

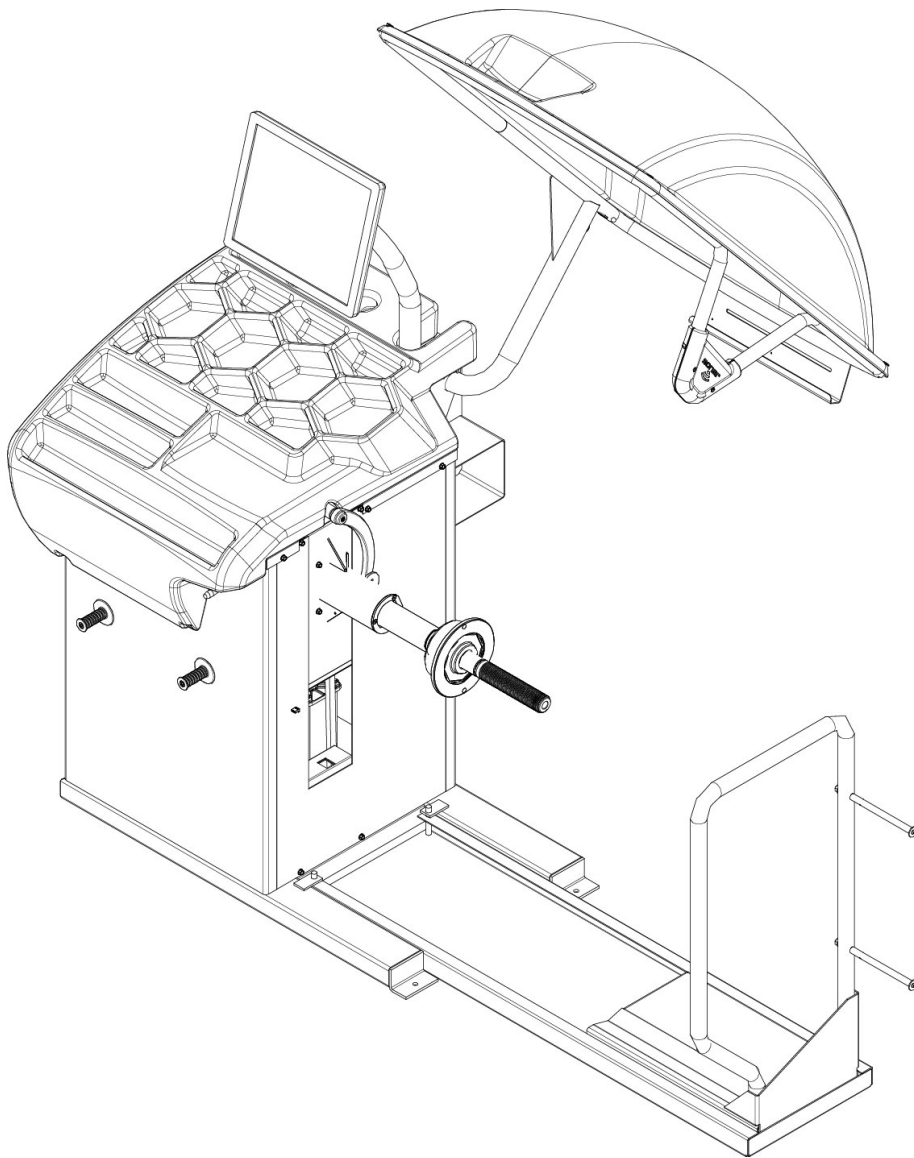


CEMB

BALANCING MACHINES

EN

Use and maintenance manual



C350 US

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The Manufacturer declines all liability for any damage to people or property caused by incorrect use of this product.
Subject to change without prior notice.



Istruzioni originali

Translation of the original instructions

Traduction de la notice originale

Übersetzung der Originalanweisungen

Traducción de las instrucciones originales

Tradução das instruções originais



EN

Use and maintenance manual

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1. Foreword



THIS MANUAL IS AN INTEGRAL PART OF THE INSTALLATION MANUAL WHICH SHOULD BE CONSULTED CONCERNING STARTING AND USING THE MACHINE SAFELY.
READ CAREFULLY BEFORE CONTINUING.

1.1 GENERAL

The machine has been constructed in conformity with the current EC Directives and the technical standards implementing the requirements, as stated in the declaration of conformity issued by the manufacturer and attached to the manual.

This publication, hereinafter simply referred to as '**manual**', contains all the information required to safely use and service the machine referred to in the Declaration of Conformity.

This appliance, hereinafter is generically referred to as '**machine**'.

The manual addresses operators instructed on the precautions to take in relation to the presence of electric current and moving devices.

This publication is intended for all 'users' who as far as within their competence need to and/or are obliged to give instructions to others or operate on the machine themselves.

These persons can be identified as follows:

- operators directly involved in transporting, storing, installing, using and servicing the machine from when it is put on the market until when it is scrapped
- direct private users.

The original Italian text of this publication constitutes the only reference to resolve any interpretation controversies related to the translation into the European Community languages.

This publication forms an integral part of the machine and must therefore be kept for future reference until final dismantling and scrapping of the machine.

1.2 PURPOSE OF THE MANUAL

This manual, and the installation manual, contains the instructions required to use the machine safely and carry out routine maintenance work.

Any calibrations, adjustments and extraordinary maintenance operations are not considered in this document as they may only be performed by the service engineer who must work on the machine according to the technical and rated characteristics for which it was built.

Though it is fundamental to read this manual, it cannot replace skilled technical staff who must be adequately trained beforehand.

The foreseen use and configurations of the machine are the only ones allowed by the manufacturer; do not attempt to use the machine in a different way.

Any other use or configuration must be agreed in advance with the manufacturer in writing and in this case an annex will be attached to this manual.

For use, the user must also comply with the specific workplace legislation in force in the country where the machine is installed.

The manual also refers to laws, directives, etc., that the user must know and consult in order to accomplish the goals that the manual sets out to achieve.

1.3 WHERE AND HOW TO KEEP THE MANUAL

This manual (and relative attachments) must be kept in a safe and dry place and must always be available for consultation.

Make a copy and keep it in the archive.

When exchanging information with the manufacturer or the technical assistance staff authorised by the former, quote the rating plate information and the serial number of the machine.

This manual must be kept for the entire lifetime of the machine, and if necessary (e.g.: damage making all or some of it illegible, etc.) the user must request another copy exclusively from the manufacturer, quoting the publication code indicated on the cover.

1.4 MANUAL UPGRADES

This manual is an integral part of the machine and reflects the state of the art at the moment it was put on the market. The publication complies with the directives in force on that date; the manual cannot be considered inadequate as a result of regulatory updates or modifications to the machine.

Any manual upgrades that the manufacturer may see fit to send to users will become an integral part of the manual and must be kept together with it.

1.5 COLLABORATION WITH USERS

The manufacturer will be pleased to provide its customers with any further information they may require and will consider proposals for improving this manual in order to more fully satisfy the requirements it was written for.

In case of transfer of ownership of the machine, which must always be accompanied by the use and maintenance manual, the original user must inform the manufacturer of the name and address of the new user in order to allow it to send the new user any communications and/or updates deemed to be indispensable.

This publication is the property of the Manufacturer and may not be fully or partly reproduced without prior written agreement.

1.6 MANUFACTURER

The machine identification data is indicated on the plate mounted on the machine.

The plate below is shown for the sake of example.

MODEL	<input type="text"/>	VER	<input type="text"/>
SER. N°	<input type="text"/>		
V	<input type="text"/>	CE	KW <input type="text"/>
A	<input type="text"/>		Hz <input type="text"/>
			T° [C] <input type="text"/>
PHASE	<input type="text" value="1"/>		AIR SUPPLY Kg/cm ² <input type="text"/>
<input type="text"/>			

1.7 MANUFACTURER'S RESPONSIBILITY AND WARRANTY

In order to make use of the manufacturer's warranty, the user must scrupulously observe the precautions contained in the manual, in particular he must:

- never exceed the limits of use of the machine
- always constantly and carefully clean and service the machine
- have the machine used by people of proven capacity and attitude, adequately trained for the purpose.

The manufacturer declines all direct and indirect liability caused by:

- use of the machine in a different way from that indicated in this manual
- use of the machine by people who have not read and fully understood the contents of this manual
- use in breach of specific regulations in force in the country of installation
- modifications made to the machine, software and operating logic, unless authorised by the manufacturer in writing
- unauthorised repairs
- exceptional events.

Transfer of the machine to a third party must also include this manual; failure to include the manual automatically invalidates all the rights of the purchaser, including the terms of warranty, where applicable.

If the machine is transferred to a third party in a country with a different language from the one written in this manual, the original user shall provide a faithful translation of this manual in the language of country in which the machine will operate.

1.7.1 Terms of warranty

The Manufacturer undertakes to replace or repair any part which it deems to be faulty free of charge at its factory, carriage paid.

If a Manufacturer's repairman (or a person authorised by the same) is required to work at the user's facilities, the relative travel expenses and board and lodging shall be charged to the user.

The free supply of parts under warranty is always subject to the faulty part being inspected by the manufacturer (or a person authorised by the same).

The warranty is not extended following repairs or other work done to the machine.

The warranty does not cover damage to the machine deriving from:

- transport
- neglect
- improper use and/or use not in compliance with the instructions in the operating manual
- incorrect electrical connections.

The warranty is invalidated in case of:

- repairs made by people who were not authorised by the manufacturer
- modifications that were not authorised by the manufacturer
- use of parts and/or equipment that were not supplied or approved by the manufacturer
- removal or alteration of the machine identification plate.

1.8 TECHNICAL ASSISTANCE SERVICE

For any technical service operation, contact the manufacturer directly or an authorised dealer always quoting the model, the version and the serial number of the machine.

1.9 COPYRIGHT

The information contained in this manual may not be disclosed to third parties. Partial or total duplication, unless authorised by the Manufacturer in writing, through photocopying, duplication or other systems, including electronic acquisition, is breach of copyright and can lead to prosecution.

2. Machine description

It is used to balance the wheels of cars, vans, 4-WD, motorcycles and scooters. The wheels must weigh less than 200 kg. and, when fitted on the balancing machine, must not interfere with any fixed part of the machine, excluding the shaft and support adaptor. The machine is supplied with equipment enabling the vast majority of car wheels available on the market to be fitted. Other wheels with special dimensions, geometry and centring require special adaptors supplied on request (consult the attached sheet “**ORIGINAL ADAPTORS**”). The machine can operate only on flat non resilient floor.

Do not mount anything other than motorbike, car or truck tyres on the wheel balancer.

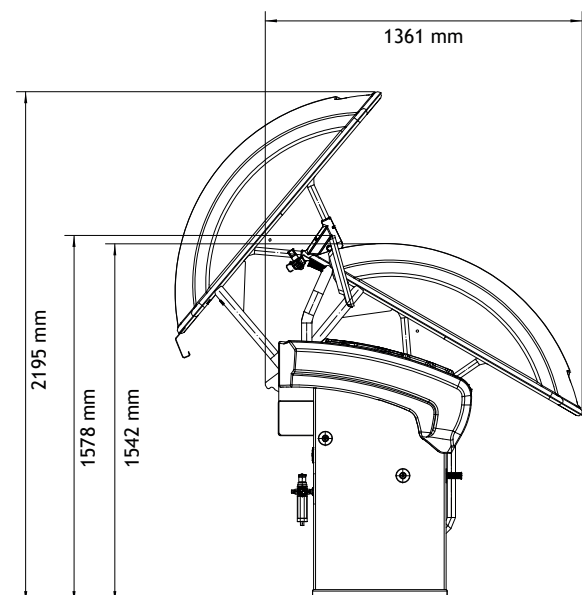
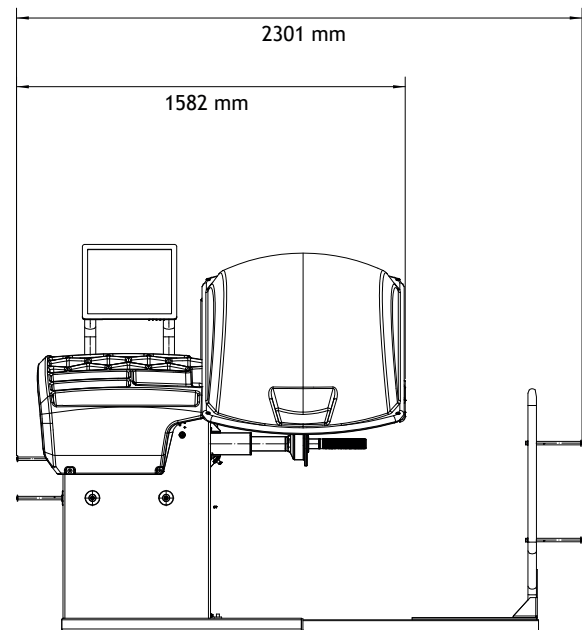
Thanks to the new and exclusive VDD (Virtual Direct Drive) system, reliable unbalance measurements can be made in a short time, almost half the time of the cycle used with respect to other balancers in this range.

2.1 TECHNICAL SPECIFICATIONS


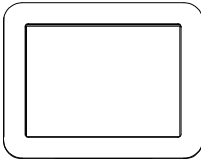
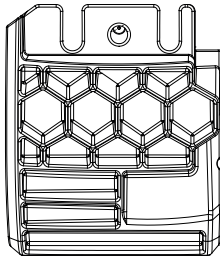
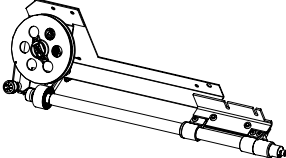

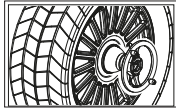
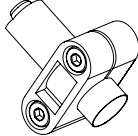
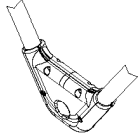
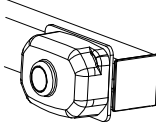
The following data refers to the balancer in its standard configuration.

Single-phase power supply	115 / 230 V 60/50 Hz
Protection class	IP 54
Rated power	1,1 kW
Balancing speed	130 rpm (for car) 80 rpm (for truck)
Measuring cycle for car/truck wheel	8 ÷ 20 s
Measurement uncertainty	± 0.5 g
Resolution	1 g for car / 10 g for truck
Average noise	< 70 dB (A)
Rim width setting range	1.5" ÷ 20" or 40 ÷ 510 mm
Diameter setting range	10" ÷ 30" or 265 ÷ 765 mm
Min/max. compressed air pressure	7 ÷ 10 kg/cm ² approx. 0.7 to 1 MPa approx. 7 to 10 bar approx. 105 to 145 psi
Maximum wheel weight	< 200 kg
Max. wheel diameter	1380 mm
Machine weight	230 kg

2.2 DIMENSIONS



2.3 COMPONENTS

		
TOUCH CONTROL PANEL		✓
WEIGHT-TOOL HOLDER		✓
AUTOMATIC GAUGE		✓
GAUGE INDEX		✓
LOCK NUT		✓
WEIGHT POSITIONING LASER		✓
LA SONAR		✓
EMS SONAR		✓

3. Starting

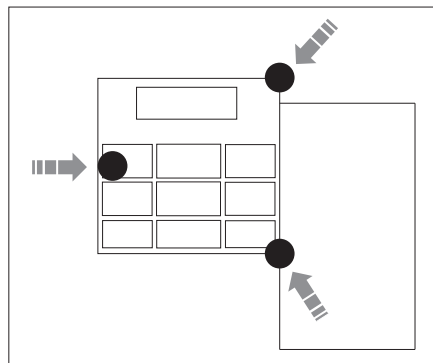


BEFORE SWITCHING ON THE MACHINE, MAKE SURE THAT ALL THE CONNECTIONS DESCRIBED IN THE INSTALLATION CHAPTER HAVE BEEN MADE CORRECTLY.

THE FOLLOWING OPERATIONS INVOLVE A POTENTIAL RISK FOR THE OPERATOR, GIVEN THE PRESENCE OF VOLTAGE ON THE EQUIPMENT. THE PERSONAL PROTECTIVE EQUIPMENT DESCRIBED IN THE INSTALLATION MANUAL MUST BE WORN AND WORK MUST BE DONE WITH DUE CARE AND ATTENTION. OPERATIONS MAY ONLY BE PERFORMED BY A SPECIALISED TECHNICIAN.

Before powering the machine, carry out the following checks:

1. Check that the balancing machine touches the floor at the three support points.

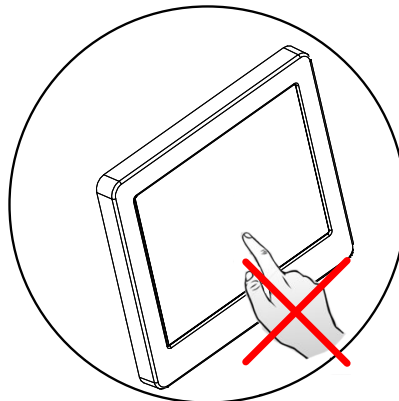


2. Make sure that all the parts of the balancer are correctly connected and fixed.
3. Make sure that the parameters (voltage and frequency) of the mains power supply are compatible with those indicated on the rating plate of the balancer.
4. Make sure the power cable is correctly connected.
5. Make sure the machine shaft and flange hole are clean.



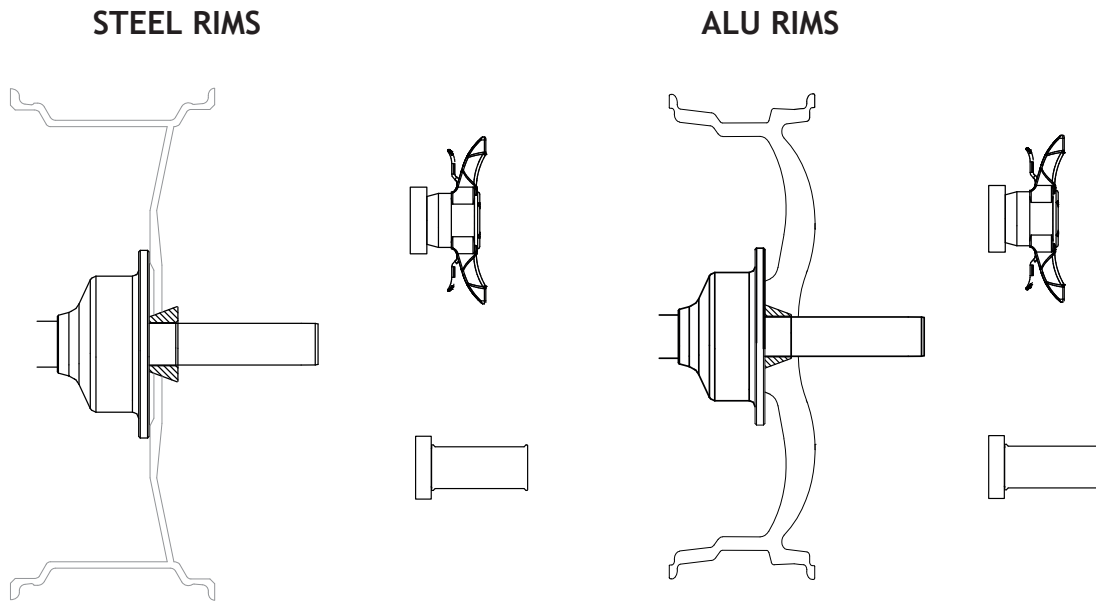
ANY TRACES OF DIRT MAY AFFECT BALANCING ACCURACY.

6. To turn on the wheel balancer press the switch on the side or back of the same; for the models with touchscreen don't touch the screen.



PRESS THE BUTTONS WITH YOUR FINGERS. NEVER USE THE COUNTERWEIGHT GRIPPERS OR OTHER POINTED OBJECTS!

7. Position the wheel on the terminal with the inner part facing the balancer.



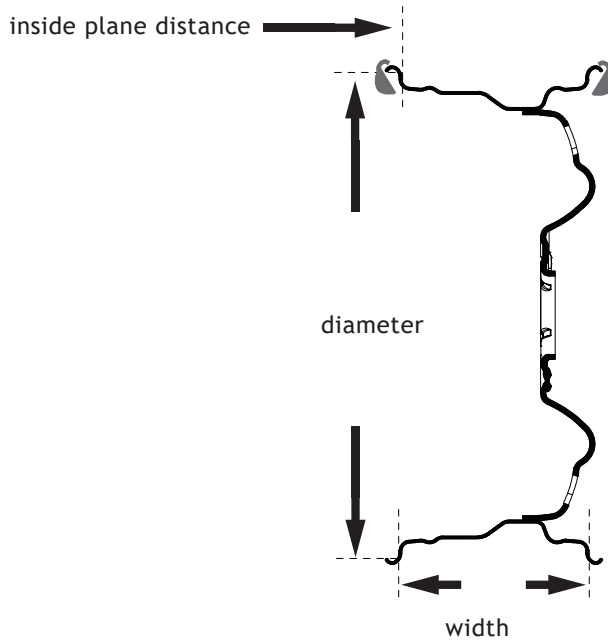
8. Firmly attach the wheel to the balancer shaft using the lock nut. In the pneumatic version, use the specific collar provided. For operation of the spindle with pneumatic locking (constant thrust air spring) connect the wheel balancer to the compressed air mains. The connection fitting is located at the back of the machine. At least 7 kg/cm^2 (~ 0.7 MPa; ~7 bar; ~105 psi) pressure is needed for correct operation of the release device.
9. In the pneumatic version, the pedal allows fastening/releasing the wheel on the adapter using the collar.
10. At this point, you can read the tyre measurements and perform balancing.
11. To perform the spin, lower the splash guard, when fitted and, if necessary and available, press the START button.
12. The wheel is automatically locked when reaching the correct angular position for weight application on the inside and outside, turning it slowly by hand. To unlock the wheel, turn it hard to move it from the correct correction position. If the unbalance is within tolerance, the wheel is locked automatically.



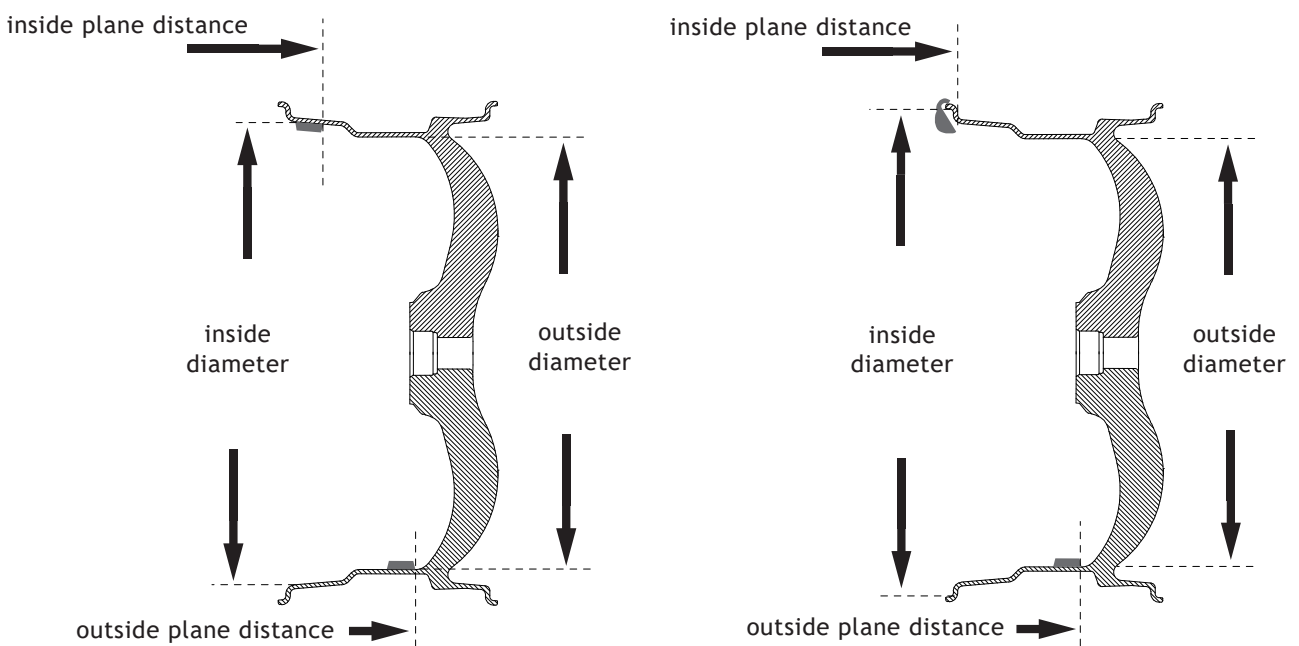
IT IS PROHIBITED TO TOUCH ANY PART OF THE MACHINE DURING THE BALANCING CYCLE.

4. Correction plane identification

- Standard dynamic balancing using only clip-on weights:









- Standard dynamic balancing using adhesive weights or a mix of adhesive and clip-on weights:



5. Use of the wheel balancer

5.1 INITIAL SCREEN



-  displays the residual out-of-balance
-  selects the correction type
-  car/truck selection
-  wheel locks/unlocks
-  main functions screen
( MENU ACCESS DIAGRAM)

-  spindle up indicator
-  spindle down indicator

Dimensions gauge: pulling it out, it measures the wheel dimensions ( WHEEL DIMENSIONS SETTING).

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 of distance + diameter gauge will cause automatic switching from the screen-save menu to the initial screen.

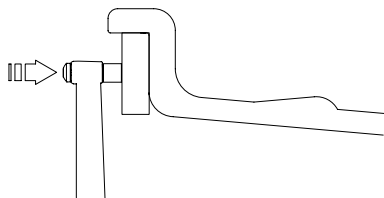


WHEN THE SCREENSAVER IS ACTIVE, AUTOMATIC STARTING ACTIVATED BY THE GUARD IS NOT AVAILABLE FOR SAFETY REASONS.

5.2 STANDARD BALANCING (clip-on counterweights)

5.2.1 Wheel dimensions setting

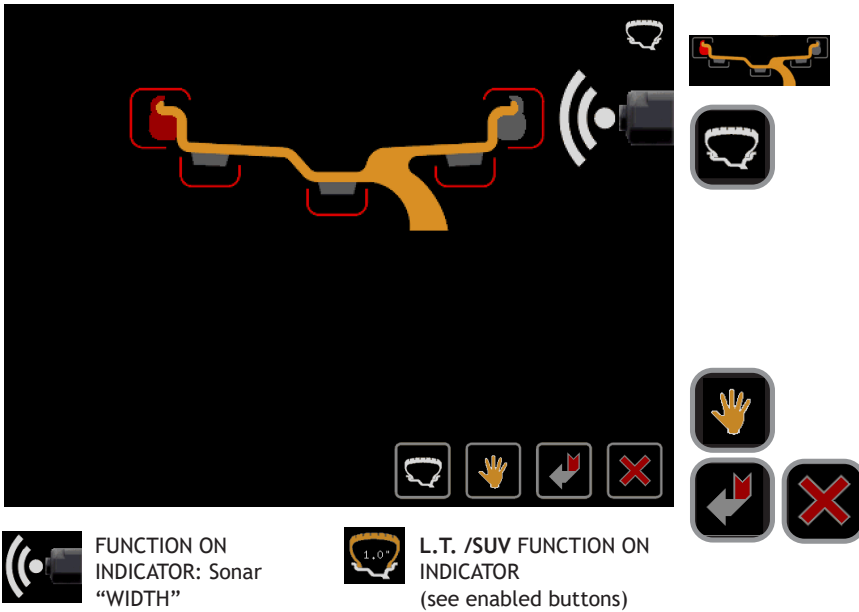
Using the special grip, move the end of gauge against the rim as shown in the figure:



Hold the gauge in position for at least 2 seconds.

If the acoustic signal is enabled ( MENU - ACOUSTIC SIGNAL), the dimensions acquisition is accompanied by a beep.

Set the gauge to the rest position.



selects the type of weight to be applied

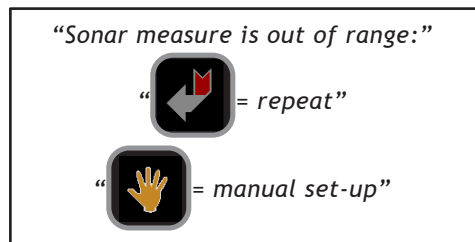
improves the dimensional calibration of large-diameter wheels such as off-road, trucks, wheels which protrude significantly from the rim. Press it several times to select the type of tyre projection (from 1.0" to 2.0"). The option is disengaged at the end of current width Measurement


selects the manual dimension presetting screen


return to the initial screen

Slowly lower the guard to automatically measure the wheel width with LA sonar and perform a measurement spin.



If the width measured is incorrect (out of range), the following message appears:



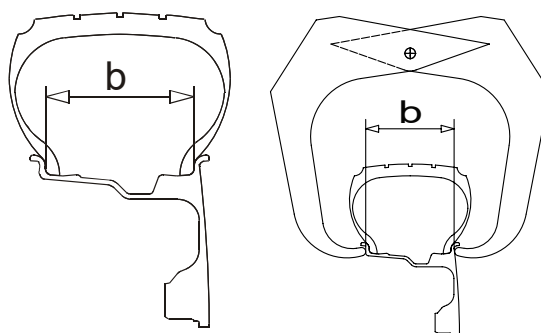
Press  to re-lower the guard and repeat the width measurement.

Press  to go to the dimensions panel where you can manually enter the width measurement.

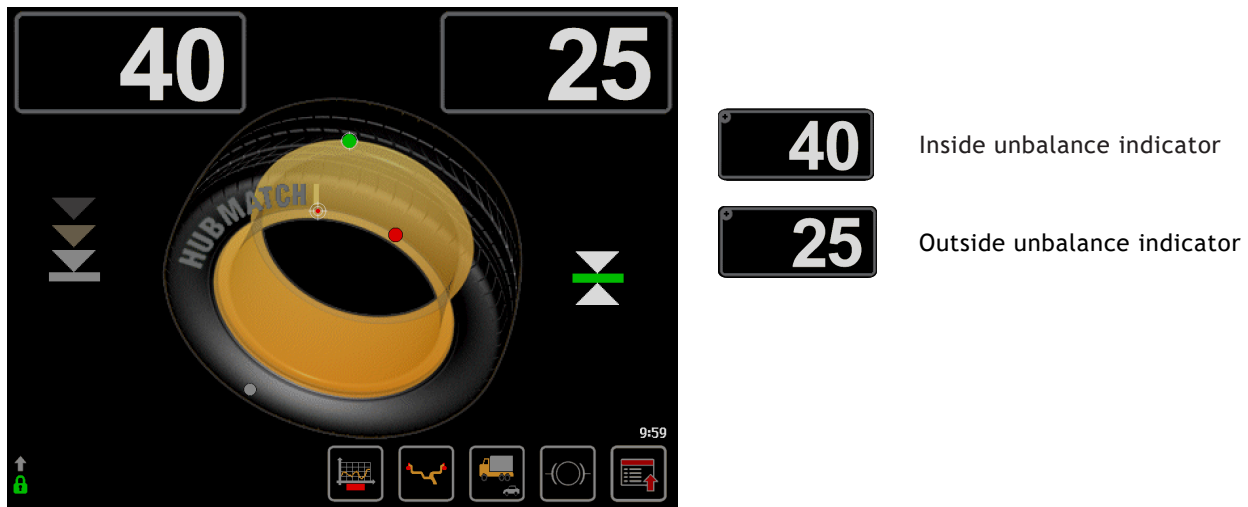
5.2.1.1 Manual width setting (only in the absence of the LA sonar)

Press   to set the width "b" in manual mode.


Normally the "nominal" width is indicated on the wheel; otherwise, measure the dimension "b" with the supplied caliper gauge.



5.2.2 Result of the measurement and weight application



If the unbalance is out of tolerance:

1. At the end of the spin, the wheel automatically comes near to the outer side (on the inner side if the outer side is already within tolerance). The spindle is automatically locked in correction position (if not disabled the wheel lock and for rotation speeds less than 5 rpm).
If the acoustic signal is enabled (👉 **MENU - ACOUSTIC SIGNAL**), a beep will sound when the correction position has been reached.
2. The symbol  is shown on the display on the side corresponding to the active correction plane.
3. Manually apply the number of weights shown on the display on the rim at 12 o'clock using clip-on weights:



IF THE OUT-OF-BALANCE IS LESS THAN THE CHOSEN THRESHOLD VALUE, "OK" APPEARS INSTEAD OF THE OUT-OF-BALANCE VALUE TO INDICATE, ON THAT PARTICULAR SIDE, THAT THE WHEEL IS IN TOLERANCE; PRESS ON THE UNBALANCE INDICATORS TO DISPLAY THE RESIDUAL VALUE BELOW THE CHOSEN THRESHOLD.

4. After applying the weights, spin the wheel to check the correction made checking that both planes are within tolerance.

If [HUBMATCH] appears (👉 **RUNOUT SETUP (OPTION) - HubMatch™**).

Enabled buttons:



enables the eccentricity measurement graph

1. The symbol above the key is displayed in yellow if the first harmonic eccentricity exceeds the limit set in the setup parameters (👉 **RUNOUT SETUP - FIRST HARMONIC LIMIT**)
2. When this push button is held down for more than 1.5 seconds, eccentricity measurement is temporarily disabled (enabled in **SETUP**). To re-enable eccentricity measurement, press the same button again for more than 1.5 seconds.

Every time the machine is switched on, the status of eccentricity measurement reflects the settings in **SETUP**



selects the correction mode. When the mode is changed, the unbalance values are recalculated automatically on the basis of the previous spin. Simultaneous display of the dynamic+static unbalance can be enabled through the special function in Setup (👉 *STATIC ALWAYS ENABLED*)



car/truck selection



wheel locks/unlocks

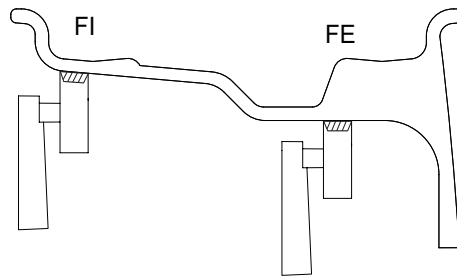


selects the special functions.

5.3 BALANCING WITH ADHESIVE WEIGHTS (ALU)

5.3.1 Wheel dimensions setting

Using the dedicated grip, move the gauge tip up against the inside of the rim and make two consecutive measurements starting from the inside (FI) as shown in the figure. The two preselected positions coincide with the point where the counterweight is to be applied.

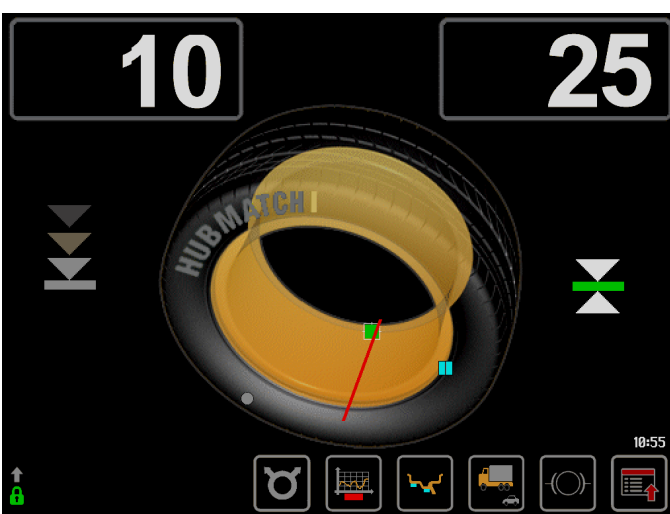


if the acoustic signal is enabled (👉 *MENU - ACOUSTIC SIGNAL*), the dimensions acquisition is accompanied by a beep.

Set the gauge to the rest position.

Slowly lower the guard and perform a measurement spin.

5.3.2 Result of the measurement and weight application



10

Inside unbalance indicator


25

Outside unbalance indicator

If the unbalance is out of tolerance:

1. At the end of the spin, the wheel automatically comes near to the outer side (on the inner side if the outer side is already within tolerance). The spindle is automatically locked in correction position (if not disabled the wheel lock and for rotation speeds less than 5 rpm).
If the acoustic signal is enabled (👉 *MENU - ACOUSTIC SIGNAL*), a beep will sound when the correction position has been reached.



- The symbol  is shown on the display on the side corresponding to the active correction plane.
 If laser option = OFF: after positioning and locking the wheel, apply the weight vertically at the top.
 If laser option = ON: apply the clip-on weights at 12 o'clock. If using adhesive weights, when the correction position is reached, the laser turns on indicating the point where to apply the adhesive counterweight.



IF THE OUT-OF-BALANCE IS LESS THAN THE CHOSEN THRESHOLD VALUE, "OK" APPEARS INSTEAD OF THE OUT-OF-BALANCE VALUE TO INDICATE, ON THAT PARTICULAR SIDE, THAT THE WHEEL IS IN TOLERANCE; PRESS ON THE UNBALANCE INDICATORS TO DISPLAY THE RESIDUAL VALUE BELOW THE CHOSEN THRESHOLD.

- After applying the weights, spin the wheel to check the correction made checking that both planes are within tolerance.


Enabled buttons:



enables the unbalance SPLIT function




enables the eccentricity measurement graph

- The symbol above the key is displayed in yellow if the first harmonic eccentricity exceeds the limit set in the setup parameters ( RUNOUT SETUP - FIRST HARMONIC LIMIT)
- When this push button is held down for more than 1.5 seconds, eccentricity measurement is temporarily disabled (enabled in SETUP). To re-enable eccentricity measurement, press the same button again for more than 1.5 seconds.

Every time the machine is switched on, the status of eccentricity measurement reflects the settings in SETUP



selects the correction mode. When the mode is changed, the unbalance values are recalculated automatically on the basis of the previous spin. Simultaneous display of the dynamic+static unbalance can be enabled through the special function in Setup ( STATIC ALWAYS ENABLED)



car/truck selection







wheel locks/unlocks



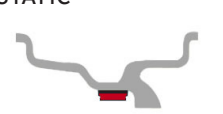


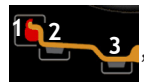
selects the special functions.


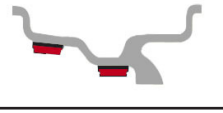
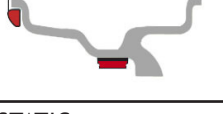

5.4 BALANCING WITH A MIX OF ADHESIVE AND CLIP-ON WEIGHTS AND STATIC BALANCING

After dimension acquisition in standard balancing mode, pressing the buttons  , you can select one of the following correction modes.

 WEIGHT APPLICATION POSITION		
Correction type	Inside	Outside
	Clip-on weight at 12 o'clock	Clip-on weight at 12 o'clock
	Clip-on weight at 12 o'clock	Adhesive weight at 12 o'clock

	Adhesive weight at the point indicated by the internal laser	Clip-on weight at 12 o'clock
	Adhesive weight at the point indicated by the internal laser	Adhesive weight at 12 o'clock
STATIC 	Adhesive weight at the point indicated by the internal laser	

After dimension acquisition in ALU mode, pressing the buttons , you can select one of the following correction modes. The adhesive weight application distance and diameter are measured by means of the automatic distance and diameter gauge, except for the static unbalance where the dimensions acquired are modified following some fixed parameters.

 WEIGHT APPLICATION POSITION		
Correction type	Inside	Outside
	Adhesive weight at the point indicated by the internal laser	Adhesive weight at the point indicated by the internal laser
	Clip-on weight at 12 o'clock	Adhesive weight at the point indicated by the internal laser
STATIC 	Adhesive weight at the point indicated by the internal laser	



IF THE LASER IS DISABLED, ALL THE WEIGHT APPLICATION POSITIONS ARE AT 12 O'CLOCK.

5.5 STATIC UNBALANCE

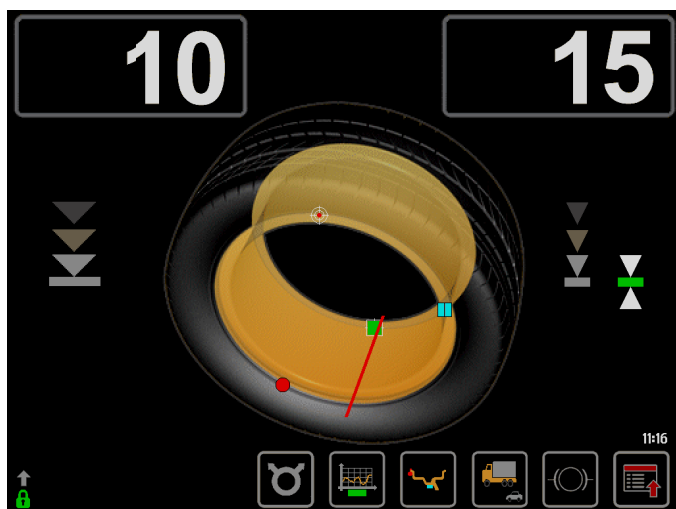






To display the static unbalance press the "correction mode" button, then press near the static weight

The correction weight application diameter cannot be set, but is deduced from the dimensions acquired in standard or ALU mode through interpolation algorithms and the use of fixed parameters. Tolerance, wheel positioning, brake and laser control is the same as for standard balancing, only that it refers to a single correction plane.

5.6 HIDE THE ADHESIVE WEIGHTS (SPLIT)

SPLIT is only possible in the event of static unbalance or ALU external side and is used to hide any adhesive weights correcting unbalance behind the rim spokes.





1. Position the static unbalance or outside ALU in the in the correction position: .
2. Press  and hold down until the laser points to the spoke where you want to hide the weight.
Release the  button.
3. Turn the wheel in the unbalance rotation direction indicated on the screen until the second spoke is in the position indicated by the laser and press the  button.
4. Bring the wheel closer to the indicated correction positions and correct the displayed value.



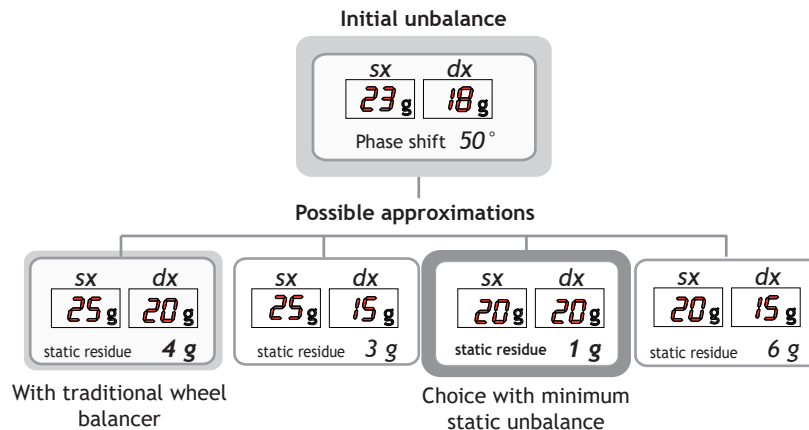
IF THE LASER IS DISABLED, BRING THE SPOKES AT 12 O'CLOCK.

5.7 MULTIPLE USERS

It is possible operate on three different vehicles at the same time, using the same wheel balancer. The system keeps three programs in memory, each with different dimensions set.

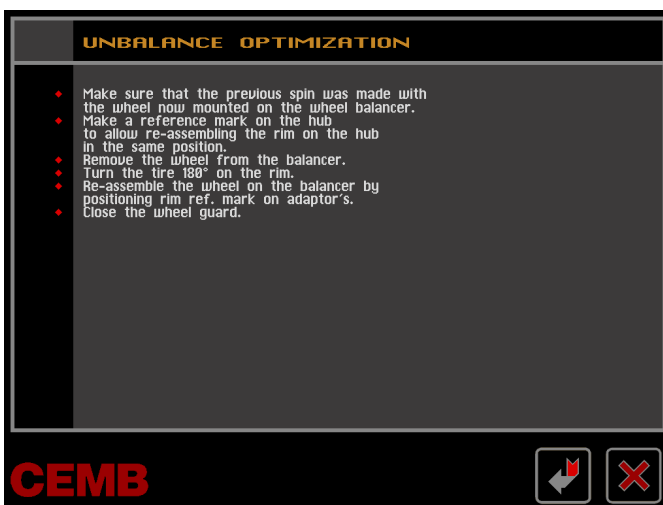
1. Press one of the three buttons to select the user  (1, 2, 3)
2. Lower the guard to balance the wheels
3. Selecting the user , the relative program (1, 2 or 3) is called for subsequent wheel balancing operations without having to enter the dimensions again.

5.8 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 in car mode and with pitch of 50 in every 50 g in truck mode, 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.

5.9 UNBALANCE OPTIMIZATION



returns to the initial screen



returns to the measurement screen

The program allows total wheel out-of-balance to be reduced by compensating, when possible, tyre and rim out-of-balance values. It requires two runs, rotating the tyre on the rim on the second run.

Having performed a run, press + and follow the on-screen instructions.

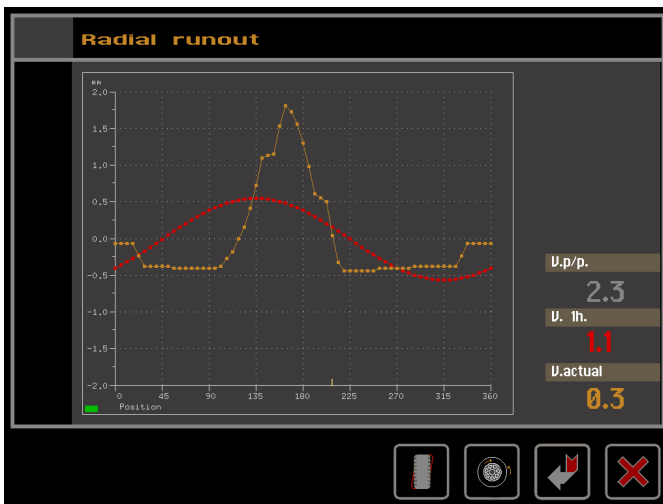
5.10 WHEEL ECCENTRICITY MEASUREMENT AND OPTIMISATION (OPTION)

5.11.1 Wheel eccentricity measurement

If the EMS sonar (Eccentricity Measurement System) is present and correctly positioned in the centre of the tread, it automatically measures the wheel eccentricity (👉 **ECCENTRICITY AND MATCHING: THEORY**) during the unbalance measurement spin.

When the first harmonic tolerance limit is exceeded (👉 **RUNOUT SETUP - FIRST HARMONIC LIMIT**), the  button is shown on the display with a red band.

From the unbalance measurement screen, press  to display the eccentricity measurement graph:



start side runout acquisition procedure (👉 **LATERAL RUNOUT MEASUREMENT PROCEDURE**)



starts side runout acquisition procedure



returns to the initial screen

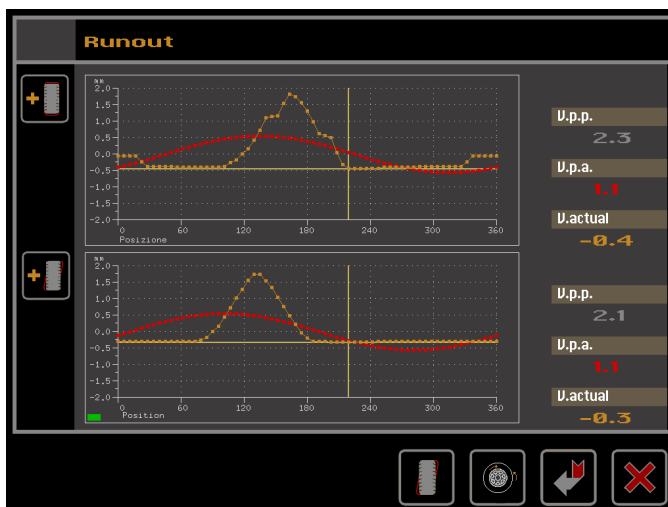
it is possible to access the eccentricity screen without having first carried out the radial eccentricity measurement in order to measure the lateral eccentricity.

if, on the other hand, the radial runout has already been measured, the relevant diagram is displayed.

GRAPH 1 (yellow): shows the real peak-to-peak eccentricity.

GRAPH 2 (red): shows the first harmonic eccentricity.

By moving the wheel, the cursor on the screen shows the current value, with the phase referred to the 12 o'clock position. After measuring the side runout, both diagrams are displayed:




zoom radial runout diagram



zoom lateral runout diagram




IF THIS SYMBOL  APPEARS AT THE LATERAL RUNOUT DIAGRAM, IT MEANS THAT THE SONAR DID NOT MEASURE ALL REQUIRED POINTS AND THE RESULTS SHOWN ON THE SCREEN MAY NOT BE RELIABLE.

REPEAT THE LATERAL RUNOUT MEASUREMENT, MAKING SURE THAT THE SONAR READS ALL POINTS OF THE WHEEL (GREEN SONAR ICON )

5.10.2 Lateral runout measurement procedure

Lower the guard to position the lateral sonar in front of the tyre side, possibly in an area without any raised writing, with the aid of the laser pointer.

Press  to start the lateral eccentricity measurement.



Manually turn the wheel keeping the guard still until the dial shows 100%
At the end of the measurement the system automatically shows the diagram.



IN ORDER TO OBTAIN MORE ACCURATE PHASE VALUES, BEFORE MEASURING THE LATERAL RUNOUT, CARRY OUT A SPIN WITH RADIAL RUNOUT MEASUREMENT.

If the value of the first harmonic is greater than the maximum limit, at the end of the eccentricity measurement, the following window appears:



starts an eccentricity optimization
( **WHEEL ECCENTRICITY OPTIMIZATION**)



returns to the initial screen

5.10.3 Wheel eccentricity optimisation

This procedure is used to assess the possibility of rotating the tyre on the rim to reduce the eccentricity of the wheel to a minimum. The eccentricity optimisation procedure is normally recommended for first harmonic values greater than the maximum limit (👉 **RUNOUT SETUP - FIRST HARMONIC LIMIT**).

Follow the simple instructions shown on the monitor.

The following is displayed at the end of the procedure:



returns to the initial screen

Mark the rim and tyre in the positions indicated on the monitor and rotate the tyre on the rim until the positions are aligned.

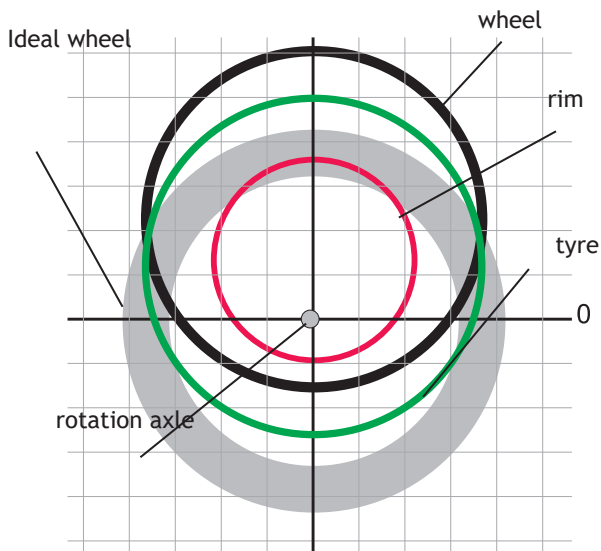
5.11 ECCENTRICITY AND MATCHING: THEORY

The software associated with eccentricity measurement is a powerful tool for determining the need to perform relative rotation between the rim and tyre in order to reduce the eccentricity of the wheel down to acceptable limits. The principle adopted is based on the consideration that a rim with acceptable tolerance, mounted with an acceptable tyre, can statistically generate a total eccentricity which is not acceptable but can be improved by matching.

Generally speaking, rim measurement is not necessary, accurate or useful because:

- To measure the rim it is necessary to remove the tyre. There can be coarse errors on the outside (e.g. aluminium wheels!)
- The two rim sides can be eccentric in a very different way. Therefore to which one to make reference? What is the effect on the tyre mounted?
- To improve the eccentricity of a wheel, **the rim should be eccentric**, to compensate the tyre. And viceversa.
- If after a rotation by 180° of a wheel, the value is still out-of-tolerance, either the tyre or rim are too eccentric: One of the two must be replaced!

Example 1



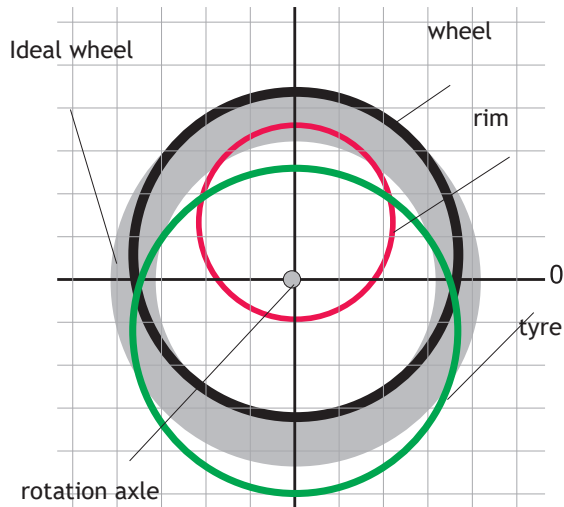
Rim + 0.8 mm
Tyre + 0.6 mm

Wheel + 1.3 mm

Eccentricity of the wheel is excessive, due to an acceptable rim or tyre but randomly placed in an "unfortunate" relative position.

SOLUTION: Rotate the tyre on the rim by 180°
RESULT: wheel eccentricity 0.3 - 0.4 mm (in tolerance)

Example 2



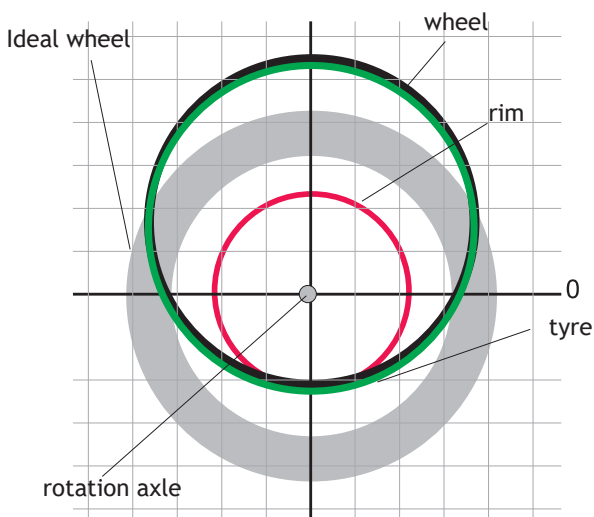
Rim + 0.8 mm
Tyre - 0.6 mm

Wheel + 0.3 mm

Eccentricity of the single items has been compensated.

The wheel is acceptable.

Example 3



Rim 0 mm
Tyre + 1.2 mm

Wheel + 1,2 mm

Eccentricity of the wheel cannot be compensated by the rotation because the rim is perfect!

The wheel is acceptable.

SOLUTION: rotate the tyre on the rim by 180°
RESULT: no improvement is obtained.

5.11.1 Presetting of tolerance on the machine

There is no general rule concerning acceptability of an eccentricity value. As a first approximation we consider it correct to use a threshold of 1 to 1.5 mm. The E/ECE/324 standard prescribes 1.5 mm as max. eccentricity of a rebuilt tyre.

5.11.2 Value of static unbalance, correlated with eccentricity

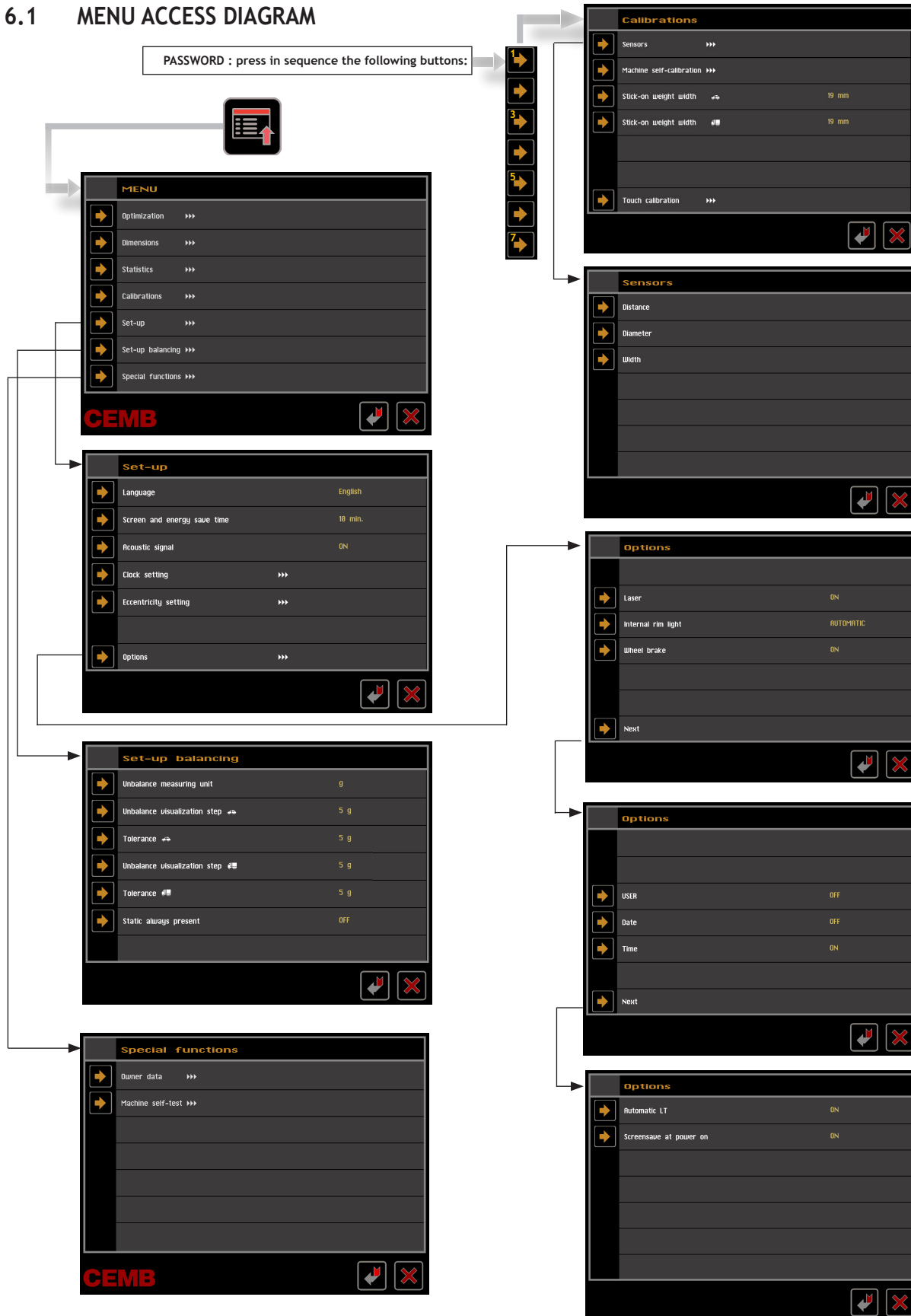
Clear indication is given in the Measurement screen of both the value and position of the static unbalance as well as the eccentricity. In fact, it is interesting to check the correlations of the two values, above all of the two positions. When the two positions have a similar angle ($\pm 30^\circ$ one from the other), there is a **clear sign that an eccentricity is present which can be compensated by matching.**

5.11.3 Value of unbalance corresponding to eccentricity

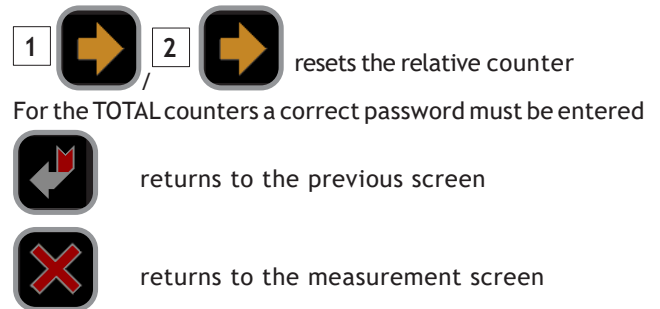
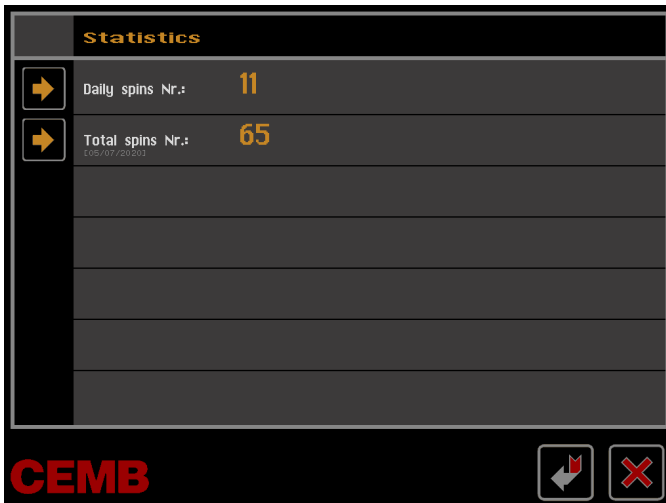
For user's reference, the centrifugal force is calculated corresponding to a certain speed, compared to the force generated by the eccentricity present on the tyre (calculated with an approximate average elastic constant).

6. Menu

6.1 MENU ACCESS DIAGRAM



6.2 STATISTICS




DAILY N° OF RUNS:

Indicates the number of runs performed as from switching on the machine. Such parameter is automatically reset after switching the machine off.

TOTAL N° OF RUNS:

Indicates the number of runs starting from the date indicated in square brackets. This parameter remains memorized even when the machine is switched off.

6.3 CALIBRATIONS

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

6.3.1 Sensors calibration

6.3.1.1 Distance gauge calibration

To calibrate the distance gauge, set it in rest position and then on the adapter plane.

When done, set the gauge in rest position. If calibration is correct, the wheel balancer is ready for operation, otherwise an error message may be displayed if there are errors or malfunctioning; in this case repeat calibration.

Enabled buttons:




confirms



cancels the distance gauge calibration function if has erroneously been accessed

6.3.1.2 Diameter gauge calibration

Position the gauge rod of the spindle sleeve as indicated in the figure and press .

Rotate the gauge downwards and place the gauge rod in contact with the spindle sleeve as indicated in the figure

and press .

Enabled buttons:



confirms

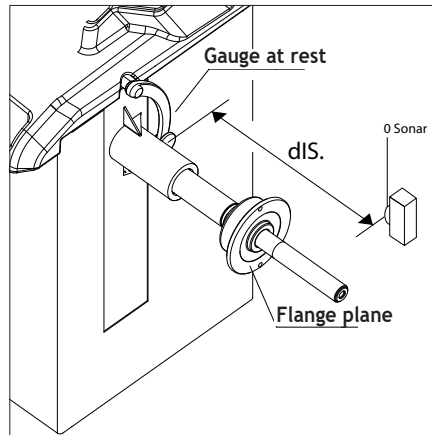


cancels the diameter gauge calibration function if has erroneously been accessed

6.3.1.3 Width gauge calibration

When calibrating the width gauge, set a measurable dimension as follows:

Distance: Gauge at rest → “0” sonar



CHECK THE CALIBRATION BY MAKING A MEASUREMENT ON A WHEEL WITH A STEEL RIM OF KNOWN WIDTH. SHOULD THE MEASUREMENT BE INCORRECT, CORRECT THE CALIBRATION VALUE PROPORTIONAL TO THE ERROR.

Enabled buttons:



sets the distance in mm between the SONAR sensor and the tip of the distance gauge in rest position



confirms



cancels the width gauge calibration function if has erroneously been accessed

6.3.2 Balancing machine calibration

To calibrate the balancing machine, use a wheel with steel rim of average dimensions, e.g. 6” x 15” (±1”).

To properly perform the procedure:

- Mount a wheel on the machine, even unbalanced, and very carefully set its dimensions.



SETTING INCORRECT MEASUREMENTS WILL RESULT IN THE MACHINE NOT BEING CORRECTLY CALIBRATED, AND BALANCING OF SUBSEQUENT WHEELS WILL HENCE BE INCORRECT UNTIL THE MACHINE IS RECALIBRATED WITH THE CORRECT MEASUREMENTS!!

- Select the truck/car mode depending on the type of calibration you want to perform.
- Follow the on-screen instructions.

6.3.3 Car adhesive weight width

It indicates the average width of the standard car adhesive weights available on the market.

To be modified ONLY if the adhesive weights used for correcting the unbalance have a width that differs by +/- 3 mm from the value set on the screen (default=19 mm).

6.3.4 Truck adhesive weight width

It indicates the average width of the standard truck adhesive weights available on the market.

To be modified ONLY if the adhesive weights used for correcting the unbalance have a width that differs by +/- 3 mm from the value set on the screen (default=25 mm).

6.3.5 TOUCH calibration

Touch the touch screen in sequence on the three points shown on the screen. To be carried out ONLY in case of malfunction of the screen pushbuttons.

7. Setup

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.

Enabled buttons:



returns to measurement screen



returns to previous screen



selects the parameter.

7.1 LANGUAGE

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

7.2 SCREEN-SAVER TIME

If this function is enabled, the screensaver will automatically be activated when the machine is not used for a certain period of time. This function can be disabled by setting it to 0.

7.3 ACOUSTIC SIGNAL

When “ON” is selected, the sending of an acoustic signal (beep) is enabled in the following cases:

- when any push button is pressed;
- when dimensions are acquired in automatic mode;
- when the correct angular position for weight application is reached in the Measurement screen.

7.4 SETTING THE CLOCK

Used to set date and time correctly. Follow the instructions on the screen.

7.5 RUNOUT SETUP

Enter the radial runout and side runout setup screen.








7.5.1 Runout unit of measurement

Display the results of the runout measurement in mm or in inches.

7.5.2 Radial runout setup

Enable the display of a menu where to set the following parameters:

Radial runout	Enables/disables radial runout measurement
Limit of first harmonic car	This is the limit of the first harmonic above which it is recommended to rotate the tyre on the rim by 180° Recommended limit = 1.2 mm
Limit of first harmonic truck	This is the limit of the first harmonic above which it is recommended to rotate the tyre on the rim by 180° Recommended limit = 3.0 mm
Matching	At the end of the spin, it enables/disables the display of the window that suggests to carry out eccentricity optimization for runout values exceeding the limit of first harmonic set
HubMatch™	<p>After performing a check spin, the HubMatch™ box will give indication on where to mark the tire, at 12 o'clock, in correspondence of the first harmonic (RFV)</p> <p>Results will be shown in 3 different colors:</p> <p>Green (): HubMatch™ suggested</p> <p>Yellow (): HubMatch™ and Match Mounting recommended</p> <p>Red (): HubMatch™ and Match Mounting possible but not suggested</p> <p>(to modify RFV default limits  FIRST HARMONIC LIMIT)</p> <p>The  symbol indicates to mark the tire when the first harmonic is in position at 12 o'clock.</p>

7.5.3 Side runout setup

it enables wheel lock during motor deceleration at the end of the spin in order to speed up the braking phase:

Side runout	Enables/disables side runout measurement
Limit of first harmonic car	This is the limit of the first harmonic above which it is recommended to rotate the tyre on the rim by 180° Recommended limit = 1.2 mm
Limit of first harmonic truck	This is the limit of the first harmonic above which it is recommended to rotate the tyre on the rim by 180° Recommended limit = 3.0 mm


7.6 OPTIONS

7.6.1 Laser

If enabled, the weight application position is indicated in correspondence to the laser (6 o'clock) to facilitate rim cleaning and adhesive weight application.

7.6.2 Rim interior light

AUTOMATIC: enables/disables the rim interior light to automatically switch on.

MANUAL: enables/disables display of the  button on the measurement screen that allows turning the rim interior light on/off.

7.6.3 Wheel locking enable

OFF: disabled both the wheel locking and the automatic wheel positioning in proximity of the correction position

ON: enables the wheel locking in the correction position

ON3: it enables wheel lock during motor deceleration at the end of the spin in order to speed up the braking phase.

7.6.4 User

Enables/disables user selection display.



7.6.5 Date

Enables/disables date display.

7.6.6 Time

Enables/disables time display.

7.6.7 LT automatic

If set to ON and with EMS enabled, the wheel bulges are automatically calculated; the calculated value can however be modified by pressing the button  ( *WHEEL DIMENSIONS SETTING*).

7.6.8 Power-on screensaver

Enable/disable the display of the screensaver when the machine is powered on.

7.7 BALANCING SETUP

7.7.1 Unit of unbalance measurement

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

7.7.2 Car unbalance display pitch

You can view the unbalances in steps of 5 grams or 1 gram (1/4 oz or 0.1 oz).



FOR FULL USE OF THE WHEEL BALANCER FUNCTIONS, IT IS ADVISABLE TO ALWAYS SET A DISPLAY STEP OF 5 GRAMS (1/4 OZ.).

7.7.3 Car tolerance

This is the unbalance threshold below which “OK” is displayed on the screen instead of the numeric value at the end of the spin.

7.7.4 Truck unbalance display step

It is possible to set the display of unbalance with a step of 50 grams or 10 grams (1 oz or 0.1 oz). For a full use of the balancing machine functions, it is advisable to always set a display step of 50 grams (1 oz).

7.7.5 Truck tolerance

This is the unbalance threshold below which “OK” is displayed on the screen instead of the numeric value at the end of the spin.

7.7.6 Static always enabled

Enables/disables the simultaneous display of the selected correction plane and STATIC unbalance.

7.8 SPECIAL FUNCTIONS

7.8.1 Presetting the customer and user name

The machine can be customised by setting the name that appears on the screensaver.

7.8.2 Wheel balancing machine SELF TEST

An automatic self-diagnostic cycle is provided for easier trouble-shooting. *(Consult the extraordinary maintenance manual or contact Technical Service).*

8. Diagnostics

8.1 INCONSISTENT UNBALANCE READINGS

In some cases, when a wheel that has just been balanced is repositioned on the balancer, the machine can detect an unbalance.

This is not a machine problem but is due to faulty mounting of the wheel on the flange. In other words, when mounting the wheel after initial balancing, it has taken another position with respect to the balancer shaft axis.

If the wheel has been mounted on the flange with screws, the screws may not have been tightened correctly (criss-cross sequence) or the tolerances of the holes drilled in the wheel may be too large. Small errors, up to 10 grams (0.4 oz), are to be considered normal in wheels locked with the relative cone: The error is normally greater for wheels locked with screws or studs.

If, after balancing, the wheel is still unbalanced when refitted on the vehicle, this could be due to an unbalanced brake drum or, very often, the tolerances of the holes drilled in the rim and drum are too large. In this case, balancing should be performed using a balancer with the wheel mounted on the vehicle.



THE INFORMATION IN THE POSSIBLE REMEDY COLUMN REQUIRES WORK TO BE PERFORMED BY SPECIALIST TECHNICIANS OR OTHER AUTHORISED PEOPLE WHO MUST ALWAYS WORK USING THE PERSONAL PROTECTIVE EQUIPMENT INDICATED IN THE INSTALLATION MANUAL. IN SOME CASES, THIS WORK CAN BE PERFORMED BY A NORMAL OPERATOR.

ERROR	PROBLEM	POSSIBLE SOLUTIONS
Black	The wheel balancer does not switch on	<ul style="list-style-type: none"> Verify correct connection to the mains Verify and eventually replace the fuses on the power card Verify monitor function Replace the computer board
Err. 1	No rotation signal	<ul style="list-style-type: none"> Check in self-diagnostics that the encoder functions properly Replace the phase pick-up board Replace the computer board
Err. 2	Speed too low during detection During the unbalance measurement revolutions, the wheel speed has fallen to below 42 rpm	<ul style="list-style-type: none"> Make sure that a vehicle wheel is mounted on the wheel balancer Use the self-diagnostics function to check the encoder Disconnect the piezo connectors from the board and do a spin (if no error is detected, replace the piezo sensors) Replace the CPU board
Err. 3	Unbalance too high	<ul style="list-style-type: none"> Verify wheel dimension settings Check detection unit connections Perform machine calibration Mount a wheel with more or less known unbalance (less than 100 grammes) and verify the response of the machine Replace the computer board
Err. 4	Rotation in opposite direction After pressing [START], the wheel starts turning in the opposite direction (anticlockwise)	<ul style="list-style-type: none"> Check in self-diagnostics that the encoder functions properly Check the bearing/spring of the phase generator
Err. 5	Guard open	<ul style="list-style-type: none"> Reset the error Close the guard Verify the function of the protection Switch
Err. 7/ Err. 8/ Err. 10	NOVRAM parameter read error	<ul style="list-style-type: none"> Repeat machine calibration Shut down the machine Wait for a minimum time of - 1 min Re-start the machine and verify correct operation Replace the computer board
Err. 9	NOVRAM parameter write error	<ul style="list-style-type: none"> Replace the computer board

Err. 11	Speed too high error During unbalance measurement rotation, wheel speed is more than 270 rpm	<ul style="list-style-type: none"> ▪ Check if there is any damage or dirt on the timing disc ▪ Check in self-diagnostics that the encoder functions properly ▪ Replace the computer board
Err.14 / Err.15 / Err.16 / Err.17 / Err.18 / Err.19	Unbalance measurement error	<ul style="list-style-type: none"> ▪ Check in self-diagnostics that the encoder functions properly ▪ Check detection unit connections ▪ Verify machine earth/ground connection ▪ Mount a wheel with more or less known unbalance (less than 100 grammes) and verify the response of the machine ▪ Replace the computer board
Err. 22	Maximum number of spins possible for the unbalance measurement has been exceeded	<ul style="list-style-type: none"> ▪ Check that a vehicle wheel has been mounted on the wheel balancer ▪ Check in self-diagnostics that the encoder functions properly ▪ Replace the computer board
Err.23	Approach function error	<ul style="list-style-type: none"> ▪ Check in self-diagnostics that the encoder functions properly ▪ Check that the wheel can rotate freely
Err.24	STOP pushbutton pressed during measurement spin	<ul style="list-style-type: none"> ▪ Check the correct operation of the pushbutton panel ▪ Do not press the STOP pushbutton during measurement spin
Err. 30	Clock error	<ul style="list-style-type: none"> ▪ Replace the computer board
Err. 31	Lowered spindle. Spin enabled without first lifting the spindle	<ul style="list-style-type: none"> ▪ Check functioning of the spindle closing microswitch ▪ Lift the spindle ▪ Lower the guard
Err. 65	Printer timeout	<ul style="list-style-type: none"> ▪ Check that a printer is present ▪ Check the code of the processor card ▪ Check the printer <-> processor card connection ▪ Run the printer test function
Err. 66	Printer buffer error	<ul style="list-style-type: none"> ▪ Reset the printer ▪ Repeat the print function
Err. 98	Dimensions error	<ul style="list-style-type: none"> ▪ Repeat the automatic measurement of the dimensions ▪ Calibrate the diameter gauge

9. Maintenance

9.1 GENERAL



BEFORE PERFORMING ANY MAINTENANCE OPERATIONS, MAKE SURE THE MACHINE HAS BEEN DISCONNECTED FROM THE MAINS POWER SUPPLY. ALWAYS USE THE PERSONAL PROTECTIVE EQUIPMENT INDICATED IN THE INSTALLATION MANUAL.

9.1.1 Introductory notes

This machine has been designed so as not to require routine maintenance, apart from accurate periodic cleaning. It is important to keep the machine perfectly clean in order to prevent dust or impurities from compromising the operation of the balancer.



THE PEOPLE RESPONSIBLE FOR CLEANING THE AREA WHERE THE MACHINE IS INSTALLED MUST WEAR PERSONAL PROTECTIVE EQUIPMENT IN ORDER TO WORK IN SAFETY AND ACCORDING TO THE CURRENT OCCUPATIONAL HEALTH AND SAFETY REGULATIONS. IN ANY EVENT, THE MAINTENANCE MUST BE CARRIED OUT EXCLUSIVELY BY A SPECIALISED TECHNICIAN TRAINED TO OPERATE ACCORDING TO CEI EN 50110-1 (NFPA70E-2004 SECTION 400.11).

As extraordinary maintenance must be performed by service staff or, in any case, by specifically authorised and trained people, is not dealt with in this manual.

9.1.2 Safety rules

Performing specialist activities on the equipment, particularly if the guards need to be dismantled, exposes people to serious danger due to the presence of potentially live parts.

The rules shown below must be scrupulously followed.

People must always use the Personal Protective Equipment indicated in the Installation Manual. During activities, unauthorised people may not access the equipment and WORK IN PROGRESS signs will be erected in the department in such a way that they are visible from every place of access.

Specialist staff must be authorised and especially trained concerning the dangers that may arise during operation and the correct methods for avoiding them. They must always work with great care and pay full attention.

If, exceptionally, the staff removes the guards to carry out a particular specialist technical maintenance, inspection or repair job, they are required to put them back after work.

After work, staff must make sure that foreign objects, in particular mechanical pieces, tools or devices used during the operative procedure that could cause damage or malfunctions are not left inside the balancer.

For safety, before starting work, maintenance, inspection and repair staff must disconnect all power sources and take all the necessary preventive safety measures.

As well as operating frequencies, the operations described below indicate the qualifications that staff must possess in order to perform the operation.

9.1.3 Replacing fuses

Some protection fuses are located on the power board (see wiring diagrams) accessible by dismantling the weight shelf). If fuses require replacement, use ones with an identical current intensity.

9.1.4 Cleaning the screen

Use a soft cloth and NON-ABRASIVE commercial glass/plastic cleaning spray or ethanol or natural detergents.

DO NOT USE:

- Organic solvents type nitro thinner
- Turpentine
- Petrol
- Trichloroethylene
- Acetone

10. Disposal



THE INSTRUCTIONS IN THIS CHAPTER ARE INDICATIVE. REFER TO THE REGULATIONS IN FORCE IN THE COUNTRY WHERE THE EQUIPMENT IS USED.

10.1 DISPOSING OF THE BALANCER

The balancer must be disposed of after dismantling the various parts.

For disposal operations, as well as wearing the Personal Protective Equipment indicated in the INSTALLATION MANUAL, refer to the instructions and diagrams in this manual. If necessary, request specific information from the manufacturer.

Once you have removed the various parts and components, separate them into the different types of materials according to the differentiated waste disposal regulations in force in the country where the machine is dismantled.

If the various components must be stored before being taken to the dump, make sure to keep them in a safe place protected from atmospheric agents in order to prevent them from contaminating the ground and the water table.

10.2 DISPOSING OF ELECTRONICS COMPONENTS



Community directive 2002/96/EC, assimilated in Italy with legislative decree n° 151 of 25th July 2005, requires electrical and electronic equipment manufacturers and users to comply with a number of obligations concerning the collection, treatment, recovery and disposal of this waste.

Please scrupulously comply with these waste disposal regulations.

Remember that abusive dumping of this waste leads to the application of the administrative penalties established by current law.

11. Spare parts

11.1 IDENTIFICATION AND ORDERING METHOD

The various parts can be identified using the exploded drawings, the electrical drawings and diagrams in the machine technical file which is archived by the Manufacturer to which a request can be made.

For off-the-shelf parts, the technical manuals or the supplier's original documents can be provided if the Manufacturer deems this to be useful.

If not supplied, this documentation is also included in the machine Technical File, archived by the Manufacturer, as regards by Ministerial Decree 2006/42/CE.

In this case, contact the Technical Service to identify the required piece.

If the required pieces are not in any position or they cannot be identified, contact the Technical Service, specifying the type of machine, its serial number and year of construction.

This information is indicated on the machine identification plate.

12. Attached documentation

If not supplied, this documentation is included in the Technical File of the machine, archived by the Manufacturer.

In this case, contact the Technical Service for detailed information concerning the machine.