intelligent®
Weighing Technology

A Higher Level of Precision...
A Higher Level of Performance

Intell-Lab™ Precision Toploading Balances

PH Series

User Operation Manual

June, 2009

SUMMARY

Summary **2**

Installation instructions **3**

Weighing pan assembly **4-5**

Keyboard and display **6**

Inputs and outputs **7**

Inputs and outputs balance Mod. K **8**

Normal weighing **9**

Calibration **10-16**

Tare function **17**

Alphanumeric keyboard **18**

Manual tare function **19**

Weight units ..... **20** PC

Interface selection **21**

Printer Interface selection **22**

Baud rate selection **23**

Filters settings **24**

Autozero function **25**

Piececounting function **26-30**

V-Range function **31**

Determination of solid density for

balances with proper optional software **32**

RS232 Interface characteristics **33-35**

INSTALLATION INSTRUCTIONS

- **Remove** balance and accessories from the carton.

- **Do not install** the balance in a place with draughts, heavy thermic changes and vibrations.

- **Place** the weighing pan and the support pan on the balance (see page 4-5).

- **Level** the balance using the level bubble and levelling feet located underneath the case (see page 7-8 fig. 1a/1b).

- **Connect** power supply to connector 2 located on the rear panel of the unit (see page 7-8).

- **Insert** power cord into AC outlet, **which shall be easily accessible;** after few seconds the balance will automatically switch on.

- **Wait 30 minutes from switch on** and calibrate the balance using the mass enclosed in the package, following the instructions (page 10).

- **Calibrate** the balance again every time it is removed from previous place.

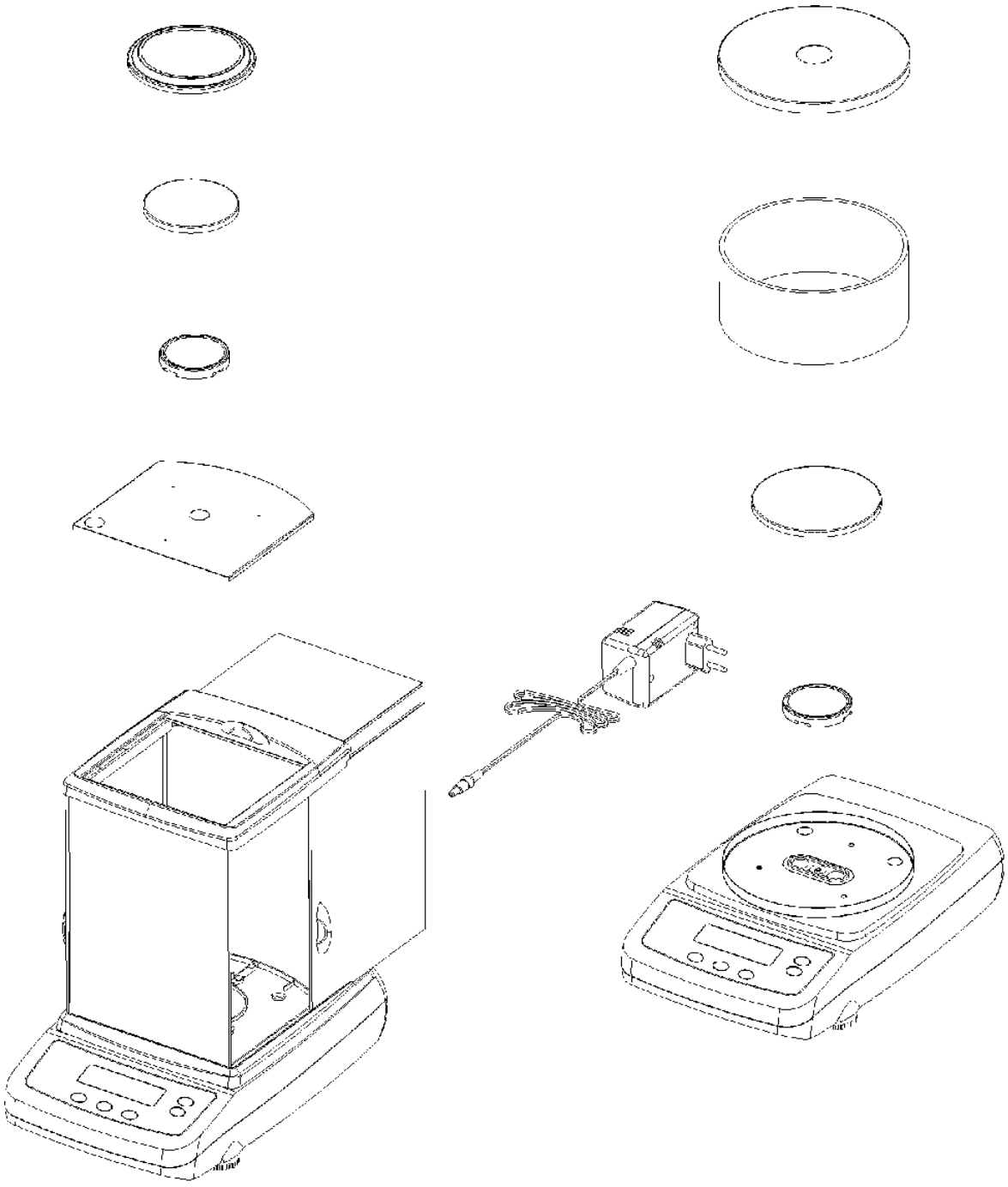
- **Check** balance calibration periodically.

- **We recommend** not to drop heavy objects on balance pan, in order to avoid damages.

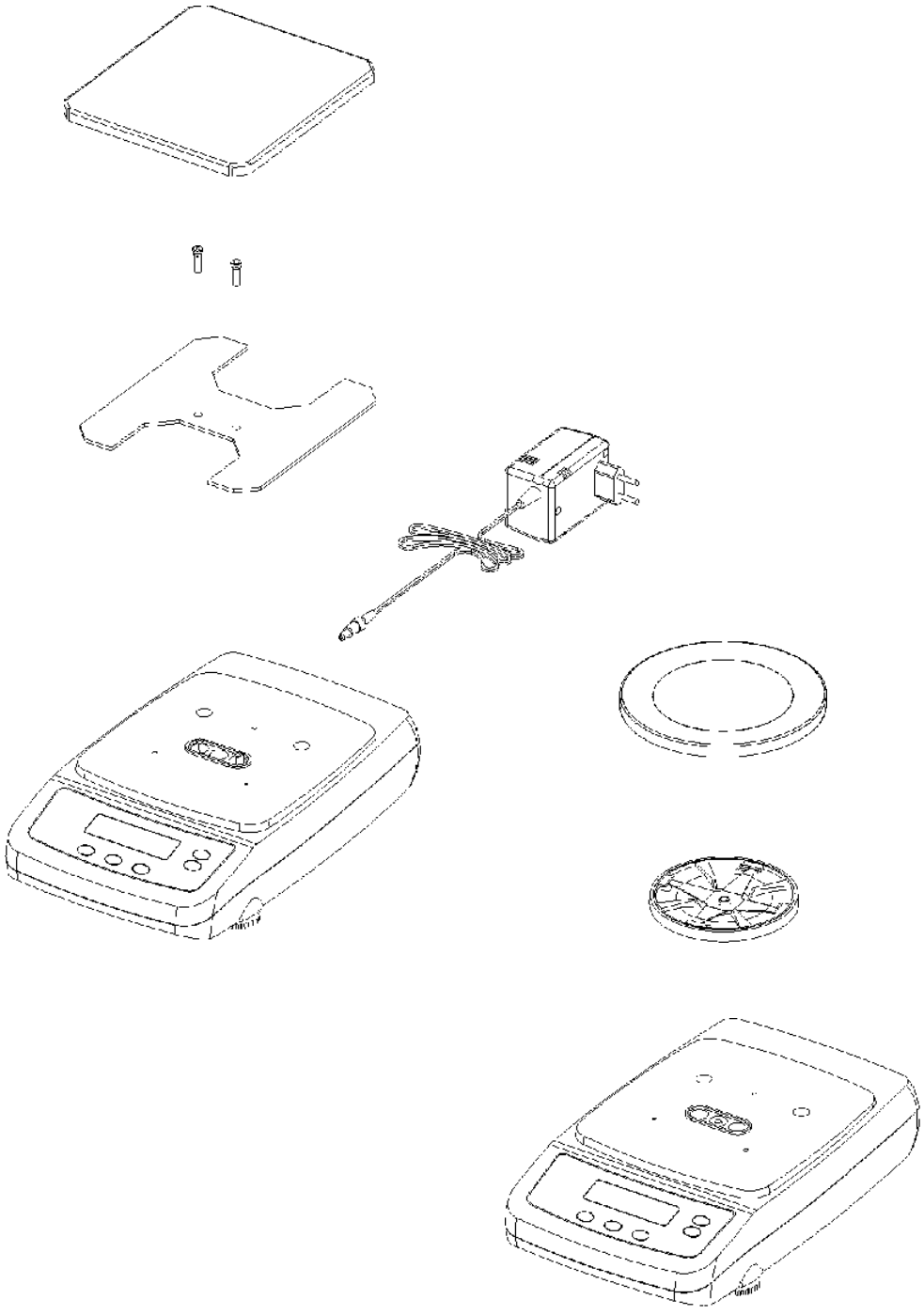
- **Assistance service** must be effected by specialized staff and the spare parts used must be original.
  Therefore, it is necessary to apply to the seller who sold the equipment.

- **Keep package** in case the balance should be sent back to the factory for service.

WEIGHING PAN ASSEMBLY



WEIGHING PAN ASSEMBLY



KEYBOARD AND DISPLAY

Fig. 1 ELECTRONIC BALANCE

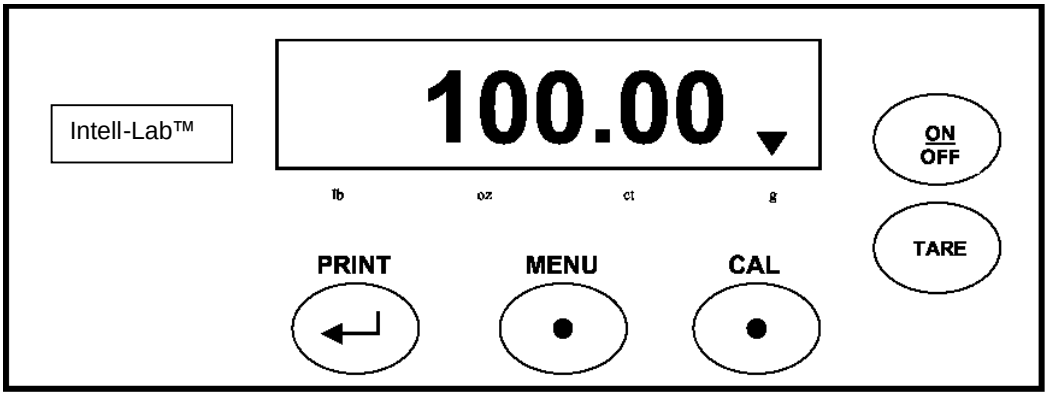
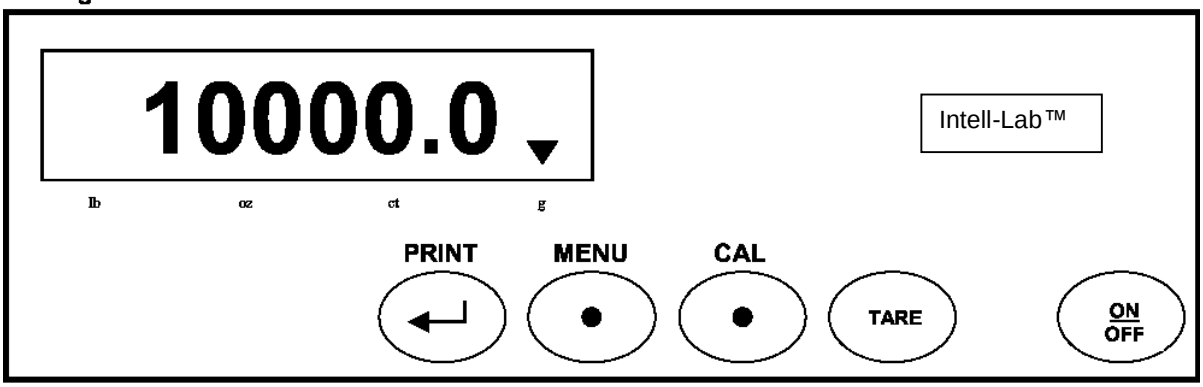
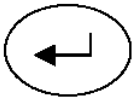


Fig. 2 ELECTRONIC BALANCE MOD. K



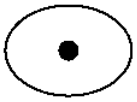
ON/OFF key.

PRINT



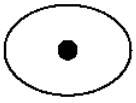
It confirms selection from MENU key or it controls printing.

MENU



It selects setup MENU'.

CAL



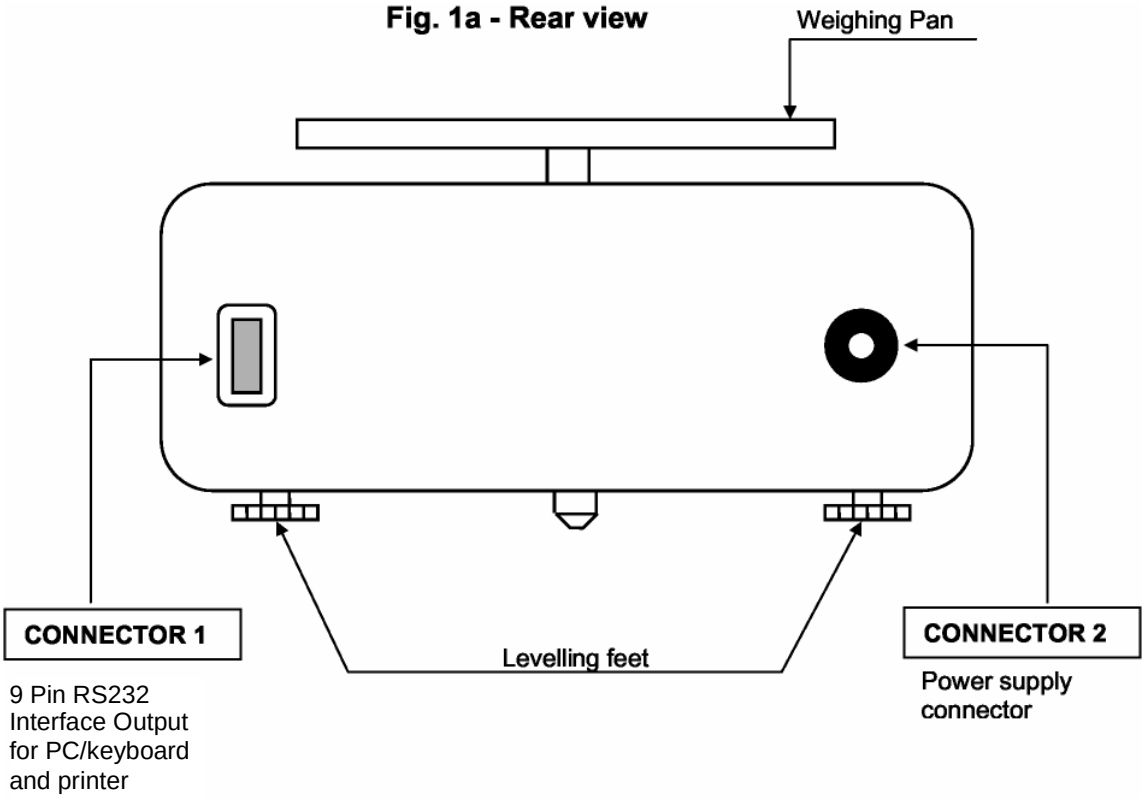
CALIBRATION key.

TARE key.

▼

Indicator of selected weight UNITS.

Fig. 1a - Rear view



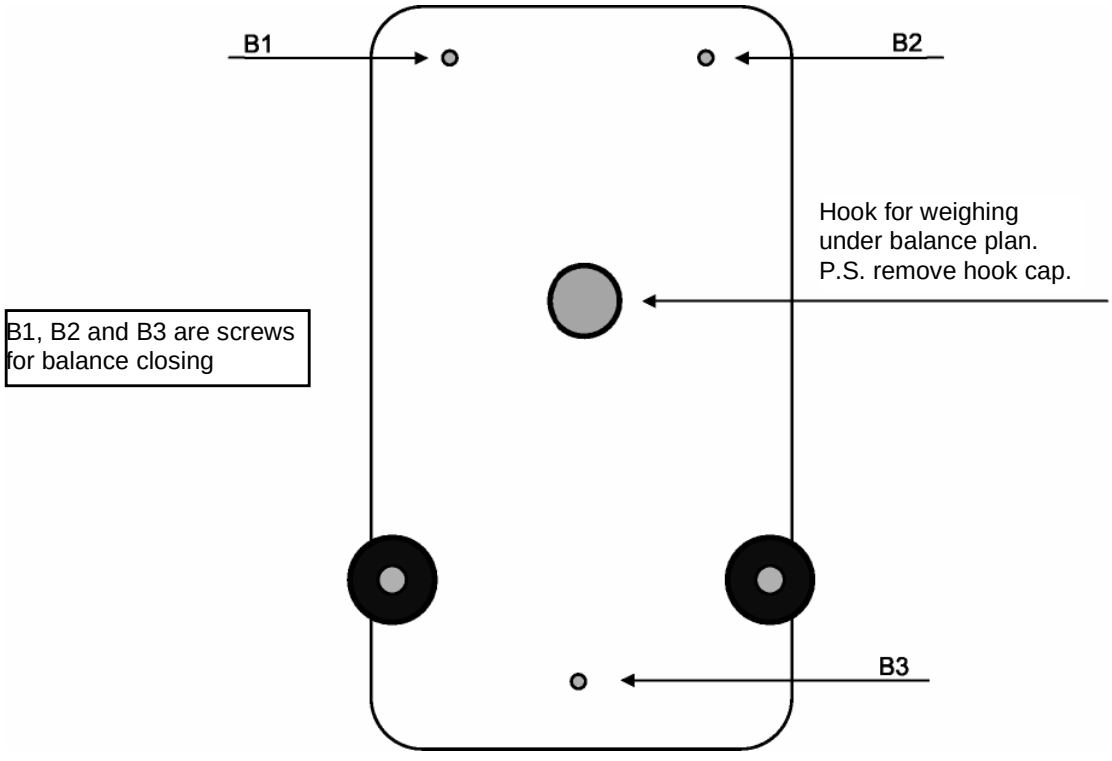
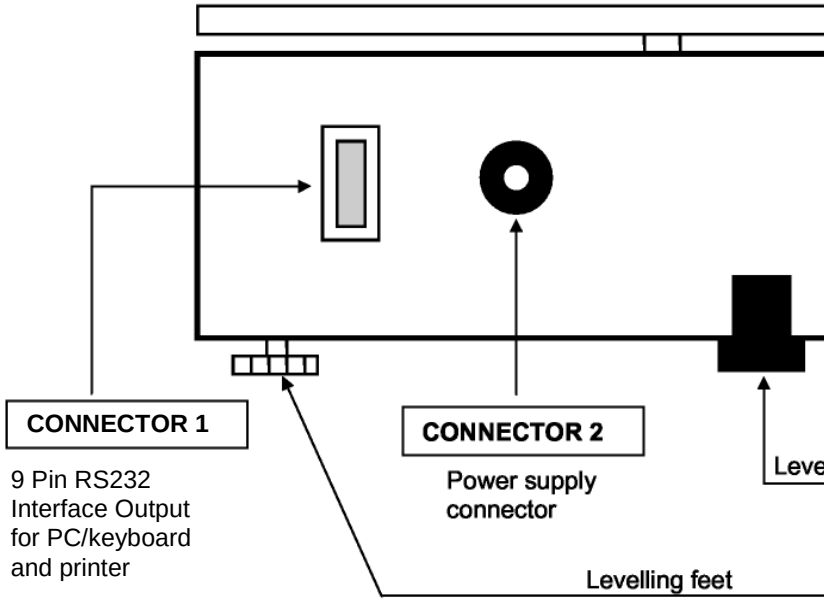


Fig. 2a - Bottom view

Weighing pan

Fig. 1b - Rear view



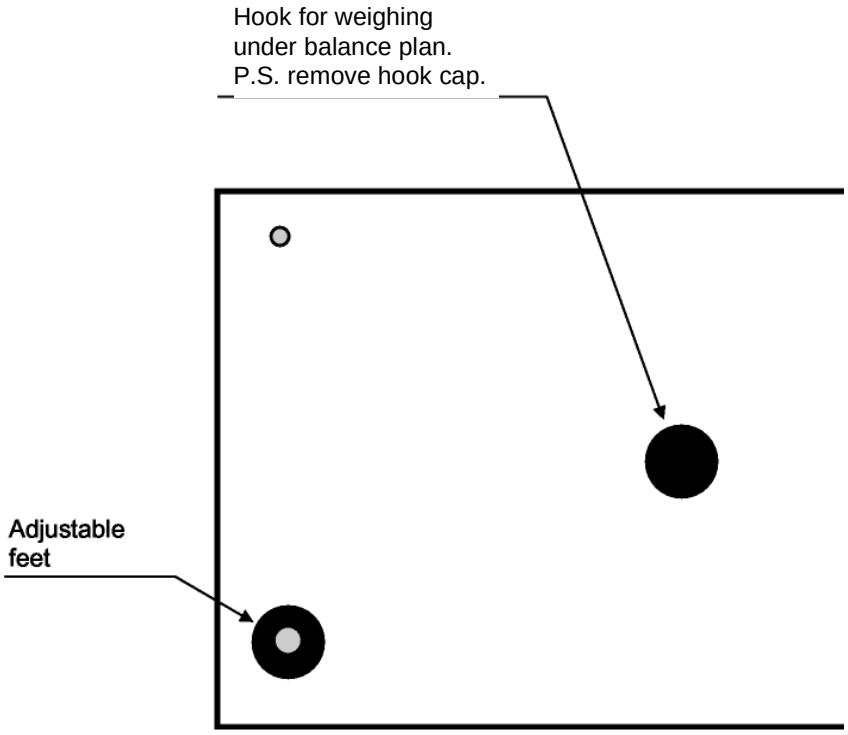
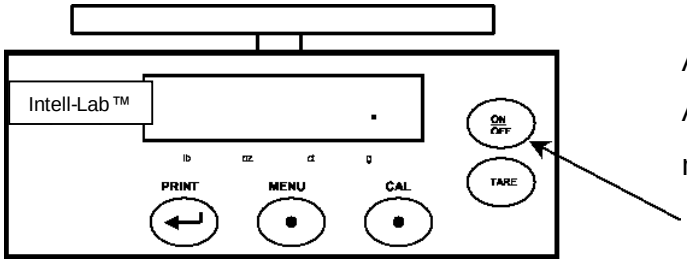


Fig. 2b - Bottom view

STAND BY

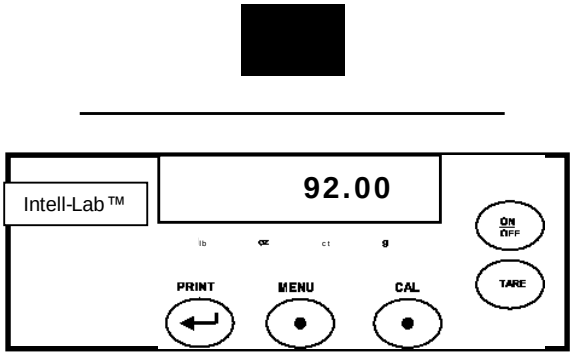


After having connected the balance to AC outlet, it is now in **"STAND BY"** mode.

To bring the balance to working conditions, press **ON/OFF** key.

To bring it in **"STAND BY"** mode, press **ON/OFF** key again.

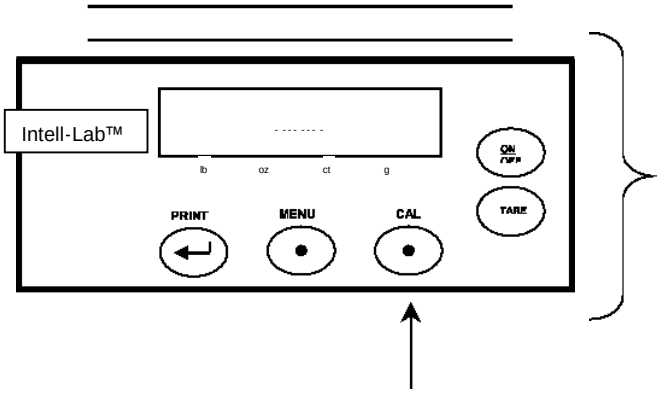
NORMAL WEIGHING



Load the good to weight on the pan and read weight value on display.

EXTERNAL CALIBRATION *

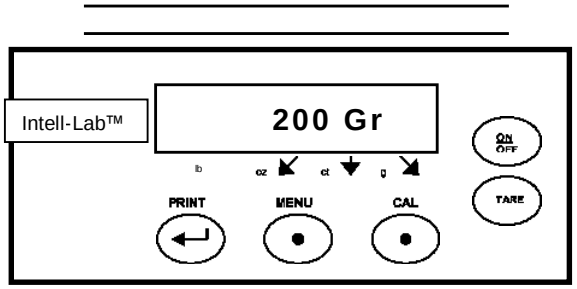
*** (For all models except Analytical balance).**



The electronic reading balance takes measurement of mass making use of gravity (g). Difference in geographic area and altitude will vary gravity acceleration (g). Therefore, for accurate measurement, scale must be adjusted to the local environment. This adjustment is accomplished by **CAL** key.

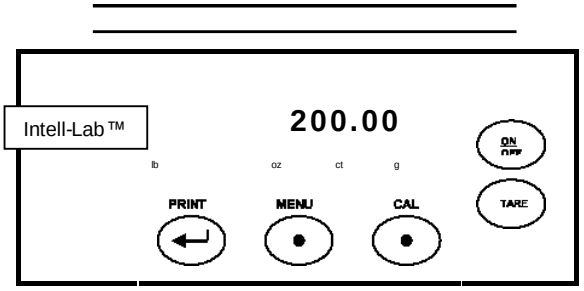
At empty pan, press **CAL** key.

Dashes are displayed.



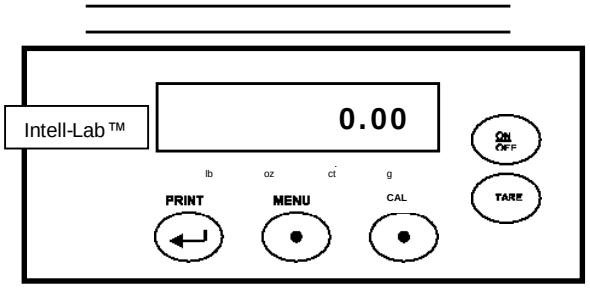
When calibration weight value starts to flash, load the weight on the pan.

calib. weight



The display will stop flashing, indicating calibration weight value.

Wait for buzzer BEEP to confirm calibration.



calib. weight

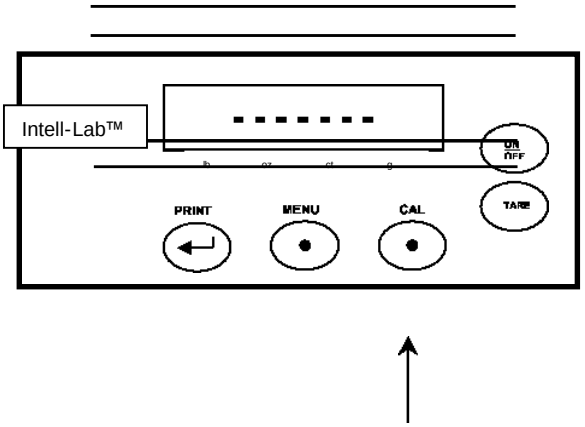
Unload calibration weight from the pan.

The balance is ready for weighing operations.

NOTE: if there is an interference during calibration process, the message **"ERR OR"**

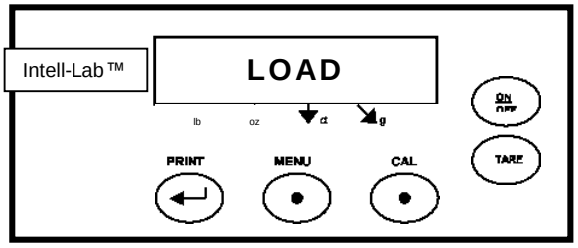
will be displayed.

(*)Moreover, it is possible to calibrate the balance with a calibration weight higher than the one set.
To perform this sort of calibration,press and keep CAL key pressed at empty pan until the acoustic alarm will be deactivated, then release the key and the following string "--------" will be displayed, followed by the flashing message "LOAD" .

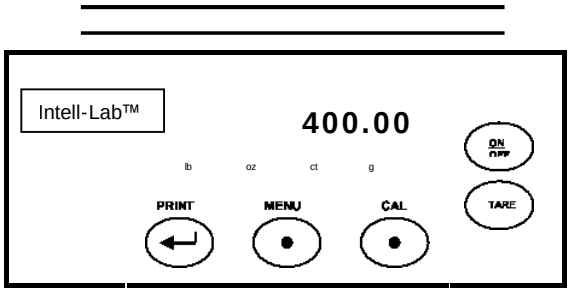


peso calib.

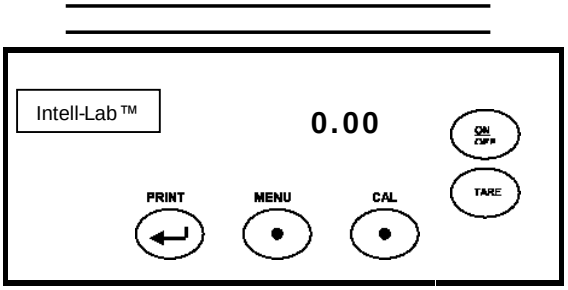
Now load on the pan a weight equal or higher than calibration weight set; the balance will recognise as valid a weight equal or higher than calibration weight as long as it is a whole number in comparison with the most meaningful digit of calibration weight..
Example: if calibration weight is 200g, it will be possible to calibrate the balance with values from 200g,300g,400g up to the highest limit of balance weighing range.
The message **"LOAD"** on display will stop flashing.
Once calibration has been effected, the value of calibrated weight will be displayed.



peso calib.



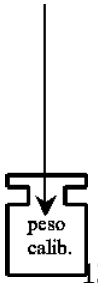
Remove calibration weight.



The balance is ready for weighing operations.

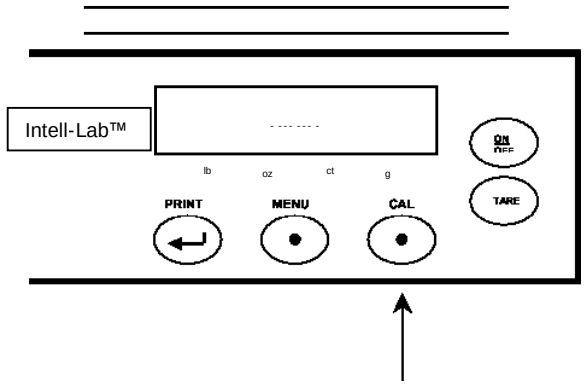
NOTE: if there is an interference during calibration process, the message **“ERROR”** will be displayed.

*** (not for Analytical balances)**



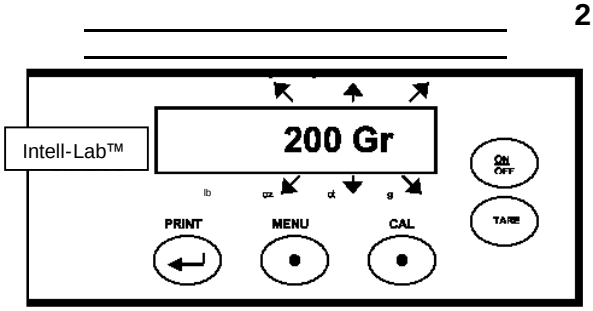
EXTERNAL CALIBRATION *

*** (Only for Analytical balances models).**

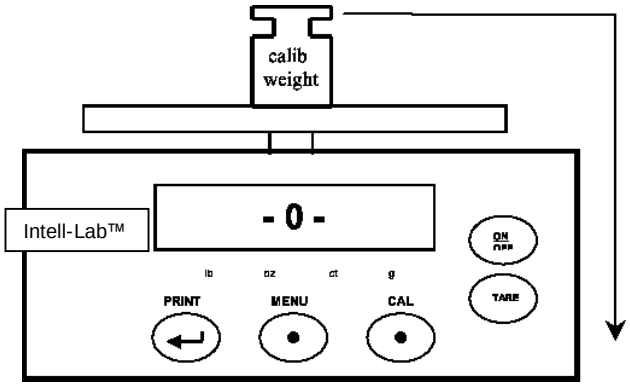


Press **CAL** key at empty pan.
Dashes are displayed.

2

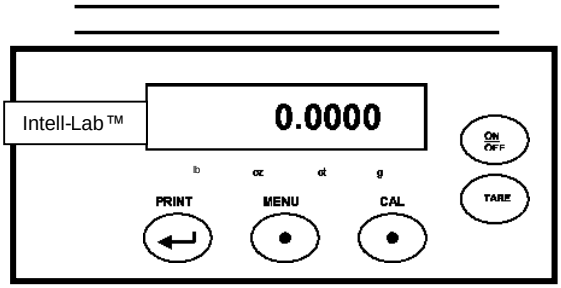


As soon as calibration weight value starts to flash, load calibration weight on the pan.



Wait for the flashing message "- **0 -"** to be displayed.

Unload weight from the pan.



If calibration operation has been effected correctly, the balance will return to normal weighing conditions. Otherwise, calibration's value will keep on flashing and the procedure will have to be repeated

starting from point “2”.

CALIBRATION MODE *

*** These functions are available ONLY for models provided with servomotor and internal calibration mass.**

The balance effects mass measurements making use of gravity (g). Differences in geographical areas and in altitude will vary gravity acceleration (g).

Therefore, in order to have precise measurements, the balance must be adjusted to local environment. This adjustment is accomplished by calibration function.

There are 4 calibration modes available :

1. Autocalibration
2. Internal calibration
3. External calibration
4. Technical calibration

1. AUTOCALIBRATION

The balance autocalibrates through internal calibration weight every 30 minutes, after checking by microprocessor that other weighing operations are not being effected. In this mode, in addition to a calibration every 30 minutes, it is possible to effect calibration with internal calibration weight by pressing **CAL** key at any time, being sure there is no weight loaded on the pan.

2. INTERNAL CALIBRATION

The balance autocalibrates through internal calibration weight ONLY on user's request by pressing **CAL** key. Calibration every 30 minutes is excluded.

3. EXTERNAL CALIBRATION

The balance calibrates through external calibration weight (NOT provided on models with internal calibration weight).

4. TECHNICAL CALIBRATION

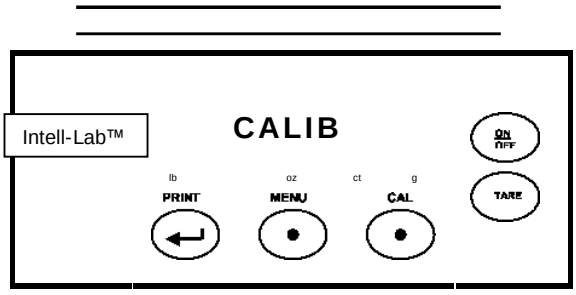
This function allows re-storing of internal calibration weight value whenever intervention of assistance-checking-service require it.

ATTENTION : this procedure must be effected using only calibration weight in class E2.

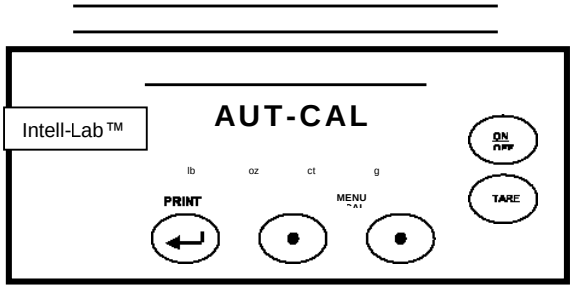
NOTE: for balances NOT provided with servomotor and internal calibration weight, ONLY EXTERNAL calibration mode is available.

CALIBRATION MODE SELECTION *

*** These functions are available ONLY for models provided with servomotor and internal calibration mass.**



From display zero condition, press **MENU** key until the message **"CALIB"** is displayed, then press key.



Select calibration mode:

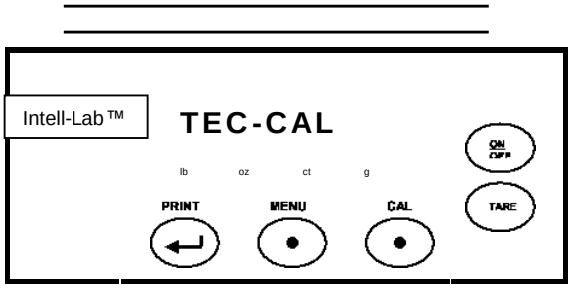
AUT-CAL = autocalibration

I-CAL = internal calibration

E-CAL = external calibration

TEC-CAL = technical calibration

by pressing **MENU** key in sequence.



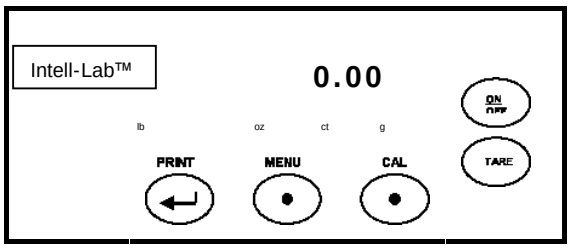
Press shortly key to confirm **AUT-CAL , I-CAL , E-CAL .** Otherwise, to confirm **TEC-CAL,** press and keep

key pressed until the acoustic alarm is over.

After selection, the balance returns to normal weighing conditions.

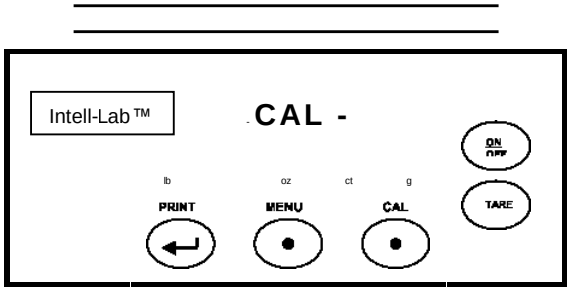
AUTOCALIBRATION *(AUT - CAL) / INTERNAL CALIBRATION * (I-CAL)

*** These functions are available ONLY for models provided with servomotor and internal calibration weight.**

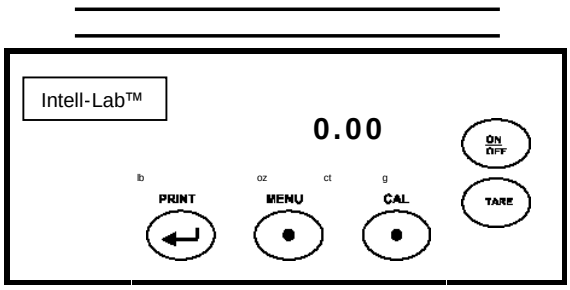


Before effecting internal calibration, be sure no weight is loaded on the pan.

Press **CAL** key at empty pan.



The message **"CAL"** will be displayed. Internal calibration weight is then loaded.



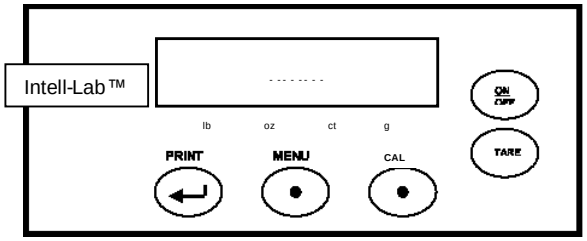
When the message **"0.00"** will be displayed, the balance returns to normal weighing conditions.

The message **"ERROR"** will be displayed if calibration is not effected because of vibrati

ons or draughts.

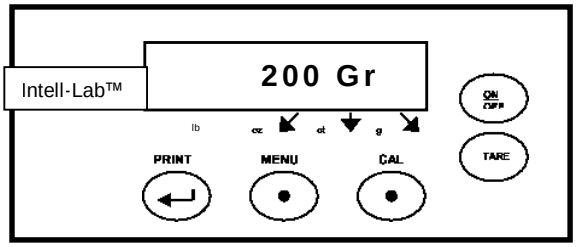
TECHNICAL CALIBRATION *

*** This function is available ONLY for models provided with servomotor and internal calibration mass.**

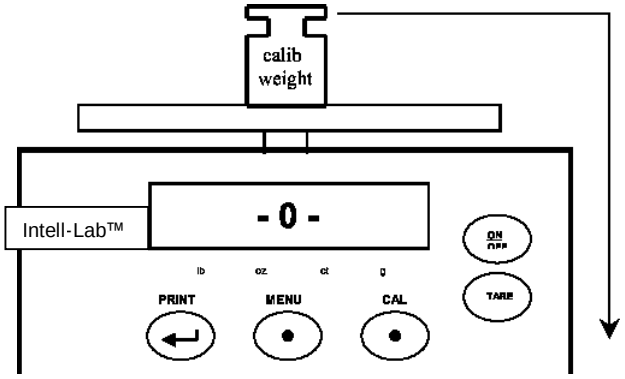


Press **CAL** key at empty pan.

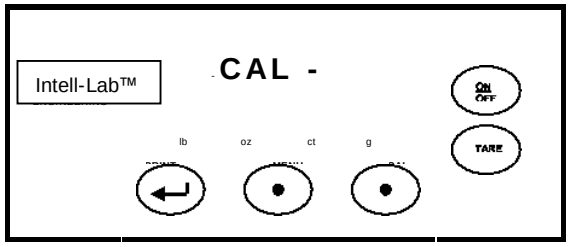
Press **CAL** key at empty pan.
Dashes are displayed.



As soon as calibration weight value starts to flash, load calibration weight on the pan.



Wait for the flashing message "- **0 -**" to be displayed.
Unload weight from the pan.



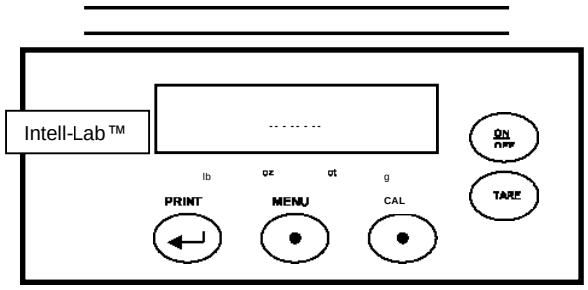
The message **"CAL"** will be displayed.
The balance will then return to normal weighing conditions.

Intell-Lab™ **TARE FUNCTION**

Load the container on the pan.

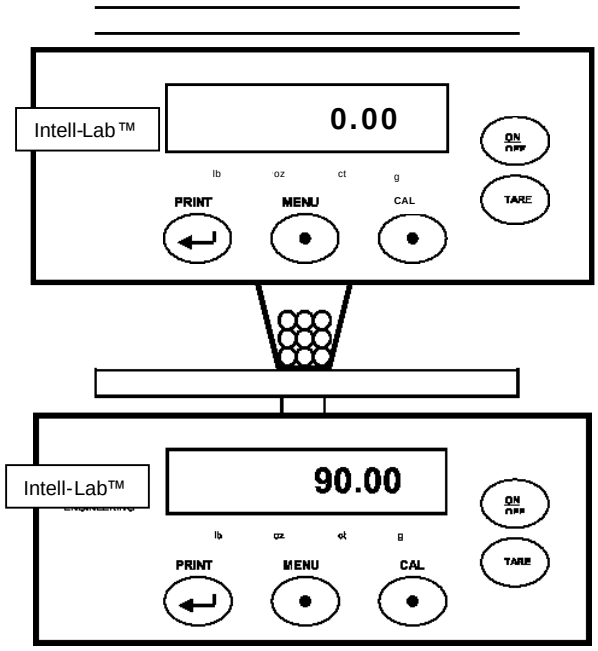
Press **TARE** key.

Dashes will be displayed until stability is reached.



The value **“0.00”** will then be displayed when stability is reached.

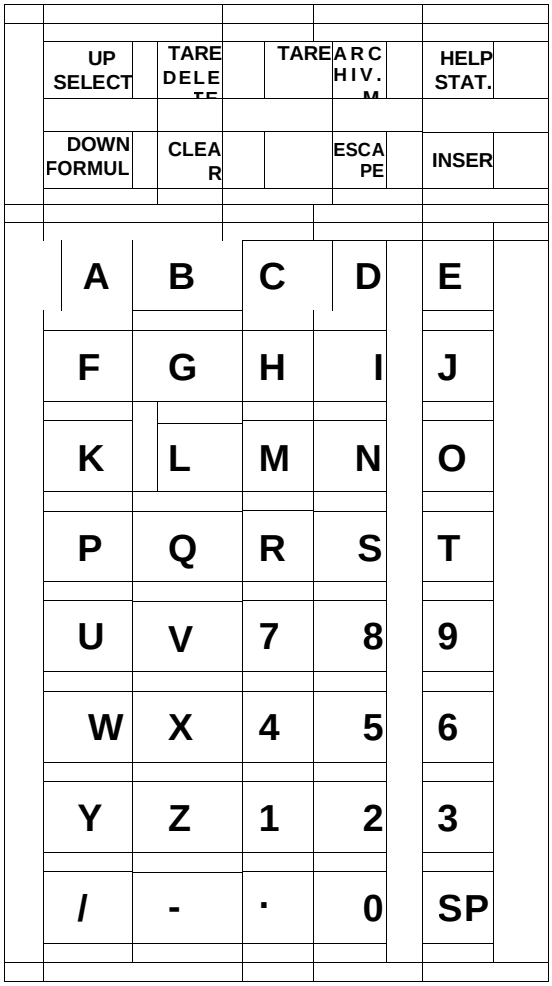
In case stability cannot be reached because of draughts, vibrations or other problems, dashes will keep on being displayed.



Load the goods to weight in the container.

Read net weight value on display.

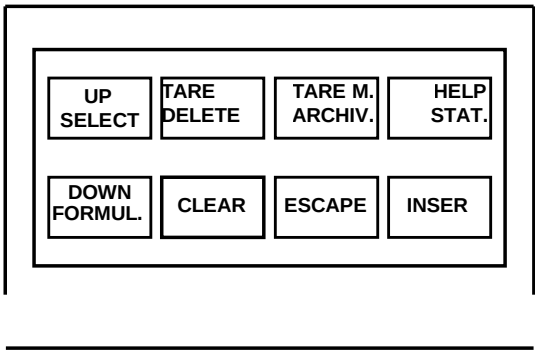
OPTIONAL ALPHANUMERIC KEYBOARD



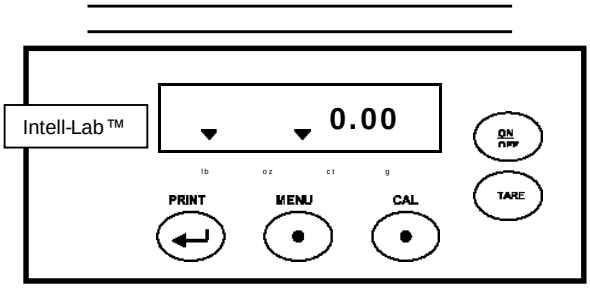
If you have an alphanumeric keyboard, it is possible to perform tare pressing **TARE/DELETE** key too in the same way previously described.

NOTE: connecting the alphanumeric keyboard to the serial entry line, it is necessary to select the baud rate at 1200 BAUD (see page 22).

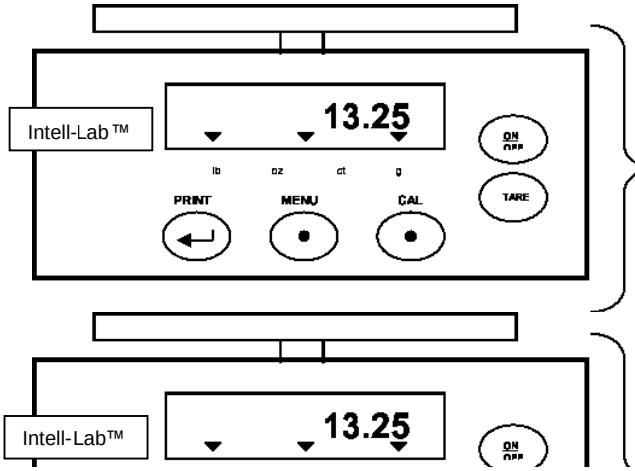
MANUAL TARE FUNCTION *



Having an optional alphanumeric keyboard, it is possible to insert a value of a known tare from the keyboard.



Press **TARE MAN** key on the alphanumeric keyboard. Three arrows will appear on the display along with the previous value of manual tare, if it has been inserted before.



Press **CLEAR** key to set at zero the previous value and digit the new value, using numerical key located at the bottom part of the alphanumeric keyboard. Press **INSER** to confirm.

Press **ESCAPE** key to go out from this condition.

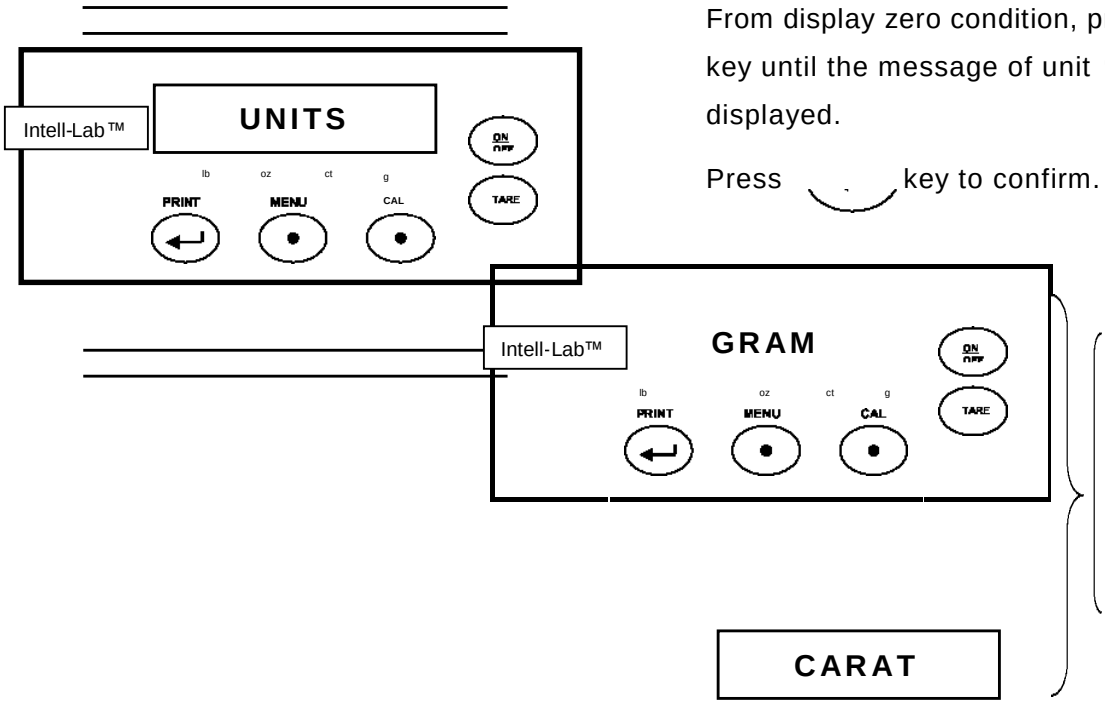
To set at zero the value of manual tare inserted by keyboard, effect a normal operation of tare with **TARE** key located on the balance, or with **TARE/DELETE** key located on the optional alphanumeric keyboard.

*** ONLY for models provided with alphanumeric keyboard.**

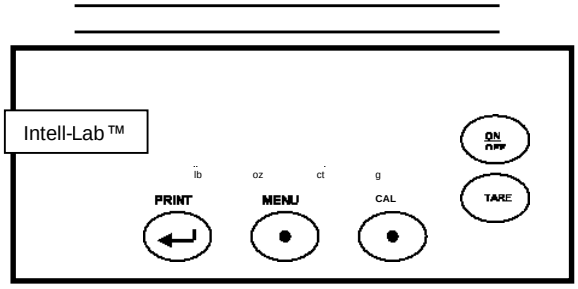
WEIGHT UNITS *

From display zero condition, press **MENU** key until the message of unit **"UNITS"** is displayed.

Press key to confirm.



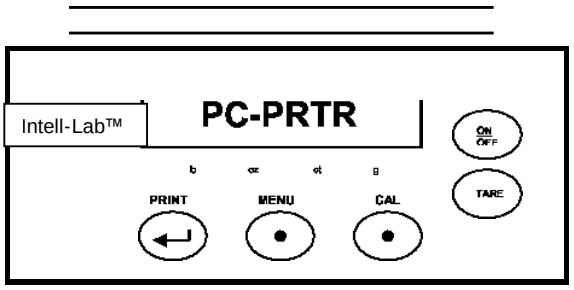
The unit **"GRAM"** wi
By pressing **MENU** ke
of unit **"CARAT"** wil
Press key to
pass to another weig



SYMBOL	MEASURE UNIT	CONVERSION FACTOR 1g =
GRAM	GRAMS	1.
CARAT	CARATS	5.
OUNCE	OUNCES	0.035273962
POUND	POUNDS	0.0022046226
PENN.	PENNYWEIGHTS	0.643014931
ONCETR.	TROY OUNCES	0.0321 50747
GRANO	GRAINS	15.43235835
TAEL HON	HONG KONG TAEL	0.02671 725
* TAEL SGP	SYNGAPORE TAEL	0.02646063
* TAEL ROC	R.O.C. TAEL	0.02666666
* MOMME	MOMME	0.2667
* x 10	x 10	10.
* x 100	x 100	100.

*** Not available for all models.**

PC INTERFACE SELECTION



Connect the balance to PC with proper cable (page 7).

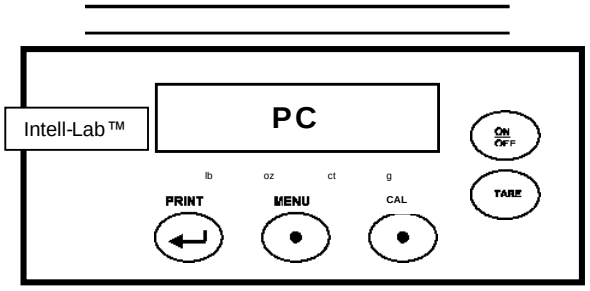
From display zero condition press **MENU** key until

the

message “

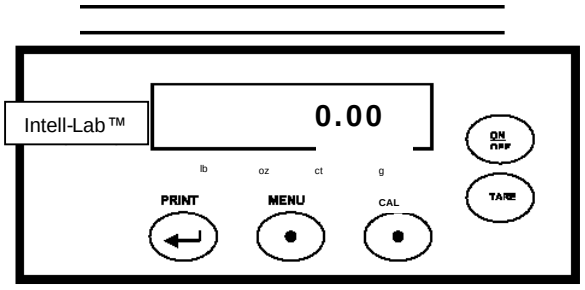
PC-PRTR “ is displayed.

Press key to confirm.



Press **MENU** key until the message **“PC”** is displayed.

Press key to confirm.

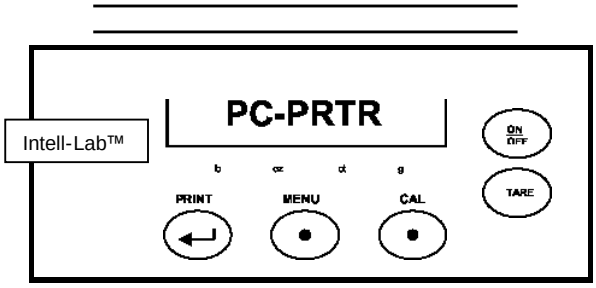


The balance returns to normal weighing condition

transmitting data conti nously.

NOTE: select baud rate (page 22).

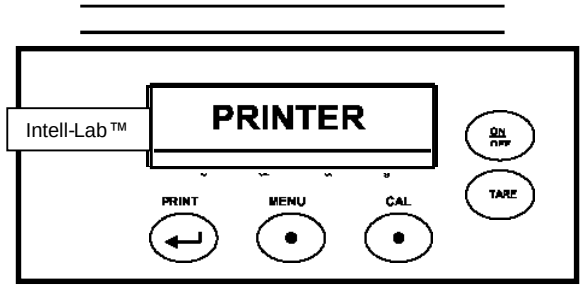
PRINTER INTERFACE SELECTION

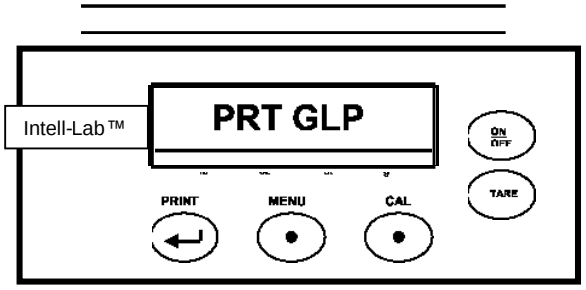


Connect the balance to the printer with proper cable (page 7).

From display zero condition press **MENU** key until the message " **PC-PRTR "** is displayed.

Press ↵ key to confirm.





To select data printer mode press **MENU** key until the following messages will be display :

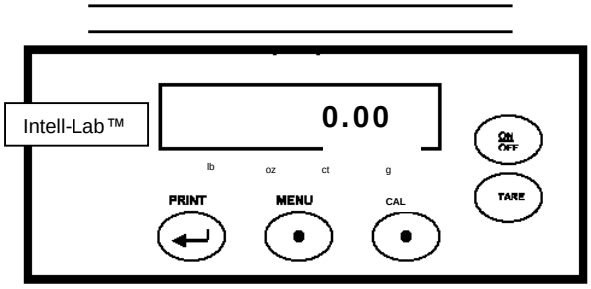
PRINTER: for printing of weight only

PRT TIM: for printing of date,hour and weight

PRT GLP: for printing of GLP data

(Printing modes PRT TIM and PRT GLP are available only using printer mod. CUSTOM DP24E4)

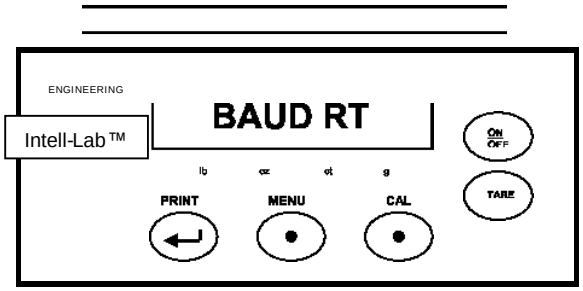
Press ↵ to confirm.



The balance returns to normal weighing conditions ready to weigh every time **PRINT** key is pressed.

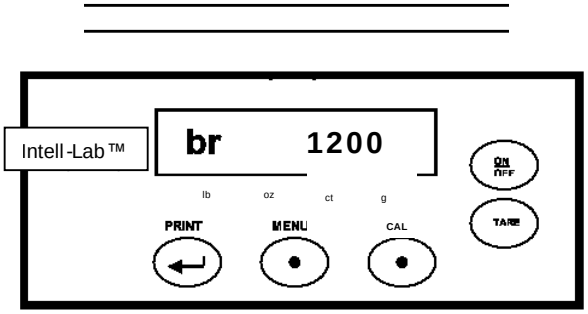
NOTE: select baud rate (page 22).

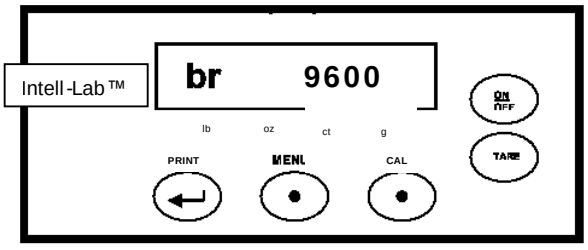
BAUD RATE SELECTION



Press **MENU** key until the message **"BAUD RT"** is displayed.

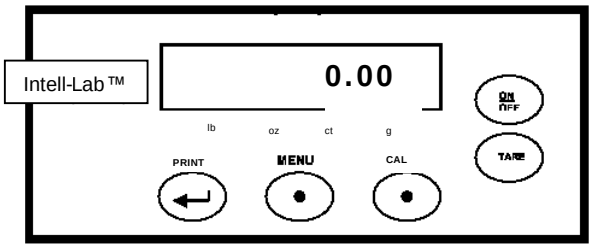
Press ↵ key to confirm.





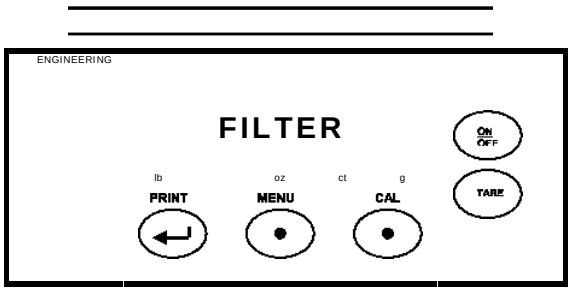
Select serial data baud rate (1200-2400-4800-9600 baud) by pressing **MENU** key in sequence.

Confirm baud rate with ↵ key.



The balance returns to normal weighing condition.

FILTERS SETTING



It is possible to adapt the balance to the ambient conditions.

Five settings are available:

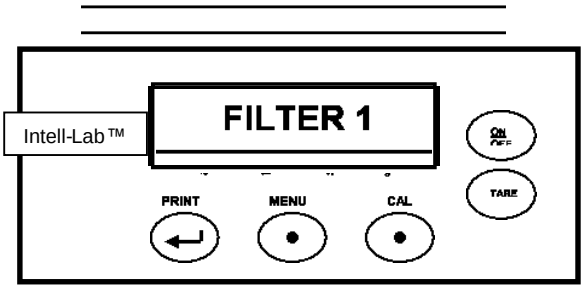
FILTER 1 : proportion of ingredients conditions

FILTRO 2 : very stable conditions

FILTRO 3 : stable conditions

FILTRO 4 : unstable conditions

FILTRO 5 : very unstable conditions



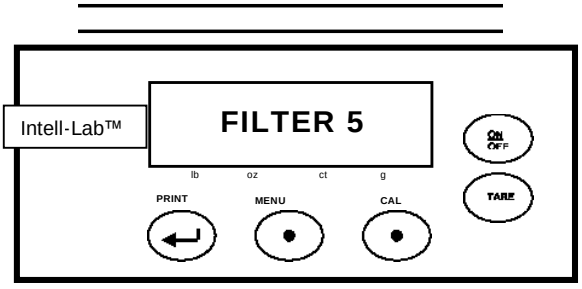
Press **MENU** key until the message

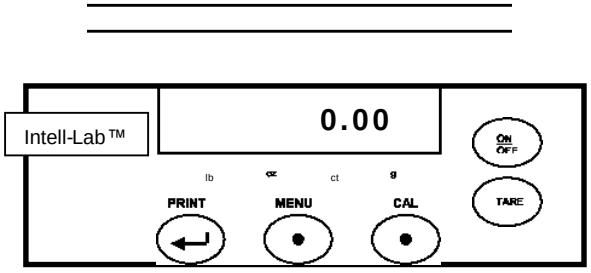
Press  key to confirm.

select by **MENU** key **FILTER 1, FILTER 2…..FILTER 5.**

Confirm selected filter with  key.

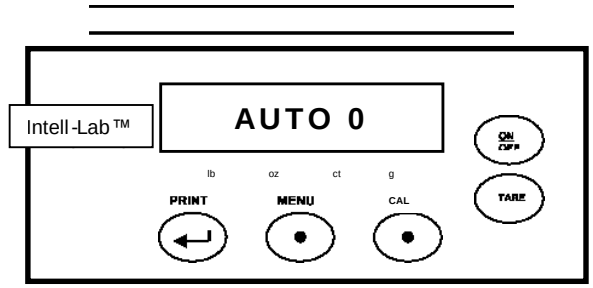
"FILTER" is displayed.





The balance returns to normal weighing conditions.

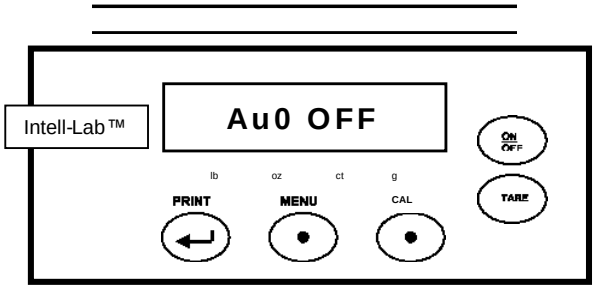
AUTOZERO FUNCTION



Autozero is a drift automatic correction from zero.

Press **MENU** key until the message **"AUTO 0"** is displayed.

Press 



Select by **MENU** key :

Au0 OFF = autozero disabled ▮▮▮▮

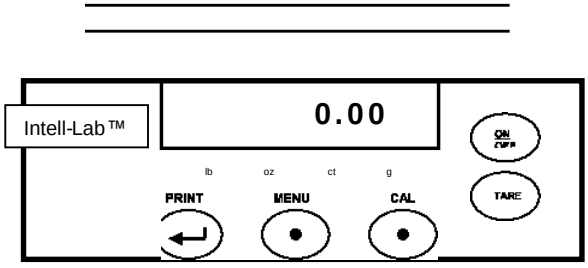
Au0 1 = level ▮▮▮

Au0 2 = level ▮▮

Au0 3 = level ▮

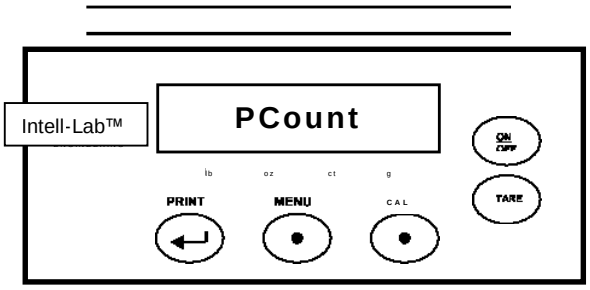
Au0 4 = level

Press  key to confirm

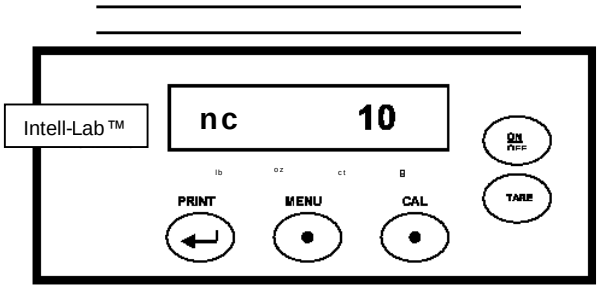


The balance returns to normal weighing conditions.

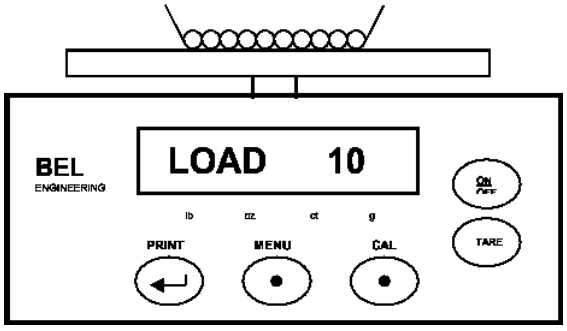
PIECECOU NTING FUNCTION *



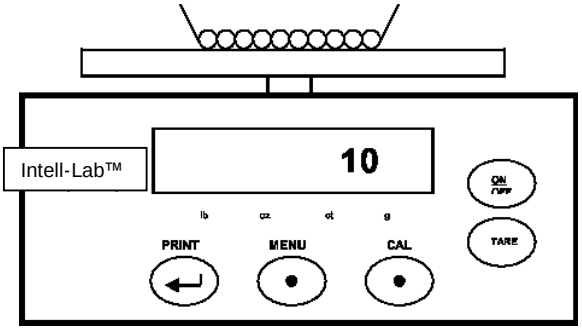
From display zero condition, press **MENU** key until the message " **PCount "** is displayed.
Press key to confirm.



Select the number of required pieces pressing **MENU** key repeatedly.
The choice of number of pieces (10, 25, 50, 100) is connected to the weight of the single piece.
Press key to confirm.

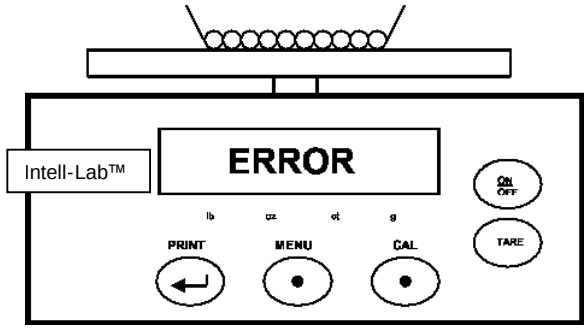


Load on the pan the number of pieces indicated on the display.
Press key once again.
Wait for stabilization of the weight.



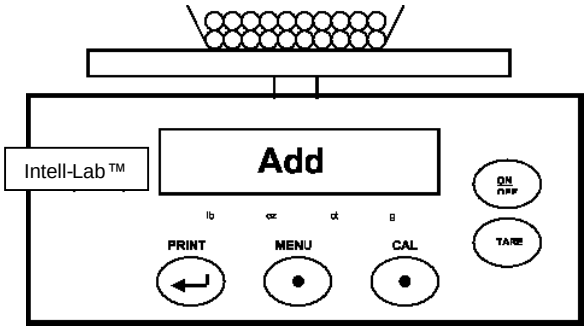
If the number of samples is enough (for example n. 10 as in picture) their number will appear on the display and it will be possible to effect counting .

* **Not available for all models.**



If the pieces to count have a too smaller weight than balance readability, the message **"ERROR"** will be displayed.

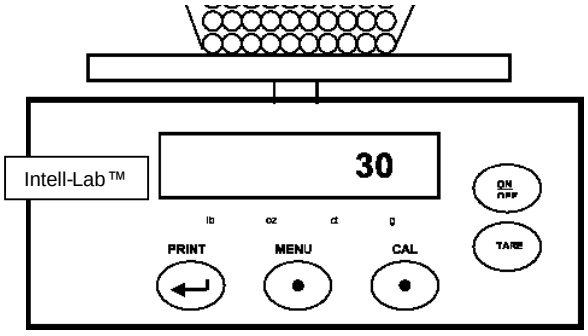
It is necessary to use a balance at higher readability.



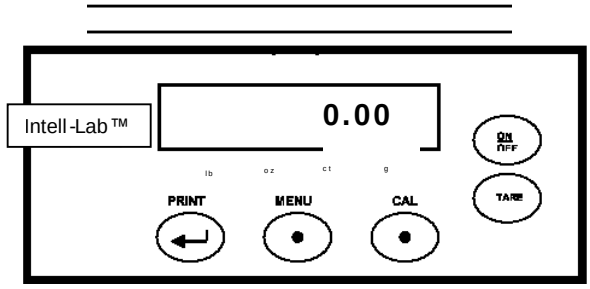
If the sample weight is acceptable but not enough, the message **"Add"** will be displayed.

Add a certain number of pieces so that the quantity on the display is approx. doubled, then press key.

If the quantity of pieces is still not enough, the message **"Add"** will be displayed again. Double again the quantity read on the display.

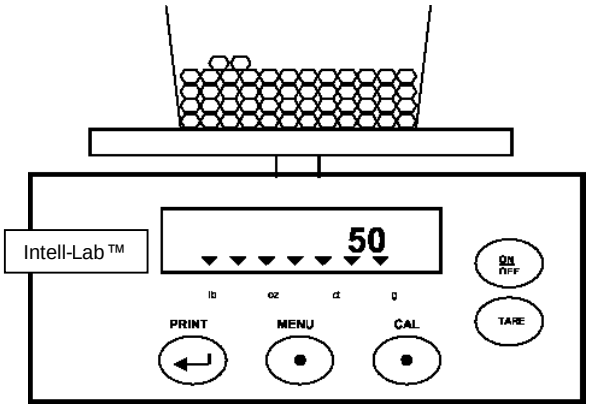


On reaching the sufficient number of pieces, their quantity will be displayed and it will be possible to proceed to count them loading the pieces to count on the pan.



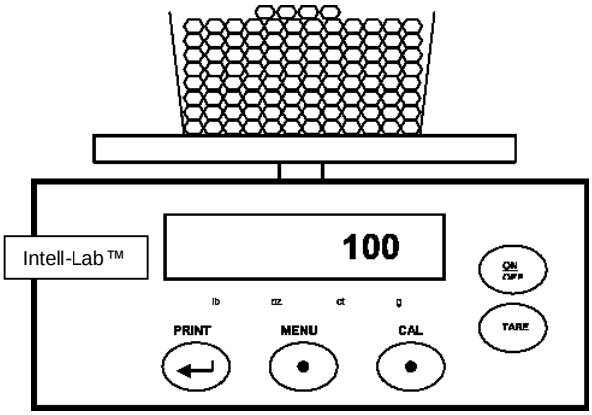
To escape from piececounting mode press **ON/OFF** key, and the balance will return to normal weighing conditions.

AUTOMATIC UPDATING OF UNIT WEIGHT



After having effected the sampling, it is possible to update the average unit weight as follows :

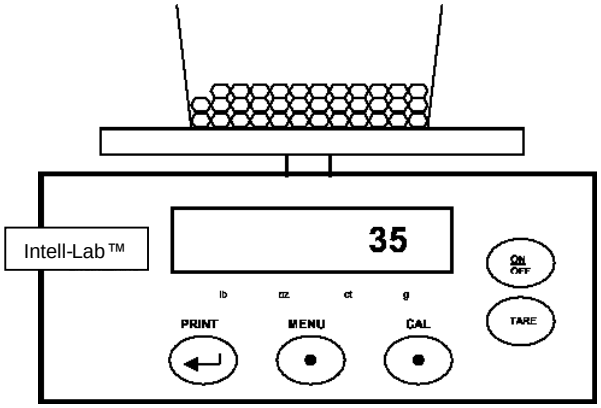
instead of loading all the pieces to count, load a number of pieces equal to the double of the one loaded on the pan. Wait for all the arrows to be displayed followed by a short acoustic message.



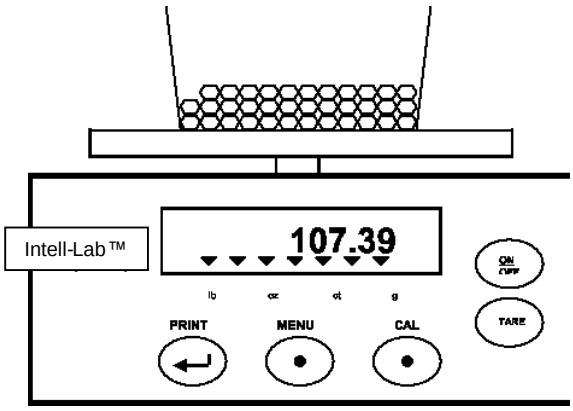
Now it is possible to repeat this procedure up to a maximum of 255 pieces or proceed to the normal counting of the pieces. This mechanism grants a more precise evaluation of the average unit weight and a better precision in counting of pieces.

NOTE: the mechanism of the automatic updating is not active if the sampling has been effected by insertion of the average unit weight from alphanumeric keyboard.

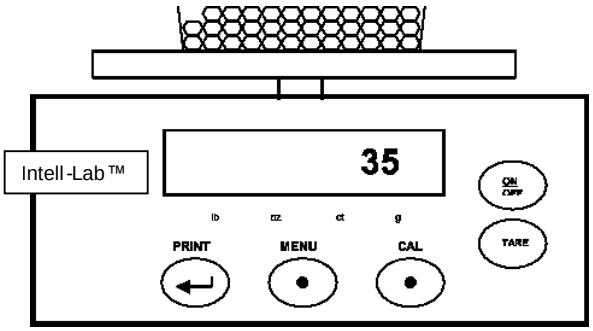
DISPLAY OF WEIGHT IN PIECECOUNTING CONDITION



To display weight value during the counting of pieces, press **MENU** key.

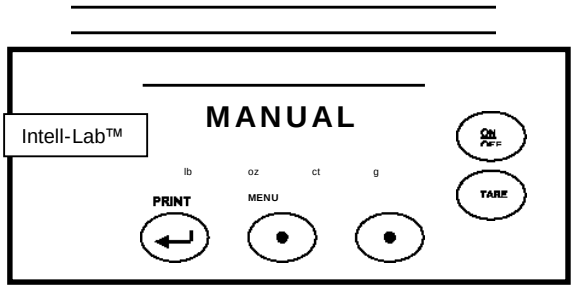


This condition is indicated by lighting of all display arrows.



To return to piececounting condition and proceed with counting, press **MENU** key again.

MANUAL INSERTION OF THE UNIT SAMPLE WEIGHT *



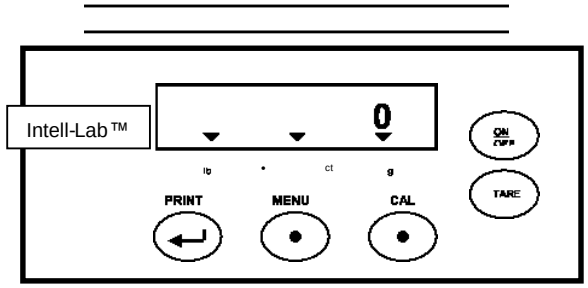
It is possible to use the optional alphanumeric keyboard to insert weight of the unit sample, if it is known.

From zero condition on the display press **MENU** key until the message **"Pcount"** is displayed.

Press . key to confirm.

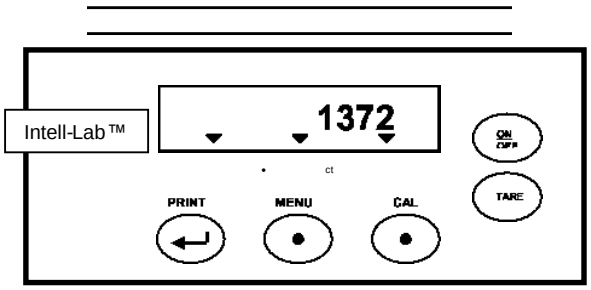
Select **MANUAL** pressing **MENU** key repeatedly.

Press . key to confirm.



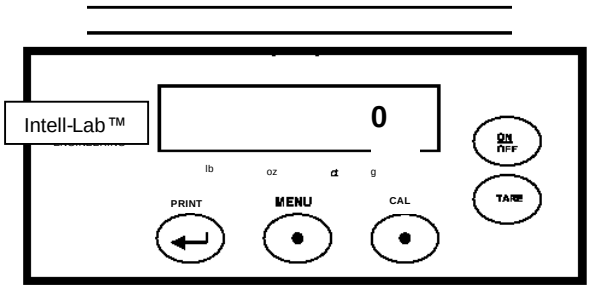
Insert unit weight (in grams) of a sample, using the numerical keys from 0 to 9 and decimal point.

In case of error, press **CLEAR** key and start again.



Press **INSER** key to confirm.
If the inserted weight is 100 times smaller than balance readability, the message **"ERROR"** will be displayed.

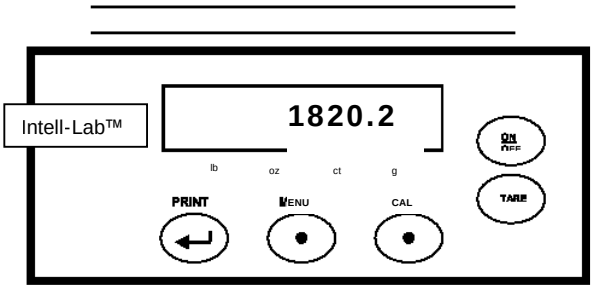
To escape without inserting the weight, press **ESCAPE** (on the alphanumeric key) or **ON/OFF.**



If the weight is enough **"0"** will be displayed; it is now possible to proceed to count loading the pieces on the pan. To escape from piececounting function, press **ON/OFF** key.

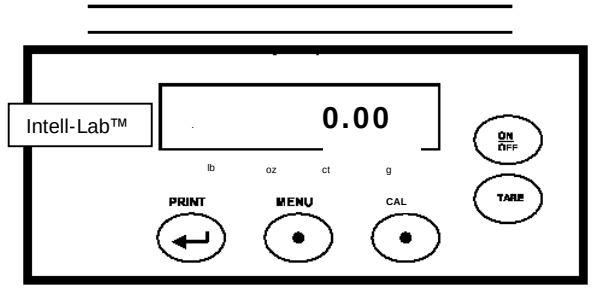
*** ONLY for models provided with alphanumeric keyboard.**

V-RANGE FUNCTION *

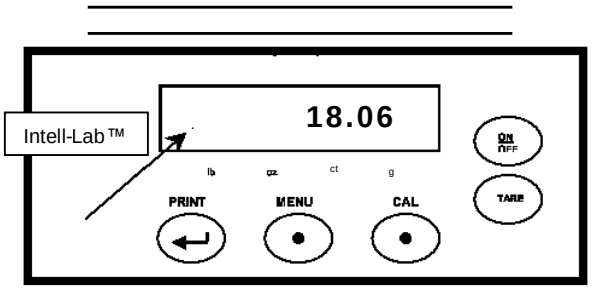


*** This function is available ONLY for models double scale VR.**

To activate **V-RANGE** function, press **ON/OFF** key.



Now a tare operation is automatically performed, and at the end it is possible to operate with the scale at highest resolution.



In this way it is possible to effect with precision proportioning of small quantities. This situation is pointed out by lighting of decimal point on the digit placed on the extreme left side of the display.

The scale at highest sensitivity remains until net weight exceedes in positive max. value foreseen for lower range or in negative a fixed limit.

Anyway, it is always possible to disable this function by pressing **ON/OFF** key.

In all these cases total weight is displayed.

Balances provided with this function can be switched off pressing and keeping pressed **ON/OFF** key until acoustic message is deactivated.

DETERMINATION OF SOLID DENSITY FOR BALANCES WITH PROPER OPTIONAL SOFTWARE *

Balance program allows to determine solid density through four steps:

–**TARE IN AIR;**
–**TARE IN WATER;**
–**SOLID WEIGHING IN AIR;**
–**SOLID WEIGHING IN WATER.**

STORAGE OF TARE IN AIR

Tare in air (weight of the small basket in air) is about zeroing of small basket weight in air. Press **TARE** key to effect this operation being sure that value displayed is **"0".**

STORAGE OF TARE IN WATER

Select density menu by pressing **MENU** key. The message **"DENS"** is displayed. By pressing **TARE** key the message **"t.H20"** is displayed. Dip the small basket in water and press **TARE** key once again. The message starts flashing until stability is reached, then an acoustic alarm is given out. Tare value in water is stored until balance is switched off, and it can be changed repeating the same sequence of operations above mentioned.

DETERMINATION OF SOLID DENSITY

Select **"DENS"** by pressing **MENU** key and then press **CAL** key. The message **"S.AIR"** will be displayed. Load a solid in the small basket and press **CAL** key. The message starts flashing. As soon as it is stable, an acoustic alarm is given out and the message **"S.H2O"** is displayed. Dip the small basket with the solid in water and press **CAL** key once again. The message will flash. As soon as stability is reached, an acoustic alarm is given out and density value is displayed.
Press **MENU** key to return to weight display.
Press **PRINT** key to print the value displayed.

*** Not available for all models**

SERIAL INTERFACE RS 232

1) General characteristics

The balance sends the value displayed in serial form RS232C, allowing to print weight on PC monitor or on a serial printer. In case of connection with PC, it is also able to get commands, always in RS232C format, that allow to effect all operations with balance keys through PC keyboard. Baud rate is selectable trough **MENU** and keys, as shown previously, at 1200, 2400, 4800, and 9600 baud. The format of character is of 8 bit preceded by a start bit and followed by a stop bit. Parity is not considered.

1) Interface selection for PC

Selecting PC output (personal computer IBM compatible) through **MENU** and keys, weight is sent continuously at the same frequency with which weight indication is updated on display. It is possible to effect all balance functions directly from PC keyboard, sending to the balance ASCII cods indicated in the list

CODE	FUNCTION
"T" = H54	TARE
"C" = H43	CALIBRATION
"E" = H45	ENTER
"M" = H4D	MENU

The connector to use for PC connection is n.1 (fig.1 page 33).

2) Interface selection for printer

Otherwise, if it has been selected output for serial printer, weight value will be printed, once this will be stable, pressing **PRINT** key. If weight does not become stable in 10 seconds, the message **"ERROR"** will be displayed and an acoustic alarm will be emitted.

The connector to use for printer connection is n.1 (fig. 1 page 33).

3) Display format

The string sent is composed of 14 characters: -

first character : weight symbol (space or -) ;

- second - ninth character : weight or pieces number ; -

tenth - twelfth character : measure unit symbol ; -

thirteenth character : carriage return ;

- fourteenth character : line feed.

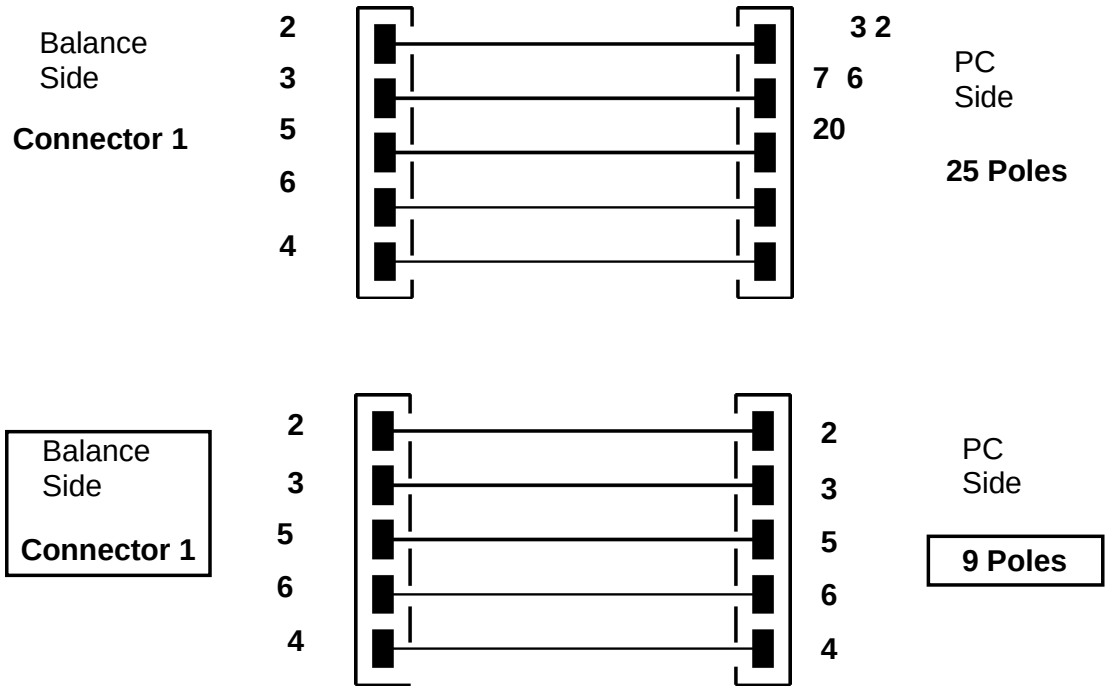
Possible non-meaningful zeroes are spaces.

ATTENTION

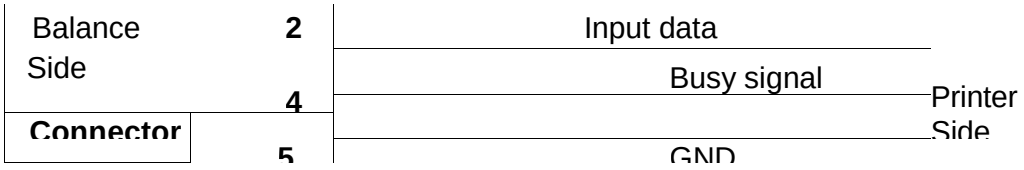
When the balance is in over range condition, weight value transmitted is replaced by strings “over” and “under” (only if PC output has been selected).

5) Connecting balance to PC

For connecting balance to PC, use connector 1 on the rear side of the balance as shown in the following figure :



6) **Connecting balance to serial printer** To print weight, connect connector 1 of the balance to serial printer as shown below :



7) Connecting balance to optional keyboard

C
o
nnector 1, used for connection to PC, can also be used for possible connection to

alphanumeric keyboard.

Connectors located on the rear panel of the balance

Fig. 1 Rear view panel of balance

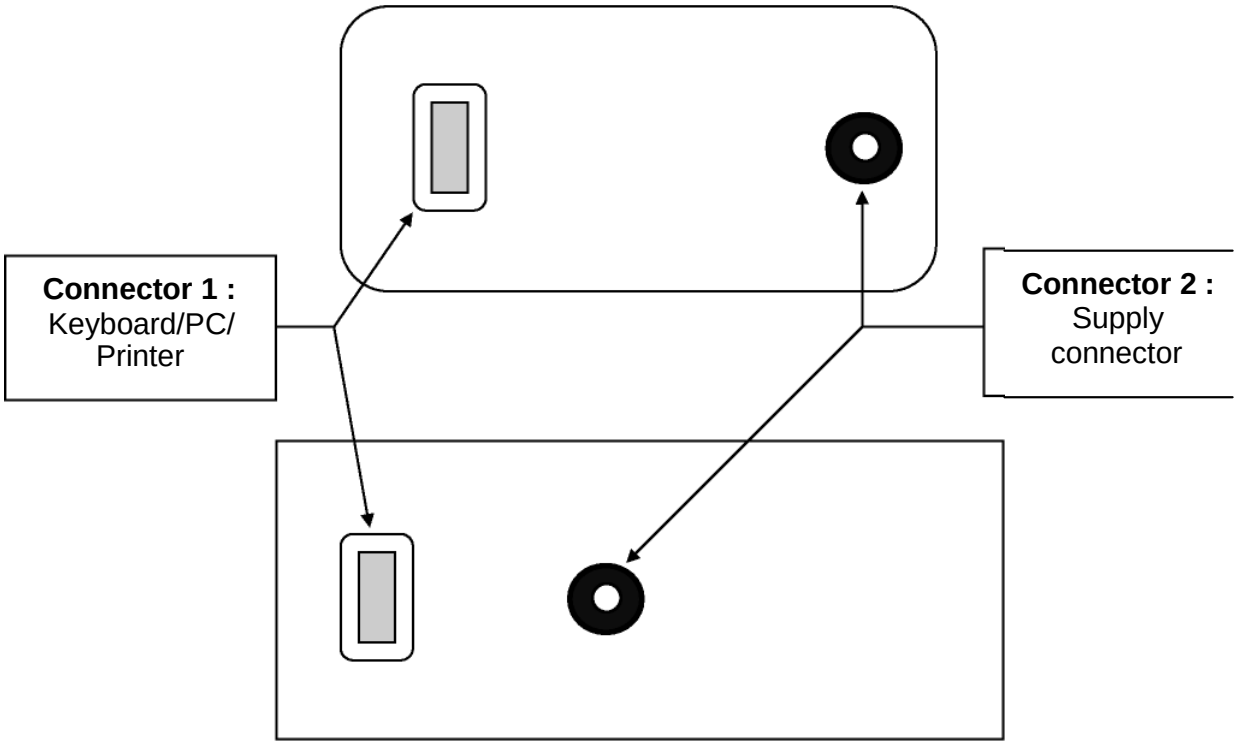
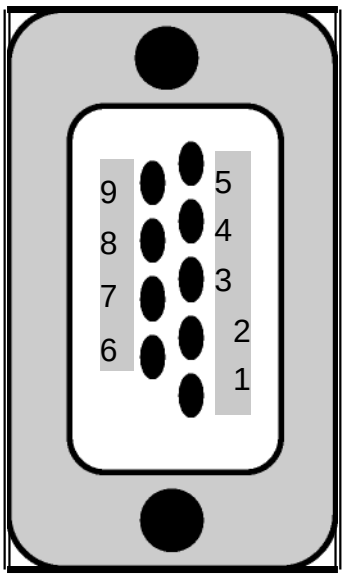


Fig. 2 Rear view panel of balance Mod. K

WEIGHING PAN ASSEMBLY

Fig. 3



CONNECTOR 1

FOR KEYBOARD OR PC OR PRINTER

pin 1 = +5v for keyboard
pin 2 = Tx signal (PC) =
pin 3 Rx signal (PC) =
pin 4 busy signal
pin 5 = Gnd
pin 4-6 = connected one with other
by PC transmission

WARRANTY CONDITIONS

1. Duration of warranty is of one (1) year from the date of purchase proved by invoice concerning the product or by delivery note.

2. Warranty covers all parts resulting defective at the origin. It does not cover mechanical or electronic parts damaged by wrong installation, tampering or incorrect use.

3. Warranty does not cover damages caused by impacts, balance drops or drop of objects on weighing pan.

4. Shipment to and from service centre is at customer charge

Intelligent Weighing Technology serves the industrial and laboratory markets in North America with competitive pricing and value for money on a complete range of industrial and laboratory scales and balances, force measurement and load monitoring technology from 0.01 mg to 275 tons.

- **We are the exclusive source for Intel l-Lab™, Intell-Industrial™, Intell-Check™, Intell-Count™, Intell-Weigh™, Intel l-Base™, Intel l-Scan™ and Intell-Print™ laboratory, industrial, counting, analytical, precision and toploading balances, printers, peripherals and weighing equipment.**
- **We are the exclusive source for UWE weighing equipment in the US and the Caribbean.**
- **We are the exclusive source for Intell-Lift™ Straightpoint (UK), Ltd. products in North America, Mexico and the Caribbean.**

We have a combined 50 years of experience in the weighing and measurement industry, both in the USA and worldwide. With contacts in over 50 countries, we provide you with the weighing and measurement equipment you need.

QUALITY- Products solidly built from the ground up with superior engineering and components for exacting results.

VALUE - Equipment priced for real-world business applications, with superior service and support.

EXPERIENCE - Expert advice to help you choose just the right product for your application.

Quality + Value + Experience...it adds up to the Intelligent Investment.

Intelligent Weighing Technology, Inc. www.intelligentwt.com