



EQUILIBRATRICE  
*WHEEL BALANCER*  
ÉQUILIBREUSE  
*AUSWUCHTMASCHINE*  
EQUILIBRADORA

# **B 235 Evo**

Cod. 4-119454 del 09/2015

Italiano  
*English*  
Français  
*Deutsch*  
Español

Manuale d'uso  
*Operator's manual*  
Utilisation et entretien  
*Betriebs und Wartungsanleitung*  
Uso y mantenimiento

# ORIGINAL INSTRUCTIONS

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# INTRODUCTION

The purpose of this manual is to provide the owner and operator with effective and safe instructions for the use and maintenance of the wheel balancer.

Follow all of the instructions carefully and your machine will assist you in your work and give long-lasting and efficient service, in keeping with manufacturer traditions.

The following paragraphs define the levels of danger regarding the machine, associated with the warning captions found in this manual.

## **DANGER**

**Refers to immediate danger with the risk of serious injury or death.**

## **CAUTION**

**Dangers or unsafe procedures that can cause serious injury or death.**

## **WARNING**

**Dangers or unsafe procedures that can cause minor injuries or damage to property.**

Read these instructions carefully before starting the machine. Keep this manual and all illustrative material supplied with the machine in a folder near it where it is readily accessible for consultation by the operators.

The technical documentation supplied is considered an integral part of the machine; in the event of sale all relative documentation must remain with the machine.

The manual is only to be considered valid for the machine model and serial number indicated on the data plate.



## **CAUTION**

**Adhere to the contents of this manual: the producer declines all liability in the case of actions not specifically described and authorised in this manual.**

## **NOTE**

Some of the illustrations contained in this manual were derived from photos of prototypes: the standard production machines may differ in some details.

These instructions are for the attention of personnel with basic mechanical skills. We have therefore condensed the descriptions of each operation by omitting detailed instructions regarding, for example, how to loosen or tighten the fixing devices on the machine. Do not attempt to perform operations unless properly qualified and with suitable experience. If in need of assistance, call an authorised assistance centre.

# TRANSPORT, STORAGE AND HANDLING

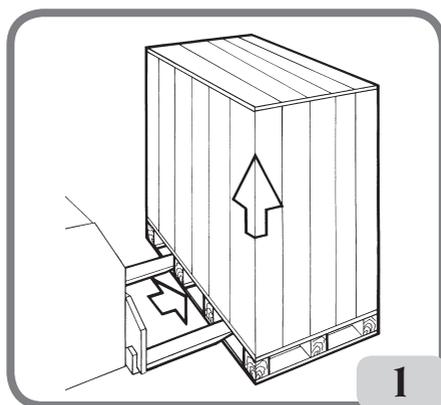
## Handling prior to installation

The basic wheel balancer packaging consists of 1 wooden crate containing:

- the wheel balancer (Fig.8)
- equipment;
- the wheel guard and corresponding mounting tube (C, Fig.4a - D, Fig. 4a).

Before installation, the wheel balancer must be shipped in its original packaging, making sure that the machine is maintained in the position indicated on the outer packaging.

The machine can be moved by placing the packaging on a wheeled trolley or inserting the forks of a fork lift truck in the relative slots in the pallet (Fig. 1).



- Packaging dimensions:

Length	Depth	Height	Weight	Packaging weight
(mm)	(mm)	(mm)	(kg)	(kg)
1410	890	1260	193 (vers. NO C) 197 (vers. C)	80

- The machine must be stored in an environment meeting the following requirements:

- relative humidity ranging from 20% to 95%;
- temperature ranging from -10° to +60°C.



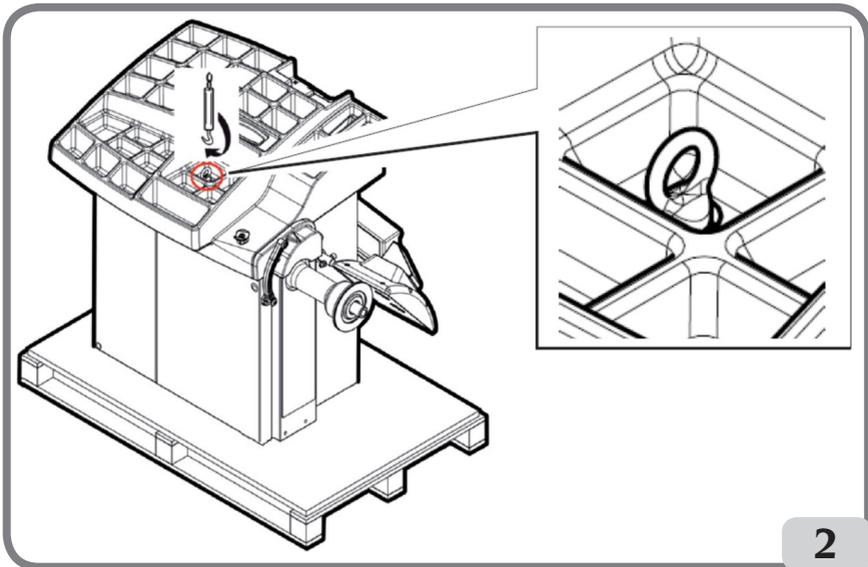
## WARNING

Do not stack more than two packs to avoid damaging them.

### Handling for installation

The machine may be handled and manoeuvred for installation as follows:

- Remove the three brackets anchoring the machine to the pallet
- Lift the machine with a hoisting hook for the weight of the machine, applied to the specific eye-bolt fixed to the machine for lifting as illustrated in figure 2
- Move the machine into the desired position and set down on the floor
- Detach the hoisting hook from the machine
- Remove the eye-bolt, then fit the specific plug supplied in the hole.



## CAUTION

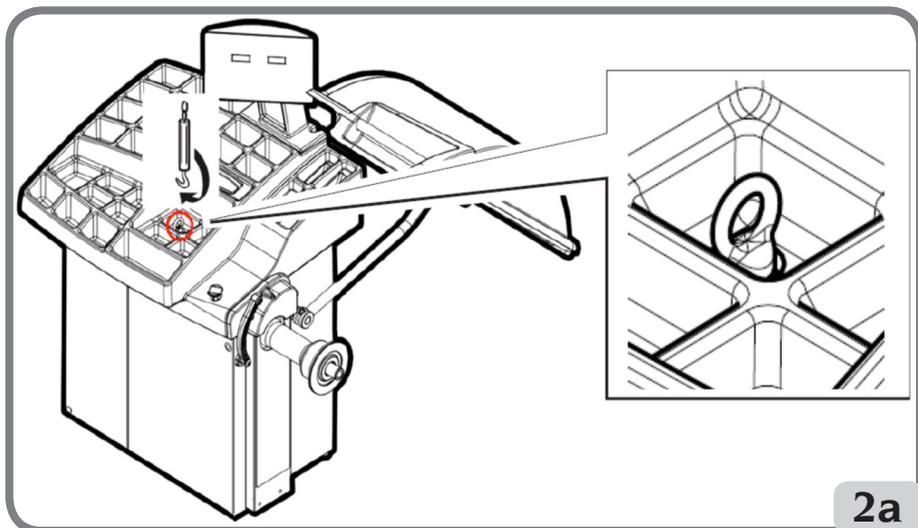
When moving the machine, do not use:

- the wheel shaft
  - the weight tray
  - the display head
- as a gripping point.

## Handling and manoeuvring after installation

The machine may be handled and manoeuvred after installation as follows:

- Disconnect the power cable from the socket
- Remove the plug in one of the trays of the weight holder cover
- Screw the eye-bolt supplied completely onto the threaded pin in the hole
- Lift the machine with a hoisting hook suitable for the weight of the machine, applied to the specific eye-bolt fixed to the machine for lifting as illustrated in figure 2a
- Move the machine as required and set down on the floor
- Detach the hoisting hook from the machine
- Remove the eye-bolt, then refit the plug removed previously from the weight tray cover



### CAUTION

When moving the machine, do not use:

- the wheel shaft
  - the weight tray
  - the display head
- as a gripping point.

# INSTALLATION



## CAUTION

Take the utmost care when unpacking, assembling, lifting and setting up the machine as indicated below.

Failure to observe these instructions can damage the machine and compromise the operator's safety.

Remove the original packaging materials after positioning them as indicated on the packaging and **keep them intact so the machine can be safely shipped at a later date if necessary.**



## CAUTION

Choose the place of installation in compliance with local regulations on occupational safety.

**In particular, the machine must only be installed and used in protected environments where there is no risk of anything dripping onto it.**

**IMPORTANT:** for the correct and safe operation of the machine, the lighting level in the place of use should be at least 300 lux.

The floor must be strong enough to support a load equal to the weight of the equipment plus the maximum load allowed. The support base on the floor and the envisaged fixing means must also be taken into account.

Environmental operating conditions must comply with the following requirements:

- relative humidity ranging from 30% to 80% (without condensation);
- temperature ranging from 0° to +50°C.



## WARNING

**For information concerning the technical features, warnings and maintenance instructions consult the related operator manuals provided with the documentation of the machine.**



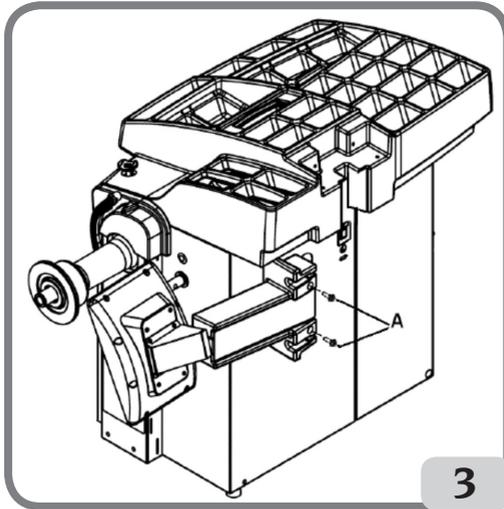
## CAUTION

**The machine must not be operated in potentially explosive atmospheres.**

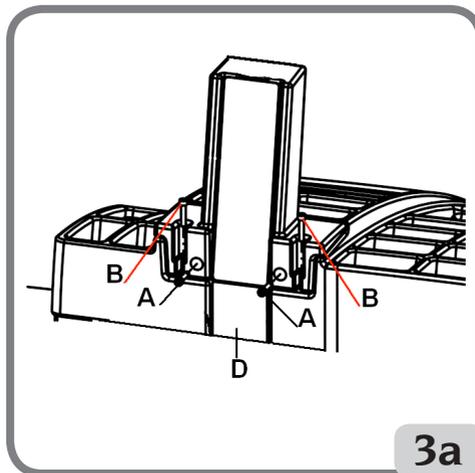
The machine is supplied partially disassembled and is to be assembled according to the procedures described below.

### Head assembly (Fig.3/3a/3b)

- loosen the screws M8 (A, Fig.3) that fasten the head to the body on the rear side of the machine;



- turn the head to a vertical position and position it on the weight tray cover as shown in the figure 3a placing the cables inside the machine;

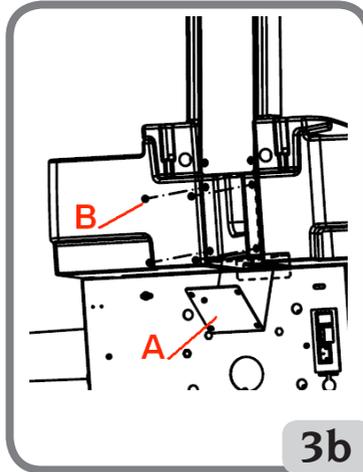


- fix the head by first tightening the two screws A and then the two screws B shown in the previous figure;
- Fit the closing plate for the weight tray cover A using the supplied screws B (Fig.3b).



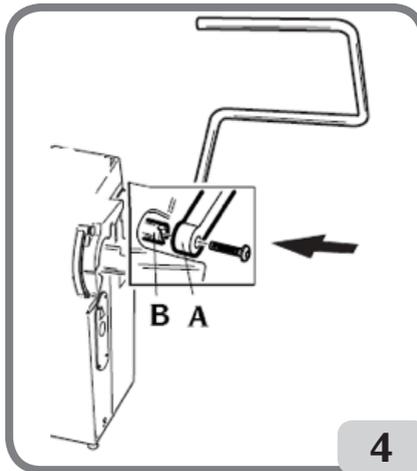
## CAUTION

Correctly fit the plate as shown below in the figure.



### Installing the wheel guard with the corresponding mounting (Fig. 4)

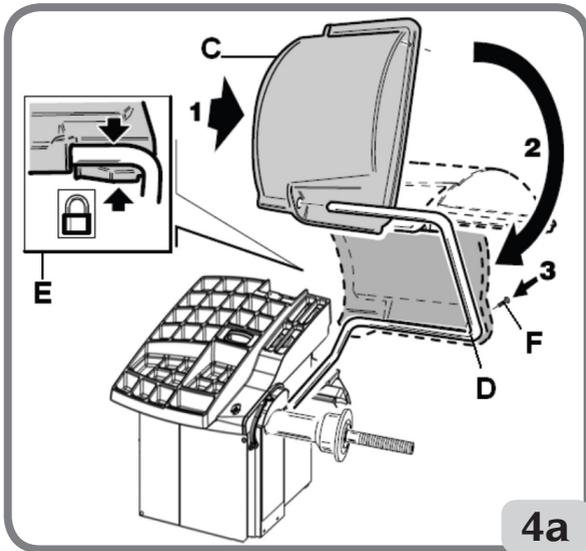
- Install the bush (A, fig. 4) on the rotation pivot (B, fig. 4). While doing this, ensure that the groove on the pivot is aligned with the pin in the bush;



- Fasten the tube on the pivot using the M12 screw supplied.
- Insert the metal tube (D, Fig. 4a) into the two plastic guard front holes (C, Fig. 4a);
- Couple the guard to the rear side of the tube by inserting it into the correct position

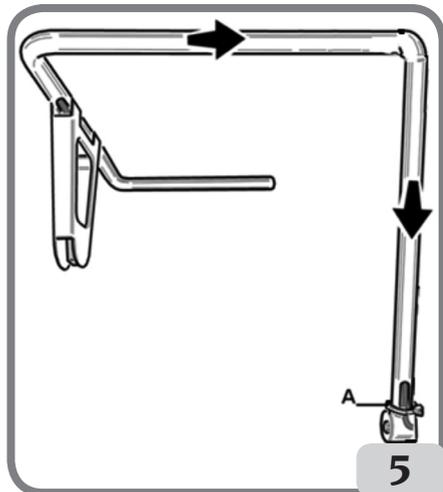
with snap-in coupling (E, Fig. 4a);

- Secure the wheel guard by tightening the screw provided (F, Fig. 4a).

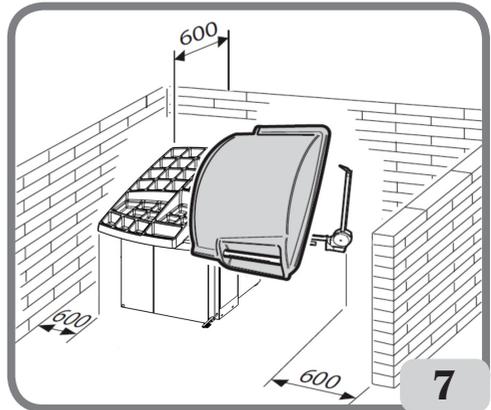
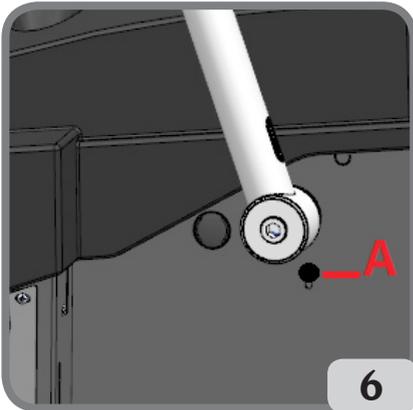


### Assembly of the ultrasonic sensor and its “optional accessory supplied on request” support for automatic width measurement

- insert the ultrasonic sensor cable in the slots on the metal pipe (see fig.5), fixing the cable in place with hose clamp supplied (A, fig.5)



-fasten the ultrasonic sensor support to the guard pipe using the three M8 screws provided (fig. 5a);

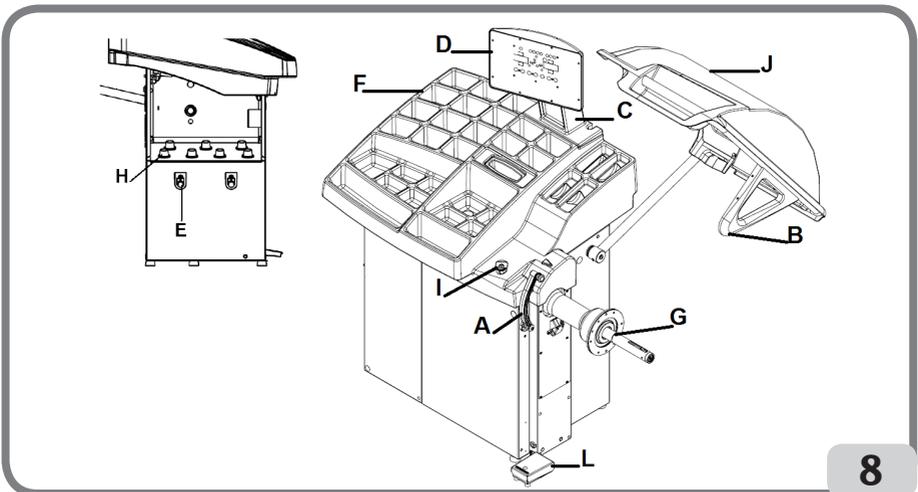


- connect the sensor cable to the connector on the side of the casing (A, fig.6)

**IMPORTANT:** after installing the ultrasonic sensor, calibrate the sensor as described in the paragraph "Calibrating ultrasonic width measuring sensor".

After assembling the machine, position it in the selected place and make sure that the spaces surrounding it are at least equal to the ones indicated in fig.7.

### Main working parts (Fig. 8)



- (A) Automatic diameter and distance measuring arm
- (B) Automatic ultrasonic sensor for measuring the width (optional)
- (C) Head
- (D) Display panel
- (E) Flange holder

- (F) weight tray
- (G) wheel support shaft
- (H) cone holder
- (I) anvil
- (J) wheel guard
- (L) control pedal C

## ELECTRICAL HOOK-UP

On request, the wheel balancer can be set up by the manufacturer to operate with the power supply available in the place of installation. The set-up data for each machine are given on the machine data plate and on a special label attached to the power supply connection cable.



### CAUTION

**Any operations for hooking up to the workshop electrical board must be carried out only by qualified technicians in compliance with the regulations in force, under the responsibility and at the charge of the customer.**

- The electric hook-up must be performed according to:
  - absorbed power specifications indicated on the machine dataplate.
  - the distance between the machine and the electric hook-up point, so that voltage drops under full load do not exceed 4% (10% when starting up) of the rated voltage specified on the data plate.
- The user must:
  - fit a plug that respects the current regulations onto the power supply cable;
  - connect the machine to its own electrical connection fitted with a suitable 30-mA current sensitive circuit breaker;
  - fit power supply protection fuses sized in compliance with specifications in the main wiring diagram of this manual;
  - provide the workshop electric installation with an efficient grounding circuit.
- prevent unauthorised use of the machine, always disconnect the power supply plug when the machine is not used (switched off) for extended periods of time.
- If the machine is connected directly to the power supply by means of the main electrical board and without the use of a plug, install a key-operated switch or suitable lock-out device to restrict machine use exclusively to qualified personnel.



### CAUTION

**For the machine correct functioning it is vital to have a good ground connection. NEVER connect the machine ground wire to a gas pipe, water pipe, telephone cable or any other unsuitable object.**

# COMPRESSED AIR HOOK-UP



## CAUTION

**All compressed air hook-ups must be carried out by qualified personnel only.**

- The hook-up to the workshop's pneumatic system must ensure a minimum pressure of 7 bar (100 psi). Lower pressure levels may prevent the machine's AUTOMATIC WHEEL LOCKING SYSTEM C from working properly.
- A universal union is used for connection to the compressed air system. No special or additional adaptor is needed for connection. A pressure-resistant hose with 6mm inner diameter and 14mm outer diameter must be fastened to the notched union using the clamp provided with the machine.

## SAFETY REGULATIONS



## CAUTION

**Non-compliance with the instructions and danger warnings can cause serious injuries to the operator or other persons.**

**Do not operate the machine until you have read and understood all the danger/warning notices in this manual.**

In order to operate the machine correctly, it is necessary to be a qualified and authorised operator, able to be trained and to know the safety regulations. Operators are expressly forbidden from using the machine under the influence of alcohol or drugs capable of affecting physical and mental capacity.

The following conditions are essential:

- the operator must be able to read and understand the contents of this manual;
- have a thorough knowledge of the features and characteristics of the machine;
- keep unauthorised persons well clear of the working area;
- make sure that the machine has been installed in compliance with all relevant standards and regulations in force;
- make sure that all machine operators are suitably trained, that they are capable of using the machine correctly and safely and that they are adequately supervised during work.
- do not touch power lines or the inside of electric motors or any other electrical equipment before making sure that they have been powered off;
- read this booklet carefully and learn how to use the machine correctly and safely;
- always keep this user manual in a place where it can be readily consulted and do not fail to refer to it.



## CAUTION

**Do not remove or deface the DANGER, WARNING, CAUTION or INSTRUCTION decals. Replace any missing or illegible decals. If one or more decals have been detached or damaged, they can be replaced by your nearest manufacturer dealer.**

- When using and carrying out maintenance on the machine, observe the unified indus-

trial accident prevention regulations for high voltage industrial equipment and rotating machinery.

- Any unauthorised modification to the machine releases the manufacturer of all liability in the event of damage or personal injury resulting from said modification. Specifically, tampering with or removal of the machine safety devices is a breach of the regulations relating to Safety at Work.



### CAUTION

**During work and maintenance operations, always tie back long hair and do not wear loose clothing, ties, necklaces, wristwatches or any other items that may get caught up in the moving parts.**

### Key to caution and instruction labels



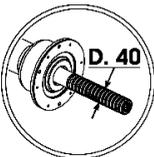
Never use the wheel spin shaft as a lifting point for the machine.



Unplug the power supply plug before performing any maintenance/repair operations on the machine.



Do not lift up the guard when the wheel is turning.



Please use centring accessories with hole diameter 40 mm.

# MAIN FEATURES

- Low balancing speed:
  - minimises wheel spin times;
  - reduces risk due to rotating parts;
  - saves energy.
- Automatic sensor for measuring the distance and diameter
- AWD (Auto Width Device) programme for measuring the width using an ultrasonic sensor (if fitted).
- “AWC” (Auto Width Calculation) programme for enabling the manual insertion of the width.
- Automatic brake for stopping the wheel at the end of the spin.
- Wheel-holder shaft locking brake
- STOP button to stop the machine immediately.
- Side flange holders.
- Top tray to take weights of all types.
- Automatic start by lowering the guard.
- Luminous digital display unit double display and 3D graphics.
- Microprocessor processing unit (16 bit).
- Resolution: 1g (1/10oz).
- Wide selection of programmes making the machine easy to use.
- Unbalance value display in grams or ounces.
- Unbalance display rounding-off setting.
- Balancing modes available:
  - *Standard* dynamic on both rim sides
  - *Alu / ALU P* seven different routines for alloy rims
  - *Motorcycle Dynamic* on both sides of motorcycle rims
  - *Motorcycle ALU* dynamic on both sides of alloy motorcycle rims
  - *Static* on a single side.
- “**Shift planes**” programme (in ALU P) for using multiple five gram weights, i.e.: available without the need for partial cuts.
- “**Hidden Weight**” programme (in ALU P) in order to divide the outer side balancing adhesive weights into two equal weights positioned behind the spokes of the rim.
- “**Split Weight**” programme (motorcycle programmes) to divide the weight into two equivalent values to be placed on either side of the spoke.
- “**OPT flash**” programme for rapid optimisation of operating noise reduction.
- “FSP” (Fast Selection Program) programme for the automatic selection of the balancing programme.
- General utility programmes:
  - Calibration
  - Service
  - Diagnostics
- Independent working environments that allow a maximum of two operators to work in parallel without needing to reset any data.
- RPA: - Automatic wheel positioning in the position where the balancing weight has to be applied.
- Possibility to select the position for applying the adhesive weight:
  - Vertical plane in the lower part of the wheel (H6) using the LASER line.

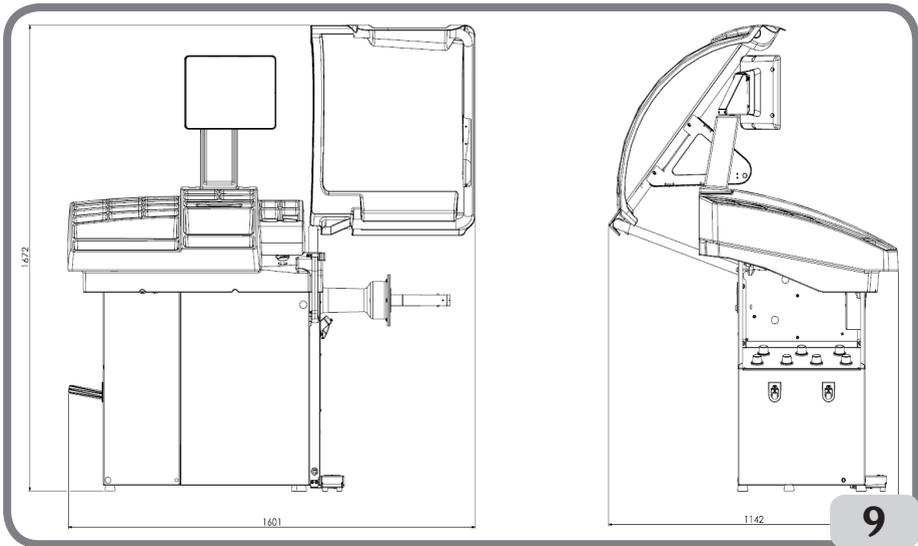
- Vertical plane in the upper part of the wheel (H12)
- CLIP: using the weight-holder terminal in the ALU P balancing programmes (in all the other H12 balancing programmes)
- LED light
- LASER indicator

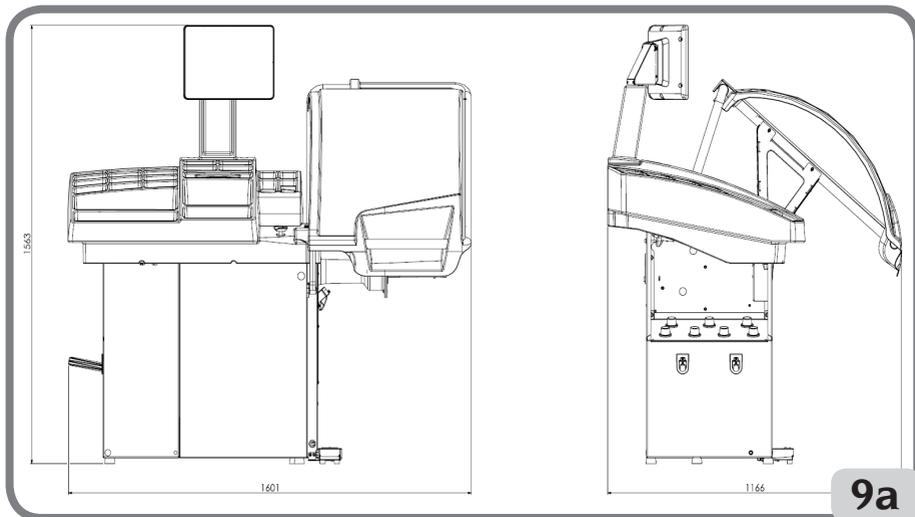
## TECHNICAL DATA

- Single-phase power supply voltage ..... 100/115  $\pm$ 10%, 200/230 V  $\pm$ 10%, 50/60 Hz
- Rated power ..... 100 W
- Rated current ..... 1A at 100-115V, 0.5A at 200-230V
- Balancing speed ..... 90/130 rpm
- Maximum unbalance value calculated ..... 999 grams
- Average spin time (with 5"x14" wheel) ..... 7 sec
- Shaft diameter ..... 40 mm
- Ambient work temperature ..... 5° to 40°C

### Machine dimensions (Fig. 9-9a)

- depth with guard closed ..... 1166 mm
- depth with guard open ..... 1142 mm
- width with guard ..... 1601 mm
- height with guard closed ..... 1563 mm
- height with guard open ..... 1672 mm





### Working range

- settable rim width ..... from 1.5" to 20"
- rim diameter measurable with the sensor  
 (version with automatic sensor) ..... from 11" to 28"
- settable rim diameter from ..... 1" to 35"
- max. wheel/machine distance ..... 360 mm
- max. wheel width (with guard) ..... 600 mm
- max. wheel diameter (with guard) ..... 1117 mm
- Max. wheel weight ..... 75 kg
- Machine weight with guard (without accessories) and without the external  
 measuring sensor ..... 193 kg
- Machine weight with guard (without accessories) and with the external  
 measuring sensor ..... 200 kg
- Noise level in operation ..... < 70 dB(A)

## STANDARD ACCESSORIES

The following parts are supplied together with the machine.

- Weight pliers
- Threaded hub
- Calliper for wheel width measurement
- Hexagon wrench, size 10
- Calibration weight
- Power cable
- Small cone
- Medium cone
- Large cone
- Small wheel fixing cap protection

Spacer cap  
Small wheel fixing cap  
Quick fastener ring for locking wheel

## OPTIONAL ACCESSORIES

Please refer to the relevant accessories catalogue.

## GENERAL CONDITIONS OF USE

The equipment is intended for professional use only.



**CAUTION**

**Only one operator at a time can work with the machine.**

The wheel balancers described in this manual must be used **exclusively** to measure the extent and position of car wheel unbalances, within the limits specified in the Technical specification section. Furthermore, models equipped with motors must be provided with a suitable guard, fitted with a safety device, which must be lowered during the spin operation.



**CAUTION**

**Any use of the machine other than the described use is to be considered as improper and unreasonable.**



**WARNING**

**Do not start the machine without the wheel locking equipment.**



**CAUTION**

**Do not use the machine without the guard and do not tamper with the safety device.**



**WARNING**

**Do not clean or wash the wheels mounted on the machine with compressed air or jets of water.**



**CAUTION**

**When working, never use equipment not manufactured by the manufacturer.**



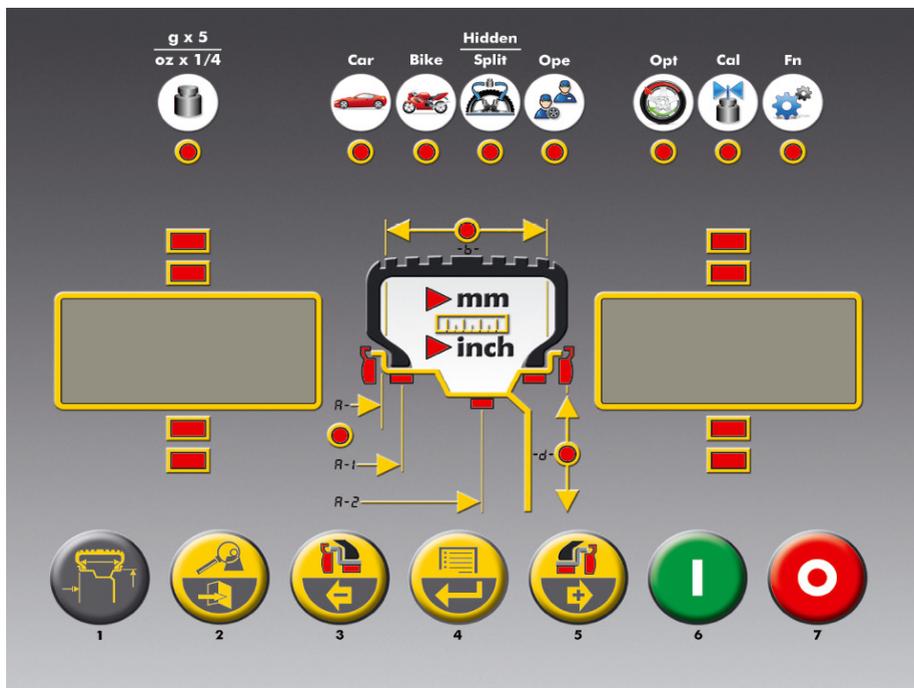
**CAUTION**

**Get to know your machine: The best way to prevent accidents and obtain top performance from the machine is to ensure that all operators know how the machine works. Learn the function and location of all the controls.**

**Carefully check that all controls on the machine are working properly.**

**To prevent accidents and personal injury, all the equipment must be correctly installed, correctly operated and correctly serviced.**

# DISPLAY PANEL



## DISPLAY PANEL - STATUS ICON

STATUS ICON		DESCRIPTION
	Unbalance rounding-off	Unbalance rounding-off to 5 grams or 0.25 ounces. If off, the rounding-off is to 1 gram or 0.10 ounce
	Car environment	Car environment active, the balancing programmes are dedicated to wheels for cars and lightweight transport vehicles
	Motorcycle environment	Motorcycle environment active, the balancing programmes are dedicated to motorcycle wheels

STATUS ICON		DESCRIPTION
	Hidden weight:	Hidden Weight function active (with car mode active) or Spilt Weight function (with motorcycle mode active)
	Operator 2	Operator 2 active. If off, the active operator is 1
	Optimisation	Unbalance optimisation function active (OPT)
	Unbalance cali- bration	Unbalance calibration function active
	Not available	Not available

## DISPLAY PANEL - CONTROL KEYPAD

KEY		DESCRIPTION
1		<p>Wheel dimen- sions</p> <p>- Press this key to manually enter the wheel dimensions in the case of an automatic measurement system malfunction or for versions with a manual internal sensor.</p>
2		<p>Multifunction key</p> <p>1. in balancing mode, press this key to temporarily display the value rounded to the gram or 1/10 of ounce.</p> <p>Note: for ALU 1P and ALU 2P balancing programs with shift plane, this key is not enabled.</p> <p>2. in a menu or in a program, press this key to exit.</p>

KEY		DESCRIPTION	
3		Internal weight selection/ Decrease	Multifunction key 1. in balancing mode, press this key to select the type of weight to use on the inner side of the wheel. 2. in the menu press this key to navigate. 3. when entering dimensions manually, press this key to decrease the displayed value.
4		Menu / Enter	Multifunction key 1. in balancing mode, press this key to access the wheel balancer menu. 2. in a menu or in a program, press this key to change the viewed option.
5		Outer weight selection/In-crease	Multifunction key 1. in balancing mode, press this key to select the type of weight to use on the outer side of the wheel. 2. in the menu press this key to navigate. 3. when entering dimensions manually, press this key to increase the displayed value.
6		Start	- Press this key to perform a spin with the wheel guard lowered - Search for another side (with RPA active and wheel guard open)
7		Stop	- Press this key to stop the spin

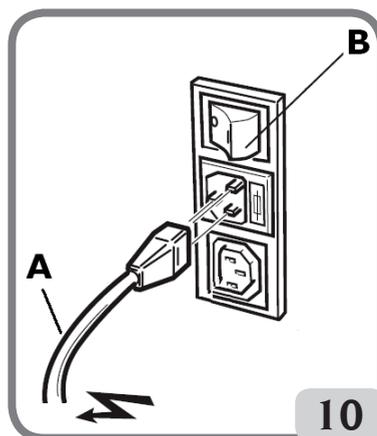
## 1. SWITCHING ON THE MACHINE

Connect the power supply cable (A, Fig. 10) supplied with the machine from the external electrical panel located on the rear side of the wheel balancer body to the mains.

Switch on the machine using the switch on the rear side of the body (B, Fig. 10).

The wheel balancer performs a checking test (all the LEDs illuminate), and if no faults are detected, a beeper sounds and the cycle status initially active is displayed, as follows:

- active balancing mode: dynamic (dyn);



values displayed : 000 000;

- grams displayed in units of 5 (or 1/4 of an ounce);
- active sensor rounding-off (version with digital sensor)
- default geometric values: width = 5.5", diameter = 14", distance = 150 mm.

Now the operator can set the data of the wheel to be balanced or select one of the programmes available.

## 1.1 USING THE AUTOMATIC WHEEL CLAMPING SYSTEM C

Procedure for locking the wheels with the automatic C system:

### Centring with front cone

- Fit the wheel on the shaft, sliding it into place until it rests against the flange.
- Fit the most suitable cone on the shaft and insert it into the central hole of the wheel.
- Fit the locking device by making it slide on the hub until it comes into contact with the cone.
- Press the control pedal for at least one second.

### Centring with rear cone

- Fit the most suitable cone for the central hole of the wheel on the shaft.
- Fit the wheel onto the cone, sliding it into place until the cone comes into contact with the plate that holds the spring.
- Apply the protective cap to the sleeve.
- Fit the locking device by making it slide on the hub until it comes into contact with the wheel.
- Press the control pedal for at least one second.

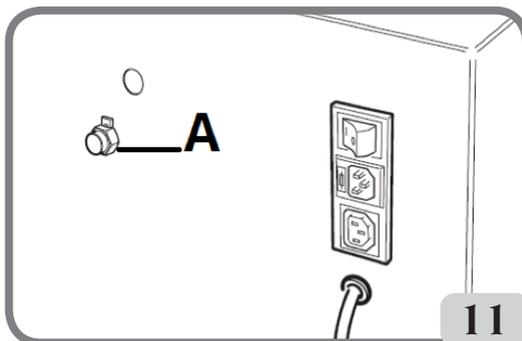
### Wheel release

- Press the control pedal for at least one second to release the wheel from the flange.

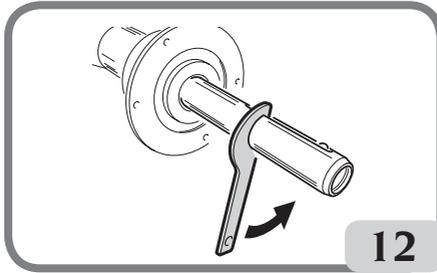
### Centring with flanges

Removing the C hub

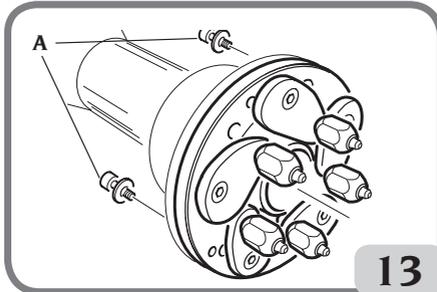
- press button A (figure 11) to discharge any air that may be in the clamping system;



- Insert the special C key (supplied with the machine) in the slot of the C hub (fig.12);



- Completely unscrew the C hub;
- Mount the flange on the shaft and lock it in place with the two screws (A, fig.13) using the CH 6 wrench.

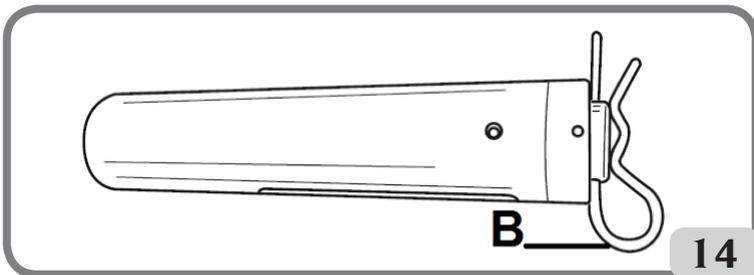


- Lock the wheel onto the flange as usual.

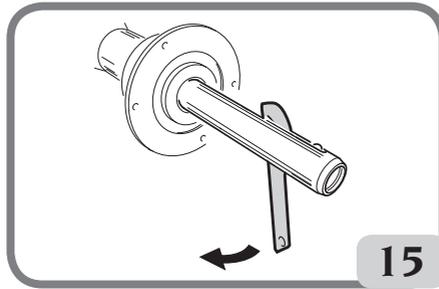
#### Assembling the C hub

To reassemble the C hub, proceed as follows:

- press button A (figure 11) to discharge any air that may be in the clamping system;
- insert the split pin (supplied with the machine) in the cylindrical protection bush (B, fig.14)



- Screw the C hub down manually until it reaches the end position
- Tighten the C hub by inserting the special C key in the C hub slot (fig.15).
- Remove the split pin from the cylindrical protection bush.



## 2. BALANCING PROGRAMME SELECTION

Before starting a balancing operation, the following steps must be followed:

- fit the wheel on the hub using the most suitable flange;
- lock the wheel so that no movement is possible during the wheel spin and braking phases;
- remove any counterweight, pebble, dirt or other foreign body;
- set the wheel's geometric data correctly.

At start-up, by default, the wheel balancer executes the dynamic programme (dyn) which uses clip weights on both sides.



The various balancing programmes can be recalled by simply selecting the keys



that represent the type of weight according to the rim and professional experience, both for the inner side as well as for the outer side.

The following balancing programmes are available:

Vehicle type	Balancing programme	Inner weight application type and mode	External weight application type and mode
	dyn 	clip weight to apply manually at the 12 o'clock position	clip weight to apply manually at the 12 o'clock position
	ALU 1P 	Adhesive weight to apply manually at the 12* o'clock position or using weight holder if present	adhesive weight to apply manually at the 12* o'clock position or using weight holder if present
	ALU 2P 	clip weight to apply manually at the 12 o'clock position.	adhesive weight to apply manually at the 12* o'clock position or using weight holder if present.

	ALU 3		adhesive weight to apply manually at the 12* o'clock position.	adhesive weight to apply manually at the 12* o'clock position
	ALU 4		clip weight to apply manually at the 12 o'clock position	adhesive weight to apply manually at the 12* o'clock position.
	ALU 5		adhesive weight to apply manually at the 12* o'clock position.	clip weight to apply manually at the 12 o'clock position
	STA		spring weight or adhesive weight to be applied manually at the 12 o'clock position either on the outer or inner side or at the centre of the rim well clip weight to be applied manually at the 12 o'clock position	
	ALU 1		Adhesive weight to apply manually at the 12* o'clock position	Adhesive weight to apply manually at the 12* o'clock position
	ALU 2		clip weight to apply manually at the 12 o'clock position	Adhesive weight to apply manually at the 12* o'clock position.
	dyn BIKE		clip weight to apply manually at the 12 o'clock position	clip weight to apply manually at the 12 o'clock position
	ALU BIKE		adhesive weight to apply manually at the 12* o'clock position.	adhesive weight to apply manually at the 12* o'clock position.

\*The machine allows the operator to change the application position of the adhesive weight from 12 o'clock (via the CLIP weight-holder) to 6 o'clock (via the laser line), depending on his requirements.

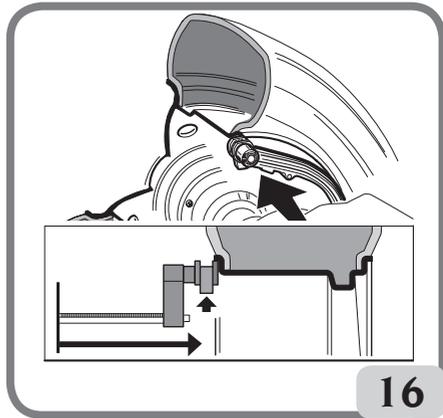
To change the application position for the adhesive weights, follow the instructions in the set up menu "Adhesive weight application position".

### **3. ENTERING WHEEL DIMENSIONS (EXCEPT FOR ALU 1P AND ALU 2P PROGRAMMES)**

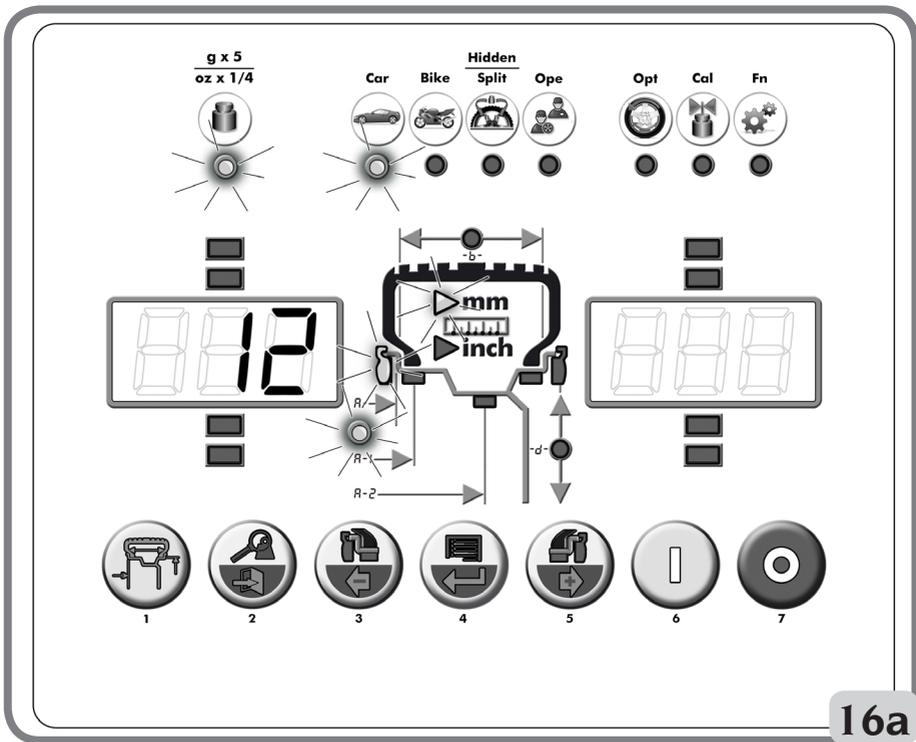
#### **Wheel data entry for wheel balancers without an ultrasonic sensor**

The machine allows for the diameter and distance values to be entered automatically; the width value can be entered using the keypad.

- Bring the automatic measuring arm into contact with the innerside of the rim (fig. 16). **Take great care to position the arm correctly so as to ensure accurate data reading.** While moving the automatic arm, the distance measured by the arm is shown on the display:

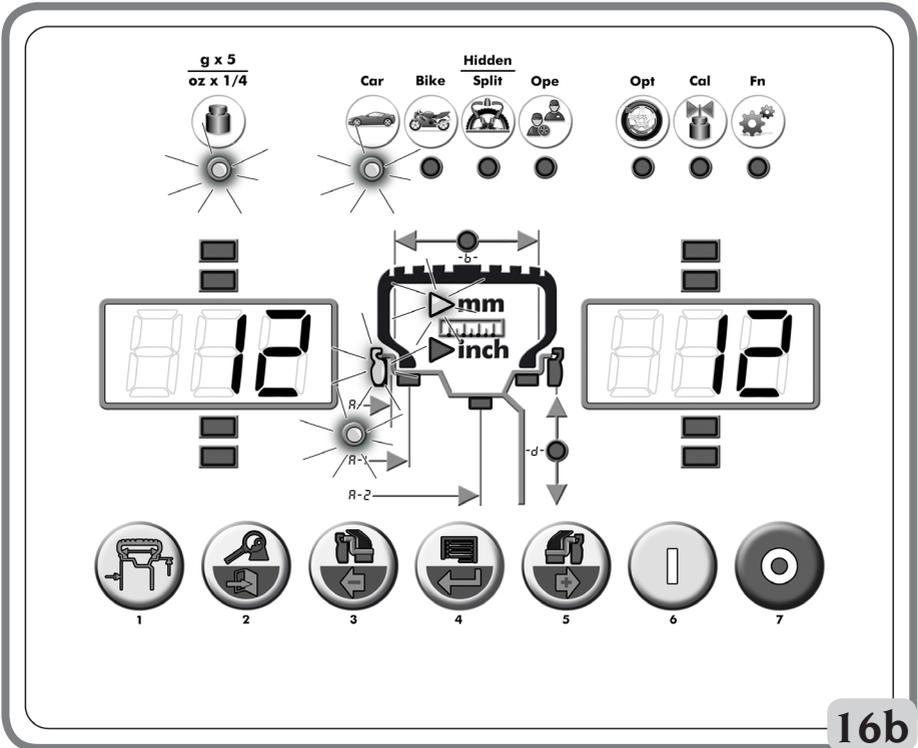


16



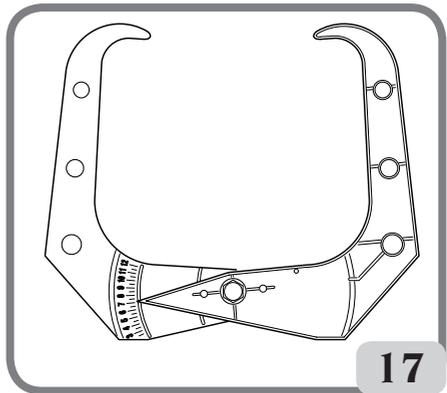
16a

When the measurement is stored, the value of the distance acquired by the machine will remain visible on the left display:



16b

- if only one measurement is taken, the machine interprets the presence of a rim with balancing using a clip weight on both sides (Dynamic Balancing Programme)
- moving the arm to the rest position, the machine will set up for the manual WIDTH entry.
- in this phase, it is possible to perform an additional acquisition of the rim diameter and distance.
- Measure the width of the rim using the provided calliper (fig. 17).
- Modify the width value displayed by pressing



17



the keys until the desired value is set.

The WIDTH can be set in millimetres or the values already set can be converted from inches



to millimetres by pressing the button.



Keep the keys   pressed to rapidly increase or decrease the previously set values.



After completing the wheel data update, press the  button to exit and display the unbalance values recalculated according to the new dimensions, or to perform a wheel spin.

- if two subsequent measurements are taken inside the rim on two balancing planes, the machine interprets the presence of a rim with balancing using a clip weight on the inner plane and an adhesive weight on the external one (ALU 2P).

In this phase, the machine could automatically change the type of weight on the inner plane from clip to adhesive (ALU 1P).



In any case, the operator can change this setting by pressing the  or  key. In this case, the balancing programme switches from ALU 1P to ALU 2P and vice versa.

### Wheel data entry for wheel balancers with an ultrasonic sensor (if installed)

To enter the distance, diameter and width values automatically, proceed as follows:

- bring the automatic internal measuring arm into contact with the inner side of the rim (fig.16). During this phase, the graphic shown in figure 16a will appear on the display.

#### Take great care to position the arm correctly so as to ensure accurate data reading.

- Keep the arm in contact with the rim until the machine has acquired the wheel's diameter and distance values. During this phase, the graphic shown in figure 16b will appear on the display.

- if only one measurement is taken, the machine interprets the presence of a rim with balancing using a clip weight (Dynamic Balancing Programme)

- when the internal measuring arm returns to its idle position, "b" (or "Lr") will appear automatically on the left display and the type of wheel will be shown on the right display:

- **P (Passenger Tyre)** for medium sized wheels (**wheels with a tyre shoulder that does not protrude much from the rim**);
- **Lt (Light Truck Tyre)** for large sized wheels (such as off-road, trucks or wheels with a tyre shoulder that protrudes considerably from the rim).



- use the  key to select the type of wheel you are using.



- If you press the  button in the phase indicated above, the width can be entered manually using the keypad.

- in this phase, it is possible to perform a new acquisition of the rim planes.

- lowering the guard confirms the selection that was made (manual width entry or wheel type selection) and a spin is performed and the wheel width is automatically measured.

Note:

- automatic width acquisition is re-enabled only with a new acquisition of the automatic internal measuring arm;
- if the wheel guard is closed or in the case of a fault of the sensor located on the guard, the machine will automatic set-up for manual width entry when the internal measuring arm is moved to the rest position.

A geometric value is displayed, and at the same time the corresponding indicator on the display lights up.

- Check the values measured and then return the arm to the rest position.
- If an incorrect value has been acquired during the measurement phase, move the arms to the rest position and then repeat the operation.

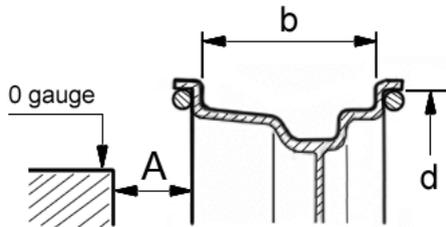
### IMPORTANT

**bear in mind that the wheel's nominal diameter (e.g. 14") refers to the planes on which the tyre bead rests, which are obviously inside the rim. The values measured are with reference to external planes and, as a result, are smaller than the nominal values due to the thickness of the rim itself. The correction value therefore refers to an average thickness of the rim. This means that the data measured on wheels with different thicknesses may vary slightly (2 or 3 tenths of an inch maximum) from the rated values. This is not a lack of accuracy of the measuring devices, but reflects reality.**

If the automatic measuring arm fails to operate, the geometrical data can be entered in manual mode by following the procedure indicated in the paragraph "entering wheel dimensions - for models with manual inner sensors (distance and diameter)".

### If the inner sensor (diameter and distance) fails to operate

- Use the keypad to enter the wheel geometric data by following the procedure described below:



- press the 1 key.
- measure the width of the rim using the calliper provided (Fig. 17)



- modify the width value (-b-) displayed by pressing the 3 keys until the desired

value is set.



The displayed values can be increased or decreased quickly by keeping the keys



pressed.

The width can be set in millimetres by changing the setting of the unit of measurement in the machine's set-up menu



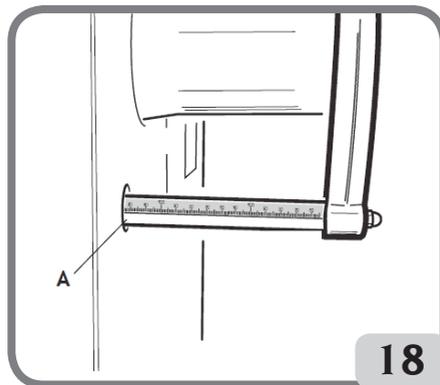
- press the  key to confirm the previous value and set the machine for diameter entry (-d-)
- read the rated rim diameter value on the tyre



- modify the displayed diameter value by pressing the   keys until the read number is set



- press the  key to confirm the previous value and set the machine for distance data entry (-A-)
- bring the distance measuring arm into contact with the inner side of the rim (fig.16).
- read the value of the distance between the wheel and the casing on the rule (A, fig.18).



- modify the displayed distance value by pressing the   keys until the read number is set



- on completion, press  to display the unbalance values recalculated on the basis of



the new dimensions, or to perform a wheel spin.



**WARNING**

If the diameter and distance values between the two balancing planes, recalculated on a statistical basis starting from the rated geometric data of the wheel, exceed the normally accepted interval stated in the technical data section, the message "A 5" is displayed.

## 4. ENTERING WHEEL DIMENSIONS IN THE ALU 1P AND ALU 2P BALANCING PROGRAMMES

With this programme the real wheel data have to be set in relation to the real balancing planes rather than the nominal values (as in standard ALU programmes). The balancing planes where the adhesive weights are to be applied may be selected by the user according to the specific shape of the rim. It should be remembered, however, that in order to reduce the quantity of the weight that is to be applied it is preferable to select balancing planes that are as far apart as possible: if the distance between the two planes is less than 37 mm (1.5"), the "A 5" message is displayed.

The various methods for inserting dimensions are described below based on the supplied devices:

- Move the end of the automatic measuring arm in line with the plane selected for the application of the inner weight. In ALU 1P, the reference of the weight mid-point is the centre of the gripper cavity (fig.19). In ALU 2P you must refer to the rim edge, because the inner weight is of the spring type (fig.20).
- Keep the arm in position. After two seconds the machine emits an acoustic confirmation signal to indicate that the distance and diameter values have been acquired.
- bring the end of the automatic measuring arm in line with the plane selected for the application of the outer weight (fig. 19a/20a) (following the procedure described above, for the inner side).

**Pay maximum attention when the end of the arm is being placed in an area of the rim free of discontinuity, so that the weight can be applied in that position.**

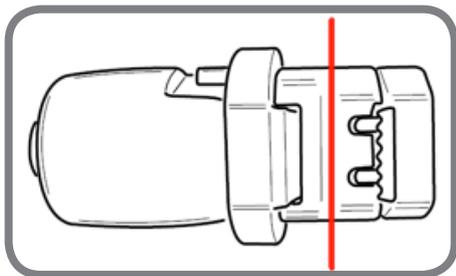
- Keep the arm in position. After two seconds the machine emits an acoustic confirmation signal to indicate that the distance and diameter values have been acquired.
- Return the measuring arm to the rest position.

Automatically the machine will set up in the ALU P balancing programmes (FSP programme).

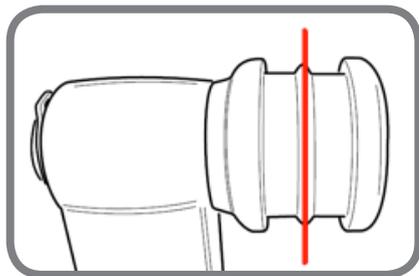
- carry out a spin
- at the end of the spin, if you want to change the balancing programme set automatically by



the machine (FSP), use the or key to select the required programme.

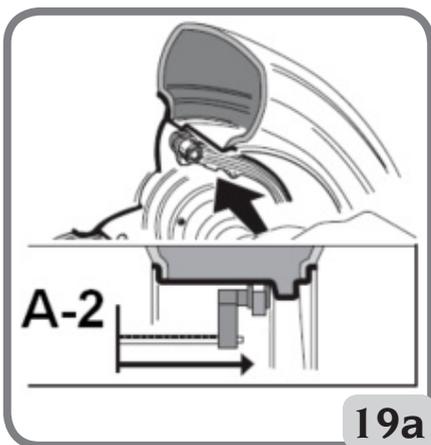
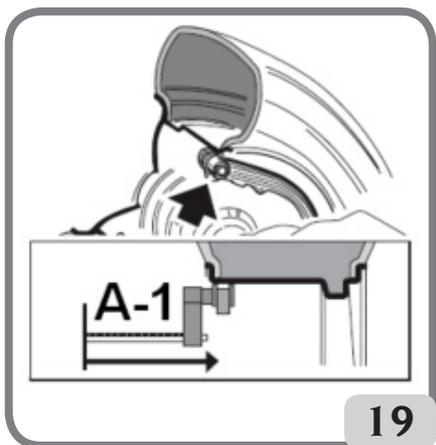


Centre of the weight-holder gripper cavity

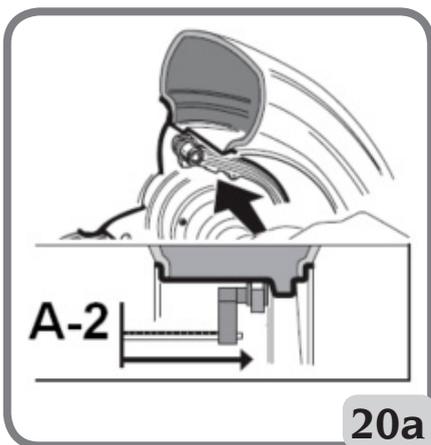
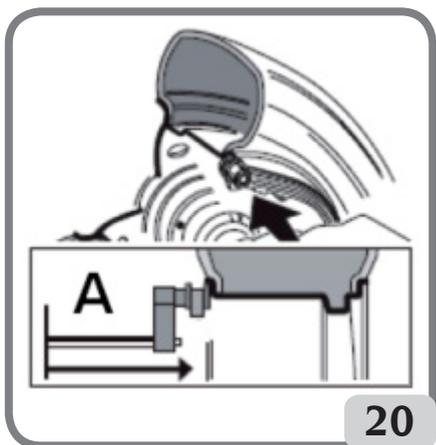


Centre of the gripper cavity without weight-holder

**ALU 1P**



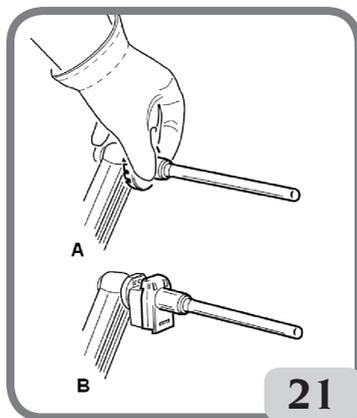
**ALU 2P**



## 5. ENTERING DIMENSIONS IN THE MOTORCYCLE PROGRAMMES

The operations described below are valid if the motorcycle setting (bike) has been activated in the "vehicle type" set up.

- Fit the appropriate extension on the inner measuring arm, specifically extension A on machines with no weight holder or extension B on machines with weight holder (Fig.21).



- To acquire the wheel dimensions, follow the instructions in the paragraph "Entering wheel dimensions".

## 6. WHEEL SPIN



Wheel spins take place automatically by lowering the guard or pressing the key with the guard lowered.

A special safety device stops rotation if the guard is raised during the spin; in this case, the "A Cr" message is displayed.



**WARNING**

To obtain the most accurate results, do not apply any undue stress to the machine during wheel spin.



**CAUTION**

Do not operate the machine without the guard and/or if the safety device has been tampered with.



**CAUTION**

Never raise the guard before the wheel has come to a stop.



## CAUTION

If the wheel keeps spinning permanently due to a fault on the machine, switch off the machine using the main switch or disconnect the plug from the power supply board (emergency stop) and wait until the wheel stops before raising the guard.



If the **7** key is pressed whilst the wheel is rotating, the spin will be prematurely interrupted.

## 7. UNBALANCE DISPLAY WITHOUT ROUNDING-OFF

When started up, the machine is set to display the unbalance values at five-gramme increments, i.e. rounded to the nearest multiple of five (or quarters of an ounce if visualised in ounces).

In this condition, the first four grams of unbalance are not displayed since an appropriate



threshold, indicated by illumination of the **LED** on the display panel, is activated.



The **2** key can be pressed to temporarily eliminate the threshold (the LED “g x 5”; “oz x 1/4” goes out) and the unbalance values will be displayed gram by gram (or in tenths of an ounce if display in ounces is active).



## CAUTION

This key is deactivated if the gram by gram unbalance display has been set in the machine set up or if the ALU 1P or ALU 2P balancing programme is used.

## 8. BALANCING WEIGHT APPLICATION

### • clip weights

- Select the first side to be balanced.
- Turn the wheel until the central element of the corresponding position indicator lights up.
- Apply the indicated balancing weight in the position of the rim corresponding to 12 o'clock.



## CAUTION

Check that the system which fits the weight to the rim is in optimum condition. A weight which is not fitted properly or correctly may come off as the wheel rotates,

thus creating a potential danger.



Pressing the button while the wheel is moving interrupts the wheel spin before time and the **A STP** message is displayed.

If the “RPA” (centred position) programme is active, at the end of each balancing spin the machine stops the wheel in the position for application of the weight on the inner side; if it is equal to zero, the wheel is stopped in the position for application on the outer side.



Pressing the button with the guard raised, automatic search for the second side position is activated.

This function is described at length in the AUTOMATIC POSITION SEARCH section.

• **Manually applied adhesive weights**

- Select the first side to be balanced.
- Turn the wheel until the central element of the corresponding position indicator lights up.
- Apply the indicated balancing weight in the position of the rim corresponding to 12 o'clock.



**WARNING**

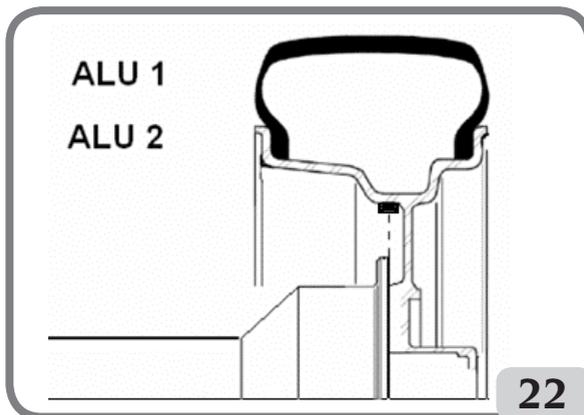
The application position of the adhesive weight can be changed from 12 o'clock to 6 o'clock by following the instructions in the “Adhesive weight application position” set-up menu.

**WARNING**

- in the MOTORCYCLE programmes (ALU), when applying the adhesive weight always use the 12 o'clock position as your reference, regardless of the setting made in “ADHESIVE WEIGHT APPLICATION POSITION”.

**IMPORTANT**

in the ALU1 and ALU2 programmes, the unbalance displayed by the machine on the outer side refers to the centre of gravity of the adhesive weight in line with the shaft assembly support flange (fig. 22)



- **Manually applied adhesive weights with laser device enabled (if provided)**

- Select the first side to be balanced
- Turn the wheel until the central element of the corresponding position indicator lights up together with the laser line
- Apply the indicated balancing weight in the position on the rim corresponding to 6 o'clock.

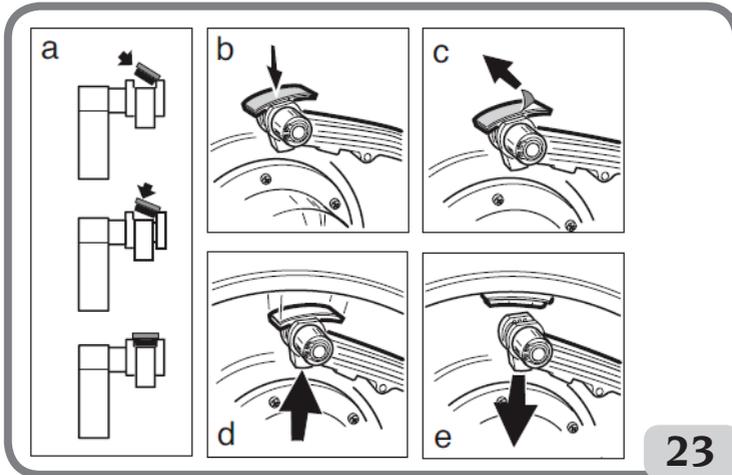
**Some slight residual unbalances may remain at the end of the test spin due to the considerable difference in shape that may be found on rims having the same rated dimensions. Therefore modify the value and position the previously applied weights for accurate wheel balancing.**

## **9. APPLYING BALANCING WEIGHTS IN ALU 1P OR ALU 2P PROGRAMMES**

- **Adhesive weights applied with a weight-holder device (if available), after modifying the application position from 12 o'clock to CLIP in the "Adhesive weight application position" set-up menu**

- 1 Select the first side to be balanced
- 2 Turn the wheel until the central element of the corresponding position indicator lights up. Keeping the wheel in position with the clamping brake, a display will now show the quantity of the weight to be applied in gr/ounces and the other will display the distance in mm alternatively to the plane identification abbreviation (A-1 for Inner Plane/A-2 for Outer Plane)
- 3 position the adhesive weight inside the cavity of the weight-holder device (fig. 23,a,b)
- 4 remove the protective film from the adhesive (fig. 23c)
- 5 move the sensor until it reaches the position signalled by the display unit.  
During this phase, the unbalance value of the side to be balanced is shown on one display, whereas the numerical value updated according to the sensor position, which becomes zero when the position for application of the weight is reached, is shown on the other display.
- 6 turn the end of the measuring arm until the weight adhesive strip is in line with the rim surface
- 7 press the button (fig. 23d) to eject the weight and make it stick to the rim
- 8 return the measuring arm to its idle position (fig.23e)
- 9 repeat the operations to apply the second balancing weight
- 10 perform a test wheel spin to check the balancing accuracy.

The rim surface must be perfectly clean to make the weight stick efficiently to the rim. If necessary, clean the surface using suitable cleansing products.



• **Manually applied adhesive weights**

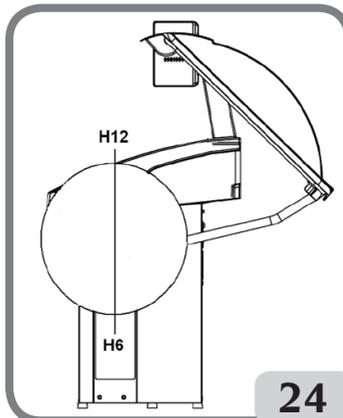
- 1 Select the first side to be balanced
- 2 Turn the wheel until the central element of the corresponding position indicator lights up
- 3 Apply the adhesive weight manually in the position in which the relative plane was measured, using the centre of gravity of the weight itself as reference. In this phase, one display shows the unbalance value of the side to be balanced and the other shows the message "H.12" that indicates the correct application position as shown in figure 24.



**WARNING**

The machine allows the operator to select how to apply the adhesive weight (CLIP or at 6 o'clock), depending on his requirements.

To change the application position for the adhesive weights, follow the instructions in the set up menu "Adhesive weight application position".



- **Manually applied adhesive weights with laser device enabled (if provided)**
  - 1 Select the first side to be balanced
  - 2 Turn the wheel until the central element of the corresponding position indicator lights up together with the laser line
  - 3 Apply the adhesive weight manually in the position in which the relative plane was measured, using the centre of gravity of the weight itself as reference. In this phase, one display shows the unbalance value of the side to be balanced and the other shows the message "H.6" that indicates the correct application position as shown in figure 24.
  
- **Adhesive weights applied manually, without a weight-holder device ("CLIP adhesive weight application position" enabled)**
  - 1 Select the first side to be balanced
  - 2 Turn the wheel until the central element of the corresponding position indicator lights up. Keeping the wheel in position with the clamping brake, a display will now show the quantity of the weight to be applied in gr/ounces and the other will display the distance in mm alternatively to the plane identification abbreviation (A-1 for Inner Plane/A-2 for Outer Plane)
  - 3 Move the sensor until it reaches the signalled position. During this phase, the unbalance value of the side to be balanced is shown on one display, whereas the numerical value updated according to the sensor position, which becomes zero when the position for application of the weight is reached, is shown on the other display.
  - 4 Manually apply the adhesive weight, taking the centre of the gripper cavity as the reference for the midway point of the weight.

**"Shift planes" programme (only with ALU P programmes)**

This function is automatically enabled when an ALU P programme is selected.

**It modifies the former selected positions for the application of adhesive balancing weights, in order to allow perfect wheel balancing using commercially available adhesive weights in multiples of five grams.**

The accuracy of the machine is thereby improved, avoiding rounding-off or cutting the weights to be applied to come closer to the actual unbalance values.

## **10. PROGRAMME FOR POSITIONING THE WEIGHTS BEHIND THE SPOKES "HIDDEN WEIGHT" (ONLY WITH ALU 1P AND ALU 2P PROGRAMMES)**

For alloy wheels, use the Hidden Weight programme in conjunction with the ALU 1P or ALU 2P programme to conceal the external weight behind two spokes for aesthetic reasons.

The Hidden Weight programme can only be activated if there is an unbalance on the outer side.

This programme divides the outer weight  $P_e$  into two weights  $P_1$  and  $P_2$  located in any position chosen by the operator. The only condition is that the two weights must be within an angle of  $120^\circ$  (including the weight  $P_e$ ), as shown in fig. 25.

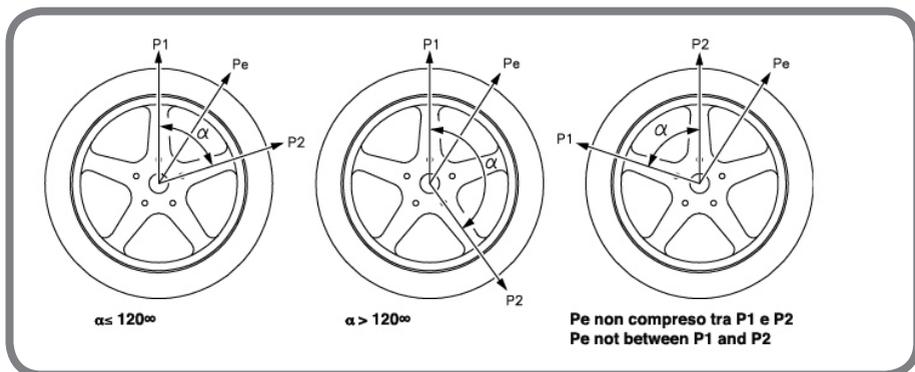


Figure 25. Conditions necessary for using the Hidden weights programme

To use this programme, proceed as follows:

- 1 Turn the wheel until the central element of the corresponding position indicator lights up

It is recommended to keep the wheel in position using the pedal brake.



- 2 Press the **4** key to activate the programme.



Programme activation is indicated by the illumination of the LED  on the display panel.

- 3 If the weight-holder device is present, turn the wheel again until the central element of the outer side ( $P_e$ ) position indicator lights up
- 4 Turn the wheel to the point where the first outer weight ( $P_1$ ) should be applied behind a spoke. The machine will display the following message:

In
- 1 -

To choose the exact position of weight  $P_1$  in relation to the unbalance  $P_e$ , use the 6 o'clock point as your reference if "LAS" configuration is active, or the 12 o'clock point if the "H12" or "CLP" configuration is active.

The angle between  $P_1$  and  $P_e$  must be less than  $120^\circ$ .



- 5 press the **4** key to memorise the first spoke.

- 6 turn the wheel to the point where the first outer weight ( $P_2$ ) should be applied behind a spoke. The machine will display the following message:

# In - 2 -

To choose the exact position of weight P2 in relation to the unbalance Pe, use the 6 o'clock point as your reference if "LAS" configuration is active, or the 12 o'clock point if the "H12" or "CLP" configuration is active.

The angle between P1 and P2 must be less than 120° and must include the outer weight Pe.



7 press the  key to memorise the second spoke

8 turn the wheel manually and the two unbalance values calculated are displayed in alternation on the display regarding the outer side as the angular position of the wheel changes. Each of the two balancing weights is applied as described in the chapter "Applying balancing weights in ALU 1P or ALU 2P balancing programmes".

The Hidden Weight function is combined with the SHIFT PLANES function to allow the use of balancing weights in multiples of 5 grams

## Notes:



- The Hidden Weight procedure can be quit at any time by simply pressing the  key.
- The Hidden Weight procedure is automatically deactivated by performing a wheel spin.

## 11. PROGRAM FOR SPLITTING THE WEIGHT ON EITHER SIDE OF THE SPOKE "SPLIT WEIGHT" (ONLY WITH MOTORCYCLE PROGRAMMES)

Some rims have spokes so wide that it is not possible to place adhesive weights next to them; for this reason, the Split Weight programme devices the counterweights into two parts.

To use this programme, proceed as follows:

- Turn the wheel until the central element of the external side position indicator lights up.

It is recommended to keep the wheel in position using the pedal brake



- Press the key to activate the programme



Programme activation is indicated by the illumination of the LED on the display panel.



- use the keys to select the spoke width

- 1 **small**
- 2 **medium**
- 3 **large**
- OFF **deactivates the programme;**



- confirm with the key.  
- apply two new counterweights in the positions indicated.

**In the motorcycle balancing programmes, the weight division operation can be performed on both balancing sides.**

## 12. OPTIMISATION PROGRAMME “OPT”

This procedure minimises any vibration still present on the vehicle while running even after accurate balancing, thus minimising the rim-tyre coupling run-out. Based on our experiences, the programme can be recalled every time it is convenient to minimise the running noise produced by the vibrations mentioned above. The calculations performed by this programme are based on the unbalance values measured during the last spin performed which must therefore refer to the wheel being serviced.



• Press the key.



• use the keys to search for OPT



• press the key to activate the optimisation procedure



Programme activation is indicated by the illumination of the LED on the display panel.

## OPERATING PHASES

<b>OP.1 H.12</b>	<ul style="list-style-type: none"> <li>- bring the valve to the "12 o'clock" position and press  to confirm</li> </ul>
<b>OP.2 180</b>	<ul style="list-style-type: none"> <li>- make a mark on the tyre 180° from the valve</li> <li>- remove the wheel from the wheel balancer</li> <li>- go to the tyre changer and move the mark made in correspondence with the valve</li> </ul> <p style="text-align: center;"></p> <ul style="list-style-type: none"> <li>- press the  key to confirm.</li> </ul>
<b>OP.3 H.12</b>	<ul style="list-style-type: none"> <li>- Remount the wheel on the wheel balancer;</li> <li>- Move the valve to the 12 o'clock position;</li> </ul> <p style="text-align: center;"></p> <ul style="list-style-type: none"> <li>- press the  key to confirm</li> </ul>
<b>OP.4</b>	<ul style="list-style-type: none"> <li>- perform a spin</li> </ul>
<b>OP.5</b>	<ul style="list-style-type: none"> <li>- turn the wheel until it is in the position shown by the position indicators.</li> <li>- use chalk to make a double mark on the outer side of the tyre at the 12 o'clock position</li> </ul> <p style="text-align: center;"></p> <p>Note: in this phase, press the  key to display: the first time the key is pressed, the actual unbalance values of the wheel as currently mounted on the wheel balancer; the second time the key is pressed, the obtained unbalance value continuing with the last phase of the optimisation procedure with the improvement percentage; when the key is pressed for the third time, the machine prepares for the last phase of the OPT programme</p> <ul style="list-style-type: none"> <li>- remove the wheel from the wheel balancer</li> <li>- on the tyre changer, move the double mark made in correspondence with the valve</li> </ul> <p style="text-align: center;"></p> <ul style="list-style-type: none"> <li>- press the  key to confirm and end the unbalance optimisation procedure.</li> </ul>

**Notes:**

- The unbalance optimisation procedure can be quit at any time by pressing the



key; the displays will show the premature exit message:

Abo	rt
-----	----



Press the  key to exit or the  key to stay in the programme.

- The following message could be displayed at the end of the first spin:

Out	2
-----	---



In this case it is advisable to exit the programme by pressing the key  the values of the weights necessary for balancing the wheel are displayed. The programme execution is interrupted, thus not achieving the moderate improvement of the end results.



By pressing the  key the optimisation procedure can be continued.

- At the end of the first spin the instruction that the tyre is to be mounted on the rim in the reverse direction may appear. If you do not intend to reverse the tyre or if doing so



is impossible, press the  key and the machine will provide the instructions for completing the programme without reversing the tyre.

### 13. ENABLING THE OTHER OPERATOR

This programme makes it possible for two different operators to use the machine at the same time due to the presence of two different working environments.

The parameters which remain saved for every working environment are:

- balancing mode (Dynamic, Alu x, Motorcycle etc.);
- wheel dimensions (distance, diameter and width of those relating to the active ALU programme).

The machine's general settings remain the same for all working environments:

- grams/ounces, sensitivity x1/x5, threshold, etc....

Proceed as follows to recall this programme:



- press the  key



- use the



- press the key to change the setting:  
or 1 first operator  
or 2 second operator



- press the key to confirm and exit



Activation of the second operator is indicated by the illumination of the LED on the display panel.

Repeat the procedure described above to return to the first operator.

## 14. WHEEL SPIN COUNTER

This programme is used to display the total number of spins performed by the machine since its first start-up (**tot SPi**), the number of spins performed since the last unbalance calibration (**CAL SPi**) and the number of partial spins performed since the machine was last started (**PAr SPi**).

Proceed as follows to recall this programme:



- press the key



- use the keys to search for **-SP in-**



- Press the key to display the total number of spins performed by the machine since its first start-up (**tot SPi**)



- Press the key to display the number of spins performed since the last sensitivity calibration (**CAL SPi**). It is reset at each new calibration.



- Press the key to display the number of spins performed since the last sensitivity

calibration (**PAR SPI**). It is reset each time it is turned off.



- press the key to exit.

## 15. GENERAL CONFIGURATIONS - SET UP

The machine can be configured according to your requirements. The following configurations are available:

- **Selecting vehicle type (car – motorcycle)**
- **Unbalance unit of measurement**
- **Unbalance rounding-off**
- **Warning OPT**
- **Rim diameter display unit of measurement**
- **Rim width display unit of measurement**
- **Beeper**
- **Setting - Application position for adhesive weights**
- **LED light**
- **Laser indicator**

Proceed as follows to access the configuration menu:



- press the key



- use the keys to search for SET UP



- Press the key.

### 15.1. SET UP - SELECTING THE TYPE OF VEHICLE (CAR/MOTORCYCLE)

Configuration used for enabling motorcycle wheel balancing functions.

Proceed as follows to recall this programme:



- Press the key.



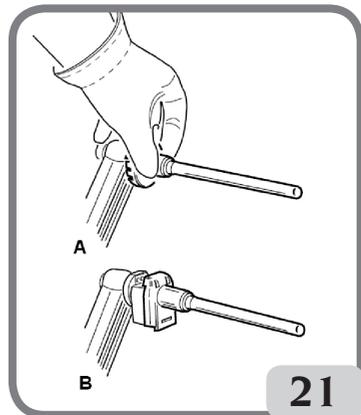
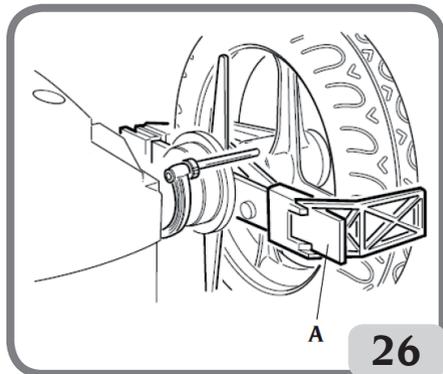
- use the keys to search for SET UP

- press the  key to confirm
- use the   keys to search for CAR on (or CAR off if previously set)
- press the  key to change the setting:  
 CAR on to activate the car working environment  
 CAR on to activate the motorcycle working environment
- press the  key to confirm and exit.

 **Warning**

Proceed as follows to balance a motorcycle wheel:

- fit the motorcycle wheel adapter A (AUMO) on the wheel balancer as shown in Fig. 26;
- insert the two screws that are supplied in the holes on the wheel contact flange;
- tighten the screws on the adapter making sure that it rests on the flange correctly;
- fit the most suitable pin (depending on the wheel central hole) onto the shaft after removing the threaded hub;
- mount the wheel after selecting the centring cones (one for each side of the wheel), tighten with the appropriate ring nut using the spacers necessary for coupling the securing cones to the threaded part of the shaft.
- mount the relative extension (A, Fig.21) on the internal measuring arm.
- set the wheel data as shown in the paragraph "Entering wheel dimensions".



**Important**

**the wheel must be fixed to the flange so as to avoid any movement of the two during the spin or braking phases.**

**Best results can be achieved if the adhesive weights are positioned with the outer edge flush with the rim edge.**

## 15.2. SET UP - UNBALANCE MEASUREMENT UNIT

The machine may be set to display the unbalance values in grams or ounces. Proceed as follows to modify this configuration:

- Press the  key.
- use the   keys to search for SET UP
- press the  key to confirm
- use the   keys to search for Unb Gr (or Unb Oun if the ounce display mode is active)
- press the  key to change the setting:
  - or Unb Gr to activate the unbalance display in grams
  - or Unb Oun to activate the unbalance display in ounces
- press the  key to confirm and exit.

## 15.3. SET UP - UNBALANCE ROUNDING-OFF

The machine may be set to display the unbalance values in five-gramme increments i.e. rounded to the nearest multiple of five (or quarters of an ounce if displayed in ounces) or rounded to the gram (or tenth of an ounce if displayed in ounces).

Proceed as follows to modify this configuration:

- Press the  key.
- use the   keys to search for SET UP



- press the key to confirm



- use the keys to search for Gr 5 (if the gram display mode is activated) or Oun 0.25 (if the ounce display mode is activated)



- press the key to change the setting:  
or Gr 1 to activate the unbalance display rounded to the gram  
or Gr 5 to activate the unbalance display rounded to the nearest multiple of five

If the ounce display mode is active

or Oun 0.25 to activate the unbalance display rounded to a quarter of an ounce

or Oun 0.10 to activate the unbalance display rounded to a tenth of an ounce



- press the key to confirm and exit.

## 15.4. AUTOMATIC POSITION SEARCH (RPA)

When the automatic position search programme is activated, at the end of every balancing spin the machine stops the wheel in the position for applying the outer side weight; if it is equal to zero, the wheel is stopped in the inner side weight application position.



Press the button to search for the second side position with the guard raised.  
Proceed as follows to deactivate the automatic position search programme:



- Press the key.



- use the keys to search for SEt UP



- press the key to confirm



- use the keys to search for rPA on (or rPA oFF if previously set)



- press the  key to change the setting:  
or rPA on to enable the Automatic Position Search programme  
or rPA oFF to disable the Automatic Position Search programme



- press the  key to confirm and exit.

## 15.5. SET UP - WARNING OPT

The machine indicates the need to perform an unbalance optimisation procedure (OPT) with the flashing LED on the display panel.

Proceed as follows to disable this function:



- Press the  key.



- use the   keys to search for SET UP



- press the  key to confirm



- use the   keys to search for OPT on (OPT oFF if disabled)



- press the  key to change the setting:  
or OPT on to activate the display of the alarm indicator light  
or OPT oFF to deactivate the display of the alarm indicator light



- press the  key to confirm and exit.

## 15.6. SET UP - RIM DIAMETER VISUALISATION MEASUREMENT UNIT

The machine may be set to display the rim diameter unit of measurement in inches or millimetres.

Proceed as follows to modify this configuration:

- Press the  key.
- use the   keys to search for SET UP
- press the  key to confirm
- use the   keys to search for -d- in (-d- MM if the display in millimetres is enabled)
- press the  key to change the setting:  
or -d- MM to activate the display in millimetres  
or -d- in to activate the display in inches
- press the  key to confirm and exit.

## 15.7. SET UP - RIM WIDTH VISUALISATION MEASUREMENT UNIT

The machine may be set to display the rim width unit of measurement in inches or millimetres.  
Proceed as follows to modify this configuration:

- Press the  key.
- use the   keys to search for SET UP
- press the  key to confirm



- use the keys to search for -b- in (-b- MM if the display in millimetres is enabled)



- press the key to change the setting:  
or -b- MM to activate the display in millimetres  
or -b- in to activate the display in inches



- press the key to confirm and exit.

## 15.8. SET UP - BEEPER

The machine can be configured to beep each time a key is pressed on the keypad. Proceed as follows to modify this configuration:



- Press the key.



- use the keys to search for SEt UP



- press the key to confirm



- use the keys to search for biP on (biP OFF if the beeper is disabled)



- press the key to change the setting:  
or biP on to activate the beeper  
or biP OFF to deactivate the beeper



- press the key to confirm and exit.

## 15.9. SET UP - ADHESIVE WEIGHT APPLICATION POSITION

The machine makes it possible for the operator to select where the adhesive weight should be applied based on his needs. To select this configuration, proceed as described below:

- Press the  key.

- use the   keys to search for SET UP

- press the  key to confirm

- use the   keys to search for ALU H.12 (ALU CLP – ALU H.6), using the laser line if present

- press the  key to change the setting:

TYPE OF WEIGHT TO BE APPLIED	CONFIGURATION SELECTED	WEIGHT APPLICATION POSITION
Traditional clip		Always 12 o'clock
Adhesive MOTORCYCLE programme		Always 12 o'clock
Adhesive	H.12	12 o'clock in all balancing programmes
Adhesive	LAS (if applicable)	6 o'clock position, via the LASER line, when the adhesive weight is inside the rim 12 o'clock position when the adhesive weight is outside the rim
Adhesive	CLP	using the weight-holder terminal in the ALU 1P/ALU 2P balancing programmes, or manually, taking the centre of the gripper cavity as your reference for the midway point of the weight, or using the 12 o'clock position for ALU Statistics programmes

- press the  key to confirm and exit.

## 15.10. SET UP - LED LIGHT

The machine allows the operator to disable or modify the lighting mode. Proceed as follows to make these settings:

- Press the  key.
- use the   keys to search for SET UP
- press the  key to confirm
- use the   keys to search for LEd 1 (LEd 2 or LEd OFF if previously set)
- press the  key to change the setting:
  - or LEd OFF to disable the lighting device
  - or LEd 1 to activate the lighting device when acquiring dimensions during an ALU1 P or ALU2 P balancing programme, at the end of a spin cycle in the case of residual unbalances for 30 seconds, in CP (centred position) for an additional 30 seconds
  - or LEd 2 in this configuration, the light will turn on, in addition to the situations indicated above (in the Led1 mode) also during the entire measurement cycle, when acquiring dimensions in all balancing programmes and in the Hidden Weight programme when selecting the two planes behind the spokes.
- press the  key to confirm and exit.

## 15.11. SET UP - LASER INDICATOR

The machine allows the operator to enable or disable the laser device. Proceed as follows to make this setting:

- Press the  key.
- use the   keys to search for SET UP

- press the  key to confirm
- use the   keys to search for LAS on (LAS oFF if previously set)
- press the  key to change the setting:  
or LAS on to enable the laser device  
or LAS oFF to disable the laser device
- press the  key to confirm and exit.



### Caution

If the laser indicator is enabled, the application of the adhesive weights (except for the ALU1 P and ALU2 P balancing programs with the weight-holder device present) and the reference for selecting the two weights behind the spokes (Hidden Weight) is at 6 o'clock (H.6).

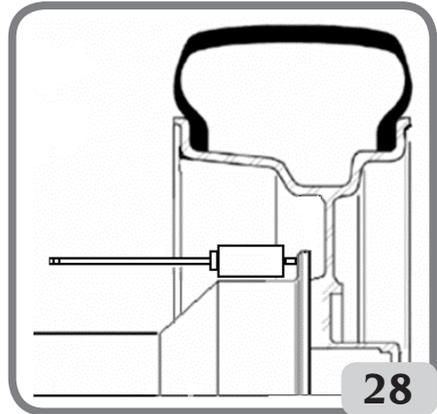
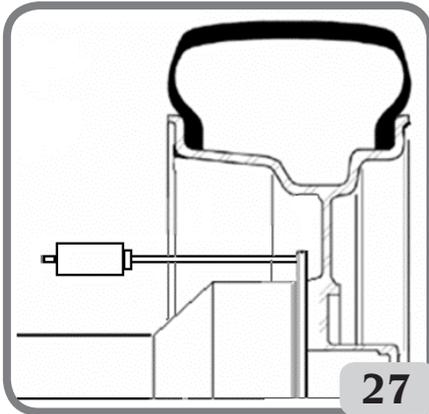
## 16. UNBALANCE CALIBRATION WITH CALIBRATION WEIGHT

This programme allows sensitivity calibration whenever calibration when it appears to be out of the tolerance range or when the machine requires this procedure to be performed by displaying the E 1 error message.

Proceed as follows to recall this programme:

- press the  key
- use the   keys to search for Unb CAL
- press the  key to perform calibration, proceeding as follows:
  1. Fit a wheel of average dimensions (diameter no less than 14"), with preferably only a small unbalance, on the wheel balancer.
  2. The machine will display the following message:
    - CAL on the left-hand display;
    - GO on the right-hand display.

3. Perform a first spin.
4. At the end of the spin, fix the calibration weight (supplied with the machine) on the shaft assembly bell as indicated in figure 27.
5. Perform a second spin.
6. At the end of the spin, change the position of the calibration weight on the swinging unit bell as indicated in figure 28.



7. Perform a third spin. This last calibration phase includes the execution of three consecutive spins in automatic mode.  
At the end of the spin (the message "End CAL" will appear on the display), if the calibration has been successful, an acoustic consent signal goes off at the end of the spin otherwise the message E 2 is temporarily displayed.

**NOTES**

- Once the procedure is finished, remove the calibration weight.



- Pressing the key , it is possible to interrupt the programme at any time.
- **THIS CALIBRATION IS VALID FOR ANY TYPE OF WHEEL!**

## **17. CALIBRATION OF THE ULTRASONIC WIDTH SENSOR (IF INSTALLED)**

Used to calibrate the ultrasonic sensor located on the wheel guard pipe (width). It must be performed when the machine requests it by displaying the E4 message, or when the measured and the actual rim widths differ.  
Proceed as follows to recall this programme:



- press the  key



- use the 3 5 keys to search for GAU CAL



- press the 4 key to perform calibration, proceeding as follows:

1. The machine will display the following message:

- CAL on the left display
- E flashing on the right display

2. fix the calibration template in line with the threaded hole on the shaft assembly bell, using the M8 screw (A, fig.29) supplied with the ultrasonic sensor;

3. use the wheel ring nut to bring the template into contact with the shaft assembly bell (fig.29);



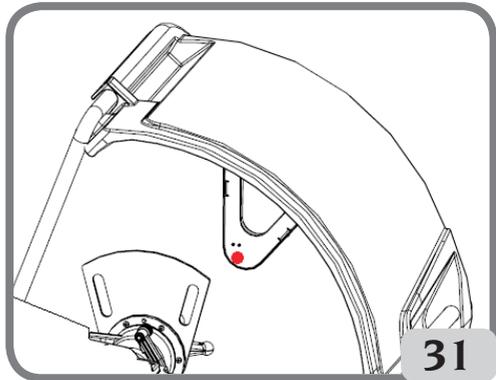
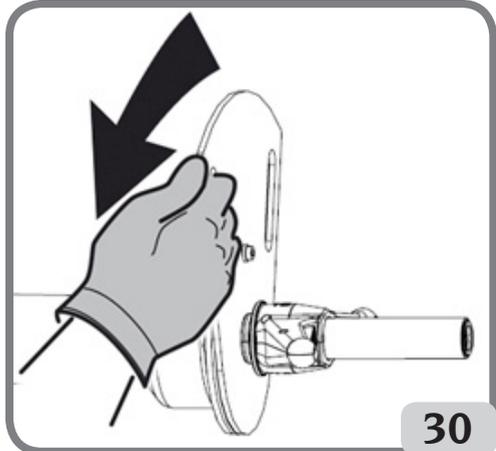
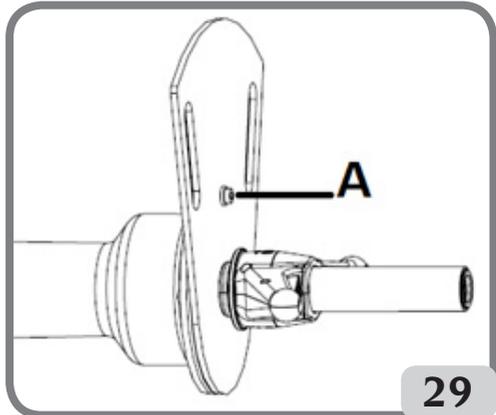
4. press the 4 key to confirm the securing of the template;

5. Once confirmed, the message “CAL rot” is shown on the display

6. slowly turn the template towards the operator to automatically enable the clamping brake (fig.30);

7. When template movement is complete, the message “CAL CLO” will appear on the display

8. slowly lower the wheel guard (fig.31); the machine will automatically calibrate the sensor.



If the calibration has been performed successfully, an acoustic consent signal is emitted.

**On the contrary, the display of the message A20 indicates that:**

- the position of the calibration template during the calibration phase is not correct. Position it correctly, checking that the ultrasonic sensor emitter/receiver is in line with the calibration template (see figure 31), then repeat the procedure.
- the internal sensor was not in the rest position. Position it to the rest position and repeat the procedure.



By pressing the  key you can quit the programme without making the calibration.

## 18. MESSAGES ON THE DISPLAYS

The machine can recognise a certain number of malfunction conditions and signals them to the user by visualising the relevant messages on the displays.

### – A – Notice Messages

- A 3** wheel not suitable for performing the sensitivity calibration, use a wheel of average dimensions (typically 5.5"X14") or larger, but NOT exceeding a weight of 40kg.
- A 5** Incorrect dimension settings for an ALU programme. Correct the set dimensions.
- A 7** The machine is temporarily unable to select the requested programme. Perform a wheel spin, then repeat the request.
- A 10** Internal sensor not in the rest position. Return the sensor to the rest position (completely in). If the message does not disappear, internal sensor operation



can be disabled by pressing the  button.

- A 20** Ultrasonic sensor calibration template in an incorrect position during calibration. Bring it to the position indicated, then repeat the calibration.  
Bring it to the position indicated and repeat the calibration.
- A 26** Programme available only after selecting one of the following programmes: ALU 1P / ALU 2P / Motorcycle Dynamic / Motorcycle ALU or if selected in the Motorcycle Programme but with the wheel NOT in the centred position.
- A 41** Incorrect wheel spin procedure on the wheel balancer without guard. The warning appears when the spin button is pressed for more than 10 seconds without pressing the "START" key at the same time. Release the button and spin the wheel according to the procedure indicated in the "Wheel Spin" paragraph.  
**If the problem persists, contact the technical support centre.**
- A Stp** Wheel stop during the spin phase.  
Wheel movement is not integral with swinging unit movement: Check correct wheel tightening.
- A Cr** Spin performed with the guard raised.  
Lower the guard to perform the wheel spin.  
In machine versions with a start button, either the START key or the button released during the spin.  
Perform the spin holding down both the START key as well as the button.

## – E – Error messages

- E 1** Absence of sensitivity calibration.  
Perform the sensitivity calibration procedure.
- E 2** Error condition during sensitivity calibration.  
Repeat sensitivity calibration paying attention to the first spin, which must be performed with the wheel as in the successive spins.  
Take particular care NOT to knock the machine during calibration.
- E 3 I/E 2/3** Error condition at the end of sensitivity calibration. Repeat the calibration, if the message persists perform the following checks:  
Correct sensitivity calibration procedure;  
Correct fastening and position of the calibration weight;  
Mechanical and geometric condition of the calibration weight;  
geometry of the wheel used.
- E 4** a) Error condition on ultrasonic sensor calibration. Calibrate the ultrasonic sensor.  
b) ultrasonic sensor not present. Visualisation of this error can be disabled by performing the following procedure:

- press the  key
- use the   keys to search for GAU CAL
- press the  key

- E 6** Error condition when executing optimisation programme.  
Repeat the procedure from the beginning.
- E 12** Ultrasonic width sensor not present, or faulty. Visualisation of this error can be disabled by performing the following procedure:

- press the  key
- use the   keys to search for GAU CAL
- press the  key

- E 27** **Excessive braking time. If the problem persists, contact the technical support centre.**
- E 28** Encoder counting error. If the error occurs frequently, call in the technical support centre.
- E 30** Wheel spin device failure. Switch off the machine and call in the technical

support centre.

- E 32 The wheel balancer has been jolted during the reading phase. Repeat the wheel spin.
- E F0 Error in reading the 0 notch.

## 19. OTHER MESSAGES

<b>OP.1</b> 	- This message indicates the valve of the wheel that must be brought to the 12 o'clock position during phases 1 and 5 of optimisation (OPt)
<b>OP.2 180</b>	- This message indicates that the position of the valve must be moved 180° with respect to the previous position (12 o'clock)
<b>Out 2</b>	<p>- This message is displayed when the improvement obtained by optimisation is not sufficient</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>- Press the  key to exit the program or the  key to continue the optimisation phase.</p>
<b>Abort</b>	<p>- Notice PREMATURE EXIT from the unbalance optimisation program</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>- Press the  key to confirm or the  key to remain in the programme</p>
<b>--I- -I--</b>	<p>- Notice TYRE MOUNTING INVERSION ON THE RIM in the OP.5 phase of the programme.</p> <div style="text-align: right; margin-right: 20px;">  </div> <p>If you do not want to (or cannot) carry out this operation, press the  key. the machine will provide the instructions to complete the programme without inversion.</p>
<b>HiddenEn</b>	- This message indicates that the operator is in the "positioning the weights behind the spokes Hidden Weight" programme
<b>no no</b>	- This message is displayed if the wheel is balanced on the outer side
<b>in -1-</b>	- This message indicates that the machine is set for acquiring the P1 position behind the first spoke
<b>in -2-</b>	- This message indicates that the machine is set for acquiring the P2 position behind the second spoke
<b>no -2-</b>	- This message is displayed for approx. 3 seconds if the selected angle is greater than 120 degrees, indicating that the procedure must be repeated correctly

<b>in H.X</b>	- This message indicates the reference for acquiring the two points P1 and P2 behind the spokes. Depending on the configuration made by the operator, the message shown on the right-hand display may be H3, H6 or H12. If the laser indicator is enabled, the reference is the 6 o'clock position (H.6)
<b>CAL GO</b>	- Calibration spin
<b>I - - CAL</b>	- This message indicates the correct position for applying the calibration weight in the unbalance calibration programme at the end of the first spin
<b>-- I CAL</b>	- This message indicates the correct position for applying the calibration weight in the unbalance calibration programme at the end of the second spin
<b>End CAL</b>	- This message indicates the end of the unbalance calibration programme
<b>GO ALU</b>	- Spin with ALU programme selected
<b>GO d15</b>	- Spin with Motorcycle Dynamic programme selected
<b>GO A15</b>	- Spin with Motorcycle ALU programme selected
<b>St</b>	- Spin with Static programme selected (car/motorcycle environment) or when the Static balancing programme is selected in the vehicle working environment
<b>St biE</b>	- This message indicates the selection of the Static balancing programme in the motorcycle working environment
<b>dyn biE</b>	- This message indicates the selection of the dynamic balancing programme in the motorcycle working environment
<b>ALU biE</b>	- This message indicates the selection of the ALU balancing programme in the motorcycle working environment
<b>ccc ccc</b>	- Unbalance values greater than 999 grams
<b>-1A</b>	- This message indicates the Inner Plane for applying the adhesive weight in the ALU IP balancing programme
<b>A-2 ---</b>	- This message indicates the External Plane for applying the adhesive weight in the ALU 1P/ALU 2P balancing programme

# CHECK FOR CORRECT FUNCTIONING OF BALANCING ACCESSORIES

Checking balancing accessories allows the operator to make sure that wear has not altered the mechanical specifications of flanges, cones, etc. beyond the specified limits. A perfectly balanced wheel, which has been disassembled and reassembled in a different position, should not show an unbalance value greater than 10 grams.

When a higher unbalance is found, check all the accessories carefully and replace the components that are not in perfect condition (e.g. showing dents, abnormal wear, flange unbalance, etc.).

Anyhow it is necessary to bear in mind that, if the cone is used to centre the wheel, satisfactory balancing results cannot be achieved if the central hole of the wheel is out-of-round or incorrectly centred; Better results can be achieved by centring the wheel using the securing holes.

Bear in mind that any re-centring error made when the wheel is mounted on the car can be removed only removed with an "on-the-vehicle balancing" of the wheel, using an on-the-vehicle wheel balancer to complement the work of the wheel balancer.

## TROUBLESHOOTING

Below is a list of faults that may occur and that the user can solve if the cause is found among those indicated.

For any other malfunction or fault call in the technical support centre.

### **The machine does not switch on(the displays remain switched off)**

**No power at the socket.**

- Check the mains voltage is present.
- Check the electrical power circuit in the workshop.

**The machine plug is defective.**

- Check that the plug is undamaged.

**One of the FU1-FU2 fuses of the rear electrical panel has blown**

- Replace the blown fuse.

### **The diameters and width values measured with the automatic measuring devices do not match the rated values of the rims.**

**The sensors have not been positioned correctly during measurement.**

- Bring the sensors to the position shown in the manual and follow the instructions in the WHEEL DATA ENTRY section.

**The external sensor has not been calibrated.**

- Calibrate the ultrasonic sensor. See warning instructions at the end of the ULTRASONIC WIDTH SENSOR CALIBRATION section

## **The automatic measuring devices are not working**



The sensor was not in the rest position at switch-on (A 10) and the key has been pressed to enter the wheel geometric data with the keypad, disabling control of the automatic sensor.

- ➔ Return the sensors to the correct position.

### **Pressing the START key and the key (only the START key if the guard is installed) the wheel does not spin (the machine does not start)**

For machines with guard, check that it is not raised (the message "A Cr" appears).

- ➔ Lower the wheel guard.

For machines without guard, check that both the START key as well as the key on the side of the machine have been pressed.

### **The wheel balancer provides unsteady unbalance values**

**The machine was jolted during the spin.**

- ➔ Repeat the spin, taking care not to disturb the machine while measuring is in progress.

**The machine does not firmly rest on the floor.**

- ➔ Make sure that the floor support is firm

**The wheel is not locked correctly.**

- ➔ Tighten the securing ring nut correctly.

### **Several spins are to be performed to balance the wheel**

**The machine was jolted during the spin.**

- ➔ Repeat the spin, avoiding any unnecessary strain during the acquisition procedure.

**The machine does not firmly rest on the floor.**

- ➔ Make sure that the floor support is firm.

**The wheel is not locked correctly.**

- ➔ Tighten the securing ring nut correctly.

**The machine has not been calibrated correctly.**

- ➔ Carry out the sensitivity calibration procedure.

**The entered geometric data are not correct.**

- ➔ Check that the data corresponds to the dimensions of the wheel and correct, if necessary.
- ➔ Perform the width measuring sensor calibration procedure.

### **LED light and/or laser indicator are NOT working**

- ➔ check if the device(s) is (are) configured correctly as shown in the paragraphs "SET UP - LED light" and "SET UP - Laser indicator". If the problem persists after checking the correct device configuration, call the technical support centre.



The “Spare parts” handbook does not authorise the user to carry out work on the machine with the exception of those operations explicitly described in the User Manual. It only enables the user to provide the technical assistance service with precise information, to minimise delays.

## MAINTENANCE



The company is not to be held responsible for any claims deriving from the use of non-original spare parts or accessories.



Unplug the machine from the socket and make sure that all moving parts have been locked before making any adjustments or maintenance work.  
Do not remove or modify any part of the machine (except for service interventions).



Keep the working area clean.  
Never use compressed air and/or jets of water to remove dirt or residues from the machine.

Take all possible measures to prevent dust from building up or raising during cleaning operations.

Keep the wheel balancer shaft, the securing ring nut, the centring cones and flange clean. These components can be cleaned using a brush previously dipped in environmentally friendly solvents.

Handle cones and flanges carefully so as to avoid accidental dropping and subsequent damage that would affect centring accuracy.

After use, store cones and flanges in a place where they are suitably protected from dust and dirt.

If necessary, use ethyl alcohol to clean the display panel.

Perform the calibration procedure at least once every six months.

## INFORMATION REGARDING MACHINE DEMOLITION

If the machine is to be scrapped, remove all electrical, electronic, plastic and metal parts and dispose of them separately in accordance with current provisions as prescribed by law.

# ENVIRONMENTAL INFORMATION

The disposal procedure described below only applies to machines with the symbol of the

waste bin with a bar across it  on their data plates.



This product may contain substances that can be hazardous to the environment and to human health if it is not disposed of properly.

The following information is therefore provided to prevent the release of these substances and to improve the use of natural resources.

Electrical and electronic equipment must never be disposed of in the usual municipal waste but must be separately collected for their proper treatment.

The crossed-out bin symbol, placed on the product and on this page, reminds the user that the product must be disposed of properly at the end of its life.

In this way it is possible to prevent that a non specific treatment of the substances contained in these products, or their improper use, or improper use of their parts may be hazardous to the environment or to human health. Furthermore, this helps to recover, recycle and reuse many of the materials contained in these products.

Electrical and electronic manufacturers and distributors set up proper collection and treatment systems for these products for this purpose.

Contact your local distributor to obtain information on the collection procedures at the end of the life of your product.

When purchasing this product, your distributor will also inform you of the possibility to return another end-of-life piece of equipment free of charge as long as it is of equivalent type and had the same functions as the purchased product.

Any disposal of the product performed in a different way from that described above will be liable to the penalties provided for by the national regulations in force in the country where the product is disposed of.

Further measures for environmental protection are recommended: recycling of the internal and external packaging of the product and proper disposal of used batteries (only if contained in the product).

Your help is crucial in reducing the amount of natural resources used for manufacturing electrical and electronic equipment, minimise the use of landfills for product disposal and improve the quality of life, preventing potentially hazardous substances from being released in the environment.

# FIRE-EXTINGUISHING MATERIALS TO BE USED

Consult the following table to choose the most suitable fire extinguisher.

	Dry materials	Flammable liquids	Electrical equipment
Water	YES	NO	NO
Foam	YES	YES	NO
Powder	YES*	YES	YES
CO <sub>2</sub>	YES*	YES	YES

YES\* Use only if more appropriate extinguishers are not at hand or when the fire is small.



## CAUTION

The indications in this table are of a general nature. They are designed as a guideline for the user. The applications of each type of extinguisher will be illustrated fully by the respective manufacturers on request.

## GLOSSARY

Below is a brief description of some technical terms used in this manual.

### AWC

Auto Width Calculation acronym

### AWD

Auto Width Device acronym

### BALANCING CYCLE

Sequence of operations to be performed by the user and the machine from the beginning of the spin until the wheel is braked to a stop after calculating the unbalance values.

### CALIBRATION

See SELF-CALIBRATION.

### CENTRING

Procedure for positioning the wheel on the wheel balancer shaft to ensure that the shaft axis corresponds to the wheel rotation axis.

### CONE

Conical element with a central hole which, when inserted on the wheel balancer shaft, is used to centre the wheels having central holes with a diameter ranging between maximum and minimum values.

### DYNAMIC BALANCING

Procedure for unbalance compensation by applying two weights, one on each of the two wheel sides.

### FLANGE (of the wheel balancer)

Circular crown-shaped disk against which the disk of the wheel mounted on the wheel

balancer rests. Also used for keeping the wheel perfectly perpendicular to its rotation axis.

**FLANGE (adapter - centring accessory)**

Device for supporting and centring the wheel. Also used for keeping the wheel perfectly perpendicular to its rotation axis.

Mounted on the shaft of the wheel balancer by means of the central bore.

**FSP**

Fast Selection Program acronym

**LOCKING DEVICE**

Wheel clamping device on the wheel balancer only used for versions with the automatic wheel clamping system.

**OPT**

Optimisation abbreviation.

**RING NUT**

Wheel blocking device on the wheel balancer, fitted with elements for coupling with the threaded hub and side pins for tightening it.

**RPA**

Acronym of Ricerca Posizione Automatica (Automatic Position Search).

**SELF-CALIBRATION**

This procedure calculates suitable correction coefficients starting from known operating conditions. It improves the machine accuracy by correcting to a certain extent the calculation errors that may result from the alteration of the machine's features over the course of time.

**SENSOR (measuring arm)**

Mobile mechanical element that, when brought into contact with the rim in a specific position, measures the geometric data: distance, diameter. Data can be measured automatically if the sensor is equipped with suitable measurement transducers.

**SPIN**

Procedure starting from the action that causes the wheel to rotate and the subsequent rotation of the wheel.

**STATIC BALANCING**

Procedure for correcting only the static element of the unbalance, by applying only one weight, usually at the centre of the rim well. Accuracy increases as the width of the wheel decreases.

**THREADED HUB**

Threaded part of the shaft on which the ring nut is engaged to lock the wheel. It is supplied disassembled from the machine.

**ULTRASONIC SENSOR**

Electronic component that, together with the information collected by the internal measuring sensor, makes it possible to measure the wheel width. This measurement is taken by transmitting and receiving ultrasonic wave trains.

**UNBALANCE**

Uneven distribution of the wheel mass that generates centrifugal forces during rotation.

# ELECTRICAL SYSTEM GENERAL DIAGRAM

AP1	Power supply unit card
AP2	Mother board (CPU)
AP5	Search card
BP1	Internal pick-up
BP2	External pick-up
FU1	Fuse
FU2	Fuse
M1	Motor
QS1	Main switch
SQ1	Safety guard micro-switch / start key
XS1	Power supply socket
BR2	Diameter measuring sensor
BR3	Distance measuring sensor
BR5	LASER indicator
BR9	External distance sonar sensor
AP22	LED light

