OPERATORS MANUAL
RPW-310-EL

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Rev.20180612

OPERATION MANUAL
RPW-310-EL

INDEX **page**

1. **Safety Instructions** 3
2. **The Weighing Electric Pallet Truck** 4
3. **Touch Panel Indicator** 6
4. **Indicator Functions** 8
5. **Printer (Option)** 12
6. **Relay (Option)** 13
7. **Trouble Shooting.** 17
8. **Calibration** 21
9. **Parameter Settings** 23

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1. SAFETY INSTRUCTIONS

1. All safety regulations that apply on the electric pallet truck remain valid and unchanged

2. No weighing operation is allowed while others are on or near the load.

3. No weighing operations allowed if any objects are in the vicinity; around, or close to the load.

4. RAVAS is not responsible for physical harm done to the operator because of the presence of the indicator.

5. Any modifications done to the system must be approved in writing from the supplier, prior to any work being completed.

6. It is the sole responsibility of the purchaser to train their own employees in the proper use and maintenance of this equipment.

7. Do not operate this unit unless you have been fully trained of its capabilities.

8. Do not use the weighing system in potentially explosive areas.

9. Do not weld to the lift truck without disconnecting the pressure sensor.

10. Check the accuracy of the scale on a regular basis to prevent faulty readings.

11. Only trained and authorized personnel are allowed to operate the scale.

12. Always follow the operating, maintenance and repair instructions of this truck and ask the supplier when in doubt.

13. Never lower loads if you are unsure you can place the goods on a stable surface. Personal injury may result from placement on an unstable environment.

14. RAVAS is not responsible for errors that occur due to incorrect weighings or inaccurate scales.

2. THE WEIGHING ELECTRIC PALLET TRUCK

TAKING THE SYSTEM INTO OPERATION

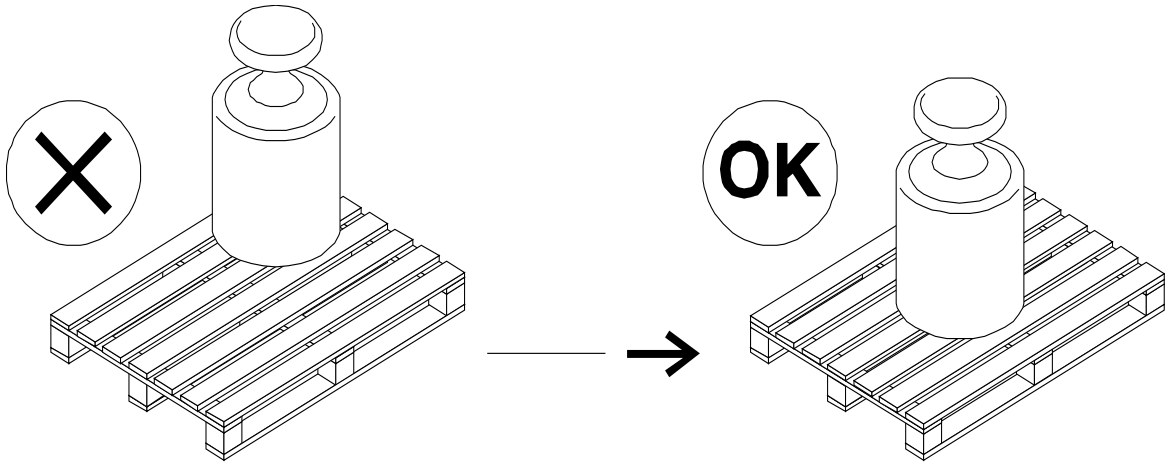
The power supply to the weighing system takes place through the battery of the electric pallet truck.

To activate the system, turn it on using the on/off (①) key on the indicator.

It is recommended not to lift loads before the zero point correction has been executed. (See page 9)

Accurate Weighing

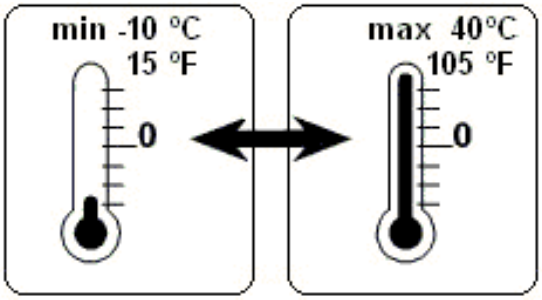
The weight must be centered over the forks of the pallet truck and be able to lift freely: without touching the electric pallet truck or other pallets. The wheels of the electric pallet truck must not be touching the pallet or any other part of the load.



The RPW-310-EL comes equipped with a level switch. This means that when the system is tilted by greater than 2º the indicator will automatically shut off. An uneven floor will have a greater effect on weighing ability. An even floor is optimal.

The most accurate weighing result is obtained when the center of gravity of the load is placed evenly between the forks.

TEMPERATURE



Temperature range: between 15 – 105 ºF (-10 - +40 ºC) the maximum inaccuracy is 0.1% of the weighed load. Outside this range inaccuracies of up to 0.3% may occur.

Fast temperature changes must be avoided because it can cause condensation in the electronics. During acclimatization the weighing system must be shut off.

MAINTENANCE

The maintenance guidelines for normal electric pallet trucks apply to the chassis of the mobile weighing system. The integrated weighing system still functions even when the chassis is damaged by overloading. Care should be taken to prevent damage to the load cells.

Main guidelines:

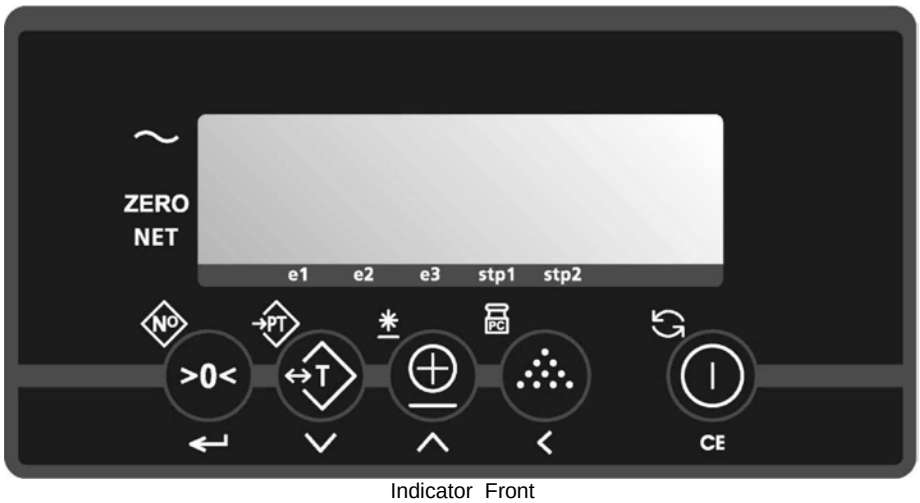
- Clean only with a damp cloth. Chemical cleaners and high pressure washers will cause damage to the system. System should be cleaned regularly to remove any accumulating dirt between the parts of the system.

- Check bolts regularly. When used roughly, they may loosen.

- The weighing system meets up to the protection class IP65. This means that dust or moisture (rain or water beam from all sides), will not influence the operation of the electronics. However, high-pressure cleansing in combination with warm water or chemical cleansers will lead to the entry of moisture and therefore negatively influence the operation of the system.

- Only specialists may perform any welding. This is to avoid damage to electronics and load cells.

3. TOUCH PANEL INDICATOR



Indicator Front

There are 3 display-modes.
The display may show the weight in kgs, lbs or it shows the number of pieces.
Also the battery sign is integrated in the display in order to show low battery status.

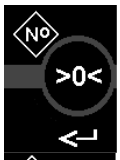
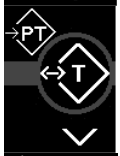
THE DISPLAY

By means of eight pointer bars the display shows:

~	◀	the weighing system (including load) is stable
	▬	the weight shown is negative
ZERO	◀	the weight shown is within the zero range
NET	◀	the display is showing the net weight
e1	▼	displayed weight is in range 1
e2	▼	displayed weight is in range 2
e3	▼	displayed weight is in range 3
stp1	▼	setpoint 1 is activated
stp2	▼	setpoint 2 is activated

THE TOUCH PANEL

Each key has 2 operational and one entry function

Key	Function level 1 (short key press)	Function level 2 (long key press)	Function level 3 (entry mode)
	zero setting	code entry	enter
	automatic tare	pre-set tare	decrease the value of the digit flashing
	print weight and add to the total	check subtotal and print total	increase the value of the digit flashing
	sampling a piece weight	enter a piece weight	shift to the next digit on the left
	on/off switch	toggle units	clear entry

IMPORTANT

Operation of a key is not accepted unless the weighing system is stable (and the “load stable” pointer lights up). This means that the indicator only executes commands with a stable load.

WARNING

When the weighed load surpasses the pre-set maximum, the display shows: “ERR02”. In order to prevent damage to the indicator or load cells, the weighing system must be unloaded immediately.

4. INDICATOR FUNCTIONS

GRADUATION

The indication is shown in 2 lb steps.

BEFORE WEIGHING: CHECK ZERO POINT

Before each weighing it is necessary to check whether the system is unloaded and free. The indicator is fitted with an automatic zero correction. This means that small deviations of the zero point will be corrected automatically. If the indicator does not determine the zero point automatically, it must be done manually using the >0< key.

GROSS WEIGHING

After lifting a load, the display shows the gross value of the weighed load.

NET WEIGHING: AUTOMATIC TARE

The indicator offers the possibility to reset tare weights to zero automatically. This way added or subtracted weights can be determined. After taring, the graduation on the display will not change.

- Lift load.
- Press the ⇔T key.
  - The indicator is set to zero.
  - The "NET" pointer shows that a tare weight is activated.
- Place or remove the net load.
  - The display shows the net value of the weighed load.
  - When removing load, this is a negative value.
- By pressing the ⇔T key again, the gross weight is displayed.

NET WEIGHING: MANUAL TARE ENTRY

A tare weight can be entered at any moment, either in a loaded or unloaded situation. For a higher accuracy, a tare weight can be entered with a smaller graduation step, independent of the applied load and the active graduation of the indicator.

- Press the →PT key for 3 seconds.
  - The display shows the current tare value.
  - The right digit is flashing.
- Press ENTER(↵) if the current tare value is required.

Or

- Press the →PT key for 3 seconds.
- Press the ∧ key to go up a value or press the ∨ key to go down a value until the required value is reached.
- Press < to change to the next digit.
- Repeat this procedure until the required tare value is displayed.
- Press ENTER (↵) to activate the tare weight.
  - The tare weight is activated.
  - The “NET” pointer lights up.
  - When the system is loaded, the net value appears in the display
  - When the system is unloaded, the read-out displays the negative value of the given tare.
  - The entered value remains active until a new tare weight is entered (display shows the new net weight).
  - Press the ↔T key to return to gross weighing mode.

CODE ENTRY

The indicator offers the possibility to enter 1 numeric code of 5 digits. Entry of codes is useful when the weighing system is connected to a printer or other peripheral equipment, in order to identify various weighings during a later processing of the information.

- Press the  key for 3 seconds.
  - The display will show the last used code with the right digit flashing.
- To accept the old value press ENTER (↵).
  - The code is activated and the display returns to the weighing mode.

Or

- Press the  key for 3 seconds.
- Press the ∧ key to go up a value or press the ∨ key to go down a value until the required value is reached.
- Press < to change to the next digit.
- Repeat this procedure until the required code is displayed.
- To accept the new code press ENTER (↵).
  - The code is activated and the display returns to normal weighing mode.

You may make a printout and add up the weights. A special printout will be made which includes the code. (See option printer).
NOTE: if the code is “000000” it will be ignored and it will not be printed on the ticket.

PIECE COUNT: SAMPLING

If an unknown piece weight is to be determined you may do this by sampling a certain number of pieces. The number of pieces taken from or placed on the weighing system determines the accuracy of the sampling. The total weight of the pieces taken from or placed on the weighing system for the sampling should be no less than 4-5 kg. The greater the weight difference, the greater accuracy. The standard sampling amount is 10 pieces, but this number can be increased up to 95 pieces.
NOTE: If the accuracy is too low when sampling, the indicator will show “ERR05”. Press any key to return to piece counting mode and increase the sampling amount.

- Press the ⁂ key.
  - The display shows “add10”. The ‘kg’ pointer turns off and the ‘pcs’ pointer goes on.
- Take or place 10 pieces from/on the weighing system and press the ENTER (↵) key.
  - The sampling is done and the display will show the total number of pieces on the weighing system.

Or

- Press the ∧ key or the ∨ key to change the number of pieces to add.
  - The display will show the new value to add (for example “add50”).
- Take or place the correct number of pieces from/on the weighing system and press the ENTER (↵) key.
  - The sampling is done and the display will show the total number of pieces on the weighing system.

You may make a printout and add up the weights. A special printout will be made which includes the piece weight sampled and the number of pieces. (See option printer).

To return to the normal weighing mode press the ↻ key for 3 seconds. Once your return to normal weighing mode the piece count total will be lost.

PIECE COUNT: ENTER A PIECE WEIGHT

- Press the PC key for 3 seconds.
  - The last used piece weight will be displayed with the right digit flashing.
- To accept the old value press ENTER (↵).
  - The display shows the number of pieces currently on the weighing system.

Or

- Press the PC key for 3 seconds.

- Press the ∧ key to go up a value or press the ∨ key to go down a value until the required value is reached.
- Press < to change to the next digit.
- Repeat this procedure until the required piece weight is displayed.
- To accept the new value press ENTER (↵).
  - The display shows the number of pieces currently on the weighing system.

You may make a printout and add up the weights. A special printout will be made which includes the piece weight sampled and the number of pieces. (See option printer).

To return to the normal weigh mode press the ⟲ key for 3 seconds. Once you return to normal weighing mode the piece count total will be lost.

SUMMING

The indicator offers the possibility to add weighings and show the total weight. When a tare weight is active, the net weight is added automatically.

- Load the system with the weight that should be added.
- Press the ⊕ key to add the weighed load to the total weight.
  - The display shortly shows the message “ADDED” and then automatically returns to the weighing mode.
  - If a printer is installed, a printout will be made. The gross, net and tare weights are totalled.
  - No weight can be recorded twice. The system needs to be returned to the net zero-range before another weight can be added up.
- The subtotal can be checked by pressing the ✳ key for 3 seconds.
  - The display shows the net total weight and the number of weightings totalled so far repeatedly for 3 seconds.
    - If the ⊕ key is pressed shortly during this period, the total is printed out (if option is installed) and reset to 0.
    - If the “CE” key is pressed during this period, the total is reset but not printed out.
    - If no key is pressed during this period, the subtotal stays in memory and the system returns to the weighing mode after 60 seconds.

CHANGE UNITS

The system is set to start up in ‘kgs’ or in ‘lbs’. However you may, at any time in the weighing mode, change to the second unit (lb⇔kg or kg⇔lb).

- Press the ⟲ key for 3 seconds.
  - The display will show the current weight in the new units for 5 seconds and then automatically change back to the start up units.

The same key is used to change from the piece counting mode back to the weighing mode.

NOTE: It is not possible to use any of the scale functions when the display has been changed to the second unit. If any key is pressed the indicator will display “ERR99” and return to normal weighing mode.

5. PRINTER (Option)

If the weighing system has been equipped with a printer, obtained and entered weighing data can be printed. Date and time are only printed out with the option board installed.

In the printout a gross weight is indicated with the letters “B/G” and a net weight with the letter “N”. A manually entered tare weight will also be printed and is indicated with the letters “PT”. The total weight is shown with the letters “TOT”.

Standard printout without code

```
B/G      1234.5  kg.
T          34.5  kg.
N        1200.0  kg.

Nr.              1
10/07/03         17:45
```

Standard printout with code

```
CODE     12345
B/G      1234.5  kg.
T          34.5  kg.
N        1200.0  kg.

Nr.              1
10/07/03         17:45
```

Piececount printout without code

```
B/G      1234.5  kg.
T          34.5  kg.
N        1200.0  kg.

PcWt        1.234  kg.
Qty         12345  PCs

Nr.              1
10/07/03         17:45
```

Piececount printout with code

```
CODE     12345
B/G      1234.5  kg
T          34.5  kg
N        1200.0  kg

PcWt        1.234  kg
Qty         12345  PCs

Nr.              1
10/07/03         17:45
```

Total printout (always without code)

```
Tot. B/G 1234.5  kg.
Tot. T     34.5  kg.
Tot. N   1200.0  kg.
Tot. Nr.         999
10/07/03         17:45
```

CHANGE TIME AND DATE ON THE PRINTOUT

If the weighing system has been equipped with a printer, and an option board, the date and time can be printed together with the weight information.

- Press the ⁂ key for 6 seconds.
  - The display will show “ho_00” or the previous hour time setting, with the right digit flashing.
- To accept the old value press ENTER (↵).
- **Or**
- Press the ∧ key to go up a value or press the ∨ key to go down a value until the required value is reached.
- Press < to change to the next digit and use the ∧ or ∨ key to change the value until the required value is reached.
- To accept the new value press ENTER (↵).
  - The display will show “m_00” or the previous minute time setting, with the right digit flashing.
- Repeat the above procedure to accept or change the minute setting.
  - The display will show “dA_00” or the previous date of the month setting, with the right digit flashing.
- Repeat the above procedure to accept or change the date of the month setting.
  - The display will show “m_00” or the previous month setting, with the right digit flashing.
- Repeat the above procedure to accept or change the month setting.
  - The display will show “YE_00” or the previous year setting, with the right digit flashing.
- Repeat the above procedure to accept or change the year setting.
  - The indicator will return to normal weighing mode.

6. RELAY (Option)

If this option is used, it is no longer possible to use the piece-counting mode. The setting of the set-points for the relay is done with the same key as is used for sampling or entering a piece weight.

Relay technical specifications: Type: Zettler AZ833-12DE
Coil voltage: 12VDC
Switched capacity: max. 30VDC/2A

The choice of relay application is made when the system is ordered and the program is selected in the parameter menu. The instructions for use depend on the application chosen.

Four different applications are possible;
1 – overload check gross weight
2 – overload check net weight
3 – dosing/filling with manual tare & start
4 – dosing/filling with auto tare & start

OVERLOAD CHECK Gross Weight / Net Weight

In this setting set-point 1 is activated as soon as the gross or net value exceeds the set-point value. In this case the set-point value is an absolute value.

To enter a new value:

- Press the ⁂ key.
  - The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
- Press ↵ to accept the old value.
  - The set-point value is activated and the display returns to the weighing mode.

Or

- Press the ⁂ key.
- Press the ∧ key to go up a value or press the ∨ key to go down a value until the required value is reached.
- Press < to change to the next digit.
- Repeat this procedure until the required value is displayed.
- Press ↵ to accept the new value.
  - The set-point value is activated and the display returns to the weighing mode.

DOSING/FILLING with Manual Tare & Start

In this setting set-point 1 and 2 are switched on as soon as the tare key has been activated and after the set-point values have been entered.

To enter new set-point values:

- Press the ⁂ key.
  - The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
- Press ↵ to accept the old value.
  - The value for set-point 1 is activated. The display shows the last entered value for set-point 2 with the left digit blinking. The pointer for set-point 2 is on.

Or

- Press the ⁂ key.
- Press the ∧ key to go up a value or press the ∨ key to go down a value until the required value is reached.
- Press < to change to the next digit.
  - Repeat this procedure until the required value is displayed.
- Press ↵ to accept the new value.
  - The set-point value is activated and the display returns to the weighing mode.
  - The display shows “tare”.

FILLING:
Place an empty container on the scale.

- Press the ⇔T key.
  - The display shows the net value and the pointers stp1 and stp2 are on.
  - Relays 1 and 2 are closed.
  - As soon as set-point 1 is reached, pointer stp1 will turn off and relay 1 will be opened.
  - As soon as set-point 2 is reached, pointer stp2 will turn off and relay 2 will be opened.
  - The display shows “done” for a few seconds and will return in the normal weighing mode.
  - The net weight is displayed. A printout may be made at this point.

It is possible to cancel the filling procedure at any time by pressing the CE key (see page 18).

DOSING:
Place a full container on the scale.

- Press the ⇔T key.
  - The display shows the net value and the pointers stp1 and stp2 are on.
  - Relays 1 and 2 are closed.
  - As soon as set-point 1 is reached, pointer stp1 will turn off and relay 1 will be opened.
  - As soon as set-point 2 is reached, pointer stp2 will turn off and relay 2 will be opened.
  - The display shows “done” for a few seconds and returns in the normal weighing mode.
  - The net weight is displayed. A printout may be made at this point.

It is possible to cancel the dosing procedure at any time by pressing the CE key (see page 18).

The printout will show the following:
- The gross weight is the weight of the container with rest material.
- The tare weight is the weight of the container with material before dosing.
- The net weight will show a minus sign as token of weight being removed from the scale.

DOSING / FILLING with Automatic Tare & Start

In this setting set-point 1 and 2 are switched on as soon as the set-point values have been entered. The tare action is done automatically in this mode.

To enter new set-point values:

- Press the ⁂ key.
  - The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
- Press ↵ to accept the old value.
  - The value for set-point 1 is activated. The display shows the last entered value for set-point 2 with the left digit blinking. The pointer for set-point 2 is on.

Or

- Press the ⁂ key.
- Press the ∧ key to go up a value or press the ∨ key to go down a value until the required value is reached.
- Press < to change to the next digit.
  - Repeat this procedure until the required value is displayed.
- Press ↵ to accept the new value.
  - The set-point value is activated and the display returns to the weighing mode.
  - The display shows “tare” and the indicator automatically tares out the scale after the scale has been stable for a few seconds.

Attention: be sure the container is already in place at this moment!

Filling & Dosing:

- The display shows the net value and the pointers stp1 and stp2 are on.
- Relays 1 and 2 are closed.
- As soon as set-point 1 is reached, pointer stp1 will turn off and relay 1 will be opened.
- As soon as set-point 2 is reached, pointer stp2 will turn off and relay 2 will be opened.
- The display shows “done” for a few seconds and will return in the normal weighing mode.
- The net weight is displayed. A printout may be made at this point.

It is possible to cancel the filling or dosing procedure at any time by pressing the CE key (see below).

The printout will show the following:

- The gross weight is the weight of the container with rest material.
- The tare weight is the weight of the container with material before dosing.
- The net weight will show a minus sign as token of weight being removed from the scale.

CANCEL DOSING / FILLING

It is possible to cancel the filling or dosing procedure at any time by pressing the CE key.

- Press the CE key to stop the procedure.
  - The display shows “stop” and the relays are opened. Pointers stp1 and stp2 will be turned off.
  - Press ENTER to start the procedure again.
    - The display sign “stop” is cleared and the net weight is displayed again. The relays are closed. Pointers stp1 and/or stp2 will be turned on.

  Or

  - Press the CE key to stop the procedure.
    - The display shows “done” for a few seconds and will return in the normal weighing mode.
    - The net weight is displayed.

7. TROUBLE SHOOTING

No power	Open indicator and measure power on the board.	Is voltage coming from the truck battery?	Check where the power line comes from. See if power is available on this point.
			Mostly a fuse is installed. Measure is voltage is also available after the fuse.
			If power is available in the indicator then check if the power board is not functioning.
		If the power from the truck is more than 12 Vdc, then the first board is a power converter board.	Check if red and black wire connected between the power board and the main board has 12 Vdc. If there is no 12Vdc coming out of this board check this board. If nothing can be found it needs to be replaced. If 12Vdc is supplied to the main board. Then check the main board.
	12Vdc on the board	Check the board for burned components	Picture of component most likely to blow when batteries have been entered the wrong way.
Accuracy	No repeatability	Check if there is a mechanical problem.	Load left and right fork with for example body weight and see if weight changes when you are in different positions on the scale. There should not be a difference larger than 2 lb. If there is a bigger difference then 5 lb you have a load cell or a mechanical problem.
			To make sure it is a mechanical problem, repeat test with a heavy load on the scale, Lift a pallet with 2000 or 3000 lb. Reset Indicator for 0 lb using the tare function. Load corners with body weight by standing on or on the sides of the pallet. If readings change more than 5 lb you have a mechanical problem.
			The push rods in the forks may not interfere with the load cells. Take of the fork shoe by unscrewing the nuts on the bottom side of the pallet truck. Push the pushrods sideways towards the load cells to see if they come in contact with the load cells: see if they can interfere with the load cells.
			With the forks lifted half way up, the brackets for the loading wheels may touch the fork shoe. By taking off the fork shoe, Scratches will show if it does and where it does.
			Check if bolts are loose.
		Check the load cells. If one is broken or gives more or less signal than the others, the scale will give different reading depending how it is loaded.	To be sure that it is not a mechanical problem, load the load cells directly. Take off the fork cover. Try to apply weight 25 to 50 kg / lb, direct onto each load cell. If the indicator shows the same reading, the load cells are OK.
			Tap with a hammer onto the load cells. Do not be afraid to break it. Repeat the test for each load cell.

			Measure resistance with ohm meter between wires and load cell body. Do this with the other load cells disconnected from indicator. No resistance is allowed.
			The load cells should have +/- 350 ohm between the signal wires: yellow and green, and excitation wires, black and red.
		Check cables	Bad connections will cause changes when moving the scale.
			Bend and move the cable briskly especially where the cable is moving continuously while lifting. While doing so, look at the display to see if it reacts to the movements.
		The potentiometers with which we calibrate the output of the load cells, are mechanical parts therefore, higher risk components	Move the board and but pressure with fingers on the potentiometers while looking at the display to see if it reacts. Do not touch the contact itself.
	Not linear	Check if it is load cells or indicator	Load cells or indicator are very rarely the cause of this problem. Easiest way to check is by changing the indicator temporarily. If problem is not solved when changing the indicator, the problem is the load cell, cable or mechanics
		Check cable	Very rarely the cause. Maybe in a lift truck.
Instability	With no load it is most of the time humidity, bad connection or component r bad shield.	Check for humidity	Check for water marks on the indicator board or load cell connections (potentiometers).
		Check the indicator.	Sometimes the indicator will show a weight when the load cells are disconnected. If you do this and the indicator becomes more stable, it is most likely elsewhere in the system.
			Check visually for traces of oxidation. If found, heating the solder contacts can solve the problem.
		Check cables. In warehouse and lift truck the cable is working all the time when following the lifting movement. It may be worn or damaged. Changing temperatures and chemicals have an effect on the lifetime of a cable.	Bad connections will cause changes when moving the scale.
			Bend and move the cable briskly especially where the cable is moving continuously when lifting. While doing so, look at the display to see if it reacts to the movements.
		The potentiometers with which we calibrate the output of the load cells are mechanical parts and are sensitive to humidity, shocks and vibration.	Move the board and but pressure with fingers on the potentiometers while looking at the display to see if it reacts. Do not touch the contact itself.

		Check the load cells.	If connected independently to the indicator, it can be checked which one is unstable and which one is not.
	With load	Check mechanics.	
Function error	No reaction when pushing keys	Check the touch panel	Test can be done by making short cut on connection of the touch panel to simulate a key being pressed. Check for wear of broken contacts in the flat cable going to the indicator board
		Lock up	Take out the battery pack and replace to see if it starts up afterwards.
	Not summing	Operator error .	Load is not stable. Scale needs to be unloaded before accepting new print. System will not print weights that are smaller than the graduation.

ERROR MESSAGES INDICATOR

Displayed error	Meaning	Out of error mode
Err01	Load cell signal is unstable	Disappears when signal is stable again
Err02	Overload on full weighing system	Disappears when overload is removed
Err03	Gross negative. This action is not allowed	Disappears after 3 sec. No Tare action will be accepted
Err04	Out of zero range	Press any key
Err05	Sampling accuracy too low	Press any key
Err06	Input signal too high (over load positive)	Check weighing system (load cells + cabling)
Err07	Input signal too low (over load negative)	Check weighing system (load cells + cabling)
Err08	Calibration out of range (negative)	Follow correct calibration procedure
Err09	Calibration out of range (signal too low)	Follow correct calibration procedure
Err10	Calibration count 2^{nd} (3^{rd}) point lower than count 1^{st}(2^{nd}) point	Follow correct calibration procedure
Err11	Calibration from within piece counting mode	Follow correct calibration procedure
Err14	Setpoint value 2 < setpoint value 1. This is not allowed	Enter limit values correctly
Err20	Signal of load cell is not correct during start-up of indicator	Check weighing system
Err97	Calibration locked (jumper JP1 placed)	Place Jumper JP1. Located next to the –EX connection
Err98	Calibration point must be higher than previous one	Follow correct calibration procedure
Err99 ----- Or -----	Action only allowed in start-up units (kg/lb) Lower than – 2% of full scale value Level ERROR > 2% non-level	Press ON/OFF (CE) key Check weighing system (mechanical) perhaps even execute a zero calibration Place weighing system in horizontal position

8. CALIBRATION

CALIBRATION INSTRUCTIONS INDICATOR 310

The calibration mode can only be reached from the standard weighing mode. You cannot get into the calibration mode when you are in piece count mode.

DEFINING ZERO

- Unload the system.
- Switch the system on.
- To enter the zero calibration mode press the >0< key for 10 seconds.
  - After 3 seconds the display will show the last entered code.
  - After 7 seconds the display will go into the zero calibration mode and start adjusting.
  - The display will show “Adj08” and run down until “Adj00”. The adjustment has been completed.
  - The indicator shows the percentage of the total capacity that was adjusted. For a normal scale this would be between 5 and 8 percent. A larger percentage could mean one or more load cells are broken. A lower percentage could mean the fork cover is not mounted.
  - The zero point has been defined, the system automatically returns to the standard weighing mode.

SINGLE POINT CALIBRATION

- Press the ⇔T key for about 30 seconds until you see UNIT in the screen.
  - When you see UNIT you press the ↵ key to continue
  - The display will show the first calibration point with the pointer “e1” flashing.
  - Press the ↵ key to be able to change the calibration weight on “e1”.
- Using the ∧ and ∨ keys you can see the three earlier programmed values on the display.
  - The pointer will move through e1-3. “e1” is the first calibration point, “e2” the second and “e3” the third.

When calibrating only one point the second and third values should be set to zero.

- Use the ∧ and ∨ keys to move to the second calibration point.
  - The display will show the pointer “e2” flashing.
- Press the ↵ key.
  - The display will show the previously entered calibration value, with the last segment flashing.
- Use the ∧, ∨ and < keys to return all the segments to zero.
- Press the ↵ key.
- Use the ∧ and ∨ keys to move to the third calibration point.
- Repeat the above to set all the segments to zero.
- Press the ↵ key.

Calibrating the single point

- Use the ∧ and ∨ keys to return to the first point.
  - The indicator shows the value of the first calibration point, with the “e1”pointer flashing.
- Load the scale with a known weight.
- Press the ↵ key to enter this weight onto the indicator, the first segment starts flashing.
- Use the ∧ and ∨ keys to change all the segments until the proper weight has been entered.
- Press the ↵ key to return to calibration mode. The “e1” pointer will start flashing.
- Press the ↵ key for 3 seconds to confirm the entered weight.
  - This calibration number counts down from Adj 08 to Adj 00, the first calibration point has now been set.
- Leave the calibration mode by pressing the ∧ or ∨ key until AP XX appears. This number indicates the calibration sensitivity percentage, eg AP 07.
- Press the ↵ key.
  - The display now shows the value of the gravitation constant. Use the ∧, ∨ and < keys to correct this for your position.
- Press the ↵ key to return to the standard weighing mode.

MULTI-POINT CALIBRATION

- Push the ⇔T key for about 30 seconds until you see “UNIT” in the screen
  - When you see UNIT you press the ↵ key to continue
  - The display will show the first calibration point with the pointer “e1” flashing.
  - Press the ↵ key to be able to change the calibration weight on “e1”..
- Using the ∧ and ∨ keys you can see the three earlier programmed values on the display. The pointer will move through e1-3. “e1” is the first calibration point, “e2” the second and “e3” the third.
- Use the ∧ and ∨ keys to return to the first point.
  - The indicator shows the value of the first calibration point, with the “e1” pointer flashing.
- Load the weighing system with a known weight.
- Press the ↵ key to enter this weight onto the indicator.
  - The first segment will start flashing.
- Use the ∧, ∨ and < keys to change all segments until the proper weight has been entered.
- Press the ↵ key to return to calibration mode.
  - The “e1” pointer will start flashing.
- Press the ↵ key for 4 seconds to confirm the entered weight.
  - This calibration number counts down from Adj 08 to Adj 00, the first calibration point has now been set.
- Move to the second calibration point.
  - The display will show the pointer “e2” flashing.
- Repeat the procedure for a second known weight. Be aware that the value of this weight has to be higher than that of the first weight. If not, the display will show ERR98 and return to the entry mode for the calibration point.
- Repeat the procedure for the third known weight. Leave calibration mode by pressing the ∧ or ∨ key until AP XX appears.
  - This number indicates the calibration sensitivity percentage, eg AP 07.
- Press the ↵ key.
  - The display now shows the value of the gravitation constant. Use the ∧, ∨ and < keys to correct this for your position.
- Press the ↵ key to return to the standard weighing mode.

9. PARAMETER SETTINGS

ATTENTION: Before entering the setup mode make sure that the battery supply is sufficient. A low battery may cause the micro-processor to block. If this happens remove the empty battery and replace it with a fully charged battery. You should be able to start the indicator in the normal way.

To enter the setup mode, turn on the indicator and keep the ① key pressed for 20 seconds. You will go through the normal start-up routine (all segments on; software version; calibration number and weight) and end up in the "P_01" with the right digit flashing.

At this stage you may proceed as follows:

- To enter parameter 01 press the ↵ key quickly.
  - The display will show the setting for this parameter at this moment.
- You may change the setting by using the ∧ or the ∨ key.

OR

- You can accept the setting by pressing ↵ .

OR

- To move to the next parameter you press the ∧ key.

OR

- To move to the previous parameter you press the ∨ key.

- To leave the set-up mode you do the following:
- With P_XX in the display press the ① key quickly.
  - The display will show "P_00"
- Press the ① key again quickly.
  - If a change was made to the settings the display will show "SET__" briefly and then return to the normal weighing mode. The calibration number will be increased by every time a change was made in the set up and also after a new calibration.
  - If no change was made, the display will return into the normal weighing mode.

In the following pages the different parameters are explained and the standard settings are given. Parameters that are not used yet will not be accessible or displayed with underscores.

PARAMETERS:

Parameter	Function	Settings	Default US
01	Start-up unit (and print units)	1=kg / 2=lb	2
02	Smallest graduation step for multi-range	0.1/0.2/0.5……10/20/50	0.5
03	Largest graduation step for multi-range	0.1/0.2/0.5 ……. 10/20/50	2
04	Number of graduations for every range	0000-9900 divisions	1000
05	Weighing capacity system (full scale)	0000-99999 units	5000
06	Motion tolerance for stable	0-32 off 0.5 grad./sec 1 grad./sec 2 grad./sec 4 grad./sec 8 grad./sec 16 grad./sec 32 grad./sec	1
07	Filter size	0-12 0=off 1=light filtering, 12=heavy filtering	8
08	Auto zero range	0=off 0.5 division 1=division 3 divisions	0.5
09	Zero range positive (+)	0-100% (approved 2%) of span	10
10	Zero range negative (-)	0-100% (approved 2%) of span	10
11	Test Function	BASIC ADC Counts 10x Resolution	bASIC
12	Power On zero	Yes / No	No
13	Approved	None, NTEP, OIML, NTEPC	None
14	Start-up number to add in sampling mode	1-2-5-10-20-50-95	10
15	Units switch mode active	Yes / No	No
16	Setpoint function	0-14 0 (not used), 1 (gross overload), 2 (net overload), 3 (fill manual tare), 4 (fill auto tare), 5 (gross overload not authorize to change gross settin), 6 (net overload not authorize to change net setting), 7(gross overload delayed), 8 (net overload delayed), 9 (gross overload delay not authorize to change gross setting), 10 (net overload delay not authorize to change net setting),11 (gross overload+errors), 12(gross overload+err, no changes allowed), 13(gross overload+err, delayed), 14(gross overload+err, no changes allowed, delayed)	0

Parameter	Function	Settings	Default US
17	Sense active (4 or 6 wire)	4; 6	4
18	Gravity value working area	9.750-9.850	9.797
19	Print format time/date	European format dd/mm/yy hh:mm American format mm/dd/yy hh:mm	USA
20	Baudrate comport 1	600-1200-2400-4800-9600-19200	9600
21	Databits comport 1	8_n_1;8_n_2;7_n_1;7_n_2;7_E_1;7_E_2;7_o_1;7_o_2	8_n_1
22-23	Not used		
24	End character comport 1	CR/LF/CRLF	cr
25	Dataprotocol comport 1	0 = PC (bi-directional) 1 = PC Excel format on print command 2 = remote display 3 = printer with power control 4 = printer without power control 5 = not used 6 = PC excel format on print command with ACK/NAK 7 = special 1 8 = special 2	0
26	Number of linefeeds comport 1	0-9	0
27	Handshake com1	soft (Xon/Xoff);hard (CTS)	soft
28	printout format for com1 and com2	stand;total;conf	stand
29	header lines added	0 - 3	0
30	Baudrate comport 2	600-1200-2400-4800-9600-19200	9600
31	Databits comport 2	8_n_1;8_n_2;7_n_1;7_n_2;7_E_1;7_E_2;7_o_1;7_o_2	8_n_1
32-33	Not used		
34	End character comport 2	CR/LF/CRLF	CR

Parameter	Function	Settings	Default US
35	Dataprotocol comport 2	0 = PC (bi-directional) 1 = PC Excel format on print command 2 = remote display 3 = printer with power control 4 = printer without power control 5 = not used 6 = PC excel format on print command with ACK/NAK 7 = special 1 8 = special 2	3
36	Number of linefeeds comport 2	0-9	5
37	Handshake com2	Soft/hard	Soft
38	Print twice	0=print only once 1=Print twice	0
39	Not used		
40	Level switch	NO; LS NC; LS NO; CS FA; CS RA; CS LS	NO
41	Delay trigger time level switch	0-10 sec.	3
42 43	Not used Comp. factor cf	 0.1 to 10.0 (not used)	 1.0
44	Comp. factor rdx	0.1 to 10.0 (not used)	1.0
45	Comp. factor rdy	0.1 to 10.0 (not used)	1.0
46	T comp. factor zero	(not used)	1.0
47	Not used		
48	T comp. factor span	(not used)	0
49	Underload % of FS	0-100 %	2
50	Peak hold time RCS	0-7	4
51	Threshold value RCS	9999 kg/lb	100.0
52	Peakhold function (RCS function)	0= OFF 1= ON (RCS function active)	0
53-58	Not used		
59	Measuring frequency	10 or 80 Hz	10
60	Battery used	12VDC 6VDC	12v
61	Low Bat switch off time	0-99 minutes 0= not switched off	2
62	Auto shut off time if not used	0-99 minutes 0= always on	30
63-64	Not used		
65	Auto shut off time backlight	0; 20; 40; 80; 160; 320 seconds	20
66	Backlight brightness	100; 75; 50;20;0 %	100
67	Not used		
68	Buzzer function	No/yes	No
69	Disable keys 2, 3 and 4 (only if P16= active)	0-3	0

Parameter	Function	Settings	Default US
70	Auto Tare release(at empty scale)	No/yes	No
71-89	Not used		
90	Reset to default parameter settings without altering calibration parameters	If parameter 01 was on 1 it will default to the EU settings, if P01=2 the US settings will be defaulted. New delivered boards will have the EU settings.	
91	Reset to default parameter settings including calibration parameters	If parameter 01 was on 1 it will default to the EU settings, if P01=2 the US settings will be defaulted. New delivered boards will have the EU settings.	
92	Recall factory settings calibration		
93	Read out last 10 error messages		
94	Not used		
95	Factor used only		00000
96	Printout parameter setup	Pr-C1: Pr-C2	Pr-C1
97	Key test function (buzzer and Nr)		
98	Scale ID number	0-999	1
99	Firmware version	(last available version	215A