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USER MANUAL

AB-SERIES 100 / 200

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Declaration of Conformity

1. General description

AB series balances are destined for high accuracy weighing in laboratory practice. Balances are equipped with internal calibration system for proper accuracy control during operation. The user should also own weight standard of OIML E2 class for periodical control of the balance (weight value stated in Technical Data sheet) - available separately. All balances are metrologically tested - calibration or legal verification certificate on demand. Legal verification is required for balances used in some applications: direct sale, pharmaceutical prescriptions, medical and pharmaceutical analysis, goods packing and others. Balances with legal verification are marked with the following:

- protective seal placed on the casing mounting screw at the back of the balance,
- calibration switch protective seal,
- notified body stamps and green metrological marking placed on the balance name plate.

2. Technical data

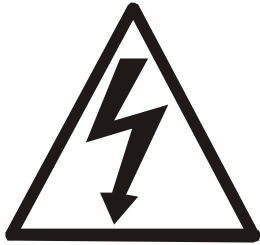
Type	PCE-AB-100	PCE-AB-200
Capacity (Max)	100 g	200 g
Min load (Min)	100 mg	100 mg
Reading unit (d)	0,1mg	0,1mg
Verification unit (e)	1mg	1mg
Tare range	-100 g	-200 g
Accuracy class	I	
Working temperature	+18 ÷ +33 °C	
Weighing time	<5 s	
Pan dimension	ϕ 90 mm	
Balance base dim.	210 x 510 x 350 mm	
Balance weight	external feeder.ZN 12V/ 500 mA: AC: 230 V 50 Hz 6VA / DC: =12V 500 mA	
Power	7,5kg	
Calibration weight (OIML)	100g – E2	200g – E2

3. Completeness

A standard set consist of:

1. Balance
2. Pan base and a pan,
3. Feeder (ZN12V/500mA)
4. User manual

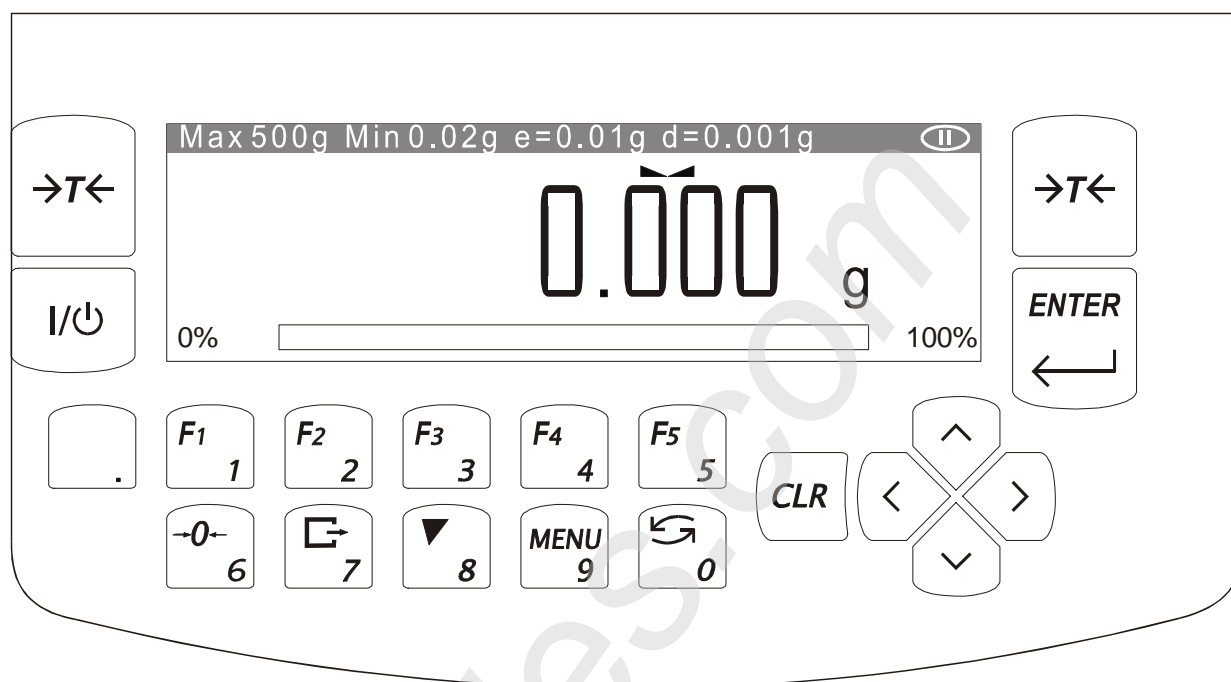
4. Security rules



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

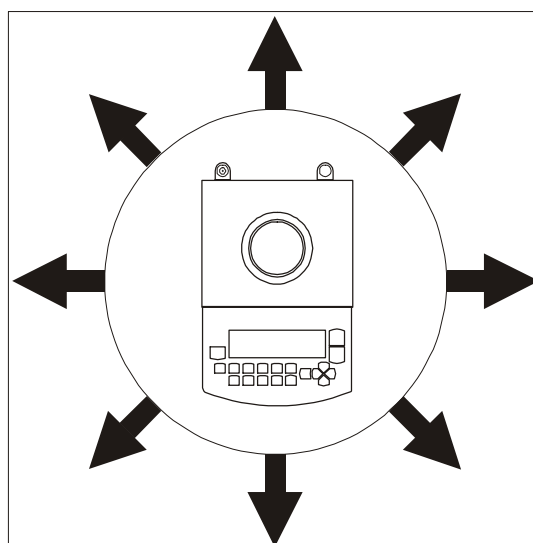
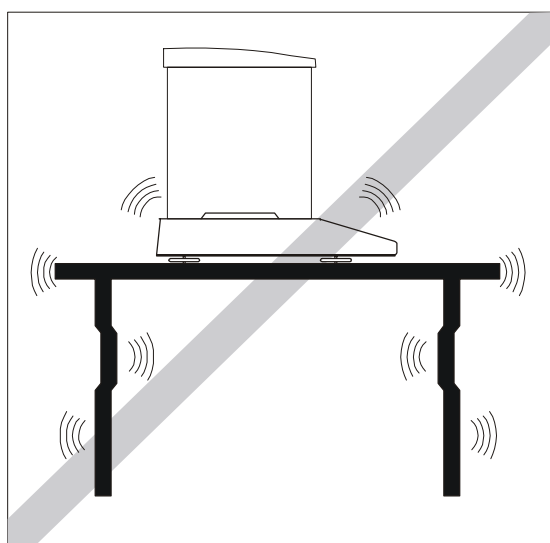
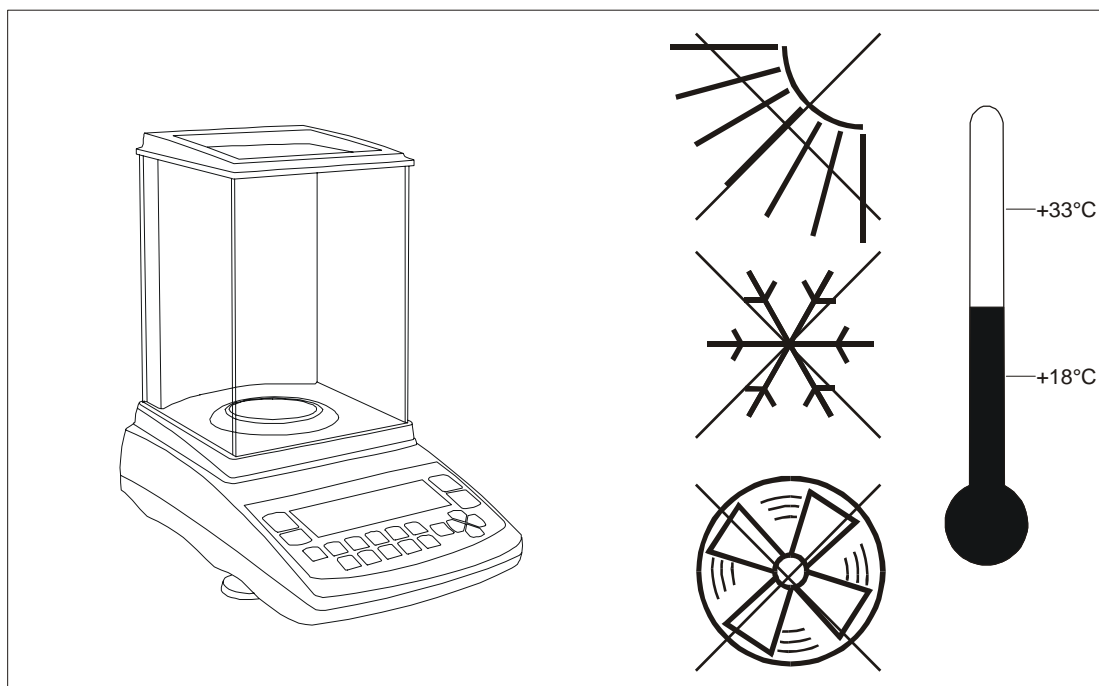
- All repairs and necessary regulations can be made by authorised personnel only.
- To avoid fire risk use a feeder of an appropriate type (supplied with the balance). Pay attention that supply voltage is compatible with specified technical data.
- Do not use the balance when its cover is opened.
- Do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

5. Keys and indicators



keys	→T←	-	tare (subtract package weight from weighed mass)
key	I/⏻	-	switch-off (standby),
key	ENTER	-	confirm
key	.	-	decimal point,
key	1/F1 ... 5/F5	-	numeric / functional keys,
key	6/→0←	-	numeric key / zeroing (balances for direct sale use only),
key	7/□	-	numeric key / data output (print / transmission),
key	8/▼	-	numeric key / internal calibration,
key	9/MENU	-	numeric key / Menu,
key	0/↻	-	numeric key / special function,
key	>	-	enter an option,
key	<	-	leave an option,
key	^	-	navigation / move a cursor up,
	v	-	navigation / move a cursor down,
indicator		-	result stabilisation,
indicator	linear	-	tatal load indicator (0-100%),
indicator	OFF	-	stand-by mode,
Max, Min, d, e, ⏻		-	metrologic parameters and accuracy class.

6. Preparations – working environment

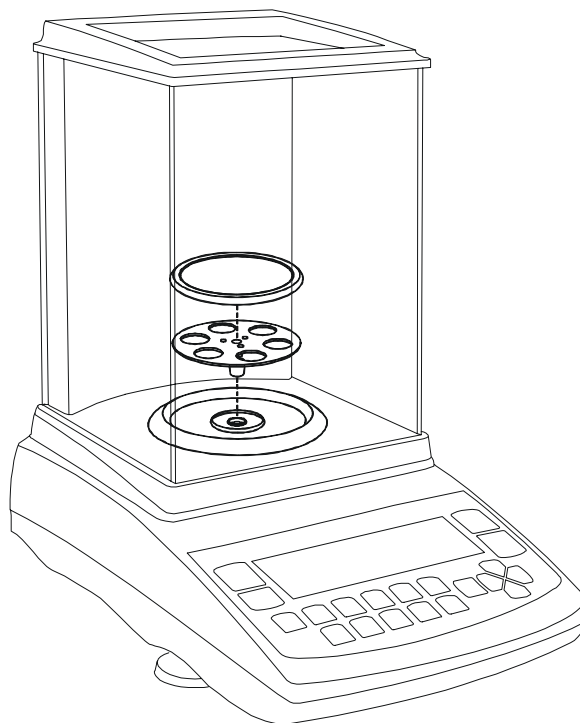


When choosing a location to set up the balance, remember the following rules to ensure proper working conditions and user-friendly operating:

- setup the balance on an even, flat surface leaving necessary room for easy access,
- maintain proper working temperature,
- avoid strong air drafts, vibrations, dust, big temperature changes and humidity over 90%,
- avoid locations with extreme heat radiation and electromagnetic or magnetic fields.

7. Preparation – the balance

1. Take the balance and supplied accessories (a feeder, pan elements) out of the box.
2. Place the balance on a stable ground not affected by mechanical vibrations and airflows.
3. Level the balance with rotating rear legs so that the air bubble in water-level at the back of the balance is in the middle.
4. Gently place the pan on the balance.




5. Plug a feeder to the power socket at the back of the balance.



Moisture in the air may condense on the surface of the balance when transferred to the warmer environment. In this case leave the balance for at least 4 hours unplugged from the mains for conditioning to avoid wrong operating or damage of the balance.

Leave the pan empty and plug the feeder to the mains. At the end of self-tests, the balance displays zero indication and is now ready to work.

8. Operation principles

1. To ensure proper weighing accuracy the balance is equipped with internal calibration system. The system automatically calibrates the balance every 2 hours and with temperature changes (more than 1°C) without user ingerence. Nevertheless, it is advised to check balance accuracy with weight standard (or other object with known weight) before and after each series of measurements.
2. Weighed sample should be placed in the centre of the pan.
3. In direct sale use (d=e), make sure that zero indicator is displayed. If not, press $\rightarrow 0 \leftarrow$ key and wait until zero indication and zero indicator appears. In other balances the key does not operate.
4. The balance is equipped with a tare equal to its range. To tare the balance press $\rightarrow T \leftarrow$ key. 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 balance is equipped with a load indicator (graduated in percentages).
5. Weighing result should be read when the indicator " lights, which signalises stabilisation of a result.
6. When the balance is not used but it is necessary to be ready to work immediately, it can be switched off by pressing I/ϕ key. The balance reading system is then switched off to "standby" mode (signalled by the indicator "OFF"). To switch the balance on press I/ϕ key. The balance is immediately ready to operate maximum accuracy (after self tests).
7. The mechanism of the balance is a precise device, sensitive to mechanical strokes and shocks.

Before transportation take off the pan (move it slightly and lift it up) and the pan base and preserve from any damages.

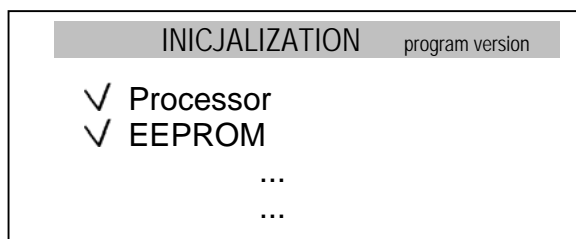


Do not overload the balance more then 20% of maximum load (Max).

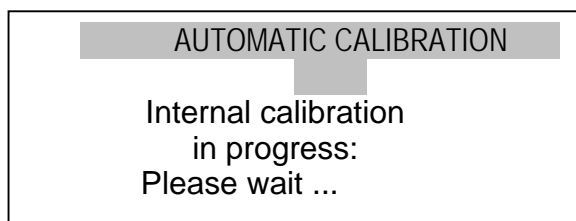
Do not press a pan with a hand.

8. The balance should not be used to weigh ferromagnetic materials due to accuracy decrease.
9. When the balance is moved to another localisation remember to level the balance and proceed with internal calibration.

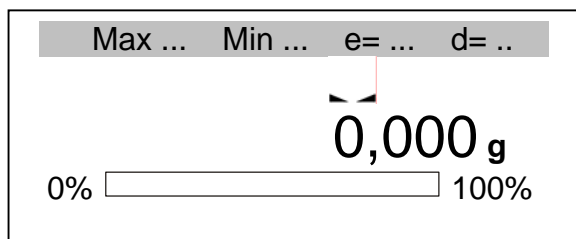
9. Start-up and user menu



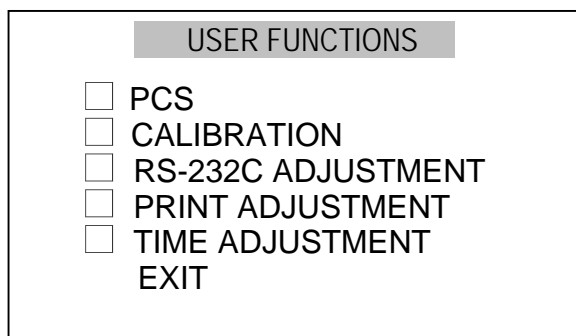
After switching-on, the balance performs automatic self-test. Each test must be accepted and confirmed with ✓ mark.



After self-test the balance proceeds with internal calibration mode as described in chapter 10.



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



To enter the user menu press *Menu* key. The cursor (dark background) is placed at the top.

To move the cursor, use the navigation keys: ▼ and ▲.

- function activated

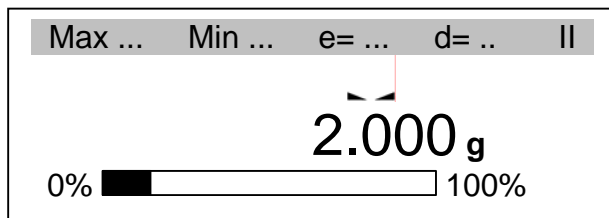
- function deactivated

To enter chosen function and open the menu of the function press *ENTER* key.

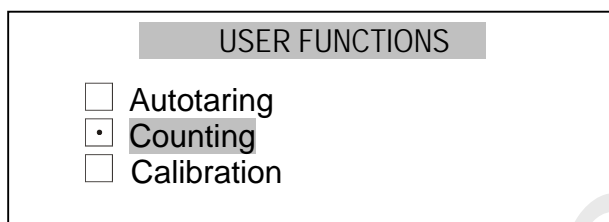
To return to the previous window pres < key. To leave the user menu and return to weighing mode chose *EXIT* option.

9.1 Pieces counting function

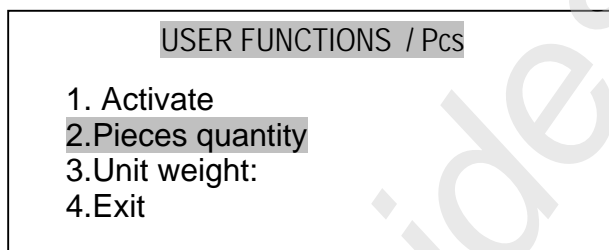
9.1.1. Counting with reference sample



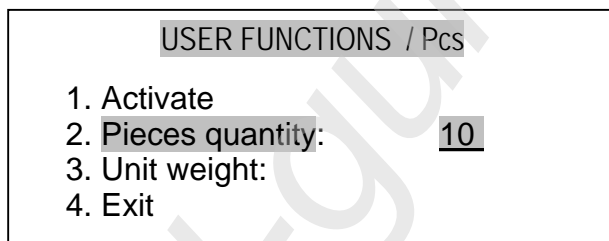
Place a reference sample with known number of pieces on the pan.



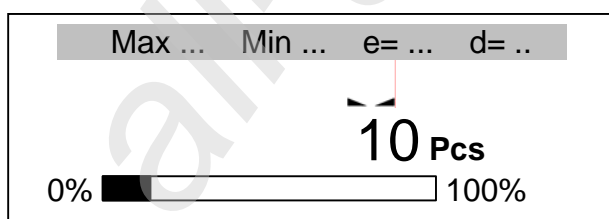
Press *Menu* key to enter the user function menu, chose *Counting* with the cursor and press *ENTER* key.



Chose *Pieces quantity* option and press *ENTER* key.



Using numeric keys enter the quantity of the sample and press *ENTER* key.

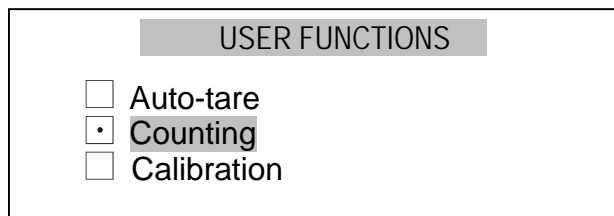


The balance calculates unit weight basing on given number of pieces and reference sample weight and then shows number of pieces on the display.

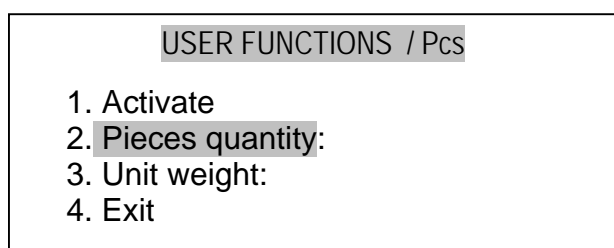
Reference sample parameters may be used in series of weighing. To recall previously used sample parameters start *Counting* function with *Activate* option.

To leave the function press *Menu* key, chose *Counting* function and then chose *Deactivate* option.

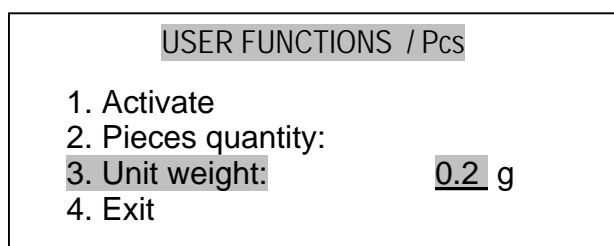
9.1.2. Counting with unit weight



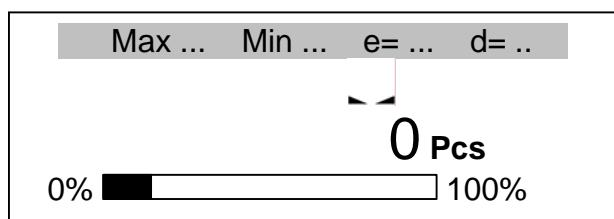
Press *Menu* key to enter the user function menu, chose *Counting* and press *ENTER* key.



Chose *Unit weight* option and press *ENTER* key.



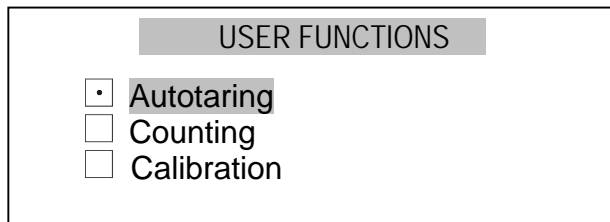
Enter unit weight value using numeric keys and press *ENTER* to accept. The unit weigh value is stored in balance memory until switched off.



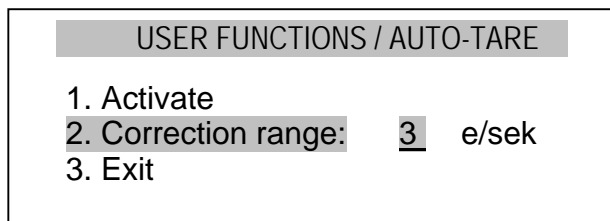
The balance shows pieces amount.

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

9.2 Auto-tare function

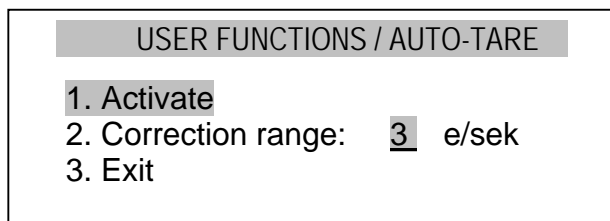


Press *Menu* key to enter the user function menu, chose *Auto-tare* and press *ENTER* key.

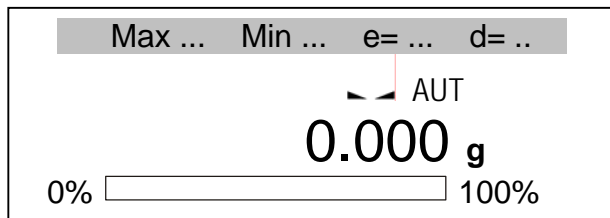


Chose *Correction range* and press *ENTER* key.

Enter maximum zero flow to be automatically corrected (chose between 0.5 ÷ 5 verification unit(s) per second).



Chose *Activate* option and press *ENTER*.



Any changes off the zero readout that are equal to a defined fraction of digits per second are automatically tared, independently of changing environment conditions (temperature, humidity, etc.).

To leave the function press *Menu* key, chose *Auto-tare* function and then chose *Deactivate* option.

9.3 External calibration / calibration options



External calibration in verified balance should be performed in authorised PCE-Group services, as it is possible only after removing protective seals. In this case the validity of the verification is void and the balance must be re-verified by the nearest Notified Body or at the place of installation.

Calibration with external weight standard in verified balances should be performed in case balance indications exceed permissible error. To calibrate the balance a service centre should use calibration weight as stated in Technical Data table (or of better accuracy) with valid calibration certificate.

In verified balances calibration function is blocked for the user. It is only possible to print calibration report useful for routine balance check-through.

The report printout example

Date : ... Time: ...	
Calibration report	

Date of production: ...	
Serial number: ...	
Program version: ...	
Adjustation no.: ...	
Factory external weight: ...	- external weight value registered during factory calibration
Factory internal weight: ...	- internal weight value registered during factory calibration
Current external weight: ...	- external weight value registered during last calibration
Current internal weight: ...	- internal weight value registered during last external calibration
Weight difference: ...	- difference between internal weight values: factory value–current value

Calibration options:

USER FUNCTIONS	
<input type="checkbox"/>	Auto-tare
<input type="checkbox"/>	Counting
<input checked="" type="checkbox"/>	Calibration

Press *Menu* key to enter the user function menu, chose *Calibration* with the cursor and press *ENTER* key.

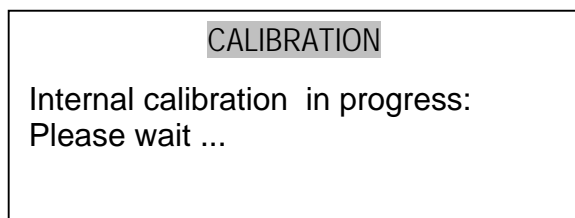
USER FUNCTIONS / CALIBRATION	
1.	Report printout
2.	Exit

Report printout enables to print current calibration data.

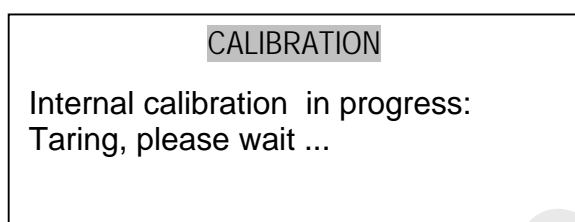
10. Internal calibration

Internal calibration is performed automatically after each start-up, also every 2 hours and with temperature changes more than 1°C.

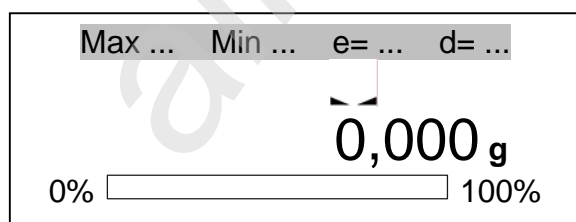
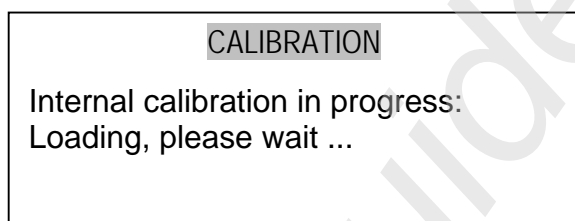
To calibrate the balance with internal weight, simply empty the pan and press ▼ key.



Press ▼ key.



Until calibration process is finished do not perform any operation, as any vibrations and shocks may affect the process of calibration and delay the calibration or deteriorate the result.

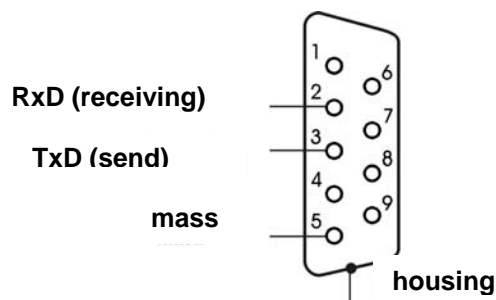



The calibration weight is placed on the pan three times to avoid inaccurate calibration result. In case any problems during calibration, the error is signalled on the display and calibration process is stopped. The result of correct calibration is zero indication.

In case internal calibration does not ensure proper accuracy of the balance (e.g. results of weighing object of known weight are wrong), please contact the nearest service centre.

11. Connecting the balance with a computer or a printer

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



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

When cooperating with the balance, a computer should be equipped with a program that enables receiving and processing data from the balance.

PCE-Group offers computer programs to cooperate with balances. Demo versions and program descriptions are available on the website: www.pce-group-europe.com

- RS 232C Test – free serial port testing program,
- PCE-SB – residual program for cooperation with Microsoft EXCEL and other Microsoft Windows applications.

Detailed information for programmers:

The balance sends data with a following method:

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

Balance → Computer: weighing result in the following format:

(16Bytes, LONG protocol - 8bits, 1stop, no parity, 4800bps),

Bytes description:

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

12. Troubleshooting and maintenance

Display indication	Possible cause	Remedy
"Test ..."	Auto-tests are being performed / electronic unit damage	wait for 1 minute
" - - - - "	The balance is during zeroing / mechanical damage	wait for 1 minute check if the balance is placed on stable ground, not affected by vibrations
"Internal calibration: load error"	To small zero load or overloading of balance mechanism / mechanical damage	Check if there are all necessary pan elements or if the balance is not loaded
„Tare range exceeded"	Tare key pressed during zero indication	Balance indications must be different than zero
„Zeroing range exceeded"	Permissible zeroing range was exceeded	Remove the load from the pan
„Weighing range exceeded"	Permissible weighing range (Max +9e) was exceeded	Reduce the load
„Measuring range exceeded (+)"	Upper limit of analog-digital transducer measuring range was exceeded	Remove the load from the pan
„Measuring range exceeded (+)"	Lower limit of analog-digital transducer measuring range was exceeded	Check if there are all necessary pan elements
„Unit weigh is too small"	Entered unit weigh is too small	Unit weight is too small or entered number of pieces is too big

If a remedy does not have any effect and the communicate is still displayed, contact your dealer or service centre.

1. A balance should be kept clean.
2. Take care that no dirt gets between the casing and the pan. If found any, remove a pan (lift it up), remove the dirt and then replace a pan.
3. In case of improper operation caused by a short-lasting power supply decay, unplug the balance from the mains and then plug it in again after few seconds.
4. It is forbidden to make any repairs by unauthorised persons.
5. To repair a balance, please contact our nearest service centre.

Declaration of conformity

PCE Deutschland



APPROVAL NO. of EC TCM 128/07-4512 (cz)

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Declaration of conformity for apparatus with CE mark

Konformitätserklärung für Geräte mit CE-Zeichen

Déclaration de conformité pour appareils portant la marque CE

Declaración de conformidad para aparatos con disitintivo CE

Dichiarazione di coformità per apparecchi contrassegnati con la marcatura CE

English We hereby declare that the product to which this declaration refers conforms with the following standards.

Deutsch Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.

Français Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.

Español Manifestamos en la presente que el producto al que se refiere esta declaración est´´a de acuerdo con las normas siguientes

Italiano Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.

Analytical balance: PCE-AB...

1. **EN 55022** standard Limits and methods of measurement of radio disturbance characteristics of information technology equipment and **IEC 61000-4-3** Electromagnetic compatibility (EMC) - **Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test, harmonised with the Council Directive 89/336/EEC**

2. **EN 61010-1:2004** standard Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements harmonized with the directive **73/23/EEC** (Low Voltage Directive).

3. **EN 45501** – the main polish and european standard concern Non-automatic weighing instruments, its metrological parameters, measuring of ranges, accuracy, influence of electromagnetic fields, disturbance of short electric impulse, influence of ambient temperature and humidity, gravity etc.subject to conformity implementing Council Directive **90/384/EEC** amended by Council Directive **93/68/EEC**

Signature: _____

PCE Deutschland GmbH&CO.KG
Management

Date: 02.03.2007

Für Rückfragen oder Fragen zur Kalibrierung, sprechen Sie uns bitte an: PCE Deutschland GmbH&CO.KG

Eine Übersicht unserer Messtechnik finden Sie hier: <http://www.warensortiment.de/messtechnik.htm>

Eine Übersicht unserer Messgeräte finden Sie hier: <http://www.warensortiment.de/messtechnik/messgeraete.htm>

Eine Übersicht unserer Waagen finden Sie hier: <http://www.warensortiment.de/messtechnik/messgeraete/waagen.htm>



WEEE-Reg.-Nr. DE64249495

Zur Umsetzung der ElektroG (Rücknahme und Entsorgung von Elektro- und Elektronikaltgeräten) nehmen wir unsere Geräte zurück. Sie werden entweder bei uns wiederverwertet oder über ein Recyclingunternehmen nach gesetzlicher Vorgabe entsorgt.