

**LABORATORY SCALE
LABORWAAGE
BALANCE POUR LABORATOIRES
BILANCIA DA LABORATORIO**

HLD

OPERATING MANUAL

Industrial Weighing Systems

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1. INTRODUCTION

This manual was created to help you install and learn all about the functional possibilities of the HLD scale.



The scales should be sited in a location that will not degrade the accuracy.

Avoid extremes of temperature. Do not place in direct sunlight or near air conditioning vents.

Avoid unsuitable tables. The tables or floor must be rigid and not vibrate. Do not place near vibrating machinery.

Avoid unstable power sources. Do not use near large users of electricity such as welding equipment or large motors.

Avoid high humidity that might cause condensation. Avoid direct contact with water. Do not spray or immerse the scales in water.

Avoid air movement such as from fans or opening doors. Do not place near open windows.

Keep the scales clean.

Do not stack material on the scales when they are not in use.

2. MAIN TECHNICAL SPECIFICATIONS

Model	Plate dimensions mm	Capacity g	Standard Division g (*)	HR Division g (*)	Linearity g +/-	Internal sensitivity g	Min. APW recommended g
HLD150	Φ80mm	150	0,02	0,002	0,004	0,0002	0,002
HLD300	Φ120mm	300	0,05	0,005	0,01	0,0005	0,005
HLD600	Φ120mm	600	0,1	0,01	0,02	0,001	0,01
HLD1500	140x150mm	1500	0,2	0,02	0,04	0,002	0,02
HLD3000	140x150mm	3000	0,5	0,05	0,1	0,005	0,05
HLD6000	140x150mm	6000	1	0,1	0,2	0,01	0,1

(*) Standard and HR division selectable in weighing phase, through the unit of measure conversion function, see section 6.8.

Stabilisation Time	2 Seconds typical.
Operative Temperature:	0°C - 40°C / 32°F - 104°F.
Power supply:	with fitted 240 Vac mains power adapter or with fitted battery
Battery life:	up to 30 hours of continuous use.
Recharge time:	12 hours.
Parameter Setup:	Calibration fully digital and programmable from the keyboard.
Display :	LCD backlit with 6 ½ digits 16 mm high.
Case:	ABS Plastic.
Zero range:	+/- 2% of max load capacity.
Auto zero at start-up:	+/- 10% of max load capacity.

3. INSTALLATION

a) Unpack then product.

b) If present (depending on the model), it is necessary to unscrew and remove the locking screw for the transportation placed under the scale, as shown in the figure below:



c) Level the platform by adjusting the adjustable feet until the bubble is in the centre of the level. The stability of the platform is very important.

ALL THE CORNERS MUST REST IN A UNIFORM WAY. Carefully check that all feet fully rest on the ground and that the platform, loaded on the corner, is not unstable (if a corner is not resting on the ground its relative foot is easier to turn).

3.1 POWER SUPPLY AND START-UP

The indicator can be powered with a fitted 240 Vac external power adapter or just with the fitted battery.


NOTE: it is advisable to completely recharge the battery (12 hours) with the first installation of the instrument.

TO POWER the instrument through the 240 Vac mains put the AC/DC power plug in the appropriate socket under the scale and the power adapter in the 240 Vac mains socket.

TO TURN ON/TURN OFF the instrument press the **ON/OFF** key.


3.2 BATTERY POWERED

The weighing indicator can be operated from the battery if desired.

When the battery needs charging the  symbol on the weight display will be empty. The battery should be charged when the symbol is on. The scale will still operate for about 10 minutes after which it will automatically switch off to protect the battery.

To charge the battery simply plug into the mains power. The scale does not need to be turned on.

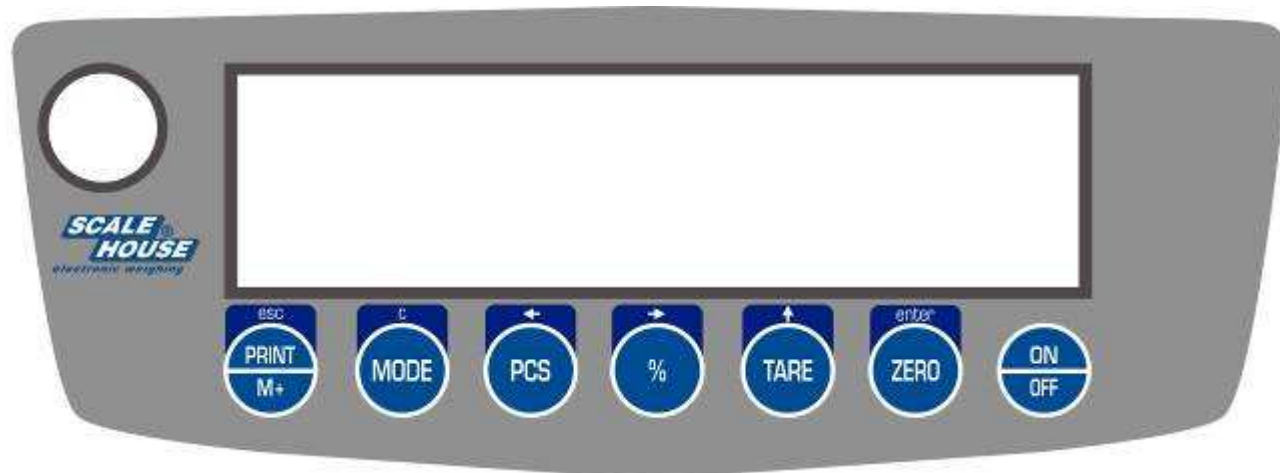
The battery should be charged for 12 hours for full capacity.

You can find the  symbol on the display to indicate the status of battery charging. When the scale is plugged into








the mains power the internal battery will be charged. If the symbol is full the battery has a full charge. If it is half the battery is nearly discharged and empty indicates the battery should be charged.

As the battery is used it may fail to hold a full charge. If the battery life becomes unacceptable then contact your distributor

4. FRONT PANEL KEYS AND INDICATORS





FUNCTION OF THE KEYS

	<ul style="list-style-type: none"> - It turns on/off the scale.
	<ul style="list-style-type: none"> - Clears the displayed gross weight if it's within +/- 2% of the total capacity. - A secondary function of "Enter" key when setting parameters or other functions.
	<ul style="list-style-type: none"> - If pressed for an instant it executes the semiautomatic tare. - A secondary function of incrementing the active digit or selecting a value or parameter when in setting mode.
	<ul style="list-style-type: none"> - If pressed for an instant it allows linking a weight to the 100 percentile (see section 6.7). - In the numeric input, it selects the digit to be modified, from left to right.
	<ul style="list-style-type: none"> - If pressed for an instant it allows to execute the reference operation (see section 6.6) - In the numeric input, it selects the digit to be modified, from right to left.
	<ul style="list-style-type: none"> - It allows to convert in the configured secondary units of measure (see section 6.8). - In the numeric input phase, it quickly clears the present value.
	<ul style="list-style-type: none"> - If pressed for an instant it adds the value to the accumulation memory if the accumulation function is not automatic. - Secondary function (ESC) is to return to normal operation when the scale is in a parameter setting mode.

5. SYMBOLS ON THE LCD DISPLAY

The LCD display has symbols which show the indicator's functioning status; you will find the description for each symbol below.

SYMBOL	FUNCTION
	Indicates the status of battery charging (see section 3.2)
	Indicates that the weight is stable.
NET	Indicates that the displayed weight is a net weight.
→0←	Indicates that the weight detected on the weighing system is near zero.
→T←	Indicates that a tare is enabled.
g	Indicates the unit of measure in use (gram).
Pcs	Indicates that the number of sampled pieces is being displayed (see section 6.6).
%	Indicates that the weight is displayed in percentile of the sample weight (see section 6.7).
kg, g, ct, lb, oz, d, oz t, dwt, mom, tLh, tLc, tL t, t, bt, n	Indicate the unit of measure in use (see section 6.8).

6. OPERATION

6.1 AUTOMATIC ZERO UPON START-UP

The indicator has an "auto zero at start-up" function: in other words it means that if at start-up a weight within +/- 10% of the capacity is detected, it will be zeroed; if the weight is not within this tolerance, the display shows "Err 4" and the present weight after a few instants.

6.2 SCALE ZERO FUNCTION

You can press the **ZERO** key at any time to set the zero point from which all other weighing and counting is measured, within +/- 2% of power up zero. This will usually only be necessary when the platform is empty. When the zero point is obtained the display will show the indicator for zero.

The scale has an automatic rezeroing function to account for minor drifting or accumulation of material on the platform (see step "P4 AZn", section 7.5). However you may need to press the **ZERO** key to rezero the scale if small amounts of weight are shown when the platform is empty.

6.3 TARE FUNCTION

Zero the scale by pressing the **ZERO** key if necessary. The zero symbol will be on.

Place a container on the platform, a value for its weight will be displayed.

Press the **TARE** key to tare the scale when the "stable" is light. The weight that was displayed is stored as the tare value and that value is subtracted from the display, leaving zero on the display. The "**→T←**" indicator will be on. As product is added only the weight of the product will be shown. The scale could be tared a second time if another type of product was to be added to the first one. Again only the weight that is added after taring will be displayed.

When the container is removed a negative value will be shown.

To remove the tare, unload the scale and press again **TARE**.

6.4 OVERLOAD MESSAGE

Please do not add item that is over the maximum capacity. When reading "-----" and hear beeping sound, remove the item on the platter to avoid damage to the load cell.

6.5 TOTALISATION OF THE WEIGHT

The scale can be set to accumulate manually the weight on the scale by pressing the **PRINT/M+** key (see step "AU", chapter 7.1).

The weight displayed will be stored in memory when the **PRINT/M+** key is pressed and the weight is stable.

The display will show "ACC 1" while the weight will be printed, then the total in memory for 2 seconds before returning to normal.

Remove the weight, allowing the scale to return to zero and put a second weight on. Press the **PRINT/M+** key, the display will show "ACC 2" and then the new total.

Continue until all weights have been added.

To view and print the totals in memory press **PRINT/M+** key when current scale in zero status (Zero indicator on)
To clear the accumulated total weight, press the **PCS** key when show total values.
Scale automatically exit form the visualization of the total values after few seconds.

NOTE:

- The totalisation functions with a minimum weight of 20d.
- The maximum number of totalisations is 999 while the maximum total value which may be accumulated is 999999.
Once reached these limits, one should clear the total; by pressing **PRINT/M+** the message "AdErr" will appear on the display.
- The total values will be cleared when it's turned off.

6.5.1 MANUAL OR AUTOMATIC TOTALIZATION

The operation of accumulation, normally done manually with key **PRINT/M+**, can be done automatically when the weight is stable. In regards to the choice of the totalisation execution mode, see step "AU", section 7.1.

6.6 COUNTING PIECES

Through the reference function it's possible to use the scale as a piece counter.

COUNTING PROCEDURE

The operations to be carried out are the following:

- 1) Place the empty container on the scale and press **TARE** to tare it.
- 2) Check that the zero is on the display and put the quantity of pieces chosen for the SAMPLE on the scale and press **PCS** key.
- 3) The display suggests a REFERENCE QUANTITY. The possible options are: 10, 20, 50, 100, and 200.
- 4) Press **TARE** the number of times needed to reach the desired sample size.
- 5) Press **ZERO**; the display will indicate "- - - - -" and the indicator will calculate the Average Piece Weight (**APW**). After a few instants the display will indicate the quantity selected put on the platform.
- 6) Add the rest of the items to count in the container and whose value will appear on the display.
- 7) Unload the scale, the APW will remain stored in memory for the next counting of similar pieces, without having to repeat the REFERENCE operation.
- 8) By pressing the **MODE** key one switches from the display of the number of pieces to the display of the average piece weight and of the net weight.
- 9) **Per cancel or to carry out a new reference operation**, press the **PCS** key and repeat the operations as describe in point 1).

6.7 SAMPLE WEIGHT PERCENTILE

In this functioning mode, the display shows the weight expressed as a percentile, comparing it with a reference weight for which the 100 percentile has been already linked.

MATCHING PROCEDURE

- Put the reference weight on the scale.
- Press the % key when the “stable” indicator is on.
- The scale has executed the percentile matching and displays the percentile of the weight on the scale.
- Unload the scale: the following weighs will be expressed as a percentage in reference to the reference weight.
- **To cancel or execute a new matching operation**, press the % key and repeat the operations described above.

6.8 UNIT OF MEASURE CONVERSION

By pressing various times the **MODE** key the conversion into the secondary units of measure takes place; the relative symbol will turn on in the display (see section 5).

NOTE: The function is not available if the counting function or the percentile function is enabled.

6.8.1 SECONDARY UNITS OF MEASURE

No	Unit mark	Unit name	Conversion (g)
1	g	gram	
2	g	gram (weight x 10, high resolution)	
3	ct	net carat	=0.2g
4	lb	lb	=453.59237g
5	oz	ounce	=28.349523125g
6	d	dram	=1.7718451g
7	ozt	troy ounce	=31.1034768g
8	dwt	penny weight	=1.55517384g
9	mom	momme	=3.749996g
10	tl.h	tael tw	=37.49995g
11	tl.c	tael chn	=37.799375g
12	Tl.t	troy tael	=37.4290018g
13	t	tola	=11.6638039g
14	Bt	Bangladeshi tola	1bt=11.6638039g
15	n	newton	

NOTE: It is possible to enable or disable the unit of measure in the “F1 Unt” step, see section 7.2.

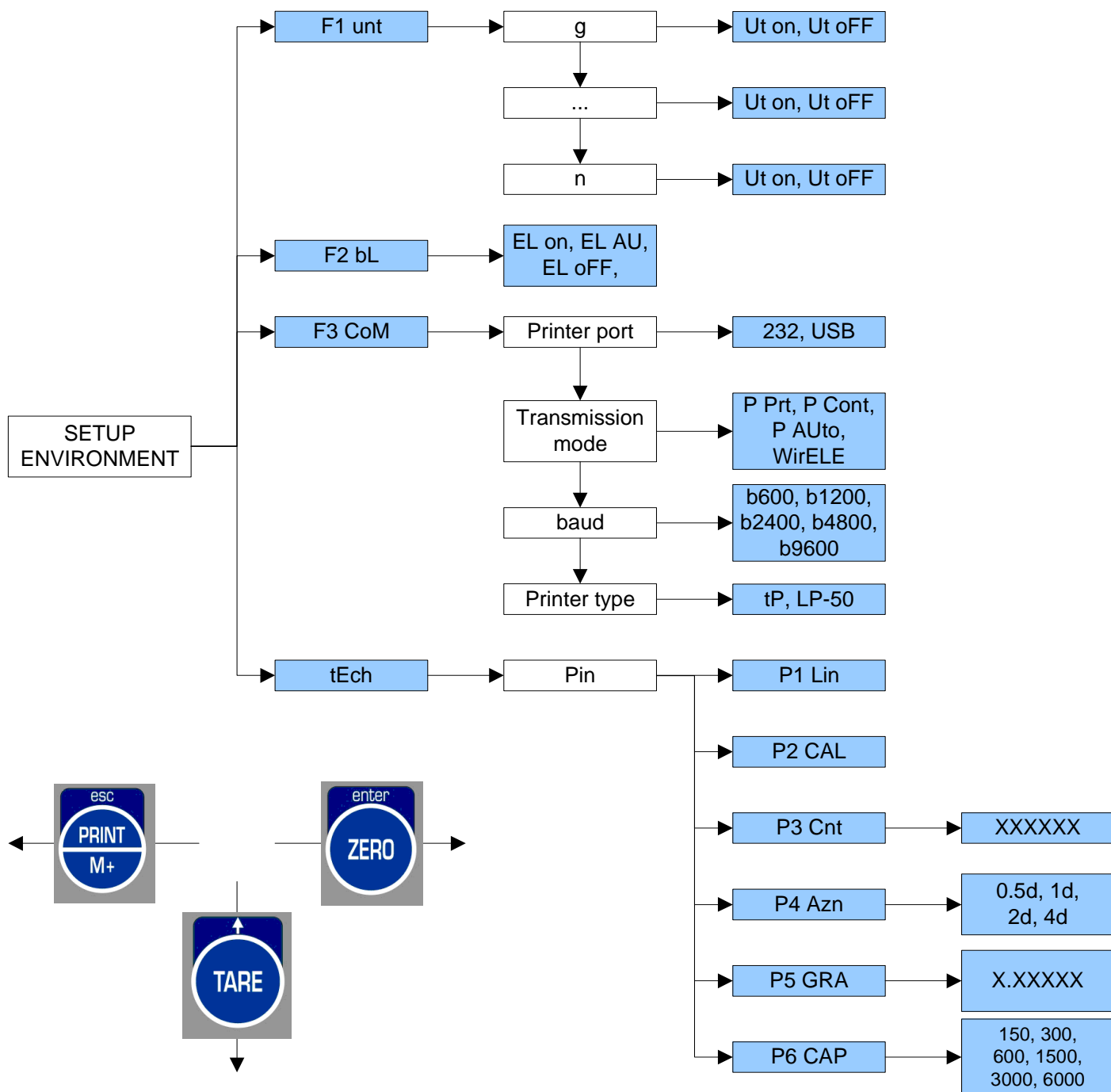
7. SET-UP ENVIRONMENT

The scale has various parameters that can be configured in the SET-UP environment.

To enter in the SET-UP environment press during the start-up the **MODE** key during the countdown.

- The display will show the first function, which is "F1 Unt":
- Pressing the **MODE** will cycle through the other functions.
- Pressing **ZERO** will allow you to set the function.
- Use **MODE** to select the value, or set a value using the % key and the **PCS** key to move the active digit and then using the **TARE** key to increment a digit
- Press the **ZERO** key to confirm the modification and pass to the following step or use the **PRINT/M+** key to leave a parameter unchanged or to escape set-up environment.

7.1 SET-UP ENVIRONMENT BLOCK DIAGRAM



7.2 F1 Unt CONFIGURATION OF SECONDARY UNITS OF MEASURE

By pressing **ZERO** it's possible to choose the units of measure for the conversion function (see section 6.8), enabling (on) or disabling (oFF) the suggested secondary units of measure:

- 1) The display proposes the first secondary unit of measure to be enabled or disabled.
- 2) Press **MODE** to change the options and confirm with **ZERO**, or press **PRINT/M+** to exit without confirming and pass to the following unit.
- 3) The display proposes the 2nd secondary unit to be enabled or disabled.
- 4) Proceed as described in point 2 up until the last proposed unit of measure.

7.3 F2 bL DISPLAY BACKLIGHTING

EL oFF backlighting always off

EL on backlighting always on.

EL AU backlighting on only when the weight is greater than 20d or when a key is pressed. When a key is pressed, if the weight is less than 20d, the backlighting remains active for 5 seconds.

7.4 F3 CoM TRANSMISSION MODE

PRINTER PORT

One will be asked to select the port to be used, press **MODE** to select one of the suggested values:

S 232 RS232 port

S USB Not used in this application.

Select **S 232** and press **ZERO** to confirm.

TRANSMISSION MODE

One will be asked to select the transmission mode, press **MODE** to select one of the suggested values:

P Prt Manual transmission through the **PRINT/M+** key.

P Cont continuous transmission with P Cont. protocol

P Auto Automatic transmission upon weight stability (when in totalisation mode).

WirELE Not used in this application.

Press **ZERO** to confirm.

BAUD RATE

One will be asked to select the baud rate, press **MODE** to select one of the suggested values: 600, 1200, 2400 4800, 9600. Press **ZERO** to confirm.

PRINTER TYPE

One will be asked to select the printer type, press **MODE** to select one of the suggested values:

tP enables the printing with ASCII printer (for example TPR).

LP-50 Non used in this application.

Select **tP** and press **ZERO** to confirm.

7.5 “tEch” - SCALE CONFIGURATION

By pressing **ZERO** it's possible to access the scale configuration menu. One is asked to enter the password.

To enter the menu press the **PCS**, **M+**, and **TARE** keys, one after the other.

The display shows the first parameter, “P1 Lin”.

IN CASE THE ZONE OF USE IS DIFFERENT FROM THE CALIBRATION ZONE ONE SHOULD:

- 1) Set the gravity acceleration value for the ZONE OF CALIBRATION, see P5 step.
- 2) Carry out the calibration as following described (P1 or P2 step).
- 3) Set the gravity acceleration value for the ZONE OF USER, see P5 step.

P1 Lin CALIBRATION WITH DEFINED SAMPLE WEIGHTS

By pressing **ZERO** it's possible to access the calibration with defined sample weights. One is asked to enter the password. To enter the menu press the **M+**, **PCS**, and **%** keys, one after the other.

- The display shows “UNLOAD”;
- Empty the platter, after Stable indicator on the weight will be acquired automatically;
- The display shows “L XXX”;
- Put the first sample weight, defined in the table below, on the scale and the stability indicator is on the weight will be acquired automatically;
- The display shows “L XXX”;
- Put the second sample weight, defined in the table below, on the scale and when the stability indicator is on the weight will be acquired automatically;
- The display shows “L XXX”;
- Put the third sample weight, defined in the table below, on the scale and when the stability indicator is on the weight will be acquired automatically;
- The indicator returns to weighing.

CALIBRATION WEIGHTS						
MODEL	HLD150	HLD300	HLD600	HLD1500	HLD3000	HLD6000
1° SAMPLE WEIGHT	50g	100g	200g	500g	1000g	2000g
2° SAMPLE WEIGHT	100g	200g	400g	1000g	2000g	4000g
3° SAMPLE WEIGHT	150g	300g	600g	1500g	3000g	6000g

P2 CAL CALIBRATION WITH FREE SAMPLE WEIGHT

By pressing **ZERO** it's possible to access the calibration with free sample weight.

- The display shows "UNLOAD";
- Empty the platter, after Stable indicator on the weight will be acquired automatically;
- Set the value of the mass weight by using the **MODE** key to clear the value, the **TARE** key to increase the value of the digit, the **PCS** key to go on the previous digit and the **%** key to go on the following digit.
- Confirm the entered value with **ZERO**; the display shows "LOAD";
- Put the mass on platter, after stable indicator on the weight will be acquired automatically.
- The indicator returns to weighing.

P3 Cnt A/D CONVERTER POINTS

By pressing **ZERO** the instrument shows the A/D converter points relative to the weight on the scale.

Press **PRINT/M+** to exit the step.

P4 AZ ZERO TRACKING

By pressing **ZERO** one sets the divisions' number for the zero tracking, in other words, scale's thermal drift compensation parameter; the set value corresponds to the number of divisions which is cleared.

Press **MODE** to select one of the suggested divisions: oFF, 0.5d, 1d, 2d, 4d.

P5 GrA GRAVITY COEFFICIENT

Trough this step one access the acceleration value setting of instrument **calibration and use** zone.

Manual entry of the g value: Set the value by using the **MODE** key to clear the value, the **TARE** key to increase the value of the digit, the **PCS** key to go on the previous digit and the **%** key to go on the following digit; **one must modify all the 6 digits of the gravitational acceleration.** Confirm the entered value with **ZERO** or press **PRINT/M+** to exit the step.

P6 CAP SCALE CAPACITY

By pressing **ZERO** one selects the total capacity of the scale.

Press **MODE** to select one of the suggested divisions: 150, 300, 600, 1500, 3000, 6000 g.

8. SERIAL OUTPUT

Specifications

RS-232 output for the transmission of the weight data

ASCII code

Baud 4800 (selectable from 600 - 9600)

Connector: 9 pin (female)

Pin 2: RECEPTION

Pin 3: TRANSMISSION

Pin 5: GND

8.1 TRANSMISSION MODES

The transmitted data format varies depending on the selected transmission mode (see section 7.4).

P Prt and P Auto

Totalisation Mode

In the normal weighing operations when one is accumulating the weight the data format is the following:

```
NO:      2
GS  100.000 g
```

Progressive of totalisations

GS for gross weight, NT for net weight

<CR><LF>

<CR><LF>

When the totals are recalled from the storage the data format is the following:

```
NO:      2
TOTAL:200.000 g
```

Progressive of totalisations

Total net weight

<CR><LF>

<CR><LF>

Counting Mode

In the counting operations when the **PRINT/M+** key is pressed the data format is the following:

```
PCS:      10pcs
UW:10.0006 g /p
GS  100.000 g
```

Number of pieces

Average piece weight

GS for gross weight, NT for net weight

<CR><LF>

<CR><LF>

Percentage Mode

In the percentage operations when the **PRINT/M+** key is pressed the data format is the following:

```
PERC:  99.99%
```

Percentage of weight

<CR><LF>

P CONT

In this transmission mode the instrument transmits continuously the following data format depending on the functioning mode:

Totalisation Mode

ST,GS,XXX.XXXXkg<CR><LF>
<CR><LF>

GS for gross weight, NT for net weight, XXX.XXXX is the weight

Counting Mode

PCS:XXXXXXXXXpcs<CR><LF>
<CR><LF>

XXX.XXXX is the Number of pieces

Percentage Mode

PERC:XXXXX.XX%<CR><LF>
<CR><LF>

XXXXX.XX is the Percentage of weight

9. ERROR MESSAGES

ERROR MESSAGES	DESCRIPTION	RESOLUTION
-----	Over range	Remove weight from the scale.
Err 4	Zero Setting Error	Upon start-up or when the ZERO key is pressed, the weight on the scale exceeds the percentage programmed on the max. capacity. Remove the excess weight and retry.
Err 5	Keyboard Error.	The keyboard could be damaged.
Err 6	Input signal greater than 3mV/V	Indicates that the A/D converter value is greater than the maximum value: - Remove the weight from the scale if it's exceeding. - The load cell or the electronics could be damaged.

RECYCLING INSTRUCTION



The crossed-out wheeled bin on the product means that at the product end of life, it must be taken to separate collection or to the reseller when a new equivalent type of equipment is purchased. The adequate differentiated refuse collection in having the product recycled, helps to avoid possible negative effects on the environment and health and supports the recycling of the materials of which the equipment is made. The unlawful disposal of the product by the user will entail fines foreseen by the current regulations.