AXIS

BA

BA/K

BA/M

BA/N, BA/H

BA/NK

USER MANUAL

BA, BA/Y, BA/M, BA/N, BA/NY, BA/H

FILE: 2025-01-17 BA R_K_W 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.

BA/W, BA/R and BA/M scales are designed for general use.

BA/N series are destined for work in industrial conditions on water and detergents requiring immunity.

BA/H series are destined for work in industrial conditions on salts and acids requiring immunity.

BA/Y scales are designed for more precise measurements.

Double-range option is described In Appendix A.

All scales are metrologically tested - calibration or legal verification on demand.

Scales have following verification features:

- a seal protecting scale casing against opening,
- notified body stamps and M metrological marking placed on the balance name plate.

Legal verification is valid for 2 years unless the seal is broken. To make a second legalization please contact with authorized service AXIS.

NACE classification: : 29.24.23.

Depending on scale's application e.g. dosing, labeling or computer cooperation scale can be equipped with following meter:

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

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

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

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

ME-01/N/25 (LED) – Universal meter with LED display (25mm digits height) in stainless steel housing. Full set of special functions (chapter 18) 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.

2. Certificates

Certificate of type approval
no. T11430R0

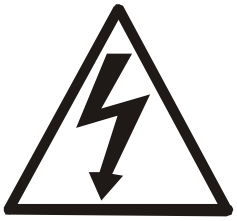
AXIS management System
Certificate
No. 90927/C/6

3. Completeness

Standard set consist of:

1. Scale
2. Feeder (In BA/N and BA/H scales only in accumulator versions)
3. Guarantee card
4. User manual

4. Safety rules



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

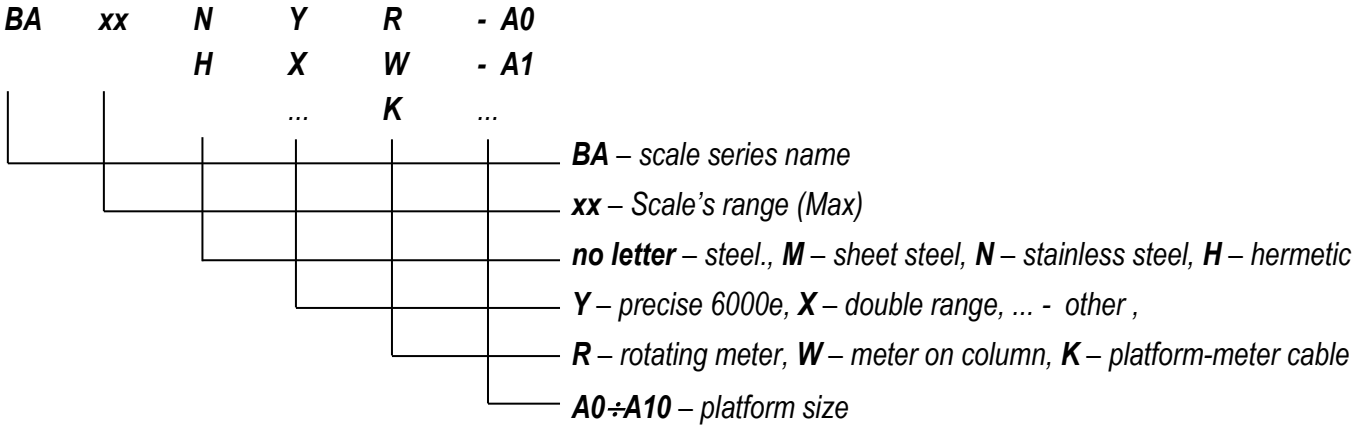
- To supply scale use socket with safety contact (scales with feeder exluded).
- All repairs and necessary regulations can be made by authorised personnel only.
- To avoid fire risk use a feeder of an appropriate type (supplied with the scale). Pay attention that supply voltage is compatible with specified 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.

5. Technical data

Method for determining scale's type:



BA/W popular platform scales (meter on column version) and BA/K (cable version):

Scale type	**BA0.3K**	**BA0.6K**	**BA1.5K**	**BA3K**	**BA3MW BA3MK**	**BA6K**	**BA6MW BA6MK**	**BA15MW BA15MK**	**BA15W BA15K**
Platform	**A0**	**A1**		**A2**	**A4+**	**A3**	**A4+**	**A4**	**A3**
Maximal load (Max)	300g	600g	1500g	3000g	3000g	6000g	6000g	15kg	15kg
Readout unit (d)	0,1g 0,05g*	0,2g 0,1g*	0,5g 0,1g*	1g 0,1g*	1g 0,1g*	2g 1g*	2g 1g*	5g 1g*	5g 1g*
Verification unit (e)	0,2g	0,2g	0,5g	1g	1g	2g	2g	5g	5g
Minimal load (Min)	2g	4g	10g	20g	20g	40g	40g	20g	20g
Tare range	-300g	-600g	-1500g	-3000g	-3000g	-6000g	-6000g	-15kg	-15kg
Accuracy class	III								
Working temperature	-10÷40°C								
Weighing time	<3s								
Cable lenght	3m (only K version)								
Supply	~230V, 50Hz, 8VA / 12V 500mA								
Internal supply (option)	NIMH (AA size) – 4 pcs (only LCD version)								
Working time with accumulator	about 6 h with display backlighting. about 16h without backlighting								
EC verification	-	✓							
Calibration standard of mass	300g	600g	1500g	3000g	6000g	3000g	6000g	15kg	15kg

** increased readability for non-EC verification applications*

Platforms	**A0**	**A1**	**A2**	**A3**	**A4**	**A4+**
Platform dimensions	100x150 x70mm	150x200 x70mm	200x200 x80mm	250x260 x110mm	300x300 x70mm	305x315 x70mm
Base with column dimensions	-			250x400mm	300x440mm	300x440mm
Scale with column height	-			400mm	415mm	415mm
Scale weight	2,5kg		2,8kg	3,5kg	7kg	7kg

Max, d and e for double-range scales are situated in appendix *A*.

BA popular platform scales (cont.):

Scale type	**BA15W BA15R BA15K**	**BA30W BA30R BA30K**	**BA60W BA60R BA60K**	**BA150W BA150R BA150K**	**BA300W BA300R BA300K**
Platform	**A5, A6, A8**	**A5, A6, A8, A10**			**A8, A10**
Maximal load (Max)	15kg	30kg	60kg	150kg	300kg
Readout unit (d)	5g *1g	10g *5g *1g	20g *10g *5g *2g	50g *10g	100g *10g
Verification unit (e)	5g	10g	20g	50g	100g
Minimal load (Min)	100g	200g	400g	1kg	2kg
Tare range	-15kg	-30kg	-60kg	-150kg	-300kg
Accuracy class	III				
Working temperature	-10 ÷ +40°C				
Weighing time	<3s				
Cable lenght	3m (only K version)				
Supply	~230V, 50Hz, 8VA				
Internal supply (option)	NIMH (AA size) – 4 pcs (only LCD version)				
Working time with accumulator	about 6 h with display backlighting. about 16h without backlighting				
EC verification	✓	✓	✓	✓	✓
Calibration standard of mass	15kg	30kg	60kg	150kg	300kg

** increased readability for non-EC verification applications*

Platforms	**A5**	**A6**	**A8**	**A10**
Platform dimensions	400x400x120	400x500x120mm	600x500x135mm	800x800x160mm
Base with column dimensions	400x560mm	400x660mm	600x660mm	800x960mm
Scale with column height	**740mm	740mm		
Scale weight	14kg	17kg	26kg	49kg

*** for BA15 – A5 scale the height is 590mm*

Max, d and e for double-range scales are situated in appendix *A*.

.

BA/YW and BA/MYW precise platform scales (meter on column):

Scale type	**BA3YW**	**BA3MYW**	**BA6YW**	**BA6MYW**	**BA12YW**	**BA12MYW**	**BA30YW**	**BA60YW**	**BA120YW**
Platform	**A2**	**A4+**	**A3**	**A4+**	**A3**	**A4**	**A5, A6**		
Maximal load (Max)	3000g		6000g		12kg		30kg	60kg	120kg
Readout unit (d)	0,5g *0,05g		1g *0,1g		2g *0,2g		5g *0,5g	10g *1g	20 *2gg
Verification unit (e)	0,5g		1g		2g		5g	10g	20g
Minimal load (Min)	10g		20g		40g		100g	200g	400g
Tare range	-3000g		-6000g		-12kg		-30kg	-60kg	-120kg
Accuracy class	III								
Working temperature	-10÷40°C								
Weighing time	<3s								
Cable lenght	3m (only K version)								
Supply	~230V, 50Hz, 8VA / 12V 500mA								
Internal supply(option)	NIMH (AA size) – 4 pcs (only LCD version)								
Working time with accumulator	about 6 h with display backlighting about 16h without backlighting								
EC verification	✓								
Calibration standard of mass	3000g		6000g	6000g	12kg	12kg	30kg	60kg	120kg

** increased readability for non-EC verification applications*

BA/YK and BA/MYK (cable version):

Scale type	**BA3YK**	**BA3MYK**	**BA6YK**	**BA6MYK**	**BA12YK**	**BA12MYK**	**BA30YK**	**BA60YK**	**BA120YK**
Platform	**A2, A3**	**A4+**	**A3**	**A4+**	**A3**	**A4**	**A5, A6**		
Maximal load (Max)	3000g	3000g	6000g	6000g	12kg	12kg	30kg	60kg	120kg
Readout unit (d)	0,5g *0,05g	0,5g *0,05g	1g *0,1g	1g *0,1g	2g *0,2g	2g *0,2g	5g *0,5g	10g *1g	20g *2g
Verification unit (e)	0,5g	0,5g	1g	1g	2g	2g	5g	10g	20g
Minimal load (Min)	10g	10g	20g	20g	40g	80g	100g	200g	400g
Tare range	-3000g	-3000g	-6000g	-6000g	-12kg	-12kg	-30kg	-60kg	-120kg
Accuracy class	III								
Working temperature	-10÷40°C								
Weighing time	<3s								
Cable lenght	3m (only K version)								
Supply	~230V, 50Hz, 8VA / 12V 500mA								
Internal supply (option)	NIMH (AA size) – 4 pcs (only LCD version)								
Working time with accumulator	about 6 h with display backlighting about 16h without backlighting								
EC verification	✓								
Calibration standard of mass	3000g		6000g		12kg	12kg	30kg	60kg	120kg

** increased readability for non-EC verification applications*

Platforms	**A2**	**A3**	**A4**	**A4+**	**A5**
Platform dimensions	200x200 x70mm	250x260 x110mm	300x300 x70mm	305x315 x70mm	400x400 x120mm
Base with column dimensions	-	250x400mm	300x440mm	300x440mm	400x560mm
Scale with column height	-	400mm	415mm	415mm	730mm
Scale weight	2,8kg	3,5kg	7kg		12kg

BA/NY precise stainless steel platform scales (meter on column version) and BA/NKY (cable version):

Scale type	**BA6NY BA6NYK**	**BA12NY BA12NYK**	**BA30NY BA30NYK**	**BA60NY BA60NYK**	**BA120NY BA120NYK**
Platform	**A3**		**A5, A6**		
Maximal load (Max)	6000g	12kg	30kg	60kg	120kg
Readout unit (d)	1g *0,1g	2g *0,2g	5g *0,5g	10g *1g	20g *2g
Verification unit (e)	1g	2g	5g	10g	20g
Minimal load (Min)	20g	40g	100g	200g	400g
Tare range	-6000g	-12kg	-30kg	-60kg	-120kg
Accuracy class	III				
Working temperature	-10÷40°C				
Weighing time	<3s				
Cable lenght	3m (only K version)				
Supply	~230V, 50Hz, 8VA / 12V 500mA				
Internal supply (option)	NIMH (AA size) – 4 pcs (only LCD version)				
Working time with accumulator	about 6 h with display backlighting about 16h without backlighting				
EC verification	✓				
Calibration standard of mass	6000g	12kg	30kg	60kg	120kg

** increased readability for non-EC verification applications*

Platforms	**A3**	**A5**	**A6**
Platform dimensions	250x260 x110mm	400x400 x120mm	400x500 x120mm
Base with column dimensions	250x400mm	400x560mm	400x670mm
Scale with column height	400mm	590mm	690mm
Scale weight	7kg	12kg	

Attention: BA6NY and BA6NKY with 0,1g readout unit and BA60NY and BA60NKY with 1g readout unit are only available in LCD display version.

BA/N stainless steel platform scales and hermetic BA/H (meter on column version), BA/NK and BA/HK (cable versions):

Scale type	**BA1.5N BA1.5NK BA1.5H BA1.5HK**	**BA3N BA3NK BA3H BA3HK**	**BA6N BA6NK BA6H BA6HK**	**BA15N BA15NK BA15H BA15HK**
Platform	**A3**			
Maximal load (Max)	1500g	3000g	6000g	15kg
Readout unit (d)	0,5g 0,1g*	1g 0,1g*	2g 1g*	5g 1g*
Verification unit (e)	0,5g	1g	2g	5g
Minimal load (Min)	10g	20g	40g	20g
Tare range	-1500g	-3000g	-6000g	-15kg
Accuracy class	III			
Working temperature	-10÷40°C			
Weighing time	<3s			
Cable lenght	3m (only K version)			
Supply	~230V, 50Hz, 8VA / 12V 500mA			
Internal supply (option)	NIMH (AA size) – 4 pcs (only LCD version)			
Working time with accumulator	about 6 h with display backlighting about 16h without backlighting			
EC verification	✓	✓	✓	✓
Calibration standard of mass	1500g	3000g	6000g	15kg

** increased readability for non-EC verification applications*

Platforms	**A3**
Platform dimensions	250x260 x110mm
Base with column dimensions	250x400mm
Scale with column height	400mm
Scale weight	3,5kg

Max, d and e for double-range scales are situated in appendix *A*.

Hermetic and stainless steel platform – cont.

Scale type	**BA15N BA15NK BA15H BA15HK**	**BA30N BA30NK BA30H BA30HK**	**BA60N BA60NK BA60H BA60HK**	**BA150N BA150NK BA150H BA150HK**	**BA200N BA200N K**	**BA300N BA300NK BA300H BA300HK**
Platform	**A5**	**A5, A6, A8, A10**				
Maximal load (Max)	15kg	30kg	60kg	150kg	200kg	300kg
Readout unit (d)	100g	200g	400g	1kg	1kg	2kg
Verification unit (e)	5g *1g	10g *5g *1g	20g *10g *5g *2g	50g *10g	50g *10g	100g *10g
Minimal load (Min)	5g	10g	20g	50g	50g	100g
Tare range	III					
Working temperature	-10÷40°C					
Tare range	-15kg	-30kg	-60kg	-150kg	-200kg	-300kg
Weighing time	<3s					
Supply	~230V, 50Hz, 8VA					
Internal supply (option)	NIMH (AA size) – 4 pcs					
Working time with accumulator	about 6 h with display backlighting about 16h without backlighting					
EC verification	✓	✓	✓	✓	✓	✓
Calibration standard of mass	15kg	30kg	60kg	150kg	200kg	300kg

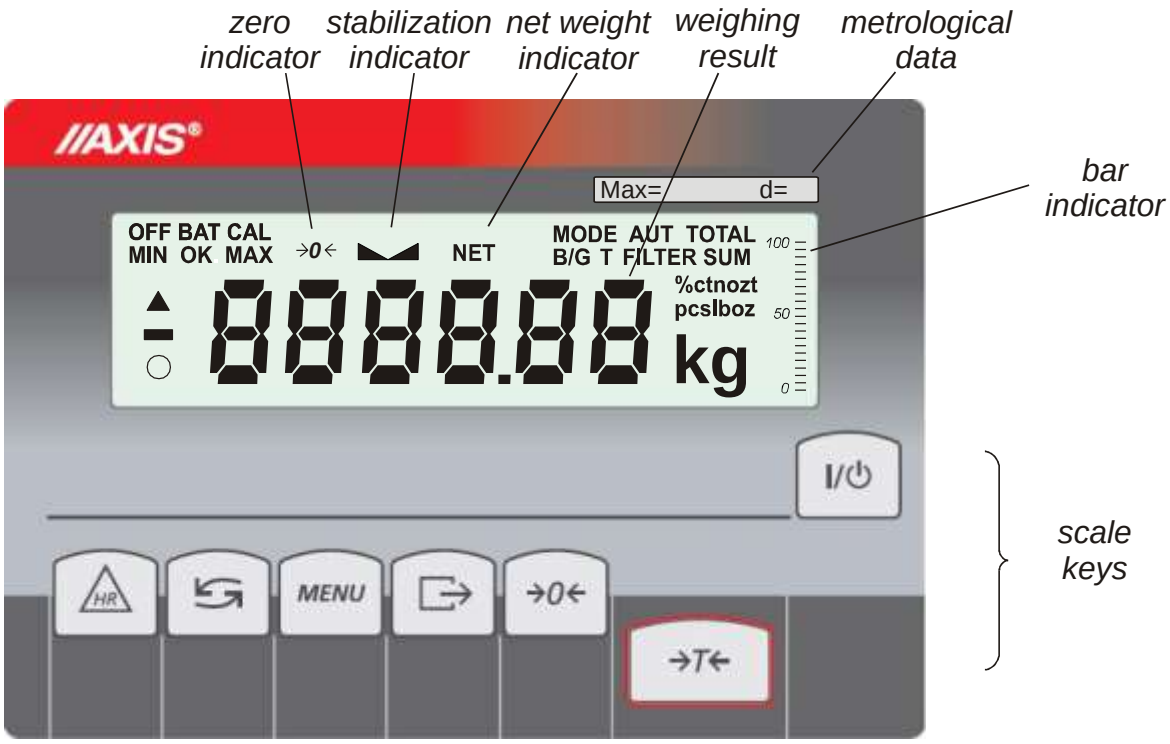
** increased readability for non-EC verification applications*

Platforms	**A5**	**A6**	**A8**	**A10**
Platform dimensions	400x400x120	400x500x100mm	600x500x135mm	800x800x150mm
Base with column dimensions	400x580mm	400x660mm	600x660mm	800x960mm
Scale with column height	590mm	690mm		
Scale weight	12kg	17kg	24kg	27kg

Max, d and e for double-range scales are situated in appendix *A*.

6. Scale with ME-01 meter keys and indicators

***LCD display version**:*



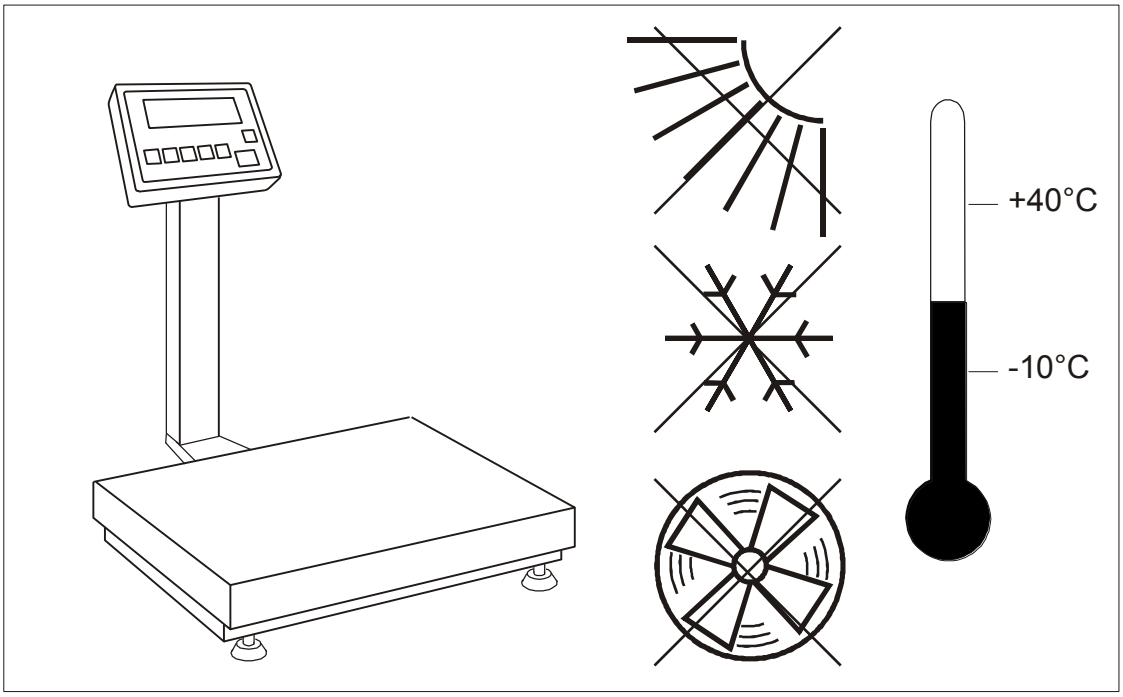
Keys:	I/⏻	-	switch-on / switch-off (standby),
"	*→T←*	-	tare, menu position confirmation, next digit (when inscribing),
"	*→0←*	-	zeroing, scrolling menu, increasing digit (when inscribing),
"	⮑	-	result printout, decimal point (when inscribing),
"	*MENU*	-	menu,
"	↻	-	function switch: special function/weighing,
"	*HR*	-	temporary high resolution indication,
Indicators:	*→0←*	-	zero indicator (unloaded scale),
"	▂▃	-	result stabilization indicator,
"	*NET*	-	net weight (after using →T← key),
"	*MODE*	-	special function menu turning on indicator
"	*B/G*	-	gross weight (after using TARE and ↻ key)
"	*AUT*	-	autotare function on,
"	*T*	-	tare memory function on,
"	*TOTAL, FILTER, SUM*	-	special functions indicators,
"	*%, ct, n, g/m2, lb,mg*	-	unit indicators,
"	*pcs*	-	pieces counting indicator,
"	*n*	-	measurements quantity indicator (total function),
"	*OFF*	-	scale turned off ⏻ (standby)
"	*MIN*	-	weighing result under threshold I (*thr* function),
"	*OK*	-	weighing result between threshold I and II,
"	*MAX*	-	weighing result above threshold II,
	BAT	-	battery discharge indicator,
	Δ, O	-	*ACtIV* function indicator,
bar	indicator	-	scale load indicator (0-100%)

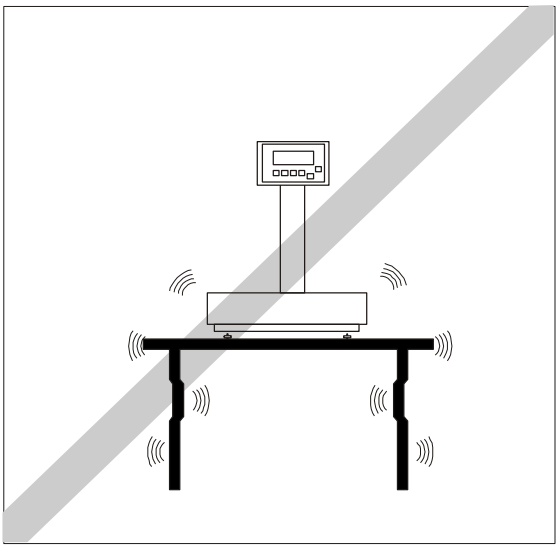
LED display version:

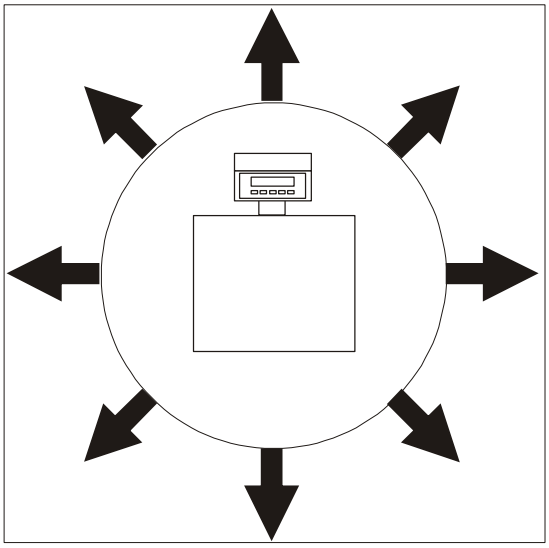
Keys:	I/⏻	-	switch-on / switch-off (standby),
"	*→T←*	-	tare, menu position confirmation, next digit (when inscribing),
"	*→0←*	-	zeroing, scrolling menu, increasing digit (when inscribing),
"	⮕	-	result printout, decimal point (when inscribing),
"	*MENU*	-	menu,
"	↻	-	function switch: special function/weighing,
"	*HR*	-	temporary high resolution indication,
Indicators:	*→0←*	-	zero indicator (unloaded scale),
"	▂▃	-	result stabilization indicator,
"	*NET*	-	net weight (after using →T← key),
"	*MODE*	-	special function menu turning on indicator
"	*B/G*	-	gross weight (after using TARE and ↻ key)
"	*AUT*	-	autotare function on,
"	*T*	-	tare memory function on,
"	*TOTAL, FILTER, SUM*	-	special functions indicators,
"	*%, ct, n, g/m2, lb,mg*	-	unit indicators,
"	*pcs*	-	pieces counting indicator,
"	*n*	-	measurements quantity indicator (total function),
"	*OFF*	-	scale turned off ⏻ (standby)
"	*MIN*	-	weighing result under threshold I (*thr* function),
"	*OK*	-	weighing result between threshold I and II,
"	*MAX*	-	weighing result above threshold II,
	BAT	-	battery discharge indicator,
	Δ, O	-	*ACtIV* function indicator,
bar	indicator	-	scale load indicator (0-100%)

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

7. Preparation of workplace

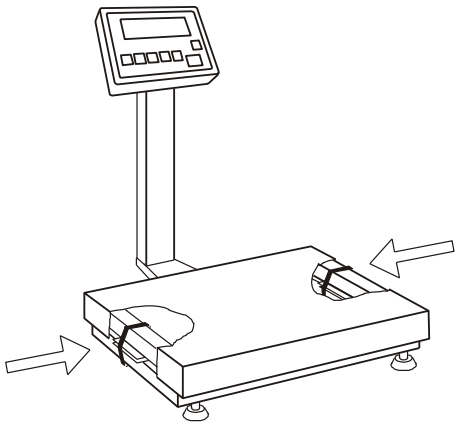






The workplace should be carefully chosen in order to keep to minimum influence of external factors that can disturb balance work. Proper temperature and work space is crucial. Balance should stand on stable foundation made of non-magnetic impact material.
Violent air movements, vibrations, dustiness, violent temperature changes or air density bigger than 90% is not allowed. Scale should work away from heat sources and devices that emit strong electromagnetic field or radiation.

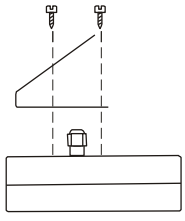
8. Preparation to work



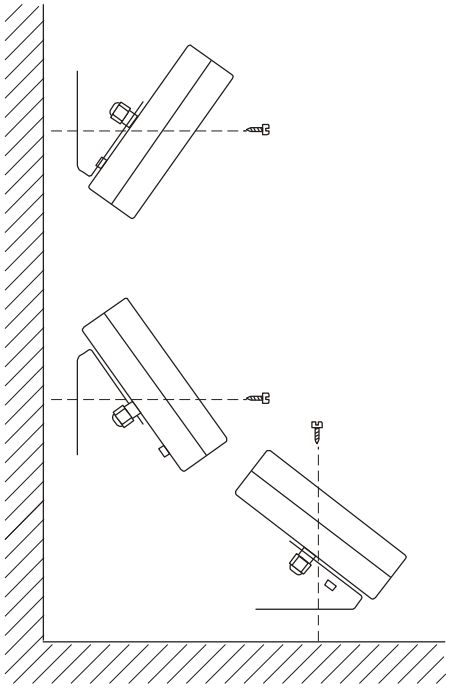
Correct Wrong

1. Take the scale out of the package removing protective foils.
2. Take a pan off and remove protective elements from below the pan.
3. Place the scale on a stable ground not affected by mechanical vibrations and airflows.
4. Level the scale with the rotating rear legs so that the air bubble in the water-level at the back of the scale is in the middle. Lock the legs with the nut.
5. Put on the pan.
6. In scales with cable connection install indicator grip to indicator and then the indicator to the wall or the table.

Version with aluminium meter:

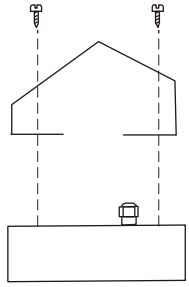


Mounting holder to meter

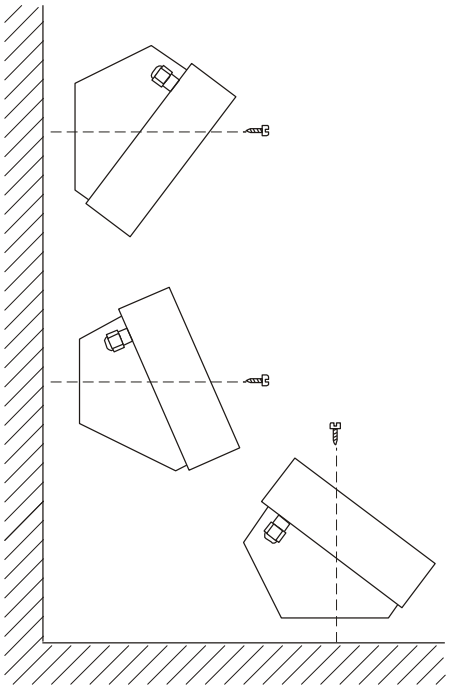


3 mounting variants to wall or console

Version with stainless steel meter:



Mounting holder to meter



3 mounting variants to wall or console

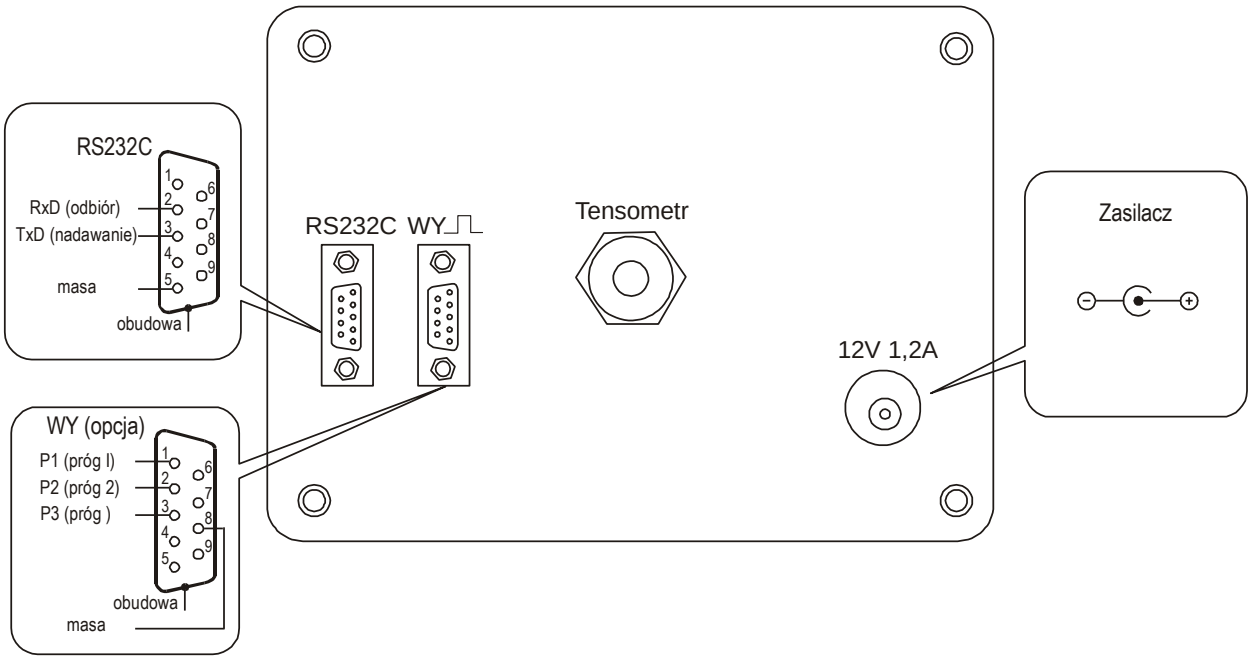
9. Balance checking and adjustment

It is advised to check scale indication accuracy before and after series of measurement using any load with known weight.
To check the scale with legal verification use a calibration weight with valid calibration certificate. In case permissible error is exceeded it is advised to contact the nearest service to calibrate the scale.

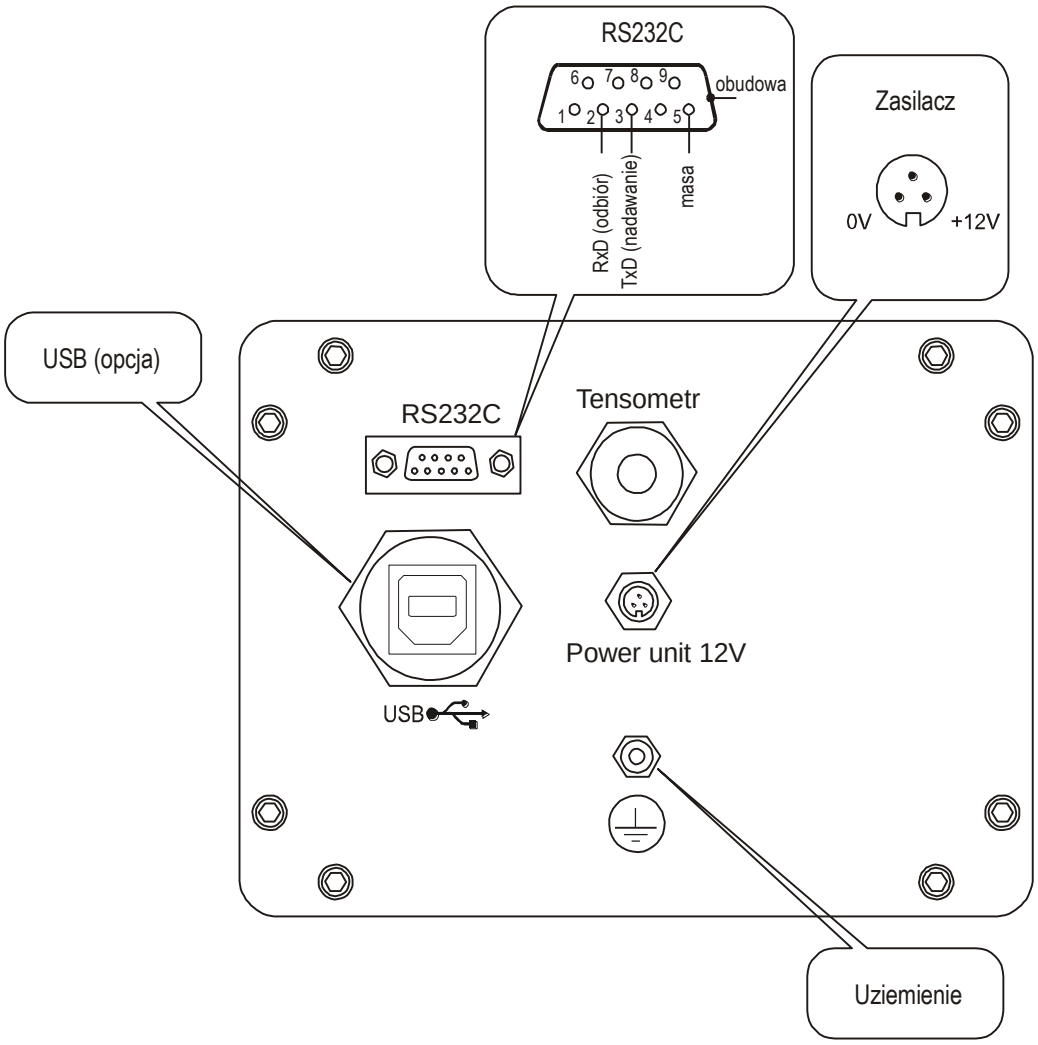
Adjusting (calibration) scale should be made if the scale precision is not sufficient. A standard of mass should be used with Max value taken from scale technical data table. In case of legalized scales with inaccessible calibration (secure seal) contact with service is recommended.

10. Description of the scale connectors

ME-01 meter in painted aluminum housing:



ME-01 meter in stainless steel housing:



Comments:

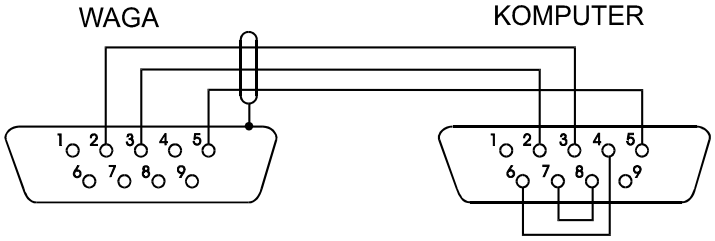
1. Separate grounding (stainless steel scales) must be connected with an additional wire.
2. The strain gauges are permanently connected.
3. Both the RS232C connector located on the housing (figure above) and the one at the end of the cable leading out through the bushing require the use of the WK-1 connecting cable.

11. Connection with a computer, printer or labeller

The scale can be equipped with one or two RS232C, USB, LAN or Wi-Fi serial ports intended for cooperation:

- with a computer - the scale transmits data after pressing a key on the scale or in response to an initiating signal from the computer **,**
- with a printer - data can be sent by pressing a key on the scale or automatically after applying the sample and stabilizing the scale reading, with the next transmission being possible after removing the sample.
- with a labeller - after pressing the key, the scale sends a set of instructions for the labeller, starting with the label template number, determined using the special *LabEL function* .

WK-1 connecting cable *(connects the scale to the computer/9-pin connector):*



The cable connecting the scale to the printer is included with the printer.

Setting the internal switches of the AXIS printer:

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

The set of data sent from the scale is determined using the special function *PrInt* , where the following data is available:
- header (weight type, Max, d, e, serial number),
- operator identification number,
- next printout (measurement) number,
- product identification number or barcode,
- number of pieces (for *PCS function*),
- unit weight of the detail (applies to the *PCS function*),
- net weight,
- tare (packaging weight),
- gross weight,
- total mass (applies to the *totAL function*).

The method of sending data and transmission parameters are set using the special *SErIAL function* .
If the scale is equipped with two serial ports, the *Print functions* and *SErIAL* are set independently for both connectors.
If the scale works with a computer, the computer must have a program that allows processing data from the scale. Such programs are available from AXIS.
More information can be found at www.axis.pl.

11.1 Detailed description of the LonG data transmission protocol

Standard parameters transmission : 8 bits, 1 stop bit, no parity, baud rate 9600bps,
After pressing the key , the scale transmits a set of data with a text description (e.g. NET, TARE, GROSS) selected using the *Print function* : If the function *Print* is not activated, only the weight indication is read (see below).

Data exchange method:

- Reading a stable weight reading:
  Computer →: **SI** CR LF (53h 49h 0Dh 0Ah) – initial signal,
  Scale →Computer: scale sends 16 bytes of data as described:

Byte	1	- "-" sign or space
Byte	2	- space
Byte	3 ÷4	- digit or space
Byte	5 ÷9	- digit, comma or space
Byte	10	- digit
Byte	11	- space
Byte	12	- k, l, c, p, o, m, g, d or space
Byte	13	- g, b, t, c, z, g, r, w or %
Byte	14	- t or space
Byte	15	- CR
Byte	16	- LF

- Reading current indications :
  Computer →Weight: **Sx1** CR LF–initiation signal
  Scale →Computer: the scale sends 16 bytes of data (as with the SI command).

- Reading the stability indicator and current reading:
  Computer →Weight: **Sx3** CR LF–initiation signal
  Scale →Computer: the scale sends the character S (stable) or U (unstable) + 16 bytes of data (as with the SI command).

Note: Entering a scale network number (*SErIAL / nr*) other than zero changes the scale operation method: communication between the computer and the scale is possible after logging in the scale with the command: 02h nr_waga . Logging out occurs after the command 03h. Using the connector testing program available on the www.axis.pl website / computer programs, e.g. for scale no. 1 you should enter: *$0201* , and then *SI* , logout: *$03.*

- Query about the presence of the scale in the system (testing the connection between the scale and the computer): Scale
  Computer →: **SJ** CR LF (53h 4Ah 0Dh 0Ah),
  Scale →Computer: **MJ** CR LF (4Dh 4Ah 0Dh 0Ah),
- Display of the text on the scale display (text message from the computer):
  Computer →Scale: **SN** n n X X X X X X CR LF , nn -display time in seconds; XXXXXX- 6 characters to display
  Weight →Computer: **MN** CR LF (4Dh 4Eh 0Dh 0Ah),
- Taring the scale from the computer (equivalent to using the →T key ←on the scale):
  Computer →Scale: **ST** CR LF (53h 54h 0Dh 0Ah), Computer
  Scale →: **MT** CR LF (4Dh 54h 0Dh 0Ah),
- Zeroing the scale (corresponds to using the →0 key ←on the scale): Scale
  Computer →: **SZ** CR LF (53h 5Ah 0Dh 0Ah),
  Scale →Computer: **MZ** CR LF (4Dh 5Ah 0Dh 0Ah),
- Turning the scale on/off (corresponds to using the I/ key ⏻on the scale): Scale
  Computer →: **SS** CR LF (53h 53h 0Dh 0Ah),
  Scale →Computer: **MS** CR LF (4Dh 53h 0Dh 0Ah),
- MENU display (corresponds to using the *MENU key* on the scale): Scale
  Computer →: **SF** CR LF (53h 46h 0Dh 0Ah),
  Scale →Computer: **MF** CR LF (4Dh 46h 0Dh 0Ah),
- Threshold 1 value setting (option):
  Computer →Weight: **SL** *D1...DN* CR LF (53h 4Ch *D1...DN* 0Dh 0Ah)
  where: *D1...DN* – threshold value, maximum 8 characters, Computer
  weight →: **ML** CR LF (4Dh 4Ch 0Dh 0Ah),
  Example:
  To set 1000g in the B1.5 scale (d=0.5g) enter:
  SL 1 0 0 0 . 0 CR LF (53h 4Ch 31h 30h 30h 30h 2Eh 30h 0Dh 0Ah).
  To set 100kg in the B150 scale (d=50g) enter:
  SL 1 0 0 . 0 0 CR LF (53h 4Ch 31h 30h 30h 2Eh 30h 30h 0Dh 0Ah),
- Threshold 2 value setting (option):
  Computer →Weight: **SH** *D1...DN* CR LF (53h 48h *D1...DN* 0Dh 0Ah),
  where: *D1...DN* – threshold value, maximum 8 characters, Computer
  weight →: **MH** CR LF (4Dh 48h 0Dh 0Ah),
- Setting the threshold value 3 - zero (option):
  Computer →Weight: **SM** *D1...DN* CR LF (53h 4Dh *D1...DN* 0Dh 0Ah),
  where: *D1...DN* – threshold value, maximum 8 characters, Computer
  weight →: **MM** CR LF (4Dh 4Dh 0Dh 0Ah).

11.2 Detailed description of the EPL data transmission protocol

Parameters transmission : 8 bits, 1 stop bit, no parity, baud rate 9600bps,

- After using the key ⮆ on the scale:

  Scale →Labeler: a set of instructions in EPL-2 language to initiate label printing

US	-	control manual
FR"0001"	-	instructions specifying the label number
?	-	instruction starting a list of variable strings
mm:gg	-	5 characters: minutes :hours
yyyy.mm.dd	-	10 characters : year.month.day
mass	-	10 characters: weight indication + mass unit
P1	-	control manual

Comments:

1. In addition to variable text, you can also place fixed text, e.g. company name, product name, etc.
2. By default, it is possible to print one label template (number 0001). Using more templates (other label numbers) is possible thanks to the special *LAbEL* function .
3. In order to print a label, the labeling machine must have a label form entered (a label template prepared on a computer and entered by the computer into the labeling machine's memory). The form of the label is designed using the ZEBRA DESIGNER program supplied with the labeller.
4. The weight transmission parameters and protocol must correspond to the labeling machine type.

12. General rules of using scale

1. Before each measurement make sure that zero indicator is displayed. If zero indicator does not display or "----" communicate appears, press →0← key and wait until zero indication and zero indicator appears.
2. The scale is equipped with a tare equal to its range. To tare the scale press →T← key (left or right). Storing a tare value does not extend measuring range, but only subtracts it from a load placed on a pan. To make weight control easier and to avoid range overdrawing, the scale (with LCD) is equipped with a load indicator (graduated in percentages).
3. Weighing result should be read when the indicator "◣ ◢" lights, which signalises result stabilization.
4. When the scale is not used but it is necessary to be ready to work immediately, it can be switched off by pressing I/⏻ key. The scale reading system is then switched off to "standby" mode (signalled by the indicator "OFF" in version with the LCD display). To switch the scale on press I/⏻ key. The scale is immediately ready to operate maximum accuracy (after self tests).
5. Weighed sample should be placed in the centre of the pan.

Place the scale on a platform to avoid dropping weighed objects on the pan.

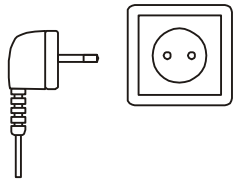
Do not overload the scale more than 20% of maximum load (Max).

6. Protect the scale against dust, aggressive dusts and liquids. To clean the scale wash it with water with soap and dry it afterwards.
7. A scale equipped with accumulators (option) automatically charges during normal work with feeder and controls accumulator state. Charging control is executed by *bAtterY* special function. The function enables to readout charging state and also to turn off charging in case of using normal batteries (instead of accumulators). Meter signalizes an accumulators discharge on LCD display and after around 1h the scale switches itself off to avoid discharging the accumulator below threshold voltage.

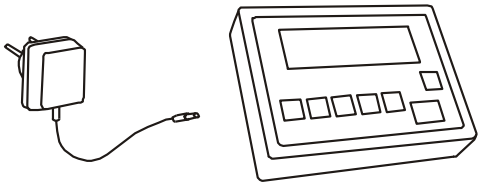
Do not allow to fully discharge the accumulator as this could damage it!

After discharge signalising appears an accumulator should be charged as quickly as possible by connecting external feeder. Charging is more effective when scale is turned off with I/⏻ key, then charging time is about 10 hours.

13. Start-up

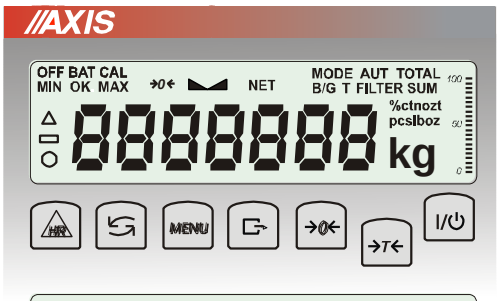


In balances with direct supply, when the weighing pan is unloaded, connect the ~ 230V power cord plug to the mains socket.

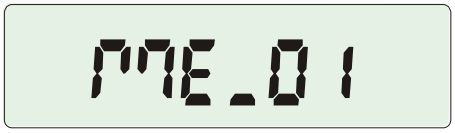


In scales with an external power supply, connect the power supply to the mains socket, and then, when the weighing pan is not loaded, insert the power supply plug into the balance 12V socket.

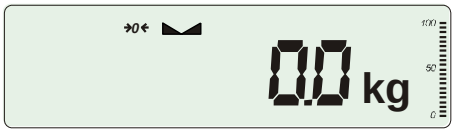
Following sequence will show up:



Display test.



Meter type displaying (indicates successful completion of all tests).



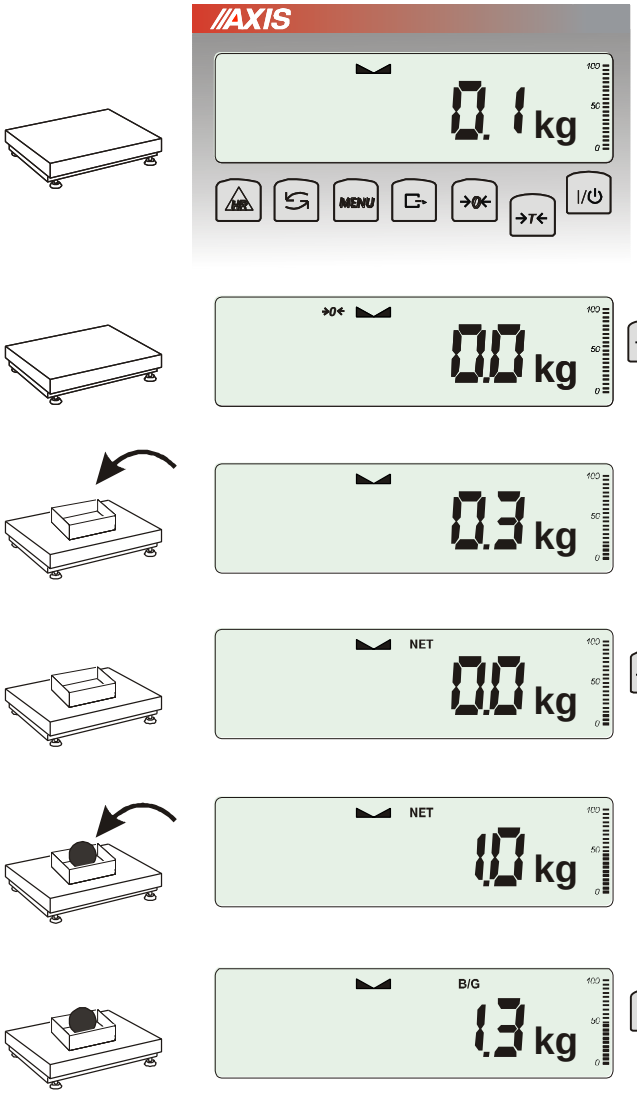
The scale is now ready to work.

Attention:

In scales powered from accumulators (option), after switching the scale on, accumulators are simultaneously charged. After the scale is turned off with the I / key, charging is performed with greater intensity (recommended charging time is 10 hours).

The UnLOAd message means that the balance is loaded or that the transport protection under the weighing platform has not been removed.

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.

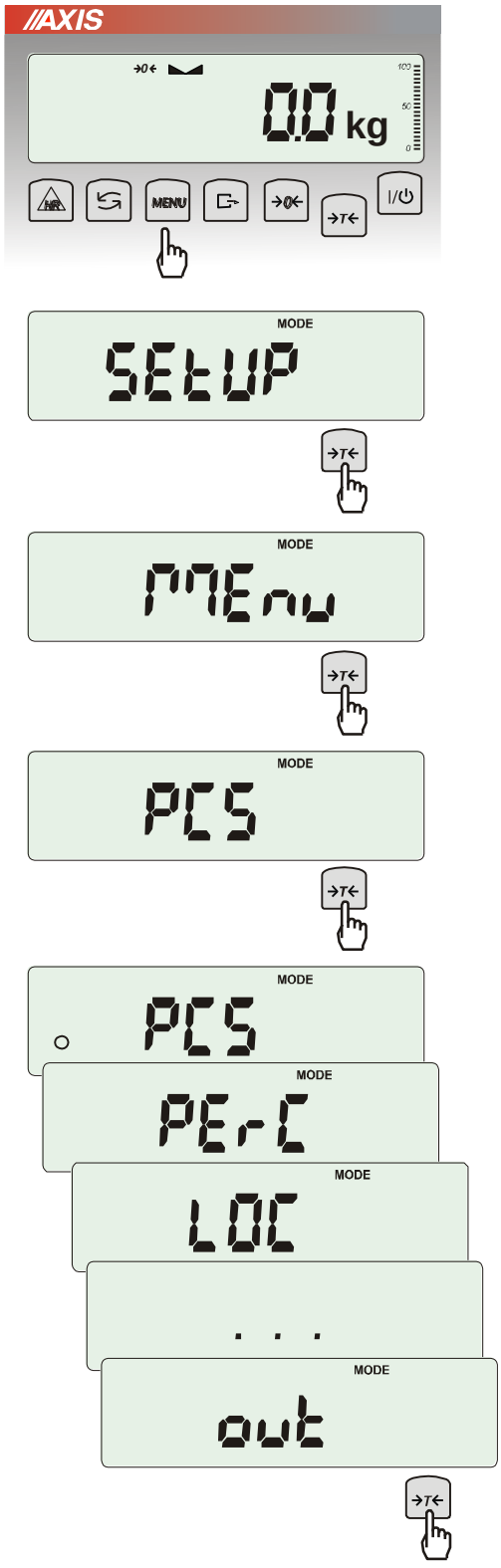
After putting container (package) tare the scale using →T← key. NET indicator will show up.

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.

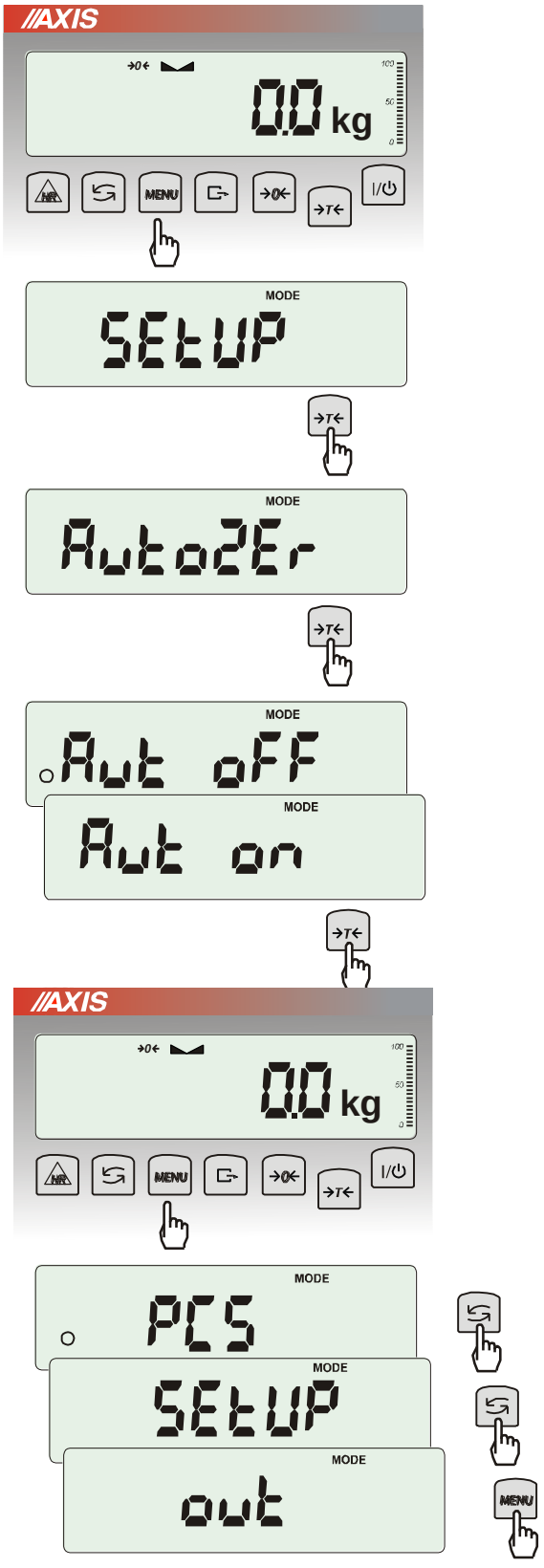
One of the configuration options is *Menu* that is used to create personalized menu.

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,

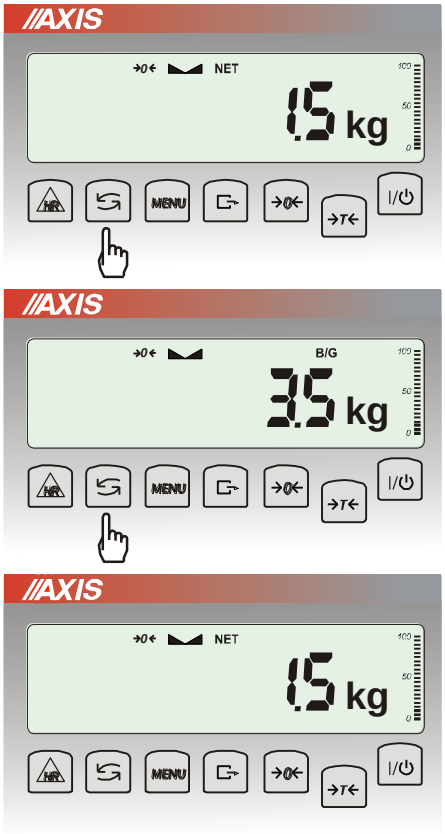
out – out to menu.

Accelerated working with menu:

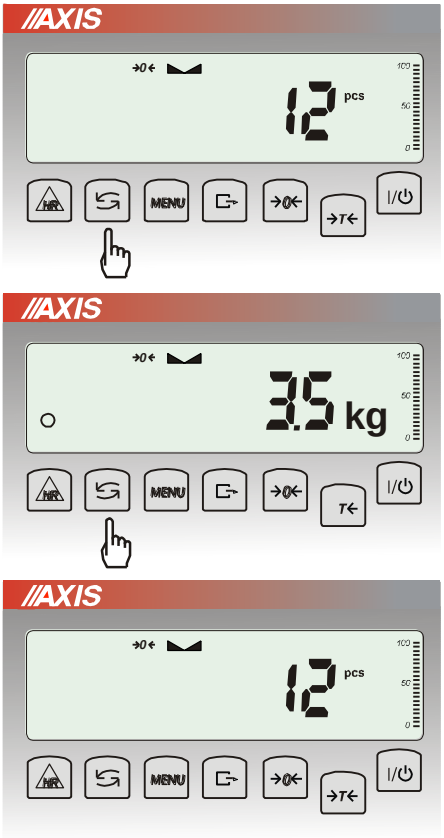
Menu first position is displayed for about 7s. During this time user can view next positions by using ↻ key (or →*0*←).

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

key working method:

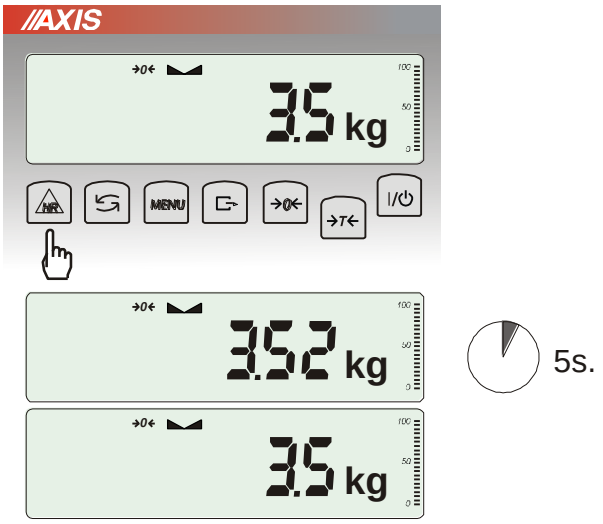


During standard weighing key is used to switch between net and gross indication.



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

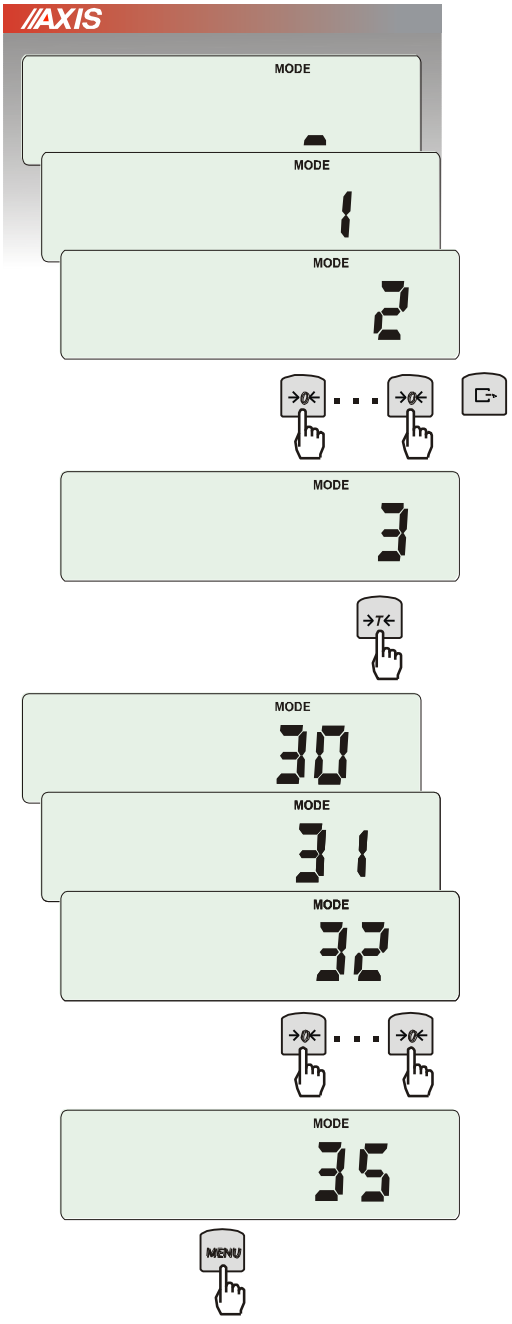
Sign „o" on the left side signalizes that special function is turned on and user can go back to function mode by pressing key.



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:

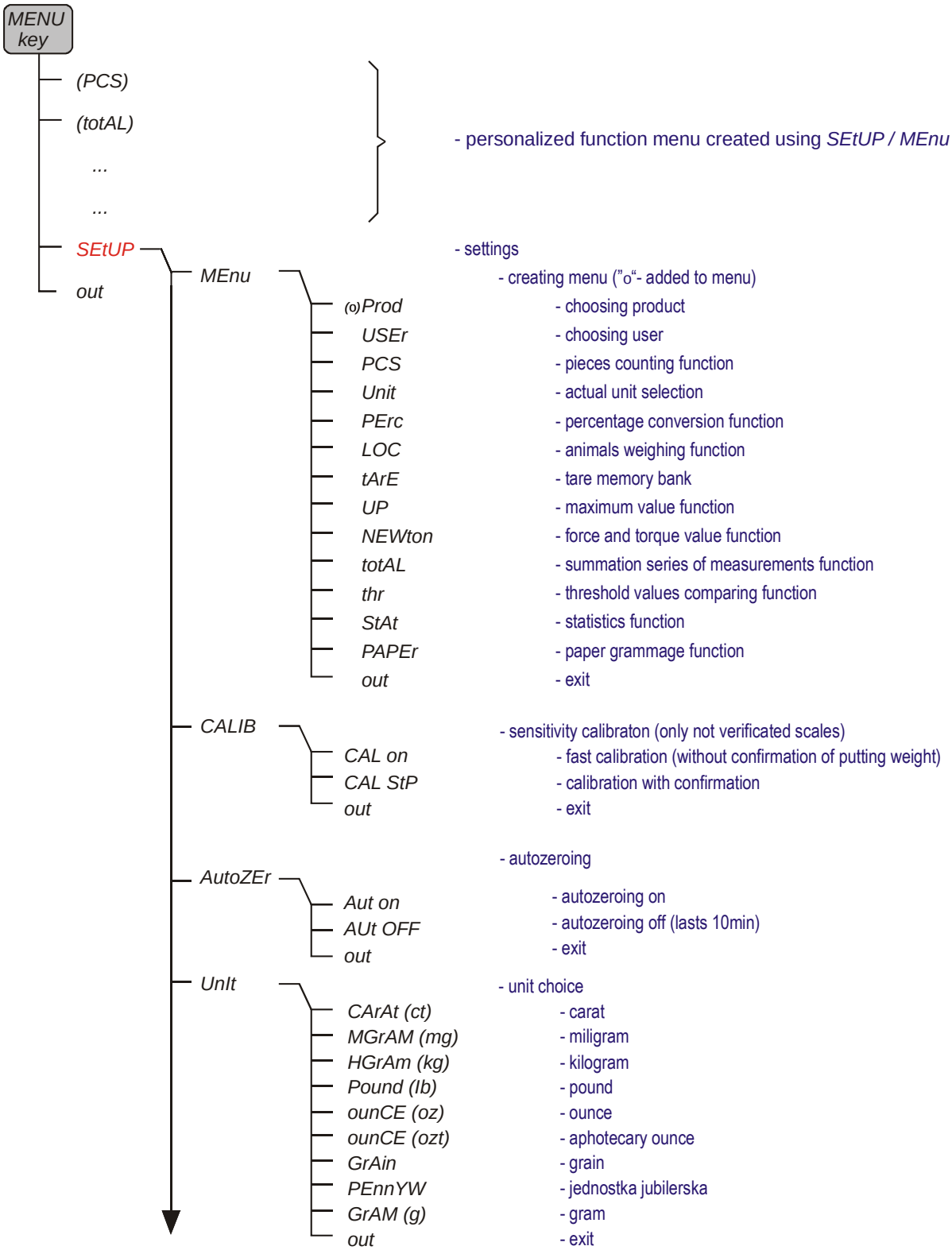
→0← - increasing digit value,

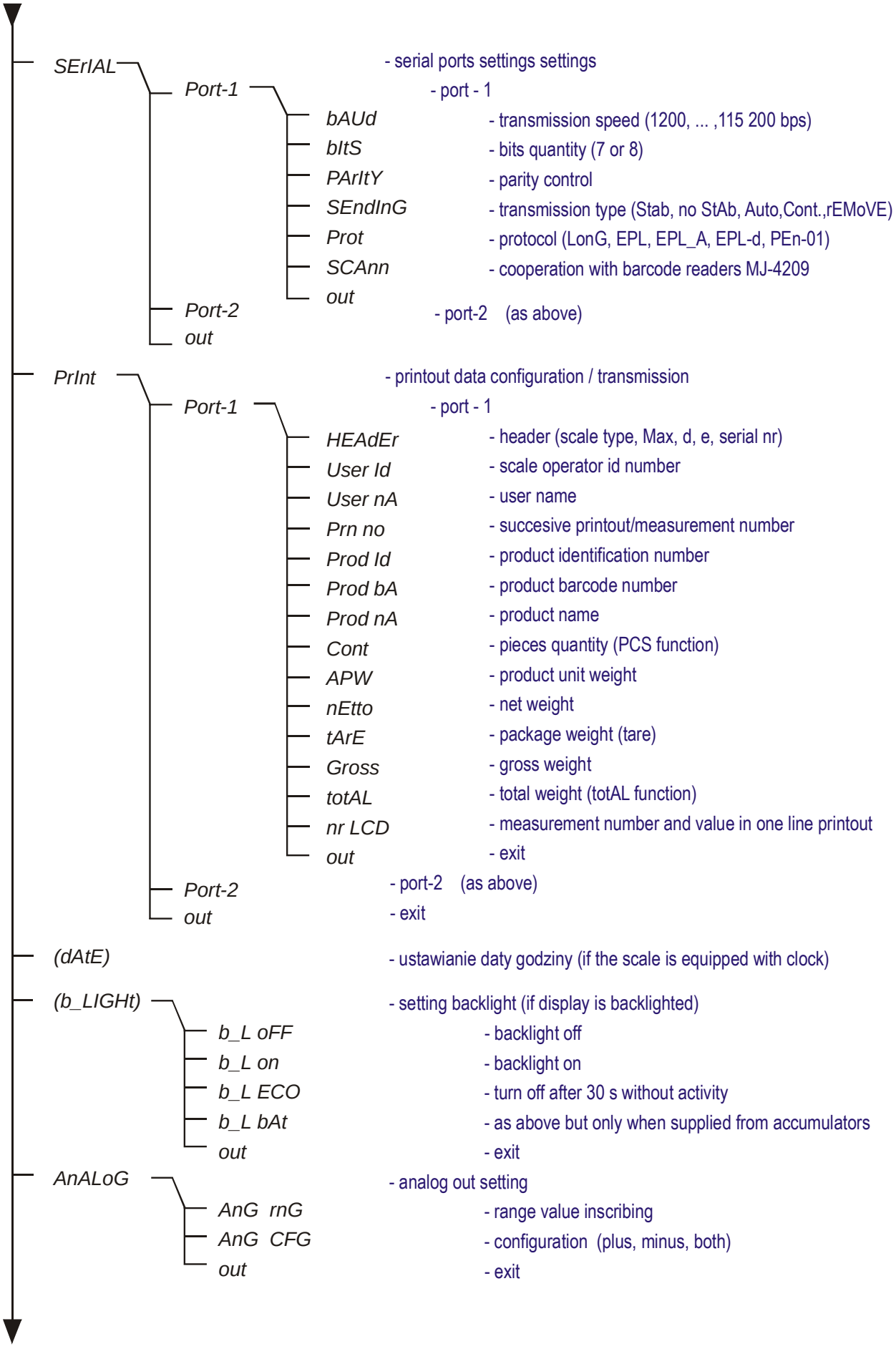
- decimal point,

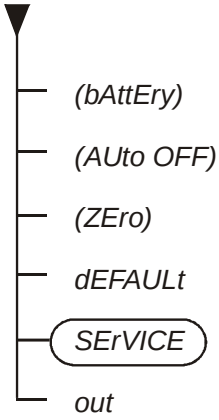
→*T*← - next digit position,

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)

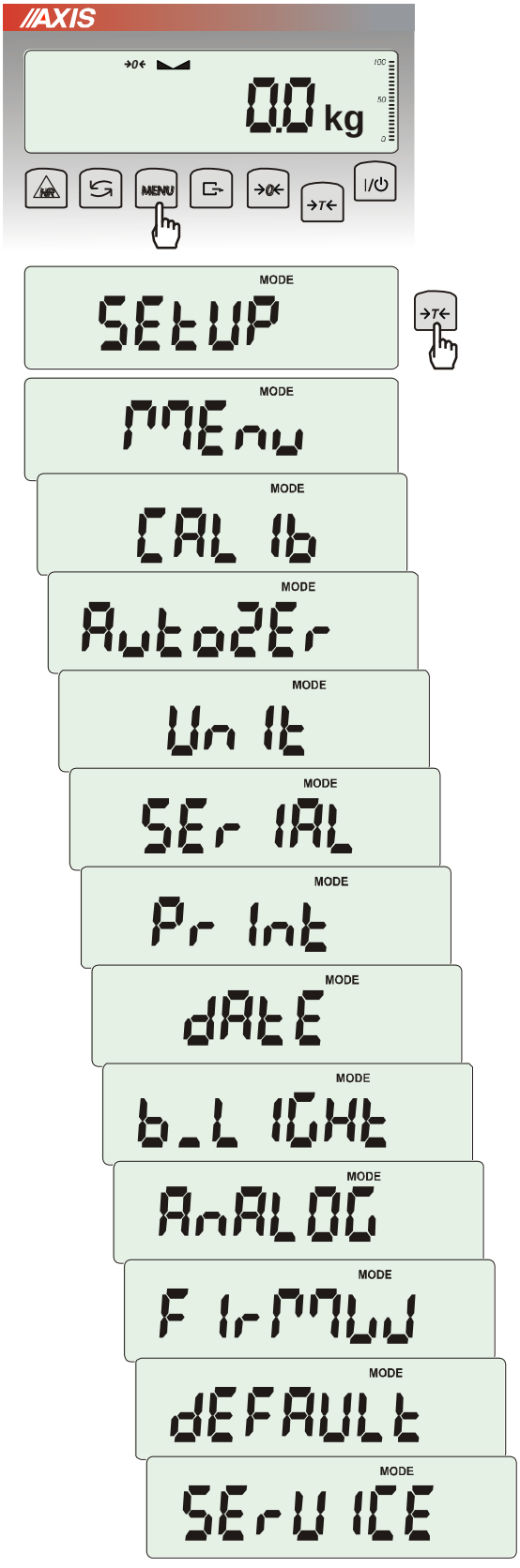
(ZEro) - scale start zero inscribing (factory zero)

dEFAULt - restore default settings for all options

SErVICE - options only for service

out - exit

17. Scale setup (SEtUP)

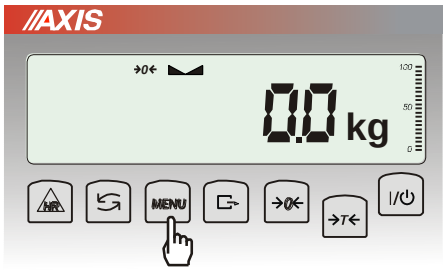


SEtUP contains all options used for setting scale work mode:

- *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)

.

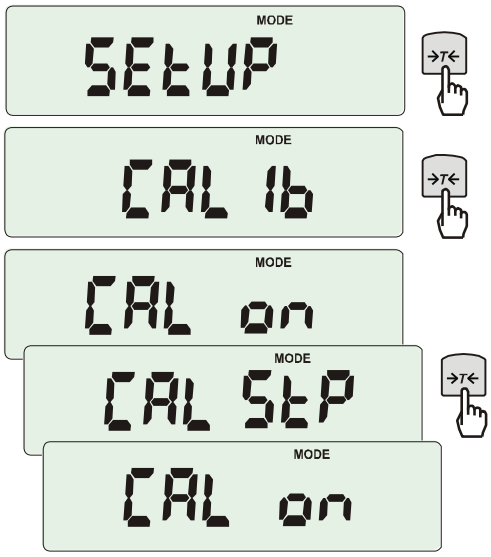
17.1 Scale calibration (CALIb)



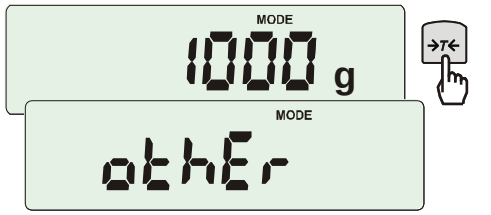
Press *MENU* key.

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

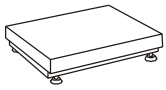
The following options will be displayed:
-*CAL on* – calibration with external recommended standard of mass (see technical data).
-*CAL StP* – calibration with external weight, confirmation of succesive steps - *MENU* key,
out – leave without changes

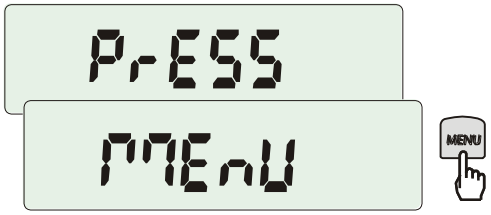


Press →*T*← key when *CAL StP* option appears (calibration in two steps).



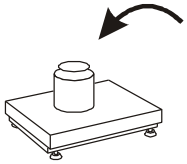
Press →*T*← key when weight value used for calibration is indicating or use *othEr* option and inscribe proper value (keys →*0*←, ⊏→ , →*T*←)

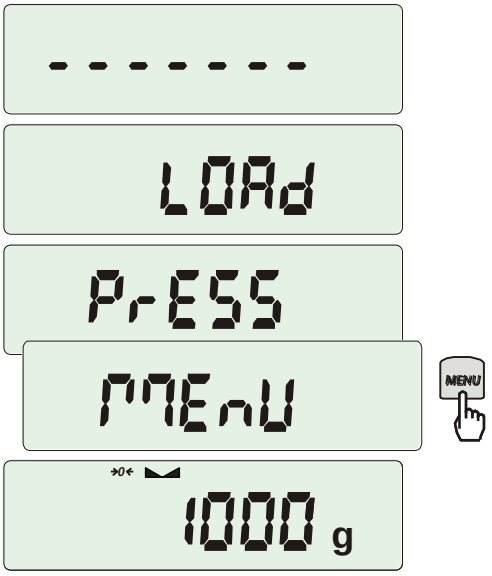




Press *MENU* and wait for writing zero to the scale.

1000g

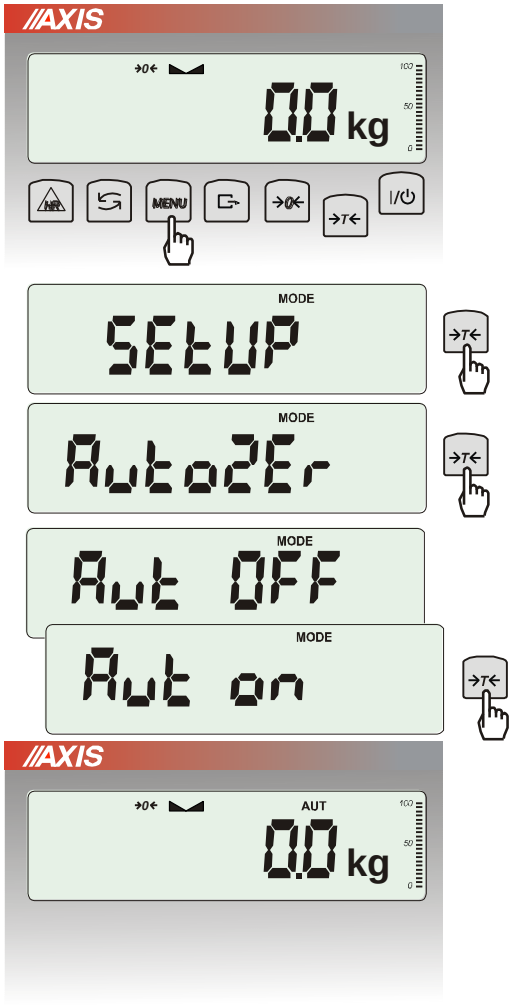




When *LOAD* message appears put standard of mass on the pan. Press *MENU* key (*CAL on* doesn't need pressing *MENU* key).

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

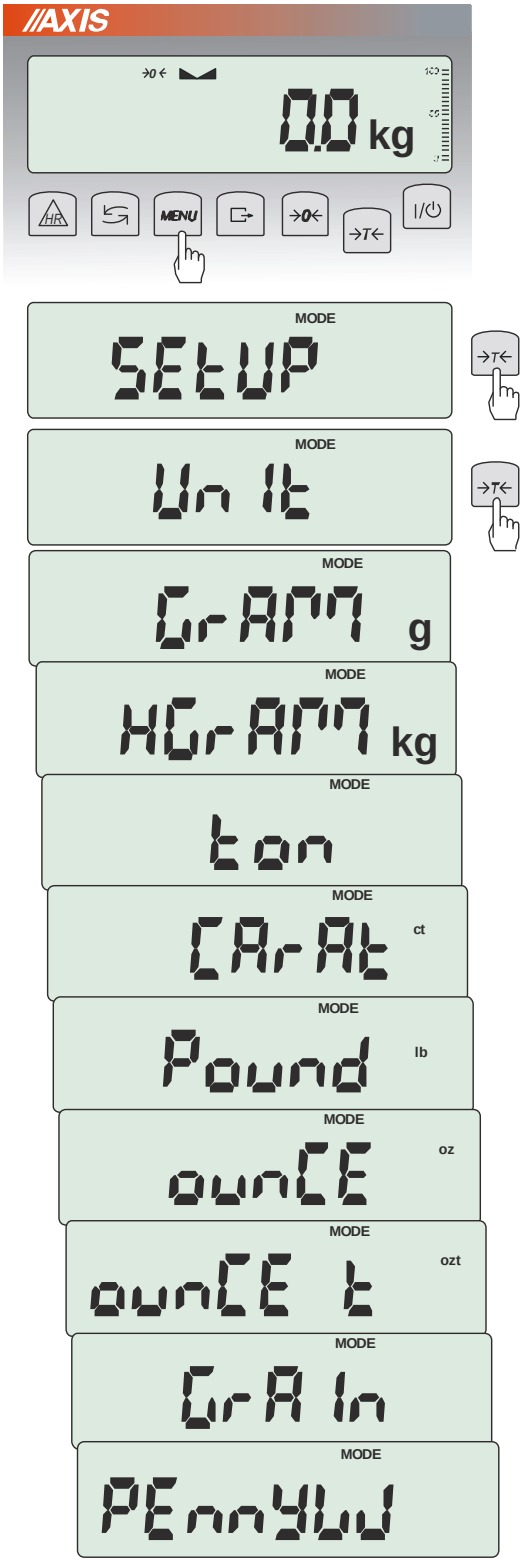
17.2 Autozeroing function (AutoZEr)



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 Selecting the starting mass unit (UnIt)



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

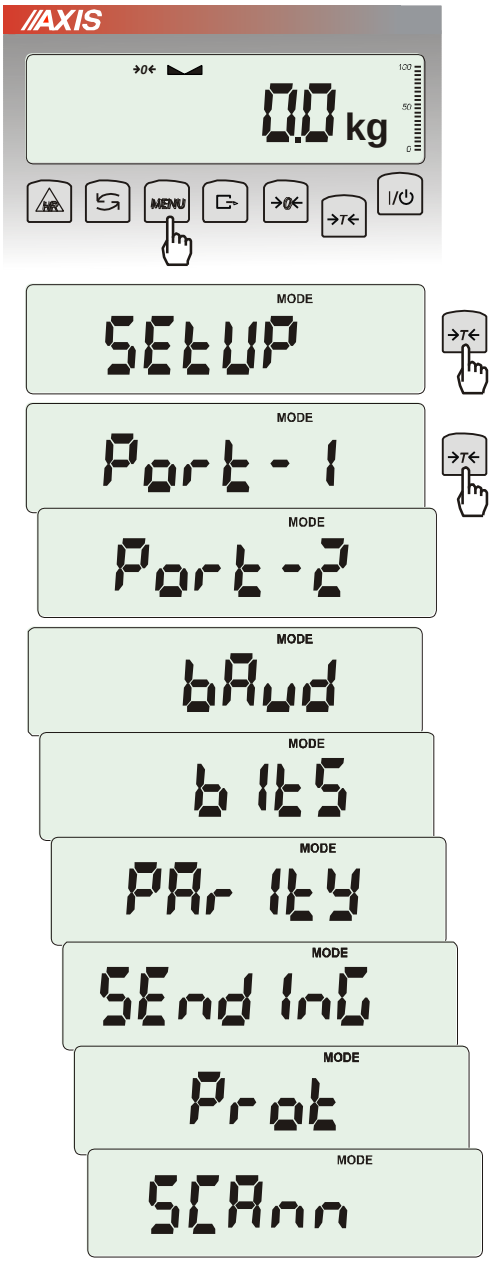
- *Gram* (1g) – gram
- *KgrAM* (1kg=1000g) – kilograms
- *tons (1t=1000kg)* – ton
- *CarAt* (1 ct = 0.2 g) – carat
- *Pound* (1 lb = 453.592374g) – lb English
- *OunCE* (1oz= 28.349523g) – ounce
- *OunCEt* (1ozt= 31.1034763g) – pharmacy ounce
- *GrAIn* (1gr= 0.06479891g) – gr
- *PennYW* (1dwt =1.55517384g)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

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

Attention:

In scales with an LED display, the mass unit symbols are not displayed, but kg , lb and g are indicated by the diode.

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):

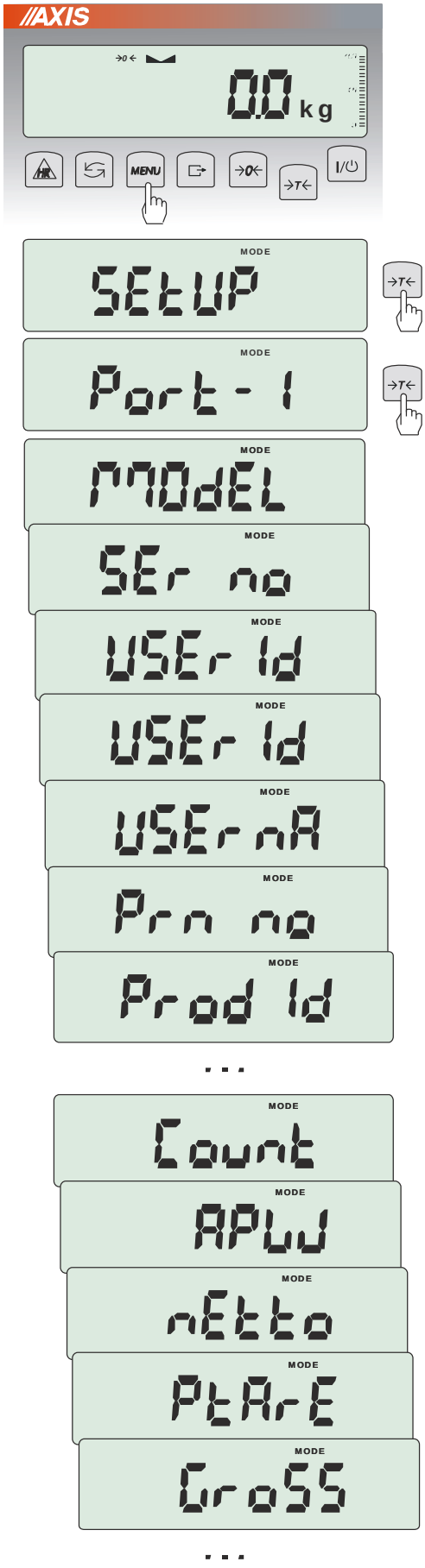
- transfer protocol *(Prot):*
  LonG – cooperation with printer or computer,
  EPL – cooperation with label printer in normal mode (activates *LAbEL* function),
  EPL_A – cooperation with label printer in automatic mode (activates *LAbEL* function),
  EPL_d – cooperation with special label printers,
  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
TOTAL             : 0.00 kg
```

17.6 Changing resolution (rESOLUt)

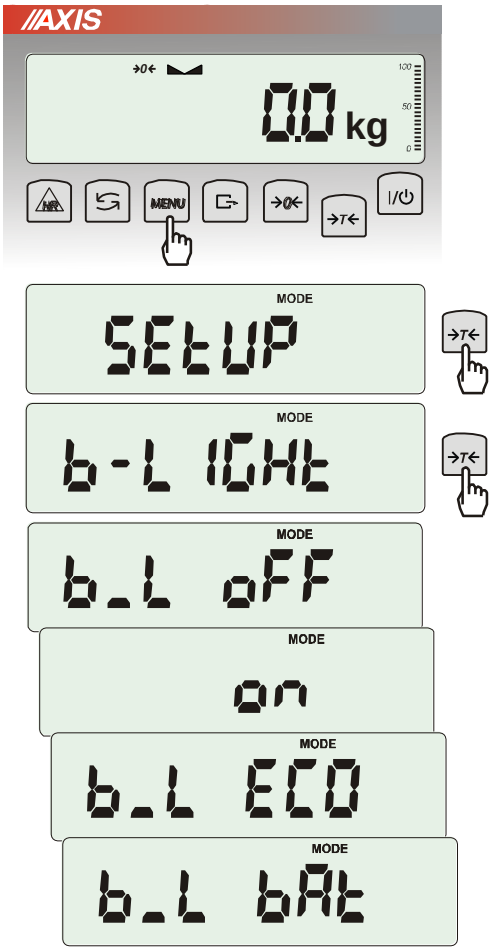
rESOLUt function allows you to select the resolution (reading scale division):

- *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.

17.7 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.

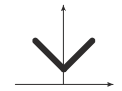
Switching backlight off causes decrease of energy consumption by the scale, what is important during powering from accumulators.

17.8 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:

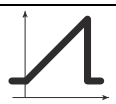
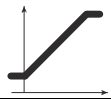
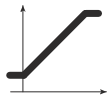
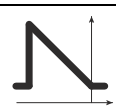
- *AnG rnG* – inscribing Max value
- *AnG CFG* – working mode configuration (*PLUS* – workmode for only positive values, *MinuS* – only for negative values, *both* – for both)

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*)*

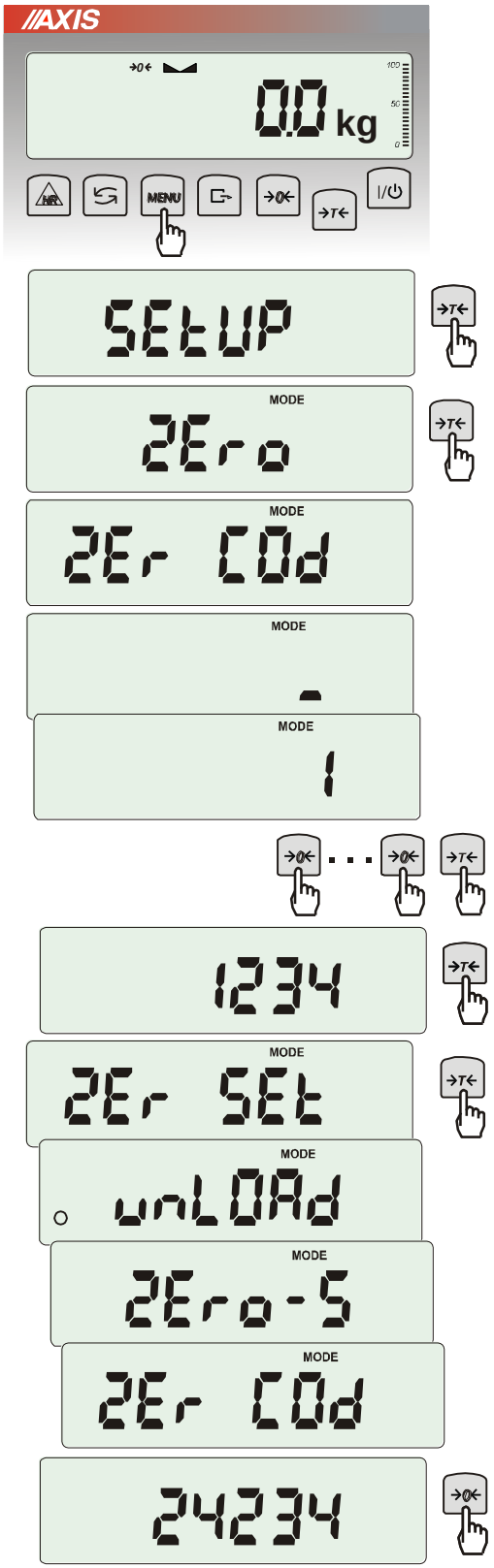
Table of current output overflows for the *AnG* option *h*:

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.

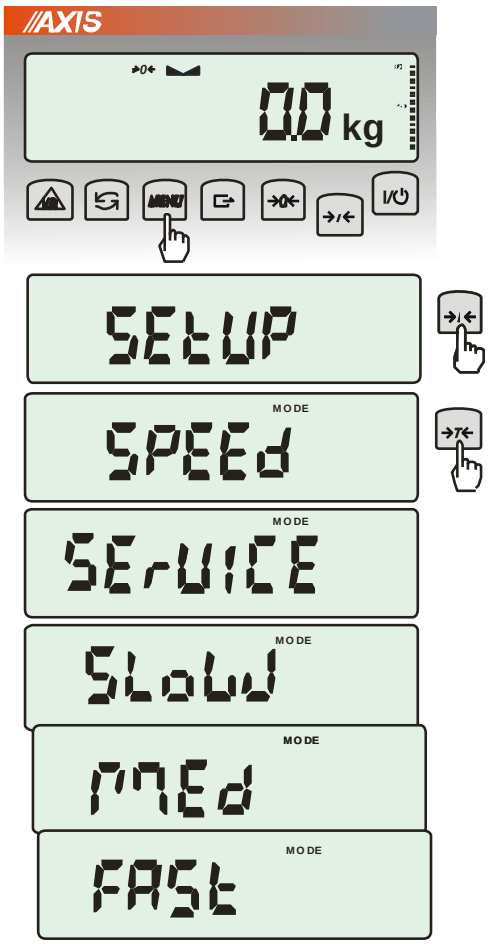
To enter code (in new scale: 1234) use keys:
→*0*← - increasing digit,
→*T*← - next digit,
MENU – end of inscribing.
The following options appear successively on display:
ZEr Cod – enter new secure code value,
ZEr SEt – enter new zero value

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:

- product database (*Prod*)
- User Database (*USEr*)
- piece counting (*PCS*)
- selection of the current mass unit (*Unit*)
- percentage conversion (*PErC*)
- label number selection (*LAbEL)* - option
- weighing animals (*LOC*)
- maximum value indication (*UP*)
- force measurement *(nEWton)*
- summing a series of weighings *(totAL)*
- comparisons with given threshold values *(thr)*
- setting the current date and time *(dAtE)* - option
- statistical calculations *(StAt)*
- determination of paper weight *(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:
  19. setting current date and time function (*dAtE*)
  20. 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:

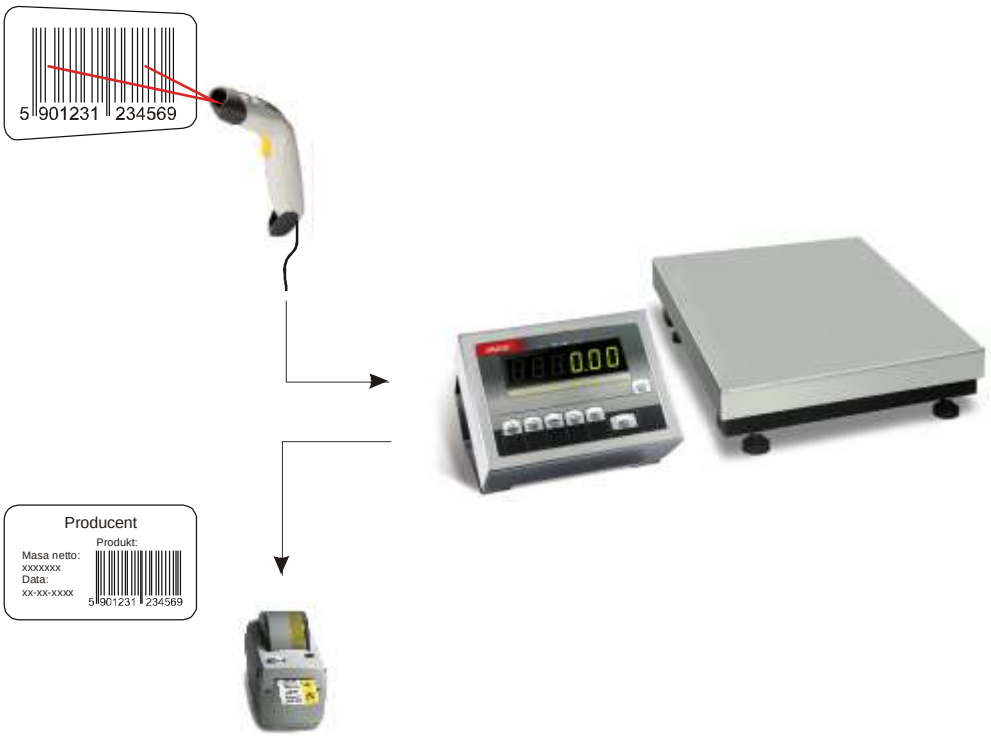
21. *M nr* – memory number where data is saved,
22. *Prod Id* - product identification number,
23. *Prod bA* – product barcode,
24. *Prod nA* – product name,
25. *USEr Id* – user identification number,
26. *USEr nA* – user name,
27. *APW* - unitary weight (used when pieces counting),

- *PtArE* - inscribing permament tare to the product,
- *thr Lo* - threshold value (low),

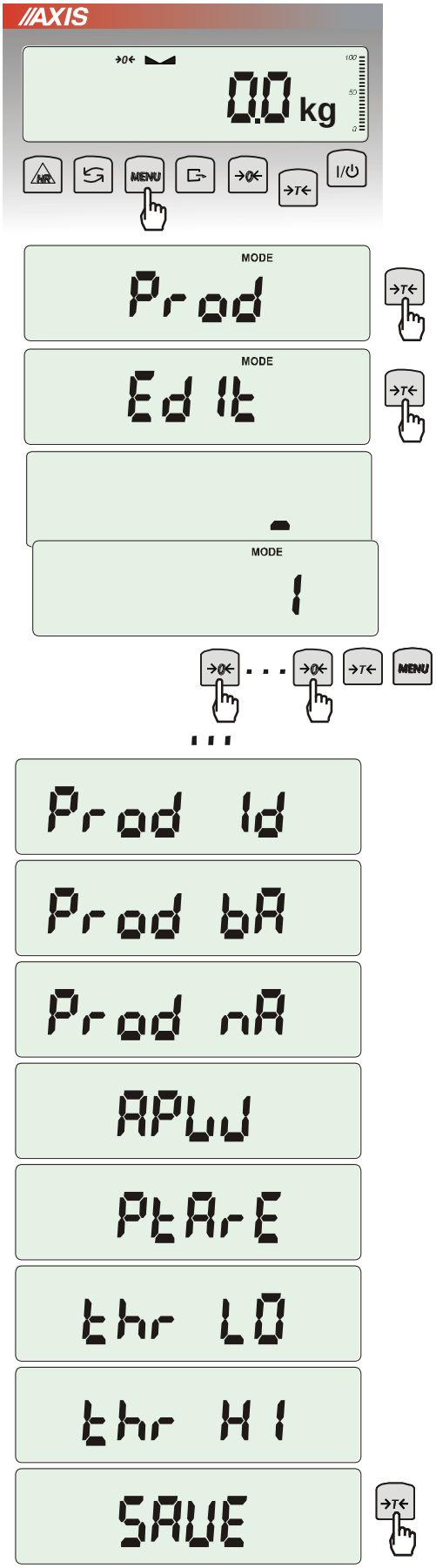
28. *thr Hi* - threshold value (upper)
29. *LAbEL* – corresponding label number.

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.



Entering data into the database



Prod and *USEr* functions allow you to enter product and user data values, as well as delete them.

For the product database, this is done using the options:

30. *Prod Id* – search for a product in the database by entering (or scanning) its ID number or barcode,
31. *ProdCLr* (appears if a product has been previously selected) – disable the current product,
32. *EdIt* – editing a product from the database,
33. *Add* – adding a product to the database,
34. *dEL OnE* – deleting a single database item
35. *dEL ALL* – deleting all database elements
36. *dateAb* – changing the database operation mode (default is *Stb*):

- *Stb* – searching for products in the database and working with products from outside the database; if the product is found, the message *Found* and recalling all its data; if the product is not in the database, there is no message and the scale saves the ID/bar number temporarily in memory and allows it to be sent to the port (to the printer/computer) together with the weight currently on the pan.
- *LIMIt* – searching for products saved in the database; if the product is found, the message *Found* and recalling all of its data ; if the product is not in the database, the message *not Found* .

- *Prn_P* – sending the entire product database to the port.

To edit data, select the *EdIt option* , enter the ID number or barcode of the product using the keys:

→0 ←- increase the digit,

→T ←- go to the next digit,

MENU - ending.

You can also use a scanner for this (connected to the RS232C input), which significantly speeds up the work and helps avoid errors.

Each product database item has the following data assigned:

- *M Id* - serial number in product memory
- *Prod Id* – product identification number
- *Prod bA* - product barcode
- *Prod on* – product name (entered from PC or scanner)
- *APW* – unit weight of the product (optional)
- *PtArE* – product packaging weight (optional)
- *thr LO* – lower threshold (MIN value)
- *thr HI* – upper threshold (MAX value)

Saving a database item requires using the *SAVE option* .

The User database is managed by a similar *USEr function* and consists of the following elements:

- *USEr Id* – user identification number,
- *USErCLr* (appears if a user was previously selected) – disables the current user,
- *User on* – user name (entered from PC or scanner),
- *Prn_U* – sending the entire user database to the port.

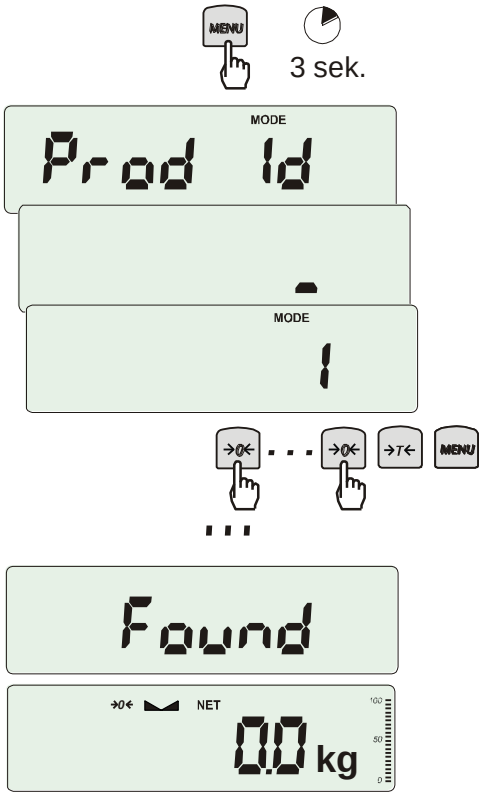
Saving a database item similarly requires using the *SAVE option* .

Recalling data from the database

The fastest way to retrieve product data is to read its barcode (*Prod bA)*) using a scanner. This can be done at any time during weighing.
After reading the correct barcode, the scale displays the following messages:

- *SCAn* – a code from outside the product database was accepted (Std mode),
- *not Found* – no code from outside the database was accepted (*LIMIt mode*) and no product is selected,
- *Found* – the code of a product belonging to the database was accepted.

Note: If the scale does not display any message, check the scanner connections, port configuration and transmission protocol (*SErIAL function*).



A quick way to recall a product (or tare) is to press the *MENU* button for a longer time , which causes the *Prod Id message to be displayed* and moves on to entering the identification number. After releasing the button and entering the number that is already in the database, the *Found* message appears , which confirms that all product data (previously entered into the database) has been recalled.
To enter the data, select the *EdIt option.* and use the keys:
→0 ←- increase the digit,
→T ←- go to the next digit,
MENU - ending.
Of course, it is also possible to recall a product using the *Prod function* and the *Prod option Id* (previous page).
Holding the *MENU key even longer* (approx. 6 seconds) will display the message *ProdCLr* and disabling the current product.

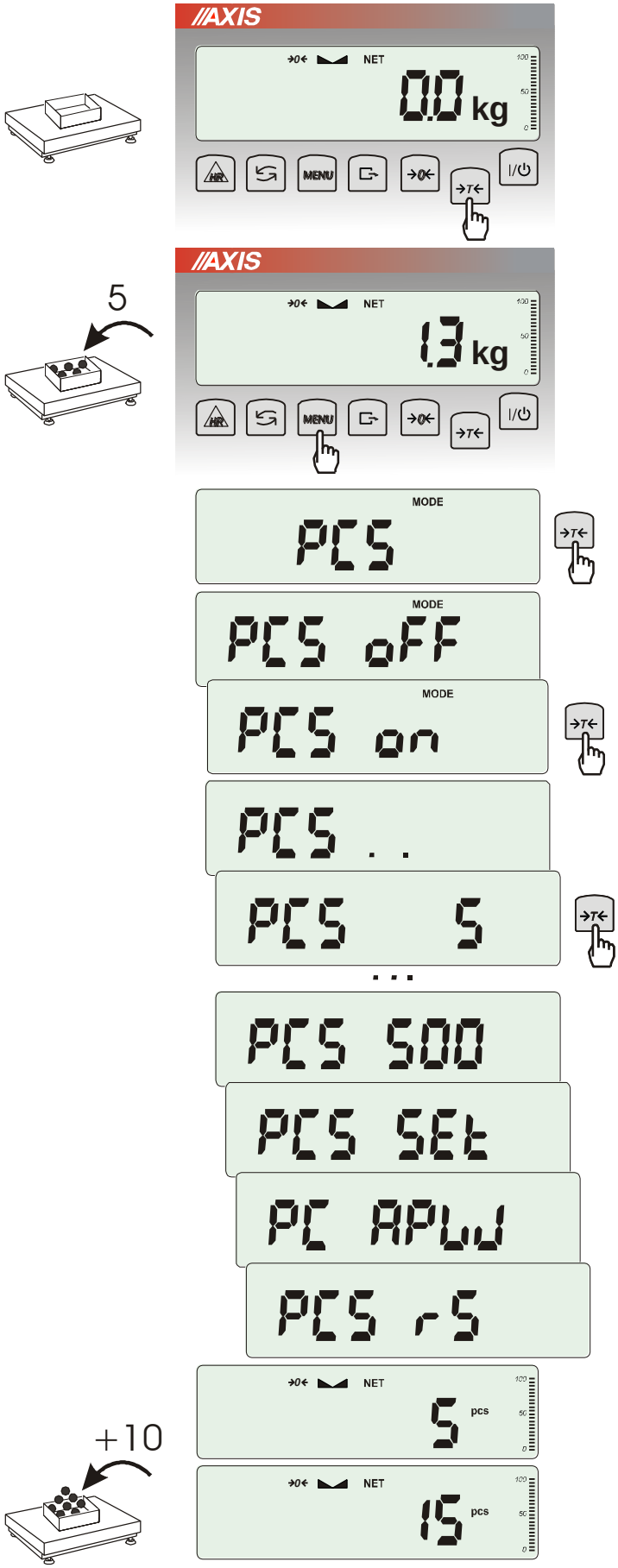
Transmission of weighing results and data from the database to a computer, printer or labeller

Full use of the database capabilities requires the simultaneous use of the appropriate scale settings (*Setup): Serial* option , *Label* (for the labeller) and *Print* .
Serial option allows you to select the appropriate transmission protocol on each of the two scale ports. This allows the labeler to work independently. Calling up a product is equivalent to selecting the label associated with it. If you do not use the database, you can select the appropriate label using *the Label option* .
For each transmission of weighing results, independently for both scale ports, a set of data identifying the weighed product and the scale User can be assigned . This is done during the scale settings using the *Print option* (*chapter 17.5)* .

Thanks to this, the following product and User data is available from the database (in addition to the current measurement results):

- *USEr Id* – identification number of the scale User,
- *User on* – scale User name (entered from PC or scanner),
- *Prod Id* – product identification number ,
- *Prod bA* – product barcode (typed or scanned),
- *Prod on* – product name (entered from a PC or scanner),
- *Label* – label number appropriate for the product,
- *APW* – unit weight of the detail (applies to the *PCS* function),
- *tArE* – tare (packaging weight),
- *total* – total mass (applies to the *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.

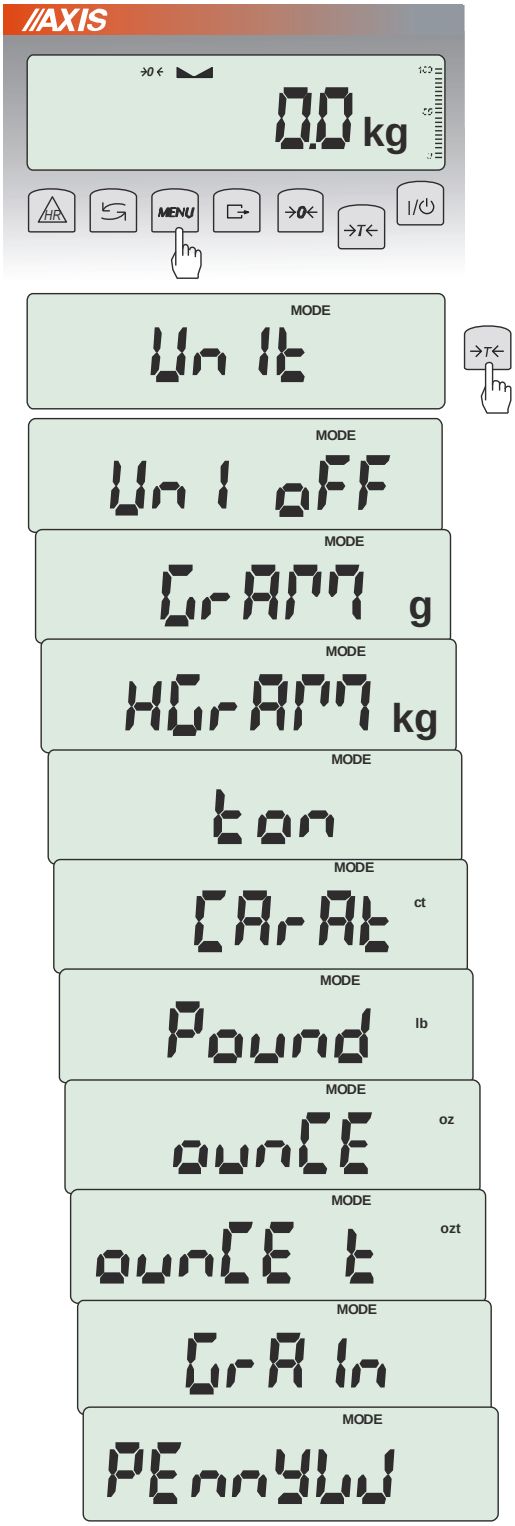
It is advised that single piece weight is not less than one reading unit and sample weight used in first phase is bigger than 100 reading units.

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

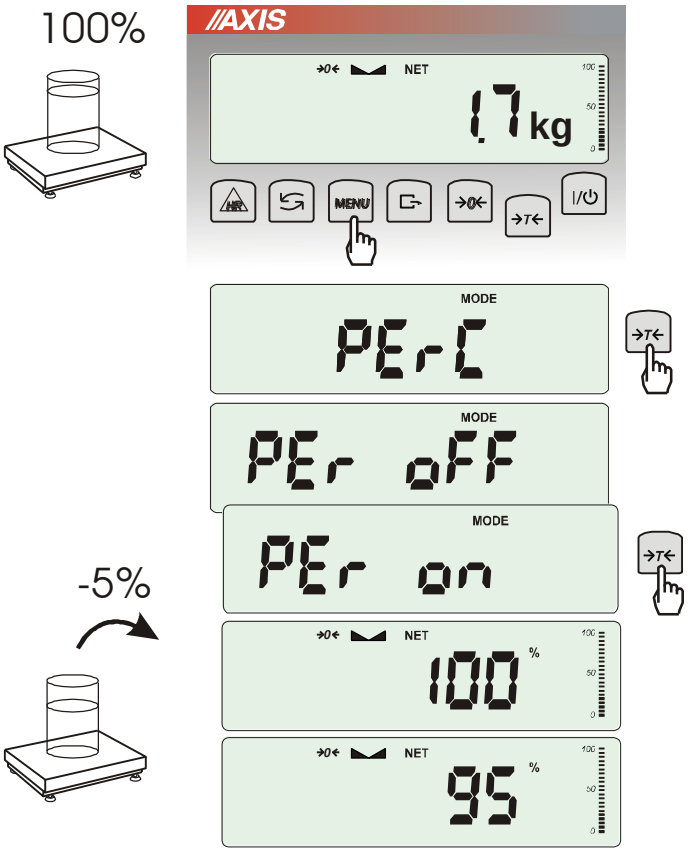
Selection is made by pressing the →*T key* ←while the unit is displayed.

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.

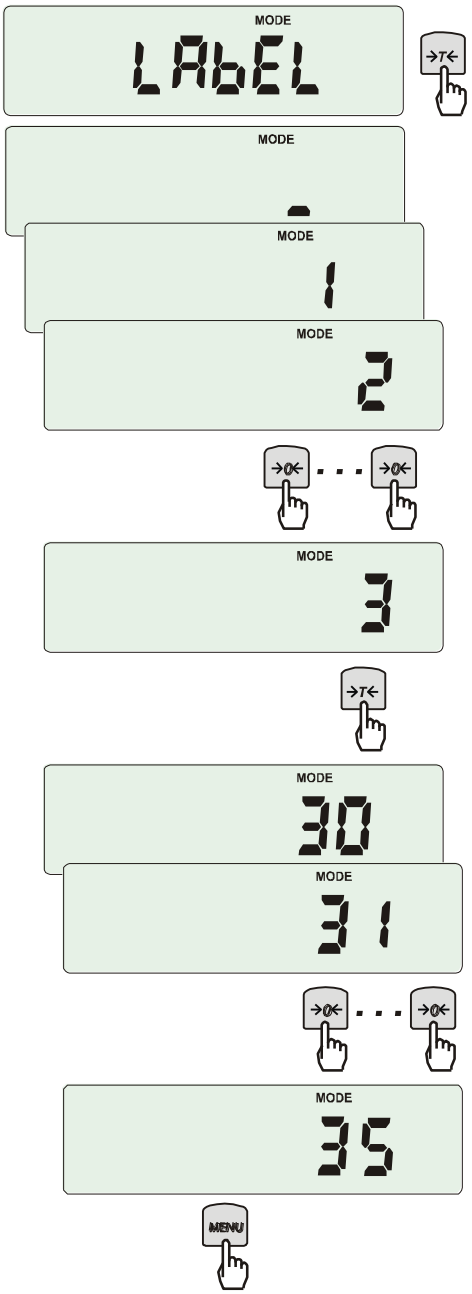
Weighing result is displayed in different format, depending on the weight value of reference sample.

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) - option

This function is used in scale 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.

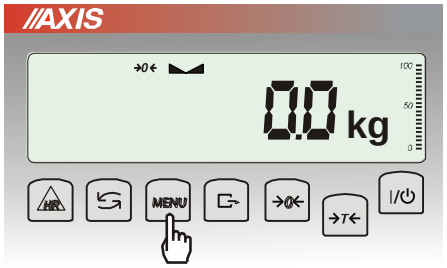
After entering label number, putting load and pressing ⇨ key will cause sending data to label printer.

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

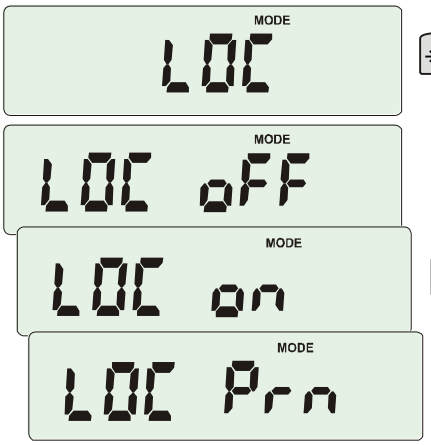
```
US              (55 53 0D 0A)
FR"0001"        (46 52 22 30   30 30 31 22   0D 0A)
?               (3F 0D 0A)
00:00           (30 30 3A 30   30 0D 0A)
2000.00.00      (32 30 30 30   2E 30 30 2E   30 30 0D 0A)
   10  g        (20 20 20 20   20 31 30 20   20 67 0D 0A)
P1              (50 31 0D 0A)
```

18.6 Weighing animals function (LOC)

The function allows weighing animal moving on the scale.



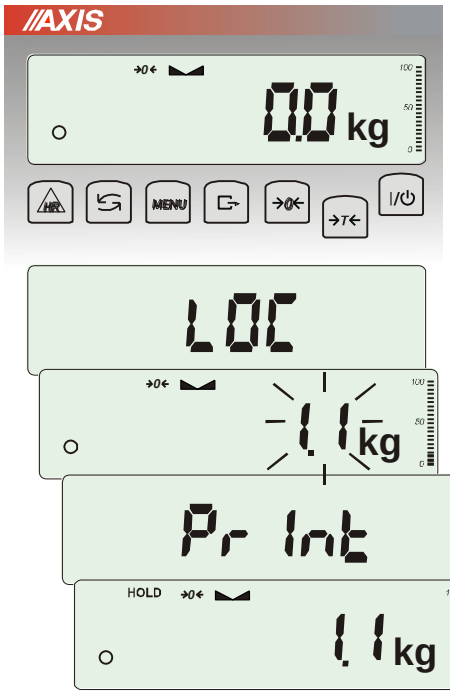
Press *MENU* key.



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.



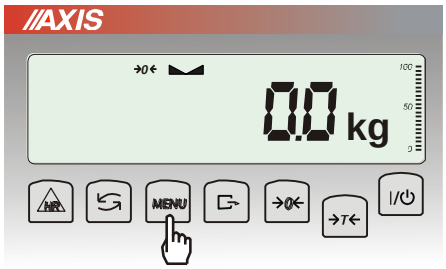
Wait until the weighing result is averaged – scale display blinks. Then scale will show stable (averaged) result and will send it through serial port. The result remains on display for about 30 second.

Important notes:

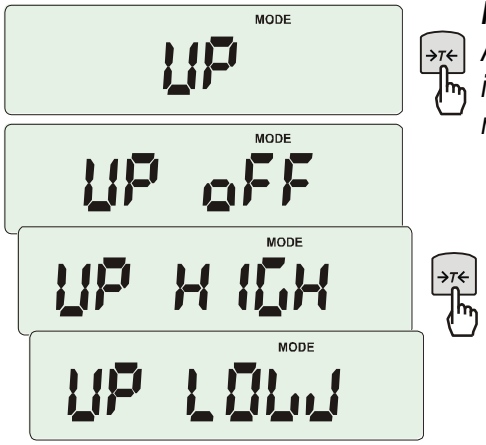
1. *The loads lower than Min value are not averaged.*
2. *In case when putting animal on scale takes more than 5s it is suggested to choose LOC PRN option (measurement started manually by pressing* ⎆ key *).*

18.7 Maximum value indication function (UP)

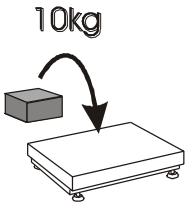
This function allows holding maximum (or minimum) value that is indicating at the moment.

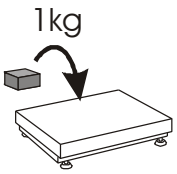


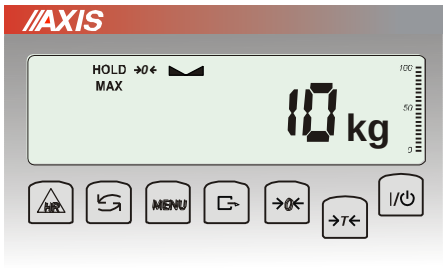
Before measurement scale should be tared.
Function has following options:
-*UP oFF* – function off,
-*HIGH* – holding maximum value,
-*LOW* – holding minimum value.
Pressing →*T*← key will cause result zeroing.



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

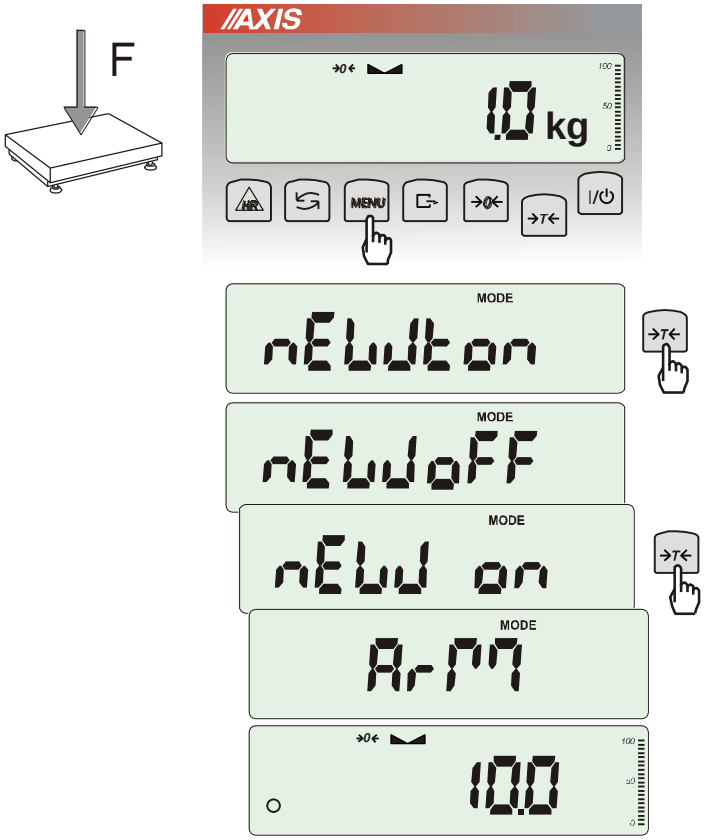






18.8 Force measuring function (nEWton)

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



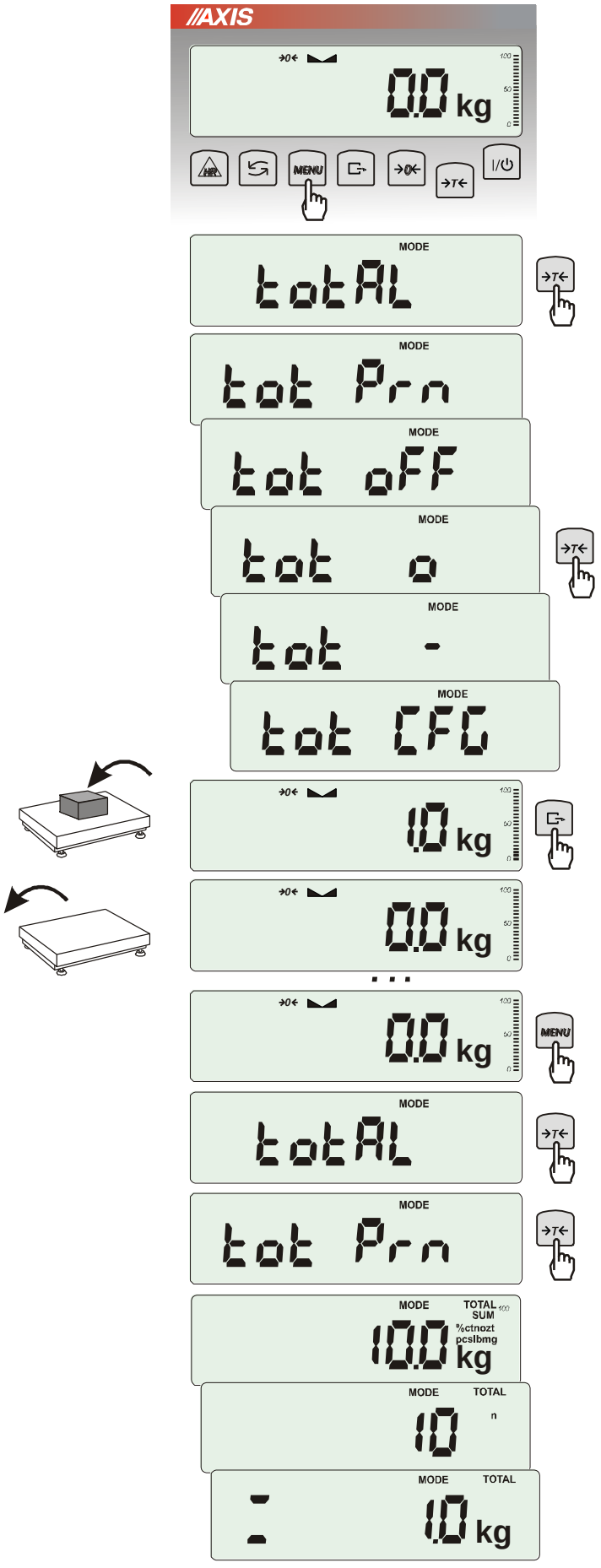
Press *MENU* key.

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)

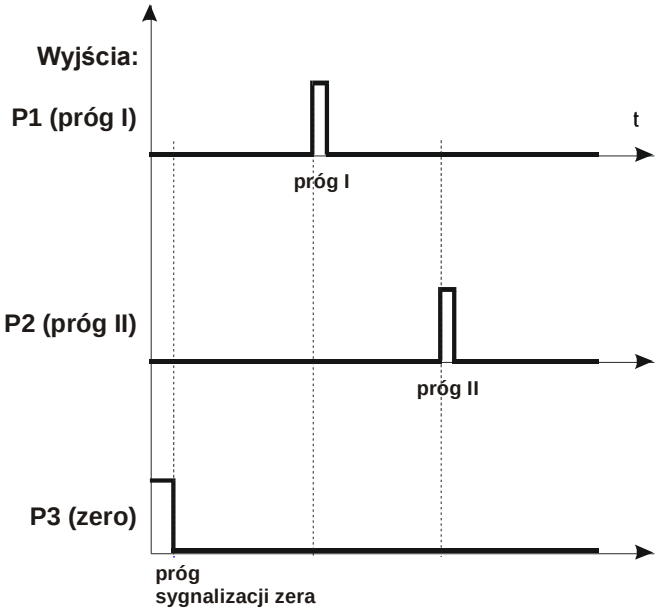
This function allows you to compare the weighing result with two previously programmed mass values: the lower and upper threshold. The comparison result is signalled by the lighting of the indicators *(MIN, OK, MAX)* and a short and long sound signal generated when the thresholds are exceeded.

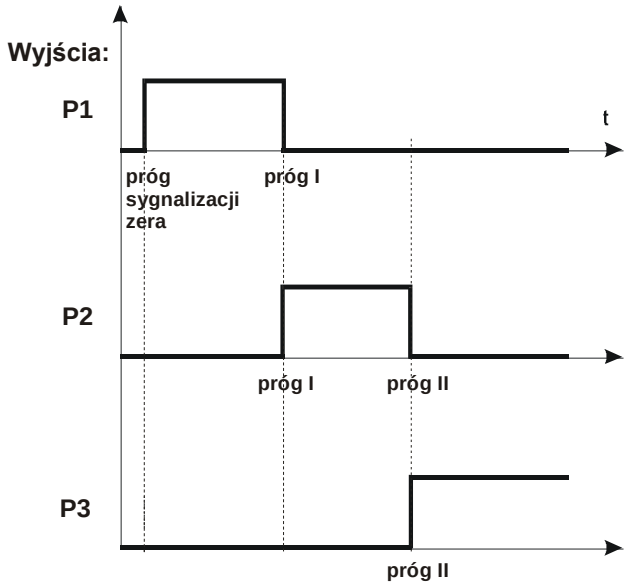
In scales equipped with an *Output connector* (marked as: WY ⌐⌐), the comparison result can be used to control a visual signaling device (*Signaling mode*), automation devices (*Impulse mode*), dosing devices (*Dosing mode*).

Impulse mode , short-circuit pulses with a duration of 0.5 s appear on outputs P1 (threshold I) and P2 (threshold II). On output P3 (zero), a short-circuit condition appears when the indication does not exceed the zero signaling threshold value. In *Signaling* mode , short-circuit conditions appear on outputs P1-P3 of the *Output connector* as a result of comparing the scale indications with the threshold values. In *Dosing* mode , the outputs are activated by the key ↻(*StArt message*) and after reaching the threshold II value, the outputs are deactivated (*End message).*

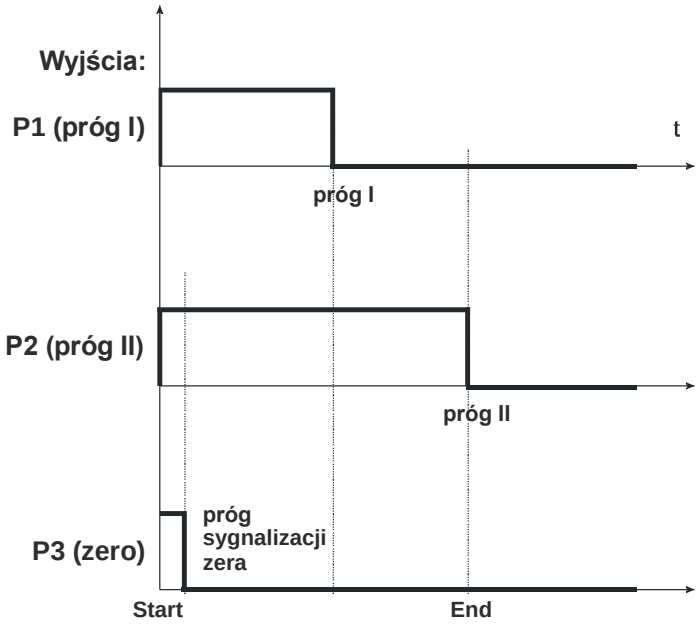
Output connector states with increasing scale load for different operating modes **:**

Pulse Mode : *Signal* Mode :

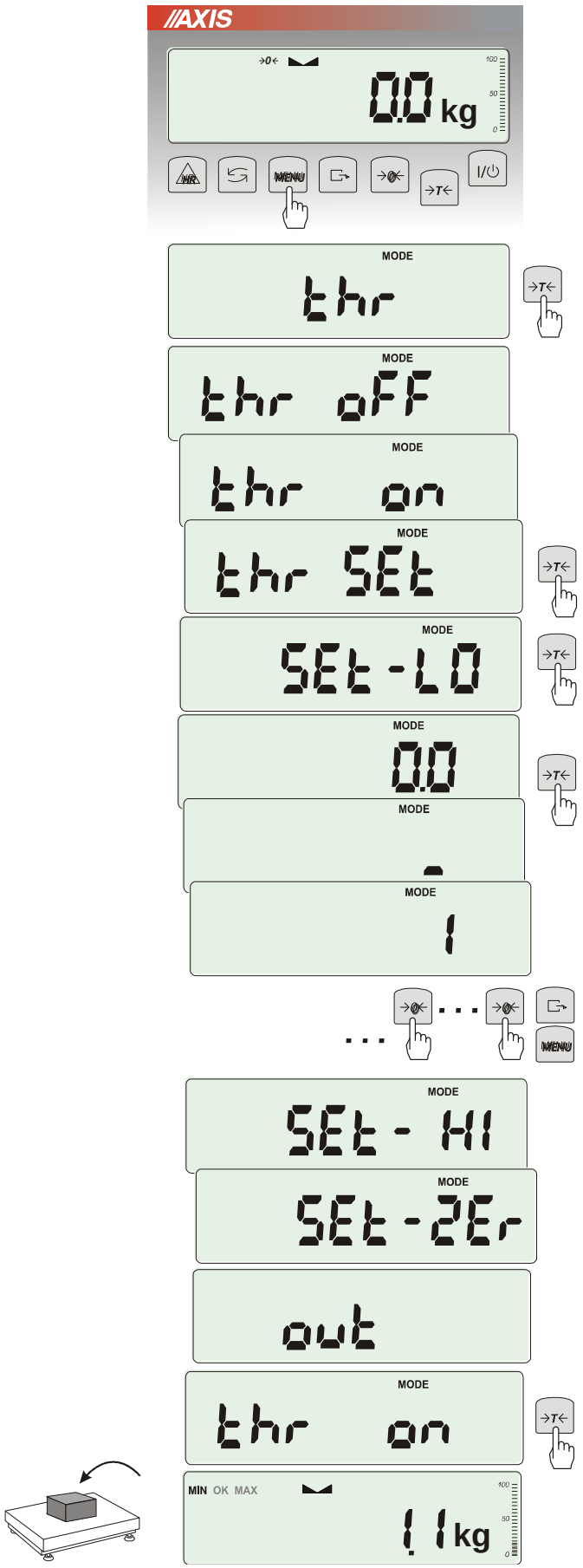




Dosing mode :



Sequence of actions:



Press the key *MENU* and select *thr by pressing the T* ←key →.

The display will show the following:

- *thr oFF* - disable the function,
- *thr on* - enable the function,
- *thr Prn* – check the last entered threshold values (press repeatedly ⊏→),
- *thr CFG – select mode for OUT* connector :

IMPULSE – Pulse mode

SIGnAL . – signaling mode

doSE -dosing mode

out – output to weighing

- *thr SEt* – setting thresholds.

By means of →*T* ←select *thr-SEt* .

The threshold entry options will appear:

- *SEt -LO* - entering the lower threshold,
- *SEt -HI* - entering the upper threshold,
- *SEt- ZEr* - entering the zero signaling threshold.

T ←key to select the →*SEt -LO* option (the previously entered value will appear), press the *T* ←key again →.

Set the lower threshold value using the keys:

→*0*← - increasing the number,

⊏→- decimal point,

→*T*← - move to the next digit,

MENU - ending.

Select the *SEt -HI option* and enter the upper threshold value.

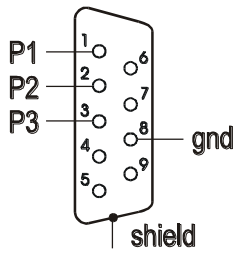
Select the *SEt- ZEr option* and enter the zero signal threshold value.

After setting the threshold values, exit by selecting the *out option* and then select the *thr option. he* to start working with the function.

To change the operating mode of the *WY connector,* use the *thr CFG option* . The default is *Signaling mode.*

To end the function, press the *MENU key* and then select *thr* and *thr oFF* .

OUTPUT ⎍ connection diagram:

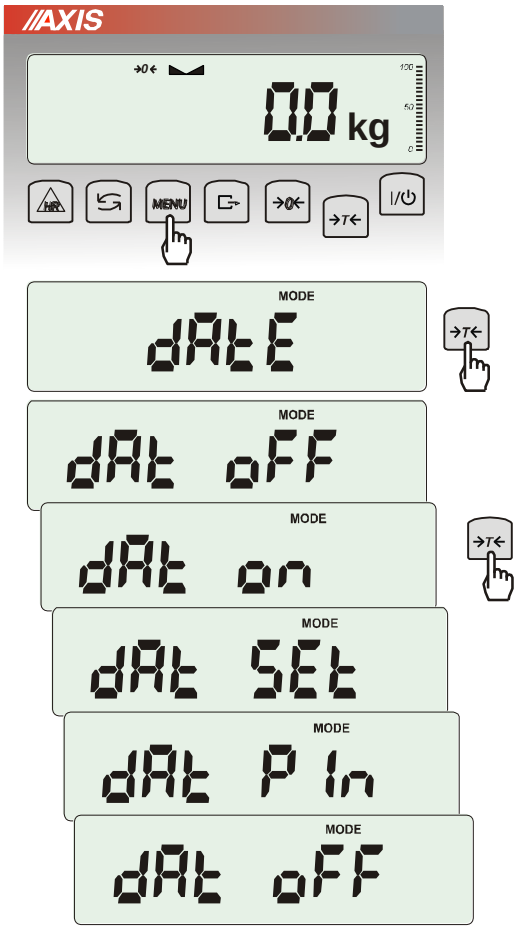


The Output connector is an optocoupler open collector output with a load capacity of 25mA / 24V.
It is recommended to use ready-made MSZ 4K/P board, which contains relays, supply voltage: AC 230V and output: AC 250V, 3A.

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) - option



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

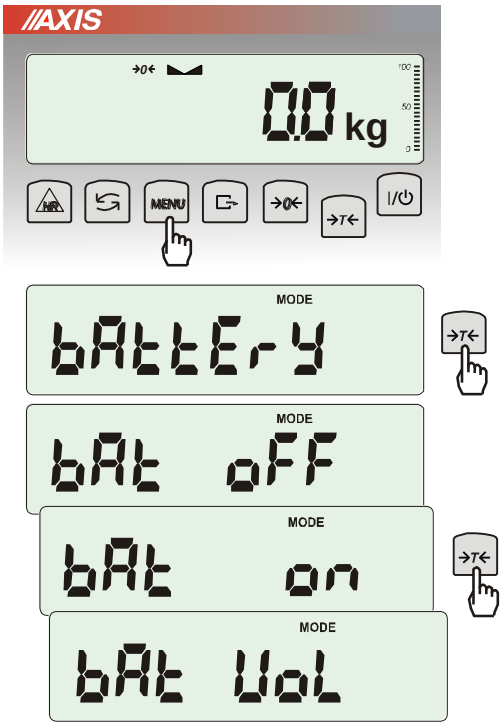
UE: dd-mm-rrrr gg:mm

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

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

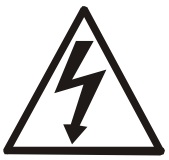
Attention: Inscribing non-zero *PIN* value causes showing *PIN* sign during next date and time changing and inscribing 4 digit code is necessary. (using keys *→0←, →T←* and *MENU).*

18.12 Charging accumulators function (bAttErY)- option



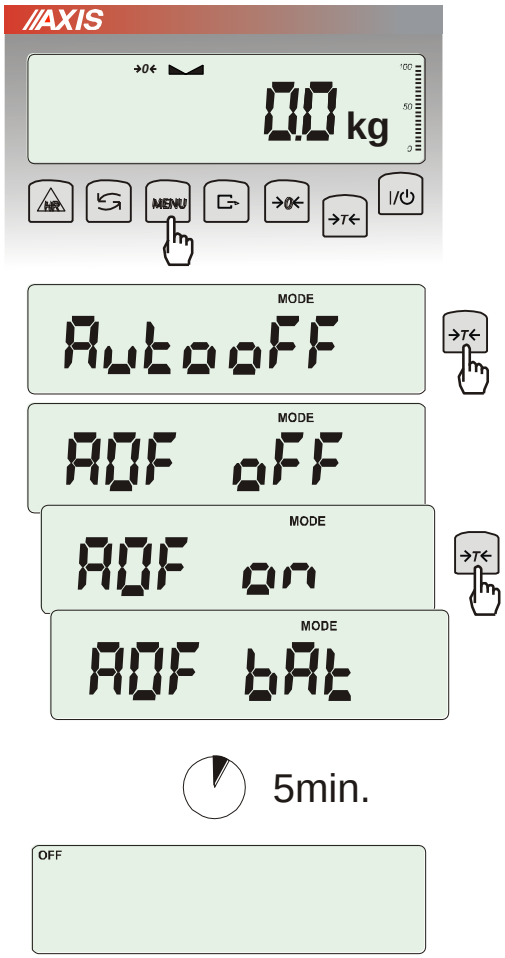
bAttErY function allows switching on or off charging accumulators during work with feeder and checking their power level.
The function has the following options:

- *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)

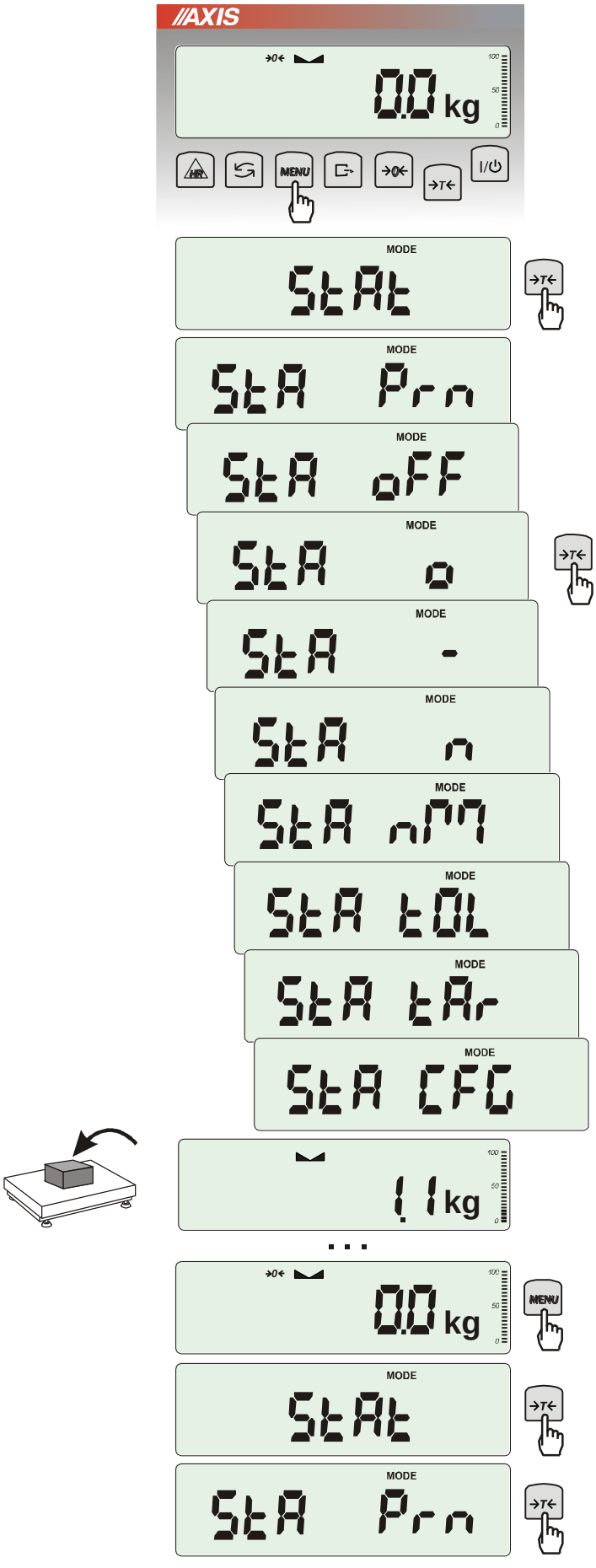
This function evaluates from series of measurements (max 1000) statistical parameters of weighting process. Adding successively measurements to register is automatic and it occur after the scale is loaded and its indications stabilize.
After each loading printout is made with: number of measurements, 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 toleranc
-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

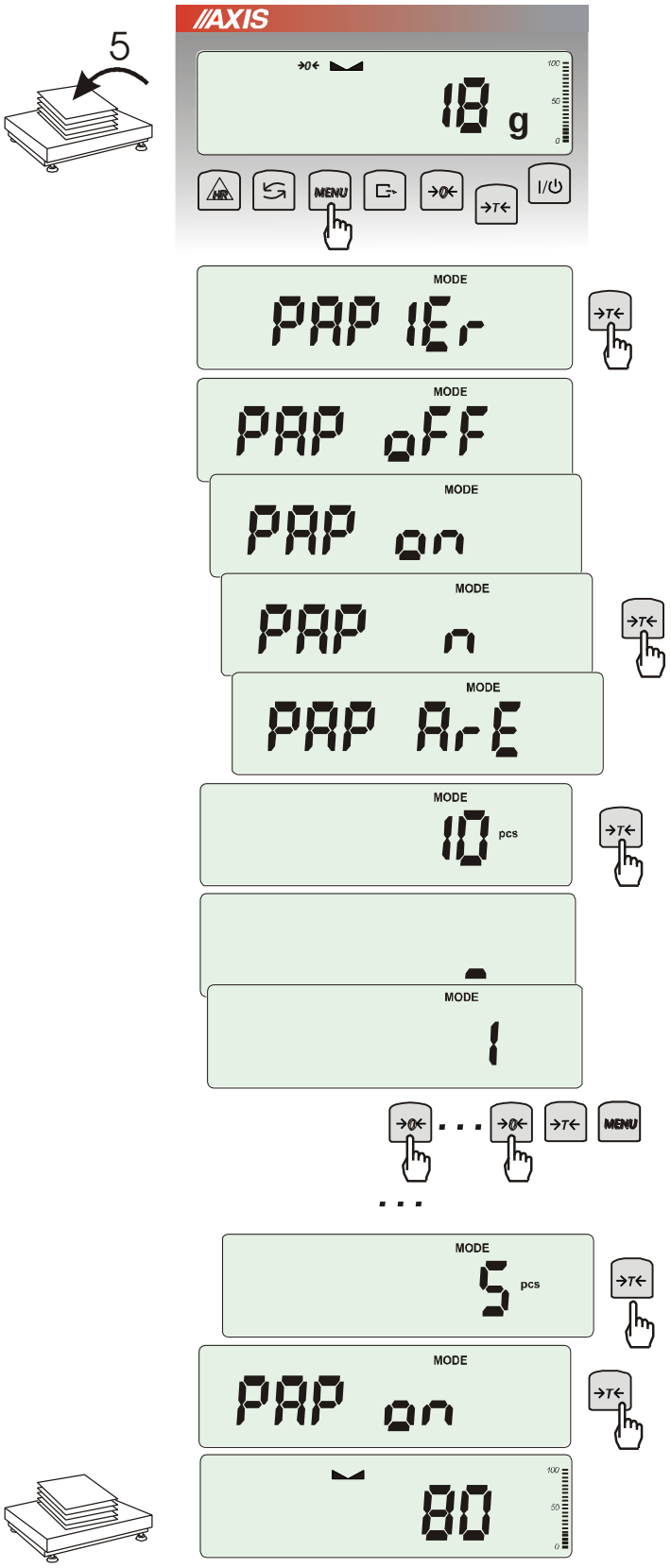
ST. DEV.% – standard deviation percentage

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.

```
------------ STATISICS ------------
NOMINAL  :    50.000 g
TOLERANCE:      100 %
MAX. N   :      500

NO.     SAMPLE       TOL-  NOM   TOL+
1       10.007 g     : *         :
2       20.125 g     :  *        :
3       20.126 g     :  *        :
4       30.205 g     :   *       :
5       30.204 g     :   *       :
6       30.201 g     :   *       :
7       40.557 g     :    *      :

        •••

N       :       25
IN TOL. :       25
( TOL-  :        0
) TOL+  :        0
TOTAL   :  1264.664 g
AVERAGE :    50.587 g
MAX     :    91.131 g
MIN     :    10.007 g
MAX-MIN :    81.124 g
ST.DEV. :   20.6480 g
ST.DEV.% :    40.82 %

------------ HISTOGRAM ------------

(TOL-   0
        0
        1
        2
        3
        4
        5
        4
        3
        2
        0
        1
)TOL+   0
```

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. The balance must be kept clean and protected from dust, and aggressive liquids. In order to clean it is recommended to wipe the scale with cloth soaked in soapy water and then dry.
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 “SErvic(e)” 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:

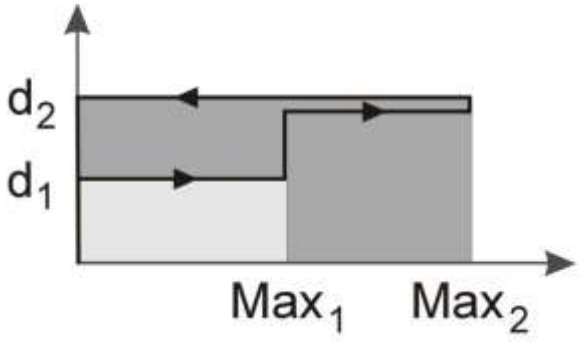
Max_1 - 50 % of maximum load (mostly),

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. Parameters of double-range scales

Scale type	BA1.5X	BA3X	BA6X	BA15X
Maximal load (Max_1/Max_2)	0,6/1,5kg	1,5/3kg	3/6kg	6/15kg
Readout unit (d_1/d_2)	0,2/0,5g	0,5/1g	1/2g	2/5g
Verification unit (e_1/e_2)	0,2/0,5g	0,5/1g	1/2g	2/5g
Minimal load (Min)	4g	10g	20g	50g
Accuracy class	III			
Tare range	-1,5kg	-3kg	-6kg	-15kg
EC verification	✓	✓	✓	✓

Scale type	BA15X BA15KX	BA30X BA30KX	BA60X BA60KX	BA150X BA150KX	BA300X BA300KX
Maximal load (Max_1/Max_2)	6/15kg	15/30kg	30/60kg	60/150kg	150/ 300kg
Readout unit (d_1/d_2)	2/5g	5/10g	10/20g	20/50g	50/100g
Verification unit (e_1/e_2)	2/5g	5/10g	10/20g	20/50g	50/100g
Minimal load (Min)	40g	100g	200g	400g	1kg
Accuracy class	III				
Tare range	-15kg	-30kg	-60kg	-150kg	-300kg
EC verification	✓	✓	✓	✓	✓

Scale type	BA3MX	BA6MX	BA15MX
Maximal load (Max_1/Max_2)	1,5/3kg	3/6kg	6/15kg
Readout unit (d_1/d_2)	0,5/1g	1/2g	2/5g
Verification unit (e_1/e_2)	0,5/1g	1/2g	2/5g
Minimal load (Min)	10g	20g	50g
Accuracy class	III		
Tare range	-3kg	-6kg	-15kg
EC verification	✓	✓	✓

Scale type	BA1.5NX(HX)	BA3NX(HX)	BA6NX(HX)	BA15NX(HX)
Maximal load (Max_1/Max_2)	0,6/1,5kg	1,5/3kg	3/6kg	6/15kg
Readout unit (d_1/d_2)	0,2/0,5g	0,5/1g	1/2g	2/5g
Verification unit (e_1/e_2)	0,2/0,5g	0,5/1g	1/2g	2/5g
Minimal load (Min)	4g	10g	20g	50g
Accuracy class	III			
Tare range	-1,5kg	-3kg	-6kg	-15kg
EC verification	✓	✓	✓	✓

Scale type	BA30NX BA30HX	BA60NX BA60HX	BA150NX BA150HX	BA300NX BA300HX
Maximal load (Max_1/Max_2)	15/30kg	30/60kg	60/150kg	150/300kg
Readout unit (d_1/d_2)	5/10g	10/20g	20/50g	50/100g
Verification unit (e_1/e_2)	5/10g	10/20g	20/50g	50/100g
Minimal load (Min)	100g	200g	400g	1kg
Accuracy class	III			
Tare range	-30kg	-60kg	-150kg	-300kg
EC verification	✓	✓	✓	✓

Scale type	BA30EX	BA60EX	BA150EX
Maximal load (Max_1/Max_2)	15/30kg	30/60kg	60/150kg
Readout unit (d_1/d_2)	100g	200g	400g
Verification unit (e_1/e_2)	5/10g	10/20g	20/50g
Minimal load (Min)	5/10g	10/20g	20/50g
Accuracy class	III		
Tare range	-30kg	-60kg	-150kg
EC verification	✓	✓	✓

Notes