

/// **AXIS**



ATZ2200

ATZ220÷ATZ520

USER MANUAL

AXIS ATA and AXIS ATZ Series

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1. General description

ATA i ATZ series electronic scales are destined for laboratory works which require high accuracy and for wide range of technical purposes as well. ATZ series are not equipped with internal calibration system.

All scales are metrologically tested by manufacturer.

All balances can be prepared to comply with verification requirements but legally verification is not possible yet.

According to an order balances can be calibrated.

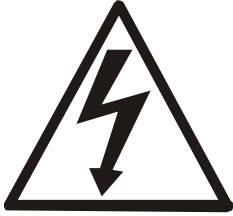
NACE classification: 33.20.31.

2. Completeness

Standard set consists of:

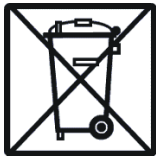
1. Scale
2. Feeder
3. Draft shield with cover,
4. User manual
5. Guarantee card

3. Safety rules



It is necessary to follow safety rules of work with the scale shown below. Obeying those rules is the condition to avoid electrical shock or damage of the scale or connected peripheral devices.

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



According to current acts of law about protection of natural environment, wasted scales should not be put into waste containers together with ordinary waste.

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

4. Technical data

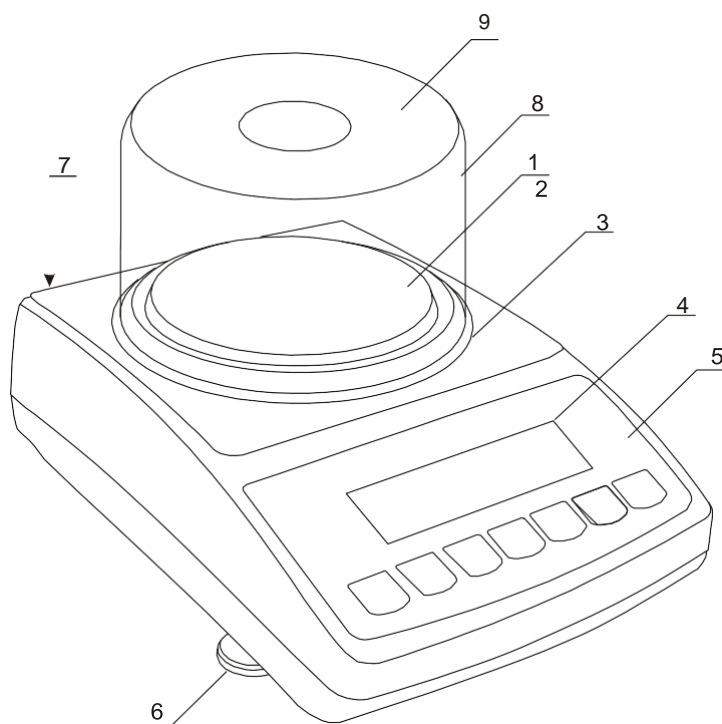
Type	ATA220 ATZ220	ATA320 ATZ320	ATA520 ATZ520	ATA1200 ATZ1200	ATA2200 ATZ2200
Load (Max)	220g	320g	520g	1200g	2200g
Readout unit (d)	0,001g	0,001g	0,001g	0,01g	0,01g
Verification plot (e)	0,01g	0,01g	0,01g	0,1g	0,1g
Tare range	-220g	-320g	-520g	-1200g	-2200g
Accuracy class	II				
Working temperature	+18 ÷ +33°C				
Weighing time	< 3s			< 2s	
Pan dimension	Ø115mm			Ø150mm	
Dimensions	185x290x90mm				
Interfaces	In standard: RS232C and USB Options: LAN, Wi-Fi or RS485				
Supply	~230V 50Hz 6VA / =12V 1,2A				
Scale weight	ATA : 2,6kg ATZ: 2,1kg				
Recommended standard of mass	F2 200g	F2 200g	F1 500g	F2 1000g	F2 2000g

Note:

F2 and F1 are names of international calibration weight classes according to O.I.M.L. Requirements about calibration weight accuracy are connected with these classes.

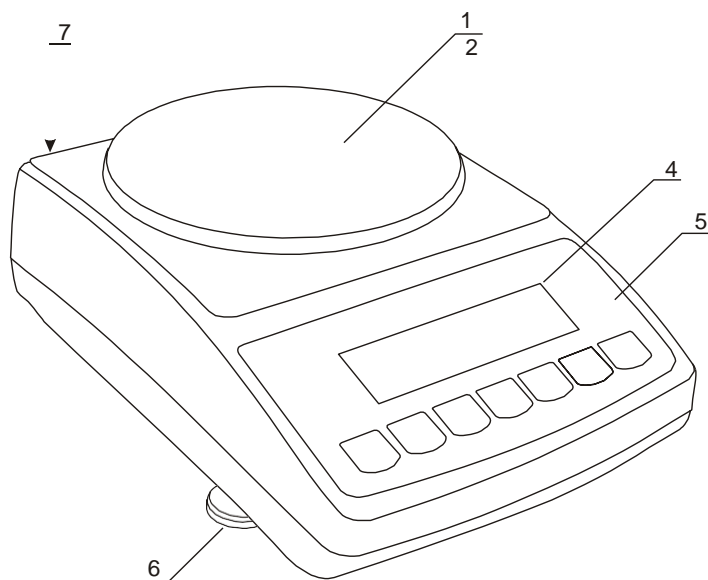
5. General scale view

ATA120÷ATA520 and ATZ120÷ATZ520 scale:



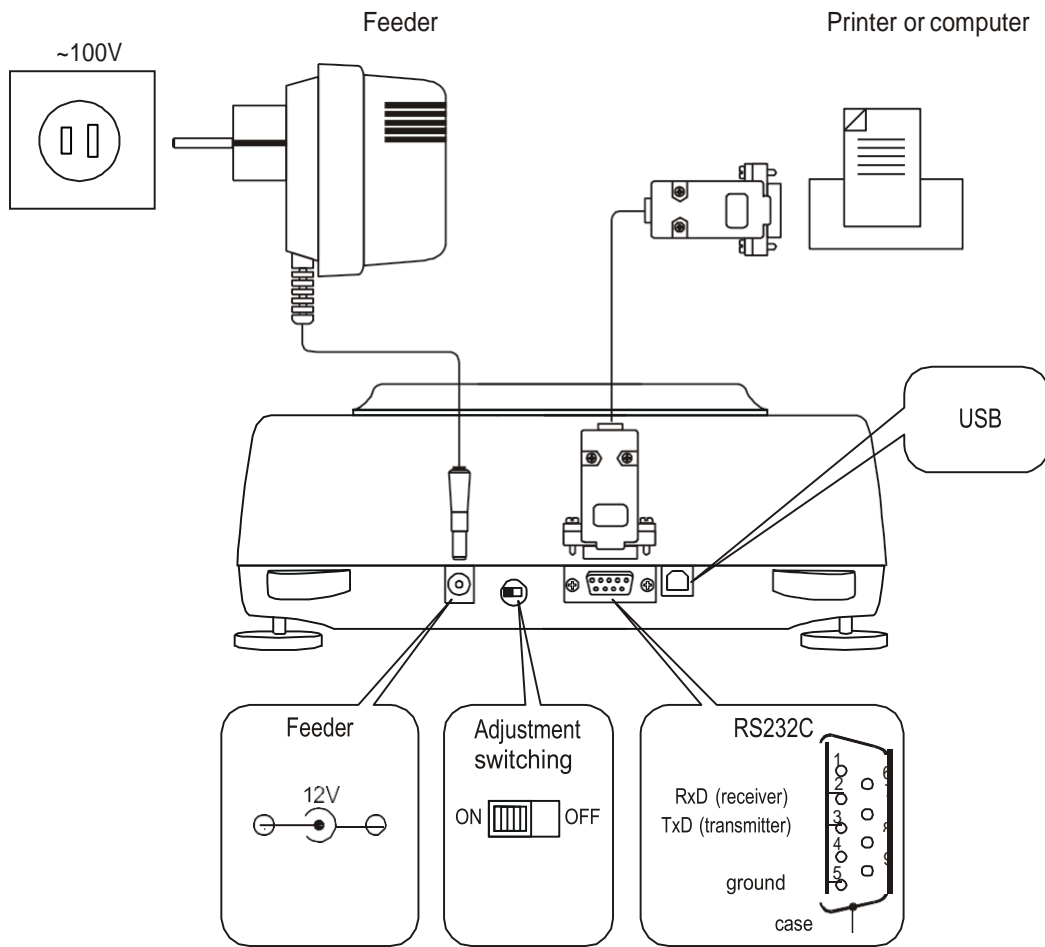
- 1 – pan
- 2 – pan support
(under pan)
- 3 – pan ring
(against blows)
- 4 – display LCD
- 5 – keys
- 6 – rotating legs
- 7 – water level
- 8 – draft shield
(option)
- 9 – draft shield cover
(option)

ATA1200÷ATA2200 and ATZ1200÷ATZ2200 scale:

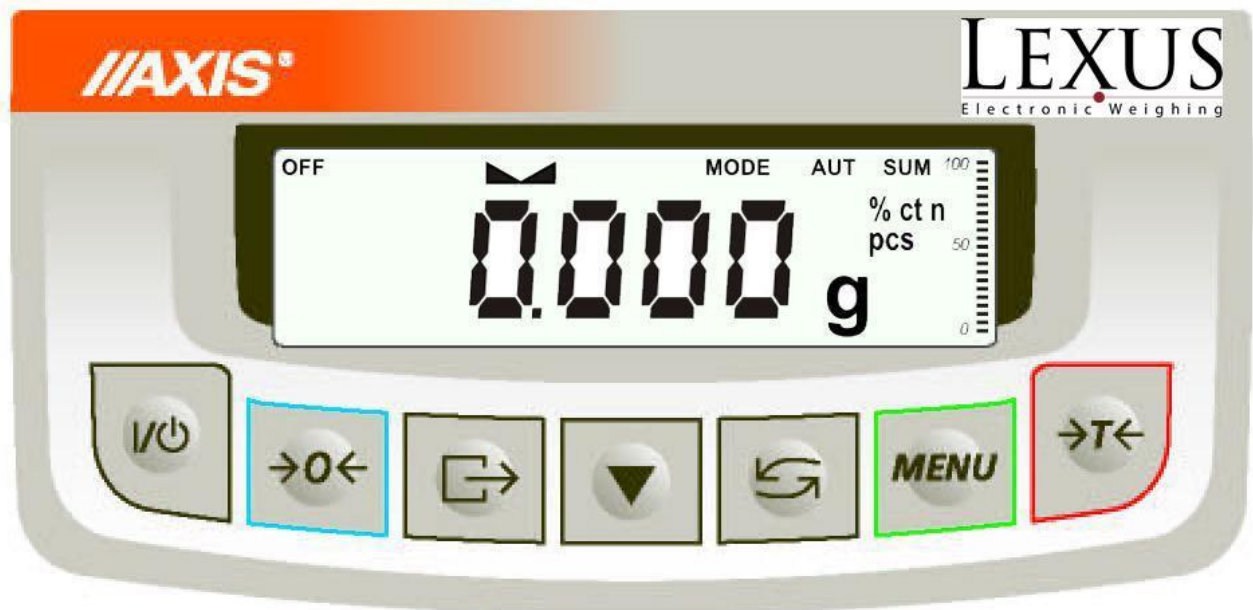


- 1 – pan
- 2 – pan support
- 3 – information window
- 4 – display LCD
- 5 – keys
- 6 – rotating legs
- 7 – level

Connectors view:



6. Keys and indicators



key	I/O	- switch on / switch off (standby),
"	→T←	- taring (storing package mass subtracted from weighed mass)
"	□	- change mode of balance work,
"	→0←	- zeroing the scale when pan is empty (option) ,
"	MENU	-special function menu,
"	↻	- result printout,
"	▼	- internal calibration / quick option view,
indicator	→0←	- zero indicator (when scale pan is empty),
"	▬▬	- indicator of weighing result stabilisation,
"	NET	- net mass (after use of →T← key),
"	MODE	- indicator of switching special function on,
	bar indicator	- indicator of scale load (0-100%).
indicator	OFF	- switching scale with I/O key (standby),
"	pcs	- indication in pieces

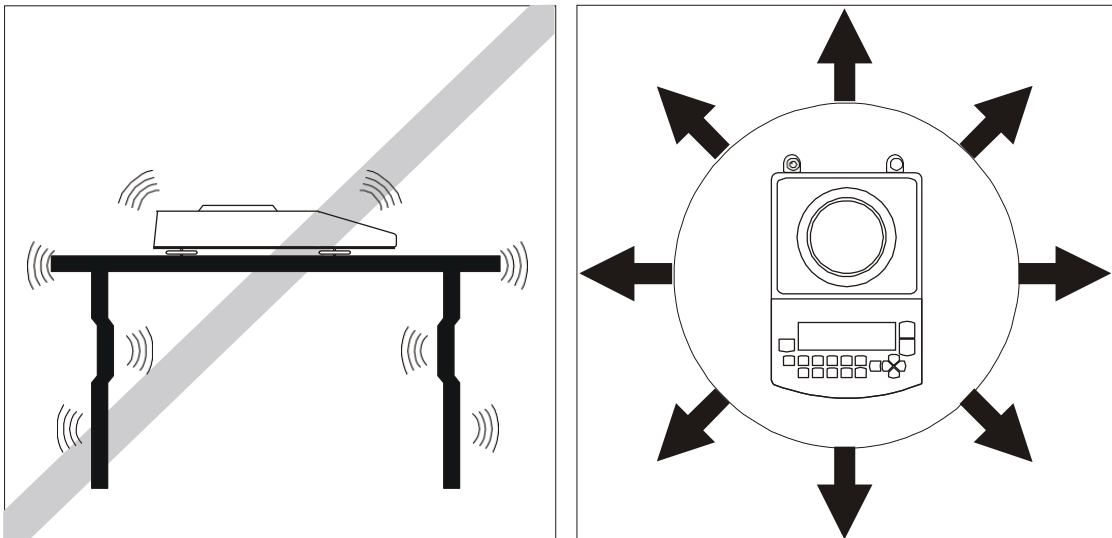
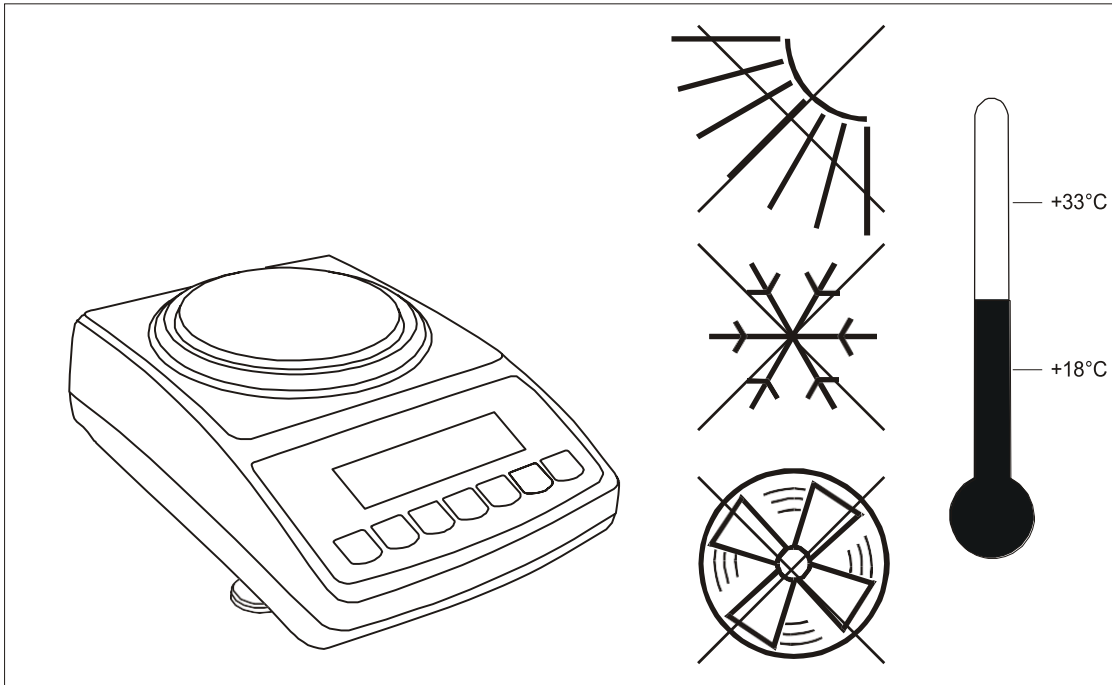
The use of keys during entering numeric values (special functions):

- ▼ - Increment current digit,
- ↻ - insert comma,
- T← - move to next position,
- MENU** - finish entering

Note:

→0← keys and →0← indicators only work in balances with d=e.

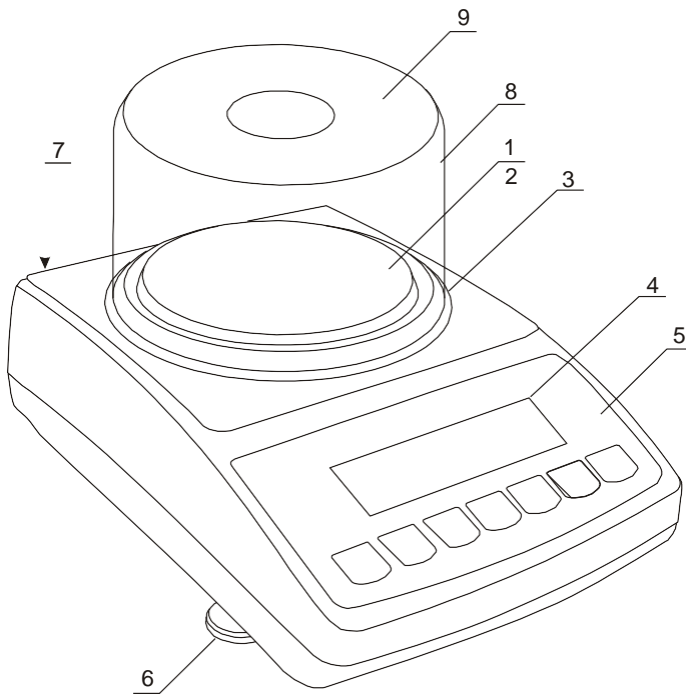
7. Preparing working environment



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

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

8. *Preparing scale to work*



1. Take the scale and feeder out of the package. It is recommended to keep the original scale package in order to transport the balance safely in future.

2. Place the scale on a stable ground not affected by mechanical vibrations and airflows.

3. Level the scale using rotating legs 6 so that the air bubble in water level 7 at the back of the scale is in the middle.

4. Put draft shield 8 on the scale and cover 9 on it.



Scale should be transported in the way, that there is no risk of accidental pressing or overweighing a pan.



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

9. General operation principles

1. In order to confirm correctness of the scale during its operation, before starting and after finishing every valid measurement series it is recommended to check weighing accuracy putting calibration weight or other object of exactly known mass on the scale. In the case when allowable measurement error of the scale is exceeded, it is recommended to perform calibration with external weight or contact authorised service centre.
2. Weighed mass should be placed in the middle of the pan.
3. The scale allows taring in the whole measuring range. To tare the scale press $\rightarrow T \leftarrow$ key. 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 a load on the pan easier and to avoid exceeding measurement range, the scales have load indicator calibrated 0÷100%.
4. Weighing result should be read when the indicator lights, which signals result stabilisation.
5. When the scale is not used but it is necessary for it to be ready to work, it can be switched off by pressing I / ON key. The scale reading system is then switched off and scale goes to standby mode signalled with *OFF* indicator. Switching the scale on is preformed by pressing I / ON key.
6. In sales having $\rightarrow 0 \leftarrow$ key (zeroing) active it should be checked if zero indicator $\rightarrow 0 \leftarrow$ is displayed before sample is placed on the pan. If not, press $\rightarrow 0 \leftarrow$ key and wait until the scale is zeroed and zero indicator appears. After that load can be placed on scale pan.
7. Scale mechanism is a precise device sensitive to overweight, mechanical shocks and strokes.
8. After every change of balance position, level the balance and perform internal calibration.



Do not overload the scale more than 20% of maximum capacity.
Do not press the pan with a hand.



For transportation time, pan support and pan ring should be packed separately.

10. Start-up

Plug feeder into ~230V power supply socket. When the pan is empty plug feeder output connector into 12V socket at back of the scale. Autotests and internal calibration will be performed.

Steps after start-up of the scale:



C-1

Tests of electronic scale components.

...

(displayed only when any test result is negative)

C-6



AtA...

Showing scale program version.



-d0Wn-

Internal calibration (press ▼ key if You want to terminate calibration)



-UP-



CCCC



-

Zeroing the scale.



0.00g

Ready to work.



It is recommended that before you start measuring the internal temperature has stabilized weight. For this to happen, the weight should remain enabled for at least 2 hours. To maintain the accuracy of the weight is not recommended to turn off the power.

11. Internal calibration

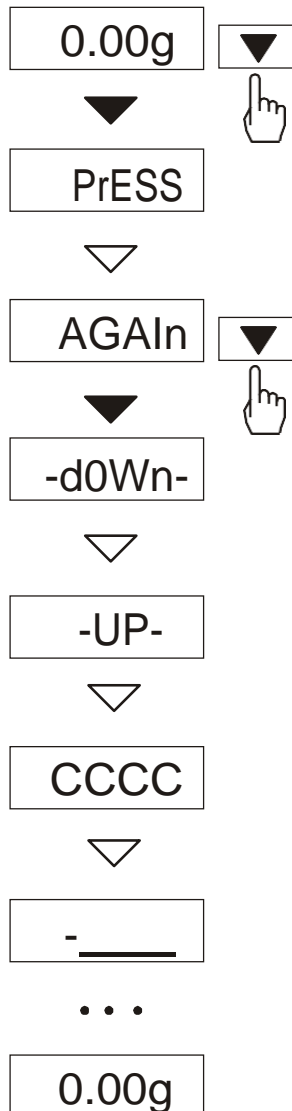
The balance is equipped with internal calibration system, which general task is to maintain required measurement accuracy on the balance.

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 twice,
- after defined time interval (for balances comply with verification requirements - 2 hours),
- after temperature change (for balances comply with verification requirements – more than 2°C).

For balances comply with verification requirements time interval is set to 2 hours and defined temperature change is 1°C. In other 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:

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 internal calibration process in balances not comply with verification requirements press ▼ 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.

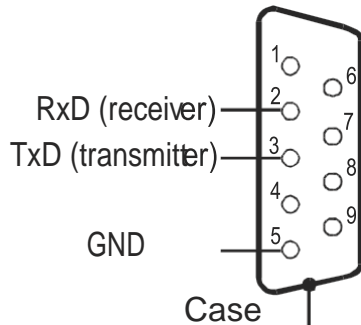
The cause of inaccuracy can be too low temperature of the balance as well, when it was unplugged from power supply. In this situation leave the balance switched on for several minutes in order to adjust its internal temperature.


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 authorized service centre.

Calibration with external weight is described in details in chapter 15.7.

13. Connection with computer or a printer

The scale may send data to a computer or a printer via RS232C interface.



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

For cooperation with the scale a computer should be equipped with software allowing receiving data from the scale and using it further.


- Communication – free program for sending simple commands to the scale and receiving weighing results,
- ProCell – program for cooperation with Microsoft EXCEL and other Microsoft Windows applications (demo version).

Three modes of work serial connections are possible:

- standard mode (stb - with stabilization of indicator or without)
- automatic mode (auto)
- continuous mode (Cont.)

Special function (*SERIAL*) is serve to choice a type of work serial connector (see below).

Standard type.

Scale sends result of weighting on an initialize signal from computer, or after pressed  key.

Automatic mode (this mode can be use to cooperation with a printer)

Data are send automatically after result stabilization, but next transmission is possible after removing previously weighted sample. Data contains next number of sample and result of weighting.

Continuous mode.


Scale sends result of weighting on each 0,1 seconds.

Detailed protocol description in standard mode

LonG protocol

Transmission proceeds in the following way:

1. Communication parameters: 8 bits, 1 stop bit, no parity, baud rate 4800bps,
2. Available orders send from computer and balance answers:


- Readout of scale indication (corresponds to pressing  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

Attention:

Network number different than zero (*SErIAL / 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.

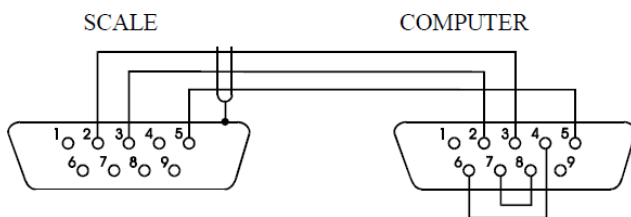
For example: Using a program to test RS232 interface for scale number 1 please write: \$0201 to log in, then *SI*, and write: \$03 to close communication.

- Asking for 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 sign on scale display (text message 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  key press):
 Computer→ Scale: **S S** CR LF (53h 53h 0Dh 0Ah),

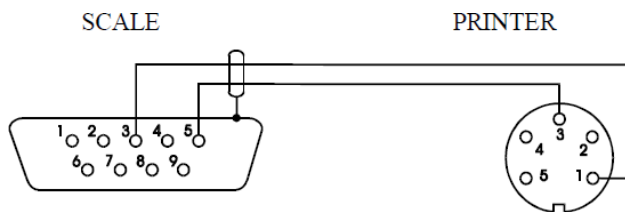
Scale →Computer: without response,

- 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 (connects printer with scale):




AXIS C-001 printer internal switches setting:

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

Protocol ELTRON description

Changing protocol from *LONG* to *ELTRON* is done using *SErIAL* function.
Communication parameters: 8bits, 1stop, no parity, 9600bps,

- After use  key scale sends:
Scale→Label printer : EPL-2 language instruction to initialize print of label:

US	- control instruction
FR"0001"	- number of labels
?	- starting instruction
hh:mm	- 5 signs: hours:minutes
yyyy.mm.dd	- 10 signs: year.month.day
mass + unit	- 10 signs: scale indicate + mass unit
P1	- ending instruction

Auto mode data transmission description

Each time after weighing when indications stabilize, moisture analyzer sends successive 3 digit weighing number and indications. Transmission is not active when indication is zero. Erasing measurements counter can be done by choosing again auto mode (look further – *SErIAL* function).

Send numbers sequence:

1. 3 digits of successive measurement number (digits are send from the oldest to youngest).
2. Two spaces that separate number from indications

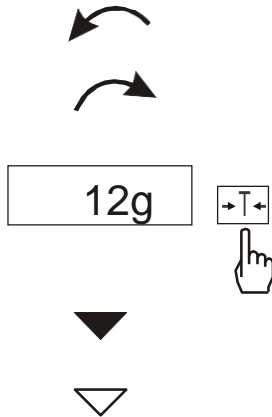
Scale indication (like in *LONG* protocol).

Attention:

1. It is possible to place a constant signs (company name, product name).
2. The default number of label's is 0001 (label number 1). Different numbers of label are possible by using a *LABEL* function.
3. Label formula must be saved in printer – label forma must be designed in computer (by Zebra Designer program) and saved in printer.
4. Parameters and protocol of transmission must be compatible with label printer.

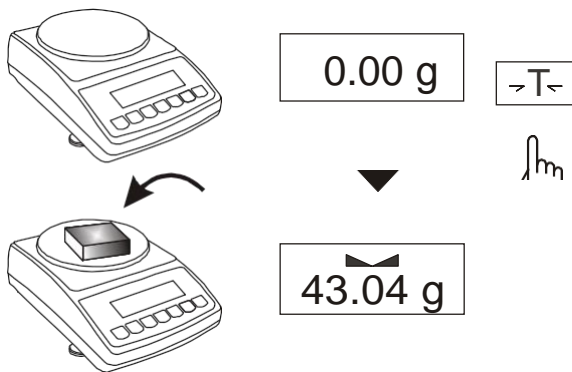
14. Basic scale functions

In further part of this manual the following graphical symbols will be used to describe scale functions:



- put load on the pan
- take load off
- press a key when indication on the left is displayed
- forced change
- automatic change

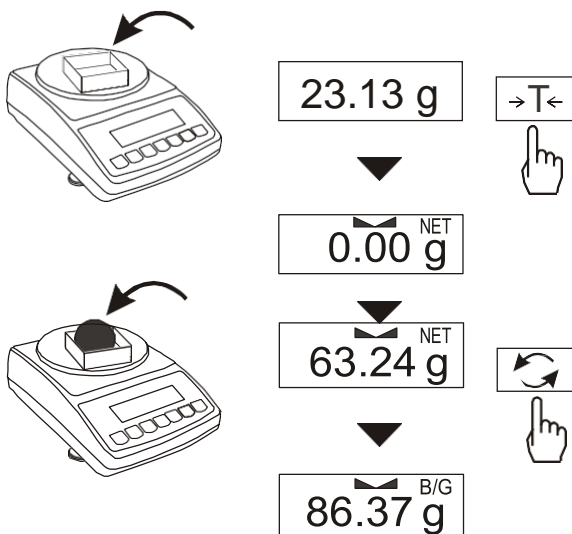
14.1. Simple weighing



If indication different from zero is shown for empty pan, →T← key should be used.

Weighing results should be read when ▾ indicator is displayed.

14.2. Weighing with tare



The scale allows taring in the whole measurement range. After taring and displaying *NET* indicator net weight is displayed. In order to readout gross weight use □ key. B/G indicator will show up. A sum of tare and net mass value can not exceed scale capacity (*Max*).

15. *Special functions*

List of available functions:

- activation of functions in menu (*ACtIV*),
- autozeroing (*AutotAr*),
- pieces counting (*PCS*),
- change of mass unit (*UnIt*),
- percent calculations (*PErCEnt*),
- preparing recipes (*rECIPE*),
- calibration with external weight /internal calibration options (*CALibr*),
- label choosing option (*LABEL*),
- setting parameters of serial interface (*SErIAL*),
- printout configuration (*Print*),
- animal weighting function (*LOC*),
- memorizing tare function (*tArE*),
- maximum value indication function (*UP*),
- force measuring function (*nEWton*),
- anty-disturbance filter option (*FILtEr*),
- setting backlight function (*b_LIGHt*),
- choosing reading unit (*rESOLUt*),
- statistical calculations function (*StAt*),
- basis weight of paper counting function (*PAPER*),
- determining solids and liquids density function (*dEnsity*),
- restore manufacture settings (*dEFAULT*),
- exchanging firmware (*FIrMW*).

function that require additional equipment for full functionality:

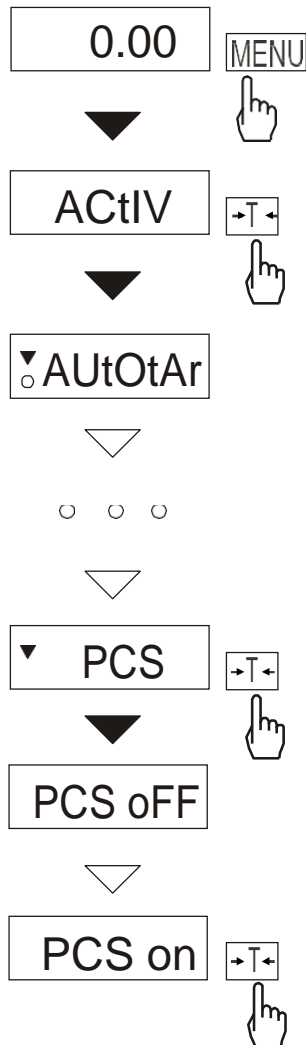
- options with the clock:
 - setting current date and time function (*dAtE*)
 - total weight function (*totAL*)
- options with the transoptors connectors:
 - checkweighing function (*thr*)



User create own menu by choosing function in *ACtIV* function (described in chapter 15.1).

When special functions are being switched *MODE* indicator is shown.

15.1. Customization of special functions menu (*ACtIV* and *dEFAULT*)



The function allows choosing among available special functions these, which will be displayed after pressing *MENU* key. It helps to avoid displaying all available functions, what can make operation time longer.

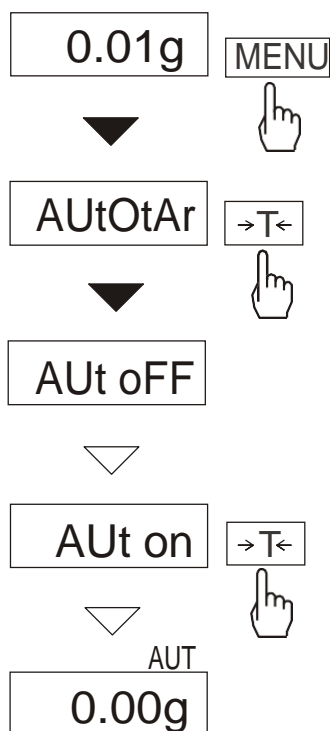
To distinguish *ACtIV* function from function menu list, ▼ indicator is displayed on the left side.

In every moment it is possible to restore primary (manufacture) settings choosing *dEFAULT* special function.

The example on the left shows the operations of adding function for setting parameters of serial interface to function menu.

In order to remove a function from menu, choose *PCS oFF* in place of *PCS on* in the last step of the example.

15.2. Autozeroing function (AutotAr)



Switching the function on causes zero indication is automatically maintained when there is no load on the pan or zero indication was received by pressing →T← key.

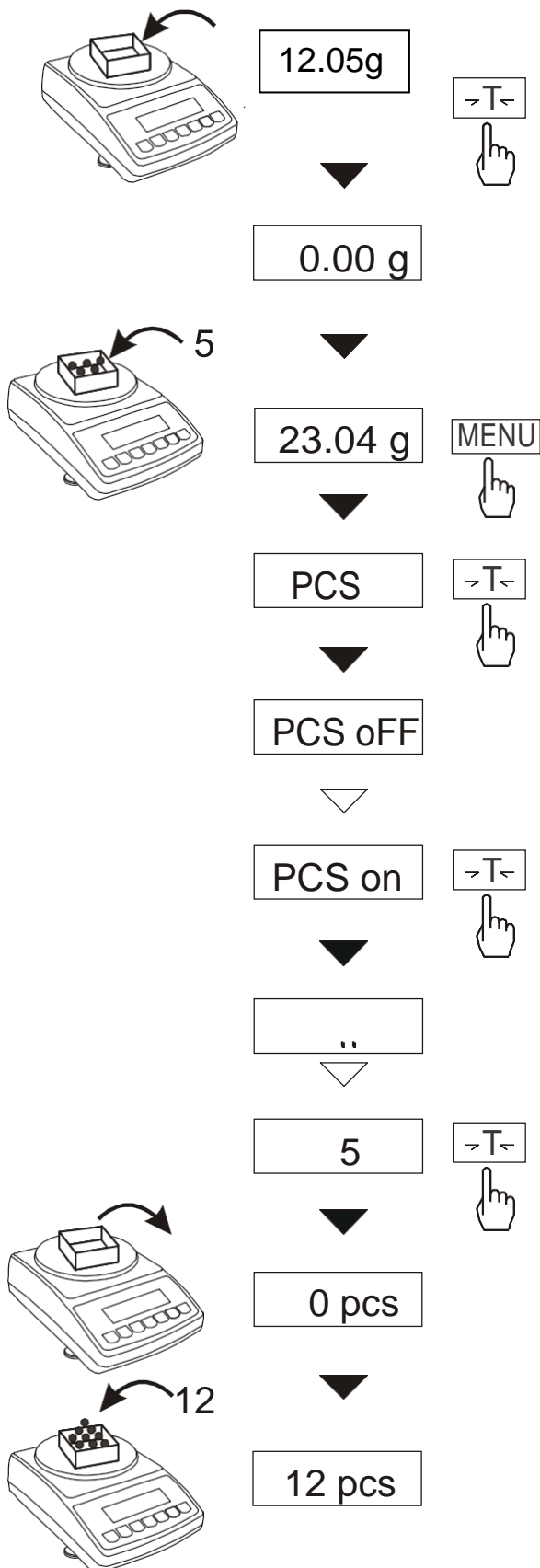
To switch the function on press *MENU* key and then using →T← key choose *AutotAr*, and then *Aut on*.

To switch the function off press *MENU* key and then using →T← key choose *AutotAr* and *AUt OFF*.

Note:

During first 10 min. after switching the scale on, the function works automatically.

15.3. Pieces counting function (PCS)



The function allows counting identical pieces, e.g pills or buttons included into weighed portion.

Measurement is performed in two phases:

- first phase – calculating the mass of single item basing on a sample containing defined amount of pieces: 5, 10, 20, 50, 100, 200 or 500 pieces,
- second phase – counting pieces in weighed portion.

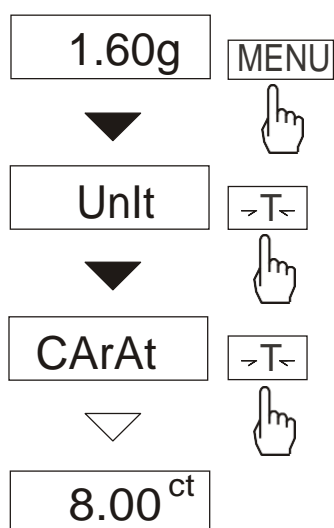
The function has the following options:

- PCS OFF – switch the function off
- PCS on – switch the function on
- PCS ... – recover last used unitary mass,
- PCS 5, 10, 20, ... , 500 – amount of pieces in a sample,
- PCS SEt – set any amount of pieces in a sample,
- PCS uM – set unitary mass directly,
- PCS rS – inserting unitary mass through serial port,
- out – leave menu without changes.

Comments:

1. It is recommended that mass of single piece is greater than reading unit and mass of sample used in first phase is bigger than 100 reading units.
2. PCS Err message indicates that a sample was not put on a pan or a mass of single piece is less than one reading unit (it is possible to count pieces knowing that errors will be bigger).

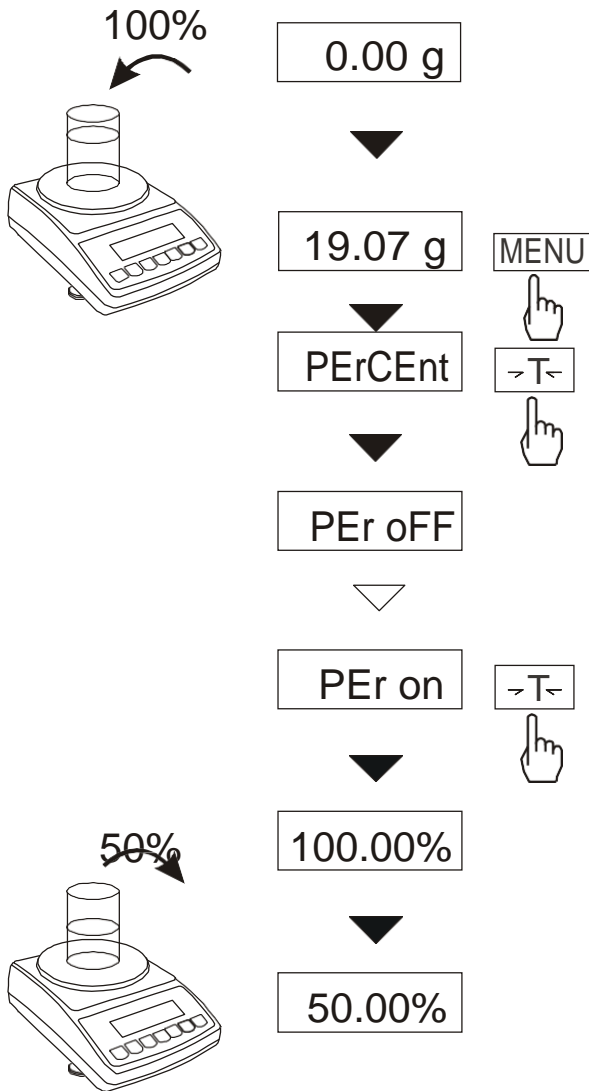
15.4. Function for changing mass unit (Unlt)



- The function allows selecting weighing unit:
- CarAt (1 ct= 0,2 g) - carat,
 - MGrAM (1mg=0,001g) milligram,
 - KGrAM (1kg=1000g) kilogram,
 - Pound (1 lb=453,592374g) English pound,
 - OunCE (1oz=28,349523g) - ounce,
 - OunCEt(1ozt=31,1034763g) pharmaceutical ounce,
 - GrAln (1gr=0,06479891g) - grain
 - PennYW (1dwt=1,55517384g) jewellery mass unit,
 - GrAM (1g) - gram.

The way of choosing carats as weighing unit is shown on the pictures on the left.

15.5. Percent calculation functions (PErCEnt)



The function allows displaying weighing result in percent.

Measurement is performed in two phases:

-first phase – weighing reference mass (mass referenced to 100%),

-second phase – weighing any sample mass as a percent of reference mass measured in first phase.

Weighing result is displayed in various formats, depending on reference mass value. For reference mass

values between 0÷3,5% of scale capacity, format of weighing result is 100.0, for values between 3,5÷35% it is 100.00 and above 35% - 100.000.

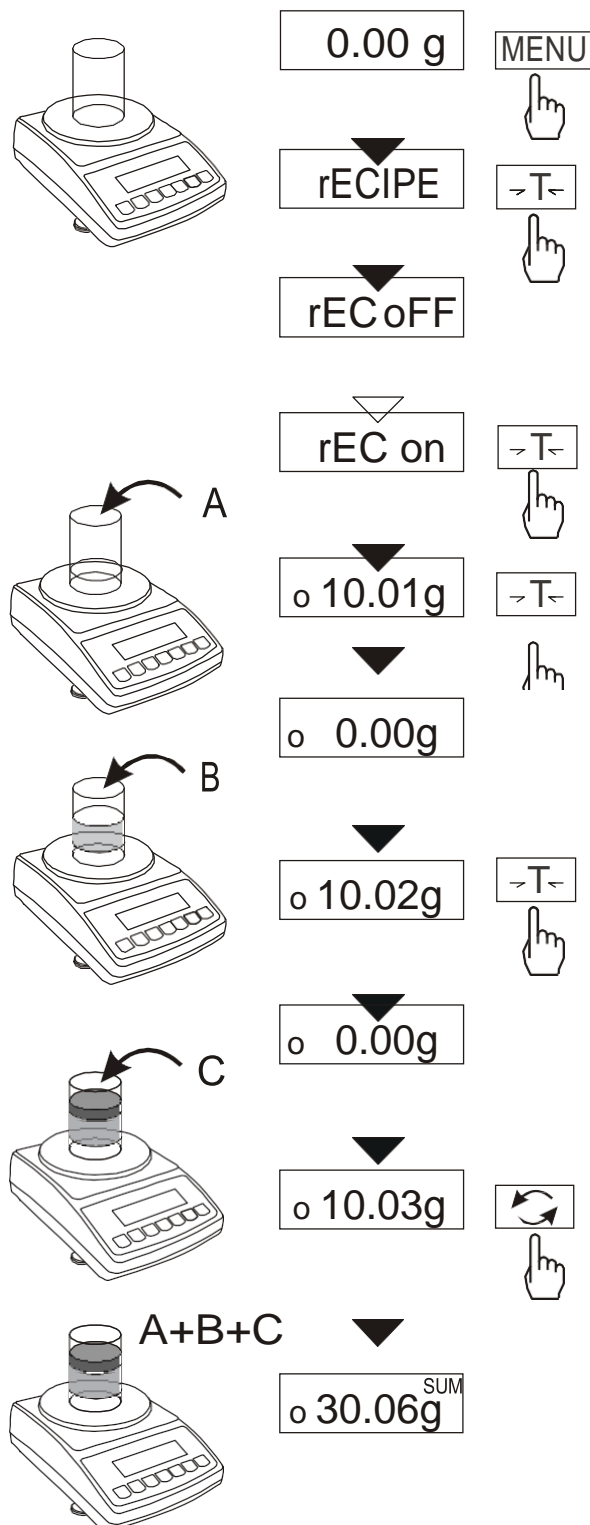
The function has the following options:

- PEr oFF – switch the function off,
- PEr on – set current indication as 100%, show indications in %,
- out – exit without changes.

Caution:

1. PEr Err message informs that reference mass is less than 0,5 or was not defined.
2. When the scale shows weighing result in percent, →T← key works as usual.

15.6. Function for summing recipe ingredients (rECIPE)



The function allows for separate weighing of several ingredients in one container with the possibility of reading current sum of all weighed ingredients. The function includes the following options:

- rEC oFF – leave the function with the possibility of read sum mass,
- rEC on – start recipe weighing,
- rEC Con – continue previous recipe,
- out – exit without changes.

When proceeding with recipe, successive ingredients (A, B, C, etc.) are weighed each time starting from zero indication, which is obtained after scale taring.

If several ingredients are weighed, their sum mass can be read (despite several taring). For this purpose use or rEC oFF option.

Using once again enables fast return to recipe.

In order to turn off rECIPE function press MENU key and then using →T← key choose rECIPE and rEC oFF.

Comments:

o indicator on the left side of scale display shows rECIPE function is active.

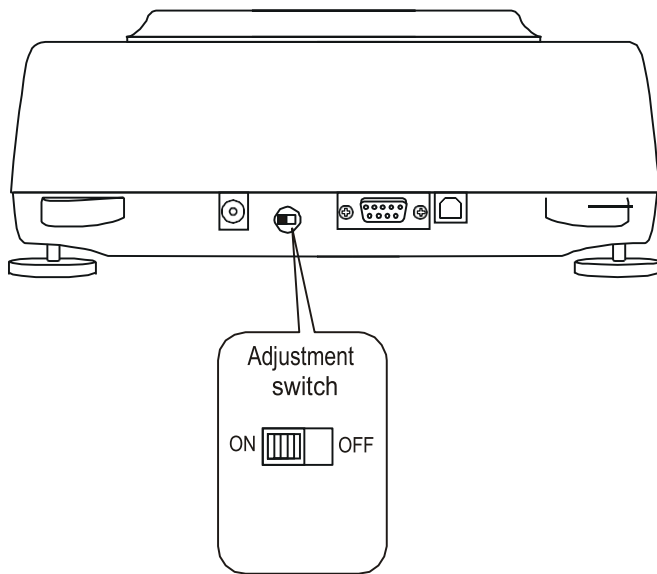
SUM indicator shown when rEC oFF option is used, disappears after using →T← key.

15.7. Calibration with external weight / calibration options (CALibr)

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.



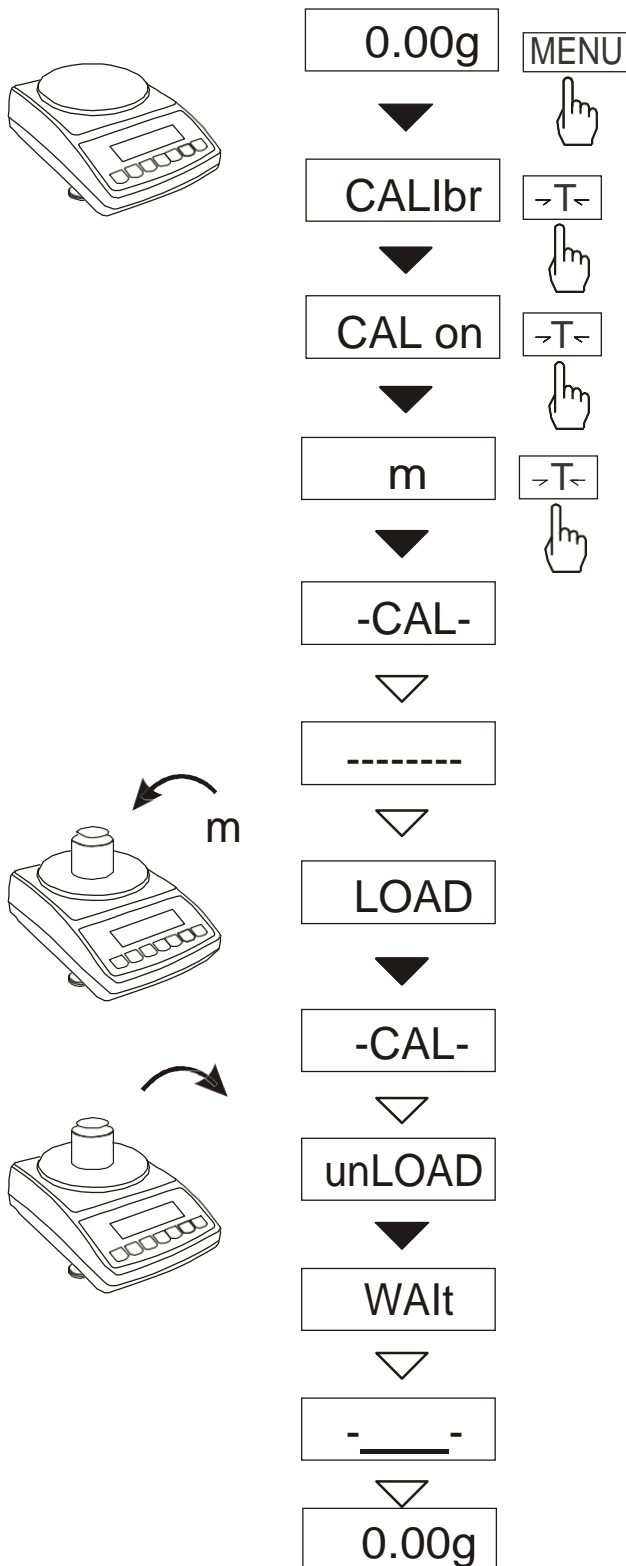
Calibration of legally verified balance requires violating a mark used to protect an access to adjustment switch and results in losing legal verification. To renew legal verification of the balance, it is necessary to contact a service or notified body.



In balances comply with verification requirements 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.

Before proceeding with calibration for balances comply with verification requirements, adjustment switch should be set to *ON* position using thin screwdriver (the balance will display the message *Pr ON*).

When calibration process, described on next page, is finished, the balance will display the message *Pr ON*. Adjustment switch should be set to *OFF* position using thin screwdriver (the balance will move to weighing).

Operations sequence:

Press **MENU** key to display user functions, shown one by one in loop. Choose calibration function pressing **→T←** key when **CALibr** function appears.

The following options will be displayed:

- **CAL on** – perform calibration with external weight
- **CAL Prn** – printout of calibration report
- **CAL tM** – set time interval for internal calibration
- **CAL °C** – set temperature difference -
- out** – switch internal calibration off for internal calibration

When **CAL on** option appears press **→T←** key to select function for calibration with external weight.

Press **▼** key several times to select calibration weight value, which will be used for calibration.

Confirm pressing **→T←** key.

When **LOAD** message appears put calibration weight on the pan and press **→T←** key.

Wait until calibration process is finished.

When **unLOAD** message appears take calibration weight off.

Wait for end of balance zeroing.

Wait until internal calibration is finished.

Balance is ready to work.

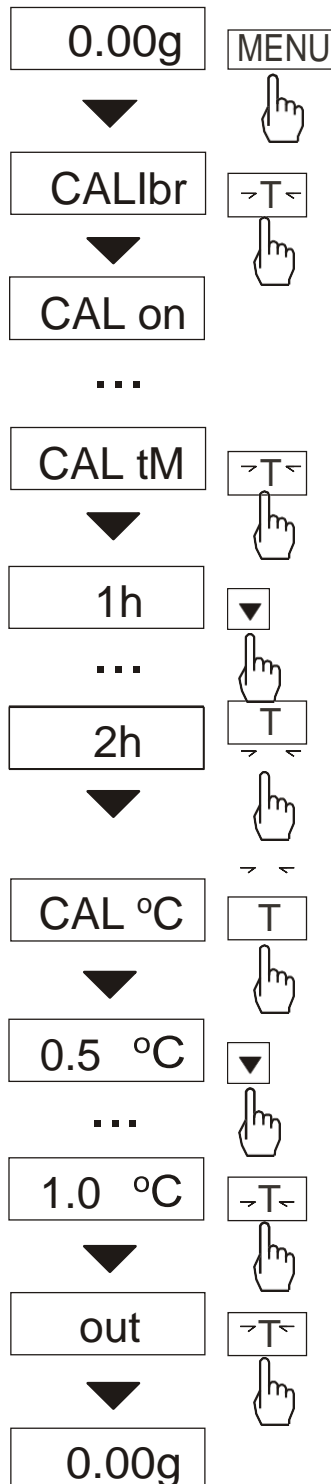
Internal calibration options:



Except of report printout (*CAL Prn*), calibration options are available after changing position of adjustment switch.

Internal calibration of the balance is performed automatically every time the balance is switched on, additionally after given time interval during work and after every temperature change of more than given value.

In order to perform internal calibration in any moment, empty the pan and press **▼** key twice (one more pressing terminates calibration).



Press *MENU* key to display function menu and choose *CALibr* function by pressing **→T←** key when it is displayed. The following options will appear:

- *CAL on* – perform calibration with external weight
- ***CAL Prn*** – printout of calibration report
- ***CAL tM*** – set time interval for internal calibration
- ***CAL °C*** – set temperature difference for internal calibration
- *out* – switch internal calibration off for internal calibration

Press **→T←** key when *CAL tM* option is displayed. Predefined time intervals for internal calibration will be displayed. Select required value pressing **→T←** key.

Accordingly choose *CAL °C* option pressing **→T←** key and selecting values of temperature difference.

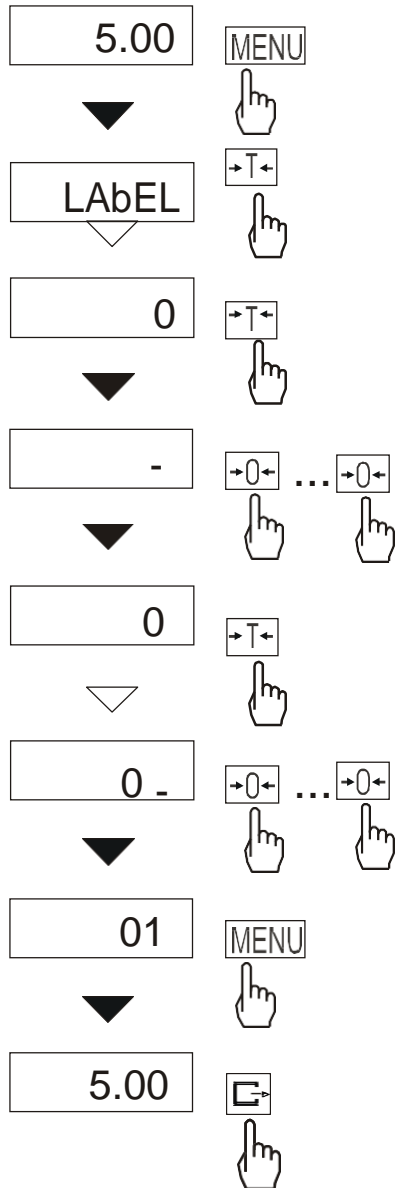
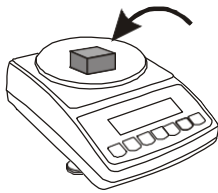
Select *out* option to finish.

The form of calibration report printout (option CAL Prn):

```
.....Calibration report.....  
  
ATA SERIES SCALE  
MAX=..... e=..... d=.....  
S/N : .....  
FIRM. VER.: ATA058 2011-10-17  
  
CALIBRATION NO.      :      ...  
CALIBRATION  DATE   :      ...  
CALIBRATION  TEMP.  :      ...  
FACTORY  EXT.LOAD   :      ...  
FACTORY  INT.LOAD   :      ...  
CURRENT  EXT. LOAD  :      ...  
CURRENT  INT.LOAD   :      ...  
WEIGHT DIFFERENCE :      ...
```

15.8. Label choosing function (LAbEL)

This function is used in scale with *ELTRON (Port-1)* data protocol. This protocol enables label printout with actual scale indication and chosen data from *PrInt* special function (variable data), for example date and time. Other data, for example company address, product name, barcode can appear on label as a constant text. Label patterns with number (4 digit) used by user should be saved in scale memory according to printer manual. Label pattern choice is made by inscribing label number using *LAbEL* function.



Press *MENU* button.

When *LAbEL* is displayed press

→**T**← key.

Actual label number will show.

To enter new label number press

→**T**← key, to exit function without number change press *MENU*.

To inscribe label number use keys:

▼ - digit increase,

→**T**← - next digit,

MENU – end.

After entering label number, putting

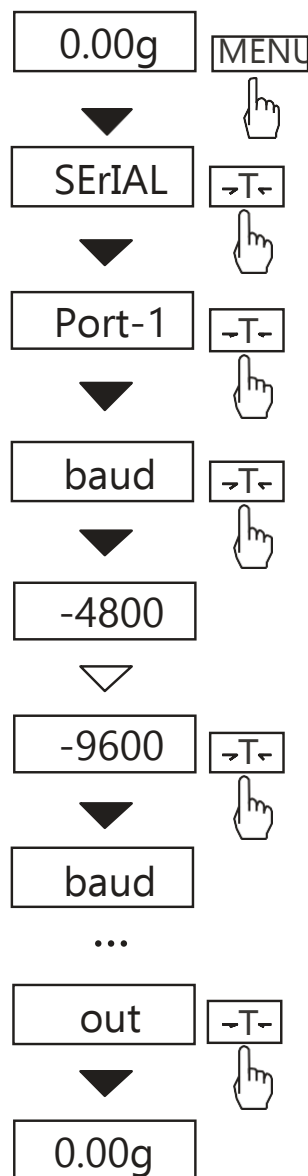
load and pressing **G** key will cause sending data to label printer.



Data format sent to label printer (label nr 1, language EPL-2):

```

US
FR"0001"
?
2000.00.00
00:00
5.00 g
P1
    
```

15.9. Function for setting serial interface parameter (SErIAL)



- The function allows setting the following communication parameters of serial interfaces (Port-1 and Port-2):
- baud rate (*bAud*): (4800, 9600, ..., 115200),
 - number of bits in single char. (*bitS*): 7, 8,
 - parity control (*PARItY*):
nonE – no control
Odd – nonparity
Even – parity control,
 - result transmission kind through serial interface (*SendInG*):
 - stb* – transmission after  key is used and result is stable,
 - transmission after  key is pressed without need of stabilisation, Automatic transmission after load is put on and result is stable (*Auto*),
 - Continuous transmission, about 10 results per second (*Cont.*)
 - transfer protocol (*Prot*):
LonG – printer, computer,
Eltron – label printer,
PEn-01 – PEN-01 attachment,
 - WiFi – Wi-Fi default settings.

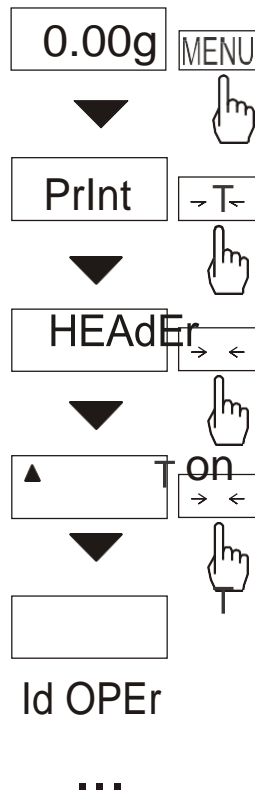
Default parameter values:

Long, 9600 bps, 8 bits, none, *stb*

In order to set needed parameters choose *SErIAL* function, select appropriate parameter and press *->T<-* key when required option or parameter value is displayed. The way of setting baud rate of 9600 bps is shown as example in the pictures on the left, setting other parameters is performed similarly.

When appropriate parameters and options are set, choose *out* to leave the function. If scale is equipped in one serial port user should use only Port-1 option.

15.10. Printout configuration (Print)



- The function allows switch on/off the following positions on printout: *HEAdEr*
- header: name, model and scale number,
 - *Id OPER* – operator code (max 6 digits),
 - *Prn no* – successive printout number (choose this option to zero counter),
 - *Id Prod* – product number (13 digits),
 - *dAtE* – date (option),
 - *tIME* – time (option),
 - *Count* – counting result,
 - *totAL* – result sum,
 - *APW* – unitary mass,
 - *netto* – net mass
 - *tArE* – current tare value,
 - *brutto* – gross mass.

In order to make difference between *Print* function from menu list, indicator is displayed on the left side. Indicator o below informs which option (ON or OFF) is actually set.

In the pictures on the left the way of setting header and operator code is shown. Setting the other parameters is done similarly.

Attention:

1.If *id Prod* or *id OPER* is chosen a fast inserting of their new values is possible (with omission of main menu). In order to do that hold for about 3 seconds *MENU* key, choose *id prod* or *id OPER* with *→T←* key and insert new value using keys:

- ▼ - increase digit,
- ↵ - dot,
- T← - next digit,
- MENU* - end.

The form of standard weighing printout:

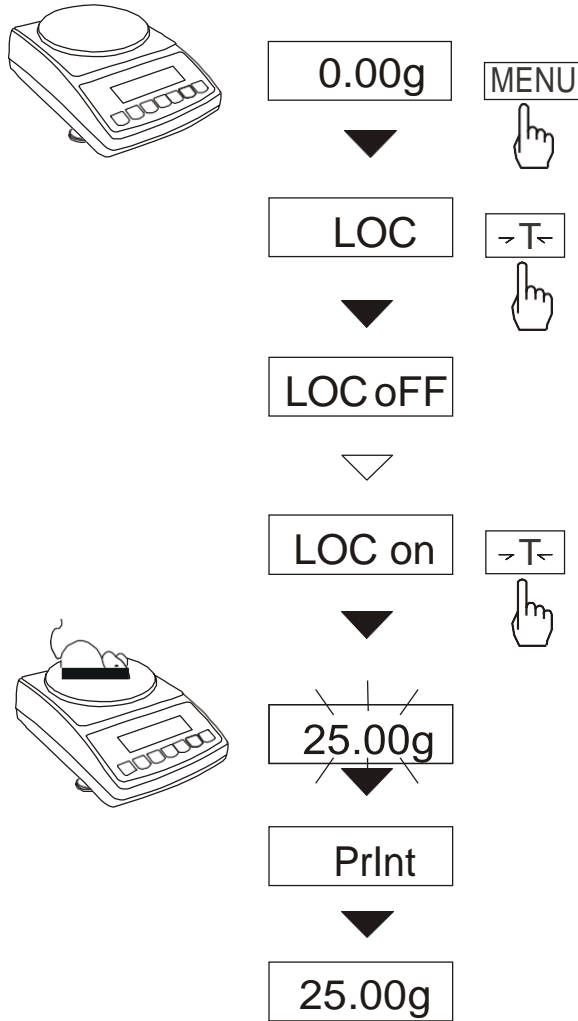
```
SIGN.           : .....  
  
ATA SERIES SCALE  
MAX=2200g  e=0.1g d=0.01g  
S/N       : 1377  
  
ID OPER.  :  
NO.       : 1  
ID PROD.  :  
COUNT    : 0 pcs  
APW       : 0.000 g  
NETTO     : 10.30 g  
TARE      : 0.00 g  
BRUTTO    : 10.30 g  
TOTAL     : 0.00 g
```

The form of PCS counting printout:

```
ATA SERIES SCALE  
MAX=2200g  e=0.1g d=0.01g  
S/N       : 1377  
  
ID OPER.  :  
NO.       : 2  
ID PROD.  :  
COUNT    : 3 pcs  
APW       : 3.859 g  
NETTO     : 10.33 g  
TARE      : 0.00 g  
BRUTTO    : 10.33 g  
TOTAL     : 0.00 g
```

15.11. Animal weighting function (LOC)


This function enables weighting moving animals.



Press *MENU* key.

When *LOC* is displayed press →T← key.

On display will appear in order :

- *LOC oFF* – leave the function,
- *LOC on* – automatic weighting after loading the balance,
- *LOC Prn* – the measurement initiated manually with  key.


When the *LOC on* is displayed push the →T← key.

Tare the balance when necessary with →T← key and then put the animal on scale.

Wait until the weighting result is averaged – the display will “blink”. Next the balance will show final result and send it via serial port to a printer or computer.

The result is displayed for about 30 seconds. In this time remove the animal from the pan.

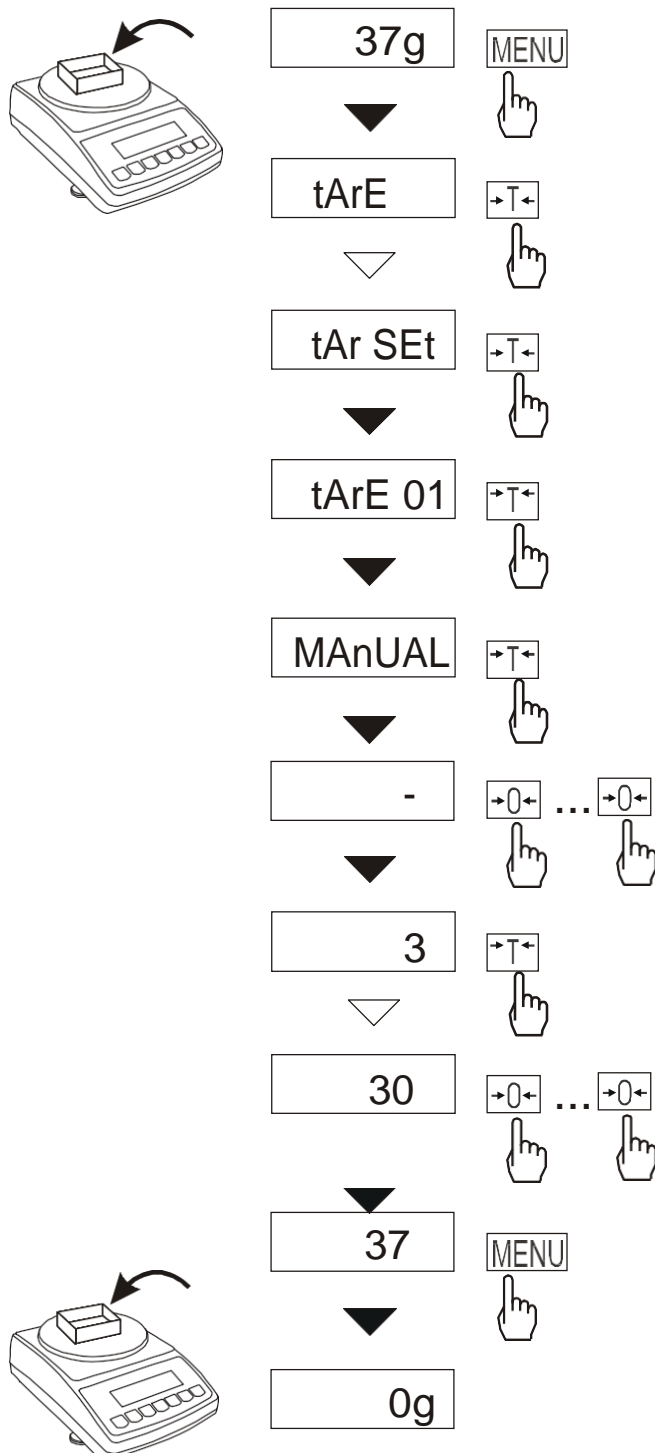
Attention:

1. The load smaller than the minimal is not averaged
2. In case placing the animal takes more than 5s, it is advised to use *LOC Prn* option and then after each loading pressing  key.

15.12. Memorizing tare function (tArE)

This function enables gross weight measurement of goods located in a container (we know the container weight) and then readout evaluated net weight of the goods. For this purpose first the tare value must be inserted to one of the ten scale memory cells. The inserted tare value can be displayed by pressing $\rightarrow T \leftarrow$ key or $\rightarrow 0 \leftarrow$ when the scale pan is unbiased. Inserting tare value may be done by using balance keys or from „nature” when locating empty container on pan is possible.

Insertion of tare values using keys:



After pressing **MENU** key and choosing tArE function the $\rightarrow T \leftarrow$ key will display the following options:

- *tAr OFF* – function off,
- *tAr on* – function on (with tare value inserted previously),
- *tAr . .* – bringing back tare value from memory,
- *tAr SEt* – writing tare value to memory,
- *out* – exit from function.

Press $\rightarrow T \leftarrow$ key while *tAr SEt* is displayed.

By pressing $\rightarrow T \leftarrow$ key choose memory cell to save tare:

tAr 01, 02, ... , 10.

Choose writing option:

- *MAnUAL* – using keys : $\rightarrow 0 \leftarrow$, $\rightarrow \leftarrow$, $\rightarrow T \leftarrow$ and **MENU**,
- *Pan* – writing actual weight value.

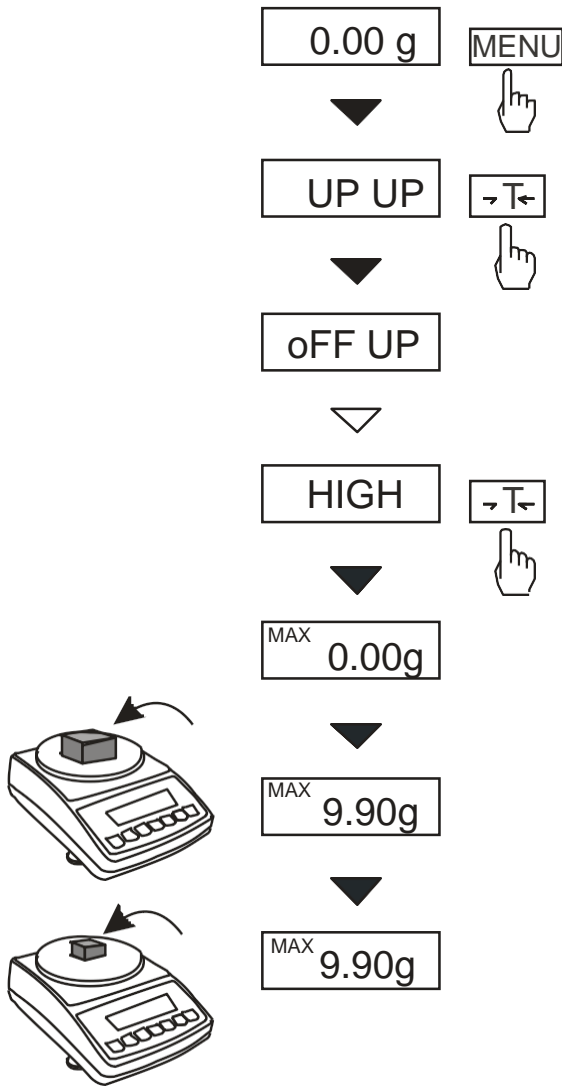
After writing to memory the scale starts working with inserted tare value.

Attention:

Tare values are also memorized when the scale isn't powered.

15.13. Maximum value indication function (UP)

This function enables to display the maximum or minimum value from actual weighing series.



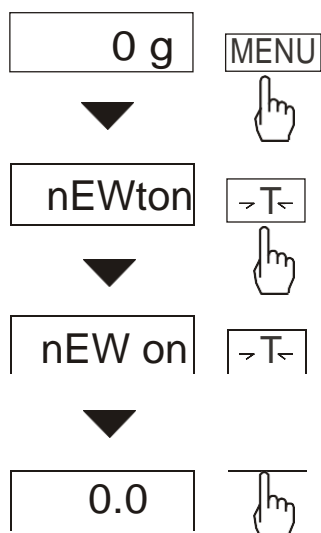
Make sure the balance displays zero indication before starting measurements (tare).

Press *MENU* key. Using $\rightarrow T \leftarrow$ key choose *UP* function, and then one of the following options:
 -*UP OFF* – function off,
 -*UP HIGH* – maximal value displaying,
 -*UP LOW* – minimal value displaying,
 -out – exit without changes.

After choosing *UP HIGH* function balance display will show maximal result of weight measurement. Pressing $\rightarrow T \leftarrow$ key (or $\rightarrow 0 \leftarrow$) will set the result to zero. This function enables to register weight value during mass change. Before choosing *UP LOW* function balance must be loaded. This option enables to register the minimum mass value.

Attention:
Autozero function and the stabilisation indicator are deactivated when UP function is active. The indication is the result of continuous averaging of 5 measurements.

15.14. Force measuring function (nEWton)

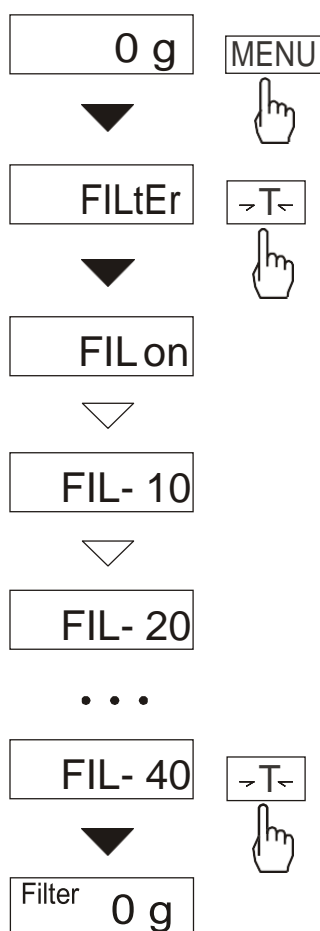


Function activation will cause displaying results in force units (mN). Press **MENU** key.

Using **→T←** key choose Newton function and then **nEW on**.

Attention: 1mN≈0,1019g

15.15. Anty-disturbance filter option (FILtEr)



This function enables using digital filter of chosen intensity during weighting. The filter reduces influence of mechanical vibrations (base vibrations, air blast) on measurement result.

Press **MENU** key and using **→T←** key choose **FILtEr** option.

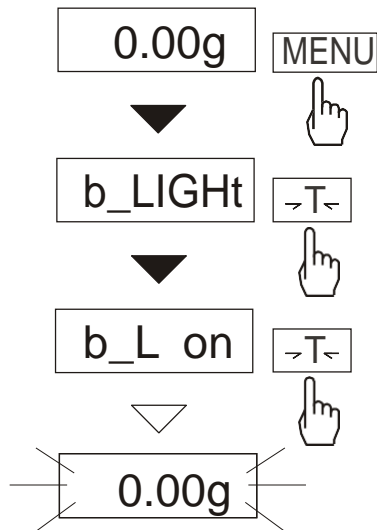
The following options will show successively on the display:

- **FIL OFF** – filter off,
- **FIL on** – filter on.

Choosing option **FIL on** will display following intensity values of the filter. After choosing intensity the weighting starts with the filter turned on.

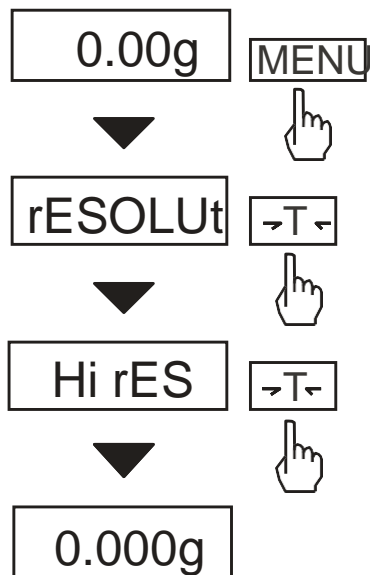
In order to go back to normal work use **MENU** key and choose **FIL OFF**.

15.16. Setting backlight function (b_LIGHt)



- The function is used for choosing the work mode of scale display backlight:
- *b_L OFF* – switch backlight off,
 - *b_L on* – switch backlight permanently on,
 - *b_L ECO* – switch off after 30 seconds of inactivity (no load changes and no key operation),
 - *out* – leave without changes.

15.17. Function for choosing reading unit (rESOLUt)



The function allows choosing reading unit value (resolution).
 Hi rES – high resolution
 LO rES – low resolution

- Available reading unit values:
- balances ATA120÷ATA520:
d=0,01g i *d=0,001g*,
 - balances ATA1200÷ATA2200: *d=0,1g*
 i *d=0,01g*.

15.18. *Statistical calculations function (StAt)*

This function evaluates from series of measurements (max 500) statistical parameters of weighting process.

Adding successively measurements to register is automatic and it occur after the scale is loaded and its indications stabilize.

After each loading printout is made with: number of measurements, result, date and time (if clock is installed and the function is activated).

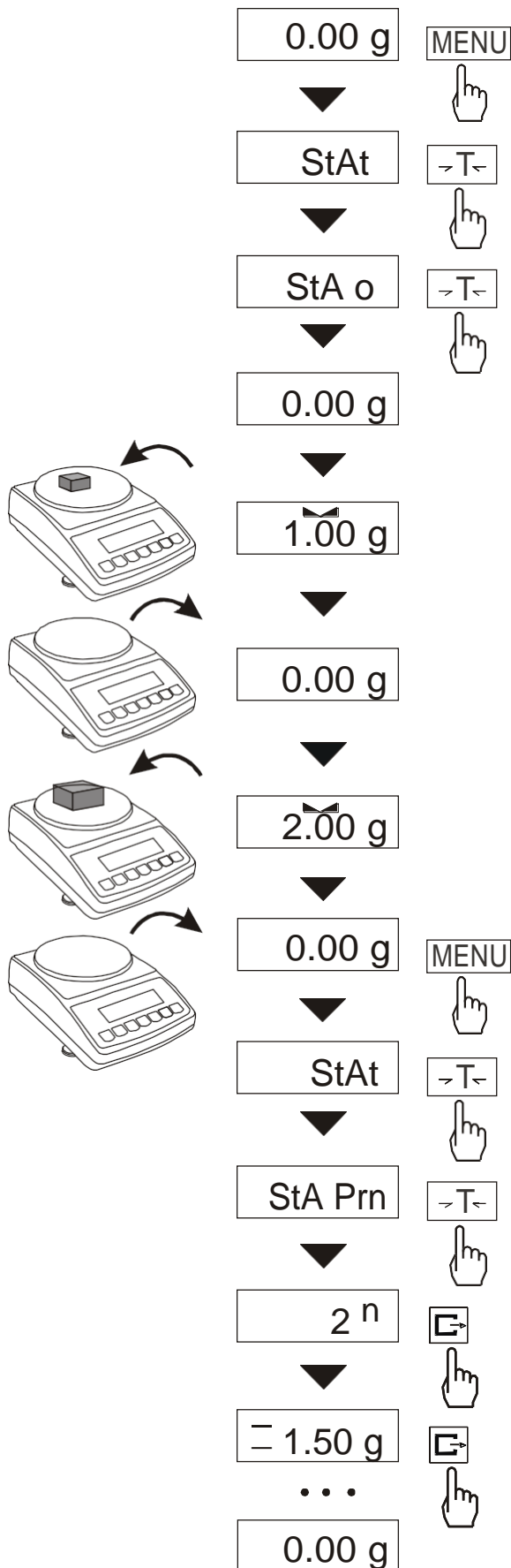
For the obtained measurements series the scale evaluates:

- n -number of samples
- sum x -sum of all samples $sum _ x = \sum x_n$
- \bar{x} -average value (sum x)/n
- min -minimal value from n samples
- max -maximal value from n samples
- max-min -maximal value minus minima value

- S -standard deviation $S = \sqrt{\frac{1}{(n-1)} \sum_n (x_n - \bar{x})^2}$
- S % -standard deviation in percentage

Statistical calculations results can be printed.

Order of operations:



Press MENU key.

When *StAt* is displayed press →T← key.

The following options are displayed:

- *StA Prn* – monitoring and printout of statistical data,
- *StA oFF* – deactivate function,
- *StA o* – activate function, work with printout of chosen weighting results,
- *StA - -* activate function, work without printout,
- *StA n* – maximal samples value,
- *Sta nM* – inscribing nominal value for statistics,
- *Sta tOL* – inscribing tolerance in %,
- *Sta tAr* – automatic tare on/off
- *StA CFG* – function configuration:
 - *Auto* – Automatic work (samples are confirmed after loading the scale and indication stabilization.),
 - *ManuAL* – manual work (confirmation is made by pressing key).
- *out* – exit from function.


Remember first to inscribe nominal weight value and tolerance (mentioned above).

After that, push →T← key when *StA o* is displayed.

Put on successively objects on the pan (remove after indication stabilization) in order to add them to measurements register.

In order to obtain printed statistical results from measurements series press MENU key and →T← key when *StAt* is displayed and later *StA Prn*,

- rESET – erasing result,
- Contin – measurement continue.

Pressing  key printouts estimated values and histogram :

Nominal - nominal value,
Tolerance - accepted value in percentage,

N - number of samples

IN TOL. – number of samples in tolerance

-TOL – amount of measurements
under allowable lower value

+TOL – amount of measurements above
allowable upper value

TOTAL - sum of weights of all n samples

AVERAGE – average weight as (Total)/n

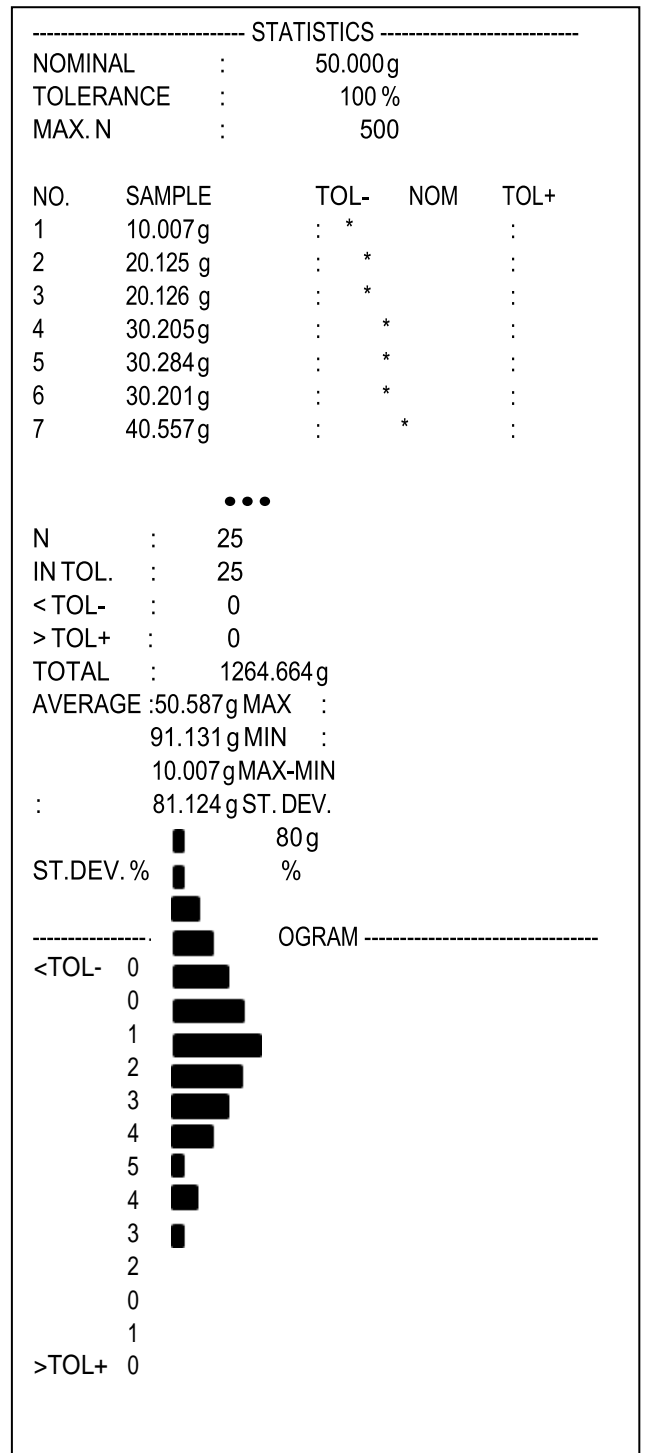
MIN – minimum weight in n samples

MAX– maximum weight in n samples

ST. DEV. – standard deviation

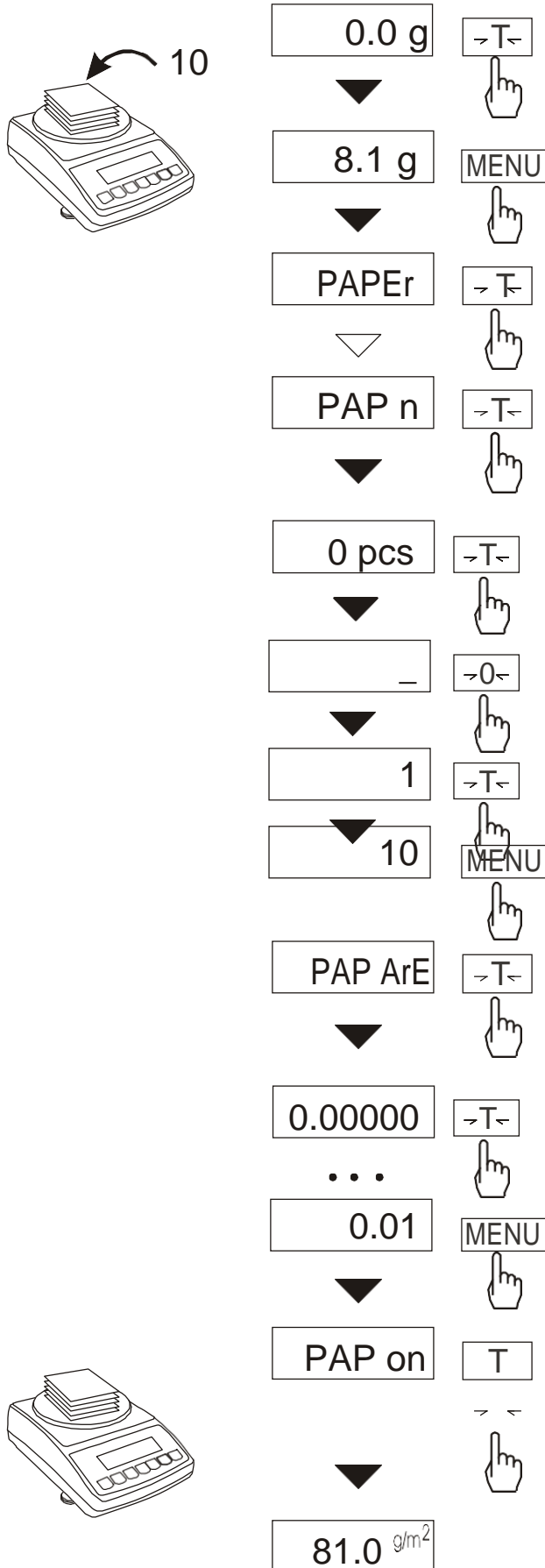
ST. DEV.% – standard deviation percentage

To finish work with this function and
zeroing result register press *MENU*
key and then when *Stat.* and *Sta off* is
displayed press $\rightarrow T \leftarrow$ button.



15.19. Basis weight of paper counting function (PAPeR)

This function allows to count the weight of 1m² sheet of paper on the basis of a sample with known surface.




Start the scale with $\rightarrow T \leftarrow$ key.
 Place on the pan a sample consisting of one or several paper slices (pay attention that the total weight is bigger than 100 readout scale graduations).
 Press the MENU key in order to enter function menu. While F.-PAP is displayed press $\rightarrow T \leftarrow$ key.
 While PAP n is displayed press $\rightarrow T \leftarrow$ key.
 Enter the quantity of paper slices using keys:
 $\rightarrow 0 \leftarrow$ -digit increase,
 $\rightarrow T \leftarrow$ -next digit,
 MENU - end.
 Press $\rightarrow T \leftarrow$ key when PAP ArE is displayed.
 Enter surface of single paper slice in m² (as above).
 Press $\rightarrow T \leftarrow$ key when PAP on is displayed.
 The scale will indicate paper substance (g/m² sign on the right side).
 In order to finish working with function, press MENU key and then using $\rightarrow T \leftarrow$ key, choose PAPER and PAPER OFF.

Attention:
 1. Message "PAP Err" means inscribed PAP n or PAP ArE values are incorrect.

15.20 Density determination (dEnSity)

15.20.1 Solids density determination



0.000g MENU

dEnSity →T←

dEn on

SoLid →F

H2O →F

t ™

18

Press tare →T←

0.0000g

9.7700g

M1

8.9800g

1.21500

This function calculates material density basing on its weight in air and in water using the formula below:

$$\rho = \frac{m_1}{m_1 - m_2} * \rho_L$$

where, m_1 – weigh in air
 m_2 – weight in water
 ρ_L - density of liquid

If distilled water (H_2O) or ethanol (*EthAnOL*) is used, enter its exact temperature (accurate to 0,5°C) – the balance will calculate its density automatically.


To enter the value use the following keys:

▼ - digit increase,
 →← - decimal point,
 →T← - next digit,
 MENU - end.

When using liquid other than distilled water or ethanol, choose OTHER option and enter its density according to its temperature.

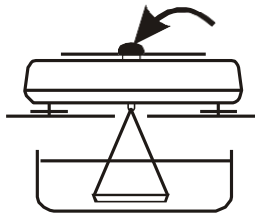
Phase I: measurement in air.
 Phase II: measurement in liquid.

To print measurement result and begin next measurement press →← key.

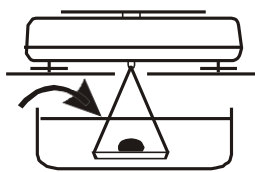
To print a density determination report after all necessary measurements, connect a printer to the balance and press  key. A sample for solid mass density determination is shown below:

DENSITY	
Mass in the air	= ...
Mass in the liquid	= ... g
Mass density	= ... g/cm ³
Density with comp.	= ... g/cm ³
Water density	= ... g/cm ³
Water temperature	= ... °C

Operation sequence (weighing in air and in liquid) for below-balance weighing:

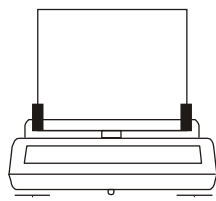


Phase I: measurement in air.



Phase II: measurement in liquid.

15.20.2 Liquid density determination



0.000g MENU

▼

dEnSity →T←

▼

dEn on →T←

▼

Liquid →T←

▼

Plunger

•••

Volume

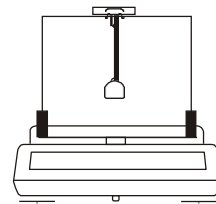
•••

5.51

▼ MENU

Press Tare

▼



0,0000g

▼

9,7700g →G→

▼

M1

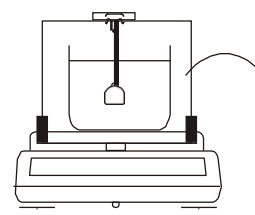
▼

8,9800g →G→

▼

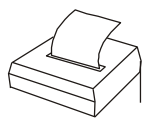
M2

▼



▼

- 1.9100 →G→



This function determines liquid density basing on plunger weight in air and in examined liquid with known volume, using the formula below:

$$\rho = \frac{m_1 - m_2}{V}$$

where

m_1 – plunger weight in air

m_2 – plunger weigh in a liquid

V – plunger volume

Plunger volume is stored on its hanger.

To enter the value use the following keys:

▼ - digit increase,

→G→ - decimal point,

→T← - next digit,

MENU - end.

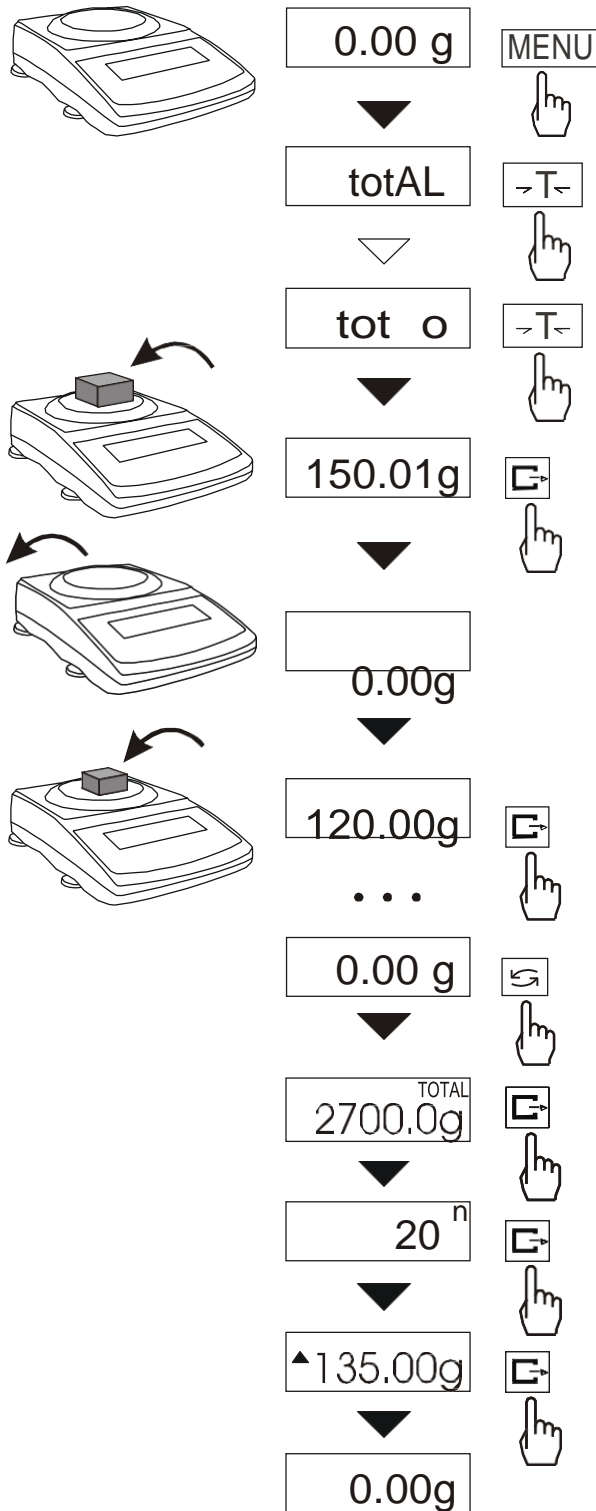
Phase I: measurement in air.

Phase II: measurement in liquid.

To print measurement result and begin next measurement press →G→ key.

15.21. Total weight function (totAL)

The function enables to calculate total weight of series of measurements greater than the balance capacity.



To enter the function, press *MENU* key and choose *totAL* option with $\rightarrow T \leftarrow$ key.

The following options are displayed:

- *tot Prn* - report printout without clearing the adding register,
- *tot oFF* - report printout with clearing the adding register,
- *tot □* - report printout after each measurement,
- *tot -* - report printout disabled.

Press the $\rightarrow T \leftarrow$ key when *tot □* is displayed.

Place successively samples on the pan and press $\rightarrow G \leftarrow$ after each measurement to store the value in the adding register. The storing is confirmed by - - on the display.

To display current results enter *totAL* function menu and choose *tot Prn* option.

The results are display in the following order:

- total weight (*TOTAL*)
- number of registered measurements (*n*),
- average value from measurements (*=*).

To clear the register and start the new series of measurements press $\rightarrow G \leftarrow$ key for the third time.

To leave the function with clearing the adding register choose *tot oFF* option. When connected to a printer, the balance prints the communicate informing about clearing the register.

The sample check for each measurement (depends on the settings of *PrInt* functions):

DATE:	...
TIME:	...
NETTO:	mass

Report printout sample:

TOTAL	=
NUMBER OF MEAS.	=
AVERAGE VALUE	=

Attention:

Maximum number of measurements 99 999.

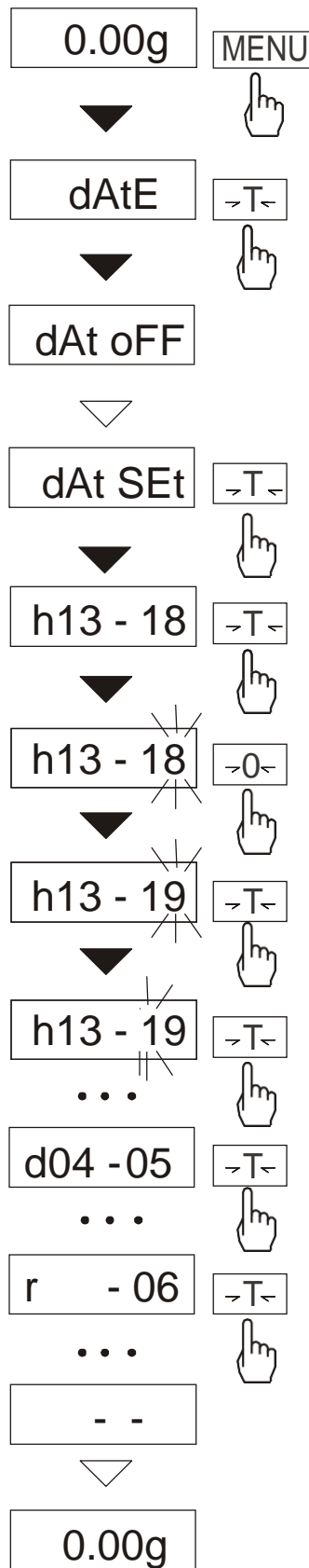
Maximum total load 99 999 000d.

The weighing unit of the aggregated value from the register (total) is the same as the weighing unit stated on the keypad or is 1000 times greater (signalised with "o" indicator at the left of the display).

If the registered value is too big to be displayed, "E" communicate appears on the display.

If the number of series is too high to be displayed, "Err1" communicate appears on the display.

15.22. Date and time setting (dAtE)



This function enables to set current date and time of internal balance clock and course of his use. Function has the following options:

- *dAt oFF* – deactivate date and time printout,
- *dAt on* – activate date and time printout (↵ key),
- *dAt SEt* – change actual date and time,
- *dAt Pln* – acces code insertion,
- *dAt For* – date print format selection *EU* or *USA*.

The example at the left presents how to use *dAt SEt* option.

In order to write actual time and date →T← key should be pressed while *dAt Set* is displayed.

Confirm numbers displayed successively using →T← key to get the right time and date.

→0← key pressed repeatedly enables speeding up the process.

Time format: *h gg – mm*
(*gg* - hour, *m* - minute).

Date format: *d mm – dd*
(*m* - month, *d* - day).

Year format: *r - rr*
(*r* - two last digits of a year).

15.23. Function of comparing with preset threshold values (*thr*)

This function compares weighing result with two reference values: lower and upper threshold. The balance signals comparison result with MIN, OK and MAX indicators and sound signal generated when threshold values are exceeded.

If comparison result is:

- smaller than lower threshold – the balance displays MIN,
- between threshold values - the balance displays OK with the sound signal when exceeding the threshold,
- greater than upper threshold - the balance displays MAX with the sound signal when exceeding the threshold,

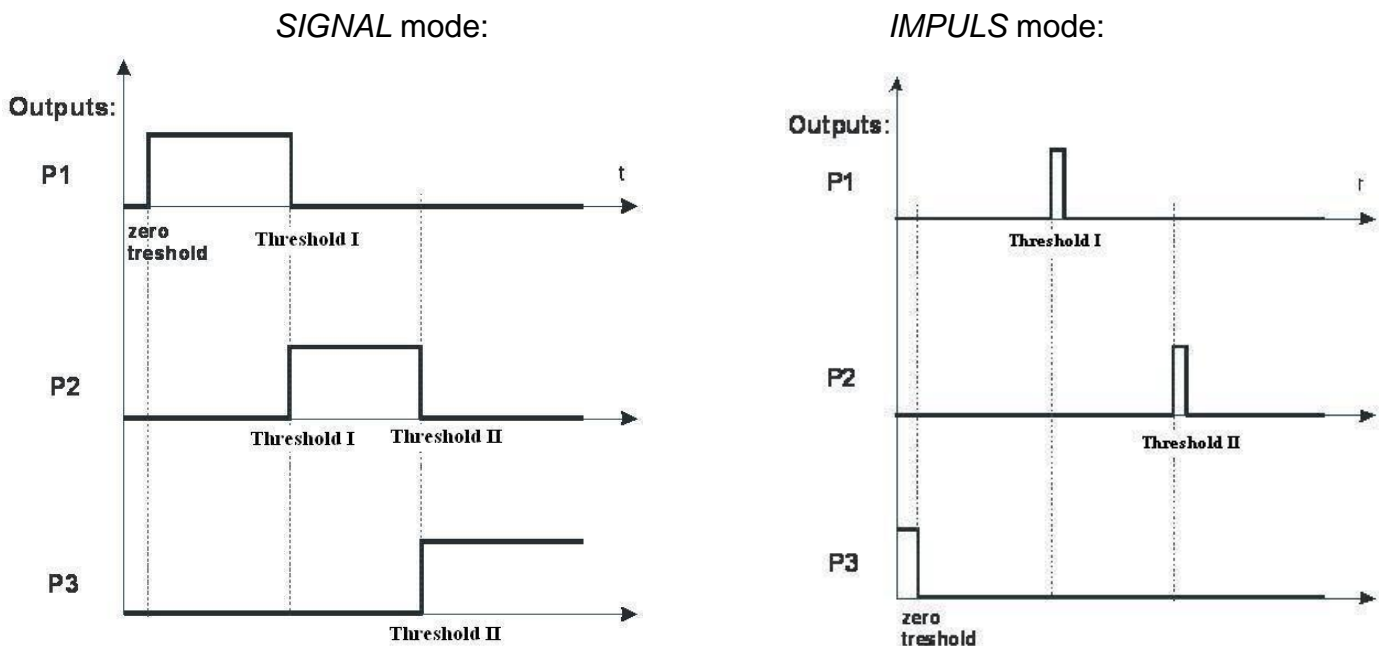
If the balance is equipped with *THRESHOLDS* control connection, the comparison result may be used to control:

- optical signalling devices (*SIGNAL* mode),
- batching devices (*IMPULS* mode).

In standard configuration the scale is set up to cooperate with optical signalling device.

On the outputs *P1* and *P2* the short-circuit states appear, which depend on comparison results of balance indications with threshold values.

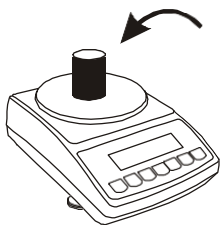
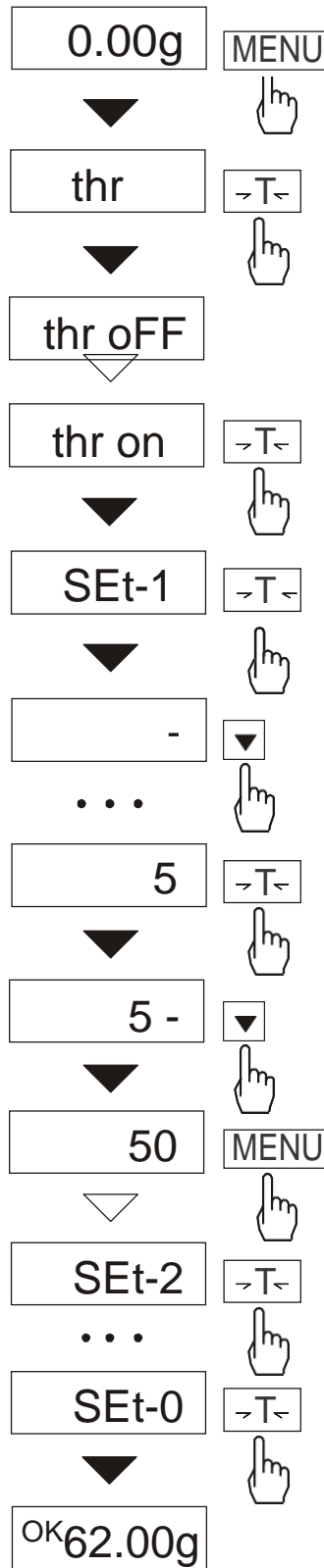
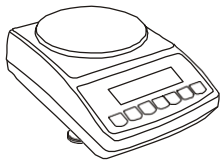
THRESHOLDS outputs states chart (with increasing balance load) for both modes:



In

IMPULS mode on outputs *P1* (threshold I) and *P2* (threshold II) short-circuit impulses appear for about 0,5s. On output *P3* (zero) short-circuit state appears with the zero threshold indication.

Order of operations:



Press *MENU* key and choose *thr* function with $\rightarrow T \leftarrow$ key.

The following options are displayed:

- *thr oFF* – deactivate the function,
- *thr on* - activate the function,
- *thr Prn* - check current threshold values (use $\square \rightarrow$ to display successive values).
- *thr CFG* - mode selection for connection *THRESHOLDS: IMPULS* or *SIGNAL*.

Choose *trESh on* option with $\rightarrow T \leftarrow$ key. Following threshold options are displayed:

- *SEt-0* - start the function with the excess signalisation,
- *SEt-1* - set lower threshold value,
- *SEt-2* - set upper threshold value,
- *SEt-3* - set zero excess signalisation,

Using $\rightarrow T \leftarrow$ key choose option *SEt-1*. Set the lower and the upper threshold values with the following keys:

- ▼ - digit increase,
- $\square \rightarrow$ - decimal point,
- $\rightarrow T \leftarrow$ - next digit,
- MENU* - end.

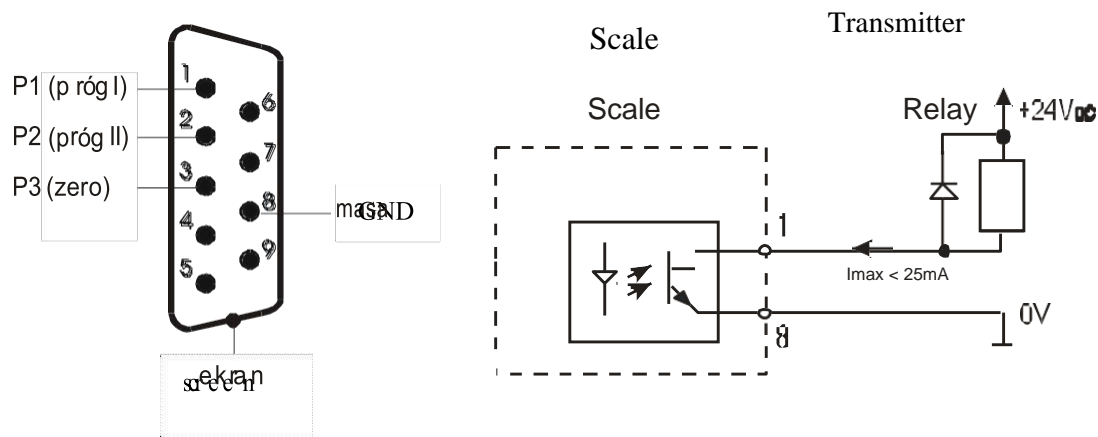
Next choose option *SEt-2* and write upper threshold value.

When necessary, use *SEt-3* option to set the value underneath which the sign MIN isn't displayed.

Choosing *SEt-0* option will make the scale work with both zero and threshold exceeding signalization.

To finish work with this function press *MENU* key and choose *thr* and *thr oFF*.

Scheme for connecting the single relay to *THRESHOLDS* connection output:



The *THRESHOLDS* connection contains transoptor outputs of open collector type, with load capacity 25mA / 24V.

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: AC 250V, 3A.

Important notes:

1. After switching the balance on, both thresholds are set as maximum values.
2. When selecting upper threshold value, pay attention that its value is not lower than the lower threshold value.
3. Selecting lower and upper threshold value is also possible by sending proper commands from computer (for more information look into scale manual).

15.24 Firmware (FlrMW)

This function enables exchanging balance firmware and is designed for service.

16. Troubleshooting and maintenance

1. The scale should be kept clean.
2. Take care that no dirt is between pan and casing of the scale. If dirt is noticed take the pan off (lift it up). Clean dirt and then put the pan on.
3. In case of improper operation caused by a short-lasting lack of power supply, switch the scale off by unplugging it from the mains, and then after several seconds switch it on.
4. Every repairs performed by unauthorized persons are forbidden
5. To repair the scale, please contact nearest service centre. The list of authorised service centres is given in guarantee card.
6. Scales can be sent for repair as messenger delivery only in original package. For transportation scale pan have to be protected against accidental pressing. If not, there is a risk of damaging the scale and losing guarantee.

Failure messages:

Message	Possible cause	Recommendation
<i>C-1 ... 6</i> (more than 1min.)	negative result in one of autotests	contact service centre if the message remains
scale is not weighing	protecting screw remains in the scale	remove protecting screw
<i>L</i>	no pan on the scale	put the pan on
	mechanical damage of scale sensor	contact service centre
<i>H</i>	overweight of the scale	take a load off the pan
	mechanical damage of the scale	contact service centre
<i>Err-b</i>	load left on the pan during start-up	take a load off the pan
indicator does not work	unstable scale position, ground vibration, air flows	locate the scale in place where stable results are maintained
	damage of the scale	contact service centre
-----	taring not finished	contact service centre

Declaration of Conformity

We:

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

confirm with all responsibility that scales

*ATA220, ATA320, ATA520, ATA1200, ATA2200
ATZ220, ATZ320, ATZ520, ATZ1200, ATZ2200*

marked with CE mark comply the following:

1. EN 55022:2000 standard Limits and methods of measurement of radio disturbance characteristics of information technology equipment 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 Council Directive 89/336/EEC

Additional information

- Conformity evaluation for the Council Directive 89/336/EEC were carried out by Laboratorium Badawcze Oddziału Instytutu Elektrotechniki in Gdańsk, accredited by PCA.

Gdańsk, 27.06.2011 r.

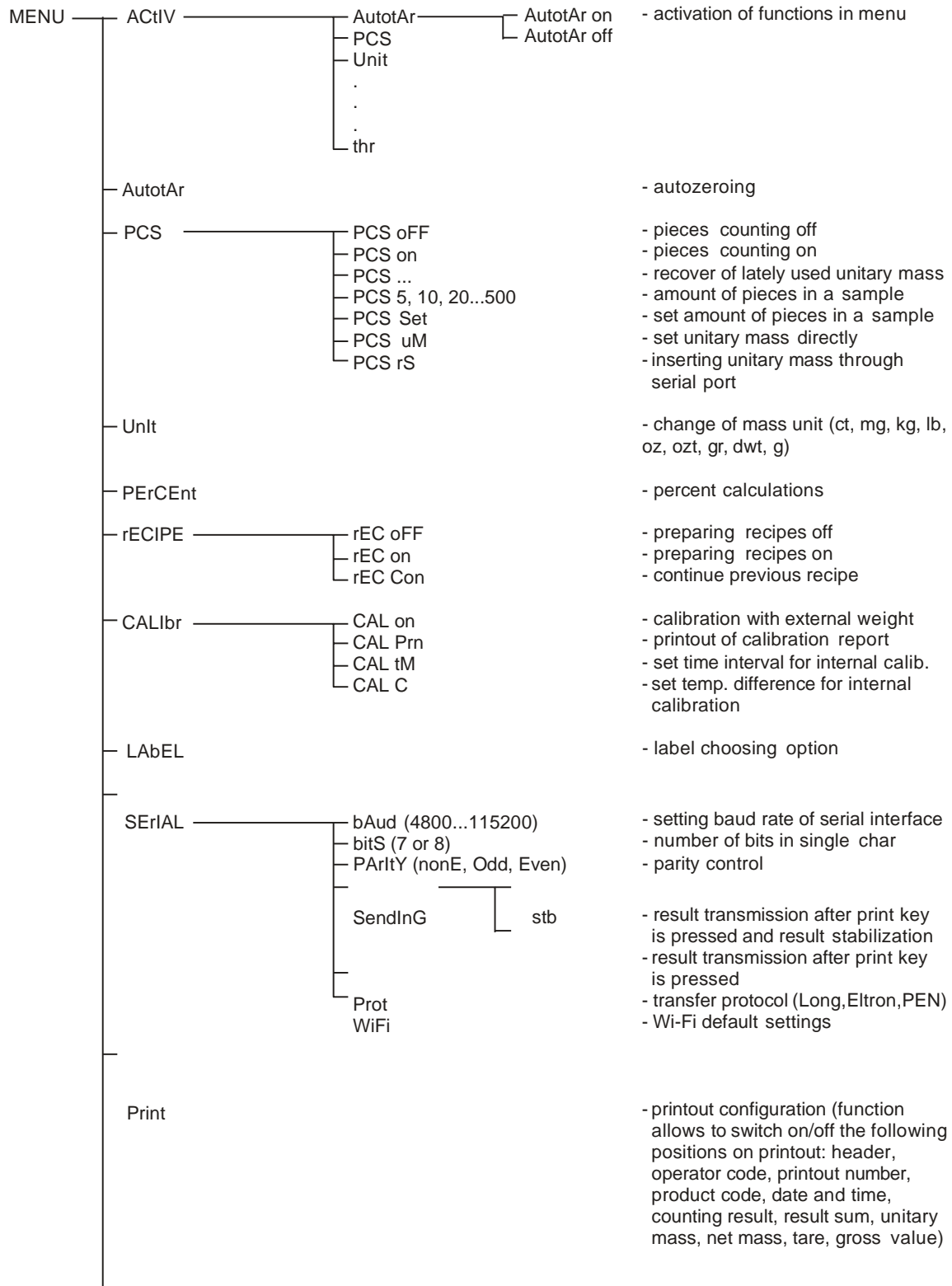
Per pro Director of AXIS Ltd:

Production Manager Jan Kończak

Signature



ATA firmware diagram



LOC	<ul style="list-style-type: none"> LOC oFF LOC on LOC Prn 	<ul style="list-style-type: none"> - animal weighing function off - automatic weighing after loading - measurement initiated manually by key
tArE	<ul style="list-style-type: none"> tAr oFF tAr on tAr ... tAr Set 	<ul style="list-style-type: none"> - memorizing tare function off - func. on (with tare value inscribed) - bringing back tare value from mem. - inscribing tare value to memory
UP		<ul style="list-style-type: none"> - maximum or minimum value indication function
nEWton		<ul style="list-style-type: none"> - force measuring function
FILtEr		<ul style="list-style-type: none"> - anty-disturbance filter option
b_LIGHt		<ul style="list-style-type: none"> - setting display backlight
rESOLUt		<ul style="list-style-type: none"> - choosing resolution of readout unit
StAt	<ul style="list-style-type: none"> StA Prn StA oFF StA o StA StA n StA nM StA tOl StA tar StA CFG 	<ul style="list-style-type: none"> - statistical calculations function - monitoring and printout of data - deactivate function - activate function, work with printout - act. function, work without printout - maximal samples value - inscribing nominal value for stat. - inscribing tolerance in % - automatic tare on/off - automatic work (samples are confirmed after indication stabil) - manual work (confirmation is made by pressing print key)
	<ul style="list-style-type: none"> Auto Manual 	
PAPER		<ul style="list-style-type: none"> - basis weight of paper counting
dEnsity		<ul style="list-style-type: none"> - determining solids and liquids density function
totAL	<ul style="list-style-type: none"> tot Prn tot oFF tot tot - 	<ul style="list-style-type: none"> - total weight function - report printout without clearing - report printout with clearing register - report printout after each measur. - report printout disabled
dAtE		<ul style="list-style-type: none"> - date and time settings
thr	<ul style="list-style-type: none"> thr oFF thr on thr Prn thr CFG 	<ul style="list-style-type: none"> - deactivate threshold function - activate threshold function - check current thr. values - mode selection (Impuls/Signal)
dEFAULT		<ul style="list-style-type: none"> - restore manufacture settings
FirMW		<ul style="list-style-type: none"> - exchanging firmware (for service)