USER MANUAL

4BA(N), 4BANA(N), 4BAF(N) , 4BAPZ(N) and 4BAPA(N) SERIES

File: 2025-01-17 4BAxx ME_01 GB

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1. General description

This manual describes scales produces by AXIS Sp. z o.o. and their basic functions. Standard execution scales are equipped with ME-01/A/LED meter and stainless steel scales with ME-01/N/LED. In case of using these meters or special meter for eg. batching meter it is essential to use proper user manual for individual meter type.

All balances are tested in respect of metrology. According to order, balances may be verified or calibrated.

EC verification (conformity assessment) of balances is required for special applications (trade, tariffs, pharmacy recipes, medical and pharmaceutical analysis, packing of goods). For other applications it is recommended to replace verification with calibration.

Verified balances have the following verification features:

- protection stamps, located on balance meter and converters connection box (installed under the bearing surface).
- Office of Measures marks and metrological mark, located on the rating plate.

Balances classification (PKWiU code) 29.24.23.

2. Certificates:

Certificate of type approval
no. T11430R0

AXIS management System
Certificate
No. 90927/C/6

3. Meters

Depending on scale's application it can be equipped with following meter:

ME-01/A/18 (LED) - **Standard** universal ME-01 meter in aluminium (A) housing and LED display (18mm digits height). Full set of special functions (chapter 15) and standard set of keys.

ME-01/A/LCD - **Standard** universal ME-01 meter in aluminium (A) housing and LCD display (18mm digits height). Full set of special functions (chapter 15) and standard set of keys.

*ME-01/N18 (LED) – **Standard** universal ME-01 meter in stainless steel housing and LED* display (18mm digits height). Full set of special functions (chapter 15) and standard set of keys.

*ME-01/N/LCD - **Standard** universal ME-01 meter in stainless steel housing and LCD display* (18mm digits height). Full set of special functions (chapter 15) and standard set of keys.

ME-01/N/25 – Universal meter with LED display (25mm digits height) in stainless steel housing. Full set of special functions (chapter 15) and standard set of keys.

ME-11/N/LCD (surcharge) – meter with numerical keyboard designed to operate special functions that need inscribing data (e.g. product code, unitary mass), stainless steel housing.

ME-02/N/LCD (surcharge) – designed for one-ingredient or multi-ingredient batching, numerical keys, stainless steel housing.

ME-03/N/G (surcharge) – designed to cooperate with label printer, numerical keys, stainless steel housing, big graphical display.

ME-12/N/G (surcharge) - designed to operate with computer through RS485 or LAN network, with possibility to connect scanner and label printer (basic functionality), graphical display– weight and text, menu and data, stainless steel housing.

ATTENTION:

In order to get acquainted with special functions and other functionality use proper meter user manuals.

4. Completation

Basic set includes:

1. The scale
2. RS232C connector (only 4BA/N, 4BA/FN, 4BA/PAN, 4BA/PZN scales)
3. User manual
4. Warranty

5. Technical data

Platform scales 4BA and 4BA/N

Scale type	4BA300(N)	4BA600(N)	4BA1500(N)	4BA2000(N)	4BA3000(N)	4BA6000(N)
Maximum load (Max)	300kg	600kg	1500kg	2000kg	3000kg	6000kg
Reading graduation (d)	100g	200g	500g	1kg	1kg	2kg
Verification graduation (e)	100g	200g	500g	1kg	1kg	2kg
Minimum load (Min)	2kg	4kg	10kg	20kg	20kg	40kg
Tare set range	-300kg	-600kg	-1500kg	-2000kg	-3000kg	-6000kg
Precision class	III					
Operational temperature	-10÷40°C					
Weighing time	<3s					
Platform dimensions: Balance weight:						
1000x1000x80(85)mm 60kg	•	•	•			
1250x1250x80(85)mm 100kg	•	•	•	•		
1500x1500x80(85)mm 140kg			•	•		
1500x1500x112(110)mm 150kg					•	
1500x2000x112(110)mm 190kg					•	•
Display cable length	4m					
Power supply	~230V, 50Hz, 8VA					
Internal supply (option)	NIMH (size AA) – 4 pcs					
Accumulator working time	About 6 h with display backlighting and 16h without					
Indicator protection rating	4B – lack of IP 4B/N (stainless scales) - IP65					
Sensors protection rating	4B - IP67 4B/N (stainless scales)- IP68					

Overrun scales 4BA/NA and 4BA/NAN:

Scale type	4BA300NA (N)	4BA600NA (N)	4BA1000NA (N)	4BA1500NA (N)	4BA2000NA (N)
Maximum load (Max)	300kg	600kg	1000kg	1500kg	2000kg
Reading graduation (d)	100g	200g	500g	500g	1kg
Verification graduation (e)	100g	200g	500g	500g	1kg
Minimum load (Min)	2kg	4kg	10kg	10kg	20kg
Tare set range	-300kg	-600kg	-1000kg	-1500kg	-2000kg
Precision class	III				
Operational temperature	-10÷40°C				
Weighing time	<4s				
Intern.(extern.) platform dimensions	A: 860(1100)x1000x48mm A+: 1000(1240)x1000x48mm B: 1000(1250)x1250x48mm C: 1250(1500)x1500x58mm				
Overrun dimensions (length x height)	A: 355 x 48mm A+, B: 415x48mm C: 480 x 58mm				
Scale weight	Platform A: 160kg Platform A+:200kg Platform B: 250kg Platofrm C: 350kg				
Supply	~230V, 50Hz, 8VA				
Internal supply (option)	NIMH (size AA) – 4 pcs				
Accumulator working time	About 6 h with display backlighting and 16h without				
Indicator protection rating	4BA/NA - no IP, 4BA/NAN (stainless scales) - IP65				
Sensors protection rating	4BA/NA - IP67, 4BA/NAN (stainless scales)- IP68				

Pallet scales 4BA/PA oraz 4BA/PAN:

Scale type	4BA300 PA(N)	4BA600 PA(N)	4BA1000 PA(N)	4BA1500 PA(N)	4BA2000 PA(N)	4BA3000 PA(N)
Maximum load (Max)	300kg	600kg	1000kg	1500kg	2000kg	3000kg
Reading graduation (d)	0,1kg	0,2kg	0,5kg	0,5kg	1kg	1kg
Verification graduation (e)	0,1kg	0,2kg	0,5kg	0,5kg	1kg	1kg
Minimum load (Min)	2kg	4kg	10kg	10kg	20kg	20kg
Tare set range	-300kg	-600kg	-1000kg	-1500kg	-2000kg	-3000kg
Precision class	III					
Operational temperature	-10÷40°C					
Weighing time	<4s					
Bearing surface internal dimensions (width.x lenght.x height.)	600x1135x78mm					
Bearing surface external dimensions (width.x lenght.x height.)	840x1260 x78mm					
Drive (entry) width	600mm					
Display lenght to indicator	4m					
Supply	~230V, 50Hz, 8VA					
Internal supply (option)	NIMH (AA size) – 4 pcs.					
Accumulator working time	About 6 h with display backlighting and 16h without					
Scale weight	70kg					
Indicator protection rating	4BA/PA - no IP 4BA/PAN (stainless steel) - IP65					
Sensors protection rating	4BA/PA - IP67 4BA/PAN (stainless steel)- IP68					

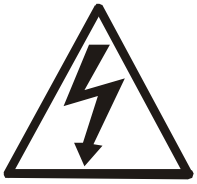
Skid scales 4BA/PZ and 4BA/PZN:

Scale type	4BA300 PZ(N)	4BA600 PZ(N)	4BA1000 P(N)	4BA1500 PZ(N)	4BA2000 PZ (N)	4BA3000 PZ(N)
Maximum load (Max)	300kg	600kg	1000kg	1500kg	2000kg	3000kg
Reading graduation (d)	0,1kg	0,2kg	0,5kg	0,5kg	1kg	1kg
Verification graduation (e)	0,1kg	0,2kg	0,5kg	0,5kg	1kg	1kg
Minimum load (Min)	2kg	4kg	10kg	10kg	20kg	20kg
Tare set range	-300kg	-600kg	-1000kg	-1500kg	-2000kg	-3000kg
Precision class	III					
Operational temperature	-10÷40°C					
Weighing time	<4s					
Skid dim. (width.× lenght.× height.)	120×1260×75mm					
Wire lenght beetwen skids	5m					
Wire lenght to meter	5m					
Supply	~230V, 50Hz, 8VA					
Internal supply (option)	NIMH (AA size) – 4 pcs.					
Accumulator working time	About 6 h with display backlighting and 16h without					
Scale weight	40kg					
Indicator protection rating	4BA/PA - no IP 4BA/PAN (stainless steel) - IP65					
Sensors protection rating	4BA/PA - IP67 4BA/PAN (stainless steel)- IP68					

Foundation scales 4BA/F and 4BA/FN:

Balance type	4BA300F(N)	4BA600F(N)	4BA1500F(N)	4BA2000F(N)	4BA3000F(N)
Maximum load (Max)	300kg	600kg	1500kg	2000kg	3000kg
Reading graduation (d)	100g	200g	500g	1kg	1kg
Verification graduation (e)	100g	200g	500g	1kg	1kg
Minimum load (Min)	2kg	4kg	10kg	20kg	20kg
Tare set range	-300kg	-600kg	-1500kg	-2000kg	-3000kg
Precision class	III				
Operational temperature	-10÷40°C				
Weighing time	<3s				
Foundation depth	128mm				
Platform dimensions: Balance weight:					
1000x1000mm 140kg	•	•	•		
1250x1250mm 170kg	•	•	•	•	
1500x1500mm 210kg		•	•	•	•
1500x2000mm 300kg					•
Display cable length	4m				
Power supply	~230V, 50Hz, 8VA				
Internal supply (option)	NIMH (AA size) – 4 pcs.				
Accumulator working time	About 6 h with display backlighting and 16h without				
Meter protection rating	ME-01/A/18 - no IP, ME-01/N/18 - IP65				
Sensors protection rating	IP68				

6. Security rules

	To avoid electrical shock or damage of the scale or connected peripheral devices, it is necessary to follow the security rules below.

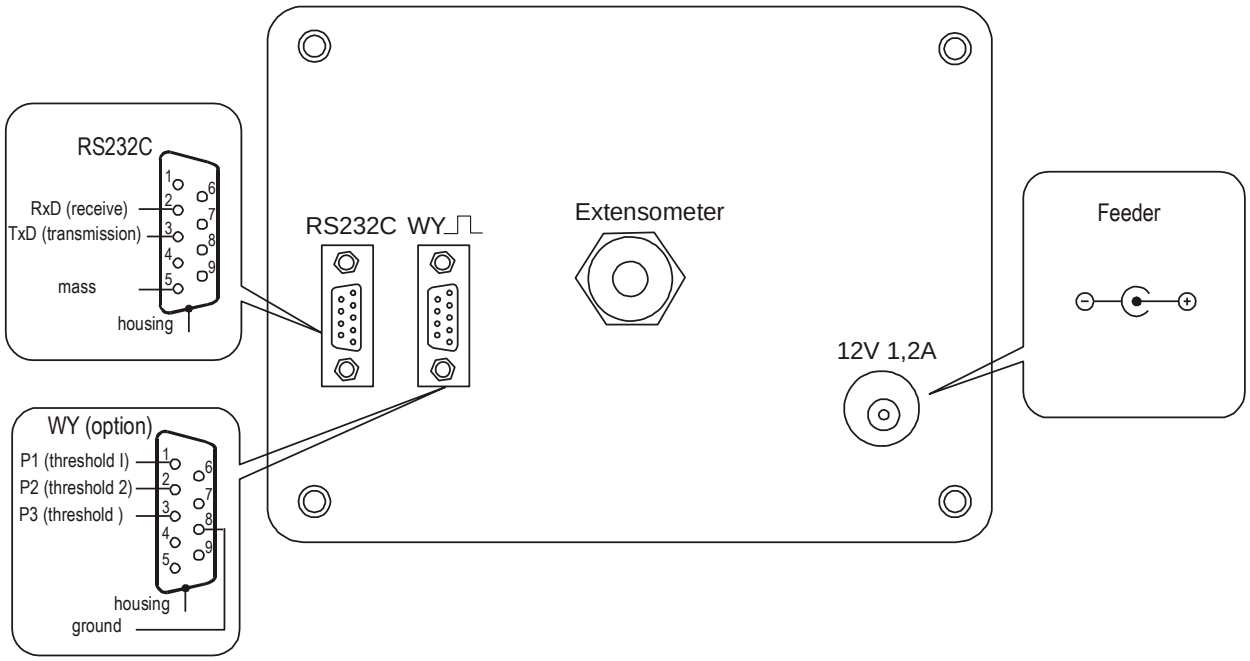
- To supply scale use socket with safety contact (scales with feeder exluded).
- All repairs and necessary regulations can be made by authorised personnel only.
- To avoid fire risk use a feeder of an appropriate type (supplied with the scale). Pay attention that supply voltage is compatible with specified 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.
- If the scale seems not to operate properly, unplug it from the mains and do not use until checked by authorised service.

	According to legal regulations it if forbidden to dispose wasted electronic equipment in waste containers.

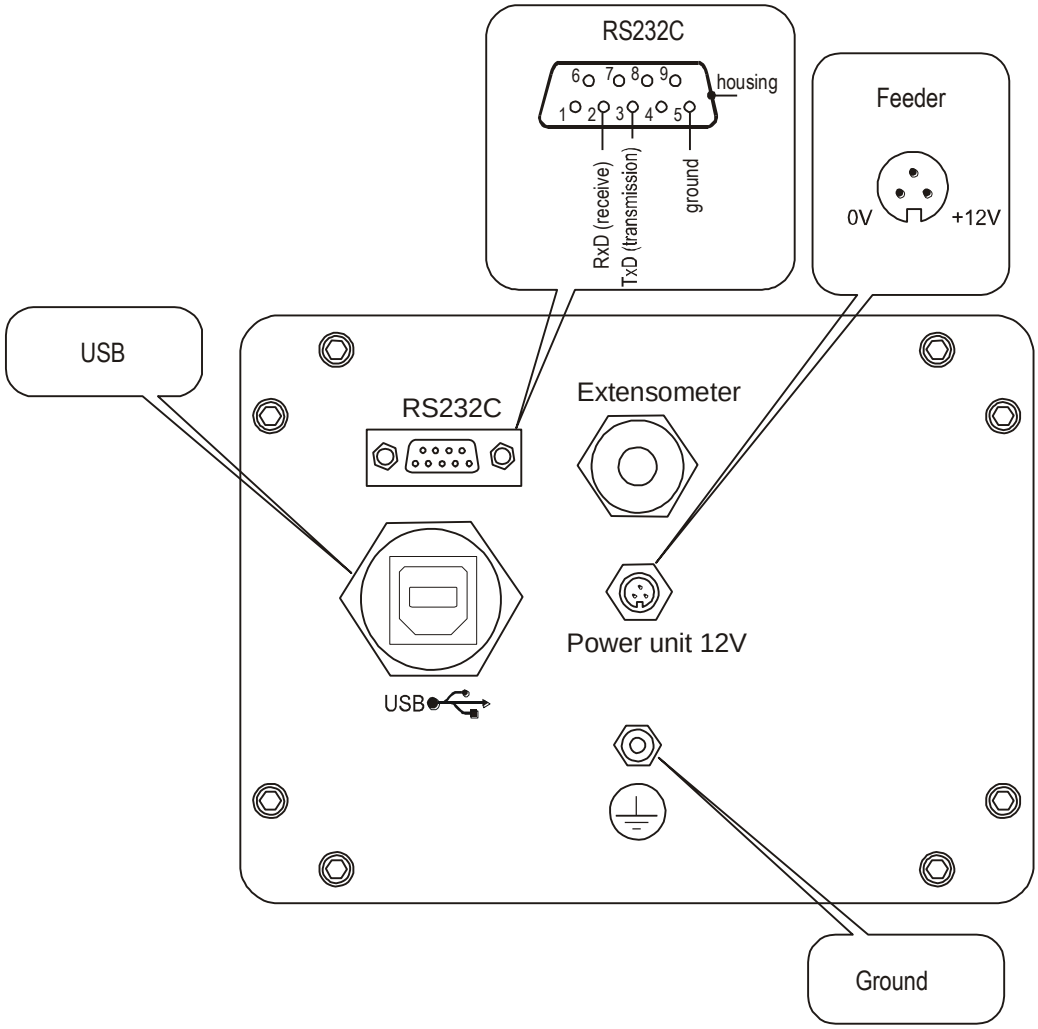
- Please return wasted scale to the point of purchase or other company specialised in recycling of wasted electronic components.

7. Scale external outputs

ME-01 meter in aluminium housing:



ME-01 meter in stainless steel housing:



Separate ground connection (scales in stainless steel version) must be connected using additional conductor.
Extensometers are connected permanently.

7.1 Connecting a computer, printer or label printer

The scale can be equipped with one or two serial interfaces RS232C, USB, LAN or Wi-Fi designed to cooperate:

- with computer – the scale sends data after pressing ⇨ key or after initiation signal from computer,
- with printer - sending data after pressing ⇨ key or automatically after putting on/off a sample and measurement stabilization,
- with label printer – after pressing ⇨ the scale sends set of instructions for label printer starting from label number set in special funcion *LabEL*.

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).

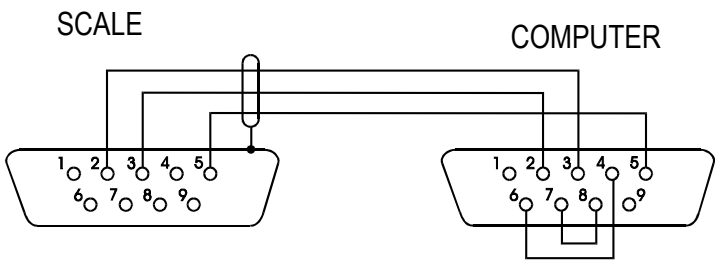
The way of sending data and transmission parameters is set using *SErIAL* special function.

If the scale is equipped with two serial joints (interfaces) *Print* and *SErIAL* function is set independently for both interfaces.

If scale cooperates with a computer then the computer must have a special program. Dedicated programs are also offered by AXIS.

Needed drivers and instructions are available on www.axis.pl.

Connecting cable WK-1 *(scale – computer / 9-pin interface):*



7.2 Detailed LonG protocol description

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

After using ⮆ key, measurement data is send together with text description (NET, TARE, GROSS) – all set by using *Print* option. If *Print* isn't set then only scale indication is send (as below).

Data exchange (communication):

- Readout of scale indication

  Computer→Scale: **SI** 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

- Readout of actual indication
  Computer→Scale: **Sx1** CR LF – initiaton signal
  Scale→Computer: scale sends 16 bytes (the same as SI commad)
- Readout of stabilization indicator and actual indication
  Computer→Scale: **Sx3** CR LF – initiaton signal
  Scale→Computer: scale send indicator S (stable) or U (unstable) + 16 bytes (the same as SI command).

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 (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: **SJ** CR LF (53h 4Ah 0Dh 0Ah),
  Scale→Computer: **MJ** CR LF (4Dh 4Ah 0Dh 0Ah),
- Displaying a inscription on scale's display (text communicate from computer):
  Computer→Scale: **SN** n n X X X X X X CR LF, nn-displaying time in seconds; XXXXXX-6 signs to display
  Scale→Computer: **MN** CR LF (4Dh 4Eh 0Dh 0Ah),
- Scale tarring (calling →*T*← key press) :
  Computer→Scale: **ST** CR LF (53h 54h 0Dh 0Ah),
  Scale→Computer: without response,

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

- Scale turning on / off (calling I/⏻ key press):
  Computer→ Scale: **SS** CR LF (53h 53h 0Dh 0Ah),
  Scale →Computer: without response,
- Entering to special function menu (calling *MENU* key press):
  Computer→ Scale: **SF** CR LF (53h 46h 0Dh 0Ah),
  Scale →Computer: without response,
- Setting threshold 1 value (option):
  Computer→ Scale: **SL** *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 threshold 2 value (option):
  Computer→ Scale: **SH** *D1...DN* CR LF (53h 48h *D1...DN* 0Dh 0Ah),
  D1...DN – threshold value, maximum 8 characters
  Scale →Computer: without response.
- Setting threshold 3 value (option):
  Computer→Scale: **SM** *D1...DN* CR LF (53h 4Dh *D1...DN* 0Dh 0Ah),
  where: *D1...DN* – threshold value, maximum 8 characters
  Scale→Computer: without response.

7.3 Detailed EPL protocol description

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 can also be inscribed e.g. factory name, product name and so on.
2. In standard only one label pattern is possible to printout (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.
4. Scales parameters and transmission protocol must corespond to label printer type.

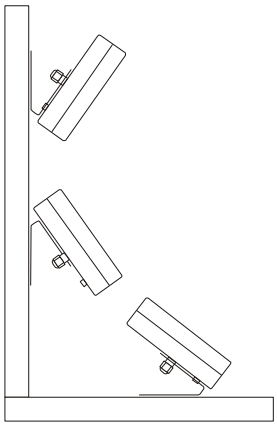
8. Balance preparation to work

8.1 Preparing platform, pallet and skid scales

1. Unpack balance, remove protective foils.
2. Place balance on flat, horizontal foundation, in place not subjected to mechanical vibrations and strong air movements.
3. Air bubble in level should be located in the middle position.

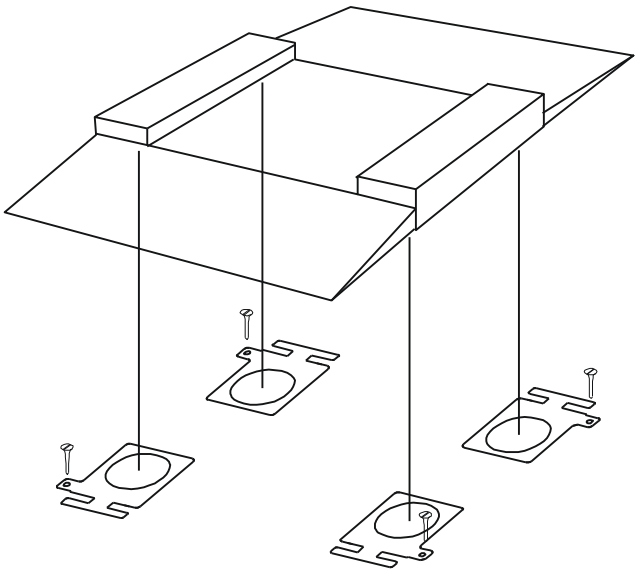
Good Bad

4. Attach meter to the wall, desktop or tripod (option), choosing one of three methods.



5. Connect the supply cable plug to socket with protective contact, when balance is unloaded.

8.2 Preparing overrun scales



1. Unpack balance, removing protective foils.

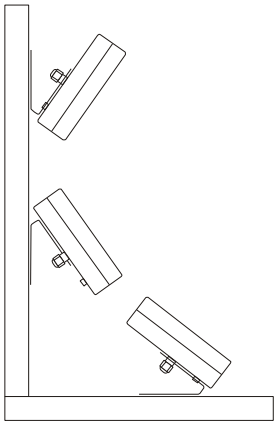
2. Place balance on flat, horizontal foundation, in place not subjected to mechanical vibrations and strong air movements. Take care if the scale stays on all four legs.

3. Air bubble in level should be located in the middle position.

Good Bad

4. Lift scale corners up and put locks under in such way that scale legs go into prepared holes.

5. Mount locks permanently to the ground using ϕ10 holes.



6. Put balance approaches (drives) on settling them into locks.

7. Unscrew transport handles (mounted for transport).

8. In hermetic scales plug not used joints with supplied caps. Attach meter to the wall, desktop or tripod (option), choosing one of three methods.

9. Connect the supply cable plug to socket with protective contact, when balance is unloaded.

8.3Preparing foundation scales

8.3.1 Preparing foundation

CAUTION!
Decision of substrate reinforcing and density is taken by building works designer.
All dimensions are in millimetres.

During foundation preparation follow the principles below:

1. Foundation and feet under balance legs should be made from concrete. Foundation bottom thickness should not be smaller than 100 mm.
2. Foundation bottom inclination angle (shown in fig. 1 on page 8) should be at least 3%.
3. Keep the same level for all feet.
4. Level the foundation frame, keeping perpendicularity of sides and equality of diagonals.
5. Diameter of PVC pipe for cables to connection box should be at least 50 mm.
6. Keep the area free from reinforcing bars as shown in fig. 2 on page 8.
7. Foundation external and internal dimensions, proper for various platform dimensions are shown in table below.

Balance type	Platform dimensions [mm]	Foundation internal dimensions (WxLxH) [mm]	Foundation enternal dimensions (WxL) [mm]
4B300FN	800x800	820x820x128	1220x1220
4B300FN	1000x1000	1020x1020x128	1420x1420
4B300FN	1250x1250	1270x1270x128	1670x1670
4B600FN	800x800	820x820x128	1220x1220
4B600FN	1000x1000	1020x1020x128	1420x1420
4B600FN	1250x1250	1270x1270x128	1670x1670
4B1500FN	1250x1250	1270x1270x128	1670x1670
4B1500FN	1500x1500	1520x1520x128	1920x1920
4B2000FN	1250x1250	1270x1270x128	1670x1670
4B2000FN	1500x1500	1520x1520x128	1920x1920
4B3000FN	1500x1500	1520x1520x128	1920x1920
4B3000FN	1500x2000	1520x2020x128	1920x2420

Keep all dimensions, shown in drawings and table.

Careless and inaccurate foundation preparation may make balance installation impossible or cause its improper operation!

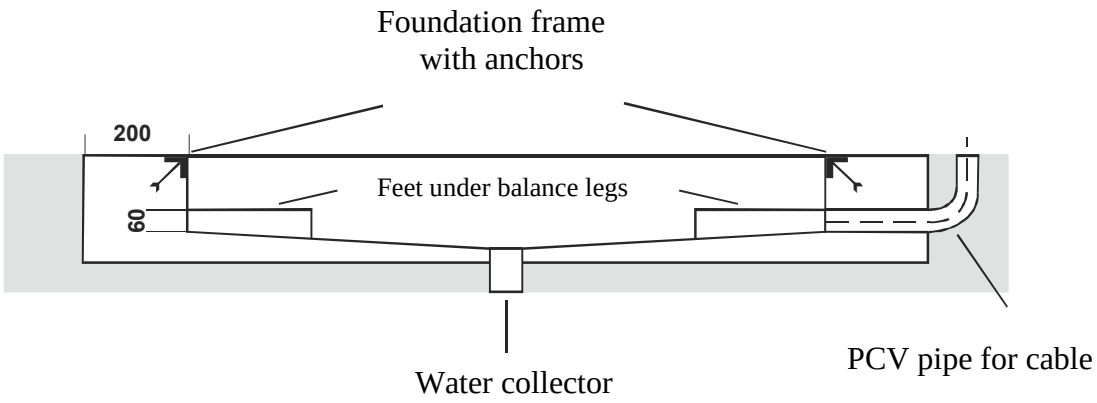


Fig.1 Foundation – crosssection

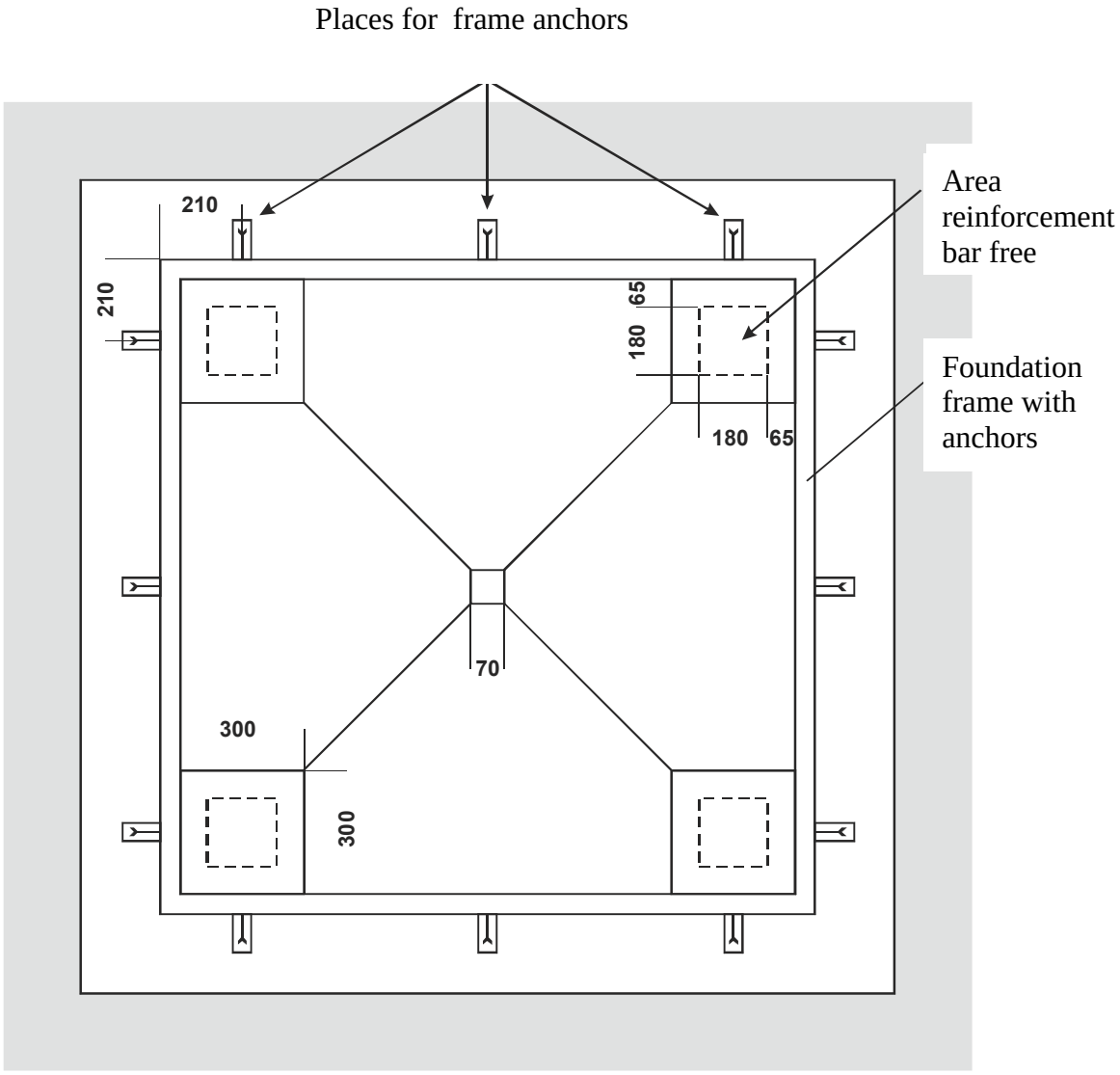
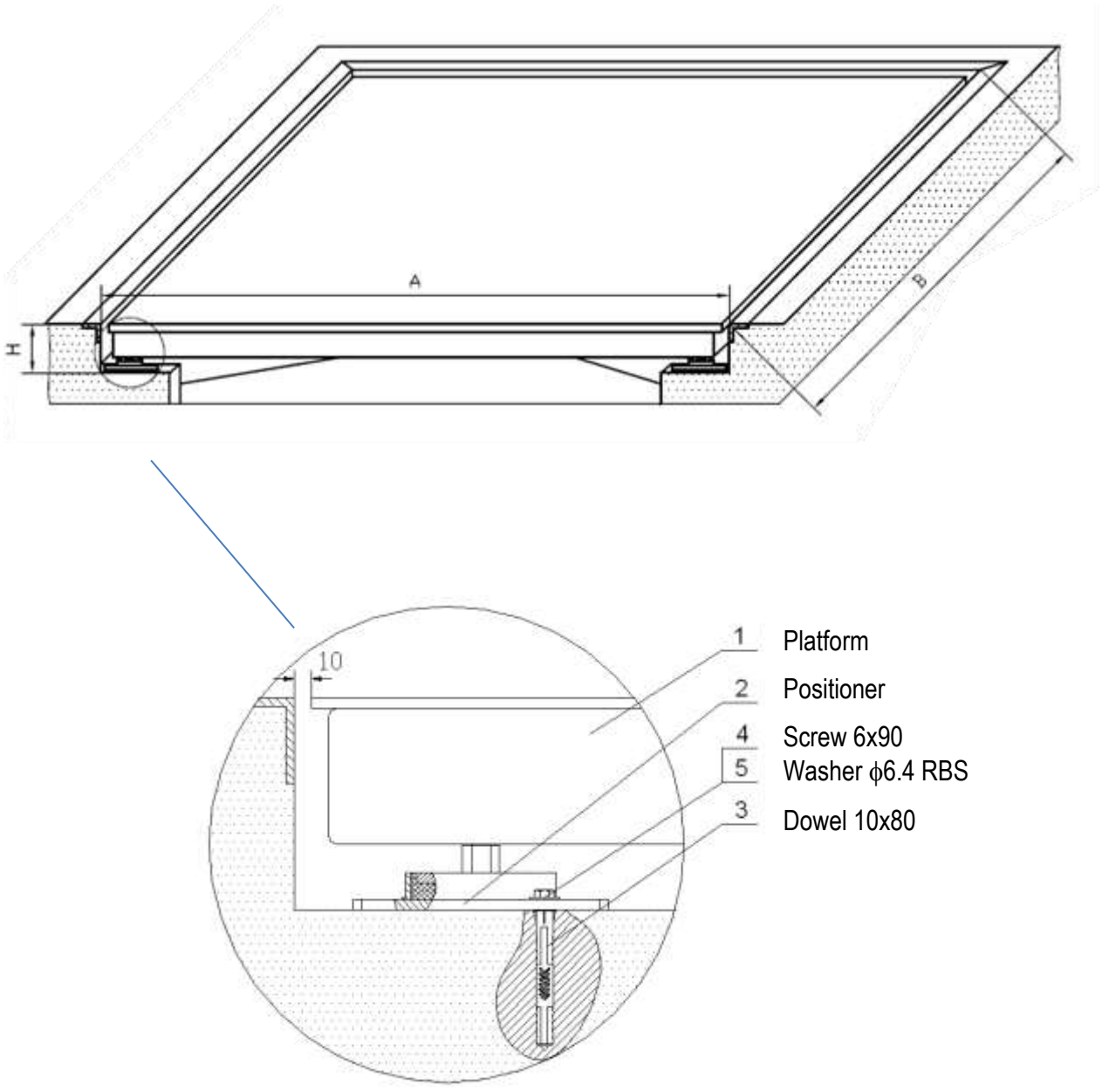


Fig. 2 Foundation – view from above

8.3.2 Scale installation

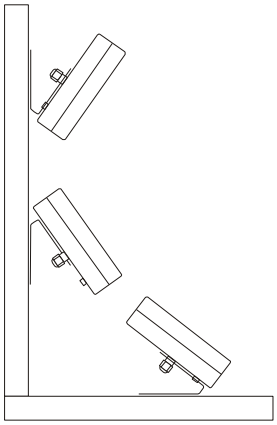


1. Prepare the foundation in accordance with the guidelines (Chapter 6) and the principles of construction technology.
2. Place the scale positioners (2) freely in the foundation.
3. Unscrew the screws securing the scale's top plate.
4. Place the scale platform (1) in the foundation so that the scale legs are in their places (bearings) in the center of the positioners (2).
5. Place the top plate on the scale structure and lightly screw in the mounting screws.
6. Check the position of the scale's top plate in the foundation - level in relation to the edge of the foundation and distance from the edge.
7. If necessary, move the positioners (2) or place sheet metal washers with the dimensions of the positioners under them.
8. If the position of the top plate is correct, carefully remove the top plate so as not to displace the positioners (2). Check whether the scale legs are straight.

9. Carefully remove the scale platform from the foundation so as not to displace the positioners (2).
10. Drill holes in the floor. Fix the positioners using 6x90 screws (4), washers (5) and 10x80 pins (3) placed in the floor material flush with its surface so that the positioners (2) can be maneuvered.
11. Adjust any possible shifts by positioning the positioners (2) so that the legs lie centrally and vertically on the positioner bearings (2). Tighten the screws (4) securely.
12. Insert the scale platform (1) into the foundation.
13. Place the top plate and fasten it with screws, starting from the holes in the middle of the top plate.

Connecting cable must be laid freely!

14. Unpack the balance. Attach meter to the wall or desktop, choosing one of three methods.



15. Connect the supply cable plug to socket with protective contact with unloaded balance, which will cause autotests performing and after indication stabilization displaying of sero indication

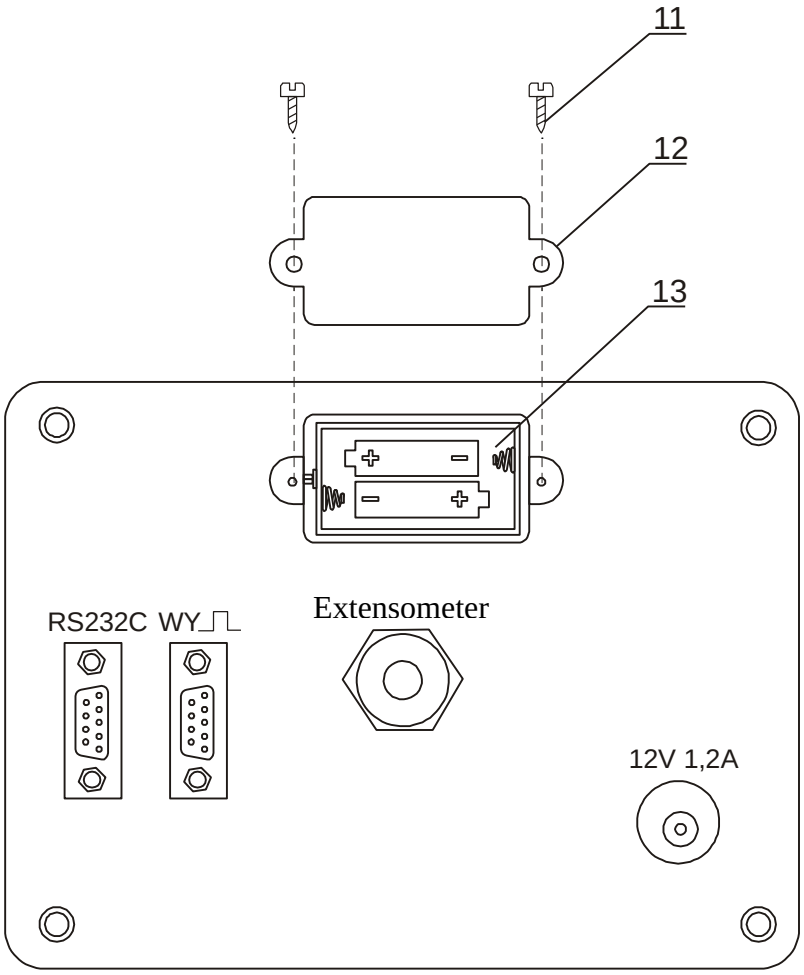
9. Balance test

During balance operation, in order to confirm its efficiency, it is recommended to check the weighing precision by putting and object of exactly known weight before and after series of measurements.

For testing of verified balances use weight standard, having valid standardization certificates. In case of allowable measurement error exceeding contact authorized service company to perform balance adjustment.

Balance adjustment must be performed by authorized service company only, as it is connected with necessity of seals breaching, required for warranty purposes.

10. Accumulator change (ME-01 option)

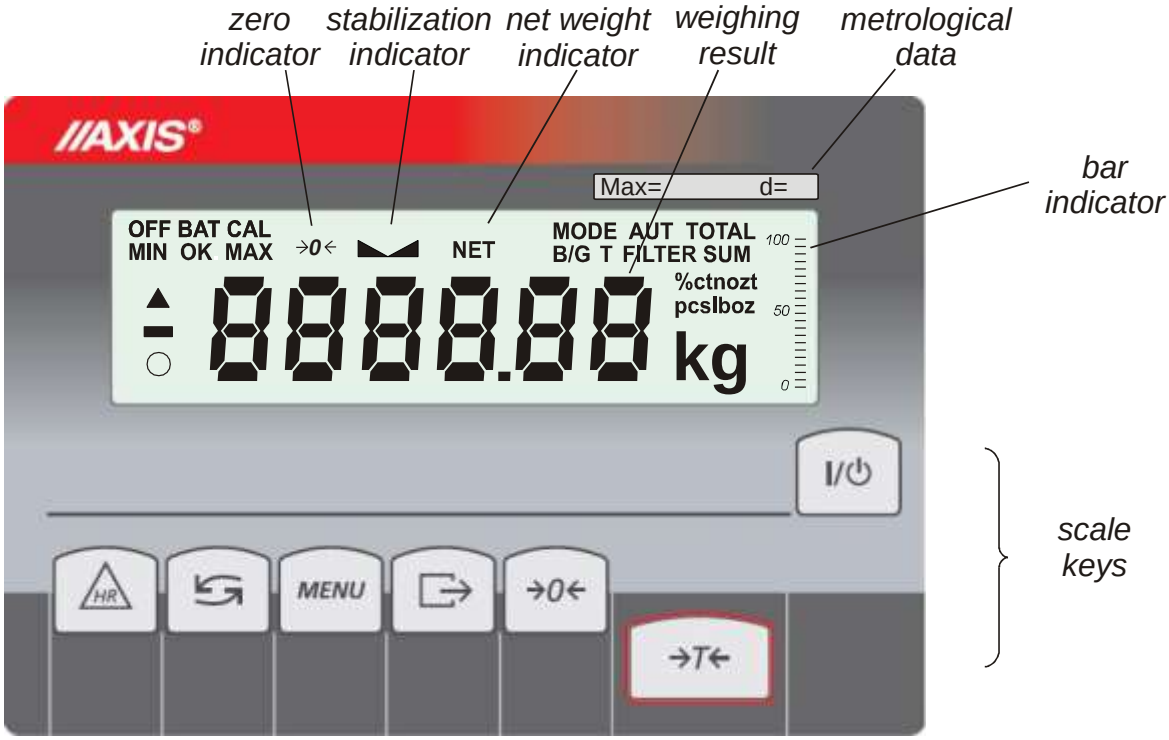


1. Remove screws *11* holding plate *12*, remove the plate.

2. Take out container with accumulators *13* and place 4 AA format accumulators. The way of packing accumulators into the container is shown on the figure on the left and is also shown on the container.

11. Scale with ME-01 meter keys and indicators

***LCD display version**:*



Keys:	I/⏻	9. switch-on / switch-off (standby),
"	→T←	10. tare (subtract package weight from weighed mass),
"	→0←	11. zeroing (when the platform is empty),
"	⮆	12. result printout,
"	*MENU*	13. menu,
"	↻	14. function switch: special function/weighing,
"	*HR*	15. temporary high resolution indication,
Indicators:	→0←	16. zero indicator (unloaded scale),
"	▂◢	17. result stabilization indicator,
"	*NET*	18. net weight (after using →T← key),
"	*MODE*	19. special function menu turning on indicator
"	*B/G*	20. gross weight (after using TARE and ↻ key)
"	*AUT*	21. autotare function on,
"	*T*	22. tare memory function on,
"	*TOTAL, FILTER, SUM*	23. special functions indicators,
"	*%, ct, n, g/m2, lb,mg*	24. unit indicators,
"	*pcs*	25. pieces counting indicator,
"	*n*	26. measurements quantity indicator (total function),
"	*OFF*	27. scale turned off ⏻ (standby)
"	*MIN*	28. weighing result under threshold I (*thr* function),
"	*OK*	29. weighing result between threshold I and II,
"	*MAX*	30. weighing result above threshold II,
	BAT	31. battery discharge indicator,
	Δ, O	32. *ACtIV* function indicator,
bar	indicator	33. scale load indicator (0-100%)

LED display version:

klawisz	I/⏻	34. switch-on / switch-off (standby),
"	*→T←*	35. tare (subtract package weight from weighed mass),
"	*→0←*	36. zeroing (when the platform is empty),
"		37. result printout,
"	*MENU*	38. menu,
"		39. function switch: special function/weighing,
"	*HR*	40. temporary high resolution indication,
wskaźnik	*→0←*	41. zero indicator (unloaded scale),
"		42. result stabilization indicator,
"	*NET*	43. net weight (after using →T← key),
"	*W1*	44. first range on in two-range scale,
"	*W2*	45. second range on in two-range scale,
"	*HOLD*	46. indication „locked" (concerns *LOC* and *UP* functions),
"	*FUNC*	47. special function turned on,
"	*PCS*	48. pieces counting,
"	*g, kg, lb, unit*	49. weight unit (*g*-gram, *kg*-kilogram, *lb*-pound, unit – other),
"	*MIN*	50. weighing result under threshold I (*thr* function),
"	*OK*	51. weighing result between threshold I and II,
"	*MAX*	52. weighing result above threshold II,

During inscribing numerical values needed during using special functions keys have special functions.

12. Operation principles

1. Before each measurement the balance should be properly zeroed, which is signalled by "→0←" indicator. If the zero indication is not shown when the balance is unloaded, or "----" is displayed, press the "→*0*←" key.
2. The balance enables tare setting in the whole measuring range. It is performed by pressing "→*T*←" key.
3. Weighed mass should be placed in the platform centre.

Do not drop weighed objects on the platform.

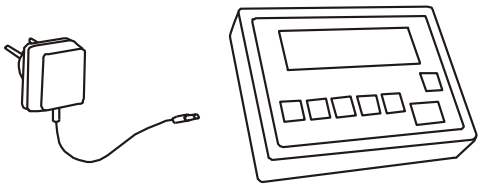
Do not overload the balance over 20% of maximum load.

4. The weighing result should be read during the "⌣" indicator lighting, which indicates the result stabilization.
5. When there is no weighing, but the balance should be ready for operation, it may be switched off by I/⏻ key. It causes the balance reading system deactivation end entering the standby mode. Balance turning on is performed by pressing " I/⏻" key.
6. Protect the balance from dust, aggressive dusts and liquids. For cleaning purposes use water and dry it.

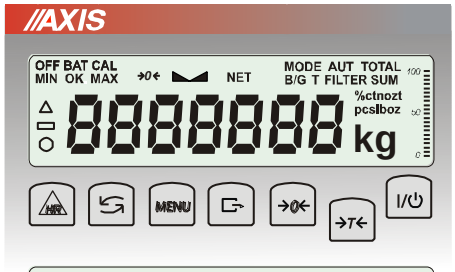
Use caution when opening pan. It is suggested to hold the pan until totally open!

(concerns foundation scales)

13. Start-up

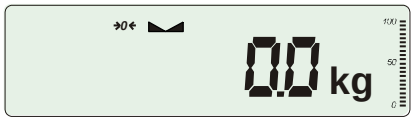


Leave the pan empty, plug a scale to the mains with a ground contact The scale proceeds with following start-up actions:



Display test

Meter type displaying

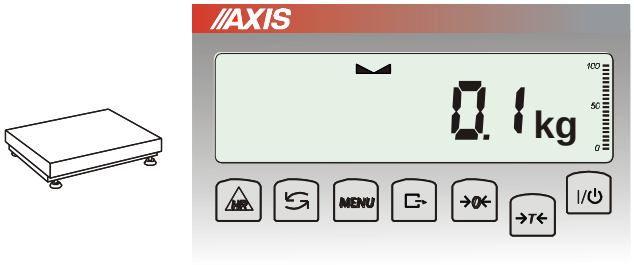


The scale is now ready to work.

Attention:

Displaying program version means positive result of all tests.

14. Weighing with tare

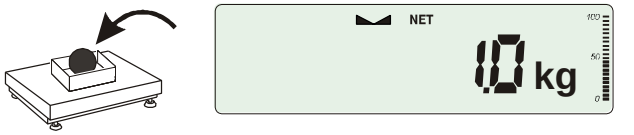


If the scale is not loaded and →0← indicator doesn't indicate, press →0← key.

Zero indication and →0← indicator mean that the scale is ready to work.

After putting container (package) tare the scale using →T← key. NET indicator will show up.

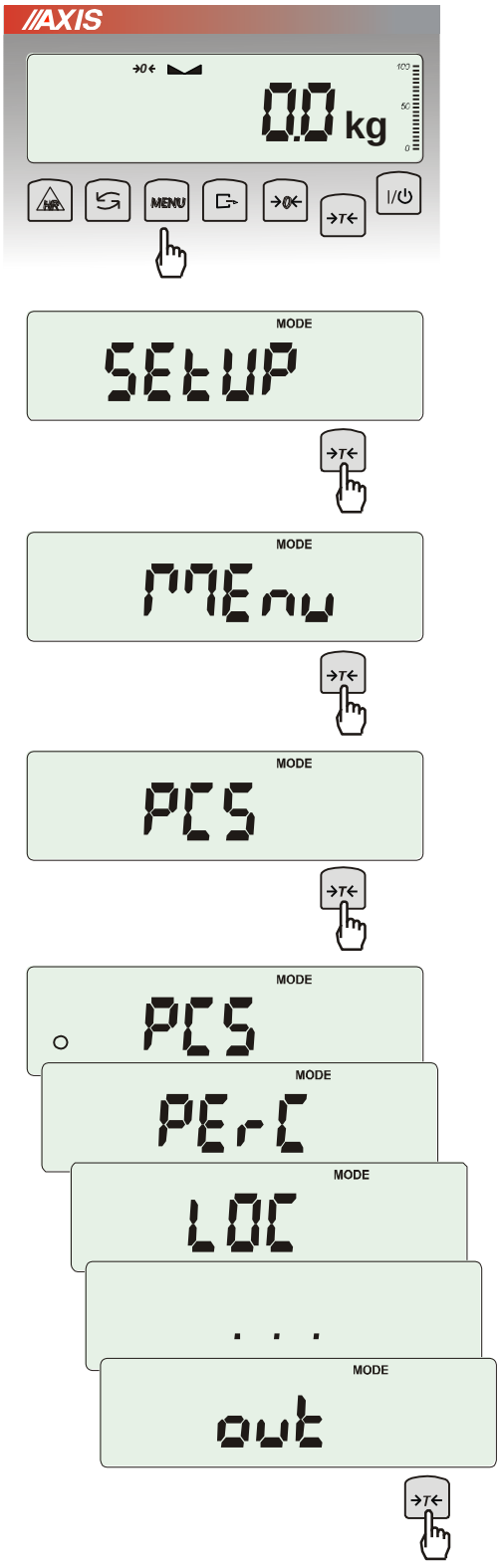
Put on weighted object and readout net weight (NET indicator shows that scale indicates net weight).



In order to readout gross weight press ↻ key (B/G indicator shows that scale indicates gross weight). Press again ↻ key in order to come back to net indications.

15. Scale menu

All scales except for basic metrological functions: weighing and taring, have many special functions and configuration options.



In order to ease using functions user can create his own (personalized) menu.

Creating personalized menu:

In „out of the box" scale after pressing *MENU* key only *SEtuP* option (it contains all configuration options) is available.

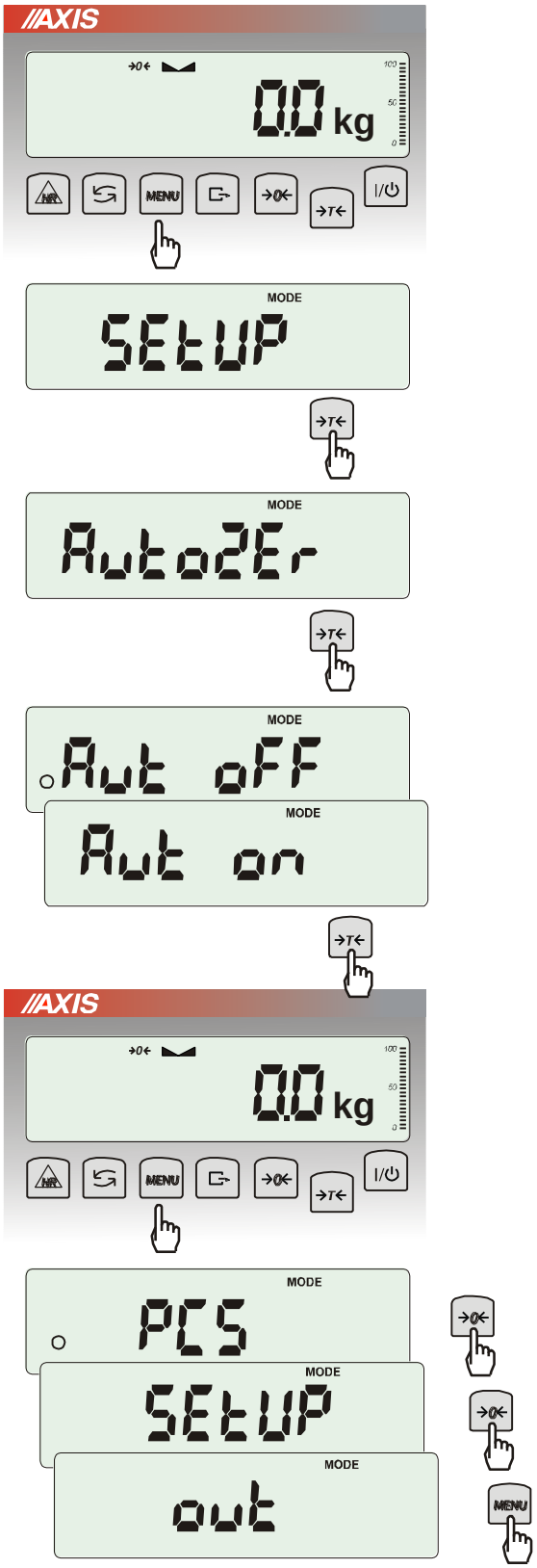
One of the configuration options is *Menu* that is used to create personalized menu.

To add a function to personalized menu press →*T*← key when the function is indicating.

Chosen function is indicated with „o" sign on the left side of display.

After adding all necessary functions press *out* in order to come back to weighing mode. User now after pressing *MEnu* key has access to selected earlier functions and to *SEtuP* option.
dEFAULt option is used to set factory settings.

16. Menu navigation rules



Choosing menu options:

First position of scale menu shows up after pressing *Menu* key. The position is displayed for about 7 seconds and then the scale sequentially displays next menu positions.

Choosing menu position (option) is done by pressing →*T*← key when it is displayed on the screen.

After choosing position (option) usually several options show up:

on – turning on selected option,

OFF - turning off,

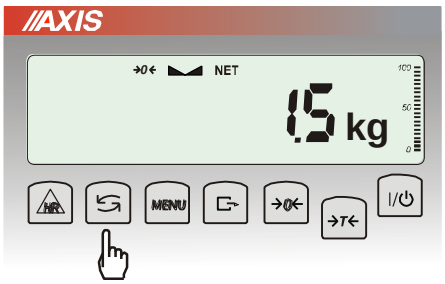
out – out to menu.

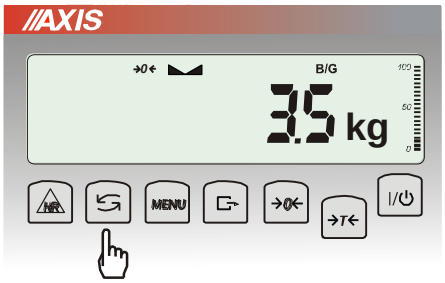
Accelerated working with menu:

Menu first position is displayed for about 7s. During this time user can view next positions by using ↻ key (or →*0*←).

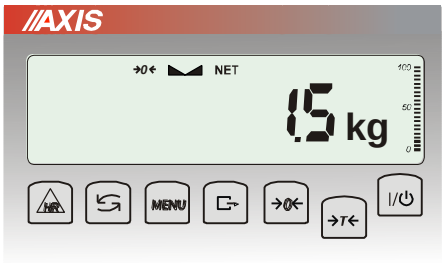
Immediate out to previous menu level is done by using *Menu* key.

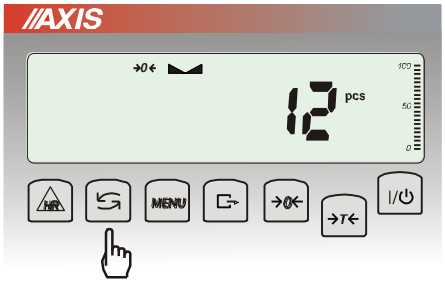
key working method:



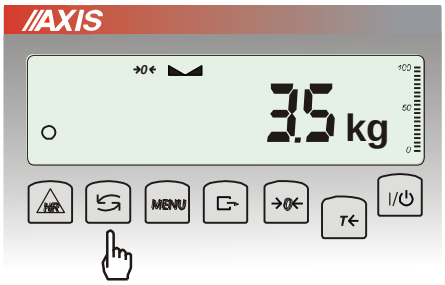


During standard weighing key is used to switch between net and gross indication.

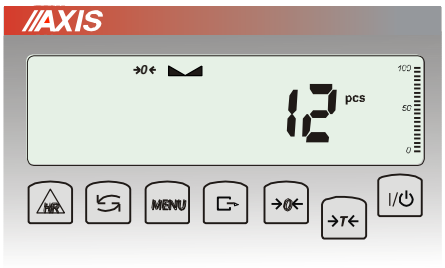


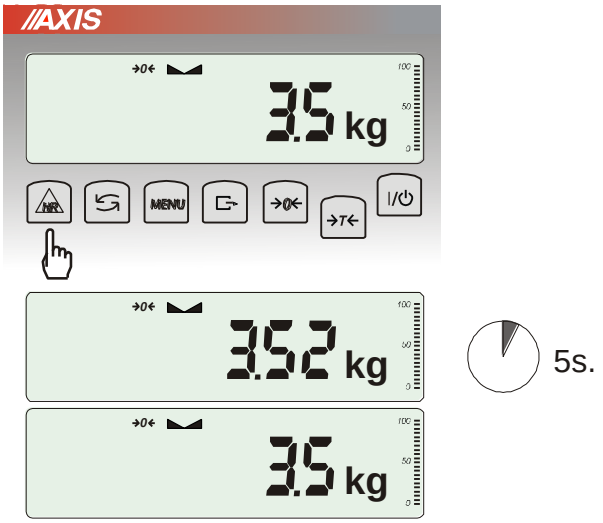


When special function e.g. *PCS* is turned on, using key enables to go back to standard weighing mode.



Sign „o” on the left side signalizes that special function is turned on and user can go back to function mode by pressing key.

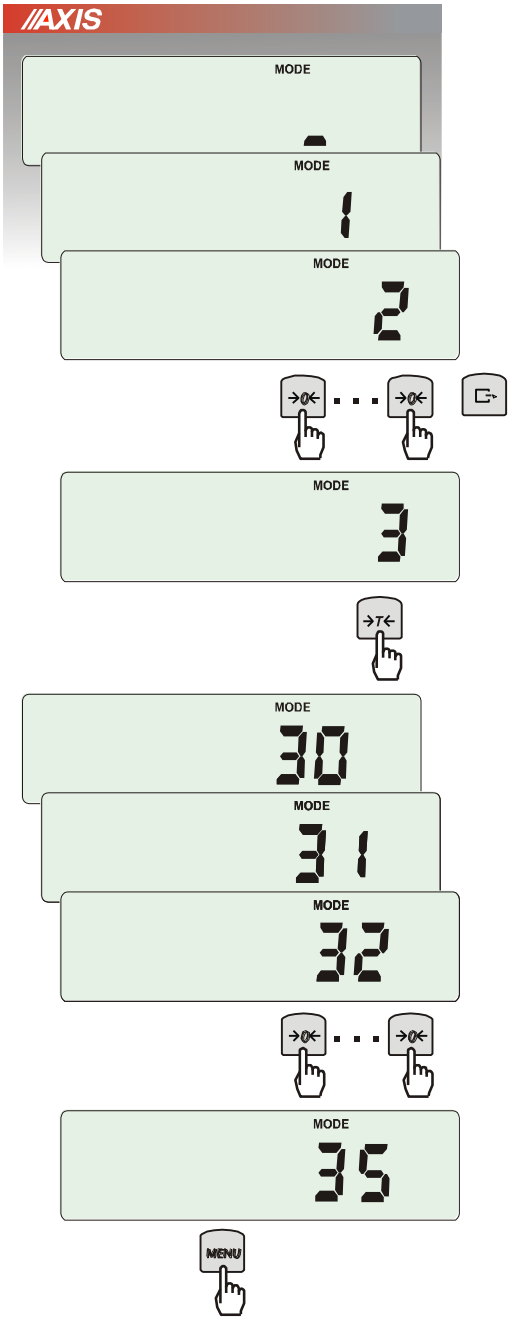




HR key working method*:*

During normal weighing temporary (5s) readout resolution increase is possible.

Return to normal indication is made automatically.



Inscribing numerical values:

Inscribing numerical values is needed in some special functions e.g. *tArE* function requires to inscribe tare values.

Keys:

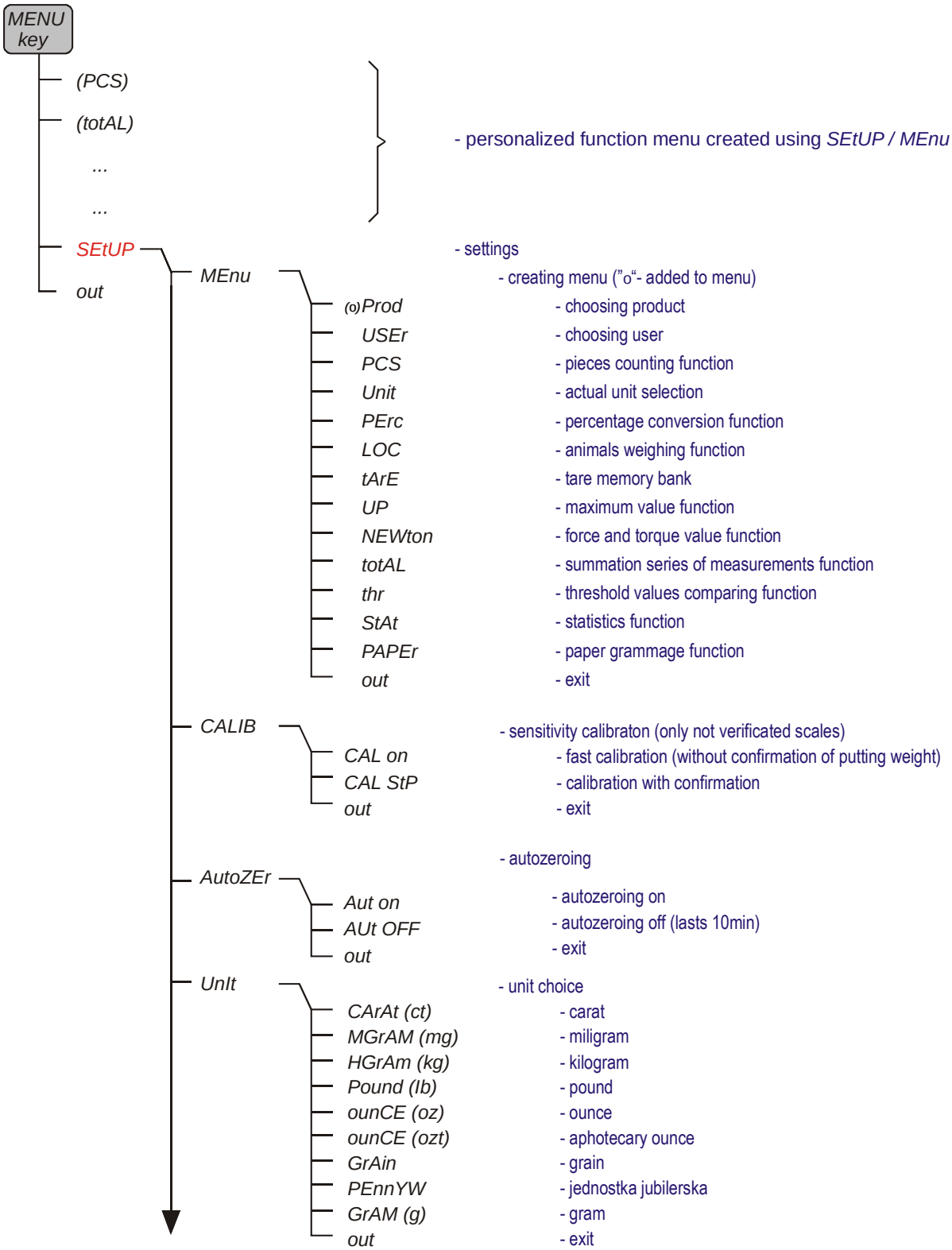
→0← - increasing digit value,

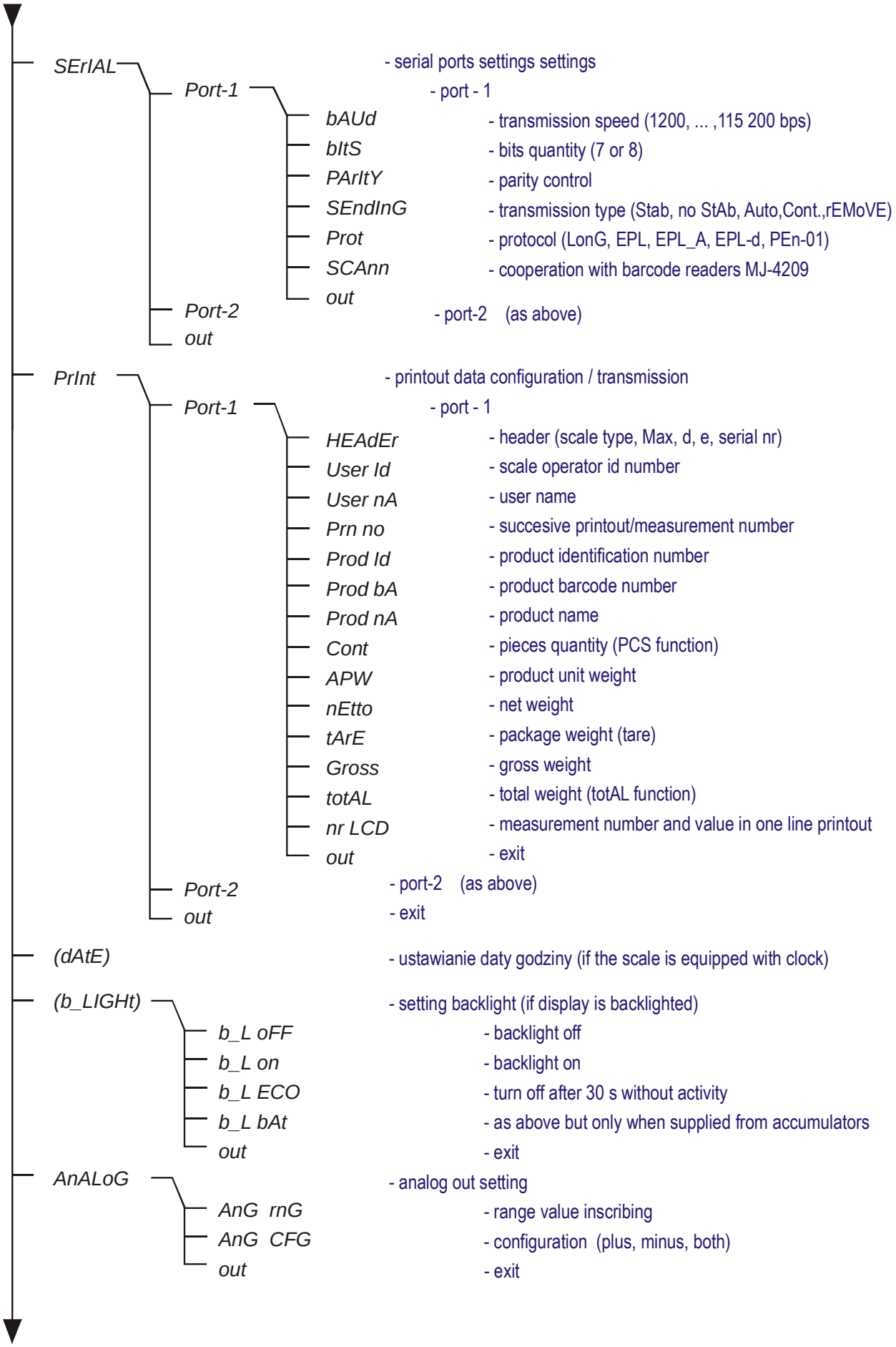
⊏→ - decimal point,

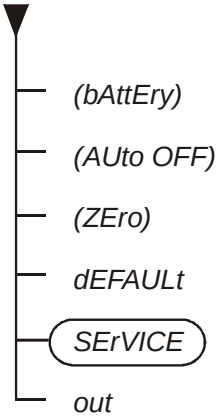
→*T*← - next digit position,

MENU - end of inscribing.

Menu diagram:

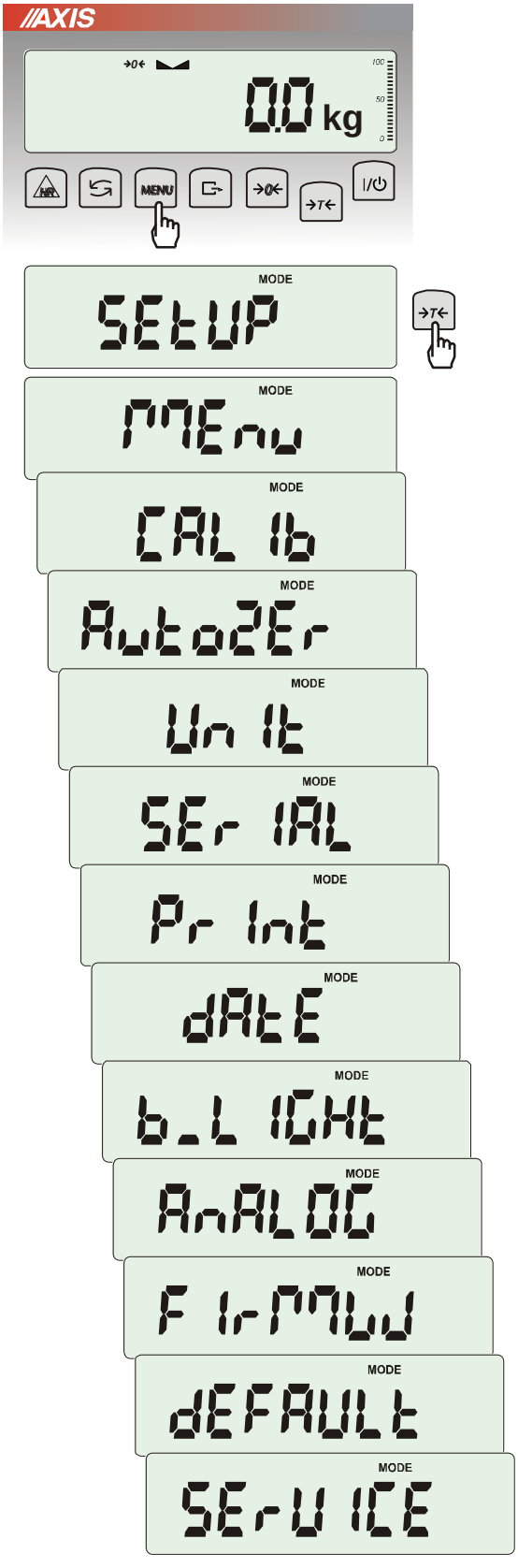



SErIAL
- serial ports settings settings
Port-1
- port - 1
bAUd
- transmission speed (1200, ... ,115 200 bps)
bItS
- bits quantity (7 or 8)
PArItY
- parity control
SEndInG
- transmission type (Stab, no StAb, Auto,Cont.,rEMoVE)
Prot
- protocol (LonG, EPL, EPL_A, EPL-d, PEn-01)
SCAnn
- cooperation with barcode readers MJ-4209
out
Port-2
- port-2 (as above)
out
PrInt
- printout data configuration / transmission
Port-1
- port - 1
HEAdEr
- header (scale type, Max, d, e, serial nr)
User Id
- scale operator id number
User nA
- user name
Prn no
- succesive printout/measurement number
Prod Id
- product identification number
Prod bA
- product barcode number
Prod nA
- product name
Cont
- pieces quantity (PCS function)
APW
- product unit weight
nEtto
- net weight
tArE
- package weight (tare)
Gross
- gross weight
totAL
- total weight (totAL function)
nr LCD
- measurement number and value in one line printout
out
- exit
Port-2
- port-2 (as above)
out
- exit
(dAtE)
- ustawianie daty godziny (if the scale is equipped with clock)
(b_LIGHt)
- setting backlight (if display is backlighted)
b_L oFF
- backlight off
b_L on
- backlight on
b_L ECO
- turn off after 30 s without activity
b_L bAt
- as above but only when supplied from accumulators
out
- exit
AnALoG
- analog out setting
AnG rnG
- range value inscribing
AnG CFG
- configuration (plus, minus, both)
out
- exit



(bAttEry)	- turn on/off accumulator charging (if the scale is equipped with accumulator)
(AUto OFF)	- automatic turning off - saving accumulator power (as above)
(ZEro)	- scale start zero inscribing (factory zero)
dEFAULt	- restore default settings for all options
SErVICE	- options only for service
out	- exit

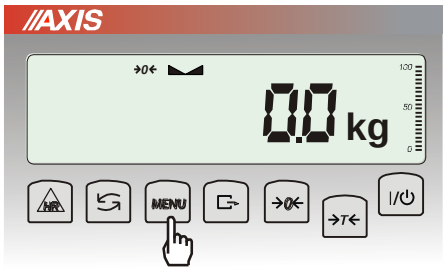
17. Scale setup (SEtUP)



SEtUP contains all options used for setting scale work mode:

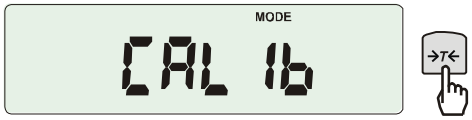
- *MEnu* – creating personalized user menu
- *CALIb* – scale sensitivity calibration
- *AutoZEro(ing)* – self-maintaining zero indication (unloaded scale)
- *UnIt* – weight unit selection
- *SErIAL* – setting serial ports
- *Print* – transmission (printout) data selection
- *rESOLUt* – changing resolution
- *b_LIGHt* – backlight setting
- *AnALoG* – analogue out configuration
- *ZErO – entering reference zero value*
- *SPEEd – weighing speed*
- *FIrMW(are)* – updating software (only for service)
- *dEFAULt* – reset to factory settings
- *SErVICE* – service menu (only for service)

17.1 Scale calibration (CALIb)

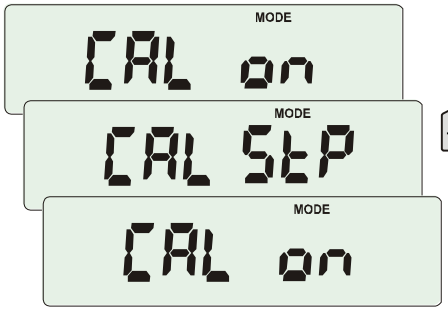


Press *MENU* key.

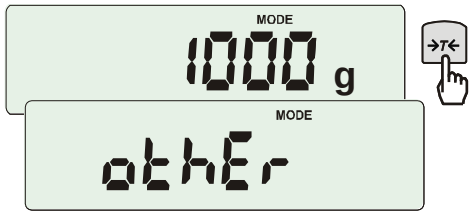
Press →*T*← key when *SEtUP* and *CALIb* function appears.



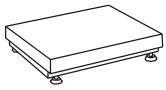
The following options will be displayed:
-*CAL on* – full load calibration (it is recommended to use standards with a weight of at least 30% Max),
-*CAL StP* – full load calibration (as above) with confirmation of the next steps with the *MENU* key,
out – leave without changes

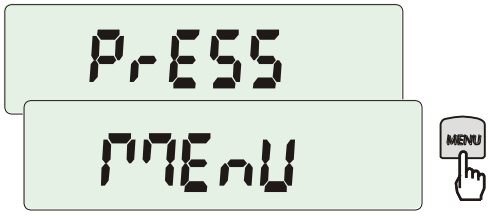


Press →*T*← key when *CAL StP* option appears (calibration in two steps).

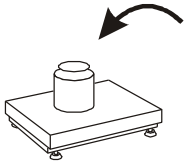


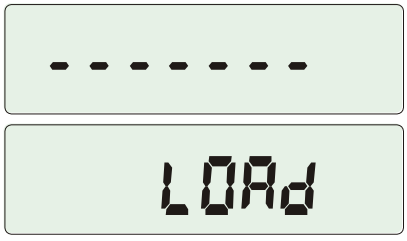
Press →*T*← key when the recommended calibration load value is displayed, or use *othEr* option and inscribe proper value (keys →*0*←, ⮆, →*T*←)



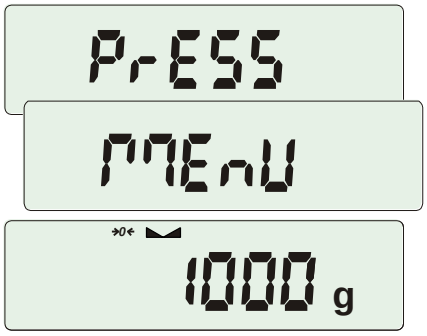


Press *MENU* and wait for writing zero to the scale.



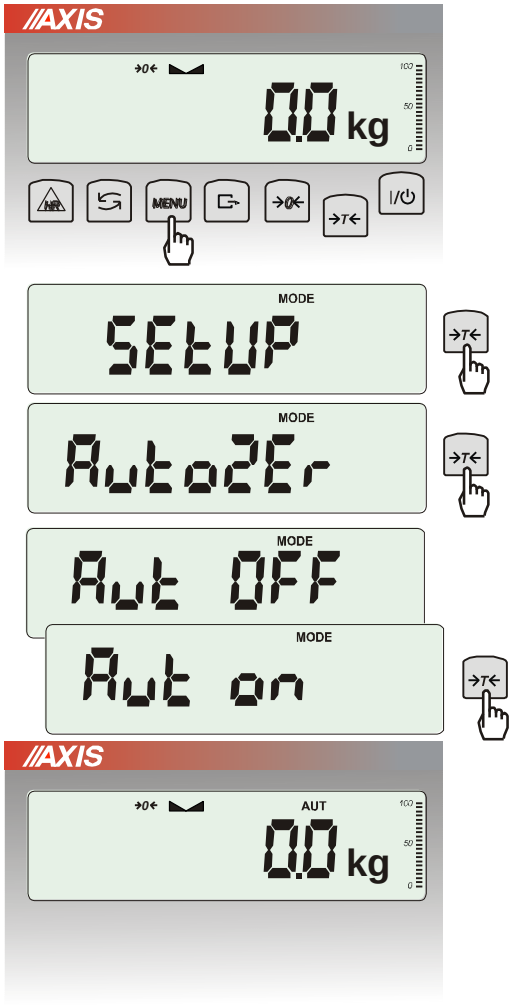


When *LOAD* message appears put standard of mass on the pan. Press *MENU* key (*CAL on* doesn't need pressing *MENU* key).



Wait until internal calibration is finished and zero indication is displayed.

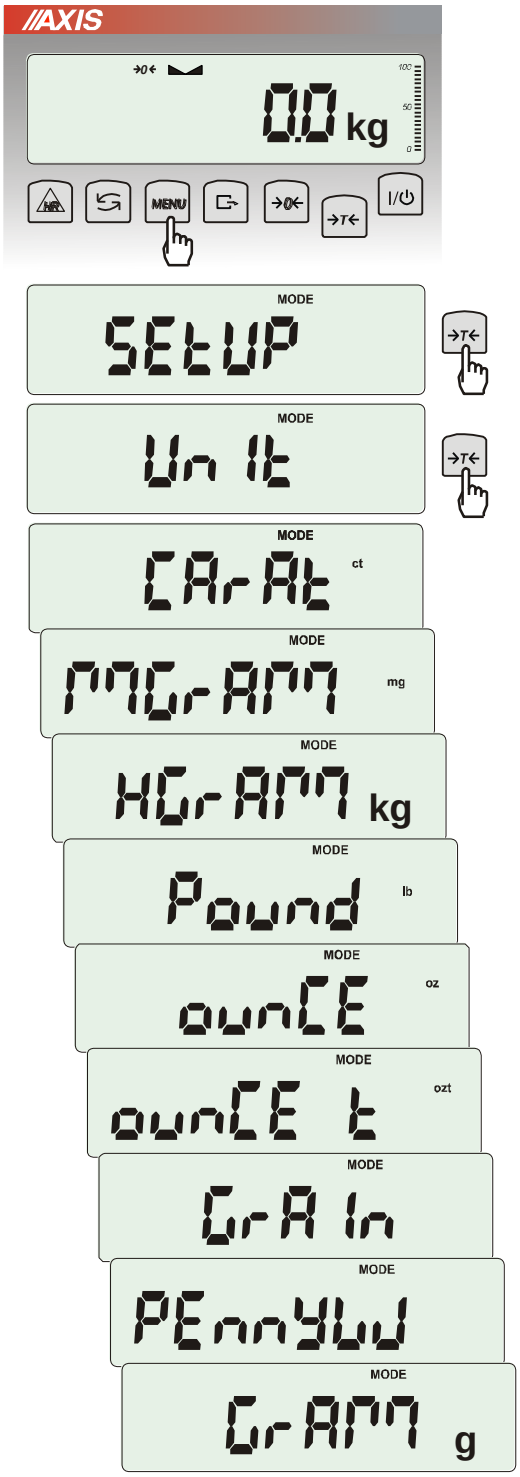
17.2 Autozeroing function (AutoZEr)



When the function is activated, the scale automatically ensures stable zero indication if the pan is empty or if zero indication was acquired by pressing →*T*← key.
To turn on the function use *MENU* key and using →*T*← key choose *AutoZEr* and then *Aut on*
To leave the function press *MENU* key, then with →*T*← key chose *AutoZEr* and *Aut OFF*.

Note:
1. AUt sign occurs only in scales with LCD display.
2. In scales with →0← key active function changes name into AutoZE (autozeroing) and works only when the scales is unbiased.

17.3 Weight unit selection (UnIt)



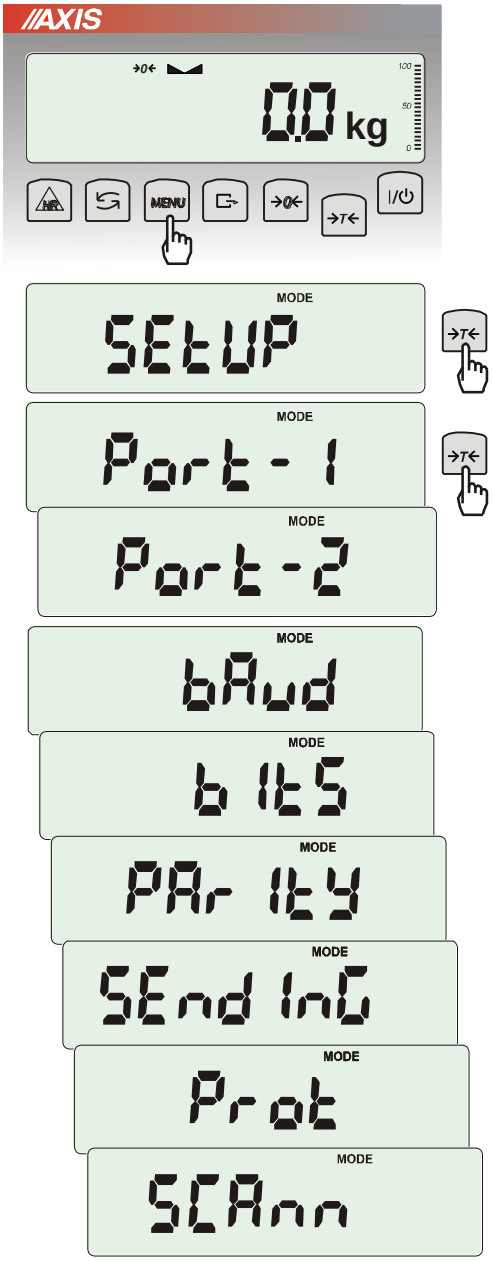
UnIt option allows you to select the unit of measurement of the weight displayed after switching on the scale:

- 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,
- GrAIn (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 example.

Attention:
In scale with LED display designations of mass units: lb, kg, oz, ozt, ct are not displayed. Units are pointed by diode light.

17.4 Serial port parameters setting (SErIAL)



The function allows setting independently communication parameters of both of serial ports *Port-1* and *Port-2* (executed in RS232C, RS485, USB or LAN standard):

- transfer protocol *(Prot):*
  LonG – cooperation with printer or computer,
  EPL – cooperation with label printer in normal mode (activates *LAbEL* function),
  EPL_A – cooperation with label printer in automatic mode (activates *LAbEL* function),
  EPL_d – cooperation with special label printers,
  Pen-01 – cooperation with PEN-01,

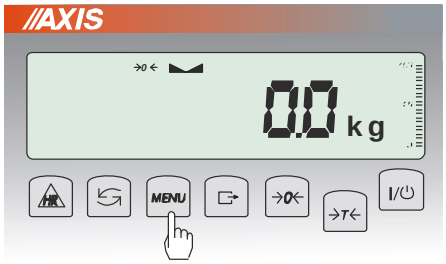
- baud rate *(bAud):* (*4800, 9600, ….115 200bps*),
- number of bits in single char. *(bitS): 7, 8*,
- parity control *(PArItY):*
  nonE – no control
  Odd –nonparity
  Even – parity control,
- scale number in network *(nr):*

  (if the scale doesn't work in network the number must be 0),

- transmission through serial interface *(SendInG)*:
  StAb – transmission after ⮕ key is used and result is stable,
  noStAb – transmission after ⮕ key is pressed without need of stabilisation,
  Auto - automatic transmission after load is put on and result is stable *(Auto)*,
  Cont - continuous transmission, about 10 results per second (*Cont.),*
  Remove – transmission after removing load.
  Default parameter values:
  Long, 9600 bps, 8 bits, none, StAb,
- *SCAnn* – cooperation with MJ-4209 barcode readers: *ON*, *OFF.*

In order to set needed parameters choose *SErIAL* function, select appropriate parameter and press →*T*← key when required option or parameter value is displayed.
In scales with an additional serial port appear *Port-1* and *Port-2*, for the independent setting of both ports.

17.5 Printout configuration (PrInt)



Function is used for printing additional information stored in scale memory, weighed product identification data and scale operator id. That information is inscribed using scale keys or scanner. After entering selected port (scale can have two ports) user may activate printout positions:

- *MOdEL* – scale model,
- *Ser no* – serial number,
- *USEr Id* – scale user identification number,
- *USEr nA* – user name,
- *Prn no* – successive printout number (choose this option to zero counter),
- *Prod Id* – product number,
- *Prod bA* – product barcode (inscribed or scanned),
- *Prod nA* – product name,
- *Count* – counting result (PCS function),
- *APW* – unitary mass (PCS function),
- *netto* – net mass
- *tArE* – current tare value,
- *GroSS* – gross mass,
- *totAL* – total mass (*totAL* function)

In printout configuration user can set if measurement (printout) number is saved after turning off the scale or not. Enter option *Print* and choose *Prn no*. Following options will appear:

- *rESEt* – resetting (zeroing) measurement number counter,
- *SAVE* – activate saving measurement number after the scale is turned off.

Attention:

If *Prod Id* or USEr *Id* is chosen, it is possible to inscribe quickly their new values (with omission of main menu).

In order to do that hold (about 3 seconds) *MENU* key and release it when *Prod Id* or USEr *Id* indicates. Inscribe new value using keys:

→0← - increasing digit,
⊏→ - decimal point,
→T← - next digit,
MENU - end.

While inscribing *Prod id* user can use barcode reader connected to RS232C interface.

If the scale is equipped with two serial joints *Print* function is set independently for both interfaces.

Sample printout during normal weighing (all printout positions deactivated):

```
20.07 kg
20.04 kg
20.04 kg
```

Sample printout during normal weighing with clock option (all printout positions deactivated):

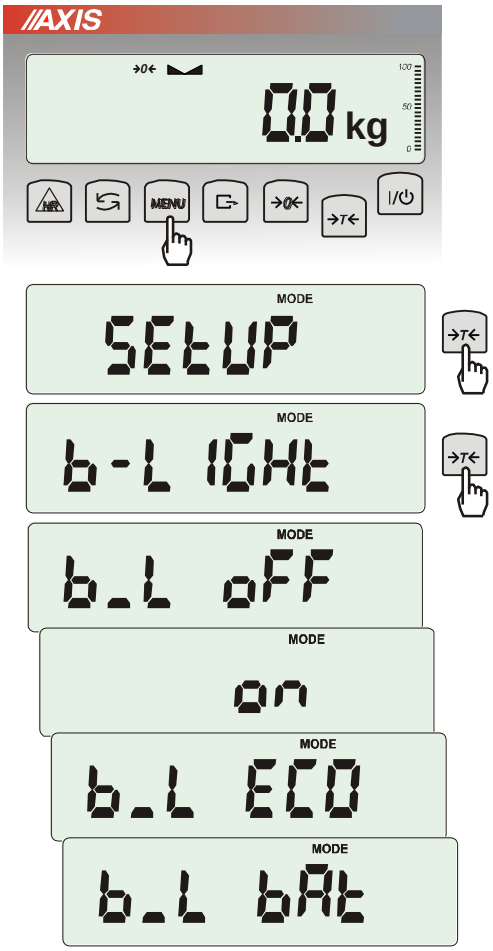
```
20.07 kg  2012-11-08   10:01
20.04 kg  2012-11-08   10:01
20.04 kg  2012-11-08   10:01
```

Sample printout during normal weighing (some printout positions activated):

```
BA30
MAX: 30kg    e=d=0.01kg
S/N    :

ID OPER.        : 000001
DATE            :  2012-11-08
TIME            :  12:26
NO              :          3
ID PROD.        :  01
COUNT           :  0 PCS
APW             :  0.000 g
NET             :  3.08 kg
TARE            :  0.00 kg
GROSS                      :  3.08 kg
```

17.6 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),
- *b_L bAt* – like above, but when powering from accumulators only,
- *out* – out without changes.

Switching backlight off causes decrease of energy consumption by the scale, what is important during powering from accumulators.

17.7 Changing resolution (rESOLUt)

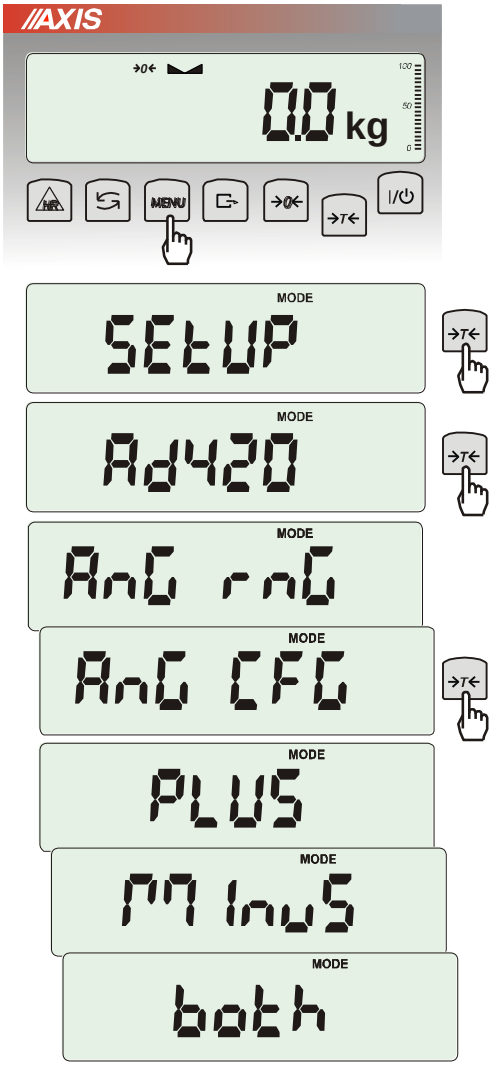
rESOLUt function allows you to select the resolution (reading scale division):

- *LO rES* – low resolution,
- *HI rES* – high resolution,

The selection is marked with a circle on the left. The selected option is active until another is set.

Note: *rESOLUt* function occurs only in scales not intended for legalization.

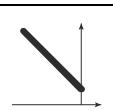
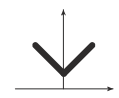
17.8 Analog out configuration (AnALoG)



This option enables to set-up analog out (4-20mA or 0-10V) working method used e.g. in PLC regulators:

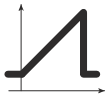
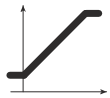
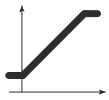
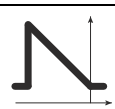
- *AnG rnG* – inscribing Max value
- *AnG CFG* – working mode configuration (*PLUS* – workmode for only positive values, *MinuS* – only for negative values, *both* – for both)

Current output status table for *AnG CFG* option:

AnG CFG	Indication	Current (Voltage)	
PLUS	0	4mA (0V)	
	Max	20mA (10V)	
MInUS	0	4mA (0V)	
	-Max	20mA (10V)	
Both	-½ Max	12mA (5V)	
	0	4mA (0V)	
	½ Max	12mA (5V)	

- *AnG h* – setting the reaction to exceeding, depending on the *AnG CFG* option *(h zero* – 0mA after exceeding, *h Max* – Max current after exceeding*)*

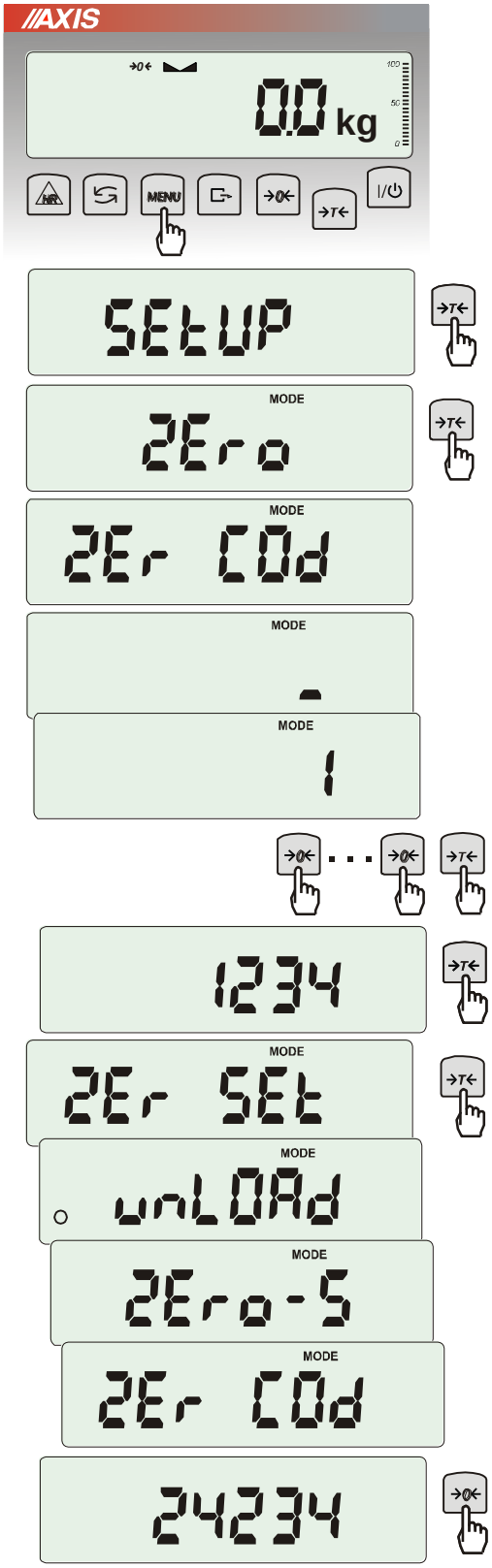
Table of current output overflows for the *AnG h* option:

AnG h	*Ang CFG*	Indication	Current (Voltage)	
h zero	-	< 0	4mA (0V)	
		> Max	4mA (0V)	
h Max	-	< 0	4mA (0V)	
		>Max	20mA (10V)	
h Z-M	*PLUS*	< 0	4mA (0V)	
		>Max	20mA (10V)	
	MInUS	> 0	4mA (0V)	
		< -Max	4mA (0V)	

17.9 Entering reference zero value (ZErO)

Note: This function is enabled in non-legalized scales only.

ZEr0 function allows entering new value of reference zero (value referred to empty pan) without need of contacting with authorised service centre.



Press *MENU* key.
When *ZErO* is displayed press →*T*← key.
On the display a sign *ZEr Cod* will show up momentary and the a dash on last digit position.

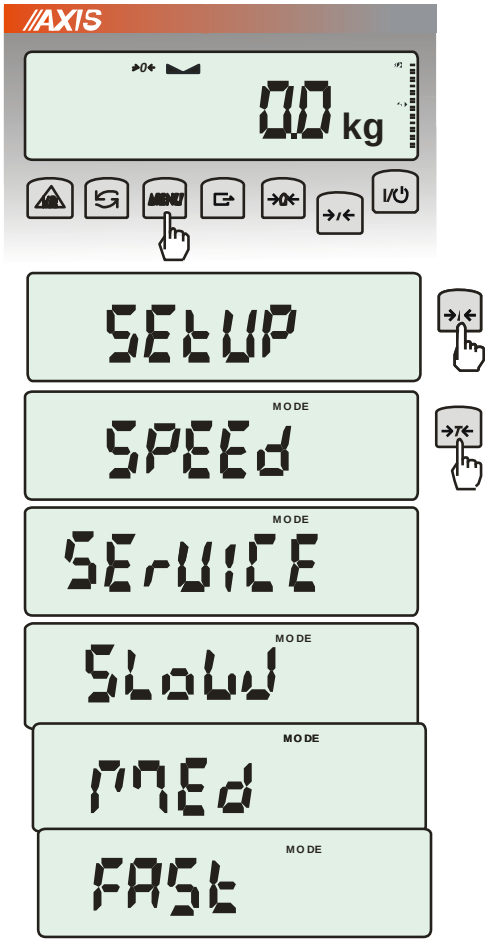
To enter code (in new scale: 1234) use keys:
→*0*← - increasing digit,
→*T*← - next digit,
MENU – end of inscribing.
The following options appear successively on display:
ZEr Cod – enter new secure code value,
ZEr SEt – enter new zero value

Using →*T*← key, choose *ZEr SEt*. Direct result from A/C converter will appear on scale display.
When the pan is empty press →*0*← key.
Wait for finishing zeroing process.

In order to change access code use
ZEr Cod option (as mentioned earlier).

17.10 Weighing speed (SPEEd)

The *SPEEd* option allows you to change the weighing speed, which affects the balance's sensitivity to external factors. We do not recommend changing this parameter without a good reason.
If the scale is unstable (it is affected by external factors such as air gusts or vibrations), we recommend reducing its speed to the *SLoW* setting.
If the scale is stable but weighs too slowly, we recommend using the *FASt* setting.
Factory reset is the *SErVICE* setting.



Press *MENU* key.

When *SEtUP* is displayed, press the →*T*← key.

When *SPEEd* is displayed, press →*T*← key.

Speed options will appear:
- *SERVICE* - factory speed,
- *SLoW* – decreased weighing speed,
- *MEd.* – average weighing speed,
- *FASt* - increased weighing speed.

18. Special functions description

All scales besides basic metrological functions: weighing and taring, have a set of special functions. Depending on meter type functions set differs. Below a list of functions available in standard ME-01 type meters:

- Products data base (*Prod*),
- Users data base (USEr),
- pieces counting function (*PCS*),
- change of mass unit (*UnIt*),
- percentage weighing function (*PErC*),
- selecting label number function (*LAbEL*),
- weighing large animals function (*LOC*),
- entering tare function (*tArE*),
- maximum value indication function (*UP*)
- force measuring function *(nEWton)*
- statistical calculations *(StAt)*
- paperweight calculation function *(PAPEr)*

and functions that require additional equipment to be completely functional:

- option with accumulator supply:
  - Setting accumulators charging (*bAttErY)*
  - Automatic switching off scale function (*AutoOFF)*
- options with the clock:
  53. setting current date and time function (*dAtE*)
  54. total weight function (*totAL*)
- options with the transoptors connectors (WY⅂Γ):
  - checkweighing function (*thr*)

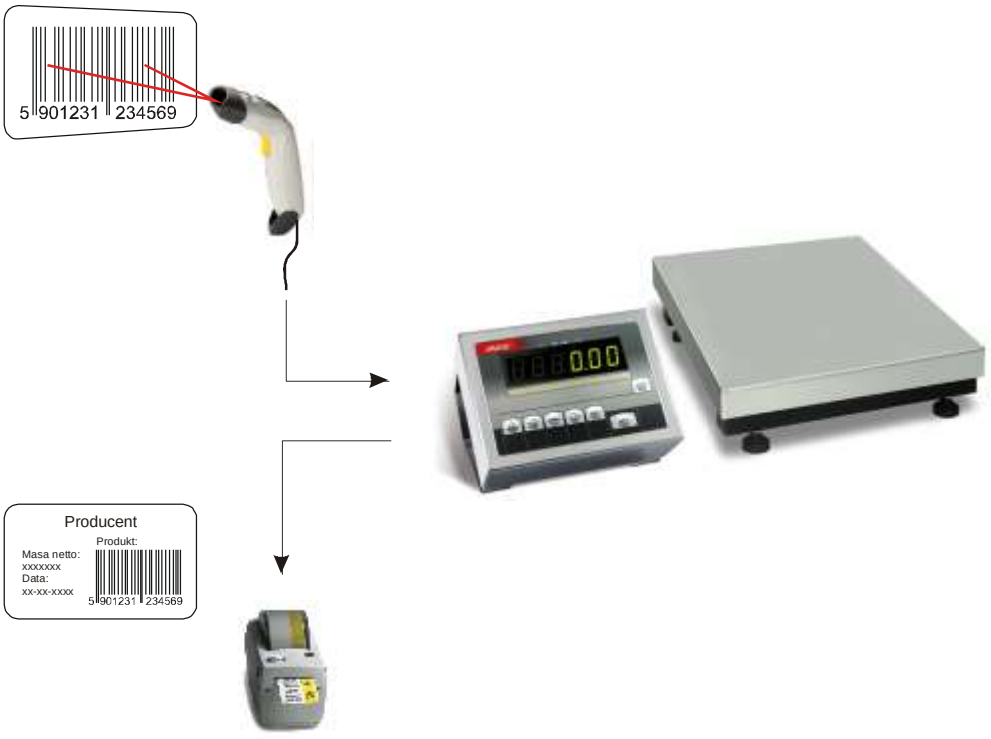
LabEL function is available in scales with EPL or EPL-A transmission protocol activates (go to *SetuP/SErIAL*). In scales with LED display special functions don't have additional marks on display and names of some functions are shortened.

18.1 Tare, products and users database (Prod and USEr)

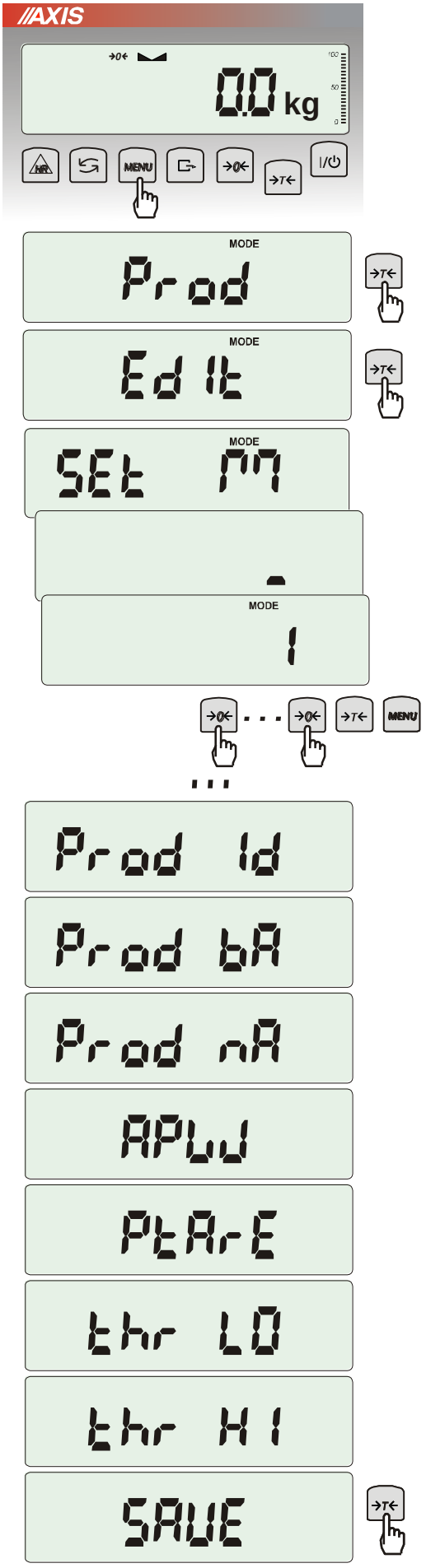
Scale is equipped with products and users database with capacity up to 400 products and 100 users. Among others each product can have tare value stored in memory (*PtArE*).
Database consists of:
-*M nr* – memory number where data is saved,
-*Prod Id* - product identification number,
-*Prod bA* – product barcode,
-*Prod nA* – product name,
-*USEr Id* – user identification number,
-*USEr nA* – user name,
-*APW* - unitary weight (used when pieces counting),
-*PtArE* - inscribing permanent tare to the product,
-*thr Lo* - threshold value (low),
-*thr Hi* - threshold value (upper),
-*LAbEL* – corresponding label number.

Database can be built in Excel datasheet form, where each product has one row and each column have product data. This way created database, saved in *.csv extension with semicolons can be send to scale using *Scale Database* software and scale's serial interface. *Scale Database* is available on our webpage *www.axis.pl/en*.
Database and possibility to cooperate with external devices: printer, label printer, barcode reader and computer enables to built product identification and product archiving systems.

Product barcode readout (during scale working) initiates searching through database and in case of finding proper record, recalls product data (*Found* communicate). Barcode reader enables also to insert numerical data conveniently (standard ME-01 meter doesn't have numerical keys). Using alphanumeric code (for example 128 code) it can be also used to insert names of products and users.



Inscribing data to base



Prod and *USEr* options enables adding and deleting product and user data.

For products database available options are:

- *Prod Id* – searching for product in database by inscribing (or scanning) id number or barcode,
- *ProdCLr* (shows up if product was selected earlier) – turns off actual product selection,
- *EdIt* – product edition from database,
- *Add* – add product to database,
- *dEL OnE* – deleting single element from database,
- *dEL ALL* – deleting all elements from database,
- *dAtAb* – changing working mode with database (default mode *Stb*):
  - *Stb* – searching products in database and working with products outside the base; if product is found then *Found* communicate appears and all product data is recalled; if there is no product in database then no communicate appears, the scale stores id/barcode number temporarily in memory and enables to send it to the port (to printer/computer) together with actual weighing result.
  - *LIMIt* – searching through products from database; if product is found then *Found* communicate appears and all product data is recalled; if there is no product in database then *not Found* communicate appears.
- *Prn_P* – sending all products database to port.

To inscribe data use *EdIt* option and keys:

→0← - increasing digit,

→T← - next dixit,

MENU – end of inscribing.

Barcode reader (connected to RS232C interface) can also be used to inscribe data and this way it is faster and more effective.

Each database product has following data:

- *M Id* – memory cel number in products database,
- *Prod Id* – product identification number,
- *Prod bA* – product barcode,
- *Prod nA* – product name (inscribed from PC or barcode reader),
- *APW* – product unitary weight (optional),
- *PtArE* – product package weight (optional),
- *thr LO* – lower threshold (MIN value),
- *thr HI* – upper threshold (MAX value).

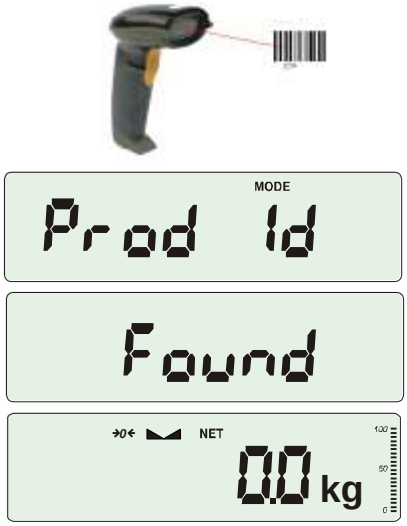
Saving inscribed product data is done by using *SAVE* option.

Users database is edited by similar function named *USEr* and consists of several options:

- *USEr Id* – user identification number,
- *USErCLr* (shows up if user was selected earlier) – turns off actual user selection,
- *USEr nA* – user name (inscribed from PC or scanner),
- *Prn_U* – sending users database to port.

Saving data is also done by *SAVE* option.

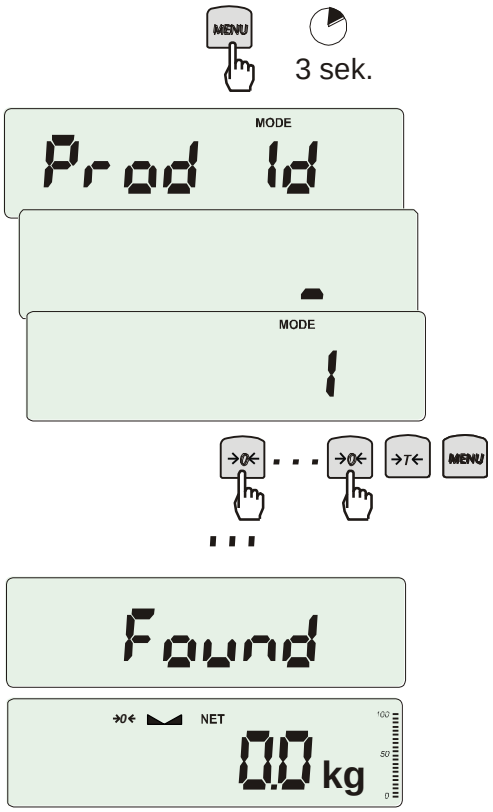
Recalling from database



The fastest way to recall product from database is to readout his barcode number (*Prod bA*) by using barcode reader (option). It can be done in any moment.
After readout of proper barcode scale indicates one of communicates:

- *SCAn* – barcode from outside the base accepted (*Std* mode),
- *not Found* – barcode from outside the base not accepted and no product is selected (*LIMIt* mode),
- *Found* – product barcode found in database and data recalled.

Attention: *If the scale doesn't indicate any communicate, check barcode reader connections, port configuration and transmission protocol* (*SErIAL function*).



Other fast way is to press and hold *MENU* key (about 3s). *Prod Id* communicate will appear. Relase the key and inscribe identification number. If the number is already saved in base *Found* communicate appears and all the product data is recalled.
To edit data choose *EdIt* option and use following keys:
→0← - increasing digit,
→T← - next dixit,
MENU – end of inscribing.
Product recalling is also possible by using *Prod* and *Prod Id* options (previous site).
If You hold *MENU* key for a longer time (about 6s) *ProdCLr* communicate will appear and actual product selection will be turned off.

Weighing results and data transmission from scale to computer or to printer
To fully use database capabilities other options must also be used: *SeriaL, LabeL* (for label printer) and *Print*.

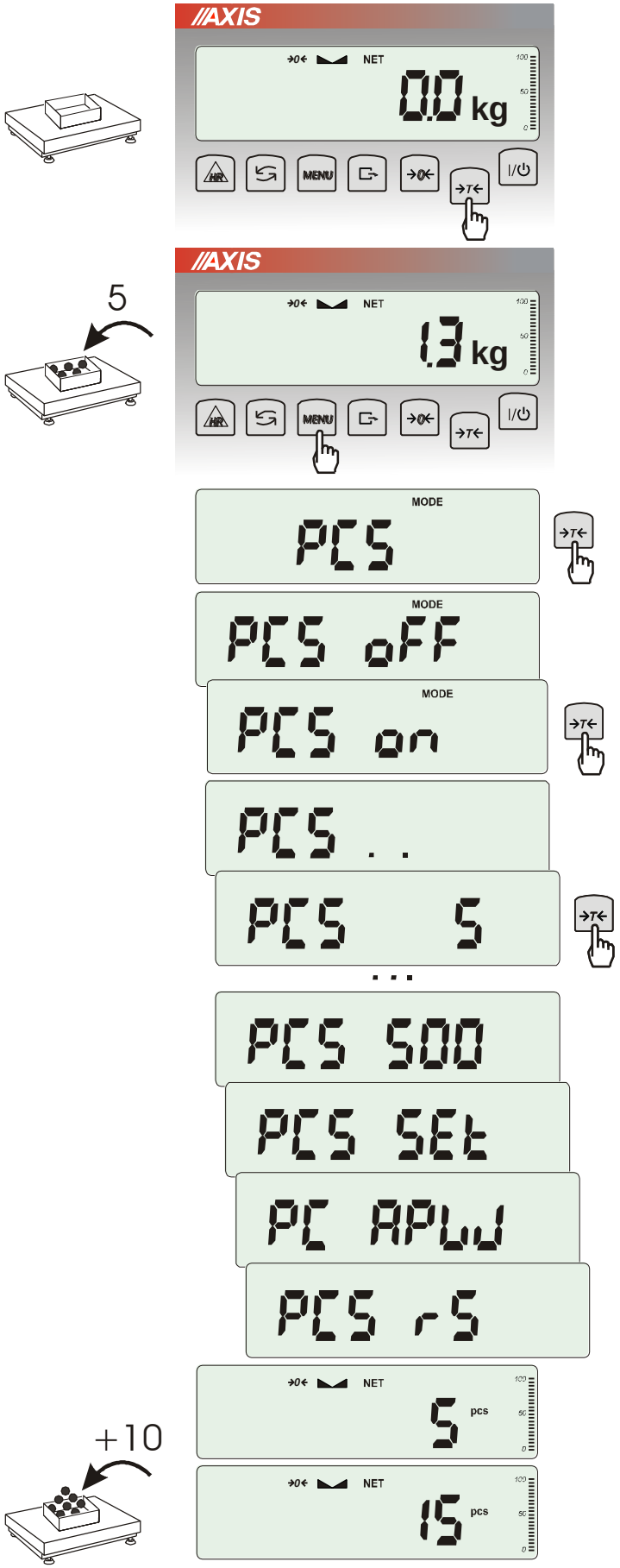
Serial option enables to select proper transmission protocol for each port. Thereby label printer can work independently. Recalling product is equivalent with choosing corresponding label number. If database is not used, proper label can be choosed using *LabeL* option.

To each weighing results transmission a set of product and user identification data is added. The set is activated in *Print* option.

Available data from products and users base (*Print / SEtuP* option):

- *USEr Id* – user identification number,
- *USEr nA* – user name (inscribed from PC or scanner).
- *Prod Id* – product identification number,
- *Prod bA* – product barcode (inscribed or scan),
- *Prod nA* – product name (inscribed from PC or scan),
- *Label* – label number for proper product,
- *APW* – unitary mass (PCS function),
- *tArE* – tare,
- *totAL* – total mass (*totAL* function).

18.2 Pieces counting function (PCS)



This function enables to count identical pieces, e.g. turnbuckles or buttons.

A measurement is performed in two phases:

- first phase - single piece weight calculation on the basis of defined pieces amount (*5, 10, 20, 50, 100, 200* or *500* pieces),
- second phase – pieces counting.

First phase options:

- *PCS . .* – recalling of a value inserted earlier (this quantity must be inscribed earlier),

-*PCS SEt* – set any amount of pieces in a sample,

-*PCS APW* – set unitary mass directly,

-*PCS rS* – inserting number of details in a sample and receiving of their mass from other scale connected by RS-232C.

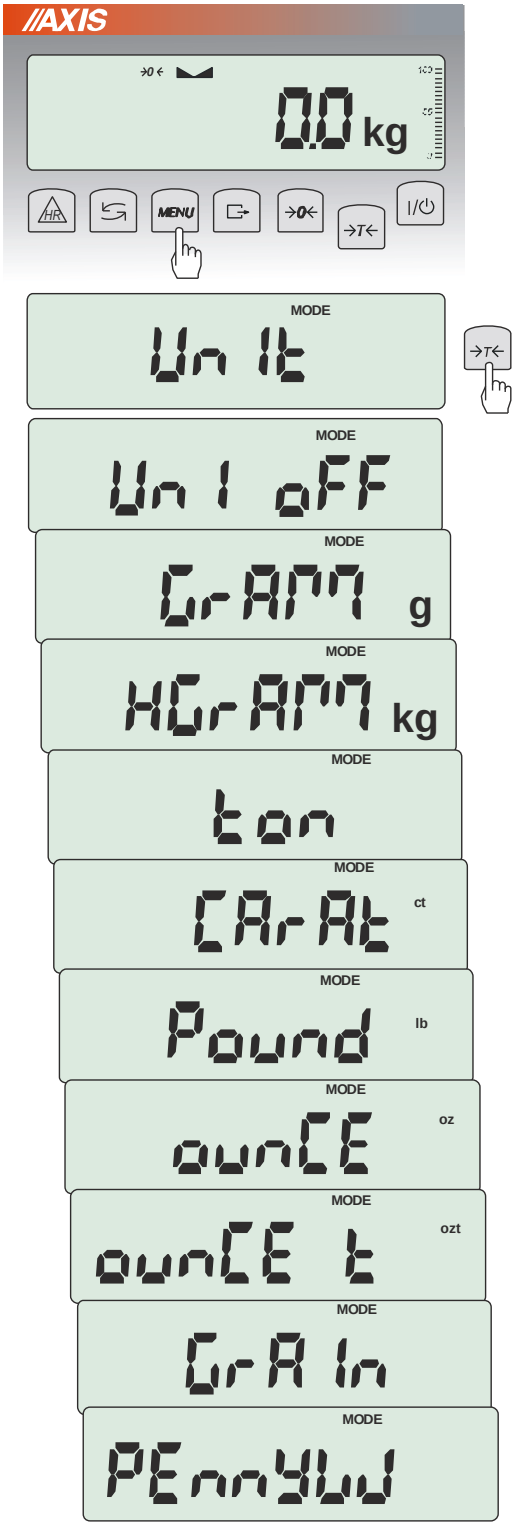
It is advised that single piece weight is not less than one reading unit and sample weight used in first phase is bigger than 100 reading units.

To leave function press *MENU* key and then using →T← key chose *PCS* and *PCS oFF*.

Note:

1. *APW too LOW communicate signalises that a sample was not put on the pan or if single piece weight is less than one-tenth readout plot (counting is not possible).*
2. *APW LOW communicate signalizes that single piece weight is more than one-tenth but less than one readout plot. (counting possible but with bigger errors, result blinks).*
3. *In scales equipped with LED display pcs sign is replaced with "■ ".*

18.3 Selecting the current mass unit (UnIt)



UnIt option allows you to select the current unit of measurement of the weight displayed until the scale is turned off:

- *Uni off* – standard unit of weight (kg)
- *Gram* (1g) – gram
- *KgrAM* (1kg=1000g) – kilograms
- *tons (1t=1000kg)* – ton
- *CarAt* (1 ct = 0.2 g) – carat
- *Pound* (1 lb = 453.592374g) – lb English
- *OunCE* (1oz= 28.349523g) – ounce
- *OunCEt* (1ozt= 31.1034763g) – pharmacy ounce
- *GrAIn* (1gr= 0.06479891g) – gr
- *PennYW* (1dwt =1.55517384g) – a jeweler's unit of mass

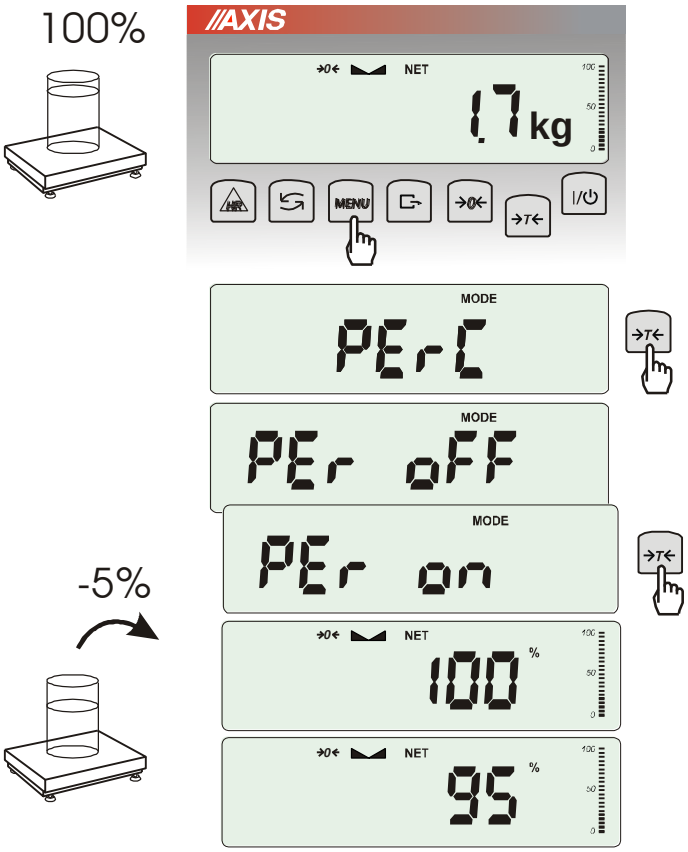
Selection is made by pressing the →*T key* ←while the unit is displayed.

When you turn the scale off and on again, the measurement unit changes to the starting unit selected using the configuration option (*SEtUP /Unit*).

Attention:

In scales with an LED display, the weight unit symbols are not displayed, but kg, lb and g are indicated by a light-emitting diode.

18.4 Percentage weighing function (PErC)



This function allows displaying weighing result in percents.

A measurement is performed in two phases:

- first phase – weighing a reference sample (100%),

- second phase – measuring specific sample as a percentage of the reference sample.

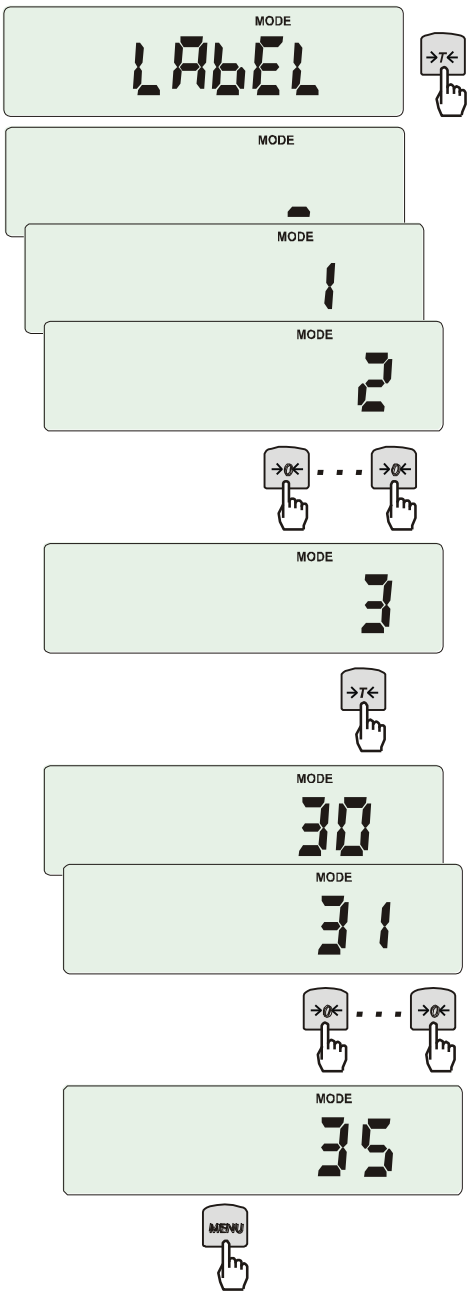
Weighing result is displayed in different format, depending on the weight value of reference sample.

The function has the following options:
- *PEr oFF* – disable the function,
- *PEr on*– set current scale indication as 100% and activate percentage weighing,
-*out*- exit without changing settings.

Note:
1. *PEr Err* message informs that reference 100% mass is less than 0,5*Min or was not defined.
2. In scales with LCD display sign "▪" is replaced with %.

18.5 Label choosing function (LAbEL)

This function is used in scales with *EPL* (*SErIAL* function) 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:

→*0*← - digit increase,

→*T*← - next digit,

MENU – end.

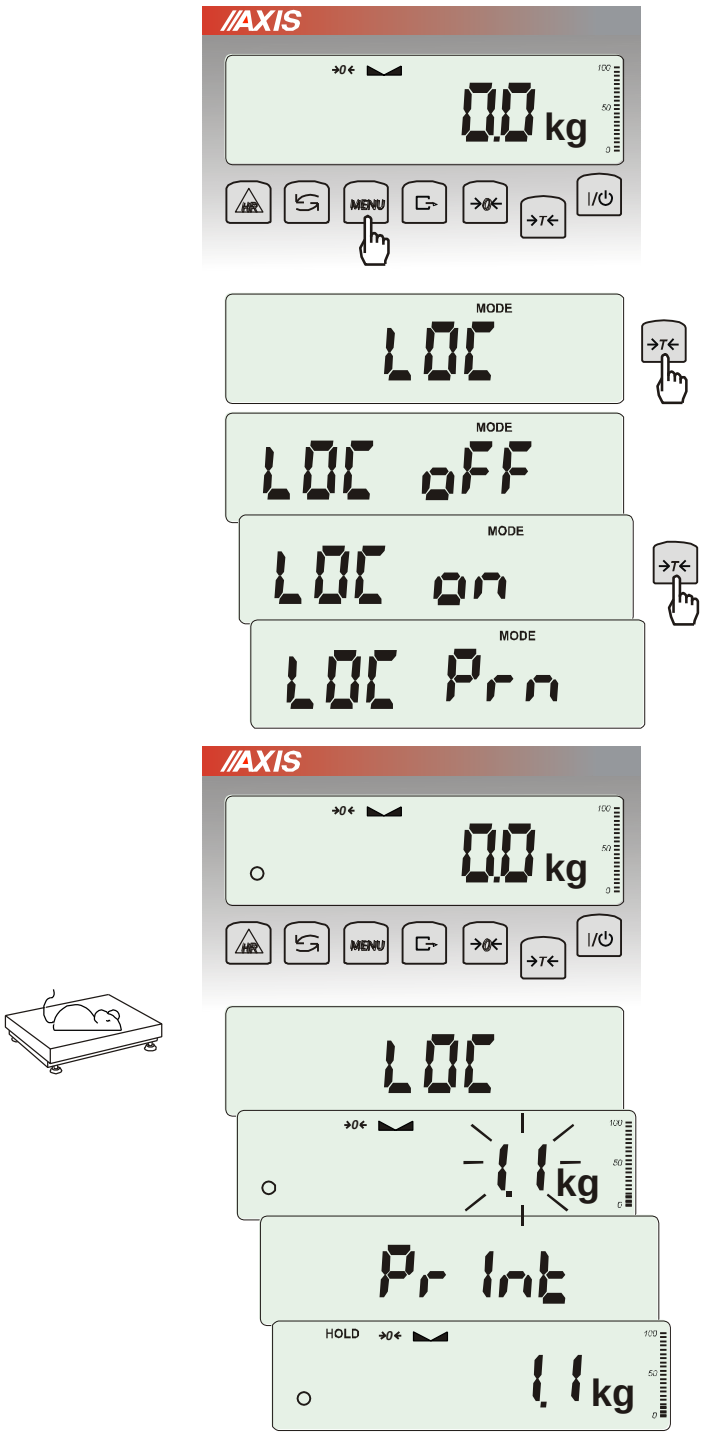
After entering label number, putting load and pressing ⇨ key will cause sending data to label printer.

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

```
US              (55 53 0D 0A)
FR"0001"        (46 52 22 30   30 30 31 22   0D 0A)
?               (3F 0D 0A)
00:00           (30 30 3A 30   30 0D 0A)
2000.00.00      (32 30 30 30   2E 30 30 2E   30 30 0D 0A)
   10  g        (20 20 20 20   20 31 30 20   20 67 0D 0A)
P1              (50 31 0D 0A)
```

18.6 Weighing animals function (LOC)

The function allows weighing animal moving on the scale.



Press *MENU* key.

When *LOC* function is displayed press →*T*← key. The following options appear on display successively:
- *LOC oFF* – leave the function,
- *LOC on* – automatic weighing after loading the scale,
- *LOC Prn* – the measurement initiated manually by pressing ⎘ key.

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

Tare the scale using →*T*← key if necessary and place the animal on the pan.

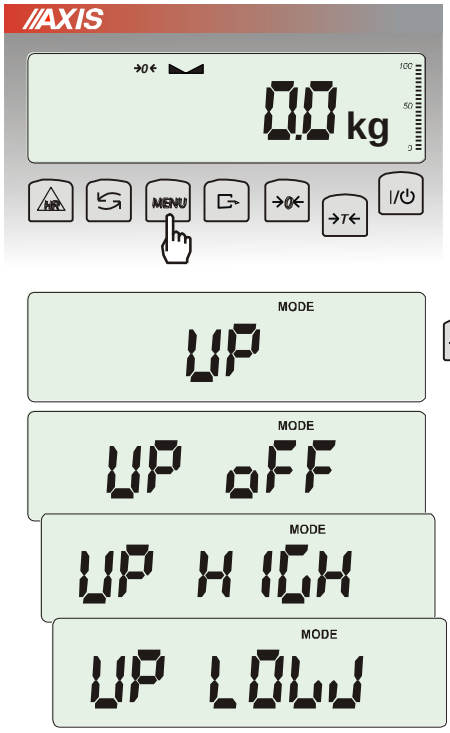
Wait until the weighing result is averaged – scale display blinks. Then scale will show stable (averaged) result and will send it through serial port. The result remains on display for about 30 second.

Important notes:

1. *The loads lower than Min value are not averaged.*
2. *In case when putting animal on scale takes more than 5s it is suggested to choose LOC PRN option (measurement started manually by pressing* ⎘ key *).*

18.7 Maximum value indication function (UP)

This function allows holding maximum (or minimum) value that is indicating at the moment.

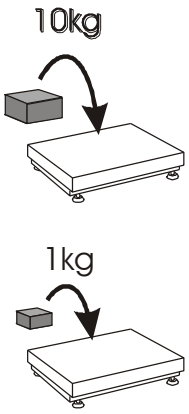


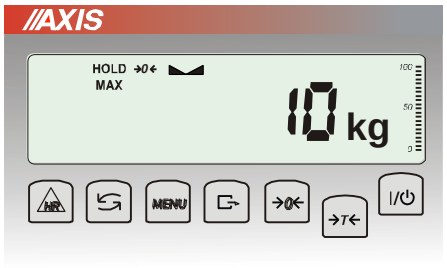
Before measurement scale should be tared.

Function has following options:

-*UP oFF* – function off,
-*HIGH* – holding maximum value,
-*LOW* – holding minimum value.
Pressing →*T*← key will cause result zeroing.

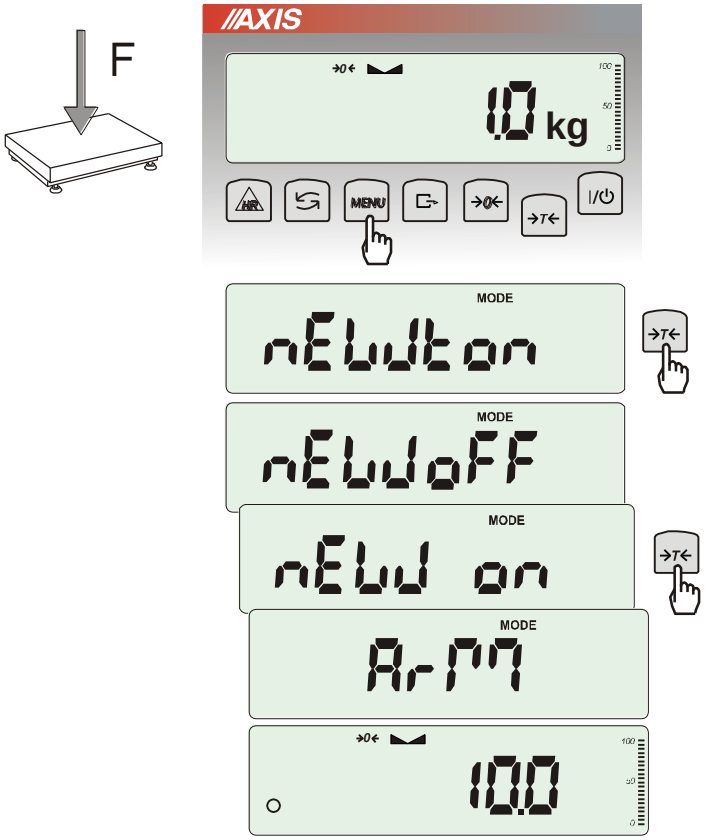
Note:
Autozeroing function and the stabilisation indicator are deactivated when UP function is running.





18.8 Force measuring function (nEWton)

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



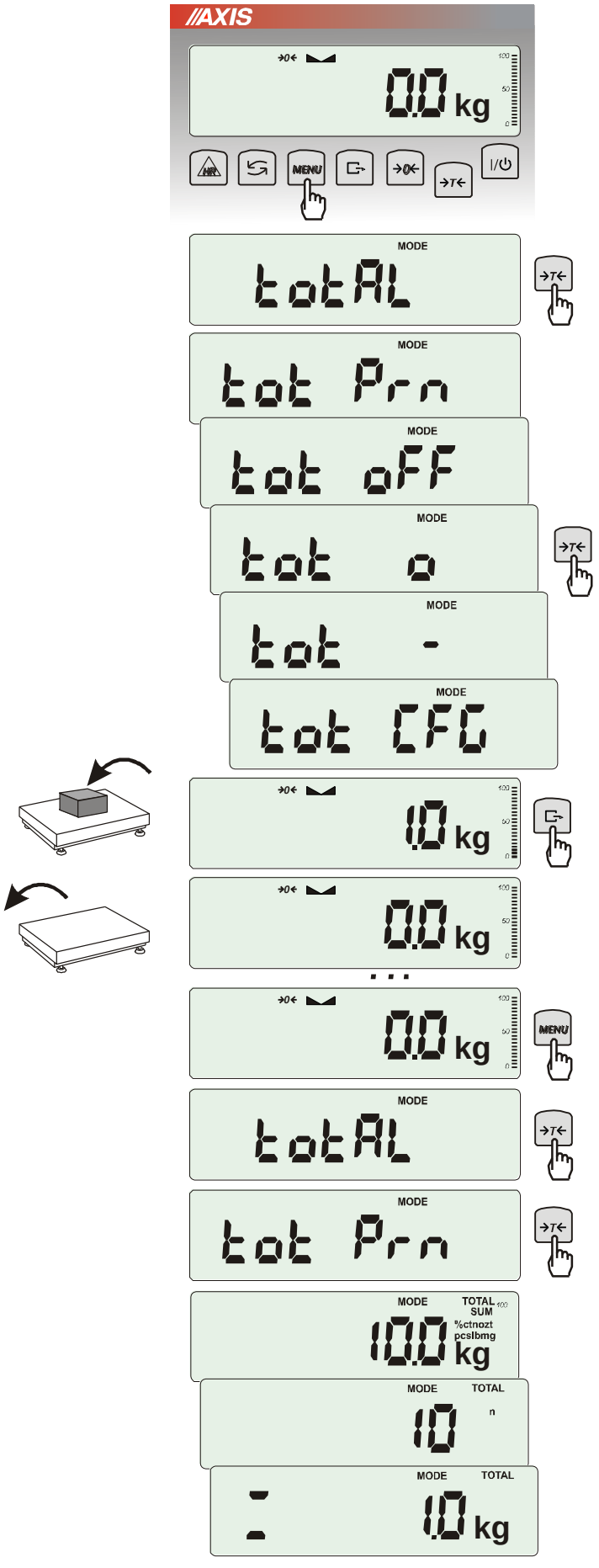
Press *MENU* key.

Using →*T*← key choose *NEWto* function.
Function has several options:
- *nEW oFF* – function off,
- *nEW on* – measurement in Newtons,
- *ArM* – torque measurement (arm length should be inscribed in meters using →*T*←, →*0*← and *MENU* keys).

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

Note: 1N≈ 0,1019kg

18.9 Total weight function (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.

Press *MENU* key.
When *totAL* is displayed press →*T*← key.

The following options will appear successively:
- *tot Prn* - report printout without clearing total register,
- *tot oFF* - clearing total register, report printout and leaving the function,
- *tot* □ - working with receipt printout after each measurement,
- *tot* - working without receipt printout,
- *tot CFG* – saving measurement mode (using ⎘ key: *Manual*, after taking off the load : *auto*).

Press →*T*← key when *tot* □ is displayed.
Perform measurement series by pressing ⎘ key for storing results into total register.

In order to print and display results enter the function by choosing *totAL* and *tot Prn* option from menu.

The results are displayed in the following sequence:
- total weight (SUM ≡),
- number of registered measurements (n),
- average value (=),

regarding that moving to display successive result is performed after pressing ⎘ key.
Attention: In scales with LED display SUM sign is replaced by "≡".

In order to go back to total weighing without zeroing total register press ⎘ key several times.

To leave the function with clearing total register, select *totAL* function from menu and choose *tot oFF* option. Scale prints the communicate informing about clearing registers.

The form of standard receipt (measurement number and weight) after each measurement:

```
1        3 g
2        5 g
3        3 g
4        4 g
```

Print configuration option (chapter 17.5) enables to extend standard receipt form.

Report form (total weight, number of measurements, average weight):

```
TOTAL   =
N       =
AVERAGE =
```

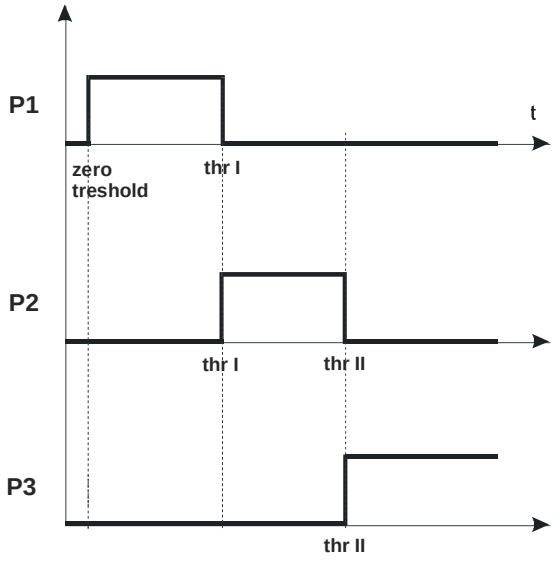
Note:
When the scale doesn't have an internal clock, Date and Time do not appear on printout.
Maximum number of measurements is 99 999.
Maximum total load 99 999 000d.
The weighing unit of the total value from the register (Total) is the same as the weighing unit stated on the keypad or is 1000 times greater, what is signalled by "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 and cannot be displayed, "Err1"communicate appears on the display

18.10 Checkweighing function (thr)

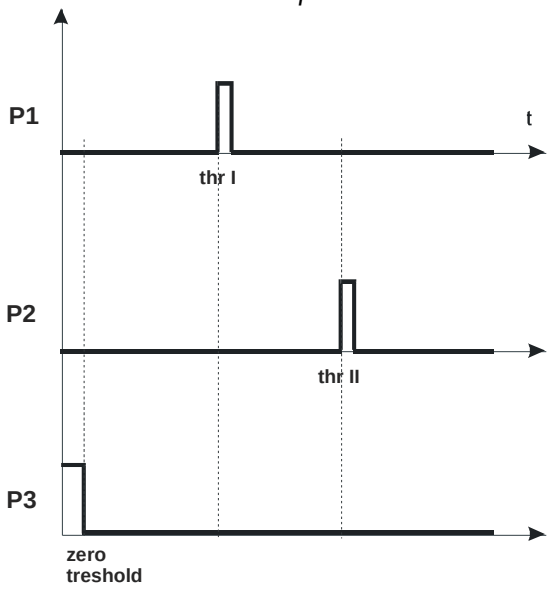
The function allows you to compare the weighing result with two pre-programmed mass values: lower and upper threshold. The result of the comparison is signaled by the lights of the indicators (MIN, OK, MAX) and a short or long sound signal generated when the thresholds are exceeded.
In scales equipped with the Output connector (marked: OUTPUT ⊓⊔), the comparison result can be used to control the optical signaling device (*Signal.* mode), automation devices (*Impulse* mode), dosing devices (*Dose* mode).
In the *Impulse* mode, short-circuit pulses with a duration of 0.5 s appear on the outputs P1 (threshold I) and P2 (threshold II). On the P3 (zero) output, the short-circuit condition appears when the indication does not exceed the value of the zero signaling threshold. In the *Signal.* device mode, short-circuit states appear on the outputs P1-P3 of the Outputs connector as a result of comparing the balance indications with the threshold values. In the *Dosing* mode, the outputs are activated with the ↻ key (*StArt* message) and after reaching the threshold II value, the outputs are deactivated (*End* message).

On the chart below output states are shown during increasing load on the scale for different working modes:

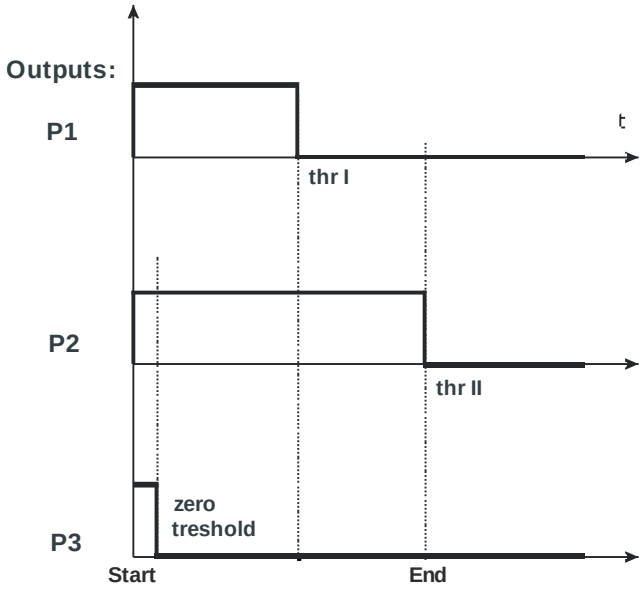
Signal. mode:



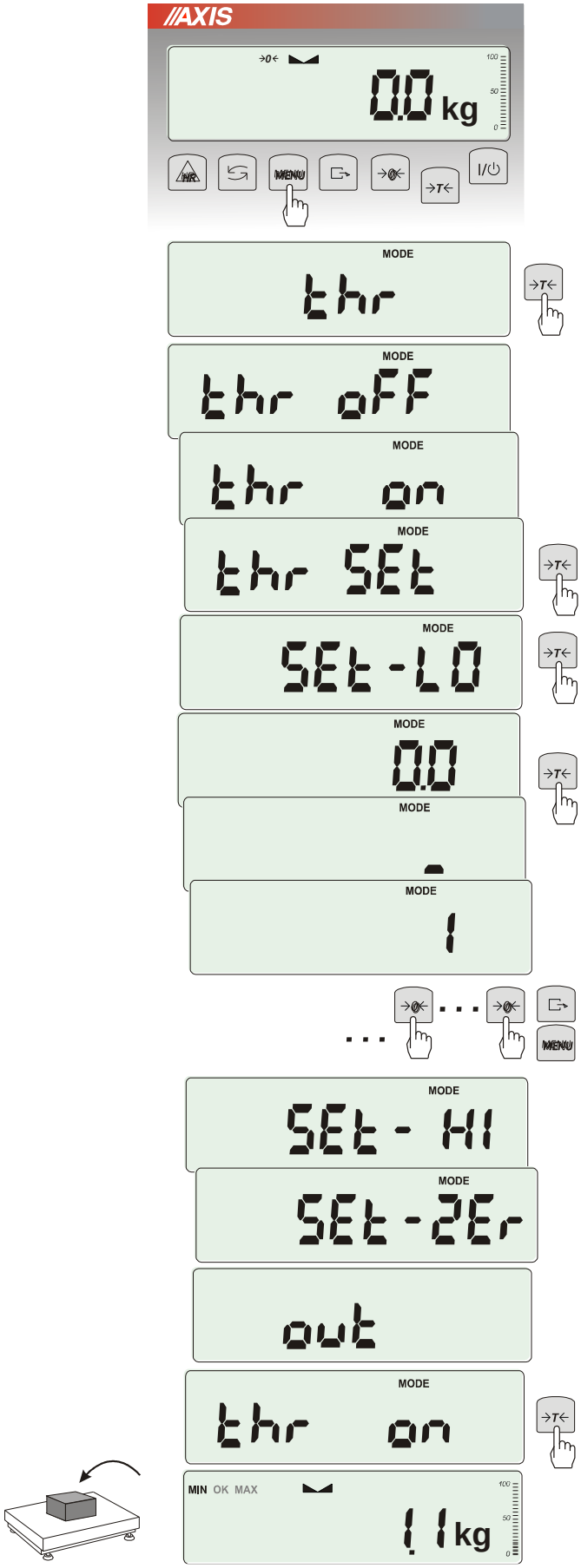
Impulse mode:



Dose mode:



Operation sequence:



Press *MENU* key and choose *thr* pressing →T← key.
The following options are displayed successively:

- *thr oFF* – deactivate the function,
- *thr on* – activate the function,
- *thr Prn* – check last threshold values (press ⊏→ key several times),
- *thr CFG* – choose *Relays* socket mode:
  IMPULS – *Impuls* mode
  SIGnAL. – *Sygnal.* mode
  doSE – *Dose* mode
  out.

Choose *thr-on* option using →T← key. The following options for entering thresholds are displayed:

- *SEt-LO* - set lower threshold value,
- *SEt-HI* - set upper threshold value,
- *SEt-ZEr* - set zero signalisation threshold.

Using →T← key select *SEt-LO* option (the previously entered value will appear), press the →T← key again.
Set lower threshold value using the following keys:

→0← - digit increase,
⊏→ - decimal point,
→T← - move to next digit,
MENU - finish.

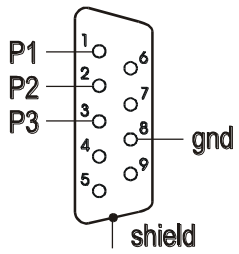
Then select *SEt-HI* option and enter upper threshold value.

Choosing *SEt-ZEr* option will enter zero signalisation.

Choosing *out* will end inscribing thresholds. Choosing again out will start thr function.
To change *Relays* socket mode use *thr CFG* option. Default option is *Indication*.

To leave the function, press *MENU* key and then choose *thr* and *thr oFF* options.

OUTPUT ⎍ connection diagram:

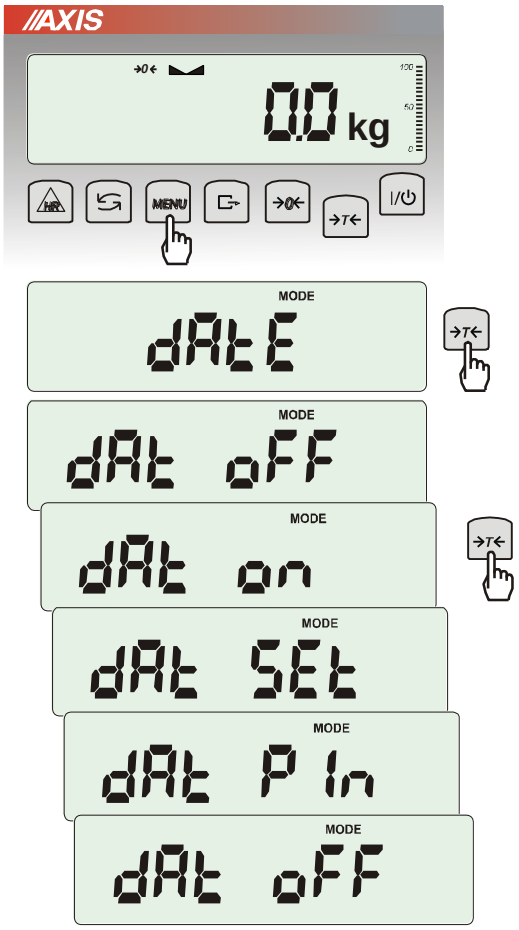


The Output connector is an optocoupler open collector output with a load capacity of 25mA / 24V.
It is recommended to use ready-made MS 3K/P board, which contains RM96P relays with DC 24V input voltage and output: AC 250V, 3A.

Important notes:

1. When the scale is turned on, both thresholds are set to maximum values.
2. When setting the upper threshold, make sure that its value is not lower than the lower threshold.
3. Setting the lower and upper threshold values is also possible by sending appropriate commands from the computer, which is described in the balance's manual.

18.11 Setting date and time function (dAtE)



The function allows setting current date and time of scale internal clock and mode of its use.
The function has the following options:
- *dAt oFF* – deactivate date and time during printout of current weighing result,
- *dAt on* – activate date and time during printout of current indication (key),
- *dAt SEt* - change current date and time,
- *dAt PIn* – data and time secure password (to prevent from changing date and time by unauthorized personel),
- *dAt For* – data printout in different format.

The example at the left presents how to set current date and time using *dAt SEt* option.

After setting proper date and time activate it with *dAt on* option.

Date and time format:

PL: rrrr-mm-dd gg:mm

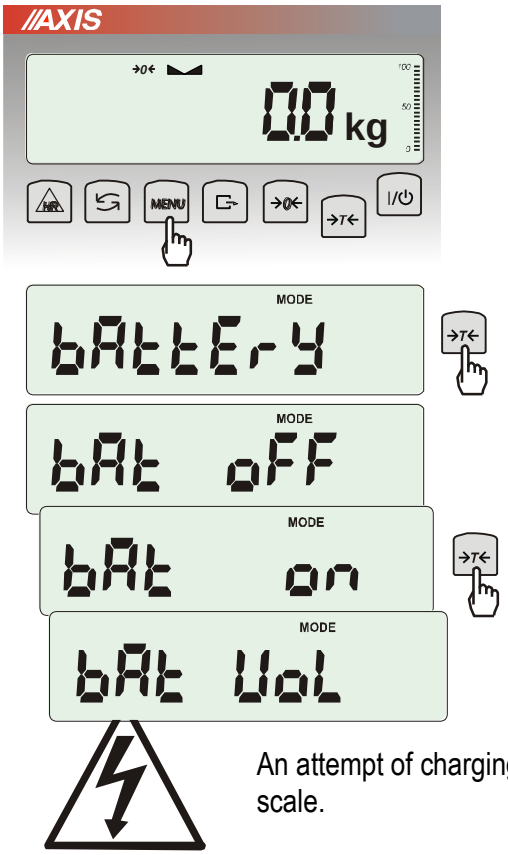
UE: dd-mm-rrrr gg:mm

USA: mm-dd-rrrr gg:mm AM/PM

(gg – hours, mm – minutes, AM – before noon, PM – after noon, mm - month, dd - day, rrrr - year).

Attention: Inscribing non-zero *PIN* value causes showing *PIN* sign during next date and time changing and inscribing 4 digit code is necessary. (using keys *→0←, →T←* and *MENU).*

18.12 Charging accumulators function (bAttErY)- option

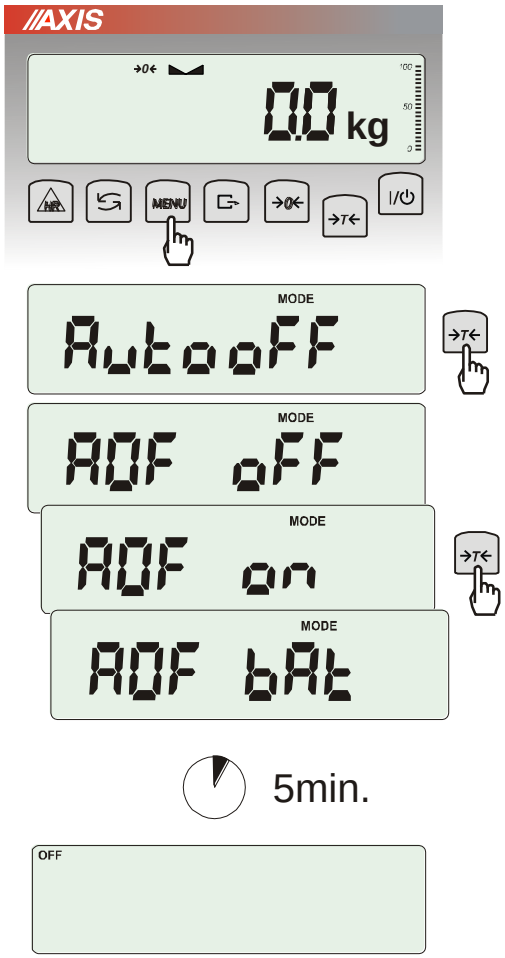


bAttErY function allows switching on or off charging accumulators during work with feeder and checking their power level.
The function has the following options:

- *bAt OFF* – charging off (option required if ordinary batteries are used !!!),
- *bAt on* – charging on, accumulators are being charged even after switching scale off using I/ ⏻ key,
- *bAt VoL* – reading power level of accumulators in % (go back to mass indication pressing *MENU* key),
- *out* – leave without changes

An attempt of charging ordinary batteries can cause serious damage of the scale.

18.13 Automatic switching off the scale function (AutoOFF)



The function is helpful in scales supplied from accumulators. The function causes scale to switch off automatically.

Press *MENU* key.

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

The following options appear successively on display:
- *AOF oFF* – deactivate function,
- *AOF on* – activate function- scale turns off after 5 minutes of not making any actions,
- *AOF bAt* – as above but only when supplied from accumulators.
- *Out* – out without changes.

18.14 Statistical calculations function (StAt)

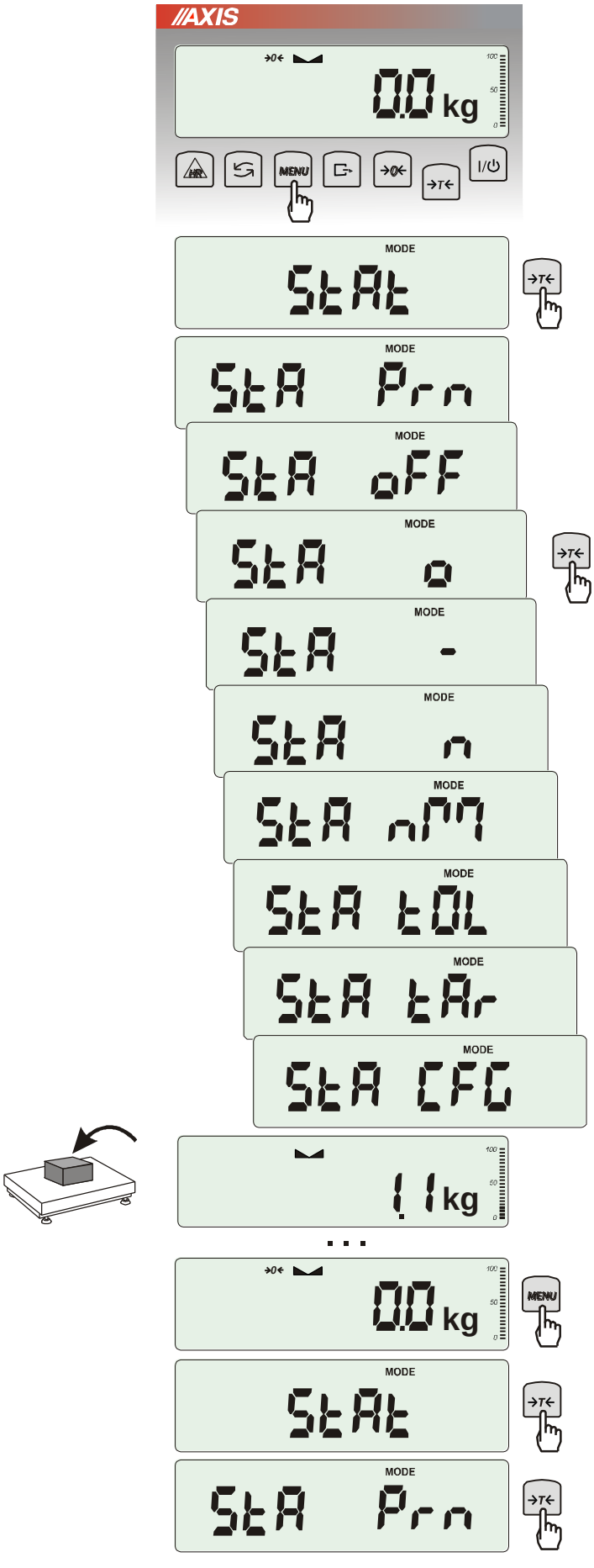
This function evaluates from series of measurements (max 1000) statistical parameters of weighting process. Adding successively measurements to register is automatic and it occur after the scale is loaded and its indications stabilize.
After each loading printout is made with: number of measurements, 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 $S = \sqrt{\frac{1}{(n-1)} \sum_n (x_n - \bar{x})^2}$
- srel -variance factor $srel = \frac{S}{\bar{x}}$

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* □ – 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).

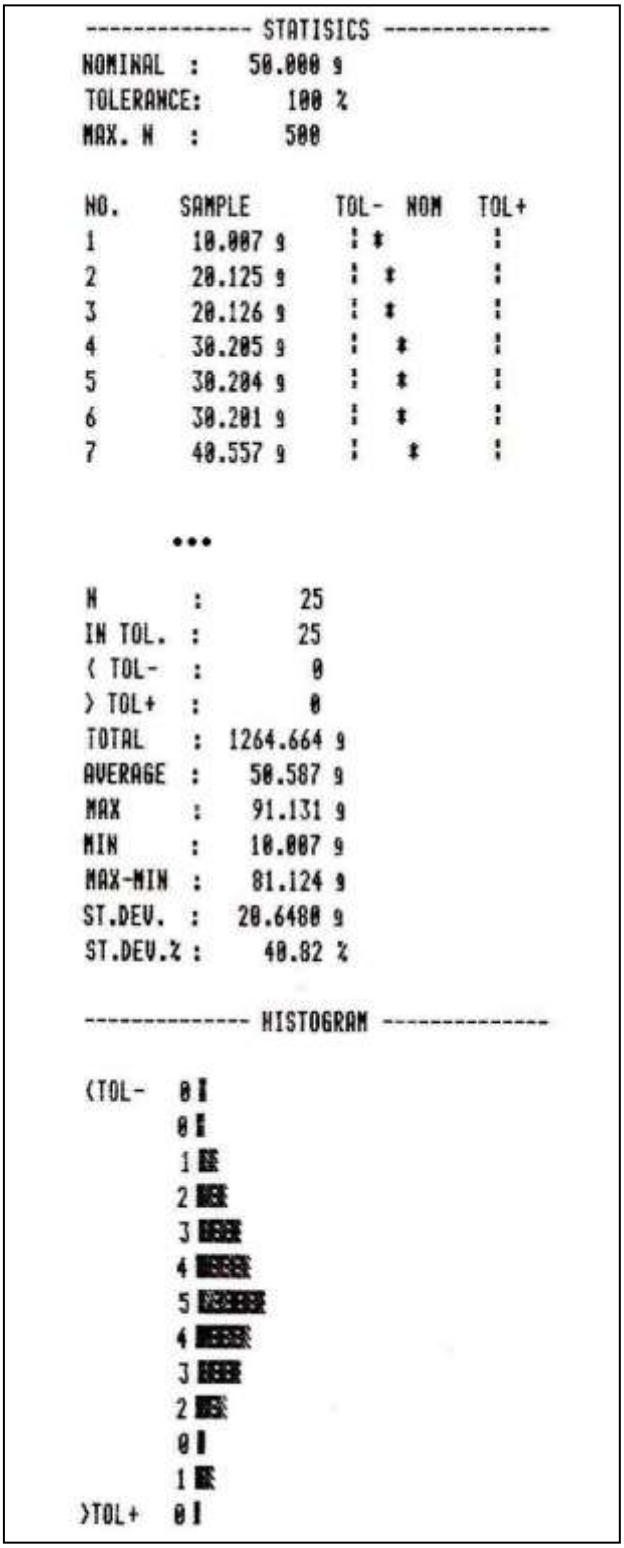
After that, push →*T*← key when *StA o* is displayed.

Put on successive 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*.
After printout two options are enabled:

- rESET – erasing results,
- Contin – continuation.

Pressing ⊏→ key printouts estimated values and histogram :



Nominal - nominal value,

Tolerance - accepted value in percentage.

N - number of sample

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

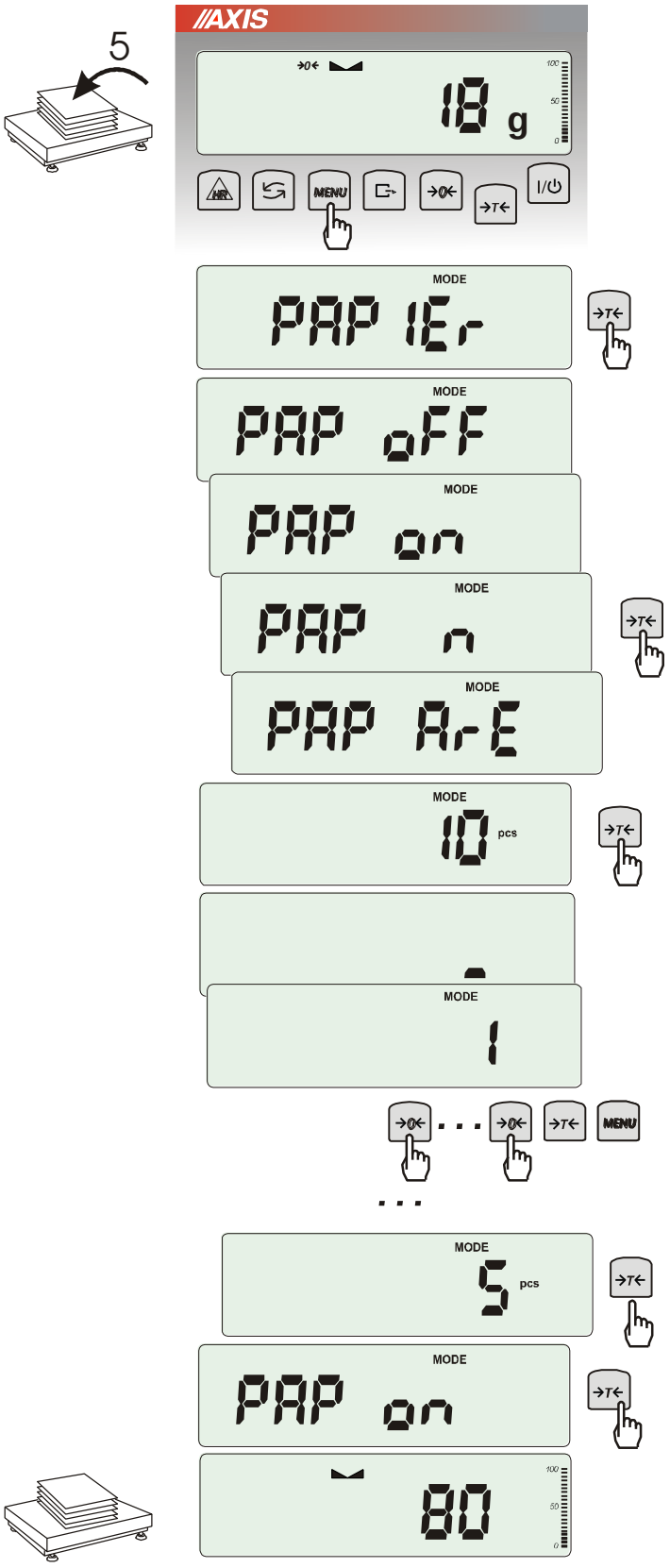
ST. DEV. – standard deviation

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 →T← button.

Statistics function cooperation with computer and Printer. Scale can be equipped with two serial ports marked as RS232C-I (computer) and RS232C-II (printer). After each data printout by printer identical set of data is sent to computer. After sending by computer initialization signal S A CR LF (53h 49h 0Dh 0Ah) the scale sends to computer statistic data enclosed in histogram.

18.15 Paperweight calculation (PAPEr)



This function enables to calculate paperweight of 1m^2 of paper basing on samples of known area. For quick access, the function is accessible directly by pressing *MENU* key.

The balance must be tared just before the measurement.
Place the specific sample quantity of the same area (possible values: 1, 2, 5, 10, 20, 50, 100).

Press *MENU* key to access Function Menu. To enter the function press →*T*← key when *PAPEr* is displayed.
Following options show on the display:
- *PAP oFF* – turn off the function,
- *PAP on* – turn on,
- *PAP n* – inscribing number of paper pieces on pan,
- *PAP ArE* – inscribing surface of single piece (in m^2)

Press →*T*← key when *PAP n* and *PAP ArE* is displayed.
Enter number of samples using:
→*0*← -increasing digit,
→*T*← - next digit,
MENU – end of inscribing.

Press →*T*← key when *PAP ArE* is displayed. Enter area of a single sample (as above).
The result of paperweight measurement is finished with „o" mark pointing g/m^2 unit.
In order to finish work with function press *MENU* and then using →*T*← key choose *PAPEr* and *PAP oFF*

Note:
"PAP Err" communicate marks that wrong values were inscribed in PAP n or PAP ArE.

19. Maintenance and repairs of small defects

1. The scale should be kept clean.
2. Take care that no dirt gets between the platform and the scale base. If found any, remove the pan (lift it up), remove dirt and then replace the pan.
3. In case of improper operation caused by short-lasting power supply decay, unplug the scale from the mains and then plug it again after few seconds.
4. If the scale is switched on with empty pan and “SErvice” communicate appears, the load cell has been mechanically damaged.
5. It is forbidden to make any repairs by unauthorised persons.
6. To repair the scale, please contact our nearest service.

Error communicates:

Communicate	Possible cause	Recommendation
unLOAd /SErvic(e)	Undesirable object under pan/platform (example: transport safety protection elements)	remove objects
	the scale was switched on with loaded pan	remove load from pan
	mechanical damage of the load cell sensor	contact an authorised service
C-1, C-2 ...	Self-tests failed	contact an authorised service
L	pan missing	put the pan on
	mechanical damage	contact an authorised service
H	overloading	remove the load from the pan
	mechanical damage	contact an authorised service
◣ ◢ indicator does not appear	unstable ground vibrations air flows	place the scale on a stable ground not affected by mechanical vibrations and airflows
	scale is damaged	contact an authorised service
- - - - - -	taring in progress	as above
- -	taring could not be finished (for example the load is too small)	zero the scale or increase load and tare again
- -	the load is too big to be zeroed	tare the scale (→T←)
Err t	exceeding the permissible operating temperature range of the scale	move the scale to a place with the right temperature

Appendix A

Information's concerning double-range scale (options)

1. General description

Double-range scale's have capability of work with greatest accuracy in bottom measuring range part. Weighing of smallest mass is more precise.

This type of scale's have two measurement range:

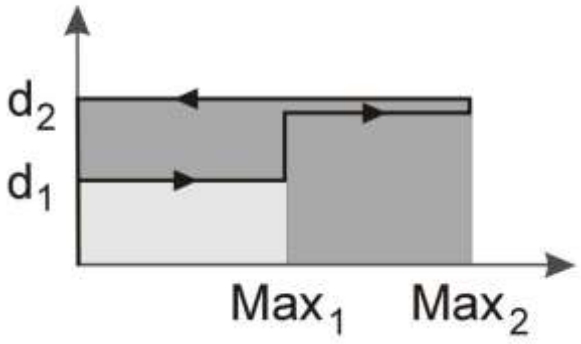
Max_1 - 50 % of maximum load (mostly),

Max_2 – 100% of maximum load,

and adequate reads digit: d_1 i d_2 ($d_1 < d_2$).

Double-range options causes change of scale's operation:

- after turn on (in small mass range 0- Max_1) scale displays result with reading unit d_1, when the load pass the Max_1 scale changes reading unit on d_2; from this moment scale displays result with reading unit d2 on all measure range (0- Max_2),
- return to unit d1 is succeed after zeroing the scale (→0← key), or then all mass is removed from pan (indicator "→0←").



2. Double-range scale parameters

Range and graduation values are represented on nominal table on the scale.