AG600, AGZ600

AG100-AG500,
AGZ100-AGZ500

AG1000-AG4000
AGZ1000-AGZ4000,AGZ10

USER MANUAL

AG and AGZ series

File: 2014-11-18 AG-100 AG0M95 GB

Contents:

Declaration of Conformity

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1. *General description*

AG and AGZ series balances are destined for high accuracy weighing in laboratory practice. AG series balances are equipped with internal calibration system for accuracy control during balance operation. AGZ series balances do not have internal calibration system and can be used when legal verification is not required.

All balances are metrologically tested. According to an order balances can be calibrated or legally verified.

Balances with legal verification are marked with the following legal and securing items:

- green metrological mark placed on the balance name plate,
- notified body stamp (number of notified body) on the balance name plate,
- protective seals placed on: an edge of balance name plate, the casing mounting
  screw and in the place of access to adjustment switch,

Renewing of balance legal verification is required when protective seal is violated or after period of 3 years starting from 1st December of year when first legal verification was performed. In order to renew legal verification please contact AXIS authorised service centre.

In AGZ series balances all functions connected with internal calibration are removed (chapter 11 and 14.5).

Balance classification according to PKWiU: 33.20.31.

Certificates:

Certificate of ISO quality system   Certificate of balance type approval
DIN EN ISO 9001:2000   TCM 128/06-4428

2. *Completeness*

A standard set consist of:

1. Balance
2. Pan elements:
   - for balances with round pan (AG100-AG600): a pan support and a pan,
   - for balances with rectangular pan, AG8 (AG1000-AG4000, AGZ10): gum
     nuts (4pcs) and a pan,
3. Draft shield with cover (AG100-AG500),
4. Feeder 12V / 1,2A
5. User manual, guarantee card

3. Technical data

Type	AG100 AGZ100	AG200 AGZ200	AG300 AGZ300	AG500 AGZ500
Capacity (Max)	100g	200g	300g	500g
Min load (Min)	0,02g	0,02g	0,02g	0,02g
Reading unit (d)	0,001g	0,001g	0,001g	0,001g
Verification unit (e)	0,01g	0,01g	0,01g	0,01g
Tare range	-100g	-200g	-300g	-500g
Accuracy class	II			
Working temperature	+18 ÷ +33°C			
Weighing time	<3s			
Pan dimension	ϕ115mm			
Balance dimension (with legs)	215(235 with legs)x345x90mm			
Balance weight	5kg			
Power supply	~230V 50Hz 6VA / =12V 800mA			
Recommended external calibration weight (OIML)	F2 100g	F2 200g	F2 200g	F1 500g

Type	AG600 AGZ600	AG1000 AGZ1000	AG2000 AGZ2000	AG3000 AGZ3000	AG4000 AGZ4000	AGZ10
Capacity (Max)	600g	1000g	2000g	3000g	4000g	10kg
Min load (Min)	0,5g	0,5g	0,5g	0,5g	0,5g	5g
Reading unit (d)	0,01g	0,01g	0,01g	0,01g	0,01g	0,1g
Verification unit (e)	0,1g	0,1g	0,1g	0,1g	0,1g	1g
Tare range	-600g	-1000g	-2000g	-3000g	-4000g	-10kg
Accuracy class	II					
Working temperature	+18 ÷ +33°C					
Weighing time	<3s					
Pan dimension	ϕ150mm	165x165mm				195x180mm
Balance dimension (with legs)	215(235 with legs)x345x90mm					
Balance weight	5kg					
Power	~230V 50Hz 6VA / =12V 800mA					
Recommended external calibration weight (OIML)	F2 500g	F2 1000g	F2 2000g			F2 5000g

Caution:

F1 and F2 are international symbols of calibration weight classes according to O.I.M.L. Some requirements for weight accuracy are connected with those classes.

4. General balance view

AG100-AG600 balances:
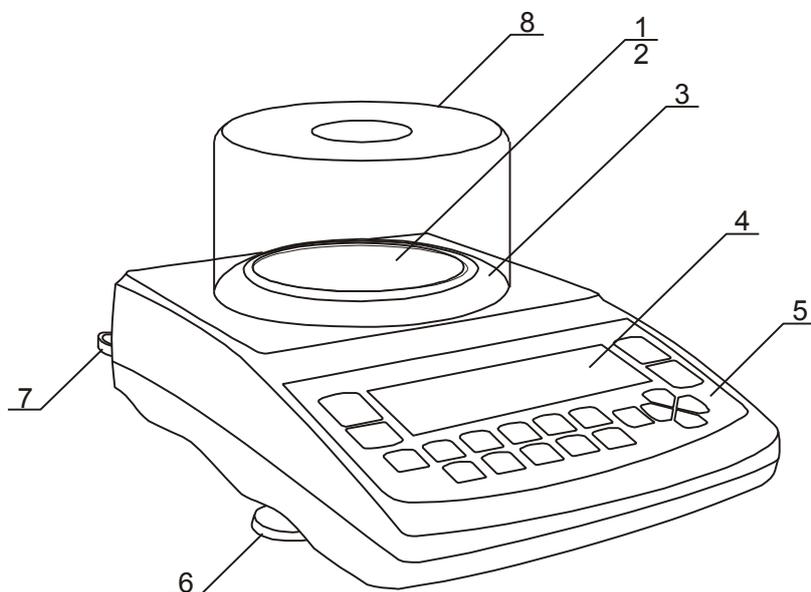
1 – pan
2 – pan support
3 – pan ring
4 – graphical display
5 – keys
6 – rotating legs
7 – water level
8 – draft shield

Note:
AG600 does not have the pan ring and the draft shield.

AG1000-AG4000, AGZ10 balances:
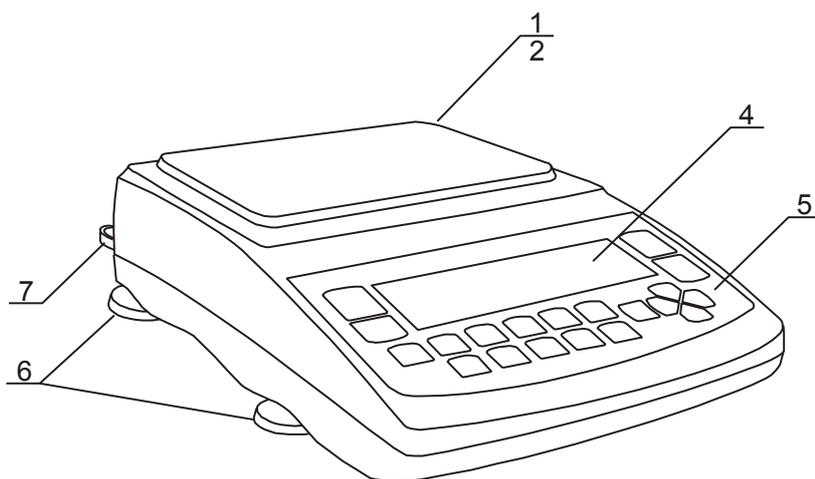
1 – pan
2 – nuts (under pan)
4 – graphical display
5 – keys
6 – rotating legs
7 – water level

Connectors view:

Feeder

12V   1,2A

⊖   •   ⊕

Adjustment switch

ON ▭ OFF

RS232C

1
2 — RxD (receiver)
3 — TxD (transmitter)
4
5 — GND

6
7
8
9

Case

PS2

Clock
+5V
GND
Data
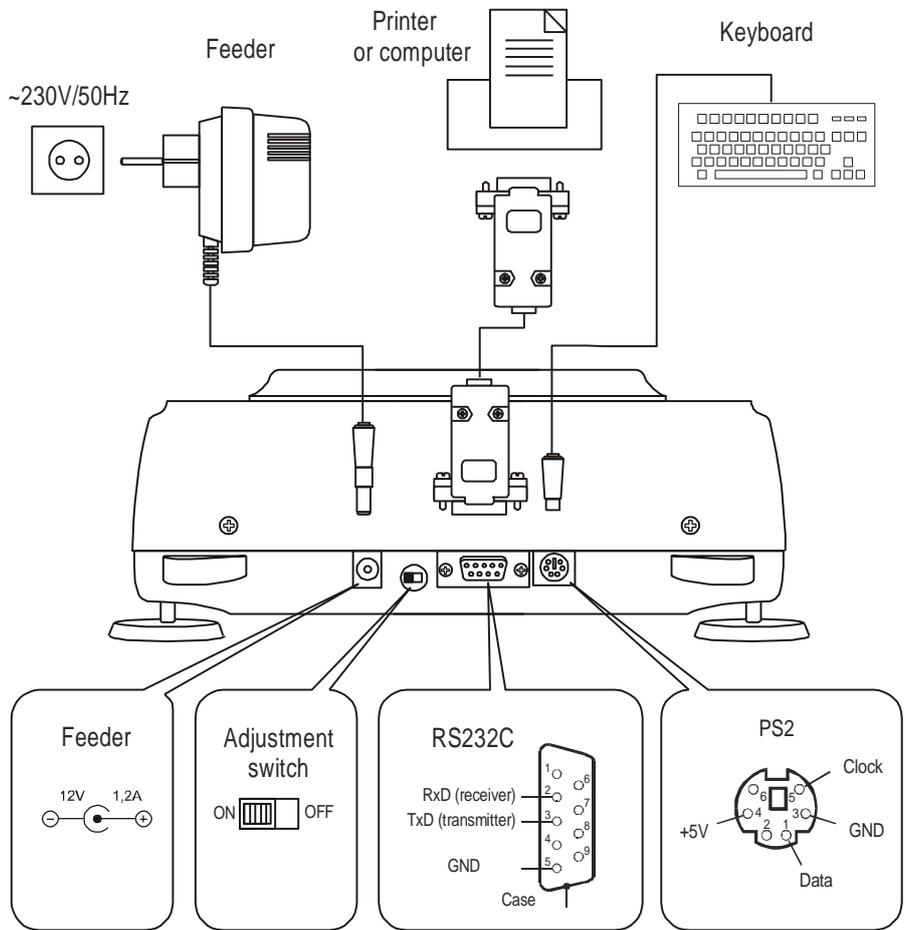
5. Keys and indicators
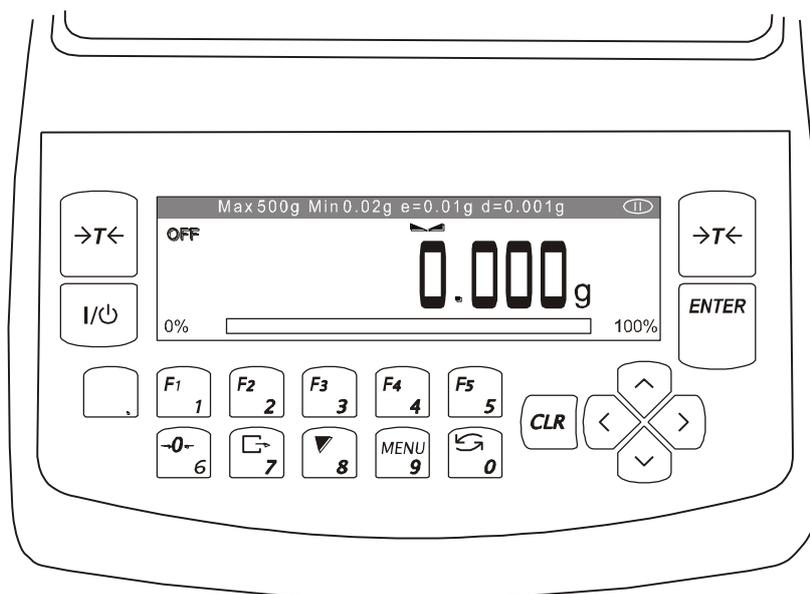
→T←	- taring (enter mass subtracted from weighed mass)
→0←	- zeroing (option),
ENTER	- confirmation / choosing an option,
.	- decimal point,
1/F1 ... 5/F5	- numeric key / functional key,
6 / →0←	- numeric key / zeroing (only for balances for direct sale),
7 / ⊏→	- numeric key / result printout (transmission),
8 / ▼	- numeric key / internal calibration,
9 / MENU	- numeric key / enter menu,
0 / ↻	- numeric key / change mode of balance work,
∧	- navigation: go to option above,
∨	- navigation: go to option below,
>	- navigation: enter into option,
<	- navigation: exit from option,
I / ⏻	- switch on / switch off (standby),
indicator ◣◢	- shows stabilization of weighing result,
linear indicator	- indicator of balance load (0-100%),
OFF indicator	- appears after the balance is switched off with I / ⏻ key,
decrease of last digit	- informs that reading unit value is lower than acceptable indication error (balances with legal verification, d≠e)
Max, Min, d, e, II	- metrological parameters of the balance.

6. Safety rules
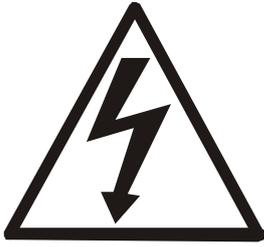
⚡ (warning triangle symbol)	It is necessary to follow safety rules of work with the balance shown below. Obeying those rules is the condition to avoid electrical shock or damage of the balance or connected peripheral devices.

- Repairs and necessary regulations can be done by authorised personnel only.
- To avoid fire risk use a feeder of an appropriate type (supplied with the balance) and supply voltage have to be compatible with specified technical data.
- Do not use the balance when its cover is opened.
- Do not use the balance in explosive conditions.
- Do not use the balance in high humidity environment.
- If the balance seems not to operate properly, switch it off and do not use until checked by authorised service centre.

(crossed-out wheeled bin symbol)	AG series balances are not allowed for use in house holds. According to current acts of low about protection of natural environment, wasted balances should not be put into waste containers together with ordinary waste.

- Wasted balance after operation period can be delivered to units authorised for gathering wasted electronic devices or to the place where it was bought.

7. Preparing working environment
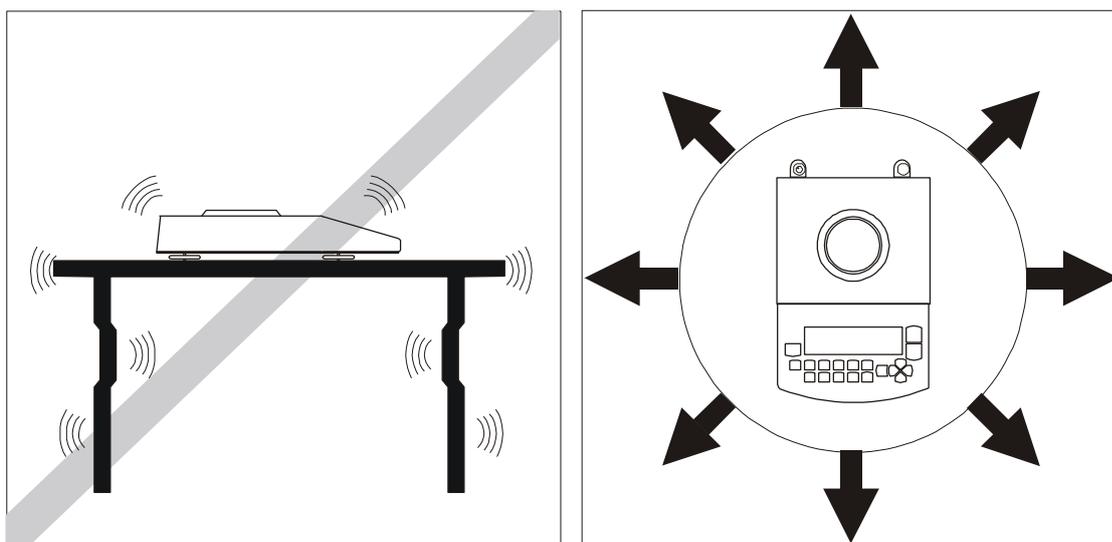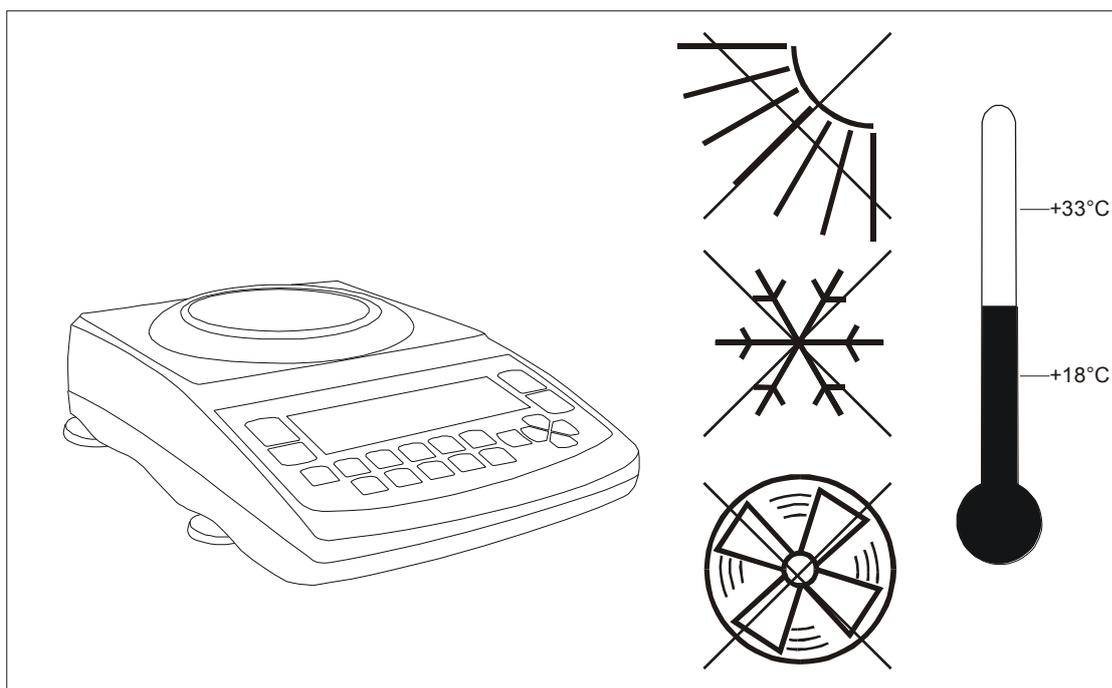
Location for the balance should be chosen with care in order to limit influence of the factors that can interrupt working balance. This location has to maintain proper temperature for working balance and necessary space for its operating. The balance should stay on stable table made of material that does not influence magnetically on the balance.

Rapid air blast, vibrations, dust, rapid temperature changes or air humidity over 90% are not allowed in balance surrounding. The balance should be far from heat sources and devices emitting strong electromagnetic or magnetic fields.

8. Preparing balance to work

1. Take the balance, the feeder and mechanical elements of the pan out. It is recommended to keep the original scale package in order to transport the balance safely in future.
2. Place the balance on a stable ground not affected by mechanical vibrations and airflows.
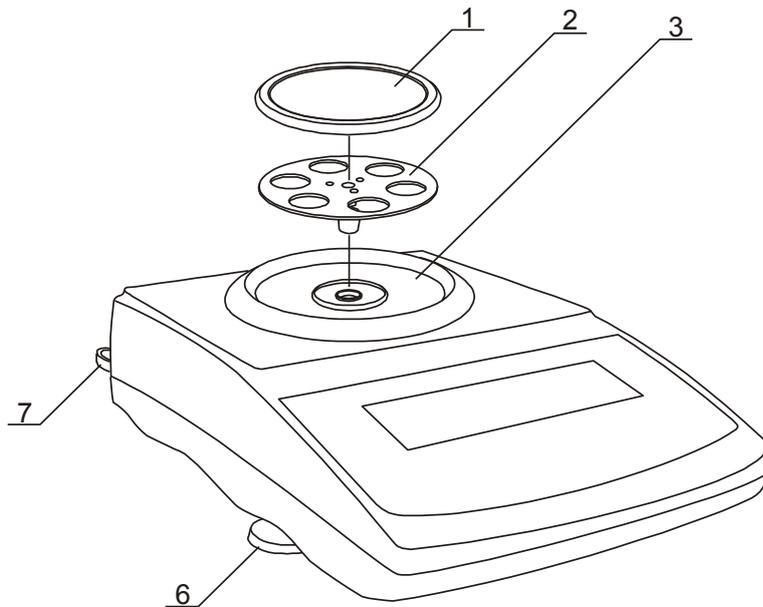
3. Level the balance with rotating legs _6_ so that the air bubble in water level _7_ at the back of the balance is in the middle.

4. (for AG100-AG600) Gently insert the mandrel of pan support _2_ into balance mechanism socket through the pan ring _3_ and the pan _1_ on (AG600 balances have not the pan ring).
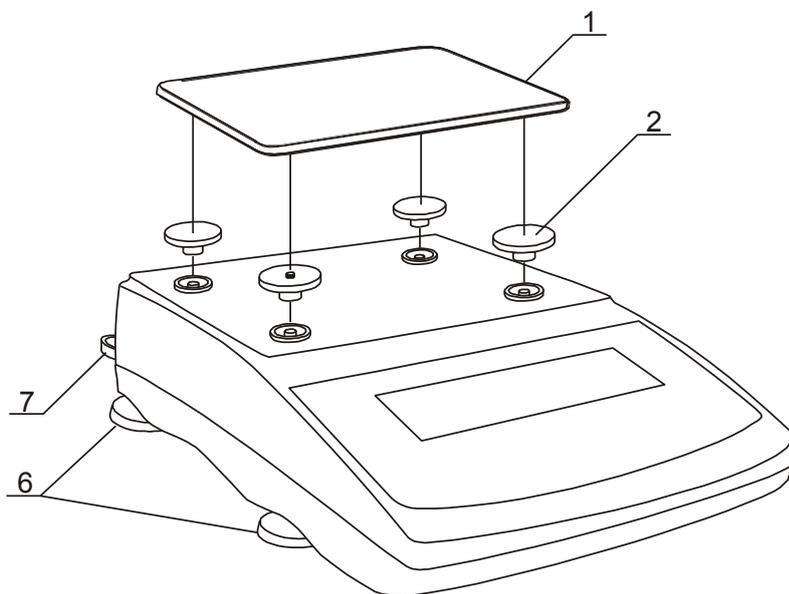
5. (for AG1000-AG4000) Place nuts _2_ on mandrels that are visible in balance cover holes, put the pan _1_ on nuts.

6. If the balance was taken from a lower temperature surrounding to a room with higher temperature, e.g. in winter, moisture can liquefy on the balance casing. Do not connect power supply to the balance, because this can cause damage or improper work of the balance. In this case leave the balance for at least 4 hours unplugged for acclimatization.

9. General operation principles

1. Weighed sample should be placed in the centre of the pan.

2. In direct sale use (d=e), make sure that →0← zero indicator is displayed before sample is placed on the pan. If not, press →0← key and wait until the balance is zeroed and zero indicator appears. In other balances the key does not operate.

3. The balance allows taring in the whole measuring range. To tare the balance press →T← key (on the left or on the right). Taring does not extend measuring range, but only subtracts tare value from mass value of a sample placed on the pan. To make the control of pan load easier and to avoid crossing measurement range, the balance has a load indicator calibrated 0÷100% Max.

4. Weighing result should be read when the indicator "➘ ➚" lights, which signalises stabilisation of a result.

5. When the balance is not used but should be ready to work immediately, it can be switched off by pressing I/⏻ key. The backlight of balance reading system is then switched off and the balance enters into "standby" mode, in which the balance maintains internal temperature and ability to start working with maximum accuracy. Standby mode is signalled by the *OFF* indicator. To switch the balance on press I/⏻ key.

6. Balance mechanism is a precise device sensitive to mechanical shocks and strokes.

    ⚠ Do not overload the balance more than 20% of maximum capacity.

    Do not press the pan with a hand.

    ⚠ For transportation take off the pan and pan support (AG(Z)100-AG(Z)600 balances) or nuts (AG(Z)1000-AG(Z)4000 and AGZ10 balances), on which the pan is placed.

7. The balance cannot be used to weigh ferromagnetic materials due to decrease of weighing accuracy.

8. After every change of balance position, level the balance and perform internal calibration.

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10. Start-up

Plug feeder into 230V power supply socket and feeder output connector into 12V socket at back of the balance.

```
┌─────────────────────────────────────────────────┐
│ model          INITIALIZATION      program version│
│                                                   │
│         √ Processor test                          │
│         √ Reading EEPROM                          │
│                 ...                               │
│                 ...                               │
│                                                   │
└─────────────────────────────────────────────────┘
```
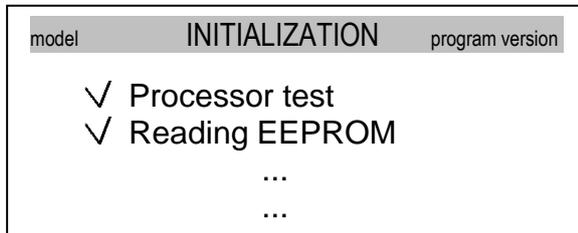
After switching-on, the balance displays AXIS logo and performs automatic self-tests. In case of test failure balance displays tests list. Lack of √ mark means negative test result.

```
┌─────────────────────────────────────────────────┐
│              AUTOCALIBRATION              .       │
│                                                   │
│         Internal calibration :                    │
│         please wait ...                           │
│                                                   │
└─────────────────────────────────────────────────┘
```
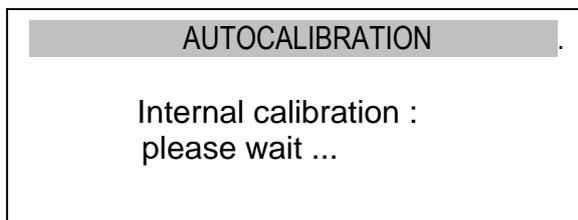
Afterwards the balance enters automatically into internal calibration mode, which is described with details in next chapter. Calibration can be terminated using *CLR* key.

```
┌─────────────────────────────────────────────────┐
│    Max ...   Min ...    e= ...    d= ..           │
│                                                   │
│                                                   │
│                 0.000 g                           │
│    0% |                          | 100%           │
└─────────────────────────────────────────────────┘
```

When internal calibration is finished, the balance enters into normal weighing mode.

11. Internal calibration

The balance is equipped with internal calibration system, which general task is to maintain required measurement accuracy on the balance.

Internal calibration is the process of putting internal weight on automatically by balance mechanism and correcting accuracy in balance firmware. The correction is necessary because of differences between values of gravitational acceleration in the place where the balance was manufactured and in the place where it is operated, as well as due to changes of balance level and temperature.

Internal calibration is performed in the following situations:
- when ▼ key is pressed,
- after defined time interval (for legally verified balances - 2 hours),
- after temperature change (for legally verified balances – more than 2^oC).

In legally verified balances time interval is set to 2 hours and defined temperature change is 2^oC. In not legally verified balances those values can be set as calibration options. The reason of starting internal calibration is shown as an icon near weight picture.

_____

In order to perform internal calibration proceed with the following:

CALIBRATION

▼ 🍶   Internal calibration ?
      (▼ - to confirm)

CALIBRATION

▼ 🍶   Internal calibration :
      taring ...

CALIBRATION

▼ 🍶 ↓   Internal calibration:
        internal load

●

●

●

Max ...   Min ...   e= ...   d= ...

0.000 g

0% |_____| 100%
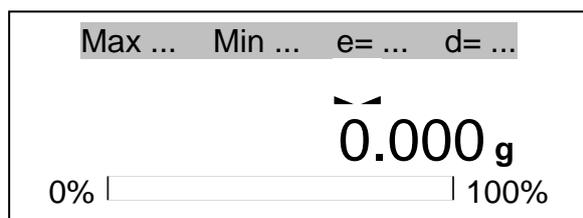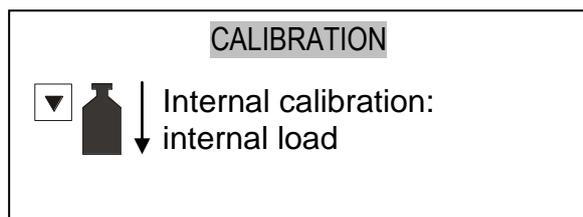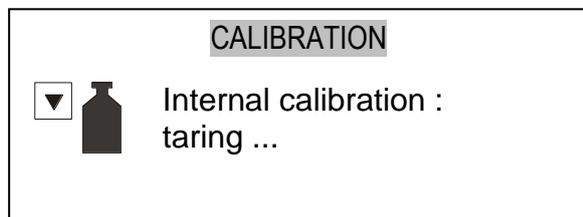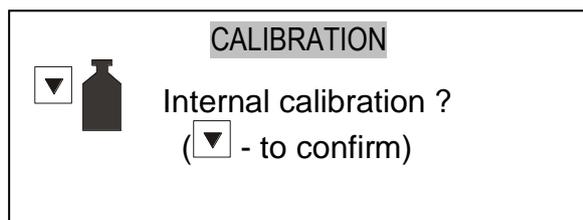
Empty the pan.
Press ▼ key twice (double pressing the key helps to avoid accidental starting calibration procedure).

During calibration internal weight is put three times on and obtained results are compared.
Discrepancy of results is signalled with a message and causes the balance being blocked.
Until calibration process is finished do not perform any operation on the balance. Any vibrations and shocks interfere calibration process and may delay it or deteriorate accuracy of its result.

When internal calibration is performed successfully the balance indicates zero on the display at empty pan.

Note:
In order to terminate calibration process press *CLR* key and wait until balance mechanism is not settled in initial position.

12. Checking the balance

In order to confirm correctness of the balance during its operation, before starting and after finishing every measurement series it is advised to check weighing accuracy. It can be done by weighing external calibration weight or other object with exactly known mass.

If exceeding of allowable measurement error is affirmed, the following things should be checked:

- if the balance stands stable and it is levelled,
- if the balance is exposed on rapid air blasts, vibrations, rapid temperature changes or air humidity,
- if the balance is not affected directly by heat source, electromagnetic radiation or magnetic field.

The cause of inaccuracy can be too low temperature of the balance as well, when it was unplugged from power supply. In this situation leave the balance switched on for several minutes in order to adjust its internal temperature.

If none of above causes of inaccuracy occurs, calibration with external weight should be performed to the balance. Recommended external calibration weight (to buy for additional charge) is given in technical data table. In order to calibrate the balance with external weight in legally verified balances verification seals should be removed and another legal verification should be performed. In this case it is recommended to contact authorised service centre.

Calibration with external weight is described in details in chapter 14.5.

13.   Connecting a computer, printer or label printer
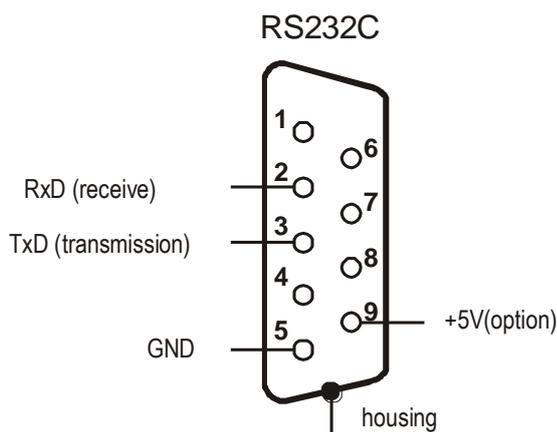
The scale is equipped with RS232C, which can be used to connect external devices such as computer or a printer.

When cooperating with computer, the scale sends weighing result after initialize signal from computer or after pressing ⤷ key on the scale.

When cooperating with a printer data is send automatically after result stabilisation, but next transmission is possible after removing previously weighted sample.

RS232C

1 ○
2 ○   ○ 6
RxD (receive)
3 ○   ○ 7
TxD (transmission)
4 ○   ○ 8
5 ○   ○ 9 — +5V(option)
GND

housing

When cooperating with label printer after pressing ⤷ key, the scale sends instructions set for the label printer. Label number 0001, hour, data (if the clock

is installed and on) and nett weight. During transmission *LabEL* communicate is displayed.

The way of sending data and transmission parameters is set using *SErIAL* special function.

Set of send data is set using special function *PrInt*.

The following data can be send:
- Header (scale type, Max, d, e, serial number),
- Operator identification number,
- Successive printout number (measurement),
- Identification number or product bar code,
- Number of pcs (PCS function only),
- Single detail mass (PCS function only),
- Nett weight,
- Tare (package mass),
- Gross weight,
- Total mass (Total function only).

Computer must have a special program for cooperation with data from a scale. Dedicated programs are also offered by AXIS.

Except RS232C joint, the scale can be equipped with USB or Wi-Fi interface. Needed controllers and instruction can be found on a CD supplied with Axis scales.

Detailed protocol description
LonG protocol

Communication parameters: 8 bits, 1 stop bit, no parity, baud rate 4800bps,

- initialising signal (data send order) – correspond to press ⤶ key

  Computer→Scale: S I CR LF (53h 49h 0Dh 0Ah),

  Scale→Computer: scale response according to description below (16 bytes):

Byte	1	-	sign „-" or space
Byte	2	-	space
Byte	3÷4	-	digit or space
Byte	5÷9	-	digit, decimal point or space
Byte	10	-	digit
Byte	11	-	space
Byte	12	-	k, l, c, p or space
Byte	13	-	g, b, t, c or %
Byte	14	-	space
Byte	15	-	CR
Byte	16	-	LF

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Attention:

Network number different than zero (*Port/nr* function) changes scale working mode: communication with a computer is possible after logging the scale in with 02h scale number command. To log the scale out use 03h command.

For example: Using a program to test RS232 interface (program is available in www.axis.pl / programy komputerowe) for scale number 1 please write: *$0201* to log in, then *SI*, and write: *$03* to close communication.

- Asking about scale presence in system (testing scale connection with computer):
  Computer→Scale: S J CR LF (53h 4Ah 0Dh 0Ah),
  Scale→Computer: M J CR LF (4Dh 4Ah 0Dh 0Ah),

- Displaying a inscription on scale's display (text communicate from computer):
  Computer→Scale: S N n n X X X X X X CR LF (53h 4Eh 0Dh 0Ah),
  nn-displaying time in seconds; XXXXXX-signs to display
  Scale→Computer: M N CR LF (4Dh 4Eh 0Dh 0Ah),

- Scale tarring (calling →*T*← key press) :
  Computer→Scale: S T CR LF (53h 54h 0Dh 0Ah),
  Scale→Computer: without response,

- Scale zeroing (calling →*0*← key press):
  Computer→ Scale: S Z CR LF (53h 5Ah 0Dh 0Ah),
  Scale →Computer: without response,

- Scale turning on / off (calling I/⏻ key press):
  Computer→ Scale: S S CR LF (53h 53h 0Dh 0Ah),
  Scale →Computer: without response,

- Entering to special function menu (calling *MENU* key press):
  Computer→ Scale: S F CR LF (53h 46h 0Dh 0Ah),
  Scale →Computer: without response,

- Setting low threshold value (option):
  Computer→ Scale: S L *D1...DN* CR LF (53h 4Ch *D1...DN* 0Dh 0Ah)
  D1...DN – threshold value, maximum 8 characters („-" – negative value, digits, dot – decimal separator), number of digits after dot should be the same as on scale display,
  Scale →Computer: without response,
  Example:
  · in order to set low threshold 1000g in scale B1.5 (d=0.5g) the following order should be sent:
  S L 1 0 0 0 . 0 CR LF (53h 4Ch 31h 30h 30h 30h 2Eh 30h 0Dh 0Ah),

· in order to set low threshold 100kg in scale B150 (d=50g) the following
order should be sent:

S L 1 0 0 . 0 0 CR LF (53h 4Ch 31h 30h 30h 2Eh 30h 30h 0Dh 0Ah),),

■ Setting high threshold value (option):
Computer→ Scale: S H *D1...DN* CR LF (53h 48h *D1...DN* 0Dh 0Ah),
D1...DN – threshold value (see)
Scale →Computer: without response.

Connecting cable WK-1 (scale – computer / 9-pin interface):
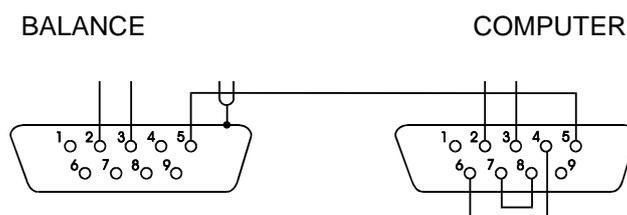
Connecting cable WD-1 (scale with AXIS printer):
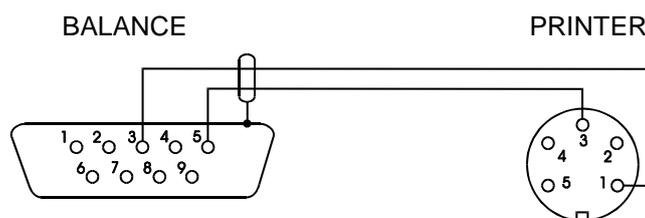
Setting internal AXIS printer swithces:

SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
on	off	on	off	off	on	off	off

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ELtron protocol

Transmission parameters: 8 bits, 1 stop bit, no parity, baud rate 9600bps,

- After using ⍈ key in scale:
- Scale→Label printer : set of instruction in EPL-2 language that initialize label printing:

US	- Steering instruction
FR"0001"	- Label number define instruction
?	- Instruction that starts list of variable signs
mm:gg	- 5 signs: minutes:hour
rrrr.mm.dd	- 10 signs: year.month.day
masa	- 10 signs: scale indication+ mass unit
P1	- Steering instruction

Attention:
1. Except variable signs constant signs also can be inscribed for example factory name, product name and so on.
2. In standard one label pattern is possible to prinout (number 0001). Using bigger amount of patterns (other label numbers) is possible thanks to *LAbEL* special function.
3. To achieve label printout, label printer must have inscribed label pattern (label pattern is created on computer and using computer it is saved to label printer memory). Label pattern is designed by ZEBRA DESIGNER program which is supplied together with label printer.

Scales parameters and transmission protocol must corespond to label printer type.

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14. Special functions

All balances, beside basic metrological functions like weighing and taring, are equipped with set of special functions. Basic set of special functions is shown below. In respect of metrology calibration with external weight is important special function.

To avoid showing too many functions in menu, user can choose which functions should be displayed in menu and should not. *Menu settings* function is used for this.

When *Menu* key is pressed, the balance shows special functions menu. Function activation is performed with the cursor (dark background). In factory settings user can only choose from *Menu setting* and *Default settings.*

```
        USER FUNCTIONS&OPT.

  ☐  Menu settings
  ☐  Default settings
  ☐  Exit
```

In *Menu settings* window choose the functions, which should be currently used in menu. The choice is made by selecting a function with a cursor and pressing *ENTER* key. The functions selected to use in menu should be signified with √ mark.

```
   USER FUNCTIONS&OPT. / ENABLING

  √   Autotaring
  √   PCS counting
      Unit selection
      Percent
      Calibration
  √   Serial Port
      Print settings
      Time&Date settings
      LCD settings
      ...
      Exit
```

To quickly go from functions menu to *Menu settings* window press ↻ key.

For moving the cursor, navigation keys ∨ and ∧ are used.

⊡ - means the function is active

☐ - means the function is inactive

Pressing *ENTER* key causes opening a window of function selected with the cursor. When < key is pressed, the balance returns to previous window

```
        USER FUNCTIONS&OPT.

  ⊡  Autotaring
  ☐  PCS counting
  ☐  Serial Port
  ☐  Menu settings
  ☐  Default settings
     Exit
```

_____

14.1 Autotaring function

This function automatically keeps zero indication when a pan is empty or zero indication was forced with →T← key.

```
        USER FUNCTIONS&OPT.

   ⊡  Autotaring
   ☐  PCS counting
                 • • •
```
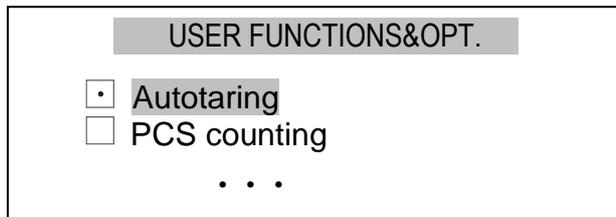
Press *Menu* key to enter the user function menu, choose *Autotaring* and press *ENTER* key.

```
 USER FUNCTIONS&OPT. \ AUTOTARING

  1. Activate
  2. Correction range:      2.0    d/sec
  3. Exit
```
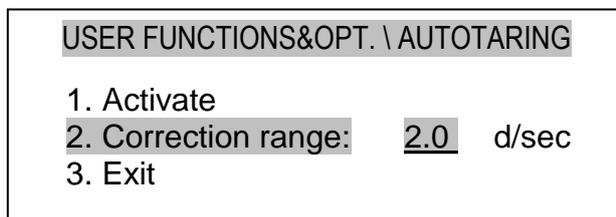
Choose *Correction range* using ∨ and ∧ keys and press *ENTER* key.
Enter maximum zero flow to be automatically corrected by *Autotaring* function. Allowed range is $0.5 \div 5$ (in balance reading units per second).

```
 USER FUNCTIONS&OPT. \ AUTOTARING

  1. Activate
  2. Correction range:    2.0  d/sec
  3. Exit
```
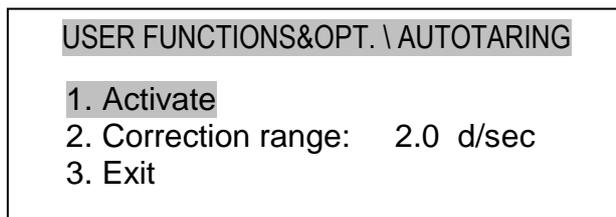
Choose *Activate* option with a cursor and press *ENTER*.

```
  Max ...   Min ...   e= ...   d= ..

                    ⤙⤚ AUT
           0.000 g
  0% |̲_____|̲ 100%
```

Indications that are near to zero will be automatically corrected and zero indication will be maintained despite changing environmental conditions (temperature, air humidity, etc.)

To stop the function press *Menu* key to enter user functions menu, choose *Autotaring* function and then choose *Deactivate* option.

_____

14.2 Pieces counting function

Pieces counting function allows determining the number of items in weighed sample according to:
1. Reference sample with known number of pieces (unitary mass is not known),
2. Unitary mass of an item.

1. Unitary mass is not known but user has got a sample.

```
┌─────────────────────────────────────┐
│ Max ...    Min ...    e= ...   d= ..      II │
│                                      │
│                 ⌣                    │
│            2.000 g                   │
│  0% ■■■■■■□□□□□□□□□□ 100%             │
└─────────────────────────────────────┘
```
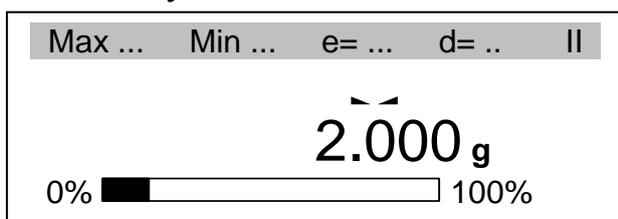
Place a sample with known number of pieces on the pan.
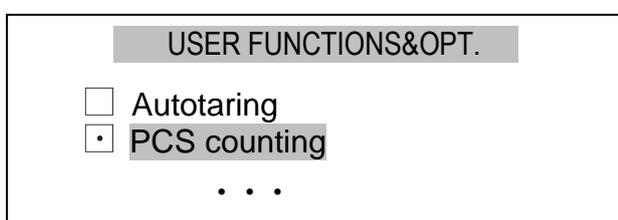
```
┌─────────────────────────────────────┐
│        USER FUNCTIONS&OPT.           │
│                                      │
│   ☐  Autotaring                      │
│   ⊡  PCS counting                    │
│             • • •                    │
└─────────────────────────────────────┘
```

Press *Menu* key to enter the user function menu, choose *PCS counting* with the cursor and press *ENTER* key.

```
┌─────────────────────────────────────┐
│ USER FUNCTIONS&OPT. \ PCS COUNTING   │
│                                      │
│   1.Activate                         │
│   2.Sample quantity                  │
│   3.Unit weight      :    none    •  │
│   4.Exit                       •••   │
│                              •••• •••│
└─────────────────────────────────────┘
```
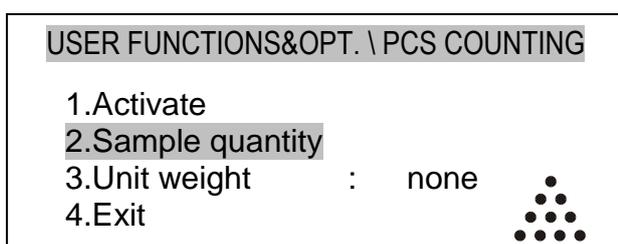
Choose *Sample quantity* option and press *ENTER* key.

```
┌─────────────────────────────────────┐
│ USER FUNCTIONS&OPT. \ PCS COUNTING   │
│                                      │
│   1.Activate                         │
│   2. Sample quantity :    12      •  │
│   3. Unit weight               •••   │
│   4. Exit                   •••• •••│
└─────────────────────────────────────┘
```
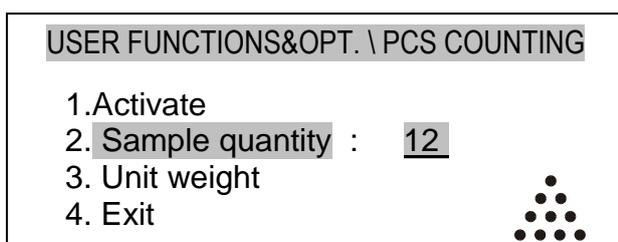
Using numeric keys enter the quantity of pieces in the sample and press *ENTER* key.

```
┌─────────────────────────────────────┐
│   Max ...    Min ...   e= ...   d= .. │
│   •                                  │
│  •••        ⌣  PCS                   │
│ •••••                                │
│ •••••       12 pcs                   │
│  0% ■■■□□□□□□□□□□ 100%                │
└─────────────────────────────────────┘
```
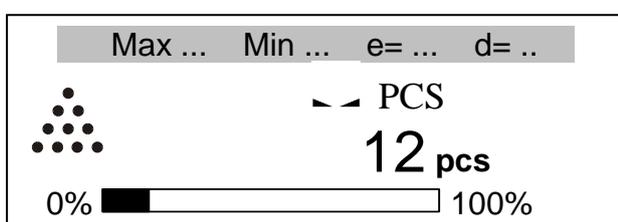
The balance calculates unitary mass of an item (unit weight) basing on given number of pieces and sample weight and then shows number of pieces on the display.
If a change of sample parameters is not required during next use of the function, start the function choosing *Activate* option and pressing *ENTER* key.

To stop the function press *Menu* key, choose *PCS counting* function and then choose *Deactivate* option.

Note:
In order to show mass value temporarily and return to pieces indication press ↻ key.

_____

2. Unitary mass of an item (unit weight) is well known.
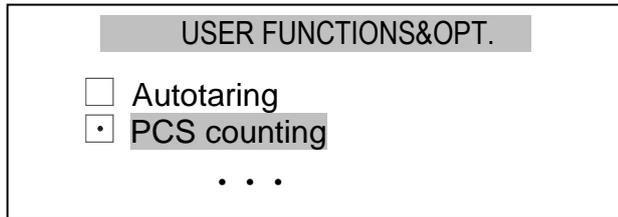
USER FUNCTIONS&OPT.	Press *Menu* key to enter the user function menu, choose *PCS counting* with the cursor and press *ENTER* key.

```
        USER FUNCTIONS&OPT.

   ☐  Autotaring
   ⊡  PCS counting
            • • •
```

Press *Menu* key to enter the user function menu, choose *PCS counting* with the cursor and press *ENTER* key.

```
USER FUNCTIONS&OPT. \ PCS COUNTING

  1.Activate
  2.Sample quantity
  3.Unit weight       :     0.198 g
  4.Exit
```
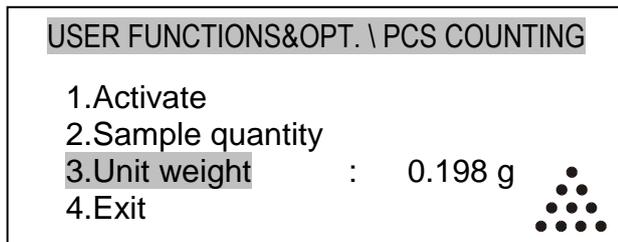
Choose *Unit weight* option with the cursor and press *ENTER* key.

```
USER FUNCTIONS&OPT. \ PCS COUNTING

  1.Activate
  2.Sample quantity
  3.Unit weight       :     0.2 g
  4.Exit
```
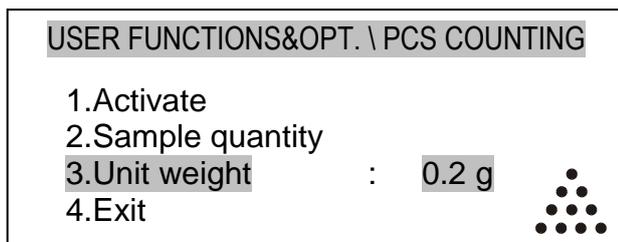
Enter unit weight value using numeric keys and press *ENTER* to accept it. The unit weigh value is stored in balance memory until switching the balance off.

```
   Max ...   Min ...   e= ...   d= ..


                        0 pcs
0%                           100%
```
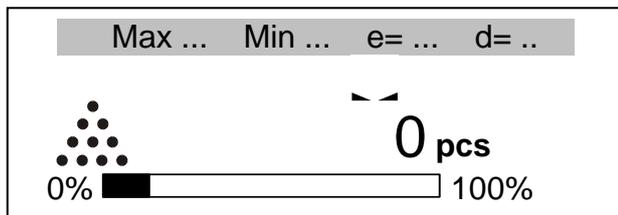
The balance displays pieces quantity.

Note: To correct wrong digits when entering unit weight, press < key to delete the last number or CLR to leave the function and proceed from the beginning.

14.3 Unit selection function

The function allows choosing the unit of mass indication.
The following units can be selected:
- gram (g)
- kilogram (kg)
- miligram (mg)
- carat: 1ct=0,2g
- pound: 1lb=453,592374g
- grain: 1gr=0,06479891g
- ounce: 1oz=28,349523g
- ounce troy: 1ozt=31,1034763g
- pennyweight: 1dwt=1,55517384g

USER FUNCTIONS&OPT.	
☐ Autotaring	
☐ PCS counting	
☐ Unit selection	
· · ·	
Exit	
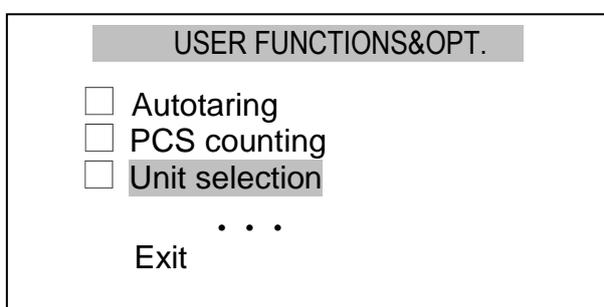
Press *Menu* key, choose *Unit selection* with the cursor and press *ENTER* key.

USER FUNCTIONS&OPT. \ UNIT SELECTION	
1. Unit : gram	
2. Exit	
g	
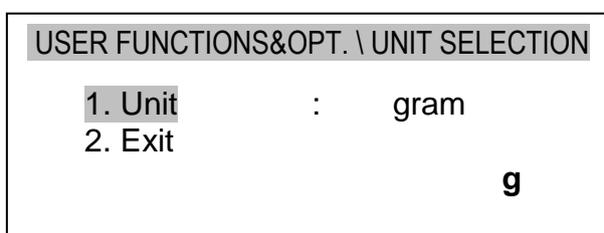
Press > key to enter unit field.

USER FUNCTIONS&OPT. \ UNIT SELECTION	
1. Unit : < gram >	
2. Exit	
g	
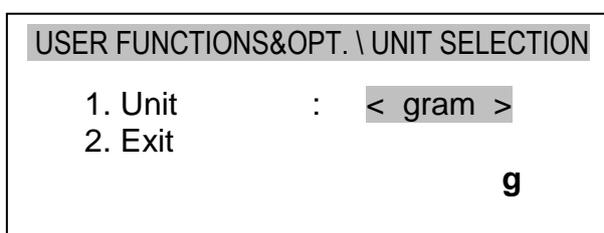
Using > and < keys choose proper unit and press *ENTER* key.
Press < key or choose *Exit* option to return to weighing.

_____

14.4 Percent function

The function allows replacing indication in mass units with percentage values according to assigned reference mass.

```
┌─────────────────────────────────────┐
│ Max ...    Min ...    e= ...   d= ..   II │
│                                       │
│                  ‿                    │
│            20.000 g                   │
│  0% ▆▂▂▂▂▂▂▂▂▂▂▂▂ 100%                │
└─────────────────────────────────────┘
```
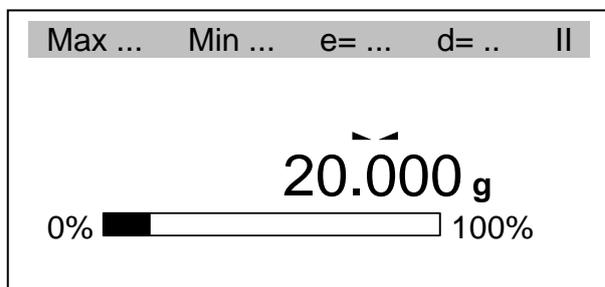
Put a mass referenced to 100% on the pan.

```
┌─────────────────────────────────────┐
│         USER FUNCTIONS&OPT.          │
│                                       │
│   ☐  Autotaring                       │
│   ☐  PCS counting                     │
│   ☐  Unit selection                   │
│   ☐  Percent                          │
│              • • •                    │
└─────────────────────────────────────┘
```
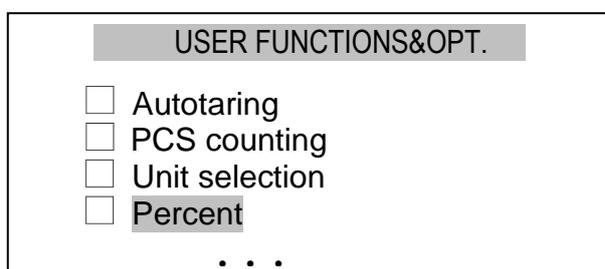
Press *Menu* key, choose *Percent* with the cursor and press *ENTER* key.

```
┌─────────────────────────────────────┐
│  USER FUNCTIONS&OPT. \ PERCENT       │
│                                       │
│  1. Activate                          │
│  2. Exit                              │
│                            %          │
└─────────────────────────────────────┘
```
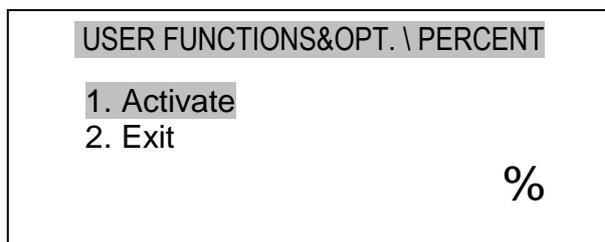
Choose *Activate* option with the cursor and press *ENTER* key to display percentage indication.

```
┌─────────────────────────────────────┐
│ Max ...    Min ...    e= ...   d= ..   II │
│                            PRO        │
│                  ‿                    │
│           100.000 %                   │
│  0% ▆▂▂▂▂▂▂▂▂▂▂▂▂ 100%                │
└─────────────────────────────────────┘
```
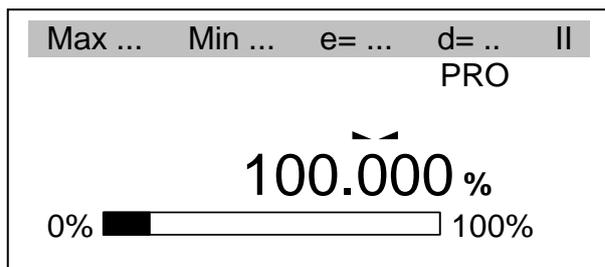
To stop the function enter *Percent* function menu and use *Deactivate* option.

Comments:

1.   In order to show mass value in grams temporarily and return to percentage indication press ↻ key.

2. According to a mass referenced to 100% percentage indications will be displayed in different formats. For reference mass in range 0÷3,5% of balance capacity, displayed result will be shortened of two decimal places, in range 3,5÷35% - shortened of one decimal place, above 35% - in full accuracy.

14.5 Function for calibration with external weight / calibration options

Calibration with external weight should be performed if balance accuracy after internal calibration is not satisfactory. Calibration weight stated in technical data table for the balance (or of better accuracy) with valid verification certificate should be used then.

⚠️   Calibration of legally verified balance requires violating a mark used to protect an access to adjustment switch and results in loosing legal verification. To renew legal verification of the balance, it is necessary to contact a service centre or notified body.
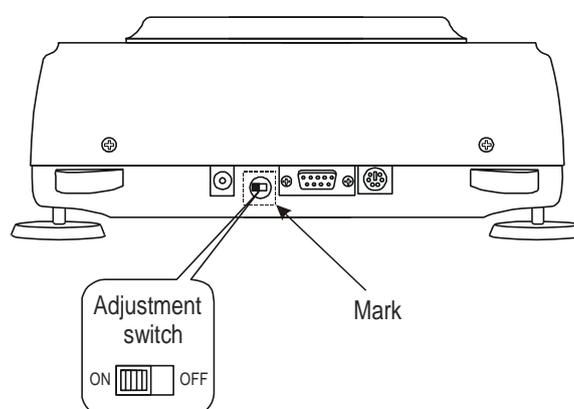
In legally verified balances performing calibration requires changing adjustment switch position, which is placed behind protecting mark (sticker) of a notified body. An access to the switch is possible only after removing the mark. Therefore, balance calibration causes lost of legal verification and, in consequence, the necessity of renew legal verification in the nearest notified body or in place where the balance is used.

Before proceeding with calibration of legally verified balance, adjustment switch should be set to *ON* position using thin screwdriver (the balance will display the message *Calibration switch ON!* and generate a sound). When calibration process, described on next page, is finished, the balance will display the message *Calibration switch ON!*. Adjustment switch should be set to *OFF* position using thin screwdriver (the balance will move to weighing).

_____

Steps during calibration with external weight:

```
┌─────────────────────────────────┐
│      USER FUNCTIONS&OPT.         │
│                                 │
│  ☐ Autotaring                   │
│  ☐ PCS counting                 │
│         . . .                   │
│  ⊡ Calibration                  │
│         . . .                   │
│                                 │
└─────────────────────────────────┘
```

Press *Menu* key, choose *Calibration* option with the cursor and press *ENTER*.

```
┌─────────────────────────────────────┐
│ USER FUNCTIONS&OPT. \ CALIBRATION   │
│                                     │
│  1. External calibration            │
│  2. External load      :   200g     │
│  3. Time of calibration :   2h      │
│  4. Temp. of calibration : 2.0°C    │
│  5. Report printout                 │
│  6. Exit                            │
└─────────────────────────────────────┘
```
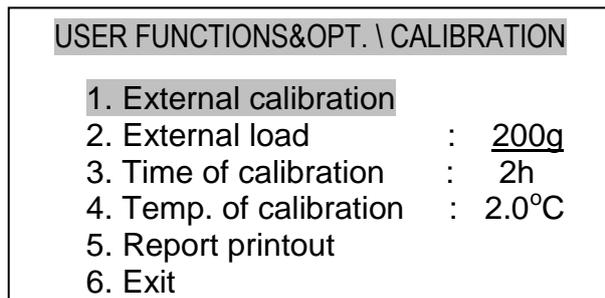
Check if *External load* value matches the value of external weight used for calibration. If not, choose *External load* option and enter correct value.

Choose *External calibration* option with the cursor and press *ENTER*.

```
┌─────────────────────────────────┐
│           CALIBRATION           │
│                                 │
│   █    External calibration:    │
│   █    taring ...               │
│                                 │
└─────────────────────────────────┘
```
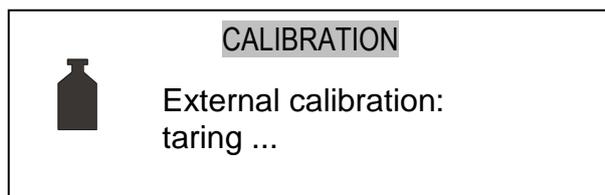
Wait until taring process is finished.

```
┌─────────────────────────────────┐
│           CALIBRATION           │
│                                 │
│   █ ↓  External calibration:    │
│   █    Put external load  200.000 g │
│                                 │
└─────────────────────────────────┘
```
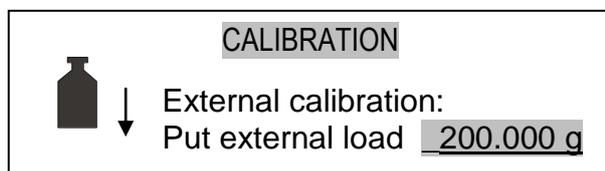
Put calibration weight matching displayed value on.

```
┌─────────────────────────────────┐
│           CALIBRATION           │
│                                 │
│   █ ↑  External calibration:    │
│   █    take off ext. load       │
│                                 │
└─────────────────────────────────┘
```
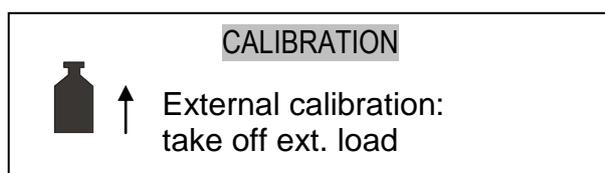
Take off the calibration weight.

```
┌─────────────────────────────────┐
│           CALIBRATION           │
│                                 │
│   █    Internal calibration:    │
│   █    please wait ...          │
│                                 │
└─────────────────────────────────┘
```
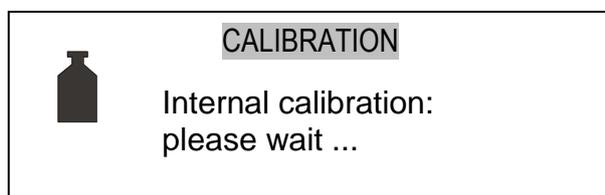
Wait until internal calibration is finished.

```
┌─────────────────────────────────┐
│  Max ...  Min ...  e= ...  d= ...│
│                                 │
│              ‿                  │
│         0.000 g                 │
│                                 │
│ 0% └──────────────────┘ 100%    │
└─────────────────────────────────┘
```
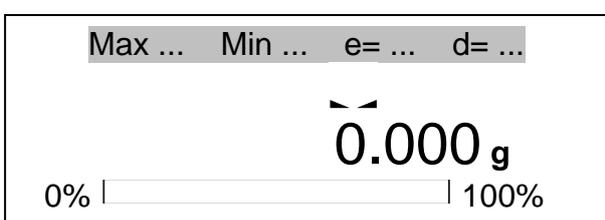
The balance is ready to work.

Calibration options (internal and external):

Except of *Report printout*, calibration options are available after changing position of adjustment switch.

```
  USER FUNCTIONS&OPT.

☐ Autotaring
☐ PCS counting
          . . .
☐ Calibration
          . . .
```

Press *MENU* key, choose *Calibration* option with the cursor and press *ENTER*.

```
USER FUNCTIONS&OPT. \ CALIBRATION

  1. External calibration
  2. External load        :   200g
  3. Time of calibration  :    2h
  4. Temp. of calibration :   2.0°C
  5. Report printout
  6. Exit
```

External load option allows entering the value of external weight used for calibration. Choose *External weight* option with the cursor, press *ENTER* key and use $>$ and $<$ keys to select desired value. Several standard values are available, but it is advised to use as great weight value as possible.

```
USER FUNCTIONS&OPT. \ CALIBRATION

  1. External calibration
  2. External load        :   200g
  3. Time of calibration  :    2h
  4. Temp. of calibration :   2.0°C
  5. Report printout
  6. Exit
```

Time of calibration option allows defining the time, after which the balance performs internal calibration automatically. *Temp. of calibration* option allows to define the change of environment temperature, at which internal calibration will be performed automatically. Values of the options are selected as with external load above.

```
USER FUNCTIONS&OPT. \ CALIBRATION

  1. External calibration
  2. External load        :   200g
  3. Time of calibration  :    2h
  4. Temp. of calibration :   2.0°C
  5. Report printout
  6. Exit
```

If external printer is connected to the balance, *Report printout* option allows obtaining calibration data of the balance, which proofs that calibration process was performed correctly and may be useful for balance diagnostics.

_____

The form of calibration report printout

Date : ... Time: ...

-----------Calibration report-----------

Date of production: ...

Scale type:

Serial number: ...

Program version: ...

Adjustation no.: ...

Date of adjustation:

Temperature of adjust.:

Factory external weight: ...   - external weight value registered during factory calibration

Factory internal weight: ...   - internal weight value registered during factory calibration

Current external weight: ...   - external weight value registered during last calibration

Current internal weight: ...   - internal weight value registered during last external calibration

Weight difference: ...   - difference between internal weight values: factory value–current value

14.6 Function for setting serial port

To enable cooperation with a printer (or a computer), transmission parameters in both devices have to be the same.
This function allows to set the following transmission parameters:
- send and receive baud rate (1 200 ÷ 115 200bps),
- number of bits in single character (7 or 8 bit),
- parity control (none, even, odd),
- protocole type (default protocol is LONG),
- transmission mode (after pressing ⇨ key if result is stable, after pressing ⇨ key independently of stable result, automatically after putting a load on the pan and weighing result stabilisation, continuous transmission every 0,1s).

```
        USER FUNCTIONS&OPT.

   ☐  Autotaring
   ☐  PCS counting
            . . .
   ☐  Serial port
            . . .
```
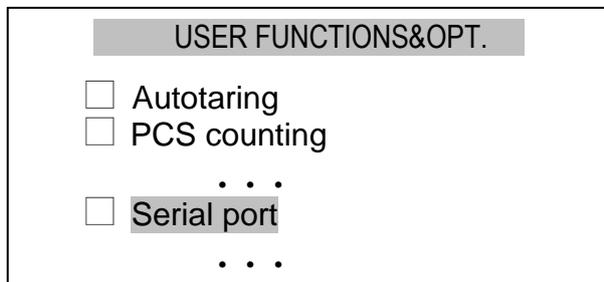
Press *MENU* key, choose *Serial Port* with the cursor and press *ENTER* key.

```
  USER FUNCTIONS&OPT./SERIAL PORT


    1. Port 1
    2. Port 2
    3. Wyjście
```
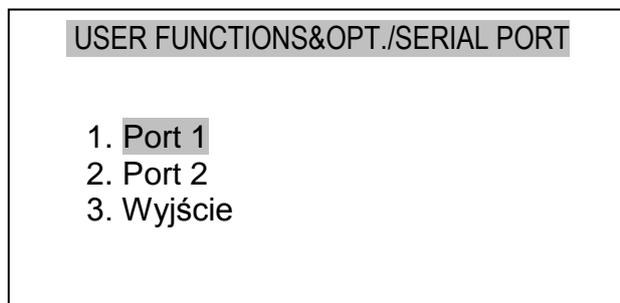
Check if port interface settings are compliant with parameters of connected external device. If not, using ∨ and ∧ keys move the cursor on parameter that should be set and press *ENTER* key.

```
      SERIAL PORT  \  PORT  1

  1. Baudrate      :        4800
  2. Bits          :        8-bit
  3. Parity        :        none
  4. Protocol      :        LONG
  5. Sending mode  : button+stab.
  6. Exit
```
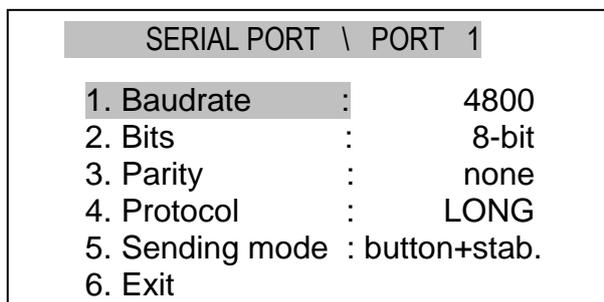
Set proper value of parameter using < and > keys and press *ENTER*.
Leave the function by pressing *MENU* key or using *Exit* option.

```
      SERIAL PORT  \  PORT  1

  1. Baudrate      :       <4800>
  2. Bits          :        8-bit
  3. Parity        :        none
  4. Protocol      :        LONG
  5. Sending mode  : button+stab.
  6. Exit
```

_____
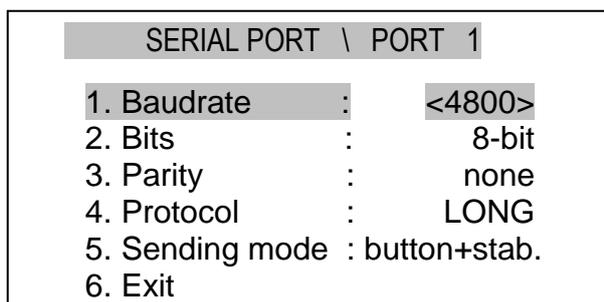
```
        USER FUNCTIONS&OPT

  ☐ Autotaring
  ☐ PCS counting
           • • •
  ⊡ Label
     Exit
```

```
   USER FUNCTIONS&OPT \ LABEL

  1. Address      :
  2. Exit
```

```
   USER FUNCTIONS&OPT \ LABEL

  1. Address      : 2345
  2. Exit
```

```
   USER FUNCTIONS&OPT \ LABEL

  1. Address      : 2345
  2. Exit
```

If the protocol is set to ELTRON (cooperation with label printer), in user function menu *Label* function activates.

This protocol allows printing scale indication and optionally date and time on label printer, as variable texts. Other data, e.g. company address, product name, its bar code can appear on label as constant fields. Label forms used by user, named as a numeric value (max. 4 digits) should be previously stored in printer memory according to printer user manual.

Choosing label form is performed by entering label number using *LAbEL* function.

14.7 Print settings function

This function allows to attach the following information to a printout:
- numbers of succesive measurements,
- date and time near each measurement.

```
        USER FUNCTIONS&OPT.

    ☐  Autotaring
    ☐  PCS counting
            • • •
    ☐  Print settings
            • • •
```
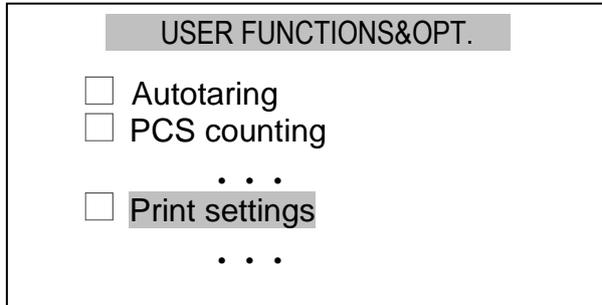
Press *MENU*, choose *Print settings* with the cursor and press *ENTER* key.

```
USER FUNCTIONS&OPT. \ PRINT SETTINGS

    ☐  Header
    ☐  Values
    ☐  Footer
    ☐  ID1
    ☐  ID2
    ☐  ID3
       Exit
```
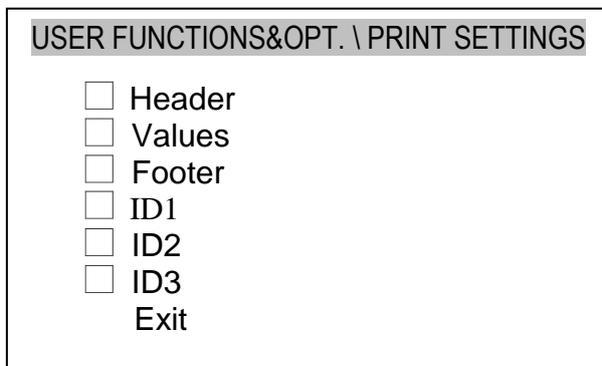
Select desired options using ∨ and ∧ keys and pressing *ENTER* key.
Use numeric keys to fill *ID1-3* field values. To delete last character use < key.

Header - the entrance to the printout header definition menu; ☐ sign indicates if at least one option in the *Header* definition menu is checked.

Header definition menu

```
    \ PRINT SETTINGS \ HEADER

    ☐  Blank line
    ☐  Mode name
    ☐  Date & time
    ☐  Balance type
    ☐  Serial number
    ☐  ID1
    ☐  ID2
    ☐  ID3
    ☐  Signature
       Exit
```
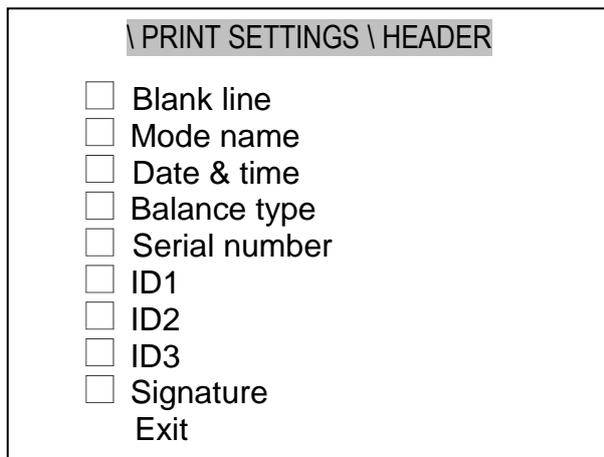
An element is checked/unchecked if *ENTER* key is pressed. Checked element will appear in a printout header if the *Header* element in *Values* definition menu is checked as well.

_____

An example of a full header printout:


```
                                                      ← blank line
-------------- WEIGHING --------------                ← mode name
 Date : 2000-04-25        Time : 22:32                ← date and time
 Scale type           : AGNZ200                       ← balance type
 Serial number        :  123456                       ← serial number
 ID1 string                                           ← ID1
 ID2 string                                           ← ID2
 ID3 string                                           ← ID3
 Signature                                            ← signature
 .....................................
```


Values - the entrance to printout values definition menu; ⊡ sign indicates if at least one option in *Values* definition menu is checked.

Values definition menu

```
       \ PRINT SETTINGS \ VALUES

        ☐ Header
        ☐ Blank line
        ☐ ID1
        ☐ ID2
        ☐ ID3
        ☐ Measur. number
        ☐ Tare
        ☐ Net
        ☐ Gross
        ☐ LCD result
          Exit
```

An element is checked/unchecked if *ENTER* key is pressed.
Tare, *Net* and *Gross* values are always expressed in grams. The value *LCD result* always indicates display state with an active unit.

An example of a full values printout (without header):


```
                                                      ← blank line
 ID1 string                                           ← ID1
 ID2 string                                           ← ID2
 ID3 string                                           ← ID3
 Measurement number : 1                               ← measurement number
 T        0.0000  g                                   ← tare
 N       66.7425  g                                   ← net
 B       66.7425  g                                   ← gross
 LCD   333.7125 ct                                    ← LCD result
```

Footer - the entrance to the printout footer definition menu; ⊡ sign indicates if at least one option in *Footer* definition menu is checked.

Footer definition menu

```
\ PRINT SETTINGS \ FOOTER

 ☐ Blank line
 ☐ Mode name
 ☐ Date & time
 ☐ Balance type
 ☐ Serial number
 ☐ ID1
 ☐ ID2
 ☐ ID3
 ☐ Signature
 ☐ Dash line 3
 ☐ 3 blank lines
    Exit
```

An element is checked/unchecked if *ENTER* key is pressed.

An example of a full printout footer :

```
                                              ← blank line
------------ PCS COUNTING -------------        ← mode name
 Date : 2000-04-25        Time : 23:05         ← date and time
 Scale type          : AGNZ200                 ← balance type
 Serial number       :  123456                 ← serial number
 ID1 string                                    ← ID1
 ID2 string                                    ← ID2
 ID3 string                                    ← ID3
 Signature                                     ← signature
 ......................................
 ----------------------------------------      ← separating line
                                               ← 3 empty lines
```

ID1, ID2, ID2 - strings (max. 20 characters) typed using PS2 keyboard or balance numeric keypad, which works similarly to mobile keyboard (characters coupled with relevant key appear in first line of the display after the key is pressed); typed string is approved with *ENTER* key, last character can be deleted using < key.

_____

14.8 Time and date setting function

The function allows to set current date and time, used in printouts:

```
     USER FUNCTIONS&OPT.

   ☐ Autotaring
   ☐ PCS counting
           · · ·
   ⊡ Time&date setting
           · · ·
```

Press *MENU*, choose *Time&date setting* with the cursor and press *ENTER* key.

```
USER FUNCTIONS&OPT.\TIME&DATE SETTING

  1. Time    :           09:11:03
  2. Date    :         2006-03-31
  3. Code
  4. 12/24   :                24H
  5. Form    :      YYYY-MM-DD
  6. Exit
```

Select desired option using ∨ and ∧ keys and press *ENTER*.
User can choose from:
Time – entering time,
Data – entering date,
CODE – securing access for changing data,
12/24 – time format selection (12 hours or 24 hours),
Form. – change data format (YYYY-MM-DD=year-month-day)

```
USER FUNCTIONS&OPT.\TIME&DATE SETTING

  1. Time:              09:11:03
  2. Date    :         2006-03-31
  3. Code
  4. 12/24   :                24H
  5. Form    :      YYYY-MM-DD
  6. Exit
```

Enter current values using numeric keys. Press *ENTER* to accept.

14.9 LCD settings function

This function allows to set contrast and backlight of balance display:

```
   USER FUNCTIONS&OPT.

 ☐ Autotaring
 ☐ PCS counting
        . . .
 ⊡ LCD settings
        . . .
```
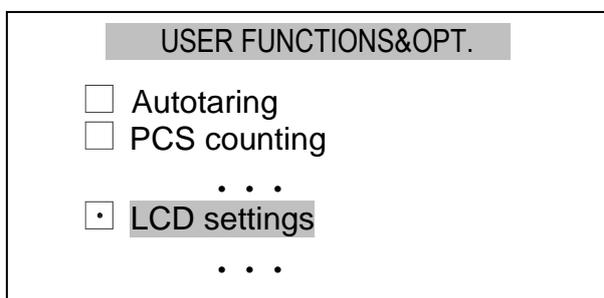
Press *MENU*, choose *LCD settings* with the cursor and press *ENTER* key.

```
 USER FUNCTIONS&OPT. \ LCD SETTINGS

 1. Contrast       :      ▭══▭  8
 2. Backlight      :      ON
 3. Exit
```
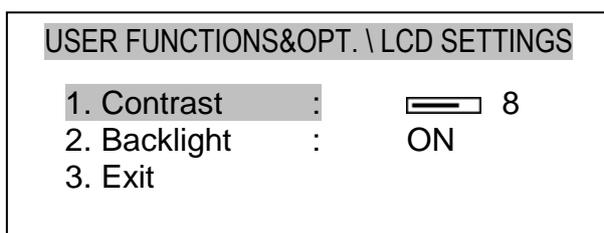
Choose *Contrast* option using ∨ and ∧ keys and press *ENTER* key.

```
 USER FUNCTIONS&OPT. \ LCD SETTINGS

 1. Contrast       :    <══▭> 12
 2. Backlight      :      ON
 3. Exit
```
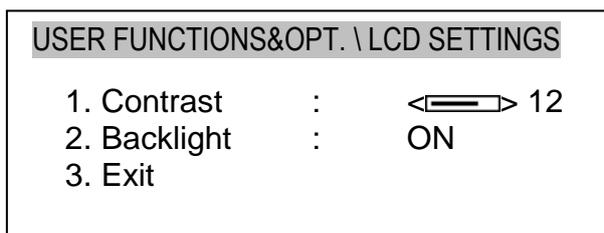
Select desired contrast value using < and > keys. Press *ENTER* to accept.

```
 USER FUNCTIONS&OPT. \ LCD SETTINGS

 1. Contrast       :    ▭══▭  12
 2. Backlight      :      ON
 3. Exit
```
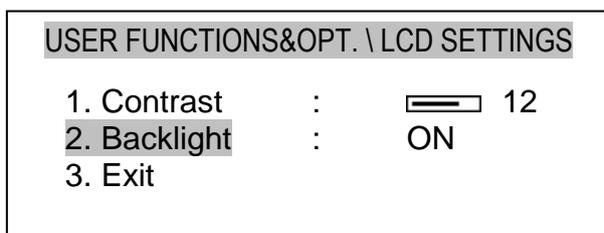
Choose *Backlight* option using ∨ and ∧ keys and press *ENTER* key.

```
 USER FUNCTIONS&OPT. \ LCD SETTINGS

 1. Contrast       :    ▭══▭  12
 2. Backlight      :    <OFF>
 3. Exit
```
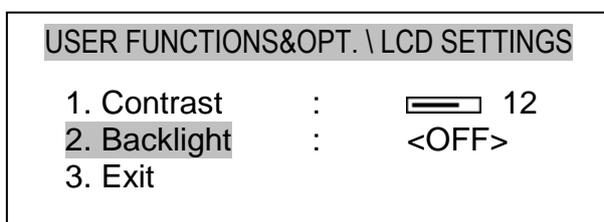
Turn display *Backlight* on or off using ∨ and ∧ keys. Press *ENTER* to accept.

_____

14.10 Recipe function

This function allows for weighing few ingredients in sequence in one vessel, with the possibility of continuous reading of summary mass value of all ingredients weighed so far.

USER FUNCTIONS&OPT.
☐ Autotaring
☐ PCS counting
• • •
⊡ Recipe
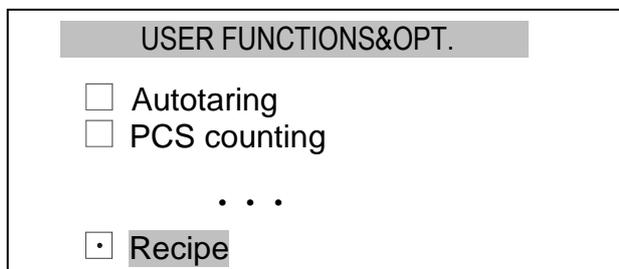
Press *MENU* key to enter the user functions menu, select *Recipe* with cursor and press *ENTER*.

USER FUNCTIONS&OPT. \ RECIPE
1. Activate
2. Reset
3. Exit

Using ∨ and ∧ keys, move cursor to *Activation* and press *ENTER*.

Max ...   Min ...   e= ...   d= ..
Σ=0.000g
n=0   SUM
0.000 g
0% ▭ 100%
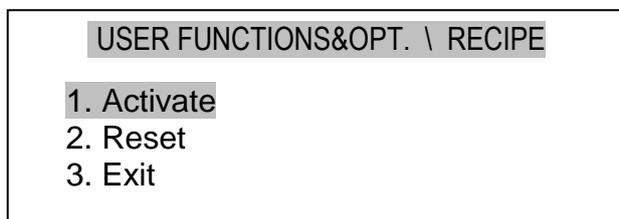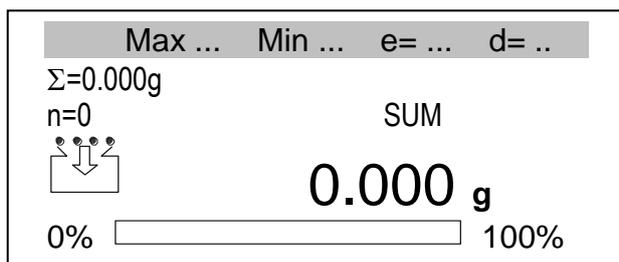
The balance is ready for weighing the successive ingredients, and after each ingredient it is necessary to press →*T*← key. It will zero the balance indications. On the left side the sum of previously weighed ingredients (Σ) and their number (n) is displayed.

To read the total mass of all weighed ingredients use ↺ key (pressing it again will cause return to ingredient weighing).

USER FUNCTIONS&OPT. \ RECIPE
1. Deactivate
2. Reset
3. Exit
Total weight: 0.000g
Number of ingred.:   0
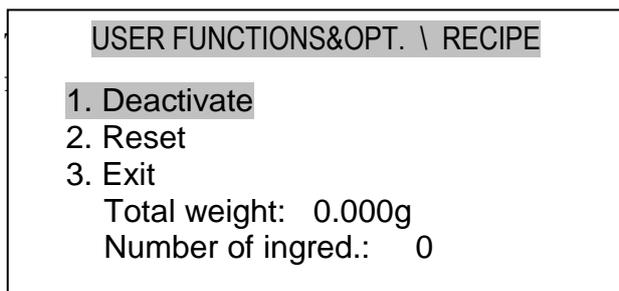
enter the user functions menu, select *Recipe*

14.11 Animals weighing function

This function allows for weighing of an animal, moving on the balance, by averaging of momentary values, measured by the balance. The samples number and sampling time, as well as operation mode are set by the balance operator.

```
        USER FUNCTIONS&OPT.

     □ Autotaring
     □ PCS counting
              • • •
     · Animal weighing
```
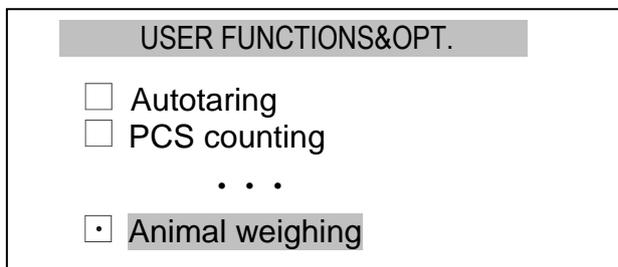
Press *MENU* key to enter the user functions menu, select *Animals weighing* with cursor and press *ENTER*.

```
   USER FUNCTIONS&OPT. \ ANIMAL

 1. Activate
 2. Number of samples:   1
 3.Sampling time:  0.1 sek
 4.Mode:          autom.
 5.Start treshold:      5.000g
 6. Exit
```
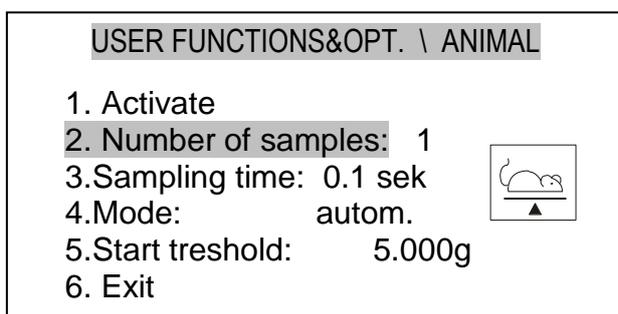
Using ∨ and ∧ keys, move cursor to *Samples number*, press *ENTER* and type in the value with digital keys. Finish by pressing *ENTER*.
In the same way set the sampling time (minimum time is 0.1 s).
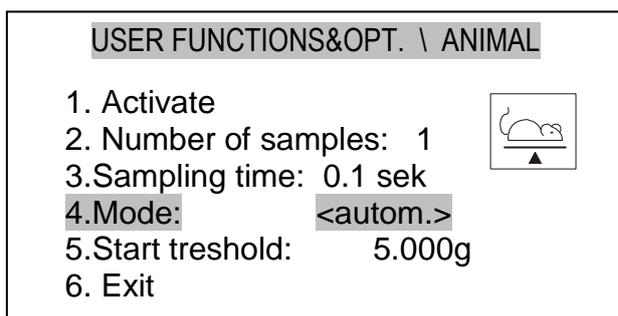
```
   USER FUNCTIONS&OPT. \ ANIMAL

 1. Activate
 2. Number of samples:   1
 3.Sampling time:  0.1 sek
 4.Mode:          <autom.>
 5.Start treshold:      5.000g
 6. Exit
```

Move cursor to *Operation mode* and using < and > keys select the process beginning method:
- manual – after pressing *ENTER*,
- autom. – after exceeding *Operation threshold*.

Confirm by pressing *ENTER*.
As the *Operation threshold* value enter the value, which will be for sure exceeded after placing the animal on the balance, e.g. 50% of the smallest animal weight.

```
   USER FUNCTIONS&OPT. \ ANIMAL

 1. Activate
 2. Number of samples:  1
 3.Sampling time:  0.1 sek
 4.Mode:          autom.
 5.Start treshold:      5.000g
 6. Exit
```
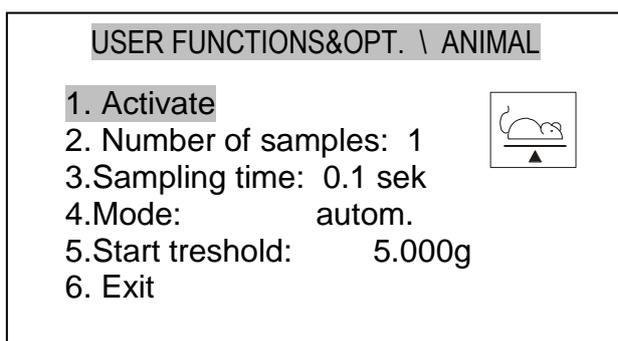
Using ∨ and ∧ keys, move cursor to *Activation* and press *ENTER*.

To finish the function operation, press *MENU* to enter the user functions menu, select *Animals weighing* function, and select *Deactivation* option

```
   Max ...   Min ...   e= ...   d= ..



 Result      10.123 g
 0% [                    ] 100%
```

_____
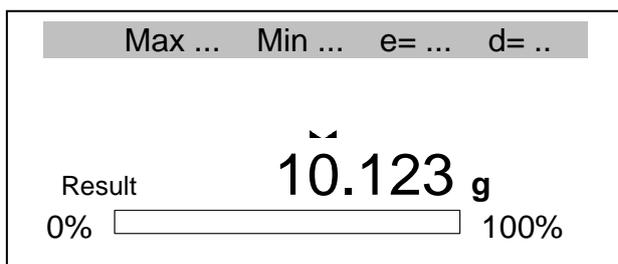
14.12 Tare setting function

This function enables to measure gross weight of a sample placed in a container of a known weigh value (stored in the memory) and to display calculated net weight of the sample. Tare value may be entered using the keypad or by sampling container weight from the pan.

Entering tare value using keys:

```
  USER FUNCTIONS&OPT.\ TARE SETTING

1. Activate
2. Tare from scale
3. Tare value:
4. Exit
```

```
  USER FUNCTIONS&OPT.\ TARE SETTING

1. Activate
2. Tare from scale
3. Tare value:   9.8
4. Exit
```

```
  USER FUNCTIONS&OPT.\ TARE SETTING

1. Activate
2. Tare from scale
3. Tare value:   9.800g
4. Exit
```

```
      Max ...   Min ...   e= ...   d= ..


              ⌐⌐ NET
        10.123 g
 0%  |_____|  100%
```
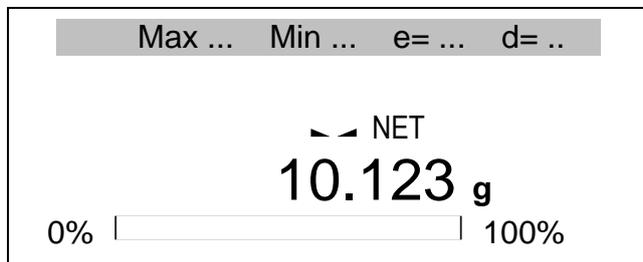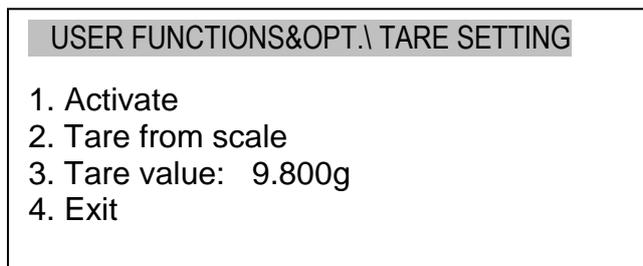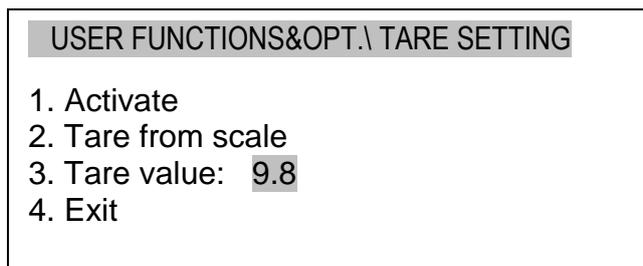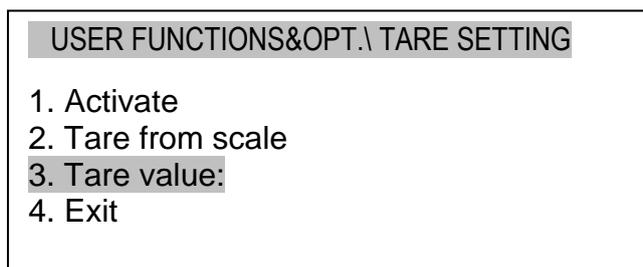
After pressing *MENU* key and choosing function *Entering tare* using *ENTER* key following options will display:
- *Activate* –function activation (after entering tare from scale the option is automatically activated),
- *Tare from scale* – scale takes actual weight from pan as tare,
- *Tare value* – manual inserting tare value,
- *Out* – out from function.

Using keys ∨ and ∧ move coursor on positions *Tare value* and by pressing *ENTER* confirm choice. Insert tare value using numerical keys and confirm using *ENTER* key. To activate function choose *Activate* option.
The balance will automatically come back to weighing and above weighing result a sign NET will show up.

14.13 Force unit function

Function activation causes displaying result in force units (N).

```
┌─────────────────────────────────────┐
│  USER FUNCTIONS&OPT.\ STRENGHT UNIT  │
│                                      │
│ 1. Activate                          │
│ 2. Exit                              │
│                            N         │
│                                      │
└─────────────────────────────────────┘
```
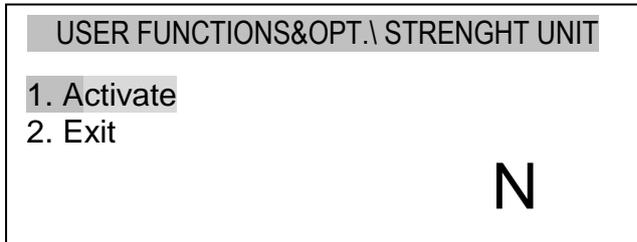
Press *MENU* key. Using *ENTER* key choose *Strenght unit* function. Choose *Activate* option and confirm using ENTER.

Attention:

Units converting from mass (kg) to force (N) is made for acceleration of gravity (g=9,80665m/s2):

1N≈0,101971 kg

_____

14.14 Maximum and minimum value indication function

This function allows for keeping the maximum value, indicated by the balance, on the display.

```
┌──────────────────────────────────┐
│        USER FUNCTIONS&OPT.        │
│                                  │
│   ☐ Autotaring                   │
│   ☐ PCS counting                 │
│            • • •                  │
│   ⊡ Maximal/minimal value        │
│                                  │
└──────────────────────────────────┘
```
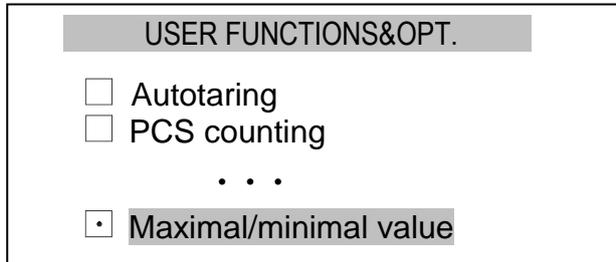
Press *MENU* key to enter the user functions menu, select *Maximum/minimal value* with cursor and press *ENTER*.

```
┌──────────────────────────────────┐
│ USER FUNCTIONS&OPT. \ MAXIMAL VALUE │
│                                  │
│   1. Activate              ⇧      │
│   2. Reset                 ──     │
│   3. Mode        : MAX     ⇧      │
│   4. Exit                         │
└──────────────────────────────────┘
```
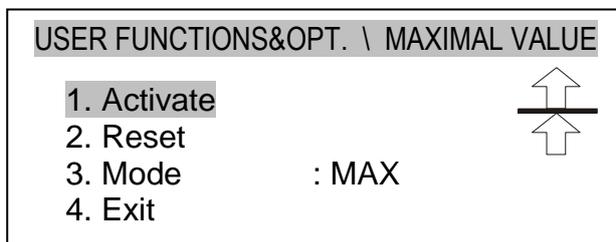
Using ∨ and ∧ keys, move cursor to *Activation* and press *ENTER*.
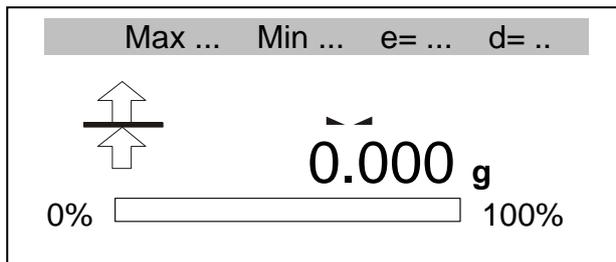
The balance is ready for weighing, but the display keeps the highest (or minimal) value, measured since the function activation or use of *Reset* option.

```
┌──────────────────────────────────┐
│   Max ...   Min ...   e= ...   d= .. │
│         ⇧                        │
│        ──      ⌣                  │
│         ⇧    0.000 g              │
│   0% ▭▭▭▭▭▭▭▭▭▭▭▭▭ 100%           │
└──────────────────────────────────┘
```

To read the mass, currently placed on the balance, use ↻ key. Reuse of that key cause return to the maximum value.
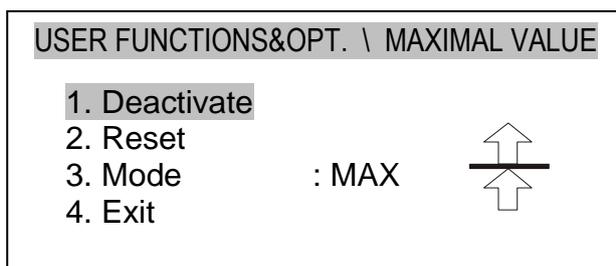
```
┌──────────────────────────────────┐
│ USER FUNCTIONS&OPT. \ MAXIMAL VALUE │
│                                  │
│   1. Deactivate                   │
│   2. Reset                 ⇧      │
│   3. Mode        : MAX     ──     │
│   4. Exit                  ⇧      │
└──────────────────────────────────┘
```

To finish the function operation, press *MENU* to enter the user functions menu, select *Maximum value* function, and select *Deactivate* option.

_____

14.15 Anti-disturbance filter function

This function allows using digital filter with selected intensivity during weighing.
Filter reduces the influence of mechanical vibrations (air blasts, base vibrations) on
measurement result.

USER FUNCTIONS&OPT\FILTER ACTIVATION
1. Activate
2. Filter type : <10>
3. Exit
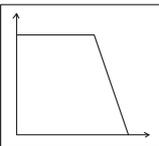
Press *MENU* key and choose *Filter activation* function.
Choose *Filter type* position and choose (using key < and >) filter intensivity from weak (10) to strongest (40).

USER FUNCTIONS&OPT\FILTER ACTIVATION
1. Activate
2. Filter type : 10
3. Exit

Next to start scale working with filter on choose *Activate* position using *ENTER* key.

_____
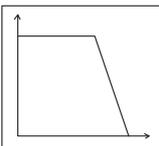
14.16 Language selection function

This function allows for language selection for messages and print purposes.

USER FUNCTIONS&OPT.
☐ Autotaring
☐ PCS counting
· · ·
⊡ Language
Exit

Press *MENU* key, select *Language selection* with cursor and press *ENTER*.

USER FUNCTIONS&OPT. \ LANGUAGE
⊡ Polish
☐ English
☐ German
☐ Russian
☐ Ukrainian
☐ Czech
☐ Spanish
☐ French
☐ Exit

Using ∧ and ∨ keys, select proper language and press *ENTER*.

.

_____

14.17 Function of comparing with preset threshold values

This function allows to compare the weighing result with two, previously programmed values: upper and lower threshold. The comparison result is signalled with the messages *MIN*, *OK* or *MAX* on the display.

If the weighing result is:
- smaller than lower threshold – the balance signals *MIN*,
- between thresholds – the balance signals *OK* and emits acoustic signal,
- bigger than the upper threshold – the balance signals *MAX*.
- smaller than zero threshold (no load) – none of above messages appears.
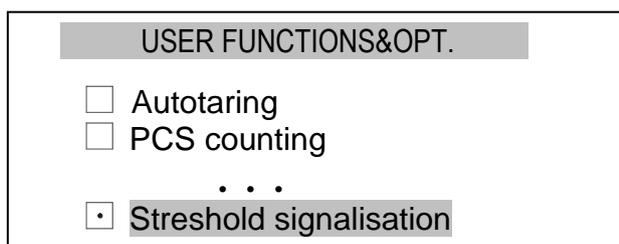
<table>
<tr><td>

    USER FUNCTIONS&OPT.

    ☐ Autotaring
    ☐ PCS counting
            . . .
    ⊡ Streshold signalisation

</td><td>

Press *MENU* key to enter the user functions menu, select *Threshold signalling* with cursor and press *ENTER*.

</td></tr>
<tr><td>

USER FUNCTIONS \ TRESHOLD SIGNAL.

    1. Activate
    2. Zero treshold :   none
    3. Min treshold   :   none
    4. Max treshold   :   none
    5. Outputs mode :   none
    6. Buzzer   :   none
    7. LCD flashing :   OFF
    8. Exit

</td><td>

Using ∨ and ∧ keys, move cursor to *Zero threshold* option and press *ENTER*.

</td></tr>
<tr><td>

USER FUNCTIONS \ TRESHOLD SIGNAL.

    1. Activate
    2. Zero treshold :   5
    3. Min treshold   :   none
    4. Max treshold   :   none
    5. Outputs mode :   none
    6. Buzzer   :   none
    7. LCD flashing :   OFF
    8. Exit

</td><td>

Enter the indications value, below which the balance is considered unloaded (no signalisation) and press *ENTER*.
In the same way enter the values for *Min threshold* and *Max threshold*.

</td></tr>
<tr><td>

USER FUNCTIONS \ TRESHOLD SIGNAL.

    1. Activate
    2. Zero treshold :   5g
    3. Min treshold   :   90g
    4. Max treshold   :   110g
    5. Outputs mode :   <signalling>
    6. Buzzer   :   stable OK
    7. LCD flashing :   OFF
    8. Exit

</td><td>

The *Outputs mode* option is used for setting the THRESHOLDS connection operation mode (see below). The appropriate mode is selected with < and > keys, confirmation – with *ENTER* key.

</td></tr>
</table>
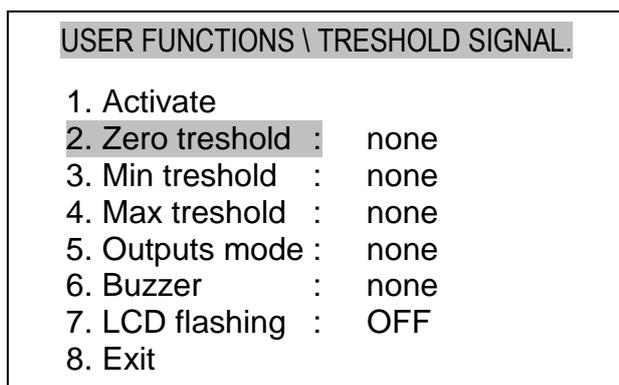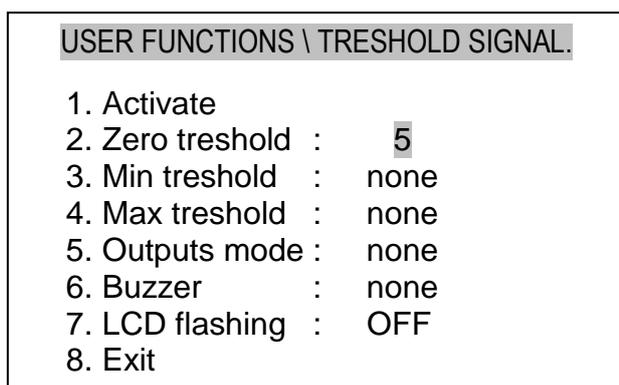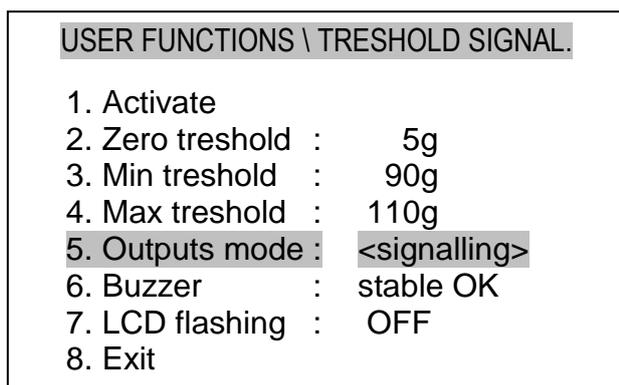
```
USER FUNCTIONS \ TRESHOLD SIGNAL.

  1. Activate
  2. Zero treshold  :      5g
  3. Min treshold   :      90g
  4. Max treshold   :      110g
  5. Outputs mode   :  signalling
  6. Buzzer         :  <stable OK>
  7. LCD flashing   :   OFF
  8. Exit
```

Buzzer option is used for selection of acoustic signalling method. Selection of *Stable OK* option means acoustic signal activation after indications stabilisation in range signalled as *OK*. It is possible to activate the signal immediately after exceeding the threshold, or total signal deactivation.

```
USER FUNCTIONS \ TRESHOLD SIGNAL.

  1. Activate
  2. Zero treshold  :      5g
  3. Min treshold   :      90g
  4. Max treshold   :      110g
  5. Outputs mode   :  signalling
  6. Buzzer         :  stable OK
  7. LCD flashing   :   OFF
  8. Exit
```

To start working with thresholds signalling, move cursor to *Activate* option and press *ENTER*.

```
    Max ...   Min ...   e= ...   d= ..

  ③  △
  ②  OK          ▶ ◀
  ①  ▽
         100.000 g
  0% [_____] 100%
```
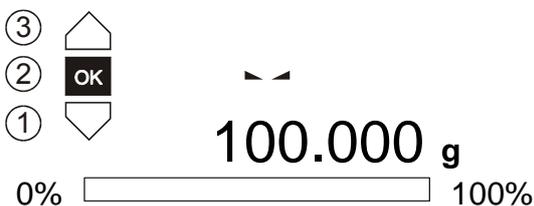
After each loading, the result of comparing with thresholds is signalled.

```
USER FUNCTIONS \ TRESHOLD SIGNAL.

  1. Deactivate
  2. Zero treshold  :      5g
  3. Min treshold   :      90g
  4. Max treshold   :      110g
  5. Outputs mode   :  signalling
  6. Buzzer         :  stable OK
  7. LCD flashing   :   OFF
  8. Exit
```

To finish the function operation, press *MENU* to enter the user functions menu, select *Threshold signalling* function, and select *Deactivation* option.

If the balance is equipped with *THRESHOLDS* control connection, the comparison result may be used to control the external optical signalling device, or other external devices.

On the outputs *P1* and *P2* the short-circuit states appear, which depend on comparison results of balance indications with threshold values. The available operation modes are shown on the states chart.

THRESHOLDS outputs states chart (with increasing balance load):

1. *Signalling device* mode:

Outputs:

P1

zero
treshold

Min
thresholdl

t

P2

Min
threshold

Max
thresholdl

P3

Max
threshold
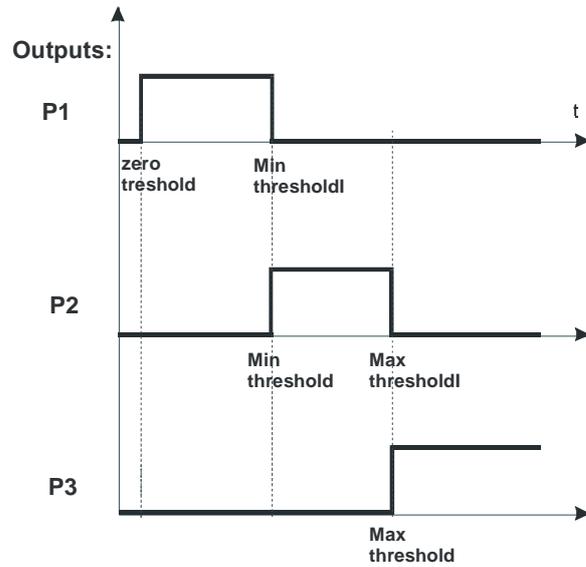
2. *Impulse* mode
   (approx. 2 sec.):

Outputs:

P1

2s.

Min
threshold

t

P2

2s.

Max
threshold

P3

zero
treshold

3. *Level* mode:

Outputs:

P1

zero
treshold

Min
threshold

t

P2

Min
threshold

Max
threshold

P3

Max
treshold

_____
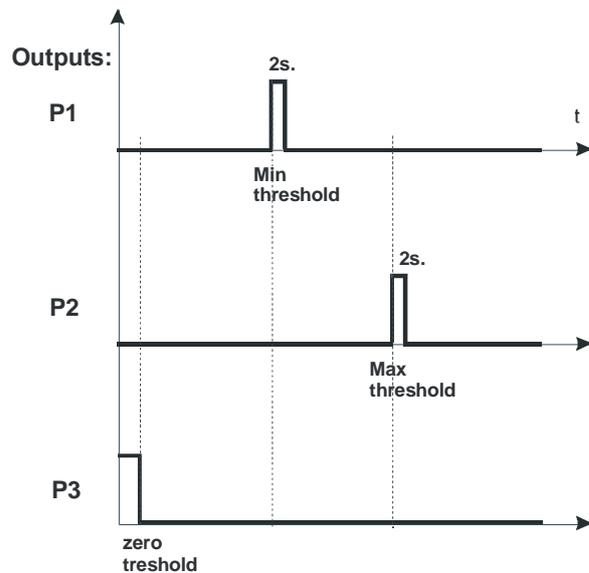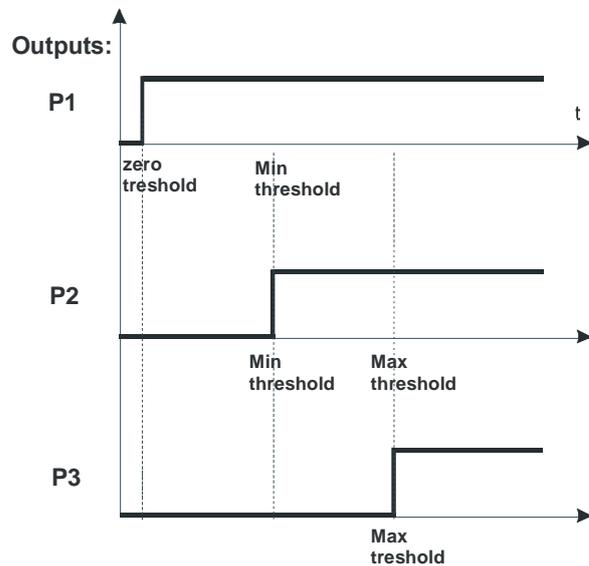
The *THRESHOLDS* connection contains three transoptor outputs P1, P2 and P3 of open collector type, with load capacity 25mA/24V. The connected relays are not supplied from the balance and require additional 24V power supply unit. The relays inputs must be protected with diodes, e.g. 1N4148.

The balance producer offers ready electronic PCB MS3K/P, which contains RM96P relays with input voltage DC24V and output: AC250V, 8A.

THRESHOLD connection   Scheme for connecting the single relay to
                                        THRESHOLDS connection output
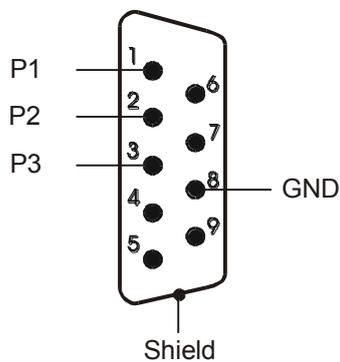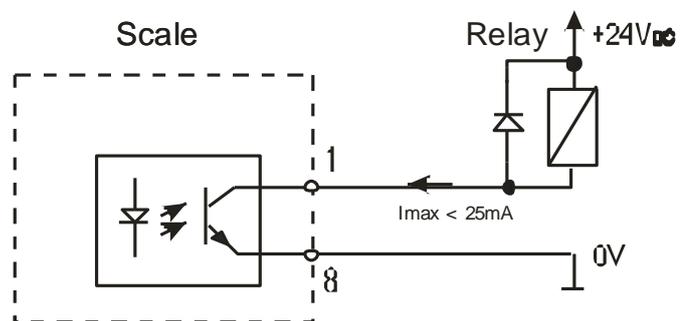
14.18 Funkcja sumowania ważeń TOTAL

The function allows calculating total weight for series of measurements, which can be greater than scale capacity. It allows calculating total weight as well as average value.

```
            USER FUNCTIONS

    ☐  Autotaring
    ☐  PCS counting
              • • •
    ⊡  Total calculation
 USER FUNCTIONS \ TOTAL CALCULATION

    1. Activate
    2. Reset
    3. Mode:
    4. Printout:
    5. Exit
```

Press *MENU* key to enter user functions, choose *Total calculation* and press *ENTER*.

Using ∨ and ∧ keys move cursor to *Activate* and press *ENTER*.

```
        Max ...   Min ...   e= ...   d= ..
 Σ=0.000g
 n=0                      TOT

             0.000 g
 0% |                      | 100%
```

Balance is ready for weighting following pieces. After weighting each object press →T← key *(manual mode)*. This will cause scale indications zeroing. On the left side of the display sum of earlier measurements is shown (Σ) and quantity of them (n).

Automatic mode doesn't require pressing →T← key after each measurement.

Printout option enables automatic printout after each measurement.

In order to readout function report use ↺ key.

```
  TOTAL REPORT     2011-09-21      9:20

     TOTAL             =
     Number of meas.   =
     Average value     =

 F1 PRINT     F3 DONE      F5 EXIT
```

14.19 Statistical calculations function

This function allows for calculations of mean value, standard deviation, relative standard deviation, maximum and minimum value, and making the histogram of performed series of measurements.

```
┌─────────────────────────────────────┐
│        USER FUNCTIONS&OPT.           │
│                                      │
│   ☐ Autotaring                       │
│   ☐ PCS counting                     │
│            • • •                     │
│   ⊡ Statistic                        │
│                                      │
└─────────────────────────────────────┘
```

```
┌─────────────────────────────────────┐
│  USER FUNCTIONS&OPT.\ STATISTIC      │
│                                      │
│   1. Activate                        │
│   2. Reset                           │
│   3. Mode:            autom.         │
│   4. Printout:          ON           │
│   5. Number of samples               │
│   6. Nominal value                   │
│   7. Tolerance                       │
│   8. Tare after stat.                │
└─────────────────────────────────────┘
```

```
┌─────────────────────────────────────┐
│  USER FUNCTIONS&OPT.\ STATISTIC      │
│                                      │
│                          ▯▮▯▮▯       │
│   1. Activate                        │
│   2. Reset                           │
│   3. Mode:          <autom.>         │
│   4. Printout:          ON           │
│   5. Exit                            │
└─────────────────────────────────────┘
```

```
┌─────────────────────────────────────┐
│  USER FUNCTIONS&OPT.\ STATISTIC      │
│                                      │
│                          ▯▮▯▮▯       │
│   1. Activate                        │
│   2. Reset                           │
│   3.Mode:            autom.          │
│   4. Printout:          ON           │
│   5. Exit                            │
└─────────────────────────────────────┘
```

```
┌─────────────────────────────────────┐
│    Max ...   Min ...   e= ...  d= .. │
│    n=1                               │
│   ▯▮▯▮▯                               │
│                  ▸ ◂                  │
│   AUTO        0.000 g                 │
│   0% ▭━━━━━━━━━━━━━━▭ 100%            │
└─────────────────────────────────────┘
```
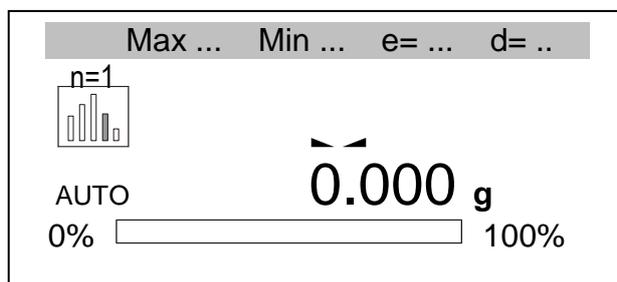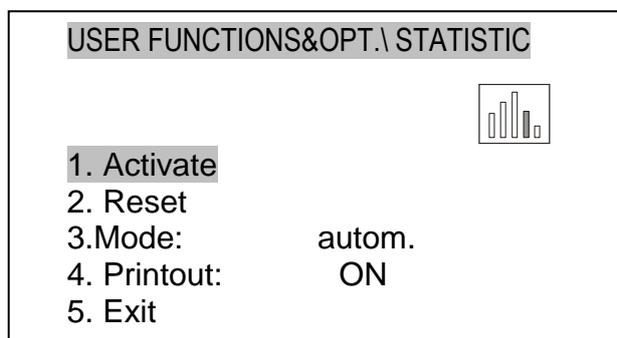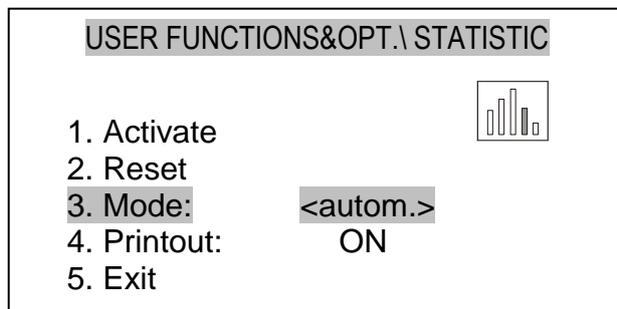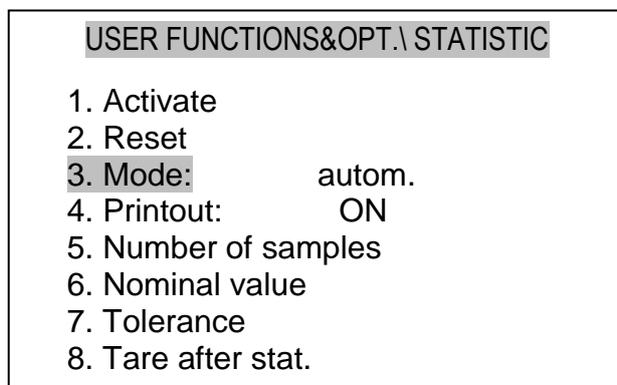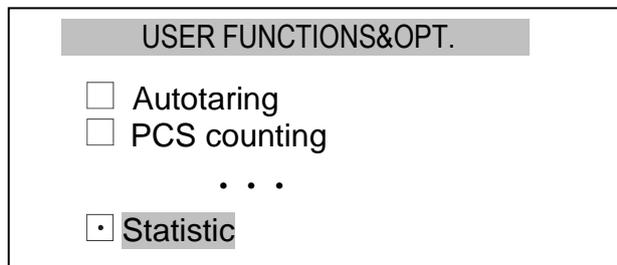
Press *MENU* key to enter the user functions menu, select *Statistics* with cursor and press *ENTER*.

Using keys ∨ and ∧ move cursor to *Operation mode*, and using < and > keys select the process beginning method:
- manual – after pressing *ENTER*,
- autom. – after indications stabilization.

Confirm by pressing *ENTER*.
When required, move cursor to *Print* and select:
- ON – printing of successive measurements,
- OFF – successive measurements without printing.

Confirm by pressing *ENTER*.
The following options enable inserting maximal quantity of samples, inserting nominal value and sample tolerance in %.
Using ∨ and ∧ keys, move cursor to *Activate* and press *ENTER*.

The balance is ready for the series of samples measurements, for which the statistical parameters will be calculated.

To perform the measurement just put the sample, wait for stabilization and remove sample. The successive results are sent to the printer.

```
STATISTICS – RESULTS 2011-10-04  14:43

        Number of samples      =
        Average value          =
        Stand. deviation       =
        Relative deviation     =
        Minimal value          =
        Maximal value          =

F1 PRINT    F2 CHART    F3 DONE    F5 EXIT
```

To read the statistical parameters, press *MENU* key. It will display report *STATISTICS – RESULTS*.

```
        1      7,5476
        2      7,5480
        3      7,1902
        4      6,8227
        5      6,4719

------------------------------------------------------
Number of samples =           5
Average value        =  7.11608  g
Stand. deviation     =  0.93771  g
Relative deviation   =    13.18  %
Minimal value        =    6.4719  g
Maximal value        =    7.5480  g
```

The individual measurements results are printed during performing (option: *Print ON*). After pressing *F1* key the statistical parameters are printed.
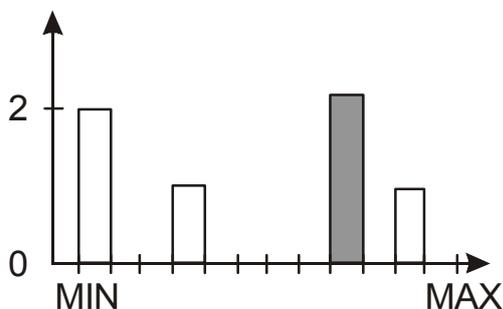
F2 key prints the histogram. Table on the left shows division into subranges (*i*) and numbers of samples (*n*) in the individual subranges. Return to report displaying takes place after pressing *CLR* key.

To finish the function operation, press *MENU* to enter the user functions menu, select *Statistics* function, and select *Deactivation* option.

_____

14.20   Funkcja wyliczenia gramatury papieru

This function enables to calculate paperweight of $1m^2$ of paper basing on samples of known area.

```
USER FUNCTIONS&OPTS \ GRAMMAGE

1. Activate
2. Quantity       :
3. Area           :
4. Exit
```

```
USER FUNCTIONS&OPTS \ GRAMMAGE

1. Activate
2. Quantity       :
3. Area           :
4. Exit
```

```
USER FUNCTIONS&OPTS \ GRAMMAGE

1. Activate
2. Quantity       :
3. Area           :
4. Exit
```

```
     Max ...   Min ...   e= ...   d= ..


                    GRMG
        0.000 g/m²
0%  |                    | 100%
```
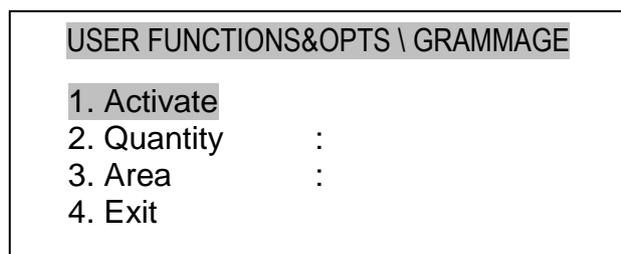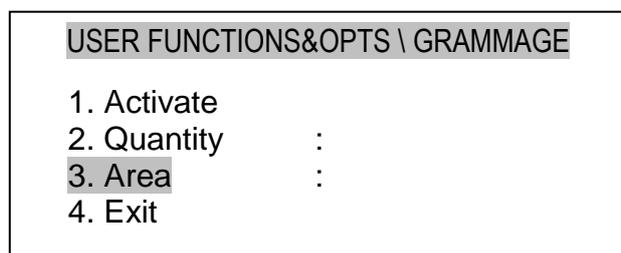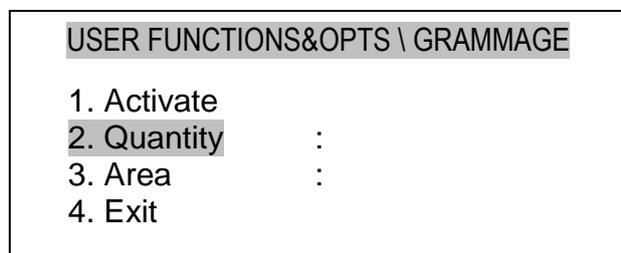
Press →*T*← key.
Put on the pan a sample consisting of one or more paper sectors (pay attetion that the minimal weight is 100 scale's readout graduation plots).

Press *MENU* key to enter function menu and choose Grammage, then press *ENTER*.
Choose position *Quantity* and press *ENTER*, insert quantity and again press *ENTER*.
Then choose *Area* and insert area of one paper sector.

14.21 Density measurement function (option)

This function allows for determination of solid body density, upon the basis of weight in the air and weight of material immersed in liquid of known density, according to the formula:

$$\rho = \frac{m1}{m1 - m2} \ * \ \rho \ liquid$$

where:
m1-mass in the air
m2-mass in the liquid

The measurement consists of two phases:
Phase I – solid body sample measurement in the air
Phase II – measurement with immersion in the liquid

This function also allows for determination of liquid density, upon the basis of plunger weight (with known density) in the air and tested liquid. The following formula is used:

$$\rho = \frac{m1 - m2}{V}$$

where:
m1-plunger mass in the air
m2-plunger mass in the liquid
V – plunger volume

The plunger volume is indicated on its hanger.

This measurement also takes place in two phases:
Phase I – plunger measurement in the air
Phase II – measurement with immersion in the liquid

More comprehensive description is delivered with the Hydro Set.

14.21.1 Solid body density determination

```
        USER FUNCTIONS

  □ Autotaring
  □ PCS counting
        • • •
    · Density measurement
 □
        • • •
```

Suspend the trays and tare scale pressing button →T←.

Press button *Menu*, select *Density measurement* with cursor and press *ENTER*..

```
      USER FUNCTIONS / DENSITY

  1.Activate
  2.Material type   :      solid
  3.Liquid type     :   water 20.0°C
  4.Liquid density  :   0.99820g/cm3
  5.Report printout
  6.Exit
```

Select *Material type* with cursor and press *ENTER*.. Use > and < keys to choose *solid* material and press *ENTER*

```
      USER FUNCTIONS / DENSITY

  1.Activate
  2.Material type   :      solid
  3.Liquid type     :   water 20.0°C
  4.Liquid density  :   0.99820g/cm3
  5.Report printout
  6.Exit
```

Select *Liquid type* with cursor and press *ENTER*.

When is used distilled water please use > and < keys and select *water*. If is used a different liquid - please choose *different*, and press *ENTER*.

```
      USER FUNCTIONS / DENSITY

  1.Activate
  2.Material type   :      solid
  3.Liquid type     :    < water >
  4.Liquid density  :   0.99820g/cm3
  5.Report printout
  6.Exit
```

If is used distilled water please write current temperature of water. This is necessary to calculate a correct value of density – require accuracy is 0,5 degree. If is used a different liquid please write accurate density value this liquid on the present temperature.

```
      USER FUNCTIONS / DENSITY

  1.Activate
  2.Material type   :      solid
  3.Liquid type     :   water  T= 20.0
  4.Liquid density  :   0.99820g/cm3
  5.Report printout
  6.Exit
```

Finish the procedure pressing *ENTER*.

```
          USER FUNCTIONS / DENSITY

     1.Activate
     2.Material type   :       solid
     3.Liquid type     :    water  T= 20.0°C
     4.Liquid density  :    0.99820g/cm3
     5.Report printout
     6.Exit
```

Select *Activate* with cursor and Press *ENTER*.
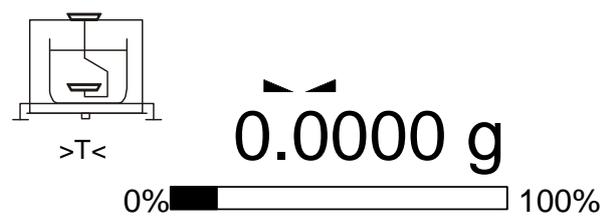
```
  Max ...    Min ...    e= ...    d= ..     II



                ⌄ ⌄
             0.0000 g
  >T<
     0%█▬▬▬▬▬▬▬▬▬▬▬ 100%
```

Press →T←. to taring scale

```
  Max ...    Min ...    e= ...    d= ..     II



                ⌄ ⌄
            10.0907 g
  ENTER
     0%█▬▬▬▬▬▬▬▬▬▬▬ 100%
```
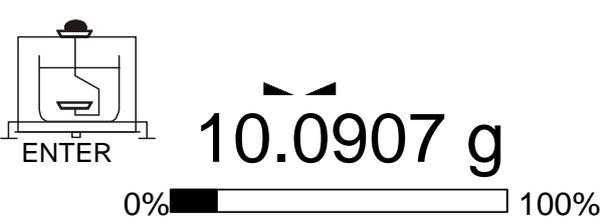
Put the examine solid body on upper tray (measurement in the air) and press *ENTER*.

```
  Max ...    Min ...    e= ...    d= ..     II



                ⌄ ⌄
             8.0912 g
  ENTER
     0%█▬▬▬▬▬▬▬▬▬▬▬ 100%
```

Put the examine solid body on lower tray (measurement in the liquid) and press *ENTER*.

Result of measurement is displayed on the screen.

```
             RESULTS

  Mass in the air      : 10.0907g
  Mass in the liquid   :  8.0912g
  Mass density         :  5.0373g/cm3
  Density with comp.  :  5.0363g/cm3

  F1 PRINT     F3 DONE     F5 EXIT
```

Scale enumerated density with the compensation of influence air density - (*Density with comp.*), too.
Press *F1* to printed a result.
Press *F5* or *ENTER* to started next measurement.
Press *F3 to* finished density measurement.

_____

14.21.2 Liquid density determination

```
┌─────────────────────────────────────┐
│         USER FUNCTIONS               │
│                                      │
│   ☐ Autotaring                       │
│   ☐ PCS counting                     │
│          · · ·                       │
│   ⊡ Density measurement              │
│          · · ·                       │
└─────────────────────────────────────┘
```

Suspend the trays and tare scale pressing button →*T*←.

Press button *Menu*, select *Density measurement* with cursor and press *ENTER*..

```
┌─────────────────────────────────────┐
│      USER FUNCTIONS / DENSITY        │
│                                      │
│   1.Activate                         │
│   2.Material type   :      solid     │
│   3.Liquid type     :   water 20.0°C │
│   4.Liquid density  :  0.99820g/cm3  │
│   5.Report printout                  │
│   6.Exit                             │
└─────────────────────────────────────┘
```

Select *Material type* with cursor and press *ENTER*.

```
┌─────────────────────────────────────┐
│      USER FUNCTIONS / DENSITY        │
│                                      │
│   1.Activate                         │
│   2.Material type   :     <liquid>   │
│   3.Liquid type     :   water 20.0°C │
│   4.Liquid density  :  0.99820g/cm3  │
│   5.Report printout                  │
│   6.Exit                             │
└─────────────────────────────────────┘
```

Use > and < keys to choose *Liquid* material and press *ENTER*.

```
┌─────────────────────────────────────┐
│      USER FUNCTIONS / DENSITY        │
│                                      │
│   1.Activate                         │
│   2.Material type   :    liquid      │
│   3.Plunger volume  :  0.00000 cm3   │
│   4.Report printout                  │
│   5.Exit                             │
└─────────────────────────────────────┘
```

Use > and < keys to choose *Plunger volume* and press *ENTER*

Please write value of plunger volume and press *ENTER*.

```
┌─────────────────────────────────────┐
│      USER FUNCTIONS / DENSITY        │
│                                      │
│   1.Activate                         │
│   2.Material type   :     liquid     │
│   3.Plunger volume: 5.00000 cm3      │
│   4.Report printout                  │
│   5.Exit                             │
└─────────────────────────────────────┘
```

Attention: Plunger volume is wrote on his hanger.

```
          USER FUNCTIONS / DENSITY

   1.Activate
   2.Material type    :        liquid
   3.Plunger volume:       5.00000 cm3
   4.Report printout
   5.Exit
```

Select *Activate* with cursor and Press *ENTER*.

```
   Max ...    Min ...    e= ...    d= ..      II



                    ⌣
              0.0000 g
   >T<
      0%█▌▭▭▭▭▭▭▭▭▭▭▭▭▭100%
```

Press →T← to taring scale

```
   Max ...    Min ...    e= ...    d= ..      II



                   ⌣
           25.5462 g
   ENTER
      0%█▌▭▭▭▭▭▭▭▭▭▭▭▭▭100%
```
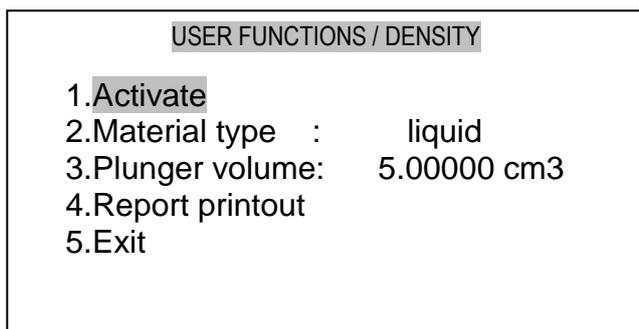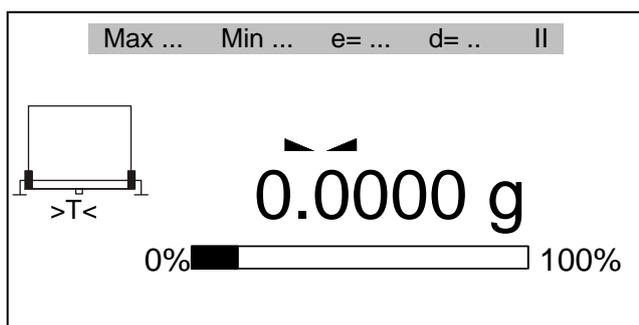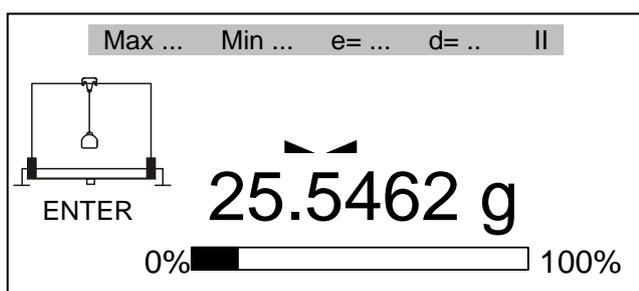
Suspend the plunger (measurement in the air) and press Enter. Please not immerse plunger in the liquid on this stage.

```
   Max ...    Min ...    e= ...    d= ..      II



                  ⌣
           15.5482 g
   ENTER
      0%█▌▭▭▭▭▭▭▭▭▭▭▭▭▭100%
```
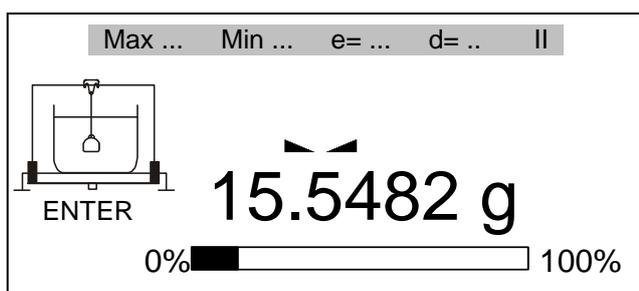
Suspend the plunger and immerse in beaker with examine liquid (measurement in the liquid) and press *ENTER*.

Result of measurement is displayed on the screen (*Liquid density*).
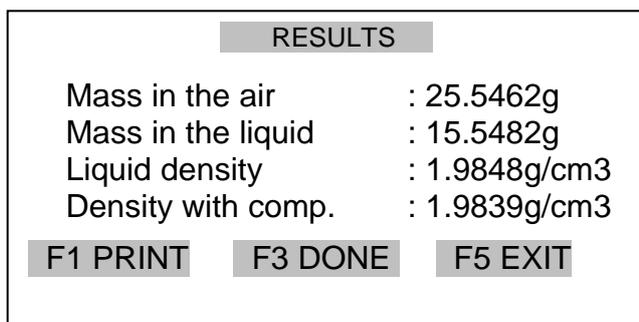
```
              RESULTS

   Mass in the air         : 25.5462g
   Mass in the liquid      : 15.5482g
   Liquid density          : 1.9848g/cm3
   Density with comp.      : 1.9839g/cm3
   F1 PRINT      F3 DONE       F5 EXIT
```

Scale enumerated density with the compensation of influence air density - (*Density with comp.*), too.
Press *F1* to printed a result.
Press *F5* or *ENTER* to started next measurement.
Press *F3 to* finished density measurement.

14.21.3 Density measurement report

To print the measurement results, connect the printer to RS232C connection of the balance. The connection method is described in the instruction manual.

```
    USER FUNCTIONS / DENSITY

  1.Activate
  2.Material type   :      solid
  3.Liquid type     :   water 20.0°C
  4.Liquid density  :   0.99820g/cm3
  5.Report printout
  6.Exit
```

After each measurement the print may be performed by pressing *F1* key (it is also possible to select *Report print* option and press *ENTER*).

Print example:

Measurement number	=	
Mass in the air	=	g
Mass in the liquid	=	g
Density …	=	g/cm^3
Density with comp.	=	g/ cm^3
Water density	=	g/cm^3
Water temperature	=	°C

15.   Procell program description (demo version)

Procell is used to forward weighing results from balance to almost any application working on Windows operating system (e.g. spreadsheet) into place, where active cursor is set.
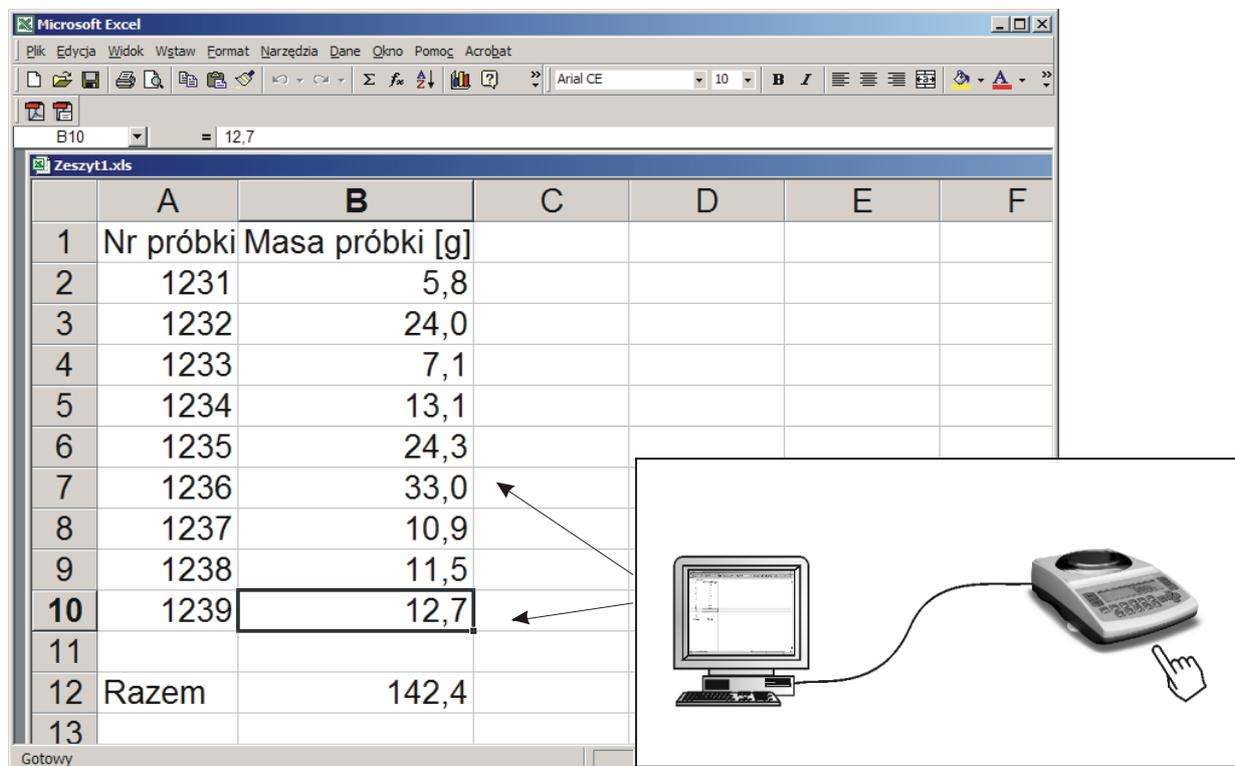
In order to write a series of weighing results into Excel table proceed with the following:
1. Connect the balance to RS232C computer serial port,
2. Run ProCELL,
3. During first start-up close registration window (or contact AXIS to register the program),
4. Open spreadsheet (ProCELL will be covered by application window),
5. Set the cursor in desired place and press ⤶ key on the balance several times.

The program automatically detects computer port (COM1-COM4), sets communication parameters and hides into taskbar at the bottom of the screen (or into systray). After that only Excel spreadsheet and ⤶ key on the balance are used.

16.   Troubleshooting and maintenance

1. The balance should be kept clean.
2. Take care that no dirt is between the casing and the pan. If a dirt is noticed, take off the pan (lift it up), clean a dirt and then mount the pan.
3. In case of improper operation caused by a short-lasting lack of power supply, switch the balance off by unplugging it from the mains, and then after several seconds switch it on.
4. All repairs of the balance should be performed by authorised service centre.
5. To repair a balance, please contact nearest service centre.
6. Balances can be sent for repair as messenger delivery only in original package, if not, there is a risk of damaging the balance and loosing guarantee.

Failure messages

Message	Possible cause	Recommendation
"Test ..."	auto-tests are in progress / damage of electronic unit	wait for 1 minute
" - - - - "	unfinished zeroing / mechanical damage	wait for 1 minute check if the balance is placed on stable ground, not affected by vibrations
"Internal calibration: load error"	too small load or overloading balance mechanism / mechanical damage	check if there are mounted all necessary pan elements or if there is no load on the pan
„Tare range exceeded"	tare key pressed during zero indication	balance indications must be different from zero
„Zeroing range exceeded"	permissible zeroing range was exceeded	take a load off the pan
„Weighing range exceeded"	permissible weighing range (Max +9e) was exceeded	reduce a load on the pan
„Measuring range exceeded (+)"	upper limit of measuring range in analogue-digital converter was exceeded	take a load off the pan
„Measuring range exceeded (-)"	lower limit of measuring range in analogue-digital converter was exceeded	check if there are mounted all necessary pan elements
„Unit weigh is too small"	entered unit weigh is too small	unit weight is too small or entered number of pieces is too big

If a failure message still appears, contact authorised service centre.

_____
—

Declaration of Conformity

We:

AXIS Spółka z o.o. 80-125 Gdańsk, ul. Kartuska 375B

confirm with all responsibility that scales:

AG100(C), AG200(C), AG300(C), AG500(C),
AG600(C), AG1000(C), AG2000(C), AG3000(C), AG4000(C),
AGZ100(C), AGZ200(C), AGZ300(C), AGZ500(C),
AGZ600(C), AGZ1000(C), AGZ2000(C), AGZ3000(C), AGZ4000(C), AGZ10C

marked with CE mark comply with the following:

1. EN 55022:2000 Electromagnetic compatibility (EMC) – information technology equipment – Radio disturbance characteristics - standard Limits and methods of measurement and IEC 61000-4-3 - Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test harmonized with the directive 2004/108/WE (Electromagnetic compatibility).

Moreover scales with the following markings on the name plate:

- the number of the Notified Body responsible for EC verification

- two-digit number of the year of EC verification

- a green metrology sticker with "M" mark

- a protective seal affixed by the Notified Body

$C \epsilon_{15}$ 1443 **M**
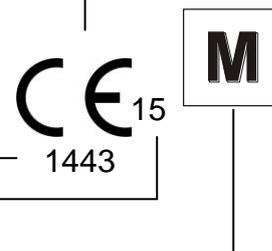
comply with the requirements on the Type-Approval Certificate No. TCM 128/07-4511 and are verified to comply with:

2. EN 45501 norm Metrological aspects of non-automatic weighing instruments and with 2009/23/WE directive.

Additional information
- Conformity evaluation for the Council Directive 89/336/EEC (replaced by 2004/108/WE) was carried out by Laboratorium Badawcze Oddziału Instytutu Elektrotechniki in Gdańsk, accredited by PCA,
- Type-Approval Certificate No. TCM 128/06-4428 was issued by Česky Metrologicky Institut Brno (Notified Body No. 1383).

Per pro Director of AXIS Sp. z o.o.:

Production Manager   Jan Kończak   _____ Date: 14-11-2014