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Servicemanual

KERN TPLJ(G)/TPLS(G)

Version 1.0

10/2021

GB

English



GB

KERN TPLJG/TPLSG

Version 1.0 10/2021

Servicemanual

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English

1 Basic Information

The device must be repaired only by trained specialist staff or personnel with professional formation (such as a repair-specialist accredited by law concerning verification). The service manual is obligatory for repair work. After repair, original conditions of the device have to be restored. Only original spare parts should be used.

Instructions about conformity-evaluated scales:

Repair must be carried only at 100% compliance with the type approval. A violation of this specification will result in a loss of the type approval! After successful repair the balance will have to be reverified before it can be used again in a statutorily regulated field.

Detailed instructions about conformity-evaluated scales:

Repair must be carried only at 100% compliance with the type approval. A violation of this specification will result in a loss of the type approval!

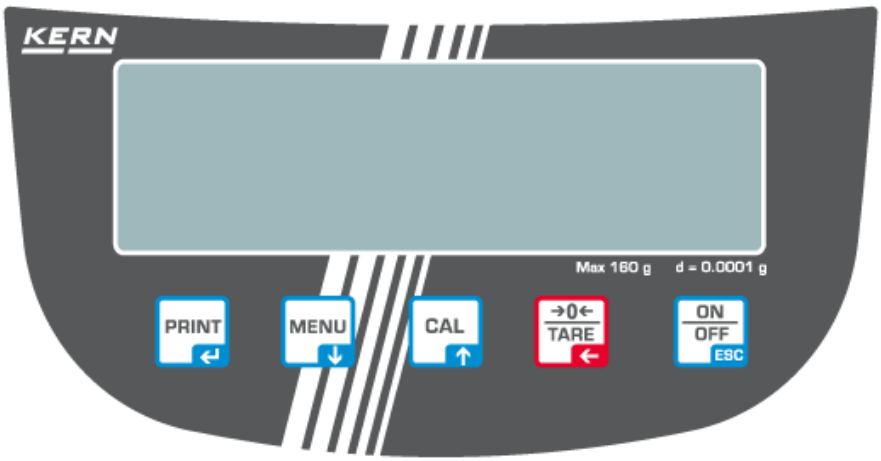
After successful repair the balance will have to be reverified before it can be used again in a statutorily regulated field.

2 Introdution

This service manual covers the PLS/PLJ series and is edited for the authorized servicing personnel.
Note all rights are reserved. Copying any part of this manual is prohibited without our permission.

3 Controls

3.1 Overview of display



3.2 Keyboard overview

Key	Designation	Short key pressing	longtime pressed button until the acoustic signal gets mute
	**MENU** button/	• Call-up application menu • Select menu items – scroll forward	• Call-up user menu • Exit user menu • Switch-over display
	Arrow button ↓	• numerical input – scroll backward	
	**ON/OFF** switch	• Turn on/off • Exit user menu	
	**CAL** button/	• Adjustment • Select menu items – scroll backward	
	Arrow button ↑	• Numerical input – scroll forward	
	**ZERO/TARE** button	• Taring • Zero	
	Arrow button ←	• Numerical input – cipher selection	
	**PRINT** button	• Calculate weighing data via interface • Confirm / store settings	

English

4 Adjustment

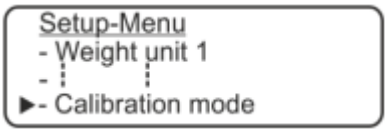
As the standard gravity value is not the same in every spot on Earth, every scale should be adjusted, in line with the weighing rules resulting from the laws of physics, to the standard gravity in the scale location (provided the scale has not already been subject to factory adjustment in its location). Such an adjustment process should be carried out during the first start, following every location change and also in the case of any ambient temperature fluctuations. To ensure achieving accurate measurement date, it is also recommended to carry out regular scale adjustment in the weighing mode.

- Ensure stable environmental conditions. The heating time is required for the stabilization (see chapter 1).
- Ensure there are no objects on the scale plate.
- Adjustment report printout, see chapter.

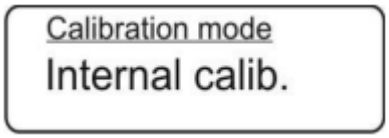
4.1 Adjustment mode selection

⇨ In the weighing mode press and hold the MENU button until the sound signal stops. The configuration menu is displayed.

⇨ Using the navigation buttons □, select the menu item <Calibration mode>.



⇨ Confirm by pressing the PRINT button, the current setting will be displayed.



⇨ Using the navigation buttons (CAL & MENU), select the required setting.



Auto. calibration	Automatic adjustment using the internal weight. Factory setting in the models in the verifiable setting.
Internal calib.	Adjustment using the internal weight after the **CAL** button is pressed. Not available in the models in the verifiable setting.
External calib.	Adjustment using the external weight, not available in the models in the verifiable setting. In models with the internal adjustment weight we do not recommend adjustment using the external weight.
Technical calib.	Changing the weight of the internal calibration weight. Not available in the models in the verifiable setting.

⇨ After the “Internal, external or automatic adjustment” option is selected confirm by pressing the **PRINT** button.
After the “Technical adjustment” option is selected, to confirm press and hold the **PRINT** button until the sound signal stops.
The scale will be switched to the menu again.

⇨ To leave the menu/return to the weighing mode, press and hold the **MENU** button until the sound signal stops.

4.2 Automatic adjustment using the internal weight

Factory setting in the models in the verifiable setting (TPLJG)

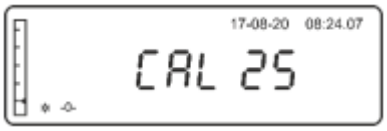
The automatic adjustment using the internal weight is started automatically:

- ⇨ when the scale was disconnected from the mains,
- ⇨ after the **ON/OFF** button is pressed in the stand-by mode,
- ⇨ after the temperature is changed by 1.5 degrees Celsjus for the nonloaded scale plate / zero indication (this prevents adjustment when a series of measurements is performed)
- ⇨ after 20 minutes, for the non-loaded scale plate / zero indication (this prevents adjustment when a series of measurements is performed).

The automatic adjustment function is always on. However, it is always possible to carry out manual adjustment (by pressing the **CAL** button) using the internal weight, see chapter 4.3

Automatic Adjustment course:

The **<Cal 25>** symbol informs about the approaching adjustment.



In that time, the user should finish weighing.

The countdown starting from 25s starts **[CAL 25]** → **[CAL 0]**

During that period of 25s, the adjustment can be stopped and delayed for 5 minutes, pressing the **ON/OFF** button. As a result, the scale will be switched back to the weighing mode, e.g. to complete the ongoing measurement.

English

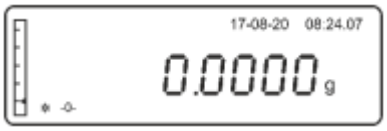
4.3 Adjustment using internal weight after the Model CAL button is pressed (models TPLJG)

Preliminary condition: Menu setting “Internal Adjustment”, see chapter 4.1

⇨ In the weighing mode, press the CAL button, the adjustment will be carried out automatically.



⇨ After the successful adjustment, the scale will switch to the weighing mode again automatically.



⇨ If an adjustment error occurs (e.g. following an impact), the error message “CAL bUt” will appear on the display. Start the adjustment process again, by pressing the **CAL** button.

English

4.4 Adjustment using external weight

- Factory setting in TPLSG models
- In TPLJG models it is available only in the verifiable setting
- Preliminary condition: Menu setting “External adjustment”, see chapter 4.1
- The weight of the recommended adjustment weight, see chapter 1 “Technical Specification”.
- Information on reference weights can be found on the Internet at http://www.kern-sohn.com/

⇨ Ensure there are no objects on the scale plate. In the weighing mode, press the CAL button.



⇨ Wait until the blinking weight value of the required adjustment weight is displayed.



⇨ During blinking, place the required adjustment weight carefully in the middle of the scale plate. The blinking symbol will disappear.



⇨ After the successful adjustment, the scale will switch to the weighing mode again automatically.

⇨ Remove the adjustment weight.

English

4.5 Manual correction of the internal weight LCD version

In these balance models there are 4 calibration modes:

From display zero condition, press and keep pressed the **MENU** button until the acoustic alarm is over, then release the button. The message "**unitS**" will be visualized on display, press then **MENU** button until you visualize "**Calib**" on display. Press **PRINT** to confirm.

1. Select the calibration mode you wish by pressing **MENU** button in sequence:
   - **AUT-CAL:** auto calibration
   - **I-CAL:** internal calibration
   - **E-CAL:** external calibration
   - **TEC-CAL:** technical calibration

2. Press **PRINT** button to confirm **"AUT-CAL", "I-CAL", "E-CAL".**
   To confirm **"TEC-CAL"** keep pressed the **PRINT** button until the acoustic alarm is over.

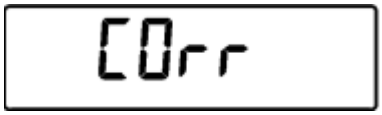
3. After selection, the balance returns to calibration menu. Press and keep pressed **MENU** button until the acoustic alarm is over, then release the button. Balance is again ready for weighing operations.

Technical calibration (TEC-CAL)

4. After having selected the **TEC-CAL** calibration mode, keep pressed the **TARE (3sec)** button. The message **"CAL"** will be displayed and balance calibration will be effected automatically.



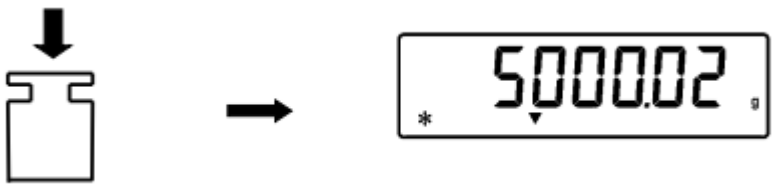
5. Then the message **"Corr"** is displayed. Keep pressed the **ENTER (3sec)** button



6. The display show:

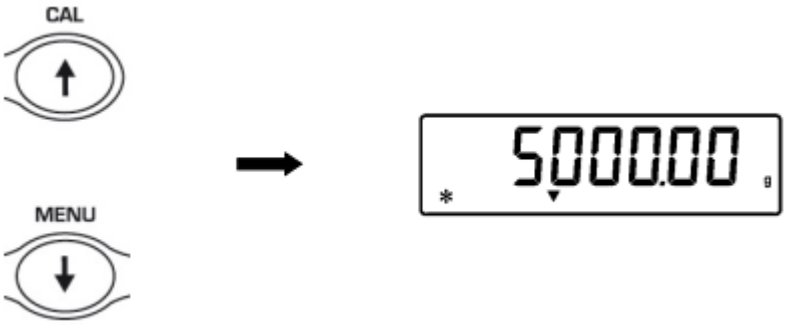


7. Load calibration



English

8. Correct the weight by pressing **CAL** e **MENU** for increase and decrease the value. (Press three times for have 1 digit correction).



9. When the value is correct press PRINT Burron

10. Select automatic calibration mode press CAL button to calibrate the balance and then check if the value of calibration weight is correct.

11. If not, please repeat the operation as explained above.

English

4.6 Correction of internal weight for LCD version

In these balance models there are 4 calibration modes:

From display zero condition, press and keep pressed the **MENU** button until the acoustic alarm is over, then release the button. The message **"unitS"** will be visualized on display, press then **MENU** button until you visualize **"Calib"** on display. Press **PRINT** to confirm.

1. Select the calibration mode you wish by pressing MENU button in sequence:
   - **AUT-CAL:** auto calibration
   - **I-CAL:** internal calibration
   - **E-CAL:** external calibration
   - **TEC-CAL:** technical calibration

2. Press **PRINT** button to confirm **"AUT-CAL", "I-CAL", "E-CAL".**
   To confirm **"TEC-CAL"** keep pressed the **PRINT** button until the acoustic alarm is over.

3. After selection, the balance returns to calibration menu. Press and keep pressed **MENU** button until the acoustic alarm is over, then release the button. Balance is again ready for weighing operations.

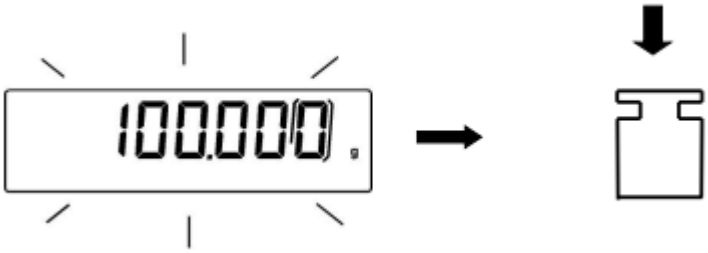
Technical calibration (TEC-CAL)

This function allows to store the value of internal reference mass whenever checking or assistance actions require it.

1. After having selected the **TEC-CAL** calibration mode, press **CAL** button at empty pan. It Will be displayed **"CAL"**

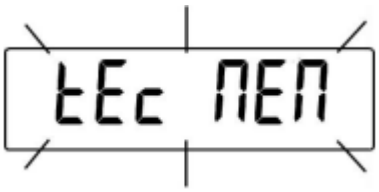


2. When the value of calibration weight starts flashing on display, load the weight on to the balance pan.



3. Wait the acoustic alarm and that the displayed calibration weight value stops flashing, then unload the weight from balance pan.

4. When string **"0.000"** is displayed continuously, then press and keep pressed the **PRINT** button. This starts the internal weight value automatic acquisition and store. During the acquisition cycle, the display will show **"TEC-MEM".**



5. After having stored the value of internal calibration weight, balance returns to normal weighing conditions.

6. Return to calibration menu as described at paragraph 6.2 and set the desired calibration mode: internal, automatic or external.



ATTENTION : this procedure must be effected only using E2-class reference masses.

English

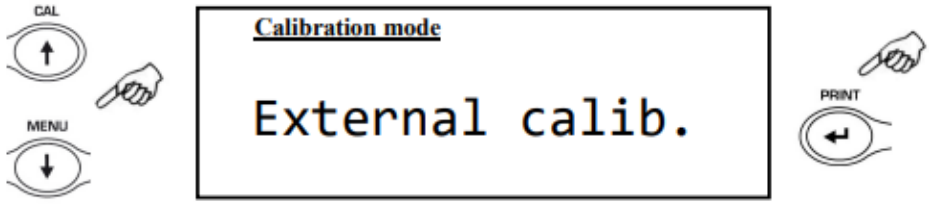
4.7 Manual correction of internal weight for graphic version

Calibration mode setting

This function allows you to set the calibration mode.

***This function is only available for the models equipped with internal calibration (not available for all models).**

1. Select the calibration mode parameter as described in paragraph 10.
   The currently set calibration mode will be shown on the display:



2. Select the desired mode. By pressing the **MENU** or **CAL** buttons it will be possible to scroll the different calibration modes forward or backward:
   - **e.** External calibration
   - **f.** Internal calibration
   - **g.** Automatic calibration
   - **h.** Technical calibration

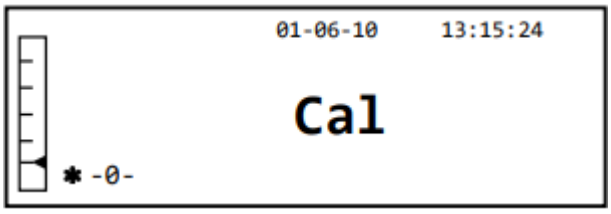
3. Press the PRINT button to confirm **"AUT-CAL", "I-CAL", "E-CAL**".
   To confirm "**TEC-CAL**", keep the **PRINT** button pressed until the beeping stops.

4. The screen relative to the balance parameters menu will then be displayed. It will now be possible to select another parameter or return to weighing mode by pressing the **ON/OFF** button.

Technical Calibration (TEC-CAL)

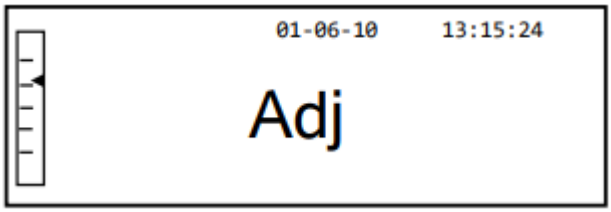
This function allows the internal reference mass to be calibrated whenever assistance-control-maintenance interventions make this necessary.

5. After having selected the **TEC-CAL** calibration mode, keep pressed the **TARE (3sec)** button with the plate empty. The word **"CAL"** will be shown and balance calibration will be effected automatically

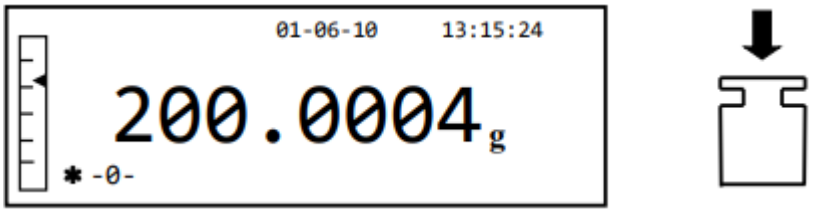


6. Then **"Adj"** is displayed

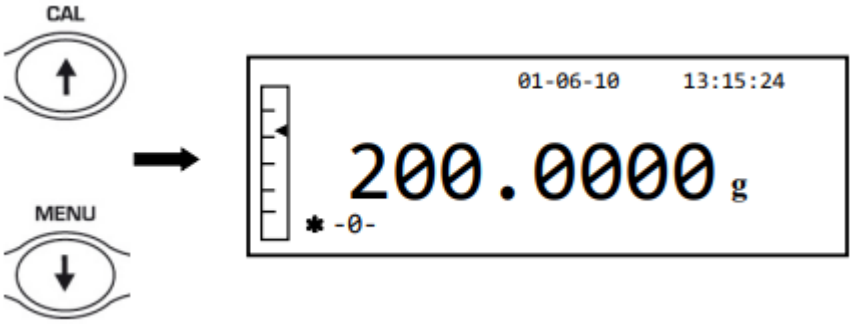
7. Press and keep pressed the **“ENTER”(3sec)** button



8. The Display shows **“0,0000”**
9. Load calibration weight



10. Correct the weight by pressing CAL e MENU for increase and decrement the value (Press three times for have 1digit correction).



11. When the value is correct press the **PRINT** button.

12. Select automatic calibration mode press **CAL** button to calibrate the balance and then check if the value of calibration weight is correct.

13. If not correct, please repeat the operation as explained above.

WARNING: this procedure must be carried out only using class E2 reference masses.

English

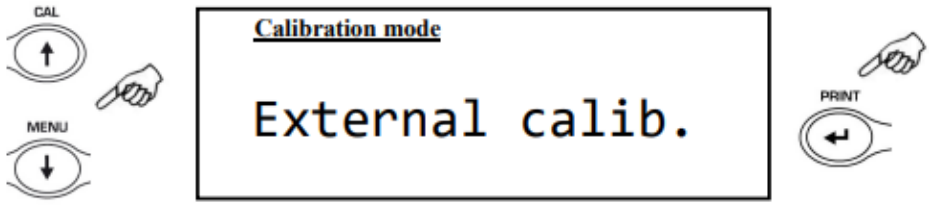
4.8 Correction of internal weight for graphic version

Calibration mode setting

This function allows you to set the calibration mode.

***This function is only available for the models equipped with internal calibration (not available for all models).**

1. Select the calibration mode parameter as described in paragraph 10.
   The currently set calibration mode will be shown on the display:



2. Select the desired mode. By pressing the **MENU** or **CAL** buttons it will be possible to scroll the different calibration modes forward or backward:
   - **i.** External calibration
   - **j.** Internal calibration
   - **k.** Automatic calibration
   - **l.** Technical calibration

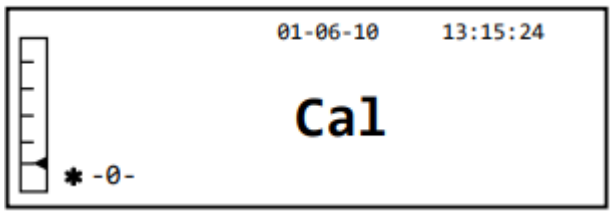
3. Press the PRINT button to confirm **"AUT-CAL", "I-CAL", "E-CAL**".
   To confirm "**TEC-CAL**", keep the **PRINT** button pressed until the beeping stops.

4. The screen relative to the balance parameters menu will then be displayed. It will now be possible to select another parameter or return to weighing mode by pressing the **ON/OFF** button.

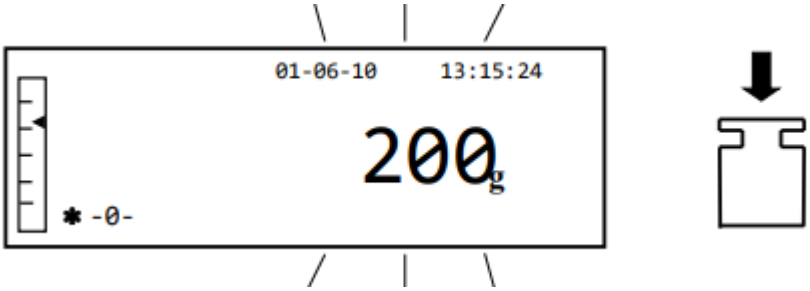
Technical Calibration (TEC-CAL)

This function allows the internal reference mass to be calibrated whenever assistance-control-maintenance interventions make this necessary.

5. After having selected the **TEC-CAL** calibration mode, press the **CAL** button with the plate empty. The word **"CAL"** will be displayed.

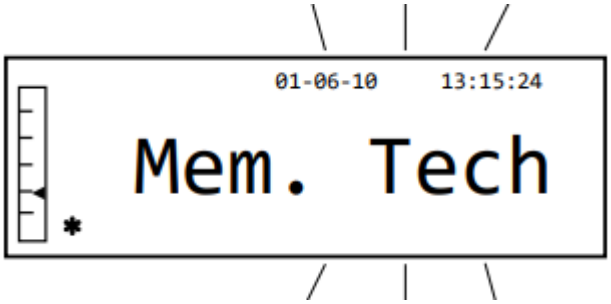


6. When the value of the calibration weight begins to flash, load the calibration weight on the plate.



7. Wait for the calibrated weight to be displayed and the stability symbol to turn on, and then remove the weight from the plate.

8. When **"0.000"** is shown on the display, press the **PRINT** button in a prolonged manner until the beeping stops. The acquisition and automatic storage of the internal weight will now begin. During the acquisition cycle, the display will show the following flashing writing:



9. Once the internal calibration has been stored, the balance will return to the normal weighing condition.

10. Now re-enter the calibration menu as described in paragraph 9.1.12 and set the desired internal, automatic, or external calibration modality.

WARNING: this procedure must be carried out only using class E2 reference masses.

English

4.9 Adjustment models PLJ-M

Menu settings

In weighing mode press the **MENU** button and keep it pressed until the acoustic signal gets mute. The first menu item „units“ is displayed.

Press **MENU** button repeatedly until „calib“ appears and confirm using **PRINT** button.

Use the **MENU** key to choose between the following settings:

AUT-CAL	Automatic adjustment with internal weight. Factory setting for models with type approval.

Take over selection using the **PRINT** button.
The balance returns to menu.

To finish the menu press the **MENU** button and keep it pressed until the acoustic signal gets mute. The balance returns automatically into weighing mode.

English

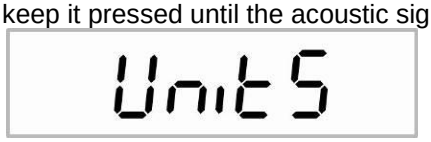
4.10 Overwrite internal adjustment weight

(Models with settings not appropriate for verification only)

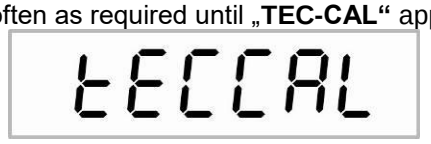
! Overwriting is restricted to specialist staff possessing well acquainted with the workings of weighing scales.



⇨ Press the **MENU** button and keep it pressed until the acoustic signal gets mute.



⇨ Press the **MENU** button as often as required until „**CAlib“** appears
⇨ Operate the **PRINT** key
⇨ Press the **MENU** button as often as required until „**TEC-CAL“** appears



⇨ Press the **PRINT** button and keep it pressed until the acoustic signal gets mute.



⇨ Press the **MENU** button and keep it pressed until the acoustic signal gets mute. The balance changes automatically into weighing mode
⇨ Ensure that there is no load on the weighing plate
⇨ Press the **CAL** key



Wait until the exact value of the adjustment weight will be shown flashing



(Example)

⇨ Place the displayed adjusting weight on the weighing plate.
The flashing display extinguishes and the balance changes into weighing mode.

⇨ Remove adjustment weight from weighing plate
⇨ Press the **PRINT** button and keep it pressed until the acoustic signal gets mute.
The calibrating process is started

During this process „**tEc MEM**“ is displayed

English

After having automatically saved the value of the internal adjustment weight, the balance will return into weighing mode.

⇨ Carry out the adjustment process as described in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**

5 Problem and solution for load cell balances.

Fault	Possible cause	Service Table
The weight does not stabilize.	Dirt inside the magnet. Bandy flexures	Mechanical group service (Clear the magnet) Mechanical group service (change flexures)
The weight indication remains locked at "0.00"	Clear linearization value. Verify that the load cell is not bent and the end stop don't touch the basament. A/D converter fail.	Function linearity load cell Change load cell Check electrical signals on the motherboard
The display is not readable	No power signal.	Change the display Check electrical signals on the motherboard
Display doesn't work correctly	Verify connection of 26 poles cable. Verify power signal. Change display board.	Change_display Check_main_board_signals_LC Change_display
Keyboard fail/ At power on if balance beeps.	Verify connection of 14 poles cable. Change keyboard.	Change_Keyboard
Corner load error	Regulated corner load error. Load cell damage	Corner load cell Change load cell
Linearity error	Regulated linearity error. Load cell damage.	Function linearity load cell Change load cell
The date and time does not remain updated	Low battery (Only for version with graphic display)	Change Time/Date battery
The internal calibration motor does not run.	The motor is burned. (For internal calibration models only)	Replace the calibration motor.

6 Change load cell series 0.001g – 0.01g – 0,1g.

1. Remove the balance top cover.

For version with windshield with three sliding glasses.

- Remove the two fixing screws of the stainless steel plate.
- Remove the screw located on the front of the cover.




For version with circular windshield.

- Remove the screw located in the front part of the base for windshield.



For version with round plate without windshield.

- Remove the screw located at the front of the circular stainless steel plate.



For version with square plate.

- Remove the screws that secure the plate, and screw under the plate
- Remove adjustable and fix rear feet
- Remove the bush from the hole.
-






English

2. Remove now four screws under the balance.
3. Remove flat cable of keyboard.





4. Remove the display (remove four screws, cable of display and keyboard) and the board shield.

Display version lcd





Display version graphic

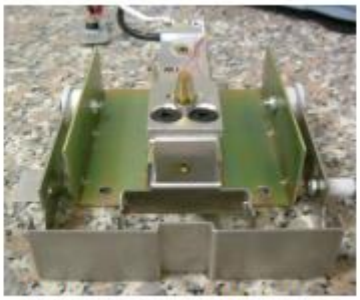
5. Unsolder cable of load cell.
6. Remove the cover shield of load cell.





7. After removing the plate, unscrew the three screws positioned in the lower part of the base to remove the load cell.





With internal calibration



Without internal calibration

Disassemble Load cell

1. Remove load cell from the support, and remove the cone support





2. Remove temperature sensor with board from the load cell.



Now you can assemble the new load cell.

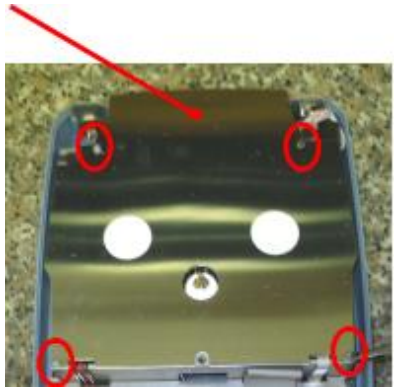
3. Attach temperature sensor and board to the load cell.
4. Attach the cone support to load cell and, fix the load cell to the support.
5. Attach load cell's support to the base of balance.
6. Connect sensor temperature and sold load cell's cable.
7. Attach the display and the board shield.
8. Check and regulate corner load error and linearity.
9. Attach the load cell shield.
10. Fix the cover of balance

English

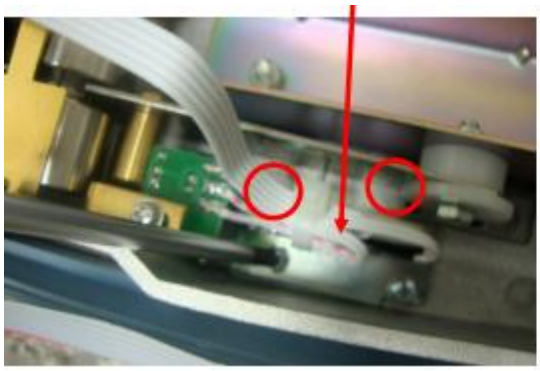
6.1 Motor replacement for self-calibration

(Only for models equipped with auto-calibration system)

1. To replace the motor, the cover of the scale, display and board shield must be removed. (See p. 12).
2. Remove the cover shield of load cell.



3. Remove the two screws that secure the motor unit to the base and remove the connector.

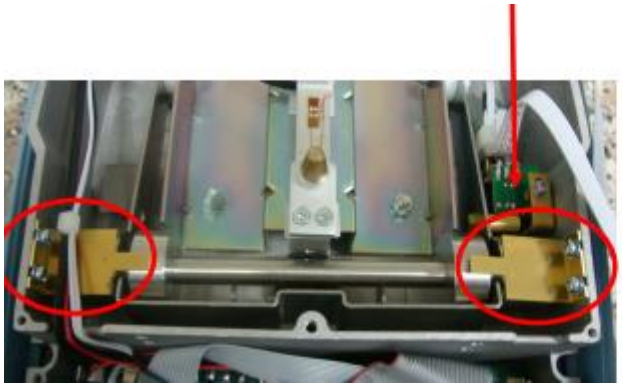


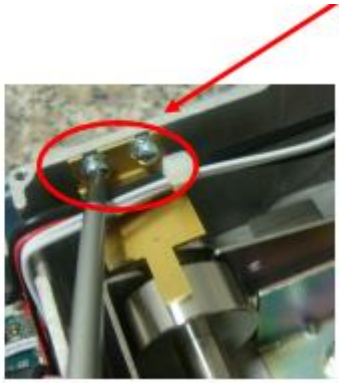


4. Place the new motor assembly and secure it with two screws and insert the connector.

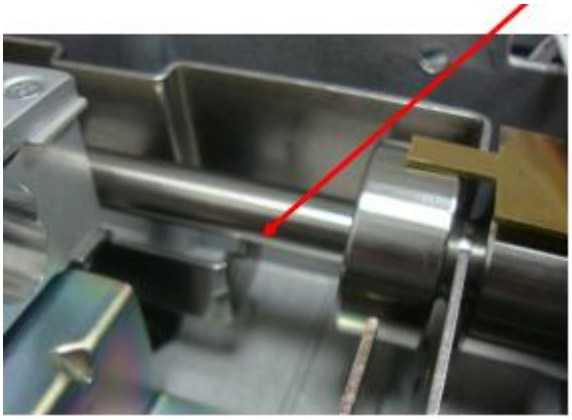


5. Check that the position of the weight locking springs is correct. When the weight is all the way up, the springs must touch the weight. If necessary, adjust using the screws indicated.

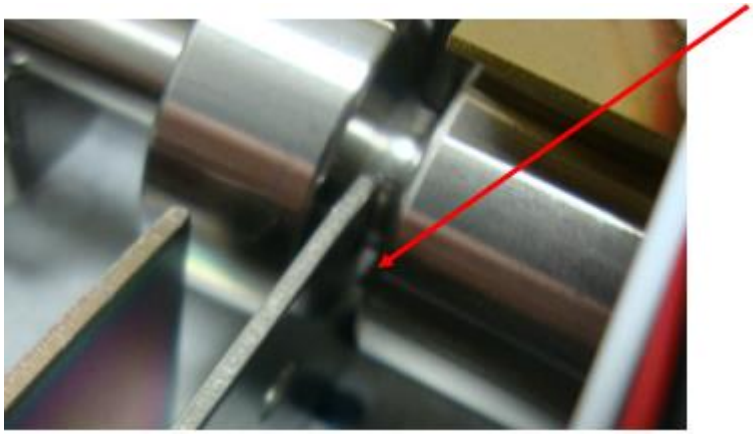




6. Check that the weight when in the high position does not touch the support fixed to the Load cell.



7. While when the weight is in the low position it must not touch the weight lifting arms.



Now you can:

8. Attach the display and the board shield.
9. Attach the load cell shield
10. Fix the cover of balance

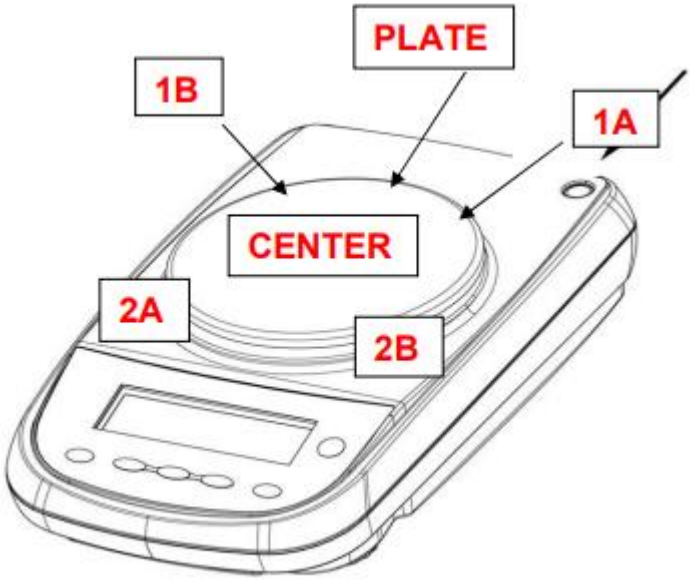
6.2 Corner load regulation for model with round plate

To adjust the angles, the cover of the scale must be removed. (See page 20).

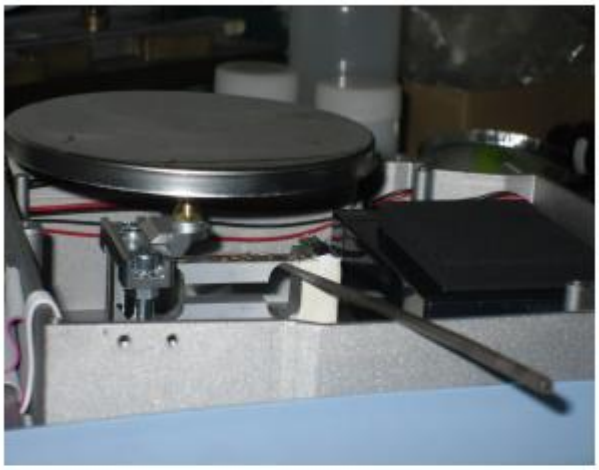
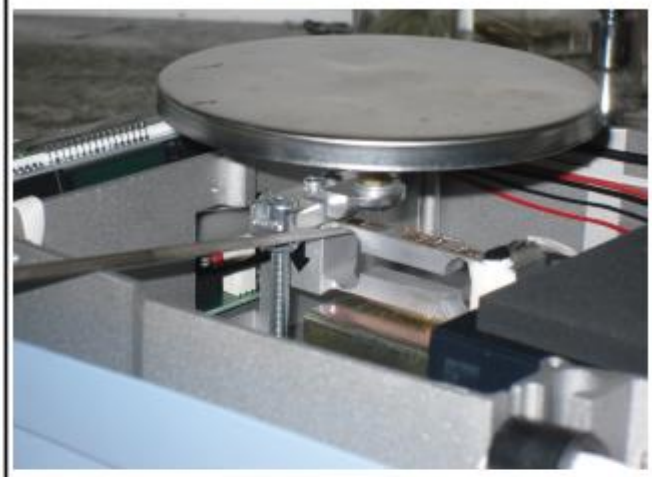
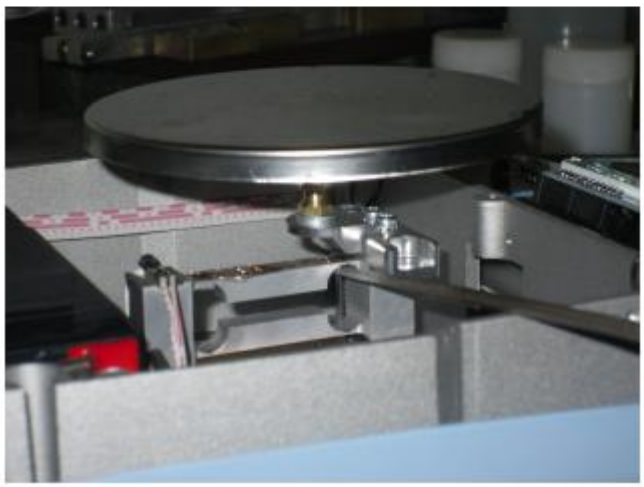
1. Remove the cover shield of load cell



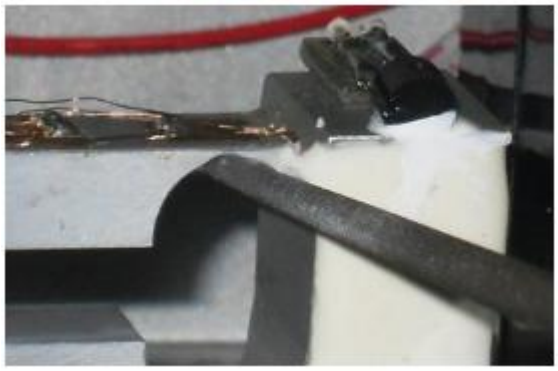
2. Put the weight (1/3 of max range) to check in the center of the plate, and press tare.
3. Move the weight in the point 2A, read and write down the value.
4. Move the weight in the center and press tare.
5. Move the weight in the point 2B, read and write down the value.
6. Take the tool and regulate as illustrated in the table below



English

IF 2A POSITIVE (+) THEN SCRATCH SIDE 1A (Rear Right of load cell) 	**IF 2A NEGATIVE (-) THEN SCRATCH SIDE 2A** (Front Right of load cell) 
IF 2B POSITIVE (+) THEN SCRATCH SIDE 1B (Rear Left of load cell) 	**IF 2B NEGATIVE (-) THEN SCRATCH SIDE 2B** (Front Left of load cell) 

<u>Attention:</u> scratch only the upper side.



<u>Attention:</u> if the corner 1A or 1B can not corrected, check if the load cell is ok.

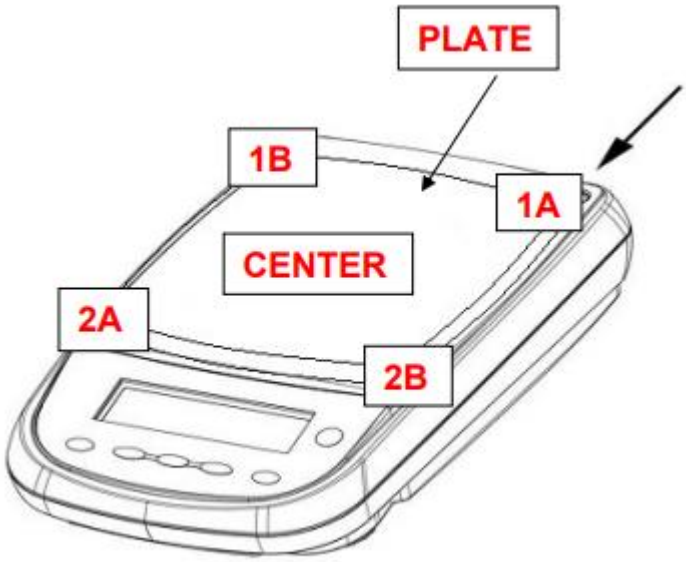
6.3 Corner load regulation for model with square plate

To adjust the angles, the cover of the scale must be removed. (See page 20).

1. Remove the cover shield of load cell.



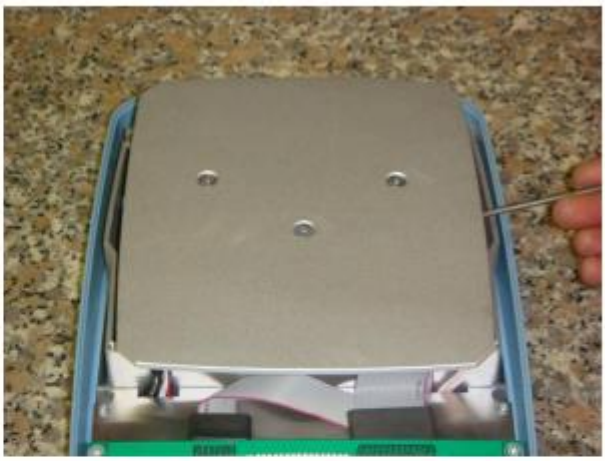
2. Put the weight (1/3 of max range) to check in the center of the plate, and press tare.
3. Move the weight in the point 2A, read and write down the value.
4. Move the weight in the center and press tare.
5. Move the weight in the point 2B, read and write down the value.
6. Take the tool and regulate as illustrated in the table below



IF 2A POSITIVE (+) THEN SCRATCH SIDE 1A
(Rear Right of load cell)



IF 2A NEGATIVE (-) THEN SCRATCH SIDE 2A
(Front Right of load cell)



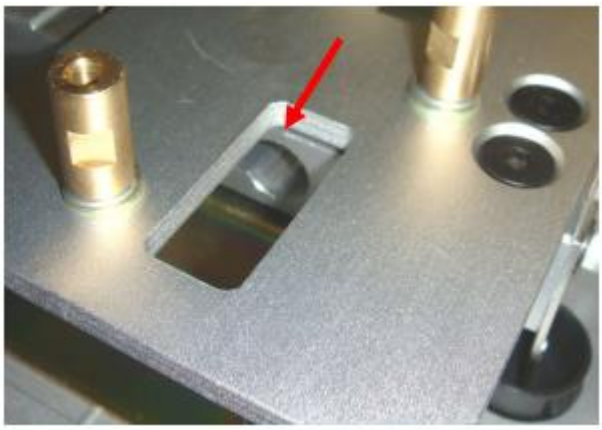
IF 2B POSITIVE (+) THEN SCRATCH SIDE 1B
(Rear Left of load cell)

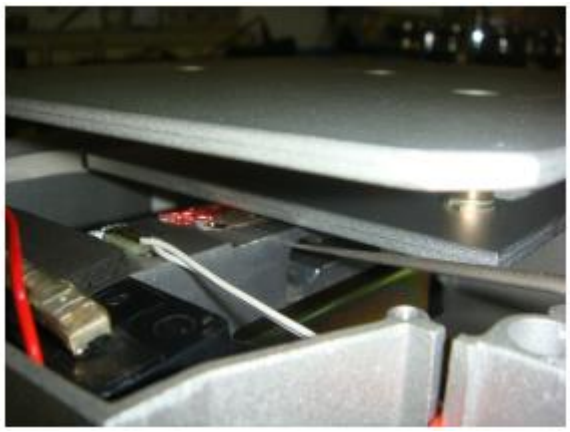


IF 2B NEGATIVE (-) THEN SCRATCH SIDE 2B
(Front Left of load cell)



<u>Attention:</u> scratch only the upper side.





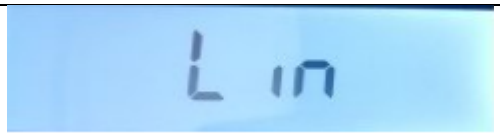
<u>Attention:</u> if the corner 1A or 1B can not corrected, check if the load cell is ok.

7 Procedure for linearize LCD balances.

Check that the instrument is level. If necessary, adjust the feet until the bubble indicator is correctly positioned.

Switch on balance and **after 2 hours press ON/OFF button**.

When the display shows the weight indication ("0.0") Press sequentially buttons ON/OFF - CAL – CAL.

	You will see "**Lin"** on display, press **ENTER** to confirm
	The display show on the left number “1” with plate empty, wait stability and after 3 seconds press **CAL** to confirm.
	When the balance and show to number 2 on the left put first weight, (according to the table weight for linearity) wait stability and after 3 seconds press **CAL** to confirm
	When the balance and show to number 3 on the left put second weight, wait stability and after 3 seconds press **CAL** to confirm
	When the balance and show to number 4 on the left Put third weight, wait stability and after 3 seconds press **CAL** to confirm
	After this point, press CAL and keep it pressed until the display show number 3 on the left and “L” on the bottom of the display Now remove the last weight loaded on the pan, wait stability and press **CAL** button.
	When the balance and show to number 2 on the left remove second weight loaded on the plate, wait stability and after 3 seconds press **CAL** to confirm
	When the balance and show to number 1 on the left remove first weight loaded on the plate, wait stability and after 3 seconds press **CAL** to confirm Now the pan is unloaded.

The Balance restarts automatically.

Press **On/Off** key and after calibrated the balance and check the linearity.

<u>Attention:</u> when you do linearity in "up and down mode" load incremental weights as shown in the table weights. For example load 2000g then add another 2000g and so on as you reach the last value, and then unload the weights in reverse order.

Clear the linearity and calibration value:

1. Switch on the Balance
2. Press sequentially buttons **ON/OFF – CAL – CAL**.
3. You will see **"Lin"** on Display, press **ENTER** to confirm.
4. The Display shows on the left number "1" press **MENU** and keep it pressed until the Display shows **CLEAR**.

8 Procedure for linearize Graphic balances.

Check that the instrument is level. If necessary, adjust the feet until the bubble indicator is correctly positioned.

Switch on balance and **after 2 hours press ON/OFF button**.

When the display shows the weight indication ("0.0") Press sequentially buttons ON/OFF - CAL – CAL.

	You will see "Service Menu" on the display, and you see the arrow next to "Linearity" Press ENTER key to confirm
	The display show on the “Weight: 01 UP” with plate empty wait stability and after 3 seconds press CAL to confirm.
	When the balance show “Weight: 02 UP put first weight, (according to the table weight for linearity) wait stability and after 3 seconds press CAL to confirm.
	When the balance shows “Weight: 03 UP put second weight, (table weight for linearity) wait stability and after 3 seconds press CAL to confirm.
	When the balance show “Weight: 04 UP put third weight, (table weight for linearity) wait stability and after 3 seconds press CAL to confirm.
	When the balance and show “Weight: 05 UP” press CAL and keep it pressed until the display show “Weight: 03 DW”
	Now remove the last weight loaded on the pan, wait stability and press CAL button.
	When the balance shows “Weight: 02 DW” remove the second weight loaded on the pan, wait stability and press CAL button.
	When the balance shows “Weight: 01 DW” remove the first weight loaded on the pan, wait stability and press CAL button Now the pan is unloaded.

The Balance restarts automatically.

Press On/Off key and after calibrated the balance and check the linearity.

<u>Attention:</u> when you do linearity in "up and down mode" load incremental weights as shown in the table weights. For example load 2000g then add another 2000g and so on as you reach the last value, and then unload the weights in reverse order.

Clear the linearity and calibration value:

1. Switch on the Balance
2. Press sequentially buttons **ON/OFF – CAL – CAL**.
3. You will see **"Lin"** on Display, press **ENTER** to confirm.
4. The Display shows on the left number "1" press **MENU** and keep it pressed until the Display shows **CLEAR**.

9 Table of weights for linearity.

RANGE(g)	RES.(g)	Weights for linearity Up	Weights for linearity Down
160	0.001	0-50g-100g-150g	150g-100g-50g-0
210	0.001	0-70g-140g-210g	201g-140g-70g-0
310	0.001	0-100g-200g-300g	300g-200g-100g-0
150/310	0.001/0,01	0-100g-200g-300g	300g-200g-100g-0
420	0.001	0-140g-280g-420g	420g-280g-140g-0

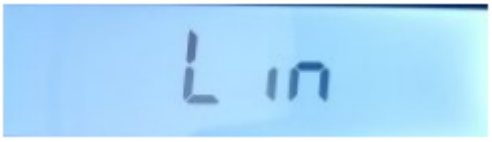
RANGE(g)	RES.(g)	Weights for linearity Up	Weights for linearity Down
1000	0.01	0-300g-600g-900g	900g-600g-300g-0
1500	0.01	0-500g-1000g-1500g	1500g-1000g-500g-0
2200	0.01	0-700g-1400g-2100g	2100g-1400g-700g-0
3100	0.01	0-1000g-2000g-3000g	3000g-2000g-1000g-0
4200	0.01	0-1400g-2800g-4200g	4200g-2800g-1400g-0
5200	0.01	0-1700g-3400g-5100g	5100g-3400g-1700g-0

RANGE(g)	RES.(g)	Weights for linearity Up	Weights for linearity Down
4500	0.1g	0-1500g-3000g-4500g	4500g-3000g-1500g-0
5200	0.1g	0-1700g-3400g-5100g	5100g-3400g-1700g-0
6500	0.1g	0-2100g-4200g-6400g	6400g-4200g-2100g-0
8000	0.1g	0-2500g-5000g-7500g	7500g-5000g-2500g-0
10000	0.1g	0-3000g-6000g-9000g	9000g-6000g-3000g-0
12000	0.1g	0-4000g-8000g-12000g	12000g-8000g-4000g-0
16000	0.1g	0-5000g-10000g-15000g	15000g-10000g-5000g-0
20000	0,1g	0-6500g-13000g-19500g	19500g-13000g-6500g-0

10 Check value A/D LCD balances.

Switch on balance.

When the display shows the weight indication. Press sequentially buttons **ON/OFF - CAL – CAL**.

	You will see **"Lin"** on display
	Press MENU key for two time and you will see **"A-d"** on display Press ENTER key to confirm
	The **A/D value** must be bigger than “0,05mV” without any weight loaded on the plate

11 Check value A/D Graphic balances.

Switch on balance.

When the display shows the weight indication. Press sequentially buttons **ON/OFF - CAL – CAL**.

	You will see "Service Menu" on display Press MENU key for two time and when you see the arrow next to **"A/D Value**". Press **ENTER** key to confirm
	The **A/D value** must be bigger than “0,05mV” without any weight loaded on the plate.

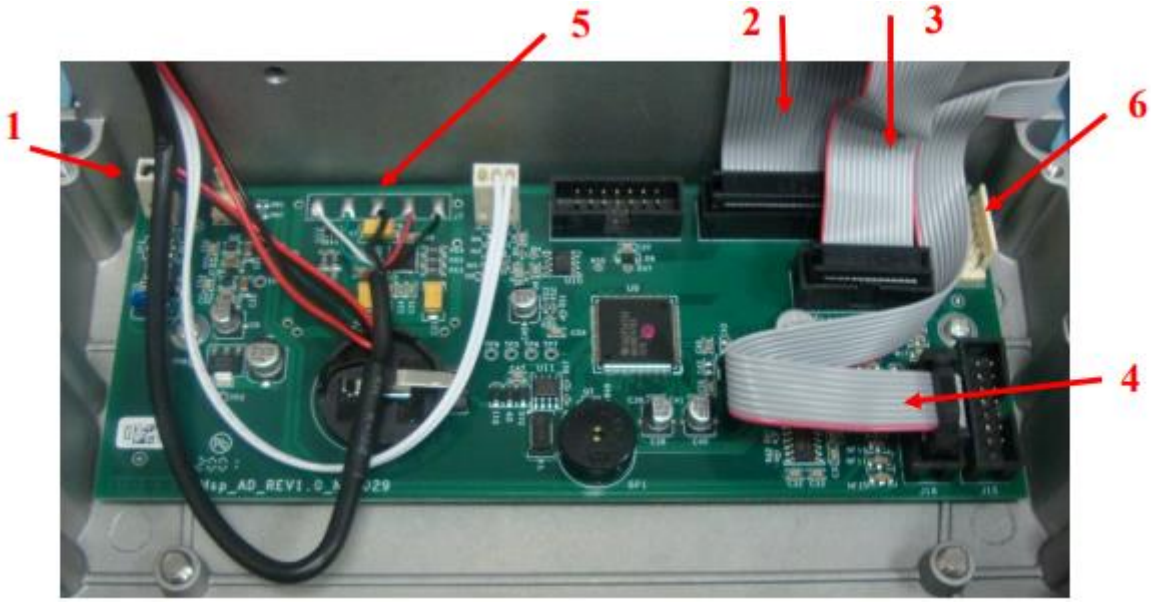
12 Change of main board

When replacing the motherboard, when ordering it is necessary to provide the data shown on the bar code label inside the instrument.



1. Remove the cover of balance, display and cover shield of board.(to see page 20)

2. Disconnect cables of power(1), display(2), keyboard(3), RS232(4), load cell(5) and motor(6) if present.



3. Remove main board. (Remove four screws)

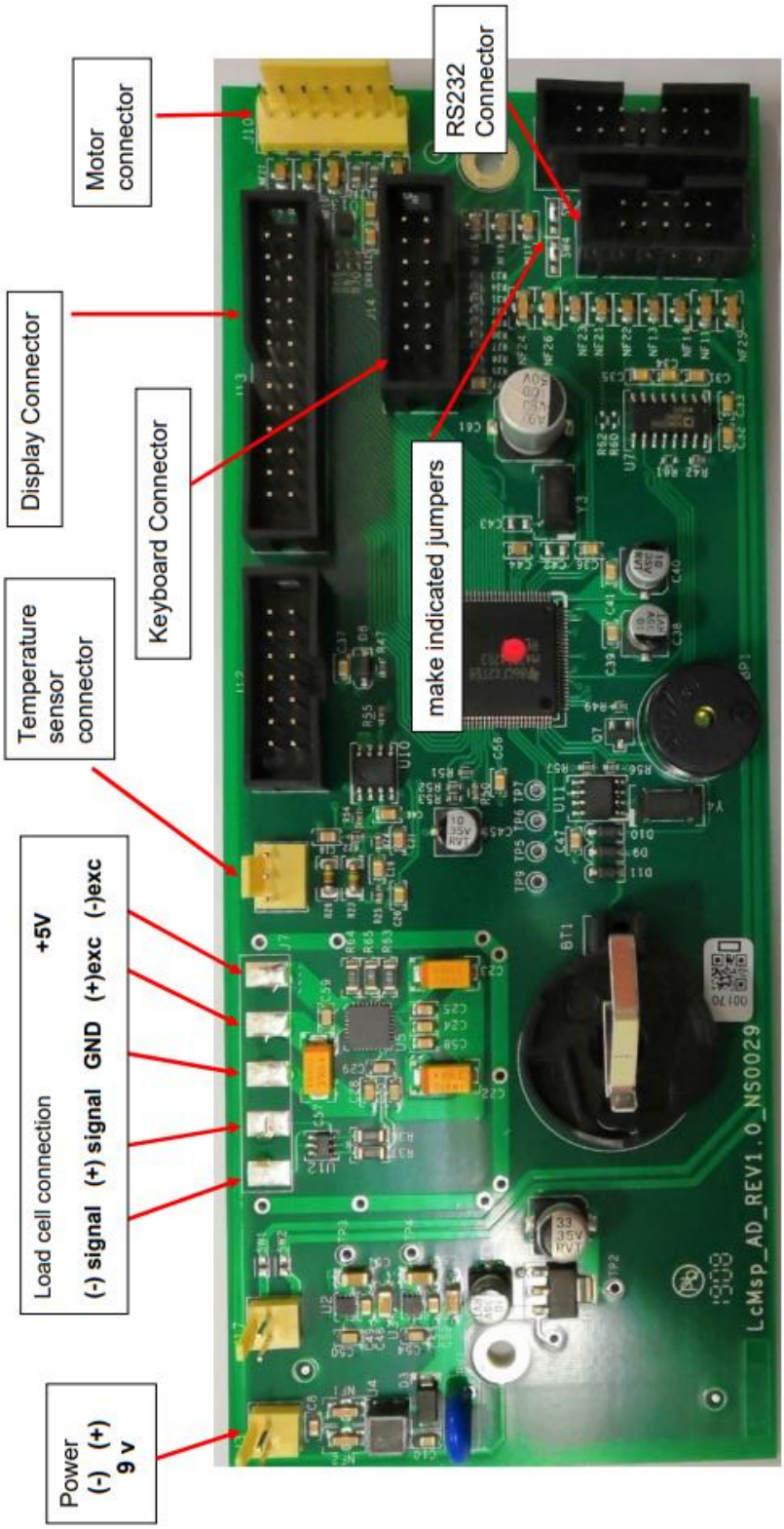


Now you can install the new main board.

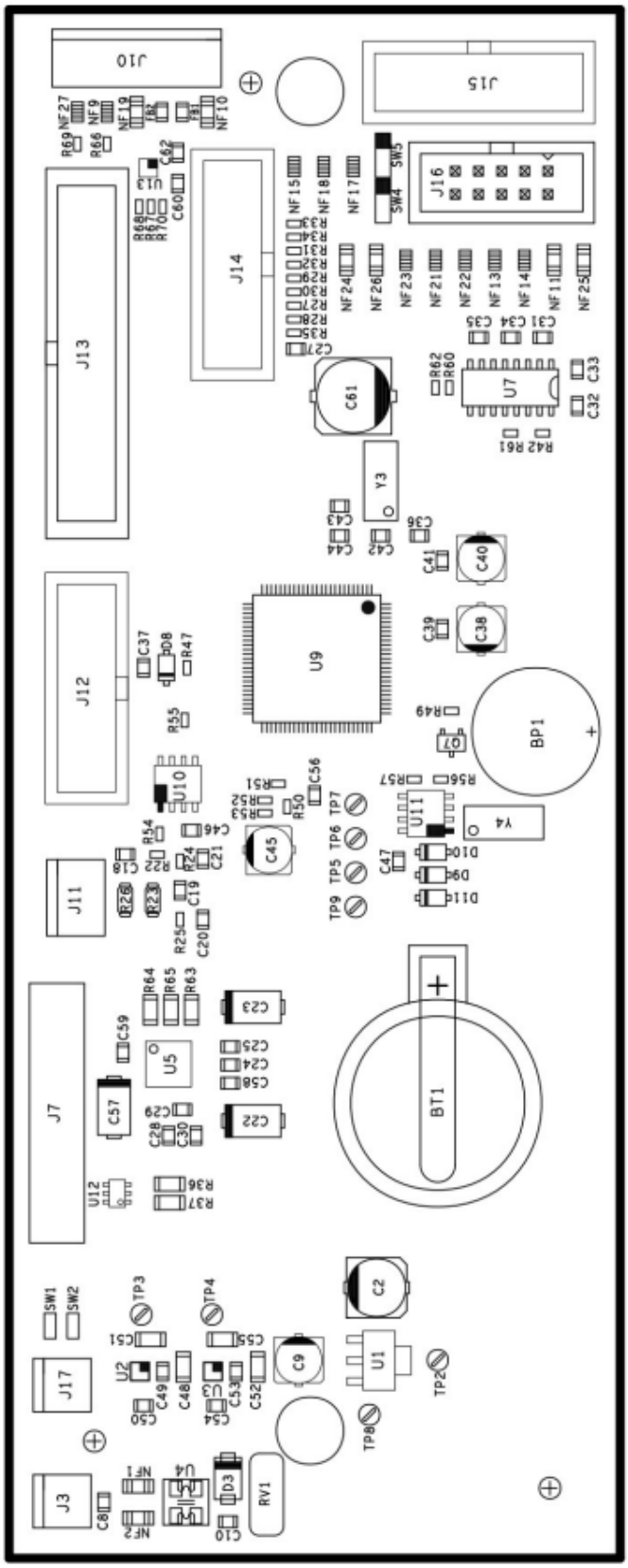
4. Attach the mainboard.
5. Connect cables of power(1), display(2), keyboard(3), RS232(4), load cell(5) and motor(6) if present.
6. Attach cover shield of board and display
7. Attach the cover of balance.
8. Check the power supplies and the A/D value are correct.
9. Check and if necessary regulate linearity and calibration.

12.1 Check of main board signals.

Model board: LCMsp_AD_rev_1.0 Code NS0029 for version LCD and Graphic. (Only difference between the LCD and Graphics version is the software.)



12.2 Position components of main board.



12.3 Test point check

Modality tester	Number test point		Value	If value is not correct
V DC	J3 Pin2 (-)	J3 Pin1 (+)	+ 9 Volt DC	Check Power supply
V DC	(J7) GND (-)	Tp3 (+)	+ 5 Volt DC	Check LM2940 (U2)
V DC	(J7) GND (-)	Tp4 (+)	+ 3,3 Volt DC	Check LM3940 (U3)
V DC	(J7) EXC (-)	(J7) EXC (+)	+ 5 Volt DC	Check LM2940 (U2)
mV DC	(J7) EXC (-)	(J7) EXC (+)	With unload plate > 0,05 mV	Check load cell
mV DC	(J7) SIGNAL (-)	(J7) SIGNAL (+)	With maximum range on plate < +5 mV	Check load cell

13 Change date and time battery, only for Series graphic.

1. Remove the cover of balance (to see page 20).
2. Remove display. (Remove four screws)



3. Replace the exhausted battery, with a new battery model CR2032 3V

