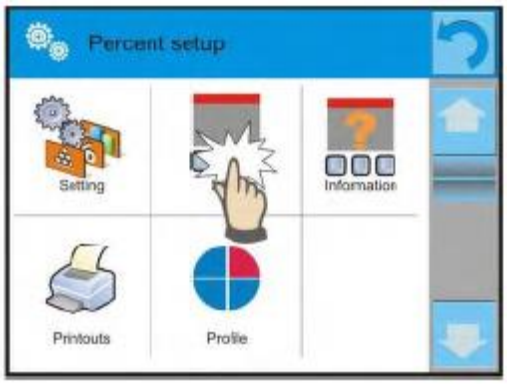
Percent Weighing mode can be aided by checkweighing and dosing functions. Access to the supplementary functions is given by setting the corresponding soft keys in the bottom bar of the display.

Values of the supplementary functions have to be entered as percentages.

Procedure:

- Touch the gray workspace area.
- The display shows the following menu: Settings, Keys, Information, Printout, and Profile.
- Press the <Settings> key.
- The display shows a list of soft keys, functions, and proximity sensors.
- Press one of available options and assign a corresponding function.

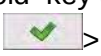




CHECKWEIGHING

This procedure uses two checkweighing thresholds, entered as [%], for controlling sample mass.

Procedure:

- Press the Checkweighing Thresholds  soft key.
- Press the Low Threshold key and enter its value in [%].
- Accept by pressing the  key.
- Press the High Threshold key and enter its value in [%].
- Accept by pressing the  key.

Caution: The value of the High Threshold has to be greater than the value of the Low Threshold.

DOSING

This procedure uses the Target Value expressed in [%], which has to be reached during weighing a poured sample. The target value also features a [+/-] tolerance that determines the parameters within which the measurement is recognized as correct.

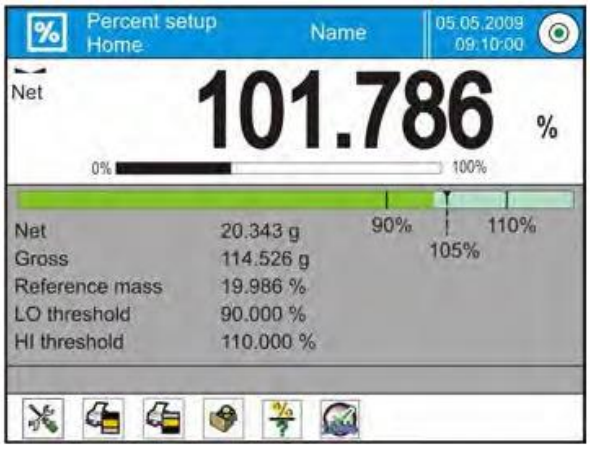
Procedure:

- Press the  Target Value> key.
- Enter the target value expressed in [%].
- If a tolerance applies, set its value.
- Accept by pressing the  > key.
- Press the High Threshold key and enter its value in [%].
- Accept by pressing the  > key

10.3 INTERPRETING THE FUNCTION BY USE OF A BAR GRAPH

The dosing and checkweighing functions use a bar graph. An example of simultaneous operation of the two functions is shown below.

- Checkweighing thresholds  > are set as: Low Threshold = 90%, High Threshold = 110%.
- Target value = 105%; tolerance = 5%  .
- Reference mass = 19.986 g  .



10.4 INTERPRETING THE FUNCTION BY USE OF A BAR GRAPH

The additional settings enable users to adjust the working mode for their needs. Functions related to checkweighing are: Result control, Tare mode, Automatic footer printout, Printout mode/Value release, Printouts.

11 DENSITY

The  Density working mode features four separate modules. The first is used to determine the density of solids; the second is for the density of liquids; the third determines the density of air; and the fourth is for determining density using pycnometer. The third module is available. Carrying out the density procedures requires installing an optional density kit appropriate to the model of balance being used.

Working mode procedure

- While in the main window, press the  > soft key in the upper bar of the display, which opens the Working modes submenu.
- Select  Density> mode, and the software automatically returns to the main screen and displays the  symbol in the upper bar.

The gray workspace area contains the following data:

- Procedure Solids
- Weighing 1
- Weighing 2
- Standard liquid Water
- Temperature 22 °C
- Density of standard liquid 0.9978 g/cm^3

The density mode the display contains the following quick access keys in the bottom bar:

1. Setup – accessing balance menu
2. Print header – printing data in the header
3. Density of solid
4. Density of liquid
5. Density of air
6. Pycnometer
7. Help

11.1 SOLIDS DENSITY DETERMINATION

Prior to procedure start, it is necessary to set process-related parameters:

- Liquid type
  - Distilled water
  - Ethanol
  - Other liquid with determined density

- Liquid temperature
  (required if either distilled water or ethanol is used as liquid for measurement performance)
- Liquid density
  This is set automatically if the liquid type Water or Ethanol is selected and the liquid temperature is entered. If liquid being used is <Other>, then density has to be entered manually.

The density of solids is calculated using the following formula:

$$\rho = \frac{A}{A - B}\rho^{O}$$

ρ - density of a sample
A - sample's mass measured in the air
B - sample mass measured in liquid
ρ^{O} - liquid density

Procedure:

- Assemble the density determination kit.
- If the density value should be saved in the product record in the database, set
- <Assign density to product> in <Settings> and activate the product using the quick access key <Product>.
- Press the  Density of solids> soft key.
- On the next screen, set the appropriate values for: Standard liquid, Temperature, and Density of standard liquid.
- Press the  START> key.
- The balance is ready to start the density determining process for solids.
- Load a sample on the TOP pan of the density kit. When the measurement is stable, press  >.
- Load the sample on the BOTTOM pan of the density kit, which is immersed in liquid. When the measurement result is stable, press  >.
- The display indicates the result of the density determining process.
- Press the  > key to finish the procedure.

Caution: Pressing the  > key starts another density determining process with the same settings.

11.2 LIQUIDS DENSITY DETERMINATION

This procedure determines the mass of a plunger if weighed in the air and then in a tested liquid. The density of the tested liquid is calculated according to a formula:

$$\rho = \frac{A - B}{V} + d$$

ρ - density of liquid
A - sinker weight measured in the air
B - sinker weight measured in water
V - volume of the sinker
d - air density (max 0.0001 g/cm^3)

Before starting the procedure, assemble the density determination kit and enter the volume of the plunger into the balance.

- Press the  sity of liquid> key.
-
- On the menu, press the  Plunger's volume> key and enter the numeric value of the volume specified on plunger's hanger.
- The balance is ready to start the density determining process for liquid.

Procedure:

- Assemble the density determination kit.
- If the density value should be saved in the product record in the database, set parameter "Assign density to product" in <Settings> and activate the product using quick access key <Product>.
- Press the  START> key.
- Follow the displayed commands.
- Carry out the measurement in the air, and when the measurement result is stable, press  >.
- Carry out the measurement in tested liquid, and when the measurement result is stable, press  >.
- The display shows the result of the determined liquid density.
- Press the  > key to finish the procedure.

Caution: Pressing the  > key starts another density determining process with the same settings.

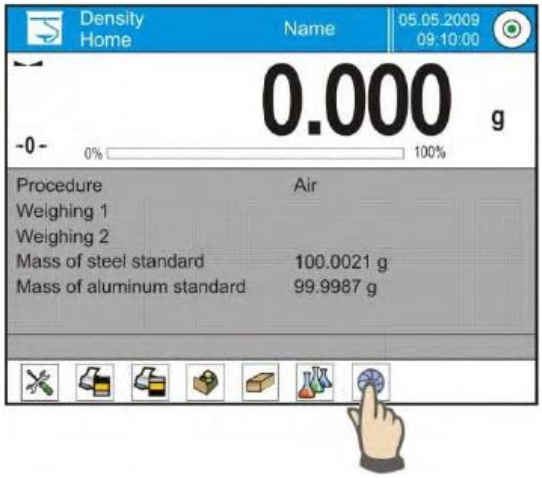
11.3 DENSITY OF AIR

The density of air  is required to calculate a correction of a measurement result related to air buoyancy compensation. The density of weighed sample is also required. The air density determining function is enabled only in balances with a reading unit lower than d=1 mg.

Determining the density of air requires a dedicated set of mass standards (additional equipment) specific to the balance model.

Procedure:

- Press the  Air density> quick access key.
- The display shows options related to this mode.



- Press the <Mass of steel standard> field and enter the value provided by the standard's calibration certificate.
- Press the <Mass of aluminum standard> field and enter the value provided by the standard's calibration certificate.
- Press the <Density of steel mass standard> field and enter the density value.
- Repeat the above process for the aluminum mass standard.
- Press the <START> field. The balance is ready to the start density determining process for air.

- Load the steel mass standard on the balance's weighing pan and, when the measurement result is stable, accept it by pressing  >.
- Load the aluminum mass standard on the balance's weighing pan and, when the measurement result is stable, accept it by pressing  >.
- The balance automatically calculates the density of air and indicates its value on the display.
- Press the  > key to finish the procedure.

The determined value of air density is automatically assigned to the field “Air density” in the “Settings/Air buoyancy compensation” menu in the Weighing working mode.

11.4 DETERMINING DENSITY USING A PYCNOMETER

Before beginning the procedure, set the following parameters:

- Pycnometer weight (if pycnometer weight is known, it is measured once only when filled with substance)
- Pycnometer volume

The density of solids is calculated according to a formula:

$$\rho = \frac{A}{A - B}\rho_o$$

ρ - density of a sample
A - sample mass measured in the air
B - sample mass measured in liquid
ρ_o - liquid density

PROCEDURE 1 – When the pycnometer weight has been entered

- To assign density as a parameter of a product, go to the Settings menu and set “Assign density to product.” Then select the product as active using the <Product> quick access key.
- Press the  Pycnometer> key.
- Using the menu, set the predetermined values for pycnometer weight and pycnometer volume.
- Press  START>.
- Carry out the procedure.
- Fill the pycnometer with tested the substance, following the pycnometer guidelines.
- Put the pycnometer on a weighing pan, wait for the indication to stabilize, and press  >.
- The density indication is displayed.
- Press  > to complete the procedure.

Caution: Pressing  > starts another density determining process with the same settings.

Procedure 2 – When the pycnometer weight has not been entered

- To record density as a parameter of the product, go to the Settings and set the “Assign density to product.” Select the product by using the <Product> quick access key.
- Press the  Pycnometer> key.
- Using the menu, set the determined values for pycnometer weight and pycnometer volume.
- Press the  START> key.

- Carry out the procedure.
- Put an empty pycnometer on a weighing pan, wait for the indication to stabilize, and press  >.
- Take the pycnometer off the weighing pan and fill it with the tested substance, following the pycnometer guidelines.
- Put the pycnometer on a weighing pan, wait for the indication to stabilize, and press  >.
- Density indication is displayed.
- Press  > to complete the procedure.

Caution: Pressing the  key starts another density determining process with the same settings.

12 ANIMAL WEIGHING

The  Animal weighing working mode enables reliable mass determination of objects in motion. In principle, these types of objects generate unstable measurements, thus they require a different method of filtering the measurement signal.

Working mode procedure

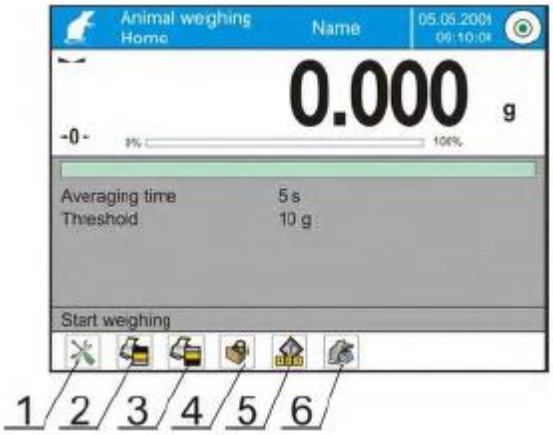
- While in the main window, press the  > soft key in the upper bar of the display, which opens the Working modes submenu.
- Select  Animal weighing> mode. The software automatically returns to the main screen and displays the  symbol in the upper bar.

The gray workspace area contains the following data:

- Averaging time
- Threshold

On selecting the animal weighing mode, the following quick access keys are displayed in the bottom bar:

1. Setup – access the balance menu
2. Print header – print data in the header
3. Print footer – print data in the footer
4. Database of products – select products from a corresponding database
5. Set tare
6. Animal weighing



12.1 SETTINGS FOR ANIMAL WEIGHING MODE

Depending on required mass analysis of the weighed object, the balance allows users to set the internal criteria of the function.

Procedure:

- Press the  Animal weighing> key.
- The display shows options for this working mode:

Averaging time

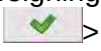
Amount of time during which the measurement records of the weighed sample are analyzed. The obtained data is used to determine measurement result.

Automatic operation

Determines the starting criterion for measurements, whether they are initiated manually, on pressing a key, or automatically.
A measurement starts automatically if the indication on the display exceeds the value of the set threshold.
The following measurement can start on unloading the weighed object from balance's pan (the indication has to return to below the value set in the threshold), loading a new object on balance's pan, and exceeding the threshold's value according to the indication.

Threshold

This value is expressed in mass measuring units.
To start a measurement, the indication has to exceed value set in the threshold.

- Set the mode's operating parameters and return to weighing.
- Load the object to be weighed on the tray and press  >.
- On completing the measurement, the display indicates and "locks" the measurement result.
- The next measurement is performed on pressing the  > key.
  - In manual mode, press  >.
  - In automatic mode, unload the weighed object from the tray and load the next object to be weighed.

12.2 ADDITIONAL SETTINGS

The additional settings allow users to adjust the working mode to their needs. To access the setting follow below procedure:

- Touch the gray workspace area.
- Press the <Settings> menu.
- The display shows functions related to checkweighing:
  - Result control
  - Tare mode
  - Automatic footer printout
  - Printout mode/Value release
  - Printout

Instructions for using the above functions are given in part 10.8, “Additional parameters on weighing process.”

13 FORMULATIONS

The  Formulation working mode enables users to prepare mixtures with several ingredients. The process is conducted automatically.

While preparing mixtures, the user can:

- Use the database of formulas, where formula records are stored. The balance’s software assists in weighing the ingredients of a mixture by displaying corresponding commands or information in the gray workspace area.
- Prepare a mixture without using the database of formulas. Then, a user controls the weighing of an ingredient, the weighing sequence, and the quantity.

If the database of formulas is used, a formulation has to first be created in the database; it can then be activated for use. A formulation can only be created from the database of formulas, which is described later in this section.

Working mode procedure

- While in the main window, press the  > soft key located in the upper bar of the display, which opens the “Working modes” submenu with available working modes.
- Select  Formulation> mode. The software automatically returns to the main screen and displays the  symbol in the upper bar.

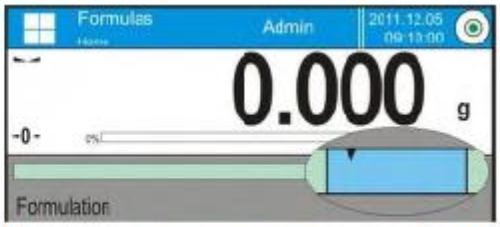
The gray workspace area contains the following data:

- Formulation
- Ingredient
- Ingredient number

- Ingredient mass
- Target value (mass)
- Sum

Caution: In the gray workspace area, a bar graph can be displayed. It shows the correctly weighed ingredient's mass with +/- tolerance, according to the set tolerance thresholds

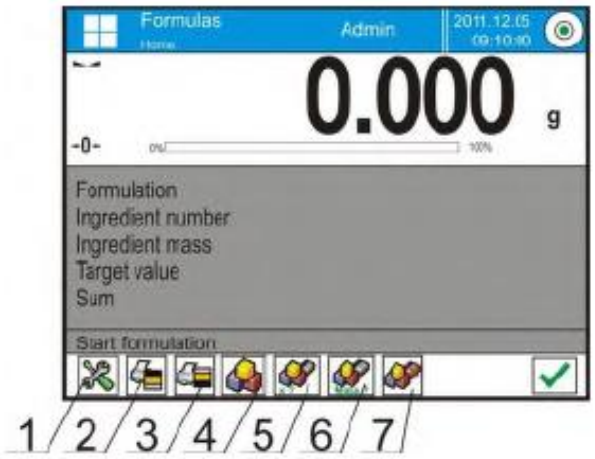
Means of verifying ingredient's mass ***TOLERANCE***



Means of verifying ingredient's mass ***THRESHOLDS***

On selecting the formulation mode, the following quick access keys are displayed in the bottom bar:

1. Setup – access the balance menu
2. Print header
3. Print footer
4. Formulation – select a formulation from the corresponding database of formulas
5. Formulation multiplier (Formulation start if "Multiplier editing" is set to NO, i.e.
6. disabled)
7. Target mass
8. Formulation without a database



13.1 ADDITIONAL SETTINGS

The additional settings enable users to adjust the working mode to their needs. To access the setting follow the below procedure:

- Touch the gray workspace area.
- The menu shows: Settings, Keys, Information, Printout, and Profile.
- Press the <Settings> key.
- The display shows functions related to formula making process.

The formula making process is related to the following functions:

- **Automatic ingredients' naming**:
  - YES
  - NO

- **Apply tare from database of tare values**:
  - YES, each of the ingredients used has a tare value assigned to a product that is saved in the database of products
  - NO, tare is not applied

- **Means of ingredient verification**:
  - The option enables the user to choose a ratio for determining the correct mass of ingredients during the formula making process.

- **TOLERANCE/THRESHOLDS**
  - TOLERANCE: The balance software accepts the mass of an ingredient if it is within set percent tolerance of the total ingredient's mass (±%) (data acquired from database of products).
  - THRESHOLDS: The software accepts the mass of an ingredient as correct if it is within set thresholds (data acquired from database of products).

The selected ratio will be in effect for all ingredients in the formula making process.

If during formula making process one ingredient's mass is exceeded (not within the set percent tolerance and above its upper set point in relation to its target mass), upon confirmation of ingredient mass, the message "Value out of range, recalculate the formulation?" will appear. Upon confirmation, the software will automatically recalculate the mass of other ingredients so that mixture proportions are correct.

This option is available when the ingredients' saved data in the database comply with the selected option "Means of Ingredient Verification." This means an ingredient is specified with thresholds, and the "Thresholds" value is selected for the "Means of Ingredient Verification" option. If the data don't agree, automatic recalculation is not available. That is, if thresholds are entered for the ingredient where "Means of Ingredient Verification" is set to the value "Tolerance."

- **Multiplier's editing**:

This allows the user to make multiple mixtures according to a selected formulation in a single weighing process:

  - **YES**: On selecting a formulation for processing, the software requests to specify the multiplier's value to be used for multiplying the mass of each ingredient while weighing. The value entered will be in effect for all ingredients in the formula making process.
  - **NO**: Entering the multiplier value is disabled, and the default value is set to 1.

13.2 ADDING FORMULAS TO THE DATABASE OF FORMULAS

The database of formulas consists of formulas' names and ingredients, with names and mass forming a formulation. Each product used for the formula making process is saved

in the database of products. When preparing a formulation, the first step requires naming the formulation and then adding ingredients to an already named formulation. The software operates intuitively and gives the user commands to follow on the display.

As each of ingredients must have its name and mass specified, the operator must know the exact composition of the total mixture. Adding a formulation to the database of formulas is performed at the database level.

Procedure:

- Enter the "  Databases" submenu and press <Formulation>.
- Press the <  Add> soft key to add a formulation.

The software will automatically add a new entry in the database and enter its editing mode. Enter all the parameters for the new formulation.

List of parameters defined for a formulation:

- Press <Name> and enter a name for the formulation.
- Enter the formulation code.
- Press <Ingredients>, and a new screen opens with a list of ingredients used in the formulation (for a new formulation, the list of ingredients is empty).
  - Press the  Add> soft key to add new ingredients.
  - Select one of available options:
    - <u>New ingredient</u> - Add a product not yet in the database of products. First, enter the name of the new product, then specify its mass to be weighed during the formula making process. The software automatically adds the products to the database of products.
      Hint: After adding the product, the balance user can fill in other data on a product from the database level.
    - New ingredient from database - Opens the database of products screen. From the list, select a product to be weighed in the mixture. The mass to be weighed is the mass of the product saved in its record in the database. The value of the mass of each added product is editable. Changing the mass of

an ingredient in a formula does not immediately change the product's mass as it is saved in the database.

- Number of ingredients – This is a non-editable option. It is updated by the software on adding the next ingredient to a formulation.
- Sum – This is the target mass of a formulation, i.e., the sum of all ingredients in a formulation. It is not editable, and it is updated by the software on adding the next ingredient to a formulation.

13.3 USING FORMULAS IN WEIGHING

Depending on the settings, a user working in Formulation mode can move to the formula making process either by selecting a formulation from the corresponding database or by weighing a mixture "manually."

Preparing mixtures can be done by:

- Preparing a formulation that is not saved in the database of formulas, or "manually."
- Preparing a formulation that is saved in the database of formulas.
- Preparing multiple repetitions of a formulation that is saved in the database of formulas with the multiplier function.
- Preparing a formulation that is saved in the database of formulas and determining the target mass of the complete formulation.

Caution: Using the above options requires enabling the corresponding quick access keys in the bottom bar and the setting corresponding options in the formulation mode.

On selecting a formulation, weigh each of its ingredients. When each measurement result is stable, press  >. The mass of each ingredient after pressing  > is zeroed and accepted for the total mass of the formulation.

Pressing  > cancels the formula making process and allows the user to select another formulation making process.

PROCEDURE 1 – Preparing a formulation that is not saved in the database of formulas ("manually")
Follow the hints and commands displayed by the balance's software.

- Press the  Formulation without a name> quick access key in the bottom bar.
- Give a name to the new formulation.
- The software automatically skips to selecting the ingredients of a formulation.
- Select an ingredient, either new or from the database of products.
- The software returns to the main screen.
- Weigh the set quantity of an ingredient.
- Accept by pressing  >.
- The software moves to selecting the next ingredient.
- Proceed as previously to weigh all the required ingredients of a formulation.
- After weighing the last ingredient, select one of below options:

- Save and close - The finished formula making process is saved in the database of formulation reports and automatically completed.
- Close - The finished formula making process is completed without saving a final report in the database of formulation reports.

- On selecting one of above options, the software finishes the formula making process and returns to the main Formulation mode screen. To proceed, press < ✔ >.

Hint: The formula making process can be cancelled at any moment by pressing <Abort> key.

PROCEDURE 2 – Preparing a formulation that is saved in the database of formulas. This is the basic process for formula making. Depending on function settings, it is possible to easily prepare multiples of a formulation.

Follow hints and commands displayed by the balance's software.

- Press the  Formulation> key.
- Select a formula from the list of available formulas.
- Press the  Formulation with multiplier> key.

If Multiplier editing is disabled (set to NO) in the Formulation mode settings, the software automatically skips to the formula making process. If Multiplier editing is enabled (set to YES), the software displays an onscreen keyboard for entering the value of the multiplier. The mass of all ingredients of a formulation will be multiplied by the specified value. (The mass of each ingredient is a product of the mass saved in a formulation and the value of the multiplier.)

- On accepting the entered multiplier's value, the software proceeds to formula making process. The gray workspace area on the display indicates the following parameters: Name of selected formulation, Name of the first ingredient, Ingredient number, Mass to be weighed, and Target mass.
- After accepting the mass of an ingredient, the software automatically adds the mass to the sum of weighed ingredients of the formulation and moves on to weighing the next ingredient.
- After weighing all of the ingredients in the formulation, the software sets a command on completing the formula making process.
- Press ✔ > to confirm completing the process. The software automatically prints a report and saves it in the database of formulation reports. (This report template is editable in "Printouts.")

PROCEDURE 3 – Preparing a formulation that is saved in the database of formulas and determining the target mass of the complete formulation.

This procedure is for users who need to prepare a mixture with predetermined mass that is different from the sum of the ingredients used.

In this case, there is no need to carry out complex calculations of the ingredients' mass. The software adjusts the mass of each ingredient in relation to the predefined target mass of the complete formulation.

Follow the hints and commands on the display.

- Press the  Formulation> key.
- Select a formula from the list of available formulas.
- Press the 

Formulation with target mass> key.
- The software displays an onscreen keyboard for entering the target mass of the mixture.
- On accepting the entered value, the software proceeds to the formula making process. The gray workspace area displays the following parameters: Name of selected formulation, Name of the first ingredient, Ingredient number, Mass to be weighed, and Target mass.
- Mass of each ingredient is automatically recalculated (proportionally) to the value of defined target mass of the complete formulation,
- After accepting mass of an ingredient, the software automatically adds the mass to the sum of weighed ingredients of the formulation, and moves to weighing the next ingredient,
- After weighing all of the ingredients in the formulation, the software sets a command on completing the formula making process,
- Press  key to confirm completing the process. The software automatically prints a report on completing the process and saves it in the database of formulation reports. (The report template can be edited in "Printouts.")

Each report on completed formula making processes can be printed from the database level, "Reports from formulas."

14 STATISTICS

The  Statistics working mode enables data to be acquired from a series of measurements and statistical calculations to be made. The range of statistical data depends on the mode's settings.

Working mode procedure

- While in the main window, press the  soft key located in the upper bar of the display, which opens the Working modes submenu.
- Select  Statistics> mode. The software automatically returns to the main screen and displays the  symbol in the upper bar.

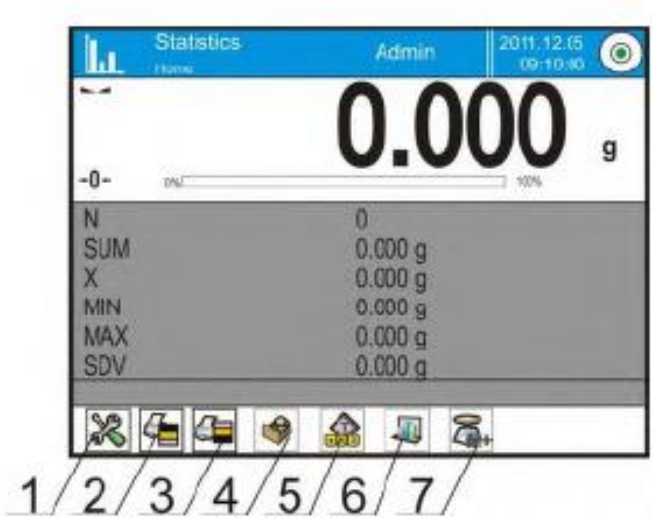
The gray workspace area contains the following data:

- N (no. of samples)
- SUM (total no. of samples)
- X (mean value from a series)
- MIN (minimum value in a series)

- MAX (maximum values in a series)
- D (MAX-MIN difference in a series)
- SDV (standard deviation)
- RDV (variation coefficient in a series)

On selecting the statistics mode, the display contains the following quick access keys in the bottom bar:

1. Setup – access to balance's menu
2. Print header – print data in the header
3. Print footer – print data in the footer
4. Database of products – select products from the corresponding database
5. Set tare
6. Statistics
7. Add to statistics



14.1 SETTING OF KEYS AND WORKSPACE FOR STATISTICS MODES

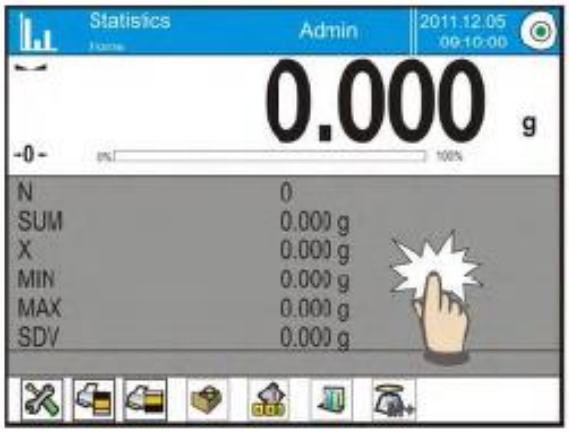
When carrying out a series of measurements, remember:

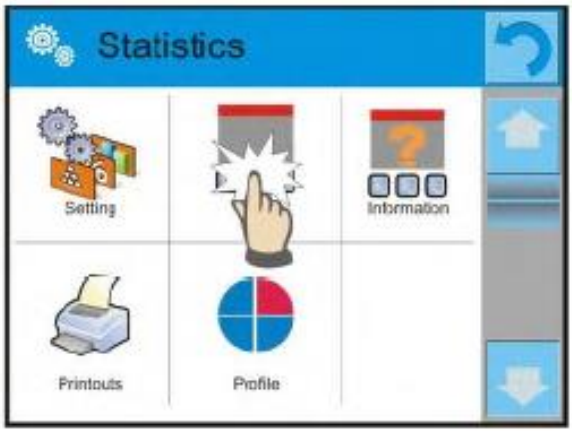
- Pressing the  PRINT> key causes a printout to be released and a measurement to be added to the statistics.
- Pressing the  Add to statistics> key ONLY adds a measurement to statistics without releasing a printout.

As in any other working mode, the balance user can define a custom set of quick access keys and customize the data displayed in the gray workspace area.

Procedure:

- Touch the gray workspace area.
- The display shows the following menu: Settings, Keys, Information, Printout, and Profile.
- Press <Settings> or <Information>.
- Assign keys to displayed quick access keys and select information to be displayed in the gray workspace area.





14.2 ADDITIONAL SETTINGS

The additional settings enable users to adjust the working mode to their needs. To access the setting follow below procedure:

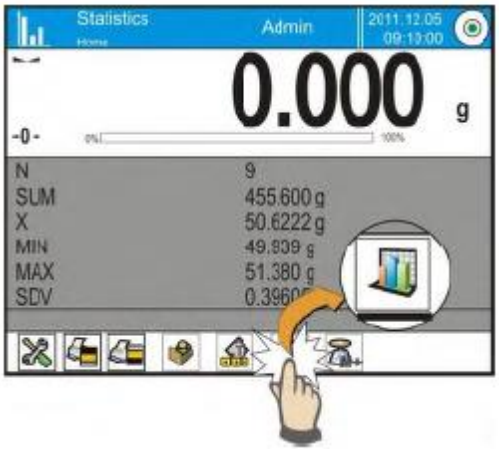
- Touch the gray workspace area.
- Press the <Settings> key.
- The display indicates functions related to checkweighing, such as:
  - Result control
  - Tare mode
  - Automatic footer printout
  - Printout mode/Value release
  - Printout

14.3 PARAMETERS RELATED TO A SERIES OF MEASUREMENTS

Each series of measurements can be accompanied by the following options: Previewing results, Printing report, deleting last measurement, and Deleting all results in statistics.

Procedure:

- Press the  Statistics> key.



- Displayed options: Result, Print, Delete last, Delete.
- Select one of available options:
  - **Result:** to preview statistics report
  - **Print:** to print report on statistics

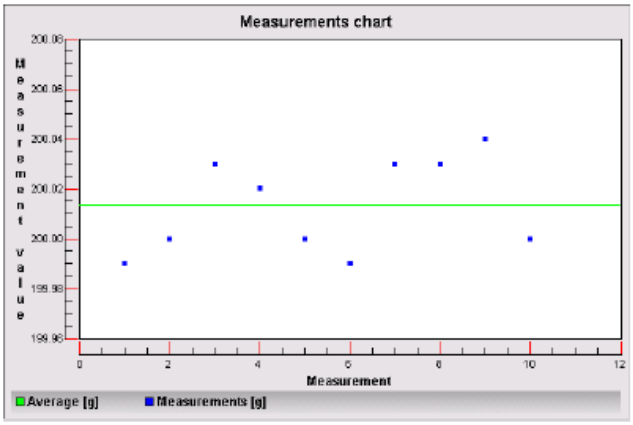
An example of report on statistics

---------- Statistics ----------

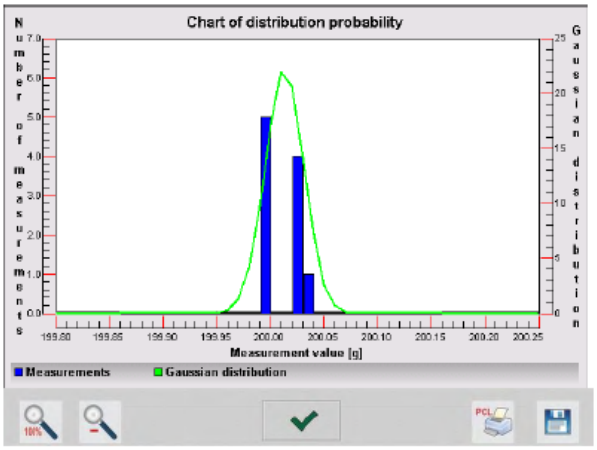
N	9
SUM	455.600 g
X	50.6222 g
MIN	49.939 g
MAX	51.380 g
D	1.441 g
SDV	0.39605 g
RDV	0.78 %

  - **Delete last:** if the last measurement has to be cancelled.
  - **Delete:** if all statistical data should be removed.
  - **Measurements chart:** The software generates and displays a chart with the distribution of measurements in the coordinates mass/measurement for a completed measurement series.

An example of the chart is shown below:



- **Probability distribution chart:** The software generates and displays a chart of probability distribution for a completed measurement series. An example of this chart is shown below. The bar chart demonstrates quantities of the same measurement in a series.



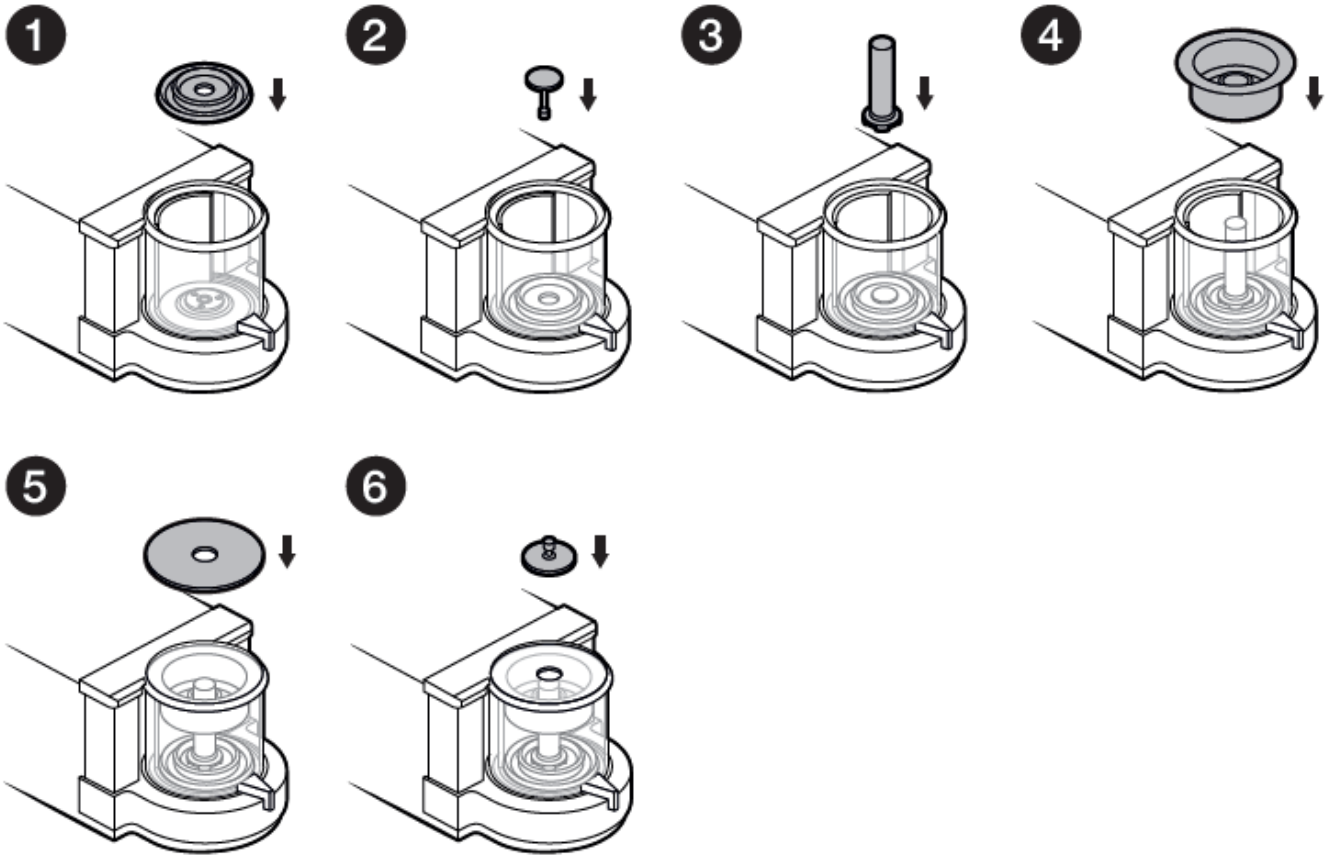
The bottom bar contains the following soft keys:

	Return to displaying the complete chart
	Zoom out to the screen's previous view
	Return to displaying the previous screen
	Print the chart on a connected printer PCL type
	Save the chart as a file in format *.bmp on an external data storage device connected to terminal's USB port.

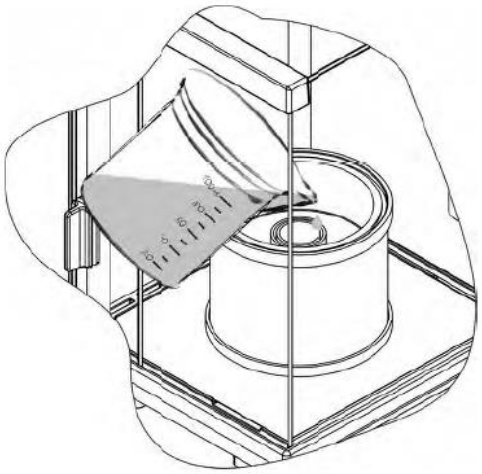
15 PIPETTE CALIBRATION

The balance allows for pipette calibration using either special balance software or in cooperation with “Pipettes” computer software for pipettes calibration.

Before pipettes calibration, a special set must be mounted inside the draft shield. The set is not standard balance equipment. See the illustration below for set assembly instruction.



The evaporation ring minimizes measurement errors as a result of liquid evaporation during the weighing process.



Before pipettes calibration, distilled water must be poured into the evaporation ring. The amount of water should not exceed 2/3 of the ring height.

The set may be operated after about an hour. This period of time is required for moisture stabilization. Remember to control the level of distilled water—the surface of the vessel should remain covered with it. Excess of water may be removed with an automatic pump or external pipette.

To minimize both changes of moisture content inside the weighing chamber and negative effect of air blowing in when the chamber door is opened, the liquid should be dosed with a pipette through the opening in the top cover of the weighing chamber.

The  Pipette calibration working mode determines volume measurement errors in piston pipettes in accordance with standard ISO 8655 or according to user requirements.

For calibrations carried out in accordance with standard ISO 8655, the errors are automatically selected to tested volume as specified in the standard (see the table of errors for standard ISO 8655).

This working mode enables:

- Calibrating pipettes with fixed or adjustable volume, single- or multi-channel
- Preparing a database of pipettes, including: pipette name, code, tested volume, and others
- Calculating results on basis of:
  - Average volume of a pipette (channel)
  - Systematic errors (accuracy error)
  - Random error CV (repeatability error)
- Carrying out automated measuring procedures by pipette type
- Storing calibration results in a database of reports from the calibration process
- Printing reports from the pipette calibration process
- Exporting reports from tests

During volume testing, the software determines the accuracy and repeatability errors for the tested volume.

For pipettes with adjustable volumes, the software enables declaring up to 5 volumes from the pipette's total range, which are checked during calibration process.

To ensure the highest accuracy of pipettes calibration process, maintain the following ambient conditions at the workstation:

- Ambient temperature of a pipette, tips, and liquid should be between 20°C– 25°C with change rate during testing within ± 0.5°C.
- Relative humidity should be between 50–75%.
- Use distilled water for pipettes calibration processes.
- A pipette, tips, and distilled water should be stabilized for temperature in the weighing room. The reference norm advises that minimum acclimatization time for is 2 hours.

While calibrating, the balance user will refer to the database of pipettes, which includes data on the pipettes, their parameters, tested volumes, and values of errors determined for specific volumes.

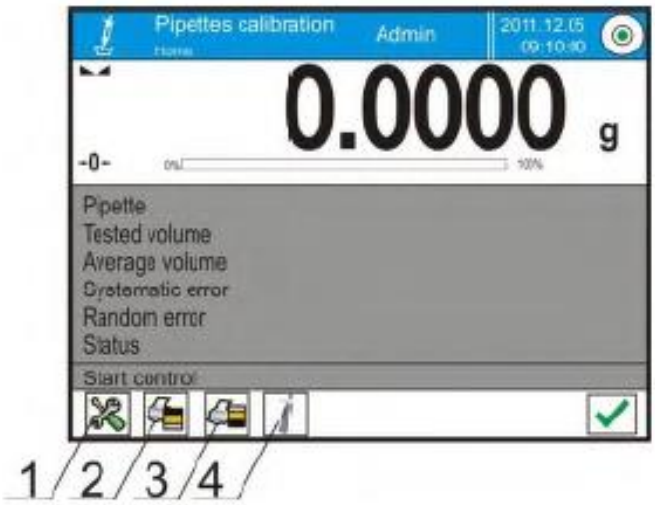
Before carrying out the calibration process, load the database with data on pipettes and calibration criteria.

Adding pipettes can only be done from the database level. This procedure is described later in this user manual.

Working mode procedure

- While in the main window, press the  soft key in the upper bar of the display, which opens the Working modes submenu.
- Select  Pipettes calibration> mode. The software automatically returns to the main screen and displays the  symbol in the upper bar.

On selecting the pipettes calibration mode, the display shows the following quick access keys in the bottom bar:



1. Setup – access to balance's menu
2. Print header
3. Print footer
4. Select pipette

The gray workspace area contains the following data:

- Pipette
- Tested volume
- Average volume
- Systematic error
- Random error
- Status

15.1 ADDITIONAL SETTINGS OF PIPETTES CALIBRATION MODE

The additional settings enable users to adjust the working mode for their needs. To access the setting follow below procedure:

- Touch the gray workspace area.
- The display shows the following menu: Settings, Keys, Information, Printout, and Profile.
- Press the <Settings> key.
- The display indicates functions related to calibration of pipettes.

Pipettes calibration is related to the following functions:

- **Number of measurements:** This option determines the number of measurements for the tested volume of a pipette (valid for each tested volume in the case of a pipette with adjustable volume).

- **Request serial number:** YES/NO. If YES is selected, then before starting the calibration procedure the software displays an onscreen keyboard for entering the serial number of a pipette.

- **Comply with ISO 8655:** YES/NO. If YES is selected for tested volumes, during the calibration process, the software automatically accepts error values as specified in standard ISO 8655 (if other error values have been accepted for a pipette, then on selecting <Comply with ISO 8655>, the error values are neglected and replaced by those from ISO standard).

- **Acquire data on ambient conditions from THB module:** YES/NO. If YES is selected, the software automatically and at a specified moment acquires and saves the ambient conditions parameters from a connected THB module. If NO is selected, then before starting and after completing the pipettes calibration process, the operator should manually enter the ambient conditions parameters (i.e., temperature, humidity, and pressure in the weighing room) from external ambient conditions sensors.

- **Result control, Tare mode, Automatic footer printout, Printout mode, Printout**: Means of using these functions is given in part 10.8, “Additional parameters on weighing process.”

15.2 PIPETTES CALIBRATION QUICK ACCESS KEYS

Each working mode features a set of default quick access keys that are automatically displayed on mode activation. The set of keys can be modified by selecting other quick access keys in the bottom bar of the display. This process requires the appropriate operator’s access level.

15.3 ADDING A PIPETTE TO THE DATABASE OF PIPETTES

The database of pipettes contains a list of pipettes’ names and other data, including tested volume and error values for a specific volume. When adding a pipette to the database, first specify its name and then add other data.

The software operates intuitively and instructs the user to follow displayed information.

Adding a pipette to the database can be done in the database’s menu.

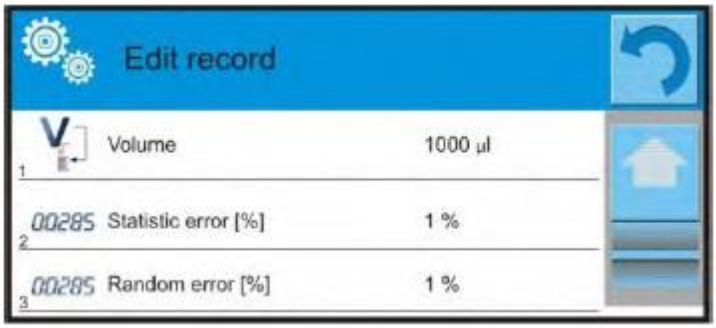
Procedure:

- Enter submenu < Databases> and press Pipettes>.
- Press Add> soft key to add a new pipette.

The software automatically adds a new entry to the database and enters its editing mode. Enter all parameters of the new formulation.

List of parameters defined for a pipette:

1. Name: press <Name> to open a screen for entering the name of a pipette
2. Code: for entering pipette's code
3. Model: for entering model name of a pipette
4. Tip: for entering name of used tip
5. Type of volume: ADJUSTABLE/FIXED
6. Nominal volume: for specifying nominal volume of a pipette
7. Minimum volume: for specifying the minimum volume of a pipette (for a pipette with fixed volume, enter <0>)
8. Number of channels: for specifying number of pipette's channels (for a single-channel pipette, enter <1>)
9. Type: NONE/A/D1/D2. Pipette type is compatible with the applicable standard. Selecting the pipette's type is mandatory if calibration process complies with the requirements of standard ISO 8655, as values of errors differ in each type of a pipette. Therefore, if the software is to accept adequate error values, it is necessary to determine the type of a pipette.
10. Tested volumes: Opens a screen with a list of calibrated volumes (for a new pipette, the list is empty), add volume to be tested, and define error value for each tested volume:
    - Press Add> soft key.
    - An onscreen numeric keyboard is displayed.
    - Enter value of tested volume in [µl] and accept by pressing >.
    - A new record is automatically added to the list with recommended error values.
    - To change error values, press the field with the added volume of a pipette.



Each field is editable and enables entering user values.

Caution: While in calibration process, the order of tested volumes corresponds to the order in which they are entered.

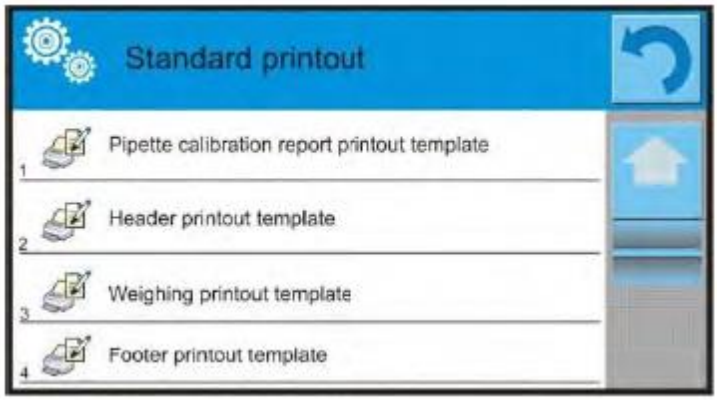
- On setting the correct values, return to the main window.

15.4 PRINTOUTS

The Printouts option allows users to customize a standard printout as well as a nonstandard printout.

- **Standard printout**

  There are four internal sections featuring different variables. For each variable, selecting YES will include it in a standard printout. Selecting NO means the variable is not printed.



Content of each of the reports:

- Working mode
- User
- Client
- Pipette
- Serial number
- Number of channels
- Channel number
- Number of measurements
- Operation with ISO 8655
- Start date
- End date
- Water temperature
- Temperature
- Humidity
- Pressure
- Z coefficient
- Measurements and statistics
- Statistics
- Status
- Empty line
- Dashes
- Signature

- Nonstandard printout

15.5 ACTIVATING PROCEDURE

The pipettes calibration process requires installing an adapter for pipettes calibration. The adapter does not come standard with the balance.

The adapter for pipettes calibration is a simple supplementary device designed for calibration and checking of piston pipettes on balances.

The adapter has been designed to minimize evaporation occurring in liquid handling procedures. It consists of a minimized weighing chamber installed inside the weighing chamber of the balance. The adapter features an evaporation ring and a dedicated weighing pan for central locating of the measuring vessel.

The adapter for pipettes calibration prevents liquid from evaporating during the calibration process. The small dimensions of the adapter combined with the evaporation ring maintain a high humidity rate inside the weighing chamber and the measuring vessel, thus stopping the liquid evaporation process.

Our research has proven that the adapter eliminates or considerably reduces liquid evaporation, which is essential for the correct gravimetric calibration of piston pipettes. Selecting an appropriate adapter and balance mostly depends on the type of calibrated pipettes.

Before starting the pipettes calibration process, assemble the adapter inside balance's weighing chamber and enter data on pipettes to be calibrated, including complete pipette characteristics and values of errors (refer to the database of pipettes).

The next step is setting the process's main options:

- Number of measurements
- Request batch number (YES/NO)
- Operation with ISO 8655 (YES/NO)
- Acquire ambient conditions from THB.Y module (YES/NO)

After setting the above options, go to pipettes calibration process.

Procedure:

- Press the  Select pipette> key.
- Select a pipette for testing from the displayed list.
- On selecting, the software returns to the main screen and the name of the selected pipette is visible in the gray workspace area.
- Press the  Start> key in the bottom bar of the display.
- If "Request batch number" is enabled (set to YES), a screen opens for entering the batch number and accepting the value.
- A new screen opens for entering the values of ambient conditions read from the external sensors (temperature, humidity, pressure and water temperature). After entering these

values, press Accept>. If “Acquire ambient conditions from THB module” is enabled (set to YES), the software automatically acquires data from the THB module on temperature, humidity, and atmospheric pressure. The value of water temperature has to be entered manually and confirmed by pressing Accept>.

- The software returns to the main window, and the gray workspace area displays the following data: Tested volume and Process status “In progress.” The task bar displays commands and hints for the user on the next step, “Weighing sample C1/V1/N1.” Description of texts: C1 – channel number; V1
- number of volume for a channel; N1 – number of measurement for the tested volume.
- Follow the displayed instructions until the calibration process is complete. The gray workspace area displays other data on calibration process, i.e. average volume, values of errors, specific to the completed process.
- On accepting the last measurement, a screen is displayed with ambient conditions parameters. Proceed as on process start: enter all ambient conditions parameters and press Accept>.
- The software automatically generates a report that is printed and stored in the database of reports for pipettes calibration (ambient conditions and water temperature values given in the report are averages from the initial and final values of a process).
- Complete the process by pressing the > key in the bottom bar. For multichannel pipettes, the balance displays a message on continuing the process for the next channels. On confirming the message, the balance carries out calibration/testing process for the next channel. The settings remain unchanged.
- The software allows the user to start the next procedure for the same pipette or select another pipette from the database.

15.6 REPORT ON THE COMPLETED CALIBRATION PROCESSES

On completing each calibration process, a report is generated. The report is saved in the “ Reports from pipettes calibration processes” database. The files are named using the date and time of the calibration process.

<u>An example of a report on pipette calibration process:</u>

---------- Pipette calibration ----------

User	Smith
Client	Jones
Pipette	p901\1k
Serial no.	7777
No. of channels	1
Channel no.	1
No. of measurements	10
Operation with ISO 8655	Yes
Start date	2012.03.15 07:50:44
End date	2012.03.15 07:54:34
Water temperature	22.15 °C
Temperature	21 °C
Humidity	48 %
Pressure	1005 hPa
Z coefficient	1.00328

------- Tested volume: 1000 µl -------

1	0.998 g	1000.82389 µl
2	0.998 g	1000.82389 µl
3	0.998 g	1000.82389 µl
4	0.998 g	1000.82389 µl
5	0.998 g	1000.82389 µl
6	0.998 g	1000.82389 µl
7	0.998 g	1000.82389 µl
8	0.998 g	1000.82389 µl
9	0.998 g	1000.82389 µl
10	0.998 g	1000.82389 µl

Average volume	1000.82389 µl
Average [%]	100.08 %
Systematic error	0.82389 µl
Systematic error [%]	0.08239 %
Permissible error	± 16 µl
Random error	0 µl
Random error [%]	0 %
Permissible error	± 6 µl
Status	Positive

Signature

.....

16 DIFFERENTIAL WEIGHING

The  Differential weighing working mode analyzes changes of mass in a single sample or multiple samples.

The process is performed by determining the sample's initial mass, and then the sample is subject to different processes, whose outcome is separation or addition of some of the sample's ingredients. Finally, the sample is repeatedly weighed (differential weighing).
After the final weighing, the balance determines the difference between the two mass values, initial and final.

The balance in differential weighing mode enables:

- Determining a series, where each series may contain several samples
- Assigning a name for each weighed sample and printing or exporting data on a series to a connected data storage device
- Determining tare value and initial mass for each sample, and performing up to five measurements for the final mass

If balance users need to use the differential weighing mode, then initially they need to enter data on a weighed series to balance's database, define the samples in a saved series, and then recall a saved series for weighing. The series are created at the databases level. The series-creating procedure is described later in this user manual.

Working mode procedure

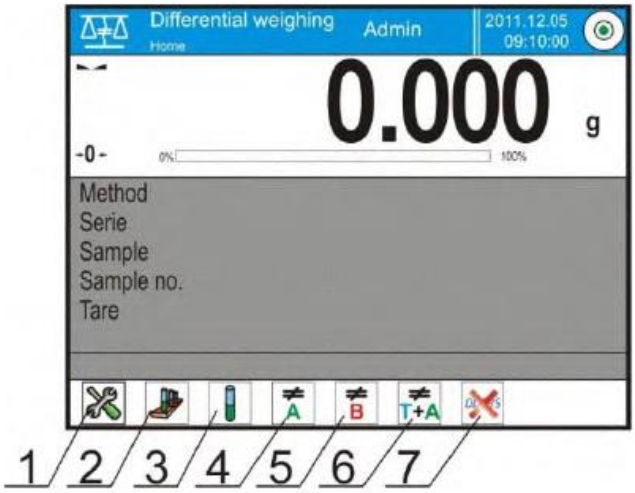
- While in the main window, press the  > soft key in the upper bar of the display, which opens the Working modes submenu.
- Select  Differential weighing> mode, and the software automatically returns to the main screen and displays the  symbol in the upper bar.

The gray workspace area contains the following data:

- Method
- Series
- Sample
- Sample number
- Tare

On selecting the differential weighing mode, the display contains the following quick access keys in the bottom bar:

1. Setup – access to balance's menu
2. Series
3. Sample
4. Weighing A
5. Weighing B
6. Weighing T+A
7. Delete value



16.1 ADDITIONAL SETTINGS

The additional settings allow users to adjust the working mode for their needs. Access to these settings is described below:

Procedure:

- Touch the gray workspace area.
- The display shows the following menu: Settings, Keys, Information, Printout, and Profile.
- Press <Settings>.
- The display indicates functions related to differential settings.

Differential weighing is related to the following settings:

- **Threshold**: mass value as the value of the maximum sample mass, e.g. filter.

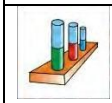
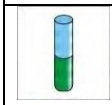
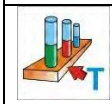
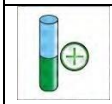
- **Ambient conditions**: The user can set the requirement for giving ambient temperature and humidity values before the weighing process: “Weighing A, Weighing T+A, Tareing T”.
  - NO: giving data on ambient conditions disabled
  - ONLINE: data on ambient conditions is acquired from the ambient conditions module that is cooperating with the balance
  - VALUE: temperature and humidity value have to be entered by the user, who reads the ambient conditions values from another device controlling the ambient conditions

- **Maximum number of weighing records**: Enter the number of repetitions for the final weighing process <B> – Max 5 repetitions. The setting is valid for all measuring series

16.2 DIFFERENTIAL WEIGHING QUICK ACCESS KEYS

Each working mode features a set of default quick access keys that are automatically displayed on mode activation. The set of keys can be modified by selecting other quick access keys at the bottom bar of the display. This process requires the appropriate operator’s access level.

The below list provides the functions of only those soft keys that are absent in the Weighing working mode.

	**Weighing A** Start sampling of initial mass <A> of the sample. The process is performed as an separate activity.
	**Weighing (T+A)** Start weighing a container for the sample (tareing) with automatic, instant sample weighing to follow (non-separable activities). On process initiation, the software orders setting the name of a sample.
	**Tare (T)** Weigh a container for a sample, performed as a separate process. On process initiation, the software orders setting the name of a sample.
	**Weighing B** Start sampling of the final mass <B> of the sample. Causes differential weighing mode to start.
	**Series** Select a sample for which the differential weighing process should be performed.
	**Sample** Select a sample for current process in a selected series.
	**Copy tare** Copy the tare value determined for a given sample to all samples in a current series and samples that do not have a tare value assigned.
	**Delete value** Delete the last saved mass value (tare, weighing A, or weighing B).
	**Add sample** Using the onscreen keyboard, enter the name of an added sample. It is mandatory to first select a series in which the sample should be added without starting the weighing process.

16.3 INTRODUCING A SERIES TO THE DATABASE OF SERIES

The database of series is made of series and samples that are components of a series. When creating a series, first set its name and then add samples to the created series. The software operates intuitively and instructs the user to follow displayed information.

Specify a name for each sample. Adding a series to the database can be done from the differential weighing mode or from the database level.

Procedure:

- Enter the  Databases> submenu and press the <Series> field.
- Press <  Add> soft key to add a series.

The software automatically adds a new entry to the database and enters its editing mode.
Enter all parameters for the new series.

List of parameters defined for a series:

1. Name: Press <Name> and a screen opens for entering the name of a series.
2. Code: for entering series code
3. Client: enables selecting a client for whom the measurements in a series are completed.
4. Samples: opens a screen with list of samples (for a new series, the list is empty). To add new samples, press  Add>, and the software automatically adds a new entry to the list. The name of a sample is given automatically (it is editable).
5. The number of samples in an edited process is updated in real time by the software on adding a new sample to the series.

Each added sample on the list has its current differential weighing status displayed (weighing phase completed for a sample).

Newly added samples do not have a status assigned—the field is empty. The status is updated in real time after completing each phase of the sample's weighing process.

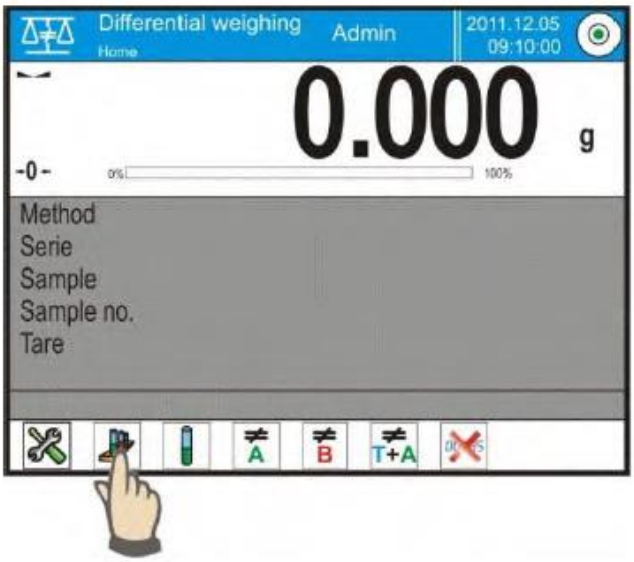
16.4 AN EXAMPLE OF PROCESS FOR DIFFERNTIAL WEIGHING MODE

On activating Differential Weighing mode:

- Select the information to be displayed in the gray workspace area.
- Select the appropriate quick access keys.
- Add a series to balance's memory (a name identifies a series).
- Add samples to a series (a name identifies a sample).
- After adding samples, return to the main screen.

Selecting a series:

- Press the <SERIES> quick access key. A window is displayed with the database of series.
- On entering the database, press the field with the name of a series. It is automatically selected for completing.
- The name of the selected series is displayed in the gray workspace area (only if such information is enabled for being displayed in the gray workspace area).



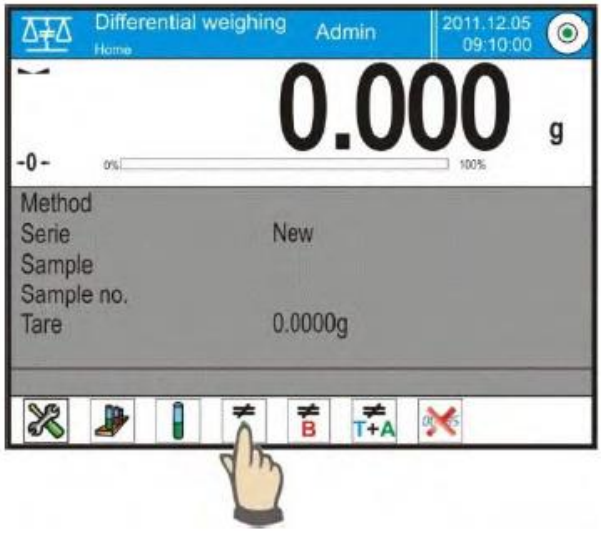
On selecting a series, press one of the below keys to carry out the process:

≠ A	**Weighing A** Weighing the initial mass of a sample
≠ T	**Tare (T)** Weighing the container for a sample tareing
≠ T+A	**Weighing (T+A)** Weighing the container for a sample (tareing) and weighing a sample (subsequent processes)
≠ B	**Weighing B** Weighing the final mass of a sample. This process is accessible only if a given series contains samples with completed weighing records <A>. Unless such weighing records are in the series, the process is unavailable.

Weighing A

On selecting an option, the balance moves to the first sample on the list for which weighing <A> is still to be performed. If there are no such samples in a series, the balance displays a message that this process is inaccessible.

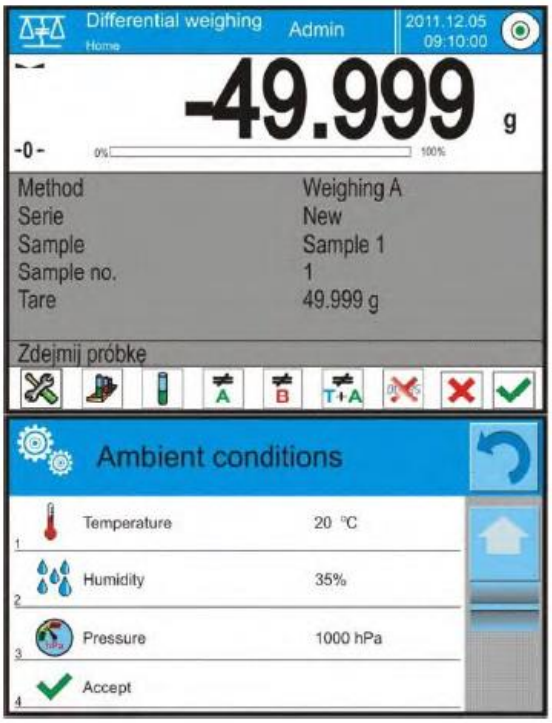
If the process is possible, then the new data on initiated process is displayed in the gray colored workspace. During the process, the bottom bar and the workspace display data on the next steps that a user should follow.



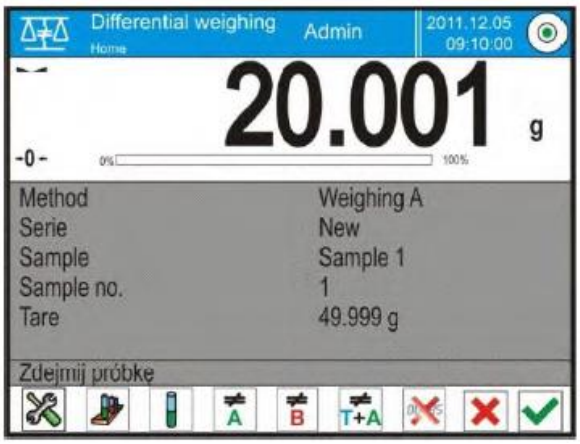
Place a sample on balance's weighing pan and press  .

A screen is displayed for entering ambient temperature and humidity value if "Ambient conditions" is set to VALUE or the data on ambient conditions is automatically acquired from the ambient conditions module and displayed for confirmation, and if "Ambient conditions" is set to ONLINE.

Hint: If "Ambient conditions" is disabled (set to NO), the software skips this part of the process.



On accepting the ambient conditions by pressing  , the software returns to the mode's main screen and displays a command in the message bar to unload the sample from the weighing pan.



The user should unload the sample from balance's weighing pan and accept the activity by pressing  .

The software automatically moves to the next sample in a series. Follow the above procedure and weigh the next samples.

The process can be aborted by pressing  .

Weighing T
On selecting this option, the balance moves to the first sample in the list for which weighing <T> is not completed. If there are no such samples in a series, the balance displays a message that this process is inaccessible.

If the process is possible, then the new data on the initiated process is displayed in the gray workspace area. During the process, the bottom bar and the workspace display data on the next steps that a user should follow.

Load a container for a sample on balance's weighing pan and press  >.
On accepting by pressing the  > key, the software displays a command in the message bar to unload the container from the weighing pan.

The user should unload the weighed container and accept the activity by pressing  >. The software automatically moves to the next sample for which Weighing <T> has to be performed.

Follow the above procedure and weigh the next containers The process can be aborted by pressing  >.

Weighing T+ A
On selecting this option, the balance moves to the first sample in the list for which weighing <T> is not completed. If there are no such samples in a series, the balance displays a message that this process is inaccessible.

If the process is possible, then the new data on the initiated process is displayed in the gray workspace area. During the process, the bottom bar and the workspace display data on the next steps that a user should follow.

Load a container for a sample on balance's weighing pan and press  >.
The mass value of the container is assigned to a sample as its tare value, balance indication is zeroed, and a command is displayed to load a sample in the container.

Put the sample into the weighed container and accept the process by pressing  >.
A screen is displayed for entering the ambient temperature and humidity value if "Ambient conditions" is set to VALUE or the data on ambient conditions is automatically acquired from the ambient conditions module and displayed for confirmation, and if "Ambient conditions" is set to ONLINE.

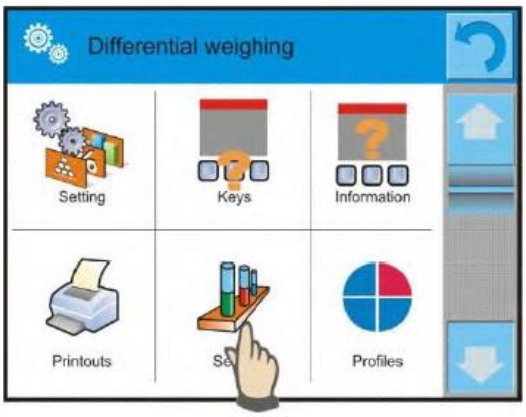
Hint: If "Ambient conditions" is disabled (set to NO), the software skips this part of the process.
On accepting the ambient conditions by pressing  >, the software returns to the mode's main screen and displays a command in the message bar to unload the sample from the weighing pan.
The user should unload the weighed sample and the container from the balance's weighing pan and accept the process by pressing  >.

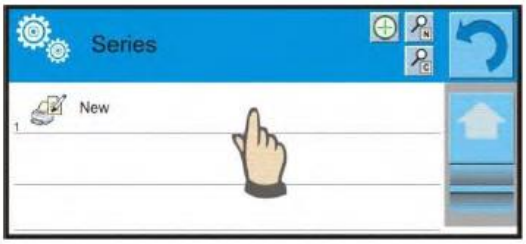
The software automatically moves to the next sample in a series. Follow the above procedure and weigh the next samples.

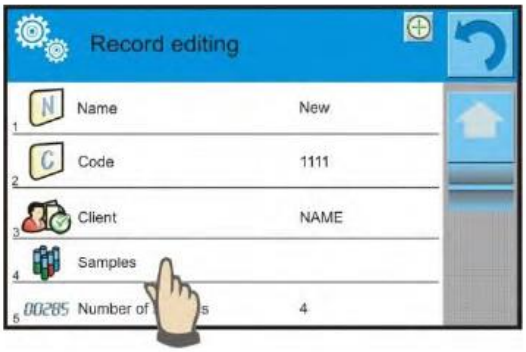
The process can be aborted by pressing  >.

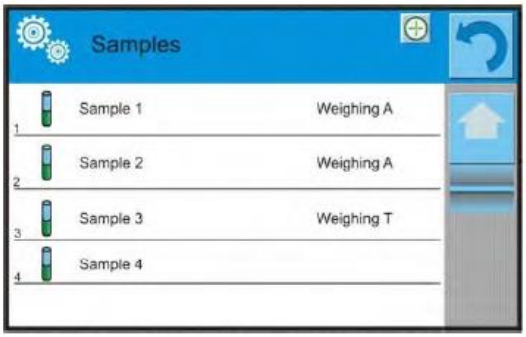
For a single series, and while weighing the next samples, the measurements can be performed according to the following outline: weighing A, weighing T, or weighing T+A. Each of the samples saved in a series will have a status description in its data that tells user the latest process phase completed for a given sample. On entering the database

of series and previewing one of the series, a window is opened with samples saved in the series.





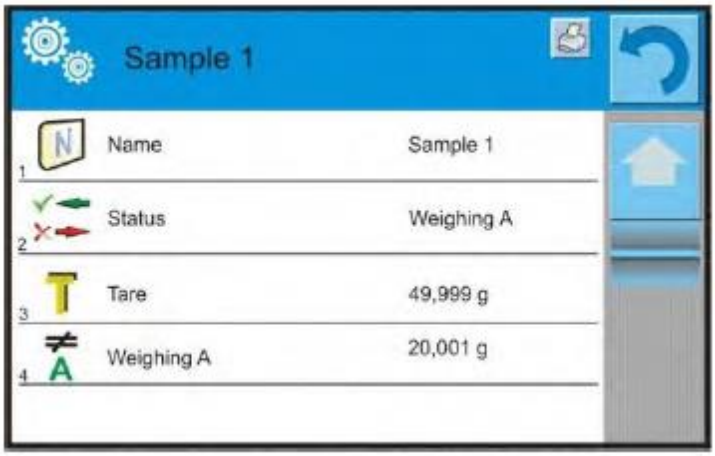




Status denotation:

- Weighing A: measurement completed for procedure Weighing A or Weighing T+A
- Weighing T: measurements completed for procedure Weighing A

To preview detailed information on a sample, press the field with its name. The opened window contains the following data:

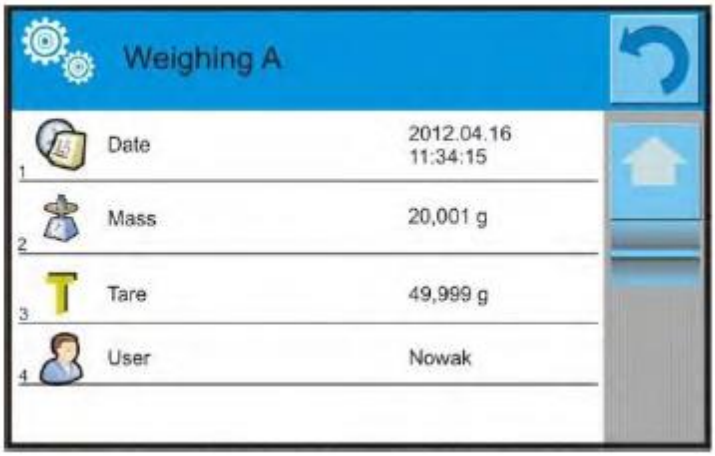


If the following procedure is completed for a sample:

- Weighing A only, then tare value is <0>.
- Weighing T only, then value of weighing A is <0>.
- Weighing T+A, then for tare and weighing A the mass values are assigned.

Data on a weighed sample can be printed on a connected printer by pressing the printer symbol in the display's upper bar.

To preview data on weighing A, press <Weighing A>:



If in a given series there are samples for which weighing of the initial mass (Weighing A) has already been completed, it is possible to perform the final weighing (weighing B) for these samples.

Weighing B
Select option:

The balance moves to the first sample on the list for which weighing <B> is not completed. If there are no such samples in a series, the balance displays a message that this process is inaccessible.

If the process is possible, then the new data on the initiated process is displayed in the gray workspace area.

Caution: “Weighing B” is accompanied by 1/3: 1 means that it is the 1 measuring cycle type B, and 3 means that the number of repetitions for this process is set to 3 (3 cycles). Remember that the software requests to carry out the FIRST cycle out of 3 from all samples in a series for which this measurement is available (a condition is competing Weighing A for the sample).

During the process, the bottom bar and the workspace display prompts for the next steps for a user to follow.

In case tare is assigned to a sample, then its value is indicated on the display with minus sign.

Place a sample on balance’s weighing pan (if tare is applied, then place a sample into the container) and press  >.
A screen is displayed for entering ambient temperature and humidity value if “Ambient conditions” is set to VALUE or the data on ambient conditions is automatically acquired from the ambient conditions module and displayed for confirmation and if “Ambient conditions” is set to ONLINE.

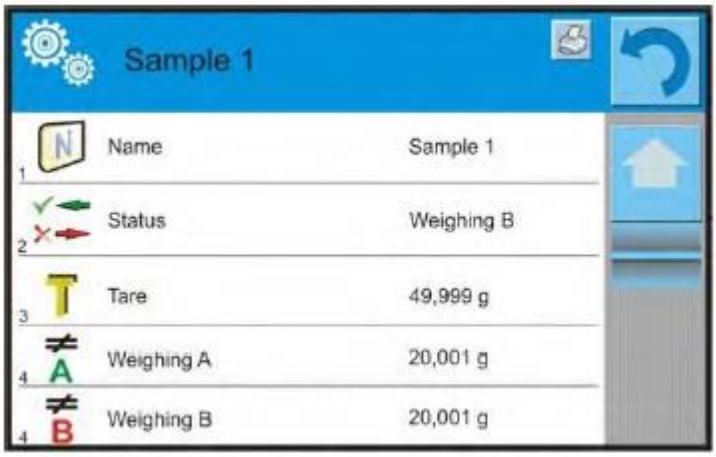
Hint: If “Ambient conditions” is disabled (set to NO), the software skips this part of the process.
On accepting the ambient conditions by pressing  >, the software returns to the mode’s main screen and displays a command in the message bar to unload the sample from the weighing pan.

The user should unload the sample from balance’s weighing pan and accept the activity by pressing  >.

The software automatically moves to the next sample in a series. Follow the above procedure and weigh the next samples.

The process can be aborted by pressing  >.
On completing measurements of final mass for the samples in a series, the user can check the results in the database of series.

To check the results, enter the database of series and select a series, then a sample and a specific sample for which Weighing B has been performed.

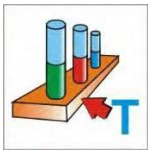


On previewing a specific weighing, a window is opened with data and values on the weighing process. Numbers displayed next to weighing data <B> denote measuring cycles.

Data on a specific series can be printed or exported to a file.

16.5 COPY TARE

This option allows copying the selected tare value in a series to all samples that do not have a tare value assigned and for which the differential weighing process (status other than Weighing B) is not completed.

Means of operation: Press key 

A screen with a list of samples for which tare value is assigned appears.

Press the tare value that should apply to other samples in a series that do not have tare applied.

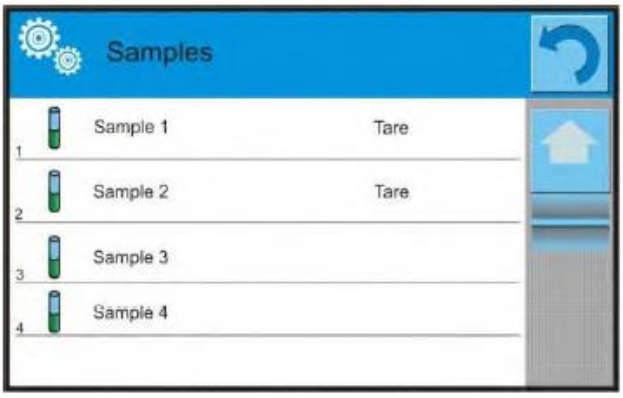
The software automatically applies the selected tare value to the data for these samples.

16.6 USING SAMPLE SELECTION

This allows selecting a sample that is prepared for weighing without needing to weigh samples in a sequence as suggested by the software. The option is available only after initiating a given process.

Procedure:

- While in differential weighing mode, after selecting a series, press the procedure selecting key, e.g. <Weighing A>.
- Press the following key:



This opens a list of samples for which the selected procedure can be performed.
Select a sample to be weighed from the displayed list.

This option is particularly useful if a series contains a large number of samples and the user wants to weigh a sample that is at the end of a series.

16.7 DELETING A VALUE

In case of an error, the user can delete the last weighing record added to the database. It applies to all processes in the working mode. The software enables deleting only the last measurement performed.

On accidentally saving a weighing record (sample or tare)— for instance, the wrong sample or container—press the following key:

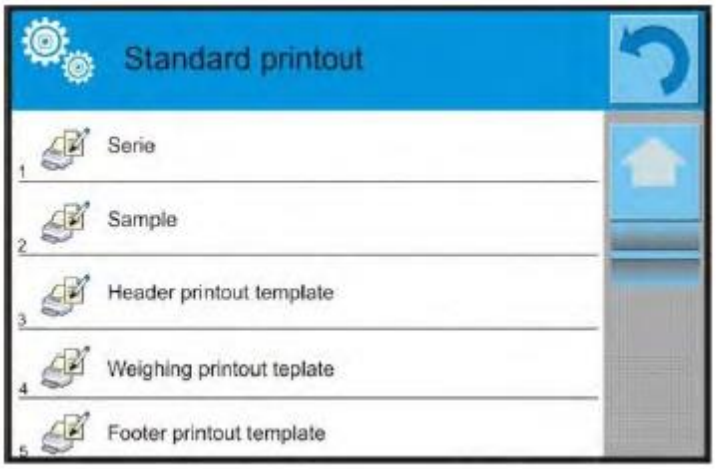
The weighing record is automatically deleted, and the software returns to the previous step of the procedure.

The process can be performed only once. Trying to use the option a second time results in a message on incorrect operation, and deleting the record is aborted.

16.8 PRINTOUTS

Printouts enable the user to customize the contents for standard printouts and nonstandard printouts.

- **Standard printout**
  There are five internal blocks featuring different variables. Each variable can be set to YES to be included on a printout or NO to not be printed.



Settings for the header printout, weighing printout, and footer printout are specified in part 15.5. The below description refers to setting a printout template for a series and sample in differential weighing mode.

A user can design the content of a report.

Content of a printout of a series:

- Dashes
- Client
- Samples
- Empty line
- Dashes
- Signature

Nonstandard printout Content of a printout of samples:

- Dashes
- Sample
- Sample number
- Status
- Tare
- Temperature
- Humidity
- Pressure
- Nonstandard printout

Weighing A

- Weighing A
- Date
- Time
- Level status
- Warehouse

- Product
- Packaging
- Universal variable 1–5
- Net
- Tare
- Nonstandard printout

Weighing B

- Weighing B
- Date
- Time
- Level status
- Warehouse
- Product
- Packaging
- Universal variable 1–5
- Net
- Tare
- Interval
- Difference
- Difference %
- Residue %
- Nonstandard printout

17 STATISTICAL QUALITY CONTROL

The  Statistical Quality Control working mode performs different types of product packing processes and monitors and/or controls the packing process. It detects excess or lack of product quantity in a package. If the samples have been weighed and the results are stored in the database, then the software discerns a trend and displays them in a form of a chart. The software is able to control a batch comprising up to 1,000 samples.

Each completed control process is saved in the SQC database, and its results are available for preview. Each series has a determined set of parameters that are stored in the database: maximum, minimum, standard deviation, and average value for each batch.

SQC control process can be performed manually by pressing the <PRINT> key for each measurement or automatically, where the measurements are saved after stability is indicated for each measured sample.

The balances feature an implemented module for statistical control processes. It is supported by a database containing a list of products with error values <–T1> and
<+T1> declared for each product.

The control process is initiated automatically and completed on controlling a required quantity of samples, which is determined by the user in the SQC mode settings.

After completing the control process, the balance can generate a final report containing all required data on the control. The report is printed on a connected printer. Data on a control is also automatically saved in the database of SQC reports.

The control cycle runs as follows:

- Select a user
- Select a product
- Control start
- Acquire weighing records
- Automatic finish of control process after weighing the required quantity of samples, also known as a batch
- Print a report on control process

17.1 WORKING MODE PROCEDURE

- While in the main window, press the  > soft key in the upper bar of the display, which opens the Working modes submenu.
- Select  SQC> mode. The software automatically returns to the main screen and displays the  > symbol in the upper bar.
- The message bar displays the command “Start control” and a soft key on control start is visible in the bottom tool bar:  Start control

Control start procedure:

- Starting a control process requires the user to log in with the corresponding access level.

Caution: Starting a control requires that the access level of the logged-in user is at least “User.” If a logged-in user or an anonymous user have access level set to “Guest,” then on control start, the software opens a message box saying “Unauthorized access.” The login procedure is described in part 9 of this user manual, and instructions for determining the access level for each user is in part 13.

- Set the working mode parameters for balance memory  SQC, using the description in part 26.2.
- Select an appropriate product by either pressing the  > soft key in the bottom bar or using the balance’s keyboard with correctly entered data on a control.

Caution: Data on a product, as listed in the below table, have to be filled in before starting a control:

	**Mass**	Nominal mass of a product
	**Tare**	Packaging mass in the adjustment unit

	SQC	
	Batch quantity	Setting the quantity of a controlled batch
	Error value [T2-]	Max permissible negative T2 error value with nominal weight value as point of reference
	Error value [T1-]	Max permissible negative T1 error value with nominal weight value as point of reference
	Error value [T1+]	Max permissible positive T1 error value with nominal weight value as point of reference
	Error value [T2+]	Max permissible positive T2 error value with nominal weight value as point of reference
	Quantity of disqualifying samples [Qn – T2]	Max permissible quantity of T2 low limit errors with nominal weight as point of reference
	Quantity of disqualifying samples [Qn – T1]	Max permissible quantity of T1 low limit errors with nominal weight as point of reference
	Quantity of disqualifying samples [Qn + T1]	Max permissible quantity of T1 high limit errors with nominal weight as point of reference
	Quantity of disqualifying samples [Qn + T2]	Max permissible quantity of T2 high limit errors with nominal weight as point of reference

Editing product records in the database is described in section 27.2 of this user manual.

- After returning to the main screen of the SQC mode, press the < > soft key in the bottom bar of the display.
- A screen for editing the Batch Number with an onscreen keyboard appears if, in the mode settings, “Request batch number” is set to YES.
- Enter the batch number of the controlled batch and accept it by pressing < >.

Caution: A user can abort the control process by pressing the < > soft key in the bottom bar of the display. On control progress, other soft keys and function keys, the SETUP and , keys are blocked.

17.2 ADDITIONAL SETTINGS

The additional settings allow users to adjust the working mode for their needs. Access to these settings is described below.

Procedure:

- Touch the gray workspace area.
- The display shows the following menu: Settings, Keys, Information, Printout, Batch, and Profile.
- Press <Settings>.
- The display opens a window with available options.

The SQC mode is related to the following settings:

- **Request batch number**
  Setting this value to YES causes the software to request entering a batch number for a product before starting each control process.

Procedure:

- Select  Batch number>, which opens an editing window with available settings.
- Select the required batch quantity. The software will then return to the previous screen.

Declaring batch quantity

The quantity or size of a batch is the number of samples intended to be measured.

Procedure:

- Select  Batch quantity>, which opens a screen with a numeric keyboard.
- Enter the required batch quantity and accept by pressing  >.

17.3 PERFORMING A CONTROL PROCESS

Before starting a control process, select a product to be controlled from the database of products using the  Product> quick access key. Then the control is ready to be initiated.

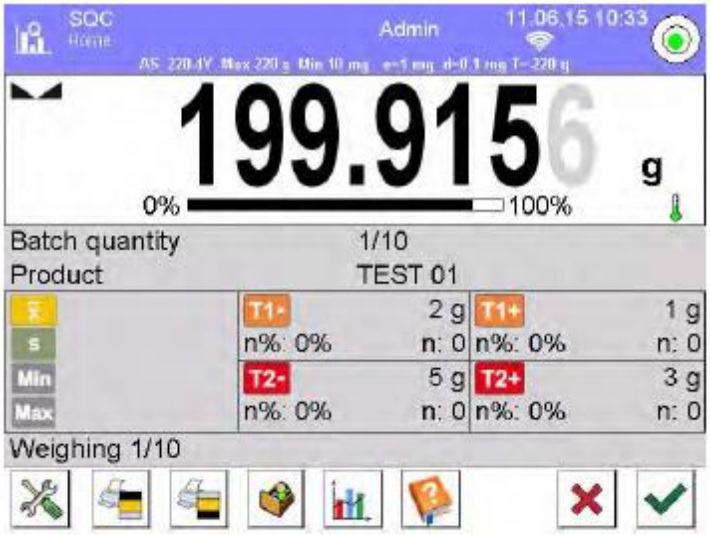
To start a control, press the  > key located in the bottom bar of the display. The software automatically opens an onscreen keyboard for entering the batch number of a product to be controlled. After entering and accepting the batch number, the software goes to the next step of the process.

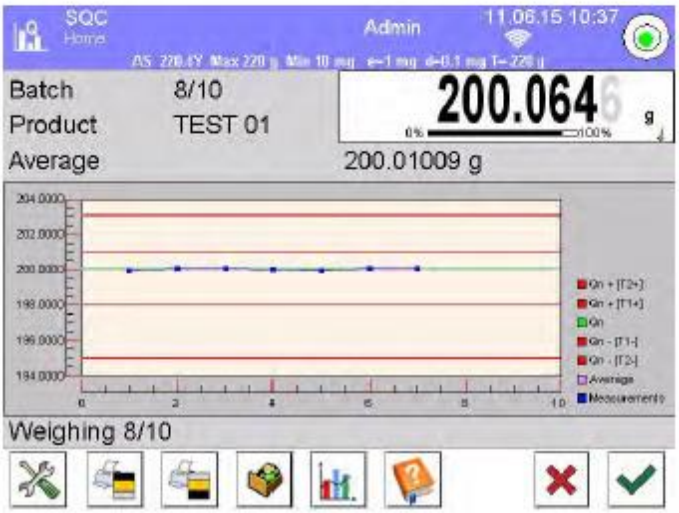
While the control process is in progress, the software carries out a real-time analysis of the results, inserts them in the corresponding fields of the display, and informs the user in the results of the completed control.

Messages displayed during a control process:

Batch quantity 1/10	A command on the course of the process and the quantity of all measurements in a tested batch

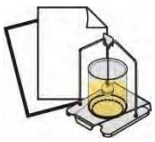
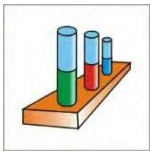
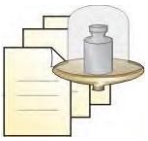
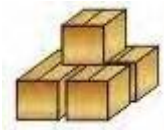
Product Name of the controlled product





18 DATABASES

The balance features the following databases  >:

 PRODUCTS	 WEIGHING RECORDS	 CLIENTS
 FORMULATION	 REPORTS FROM FORMULAS	 REPORTS FROM DENSITY
 CONTROLS	 AVERAGE TARE	 PIPETTES
 PIPETTE CALIBRATION REPORTS	 SERIES	 SQC REPORTS
 MINIMUM SAMPLES	 MASS CONTROLS	 AMBIENT CONDITIONS
 PACKAGES	 WAREHOUSES	 PRINTOUTS

 UNIVERSAL VARIABLES	 DATABASES MANAGEMENT	

18.1 PROCESSES PERFROMED IN DATABASES

Databases can be operated only by an authorized personnel.
To edit databases:

- Press and hold for a moment the key with the respective database icon
- Wait to see the database menu
- Select one of available options (options depend on a database type)

Options descriptions:

- OPEN – Allows the user to enter a chosen database (similar to a single click)
- IMPORT – Allows data to be imported from a storage device. Plug the data storage device into a USB port. Upon its detection, a screen with a list of saved files will open. Select the file with data to be imported. Copying starts automatically. When all the data has been copies, “Completed” is displayed. Confirm completion.
- EXPORT - Allows data to be exported from a selected database to a storage device. Plug the data storage device into a USB port. Copying starts automatically. When finished, a screen with both the file name to which data has been saved and the message “Completed” is displayed. Confirm completion.
- INFORMATION – Displays data about database content (see the illustration below).

Touch  >, and the program returns to the previous screen.

- CANCEL - Returns to the main window.

The following processes can be done in almost any database:

1. Adding an entry to a database  >
2. Searching for a record in a database by name <  >
3. Searching for a record in a database by code <  >
4. Searching for a record in a database by date <  >
5. Exporting database content to a data storage device through a USB port  >
6. Printing data on a specific record from a database  >

The above processes are performed by pressing dedicated soft keys located in the upper right corner of the display. Follow hints and commands displayed by the balance's software.

18.2 PRODUCTS

The database of products contains the names of all products that are weighed, counted, or controlled.

Procedure:

- Enter the  Databases> submenu and press <Products>.
- Press the  Add> key to add a new product to the database.
- Select one of the available options:

List of parameters defined for a product:

1. Name
2. Description
3. Product code
4. EAN code
5. Mass [unit mass of a product]

6. Dosing power [enabled only in Mass control mode and determined in [%] from 0% to 100%. It is the operation power of the automatic feeder PA-02/H. The value of dosing power has to be determined by tests dependent on the size, shape, and mass of dispensed parts or pills.]
7. Min [Minimum mass for weighing the product using result control thresholds – LO. Value of error "T1-" in the Mass control working mode is determined as percent of the nominal mass]
8. Max [Maximum mass for weighing the product using result control thresholds – HI. Value of error "T1+" in the Mass control working mode is determined as percent of the nominal mass]
9. Tolerance [% value calculated in relation to mass (5), denoting measuring area in which the measurement is recognized as correct.
10. Tare [product's tare value, set automatically on selecting a product from the database]
11. Price [Unit price of a product]
12. PGC mode [control mode (Non-destructive average tare, Non- destructive empty–full, Destructive full–empty, Destructive empty–full)]
13. Batch [measuring batch for control: Non-destructive empty–full, Destructive full–empty, Destructive empty–full]
14. Unit [product measuring unit]
15. Batch quantity [Option available only for PGC mode, specifies controlled product batch quantity]
16. Average tare estimation time interval [Option available only for PGC mode, specifies minimum time interval needed for estimation of the packaging's average tare given in [h]; if software detects that preset time interval has passed, it displays the message "Estimate average tare." It is the user who decides whether to estimate the tare again or not. The message has an informative function only.]
17. Number of packagings [Option available only for PGC mode, specifies number of packagings needed for estimation of average tare]
18. Internal control [Option available only for PGC mode, allows for specification of internal control criteria accordant with company standards for a given product]
19. Density [product's density, used for compensating air buoyancy, as sample density] [g/cm^3]
20. Shelf-life time in days
21. Date [Set product's date (constant)]
22. VAT [VAT value related to a product]
23. Ingredients [Editing field for entering names of ingredients used for preparing a product, e.g. if a product is a mixture, or if a product requires additional description of its features or application]
24. Printout [printing a template assigned to a product]

CAUTION: Remember to assign products to corresponding functions, as some of data values are attributed according to their modes, e.g. thresholds in Checkweighing mode are set in [g], while thresholds in Parts Counting mode are set in [pcs]. The values are selected automatically depending on which mode is enabled while entering a database.

18.3 WEIGHING RECORDS

Each measurement result sent from a balance to a printer or a computer is saved in the database of weighing records (see an exception – part 10.8. – Result control). Balance user can preview data from each weighing record.

Procedure:

- Enter the  Databases> submenu.
- Enter  Weighing records> database and press the desired record.

List of parameters for a weighing record saved in the database:

1. Measurement date
2. Measurement result
3. Tare value
4. Determination of measurement status (stable/unstable)
5. Product name
6. User
7. Client, client name
8. Working mode name
9. Warehouse, name of source warehouse
10. Packaging, name of tare applied during weighing product's weighing process
11. Result control, information on threshold in which the weighed product was placed:
    MIN – below LOW threshold (possible only if "Result control" is set to NO)
    OK – between the LOW and HIGH thresholds
    MAX – above HIGH threshold (possible only if "Result control" is set to NO)
12. Weighing platform number, field denoting number of a weighing platform (balance/scale) on which a measurement was completed
13. Levelling, demonstrates if level status was maintained during measurement
14. Ambient conditions alerts, demonstrates if temperature and humidity were stable during measurement

18.4 CLIENTS

The database of clients contains names of clients for whom the measurements are performed.

Procedure:

- Enter the <  Databases> submenu and press <Clients>.
- Press the <  Add > key.
- If a client already exists in the database of clients, press the field with their name.

List of parameters defined for a client:

1. Client name
2. Client code [internal code identifying a client]
3. VAT number [tax identification number]
4. Address
5. Postal code

6. City
7. Discount
8. Printout [type of printout, label declared to a client]

18.5 FORMULATION

The database of formulas contains a list of created formulas/mixtures that can be prepared by weighing each of the formulation's ingredients.

Procedure:

- Enter the <  Databases> submenu and press <Formulas>.
- Press the <  Add > key to create a new formulation.
- If a formulation already exists in the database, press the field with its name.

List of parameters defined for a formulation:

1. Name
2. Code
3. Ingredients
4. Number of ingredients
5. Sum

18.6 REPORTS ON FORMULATION

These reports contain data on completed formulas. Each report can be previewed, searched by name, date, and code, or exported and printed.

Procedure:

- Enter the  Databases> submenu and press <Reports from formulation>.
- Press the field of a desired report record. If it isn't visible on the top of the list, use the navigating keys.
- The report's name consists of the date and time of its creation, e.g., 2011.10.12 15:12:15

It is possible to search for a report on formulation.

List of parameters in a report on formulation:

1. Start date
2. End date
3. Formulation
4. Sum
5. Target value
6. User
7. Client
8. Warehouse
9. Number of measurements
10. Status

18.7 REPORTS ON DENSITY

Reports from density contain data on completed density determination processes of solids, liquids, and air. Each report can be previewed, searched by name, date, and code, or exported and printed.

Procedure:

- Enter the <  Databases> submenu and press  Reports from density>.
- Press the field of a desired report record. If it isn't visible on the top of the list, use the navigating keys.
- The report's name consists of the date and time of its creation, e.g., 2011.12.12 11:12:15

It is possible to search for a report on density.

List of parameters in a report on density**:**

1. Sample number, a field with a value if in "Density mode," "Request sample number" is set to YES
2. Start date
3. End date
4. Density [calculated density of a sample of solid, liquid or air]
5. Volume [calculated volume of tested sample, density measurement of solid object]
6. Procedure [depending on the selected procedure, data contained in a report may change]
7. User [name of the user performing the procedure]
8. Product [name of tested sample]
9. Standard liquid [name of the liquid used for determining density measurement of solid object]
10. Standard liquid density [density determination of solid object]
11. Temperature [temperature of liquid used for carrying out a measurement, density determination of solid object]
12. Plunger volume [density determination of liquid]
13. Mass of steel standard [density determination of air]
14. Mass of aluminum standard [density determination of air]
15. Density of steel standard [density determination of air]
16. Density of aluminum standard [density determination of air]
17. Weighing 1 [mass measurement of tested sample or a plunger in the air, or mass of measured steel standard]
18. Weighing 2 [mass measurement of tested sample or a plunger in liquid, or mass of measured aluminum standard]

18.8 PIPETTES

- Enter the <  Databases> submenu and press  Pipettes>.
- Press the <  Add> soft key to add a new pipette.
- If a pipette already exists in the database of pipettes, press the field with its name to enter its specification.

List of parameters defined on a pipette:

1. Name
2. Code
3. Model
4. Tip
5. Type of volume
6. Nominal volume
7. Minimum volume
8. Number of channels
9. Type
10. Tested volumes

18.9 REPORTS ON PIPETTE CALIBRATION

Reports contain data on completed pipette calibration processes. In the case of multichannel pipettes, the reports are generated for each channel separately. Each report can be previewed, searched by date, exported, or printed.

Procedure:

- Enter the <  Databases> submenu and press  Reports from pipette calibration processes>.
- Press the field of a desired report record. If it isn't visible at the top of the list, use the navigating keys to scroll down.
- The report's name consists of the date and time of its creation, e.g., 2012.03.12 11:12:15

It is possible to use an option for searching a report.

List of parameters in a report on pipette calibration process**:**

1. Pipette [name from the database of pipettes]
2. Serial no. [serial number entered during calibration process]
3. Channel no.
4. Start date
5. End date
6. User [name of a user carrying out calibration]
7. Client [client name]
8. Number of measurements [number of measurements for each tested volume]
9. Operation with ISO 8655 [information if errors comply with the standard]
10. Status [information whether the errors are below permissible value accepted for the tested volume]
11. Temperature [average temperature value during calibration process]
12. Humidity [average humidity value during calibration process]
13. Pressure [average pressure value during calibration process]
14. Water temperature [average water temperature during calibration process]
15. Z coefficient [value if the Z coefficient for given temperature]

18.10 REPORTS ON PIPETTE CALIBRATION

The database of series contains data saved for a series and measurements of samples.

Procedure:

- Enter the <  Databases> submenu and press  Series>.
- Press the <  Add> key to add a new series to the database.
- If a series already exists in the database, press the field with its name to change any data that is able to be edited.

List of parameters defined for a series:

1. Name
2. Code
3. Client
4. Samples
5. Number of samples

18.11 A REPORT ON SQC

Each completed product control is sent to a connected printer and saved in the SQC Reports database. Each record (control) saved in the database includes its individual number, which is assigned at the moment the control ends.

Control number format:

y y / M M / d d / H H / m m / s s, where: yy – year of control end,
MM – month of control end, dd – day of control end, HH – hour of control end,
mm – minute of control end, ss – second of control end.

The user can preview data contained in each of the control records.

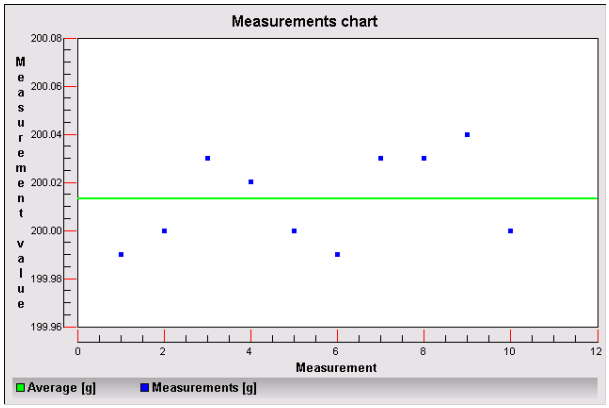
Procedure:

1. Enter the  Databases> submenu in accordance with part 27 of this user manual.
2. Enter the <SQC Reports> database and press the desired record from a completed control.

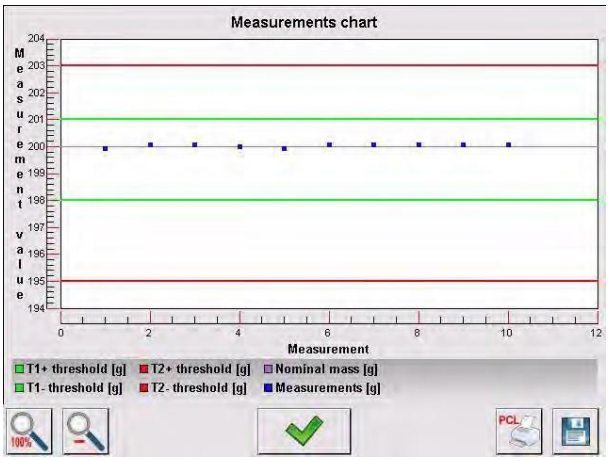
List of parameters defined for a control:

1. Batch number [Batch number of a controlled product]
2. Start date [Date of control start]
3. End date [Date of control end]
4. User [Name of operator carrying out a control]
5. Product [Name of controlled product]
6. Batch quantity [Number of controlled samples]
7. Average [Average value from completed measurements]
8. Standard deviation [Average standard deviation]
9. Min [Minimum value of completed measurements]
10. Max [Maximum value of completed measurements]

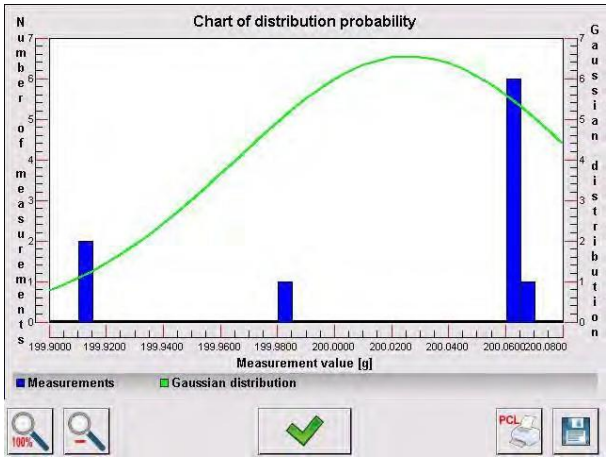
11. Number of T2- errors [Quantity of –T2 errors]
12. Number of T1- errors [Quantity of –T1 errors]
13. Number of T1+ errors [Quantity of +T1 errors]
14. Number of T2+ errors [Quantity of +T2 errors]
15. A chart from control processes



16. A chart from control processes with limits



17. A chart of distribution probability



18.12 AMBIENT CONDITIONS

The Ambient conditions database contains parameters related to the measurement of ambient conditions at a workstation. Depending on the balance's configuration, a report may contain data on temperature, humidity, and the value of atmospheric pressure. If a THB ambient conditions module is connected to a balance, records from the module are also saved.

Procedure:

- Enter the < Databases> submenu and press Ambient conditions>.
- Press the field of a desired report record. If it isn't visible on the top of the list, scroll down using the navigating keys.
- The report's name consists of date and time.

It is possible to use an option for searching a report.

18.13 PACKAGES

The database of packages contains list of packages for which a name, code, and mass value are specified. During the weighing process, if the name of a package is selected from the database, the tare value is automatically applied. The display indicates the mass value with a minus sign.

Procedure:

- Enter the < Databases> submenu and press Packages>.
- Press the < Add> to add a new package.
- If a packaging record already exists in the database, press the field with its name and enter data for the packaging.

It is possible to search for a record by name or code.

18.14 WAREHOUSES

Depending on how the work is organized, the Database of Warehouses contains a list of places used for picking up a sample for weighing or a list of places to which a weighed sample was delivered. Each warehouse should have its name, code, and description specified. If the user

selects the name of a warehouse during the weighing process, it is automatically assigned to the measurement result.

Procedure:

- Enter the <Databases> submenu and press Warehouses>.
- Press the <Add> key to add a new warehouse.
- If a warehouse record already exists in the database, press the field with its name and enter identifying data.

It is possible to search for a record by name or code.

18.15 PRINTOUTS

The database of printouts contains all saved nonstandard printouts. Each nonstandard printout features a name, code, and a template.

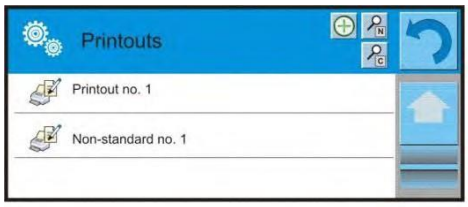
Procedure:

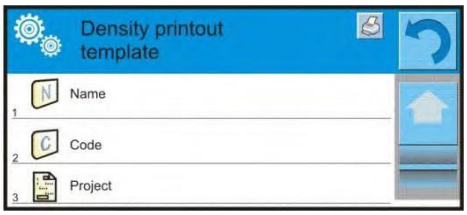
- Enter the <Databases> submenu and press Printouts>.
- Press the <Add> key to add a new printout.
- If a nonstandard printout template already exists in the database, press the field with its name and enter identifying data.

It is possible to search for a printout by name or code.

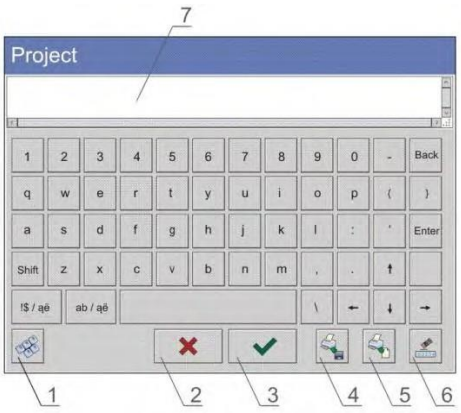
Designing new printout template

- Enter the <Databases> submenu and press Printouts>.
- Press the <Add> key to create a new printout or edit an existing template.





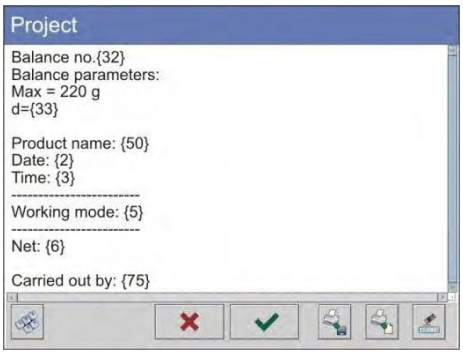
- In the “Record editing” field, press <Template>.
- A new screen opens for creating an optional printout.
- While designing a printout, use the onscreen keyboard, which has the same options as a regular computer keyboard.



1) enlarging the editing field (7) is recommended while using an external computer keyboard connected to the balance's USB port
2) cancel
3) accept
4) download a printout template from a file
5) list of variables for use while designing a printout
6) delete all printout content
7) printout editing field

To erase characters in a printout, press the <Back> key. To move the cursor, press navigating arrows.

Example of Printout 1 – Use of large editing field



Example of Printout 2 – Printout template from a file

All printout templates can be designed as external files that are imported to the balance. A printout template has to have the file extension: *.txt or *.lb and contain all constant and variable data. On import, the content of a printout template can be modified.

Procedure:

- Design a *.txt or *.lb file in an optional editor.
- Copy the file to a data storage device.
- Connect the data storage device to balance's USB port.

- Press [4]  Download a printout template from a file>.
- The balance's display shows data stored on the storage device connected to the USB port.
- Search for a file with the printout template and press its name.
- The printout template is automatically copied to an editing field.

18.16 UNIVERSAL VARIABLES

Universal variables are a set of alphanumerical data that are combined with printouts, products, or other information related to weighing. Each variable should have its name, code, and value specified.

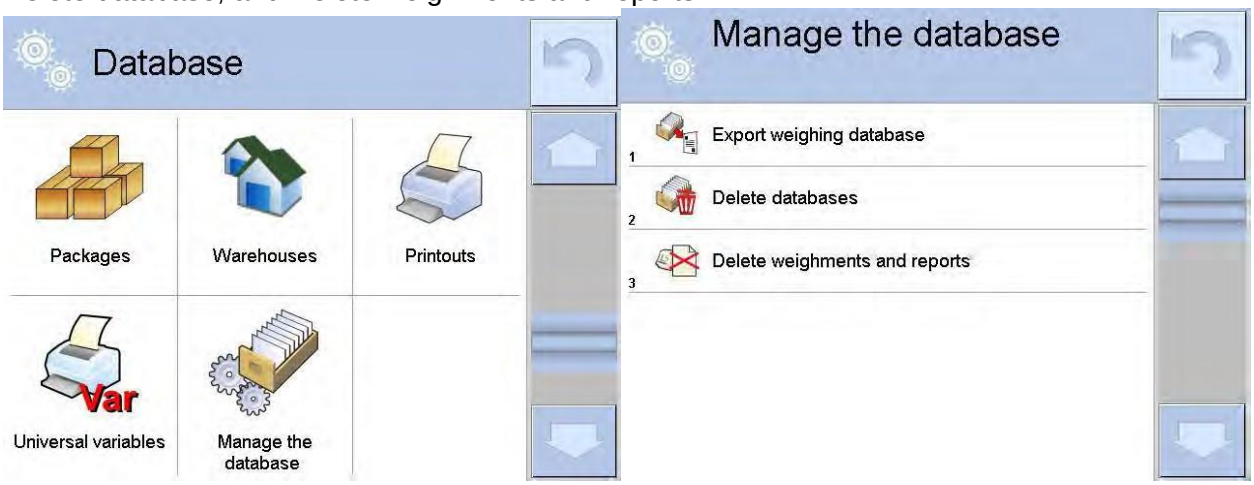
Procedure:

– Enter the  Databases> submenu and press  Universal variables>.
– Press the  Add> key to add a new universal variable.
– If a universal variable already exists in the database, press the field with its name and enter the required modifications to the following fields: code, name, value.

It is possible to search for a record by name or code.

18.17 OPERATING DATABASE

This function allows a user to operate database data. It comprises three options: Export to file, Delete database, and Delete weighments and reports.



Export database of weighing records to file

All completed measurements are saved and stored in a database. The balance enables exporting such data to a file using a data storage device connected to balance's USB port.

Procedure:

– Plug a data storage device into the balance's USB port.
– Press the  Export database of weighing records to file>, and a window opens where export options have to be set.

“Data selection” allows the user to specify which data related to the measurement are to be exported.

– Set the option and touch <Export weighings>. The software will automatically export the weighing database.
– A message with information on the number of exported data and the file name (with file extension *.txt) will be displayed, and the software will return to the previous window.

– The user may return to a weighing procedure or proceed to other settings.

Caution: If the balance software cannot identify the data storage device, then upon entering the Export weighings database, the message "Operation failed" is displayed.

- The file name consists of the database name and balance serial number, e.g. "Weighing date_2602776.txt".
- Unplug the data storage device from the USB port.

Created file template

The file is created as a chart with columns separated by <Tab>. This allows a direct export of the file to an Excel spreadsheet.

The chart contains all data concerning a given measurement: date and time, mass and mass unit, tare and tare unit, series number, operator's name, client's name, packaging name, source warehouse name, target warehouse name, and control result.

Delete database

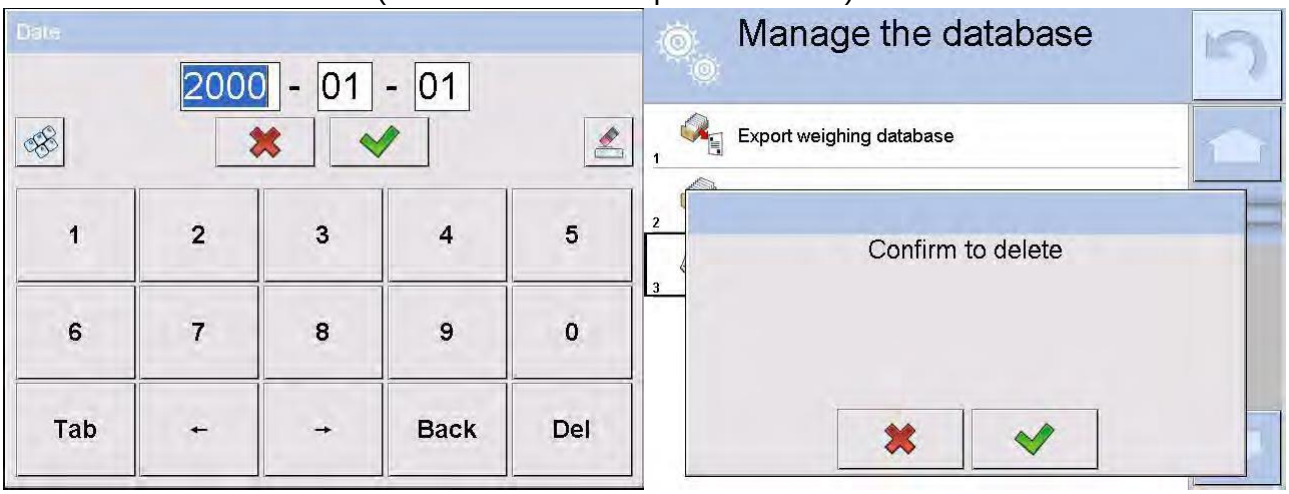
This function allows a user to delete the data of a chosen database. Upon activation, a window is displayed with databases. Select a database with data to be deleted.

Upon confirmation, the software deletes data and displays a summary message:

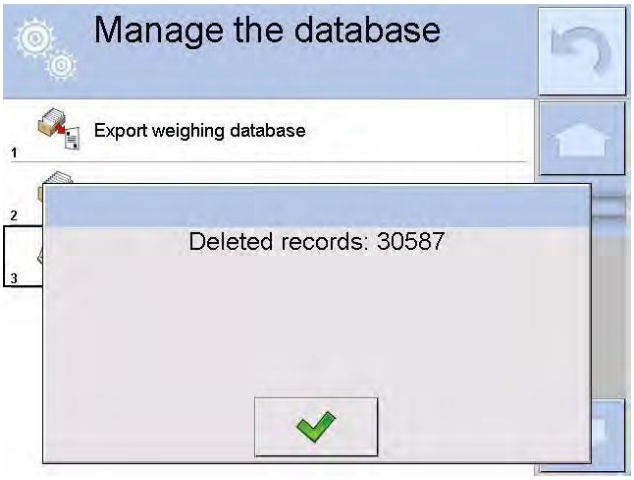
Upon confirmation, the software returns to the previous window. The user may continue a weighing procedure or proceed to other operations.

Delete weighments and reports

This function allows to delete a database of weighments and reports. The software displays a window with a numeric keyboard. Use the keyboard to enter a date (year- month-day) specifying which data is to be removed (data older than the specified a date).



Upon confirmation of the entered date, all weighments and reports older than those specified by the date will be removed. The number of removed weighments and reports will be displayed in a message.



19 COMMUNICATION

The Communication menu is located under Parameters. It is accessed by pressing the

<Setup> key or the Setup> quick access key. The balance enables communicating with peripheral devices through the following ports:

- COM 1 (RS232)
- COM 2 (RS232)
- Wi-fi
- Ethernet
- Tcp

The ports are configured under Communication.

Enter the Communication> submenu by pressing the SETUP> key and then < Communication>.

19.1 RS 232 port settings

Procedure:

- Select communication port COM1> or COM2>
- Set the appropriate values

The RS 232 ports enable the following setting of transmission parameters:

- Baud rate - 4800, 9600, 19200, 38400, 57600, 115200 bit/s
- Data bits - 5, 6, 7, 8
- Stop bits - None, 1, 1.5, 2
- Parity - None, Odd, Even, Marker, Interval

19.2 Ethernet port settings

Procedure:

- Select the Ethernet> communication port and set the appropriate values

- DHCP - Yes – No
- IP Address - 192.168.0.2
- Subnet mask - 255.255.255.0
- Default gate - 192.168.0.1

Caution: The above settings are for information purposes only. Transmission parameters should be selected in accordance with the settings of the client's local network.

To carry out changes in the settings, press the > key. The follow message will be displayed: "To make changes effective, restart the balance"

Return to weighing mode and restart the device.

19.3 Wi-Fi settings

If the balance is equipped with a wi-fi module, the top toolbar of the main display has a wi-fi icon:

Procedure:

- Select the Wi-Fi> communication interface and set the parameters:

  - DHCP - Yes/No
  - IP Addresse - 10.10.9.155
  - Subnet mask - 255.255.255.0
  - Default gateway - 10.10.8.244

Caution: The above settings are for informative purposes only. Transmission parameters must be set with respect to the local network.

Upon completing modifications, press the > key. The following message will be displayed: "Restart balance to make it operate with new settings"

Go to weighing made and restart the balance.

The user may use "Available networks" to view the list of networks detected by the balance:

An lock icon by a network name means the network requires a password. Press

<Refresh> icon to search for available networks.

To check selected network parameters press <Network status> field, you will see a window with the available networks.

The selected network and parameters for connection are stored in the balance. The program will connect to the network using the stored parameters each time the balance is activated. The user may change this by selecting “Forget network” to disconnect from that network.

19.4 TCP protocol settings

TCP, i.e., Transmission Control Protocol, enables two computers to communicate. The TCP operates in client-server mode. The server waits to establish a connection on a specified port, and the client establishes connection with a server.

Procedure:

- Enter the < Communication> submenu
- Select < Tcp Port>, which opens a “Port” window with an onscreen keyboard.
- Enter the required port number and accept by pressing >.

20 PERIPHERAL DEVICES

The Peripheral Devices menu is located under Parameters. It is accessed by pressing the <Setup> key or the Setup> quick access key. There is a list of connectable peripheral devices that can be used with the balance.

20.1 COMPUTER

An active connection between a balance and a computer is shown by the symbol in the upper bar of the main window. The Computer submenu allows for configuring connection settings.

Procedure:

- Press 

> and then  Peripheral  Computer>.
- Set the balance's parameters in relation to the computer.
- Computer port
  - available options: none, COM 1, COM 2, Tcp
- Address
  - give the address of a balance connected to a computer
- Continuous transmission
  - available options: NO, YES (printout format depends on the printout template in the balance; see next parameter).
- Weighing printout template
  - to design an individual printout to a computer using a dedicated window with printout template, see part 24.11 of this user manual.

20.2 PRINTER

The Printer submenu enables:

- Setting the communication port with a printer
- Defining the printer's code page (default 1250)
- Defining controlling codes for PCL printer or EPSON label printer

Caution: Codes must be entered in hexadecimal form

- Defining printout standards

To ensure that the balance and printer work correctly together (correct printout of letters with diacritical signs specified for a given language), a suitable transmission speed must be chosen for the balance. It must be respective to the printer's
transmissions speed (see the printer settings). Additionally, a given printout code page must match the printer code page.

The code page accordance may be obtained by:

- Setting the correct code page in the printer (see the printer manual) with respect to the printout code page set in the balance
- Sending the control code from the balance to the printer, which automatically sets the correct code page (with respect to the code page set in the balance) in advance before execution of the data printout, if this is an option on the printer.

Example balance settings for correct cooperation with Cole-Parmer 10100-85 Epson TM-U220D Printer:

Printer

- Communication parameters of the port to which the printer is connected
  - baud rate – 9600 bit/s
  - data bits 8
  - stop bits 1
  - parity – none

Printer's parameters

- port– COM1 or COM2 (the one to which the printer is connected)
- code page **852**

In the Database of Products/Products/Product editing, press the <Printer> symbol.

Barcode scanner

The balance is compatible with barcode scanners, which can quickly search for a product in the Database of products. Connection to a barcode scanner is configured in the Barcode Scanner submenu.

Available options:

- Setting communication port with a barcode scanner
- Offset setting
- Setting barcode length

Caution: Submenu Communication requires setting the baud rate to be compatible with the one used by the barcode scanner (default 9600b/s). A detailed description of using the balance with a barcode scanner is provided in Appendix F of this user manual.

The balance communicates with a barcode scanner using the following ports:

- RS 232 (COM1)
- RS 232 (COM2)

Offset

Set the first data-carrying character of a barcode, which is the first recognized character while searching for a product.

Code length

Set number of characters recognized during the search for a product.

20.3 TRANSPONDER CARD READER

A user can be logged in each time the balance is turned on by:

- Entering the user's password using the onscreen keyboard
- Holding a registered card to the a transponder card scanner

Caution: For the correct balance's compatibility with a transponder card reader, set the appropriate baud rate value in submenu Communication (default 9600b/s).

Transponder card scanner port

The balance enables communicating with a transponder card scanner using the following ports:

- RS 232 (COM1)
- RS 232 (COM2)

Assigning a card number to a user

To log in an operator using a transponder card scanner, first assign the number of an already registered card to a selected user in the database of operators.

Procedure:

- Connect a transponder card scanner to a balance's port (RS 232 COM1 or RS 232 COM2) and select the communication port in the balance settings for the transponder card scanner.
- In the  Communication> submenu, set the baud rate to be compatible with the transponder card scanner (default 9600b/s).
- Enter the Database of operators and edit the desired operator's record.
- Go to the  Card number> option
- On entering editing mode in  Card number> option, an editing window is opened with an onscreen keyboard.
- Hold the card near the transponder card scanner. The balance automatically displays the number of the detected card in the <Card number> field.
- Accept the recognized number by pressing  > and returning to the main window of weighing mode.

20.4 ADDITIONAL DISPLAY

The balance is compatible with using an external display using the following ports:

- RS 232 (COM1)
- RS 232 (COM2)
- Tcp.

The type of data to be shown on the additional display is set in <Project (template)>.

Procedure – designing a variable:

- Enter  Peripheral devices>.
- Press  Additional  Project>, which opens an editing window, <Project>, with an onscreen keyboard.
- Use the onscreen keyboard to enter desired value of a standard or select the desired value of the standard using the list displayed by pressing  >.
- Accept by pressing  >.

20.5 AMBIENTS CONDITIONS MODULE

A balance can be connected to an ambient conditions module THB.Y series using ports COM 1 or COM 2.

Ensure the balance and the ambient conditions module are compatible by entering the module connection address and the baud rate of the port where the THB module is plugged in. (A*ddress and baud rate settings are specified on module data plate*).

21 INPUTS / OUTPUTS

Application of inputs

The set of inputs is used to control the balance's operation. Each of four inputs can be connected to the following functions or keys:

- o Checkweighing thresholds
- o Target value
- o Profile
- o Adjustment/Calibration
- o Zero
- o Tare
- o Set tare
- o Disable tare
- o Restore tare
- o Packaging
- o Print
- o Header printout
- o Footer printout
- o Universal variable 1 □ 5
- o Accept
- o Abort
- o User
- o Left door
- o Right door
- o Parameters
- o Statistics
- o Add to statistics
- o Product
- o Warehouse
- o Client
- o Parts counting: give part mass
- o Parts counting: set mass of a single part
- o Percent Weighing: give reference mass
- o Percent Weighing: set 100%
- o Density of solid
- o Density of liquid
- o Air density
- o Control mass comparator's robot
- o Task
- o Reference standard

On changing the logic status of the input system, e.g. from [0] to [1], a function that is assigned to the system is carried out. For instance:

- Performing the automatic adjustment process to check the balance's accuracy
- Displaying the value of set checkweighing thresholds
- Restoring tare value to weigh the net mass of a measured load

Procedure:

- Press <SETUP> and then the <Inputs/Outputs> key.
- Press the <Inputs> key.
- Enter the editing mode for a selected input, which opens list of available functions.
- Select a function from the displayed list and return to weighing.

Application of outputs

The set of outputs is used for showing the status of the measurement result. Changing the logic status of the output system, e.g. from [0] to [1], takes place on meeting the requirement assigned to the output.

Each of four outputs can be connected to the following data:

Available options	Balance status, which switches the logic of output
None	-------
Stable	Each stable measurement switches the logic of the system
MIN stable	Stable measurement below [MIN] threshold switches the logic of the system
MIN unstable	Unstable measurement below [MIN] threshold switches the logic of the system
OK stable	Stable measurement within [MIN] [MAX] thresholds switches the logic of the system
OK unstable	Unstable measurement within [MIN] [MAX] thresholds switches the logic of the system
MAX stable	Stable measurement below [MAX] threshold switches the logic of the system
MAX unstable	Unstable measurement below [MAX] threshold switches the logic of the system
Confirmation of cycle completion	End of procedure

Procedure:

- Press < SETUP > and then the Inputs/Outputs> key.
- Press the < Outputs> key.
- Enter the editing mode for a selected output, which opens list of available functions.
- Select a function from the displayed list and return to weighing, saving the changes.

22 USERS

The Users menu contains a list of people who are authorized to operate the instrument. The following data can be defined for each balance user:

- Name
- Code
- Password

- Access level
- Language
- Profile
- Card number

Adding a new user can only be done by an Administrator-level user. To add a new user, press the  soft key in the Users menu.

- A message box appears on the display: “Create new record.”
- Accept by pressing the corresponding key.
- Define all necessary fields to create a new balance user.

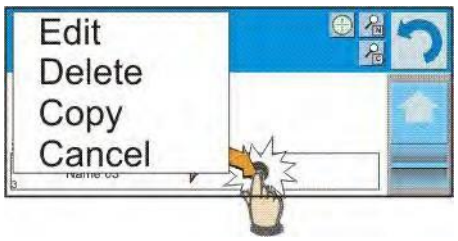
Hint: Search for a user in the database by code or name.

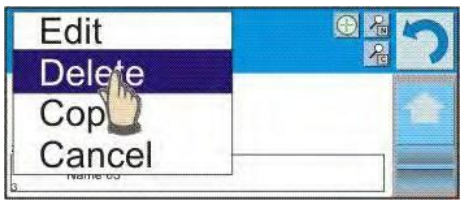
Editing data on a user:

- Press the field with name of a user.
- The display indicates data on a specific user.
- Select and change the necessary data.

Deleting a user can only be done by an Administrator-level user.
To delete a user:

- Press and hold the user name.
- A menu opens for that user record.
- Select <Delete>.





Full access to the balance’s parameters and the ability to edit databases requires logging in to instrument’s software as an operator with Administrator access. Operators should log in each time the balance is turned on.

Login procedure

- While in the main weighing screen of the application, press <Log in> in the upper bar, which opens a new screen with the operators database, including “ Admin” entry.
- On opening the Admin entry, an onscreen keyboard will appear.
- Enter password “1111” and accept it by pressing >.
- The software will automatically return to the main screen, and the display’s upper bar will read “Admin” instead of “Log in.”
- After the first login, the administrator should add user profiles and set their corresponding access levels.

On future logins, select a user from the list and enter the corresponding password. The balance will start up with the appropriate access level set for the user.

Logout procedure

- While on the main weighing screen of the application, press the name of the logged-in operator in the display's upper bar. This opens a new screen with the operators' database.
- Press the <Log out> soft key, the first in the list.
- The main screen will reappear, and the display will read "Log in" instead of name of a logged-in operator.

22.1 ACCESS LEVEL

The balance provides four access levels*: administrator, advanced operator, operator,* and *none* (for anonymous logging).

On switching on the balance, the display is immediately activated so users can begin the measurement process. These measurements, however, cannot be saved in the balance's database unless a user with at least the minimum access level is logged in. This enables the user to save the results of the measuring process in the balance's databases using available function keys.

The table below describes the ability to edit user parameters, databases, and software functions depending on active access level.

Authorization	Access level
None (guest)	No access to editing any of the user parameters. Cannot accept a weighing record nor start a process. No access to the Databases menu.
Operator	Access to editing parameters in the "Profiles; Readout" submenu and settings in "Others," except for "Date and Time." The operator can start and carry out all weighing processes and has access to "Export weighing database to a file" and preview data in "Databases." An operator can define universal variables.
Advanced operator	Access to editing parameters in the "Profiles; Readout"; "Working modes"; "Communication"; "Peripherals"; and "Others" submenus except for "Date and Time." The advanced operator can start and carry out all weighing processes and can erase old data from the databases.
Administrator	Access to all user parameters, functions, and editing databases.

The  Access level determines the scope of activities that a user can carry out. This menu can only be modified by the balance's Administrator.

Anonymous user
An Administrator can grant access level to a balance user who is not logged in (i.e., Anonymous user).

Procedure:

From the  Access level menu, select  Anonymous user> and set the appropriate access level for the anonymous user. Available access levels for an anonymous user are: Guest, User, Advanced User, Administrator.

Caution: Setting Guest access level means that logged-in user has no permissions to change any settings on a balance.

Date and time
The default settings enable a user logged in as the Administrator to change date and time settings. However, required access level required for modifying  Date and time can be changed.

Procedure:

From the  Access level menu, select  Date and time> and set the desired access level required to modify the settings. Available access levels for changing date and time settings are: Guest, User, Advanced User, Administrator.

Caution: Setting Guest access level allows free access to date and time settings without needing to log in.

Printouts
The default settings enable a user logged in as the Administrator to edit the default printout templates. However, the required access level for modifying  Printouts can be changed.

Procedure:

From the  Access level menu, select  Printouts> and select one of available options: Guest, User, Advanced User, Administrator.

Caution: Setting Guest access level allows free access to printouts settings without needing to log in.

Movies

The default balance settings allow only an **Administrator** to access the <  Movies> menu, so only the Administrator can add or delete operations. If the Administrator has given access to changes, it is possible for other users to access the  Movies> menu options too.

Procedure:

Enter the <Access level> menu and select Movies>. Then choose one of the available options: Guest, User, Advanced User, Administrator.

Caution: Setting <Guest> access level allows free access to movies settings without needing to log in.

Auto logout

Auto logout was designed to trigger the logout operation when the balance has been inactive for specified time interval. By default, this is set to <None>.

Procedure:

Enter the <Access level> menu and select Auto logout>. The choose one of the available options: None/3/5/15/30/60. Time is given in minutes.

Databases

The Administrator is also authorized to set the access level required to modify each of the databases.

Procedure:

From the Access level menu, select Databases> and set the desired access level—Guest, User, Advanced User, Administrator—for each of the databases.

Caution: Setting Guest access level allows free editing of each of the databases.

23 PRINT MODE

Function designed to enable print mode setting, it activates “Enter” key on keyboard.
Print mode options:

- <WHEN STAB>, for this option stable measurement result, along with the settings for parameter
- <GLP PRINTOUT>, is sent to the printer port. On pressing “Enter” key, when the result is not stable (no marker on a display), the balance software sends the measurement result to the port after reaching stability for the measurement.
- <EACH>, for this option every time that the “Enter” button is pressed, it results in sending the reading to the printer port along with the settings for <GLP PRINTOUT> parameter. Every single reading is sent (stable and unstable). For unstable readings <?> character appears at the beginning of the printing frame.
- <AUTO> - select this option to enable automatic printing of measurements. If this option has been selected, remember to set <AUTO THRES> parameter to suit your needs.

Automatic operation procedure:

- Press →0← button to zero the balance (marker of stable measurement ◣◢ and zero marker -0- are shown on a display)
- Deposit load, the balance sends the first stable measurement to the printer port,
- Remove the load from the pan,
- Next measurement is possible when the indication is lower than the set value of <AUTO THRES.> parameter (next measurement does not require zero value).

For automatic operation adjust the threshold value. For automatic operation, the measurement will not be sent from the computer to the printer if the mass measurement stays within the set value range **<AUTO THRES>.**

<AUTO THRES> parameter relates to the following functions:

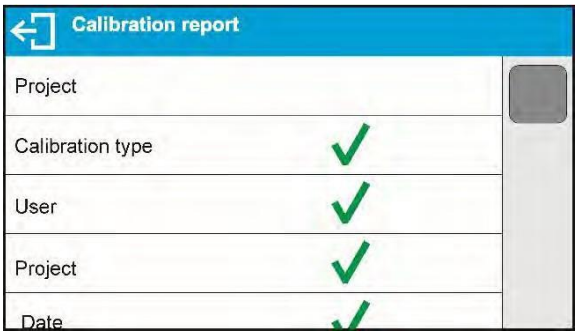
- automatic tare
- automatic operation
- auto with interval

<AUTO+INT.> select this option to start automatic printout and record of indications in the Weighings database and Alibi database, carried out in a cyclic manner in a specified time interval. The interval is set in minutes, in parameter P2.2.3.3 <AUTO INT.>. Interval range is 1-9999 min.

CAUTION!
Each result is printed and recorded. Automatic operation with interval starts when the switching function is turned on and it lasts until it is switched off. The first stable weighing result of value greater than AUTO THRES value is printed as a first measurement. The following measurements are printed with frequency set in INTERVAL parameter. Automatic operation with interval stops when the option is off. On switching the function of auto print with interval, PRINT button becomes inoperative (no indication is printed when pressed).

23.1 ADJUSTMENT PRINTOUT REPORT

ADJUSTMENT REPORT is a group of parameters enabling data to be printed on a printout.



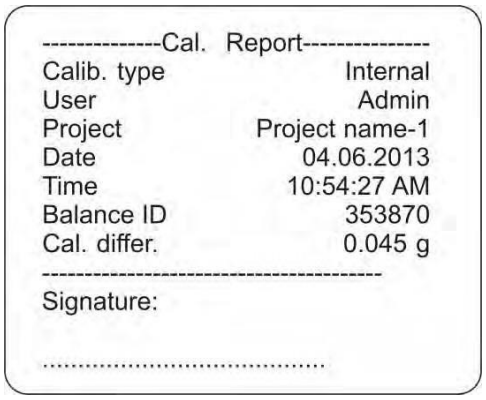
Variable	Overview
PROJECT	Option enables naming the project (name associated with a weighing). The name may consist of maximum 31 characters.
CALIB TYPE	Option enables printing out the type of the adjustment being carried out.
USER	Option enables printing out the name of a logged-in user.
PROJECT	Option enables printing out the name of the project (see parameter Project).
DATE	Option enables printing out the date of the carried-out adjustment.
TIME	Option enables printing out the time of the carried-out adjustment.
BALANCE ID	Option enables printing out the balance ID number.
CAL. DIFFER	Option enables printing out the difference between mass of an adjustment weight measured during the last adjustment and the current measured mass of this weight.
DASHES	Option enables printing out dashes that separate the date of a printout from a signature.
SIGNATURE	Option enables providing an area for the signature of a user performing the adjustment.

Procedure for naming the project

For the parameters described above, one of these values must be selected:

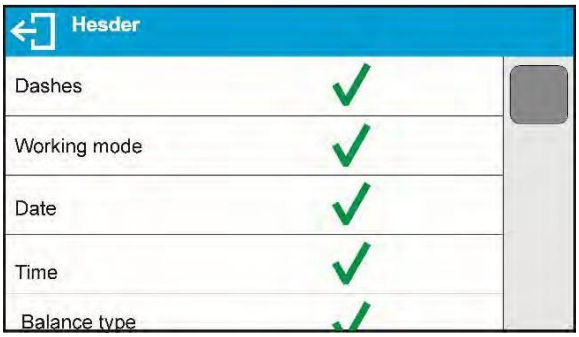
NO - do not print
YES - print

An example report:

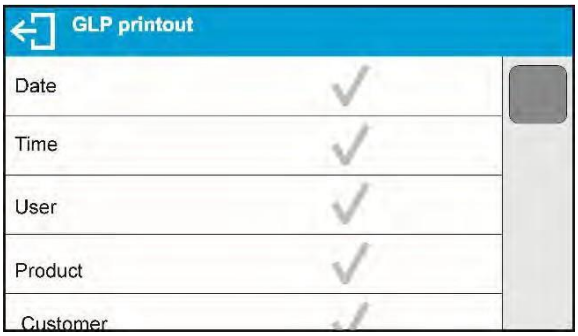


23.2 ADJUSTMENT PRINTOUT REPORT

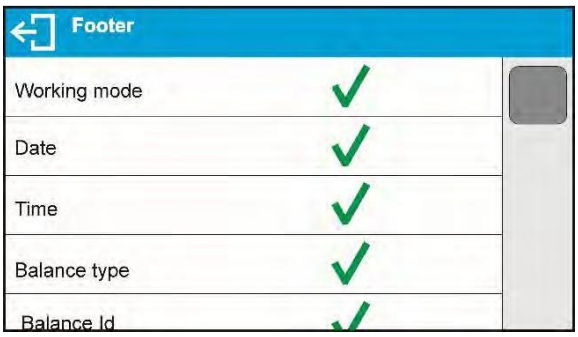
HEADER group of parameters enabling to declare data that is to be printed on a header printout.



GLP PRINTOUT group of parameters enabling to declare data that is to be printed on a measurement result printout



FOOTER group of parameters enabling to declare data that is to be printed on a footer printout



Printout variables list

Variable	Overview	Active for
WORKING MODE	Option enables printing out the name of a working mode.	Header Footer
BALANCE TYPE	Option enables printing out the balance type.	Header Footer
BALANCE ID	Option enables printing out the balance ID number.	Header Footer
USER	Option enables printing out the name of a logged- in user.	Header GLP printout Footer
PRODUCT	Option enables printing out the name of a currently selected product.	Header GLP printout Footer
CUSTOMER	Option enables printing out the name of a currently selected Customer.	Header GLP printout Footer
PACKAGING	Option enables printing out the name of a currently selected packaging.	GLP printout
DATE	Option enables printing out the date of the carried out adjustment.	Header GLP printout Footer
TIME	Option enables printing out the time of the carried out adjustment.	Header GLP printout Footer
VARIABLE 1	Option enables printing out the value of VARIABLE 1.	Header GLP printout Footer
VARIABLE 2	Option enables printing out the value of VARIABLE 2.	Header GLP printout
VARIABLE 3	Option enables printing out the value of VARIABLE 3.	Header GLP printout
NET	Option enables printing out net weight value in a basic unit (calibration unit).	GLP printout
TARE	Option enables printing out the tare value in the current unit.	GLP printout
GROSS	Option enables printing out the gross mass value in the current unit.	GLP printout

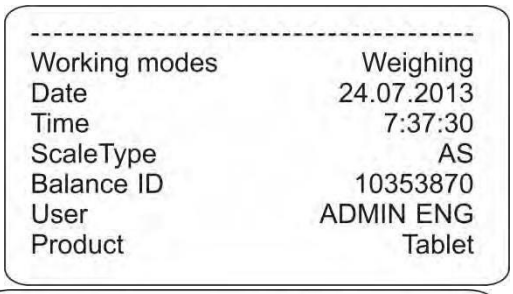
CURR.RES	Option enables printing out the current measurement result (NET weight) in a current unit.	GLP printout
CAL.REPORT	Option enables printing out a report from the last adjustment, according to the settings declared for the adjustment report printout.	Header GLP printout Footer
DASHES	Option enables printing out separating dashes.	Header Footer
EMPTY LINE	Option enables printing out an empty separating line.	Header Footer
SIGNATURE	Option enables providing an area for the signature of a user performing the adjustment.	Footer
NSTD. PRNT.	Option enables printing out one of 100 non- standard printouts on the footer printout. You can choose one of the following options: NONE / non- standard printout name. The way of entering non- standard printouts is described further down this user manual.	Header GLP printout Footer

For the parameters described above, one of these values must be selected:

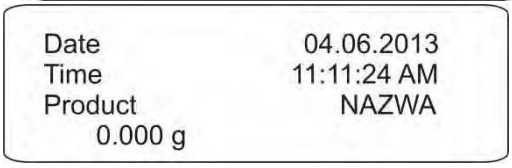
NO- do not print
YES- print

Example reports:

Header



GLP printout



Footer

24 PROXIMITY SENSORS

The balance has two proximity sensors that allow for wave control of the balance. The user does not have to either press any key on the overlay or touch the screen.

The program recognizes four types of motions performed near the sensor:

- Placing hand near the left sensor <Left proximity sensor>
- Placing hand near the right sensor <Right proximity sensor>
- Motion to the left <Proximity sensor: left motion>
- Motion to the right <Proximity sensor: right motion>

  - *Caution: When using the LEFT MOTION or RIGHT MOTION, the "Proximity sensors delay" must be set to 500 ms.*

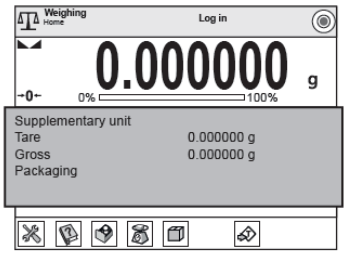
The following available options may be assigned to each of the motions:

- None
- Profile
- Adjustment
- Zeroing
- Tareing
- Tare setting
- Tare switch off
- Reset tare
- Packaging
- Print
- Header printing
- Footer printing
- Unit
- Universal Variable 1
- Universal Variable 2
- Universal Variable 3
- Universal Variable 4
- Universal Variable 5
- Confirm
- Abort
- User
- Left door
- Right door
- Open/Close door
- Parameters
- Product
- Warehouse
- Client

To ensure correct operation, the user must remember to set the correct sensor sensitivity and the correct value for the proximity sensors' delay.

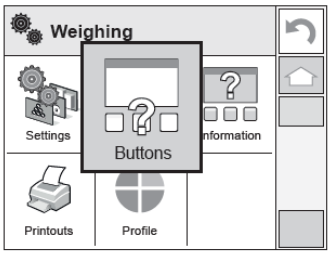
Proximity Sensor Setup:

1



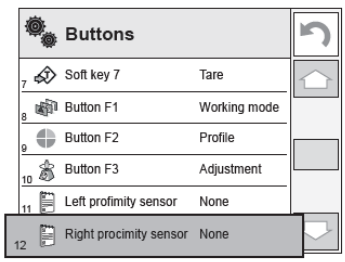
Press information field to access current working mode options.

2



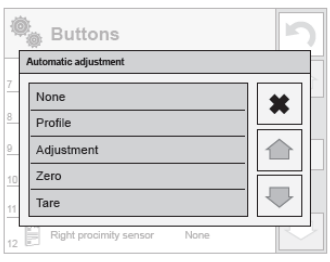
Press "Buttons" button.

3



Select "Right Sensor" parameter.

4



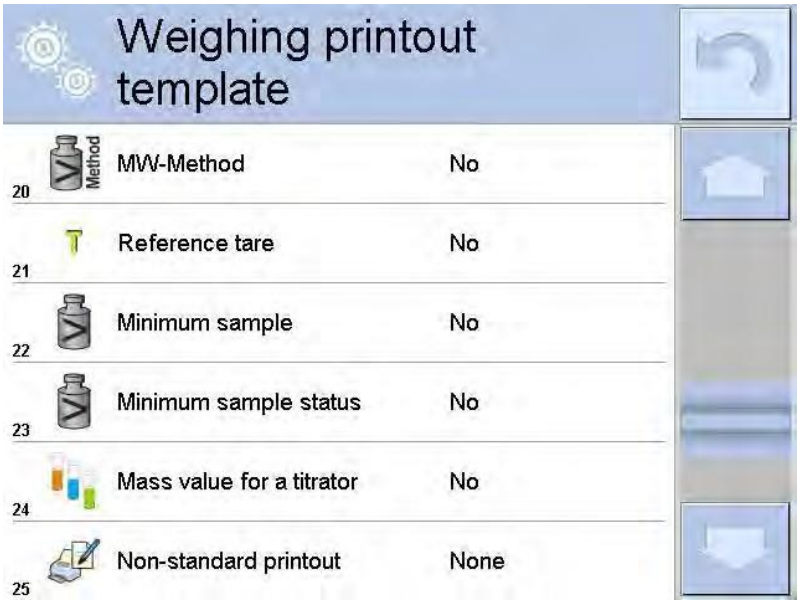
Select function that is to be assigned to the right sensor.

To setup up the left sensor, repeat steps 3 and 4. This time select Left Sensor parameter. Following the above procedure you can also set sensors for remaining work modes.

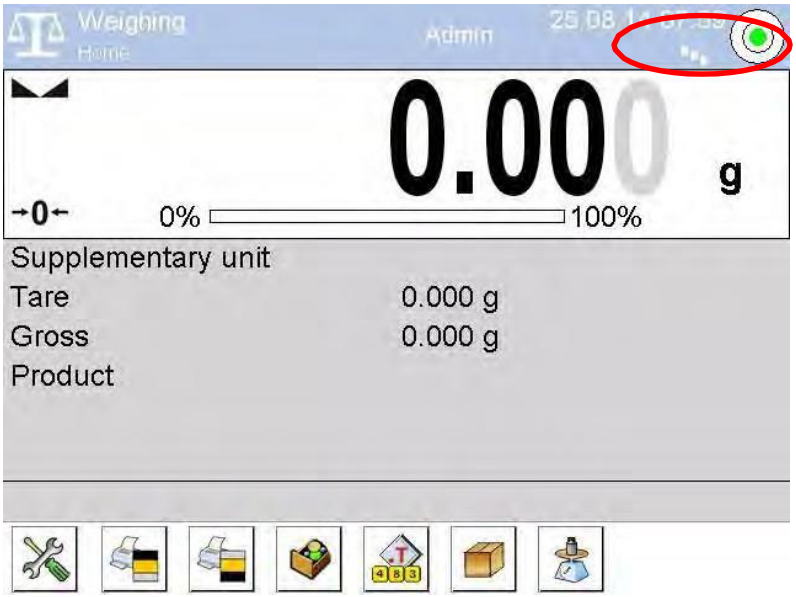
25 ADVANCED FEATURES

25.1 COOPERATION WITH TITRATORS

To ensure correct cooperation with titrators, “Mass for titrator” must be set to YES. This setting must be in place for standard printout content. Any other variables for this printout must be off.



If the option is on, an icon in the top toolbar of the main screen indicates the specific mass printout format accepted by TITRATORS.



Automatic adjustment time

Automatic adjustment time determines the time interval for which the automatic internal adjustment of a balance is activated. Intervals are in hours and range between 1 and 12 hours.

To set the time interval for automatic internal adjustment:

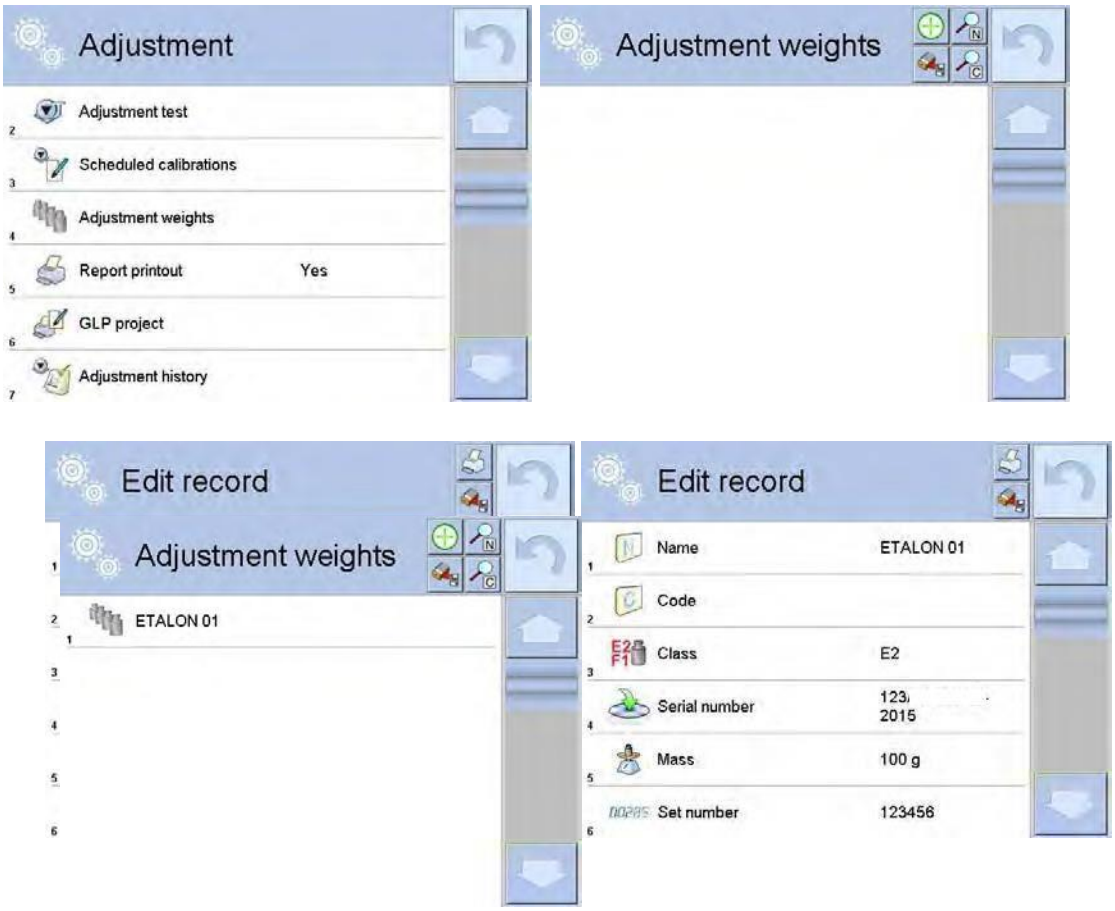
- Select <Automatic adjustment time>.
- Select the appropriate time interval (given in hours) from the menu. This is the time between the last internal automatic adjustment and the next.

Scheduled balance adjustment

The Scheduled calibrations parameter allows the user to specify a particular time for adjustment and the time between adjustments. This schedule is independent from automatic adjustments and the criteria that trigger that process (time, temperature).
Scheduling allows the user to plan when internal and external adjustments will be performed. To design the schedule for external adjustment, enter the mass standards for adjustment performance into the balance.

Settings:

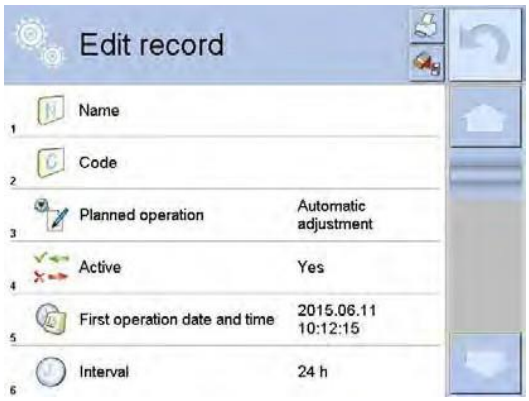
1. Enter the data for the mass standards to be used for external adjustment.
2. In the user menu, select <Adjustment>, find the Mass standards> option, and enter the necessary data:



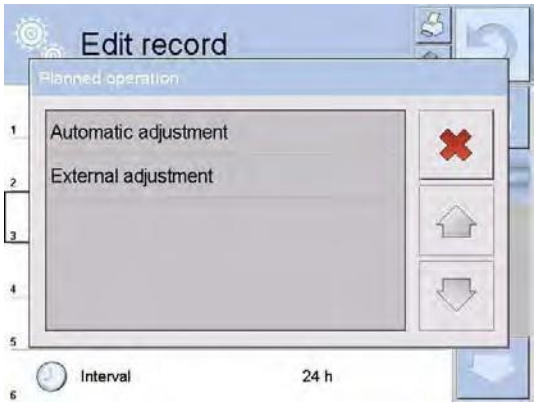
3. From the user menu, again select <Adjustment>:

4. Press <Scheduled calibrations>, wait for the “Scheduled calibrations” screen to open, and add adjustment procedures. Remember, only an Administrator can add new positions.

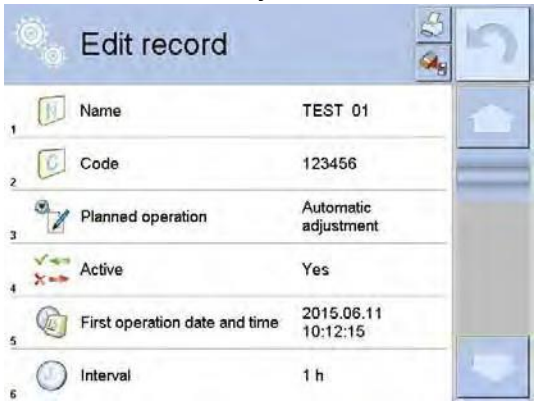
5. To add a new position, press the  key and wait for the screen with data on the planned balance adjustment to open.



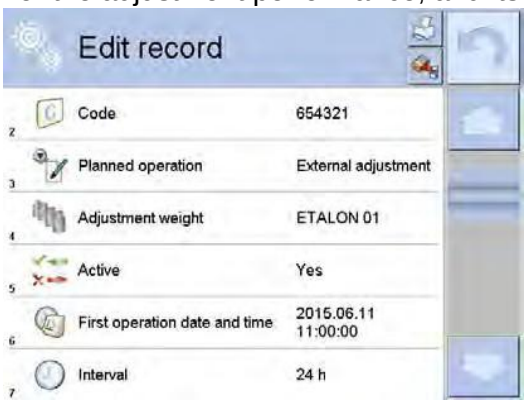
6. Select <Automatic adjustment> (internal) or <External adjustment>.



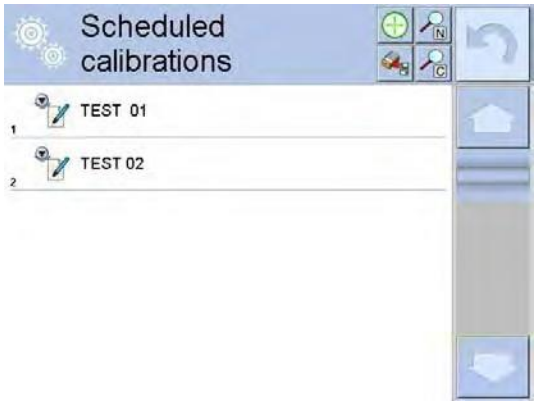
7. For an automatic adjustment, enter the data on the adjustment and its schedule.



8. For the external adjustment option, enter the data on the adjustment, the mass standard used for the adjustment performance, and its schedule.



9. When all necessary data has been introduced, go back to the previous screen. There will be newly added selections for the planned balance adjustment procedure.

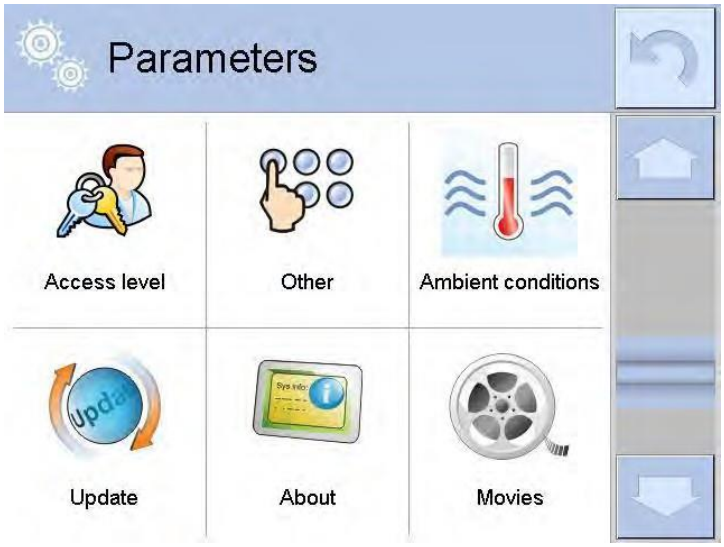


10. Upon entering all data, exit the menu.

Now adjustment procedures will be performed automatically in accordance with specified time and intervals.

25.2 ADJUSTMENT PRINTOUT REPORT

Users can watch an instructional movie explaining how to operate balance functions. Go to <Movies>, select the appropriate file, and press to watch the movie stored in the balance memory. The program plays *.wmv files.



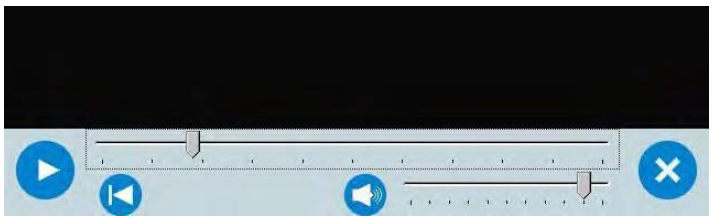
The “Movies” menu allows the user to add and delete movies from the balance memory. To add a movie:

- Save the movie on a USB storage device.
- Plug the storage device into the USB port of the balance head.
- Enter <Movies>.
- Press the > key in the top toolbar.
- Select the appropriate file.
- The movie is stored to the balance memory.

To play the movie:

- Save the movie to the balance memory (see instructions above).
- Enter <Movies>.
- Press the name of a movie to be watched.

The movie starts automatically. Functions available for playback are as follows:

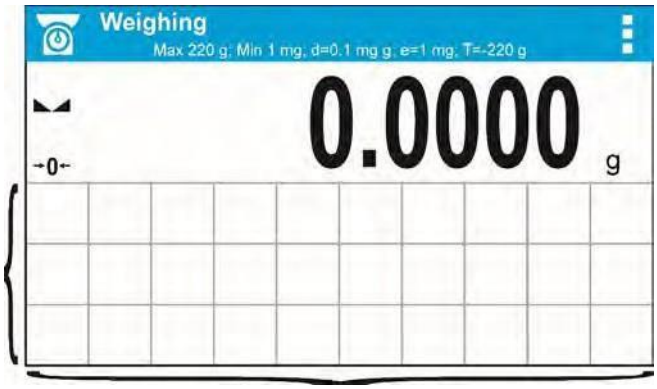


	Play/ Pause playing
	Stop playing
	Increase/decrease the volume (volume power adjusted; for settings go to the <Other> menu).

	Sound on/Mute
	Restart video

25.3 BUTTON, LABELS AND TEXT FIELDS CONFIGURATION

Area beneath weight indication section can be freely programmed. It is divided into active fields taking the form of a table with 3 rows and 10 columns.



The division lines presented above are not visible on the balance screen, they serve only for informative purposes.

This section is designed to explain user-selected widgets: buttons, labels, text fields, bar graphs.

- **button** – pictogram to which a function is assigned, the function is triggered upon pressing the pictogram;

- **label** – field for information, its content is stable. The content depends on displayed option, wherein the options change in course of balance operation. The label may be active or passive. Active label, when pressed, triggers function that is assigned to it, e.g. selecting product out of products database. Passive label provides you with information on current state, no function is assigned to it;

- **text field** - field for information, both content (text and variables of line 1 and 2) and function assigned to text field are programmable. The field may be active or passive. Its operation is likewise as for label; the only difference is that for the text field it is the user who specifies which function is to be assigned to it. The function does not have to refer to displayed information,
  e.g. the text field displaying date and time may trigger balance calibration upon being pressed;

- **bar graph** – option available for *Check weighing* and *Dosing* modes, field providing information on Min and Max threshold – *Check weighing* mode, and target weight - *Dosing* mode, the given information is presented in a graphic form, bar graph color informs whether weight stays within the specified tolerance or is out of it.

The section may be set up freely to match your needs. Each of the modes may be configured independently.

Set up rules:

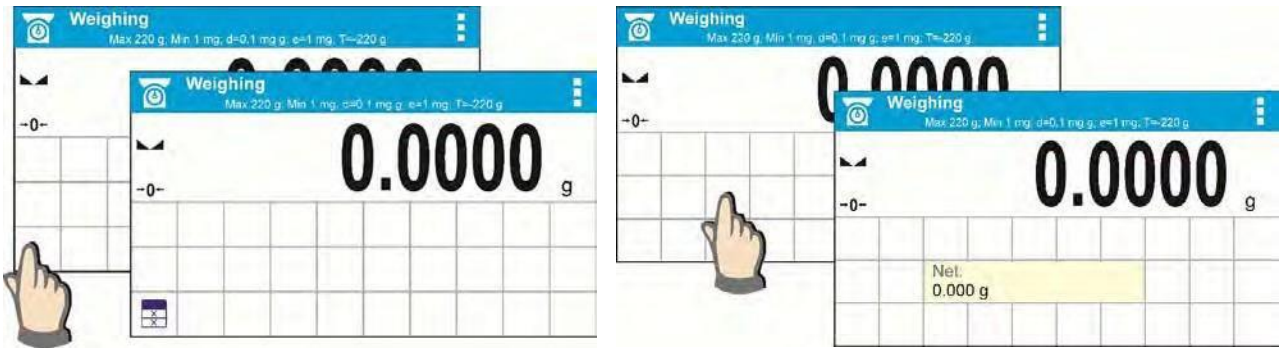
Widgets dimensions (width x height)

- button – 1x1
- label – 2x1; 3x1; 4x1; 5x1
- text field – 2x1; 3x1; 4x1; 5x1; 6x1; 7x1; 8x1; 9x1; 10x1
- bar graph – 5x1; 10x1

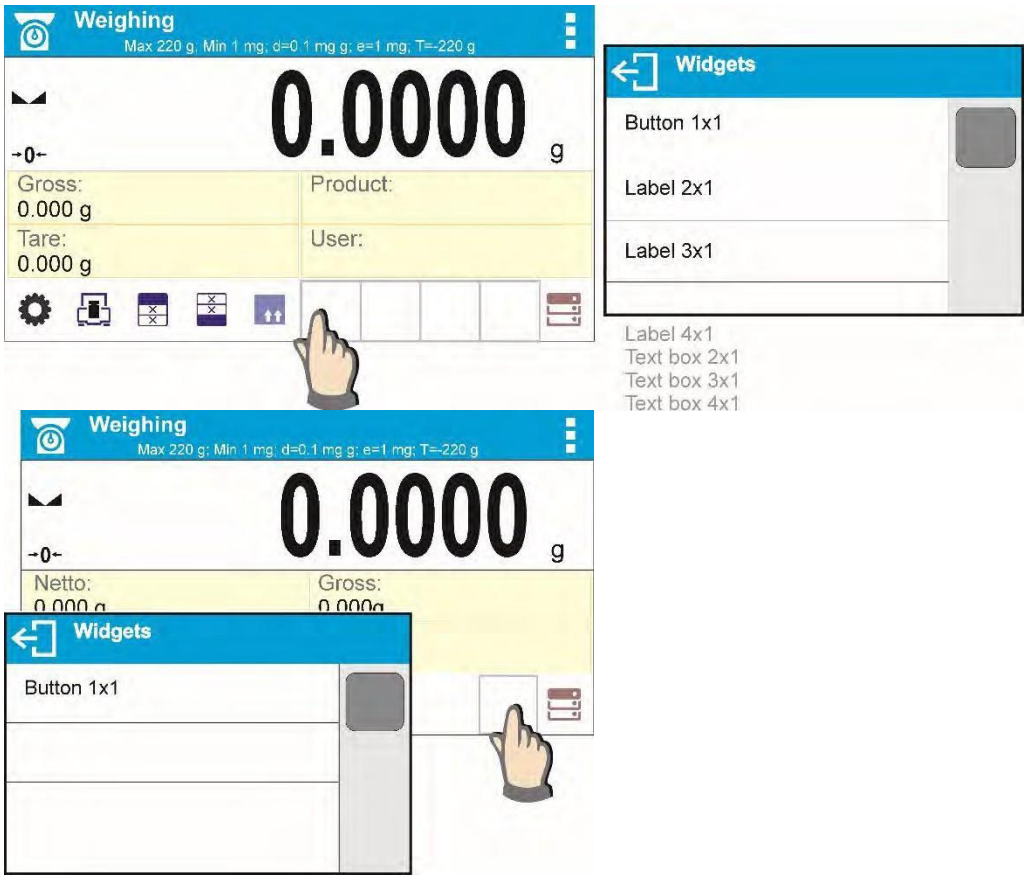
To quickly restore the default widgets layout press any widget and hold it until a window with available options is displayed. Select **<Default screen settings>** and confirm.

Exemplary arrangement and dimensions of labels and text fields.

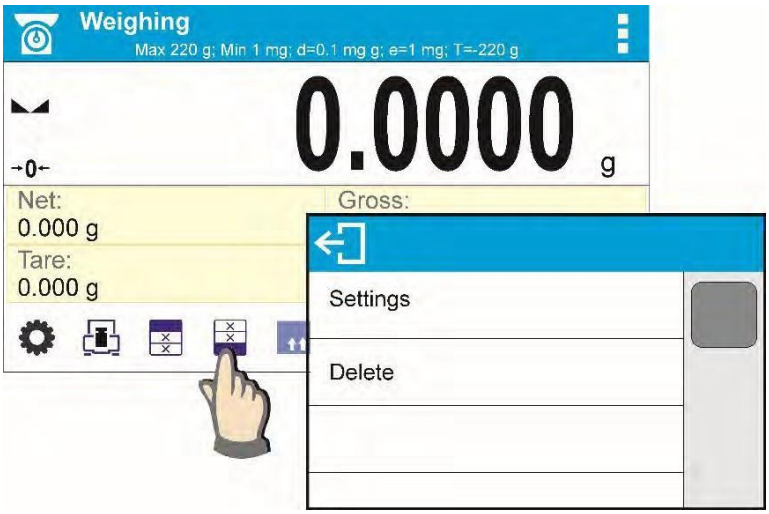
1. Always click the far left side of a field to hold a selected widget.



2. A new widget can only be applied to an area that holds no other widgets. The software automatically detects which widgets can be applied to an area, this is conditioned by the widget dimensions.



3. It is possible to change functions assigned to an already applied widget. The applied widget, if not needed, can be removed.



4. To rearrange widgets layout, it is required to delete an already applied widgets first, and define new arrangement of buttons, labels and text fields next.

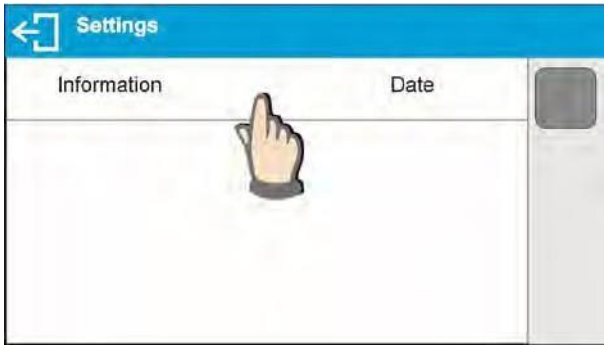
25.4 LABELS

You can select label size and type of information to be displayed for a label.
To select a label, use the list of available labels. Upon label selection, specify the type of information to be displayed on the label. The selected label is displayed automatically on a specified home screen spot.

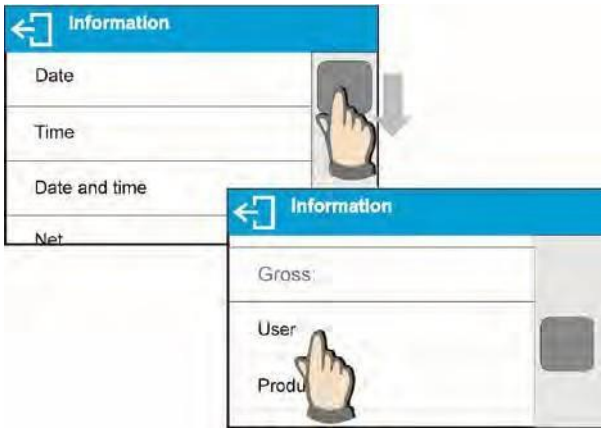
Procedure:

Press and hold the spot where the label is to be placed.

Select a label and its size.



Label settings window opens, click INFORMATION field to see a list of information type available for the selected label.



Select data to be displayed.

The selected label is displayed automatically on the home screen.

Information type:

Label information type	Modes featuring the information
Date	All modes
Time	All modes
Date and time	All modes
Net weight	All modes
Tare	All modes
Gross weight	All modes
User	All modes
Product	All modes
Packaging	All modes
Customer	All modes
Variable 1	All modes
Variable 2	All modes
Variable 3	All modes
MSW value	Weighing mode only
MSW tare	Weighing mode only

MSW status	Weighing mode only
Part mass	Parts Counting mode only
Thresholds	Check weighing mode only
Min threshold	Check weighing mode only
Max threshold	Check weighing mode only
Target value	Dosing mode only
Reference mass	Percent Weighing mode only
Weighing in air	Solids and Liquids Density Determination
Weighing in liquid	Solids and Liquids Density Determination
Liquid	Solids Density Determination mode only
Temperature	Solids Density Determination mode only
Liquid density	Solids Density Determination mode only
Sinker volume	Liquids Density Determination mode only
Number	Statistics mode only
Sum	Statistics mode only
Mean	Statistics mode only
Min	Statistics mode only
Max	Statistics mode only
Difference	Statistics mode only
SDV	Statistics mode only
RDV	Statistics mode only
Threshold	Peak Hold mode only
Formulation	Formulation mode only
Sum	Formulation mode only
Target value	Formulation mode only

25.5 TEXT FIELDS

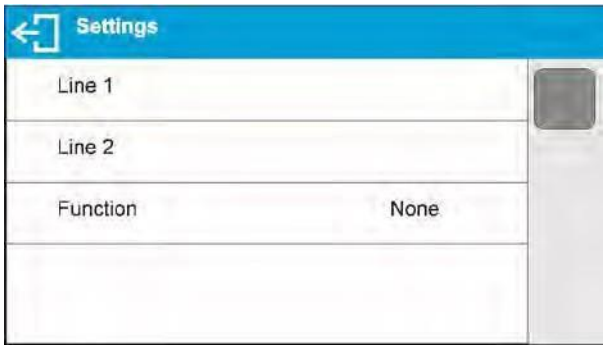
You can select text field size and type of information to be displayed in the first and the second line of the field, plus you can decide on a function and assign it to a text field.

Upon completed setup operation, the selected text field is displayed automatically on a specified home screen spot.

Procedure:

Press and hold the spot where the key is to be placed.

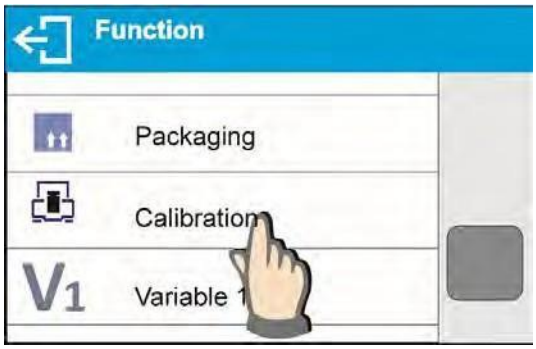
Select text field and its size.



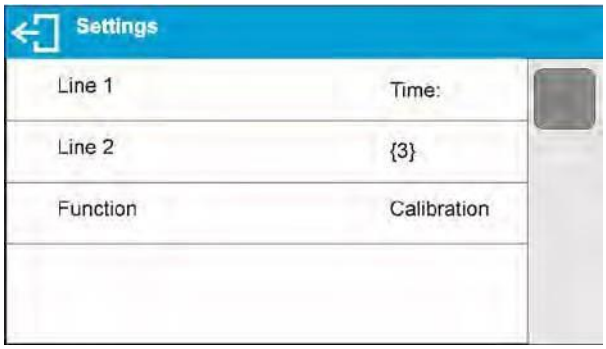
Text field settings window opens. Define text field parameters:

- Line 1: e.g. text <Time:>,

Line 2: e.g. variable {3}, variable for current time displaying (other variables refer to point for non- standard printouts).



function: e.g. adjustment.



When all text field parameters have been defined, the window displays respective values.

The defined text field is displayed automatically on the home screen.

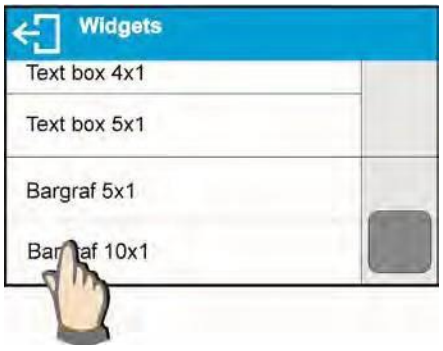
25.6 BAR GRAPHS

The bar graph function is accessible for all weighing modes. The bar graph presents in a graphic form how much of balance capacity is in use. Additionally, it shows Min and Max thresholds positions for the Check weighing mode, and for Dosing mode it shows target weight value along with permissible tolerance.

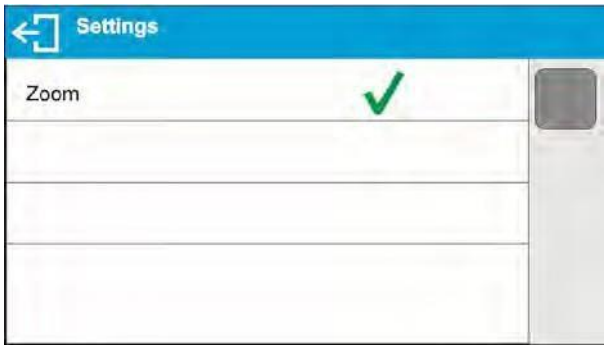
You can select bar graph size and turn on/off <Zoom> function. This function rescales bar graph to improve visualization of indication.

Procedure:

Press and hold the spot where bar graph is to be placed.

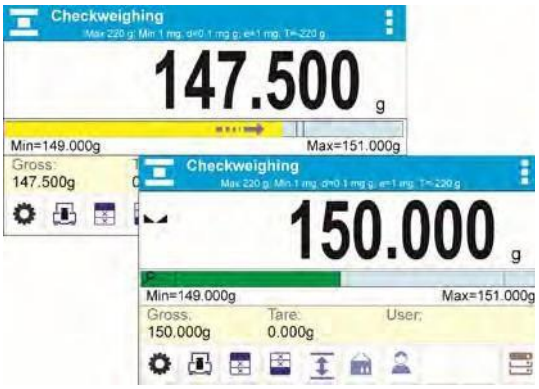


Select bar graph and its size.

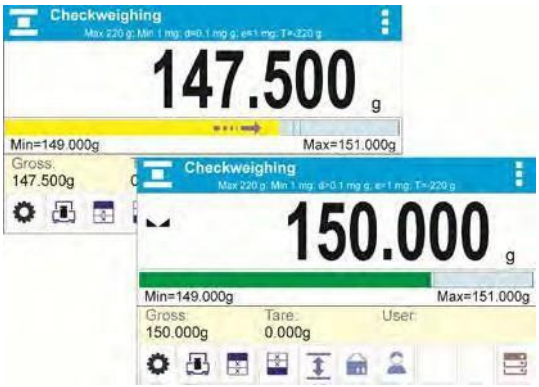


Bar graph settings window opens.

The selected bar graph is displayed automatically on the home screen.



Example for bar graph with <Zoom> function on:

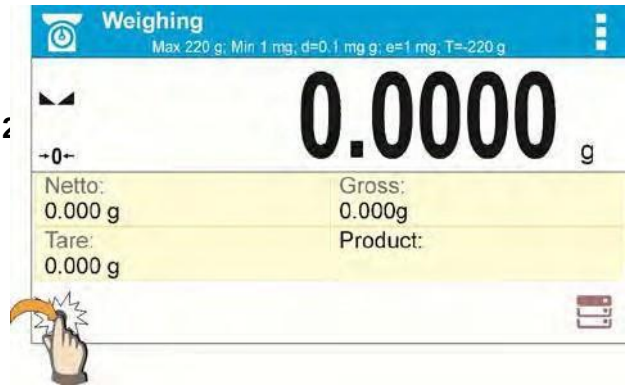


Example for bar graph with <Zoom> function off:

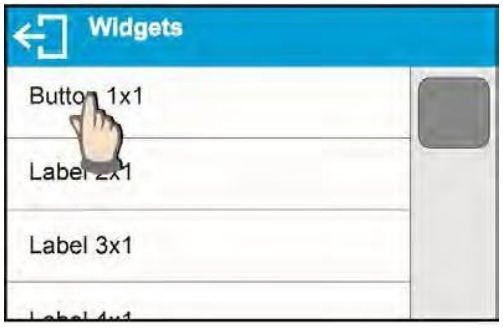
25.7 QUICK ACCESS KEYS CUSTOMIZATION

You can define quick access keys; the keys are displayed underneath weight indication section. Quick access keys provide direct access to the most frequently operated functions, it is selected from a list of available keys.

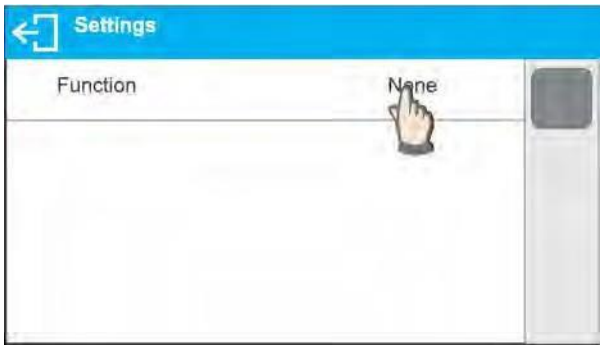
Procedure:



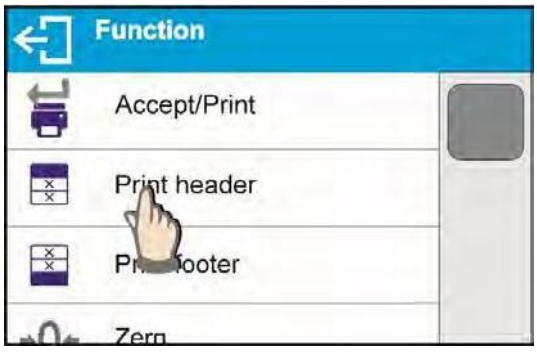
Press and hold the spot where the key is to be placed.



Select option: key 1x1



Enter key setup.



Select the key.

The selected key is displayed automatically on a home screen.

25.8 WEIGHING UNIT ACCESSIBILITY

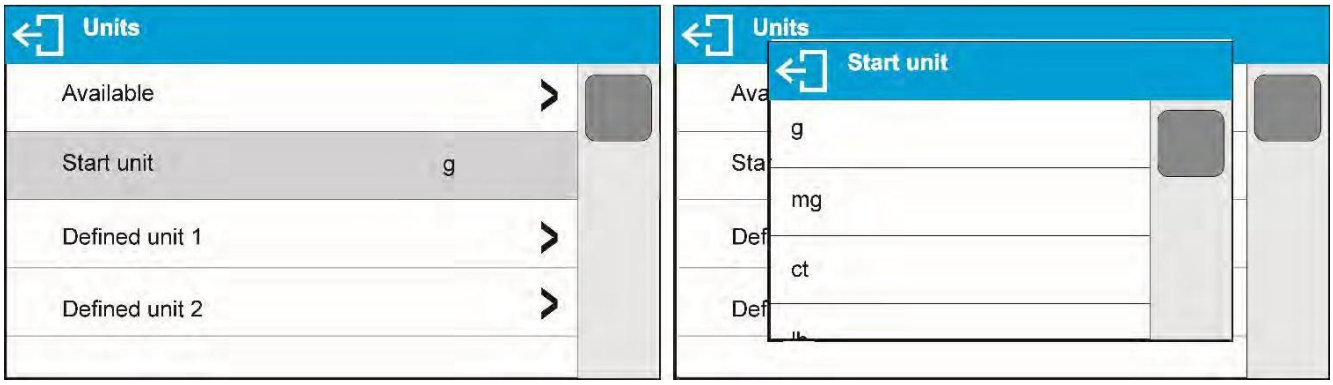
You may declare which units shall be accessible while selecting a temporary unit by means of unit key. Units with parameter value set to <Yes ✓ > option are available for selection in working modes,
i.e. modes facilitating units change.

Units with parameter value set to <No ✓ option will not be accessible while operating the balance.

25.9 START UNIT SELECTION

Upon selection of start unit, the balance activates with the specified start unit for these modes where change of the unit is possible.
Ability of selecting a given unit depends on the balance status, i.e. if the balance is verified or not.

26



25.10 BALANCE SETTINGS

A user can set up parameters which influence balance operation. These parameters are to be found in parameters group **MISC**.

Menu language

Language parameter enables selecting the language of the balance menu descriptions. Available languages: POLISH, ENGLISH, RUSSIAN, SPANISH, FRENCH, GERMAN, ITALIAN, CZECH, CHINESE, ARABIC, TURKISH, KOREAN.

Permissions

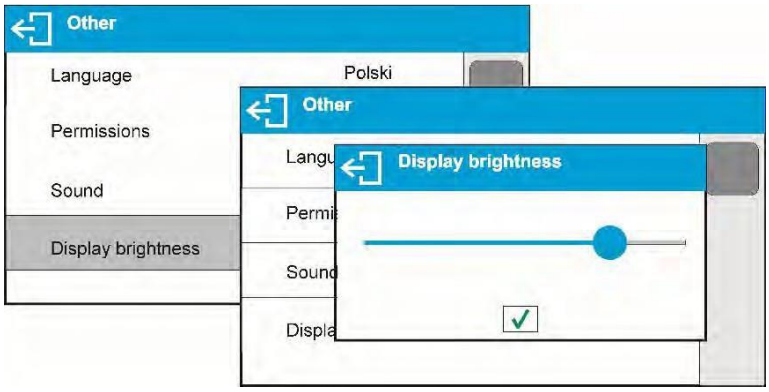
Permissions parameter enables choosing access level for a particular user, one that is not logged in. Available access levels: ADMIN. / USER. / ADV.
Depending on selected permissions level, you can enter balance parameters and modify the settings, as far as possible for a particular level. Logging in operation is not required (for permissions overview read point 8.2).

"Beep" sound – reaction to operation of pressing a key

Sound parameter enables switching on/off a 'beep' sound responsible for informing a user about pressing any key of balance overlay or display, or about proximity sensors response.

Backlight and adjusting display brightness

Display brightness parameter enables setting the brightness of the backlight or switching off the display brightness completely.



Proximity sensors sensitivity adjustment

Proximity sensors sensitivity parameter specifies distance within which the sensors can be operated, its scale is expressed in percent and it ranges from 0% to 100%. For lower percent value the proximity sensors operate at a shorter distance.
Usually the sensitivity value is comprised within 50%-70% limits.

Date
Date parameter enables setting the current date.

Time
Time parameter enables setting the current time. Procedures for change of time settings and date settings are likewise.

Date format
Date form. parameter enables altering the date format on the printout [YYYY.MM.DD / YYYY.DD.MM
/ DD.MM.YYYY / MM.DD.YYYY], where: YYYY – year; MM – month; DD – day.

Time format
Time form. parameter enables specifying time format for a printout [12h / 24h].
For **[12h]** option selected, **<A>** or **<P>** letter is displayed next to presented time value, where: **A** stands for hours before noon; **P** stands for hours after noon.

Backlight turn-off time

<BACKLIGHT OFF> parameter enables activation of display stand-by mode, the stand-by mode is activated when no weighing process is carried out (stable indication is a necessary condition for activation of the stand-by mode).

NONE – backlit turn-off time not activated.

0.5; 1; 2; 3; 5 – time given in minutes.

If the software registers stable indication for a specified time interval, set in parameter <BACKLIGHT OFF>, then the display goes out immediately. The backlight activates upon change of indication (no stability pictogram on the display) or pressing any key on the balance keypad. The display remains blank also when balance menu is entered.

Auto switch-off

<AUTO OFF> parameter enables automatic display deactivation (the parameter functioning is likewise to  button functioning). Upon display deactivation the other subassemblies are powered and the balance turns to stand-by mode.

NONE – auto switch-off not activated.

0.5; 1; 2; 3; 5 – time given in minutes.

If the software registers stable indication for a specified time interval, set in parameter <AUTO OFF>, then the display is turned-off immediately.

To start-up the balance, it is necessary to press  button located on the balance keypad. The balance automatically returns to weighing operation.

Balance cannot be turned off if any process is started or if balance menu is entered.

Autotest GLP

AUTOTEST GLP function is designed to aid a user in assessing balance's operation and diagnosing the reasons for occurrence of errors in weighing which exceed the maximum permissible values for a given balance model.

By means of a simple, repeatable and fully documented way, the function enables optimizing balance's settings to maintain the best possible repeatability and weighing time at workstation. The main purpose of the function is the possibility of monitoring the above-mentioned parameters at optional moment and saving records from the carried-out tests in the form of printed reports of the tests that are automatically generated at the end of examination. Up to 50 reports can be recorded. The test controls repeatability of placing the interval weight and determining error of indication with reference to balance's maximum capacity.

Testing procedure:

- deposit internal weight twice,
- deposit internal weight ten times, calculate the value of standard deviation,
- perform balance adjustment,
- print a report.
  Test results provide balance data, calculated error for Max capacity and value of repeatability of indication expressed as standard deviation.

An example report:

```
.....................................................
--------- Autotest GLP: Report ---------
Balance type
Balance ID                  400010
User                         Admin
Software rev.                v.0.4.9
Date
2013.07.16
Time                      09:17:16
-----------------------------------------
Number of measurements      10
Reading unit          0.001/0.01 g
Internal weight mass  1402.094 g
Filter                      Average
Value release       Fast &Reliable
-----------------------------------------
Deviation for Max.         -0.118 g
Repeatability              0.0088 g
Signature

      .....................................
```

Enter <OTHER> parameters' group, start <AUTOTEST GLP> parameter.

Press <Start> field. Autotest GLP procedure starts, it is carried out automatically. Autotest procedure progress bar is displayed.

Press ⏎ or ⌂ button to abort the procedure, you can do it at any time.

On completing procedure the parameter screen is displayed, value informing on recorded autotest number, to be found in <RESULT> field, is increased by <1>. To view results press <RESULTS> field and select the given autotest.

To print a report, go to <Details> window and press printer pictogram. The software can store up to 50 reports.

26 MAITENANCE ACTIVITIES

Disassemble the balance weighing pan and other detachable components (the components differ depending on a balance type – see *Unpacking and Installation* section). Be careful while detaching the components so as not to cause any damages to the balance mechanism.

Using handheld vacuum cleaner remove dust from the weighing chamber.

Using a dry flannel cloth to clean glass parts (mild cleanser may be applied if it does not contain any abrasive substances) – for draft shield disassembly instruction go to the next section of this manual.

Using a dry flannel cloth to clean disassembled components (mild cleanser may be applied if it does not contain any abrasive substances).

CAUTION!
Cleaning draft shield while still installed may cause damage of the measuring system.

To ease cleaning of glass draft shield panes, it is recommended to remove them by following the instruction below.

Cleaning ABS components:
To clean dry surfaces and avoid smudges, use clean non-colored cloths made of cellulose or cotton. You can use a solution of water and detergent (soap, dishwashing detergent, glass cleaner) if needed. Gently clean the intended surface and let it dry. Repeat cleaning process if needed.

In the case when contamination is hard to remove, e.g. adhesive, rubber, resin, polyurethane foam residues etc., you can use a special cleaning agent based on a mixture of aliphatic hydrocarbons that do not dissolve plastics. Before using the cleanser for all surfaces, we recommend spot test and small area first. Do not use products containing abrasive substances.

Cleaning stainless steel components:
Avoid using cleansers containing any corrosive chemicals, e.g. bleach (containing chlorine). Do not use abrasive substances. Always remove the dirt using microfiber cloth to avoid damage of the protective coating.

Daily maintenance:
1. Remove the dirt using cloth dipped in warm water.
2. For best results, add a little dishwashing detergent.

Cleaning powder-coated components:
For the first cleaning stage, you need running water or wet sponge to help remove loose, heavy dirt. Do not use cleansers containing abrasive substances.
Next using cloth and cleanser-water solution (soap, dishwashing liquid) gently rub the cleaned surface.

Avoid using cleanser without water since it may result in damage of the cleaned surface, please keep in mind that large amount of water mixed with cleanser is desired.

Cleaning aluminum components:
While cleaning aluminum components use products that are acidic by nature, e.g. spirit vinegar, lemon. Do not use abrasive substances. Avoid using hard brush as this may cause scratches. It is recommended to use microfiber cloth.

Polishing the surface using circular movements. Use a clean, dry cloth.

Cleaning draft shield panes:
Select dissolvent depending on a dirt. Never soak the glass panes in alkaline solutions since they interact with glass and may cause damage. Do not use abrasive substances.

For organic dirt use acetone first, next use water or detergent. For other than organic dirt use diluted acid solutions (soluble salts of hydrochloric or nitric acid) or base solutions (ammonium or sodium base).

To remove ACIDS use protophilic solvent (sodium carbonate), to remove BASE use protogenic solvent (mineral acid of various concentration).

In case of heavy contamination use brush or detergent and avoid detergents containing large and hard molecules which could potentially scratch glass panes.

Only use a soft brush with wooden or plastic handle to avoid risk of scratches. Do not use a wire brush.

At the end of the cleaning process rinse the pane using running water first, and then distilled.

Rinsing is a necessary cleaning process, allowing to remove remaining soap, detergents and other cleansers from the panes prior their reinstallation.

Avoid drying the panes either using paper towel or forced air circulation since some fibers, grains or contamination of other type could permeate into the panes thus causing weighing errors.

Do not use dryers when drying glassware, leave glass components on a rack to dry.

All the operations should be done carefully. Pay special ATTENTION to the spot where the weighing pan was installed: dirt and other small elements might enter the balance construction through this opening, which might negatively influence the balance parameters.

27 ACCESSORIES

Available Accessories for Cole-Parmer UMA-T/MA-T Balances:

- 10100-83 PO108 Cable- RS232 Cable to USB
- 10100-84 PO151 Cable- RS232 Cable to Epson Printer
- 10100-85 EPSON TM-U220D Printer
- 10100-86 Printer Paper
- 10100-94 Adapter for Pipettes Calibration (21g option)
- 10100-95 Wireless Terminal
- 10100-96 Pipettes PC Software
- 10100-97 THB.Y Module

27.1 WIRELESS TERMINAL OPTION (10100-95)

The optional battery-operated terminal uses a wireless connection to communicate with the weighing module. This eliminates the need for the usual cable to connect the devices.

Features:
Maximum range: 10 m
Maximum usage on a full charge: 8 h

Benefits:

1. **Lack of additional sources of vibration**
   Since the terminal doesn't have to share the bench with the weighing module, it eliminates extra vibrations for more stable and accurate measurements.
2. **Comfort of weighing in fume cupboards and laminar flow cabinets**
   The wireless connection between the terminal and the weighing module makes it easier and safer to use the scale in different locations.
3. **Elimination of unfavorable influence factors**
   Thanks to the wireless connection, the weighing module may be completely separated from the operator and be placed in an anti-draft chamber. This makes weighing contaminated and toxic substances possible without putting one's health and life at risk.
4. **Improved pipetting ergonomics**
   The process of calibrating pipettes calibration requires precision and speed, which can be delivered via the wireless connection.

   Wireless solutions are equipped with two power supplies: one for the weighing module and one for powering the terminal.

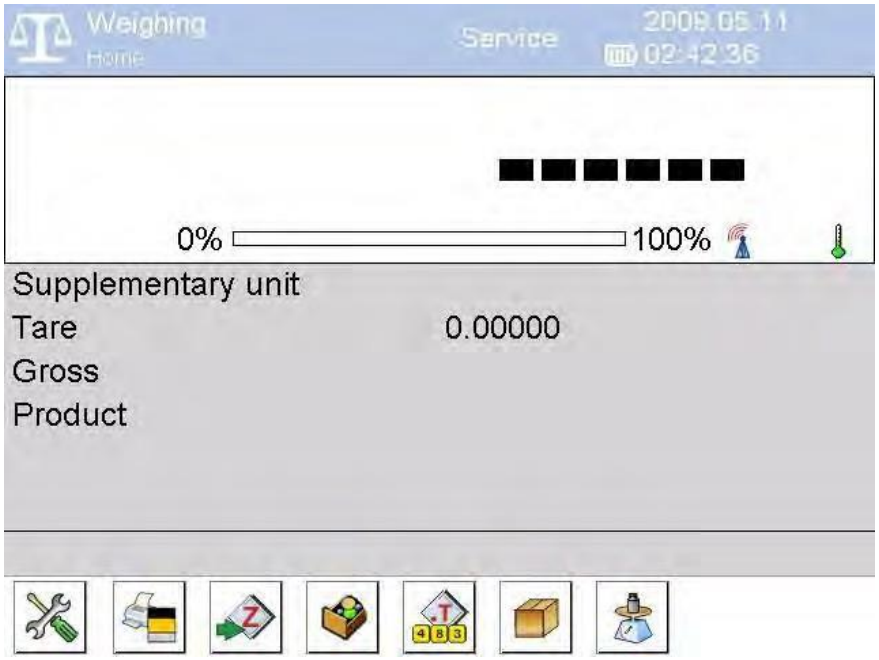
Battery charge status icon:

No.	*Icon*	*Description*
1		Battery charging

2		Battery charged, terminal connected to the mains
3		Battery charged, terminal not connected to the mains
4		Battery status (about 50%), terminal not connected to the mains
5		Minimal battery status, necessity of connecting the terminal to the mains

Wireless connection icon:

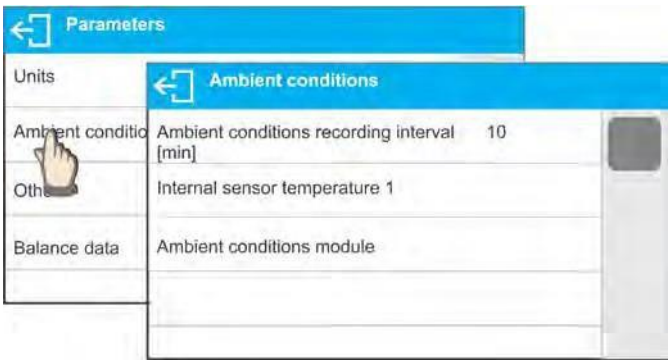
No.	*Icon*	*Description*
1		Correct connection of wireless modules – correct cooperation
2		Connection interrupted – loss of connection



In the above screen, the terminal is connected to the power outlet and the battery is charged, but there is no connection with the weighing module.

27.2 AMBIENT CONDITIONS

Parameters group which has been designed to enable you to turn on readout of ambient conditions recorded by the 10100-97 THB.Y ambient conditions module, and to specify tolerance temperature and humidity values and a change rate for the values per hour. Entered values are referred to indicted values. Next on the basis of values comparison respective pictograms are displayed informing you whether the sensor-read values are comprised within permissible limits or not. Particular sensors settings:

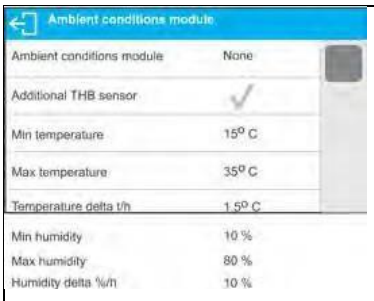


- Ambient conditions recording interval [min]: parameter enabling you to specify record frequency of sensor-registered data, and to determine how often the displayed pictograms (providing information on ambient conditions state) are to be refreshed,
- Internal sensor 1: enter this parameter to specify tolerance temperature values and balance temperature change rate,

	**Min temperature** –min balance temperature, for lower temperature values the thermometer pictogram is red **Max temperature** – max balance temperature, for higher temperature values the thermometer pictogram is red **Temperature ∆t/h** – maximum balance temperature change rate, for higher change rate values the balance displays blinking red thermometer pictogram

In order to enable/disable parameter visibility go to service menu.

- Ambient conditions module: parameters group which has been designed to enable you to turn on readout of data recorded by a balance-connected ambient conditions module, and to specify tolerance values for this module.



Ambient conditions module – parameter specifying module's working mode.

Available options:
None – readout of ambient condition module indications turned off;
Record and alert – readout and record of indications into database turned on, option of display of warnings informing on ambient conditions change turned on, the warnings are displayed in accordance with the following tolerance values settings.
Additional temperature sensor – turning on readout of indication of the additional temperature sensor connected to the ambient conditions module.
Min temperature – min balance temperature, for lower temperature values the thermometer pictogram is red
Max temperature – max balance temperature, for higher temperature values the thermometer pictogram is red
Temperature ∆t/h – maximum balance temperature change rate, for higher change rate values the balance displays blinking red thermometer pictogram
Min humidity – min humidity value, for lower humidity values the thermometer pictogram is red
Max humidity – max humidity value, for higher humidity values the thermometer pictogram is red
Humidity ∆%/h – maximum humidity change rate, for higher change rate values the balance displays blinking red thermometer pictogram

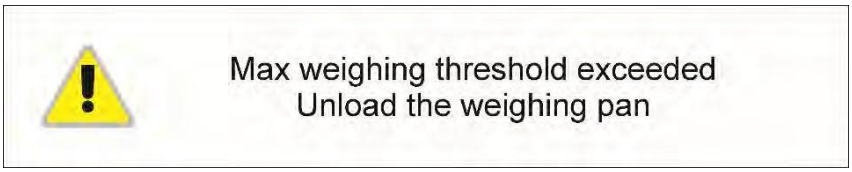
With all the parameters set, the home screen displays respective pictograms informing on current ambient conditions readouts and their change.

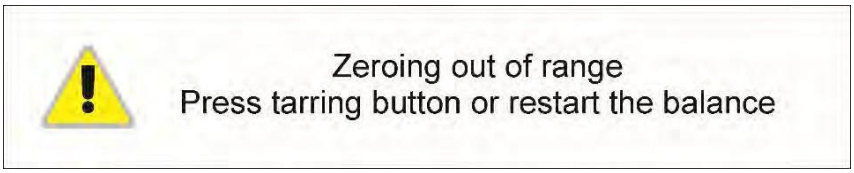
Pictograms for ambient conditions state:

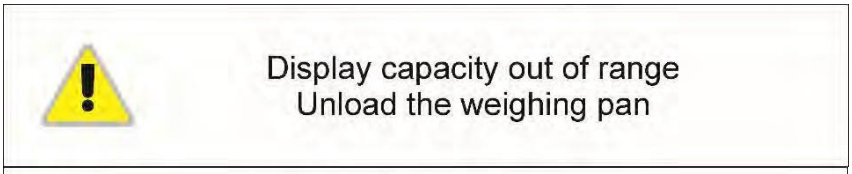
No.	*Pictogram*	*Overview*
1		Indicated temperature is within specified permissible limits
2		Indicated temperature is out of specified permissible limits
3		Indicated humidity is within specified permissible limits

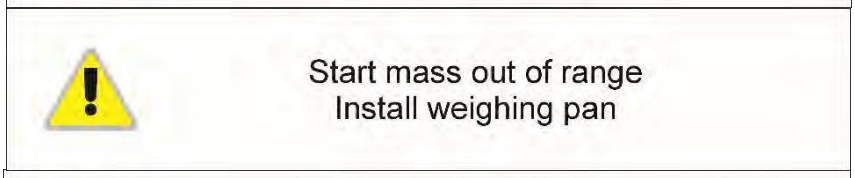
4		Indicated humidity is out of specified permissible limits
5		Temperature change rate is to high (blinking pictogram)
6		Humidity change rate is too high (blinking pictogram)

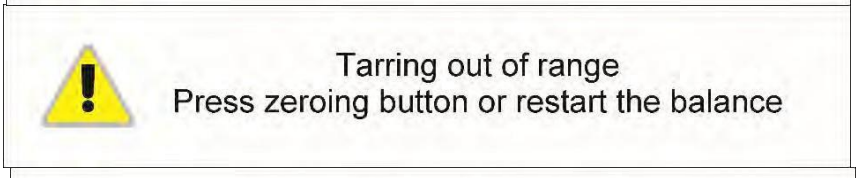
27.3 ERROR MESSAGES

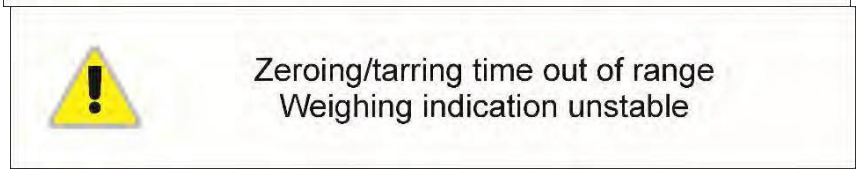










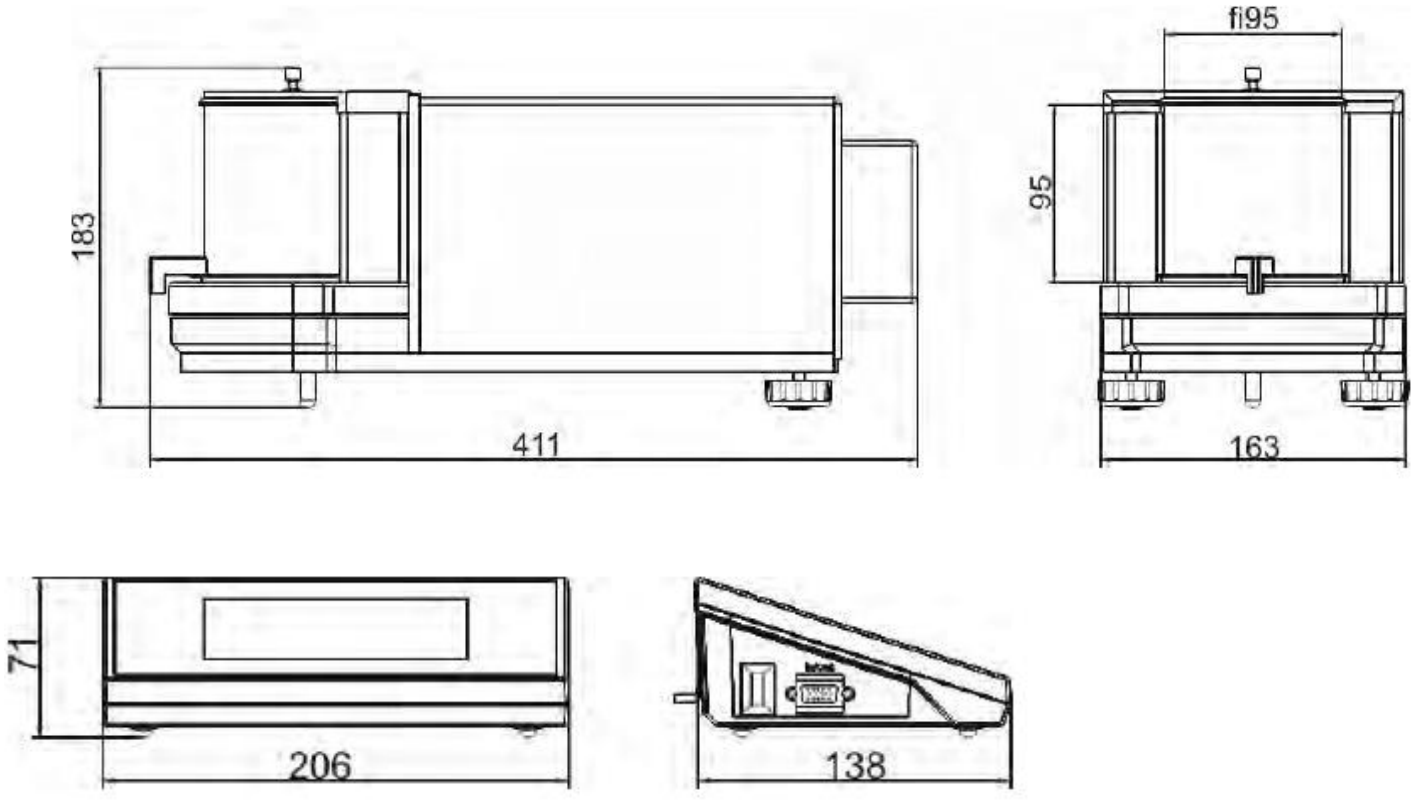


28 APPENDIX

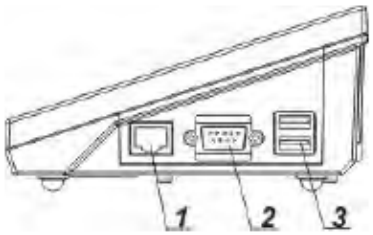
28.1 UMA/MASERIES BALANCES

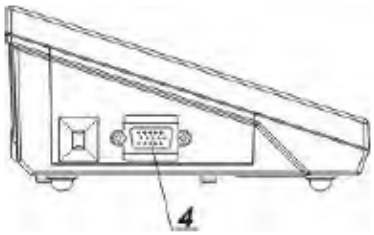
MODEL	CATALOG NUMBER	CAPACITY	READABILITY	LINEARITY	REPEATABILITY	PAN SIZE
UMA-T-2	10100-23	2.1 g	.1 µg	±1.5 µg	.1 µg	16 mm
MA-T-2	10100-24	2.1 g	1 µg	±3 µg	1 µg	16 mm
MA-T-5	10100-25	5.1 g	1 µg	±5 µg	1 µg	26 mm
MA-T-5.F	10100-26	5.1 g	1 µg	±5 µg	1 µg	100mm
MA-T-11	10100-27	11 g	1 µg	±6 µg	1 µg	26 mm
MA-T-21	10100-28	21 g	1 µg	±7 µg	1 µg	26 mm
MA-T-21.P	10100-29	21 g	1 µg	±7 µg	1 µg	26 mm

28.2 DIMENSIONS



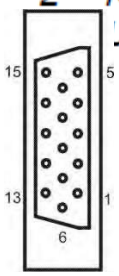
28.3 CONNECTORS



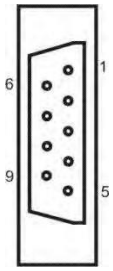


1 – Ethernet RJ45 connector
2 – RS232 connector (COM1)
USB connector

4 – IN/OUT, RS232 (COM2) connector



28.4 RS232 AND IN/OUT CONNECTORS



RS232 - connector DB9/M (male), front view:

Pin2 - RxD
Pin3 - TxD
Pin5 - GND

IN/OUT, RS232 connector DSUB15/F (female), front view:

Pin1 - GNDWE
Pin2 - OUT1
Pin3 - OUT2
Pin4 - COMM
Pin5 - 6÷9VDC
Pin6 - IN4
Pin7 - IN3
Pin8 - TxD2
Pin9 - 5VDC
Pin10 - GNDRS
Pin11 - IN2
Pin12 - IN1
Pin13 - RxD2
Pin14 - OUT4
Pin15 - OUT3

28.5 WARRANTY CARD

Three-Year Limited Warranty

Cole-Parmer will exchange, replace or repair the existing balance for any damage that appears to be faulty by production or by construction within the 3-year warranty period.

Warranty is voided if:

A. Cole Parmer will exchange, replace or repair the existing balance for any damage that appears to be faulty by production or by construction within the 3-year warranty period.

B. Warranty is voided if:
   - mechanical defects caused by inappropriate use:
     - defects of thermal and chemical origin,
     - defects caused by lightning, overvoltage in the power network
     - defects caused by water damage
     - or other random event
   - overloading the mechanical measuring system
   - installing another version of the operating system
   - utilizing the balance contrary to its intended use
   - repairs carried out by non-authorized service centers
   - removing or destroying protective stickers which secure the balance's housing against unauthorized access

C. Warranty card must be filled out for warranty to be valid.

Cut Here_ _

Warranty Registration Card

(Please Return Within 30 Days)

Company or Institution____**Department**__________________________

Contact Name____**Title**________________________________

Street Address____

City____**State**______________**Zip**_________________

Telephone____ **Date Purchased**_________________________

Purchased From____

Model Number____**Serial Number**__________________________

Industry____**Application**_____________________________

What influenced you to purchase this product?________________________

For your reference and records:

Model Number

Serial Number

Purchase Date

_____

_____

_____

Place Stamp

Here

Cole-Parmer
Warranty Registration
625 East Bunker Ct
Vernon Hills, IL 60061

It is recommended that Cole-Parmer products are calibrated annually to ensure proper function and accurate measurements; however, your quality system or regulatory body may require more frequent calibrations. To schedule your recalibration, please contact InnoCal, an ISO 17025 calibration laboratory accredited by A2LA.

INNOCAL®
INNOVATIVE CALIBRATION SOLUTIONS
Phone: 1-866-INNOCAL (1-866-466-6225)
Fax: 1-847-327-2993
E-mail: sales@innocalsolutions.com
Web: InnoCalSolutions.com

For Product and Ordering Information, Contact:

Cole-Parmer®
Toll-Free: 1-800-323-4340
Phone: 1-847-549-7600
Fax: 1-847-247-2929
ColeParmer.com/Digi-Sense