Contents

1 - GENERAL

► 1.1 - General safety recommendations

- **The balancing machine should only be used by duly authorized and trained personnel.**
- **The balancing machine should not be used for purposes other than those described in the instruction manual.**
- **Under no way should the balancing machine be modified except for those modifications made explicitly by the manufacturer.**
- **Never remove the safety devices. Any work on the machine should only be carried out by duly authorized specialist personnel.**
- **Do not use strong jets of compressed air for cleaning.**
- **Use alcohol to clean plastic panels or shelves (AVOID LIQUIDS CONTAINING SOLVENTS).**
- **Before starting the wheel balancing cycle, make sure that the wheel is securely locked on the adapter.**
- **The machine operator should not wear clothes with flapping edges. Make sure that unauthorized person nel do not approach the balancing machine during the work cycle.**
- **Avoid placing counterweights or other objects in the base which could impair the correct operation of the balancing machine.**
- **For TFT monitors, see the specific instructions attached.**

► 1.1.1 - Standard safety devices

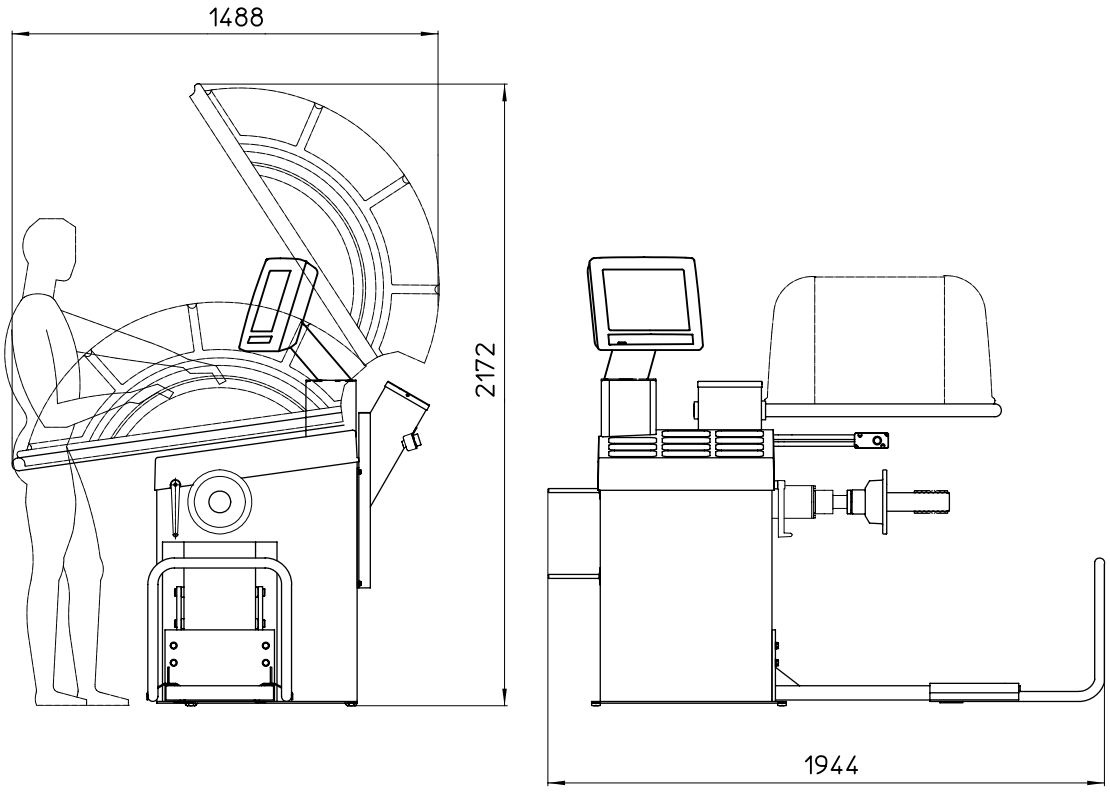
- **STOP push button for stopping the wheel under emergency conditions.**
- **The safety guard (option) of high impact plastic is with shape and size designed to prevent risk of counterweighhyghts from flying out in any direction except towards the floor.**
- **A microswitch prevents starting the machine if the guard is not lowered and stops the wheel whenever the guard is raised.**
- **Protection system on LIFT control.**

► 1.2 - Field of application

The machine is designed for balancing wheels weighing up to 250 kg. It can be operated within a temperature range of 0° to + 45°C. EMS option: can measure radial geometric deformity (run-out) with all truck wheels.

► 1.3 - Overall dimensions

1



► 1.4 - Specification

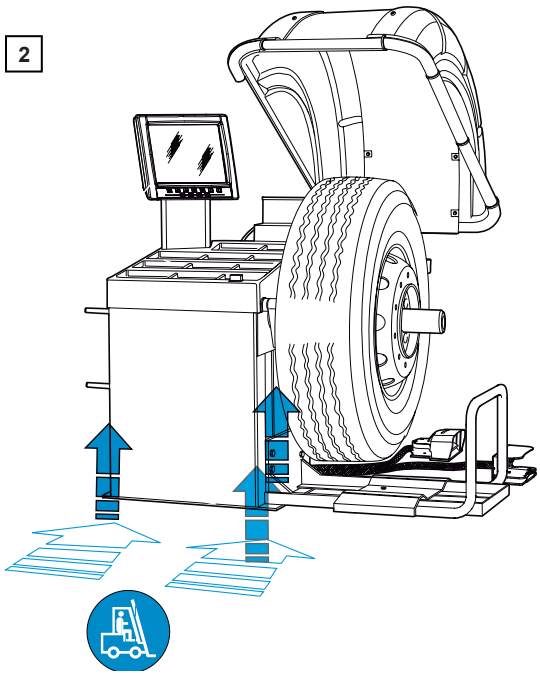
Single phase power supply	230 - 400 V Three-phase
Protection class	IP 54
Max. power consumption	1,5 Kw
Monitor	TFT 15”
Balancing speed	160 min-1 for cars - 70 min-1 for trucks
Cycle time for wheel	8 to 20 seconds
Balancing accuracy	1 gram for cars / 10 grams for trucks
Position resolution	± 1.4°
Average noise level	< 70 dB(A)
Distance rim - machine	0 - 300 mm (400 mm max. presettable)
Rim width setting range	1.5” to 20” or 40 to 510 mm
Diameter setting range	10 to 30” or 265 to 765 mm
Max. wheel weight	250 kg
Max. wheel diameter	1300 mm
Min/max. compressed air pressure	8 to 10 kg/cm^2
	approx. 0.8 to 1MPa
	approx. 8 to 10 BAR
	approx. 115 to 145 PSI

2 - HANDLING AND LIFTING

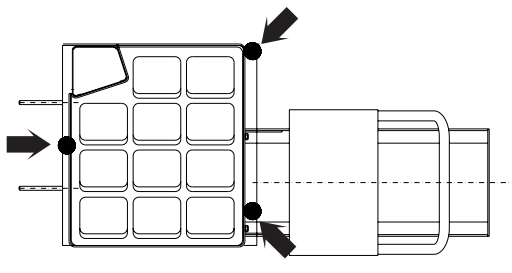
The balancing machine must be lifted only by levering on the substructure / base at the 3 specific fixing points. Other points - such as the spindle, the workhead or the accessory bench - must not be subject to any kind of force.

Make sure that the balancing machine contacts the floor at all three support points. It will operate correctly without having to be secured to the ground.

2



2a



3 - COMMISSIONING

► 3.1 - Electrical connection

THE ELECTRICAL CONNECTION MUST BE MADE BY SPECIALIZED PERSONNEL. CONNECTION TO THE SINGLE PHASE MAINS MUST BE MADE BETWEEN PHASE AND NEUTRAL, AND NEVER, UNDER ANY CIRCUMSTANCES, BETWEEN PHASE AND EARTH (GROUND). EFFICIENT EARTHING (GROUNDING) IS ESSENTIAL FOR CORRECT MACHINE OPERATION. THE MANUFACTURER DECLINES ALL RESPONSIBILITY AND WARRANTY IN THE EVENT OF INCORRECT CONNECTION.

Before connecting the machine to the mains through relative cable, check that the mains voltage matches the one shown on the nameplate at the back of the balancing machine. Rating of the electrical connection should be on the basis of the machine electrical power consumption (see nameplate).

- The machine mains supply cable should be fitted with a plug conforming to current regulations.
- It is recommended to provide the machine with its own electrical connection through an automatic switch.
- When connection is made directly to the main control panel without using any plug, it is advisable to padlock the main switch of the balancing machine in order to limit its use to authorized personnel only.

► 3.2 - Pneumatic connection

Connection to the compressed air supply is available on the filter - regulator - lubrication unit located on the rear of the balancing machine. The lift is controlled by a pedal that can be positioned ad lib (*NOTE: keep away from lift movement area*).The ascent and descent speed can be adjusted on the pedal according to need. The air circuit is designed to ensure significant “elasticity” of movement for the lift whatever the position of its travel; this means that the position of the wheel can be adjusted with minimal manual effort.

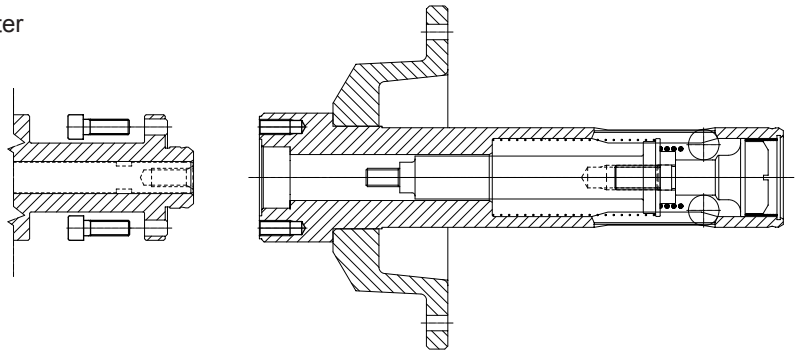
► 3.2.1 - Extra safety devices (BP device)

- **A one-way valve prevents accidental release of the wheel should pressure be cut out during the balancing cycle.**
- **Pressure switch to halt the motor if there is no pressure. Always actuate the unlocking control pedal with the machine stationary in order to avoid stress and abnormal wear on the adapter.**

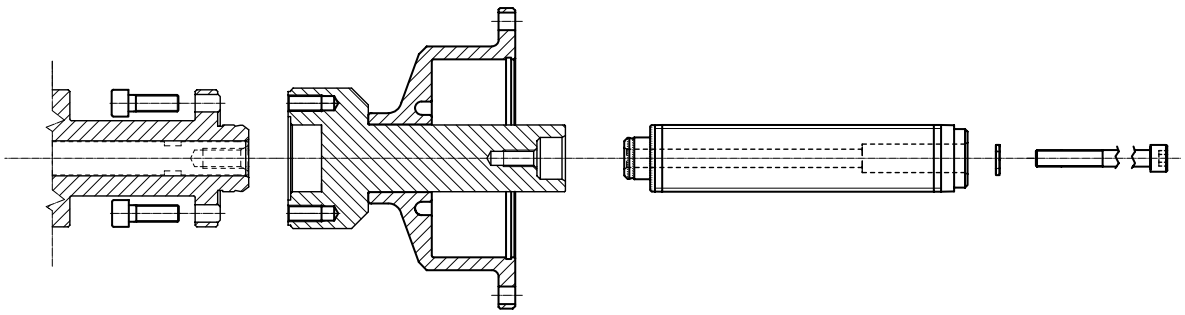
► 3.3 - Adapter mounting

Before fitting the adapter on the shaft of the balancing machine, make sure that the shaft and the adapter centering area are clean. Clamp the adapter on the shaft of the balancing machine. The machine can be operated with CEMB adapters for both trucks and cars (☛ figg. 3 e 3a). The vehicle adapter is locked manually with a threaded ring nut.

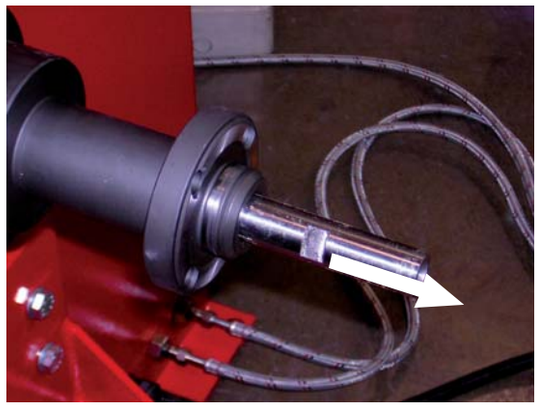
3 - Truck adapter



3a - Car adapter



A



Clean the surface on which the adapter will be fitted and push the pneumatic locking pedal to extract the central tie-rod

B

Holding the pneumatic locking pedal depressed, screw the internal cap onto the central tie-rod

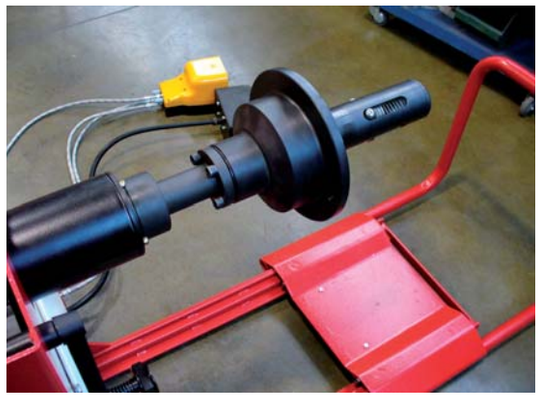
C

Release the pneumatic locking pedal so that the tie-rod retracts together with the entire adapter

D

Centre and lock the adapter with the 4 Allen screws

E



► 3.4 - Wheel mounting

The wheels should be fastened with one of the numerous adapters manufactured by CEMB.
N.B.: *Incorrect centering inevitably causes unbalance.*

► 3.5 - Guard mounting and adjustment (option)

1. Fasten the components to the base as illustrated in specific exploded view.
2. The positions of these guards can be adjusted using the special screws accessed from inside the main support.
3. Check that the microswitch is held down when the guard is closed.
4. Adjust the angular position of microswitch control.

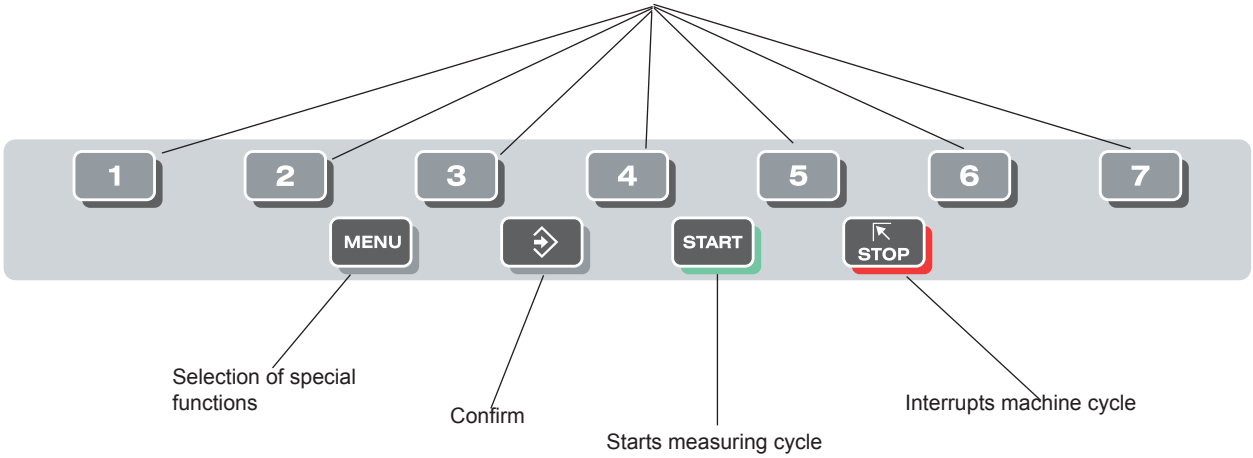
4 - CONTROLS AND COMPONENTS

► 4.1 - Automatic distance + diameter gauge

It allows measurement of the distance from the machine and the wheel diameter at the point of application of the counterweight. It also allows correct positioning of the counterweights inside rim by using the specific function (☞ ***INDICATION OF EXACT CORRECTION WEIGHT POSITION***) which allows reading, on the monitor, the position used for the measurement inside the rim (for calibration, see the corresponding paragraph).
The gauge can only be used with the counterweight pincers mounted.

► 4.2 - Keyboard

FUNCTION KEYS: they immediately select function indicated on the monitor



- *Press the buttons with the fingers only*
- *Never use the counterweight pincers or other pointed objects.*
- *When the beep signal is enabled (☞ **ACOUSTIC SIGNAL**), pressing of any push button is accompanied by a "beep".*
- *The TFT monitor is NOT the TOUCH SCREEN type.*

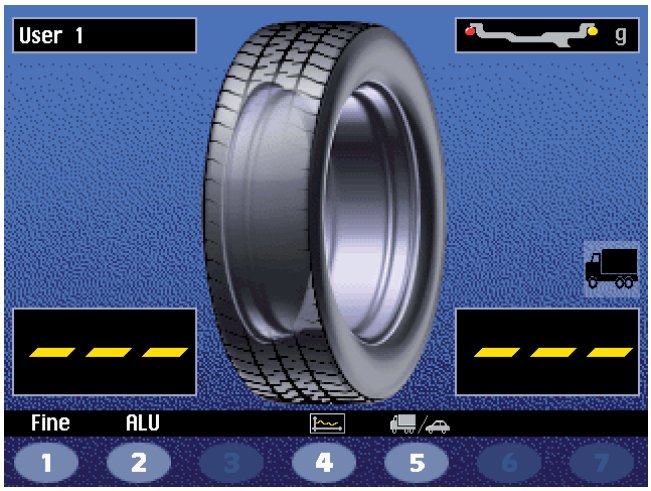
► 4.3 - Pedal controls

The machine is equipped with a pedal to lock/release the pneumatic spindle and a pedal to control the lift .

5 - INDICATIONS AND USE OF THE WHEEL BALANCER

The monitor shows several information and suggests various alternative ways of use to the operator.
This is done through various “screens”.

► 5.1 - Initial screen



Buttons enabled

MENU : main functions screen (☞ ***MENU ACCESS DIAGRAM***)

2 : type of correction (☞ ***ALU AND STATIC MODES***)

5 : Vehicle/truck selection

START : balancing spin (☞ ***RESULT OF MEASUREMENT***)

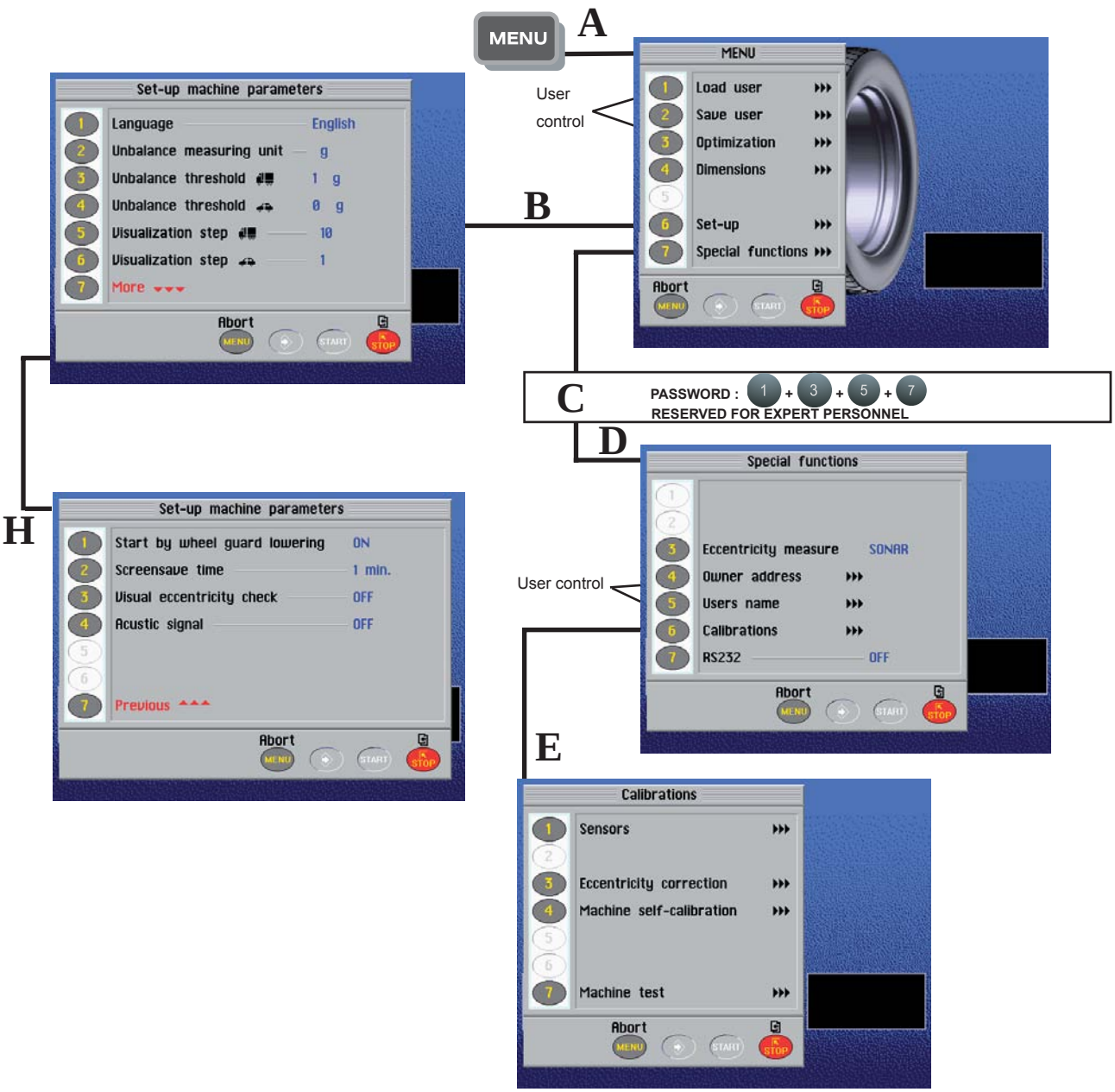
Dimensions gauge : when extracted, the Dimensions screen is selected (☞ ***PRESETTING OF WHEEL DIMENSIONS***).
If the machine remains on the initial screen for a certain amount of time without being used, the system is automatically switched to a screen-save. Striking of any key, movement of the wheel or distance + diameter gauge will cause automatic switching from the screen-save menu to the initial screen.

► 5.1.1 - Screen-save screen

N.B.: Name of the wheel balancer’s owner. Can be preset via the monitor (☞ ***PRESETTING THE CUSTOMER AND USER NAME***).

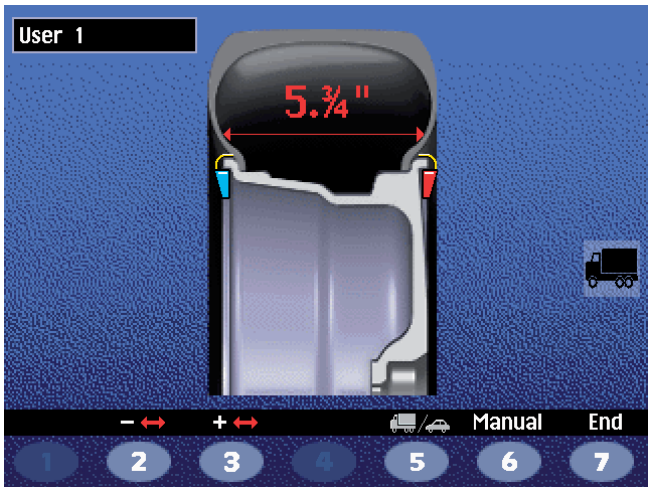
► 5.2 - Menu access diagram

- The symbol ▶▶▶ indicates the presence of a further menu.
- To return to the previous menu, press button STOP
- To return to the initial screen, press button MENU



► 5.3 - Presetting of wheel dimensions

► 5.3.1 - Automatic presetting

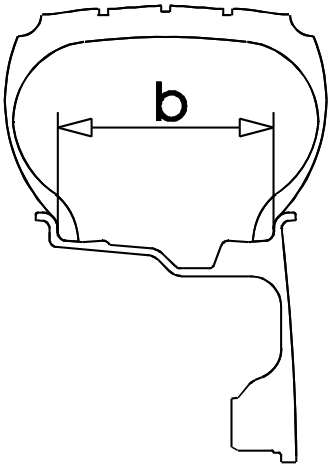


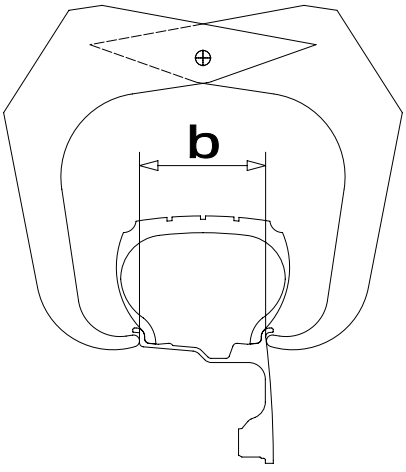
The screen appears upon removing the distance + diameter gauge.
The "dimension acquired" message is indicated by the inside correction weight symbol, which changes from blue to red.

► 5.3.1.1 - Standard wheels

Remove the gauge and position it corresponding to the correction zone. Wait for the weight symbol on the screen to pass from blue to red.
If the acoustic signal is enabled (see ***ACOUSTIC SIGNAL***), the acquisition of the dimensions is accompanied by a "beep".
Set the distance+diameter gauge to the rest position.
The current width value is displayed inside the tyre.

2 / 3 - Set the nominal width, which is normally shown on the rim, or measure the width "b" with the caliper gauge provided.

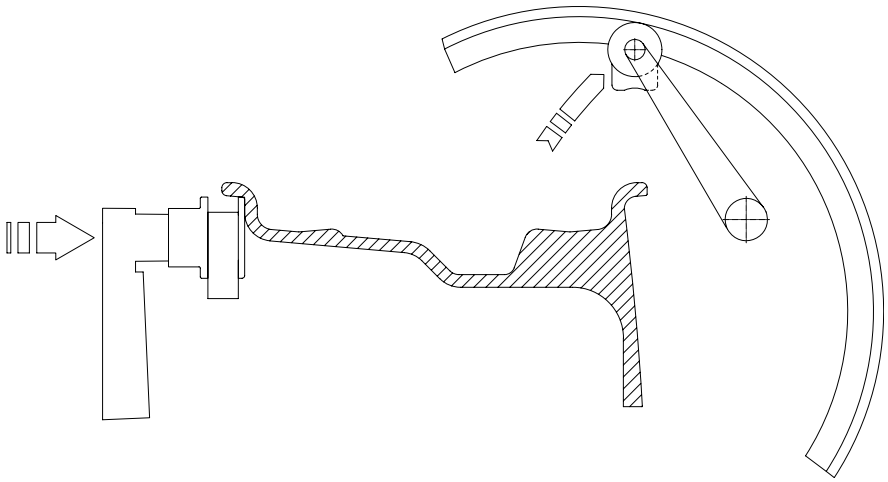




The calibration performed as such is necessary for modes ALU, Static, Dynamic.
Manually presetting is possible by using the push buttons as described in ***MANUAL PRESETTING***.

N.B. *Depending on the preset diameter, the machine is automatically set to truck mode (diameter ≥ 18" or 450 mm) or car mode. However such selection can be changed at any moment in the Measurement screen (* ***RESULT OF MEASUREMENT****).*

5



The enabled buttons are:

2 decrease width

3 increase width

5 car/truck selection

6 select the dimensions presetting in manual mode screen

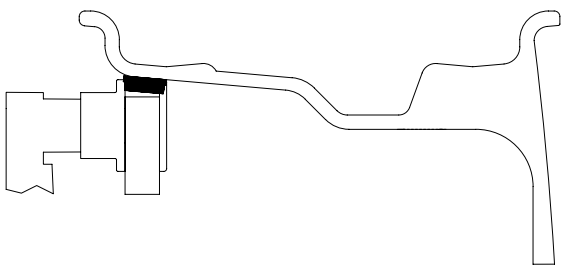
7 / STOP return to initial frame

START launch balancing

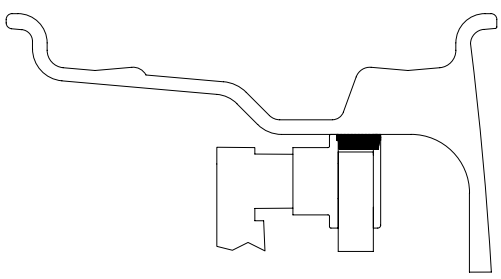
► 5.3.1.2 - Wheels ALU

After the measurement performed for the FI inner side, as indicated in fig. 6, pull out the gauge again to store the data for the FE outer side (fig. 6a); hold the position for at least 2 seconds until the counterweight symbols change. colour. When the acoustic signal is enabled (see ***ACOUSTIC SIGNAL***), the acquisition is accompanied by a "beep".

6 **ALU inside**

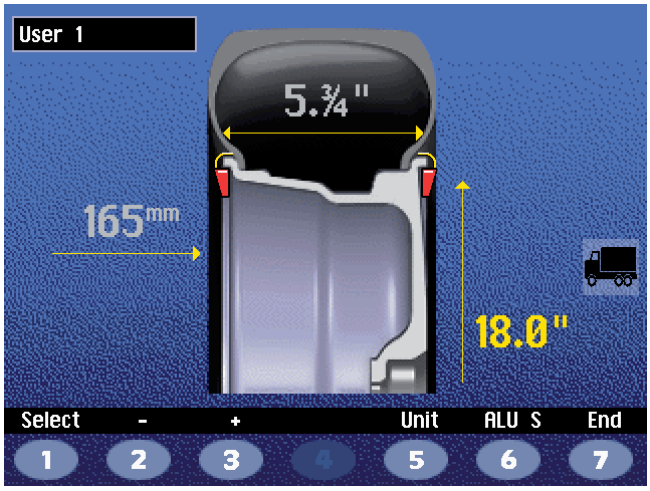


6a **ALU outside**



► **5.3.2 - Manual presetting**

► **5.3.2.1 - Standard wheels**



If necessary, the dimensions can be inserted or edited in manual mode as follows:

- press MENU + 4 or else press 6 from the Dimensions screen in automatic mode (which can be reached by pulling out the distance + diameter gauge).

- press 1 to select the dimension to be preset (highlighted in red).

- press 2 / 3 to preset the required value.

- press 5 to change unit of measurement.

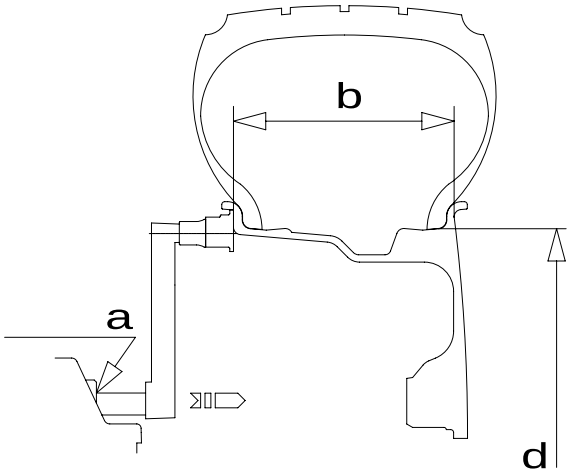
- press 6 to switch to the Manual Presetting screen for the ALU dimensions

- press 7 to return to the Measurements screen

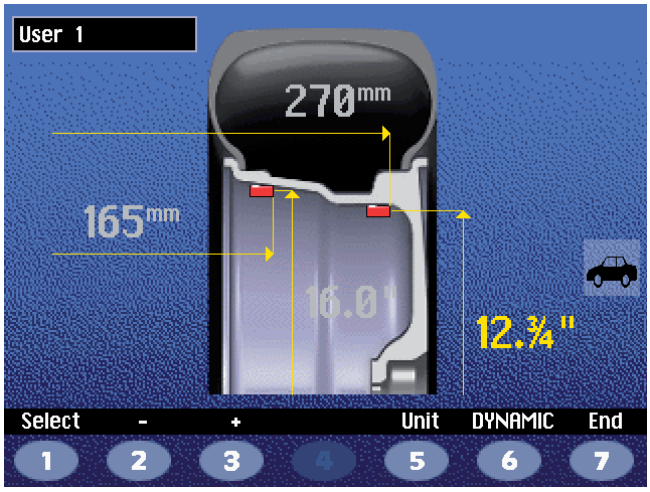
Definition of dimensions:

d = DIAMETER: Preset the nominal diameter stamped on the rim.
b = WIDTH: Preset the nominal width indicated on the rim.
a = DISTANCE: Preset the distance of the inside of the wheel from the machine measured with special gauge as described in fig. 7.

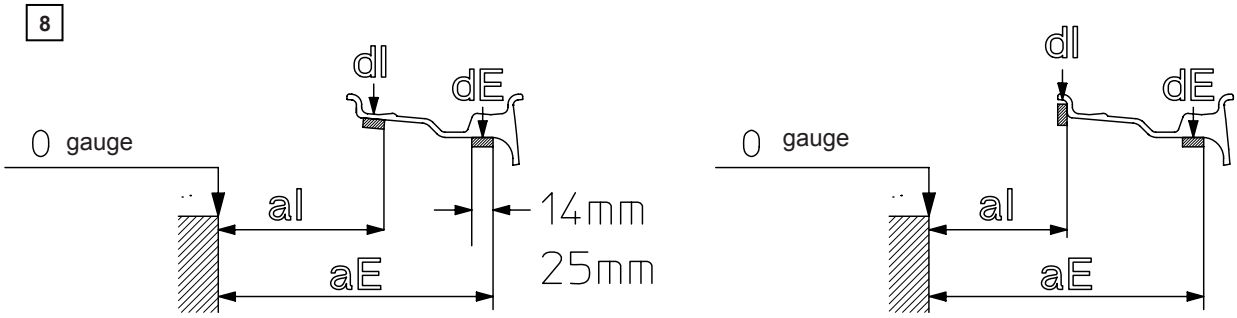
7



► **5.3.2.2 - Wheels ALU**



Preset the dimensions indicated on the screen:



The enabled buttons are:

1	setting of dimensions in input (displayed in red)
2 / 3	decrease/increase dimension in input
5	change unit of measurement (mm; inch) of dimension in input
6	select the dimensions presetting in manual mode screen
7 / STOP	return to initial frame
START	launch balancing

► 5.4 - USER control

The wheel balancer can be used simultaneously by 4 different users who, through a simple sequence, can memorize their work condition and call it when needed. The users' names can be memorized (☞ ***PRESETTING THE CUSTOMER AND USER NAME***).

► 5.4.1 - USER memorization

- Preset the dimensions correctly according to the procedures already described in sections ***AUTOMATIC PRESETTING*** and ***MANUAL PRESETTING***.

- Press MENU; the "MENU" window appears on the monitor.

- Press 2; a window appears with the list of available USERS. The current user is displayed in red.

- Press the number corresponding to the required USER. The system returns to the initial screen automatically.

► 5.4.2 - To call USER

- Perform a measuring spin with any dimensions.

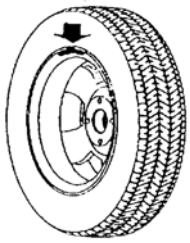
- Press button MENU; the "MENU" window appears on the screen.

- Press 1, a window appears with the list of available USERS. The current user is displayed in red.

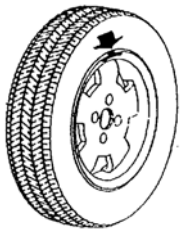
- Press the number corresponding to the required USER. The system automatically returns to the initial screen with recalculation of the unbalance values on the basis of the effective dimensions of the USER called.

- *The dimensions memorized as USER are lost when the machine is switched off.*
- *The USER control is also valid for the ALU dimensions.*
- *The current USER is always displayed in the Measurements and Dimensions screens.*

► 5.5 - Result of measurement



Correction on inside



Correction on outside

After performing a balancing spin, the unbalance values are displayed as well as arrows useful for positioning the point of application of the correction weight. After positioning the wheel, apply the weight in the 12 o'clock position. When the acoustic beep is enabled (***ACOUSTIC SIGNAL***), reaching of the correction position is indicated by a "beep".
If the unbalance is less than the chosen threshold value, the "OK " message appears instead of the unbalance value to indicate, on that particular side, the wheel is in tolerance; the residual unbalance can be displayed by pressing button 1 with an accuracy of 0.5 g (0.1 oz).

The following buttons are enabled:

1 Display of residual unbalance

2 Selection of correction mode (DYNAMIC, STATIC, ALU). When the mode is changed, the unbalance values are recalculated automatically on the basis of the previous run, (***ALU AND STATIC MODES***).

4 Eccentricity measurement graph (option).
1)The symbol above the key is displayed in red if the first harmonic eccentricity exceeds the recommended minimum limit (1.2 mm for vehicles, 3.0 mm for trucks).
*2) Holding this button down for more than 1.5 seconds, eccentricity measurement is temporarily disabled (enabled in **GENERAL SETUP**). To re-enable eccentricity measurement, again hold down the 4 button for more than 1.5 seconds. Each time the machine is switched on, the state of eccentricity measurement reflects what has been set in **GENERAL SETUP.***

5 Car/truck selection

6 Unbalance split control for presettable components (***"SPLIT" CONTROL***). Button only enabled in STATIC or ALU correction

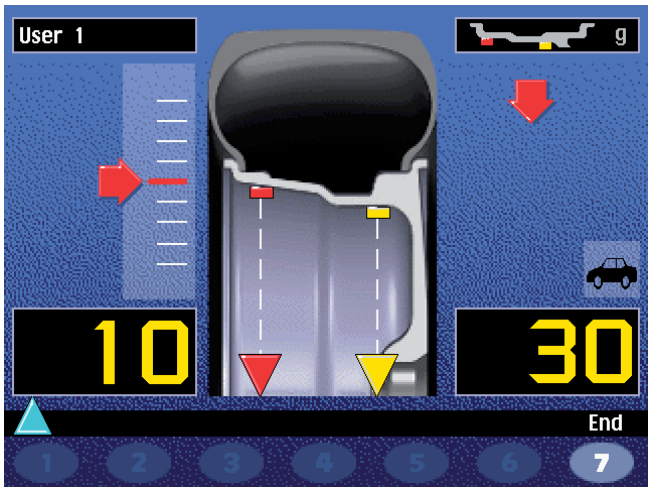
7 Indication of the longitudinal position of the unbalance (***INDICATION OF EXACT CORRECTION WEIGHT POSITION***) is enabled

MENU Selecting special functions

START Balancing run.

If the machine remains on this screen without being used for more than the time preset in the Setup parameters (6), the screen automatically returns to the screen-save.

► **5.5.1 - Indication of exact correction weight position**

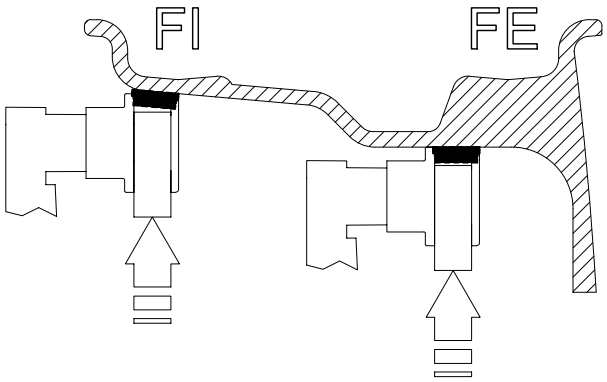


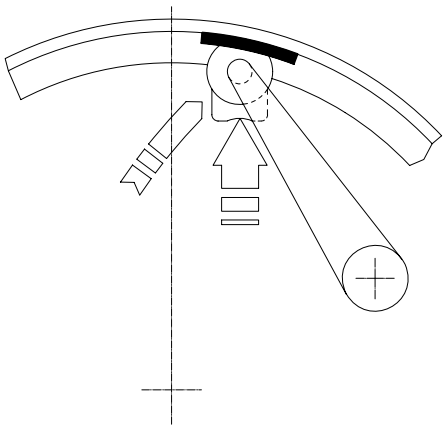
It is advisable use this function in the event of correction of the external side using an adhesive weight placed inside the rim. Remember to thoroughly clean the application areas.
This function allows cancelling approximations in the mounting of counterweights with consequent reduction of the residual unbalance.

- Press button 7 from the Measurements screen.
- Pull out the rim distance + diameter gauge. Approach of the weight to the correction position is indicated by a moving coloured arrow [△].
- When a fixed arrow [▽] is reached, rotate the wheel to correction position (FI or FE) and apply the counterweight by turning the tip of the gauge towards the outside, into the position **in which touches the wheel.** Compensation is made for the fact that the weight application position is no longer at 12 o'clock (fig. 11).

When the acoustic signal is enabled (see ***ACOUSTIC SIGNAL***), the reaching of a fixed arrow [▽] is accompanied by a "beep".

9





► 5.5.2 - “SPLIT” control

The SPLIT function is only possible in the case of static unbalance or ALU on the outside. It serves for concealing any stick-on unbalance correction weights behind the rim spokes.

PRESETTING THE NUMBER OF RIM SPOKES

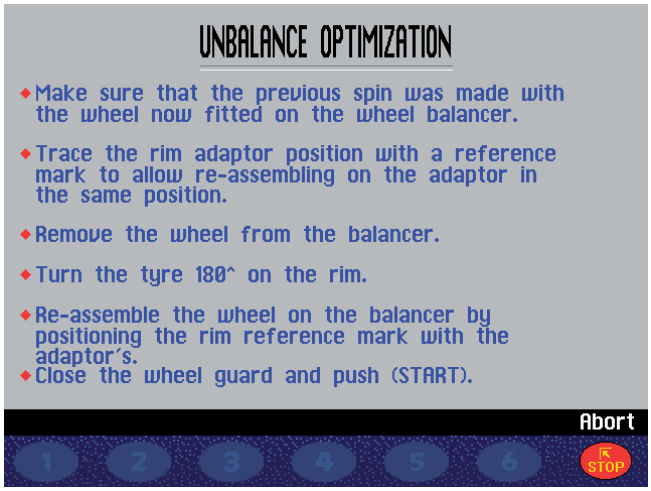
- From the STATIC or ALU measurement screen, press 6;
- A window appears on the display indicating the currently preset number of spokes
- Set the required number of spokes in the range 3 to 12 by pressing 1 and 2
- Press ⇨ to confirm the presetting
- Bring a spoke to the 12 o’clock position
- Press ⇨; the measurement screen reappears with the unbalance values already split

The ALU unbalance on the inside does not vary while as regards the STATIC unbalance and that ALUS on the outside, two weights appear for the same side:

- Gradually turn the wheel until an unbalance value appears;
- Apply an adhesive weight of the value indicated on the screen for the outer or STATIC side, behind the spoke in the 12 o’clock position;
- Again turn the wheel until a new unbalance value appears;
- Apply an adhesive weight of the value indicated on the screen for the outer or STATIC side, behind the spoke in the 12 o’clock position;
- Perform a run to check for correct wheel balancing.

Note: *when SPLIT is enabled, the icon* *is shown on the left of the screen.*

► 5.5.3 - Unbalance optimization



The symbol  is displayed automatically for static unbalance exceeding 30 grams (1.1 oz) for cars or 300 g (10.5 oz) for trucks. The program allows reducing the total unbalance of the wheel by compensating, when possible, the unbalance of the tyre with that of the rim. It requires two spins with rotation of the tyre on the rim in the second spin.

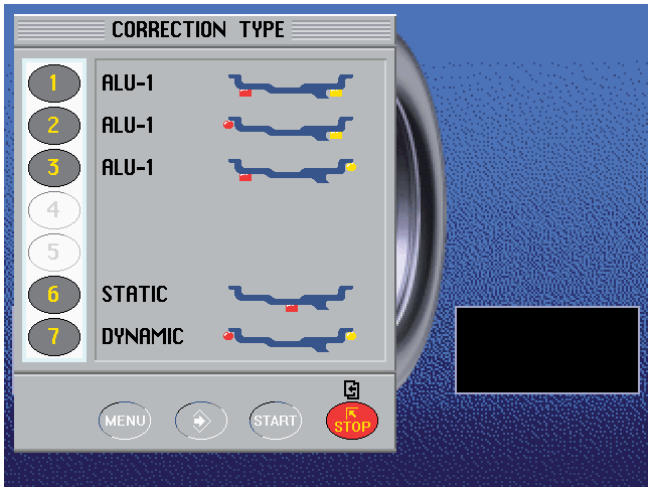
Press MENU + 3 after a first spin and follow the instructions appearing on the monitor.

► 5.5.4 - ALU and STATIC modes

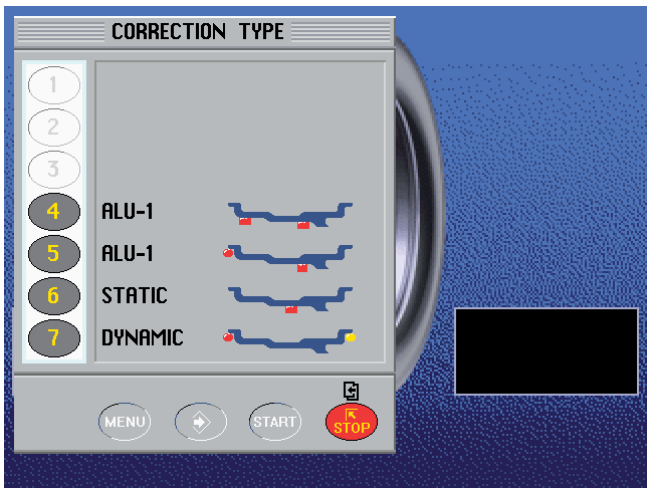
From the Measurement screen, press 2 button : a window with the possible modes appears.

Select the type required through the numeric keys. The return to the Measurement screen with the recalculated values is automatic. The enabled weight application position is always displayed inside the section of the circle.

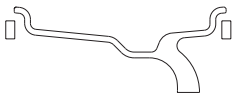
CORRECTION METHODS FOR STEEL OR LIGHT ALLOY RIMS



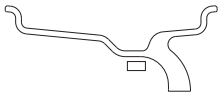
CORRECTION METHOD WITH WEIGHTS INSIDE THE RIM



Possible types of correction:



Balancing of steel or light alloy rims with application of clip-on weights on the rim edges

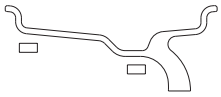


The STATIC mode is necessary for motorcycle wheels or when it is not possible to place the counterweights on both sides of the rim.

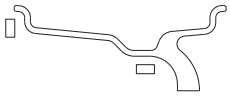
Balancing of light alloy rims with application of adhesive weights on the rim shoulders.

Combined balancing: adhesive weight on the outside, clip-on weight inside.

Combined balancing: clip-on weight outside and adhesive weight inside.

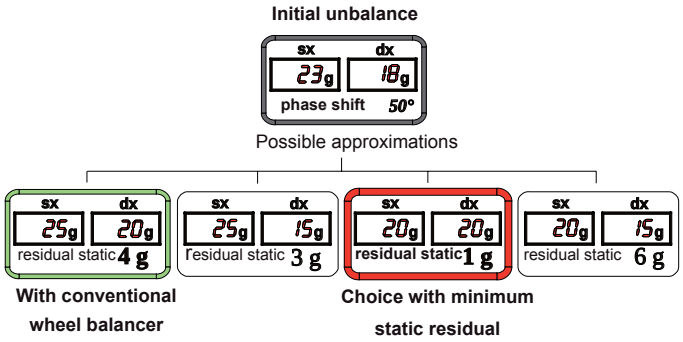


Balancing of alloy rims with hidden application of the adhesive weight on the outside.



Combined balancing: clip-on weight inside and adhesive hiddenweight outside (Mercedes).

► 5.5.5 - Automatic minimization of static unbalance



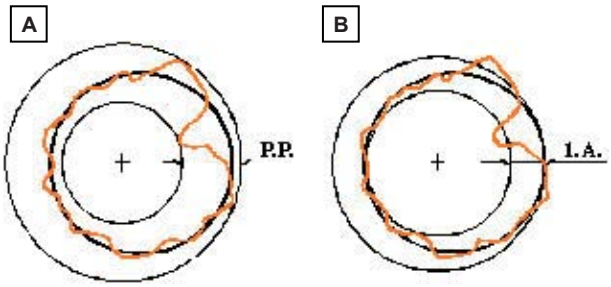
This program is designed to improve the quality of balancing without any mental effort or loss of time by the operator. In fact by using the normal commercially available weights, with pitch of 5 in every 5 g, and by applying the two counterweights which a conventional wheel balancer rounds to the nearest value, there could be a residual static unbalance of up to 4 g. The damage of such approximation is emphasized by the fact that static unbalance is cause of most of disturbances on the vehicle. This new function, resident in the machine, automatically indicates the optimum entity of the weights to be applied by approximating them in an “intelligent” way according to their position in order to minimize residual static unbalance.

► 5.6 - Eccentricity measurement (EMS optional)

The much enlarged figures show the outer tyre surface and axis of wheel rotation.

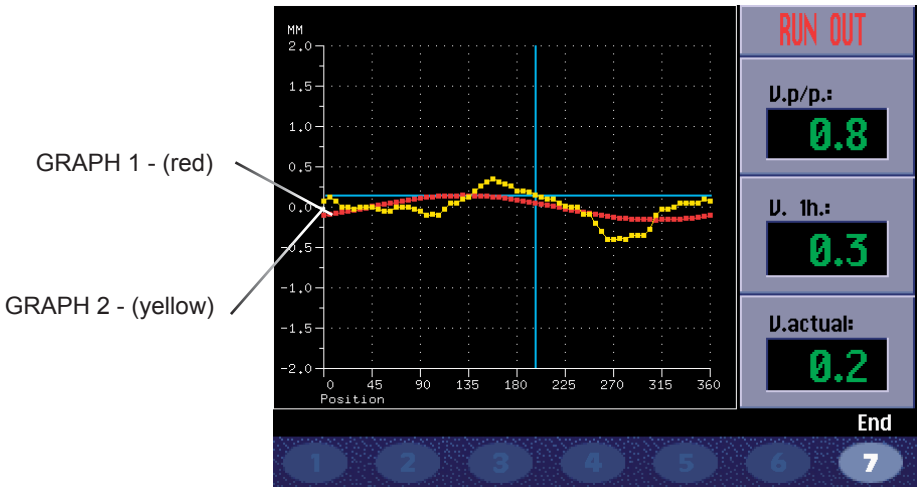
Fig. A shows measurement of the total Peak-to-Peak eccentricity defined as maximum radial deviation of the tyre surface.

Fig. B shows measurement of the eccentricity of the 1st harmonic, i.e. the eccentricity of that circle which “recopies” the tyre shape, by averaging the local deviations of the tyre from the round shape.



Obviously the P.P. measurement is normally greater than that of the 1st harmonic. Tyre manufacturers normally supply two different tolerances for the two eccentricities.

At the end of the balancing spin it is possible to automatically measure the eccentricity of the tyre through the SONAR sensor installed on the guard. The sensor should be positioned by hand in front of the tyre tread.



GRAPH 1 : represents the actual Peal-to-Peak eccentricity.
GRAPH 2 : represents the eccentricity of the 1st harmonic. For a wheel to be in optimum conditions, such graph should approach a straight line.

When the wheel is moved, the cursor on the screen indicates the actual value, with the phase referred to the eccentricity measurement sensor.

NOTE: Should the wheel stop before having completed the eccentricity measurement, a message appears on screen instructing you to slowly turn the wheel by hand in order to complete the measurement.

6 - SETUP (see Diagram showing access to the menus)

The Setup screen provides the user with many possibilities required for presetting the machine according to his own requirements. Such settings remain unaltered even when the machine is switched off.

The following buttons are enabled:

: return to previous window

: return to Measurement screen

from 

to 

: for selection of the parameter.

► 6.1 - Language

This function allows selecting the language to be used for displaying descriptive and diagnostic messages regarding machine operation.

► 6.2 - Unit of unbalance measurement

It is possible to select whether to display the unbalance values expressed in grams or ounces.

► 6.3 - Unbalance display threshold for truck/car

This consists of the unbalance threshold below which the wording “OK” appears on the screen at the end of the spin instead of the unbalance; the presettable values vary according to the unit of measurement selected.

► 6.4 - Unbalance display pitch for truck/car

This represents the display pitch of the unbalance and varies according to the unit of measurement selected. The selection “5 g” (1/4 oz) for cars and of “50 grams” (1.0 oz.) for trucks.enables display of the correction values on both sides such as to bring the static unbalance to 0 (theoretical). It is recommended to preset this function as standard use of the machine as it improves the balancing quality. The computer makes a complex calculation which allows cancelling the residual static unbalance by varying the value and position of the counterweights of fixed value.

► 6.5 - Spin with guard closed

When “ON” is selected the automatic start of the spin is enabled upon closing the guard.

► 6.6 - Screen-saver time

When the machine remains unused for longer than the time preset with this function, the processor automatically returns to the screen-saver screen. Preset the time in minutes.

► 6.7 - Visual eccentricity check

At the end of the spin, when the measured unbalance values reappear on the screen, it is possible to open the guard for a visual check to see if the wheel is eccentric or not while the wheel is gradually dropping in speed. On the other hand, if the guard is left closed, the machine completes the normal positioning.

► 6.8 - Acoustic signal

When “ON” is selected, an acoustic signal (beep) is given in the following cases:
- when any button is pressed;
- upon reaching the correct angular weight application position, in the Measurements screen;

WARNING

7 - SPECIAL CALIBRATIONS AND FUNCTIONS (See access diagram)

In order to gain access to the “Reserved Calibrations and functions” it is necessary to enter a password.
Any incorrect operation within the functions described below could impair the operation of the wheel balancing machine. Unauthorized use will cause cancellation of the warranty on the machine.

► 7.1 - Enabling eccentricity measurement

This function enables/disenables measurement of the tyre eccentricity during an unbalance measurement run.

► 7.2 - Presetting the customer and user name

The machine can be customized by presetting:
a) The name appearing on the Initial screen (screen-save).
b) The name of 4 different machine users (USER NAME).
An “ideal” keyboard appears on the monitor with the set of characters available for composition of the wordings. The Customer’s name consists of three lines, each max. 30 characters.
The USER NAME consists of a wording max. 15 characters.

► 7.3 - Calibrations

When 

is pressed from the Special Functions menu, access is gained to the Calibration menu.

► 7.3.1- Adapter eccentricity correction

Used to offset electronically any systematic balancing errors caused, for example, by an eccentric flange. It is not able to offset errors caused by worn flanges or backlash. Do not use except under the guidance of specialist personnel. Follow the instructions on the screen.
If E.C. (balancing cycle) is enabled, on the left of the screen there appears the icon  .

► 7.3.2 - Wheel balancing machine calibration

For machine calibration, proceed as follows:
- Use a wheel with steel rim of average dimensions. E.g.: 6”x 14” (± 1”)
- Preset the wheel dimensions with GREAT CARE.
- Follow the on-screen instructions.

► 7.3.3 - Wheel balancing machine self-test

An automatic self-diagnostic cycle is provided for easier trouble-shooting. At the end of the self-diagnostic cycle, several parameters are displayed which are useful for the Technical Service Department in order to identify machine faults.

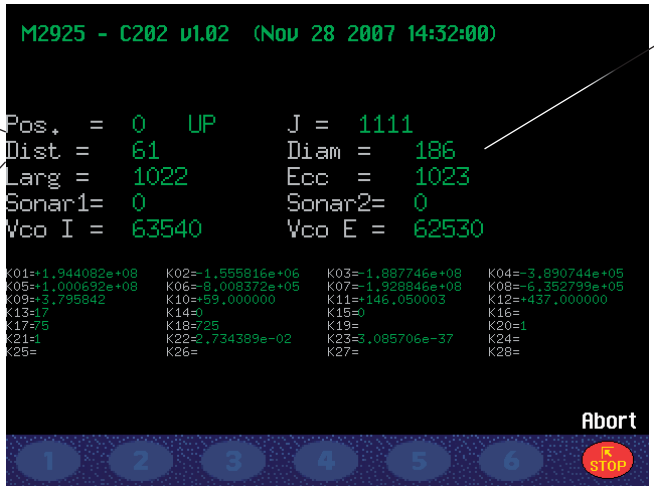
Returns to previous menu

► 7.3.3.1 - To check the encoder

When the spindle is rotated:
- the angular position “POS” should vary from 0 to 128;
- the wording “UP” should appear when rotated clockwise and “DOWN” when rotated in the opposite direction.

Check encoder

Check for correct operation of the distance gauge; the number increases when the gauge is pulled out.



Check of the eccentricity sonar (option): the number decreases when a surface is approached to the sonar

In the event of failure or faulty operation of the wheel balancing machine, notify the Technical Service of all the parameters displayed.

► 7.4 - RS232C serial port management (option)

Enables/disenables transmission on the RS232C serial port of unbalanced values and measured stages.

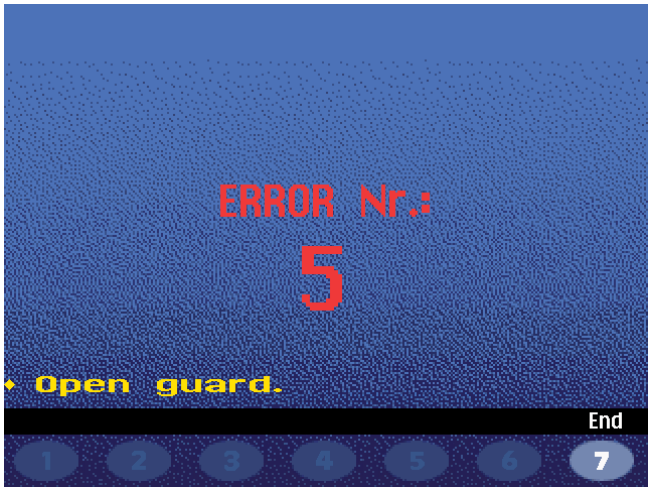
Transmission speed = 9600 baud
Data format = 1 bit Start
7 bit data
1 bit Even parity
1 bit Stop

At the end of each unbalanced measurement run, the balancing machine activates the RTS signal and then waits for the “$” character to begin data transmission; all functions are blocked until transmission is enabled, at the end of which the RTS signal returns to the standby state.
Data transmitted on the serial line are in ASCII format and separated by the character <cr> (0x0d).

The send sequence is:
- 00000 <cr>
- Value of correction weight on left side <cr>
- Left side correction stage <cr>
- Value of correction weight on right side <cr>
- right side correction stage <cr>

The first 5 zero-set bytes are the transmission start message (handshake). The correction values are expressed in gr in steps of 1 gr.
The stage values are expressed in degrees in the range 0 % 359.

8 - ERRORS



ERRORS	CAUSES	CONTROLS
Black	The wheel balancer does not switch on.	1. Verify correct connection to the mains. 2. Verify and eventually replace the fuses on the power card. 3. Verify monitor function. 4. Replace the computer board.
Err. 1	No rotation signal.	1. Verify belt tautness. 2. Verify the function of the phase pick-up board and, in particular, the reset signal. 3. Replace the phase pick-up board. 4. Replace the computer board.
Err. 2	Speed too low during detection. During unbalance measurement rotation, wheel speed is less than 42 rpm.	1. Make sure that a vehicle wheel is mounted on the wheel balancer. 2. Verify belt tautness. 3. Verify the function of the phase pick-up board and, in particular, the reset signal. 4. Replace the computer board.
Err. 3	Unbalance too high.	1. Verify wheel dimension settings. 2. Check detection unit connections. 3. Perform machine calibration. 4. Mount a wheel with more or less known unbalance (less than 100 grammes) and verify the response of the machine. 5. Replace the computer board.
Err. 4	Rotation in opposite direction. After pressing [START], the wheel begins to rotate in the opposite direction (anti-clockwise).	1. Verify the connection of the UP/DOWN – RESET signals on the phase pick-up board.
Err. 5	Guard open The [START] pushbutton was pressed without first closing the guard.	1. Reset the error by pressing pushbutton [7]=End. 2. Close the guard. 3. Verify the function of the protection uSwitch. 4. Press the [START] pushbutton.
Err. 7 / Err. 8	NOVRAM parameter read error	1. Repeat machine calibration 2. Shut down the machine. 3. Wait for a minimum time of ~ 1 Min. 4. Re-start the machine and verify correct operation. 5. Replace the computer board.
Err. 9	NOVRAM parameter write error.	Replace the computer board.
Err. 11	Speed too high error. During unbalance measurement rotation, wheel speed is more than 270 rpm.	1. Check if there is any damage or dirt on the timing disc. 2. Verify the function of the phase pick-up board and, in particular, the reset signal. 3. Replace the computer board.
Err. 12	Unbalance measuring cycle error.	1. Verify phase pick-up board function. 2. Verify correct motor operation. 3. Verify belt tautness. 4. Replace the computer board.

Err.13 / Err.14 / Err.15 / Err.16 / Err.17 / Err.18	Unbalance measurement error.	1. Verify phase pick-up board function. 2. Check detection unit connections. 3. Verify machine earth/ground connection. 4. Mount a wheel with more or less known unbalance (less than 100 grammes) and verify the response of the machine. 5. Replace the computer board.
Err. 20	The wheel comes to a halt before completing positioning correctly.	1. Make sure that the wheel to be balanced is at least 10” in diameter. 2. Verify the correct setting of wheel dimensions on screen. 3. Verify belt tautness. 4. For wheels less than 12” in diameter wheels: disenable the eccentricity measurement procedure
Err.40/ Err.41/ Err.42/ Err.43	Eccentricity graph plotting procedure error.	Perform a new eccentricity measurement.
Err.45/ Err.46/ Err.47/ Err.48	Eccentricity graph value display readout error.	Perform a new eccentricity measurement.
Err.50/ Err.51/ Err.52/ Err.53	Eccentricity graph current value cursor plotting procedure error.	Perform a new eccentricity measurement.

9 - ROUTINE MAINTENANCE (see exploded drawings) (For non specialized personnel only)

Always disconnect the machine from the mains before carrying out any operation.

► 9.1 - Adjusting belt tautness

1. Remove the weight shelf
2. Slightly slacken the motor locking screws
3. Move the motor by acting on the rear and front thrust screws, keeping the motor axis parallel to the spindle axis
4. Lock the motor screws and make sure that the belt does not oscillate in movement (especially from side to side) when braking.

► 9.2 - Replacing fuses

Remove the weight holder shelf to gain access to the power supply board where the 4 fuses are located (☞ Exploded Drawings). If fuses require replacement, use ones of the same current rating. A fuse is also fitted to the braking transformer cable. If the fault persists, contact Technical Service.

► 9.3 - Air circuit maintenance

It is important to clean the compressed air filter regularly and make sure that there is sufficient lubrication oil. The oil bath must be 3/4 full; to top-up, use average viscosity mineral oil (30° cST to 40° WAIRSOL type LXOL). Normal oil flow is one drop every 10 operations.

N.B. DRAIN FREQUENTLY ANY CONDENSATE BUILT UP IN THE FILTER BOWL VIA RELATIVE VALVE.

NONE OF THE OTHER MACHINE PARTS REQUIRE MAINTENANCE.