



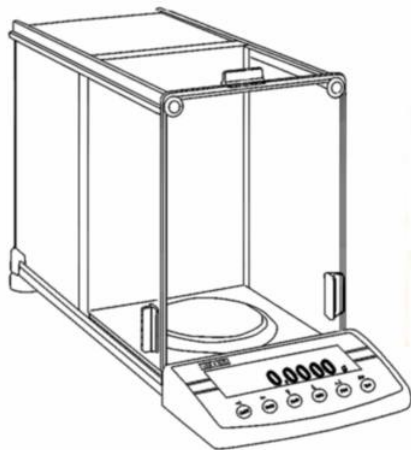
Adam Equipment

AEA /AEP SERIES

(Includes EC Type approved models)

OPERATORS MANUAL- FULL VERSION

Software revision upto MBA p.22



AEA Balances



AEP Balances

ADAM EQUIPMENT CO. LTD.
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1.0 INTRODUCTION

The AEA and AEP Series of balances are general purpose laboratory instruments which feature graphical displays, multiple operating modes, 16 weighing units, RS-232 interface, PC keyboard interface and the ability to have a second display. They are ideal for precise mass measurement.

OIML TYPE APPROVAL: The AEA and AEP balances can be configured at the factory for compliance with EN45501, OIML R-76. The balances have earned the EC type approval certificate and OIML Certificate of conformity. Some functions may not be available on approved models. These will be described in a box such as this.

The balances have the ability to weigh in the following weighing units. Each unit can be enabled or disabled by the user.

grams (default weighing unit)		
milligrams	pennyweight (dwt)	Mommes
carats	tael, Hong Kong	Grains
pounds	tael, Singapore	Newtons
ounces	Tael, Taiwan	Custom
troy ounces	Tical	Custom Factor

OIML TYPE APPROVAL: Weighing units are grams, milligrams and carats only. The display and the RS-232 output when set to printer are marked with brackets on the least significant digit. For example-

1 2 . 3 4 g

Weighing modes include:

Parts counting	Check-weighing
Filling	Percent Weighing with a reference mass
Animal weighing	Measuring density of solids and liquids
Formulation	Statistics of measurements

All weighing units and modes can be enabled or disabled by the user using the programming menus. The modes can be used independently or together, for example when parts counting, it is possible to also have the check-weighing and statistics modes operating.

The balances include internal calibration weights, as well as the ability to calibrate to external masses if necessary.

OIML TYPE APPROVAL: Calibration is with internal mass only.

Interface connections for RS-232, PC keyboard, secondary display and remote tare and print switches are on the rear panel. The PC keyboard can be used to replace the balance keypad and to input text as well as numbers into the balance memory.

The RS-232 interface for connection to a printer or PC is standard. The output format from the balance can be designed by the user to include text and balance information as required by the application. The output can include time, date, balance ID number, user names and control characters for printers. This feature makes the balance ideal for GLP record keeping applications.

The balances also include a weigh below fitting (a below balance hook) to make it possible to weigh samples that cannot be put on top of the balances and for density measurements. The AEP balances include a security bracket to secure the balance to a table top or other support.

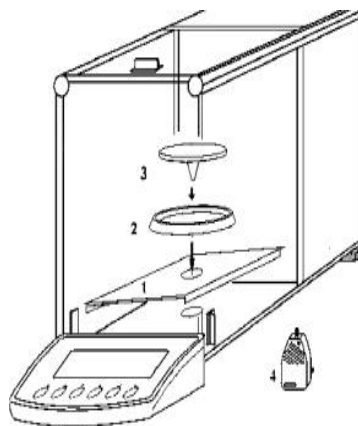
2.0 UNPACKING THE BALANCE

2.1 AEA ANALYTICAL BALANCE

Remove the balance from the packing by lifting the carrier section of the box with the handles. Take out the balance and put it on a stable table. Within the accessories box you will find all the parts needed to complete the balance.

- ✓ AC adapter,
- ✓ Pan,
- ✓ Pan Ring,
- ✓ Bottom Cover of Weighing Chamber,
- ✓ The User Reference Manual

Assemble the parts according to the diagram.



Install the Pan Ring (2) before the pan (3) is placed on the balance. After assembling all parts close the glass doors of the weighing chamber. Connect the balance to the power supply (4) and switch on the main. The power supply socket is at the back of balance.

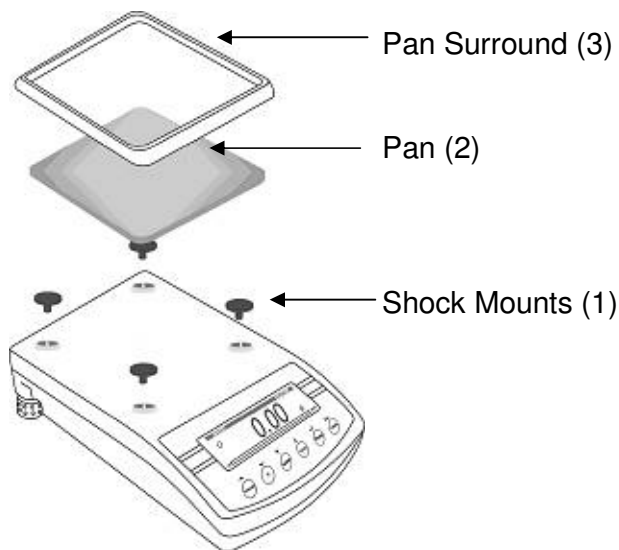
1. Bottom cover of weighing chamber
2. Pan Ring
3. Pan

The power supply (4) is available in various AC voltages and pin styles for use around the world. Before using the power supply verify it matches the AC voltage and pin styles you require.

2.2 AEP TOP LOADING BALANCES

Remove the balance from the packing by lifting it from the box and put on a stable table. From the accessories box you will find all the parts needed to complete the installation of the balance.

- ✓ AC adapter
- ✓ The User Reference Manual
- ✓ Pan
- ✓ Glass Breeze Shield with cover for 0.001g balances
- ✓ Shock Mounts
- ✓ Pan Surround or Plate for under the pan

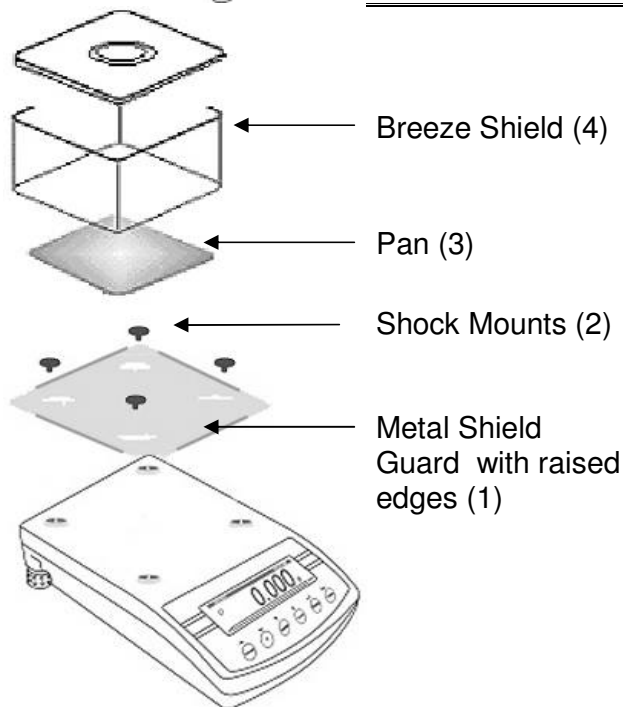


AEP with 165 x 165 mm pan

Assemble according to the diagram.

- (1) Install the shock mounts into the holes provided on the top surface, if not installed already.
- (2) Place the stainless steel pan on top of the shock mounts.
- (3) Then place the pan surround.

Connect the power supply module into the connector at the back of the balance. Then plug in the power supply module into the AC main power.



AEP with 128 x 128 mm pan

Assemble according to the diagram.

- (1) Place the Metal Shield Guard coinciding with the holes provided on the top surface, if not installed already. **NOTE: Raised edges to be upwards.**
- (2) Install the shock mounts into the holes after the shield guard is placed, if not installed already.
- (3) Place the stainless steel pan on top of the shock mounts.
- (4) Then place the assembled Breeze Shield around the pan.

Connect the power supply module into the connector at the back of the balance. Then plug in the power supply module into the AC main power.

3.0 SETTING UP THE BALANCE

3.1 INSTALLATION CONDITIONS

- Make sure the balance is on a level, firm and stable table.
- Avoid air drafts such as fans, air-conditioning vents, windows, doors.
- The temperature and humidity should be stable, (change in temperature should not exceed 0.5°C per hour). Air temperature should be between +15°C & +30°C and relative humidity between 45% & 85%.
- Avoid locations where the balances might be heated (direct sunlight) or cooled (air conditioner vents).
- A strong magnet is a part of these balances therefore take care when weighing magnetic material or using equipment containing magnets.
- Static electricity will have an influence on the balance indication, to minimise this effect ground the balance using the earth screw on the back of the balance.

3.2 LEVELLING THE BALANCE

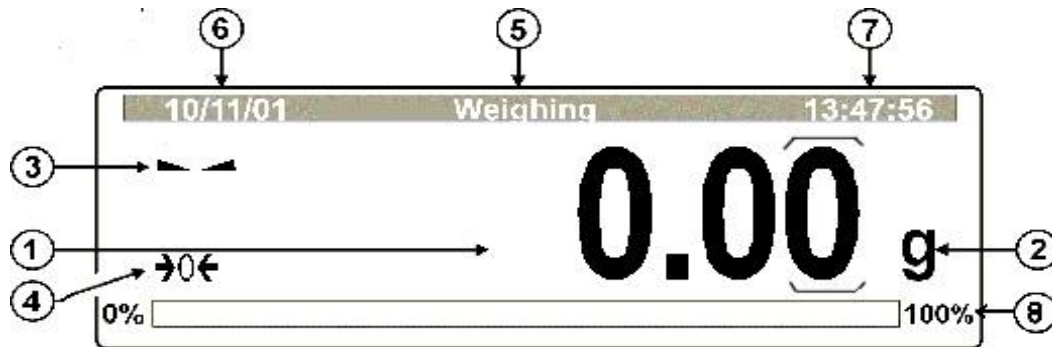
- After putting the balance in place you must level it, using the spirit level on the rear of the balance.
- To level the balance turn the two adjustable feet at the rear of the balance until the bubble in the spirit level is centred.

3.3 WARM-UP TIME

- Before you start weighing, you have to wait for the balance to achieve a stable internal temperature. Typical warm-up time for a balance already at room temperature is about 1 hour for the analytical balances and about 15 minutes for the AEP series. **These times are applicable for the balances already at room temperature.**
- A stable reading is shown by the weighing unit being on, normally "g" (by default) but it may change depending on the weighing unit and the weighing mode selected by the user. It will turn off if the balance is not stable.
- Exact zero is shown when the circle symbol is on to the left of the display area.

4.0 DESCRIPTION

4.1 GRAPHICAL DISPLAY

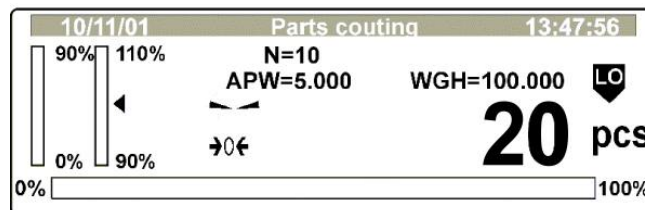


DISPLAY DURING NORMAL WEIGHING

1. Displays mass or other main readings
2. Unit of measurement.
3. Stability Indication
4. Zero Indication
5. Message showing the balance is currently in weighing mode
6. Date (shown only if enabled)
7. Time (shown only if enabled)
8. Capacity Tracker showing what part of the maximum range is used

OIML TYPE APPROVAL: The approved balances will have a bracket around the digit(s) to the right of the verification interval (e). The brackets show that the digits are less than the value of the verification interval, e. These brackets will remain visible in special modes and other allowed weighing units. They do not affect the accuracy or operation of the balance.

When the balance is used for special functions the display may have other symbols or features. For example, when parts counting with the filling guide, check-weighing and statistics enabled, the display may look like:



DISPLAY DURING PARTS COUNTING

See Section 14 for more details. The picture above shows bar-graphs used for the Filling mode, symbols for Check-weighing mode and special text used for parts counting and statistics.

4.2 KEYBOARD

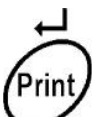
The basic keyboard has 6 keys used to control the functions of the balance and they all have secondary functions when used for entering data or setting of parameters for the balance.

 **[On/Off]** is used to switch on and off the balance display. As long as the power supply is plugged into the balance and the AC power is on, power is still supplied to the electronics so that the balance is always ready. On the top of the display, you will see the message "Turned Off". Press **[On/Off]** again to return to normal.
Secondary function is to move the cursor to the left in the user menus.

 **[Setup]** is used to enter the user menus.
Secondary function is to move the cursor to the right in the user menus.

 **[Mode]** is used to choose the working mode for the balance from a list of modes that is enabled.
Secondary function is to move the cursor down or decrease the numeric values while in the user menus.

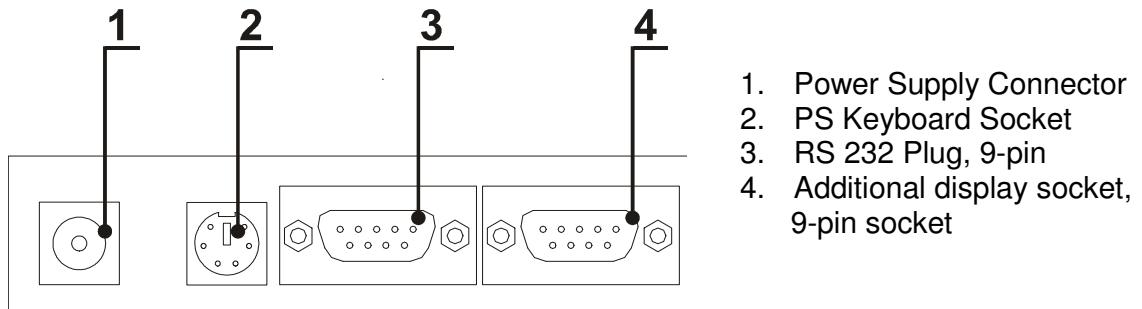
 **[Units]** is used to change the weighing units choosing from a list of units that has been enabled.
Secondary function is to move cursor up or increase the numeric values while in the user menus.

 **[Print]** is used to send the data to an external device through the RS 232 interface. It also stores data in memory when the statistics mode is enabled.
Secondary function is to accept the values or settings, while in the user menus.

 **[Tare]** is used to zero the display. If there is a weight on the balance when the balance is tared, the display will show a negative value when the weight is removed.
Secondary function is to escape or exit from a section of the user menus. This helps to move up one layer within the menus.

4.3 INTERFACE SOCKET

The user interfaces are on the rear panel of the balance.



The power supply for the balances is normally 10-12 VAC.

The keyboard interface accepts a standard PS type keyboard. See Section 5 for details of how this keyboard can be used to supplement the balance keypad and how it makes the entry of text and numeric values much easier.

The RS-232 interface is described in Section 17. The connector is a standard 9 pin plug.

The Secondary display is a special item available from Adam Equipment or your distributor. This option allows a display to be mounted near the balance but remote from it. The secondary display is a seven-segment LCD type, therefore the full graphics capability of the balance is not displayed.

4.4 AEP SECURITY BRACKET

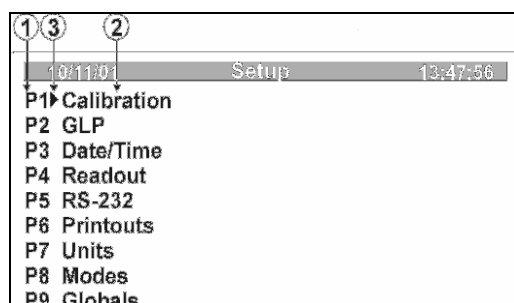
The AEP balances have a security bracket built into the base which enables the balance to be secured to a table top or other device using a cable or bolt assembly.

5.0 USER MENUS

The balances have a series of menus to allow the user to configure the balance to the application. These menus are accessible by pressing the **[Setup]** key.

The menus have functions or parameters that allow you to optimise the operation of the balance.

The Menus are separated into 9 sections (P1 to P9). Each of these sections can be accessed through the main menu.



Each of the 9 sections has parameters or functions as shown below.

P1 Calibration	P2 GLP	P3 Date/Time	P4 Readout	P5 RS-232	P6 Printouts	P7 Units	P8 Modes	P9 Globals
Int. calibr. Ext. calibr. User calibr. Calibr. Test Weight.corr. Aut. calibr. Auto cal time Print report	User Project. Time print Date print User print Project print Id print Last Cal print	Date format Time format Time Date Disp. time Disp. date	Filter Disp refresh Autozero Last digit	Baud rate Parity Data bits Stop bits Handshake Auto print Interval Min. mass Print on stab Printout to	Printout No. Pr. 1 start Pr. 1 stop Pr. 2 start Pr. 2 stop Pr. 3 start Pr. 3 stop Pr. 4 start Pr. 4 stop String 1 String 2 String 3 . . . String 78 String 79 String 80	Grams Milligrams Carats Pounds Ounces Ounces troy Dwt Tael Hk. Tael S. Tael T. Mommies Grains Newtons Tical Custom Custom Factor	Parts Count Check-weighing Filling Percent Animal Density Formulation Statistics	ID setting ID autoprnt Beep Language Backlight Contrast Screensaver Temperature Balance Id Software rev. Par. printout Par. Receive. Factory Def.

Parameters in the user menu are mainly of 4 types:

1. Functional (for example, calibration)
2. User Selected (for example, report printout)
3. User Set (for example, user number)
4. Information for the user (for example, balance number)

This section describes how to use the balance keys, the PC keyboard and the RS-232 interface to set the parameters or start the functions. Further details about each section are available in Section 14.

5.1 MOVING WITHIN THE USER MENU

When the [Setup] key is pressed, the main menu is seen.

A. View of the main menu

1	3	2
10/11/01 Setup 13:47:56		
P1▶ Calibration		
P2 GLP		
P3 Date/Time		
P4 Readout		
P5 RS-232		
P6 Printouts		
P7 Units		
P8 Modes		
P9 Globals		

- 1. The submenu number designation (P1 to P9).
- 2. Name of the submenu
- 3. Cursor, ▶, to mark the menu selection

B. View of a typical submenu

1	5	2	7	3	4
31/10/03 Setup 11:23:55					
P1	▶ 01	Int. calibr.	*****	function	
	02	Ext. calibr.	*****	function	
	03	User calibr.	*****	function	
	04	Calibr. test	*****	function	
	05	Weight corr.	0.0		
	06	Auto calibr.	3	both	
	07 ▶	Auto cal. time	4	4 hours	
	08	Print report	1	On	
		6	8		

- 1. Designation of submenu number (P1 to P9)
- 2. Number of the parameter and it's name (01 Int. Calibr.) is displayed
- 3. Value of parameters are displayed (if there are stars, ★★★★★★, this parameter is accessible as a function)
- 4. Parameter description or additional information which will help to choose the desired value
- 5. Cursor, ▶, to show the parameter menu selected, (i.e. P1)
- 6. Cursor, ▶, to show the sub-parameter selected, (i.e. P1 06)
- 7. "Setup" shows the user is in the parameter setting mode
- 8. If a digit is flashing it means you can change this value with suitable keys

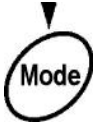
5.1.1 Using the balance keyboard to move and change values

Enter main menu



10/11/01	Setup	13:47:56
P1▶	Calibration	
P2	GLP	
P3	Date/Time	
P4	Readout	
P5	RS-232	
P6	Printouts	
P7	Units	
P8	Modes	
P9	Globals	

Mode



Move the cursor down

Units



Move the cursor up

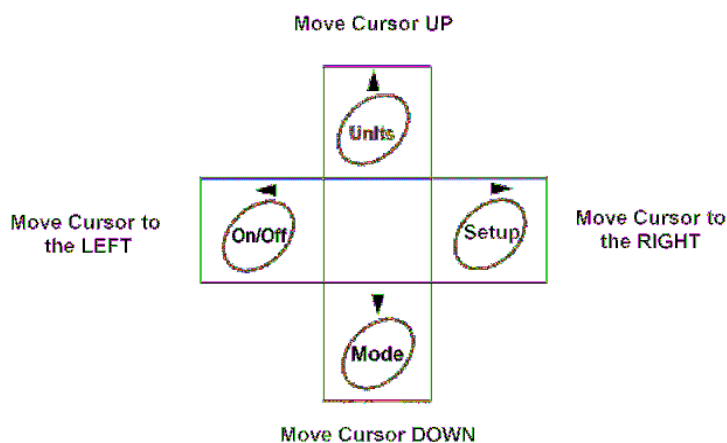
Move the cursor to the desired menu and to enter its submenu press:



The submenu options will be displayed. For example, the submenu for the Calibration menu is as follows:

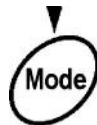
31/10/03		Setup		11:23:55	
P1 ▶	01	Int. calibr.	*****	function	
	02	Ext. calibr.	*****	function	
	03	User calibr.	*****	function	
	04	Calibr. test	*****	function	
	05	Weight corr.	0.0		
	06	Auto calibr.	3	both	
	07 ▶	Auto cal. time	4	4 hours	
	08	Print report	1	On	

Moving within the menu:



After choosing the parameter the following may be observed.

1. For parameter described as a function, the image on a display is changed as the function is activated.
2. For changing values the active digit will flash. To change the active digit move left or right. To change the value, move up or down.
3. For setting up a parameter with one of the pre-set values or to toggle on/off, a digit will be flashing.



Decreasing parameter value

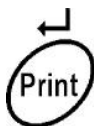


Increasing parameter value

4. When changing the value for a parameter that can be toggled or set to one of the preset values, the meaning of the option will be shown on the right side of the screen, next to the value that is changed. For example, while setting up the auto-calibration, 0=none, 1=temp, 2=time or 3=both temp and time- may be chosen.

31/10/03		Setup		11:23:55
P1	►01	Int. calibr.	*****	function
	02	Ext. calibr.	*****	function
	03	User calibr.	*****	function
	04	Calibr. test	*****	function
	05	Weight corr.	0.0	
	06►	Auto calibr.	1	temp
	07	Auto cal. time	4	4 hours
	08	Print report	1	On
31/10/03		Setup		11:23:55
P1	►01	Int. calibr.	*****	function
	02	Ext. calibr.	*****	function
	03	User calibr.	*****	function
	04	Calibr. test	*****	function
	05	Weight corr.	0.0	
	06►	Auto calibr.	2	time
	07	Auto cal. time	4	4 hours
	08	Print report	1	On

After the value is set press either:



Esc



Accept the value as it is set.

Exit without changing the value from the original setting.

All changes done while setting the parameters are held in a temporary memory. For the balance to remember all changes you should be sure to **SAVE** the settings into permanent memory. See below.

After setting a parameter, you should go back to weighing mode:

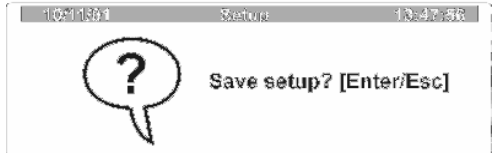
31/10/03		Setup		11:23:55	
P1	►01►	Int. calibr.	*****	function	
	02	Ext. calibr.	*****	function	
	03	User calibr.	*****	function	
	04	Calibr. test	*****	function	
	05	Weight corr.	0.0		
	06	Auto calibr.	3	both	
	07	Auto cal. time	4	4 hours	
	08	Print report	1	On	



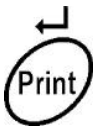
Press **[Esc]** to return to the main menu



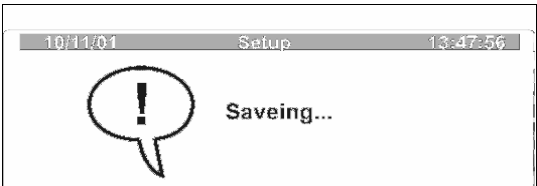
Press **[Esc]** again to exit the menus,



You will see displayed question asking if you want to save the changes in the permanent memory (Enter) or if you wish to escape (Esc) without saving the values.



If you want to save the values press **[Enter]**. The balance will save the changes, and after saving will return to the weighing mode.



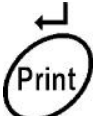
If you do not want to save changes, press **[Esc]**. The balance immediately returns to the weighing mode without saving the changes in parameters.



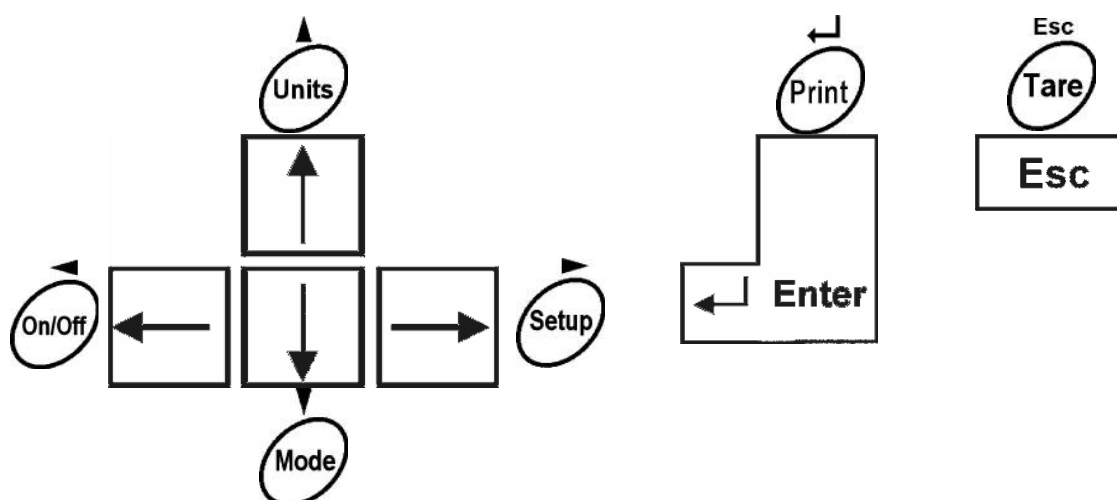
5.1.2 PS keyboard connected with balance

A PS type keyboard can be used as an input device for the balance. This keyboard will make it easier to input numeric values and text, as shown below. In addition the function keys can be used in place of the balance keypad.

Functional keys of the keyboard can be used the same way as the balance keypad:

						Balance keys
F1	F2	F3	F4	F5	F6	Function keys on the PS keyboard

The balance keys can also be replaced by the following keys:



Using the PS keyboard to set up balance parameters is very quick, especially when numeric values or text need to be input to the balance.

1. After entering the menus use the arrow keys or the PS keyboard equivalents to move the cursor to the desired parameter.
2. When setting parameters use the arrow keys or optionally use the numeric keys to enter new values or text as needed. It may be necessary to use the cursor to move the cursor to delete old values before new values can be put in. Refer to the sections describing each menu to see examples of entering numeric or text values.

5.1.3 Virtual keyboard using RS 232

With commands sent by RS-232 you can also duplicate the balance keypad.

						Balance keys
#o	#s	#m	#u	#p	#t	Messages through RS-232

For more details about using the RS-232 interface see Section 17.

5.2 SUMMARY OF USER MENUS P1 TO P9

The following show a brief description of the contents of each sub-menu. For details of how the menus are used see the Sections referenced.

Press **[Setup]** to see user main menu:

	31/10/03 Setup 10:23:56 P1 ► Calibration P2 GLP P3 Date/Time P4 Readout P5 RS-232 P6 Printouts P7 Units P8 Modes P9 Globals
--	---

5.2.1 Menu “P1 ✕ Calibration”- Reference Section 7

31/10/03	Setup	11:23:55
P1 ►01►	Int. calibr.	***** function
02	Ext. calibr.	***** function
03	User calibr.	***** function
04	Calibr. test	***** function
05	Weight corr.	0.0
06	Auto calibr.	3 both
07	Auto cal. time	4 4 hours
08	Print report	1 On

Calibration menu. Allows access to functions for calibration using internal or external weights, a calibration test, a correction value for the internal weight, enable automatic calibration and printing of a calibration report.

5.2.2 Menu “P2 ✕ GLP”- Reference Section 8

19/11/2003	Setup	15:46:53
P2 ►01►	User	
02	Project	
03	Time print	0 off
04	Date print	0 off
05	User print	0 off
06	Project print	0 off
07	Id print	0 off
08	Last cal print	0 off

GLP Menu. Allows the user to store a User name or number and a Project name or number. It enables or disables printing of balance data.

5.2.3 Menu "P3 ✕ Date/Time"- Reference Section 9

10/11/01		Setup		13:47:56
P3 ▶ 01 ▶	Date format	0	DA/MO/YR	
02	Time format	1	12 hour	
03	Time	*****	function	
04	Date	*****	function	
05	Disp. time	1	on	
06	Disp. date	1	on	

Date/Time Menu. User can set the format of the date and time display, set the date and time and select if the date or time should be displayed.

5.2.4 Menu "P4 ✕ Readout"- Reference Section 15

19/01/2004		Setup		15:46:53
P4 ▶ 01 ▶	Filter	3	normal	
02	Display refresh		0.1 s	
03	Autozero	1	on	
04	Last digit	1	always	

Readout Menu. This menu changes the way the scale operates- the filters, auto-zero and display of the last digit.

5.2.5 Menu "P5 ✕ RS-232"- Reference Section 11

19/01/2004		Setup		15:56:53
P5 ▶ 01 ▶	Baud rate	1	4800	
02	Parity	0	none	
03	Data bits	2	8 bits	
04	Stop bits	1	1 bit	
05	Handshake	0	none	
06	Auto print	0	None	
07	Interval	1	* 0.1 s	
08	Min. mass	4	10 div	
09	Print on stab	1	enabled	
10	Printout to	1	computer	

RS-232 Menu. This menu sets the parameters for RS-232 communications.

5.2.6 Menu "P6 ✕ Printouts"- Reference Section 10

10/11/01		Setup		13:47:56
P6 ▶ 01 ▶	Printout No.	0	Standard	
02	Pr. 1 start	0		
03	Pr. 1 stop	0		
04	Pr. 2 start	0		
05	Pr. 2 stop	0		
06	Pr. 3 start	0		
07	Pr. 3 stop	0		
08	Pr. 4 start	0		
09	Pr. 4 stop	0		
10	String 1			
11	String 2			
...				
88	String 79			
89	String 80			

Printouts Menu. This menu selects any of the 5 user programmed formats for printing to be used. The default user printout is set by the GLP Menu. The other 4 are set using this menu. 80 strings of data can be programmed for use of the printing formats. The 80 strings can be text, balance data or control characters for printers.

5.2.7 Menu “P7 ✕ Units”- Reference Section 12

30/10/03		Setup		11:47:52
P7	►01►	Grams	1	enabled
	02	Milligrams	1	enabled
	03	Carats	1	enabled
	04	Pounds	0	disabled
	05	Ounces	0	disabled
	06	Ounces troy	0	disabled
	07	Dwt	0	disabled
	08	Taels Hk.	0	disabled
	09	Teals S.	0	disabled
	10	Taels T.	0	disabled
	11	Mommes	0	disabled
	12	Grains	0	disabled
	13	Newtons	0	disabled
	14	Tical	0	disabled
	15	Custom	0	disabled
	16	Custom factor	2.0	

Units Menu. The user can enable any number of units out of the 16 weighing units. These units are then accessible by using the [Units] key.

5.2.8 Menu “P8 ✕ Modes”- Reference Sections 13, 14

31/10/03		Mode		14:12:38
P8	►01►	Parts count	1	enabled
	02	Checkweighing	0	enabled
	03	Filling	1	enabled
	04	Percent	1	enabled
	05	Animal	0	disabled
	06	Density	1	disabled
	07	Formulation	0	disabled
	08	Statistics	0	disabled

Modes Menu. The user can select any of the 8 weighing modes to be enabled. These units are then accessible by using the [Modes] key.

5.2.9 Menu “P9 ✕ Globals”- Reference Section 16

191/01/04		Setup		11:23:55
P9	►01►	ID setting	*****	function
	02	ID autoprint	0	off
	03	Beep	1	enabled
	04	language	1	English
	05	Backlight	1	on
	06	Contrast	*****	function
	07	Screensaver	0	disabled
	08	Temperature	*****	function
	09	Balance Id	111438	
	10	Software rev.	MBA a.22	
	11	Par. printout	*****	function
	12	Par. receive.	*****	function
	13	Factory Deff.	*****	function

Globals Menu. These parameters control data used in the balance and the operation of the balance.

6.0 WEIGHING

It is suggested that the balance is calibrated before weighing, especially if the balance has experienced any temperature change, has been moved or some time has passed since the last calibration.

- For best results we suggest the balance is "exercised" briefly by pressing on the pan once or twice up to nearly the full capacity. Observe the % load bar-graph.
- Check the balance is showing "zero" and is stable. The zero symbol $\rightarrow \bigcirc \leftarrow$ and the stable symbol $\blacktriangle \triangleleft$ will be on to the left of the display.

If balance is not showing zero, press  .

- If another unit of weight is needed, press the **[Units]** key to cycle through the units that have been enabled. If the desired unit is not enabled see manual Section 12.



g	Grams	dwt	Pennyweight	N	Newtons
mg	Milligrams	t	Taels, Hong Kong	Ti	Tical
ct	Carats	t	Taels, Singapore	CU	Custom
lb	Pounds	t	Taels, Taiwan		Custom factor
oz	Ounces	m	Mommes		
oz t	Ounces troy	GN	Grains		

- Put the load on the pan. After stabilisation (weighing unit will be on) you can read the result on the display.

 You can zero the display at any time by pressing the **[Tare]** key. (Remember that the sum of load masses on the balance can not exceed the maximum capacity of the balance).

 During breaks and between weighing, you shouldn't switch off the balance power. Simply switch off the display using the **[On/Off]** key. After switching on again, the balance is ready to weigh without a warm-up time.

7.0 CALIBRATION

To ensure balance accuracy it must be calibrated using a known value of calibration mass. In these balances there is the ability to calibrate using the internal mass or with an external mass.

OIML TYPE APPROVED: Calibration is only possible using the internal mass. External calibration is not allowed. The Auto-calibration function is always on.

Calibration should be done when:

- ✓ A new weighing session is begun
- ✓ When there are long breaks between the multiple weighing those are related
- ✓ Temperature changes by more than 1,5 °C

You can do calibration in different ways:

- Manual calibration is done by the operator, using the Calibration Menu.
- When calibrating manually you can select to use the internal calibration mass or an external calibration mass. If you select the external mass then you can choose to use a preset value for that mass, or you can enter a value that matches the mass you wish to use.
- Automatic calibration is done when it is enabled. To enable auto-calibration whenever there is a change in temperature, set the parameter **P1 06 Aut. calibr.** to **1: ON**. See below.

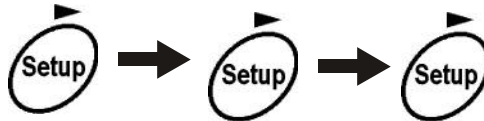
31/10/03		Setup	11:23:55	
P1	► 01	Int. calibr.	*****	function
	02	Ext. calibr.	*****	function
	03	User calibr.	*****	function
	04	Calibr. test	*****	function
	05	Weight corr.	0.0	
	06►	Auto calibr.	1	temp
	07	Auto cal. time	4	4 hours
	08	Print report	1	On

7.1 Manual Calibration

WARNING: Make sure that there is no load on the pan when calibrating.

7.1.1 Internal calibration

- To begin calibration using the internal mass, press the **[Setup]** key 3 times.



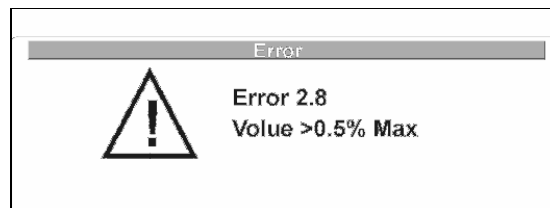
- The balance will verify the conditions are acceptable and immediately begin calibration.
- The progress of the calibration will be shown by a message on the display.
- After calibration the balance will return to the weighing mode.

- If you wish to abort the calibration press the  key.



Calibration will stop and then the balance will return to the **P1 Calibration** submenu.

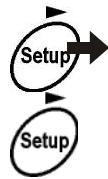
- If the balance detects a weight is on the pan, an error message will be displayed.



- You should take off the load from the pan.
- The balance will automatically repeat calibration.

7.1.2 Calibration with External Mass

To calibrate the balance using an external mass press **[Setup]** to enter the main menu and then press **[Setup]** again to enter the Calibration Submenu.



Enter the **P1 Calibration** submenu



Put the cursor next to
P1 02 External calibration



Enter the External calibration procedure. You will see message to clear the pan.

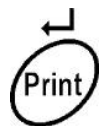
31/10/03	Setup	11:23:55
P1	01	Int. calibr.
	02	Ext. calibr.
	03	User calibr.
	04	Calibr. test
	05	Weight corr.
	06	Auto calibr.
	07	Auto cal. time
	08	Print report

Setup
 External calibration Clear the pan [Enter]

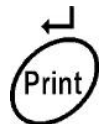
When the pan is clear press **[Enter]**. The balance will show a message that it is measuring mass without a load on the pan.

Setup
 External calibration Weight measuring

Setup
 External calibration Load weight 500.0 g [Enter]



The next message will tell the user to put a load on the balance. The value is a preset mass which is taken from memory.



After you put this mass on the balance, press **[Enter]**. A message about measuring the mass is shown. After completing the operation, the balance will return to the calibration submenu.

Setup
 External calibration Weight measuring

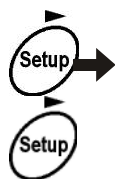


If you press **[Esc]** you can stop calibration at any time.

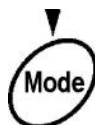
Return to weighing as described in section 5.1.1 of this manual.

7.1.3 Calibration with an external mass selected by the user

This procedure is similar to the previous section except that the user can select the value of the mass.



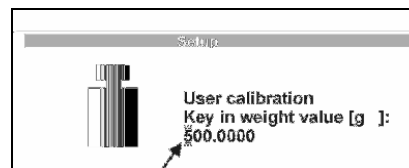
Enter the **P1 Calibration** submenu



Put the cursor next to
P1 03 User calibration

31/10/03		Setup		11:23:55
P1	► 01	Int. calibr.	*****	function
	02	Ext. calibr.	*****	function
	03 ►	User calibr.	*****	function
	04	Calibr. test	*****	function
	05	Weight corr.	0.0	
	06	Auto calibr.	1	both
	07	Auto cal. time	4	4 hours
	08	Print report	1	On

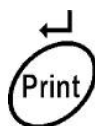
Start User Calibration. You will see a message asking for the value of the calibration mass to be used. The balance will suggest you to use the mass stored in the memory. In the displayed mass the first digit will be flashing, This means you can change the value.



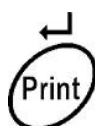
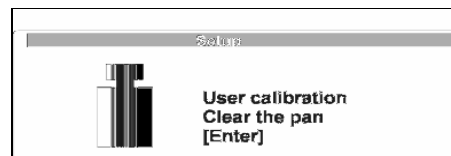
To change the value to a new value you have to use those keys:

	Increasing the flashing digit value +1
	Decreasing the flashing digit value -1
	You choose another digit to change by moving RIGHT
	Or moving LEFT

After setting a new mass weight you have to save it.



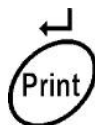
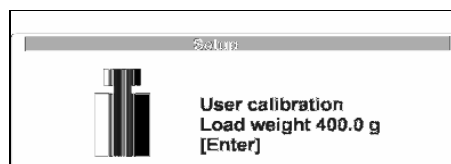
Press **[Enter]** to save the value.



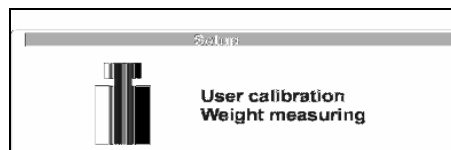
When the pan is clear press **[Enter]**. The balance will show a message that it is measuring mass without a load on the pan.



Next message will tell the user to put the mass on the balance. The value is the mass set previously.



After you put this mass on the balance, press **[Enter]**. A message about measuring the mass is shown. After completing the operation, the balance will return to the calibration submenu.



Return to weighing as described in section 5.1.1 of this manual.

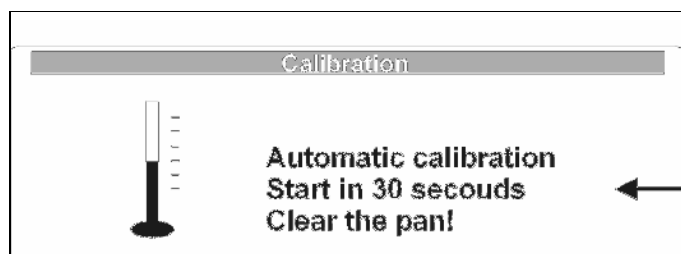
WARNING:

Mass of the external calibration weight should be about $\frac{3}{4}$ of the maximum loading. The user can do calibration with any weight but if the mass is too small, larger errors may be seen when measuring larger weights.

7.2 AUTOMATIC CALIBRATION

Automatic calibration can be enabled so that the balance will calibrate anytime the temperature inside the balance changes by more than about 1°C.

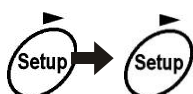
If automatic calibration is about to begin you will see message;



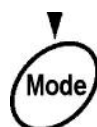
The user then has time to take off weight from the pan.

7.2.1 Automatic calibration settings

To enable the Automatic Calibration set the parameter **P1 06 =1: On**.



Enter the **P1 Calibration** submenu.



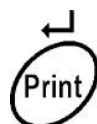
Put the cursor next to
P1 06 Automatic calibration.



Enter the parameter, the
flashing digit shows the
value can be changed.



Set parameter value to **1**.
Value will change from **0** to
1 and the description from
"none" to "temp".



Save the chosen value.
1 will stop flashing.

31/10/03 Setup 11:23:55			
P1	► 01	Int. calibr.	function
	02	Ext. calibr.	function
	03	User calibr.	function
	04	Calibr. test	function
	05	Weight corr.	0.0
	06 ►	Auto calibr.	0 none
	07	Auto cal. time	4 4 hours
	08	Print report	1 On

31/10/03 Setup 11:23:55			
P1	► 01	Int. calibr.	function
	02	Ext. calibr.	function
	03	User calibr.	function
	04	Calibr. test	function
	05	Weight corr.	0.0
	06 ►	Auto calibr.	0 none
	07	Auto cal. time	4 4 hours
	08	Print report	1 On

31/10/03 Setup 11:23:55			
P1	► 01	Int. calibr.	function
	02	Ext. calibr.	function
	03	User calibr.	function
	04	Calibr. test	function
	05	Weight corr.	0.0
	06 ►	Auto calibr.	1 temp
	07	Auto cal. time	4 4 hours
	08	Print report	1 On

31/10/03 Setup 11:23:55			
P1	► 01	Int. calibr.	function
	02	Ext. calibr.	function
	03	User calibr.	function
	04	Calibr. test	function
	05	Weight corr.	0.0
	06 ►	Auto calibr.	1 temp
	07	Auto cal. time	4 4 hours
	08	Print report	1 On

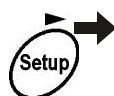
Return to weighing mode as described in Sec. 5.1.1 of this manual.

OIML TYPE APPROVAL: The Autocalibration function cannot be turned off. You must allow the balance to calibrate when it is necessary.

7.3 CALIBRATION TEST

A test is done to check if the calibration set previously is still valid by measuring the internal mass against the value stored in the memory for the mass. This is only checking and showing the test result without changing any values in the memory or affecting the balance in any way.

How to do the Calibration Test



Enter the menu for **P1 calibration**

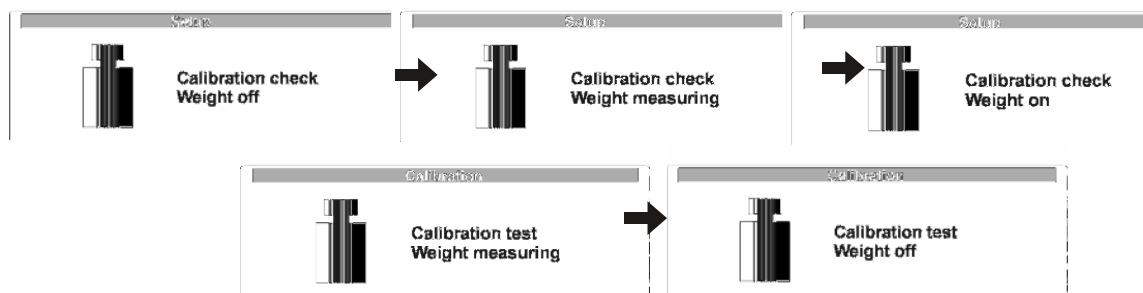


Put the cursor next to **P1 04 Calibration test.**

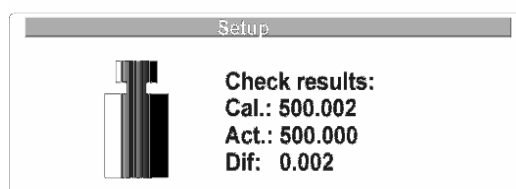


Start the test.

After starting the test you will see these messages:



After the end of calibration check, you will see the test result.



Cal. – Weight of the mass as remembered by the balance
Act. – Mass determined by the balance during the test
Dif. – Computed difference of the values.

Return to the weighing mode as shown in Section 5.1.1 of this manual.

7.4 CORRECTION OF THE INTERNAL CALIBRATION MASS

If the user has a master weight that is used for calibration it may be necessary to change the value of the internal mass of the balance in order to display the correct value when the user's master mass is checked on the balance after calibration.

To determine the amount of correction, calibrate the balance using the internal mass and then weigh the user master mass. For example if the users master mass is 1000g but displays 999.98g when checked on the AEP balance, the value of the internal mass can be changed so that after calibration the users mass will show 1000.00g. See section 7.3 for details on the value of the internal calibration mass.

Determine the amount of correction by:

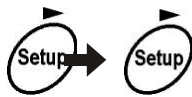
$$\text{Correction} = (\text{Ideal mass} - \text{reading}) \times \frac{\text{Internal mass}}{\text{Ideal Mass}}$$

In this example, a 1kg user supplied master showed 999.98g and the internal mass is normally about 510g for the AEP. In this case as the users master and the internal mass are about the same value the internal mass should be corrected by entering 0.0102 for the correction. If the user's external mass is much different from the internal mass the corrections will have to be modified to account for the differences.

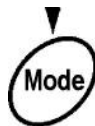
$$\text{Correction} = (1000.000 - 999.98) \times \frac{510.000}{1000.000} = 0.0102\text{g}$$

Enter this value into parameter **P1 05 Weight Corr.** as described below.

7.4.1 Entering Calibration Weight Correction



Enter the **P1 Calibration** menu



Set the cursor next to
P1 05 Weight Corr.

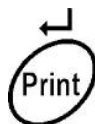


Enter the weight correction
parameter. The correction
digit set earlier will flash.

31/10/03	Setup	11:23:55
P1 ▶ 01	Int. calibr.	function
02	Ext. calibr.	function
03	User calibr.	function
04	Calibr. test	function
05 ▶	Weight corr.	0.0
06	Auto calibr.	0 none
07	Auto cal. time	4 4 hours
08	Print report	1 On

31/10/03	Setup	11:23:55
P1 ▶ 01	Int. calibr.	function
02	Ext. calibr.	function
03	User calibr.	function
04	Calibr. test	function
05 ▶	Weight corr.	0.0
06	Auto calibr.	0 none
07	Auto cal. time	4 4 hours
08	Print report	1 On

Enter the new value and save it as described in earlier sections.



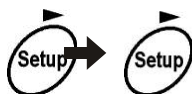
Save the new weight
correction value.

31/10/03	Setup	11:23:55
P1 ▶ 01	Int. calibr.	function
02	Ext. calibr.	function
03	User calibr.	function
04	Calibr. test	function
05 ▶	Weight corr.	0.002
06	Auto calibr.	0 none
07	Auto cal. time	4 4 hours
08	Print report	1 On

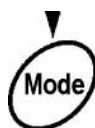
Return to the weighing mode as described in Section 5.1.1 of this manual.

7.5 CALIBRATION REPORT PRINTOUT

After any calibration it is possible to print a report showing details for the calibration. Examples of typical reports are shown below. The format of the reports is set by the P2 GLP parameter. See Section 8. To enable the parameter for printing the report, set **P1 07 Printing =1: On**.



Enter the **P1 Calibration** submenu.



Put the cursor next to
P1 07 Print Report.

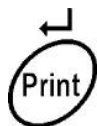
31/10/03	Setup	11:23:55
P1 ▶ 01	Int. calibr.	function
02	Ext. calibr.	function
03	User calibr.	function
04	Calibr. test	function
05	Weight corr.	0.0
06	Auto calibr.	0 none
07 ▶	Auto cal. time	4 4 hours
08	Print report	0 off



Enter the parameter. The flashing digit shows the value can be changed.



Set parameter value to **1**. Value will change from **0** to **1** and description from **off** to **on**.



Save the chosen value.

31/10/03		Setup		11:23:55
P1	► 01	Int. calibr.	*****	function
	02	Ext. calibr.	*****	function
	03	User calibr.	*****	function
	04	Calibr. test	*****	function
	05	Weight corr.	0.0	
	06	Auto calibr.	0	none
	07	Auto cal. time	4	4 hours
	08	► Print report	0	off

31/10/03		Setup		11:23:55
P1	► 01	Int. calibr.	*****	function
	02	Ext. calibr.	*****	function
	03	User calibr.	*****	function
	04	Calibr. test	*****	function
	05	Weight corr.	0.0	
	06	Auto calibr.	0	none
	07	Auto cal. time	4	4 hours
	08	► Print report	1	On

31/10/03		Setup		11:23:55
P1	► 01	Int. calibr.	*****	function
	02	Ext. calibr.	*****	function
	03	User calibr.	*****	function
	04	Calibr. test	*****	function
	05	Weight corr.	0.0	
	06	Auto calibr.	0	none
	07	Auto cal. time	4	4 hours
	08	► Print report	1	On

Return to the weighing mode as described in Section 5.1.1.

Examples of report printouts from calibration and calibration tests:

```

*** Internal calibration report ***
Cal: 175.1067 g
Old: 175.0685 g
Dif: 0.0383 g

Name .....

```

```

*** Check calibration report ***
Date: 10/22/2001
Time: 07:31:12 PM
Id: 10
Cal.: 551.510 g
Act.: 551.505 g
dif.: 0.005 g
User:
Prjt:

Name .....

```

Contents of the reports is set using Parameter of **P2 GLP**. See Section 8 for details of this parameter.

In addition to the information requested using the GLP parameters, the balance will print the calibration mass, weight displayed for the mass as tested and the difference.

8.0 FORMAT STANDARD PRINTOUT <P2 GLP>

In this parameter group, user can determine what data should be printed when the standard printing format is used. In addition the user description and project description can be entered.

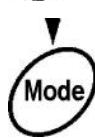
The standard printing format is used for the GLP printouts and when the printout number is set to use format 0. See section 10.

8.1 USER NUMBER

In order to print a user number it must first be stored in memory. The user number can be a number or any combination of numbers, text and symbols as long as they are a total of 8 characters or less.



Enter the main Setup menu



Set the cursor next to **P2 GLP**

31/10/03		Setup		10:23:56	
P1	Calibration				
P2	GLP				
P3	Date/Time				
P4	Readout				
P5	RS-232				
P6	Printouts				
P7	Units				
P8	Modes				
P9	Globals				

19/11/2003		Setup		15:48:53	
P2	01	User	Nowak		
	02	Project	WX/235		
	03	Time print	0		off
	04	Date print	1		on
	05	User print	1		on
	06	Project print	0		off
	07	Id print	1		on
	08	Last cal print	0		off



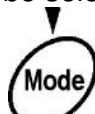
Enter the submenu for **P2 GLP**



The cursor will initially be next to the **P2 01 User number** parameter.
Enter the parameter, the first digit location will flash.

The data for the user number can be entered using the keypad on the balance or with a PC keyboard plugged into the balance. Refer to Section 5 for details on how to use the balance keypad or the PC keyboard for entering data.

If the balance keypad is used the flashing digit can be changed or the flashing digit can be selected as shown below:



Decrease the flashing digits by one



Increase the flashing digit by one



Set the flashing digit one to the right.



Set the flashing digit one to the left.



When the desired value has been entered store the value by pressing the **[Enter]** key.

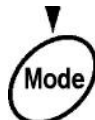
19/11/2003		Setup		15:48:53	
P2	01	User	Nowak		
	02	Project			
	03	Time print	0	off	
	04	Date print	1	on	
	05	User print	1	on	
	06	Project print	0	off	
	07	Id print	1	on	
	08	Last cal print	0	off	

8.2 PROJECT NO.

Using the same procedure, the **P2 02 Project** can be entered. Again the value is limited to 8 characters of text, numbers or symbols.



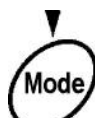
Enter the main Setup menu.



Set the cursor next to **P2 GLP**



Enter the submenu for **P2 GLP**



Set the cursor next to **P2 02 Project**



Enter the details of **P2 Project**
Set and store the project reference number using the same procedure as used above.

31/10/03		Setup		10:23:56	
P1		Calibration			
P2		GLP			
P3		Date/Time			
P4		Readout			
P5		RS-232			
P6		Printouts			
P7		Units			
P8		Modes			
P9		Globals			

19/11/2003		Setup		15:48:53	
P2	01	User	Nowak		
	02	Project			
	03	Time print	0	off	
	04	Date print	1	on	
	05	User print	1	on	
	06	Project print	0	off	
	07	Id print	1	on	
	08	Last cal print	0	off	

19/11/2003		Setup		15:48:53	
P2	01	User	Nowak		
	02	Project	WX/235		
	03	Time print	0	off	
	04	Date print	1	on	
	05	User print	1	on	
	06	Project print	0	off	
	07	Id print	1	on	
	08	Last cal print	0	off	

8.3 STANDARD PRINTOUT CONTENTS

In the standard printout enable or disable the following items. If an item is enabled (**on**) it will be printed, if it is disabled (**off**) it will not be printed.

- P2 03 Time print** – Time of measurement or report from the internal clock
- P2 04 Date print** – Date of measurement or report from the real time clock
- P2 05 User print** – Name of the user set in **P2 01 user** (see above)
- P2 06 Project print** – Name of the project set in **P2 02 project** (see above)
- P2 07 Id print** – Scale number set by the maker
- P2 08 Last cal print** – Details of the calibration report printed last

To enable or disable these items:



Enter the main Setup menu



Set the cursor next to
P2 GLP

31/10/03		Setup		10:23:56	
P1		Calibration			
P2	▶	GLP			
P3		Date/Time			
P4		Readout			
P5		RS-232			
P6		Printouts			
P7		Units			
P8		Modes			
P9		Globals			

19/11/2003		Setup		15:48:53	
P2	▶	01	User	Nowak	
		02	Project	WX/235	
		03	Time print	0	off
		04	Date print	1	on
		05	User print	1	on
		06	Project print	0	off
		07	Id print	1	on
		08	Last cal print	0	off



Enter the submenu for
P2 GLP



Set the cursor next to the parameter to change

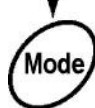


Enter the parameter, the value 0 or 1 will flash.

Set the new parameter value



Increase value +1



Decrease value -1



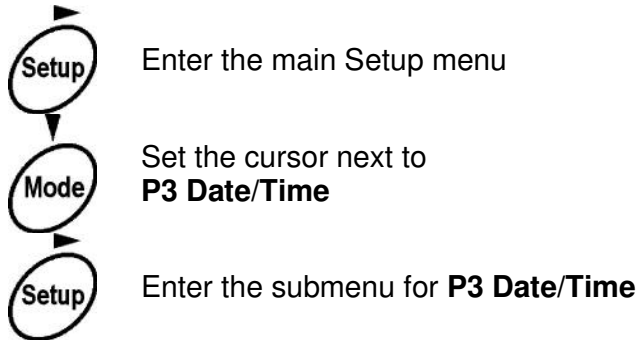
Save the **value**

Repeat the procedure for each parameter for which you want to change the value.
Return to weighing as described in section 5.1.1.

9.0 DATE AND TIME PARAMETERS <P3 Date/Time>

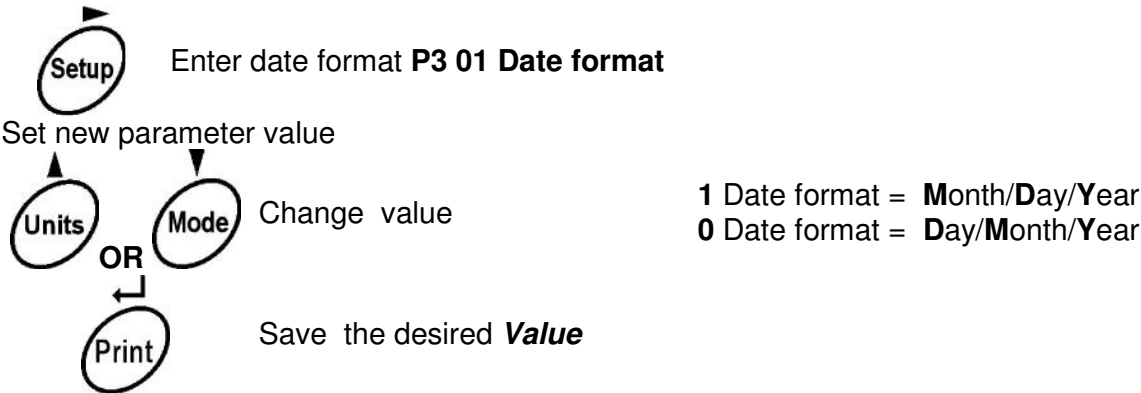
In this section you can set date and time in the scale memory and format the displaying and printing of the date and time.

9.1 SETTING UP THE DATE FORMAT



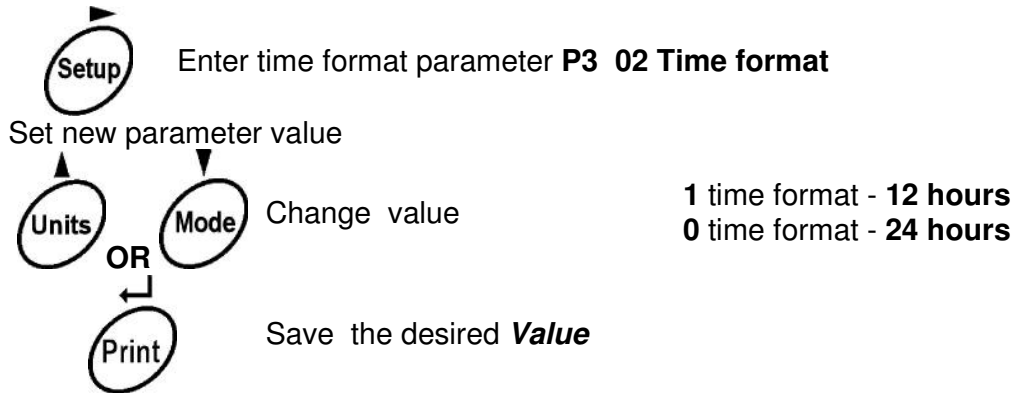
10/11/01		Setup	13:47:56
P3 ▶ 01 ▶	Date format	0	DA/MO/YR
02	Time format	1	12 hour
03	Time	*****	function
04	Date	*****	function
05	Disp. time	1	on
06	Disp. date	1	on

The format for showing the date can be either **Month/Day/Year** or **Day/Month/Year**.



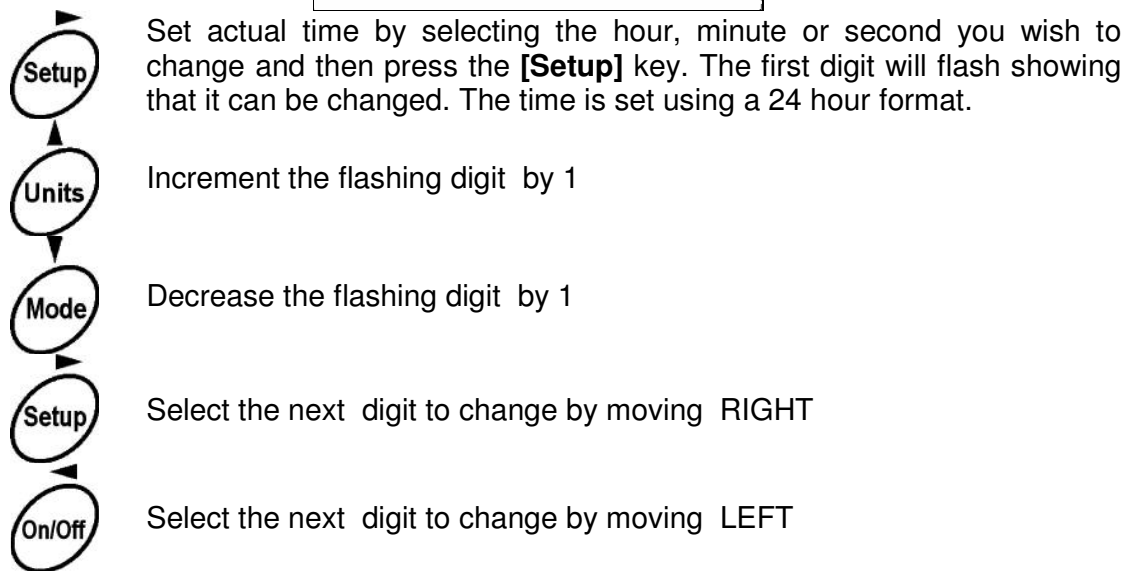
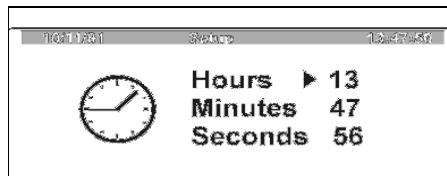
9.2 SETTING TIME FORMAT

The format for the time can be set for a 12 hour or a 24 hour clock.



When printing dates in the **12 hours** format the printouts will show **PM** or **AM**.

9.3 SETTING TIME





After setting the hours, minutes or seconds, save it.



Press Setup a second time to return to the Date/Time Submenu.

9.4 SETTING DATE



Enter the parameter for setting the date
P3 04 Date, you will see the following displayed:



Set the date the same way as the time was set in the previous section.

Return to weighing as described in Section 5.

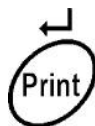
9.5 SETTING DISPLAYING DATE AND TIME

The user can choose if the date and time are to be shown on the top of the display. The parameters controlling this are set to **on** or **off depending on whether** to display the information or not.

To change the parameter:



From the Date/Time Submenu enter either the **P3 05 Disp. Time** or **P3 06 Disp. Date** parameter then set to either 1 = on or 0 = off using the procedure as shown above.



Save the setting **Value**

Return to weighing as described in Section 5.

10.0 TYPES OF PRINTOUTS <P6 Printouts>

In this section it is possible to select one of 5 styles for the RS-232 output. The default style is defined in the **P2 GLP** Menu, see Section 8. The other 4 styles are designed in the **P6 Printout** menu.

10.1 STANDARD PRINTOUT

When the balance receives a command to print results by pressing the  key or from the RS-232 interface, it will send the data that has been set in the P2 GLP menu. See Sec. 8 for a detailed explanation on how to set the options in this menu.

Examples of outputs using this format:

```
Date: 22/10/2001
Hour: 13.04.23
User: Robert
Project: XW/456
        0.008 g
```

```
Date: 22/10/2001
Hour: 13.16.49
User: Robert
Project: XW/456
Balance: 10
?      62.685 g
```

Question mark before the mass means that result is from the balance when it was unstable.

10.2 NON- STANDARD PRINTOUTS

This section will allow the user to define 4 styles that can be printed and the user can select any of these styles or the default style will be used.

The printouts are defined by selecting out of 80 groups of data which will be included in each of the 4 styles. Each style will have a group number for the first line and the last line.

Printout 1 Start – 1 for example selects line 1 to start style 1.

Printout 1 Stop – 40 selects line 40 to end style 1.

All text and commands included in groups 1 to 40 will be printed.

It is possible that the groups used for 2 different styles can overlap. For example:

Printout 1 Start – 1

Printout 1 Stop – 40

Printout 2 Start – 20

Printout 2 Stop – 40

This means that the contents of groups 1 to 40 are used for style 1 and for groups 1 to 20 only are used for style 2.

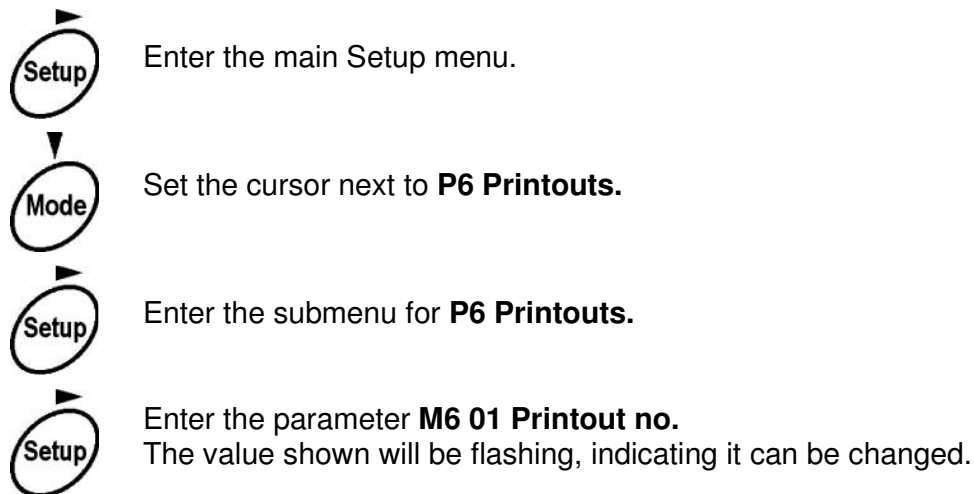
The groups can contain any of the following:

- Variables taken from the memory or the weighing results of the balance. For example, time, date, mass, user number, project number, balance number.
- Texts that can be made up of any symbol, letter or number.
- Commands used by printers, for examples: Escape codes for bold print, form feed etc.
- Each group is made up of 8 characters. As there are 80 groups this gives up to 640 characters that can be used for outputs.
- The 80 groups are shown in the submenu as parameters **P6 10 String 1** to **P6 89 String 80**.

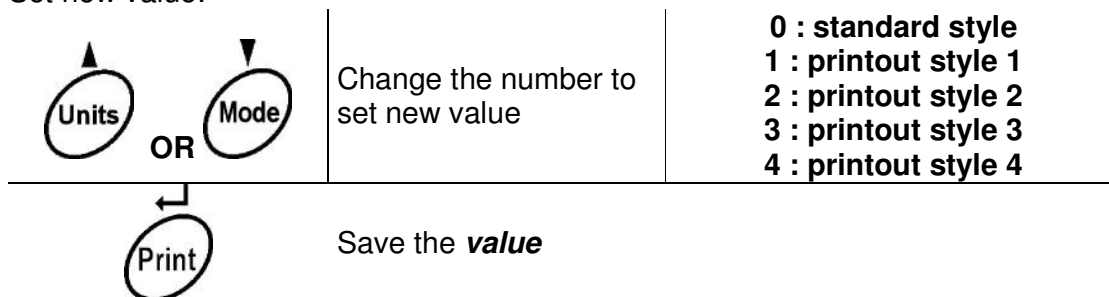
See Section 10.2.3 for details of storing text in the groups.

10.2.1 Setting the Print Format to be used

Parameter **P6 01 Printout No** is set to use printout style 0 (default) or one of the special styles, 1 to 4.



Set new value:



10.2.2 Setting the groups for the Printout Styles

Each of the 4 special styles will begin at one group number and end at another. The groups can overlap but must be continuous.

For example to set the range for style 1-

Enter parameter group **P6** Printouts and select parameter **P6 02 printout 1 start**, the first group to be used for this style. Set the group number as shown in the previous section.

Repeat to set the last group number to be used, by setting parameter **P6 03 printout 1 stop** to the group number required.

10.2.3 Storing Text

The text to be printed is stored in the parameters **P6 10 Text 1** to **P6 89 Text 80**.

It is suggested the balance be used with the PC keyboard to make the entry of text easier and faster.

The text entered can be from the memory or the results of the balance (Table 1) or the results from Statistical analysis of the weighing results (Table 2). Note that the Statistics must be active on the balance, see section 14. Special characters for controlling the printer (Table 3) or the text can be letters, number or symbols.

Storing text groups

Each group (**P6 10 Text 1** to **P6 89 Text 80**) can contain a maximum of 8 characters, (letters, digits or space). To write a sentence with many words you must use adjacent groups as shown below.

Note that the commands are case sensitive. %N is not the same as %n.

TABLE 1 Variables from the balance

%%	To print the symbol “%”
%N	Actual net mass from the balance
%d	Date
%t	Time
%i	Balance no.
%R	Program revision no.
%P	Project no.
%U	User no.
%F	Name of the function or mode in use

TABLE 2 Results of Statistics

%n	Number of measurements
%x	Mean value
%S	Sum
%m	Minimum value
%M	Maximum value
%D	Difference between maximum and minimum values
%s	Standard deviation
%r	Relative variance

Variable for modes with a value dependent upon the mode

%V	Value connected with work mode Amount of parts for mode counting parts
-----------	---

Special symbols to control the output

\\	Print the symbol “\”	
\c	CRLF	carriage return plus line feed
\r	CR	carriage return only
\n	LF	Line feed only
\t	Tab	
\s	Jump to next “group”	
\0	End of printout	

In addition special codes can be sent to a printer or other device by sending the hexadecimal code for the command. The command is in the form \xx where the xx represents the command code in hex.

For example to send the command to a printer to do clear the buffer might require sending the hexadecimal code 18h, the command is \18,, code 0Eh for double strike would be \0E. Note all letters must be upper case. \0E is Ok but \0e would be ignored as it is not correct.

10.2.4 Examples of Text

In order to understand how the special characters can be used consider these examples.

Example 1: To print the text “Max mass can not exceed 11.250 g !” on the top of a label with only the weight on the next line, then 2 blank lines then the date.

Max mass can not exceed 12.250 g !
12.456 g

14/12/2001

Text Line
Weight from balance
CRLF
CRLF
Date from the balance
CRLF
CRLF

Storing of this information requires 6 groups of text.
For convenience they are shown in groups 10 to 15-

Parameter no.	Text								
	1	2	3	4	5	6	7	8	
19 Text 10	M	a	x		m	a	s	S	First text
20 Text 11		c	a	n		n	o	T	2 nd text
21 Text 12		E	x	c	e	e	d		3 rd text
22 Text 13	1	1	.	2	5	0		G	4 th text
23 Text 14		!	\	c	%	N	\	C	Text, CRLF, Net weight, CRLF
24 Text15	\	c	%	d	\	c	\	c	CRLF, date, CRLF, CRLF

To print this label using Style 1 the start line would be set to 10 and the stop line to 15.

Example 2: To print a label with a title block, date, time mass, a line for a signature and then a description of the weighing mode used.

Adam Equipment Co.
Milton Keynes UK
Date: 14/12/2001
Time: 09:38:00
Load mass: 123.456 g
*****Signature:*****
Checkweighing

Title text
2nd line text
Text of Date followed by date from balance
Text of Time followed by time from balance
Net weight from balance
Text
Mode from balance
CRLF

You should enter the next texts and set 8 signs in each one till we finish setting the printout.

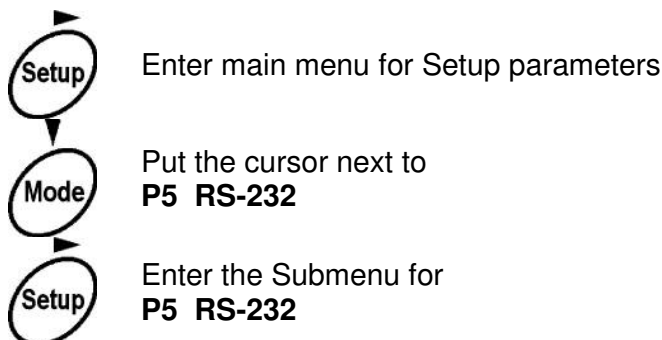
Parameter no.	Text								
	1	2	3	4	5	6	7	8	
25 Text 16	A	d	a	m		E	q	u	1 st text
26 Text 17	i	p	m	e	n	t		C	2 nd text
27 Text 18	o	.	\	c	M	i	l	t	Text, ,CRLF, text
28 Text 19	o	n			K	e	y	n	Text
29 Text 20	e	s		U	K	\	c	D	Text, CRLF, text
30 Text 21	a	t	e	:	%	d	\	c	Text, date, CRLF
31 Text 22	T	i	m	e	:	%	t	\	Text, time,
32 Text 23	r	\	n	L	o	a	d		CR, LF, text
33 Text 24	m	a	s	s	:	%	N	\	Text, Net weight
34 Text 25	c	\	c	*	*	*	*	*	CRLF, CRLF, text
35 Text 26	S	i	g	n	a	t	u	r	Text
36 Text 27	e	:	.	.	.	.	.	.	Text
37 Text 28	.	.	.	.	\	c	*	*	Text, CRLF
38 Text 29	*	%	F	*	*	*	\	c	Text, Mode, text, CRLF
39 Text 30									

If style 2 was to print this label it would start at group 16 and stop at group 29. Then if Style 3 where to print the combined labels it would start at group 10 and stop at group 29.

11.0 RS 232 FUNCTIONS <P5 RS-232>

The parameters that control the RS-232 communications can be set as necessary. These parameters control the basic communications (Baud, Parity, number of bits of data and stop, the handshaking protocols, etc.) as well as setting of minimum mass and printing when stable or unstable and automatic printing at a given time interval.

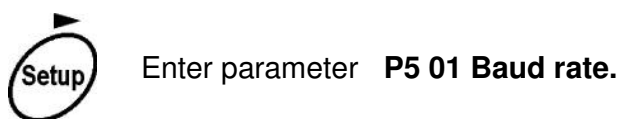
SETTING MENU FOR P5 RS-232



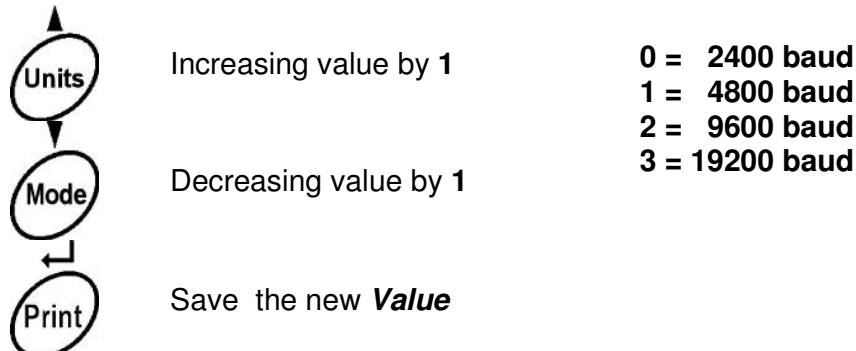
10/11/03		Setup		13:47:56	
P5	▶ 01	▶ Baud rate		2	9600
	02	Parity		0	none
	03	Data Bits		2	8 bits
	04	Stop bits		1	1 bit
	05	Handshake		0	none
	06	Auto print		0	None
	07	Interval		25	* 0.1 s
	08	Min. mass		4	10 div
	09	Print of stab		1	enabled
	10	Printout to		0	printer

The parameters that can be changed are shown above.

11.1 SETTING TRANSMISSION SPEED (BAUD RATE)

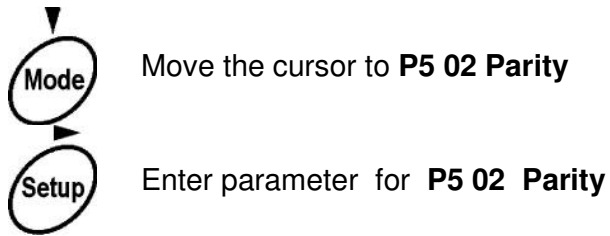


Set the new value for baud rate:

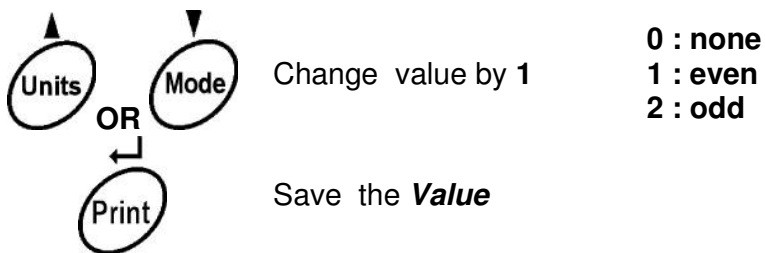


If this is the only change you can return to weighing as shown in Section 5.

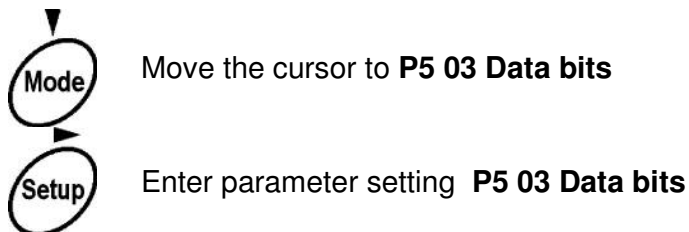
11.2 SETTING PARITY CONTROL



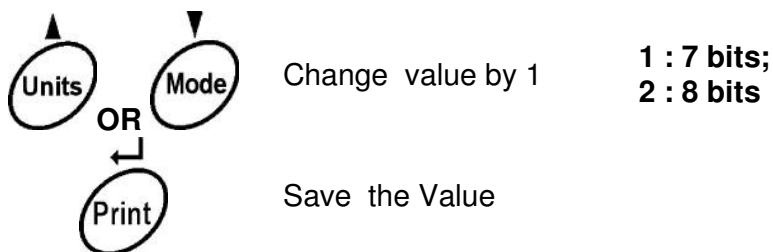
Set the new value for Parity:



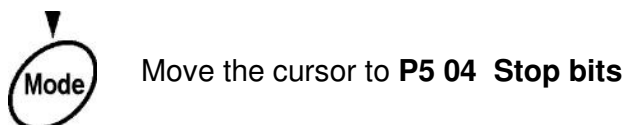
11.3 SETTING NUMBER OF DATA BITS

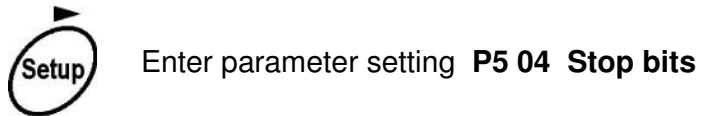


Set new value:

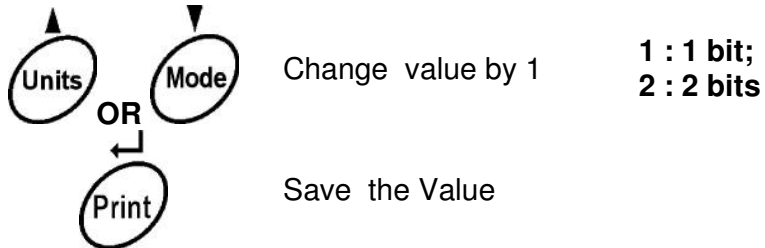


11.4 SETTING NUMBER OF STOP BITS

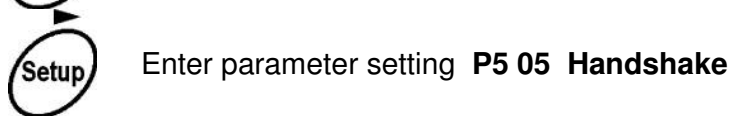
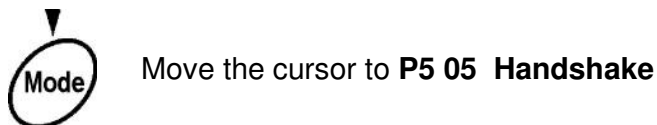




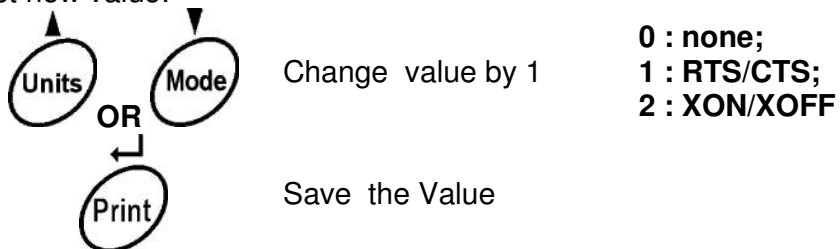
Set new value:



11.5 SETTING HANDSHAKE METHOD

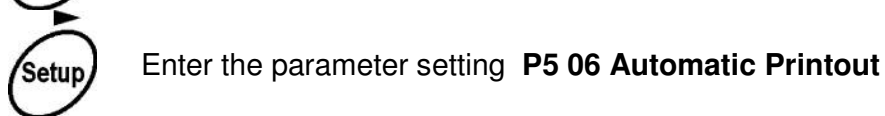
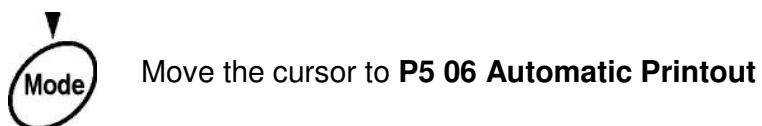


Set new value:

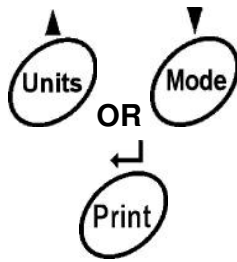


11.6 SETTING AUTOMATIC PRINTOUT

The balance can be made to print automatically, either continuously or at an interval set by the user or when the balance becomes stable.



Set new value:



Change value by 1

Save the Value

0 : none;
1 : continuous;
2 : interval;
3 : on stability

11.7 SETTING INTERVAL FUNCTION

If the balance has been set to print at an interval (see 11.7) then the interval time must be specified. The value can be set in 0.1 second increments from 0.1 second to 999.9 seconds.

The value entered is the time in seconds X 0.1 so that entering 600 means the printout will happen every 600 x 0.1 seconds = 60 seconds.

Set the new parameter value:



Enter the parameter **P5 07 Interval**

The first digit will be flashing indicating that this digit can be changed. You can either change this digit or select another.



Increasing value by 1



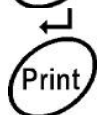
Decreasing value by 1



Select the next digit to the **RIGHT**



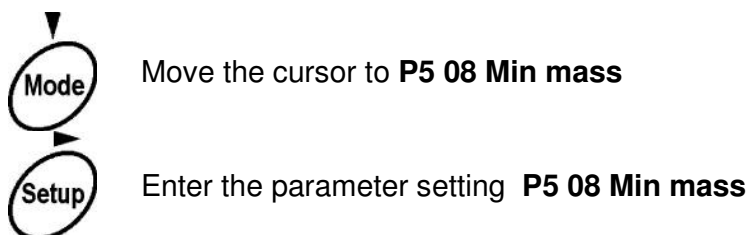
Select the next digit to the **LEFT**



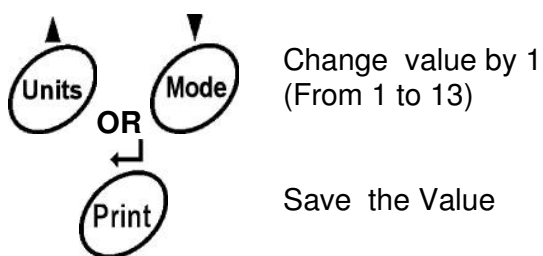
Save the Value

11.8 SETTING OF MINIMUM MASS

The balance can be set to print automatically when the weight on the platform crosses a minimum mass. The value of the minimum mass can be set from 1 to 13 for 1 division to 10000 divisions respectively.



Set new value:

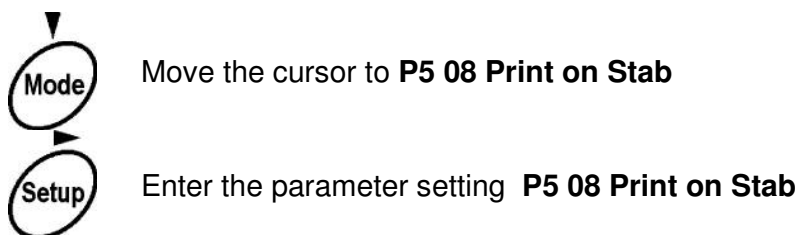


The value with divisions for minimum mass:

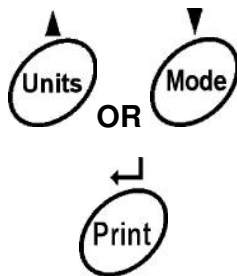
1 : 1 div	8 : 200 div
2 : 2 div	9 : 500 div
3 : 5 div	10 : 1000 div
4 : 10 div	11 : 2000 div
5 : 20 div	12 : 5000 div
6 : 50 div	13 : 10000 div
7 : 100 div	

11.9 SENDING DATA WHEN STABLE OR UNSTABLE

The balance can transmit the data when the weight is stable or unstable as selected by the user. When the weight is transmitted and it is unstable a question mark (?) will be printed in front of the weight.



Set the new value:



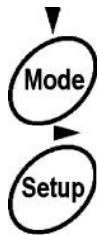
Change value by 1

0 : enabled
(will print only when stable)
1 : disabled
(will print regardless of stability)

Save the Value

11.10 SEND PRINTOUT TO

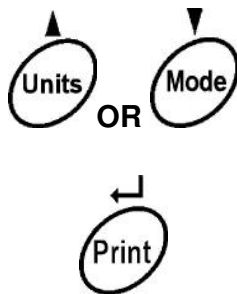
The balance will transmit the data in a format that is better suited for a printer or a computer.



Move the cursor to **P5 09 Printout to**

Enter the parameter setting **P5 09 Printout to**

Set new value:



Change value by 1

0 : printer
1 : computer

Save the Value

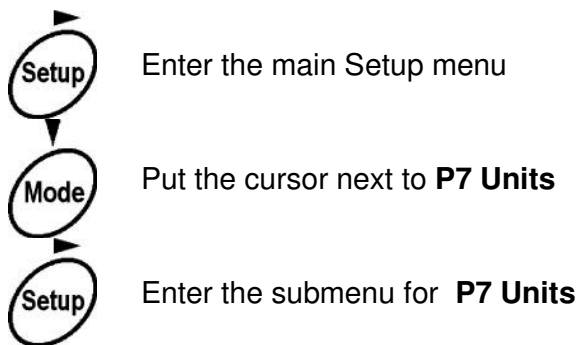
12.0 MASS UNITS <P7 Units>

The balance has 16 weighing units that can be either enabled or disabled by the user. If the weighing unit is enabled it will be selected when the **[Units]** key is pressed. If it is disabled it will not be seen.

For example it is possible to have a balance with only grams or any one of the 16 weighing units to select from.

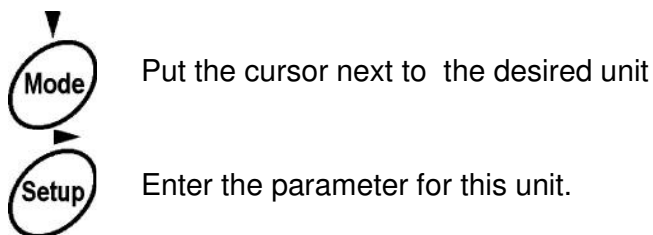
OIML APPROVED BALANCES: Only grams, milligrams and carats are allowed. All other units have been disabled.

To enable or disable any of the weighing units:

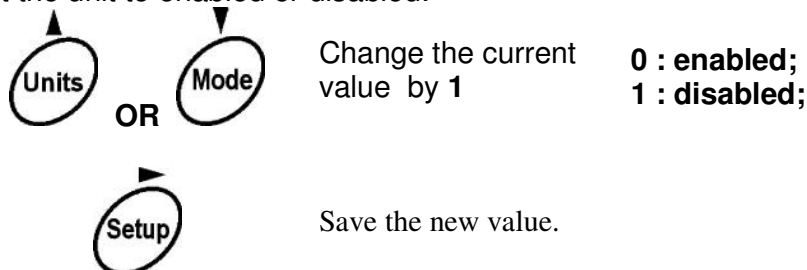


30/10/03		Setup		11:47:52
P7	►01►	Grams	1	enabled
	02	Milligrams	1	enabled
	03	Carats	1	enabled
	04	Pounds	0	disabled
	05	Ounces	0	disabled
	06	Ounces troy	0	disabled
	07	Dwt	0	disabled
	08	Taels Hk.	0	disabled
	09	Teals S.	0	disabled
	10	Taels T.	0	disabled
	11	Mommes	0	disabled
	12	Grains	0	disabled
	13	Newtons	0	disabled
	14	Tical	0	disabled
	15	Custom	0	disabled
	16	Custom factor	2.0	

You will see the weighing units available and a description showing which units are enabled and which are disabled. To change the status of any weighing unit:



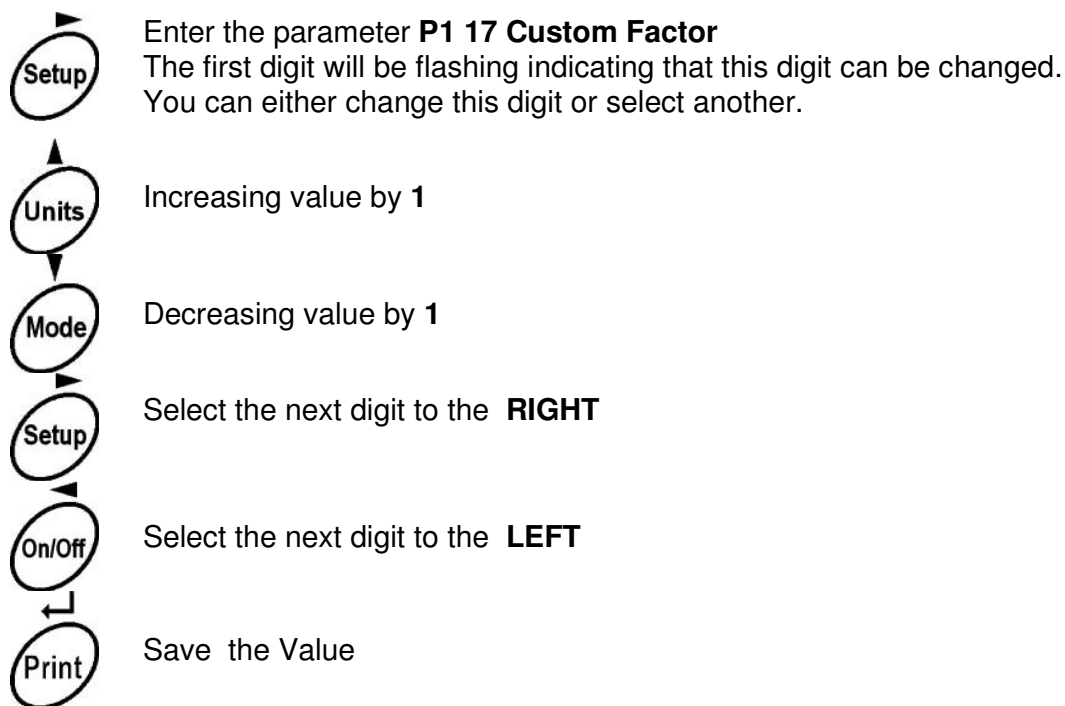
Set the unit to enabled or disabled:



After setting all the units as required, return to normal weighing as described in section 5.

12.1 CUSTOM WEIGHING UNIT

The balance has one weighing unit that can be set to convert the weight on the scale to any other unit of weight. For example if you needed to weigh in a unique unit that was equivalent to 4 grams per unit, you could make the scale display the correct weight: 0.25 X grams.



Verify the Customs unit has been enabled.

Return to normal weighing and press **[Units]** until the legend "C" is displayed. Place a weight on the scale and it will display the weight in the custom units defined.

NOTE:

When using Taels, only one of the 3 Taels units listed may be used. If more than one Taels unit has been enabled only the first unit listed will be used.

For example if both Taels Hong Kong and Taels Singapore are enabled only the Taels Hong Kong will be used.

Sl. No.	Name of the Units	Description	Conversion Factor	Display Symbol
01	Grams	A standard metric unit	1.0	g
02	Milligrams	Another metric unit	0.001	mg
03	Carats	Used for weighing jewellery and gems, etc.	5.0	ct
04	Pounds	Standard weighing unit in UK	0.002205	Lb
05	Ounces	Avoirdupois ounce- used in England. 16 ounces make a pound.	0.03528	OZ
06	Ounces troy	Troy ounce- used for weighing gold, silver, etc.	0.03216	OZt
07	Dwt	Pennyweight was the weight of a silver penny in medieval England.	0.6432	dWt
08	Taels Hk.	Used to weigh coral, pearls, etc.	0.02675	TL.T
09	Taels S.	Singapore Taels	0.02646	TL.C
10	Taels T.	Taiwan Taels	0.02675	TL.t
11	Mommes	A weighing unit previously used in Japan to weigh pearls.	0.266675	MM
12	Grains	The basic unit of weight in the imperial system. Used to weigh gun pallets.	15.435	GN
13	Newtons	Used to measure force/pressure	0.009808	N
14	Tical	A weighing unit	0.08576	t
15	Custom	User can set his own unit.	set by user	CU
16	Custom factor	A user-defined factor can be set, for example a unit set by user which is 0.25 of gram		

OIML APPROVED BALANCES: Only grams, milligrams and carats are allowed. All other units have been disabled. The display and the RS-232 output are marked with brackets on the least significant digit. For example-

12.34 g

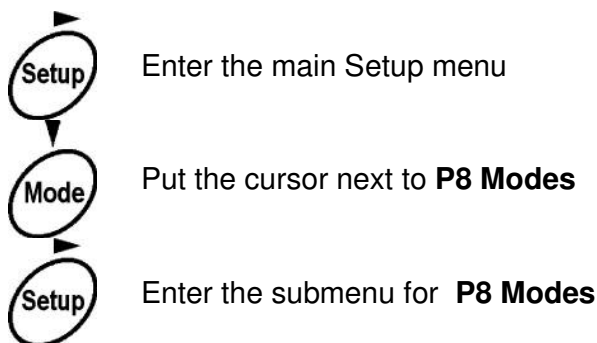
13.0 ENABLING THE MODES <P8 Work modes>

The balance will allow the user to enable or disable the special functions, called modes. These functions allow the balance to be used for Parts Counting, Checkweighing, Filling, Percent Weighing, Animal Weighing, Density determination for solids and liquids, Formulation and Statistics determination of the results.

Details of these modes are given in Section 14. This section describes how to enable or disable these modes. When they are enabled they are accessible by

pressing the  key. If they are disabled they are not seen when the **[Mode]** key is pressed.

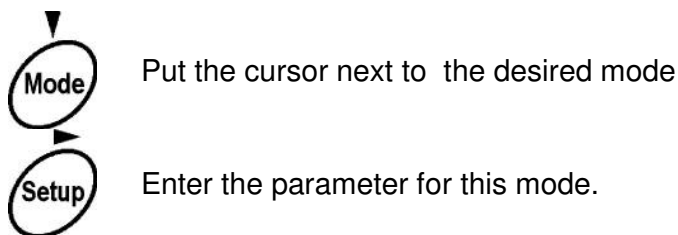
To enable or disable any of the modes:



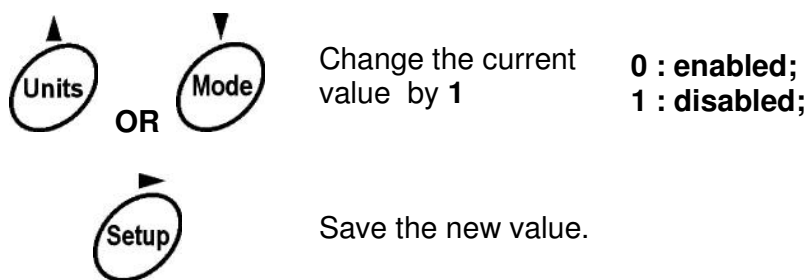
31/10/03		Mode		14:12:38
P8	►01►	Parts counting	1	enabled
	02	Checkweighing	0	enabled
	03	Filling	1	enabled
	04	Percent	1	enabled
	05	Animal weighing	0	disabled
	06	Density	1	disabled
	07	Formulation	0	disabled
	08	Statistics	0	disabled

You will see the modes available and a description showing which are enabled and which are disabled.

To change the status of any mode:



Set the mode to be enabled or disabled:



After setting all the units as required, return to normal weighing as described in section 5.

Refer to Section 14 for details on the operation of each mode.

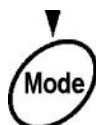
14.0 MODES OF OPERATION

Modes can be selected to enable the user to count parts, perform check-weighing, filling, percent weighing, animal weighing, density determination, formulation and statistics of weighing activity. Many of these functions can work together, such as using statistics and parts counting together, or check-weighing using a number of parts during parts counting. Each major mode is described below. The secondary modes that can be used at the same time are mentioned within each section.

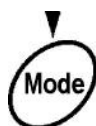
14.1 PARTS COUNTING

It is possible to count parts using the balance, to weigh the parts and then compute the number parts based upon a unit weight. The unit weight can be input by the user, recalled from a data base of previously stored unit weights or determined by weighing a sample of the parts to be counted. Up to 400 unit weights can be stored and recalled by the user, along with a description of the part.

The accuracy of the parts counting method is limited by the uniformity of the parts. If the parts weigh within 1% of each other the accuracy of the parts counting will be better than if they are only within 5% of each other.



Enter the **Modes** menu.



Set cursor next to the **M1 Parts counting** option.

31/10/03	Mode	13:32:26
M0	Basic weighing	
M1 ►	Parts counting	
M2	Checkweighing	
M3	Filling	
M4	Percent	
M5	Animal weighing	
M6	Density	
M7	Formulation	
M8	Statistics	

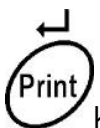


Enter the submenu **M1 Parts counting** (setting the parameters)

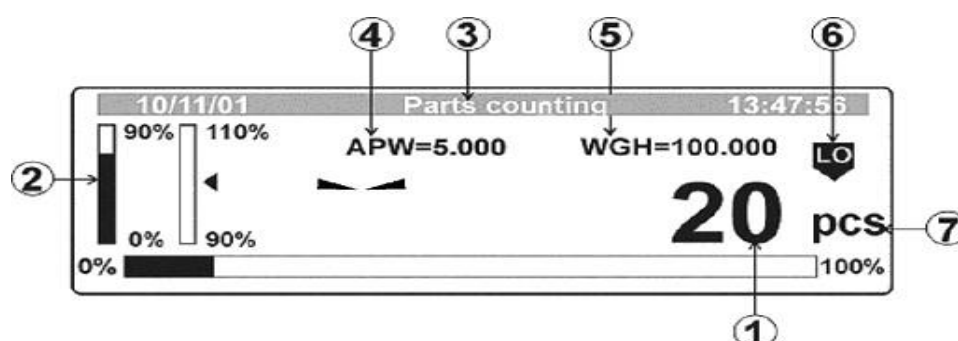
Parts counting setup				
M1 ►	01	Unit weight	► 5.0000	g
	02	Recall sample		
	03	Store sample		
	04	Checkweighing	ON	
	05	Filling	ON	
	06	Statistics	OFF	
	07	Run		

At this point you can either use the cursor keys to move within the menu to set a unit weight, recall a unit weight from the data base, store a unit weight and description in the data base, enable or disable the check-weighing, filling and statistics functions

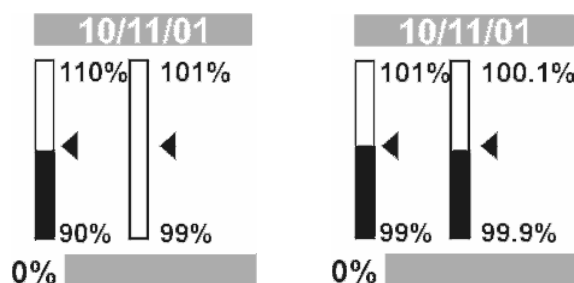
OR

Press the  key to go directly to the parts counting display with the options unchanged.

14.1.1 Description of the graphic display for the parts counting function



1. Computed number of parts which are on the pan.
2. Side bar-graphs used for the filling function, showing graphically how many parts are needed to achieve the target number. During the counting process the description on bar-graphs will change as the number of parts gets closer to the target value.



You can see bar-graphs only when the FILLING function is enabled.

3. Name of the active mode (Parts Counting)
4. Unit Weight.
5. Mass of all items on the pan.
6. Graphic display for check-weighing. The display will show if the number of parts is below, above or between the number of items, set as limits.
(The limits low (**LO**) and high (**HI**) are set as number of items and not as mass during parts counting).

	Number is below the low limit
	Number of items is greater than the low limit and less than the high limit.
	Number of items is greater than the high limit.

You can see those symbols only when the check-weighing function is enabled.

7. Symbol showing the balance is in the parts counting mode and is stable.

14.1.2 Set Unit Weight

The unit weight can be set using 3 different methods:

- 1) Input the unit weight manually into parameter M1 01
- 2) Compute the unit weight by weighing a known quantity of parts (the sample)
- 3) Recall the unit weight from the data base of up to 50 items.

1) Setting unit weight manually

If the display is already showing the Parts Counting sub-menu proceed as below.

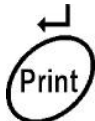
Press the  key to show the sub-menu.

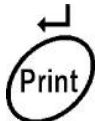


With the **[Setup]** key enter parameter **01 Unit weight** (first digit will flash)

Parts counting setup		
M1 ▶	01 Unit weight	▶ 5.0000 g
	02 Recall sample	
	03 Store sample	
	04 Checkweighting	ON
	05 Filling	ON
	06 Statistics	OFF
	07 Run	

Use the keys as described in section 5 to set a new value for the unit weight. Press



the  key to accept the new value. The display will change to the parts counting screen with the new unit weight being used to count parts.

2) Compute the unit weight by weighing a known quantity of parts (the sample)

When the display is showing the main parts counting screen, press the  key to display the sample size screen:



Enter the submenu for weighing a sample of the items to be counted.

Parts counting		
M1 ▶ 01 ▶	01 Sample size	10
	02 Sample size	20
	03 Sample size	50
	04 Sample size	100
	05 Sample	▶ 0 PCS

Using the following keys set the sample size



Move cursor to the next parameter down.

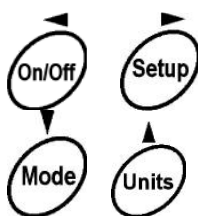


Move cursor to the next parameter up.

You can select a preset sample size of 10, 20, 50 or 100 pieces, or use **05 Sample** parameter to set any quantity required (1 to 100,000 pieces).

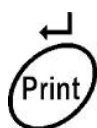
NOTE: The mass of each piece can't be smaller than the resolution of the balance, for example 0.01g or 0.001g.

Use the balance keypad or the external PC keyboard to set the sample size required. Select one of the preset sizes or set a new size using **05 Sample** parameter. For example set 17 parts in the example shown.



Use the function keys (or a PC keyboard) to set the required number of parts.

Parts counting		
M1 ▶ 01 ▶	01 Sample size	10
	02 Sample size	20
	03 Sample size	50
	04 Sample size	100
	05 Sample	▶ 17 PCS



Store the value selected and start procedure to weigh the samples. Display will ask that the samples be placed on the scale.

12/1/2011	Parts counting	12:47:50
Tare a container if necessary		
Place 17 parts[Enter]		
		0.00 g
0%		100%

If parts are to be weighed in a container place the empty container on the pan and press the **[Tare]** key.  Place the samples (17 in this sample) in the container then press the **[Enter]** key. 

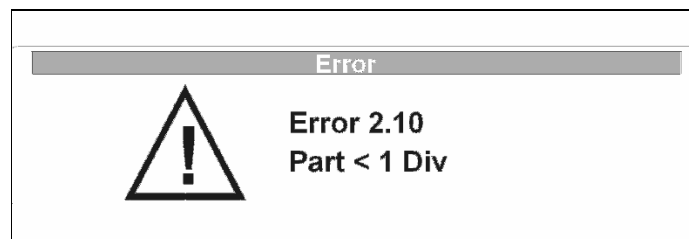
The balance will calculate the average weight of one item based upon the weight of the samples and the quantity selected. To count more items simply add them to the container. If necessary a different container can be used by taring the weight of the empty container and adding the parts to be counted.

When using the samples to set the unit weight the balance will automatically increase the accuracy of the unit weight computed as more parts are added. This is called **Automatic Correction of Accuracy (ACA)** and is shown by an arrow symbol above the “pcs” label on the display.

There are 4 conditions that must be met for the **ACA** function to be active:

- a) Mass must be added to the balance.
- b) The number of parts added must be less than the number of parts previously displayed.
- c) The unit weight must be within a tolerance of +/- 0.3% from the original unit weight.
- d) Result has to be stable.

During the process of determining the unit weight the balance will check that the unit weight is large enough for accurate counting. If the unit weight is too low an error message will be shown:



3) Recalling Unit Weight from the Data Base

The Unit Weight can be stored in memory and recalled for future use. Up to 100 unit weights can be stored along with a description of the product. The procedure that follows describes recalling the unit weight from the data base.



Set the cursor next to parameter
M1 02 Recall sample



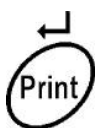
Enter the submenu for this parameter
M1 02 001



OR



Set the cursor next to the
details of the required unit
weight. For example
M1 02 003: sample 003 :1.032



Press the **[Enter/Print]** key to select the
new unit weight. The balance will return to
the Counting sub-menu.

Parts counting setup				
M1 ▶	01	Unit weight	1.000	g
	02	Recall sample		
	03	Store sample		
	04	Checkweighing	ON	
	05	Filling	ON	
	06	Statistics	OFF	
	07	Run		

Parts counting setup ▶ Recall sample				
M1 ▶	02 ▶	001 ▶	sample 001	1.500 g
		002	Sample 002	1.450 g
		003	sample 003	1.032 g
		...	...	...
		...	...	...
		...	...	...
		399	sample 399	1.015 g
		400	sample 400	2.030 g

Parts counting setup ▶ Recall sample				
M1 ▶	02 ▶	001	sample 001	1.500 g
		002	Sample 002	1.450 g
		003 ▶	sample 003	1.032 g
		...	...	...
		...	...	...
		...	...	...
		399	sample 399	1.015 g
		400	sample 400	2.030 g

Parts counting setup				
M1 ▶	01	Unit weight	1.032	g
	02	Recall sample		
	03	Store sample		
	04	Checkweighing	ON	
	05	Filling	ON	
	06	Statistics	OFF	
	07	Run		

Press **[Enter/Print]** again to go to Parts Counting with the new unit weight being used.

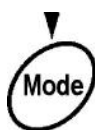
4) Saving Unit Weight details in the Data Base

You can save details of 400 different items, giving each a unique name. The names are limited to a maximum of 10 characters, numbers, letters or symbols.

After setting a new unit weight as described in parts 1) and 2) above, proceed to store the unit weight with a description.

From the Parts Counting sub-menu:

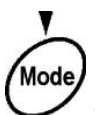
Parts counting setup				
M1 ▶	01	Unit weight	5.0000	g
	02	Recall sample		
	03	Store sample		
	04	Checkweighing	ON	
	05	Filling	ON	
	06	Statistics	OFF	
	07	Run		



Set the cursor next to **03 Store sample**



Enter the submenu parameter
M1 03 Store sample



or

Set the cursor next to the location you wish to store the details, 400 memory locations are reserved for this purpose.



Enter the description field. The first location will flash. Using function keys or a PC keyboard – enter the name of the item, - not more than 10 characters (letters, digits, others)



Save the new name.
(last digit will stop flashing)
Note the unit weight has not changed yet.



Pressing a second time, will return to the Parts Counting submenu. The Unit Weight is stored at this time.

Parts counting setup				
M1 ▶	01	Unit weight	1.000	g
	02	Recall sample		
	03	Store sample		
	04	Checkweighing	ON	
	05	Filling	ON	
	06	Statistics	OFF	
	07	Run		

Parts counting setup ▶ Store sample				
M1 ▶	02 ▶	001 ▶	sample 001	1.500 g
		002	sample 002	1.450
		003	sample 003	1.032
		...	...	...
		...	...	...
		...	...	...
		399	sample 399	1.015
		400	sample 400	2.030

Parts counting setup ▶ Store sample				
M1 ▶	03 ▶	001	sample 001	1.500 g
		002	sample 002	1.450
		003	sample 003	1.032
		004 ▶	sample 004	1.000
		...	...	...
		...	...	...
		399	sample 399	1.015
		400	sample 400	2.030

Parts counting setup ▶ Store sample				
M1 ▶	03 ▶	001	sample 001	1.500 g
		002	sample 002	1.450
		003	sample 003	1.032
		004 ▶	AAAA 004	1.000
		...	...	...
		...	...	...
		399	sample 399	1.015
		400	sample 400	2.030

Parts counting setup				
M1 ▶	01	Unit weight	5.000	g
	02	Recall sample		
	03	Store sample		
	04	Checkweighing	ON	
	05	Filling	ON	
	06	Statistics	OFF	
	07	Run		

If you view the data base using **M1 02 Recall Sample** you will see the new item that has just been entered with the current unit weight.

14.1.3 Using Checkweighing in the Parts Counting Mode

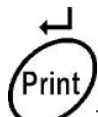
It is possible to use checkweighing while in the parts counting mode to show when the parts counted are within the limits set by the checkweighing program.

From the parts Counting menu select the check weighing option, **M1 04**.

Parts counting setup				
M1 ▶	01	Unit weight	5.0000	g
	02	Recall sample		
	03	Store sample		
	04	Checkweighing	▶ ON	
	05	Filling	ON	
	06	Statistics	OFF	
	07	Run		

Press  to select the checkweighing menu.

Parts counting setup ▶ Checkweighing			
M1 ▶ 04 ▶ 01	Checkweighing	▶ ON	
02	Low limit	0	PCS
03	High limit	0	PCS

Enter the values for the low limit and high limit then press the **[Enter]** key,  to return to parts counting. The symbols above the PCS indication will show when the count is "**LO**", below the low limit, "**OK**" between the limits or "**HI**" if the count is above the High Limit.

To disable Checkweighing set parameter **M1 04** to **OFF**.

14.1.4 Using the Filling mode while in Parts Counting

It is possible to use the Filling program while in Parts Counting Mode. The program will set a target number of parts for filling and show a bar-graph that indicates how close the current value is to the target.

From the parts Counting menu select the Filling option, **M1 05**.

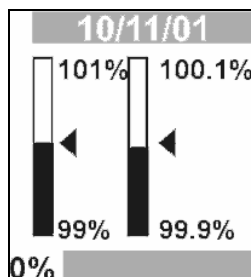
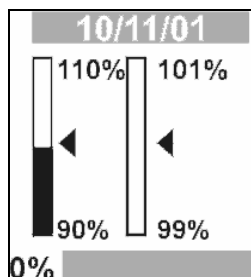
Parts counting setup			
M1 ▶ 01	Unit weight	5.0000	g
02	Recall sample		
03	Store sample		
04	Checkweighing	▶ ON	
05	Filling	▶ ON	
06	Statistics	OFF	
07	Run		

Press  to select the Filling menu.

Parts counting setup ▶ Filling			
M1 ▶ 05 ▶ 01	Filling	▶ On	
02	Target weight	0	PCS



Enter the value for the target weight (count) and press the **[Enter]** key, to start the Parts Counting mode with the filling program operating.



The bar graphs will fill as the count approaches the target value, filling the left bar first then as the count is nearer to the target the right bar will fill. The nearer you are to the target, the finer the resolution of the bar graphs will be. See the above diagrams.

14.1.5 Set Statistics in parts counting

The user can set the statistics program so that it collects the count when the **[Print]** key is pressed. These values are stored in the memory and can be recalled. When they are recalled they can be displayed on the balance and printed using the RS-232 interface.

The procedure that follows shows how to enable the statistics mode, clear the old data from the memory, collect new data and recall and print the results of multiple samples.

Procedure:



While in Parts Counting Enter the Parts Counting submenu

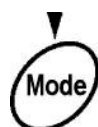


Set the cursor next to parameter **M1 06 Statistics**



Enter the Statistics sub menu

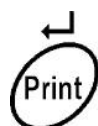
Parts counting setup			
M1 ▶	01 Unit weight	▶ 5.0000	g
	02 Recall sample		
	03 Store sample		
	04 Checkweighting	ON	
	05 Filling	ON	
	06 Statistics	OFF	
	07 Run		
Parts counting setup			
M1 ▶	01 Unit weight	5.0000	g
	02 Recall sample		
	03 Store sample		
	04 Checkweighting	ON	
	05 Filling	ON	
	06 Statistics	▶ OFF	
	07 Run		
Parts counting setup ▶ Statistics			
M1 ▶	06 ▶ 01 Statistics	▶ OFF	
	02 Results		
	03 Clear		



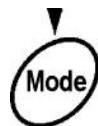
Select the parameter **M1 03 03 Clear** to erase all old data.



Enter the function to delete the old data for statistics



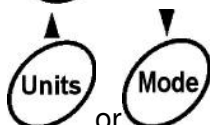
Press **Enter** to verify you want to clear the memory



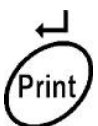
Enter parameter **M1 06 01 Statistics** to enable the statistics function



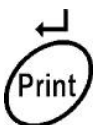
Enter parameter **M1 06 01 Statistics**



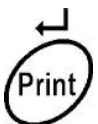
Change the parameter description to **"ON"**



Save the choice



Return to the Parts Counting submenu



Press **[Enter]** to go to the Parts Counting mode.

Parts counting setup ▶ Statistics	
M1 ▶ 06 ▶ 01 Statistics	OFF
02 Results	
03 Clear	▶

Parts counting setup ▶ Statistics	
 Clear statistics ?	

Parts counting setup ▶ Statistics	
M1 ▶ 06 ▶ 01 Statistics	OFF
02 Results	
03 Clear	▶

Parts counting setup ▶ Statistics	
M1 ▶ 06 ▶ 01 Statistics	▶ OFF
02 Results	
03 Clear	

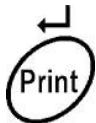
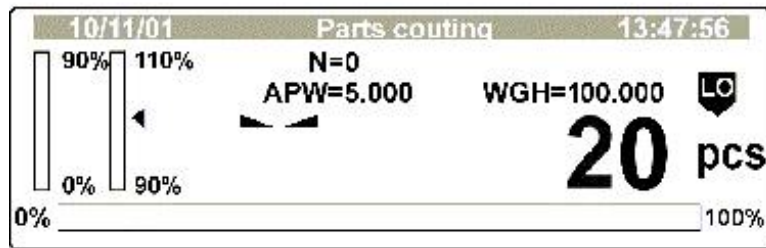
The **"OFF"** message will flash

Parts counting setup ▶ Statistics	
M1 ▶ 06 ▶ 01 Statistics	▶ ON
02 Results	
03 Clear	

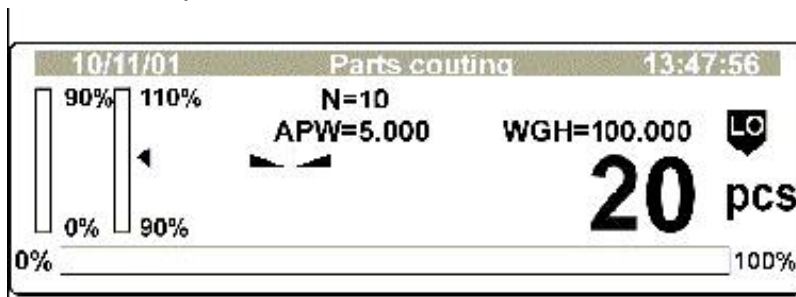
Parts counting setup ▶ Statistics	
M1 ▶ 06 ▶ 01 Statistics	▶ ON
02 Results	
03 Clear	

Parts counting setup	
M1 ▶ 01 Unit weight	5.0000 g
02 Recall sample	
03 Store sample	
04 Checkweighing	ON
05 Filling	ON
06 Statistics	▶ ON
07 Run	

The balance will now be in the Parts Counting mode. Continue with counting of parts as before. The checkweighing and filling modes can be either **ON** or **OFF**.



During parts Counting the value displayed will be stored in the memory and the number of values entered into the memory (N) will be incremented by one.

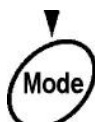


After a few samples have been stored in the memory (for example N=10 as shown above) the user can recall the results of statistics for these values.



Enter the Parts Counting submenu

Parts counting setup		
M1 ▶ 01	Unit weight	▶ 5.0000 g
02	Recall sample	
03	Store sample	
04	Checkweighting	ON
05	Filling	ON
06	Statistics	ON
07	Run	



Set the cursor next to parameter **M1 06 Statistics**

Parts counting setup		
M1 ▶ 01	Unit weight	5.0000 g
02	Recall sample	
03	Store sample	
04	Checkweighting	ON
05	Filling	ON
06	Statistics	▶ ON
07	Run	



Enter the statistics submenu

Parts counting setup ▶ Statistics		
M1 ▶ 06 ▶ 01	Statistics	▶ ON
02	Results	
03	Clear	



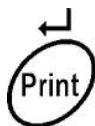
Set the cursor next to parameter **M1 06 02 Results**

Parts counting setup ▶ Statistics		
M1 ▶ 06 ▶ 01	Statistics	ON
02	Results	▶
03	Clear	



Enter the function of showing statistics results.

Parts counting setup ▶ Statistics		
N=10	SUM=40	X=4
MIN=4	MAX=5	D=1
SDV=2	RDV=52.7	



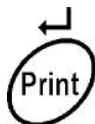
If desired the results can be printed using the RS-232 interface (example shown).

N : 10		Number of samples
SUM : 40	pcs	Total Count
X : 4	pcs	Average
MIN : 4	pcs	Minimum count
MAX : 5	pcs	Maximum Count
D : 1	pcs	Difference
SDV : 2	pcs	Standard Deviation
RDV : 52.7	%	% Std. Dev.



Return to the Statistics submenu

Parts counting setup ▶ Statistics	
M1 ▶ 06 ▶ 01 Statistics	ON
02 Results	▶
03 Clear	



Enter the Parts counting mode to continue adding more samples to the memory.

14.1.6 Enter in mode parts counting

When in the parts counting submenu, it is possible to begin the parts counting by either pressing the **[Enter]** key or by selecting the parameter **M1 07**. Both the methods work the same.



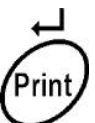
Set the cursor next to parameter **M1 07 Run**



Enter the parts Counting mode

Parts counting setup		
M1 ▶ 01 Unit weight	5.0000	g
02 Recall sample		
03 Store sample		
04 Checkweighting	ON	
05 Filling	ON	
06 Statistics	OFF	
07 Run		▶

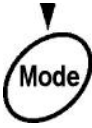
OR



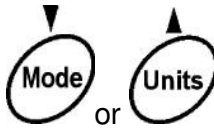
If you press the **[Enter]** key you enter the Parts Counting mode regardless of the position of the cursor.

14.1.7 To return to weighing

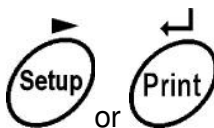
When you are in parts counting mode you can return to normal weighing mode or other modes as shown below:



Enter the Modes menu



Set the cursor next to **MO** Basic weighing



Enter the **MO** Basic weighing Mode

31/10/03	Mode	13:32:26
M0	Basic weighing	
M1 ▶	Parts counting	
M2	Checkweighing	
M3	Filling	
M4	Percent	
M5	Animal weighing	
M6	Density	
M7	Formulation	
M8	Statistics	



31/10/03	Mode	13:32:26
M0 ▶	Basic weighing	
M1	Parts counting	
M2	Checkweighing	
M3	Filling	
M4	Percent	
M5	Animal weighing	
M6	Density	
M7	Formulation	
M8	Statistics	



15.10.01	Weighing	13:47:32
		
		
0.00		g
0% 100%		

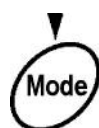
OIML TYPE APPROVAL: The display and the RS-232 output are marked with brackets on the least significant digit. For example-

12.34 g

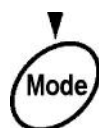
14.2 CHECK-WEIGHING

The balance uses check-weighing to compare the weight being measured to preset high and low limits. The comparison is shown on the display using symbols and bar-graphs near the display of the weight.

To use the Check-weighing select it from the Modes menu.



Enter the Modes menu



Set the cursor next to
M2 Checkweighing



Press **[Setup]** to enter the
submenu for **Checkweighing**

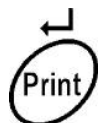
31/10/03	Mode	13:32:26
M0	Basic weighing	
M1	Parts counting	
M2	Checkweighing	
M3	Filling	
M4	Percent	
M5	Animal	
M6	Density	
M7	Formulation	
M8	Statistics	
Checkweighing setup		
M2	01 Low limit	0.00 g
	02 High limit	0.00 g
	03 Statistics	ON
	04 Run	

Using function keys to set the parameter values for the **Checkweighing** mode.
(Refer to section 14.1 for more details of using the function keys).

NOTE :

You should set parameters **M2 02 High Limit** first as the program is automatically checking to verify the values for the limits are acceptable, i.e. the high limit is larger than the low limit. If they are wrong the balance will show an error message and come back to the submenu without changing any parameter.

After setting the values enter **Checkweighing**:



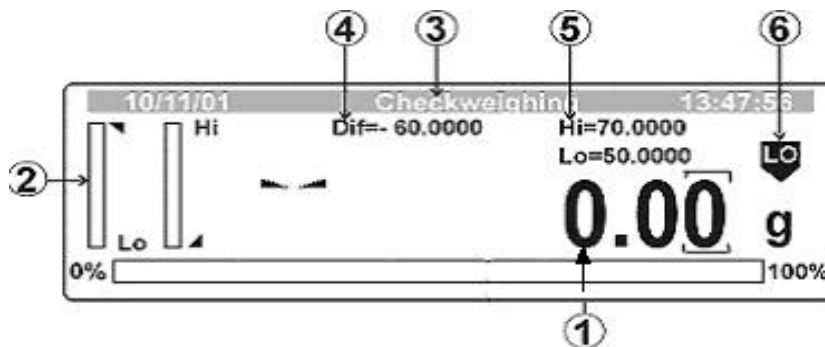
Doesn't matter where the cursor is, if you press **[Enter]** you enter into the
mode **M2 Checkweighing**

OR

Mode (arrow pointing to Mode button) Set the cursor next to M2 04 Run Setup (arrow pointing to Setup button) With Setup enter mode M2 Checkweighing	Checkweighing setup <table border="1"> <tr><td>M2 ▶</td><td>01</td><td>Low limit</td><td>0.00</td><td>g</td></tr> <tr><td></td><td>02</td><td>High limit</td><td>0.00</td><td>g</td></tr> <tr><td></td><td>03</td><td>Statistics</td><td>ON</td><td></td></tr> <tr><td></td><td>04</td><td>Run</td><td>▶</td><td></td></tr> </table> <table border="1"> <tr> <td>10/11/01</td> <td>Checkweighing</td> <td>13:47:56</td> </tr> <tr> <td>Lo</td> <td>Hi</td> <td></td> </tr> <tr> <td colspan="3">Dif= 60.0000</td> </tr> <tr> <td colspan="3">Hi=70.0000</td> </tr> <tr> <td colspan="3">Lo=50.0000</td> </tr> <tr> <td colspan="3">0.00 g</td> </tr> <tr> <td colspan="3">0% 100%</td> </tr> </table>	M2 ▶	01	Low limit	0.00	g		02	High limit	0.00	g		03	Statistics	ON			04	Run	▶		10/11/01	Checkweighing	13:47:56	Lo	Hi		Dif= 60.0000			Hi=70.0000			Lo=50.0000			0.00 g			0% 100%		
M2 ▶	01	Low limit	0.00	g																																						
	02	High limit	0.00	g																																						
	03	Statistics	ON																																							
	04	Run	▶																																							
10/11/01	Checkweighing	13:47:56																																								
Lo	Hi																																									
Dif= 60.0000																																										
Hi=70.0000																																										
Lo=50.0000																																										
0.00 g																																										
0% 100%																																										

14.2.1 Description of the graphic display for checkweighing

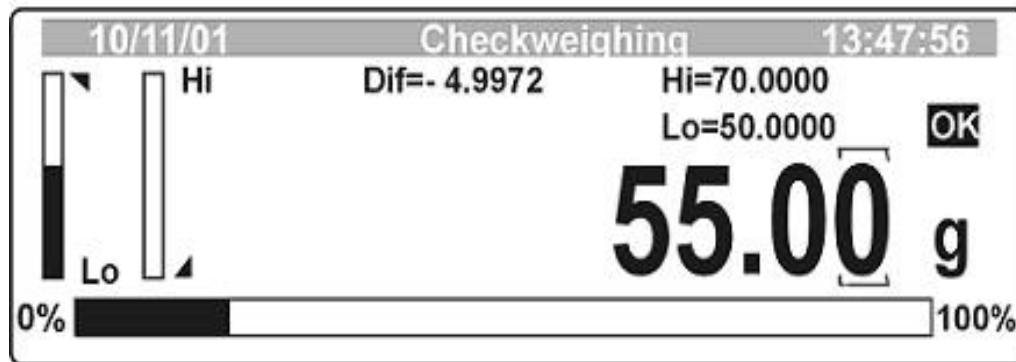
During checkweighing the following display will appear:



1. Value of mass on the pan displayed with the current weighing unit.
2. Bar-graphs will show when the weight is between the low and high limit. The left bar-graph shows the range from the low limit to the mid point between the limits and the right bar-graph shows the values from the mid point to the high limit. In the sample the midpoint is 60.000g.
3. Name of the mode being used- Checkweighing.
4. Shows the difference between the displayed weight and the midpoint between the limits.
5. High limit (**HI**) and low limit (**LO**) as set in the Checkweighing submenu.
6. Graphic symbol to show the weight is between limits or below the low limit, or above the high limit.

LO	Mass on the balance is below the Low limit
OK	Mass is between the limits.
HI	Load mass is to high

Example of display during checkweighing;

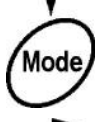


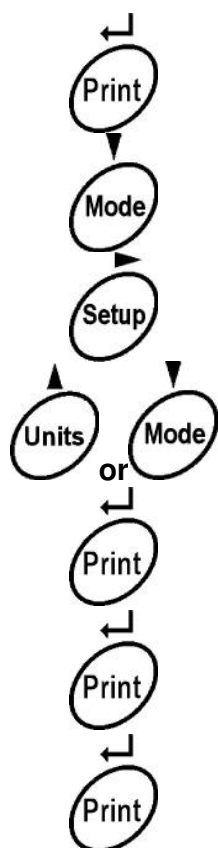
14.2.2 Setting Statistics to operate during Checkweighing

The user can set the statistics program so that it collects the count when the print key is pressed. These values are stored in memory and can be recalled. When they are recalled they can be displayed on the balance or printed using the RS-232 interface.

The procedure that follows shows how to enable the statistics mode, clear the memory of old data, collect new data and recall and print the results of multiple samples.

Procedure:

	While in Checkweighing Enter the Parts Counting submenu	<table border="1"> <tr><th colspan="5">Checkweighing setup</th></tr> <tr><td>M2</td><td>▶ 01</td><td>Low limit</td><td>▶ 0.00</td><td>g</td></tr> <tr><td></td><td>02</td><td>High limit</td><td>0.00</td><td>g</td></tr> <tr><td></td><td>03</td><td>Statistics</td><td>ON</td><td></td></tr> <tr><td></td><td>04</td><td>Run</td><td></td><td></td></tr> </table>	Checkweighing setup					M2	▶ 01	Low limit	▶ 0.00	g		02	High limit	0.00	g		03	Statistics	ON			04	Run		
Checkweighing setup																											
M2	▶ 01	Low limit	▶ 0.00	g																							
	02	High limit	0.00	g																							
	03	Statistics	ON																								
	04	Run																									
	Set the cursor next to parameter M2 03 Statistics	<table border="1"> <tr><th colspan="5">Checkweighing setup</th></tr> <tr><td>M2</td><td>▶ 01</td><td>Low limit</td><td>0.00</td><td>g</td></tr> <tr><td></td><td>02</td><td>High limit</td><td>0.00</td><td>g</td></tr> <tr><td></td><td>03</td><td>Statistics</td><td>▶ ON</td><td></td></tr> <tr><td></td><td>04</td><td>Run</td><td></td><td></td></tr> </table>	Checkweighing setup					M2	▶ 01	Low limit	0.00	g		02	High limit	0.00	g		03	Statistics	▶ ON			04	Run		
Checkweighing setup																											
M2	▶ 01	Low limit	0.00	g																							
	02	High limit	0.00	g																							
	03	Statistics	▶ ON																								
	04	Run																									
	Enter the Statistics sub menu	<table border="1"> <tr><th colspan="5">Checkweighing setup ▶ Statistics</th></tr> <tr><td>M2</td><td>▶ 03</td><td>▶ 01</td><td>Statistics</td><td>▶ ON</td></tr> <tr><td></td><td></td><td>02</td><td>Results</td><td></td></tr> <tr><td></td><td></td><td>03</td><td>Clear</td><td></td></tr> </table>	Checkweighing setup ▶ Statistics					M2	▶ 03	▶ 01	Statistics	▶ ON			02	Results				03	Clear						
Checkweighing setup ▶ Statistics																											
M2	▶ 03	▶ 01	Statistics	▶ ON																							
		02	Results																								
		03	Clear																								
	Select the parameter M2 03 03 Clear to erase all old data.	<table border="1"> <tr><th colspan="5">Checkweighing setup ▶ Statistics</th></tr> <tr><td>M2</td><td>▶ 03</td><td>▶ 01</td><td>Statistics</td><td>ON</td></tr> <tr><td></td><td></td><td>02</td><td>Results</td><td></td></tr> <tr><td></td><td></td><td>03</td><td>Clear</td><td>▶</td></tr> </table>	Checkweighing setup ▶ Statistics					M2	▶ 03	▶ 01	Statistics	ON			02	Results				03	Clear	▶					
Checkweighing setup ▶ Statistics																											
M2	▶ 03	▶ 01	Statistics	ON																							
		02	Results																								
		03	Clear	▶																							
	Enter this function to delete the old data for statistics	 Clear statistics ?																									



Press **[Enter]** to verify you want to clear the memory

Enter parameter **M1 06 01 Statistics** to enable the statistics function

If it is showing **OFF** set it to **ON**. Enter parameter **M1 06 01 Statistics**

Change the parameter description to **"ON"**

Save the choice

Return to the Checkweighing submenu

Press **[Enter]** to go to the Checkweighing mode.

Checkweighing setup > Statistics				
M2	▶ 03	▶ 01	Statistics	ON
		02	Results	
		03	Clear	▶

Checkweighing setup > Statistics				
M2	▶ 03	▶ 01	Statistics	▶ OFF
		02	Results	
		03	Clear	

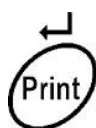
The **"OFF"** message will flash

Checkweighing setup > Statistics				
M2	▶ 03	▶ 01	Statistics	▶ ON
		02	Results	
		03	Clear	

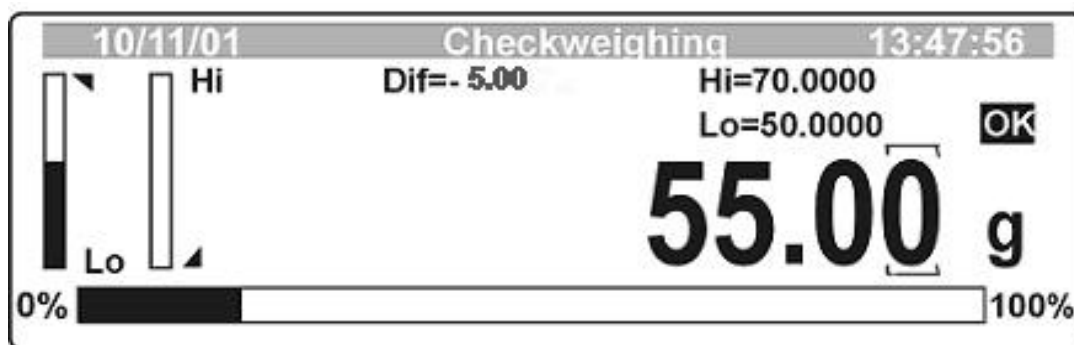
Checkweighing setup > Statistics				
M2	▶ 03	▶ 01	Statistics	▶ ON
		02	Results	
		03	Clear	

Checkweighing s etup				
M2	▶ 01	Low limit	0.00	g
	02	High limit	0.00	g
	03	Statistics	ON	
	04	Run	▶	

The balance will now be in the Checkweighing mode. Continue as before.



During weighing the value displayed will be stored in memory and the number of values entered into memory (N) will be incremented by one.



After a few samples have been stored in memory (for example N=10 as shown above) the user can recall the results of statistics for these values.



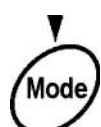
Enter the Parts Counting submenu



Set the cursor next to parameter **M2 03 Statistics**



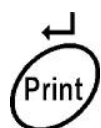
Enter the **Statistics** submenu



Set the cursor next to parameter **M2 03 02 Results**



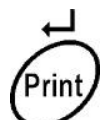
Enter the function to show the statistics results



If desired the results can be printed using the RS-232 interface (see the example shown here)



Return to the Statistics submenu



Return to the Checkweighing mode

Checkweighing setup				
M2 ▶	01	Low limit	0.00	g
	02	High limit	0.00	g
	03	Statistics	▶ OFF	
	04	Run		

Checkweighing setup				
M2 ▶	01	Low limit	0.00	g
	02	High limit	0.00	g
	03	Statistics	▶ ON	
	04	Run		

Checkweighing setup ▶ Statistics				
M2 ▶	03 ▶	01	Statistics	▶ ON
		02	Results	
		03	Clear	

Checkweighing setup ▶ Statistics				
M2 ▶	03 ▶	01	Statistics	▶ ON
		02	Results	
		03	Clear	

Checkweighing setup ▶ Statistics				
	N=10	SUM=40	X=4	
	MIN=4	MAX=5	D=1	
	SDV=2	RDV=52.7		

N : 10	Number of samples
SUM : 999.923 g	Total Count
X : 99.9923 g	Average
MIN : 99.976 g	Minimum count
MAX : 100.032 g	Maximum Count
D : 0.056 g	Difference
SDV : 0.363 g	Standard Deviation
RDV : 0.36 %	% Std. Dev.

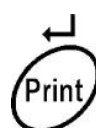
Checkweighing setup ▶ Statistics				
M2 ▶	03 ▶	01	Statistics	▶ ON
		02	Results	
		03	Clear	

14.2.3 Start Check-weighing

When in the Check-weighing submenu it is possible to begin the check-weighing mode by either pressing the **[Enter]** key or by selecting the parameter **M2 04 Run**. Both methods work the same.

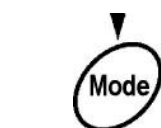
-  Set the cursor next to parameter **M2 04 Run**
 Enter the parts Counting mode
 or:

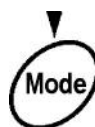
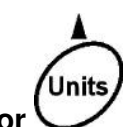
Checkweighing setup				
M2	► 01	Low limit	0.00	g
	02	High limit	0.00	g
	03	Statistics	ON	
	04	Run	►	

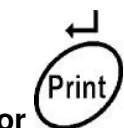
-  If you press the **[Enter]** key you enter the checkweighing mode immediately.

14.2.3 To return to weighing

When you are in the Checkweighing mode you can return to normal weighing mode or other modes as shown below:

-  Enter the Modes menu

-  or  Set the cursor next to **M0 Basic Weighing**

-  or  Enter the **M0 Basic weighing Mode**

31/01/04		Mode	13:32:26
M0		Basic weighing	
M1	►	Parts counting	
M2		Checkweighing	
M3		Filling	
M4		Percent	
M5		Animal weighing	
M6		Density	
M7		Formulation	
M8		Statistics	

31/01/03		Mode	13:32:26
M0	►	Basic weighing	
M1		Parts counting	
M2		Checkweighing	
M3		Filling	
M4		Percent	
M5		Animal weighing	
M6		Density	
M7		Formulation	
M8		Statistics	

15.10.01		Weighing	13:47:32
		0.00g	
→0←			
0%			100%

14.3 FILLING MODE

The user can use the filling program to set a target weight in the balance. Then as the product is added to the balance, the display will show the target weight on a bar-graph and fill the bar graph as the weight approaches the target value.

It is possible to use the Statistics Mode to collect details of the weights on the balance at the same time as using the Filling mode.

To start the Filling Mode from the normal weighing mode:



Enter the modes menu



Set the cursor next to parameter **M3 Filling**



Enter the sub-menu for **M3 Filling**

31/01/04	Mode	13:32:26
M0	Basic weighing	
M1	Parts counting	
M2	Checkweighing	
M3	Filling	
M4	Percent	
M5	Animal weighing	
M6	Density	
M7	Formulation	
M8	Statistics	
Filling setup		
M3	01 Target weight	0.00 g
	02 Statistics	OFF
	03 Run	

Use the keys to set the target weight and turn the Statistics function to **ON** or **OFF**. Refer to section 14.2 for details on setting the values, running the filling program and operating the Statistics Mode.

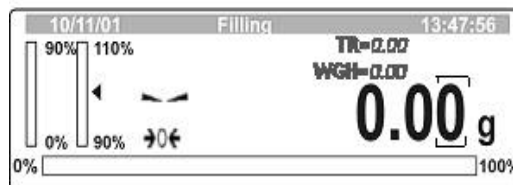


To begin the filling program Set the cursor next to **M3 03 Run**

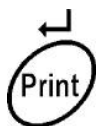
Filling setup		
M3	01 Target weight	0.00 g
	02 Statistics	OFF
	03 Run	



Start the Filling Mode

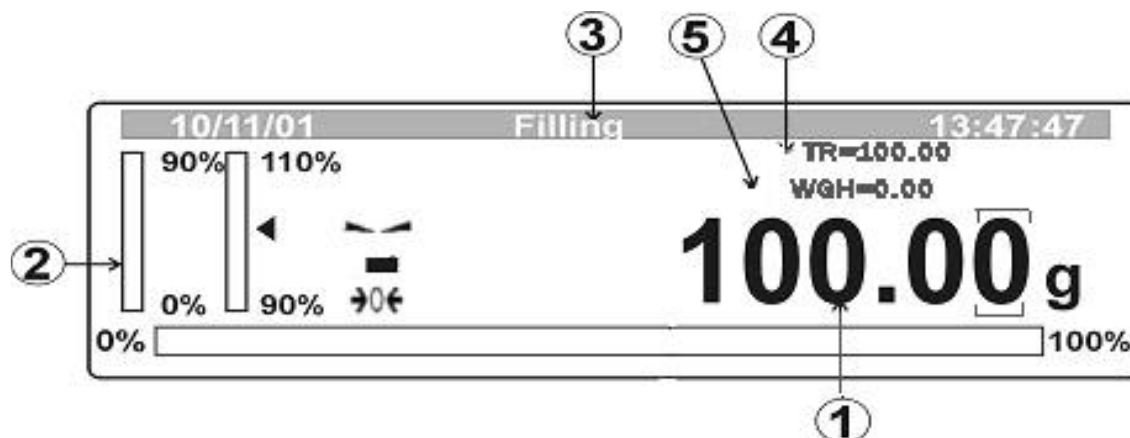


Or:

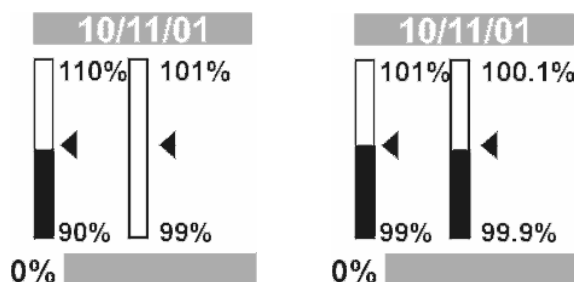


Press **[Print/Enter]** at any time

14.3.1 Description of the Graphic Display when Filling Mode is active

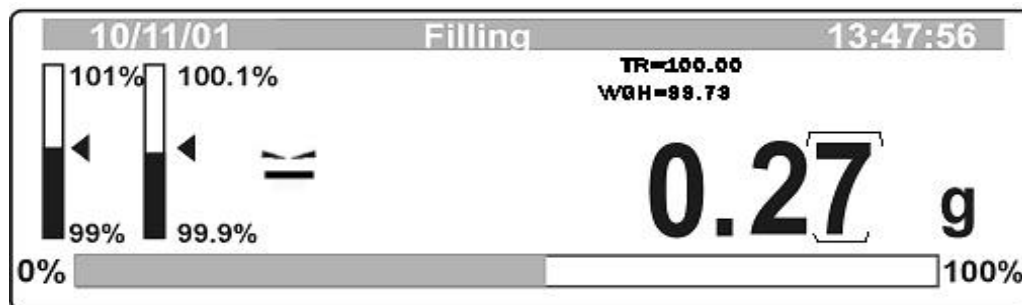


1. Value for the mass that must be added (or removed) from the balance in order to meet the target weight.
2. Bar-graphs to display the target weight and the actual weight. As the weight approaches the target, the bar-graph displays will show finer resolution, starting with $\pm 10\%$ either side of the target, then $\pm 1\%$ and finally $\pm 0.1\%$.



3. Name of the mode in use (Filling Mode).
4. Target mass as set in the sub-menu.
5. Mass currently on the balance.

Example of display during working in Filling Mode is given below. It shows the target value is 100.00g and the weight on the balance is 99.73g. This means the weight to be added is 0.27g to reach the target as shown on the display.



14.3.2 Enabling Statistics when Filling Mode is active

If the Statistics mode is to be enabled while the filling mode is active, the same procedure should be followed as described in Section 14.2.2.

The main points to be considered are:

1. Clear previous statistics values.
2. Set parameter **M3 02 Statistics** to **ON**.
3. Enter the Filling Mode.
4. Use the **[Print]** key to enter the values into memory.
5. Recall the results after measurements, view results on the display and if necessary, print them.
6. Return the balance to any weighing mode.

14.4 PERCENT WEIGHING

The balance will use a standard weight to determine other weights as a percent of the standard. The Standard weight can either be a mass that is being weighed or a value input by the user.

To use the Percent Weighing Mode:



Enter the Mode main menu
Set the cursor next to
M4 Percent

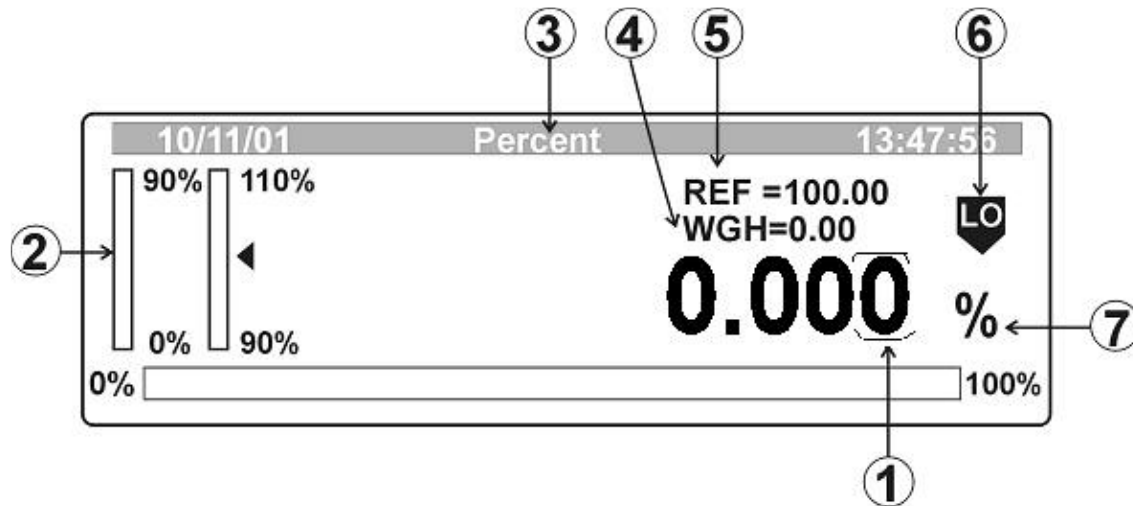


Enter the submenu for
M4 Percent

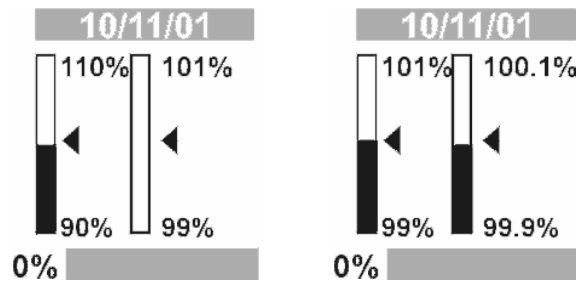
10/11/01		Mode	13:47:56
M0	Basic weighing		
M1	Parts counting		
M2	Checkweighing		
M3	Filling		
M4	▶ Percent		
M5	Animal weighing		
M6	Density		
M7	Statistics		
Percent's setup			
M4	▶ 01	Reference	▶ 0.00 g
	02	Decimal places	3 PLACES
	03	Checkweighing	OFF
	04	Filling	OFF
	05	Statistics	OFF
	06	Run	

Using the keys, set the parameter values as described in Section 14.1 or 14.2. The values to be set are the reference weight, number of decimal places to display and setting the Filling and Statistics modes to either **ON** or **OFF**. After the first time the function is used, the reference weight must be set to a number other than zero or an error message will be shown.

14.4.1 Description of the graphic display for Percent Weighing



1. Percent value of the unknown mass compared to the reference mass. The reference mass is 100%.
2. Bar-graphs to display the target weight and the actual weight. As the actual weight approaches the target weight, the bar-graphs will show finer resolution, stating with $\pm 10\%$ of either side of the target, then $\pm 1\%$ and then $\pm 0.1\%$.



Bar-graphs are seen only when the filling mode is active.

3. Name of the current mode (Percent).
4. Mass on the pan in grams.
5. Reference mass value.
6. Symbols used by the checkweighing program. This shows the comparison between the weight on the pan and the preset limits- Low limit (LO) and High limit (HI) are set in %.

LO	Mass is below the low limit
OK	Mass is between the limits
HI	Mass is above the high limit

Symbols are seen only when the checkweighing mode is active.

7. % symbol is used when the scale is in the Percent Weighing Mode.

14.4.2 Setting Reference Mass

The reference mass can be set by entering a value into the memory of the balance or by measuring a mass on the balance.

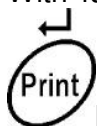
- 1) Set by inserting a value into the **M4 01 Reference** parameter in the Percent Weighing submenu.



Enter the Percent Weighing
M4 01 Reference (first digit will
flash)

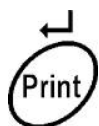
PERCENT WEIGHING		
M4 ▶	01 Reference	▶ 0.0000 g
	02 Decimal places	1 PLACE
	03 Checkweighing	OFF
	04 Filling	OFF
	05 Statistics	ON
	06 Run	

With function keys input a new value for the reference mass and save it with the



key.

- 2) Input the reference mass by weighing a master sample



Enter the Percent Weighing Mode

10011001	Percent	10007.50
		REF = 100.000
		WGH = 0.000
		0 %
0%		100%



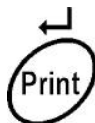
Enter a submenu for weighing the
master mass.

10011001	Percent	10007.50
	Tare a container if necessary	
	Place a reference mass	[Enter]
		0.00 g
0%		100%

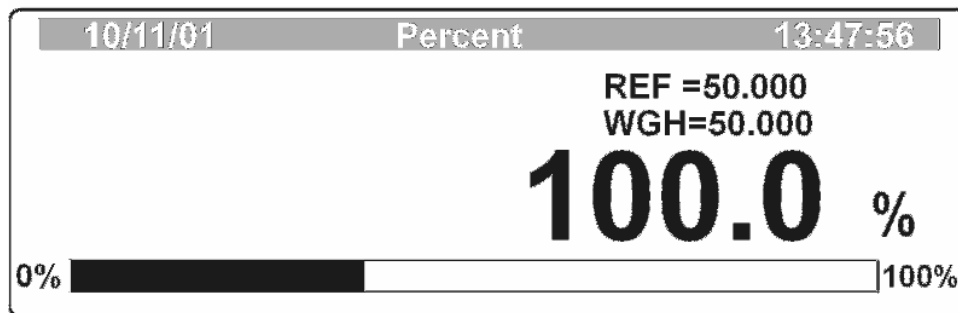
The balance is requesting the master mass be weighed. If the mass must be in a

container, first place the empty container on the balance and press  to tare the weight of the container.

Then put the reference mass on the pan or in the container and when result is stable press:



The program will automatically take the mass on the pan as the reference mass and return to Percent Weighing Mode.



14.4.3 Using Check-weighing in Percent Weighing Mode

The Checkweighing Mode is used as shown in section 14.2. The only difference is that the values entered are in percent, not mass.

Percent setup ▶ Checkweighing			
M4 ▶ 03 ▶ 01 Checweighing	▶	On	
02 Low limit		0.0000	%
03 High limit		0.0000	%

Set the High and Low Limits and set the mode to **ON**.

14.4.4 Using Filling Mode within Percent Weighing Mode

The Filling Mode can be used at the same time as the Percent Weighing Mode. Refer to section 14.3 for using the Filling Mode. The value entered for the target weight will be shown as percent, not mass.

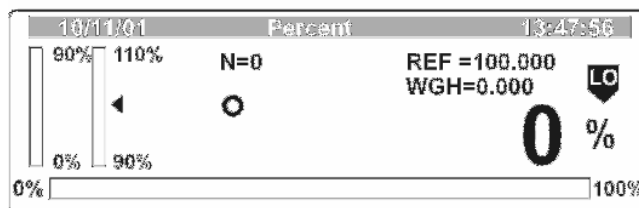
Percent setup ▶ Filling			
M4 ▶ 04 ▶ 01 Filling	▶	ON	
02 Target weight		0.0	%

14.4.5 Using the Statistics Mode while in Percent Weighing Mode.

If the Statistics mode is desired while doing percent weighing it should be enabled and operated as described in Section 14.2.2, the operation is identical.

The main points to consider are:

1. Clear previous statistics values
2. Set parameter **M4 05 Statistics** to ON
3. Enter the Filling Mode
4. Use the Print key to enter values into memory.
5. Recall the results after measurements, view results on the display and if necessary print them.
6. Return the balance to any weighing mode.

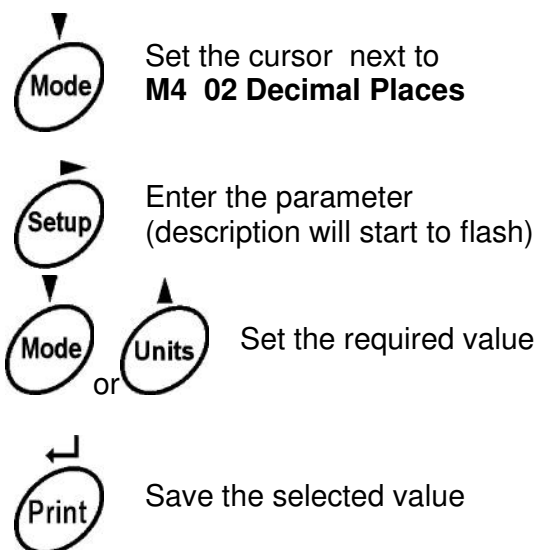


14.4.6 Setting the Number of Decimal Places in Percent Weighing Mode

The number of decimal places shown by the balance when in the Percent Weighing Mode is set by the user. The balance will round off the results as necessary to maintain best accuracy.

From the Percent Weighing Submenu:

Percent setup		
M4 ▶	01 Reference	▶ 0.0000 g
	02 Decimal places	▶ 1 PLACE
	03 Checkweighing	OFF
	04 Filling	OFF
	05 Statistics	ON
	06 Run	



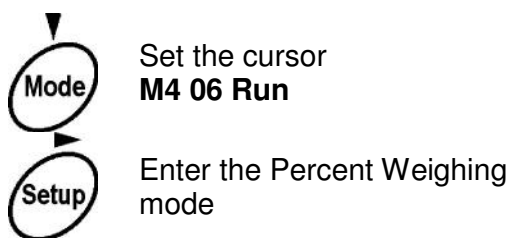
Percent setup		
M4 ▶	01 Reference	0.0000 g
	02 Decimal places	▶ 1 PLACE
	03 Checkweighing	OFF
	04 Filling	OFF
	05 Statistics	ON
	06 Run	

1 Place
2 Places
3 Places
4 Places

Percent setup		
M4 ▶	01 Reference	0.0000 g
	02 Decimal places	▶ 3 PLACES
	03 Checkweighing	OFF
	04 Filling	OFF
	05 Statistics	ON
	06 Run	

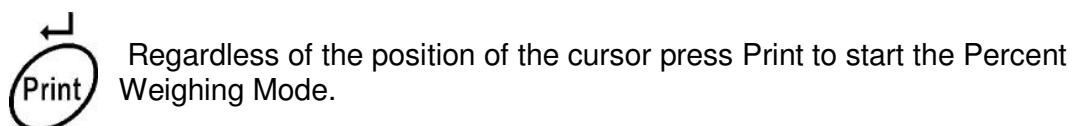
14.4.7 Enter Percent Weighing Mode

After setting any parameter enter the Percent Weighing Mode:



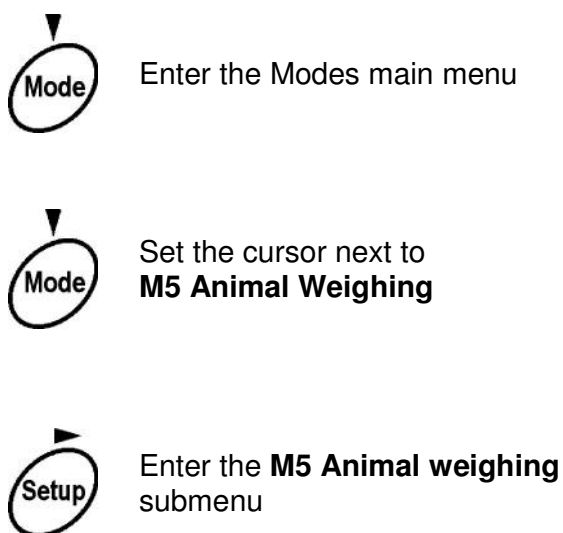
Percent setup		
M4 ▶	01 Reference	0.0000 g
	02 Decimal places	3 PLACES
	03 Checkweighing	OFF
	04 Filling	OFF
	05 Statistics	ON
	06 Run	

OR



14.5 ANIMAL WEIGHING MODE

The balance is well suited for animal weighing with special variable filters to eliminate the effects of the movement of the animal. The user can select to automatically start or manually start the weighing process and enable the Statistics Mode to operate at the same time. The balance will show the results using the current unit of weight.



31/10/03	Mode	13:32:26
M0	Basic weighing	
M1	Parts counting	
M2	Checkweighing	
M3	Filling	
M4	Percent	
M5 ▶	Animal weighing	
M6	Density	
M7	Formulation	
M8	Statistics	
Animal weighing setup		
M5 ▶	01 Filter	▶ FASTEST
	02 Threshold	10 DIV
	03 Autostart	ON
	04 Statistics	OFF
	05 Run	

Use the function keys to set the parameter values **Animals weighing**. Refer to Section 14.2 for more details on using the function keys.

14.5.1 Setting the Filter for Animal Weighing

Animal weighing setup		
M5 ▶	01 Filter	▶ FASTEST
	02 Threshold	10 DIV
	03 Autostart	ON
	04 Statistics	OFF
	05 Run	



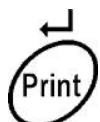
Enter the **M5 01 Filter** parameter (Description will flash)

Animal weighing setup		
M5 ▶	01 Filter	▶ FASTEST
	02 Threshold	10 DIV
	03 Autostart	ON
	04 Statistics	OFF
	05 Run	



Set the required value

FASTEST
FAST
NORMAL
SLOW
SLOWEST



Save the selected value

The filter value will depend upon the activity of the animal being weighed and the response time required. The slower the filter, the better the results will be due to longer averaging times, however the time of measurement will also increase.

14.5.2 Setting the Threshold limit for Animal Weighing

This parameter is the limit that the weight must go below in order to start a new weighing test when the balance is set for Automatic Start. (Parameter **M5 03 Autostart** set to **ON**)

Animal weighing setup		
M5 ▶	01 Filter	▶ FASTEST
	02 Threshold	10 DIV
	03 Autostart	ON
	04 Statistics	OFF
	05 Run	



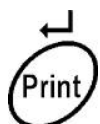
Enter the threshold parameter **M5 02 Threshold** (Description will flash)

Animal weighing setup		
M5 ▶	01 Filter	▶ FASTEST
	02 Threshold	▶ 10 DIV
	03 Autostart	ON
	04 Statistics	OFF
	05 Run	



Set the required value shown as number of scale divisions.

10 DIV
20 DIV
50 DIV
100 DIV
200 DIV
500 DIV
1000 DIV



Save the selected value

14.5.3 Set automatic work for animal weighing

To enable the automatic starting of animal weighing when a new animal is placed on the balance set the Autostart option to **ON**. To use Manual start set it to **OFF**.

Animal weighing setup		
M5 ▶	01 Filter	FAST
	02 Threshold	10 DIV
	03 Autostart	▶ ON
	04 Statistics	OFF
	05 Run	

14.5.4 Using the Statistics Mode while in Animal Weighing Mode

If the Statistics mode is desired while doing Animal Weighing it should be enabled and operated as described in Section 14.2.2, the operation is identical.

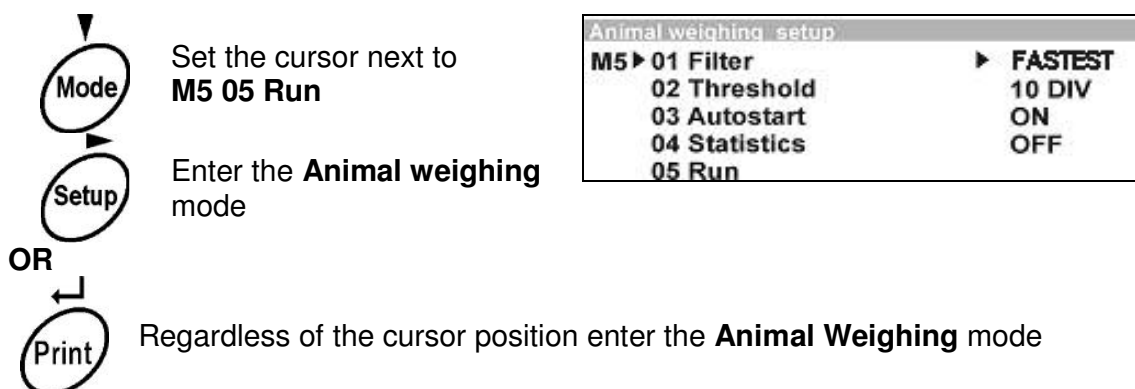
The main points to consider are:

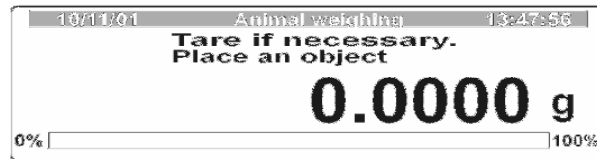
- Clear previous statistics values
- Set parameter **M5 04 Statistics** to ON
- Enter the Animal Weighing Mode
- Use the Print key to enter values into memory
- Recall the results after measurements, view the results on the display and if necessary print them
- Return the balance to any weighing mode

10/11/01	Animal weighing	13:47:56
Tare if necessary. Place an object [Units]		
N=0	0.0000 g	
0%	100%	

14.5.5 Animal Weighing Using the Automatic Starting option

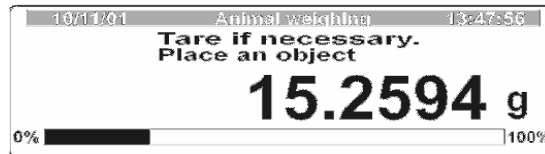
After setting parameters enter the **Animal weighing** mode:



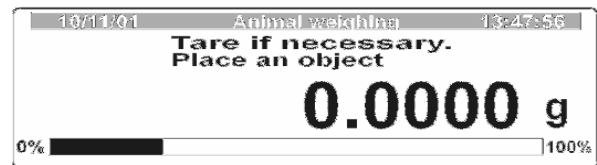


If the animal is to be weighted in a cage, you should tare the weight of the cage before beginning.

Put the empty cage on the pan

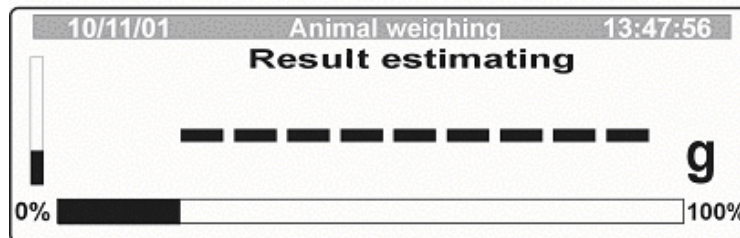


Tare the cage mass

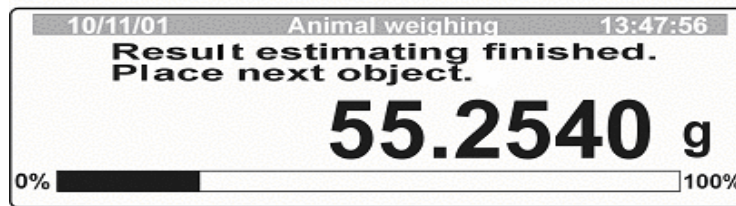


Put the animal on the pan and the balance program automatically starts weighing.

A message will be displayed during this time:



On the left side a bar graph will be displayed showing the progress of the special filters. After the end of the weighing process the results will be displayed:



Results on the screen is locked, the results will not change until a new animal is weighed. The weight must return to a value less than the Threshold value, set in the parameter **M5 02 Threshold**.



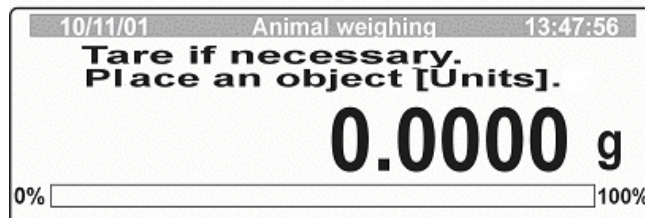
OR if you press the **Units** key it will force a Manual Animal Weighing.

14.5.6 Manual Weighing of Animals

Regardless of if the Autostart option has been set to **ON** or **OFF** it is possible to start a Manual Animal Weighing by pressing the **[Units]** key.



After setting the Autostart Parameter to **OFF**, enter the Animal Weighing Mode.

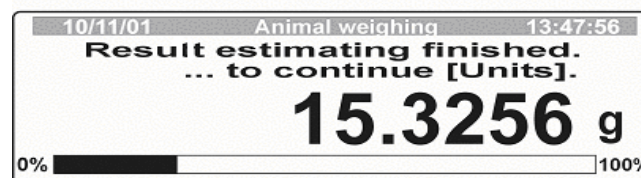


If the animal is to be weighted in a cage you should tare the weight of the empty cage



first. Then put the animal into the cage and press the **[Units]** key.

The Animal Weighing program will start. After the process is completed the display will show the results:

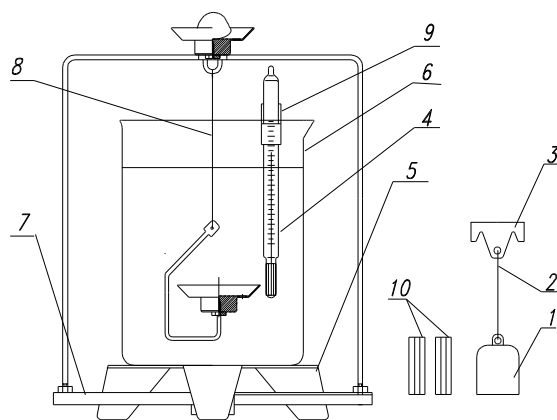


14.6 DENSITY MEASUREMENT

The balance is capable of measuring the density of either a solid or a liquid. The balance can be used with the Adam Equipment Density Determination Kit as described below or by using the weigh below abilities of the balance.

14.6.1 Density Determination Kit

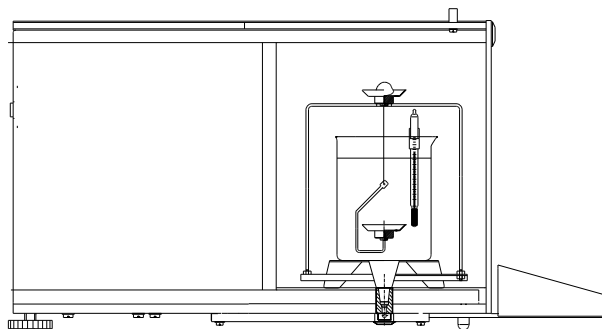
The Density Determination kit includes all the parts necessary to determine the density of either a solid or a liquid. The kit consists of the following:



- | | |
|------------------------------------|-----------------------------|
| 1. Glass Float | 6. Beaker |
| 2. Wire to connect float to hanger | 7. Pan Frame |
| 3. Hanger for the float | 8. Hanger for solid samples |
| 4. Thermometer | 9. Thermometer Clip |
| 5. Beaker support | 10. Counterweights |

For installation of the Density Determination Kit refer to the instructions that come with the kit.

A typical installation in an analytical balance:



14.6.2 Density Measurement of Solids

To determine the density of a solid it is necessary to weigh the sample while in the air and then to weigh it while it is suspended in a liquid of known density. The balance will guide you through the steps of this procedure using messages on the display. The type of liquid that can be used are set by the user. It includes distilled water, alcohol and any other liquid as long as the user knows its density.

- WATER (distilled water)
- ALCOHOL (spirit 100% +/- 0.1% in temperature 20°C),
- OTHER (a user supplied liquid with known density)

For water and alcohol you will be required to give the temperature, therefore the thermometer is included in the kit.

Result of the test is shown on the display automatically when the test is finished. Result of measurement can be sent over the RS 232 interface to a printer or PC by

pressing  .

 Enter modes menu.

 Set the cursor next to **M6 Density**

 Enter the submenu for **M6 Density**

31/01/04		Mode	13:32:26
M0	Basic weighing		
M1	Parts counting		
M2	Checkweighing		
M3	Filling		
M4	Percent		
M5	Animal weighing		
M6	► Density		
M7	Formulation		
M8	Statistics		
Density setup			
M6	► 01 Procedure	► SOLID DENSITY	
	02 Liquid	WATER	
	03 Temperature	22	°C
	04 Density	1.0546	g/cm3
	05 Statistics	OFF	
	06 Run		

Select the option **M6 01** to choose Solid Density, Select the liquid to be used, set the temperature for the water or alcohol, or set the density for another liquid.



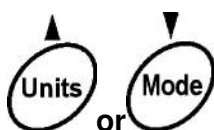
With F enter submenu **M6 Density** (setting parameters)

Density setup		
M6 ▶ 01 Procedure	▶ SOLID DENSITY	
02 Liquid	WATER	
03 Temperature	22	°C
04 Density	1.0546	g/cm ³
05 Statistics	OFF	
06 Run		



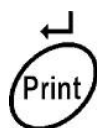
Enter parameter **M6 01 Procedure**

Name will flash



Change procedure name

Density setup		
M6 ▶ 01 Procedure	▶ LIQUID DENSITY	
02 Liquid	WATER	
03 Temperature	22	°C
04 Density	1.0546	g/cm ³
05 Statistics	OFF	
06 Run		



Save choice

Density setup		
M6 ▶ 01 Procedure	▶ LIQUID DENSITY	
02 Sink volume	10.0046	cm ³
03 Statistics	OFF	
04 Run		

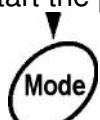
Use the same method to set:

M6 02 Liquid

M6 03 Temperature, if water or alcohol is selected

M6 04 Density if another Liquid is selected.

Start the procedure:



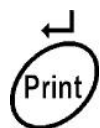
Set the cursor next to **M6 04 Run**



Enter the **Density** mode

Density setup		
M7 ▶ 01 Procedure	LIQUID DENSITY	
02 Sink volume	10.0046	cm ³
03 Statistics	OFF	
04 Run	▶	

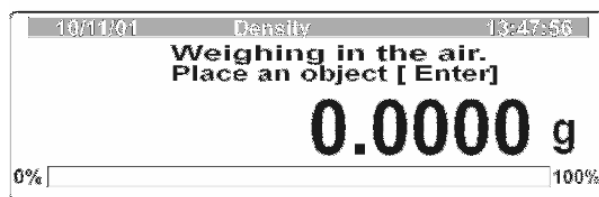
OR



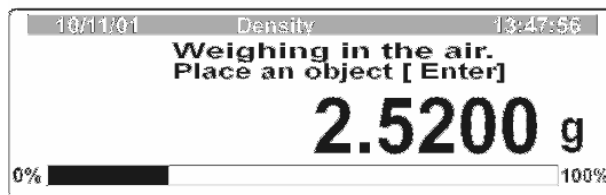
At any time press **[Print/Enter]** to enter the **Density** mode

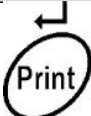
Make sure the Density Kit is assembled correctly and there are no air bubbles on any of the parts in the liquid. Tare the balance if necessary to zero the display.

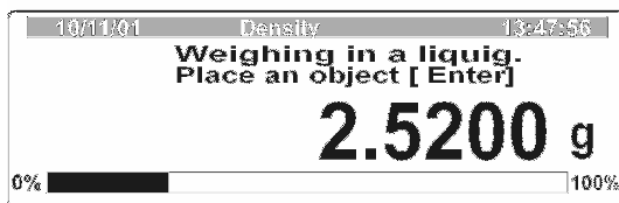
The display will guide you through the steps of weighing the sample in air and then weighing it in the liquid.



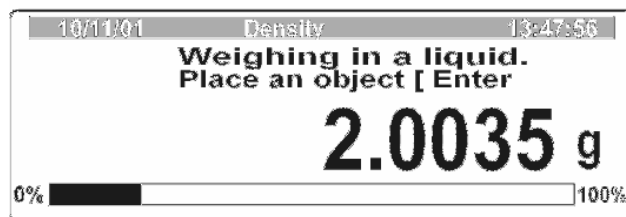
1. Put the sample on the small test pan above the liquid.

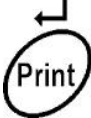


2. After the result is stable (the unit of mass is on) press  .

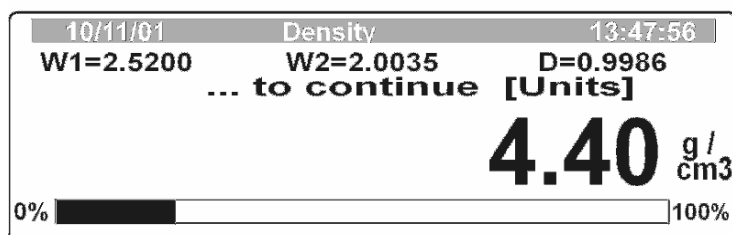


3. Put the sample on the lower pan in the liquid. Make sure there are no bubbles on the sample or any other part in the liquid.



4. After the result is stable (the unit of mass is on) press  .

You will see results of the density measurement and other messages.

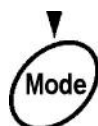


W1 – sample mass in the air, **W2** – sample mass in the liquid,
D – Density of liquid .

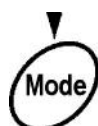
14.6.3 Density Measurement of Liquids

The main part necessary for determination of the density of a liquid is the glass float supplied in the Density Determination kit. Refer to item (1) in the drawing of the Density Determination Kit at the beginning of this section. This float has a hanger attached with the precise volume of the float stamped upon it.

Before proceeding with the density test enter the volume of the float into memory.



Enter mode menu



Set the cursor next to
M6 Density



Enter the submenu for
M6 Density



Enter parameter
01 Procedure

31/01/04 Mode 13:32:26	
M0	Basic weighing
M1	Parts counting
M2	Checkweighing
M3	Filling
M4	Percent
M5	Animal weighing
M6	► Density
M7	Formulation
M8	Statistics

Density Setup	
M6 ► 01 Procedure	► SOLID DENSITY
02 Liquid	WATER
03 Temperature	22 °C
04 Density	1.0546 g/cm ³
05 Statistics	OFF
06 Run	

The Name will flash

Units or Mode Change procedure name to Liquid Density

Print Save choice

Units or Select Parameter for M6 02 Sinker Volume

Mode Enter parameter 01 Procedure

Units or Mode Enter the new value for the volume

Print Save choice

Density setup		
M6 ▶ 01 Procedure	▶ LIQUID DENSITY	
02 Liquid	WATER	
03 Temperature	22	°C
04 Density	1.0546	g/cm3
05 Statistics	OFF	
06 Run		

Density setup		
M6 ▶ 01 Procedure	▶ LIQUID DENSITY	
02 Sinker volume	10.0046	cm3
03 Statistics	OFF	
04 Run		

Density setup		
M6 ▶ 01 Procedure	LIQUID DENSITY	
02 Sinker volume	▶ 10.0046	cm3
03 Statistics	OFF	
04 Run		

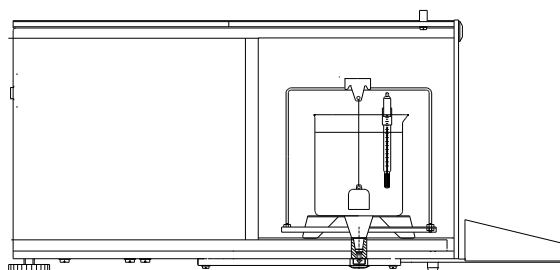
Name start to buzz

Density setup		
M6 ▶ 01 Procedure	LIQUID DENSITY	
02 Sinker volume	▶ 10.0046	cm3
03 Statistics	OFF	
04 Run		

Density setup		
M6 ▶ 01 Procedure	▶ LIQUID DENSITY	
02 Sinker volume	10.0046	cm3
03 Statistics	OFF	
04 Run		

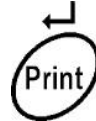
Procedure:

Measurement of liquid density compares the weight of the glass float when measured in the air and in the liquid.

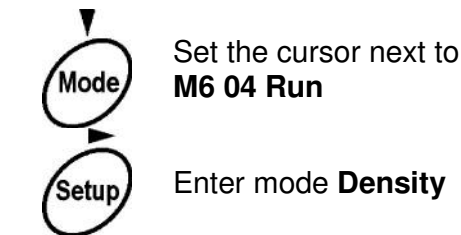


If necessary install the density determination kit onto the balance as described in the instruction for the Density Determination Kit.

The result of the liquid density test is shown the display automatically after the completion of the procedures. Measurement result can sent through the RS 232 interface to a printer or PC by pressing:

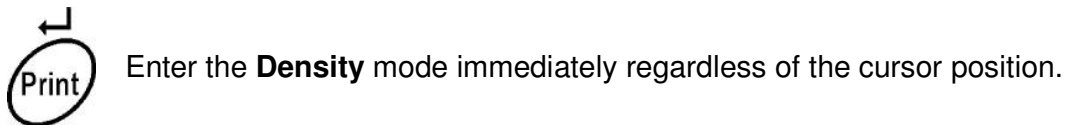


To begin enter the Density menu (M6) as above and select the M6 01 Liquid Density Option.

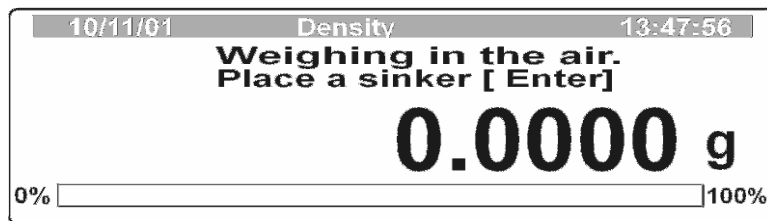


Density setup		
M6 ▶ 01 Procedure	LIQUID DENSITY	
02 Sinker volume	10.0046	cm3
03 Statistics	OFF	
04 Run	▶	

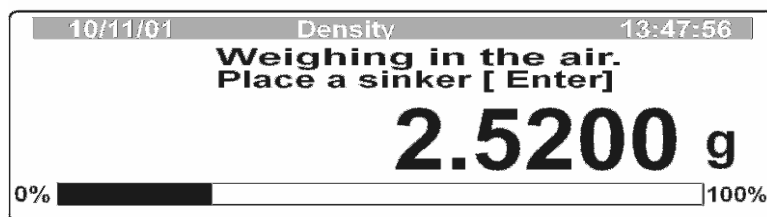
+
OR



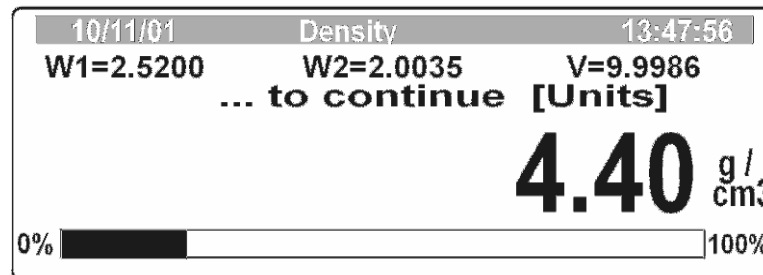
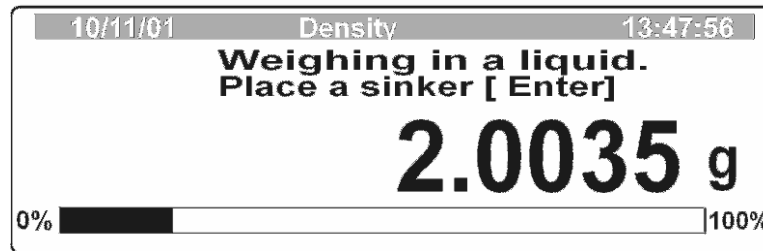
1. Enter Density Mode



2. Weigh the float in the air and when results are stable press **[Print/Enter]**



3. Weight the float in the liquid and when results are stable press **[Print/Enter]**



On the display you will see the computed value of density for the liquid. You will also see additional information: **W1** – float mass in the air, **W2** – float mass in the liquid **V** – volume of the float

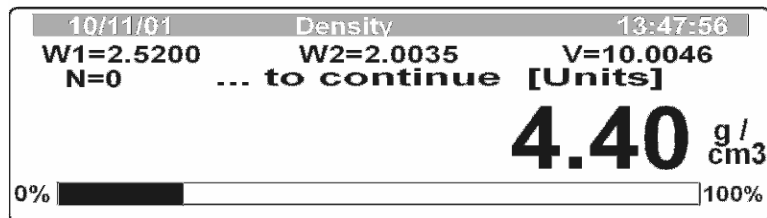
14.6.4 Using Statistics in the Density Mode

It is possible to keep the statistics of the results from Density test by setting the Statistics parameter to **ON**, while in the Density Submenu. The procedure for collecting the data is the same whether Solid Density or Liquid Density is selected.

When using statistics the user should:

1. Set the Statistics mode to be **ON**.
2. Delete previous statistics data.
3. Enter the Density mode.
4. Collect the data by pressing the **[Print]** key.
5. After the data is collected, look at the results of statistics and print them.
6. Return to any of the weighing modes.

During the Density test the display will show the number of items stored in the statistics program, (**N**= number of results)



Each time [**Print/Enter**] is pressed it will increase the number of items stored by one.

PROCEDURE



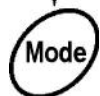
Enter Density Mode submenu



Set the cursor next to the **Statistics** parameter.
M3 for Liquid Density or **M5 for Solid Density**



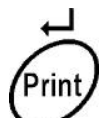
Enter **03 Statistics** parameter



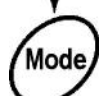
Set the cursor next to the **03 Clear** parameter to clear old data from memory.



Enter the Clear Statistics screen



Verify you wish to clear the data by pressing [**Print/Enter**] key.



Enable the Statistics function if necessary by setting cursor next to parameter **01 Statistics**



Enter parameter **01 Statistics**

Density setup	
M7 ▶ 01 Procedure	▶ LIQUID DENSITY
02 Sinker volume	10.0046 cm ³
03 Statistics	OFF
04 Run	

Density setup	
M7 ▶ 01 Procedure	LIQUID DENSITY
02 Sinker volume	10.0046 cm ³
03 Statistics	▶ OFF
04 Run	

Density setup ▶ Statistics	
M6 ▶ 05 ▶ 01 Statistics	▶ OFF
02 Results	
03 Clear	

Density setup ▶ Statistics	
M6 ▶ 05 ▶ 01 Statistics	OFF
02 Results	
03 Clear	▶

Gęstość ▶ Statystyka	
Clear Statistics?	

Density setup ▶ Statistics	
M6 ▶ 05 ▶ 01 Statistics	OFF
02 Results	
03 Clear	▶

Density setup ▶ Statistics	
M6 ▶ 05 ▶ 01 Statistics	▶ OFF
02 Results	
03 Clear	

Start to buzz



Enter the Density mode submenu



Set the cursor next to **03 Statistics**



Enter the **03 Statistics** submenu



Set the cursor next to **02 Results**



Enter to view the results of the statistics

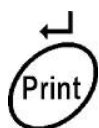
Density setup		
M7 ▶ 01 Procedure	▶ LIQUID DENSITY	
02 Sinker volume	10.0046	cm3
03 Statistics	ON	
04 Run		

Density setup		
M7 ▶ 01 Procedure	LIQUID DENSITY	
02 Sinker volume	10.0046	cm3
03 Statistics	▶ ON	
04 Run		

Density setup ▶ Statistics		
M6 ▶ 05 ▶ 01 Statistics	▶ ON	
02 Results		
03 Clear		

Density setup ▶ Statistics		
M6 ▶ 05 ▶ 01 Statistics	ON	
02 Results	▶	
03 Clear		

Density setup ▶ Statistics		
N=10	SUM=44.6	X=4.45
MIN=4.43	MAX=4.48	D=0.00
SDV=0.00	RDV=0.00	



Press **[Print/Enter]** to print the results on a printer An example of the results is shown.

N : 10
 SUM : 44.60
 g/cm3
 X : 4.45 g/cm3
 MIN : 4.43 g/cm3
 MAX : 4.48 g/cm3
 D : 0.00 g/cm3
 SDV : 0.00 g/cm3
 RDV : 0.00 %



Return to the statistics submenu for the density mode

Enter the **Density mode**.

Density setup ▶ Statistics		
M6 ▶ 05 ▶ 01 Statistics	ON	
02 Results	▶	
03 Clear		

14.7 STATISTICS MODE

This mode allows the results of the statistics to be seen at the same time as the weighing procedure is progressing. The Statistics submenu allows the user to select which items of data to display.



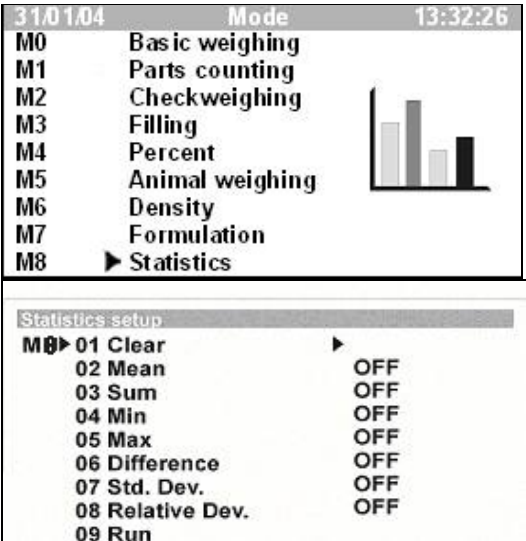
Enter the **Mode** menus



Set the cursor next to the **M8 Statistics** parameter



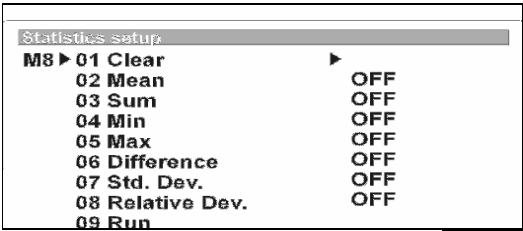
Enter the submenu for **M8 Statistics**



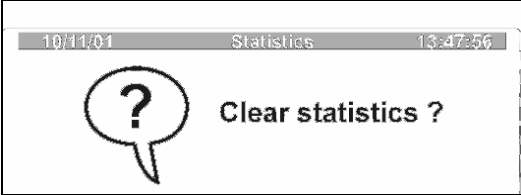
Use the function keys to select the item in the sub-menu to be changed or used.

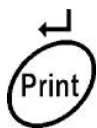
01 Delete

Delete last statistics operations (clearing memory)



Activate the procedure for deleting old data





Verify you wish to delete the data.

Statistics setup		
M8 ▶	01 Clear	▶
	02 Mean	OFF
	03 Sum	OFF
	04 Min	OFF
	05 Max	OFF
	06 Difference	OFF
	07 Std. Dev.	OFF
	08 Relative Dev.	OFF
	09 Run	

Items **M8 02** to **M8 08** are values that can be either shown or not shown. To see the values during the statistics mode set the option to **ON**.

02 Mean

Mean value of samples weighed

03 Sum

Sum of all samples weighed

04 Min

Mass of the lightest sample

05 Max

Mass of heaviest sample

06 Difference

Mass difference between lightest and heaviest samples

07 Standard Deviation

Standard Deviation of the samples

08 Relative Deviation

Relative Deviation of the samples, Standard Deviation/ average X 100.

After setting these items to be either **ON** or **OFF** you can enter the Statistics Mode.



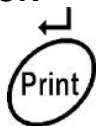
Set the cursor next to parameter
M8 09 Run



Enter **Statistics mode**

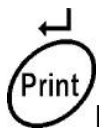
Statistics setup		
M8 ▶	01 Clear	
	02 Mean	OFF
	03 Sum	OFF
	04 Min	OFF
	05 Max	OFF
	06 Difference	OFF
	07 Std. Dev.	OFF
	08 Relative Dev.	OFF
	09 Run	▶

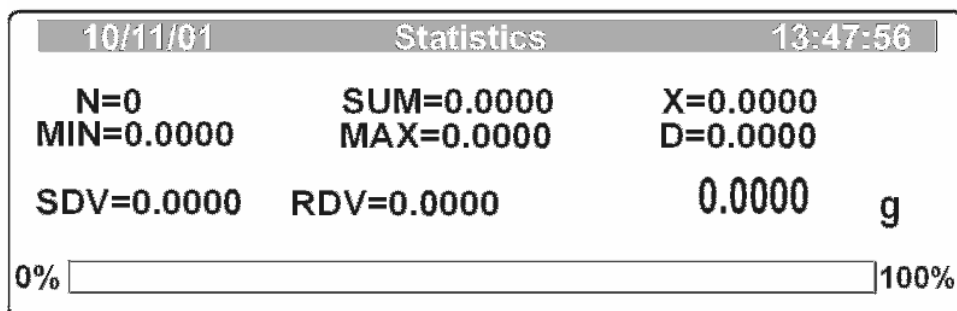
OR



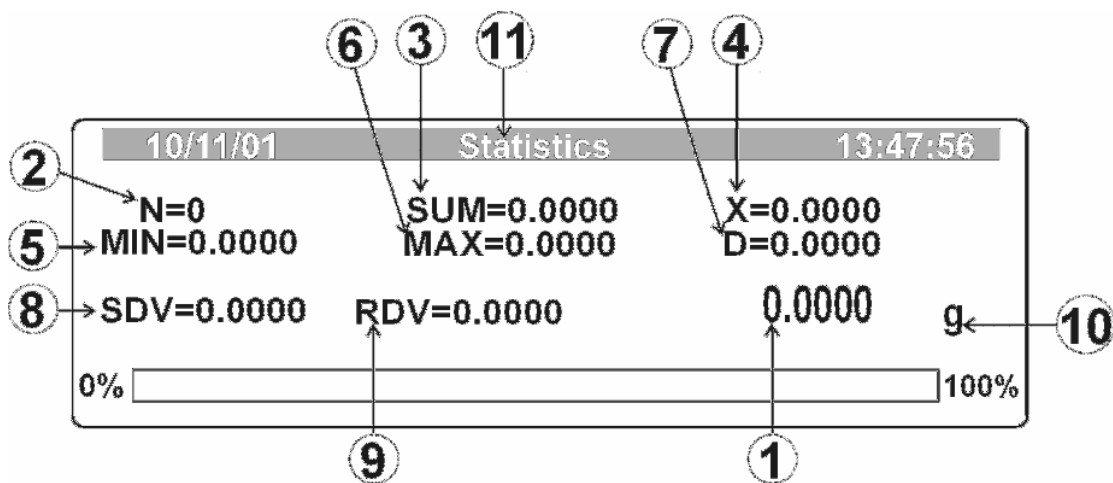
Press **[Print/Enter]** to begin statistics regardless of the cursor position.

During statistics the display will show the results of the statistics calculations as the data is entered.

Enter the data by pressing the  key when the balance is stable.



To print all statistics at any time you should press the  key.



1. Mass on the balance pan.
2. Number of items stored in memory.
3. Sum of all weighed samples.
4. Average mass of all weighed samples.
5. Lightest mass.
6. Heaviest mass.
7. Difference between the lightest and the heaviest samples.
8. Value of the standard deviation of the samples.
9. Value of the relative deviation.
10. mass unit [g]
11. Statistics Mode

15. OPTIMISING THE BALANCE FOR THE CONDITIONS

<P4 Readout>

The balance can be set to optimise for use in the conditions it may work within. The users can adjust parameters that affect the filters, autozero, stability, display update time and the appearance of the last digit. The factory settings are suitable for most applications of the balance. Use care when changing any of these values.

15.1 ENTER MENU GROUP P4 READOUT

To access the parameters for adjusting the operating conditions of the balance, enter the Setup menu called **P4 Readout**.



Enter the main Setup menu.



Set the cursor next to **P4 Readout**



Enter the submenu for **P4 Readout**

10/11/01		Setup		13:47:56	
P4	►01►	Filter		4	slow
	02	Disp refresh		2	0.2 s
	03	Autozero		1	on
	04	Last digit		0	always
	05	Stable release		5	0.5 s
	06				
	07				

The parameters that can be adjusted are displayed above.

15.2 FILTER SETTINGS

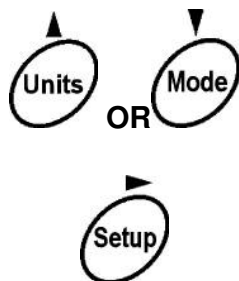
Depending upon the environmental conditions the balance is in it may be necessary to reset the digital filters. If the filters are slower than the balance will reject noise, vibration or other disturbances better, but the response time will be longer. Likewise a faster filter will be faster but more susceptible to the environment.



Enter parameter **P4 01 Filter**

The present value will flash showing it is ready to be changed.

Set new value:



Change the value

- 1 : fastest
- 2 : fast
- 3 : normal
- 4 : slow
- 5 : slowest

Save the value

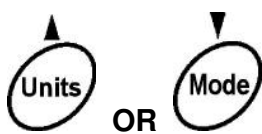
15.3 SETTING TIME TO REFRESH THE DISPLAY

This parameter sets the refresh time of the display that is the time between updates for the display. A fast update rate is often required when filling to precise weights, a slower update may be advantages when the weights change slowly.



Enter the parameter **P4 03 Disp refresh**, the current setting will flash.

Set new value:



Change the value

- | | |
|----------|-----------|
| 1: 0.1 s | 6: 1.0 s |
| 2: 0.2 s | 7: 2.0 s |
| 3: 0.3 s | 8: 3.0 s |
| 4: 0.4 s | 9: 4.0 s |
| 5: 0.5 s | 10: 5.0 s |



Save the new value

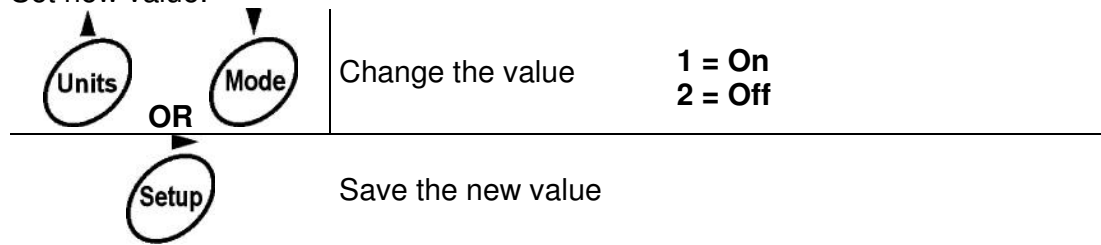
15.4 AUTOZERO

The autozero is used to set the zero point of the balance when all weight is removed. It will cause the balance to find zero even if a small amount of material is left on the pan or other conditions cause the weight to be close to zero (one division or less typically). If necessary the autozero can be turned off.



Enter the parameter **P4 06 Autozero**, the current setting will flash.

Set new value:



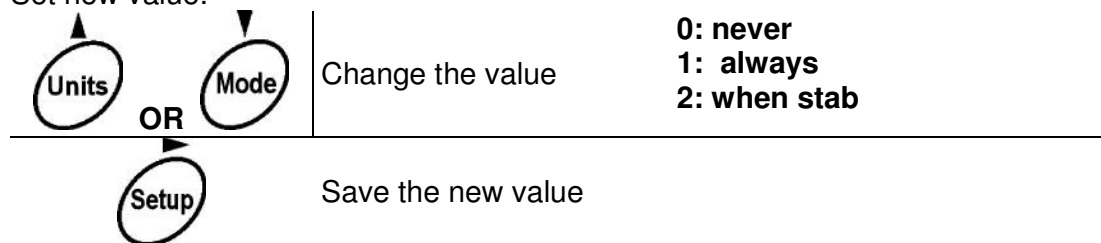
15.5 SETTING THE DISPLAY OF LAST DIGIT

The operation of the last digit can be controlled. The user can select to turn the digit off, turn it on all times, or turn it off when the balance is not stable.



Enter the parameter **P4 06 Autozero**, the current setting will flash.

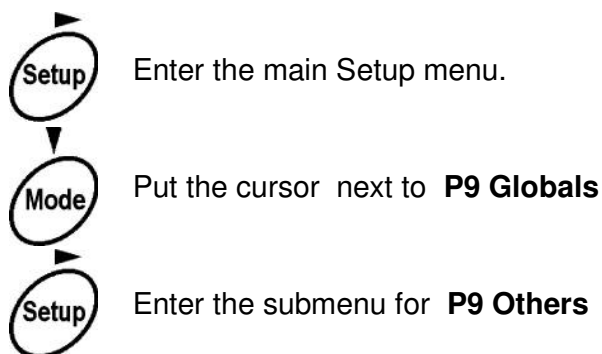
Set new value:



16. GLOBAL PARAMETERS < P9 Globals>

This section contains parameters that are used by the balance for many secondary functions. For example setting the screensaver on or off, turning the beeper on or off and printing or receiving parameters through the RS -232 interface.

16.1 ENTERING P9 GLOBAL PARAMETERS



191/01/04	Setup		11:23:55
P9	▶ 01	▶ ID setting	***** function
	02	ID autoprint	0 off
	03	Beep	1 enabled
	04	language	1 English
	05	Backlight	1 on
	06	Contrast	***** function
	07	Screensaver	0 disabled
	08	Temperature	***** function
	09	Balance Id	111438
	10	Software rev.	MBA a.22
	11	Par. printout	***** function
	12	Par. receive.	***** function
	13	Factory deff.	***** function

The display shows the parameters that can be set in this menu.

16.2 SETTING PARAMETERS

The parameters that can be set in this section are described below. The parameters are set using the cursor keys or an external PC keyboard as described in previous sections, (See Section 5):

P9 01 ID Setting

A function to allow you to set 6 ID numbers that can be printed automatically if **P9 02** is enabled. These numbers will be used in future units to control RS-485 applications.

P9 02 ID Autoprint

Enable or disable the printing of the ID numbers set in **P1 01**.
Set to either 0= Off or 1= On.

P9 03 Beep

Determines if the beeper should be on or off when a key is pressed.

P9 04 Language

User can choose language a language other than English if the balance has other languages available. Not implemented at this time.

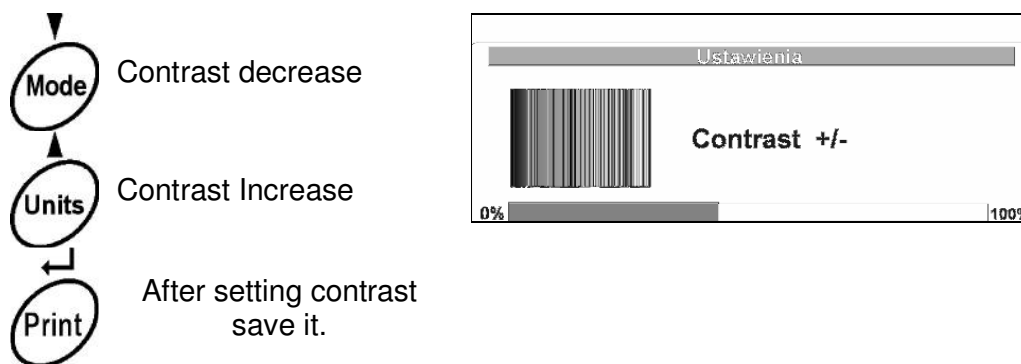
P9 05 Backlight

User can turn the backlight on or off as desired.

P9 06 Contrast

Changing display contrast. The contrast can be set to improve the viewing of the display.

After entering this parameter you can see a display window that actively changes as the contrast is changed. Store the setting that gives the best image.



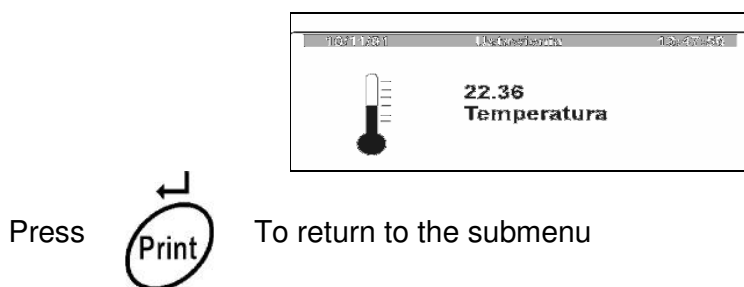
P9 07 Screensaver

The screensaver will change the display to a blank screen with a few symbols moving across it if the balance is not used for some time. To restore the normal display press any key.

This parameter will enable or disable the screensaver function.

P9 08 Temperature

This parameter will show the current temperature being measured by the temperature sensor within the balance. This is shown for information only.



P9 09 Balance Id.

This parameter shows the balance ID number set at the factory.

P9 10 Software rev.

This parameter shows the program revision number as set at the factory.

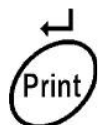
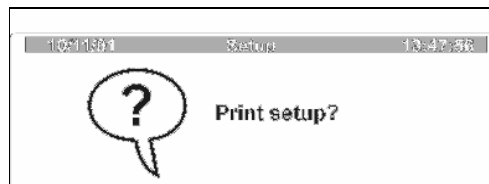
P9 11 Parameter printout

This parameter will send all the balance parameters to a printer or PC connected to the RS-232 interface.

To activate this parameter:

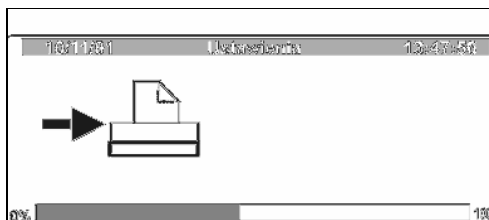


Entering the parameter, you will see this question:



Press **[Enter]** to print the parameters or press **[Esc]** to go back to the submenu.

After pressing **[Enter]**, printing will start, via the RS 232 interface.



P9 12 Parameters receive

This function allows the balance parameters to be sent from a PC. All of the parameters can be set this way or only a few. See below for details of how this can be used to set some parameters.

After entering this parameter you will see a window:



The balance is now ready to receive data. After the data has been sent the display will change to a screen showing how many lines of data are received and if there are any error detected.

An example of how this parameter can be used:

If the balance was originally set to print using only the standard printout style originally and you wished to print the label described in section 10.2.4, (example 2) using style 1, the text for this label could be entered from the PC. It is easiest to do this by sending the original parameters to the PC and store it as a text file. Then edit the part of the text file needed and send it back to the balance.

A section of the parameters as sent to the PC might look like:

```
P6.01:0      ;      standard Printout No.
P6.02:1      ;              Pr. 1 start
P6.03:1      ;              Pr. 1 stop
P6.04:1      ;              Pr. 2 start
P6.05:1      ;              Pr. 2 stop
P6.06:1      ;              Pr. 3 start
P6.07:1      ;              Pr. 3 stop
P6.08:1      ;              Pr. 4 start
P6.09:1      ;              Pr. 4 stop
P6.10:       ;              String 1
P6.11:       ;              String 2
P6.12:       ;              String 3
P6.13:       ;              String 4
P6.14:       ;              String 5
P6.15:       ;              String 6
P6.16:       ;              String 7
P6.17:       ;              String 8
P6.18:       ;              String 9
P6.19:       ;              String 10
P6.20:       ;              String 11
P6.21:       ;              String 12
P6.22:       ;              String 13
P6.23:       ;              String 14
P6.24:       ;              String 15
P6.25:       ;              String 16
P6.26:       ;              String 17
P6.27:       ;              String 18
P6.28:       ;              String 19
P6.19:       ;              String 20
P6.30:       ;              String 21
P6.31:       ;              String 22
```

This string can be edited to show the data as required for printing in style 1, using the text shown for the example. Add the word **SETUP** at the beginning and the word **SAVE** at the end to complete the format for the data to be sent.

SETUP				Add "SETUP" to begin
P6.01:1	;	standard	Printout No.	Change to style 4
P6.02:7	;		Pr. 1 start	Start at group number 7
P6.03:20	;		Pr. 1 stop	End at group number 20
P6.04:1	;		Pr. 2 start	
P6.05:1	;		Pr. 2 stop	
P6.06:1	;		Pr. 3 start	
P6.07:1	;		Pr. 3 stop	
P6.08:1	;		Pr. 4 start	
P6.09:1	;		Pr. 4 stop	
P6.10:	;		String 1	
P6.11:	;		String 2	
P6.12:	;		String 3	
P6.13:	;		String 4	
P6.14:	;		String 5	
P6.15:	;		String 6	
P6.16:Adam Equ;			String 7	
P6.17:ipment C;			String 8	
P6.18:o.\cMilt;			String 9	

```

P6.19:on Keyn;          String 10
P6.20:es UK\cD;         String 11
P6.21:ate:%d\c;         String 12
P6.22:Time:%t\;         String 13
P6.23:r\nLoad ;         String 14
P6.24:mass:%N\;         String 15
P6.25:c\c*****;        String 16
P6.26:Signatur;         String 17
P6.27:e:.....;         String 18
P6.28:....\c**;         String 19
P6.29:%F*** ;           String 20
P6.30: ;                String 21
P6.31: ;                String 22
SAVE

```

Add "SAVE" to end

Send this file to the balance using **P9 12 Parameters Receive** to store these parameters in the balance memory. Store these new parameters by saving the memory as shown in Section 5.

P9 13 Factory Deff.

Bring the cursor next to P9 13	31/10/03 Setup 11:23:54 <table><tr><td>P9 ▶</td><td>01</td><td>ID setting</td><td>*****</td><td>function</td></tr><tr><td></td><td>02</td><td>ID autoprint</td><td>0</td><td>off</td></tr><tr><td></td><td>03</td><td>Beep</td><td>1</td><td>enabled</td></tr><tr><td></td><td>04</td><td>language</td><td>1</td><td>English</td></tr><tr><td></td><td>05</td><td>Backlight</td><td>1</td><td>on</td></tr><tr><td></td><td>06</td><td>Contrast</td><td>*****</td><td>function</td></tr><tr><td></td><td>07</td><td>Screensaver</td><td>0</td><td>disabled</td></tr><tr><td></td><td>08</td><td>Temperature</td><td>*****</td><td>function</td></tr><tr><td></td><td>09</td><td>Balance Id</td><td>111438</td><td></td></tr><tr><td></td><td>10</td><td>Software rev.</td><td>MBA a.21</td><td></td></tr><tr><td></td><td>11</td><td>Par. printout</td><td>*****</td><td>function</td></tr><tr><td></td><td>12</td><td>Par. receive.</td><td>*****</td><td>function</td></tr><tr><td></td><td>13 ▶</td><td>Factory deff.</td><td>*****</td><td>function</td></tr></table>	P9 ▶	01	ID setting	*****	function		02	ID autoprint	0	off		03	Beep	1	enabled		04	language	1	English		05	Backlight	1	on		06	Contrast	*****	function		07	Screensaver	0	disabled		08	Temperature	*****	function		09	Balance Id	111438			10	Software rev.	MBA a.21			11	Par. printout	*****	function		12	Par. receive.	*****	function		13 ▶	Factory deff.	*****	function
	P9 ▶	01	ID setting	*****	function																																																													
	02	ID autoprint	0	off																																																														
	03	Beep	1	enabled																																																														
	04	language	1	English																																																														
	05	Backlight	1	on																																																														
	06	Contrast	*****	function																																																														
	07	Screensaver	0	disabled																																																														
	08	Temperature	*****	function																																																														
	09	Balance Id	111438																																																															
	10	Software rev.	MBA a.21																																																															
	11	Par. printout	*****	function																																																														
	12	Par. receive.	*****	function																																																														
	13 ▶	Factory deff.	*****	function																																																														
Enter the parameter by pressing [Setup] . The display will ask whether you would like to set the balance to the factory default settings.	31/10/03 Setup 11:23:55  Factory defaults ???																																																																	
If you press [Print/Enter] all parameters will be set back to factory default settings. Or press [Tare/Esc] to go back to the submenu.																																																																		

17. RS-232 INTERFACE

The RS-232 interface is used to connect the balance to a printer or another device such as a PC. The following section shows how to connect the balance to the external device and the commands that can be used.

The balance will output data when the **[Print]** key is pressed, the external device sends a command to print data or if the Automatic print parameter **P5 06** Automatic Printout is set to print when the balance is stable. See section 11.7.

Before any communications can be done the RS-232 parameters of the balance and the device connected to the balance must both be set the same. See section 11.

17.1 RS-232 CONNECTIONS

The connections between the balance and the external device must be compatible. Following are some examples-

17.1.1 Balance to Adam Printer

Balance Connector DE 9/F	Printer Connector 5 pin DIN
3 (TxD)	1 (RxD)
5 (GND)	3 (GND)
7- 8 jumpered	

17.1.2 Balance to PC (9 pin) without handshaking control

Balance Connector DE 9/F	PC Connector DE 9/F
2 (RxD)	3 (TxD)
3 (TxD)	2 (RxD)
5 (GND)	5 (GND)
4 - 6 jumpered	4 - 6 jumpered
7- 8 jumpered	7 - 8 jumpered

17.1.3 Balance to PC (9 pin) with handshaking control

Balance Connector DE 9/F	PC Connector DE 9/F
2 (RxD)	3 (TxD)
3 (TxD)	2 (RxD)
4 (DTR)	6 (DSR)
5 (GND)	5 (GND)
7 (RTS)	8 (CTS)
8 (CTS)	7 (RTS)

17.1.4 Balance to PC (25 pin) without Handshaking Control

Balance Connector DE 9/F	PC Connector DB 25/F
2 (RxD)	2 (RxD)
3 (TxD)	3 (TxD)
5 (GND)	7 (GND)
7 - 8 jumpered	4 - 5 jumpered
	6 - 20 jumpered

17.1.5 Balance to PC (25pin) with Handshaking Control

Balance Connector DE 9/F	PC Connector DB 25/F
2 (RxD)	2 (TxD)
3 (TxD)	3 (RxD)
4 (DTR)	6 (DSR)
5 (GND)	7 (GND)
7 (RTS)	5 (CTS)
8 (CTS)	4 (RTS)

From these examples you can make the cables necessary for most other devices.

17.2 FORMAT OF DATA

The basic weight data from the balance will be sent with the following format. The string length is always the same.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Sign	Weight with decimal point								space	unit	unit	unit	CR	LF	
	6	1	3	.	4	5	6			d	w	t	CR	LF	
-	1	0	1	2	.	1	2			g			CR	LF	

For the sign a positive number will have a space, a negative number the minus sign.

If the standard style or the user-defined style is used then the format will be as the style demands.

OIML TYPE APPROVAL: Approved balances will have an output that reflects the information on the display. Where the display has brackets to show the digits following the verification interval, the RS-232 output will put brackets before and after the last digit.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
									0	1							
Sign	Weight with decimal point								space	unit	unit	unit	CR	LF			
	6	1	3	.	4	5	[	6	]		d	w	t	CR	LF		
-	1	0	1	2	.	1	[	2	]		g			CR	LF		

17.3 COMMANDS TO THE BALANCE

Commands can be sent to the balance to control most functions of the balance and request information from the balance.

The balance will respond with a message when the information is requested. If the balance did not understand a command the message “**ES**” will be sent.

All commands to the balance and all replies from the balance end with a carriage return and line feed (CR, LF).

17.3.1 Command List

Commands for the Balance:

S	Send Stable results from balance
SI	Send Immediate Results from balance
Z	Zero the balance when stable
ZI	Zero the balance Immediately
T	Tare the balance when stable
TI	Tare the balance immediately
CØ	Turn off continuous transmission
C1	Turn on continuous transmission
NB	Return Balance Number
FS	Return the Full Scale capacity of balance
RV	Return software revision number
PM	Return current mode of balance
PS	Return current parameter values from balance
DS “ssss”	Display a string of data “ssss”
CS	Clear the data string form display
DH “ssss”	Display the string as a header at top of display
CH	Clear the header string form display
CL	Start internal calibration
KL	Lock the keypad
KU	Unlock the keypad
EØ	Turn off the Echo of the keypad
E1	Turn on the keypad echo, keys will echo to RS-232, format is: #t =Tare, #p = Print, #m = Mode, #u = Units, #s = Setup, o = On/Off
OØ	Turn of the balance
O1	Turn On the balance
AØ	Turn off Autozero
A1	Turn on Autozero
TCØ	Turn off the Automatic calibration with temperature change
TC1	Turn on the automatic calibration with temperature change

Note all commands must be terminated by a CR LF. All data sent from the balance will also be terminated with the CR LF.

17.3.2 Command Details

The commands above will cause the balance to respond. If the balance does not understand any command it will reply with ES. If a command is understood it will respond with the command followed by "A" to acknowledge the command and then the command followed by "D" to show it was done.

For example send T <CR><LF> to tare the balance, the balance will reply with T_A<CR><LF> and then T_D<CR><LF> to show the balance was tared.

If a command is sent and it is understood but not possible to do the command the balance will return the command followed by "I". For example send RV to get the software revision, the balance will return RV_I<CR><LF> if it is impossible to complete the command at this time.

If a command is sent but there is an error then the balance will return the command name followed by "E". For example sending a new time but it is out of a legal range for time. Send PT_28:12:00<CR><LF> the balance will return PT_E<CR><LF>.

IF the commands are asking for data from the balance the balance will return the command name followed by "A" and then the command name followed by the data requested. For example if the weight is requested by sending S<CR><LF> the balance will reply: S_A<CR><LF>
S____123.456_g__<CR><LF>

If the request for data is below the zero of the balance the symbol "V" will be sent for the weight, and if it is above the maximum the symbol "^" will be shown in place of the value.

17.3.3 Keypad Emulation

The keypad on the balance can be emulated by RS-232 commands. For example to tare the balance immediately send #t<CR><LF>. The other keys are emulated by:

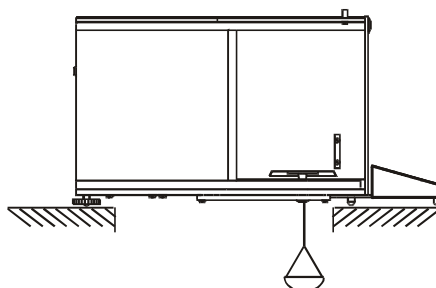
#t	Tare / ESC
#p	Print / Enter
#u	Units / ▲
#m	Mode / ▼
#s	Setup / ►
#o	On/Off / ◀

18. BELOW BALANCE WEIGHING

The AEA and AEP balances have the capability of doing below balance weighing if required. This feature is convenient for doing density measurements of material that is too large for the Density Determination kit to deal with and can be valuable when weighing samples in a chamber or samples that are not wise to use on top of the balances, for example highly magnetic materials.

To use this feature:

- Remove hole plug in the bottom of the balance,
- In the hole you will find a fitting that can be used to suspend the sample.
- It is up to the user to find a suitable hook or wire suspension to support the sample
- A hook is available from Adam Equipment. Contact your supplier for more details.



Below Balance Weighing on an AEA Analytical Balance

Warning:

1. The Suspension should not be moved or rotated as damage to the weighing mechanism can result.
2. The mass of all hanging elements must be tared before mounting the sample to get a true mass of the sample only.

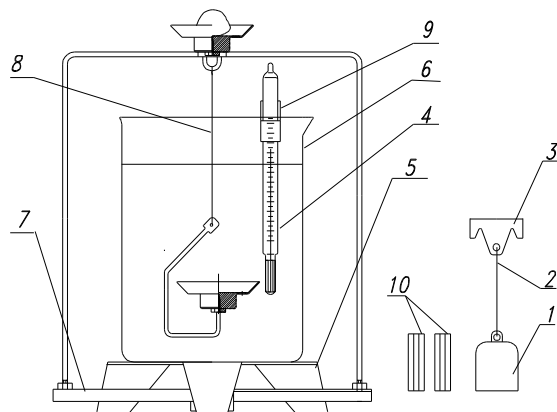
To use this arrangement for density measurements it is often convenient to mount the balance on a support above the table and hang the sample below the balance. When the program is looking for a weight in air simply hang the sample from the balance. When the program request the weight in water it will be necessary to bring a beaker of water up under the sample and obtain a weight while the sample is suspended in the water.

Make certain the water is deep enough to suspend the sample fully. Do not submerge the sample more than necessary and make sure all bubbles are removed from the sample before storing the weight.

19. ADDITIONAL EQUIPMENT

19.1 DENSITY DETERMINATION KIT

To assist the user to do density determination of both solids and liquids using the AEP, AEA, ADP and AAA balances from Adam Equipment. See section 14.6 for a description of the Density Determination Kit and the operation of the balance using this kit.



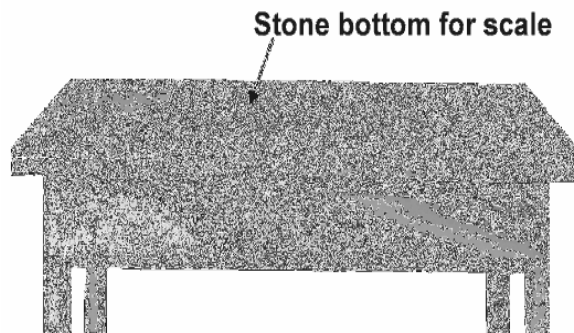
19.2 ADAM PRINTER

The Adam printer is a compact thermal printer which is ideal for use with the balances from Adam Equipment. There are 2 versions of the printer available, one to simple print data as it is received from the balance and the second has the capability to compute statistical information based on the data it receives.

19.3 ANTI-VIBRATION TABLE

To ensure the balance is mounted on a stable, vibration free surface, we offer an anti-vibration table as an option.

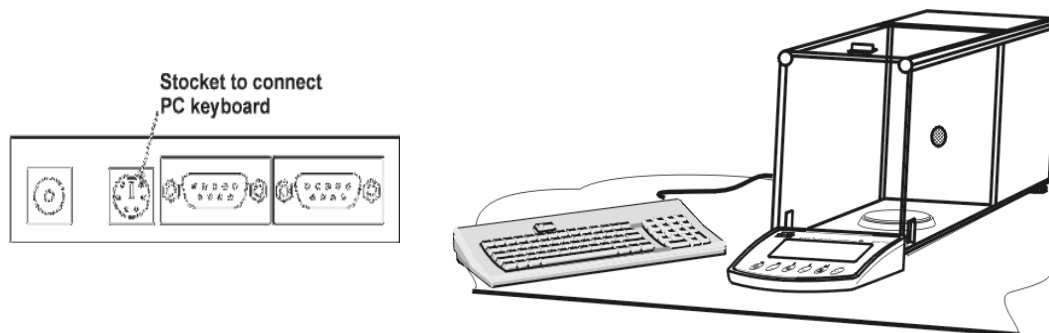
The main part of the table is a heavy stone base mounted in a steel frame. The stone helps prevent movements and vibrations from affecting the balance. This helps to ensure precision weighing.



19.4 PS KEYBOARD

The PC style PS Keyboard can connect with the balance and makes setting values and programming the balances easier.

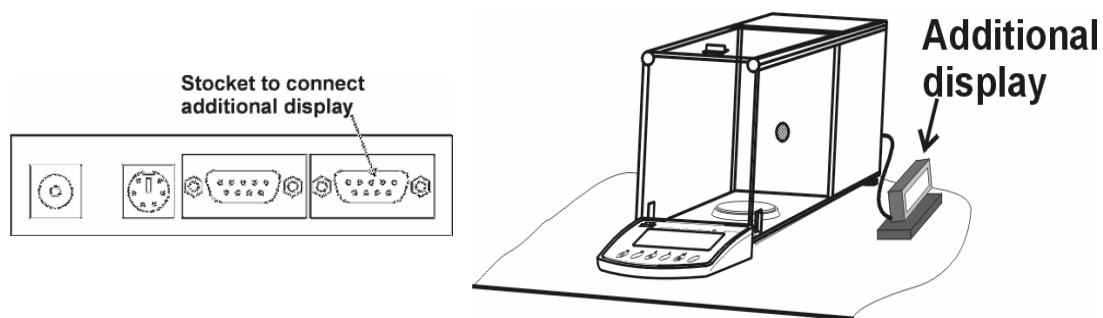
The keyboard is a standard PS type with the mini-din connector.



19.5 ADDITIONAL DISPLAY

The AEP and AEA balances can be equipped with an additional display to show the main weighing results. The display is an easy to read seven-segment LCD with a one meter long cable.

The display plugs into a connector on the back of the balance. It shows the weight, and symbols for the unit of weight, tare and stability. It comes in an enclosure for wall or table mounting with a flexible lead.



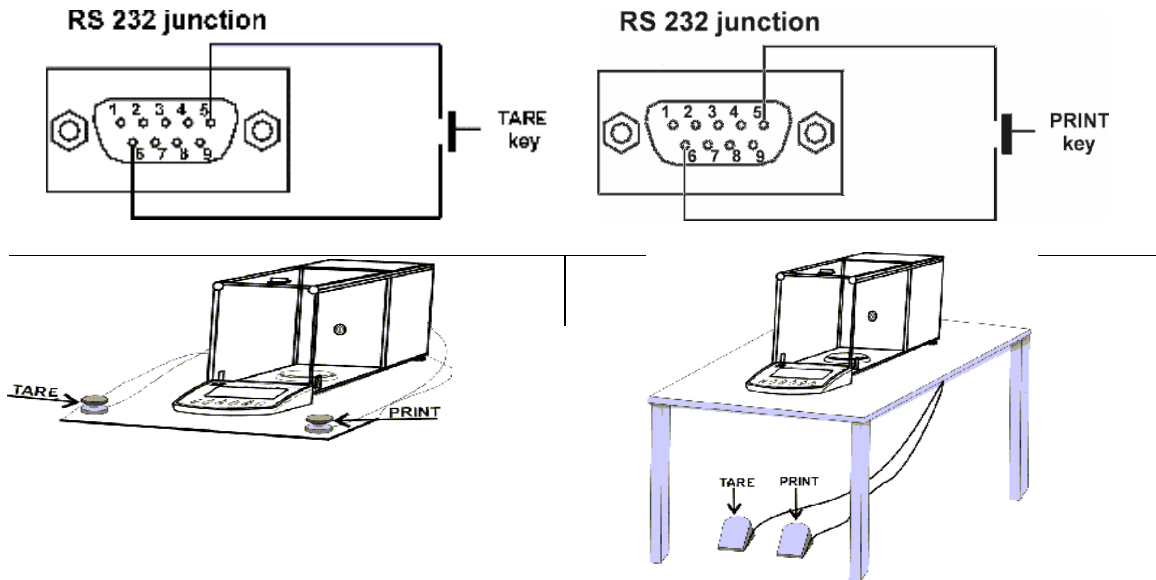
19.6 ADDITIONAL KEYS (HAND, FOOT)

External switches can be added for Tare and Print. This allows the balances to be used without touching the balances.

By using the external keys frees the hands in a busy environment or where contamination is a problem.

Keys can be purchased to meet your requirements. Contact your dealer or Adam Equipment.

Method of connecting the Tare and Print keys. These keys use unused pins on the RS-232 connector. Cable length should be one meter or less.



20. ERROR MESSAGES

As the balances operate they are constantly checking the function of the balance and the operations the user is doing. If an error is detected a display will be shown that shows the error code and a brief message. The main error messages are shown below with a brief suggestion of how the error can be corrected.

If an error continues to appear contact your distributor or Adam Equipment.

Code	Description	Resolution
1.1	Check sum error	Initial memory-check error. Try turning the balance again.
1.2	A/D error	A/D did not have legal outputs, Try turning the balance on again.
2.1	Under Load	Check the pan is correctly installed.
2.2	Over Load	Remove weight from the pan, check the pan is correctly installed.
2.3	A/D Null	A/D is below zero point. Check the pan.
2.4	A/D Full	A/D is greater than the maximum. Remove weight from the pan. Check the pan mounting.
2.5	Zero > Max.	A/D at zero is too large,
2.6	Tare > F.S.	Tare less weight.
2.7	Tare < 0	Balance is below zero too far for the tare key to zero the balance.
2.8	Value > 0.5%	Trying to set a zero point that is too large, remove weight from the pan/
2.9	Value > 4%	
2.10	Unit , 1 div.	Parts counting may be inaccurate as the unit weight is too small to count with good accuracy
2.11	Unit ,10 div.	
2.12	Ref <100 div.	Percent weighing may be inaccurate as the reference weight is too small.
3.1	Entry > Max.	A value to be input is greater than the maximum capacity
4.1	Write Error	Memory problem, try again. Remove power, turn on again and try again.
4.2	Erase Error	
5.1	Overrun Error	RS-232 error, try again after checking parameters and wiring
5.2	Parity Error	
5.3	Framing Error	
6.1	Wrong date	Enter correct date format.
7.1	Operation Timeout	Balance did not have time to complete an operation, try again. Make sure balance is stable.

21. TECHNICAL SPECIFICATIONS OF AEA BALANCES

AEA ANALYTICAL BALANCE SPECIFICATIONS					
	AEA 100SG	AEA 160DG	AEA 100G	AEA 160G	AEA 250G
Maximum weighing capacity (Max)	100 g	62g / 160 g	100 g	160 g	250 g
Readability	0.01 mg	0.01 mg / 0.1 mg	0.1 mg	0.1 mg	0.1 mg
Tare range	-100g	-160 g	-100 g	-160 g	-250 g
Min. Capacity Range	0.5 mg	0.5 mg	5 mg	5 mg	5 mg
Repeatability (std. deviation)	0.03 mg	0.04 mg / 0.2mg	0.2 mg	0.2 mg	0.2 mg
Linearity ±	0.03 mg	0.04 mg / 0.2mg	0.2 mg	0.2 mg	0.3 mg
Response Time	8 secs	10 / 4 secs	typically 5 seconds		
Operating temperature	Compensated ±4d/°C over +15°C to 30°C Operational +5°C to +40°C				
Power supply	11VAC-14VAC, 50/60Hz 400ma. or 16VDC to 20VDC @400ma External Module				
Pan Size (mm)	80 mm / 3.1" diam.		100 mm / 3.9" diam		
Calibration	Calibration with internal mass. Optionally the user can use an external mass				
Weighing units User selectable	grams, milligrams, carats, pounds, ounces, troy ounces, pennyweight (dwt), teals (Hong Kong), teals (Singapore), teals (Taiwan), ticals, mommes, grains, newtons, custom, custom factor				

Functions	Weighing, Parts Counting, Check weighing, Statistics, Percent Weighing, Animal Weighing, Density Determination of solids and liquids, Filling program, Ambient temperature control for calibration, Full control of filters for ambient conditions, error messages, menu to access all parameters and enable or disable all modes and functions. Weigh below ability.
Languages supported	English Others as developed
Display	Graphics LCD with Backlight, 134mm x 40mm / 5.2" x 1.6" Displays weighing information, date, time, 0-100% capacity and special data for weighing functions
Interface	RS-232, bi-directional, 2400 –19200 baud With handshaking and complete control of balance functions
Output formats	1 standard and 4 user programmable formats up to 80 strings of text or control characters Special GLP format for monitoring calibration
Real time clock	Standard Formats of date month/day/year or day/month year formats of time, 12 or 24 hour clock
Chamber Size (w x d x h) (height above pan)	172 x 170 x 230 mm 6.8" x 6.7" x 9"
Overall size (w x d x h)	185 x 470 x 280mm 7.3" x 18.5" x 11"
Gross weight	12 kg / 26Lb
Accessories	Thermal printer, statistics printer, anti-vibration table, density determination kit, below balance weighing hanger, data collection program, dust cover

22. TECHNICAL SPECIFICATIONS OF AEP BALANCES

AEP BALANCE SPECIFICATIONS									
	AEP-150G	AEP-250G	AEP-450G	AEP-650G	AEP-1500G	AEP-2500G	AEP-4500G	AEP-6000G	
Maximum weighing capacity (Max)	150g	250g	450g	650g	1500g	2500g	4500g	6000 g	
Tare range	-150g	-250g	-450g	-650g	-1500g	-2500g	-4500g	-6000g	
Readability	0.001g	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g	0.01 g	
Repeatability (s.d.)	0.001g	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g	0.01 g	
Linearity ±	0.002g	0.002g	0.002g	0.002g	0.02g	0.02g	0.02g	0.02g	
Response Time	3 seconds typical								
Operating temperature	Compensated ±1d/°C over +15°C to 30°C with automatic temperature compensation program active Operational +5°C to +40°C								
Power supply	11VAC-14VAC, 50/60Hz 500mA. or 16VDC to 20VDC @500mA External Module								
Pan Size (mm)	128 x 128mm / 5" x 5"			165 x165mm / 6.5" x 6.5"					
Calibration	Calibration with internal mass. Optionally the user can use an external mass								
External Cal weight (g) Class F1	100g	200g	200g	500g	1000g	2000g	2000g	5000g	
Weighing units User selectable	grams, milligrams, carats, pounds, ounces, troy ounces, pennyweight (dwt), teals (Hong Kong), teals (Singapore), teals (Taiwan), ticals, mommes, grains, newtons, custom, custom factor								

Functions	Weighing, Parts Counting, Check weighing, Statistics, Percent Weighing, Animal Weighing, Density Determination of solids and liquids, Filling program, Ambient temperature control for calibration, Full control of filters for ambient conditions, error messages, menu to access all parameters and enable or disable all modes and functions. Weigh below ability. Output for external Tare and Print keys.	
Languages supported	English Others as developed	
Display	Graphics LCD with Backlight, 134mm x 40mm / 5.2" x 1.6" Displays weighing information, date, time, 0-100% capacity and special data for weighing functions	
Interface	RS-232, bi-directional, 2400 –19200 baud With handshaking and complete control of balance functions	
Output formats	1 standard and 4 user programmable formats up to 80 strings of text or control characters Special GLP format for monitoring calibration	
Real time clock	Standard Formats of date month/day/year or day/month year formats of time, 12 or 24 hour clock	
Breeze Shield	Glass, 130mm x 80mm high / 5.1" x 3.1" high	n.a.
Dimensions (w x d x h)	205mm x 300mm x 90mm / 8.1" x 11.8" x 3.6"	
Gross weight	10 kg / 22 lb	
Accessories	Battery Pack, Dust Cover, In-Use Wet Cover, Adam Printer, Adam Printer with Statistical Analysis Software, Anti-Vibration Table, Data Collection Program, Density Determination Kit, Weigh Below Hook	Battery Pack, Dust Cover, In-Use Wet Cover, Adam Printer, Adam Printer with Statistical Analysis Software, Anti-Vibration Table, Data Collection Program, Weigh Below Hook

ADAM

Adam Equipment

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	Declaration of Conformity Konformitätserklärung Déclaration de Conformité	Verklaring van overeenstemming Dichiarazione di Conformità Declaración de Conformidad
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The non-automatic weighing instrument
Die nichtselbsttätigen Waage
L'instrument de pesage à fonctionnement non automatique

Het niet –automatische weegwerktuig
Strumento per pesatura non automatico
Instrumento para pesaje non automatico



Manufacturer :	Adam Equipment Co. Ltd.
Type:	AEA Series
No of the EC type-approval certificate:	T6069
Corresponds to the production model described in the EC type-approval certificate and to the requirements of the Council Directive 90/384/EEC as amended and to the requirements of the following EC Directives:	
73/23/EEC	Electrical equipment for use within certain voltage limits (Low Voltage Directive)
89/336/EEC	Electromagnetic compatibility
This declaration is only valid when accompanied by a Certificate of Conformity issued by a Notified Body.	

Hersteller :	Adam Equipment Co. Ltd.
Typ:	AEA Series
Nr. de EG-Bauartzulassung:	T6069
Entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster, sowie den Anforderungen der EG-Richtlinie 90/384/EWG in der jeweils geltenden Fassung und den Anforderungen folgender EG-Richtlinien:	
73/23/EWG	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (Niederspannungsrichtlinie)
89/336/EWG	Elektromagnetische Verträglichkeit
Diese Erklärung gilt nur in Verbindung mit einer Konformitätsbescheinigung einer benannten Stelle	

Fabricant :	Adam Equipment Co. Ltd.
Type:	AEA Series
N° du certificat d'approbation CE de type:	T6069
Correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences de la directive 90/384/CEE modifiée et aux exigences des directives CE suivantes:	
73/23/CEE	Matériel électrique pour utilisation dans des limites de tension définies (Directive Basse Tension)
89/336/CEE	Compatibilité électromagnétique
Cette déclaration est seulement valide quand elle est accompagnée par un Certificat de Conformité délivré par un Organisme Notifié.	

Fabrikant :	Adam Equipment Co. Ltd.
Type:	AEA Series
Nummer van de Verklaring van EG-typegoedkeuring	T6069
Conform met het model beschreven in de verklaring van EG-typegoedkeuring en met de voorschriften van EG richtlijn 90/384/EEC zoals gewijzigd en met de volgende EG richtlijnen:	
73/23/EEC	Laagspanning richtlijn
89/336/EEC	EMC richtlijn
Deze verklaring is alleen geldig samen met een certificaat van overeenstemming afgegeven door een bevoegde instantie.	

Produttore	Adam Equipment Co. Ltd.
Modello:	AEA Series
N. di certificato di approvazione di tipo CE	T6069
Conforme al modello di produzione descritto nel certificato di approvazione di tipo CE e secondo le richieste CE direttiva 90/384/CEE come modificato e secondo le richieste della seguente direttiva CE	
73/23/EWG	Strumenti elettrici per uso entro certi limiti di voltaggio (Direttiva di voltaggio basso)
89/336/EWG	Compatibilità elettromagnetica
Questa dichiarazione è valida solamente se accompagnata da un certificato di conformità rilasciato da un ente riconosciuto.	

Fabricante	Adam Equipment Co. Ltd.
Tipo:	AEA Series
Numero del certificado de aprobacion de tipo CE:	T6069
Conforme al modelo de producción descrito nel certificado de aprobación del tipo CE e segun los requisitos del CE direttiva 90/384/CEE como modificato e segun los requisitos della siguiente direttiva CE	
73/23/CEE	Instrumentos electricos para uso dentro ciertos limites del voltaje (Directiva de voltaje bajo)
89/336/CEE	Compatibilidad electromagnetica
Esta declaracion es valida solamente si acompañada a un certificado da conformidad emitida par un organismo notificado.	

Signature
Unterschrift
Signature
Handtekening
Firma
Firma


J.S. Cumbach
Technical Manager

Date
Datum
Date
Datum
Date
Fache

27 January 2004



Adam Equipment

ADAM EQUIPMENT, BOND AVENUE, DENBIGH EAST INDUSTRIAL ESTATE,
MILTON KEYNES, MK1 1SW, U.K.

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E-Mail Address: info@Adamequipment.co.uk

	Declaration of Conformity Konformitätserklärung Déclaration de Conformité	Verklaring van overeenstemming Dichiarazione di Conformità Declaración de Conformidad
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The non-automatic weighing instrument
Die nichtselbsttätigen Waage

L'instrument de pesage à fonctionnement non automatique

Het niet –automatische weegwerktuig
Strumento per pesatura non automatico
Instrumento para pesaje non automatico

II

Manufacturer :	Adam Equipment Co. Ltd.
Type:	AEP Series
No of the EC type-approval certificate:	T6097
Corresponds to the production model described in the EC type-approval certificate and to the requirements of the Council Directive 90/384/EEC as amended and to the requirements of the following EC Directives:	
73/23/EEC	Electrical equipment for use within certain voltage limits (Low Voltage Directive)
89/336/EEC	Electromagnetic compatibility
This declaration is only valid when accompanied by a Certificate of Conformity issued by a Notified Body.	

Hersteller :	Adam Equipment Co. Ltd.
Typ:	AEP Series
Nr. de EG-Bauartzulassung:	T6097
Entspricht dem in der Bescheinigung über die Bauartzulassung beschriebenen Baumuster, sowie den Anforderungen der EG-Richtlinie 90/384/EWG in der jeweils geltenden Fassung und den Anforderungen folgender EG-Richtlinien:	
73/23/EWG	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter (Niederspannungsrichtlinie)
89/336/EWG	Elektromagnetische Verträglichkeit
Diese Erklärung gilt nur in Verbindung mit einer Konformitätsbescheinigung einer benannten Stelle.	

Fabricant :	Adam Equipment Co. Ltd.
Type:	AEP Series
N° du certificate d'approbation CE de type:	T6097
Correspond au modèle décrit dans le certificat d'approbation CE de type, aux exigences de la directive 90/384/CEE modifiée et aux exigences des directives CE suivantes:	
73/23/CEE	Matériel électrique pour utilisation dans des limites de tension définies (Directive Basse Tension)
89/336/CEE	Compatibilité électromagnétique
Cette déclaration est seulement valide quand elle est accompagnée par un Certificat de Conformité délivré par un Organisme Notifié.	

Fabrikant :	Adam Equipment Co. Ltd.
Type:	AEP Series
Nummer van de Verklaring van EG-typegoedkeuring	T6097
Conform met het model beschreven in de verklaring van EG-typegoedkeuring en met de voorschriften van EG richtlijn 90/384/EEC zoals gewijzigd en met de volgende EG richtlijnen:	
73/23/EEC	Laagspanning richtlijn
89/336/EEC	EMC richtlijn
Deze verklaring is alleen geldig samen met een certificaat van overeenstemming afgegeven door een bevoegde instantie.	

Produttore	Adam Equipment Co. Ltd.
Modello:	AEP Series
N. di certificato di approvazione di tipo CE	T6097
Conforme al modello di produzione descritto nel certificato di approvazione di tipo CE e secondo le richieste CE direttivo 90/384/CEE come modificato e secondo le richieste della seguente direttiva CE	
73/23/EWG	Strumenti elettrici per uso entro certi limiti di voltaggio (Direttivo di voltaggio basso)
89/336/EWG	Compatibilità elettromagnetico
Questa dichiarazione è valida solamente se accompagnato da un certificato di conformità rilasciato da un ente riconosciuto.	

Fabricante	Adam Equipment Co. Ltd.
Tipo:	AEP Series
Numero del certificado de aprobacion de tipo CE:	T6097
Conforme al modelo di produccion descrito nel certificado di aprobacion del tipo CE e segun los requisitos del CE diretiva 90/384/CEE como modificado e segun los requisitos della siguiente directive CE	
73/23/CEE	Instrumentos electricos para uso dentro certi limites del voltaje (Diretivo di voltaje bajo)
89/336/CE E	Compatibilidad electromagnetico
Esta declaracion es valida solamente si acompañado a un certificado da conformidad emitida par un organismo notificado.	

Signature
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Signature
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Firma

J.S. Cumbach
Technical Manager

Date
Datum
Date
Datum
Date
Fache

27 January 2004

ADAM EQUIPMENT is an ISO 9001:2000 certified global organisation with more than 30 years experience in the production and sale of electronic weighing equipments. Products are sold through a world wide distributor network -supported from our company locations in the UK, USA and SOUTH AFRICA. The company and their distributors offer a full range of Technical Services such as on site and workshop repair, preventative maintenance and calibration facilities.

ADAM's products are predominantly designed for the Laboratory, Educational, Medical and Industrial Segments. The product range can be classified as follows:

- Analytical and Precision Laboratory Balances
- Top Loading Scales for Educational establishments
- Counting Scales for Industrial and Warehouse applications
- Digital Weighing/Check-weighing Scales
- High performance Platform Scales with extensive software features including parts counting, percent weighing etc.
- Digital Electronic Scales for Medical use
- Retail Scales for price computing

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