MANUAL

TIRE WHEEL BALANCER

OPERATION INSTRUCTION

EDITION A-01

Contects

1.	Preface	**P.3**
2.	General safety rules	**P.4**
3.	Transport and handling	**P.5**
4.	Installation and commissioning	**P.7**
5.	Installation	**P.8**
6.	Use suspension	**P.9**
7.	Environmental information	**P.9**
8.	Technical data	**P.10**
9.	Ordinary maintenance	**P.10**
10.	Machine start-up diagnostics	**P.11**
11.	Control panel	**P.12**
12.	Machine calibration	**P.14**
13.	Use of the machine in normal mode	**P.20**
14.	Optimization	**P.38**
15.	Hidden weight program	**P.41**
16.	Utility programs	**P.43**
17.	Service mode	**P.46**
18.	Signalling	**P.51**
19.	Troubleshooting	**P.56**
20.	Maintenance	**P.57**
21.	Information regarding machine demolition	**P.58**
22.	Environmental information	**P.58**
23.	Fire prevention means to use	**P.59**

1. PREFACE

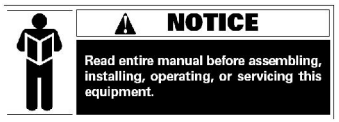
Confirming the machine including the operation system, tools and accessories are operated normally and without any damage, you hand the machine to the customers and the machine will endure some period of guarantee. During this period, the manufacturer will repair the machine or the no-normal parts of the machine or machine itself free of charge but will not be responsible for the damage and wear and tear caused by the no-normal usage, transportation and maintenance. And the manufacturer will not notify the customers when he renews the products or improves the production line. The purpose of this manual is to provide the users and owners of this machine with the guide of safety and regulation to make the operators properly maintenance and operates the machine. If you carefully follow this instruction manual, the machine will provide you with the service of higher efficiency and more durable. The following paragraphs will provide you with the danger level related to the machine.

	Danger: operation can cause the serious injury or death.
	Warning: operation can cause the serious damage or unsafe.
	Caution: operation can cause slight wound and the damage of the objects.

*Read the manual carefully before use the machine and keep this manual on the document folder near the machine for check at any time.

* Technical document should be considered to be the integrated part of the machine and it should be placed together with the machine when being sold to the new owner.

*Only when the series number and model of the manual are same to the series number and model on the nameplate, the manual can be considered to be effective.



* Firmly keep in mind and follow the description and information of this manual at any time and the operators should be responsible for the operations not described and authorized in the manual.

* Some information of the manual comes from the pictures, it is normal that you will see some differences to the standard machines.

* Do not try the other operations except under the guidance of the personnel with experience. If necessary, please contact with the authorized service center for help.



The select of the installation site must be in accordance with the current effective safety regulation. We should specially point out that the installation and operation of the machine must have the anti-moisture protective methods. If you want to correctly and safely use the machine, you should meet the following environment requirements:

- Luminosity in site should be at least 300 lux.
- RD：<85% (without condensation).
- Environment temperature: 0° -50°C.
- The floor of the ground should be enough solid to support the maximum weight of the machine.
- The machine should not be used in the environment with the potential exploded factors.

2. SAFETY REGULATIONS



* Not following the information and overlooking the warning labels will cause the series injuries to the operators and the other personnel.

* You can operate the machines after you completely read and understand the entire damages/warnings.

* The correct use of the machine needs the professional operator who must undertake the suitable training and can understand the written descriptions of the manufacturer, familiar with the safety regulations and follow all these descriptions and regulations. And mean while the operator should be a person without bad habit and of healthy of mentality and physiology.

Before operating the machine, you must have the following conditions:

- Read and understand the information and the description in the manual
- Fully understand the characteristic and the features of the machine
- Keep the unauthorized personnel from the operative site
- Be sure the installation should be in accordance with the current standard and the regulation
- Be sure that the operators of the machine should endure the proper training and operate the machine correctly and safety.

- Before power off the machine, do not touch the cables, motors or other electrical elements.

WARNING

Do not remove or wear out any label of danger, caution and warning or instruction. If the label is lost or fuzzy, you should change it at once. If the label is missing, please contact with the nearest dealer to get it.

- See the accident precaution regulation related to the operation and maintenance of the mechanism of high voltage and rotation
- The manufacturer will not be responsible for the damage and accident caused by the changes and modifications not authorized by the manufacturer.

3. CARRIAGE, HOISTING, STORAGE AND TRANSPORTATION OF THE MACHINE

Place, transport and store the machine according to the indication on the package container. When transport and hoist the wheel balancer, do not make the accessory hang, weight tray, balance shaft and display cover to be the weight bearing area because this can cause the damage of the machine or the precision error and even the injury to the operator. According to the construction of the wheel balancer, the center of gravity is on the right off-center, therefore when lift the machine unpacked, the lift arm of the hydraulic vertical lift of the forklift should be deflect to the right meaning not exceed 1/4 of the width of the machine. It is best to cover a layer of paper shell and rubber to avoid the slide of the machine. When lift and slide the machine, there should be the personnel to hold the machine and the maximum height of lifting should not exceed one meter. If exceeding one meter, you should fix the machine properly.

If hoist the wheel balancer, you can pass the wide cloth band through the clearance under the machine. The cloth band must be 2 pieces or more than 2pieces and the load bearing should be more than 500kg and the length should be of same. The position of the cloth band should be in accordance with the requirement of lifting the machine. When hoist, it is best that some personnel to hold the machine. When lift or hoist the machine, the speed should be not more than 35mm/s for fear that the much inertia causing the slide and swing of the machine to cause the dangerous.

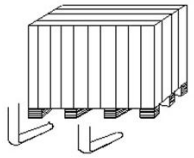
Storage: The machine should not be exposed and should be covered with the plastic film. The machine should be stored in the warehouse of ventilation, dry and waterproof. In the storage area, the temperature should be controlled in the range of -10℃～55℃ and RH should be controlled in the range of 30%～90%. It is forbidden to store the machine together with the dangerous chemical, the inflammable and explosive materials or the objects easy to born the dust.

Transportation : The load of the machine should be accordance with the indication on the outer package and fix firmly. No matter what kind of transportation, the environment temperature and humidity should comply with the requirement of the storage requirement specified in term2.2. It is forbidden transport the machine together with the dangerous chemicals, inflammable and explosive materials or the objects easy to born the dust.

Installation

After confirming the package of the wheel balancer intact, you can carry the machine to the installation area as shown in the Fig1

Environment requirement at the installation site: Temperature 0℃-50℃, RH≤85%, without water source, fire source, dust, inflammable and explosive materials and the chemicals. The floor should be flat and solid.



Before installation, detach the upper cover of the package box of the wheel balancer and confirm the machines, accessories shipped together with the machine and the data you purchase according to the packing list. If you have any question, you can contact with the dealers. The packing material such as plastic, polystyrene, nail, screw, wood and the carton must be placed into a scrap box and handle according to the local law and regulation. When install, detach the connect bolt between the wheel balancer and the pallet of the package box and move the machine from the pallet to the installation position. To guarantee the safety and fast of the operation, there should be the distance more than 300cm from the wall of the building to the right and rear of the machine. And the distance of more than 200cm from the wall of the building to the left of the machine. After the wheel balancer is moved to the proper position, drill 3 anchor holes on the ground according to the installation hole at the foot of the machine and then use 3 pieces of M10X160 anchor screws to fix the machine on the ground to guarantee the stability and reliability of the machine.

If the machine is not packed, observe following precautions:

PROTECT THE SHARP EDGES AT THE ENDS WITH SUITABLE MATERIAL (Bubble wrap or cardboard).

DO NOT USE METAL WIRE ROPES FOR LIFTING BOARD.

SLING WITH STRAPS OF AT LEAST 200 cm IN LENGHT AND WITH A HIGHER FLOW RATE OF 500 kg.

DO NOT FORCE ON SHAFT AND/OR FLANGE.

ALWAYS UNPLUG THE POWER SUPPLY CABLE FROM THE SOCKET BEFORE MOVING THE MACHINE.

4. INSTALLATION AND SWITCHING ON

After unpacking wheel balancer, check the status of integrity and presence of faults, make the assembly of the components as shown in following pictures.

4.1 Electrical connection

The standard version of the machine must be connected to a mains 230V Single Phase.
The change of the power supply cannot be realized by the user; it must be requested to BRIGHT or to a dealer or to an authorized service center. To accomplish the electric connection, connect the machine's power supply cable with the plug in use in the country.

ALL OPERATIONS TO MAKE ELECTRICAL CONNECTION AND INTERVENTIONS (HOWEVER LIGHT) ON ELECTRICAL PARTS MUST BE CARRIED OUT BY QUALIFIED PERSONNEL.

The dimensioning of electrical connection must be carried out in according to electric power absorbed by the machine. The absorption is specified in paragraph 10. The user must:

- Check that the supply voltage correspond to the voltage indicate on the nameplate of the machine;
- Check the conditions of the wire and the presence of the ground conductor;
- Check the machine is connected to its own electrical connection, fitted with a proper 30 mA sensitive automatic circuit breaker, against a possible electrical overload over 30 mA;
- Connect the power supply cable to the plug with great care and following to the current regulations.

WHEN THE MACHINE IS TURNED OFF FOR A LONG TIME IT IS NECESSARY TO DISCONNECT THE POWER PLUG TO AVOID USE BY UNAUTHORIZED PERSONNEL.

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 TO RESCTRICT THE MACHINE USE EXCLUSIVELY TO QUALIFIED PERSONNEL.

IN CASE OF OPERATIONS ON ELECTRIC PARTS, CABLES ENGINES OR ANY ELECTRIC DEVICES, IT IS NECESSARY TO CUT OFF THE ELECTRICITY.

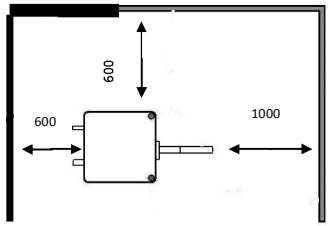
DO NOT REMOVE, DAMAGE AND MAKE COMPLETELY ILLEGIBLE THE STICKERS OF DANGER, WARNING, INSTRUCTIONS AND CAUTION. REPLACE ANY MISSING, DAMAGED OR ILLEGIBLE STICKERS. THE STICKERS CAN BE FOUND AT THE NEAREST

DEALER OF MANUFACTURER.
THE DAMAGE FOR FAILURE TO COMPLY WITH THE ABOVE WRITTEN INSTRUCTIONS, IT WOULD BE NOT CHARGED AGAINST THE MANUFACTURER AND IT MAY CAUSE THE INVALIDATION OF THE WARRANTY.

5. INSTALLATION

5.1 Installation area

To install the machine you need a useful space on the basis of the information given in picture F5.1.



F5.1

From working position, the user must be able to view the machine and the surrounding area.

INSTALLATION AREA MUST BE KEEP CLEAR BY POSSIBLE DANGEROUS OBJECTS.

UNAUTHORIZED PERSONNEL MUST NOT STAND NEAR BY THE WORKING AND INSTALLATION AREAS.

THE MACHINE MUST BE PLACED ON A HORIZONTAL SURFACE RATHER MADE OF CONCRETE OR TILED.

AVOID BREAKABLE AND ROUGH SURFACES.

SURFACE MUST ENDURE THE STRESS LOAD DURING THE MACHINE OPERATION.

THE MACHINE MUST BE FIXED ON THE FLOOR WITH SCREWS AND EXPANSION PLUGS IN ACCORDING TO FOLLOWING INSTRUCTIONS.

THE USE OF THE MACHINE IS ONLY ALLOWED IN PLACES THAT DO NOT PRESENT RISKS OF EXPLOSION OR FIRE.

6. SUSPENSION OF THE USE

In case the machine is not used for a long time it is necessary to disconnect the power supply and protect all parts that could be damaged by dust. Grease all parts that could be damaged in case of oxidation. In this specific case, protect the shaft and flange.

7. 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.



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. This product may contain substances that can be hazardous to the environment and to human health if it is not disposed of properly. We are therefore providing you with the information below in order to prevent these substances from being released into the environment 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.

Thus, the hazardous consequences that non-specific treatments of the substances contained in these products, or improper use of parts of them, may have on the environment or on human health are prevented. 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. At the end of the product's working life contact your supplier for information about disposal procedures. When you purchase this product, your supplier will also inform you that you may return another worn-out appliance to him free of charge, provided it is of the same type and has provided the same functions as the product just purchased.

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

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

8. TECHNICAL DATA

General features

Power supply voltage(1)	

Power consumption	W
Balancing speed	RPM
Maximum unbalance calculated	
Accuracy	
Shaft diameter	
Working environment temperature	
Storage temperature	
Storage relative humidity	
Machine weight (without accessories)	
Noise level	

9. ROUTINE MAINTENANCE OF THE WHEEL BALANCER

Warning

The manufacturer declines all responsibility in the event of claims resulting from the use of non-original spare parts or accessories.

Warning

Unplug the machine from the socket and make sure that all moving parts have been locked before performing any adjustment or maintenance operation.

Warning

Do not remove or modify any part of the machine (except for service interventions).

Caution

Keep the work 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 rising during cleaning operations.

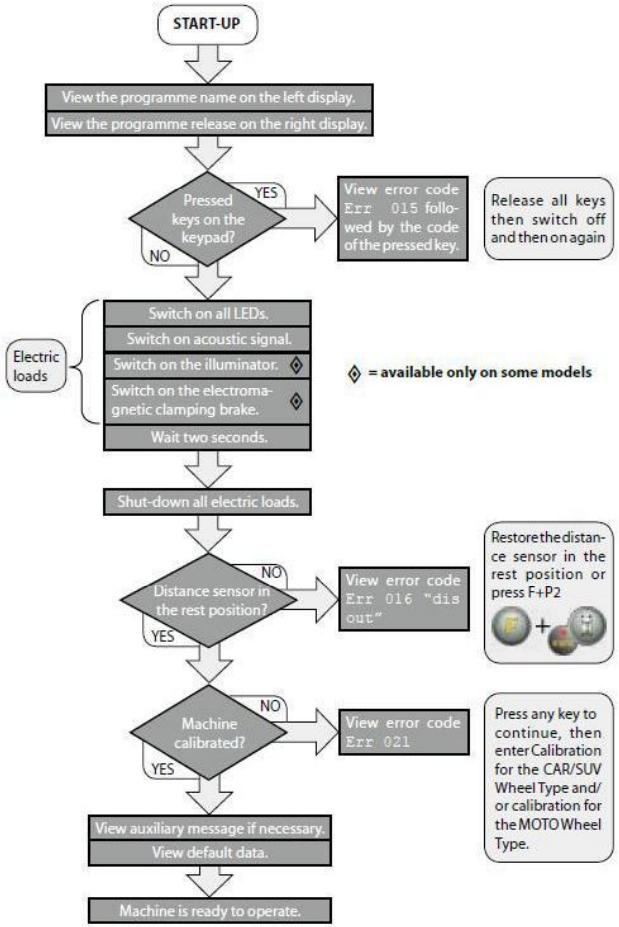
Keep the wheel balancer shaft, the securing ring nut, the centering cones and flange clean. These components can be cleaned using a brush previously dripped in environmentally friendly solvents.

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

10. MACHINE START-UP –DIAGNOSTICS

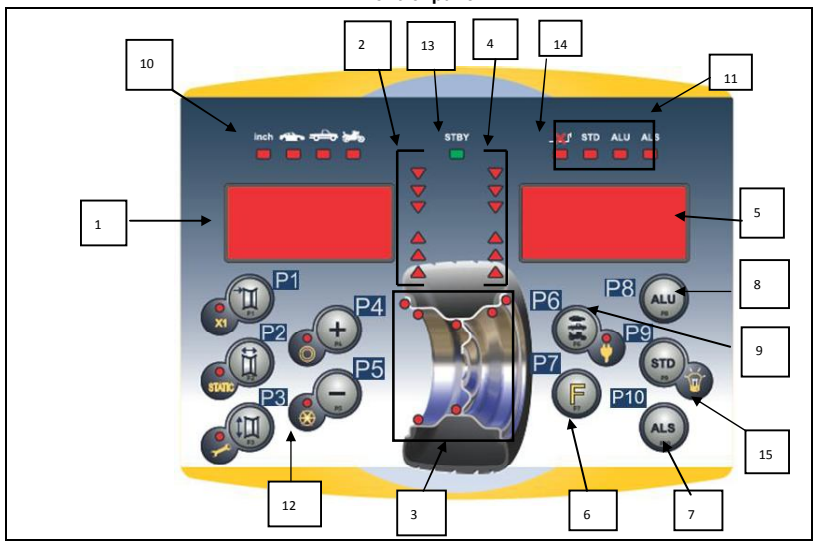


11. CONTROL PANEL

The machine control panel is shown in Figure F10.1. The control panel allows the operator to give commands and enter or edit data. The same control panel displays the balancing results and machine messages. The functions of the various parts of the control panel are

described in table T10.1. The control panel is provided on the rear with an electronic control board collecting, processing and displaying data.

F11.1: Control panel



T11.1: Functions of different parts of the control panel

Pos.	Description
1 – 5	Display to show inside/outside imbalance value.
2 – 4	Light indicator showing inside/outside imbalance angular position.
3	Imbalance Weight Position light indicator. Group of 5 LEDS (red). Position depends by the Program and Wheel Type selected.
6	"F" key to access the secondary function of the keys【P7】
7	ALS program selection key 【P10】
8	ALU program selection button 【P8】
9	Indicator light for the selected CAR/MOT/SUV (Auto-vehicle/Motorbike/Off-road) Wheel Type. Group of three indicator lights (red) indicating the Type of programme selected【P6】
10	Indicator light (red) for the selected unit of measure: inches - mm.
11	Indicator light for the selected Programme Type (Standard/Alu/AluS). Group of three indicator lights (red) indicating the Type of programme selected.
12	Example of standard key: it features a main function (indicated in the big circle) and a secondary function (indicated in the small circle)i
13	Active standby status indicator light

14	Enabling (on) - disabling (off) indicator light of the automatic acquisition system of the wheel size
15	STD Programme【P9】

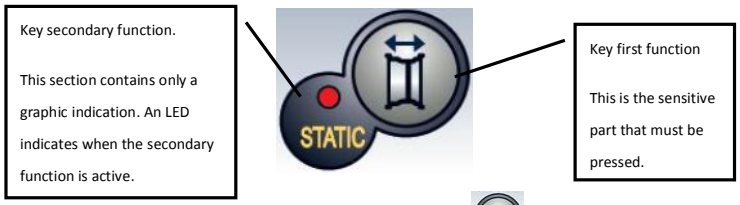
11.1 Keypad

The ten buttons have a main function indicated by a symbol in the levelled square, and a secondary function indicated by a small icon located nearby. Some of the secondary functions feature an LED to indicate their activation. The keys [P7] 

, [P8] ALU 

, [P10] ALS 

, do not have a secondary function. The secondary function of the keys is identified in this manual with the codes from [F+P1] to [F+P9] as shown in Figure F11.2.



To enter the secondary function of a key, press the [P7] 

then, by holding it down, press one of the keys for which a secondary function is desired; then release both keys.

Figure F11.2: Key secondary functions numbering

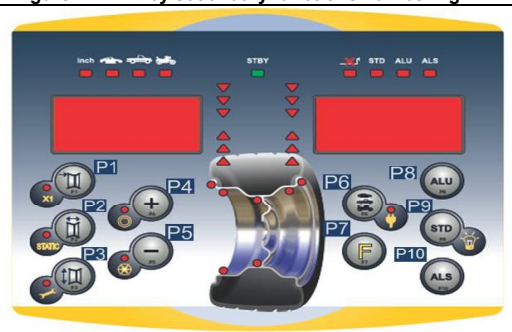


Table T11.2: Settings, programs and menus available in SERVICE mode

SERVICE mode			
Key	*Setting/Program or Menu*	*Key*	*Setting/Program or Menu*
[P1]	Measurement scale calibration selection	[F+P1]	Not used
[P2]	Not used		
[P3]	Machine calibration	[F+P3]	Exit SERVICE mode (return to the NORMAL mode)
[P4]	Grams/ounces selection	[F+P4]	Read counter with the number of launches
[P5]	Inches/mm selection	[F+P5]	Parameters (Menu with password reserved for technical service)
[P6]	Imbalance threshold view selection	[F+P6]	Not used
[P9]	Not used	[F+ P9]	Testing programs

Note: The [P7] 

, [P8] ALU 

and [P10] ALS 

keys are not used to access settings, programs and menus.

11.2 STANDARD, SERVICE, STAND-BY operating modes

The machine features three operating modes:

- STANDARD mode. This mode is enabled after the machine is turned on and it is possible to perform the wheels balancing;
- SERVICE mode. In this mode various utility programs are available for setting parameters (such as grams or ounces) or checking the machine operations (such calibration);
- STAND-BY mode. After 5 minutes of inactivity, the machine will automatically go into STANDBY mode to reduce power consumption. The STAND-BY green LED on the control panel flashes when the machine is in this operating mode. All acquired data and settings are held in STAND-BY mode. In the SERVICE mode is not possible to switch to STAND-BY mode.
  To exit from STAND-BY mode choose by any of the following means:
  - Press any key (with the exception of [P7] 

);
  - Rotate manually the wheel.

Note: The machine will exit STAND-BY mode also by pressing the [P8] ALU 

key.

12. MACHINE CALIBRATION

To function properly, the machine must be calibrated. Calibration allows storing the mechanical and electrical parameters specific to each machine so as to provide the best balancing results.

12.1 When to carry out machine calibration

Table T12.1 lists the cases in which machine calibration should be carried out. Calibration must be carried out whenever one or more of the conditions listed are active.

Table **12.1** Conditions for machine calibration

When the machine is installed at the site of the end customer	Compulsory	Technical Support
When the CPU-C1 electronic circuit board is replaced	Compulsory	Technical Support
When a mechanical part linked to the pick-up signals (pick-up, pick-up compression springs, suspension unit + shaft) is replaced	Compulsory	Technical Support
When calibration of the pick-up pre-tensioning springs has been altered	Compulsory	Technical Support
When the encoder disc is replaced	Compulsory	Technical Support
When you use a flange for motorbikes different from that used in the previous calibration for MOTO Wheel Type	Compulsory	Final user and/or Technical Support
When the machine does not provide optimal balancing results	Recommended	Final user and/or Technical Support
When there are consistent and constant variations in temperature and humidity (e.g. in seasonal changes)	Recommended	Final user and/or Technical Support

The machine requires two independent calibrations:
• Calibration for the CAR/SUV Wheel Type (calibration is the same for both types of wheels);
• Balancing for the MOTO Wheel Type (wheels for motorbikes).

It is not compulsory to run both calibrations. If, for example, a user uses the machine exclusively for motorbike wheel balancing, he must perform calibration only for the MOTO Wheel Type. Similarly, if the user uses the machine exclusively to balance auto-vehicle/off-road wheels (CAR/SUV), he must run calibration only for the CAR/SUV Wheel Type.
If the user instead uses the machine to balance all Wheel Types, he must run both calibrations. It does not matter the order in which the two calibrations are performed.

12.2 Calibration according to the CAR/SUV Wheel Type

The calibration for the CAR and SUV Wheel Types is the same.

To perform machine calibration, you must first provide for the following material:
• A balanced wheel with steel rim that has the following dimensions: Diameter 15” Width

6”. The distance of the wheel from the machine should be approximately 100 mm. You can also use wheels with dimensions similar to those recommended as long as the difference is minor. It is not possible to use wheels with rims in aluminum;
• A 50 gram weight (preferably in iron or zinc).

To run the machine calibration, proceed as follows:

1. Start-up the machine;
2. Remove the wheel and any other accessories from the shaft;
3. Press [F+P3]  + . The writing SER SER will be displayed (this means that we have entered the SERVICE mode) (service programme);
4. Press [P3] . The writing CAL CAR (machine calibration for auto-vehicle and light off-road vehicle wheels);
5. With buttons [P4]  or [P5] , select the CAR (auto-vehicle and light off-road wheels) or MOT (motorbike wheels) calibration type.

Note:
the calibration for motorbike wheels is described separately in chapter 4.3 Machine calibration for MOTO Wheel Type.

---

6. Press [P3] . The writing CAL 1 will be displayed;
7. Mount the wheel on the shaft and enter its dimensions by pressing the keys [P1] , [P2] , [P3]  to select the dimensions to edit and keys [P4]  or [P5]  to edit the value. If the dimensions of the wheel were introduced before entering the calibration programme, this step can be skipped. It is not possible to enter the data with the automatic acquisition system;
8. run a launch again;
9. Once the launch is completed, manually rotate the wheel until value 50 is seen on the left display. Apply the 50 g weight at the 12 o’clock position on the internal side of the wheel.
10. run a launch again;

11. Remove the 50 g weight applied on the internal side.

12. Manually rotate the wheel until the value 50 is seen on the right display. Apply the 50 g weight at the 12 o'clock position on the external side of the wheel.

13. run a launch again;

14. Calibration is completed: the machine automatically exits the calibration programme and returns to the NORMAL mode, ready to perform the balancing.

If during machine calibration there are some anomalies, error codes will be displayed (e.g. Err 025). See *Error Codes* and act accordingly to eliminate the problem and to continue/repeat/cancel the calibration in progress.

12.2.1 *How to exit the CAR/SUV Wheel Type calibration*

You can exit the ongoing calibration procedure at any time by pressing [F + P3]


+

. The machine will return to the SERVICE mode displaying the writing SER SER. To return to the NORMALE mode, press [F+P3].
The calibration procedure in progress will be cancelled and the balancing results will use previous calibration values.

12.3 Calibration according to the MOTO Wheel Type

Calibration for the MOTO Wheel Type (wheels for motorbikes) is completely separated from the machine calibration for the CAR/SUV Wheel Type because it takes into account the fact that the machine uses a special flange for motorcycle wheels that slightly alters the balancing of the shaft.
If MOTO Wheel Type calibration has not been carried out and you try to run a balancing launch when the MOTO Wheel Type is selected, the machine will not run the launch and will display the error code ERR 031.
To calibrate motorbike wheels, proceed as follows:

1. Switch the machine on;

2. Apply the flange on the shaft for motorbike wheels as shown in Figure F12.1.

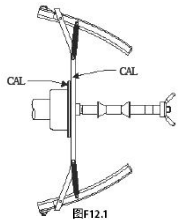


Fig. F12.1 Application of the motorbike flange onto the shaft. Align the writing "Cal" on the flange and on the flange for motorbikes.

3. Press the [F+P3]  + . The display will show the message SER - SER (this indicates that we have entered Service mode).

4. Press [P3] . The writing CAL CAR (calibration for auto-vehicle and off-road vehicle wheels) will be displayed;

5. To select the MOTO (motorbike wheel) calibration type, press [P4]  or [P5] . When the MOTO calibration type is selected, the machine automatically loads the geometric data of the motorbike flange and automatically sets the MOTO Wheel Type and the ALU1 programme.

6. Press [P3] to confirm. The writing CAL 0 will be displayed;

7. run a launch.

8. At the end of the launch, the machine will display the writing h12 CAL. Apply the calibration weight on the internal side as shown in Figure F12.2. The calibration weight is to be applied on the hole that has the writing "CAL" marked on it;

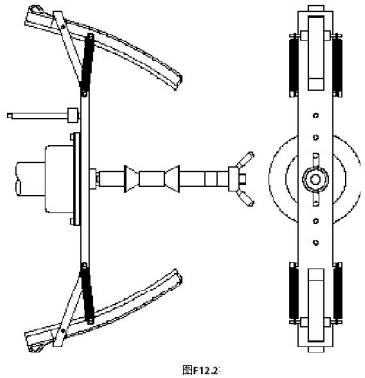


Fig. F12.2 Application of sample weight on the internal side of the motorcycle flange on the shaft (Cal2 phase)

9. Bring the motorcycle flange in perfect vertical position with the calibration weight at the top part as shown in figure F12.2 and run a launch.

Note: If the position is significantly different from the vertical one, the machine will reject running the launch by emitting an acoustic error message (triple beep).
If the flange for motorbikes is close enough to the vertical position but not perfectly vertical, the machine will run the launch but at the end of the calibration procedure, all balancing launches will present an error indicating the angular position of the balancing weights;

---

10. At the end of the launch, the machine will display the writing CAL h12. Apply the calibration weight on the external side as shown in Figure F12.3. The calibration weight is to be applied on the hole that has the wording “CAL” marked on it;

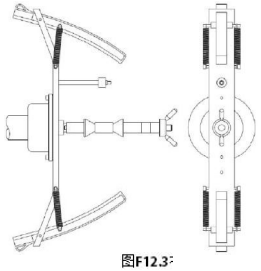


Fig. F12.3 Application of the sample weight on the external side of the flange for motorbikes on the shaft (Cal3 phase)

11. Bring the flange for motorbikes in perfect vertical position with the calibration weight at the top part as shown in figure F12.3 and and run a launch. If the position is significantly different from the vertical one, the machine will reject running the launch by emitting an acoustic error message (triple beep).

12. Once the calibration launch for the MOTO Wheel Type is completed, the machine returns directly to the NORMAL mode, ready to perform the balancing.

When the machine completes calibrating, the MOTO Wheel Type and the ALU1 Programme Type will remain set. Even the dimensions of the wheel will remain those set automatically by the machine for this type of calibration.
If there are some anomalies during machine calibration, error codes will be displayed (e.g. Err 025). See Error Codes and act accordingly to eliminate the problem and to continue/repeat/cancel the calibration in progress.

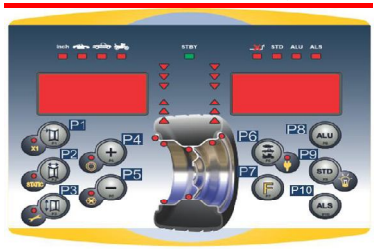
12.3.1 How to exit from auto-vehicle calibration mode for the MOTO Wheel Type

You can exit the ongoing calibration procedure at any time by pressing

[F+P3]  + . The machine will return to the SERVICE mode displaying the writing SER SER. To return to the NORMAL mode, press [F+P3]  +  .
The calibration in progress will be cancelled and the balancing results will use the calibration results for the MOTO Wheel Type previously used. Even in this case, the MOTO Wheel Type and the ALU1 Programme Type will remain set and the dimensions of the wheel will remain those set automatically by the machine for this type of calibration.

13. use of the machine under STD mode

Machine control display



To use the machine, you must select or set as follows:
• Programme type (programme for wheels with steel, aluminium or special aluminium rims).
Default = programme for wheels with steel rims;
• Wheel Type (auto-vehicle, motorbike, off-road). Default = auto-vehicle;
• Dimensions of the wheel to balance. The dimensions can be entered manually (always) or partially or fully in automatic (only available on some models).
• Dynamic or Static balancing. Default = Dynamic;
• Display resolution X1 or X5. Default = X5;
The selections described above may be entered before or after the launch. For any variation of the selection or data settings, the machine will run a recalculation by displaying the new values of imbalance.

Once the selections/settings have been entered, you can run a launch by rotate the quick nut hand manually (rotate the motor adaptor when under MOTO mode). At the end of the launch, the machine displays the wheel imbalance values. Apply the weights displayed by the machine at the indicated positions and then run a second test launch.
Normally, the weights should be applied at the 12 o’clock position with the exception of special programmes for ALS2 and ALS1 aluminum.

13.1 balance type

The machine allows the choice between eight different Programme Types of Balancing Programmes as listed in table T13.1.

T13.1 - Programme Types available

Programme type	Wheel material	Weight position along the rim section	Automatic acquisition	Notes
STD	Steel	Default	2 sensors	Start-up default
ALU1	Aluminum	Default	2 sensors	Forcibly set when the Motorbike Programme Type is selected.
ALU2	Aluminum	Default	2 sensors	
ALU3	Aluminum	Default	2 sensors	
ALU4	Aluminum	Default	2 sensors	
ALU5	Aluminum	Default	2 sensors	
ALS1	Aluminum	Default for the internal weight, provided by the user for the external weight	1 sensors	
ALS2	Aluminum	Provided by the user	1 sensors	

(1) Available only for some versions

STD Programme is selected in the NORMAL mode by pressing the buttons [P9] 

; press the button [P8] 

and [P10] 

to select ALU and ALUS program; At the first selection of one of these two buttons, the currently selected Programme Type will appear on the display; if within about 1.5 seconds, one of these two buttons is not pressed again, the display will return to the previous state without editing the running Programme Type.

Depending on the running Programme Type, the following LEDs are lit on the control panel:

The machine displays the default program and refer to the light display on control panel:

•Programme type LED See figure F11.1, detail [11].

•Weight Imbalance Position LED. See figure F11.1, detail [3].

Note:

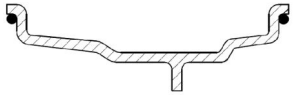
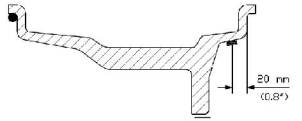
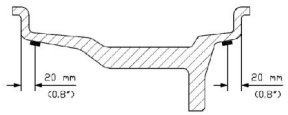
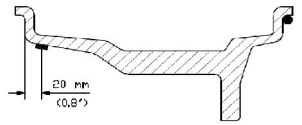
The selection of the STD program type remmoves the selection of the static imbalance display.

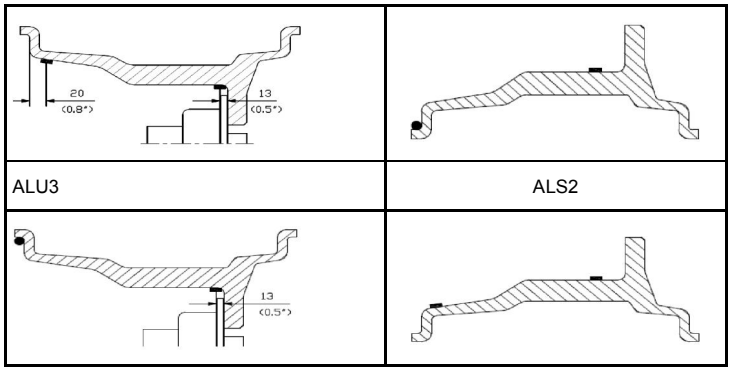
The selected Programme Type also influences the automatic acquisition of wheel dimensions (feature available only on some models of the machine) as shown in the Automatic acquisition column in table T13.1.

The acquisition that features only 1 sensor uses the Distance/Diameter sensor.

The position of the balancing weights along the section of the rim in the various Programme Types is shown in Figure F13.1.

F13.1 - Position of the weights in the various Programme Types along the section of the rim.

STD	ALU4
	
ALU1	ALU5
	
ALU2	ALS1



ALU3	ALS2

Table T13.1.1 Angular position of the balancing weights in the various Programme Types

	Programme Type								
	STD, ALU1,2,3,4,5			ALS1		ALS2			
	Internal	External Plane	Static Plane	Internal Plane	External Plane	Static Plane	Internal Plane	External Plane	Static Plane
Manual	H12	H12	H12	H12	H6	H6	H6	H6	H6
Semi-automatic	H12	H12	H12	H12	Sensor-rim contact point (1)	H6	Sensor-rim contact point (1)	Sensor-rim contact point (1)	H6
Automatic	H12	H12	H12	H12	Sensor-rim contact point (1)	H6	Sensor-rim contact	Sensor-rim contact point (1)	H6

Note (1): if the data acquisition system is disabled, the angular position of the weight will be in the 6 o'clock position.
In table T13.1.1, the symbol H12 indicates that the angular position of the weight is at 12 o'clock while the symbol H6 indicates that the angular position of the weight is at 6 o'clock.
The machine data acquisition systems are defined as follows:
• Manual when the data of the rim must be all entered manually;
• Semi-automatic when the Distance and Diameter data are automatically acquired via the Distance/Diameter sensor while the data on the Width must be entered manually;
• Automatic when all data of the rim is automatically acquired via the two sensors.

Automatic or Semi-Automatic machines with the sensors disabled (due to failure or for any other reason) become, to all intents, Manual machines. Entering the dimensions of the rims must be carried out manually and the angular position of the balancing weights will follow the procedures of the Manual machines.

13.2 Wheel type

The machine allows choosing between three different Wheel Types as listed in table T13.2.

T13.2 - Wheel Types to select

Wheel type	Vehicle	Notes
CAR 	Auto-vehicles	Start-up default
SUV 	Off-Road vehicles	Not suitable for balancing wheels of trucks
MOTO 	Motorbikes	Forcibly set the ALU1 Programme Type

Each of these programmes set specific values for the measurement of the dimensions of the wheel and the calculation of imbalances. The particularities of each programme are indicated in the following paragraphs.

To select a specific Wheel Type, press repeatedly [P6]  until the corresponding LED turns on as shown in the table T13.2.

13.2.1 CAR wheel type (auto-vehicles)

The selection of the CAR Wheel Type allows the balancing of wheels of auto-vehicles. For

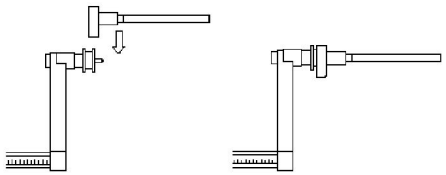
off-road vehicles, it may be appropriate to select the SUV Wheel Type (see paragraph below).

To select the CAR wheel type, press repeatedly [P6]  until the CAR LED of the Wheel Type group LED lights up. See table T13.2.

13.2.2 MOTO wheel type (motorbikes)

The selection of the MOTO Wheel Type allows the balancing of wheels of motorbikes. These wheels need to be mounted on the shaft of a special flange. Since the flange pushes the wheel away from the machine, you must also install a special extension for the distance sensor.

To select the MOTO wheel type, press repeatedly [P6]  until the MOTO LED of the Wheel Type group LED lights up. See table T3.2.
When the MOTO wheel type is enabled, the ALU1 Programme Type is automatically selected and any attempt to select another type by pressing [P4]  or [P5]  will be rejected. The point of application of the weights along the rim section is that of the ALU1 Programme Type and is indicated in figure F13.1.
When the MOTO Wheel Type is enabled, you can select the display of dynamic or static imbalance by pressing [F+P2]  +  but if the set width of the wheel is less than 114 mm (or 4.5 inches), the static imbalance value will be always displayed.
To acquire the geometric data of the wheel automatically with the Distance/Diameter and Width sensors, you must use the same reference points on the rim of the ALU1 Programme Type.
Furthermore, when the MOTO wheel type is enabled, the current distance value is automatically increased by 150 mm in order to take account of the length of the extension for the Distance sensor.



图F13.2

F13.2 Application of the extension of Distance/Diameter sensor for measuring MOTO wheel type

---

Note:

On machines without automatic sensor (or on machines where the automatic distance sensor is disabled), the distance data must be entered manually. To carry out this operation, you must: : a) place the tip of the extension of the Distance/Diameter sensor on the rim, b) read the distance value on the graduated scale, c) add 150 mm to the read value, d) enter the distance value manually by pressing [P1]  *and therefore* [P4]  or [P5] .

Whenever the motorbike flange is removed (e.g. to balance wheels of auto-vehicles) and reassembled after, make sure the writings “Cal” present on the flange and on the flange for motorbikes are aligned. If this is not carried out, balancing accuracy may be compromised.

13.2.3 SUV wheel type (off-road vehicles)

The selection of the SUV Wheel Type allows the balancing of wheels of off-road vehicles. These vehicles are generally equipped with wheels that are larger than normal and the tyre is relatively large compared to the diameter of the rim (i.e. not low or super low type). Selecting this wheel type however does not allow the balancing of wheels for trucks because they have rims that are significantly different.
The choice of the CAR or SUV Wheel Type is at the discretion of the operator who should run balancing tests to determine which Wheel Type gives the best results for the particular wheel that is subject to balancing.

To select the SUV wheel type, press repeatedly [P6]  until the SUV LED of the Wheel Type group LED lights up. See table T13.2.
All Programme Types listed in table T3.2re available for the SUV Wheel Type.
Weight positions along the section of the rim are the same as indicated in Figure F13.1.

13.3 Entering wheel dimensions

The dimensions of the wheel to balance can be entered in two ways:
• Manual Mode. This mode is always available.
• Automatic Mode. Only some models are equipped with sensors for the automatic

entering (partial or total) of wheel dimensions.

Note:

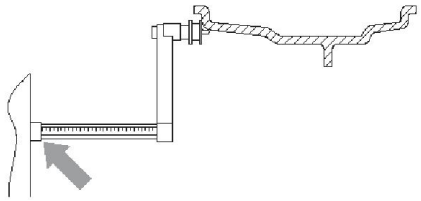
all machines are equipped with graduated scales for manual measuring of the distance.

13.3.1 ***Manual entering of the wheel dimensions for the STD and ALU1,2,3,4,5 Programme Types***

To introduce the wheel size manually, proceed as follows:

1. Assemble the wheel on the shaft;
2. Extract the distance sensor and place it on the wheel as shown in Figure F3.3.
3. Read the distance value on the graduated scale as shown in figure F3.3. The distance value is always expressed in millimeters;
4. Press [P1]  to modify the distance and then press [P4]  or [P5]  within 1.5 seconds to enter the read value. If you do not press buttons [P4] or [P5]  within this time limit, the machine will return to the previous display. In this case, you can press [P1]  again to enter or edit data;
5. Measure the width of the wheel with the special gauge or read the value of the width indicated on the rim. The value of the width can be in inches or millimetres according to the selected unit of measure.
6. Press [P2]  to modify the width and press [P4]  or [P5]  within 1.5 seconds to enter the read value. If either one of these two buttons is not pressed within in this time frame, the machine will return to the previous screen. In this case, you can press [P2]  again to enter or edit data;
7. Read the value of the diameter indicated on the rim or tyre. The value of the diameter may be expressed in inches or millimeters according to the selected unit of measure.
8. Press [P3]  to modify the diameter value and then press [P4]  or

[P5]  within 1.5 seconds to enter the read value. If either one of these two buttons is not pressed, in this time frame, the machine will return to the previous screen. In this case, you can press [P3]  again to enter or edit data;



F13.3.1 - Manual acquisition of wheel dimensions: placing the Distance sensor

13.3.2 ***Manual entering of the wheel dimensions for ALS1 and ALS2 Programme Types***

To introduce the wheel size manually, proceed as follows:

1. Assemble the wheel on the shaft;
2. If the selected programme type is ALS1, extract the distance sensor and place it on the wheel as shown in Figure F3.4, otherwise proceed with step 4.
3. If the selected programme type is ALS2, extract the distance sensor and place it on the plane chosen for the internal weight as shown in Figure F3.4;
4. Read the value of the internal distance of the plane on the graduated scale. The distance value is always expressed in millimeters;
5. Press [P1]  once to view the **di1** parameter (distance of the internal plane), and press [P4]  or [P5]  within 1.5 seconds to enter the read value. If either one of these two buttons is not pressed, in this time frame, the machine will return to the previous screen. In this case, you can press [P1]  again, twice in rapid sequence, to enter or edit data;
6. Extract the distance sensor and place it on the plane chosen for the external weight as shown in Figure F13.3.5;
7. Read the distance value on the graduated scale. The distance value is always expressed in millimeters;

8. Press [P1]  twice in rapid sequence until **di2** (distance of the external surface) is displayed and, within 1.5 seconds, press [P4]  or [P5]  to enter the read value. If either one of these two buttons is not pressed, in this time frame, the machine will return to the previous screen. In this case, you can press [P1] again, twice in rapid sequence, to enter or edit data;

9. Press the button [P3]  once to view **da1** (diameter of the internal plane), and buttons [P4] or [P5] within 1.5 seconds to enter the value resulting from one of the two methods described in the note below.
If either one of these two buttons is not pressed, in this time frame, the machine will return to the previous screen. In this case, you can press [P3] again to enter or edit data;

10. Press the button [P3]  twice in rapid sequence to view **da2** (diameter of the external plane), and buttons [P4]  or [P5]  within 1.5 seconds to enter the value resulting from one of the two methods described in the note below. If either one of these two buttons is not pressed, in this time frame, the machine will return to the previous screen. In this case, you can press [P1]  again, twice in rapid sequence, to enter or edit data;

Note:

The nominal diameter of the wheel does not match with the diameters where the weight are actually applied. There are two possible methods for determining the da1 and da2 diameters to be entered in step 9) and 10).

*METHOD 1: MANUAL MEASURING OF THE **da1** AND **da2** DIAMETERS*
This method provides for a manual measuring of the da1 and da2 diameters or only the external da2 diameter (depending on the Programme Type enabled) with the aid of a ruler as shown in figure 13.3.2. The values to enter are indicated in table T13.3.1.

T13.3.1 measuring the da1 and da2 diameters for manual entering of the data

Programme –	***Internal diameter da1***	***External diameter da2***
ALS1	*Enter the nominal diameter of the rim*	*Enter the actual diameter **da2** measured with the aid of a measuring tape. The measurement must be performed on the balancing plane chosen for **da2**.*
ALS2	*Enter the actual diameter **da1** measured with the aid of a measuring tape. The measurement must be performed on the balancing plane chosen for*	*Enter the actual diameter **da2** measured with the aid of a measuring tape. The measurement must be performed on the balancing plane chosen for **da2**.*



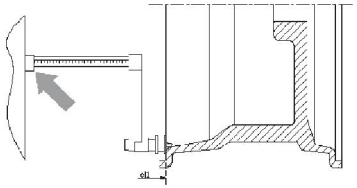
F13.3.2 ALS1/ALS2 Example of manual measuring of the external diameter (da2) of the wheel in the ALS1/ALS2 Programme Type
*METHOD 2: ENTERING **da1** and **da2** STARTING FROM THE NOMINAL DIAMETER*
This second method is used with the nominal diameter of the rim together with the corrections indicated in table T13.3.2.

T13.3.2 Determining diameters da1 and da2 starting from the nominal diameter of the rim

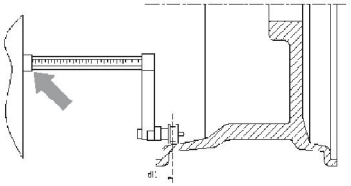
Programme Type	***Internal diameter da1***	***External diameter da2***
ALS1	***da1** = nominal rim diameter*	***da2** = nominal diameter – 2.0 inches (or 50 mm)*
ALS2	***da1** = nominal diameter – 1.0 inch (or 25 mm)*	***da2** = nominal diameter – 2.0 inches (or 50 mm)*

Since manual measuring is not required, this method is faster, but the results may be

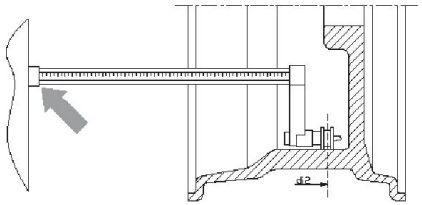
slightly less accurate.



F13.3.3- ALS1 Manual Acquisition of wheel distance in the ALS1 Programme Type



F13.3.4- ALS2 Manual Acquisition of the internal plane distance in the ALS2 Programme Type

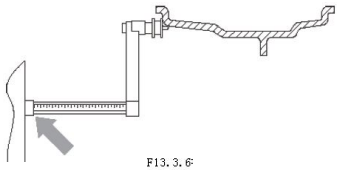


F13.3.5- ALS1和ALS2 Manual Acquisition of the external plane distance in the ALS1 and ALS2 Programme Types

13.3.3 Automatic acquisition of the wheel dimensions for the STD and ALU1,2,3,4,5 Programme Types

To introduce the wheel size automatically, proceed as follows:

1. Assemble the wheel on the shaft;
2. Extract both sensors and rest them on the rim as shown in Figure 13.3.6;
3. Wait to hear the long acquisition beep and then set the sensors back to the rest position.
4. Introduce rim width manually. The width of the rim is normally printed on the rim itself. Alternatively, use the appropriate width measuring gauge.

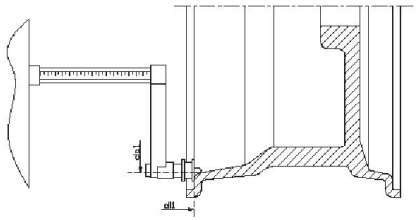


F13.3.6

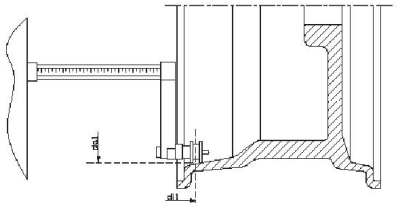
13.3.4 Automatic acquisition of the wheel dimensions for the ALS1 and ALS2 Programme Types

To automatically enter the dimensions of the wheel in the ALS1 and ALS2 Programme types, proceed as follows:

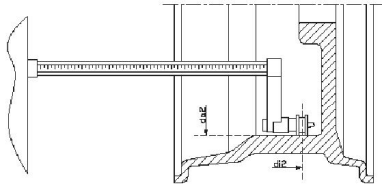
1. Assemble the wheel on the shaft;
2. Extract the Distance/Diameter sensor and place it on the plane chosen as the internal plane. The point of support differs depending on whether the ALS1 or ALS2 programme has been enabled. See figures F13.3.7 and F13.3.8;
3. Wait to hear the long acquisition beep and then set the sensor back to the rest position;
4. Extract the Distance/Diameter sensor and place it on the plane chosen as the external plane. See figure F3.9;
5. Wait to hear the long acquisition beep and then set the sensor back to the rest position;
6. The dimensions of the wheel have been acquired and the values can be displayed and/or modified by pressing [P1]  for the di1/di2values (internal/external plane distance) and [P3]  for the da1/da2values (internal/external diameter plane).



F13.3.7 - Automatic acquisition of the internal plane distance in the ALS1 Programme Type



F13.3.8 - Automatic acquisition of the internal plane distance in the ALS2 Programme Type



F13.3.9 - Automatic acquisition of the external plane distance in the ALS1 and ALS2 Programme Type

13.3.5 Use of the Special Programme Types for ALS1 and ALS2 aluminum wheels

The machine features two Special Programme Types for aluminum wheels called ALS1 and ALS2.

These two programmes are different from the normal Programme Types for aluminum wheels (from ALU1 to ALU5) because they allow the user to select the planes on which apply the balancing weights. This allows balancing aluminum wheels with special rim configurations where the use of conventional programmes for aluminum, which require precise weight positioning, would result difficult.

The difference between the ALS1 and ALS2 programmes lies in the fact that in the ALS1 Programme Type the user can freely choose only the external balancing plane (the internal plane is in a predetermined position) whilst, in the ALS2 Programme Type, the user can freely choose both balancing planes.

The ALS1or ALS2 Programme Types use only the Distance/Diameter sensor to acquire the balancing planes chosen by the user. The Width sensor is not used.

Use of the ALS1 or ALS2 Programme Types is divided into three parts:

• Acquisition of balancing planes;

• balancing launch;

• Search of the balancing planes for weight application.

13.3.5.1 Acquisition of the balancing planes

The two balancing planes are acquired at this stage. During acquisition, the two pairs of distance and diameter values are stored. These pairs are called di1 and da1 (distance 1 and diameter 1) for the internal plane and di2 and da2 (distance 2 and diameter 2) for the external plane.

Once acquisition is completed, you can view (and even edit) these two pairs of values by pressing [P1]  for the distance and [P3]  for the diameter.

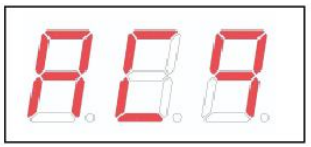
By pressing [P1] , , the displaying of the distance values di1 and di2 are alternated. By pressing[P3] , the displaying of the diameter values da1 e da2 are alternated.

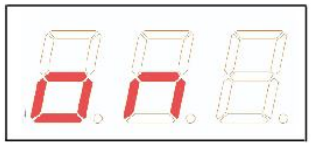
To carry out acquisition, proceed as follows:

1. Select the ALS1 or ALS2 Programme Type by repeatedly pressing [P4]  or [P5] ;

2. Select the plane balancing acquisition mode by pressing [P2]  until the writing ACq is viewed on the left display as shown in figure F13.3.10. When the machine is switched on, the acquisition mode is set by default ;

F13.3.10 -"Balancing planes acquisition enabled" message





3. Extract the Distance/Diameter sensor and place it on the rim that corresponds to the internal plane chosen to apply the balancing weight. See figure F13.3.7 for the ALS1 Programme Type and figure F13.3.8 for the ALS2 Programme Type;

4. Keep the sensor in the rest position until you hear the acquisition beep. If the sensor is left in the rest position for a longer time, further acquisition probing of that plane will be run

without entailing consequences;
5. Set the Distance/Diameter sensor in the rest position immediately. If you hesitate with this operation, the machine may detect an incorrect plane: in this case, restore the sensor in rest position and repeat acquisition procedure;
6. Extract the Distance/Diameter sensor and place it on the rim corresponding to the external plane chosen to apply the balancing weight. See figure F13.3.9;
7. Keep the sensor in the rest position until you hear the acquisition beep. If the sensor is left in the rest position for a longer time, further acquisition probing of that plane will be run without entailing consequences;
8. Set the Distance/Diameter sensor in the rest position immediately. If you hesitate with this operation, the machine may detect an incorrect plane: in this case, restore the sensor in the rest position and repeat acquisition procedure;

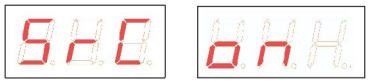
13.3.5.2 Balancing launch

Run a balancing launch. Once the launch cycle is completed, the imbalance values calculated according to the balancing planes chosen will be displayed.

13.3.5.3 Search of the balancing planes

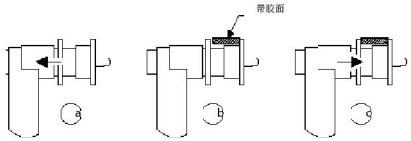
The purpose of the balancing planes search is to find the planes previously chosen by the operator in order to apply the balancing weights. Proceed as follows:

1. the machine will enter [SrC] [On] status when stop rotation and SRC will be on left window for a while then the imbalance value will be on it.



F13.3.11 - "Balancing planes search enabled" message

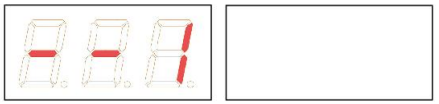
2. Apply the weight shown on the left display (internal weight) on the Distance/Diameter sensor as seen in figure F13.3.12;



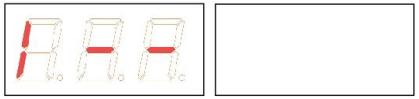
F13.3.12 Application of adhesive weights on the Distance/Diameter

3. Manually rotate the wheel until all the internal imbalance position LEDs light up (see fig. F11.1, detail [2-4]). Block the wheel in this position by using the footbrake or

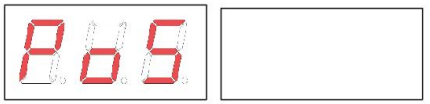
electromagnetic brake (if present);
4. Slowly extract the sensor until you hear the continuous beep indicating that the internal balancing plane has been reached. The left display helps the operator in this operation by indicating the direction in which the sensor must be moved. See figures F13.3.13, F13.3.14 and F13.3.15;



F13.3.13 - Balancing planes search: the left display indicates to extract the sensor (moving it to the right) in order to find the exact position of the internal balancing plane



F13.3.14 - Balancing planes search: the left display indicates to re-introduce the sensor (moving it to the left) in order to find the exact position of the internal balancing plane



F13.3.15 -Balancing planes search: the left display indicates that the sensor is exactly on the internal balancing plane.

5. Keep the Distance/Diameter sensor blocked at this distance, then, rotate it until the adhesive weight sticks on the rim. The sensor's contact point on the rim will assume an intermediate position between 12 o'clock and 6 o'clock depending on the diameter of the rim. See also table T13.3.3;
6. Bring the Distance/Diameter sensor back in the rest position. The indications on the left and right display will be exchanged to indicate the search for the external balancing plane;
7. Release the wheel and repeat steps 2 to 6 for the external weight;
8. Run a balancing test launch.

If the balancing of an identical wheel must be performed, you can skip the balancing plane acquisition phase and carry on directly with the balancing launch.

Note: If you set the static imbalance display, the sole balancing weight must always be applied in the 6 o'clock position at any point along the section of the rim. The balancing plane search phase described in chapter 13.3.5.1 should therefore not be run.

13.3.6 Use of the ALS1 or ALS2 Programme Types without automatic acquisition

When a machine is not equipped with the automatic acquisition system by means of the Distance/Diameter sensor, or when the sensor itself has been disabled, you can still use the special ALS1 or ALS2 programmes.

Since it is not possible to acquire the two planes automatically by means of the Distance/Diameter sensor, you must manually enter the values of the two pairs of dimensions di1/da1 and di2/da2 as shown in chapter 13.3.2 *manual entering of the wheel dimensions for the ALS1, ALS2 Programme Types*.

After the launch, the angular position of the balancing weights are given in table T13.3.

T13.3.3 Angular position of the balancing weights in the ALS1 and ALS2 Program Types without automatic acquisition system

Programme Type	Internal Plane	External Plane	Static Plane
ALS1	H12	H6	H6
ALS2	H6	H6	H6

13.3.7 Use of the ALS1 or ALS2 Programme Types without preliminary acquisition of the balancing planes

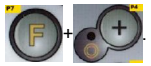
It is possible to run a launch when any Programme Type, other than ALS1 or ALS2, is enabled and then selecting the ALS1 or ALS2 Programme Type. The machine will recalculate the imbalance data according to the new Programme Type selected.

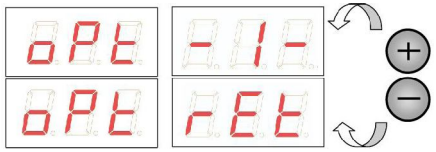
In this case, however, the imbalance values displayed are obtained by using the balancing planes (i.e. the two di1/da1 and di2/da2) dimension pairs previously acquired or, lacking these, the default balancing planes.

14. OPTIMIZATION

The optimization program is used to minimise the amount of balancing weights to be applied on the rim by opposing the imbalance of the rim to that of the tyre. Therefore, use this program when the wheel requires the application of heavy balancing weights.

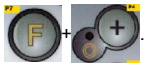
To enter the Optimization Program, proceed as follows:

1. Press [F+P4] . The display will show which options can be seen in Figure F16.1. Press [P4]  or [P5]  and choose option oPt-1- to continue, or oPt rEt to return to the operating program. Press [F+P4]  to confirm the chosen option;

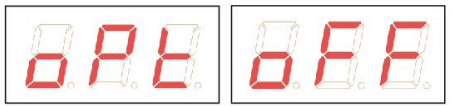


F14.1 Access to the Optimization Program

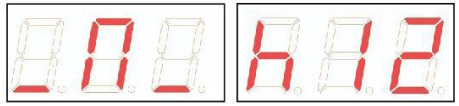
Note:

It is possible to exit the optimization procedure at any time by repeatedly pressing [F+P4] .

2.If the wheel static imbalance is less than 12 grams, the machine will display the message shown in Figure F14.2 for a second and then will automatically exit the optimization program. If the wheel static imbalance is instead greater than or equal to 12 grams, the message shown in Figure F143 will be displayed;

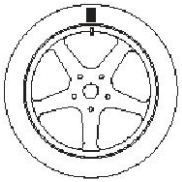


F14.2 Optimization program not possible



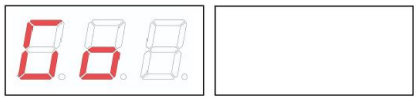
F14.3 "Bring valve to 12 o'clock position" message

3. Bring the valve to the 12 o'clock position, mark the valve position on the tyre (see Figure F14.4);



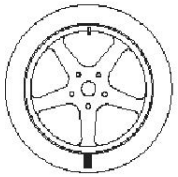
F14.4 - Valve position reference mark on the tyre

4.press [P4] . The message seen in Figure F14.5 will be displayed;



F14.5 "Run the launch" message

5.Remove the wheel from the shaft, remove the tyre off the bead, rotate it so that the mark is at 180° with respect to the valve (see Figure F14.6);

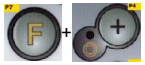


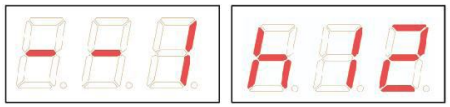
F14.6 - Reference mark on the tyre at 180° from the valve

6. Remount the wheel on the shaft, erase the mark and run a launch;

7.At the end of the launch, the message shown in Figure F14.3 will be displayed. Two options are possible:

a) Bring the valve to the 12 o'clock position and press [P4]  to continue. In this case, the message shown in Figure F14.7 will be displayed;

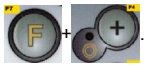
b) Press [F+P4]  to exit the optimization program and to directly return to the operating program;



F14.7 "Final valve alignment with mark on tyre" message

8. Rotate the wheel until all position arrow LEDs light up and then mark the 12 o'clock position as shown in Figure F14.4;

9. Remove the wheel from the balancing machine, remove the tyre off the bead, and rotate it until the valve matches the mark on the tyre;

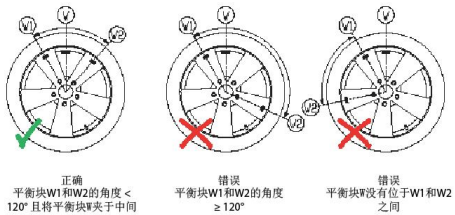
10. Optimization has been completed: exit the optimization menu by pressing [F+P4] .

11. Remount the wheel on the balancing machine and balance it with the normal procedure.

15. HIDDEN WEIGHTS PROGRAM

This program divides the external weight W into two weights W1 and W2 (smaller than the initial external weight W) located in either of two positions selected by the operator.

The two weights W1 and W2 must form a maximum angle of 120° including the external weight W, as shown in Figure F15.1.



F15.1 - Hidden Weights Program: valid and invalid conditions for use.

The Hidden Weights program is used for aluminum rims when:

•You want to hide the external weight behind two spokes for aesthetic reasons.

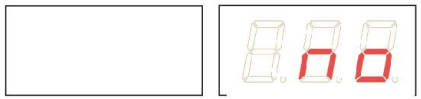
• The position of the external weights coincides with a spoke, therefore a single weight cannot be applied.

Note: This program can be used with any program type and with any wheel type. It can also be usedto divide the static weight into two separate weights (especially useful with wheels for motorbikes).

To use the HIDDEN WEIGHTS program, proceed as follows:

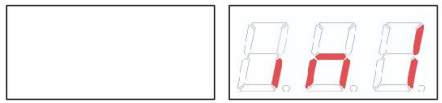
1. Perform wheel balancing without applying the external weight;

2. press [F+P5]  +  to run the Hidden Weights program. If the wheel is balanced on the external side, the machine will display as F15.2 and triple sound to indicate that the operation is not allowed;



F15.2 hidden weight function unavailable or wrong position

3. If instead there is an imbalance on the external side, the machine will display the message shown in Figure F15.2;



F15.3 **W1 weight position input**

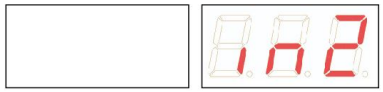
Note:

You can exit the “hidden weights” program at any time by pressing *[F+P5]*  + .

4. Manually rotate the wheel anticlockwise up to the point where you want to apply the external weight W1.

5.press [P1]  to confirm. The angle formed by W1 and by the initial external weight W must be less than 120°;

6. If the angle chosen is higher than 120°, the machine displays F15.2, thus indicating to choose another point. If instead the angle is less than 120°, the machine will display the message shown in Figure F15.4, allowing the operator to continue with the next step;



F15.4 **W2 weight position input**

7. Manually rotate the wheel anticlockwise passing through the imbalance point (previously identified) up to the point at which you want to apply the external weight W2 and press [P1]  to confirm. The angle formed by weights W1 and W2 must not be less than 120° and must include external weight W;

8. If external weight W is not included between the positions of weights W1 and W2, the machine will display F15.2 and one sound, thus indicating to repeat the procedure in step 7. If instead the angle chosen is less than 120°, the machine will immediately display the external weight W2 value;

9. Block the wheel and apply external balancing weight W1 as indicated on the display referring to T13.3.1;

10. Manually rotate the wheel until external weight value W1 appears on the left display;

11. Block the wheel and apply external balancing weight W2 as indicated on the display referring to T13.3.1;.

12. The procedure of the Hidden Weights program has been completed: press [F+P5]  +  to exit and perform the balancing test launch.

Note:

F16.1 indicates the position of the external weight at the 12 o’clock position but this is valid only for certain program type. Table T13.1 shows the actual position of the external

imbalance based on the program type and on the enabling state of the distance/diameter sensor.

---

16. **UTILITY PROGRAMS**

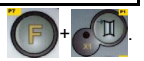
Utility programs are available only in NORMAL mode.

16.1 Selecting the imbalance display resolution

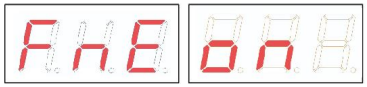
The machine has two wheel imbalance display resolutions. The two resolutions are defined as X1 (high resolution) and X5 (low resolution). The resolution with which the imbalances of the wheel are displayed varies depending on the weight unit of measurement as indicated in table T16.1.

Table T16.1 display resolution

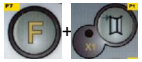
Set resolution	**Imbalance unit of measurement**	**Display resolution**	**Notes**
X1 (High resolution)	Grams	1 gram	
	Ounces	0.1 ounces	
X5 (Low resolution)	Grams	5 grams	The X5 resolution is set by default at start-up
	Ounces	0.25 ounces	

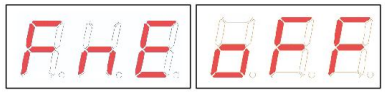
To view the X1 resolution imbalance (high resolution), press [F+P1] .

The machine will display the message visible in Figure F18.1 for one second and the LED next to the button lights up. Imbalance values are now displayed in X1 resolution (high resolution).



F16.1 **Enabling imbalance display in high resolution**

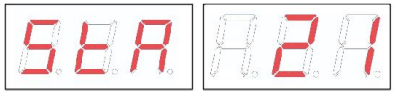
To return to viewing in X5 resolution (low resolution), press [F+P1] . The machine will display the message visible in Figure F16.2 for one second and the LED next to the button will turn off. Imbalance values are now displayed in X5 resolution (low resolution).



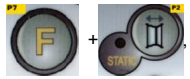
F16.2 **disabling imbalance display in high resolution**

16.2 Selection of the static imbalance display

To view the static imbalance, press [F+P2]. The machine will show the static imbalance value on the display as seen in picture F16.3, and the LED next to the button lights up.



F16.3 **Static imbalance display enabled. The right display indicates the entity of the static imbalance**

To return to dynamic imbalance display, press [F+P2] , The LED next to the button will turn off.

Note:

In some cases, static imbalance is forcibly set by the machine according to the current settings. For example, if the MOTO wheel type program is enabled and the width set is less than 4.5inchs, the machine will automatically set the static imbalance display.

16.3 **Illuminator (only in some machine models)**

The illuminator is quite useful because it allows shedding light on the internal part of the rim which is normally barely visible, thus making balancing operations easier.

To turn on the illuminator, press [F+P9] . To turn off the illuminator, press [F+P9] again.

The illuminator is also automatically managed by the machine that turns it on in the following cases:

- When the Distance/Diameter sensor is extracted;
- After a wheel stop procedure on the position of imbalance (SWI procedure) which resulted in the balancing position of the internal weight;
- When the wheel itself is in the balancing position of the internal weight by manually

rotating the wheel after a launch;

16.4 Temporary disabling of the diameter and distance sensor (where applicable)

If the machine displays the error code **Err 016 "dis out"** (distance/diameter sensor not in the rest position) at start-up, although being in rest position, it means that an anomaly has occurred in the acquisition system.

It is however possible to immediately (and temporarily) disable the acquisition system by pressing the button [F + P2]  + . The LED [6],  located on the control panel, will light up to indicate that the automatic acquisition system is disabled and that the machine is ready for use.

Not being able to use the automatic acquisition system, sizes of the wheel must be entered manually as described in chapters 13.3.1 and 13.3.2. By switching the machine off and then on, the error code will be displayed again for which it will be necessary to repeat the procedure described above.

17. "SERVICE" MODE

In this mode, the machine allows the user to enter certain settings (for example, selection of the units of measurement) or use special testing (to check the machine operation) or configuration programs.

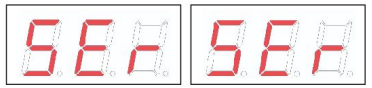
Some testing and configuration programs are included in Menus while setting programs are available with direct access via buttons.

Note:

Some setting or configuration programs are not available to the end user but only to technical support personnel.

To access SERVICE mode, proceed as follows:

1. Switch the machine on and wait for the initial test to finish. After running the initial test, the machine is in NORMAL mode;
2. Press the [F+P3]  + . The machine will enter SERVICE mode and display the Ser Ser messages. See Figure F17.1;



F17.1 **SERVICE mode enabled**

3. To exit SERVICE mode, you must first exit any testing Menus and programs, and then return to the messages display shown in Figure F17.1;
4. Press [F+P3]  + : the machine will return to NORMAL mode.

17.1 [P1] MENU Sensor calibration programmes

This menu allows running the test and/or calibration of the sensors for measuring Distance, Diameter and Width. The Menu has the following options:

- DiS Distance sensor test;
- Lar Test and/or calibration of the Width sensor;
- DiA Test and/or calibration of the Diameter sensor;
- Ret Returns to the Service mode.

To scroll through the different menu options, press [P4]  or [P5]  until the desired option is viewed, then press [P1]  to confirm the selection.

Note:

Sensor calibration program are mainly reserved for technical support personnel but may also be run by end user as it does not impair machine operation.

DiS **Distance sensor test**

This programme allows checking the correct functioning of the automatic acquisition of the wheel's distance. There are no calibrations to carry out to the automatic acquisition system of the distance.

Dia **Test and/or calibration of the Diameter sensor**

This programme allows checking the correct functioning of the automatic acquisition of the wheel's diameter. The automatic wheel diameter acquisition system requires calibration.

Ret **Returns to the Service mode**

This Test Programme menu option sets the machine back in the SERVICE mode.

17.2[P2] Not used

This button is not currently used in Service mode.

17.3[P3] Machine calibration

This button allows accessing the machine's calibration procedure as described in detail in chapter *Machine calibration*.

17.4[P4] Select grams/ounces

By pressing this button, the machine alternates the unit of measure of the wheel weight: if the unit of measure selected is in grams, select ounces and vice versa. This selection is maintained even when the machine is shut-down. The unit of measurement selected will be displayed for one second.

17.5[P5] Select inches/millimetres

By pressing this button, the machine alternates the unit of measure of the wheel dimensions: if the unit of measure selected is in inches, select mm and vice versa. This selection is maintained even when the machine is shut-down. The unit of measurement selected will be displayed for one second.

17.6[P6] Select the imbalances view threshold

This button allows editing the imbalances view threshold. This procedure is intended for technical support personnel and is not described in this manual.

17.7[P9] Not used

This button is not currently used in Service mode.

17.8[F+P1] Not used

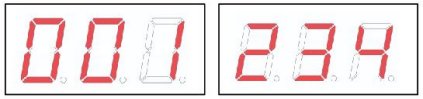
This button is not currently used in Service mode.

17.9[F+P3] Exit the SERVICE mode

This button allows the machine to exit the SERVICE mode and return to the NORMAL mode.

17.10[F+P4] Read launch number counter

By pressing this button, the total number of balancing launches run by the machine will be displayed. The number of launches is shown on both displays. Figure F17.3 shows as an example of a machine's display that has run 1,234 balancing launches.



F17.3 - Display of the number of the balancing launches

Balancing launches that were interrupted are not included in the total count of balancing launches.

17.11[F+P5] MENU Parameters

The Menu parameter is reserved for the technical support personnel and therefore is not described in this manual. Access to this menu is protected by password.

17.12[F+P9] MENU Test Programmes

This menu allows running tests for some machine functions. The Menu has the following options:

- Enc Encoder disc test;
- RPM Number of shaft RPMs test;
- SIG Pick-up signals test;
- dPy Display test.
- tAS Keypad test;
- UFc Converter voltage-frequency test.
- Ret Returns to the Service mode

To scroll through the different menu options, press [P4]  or [P5]  until the desired option is viewed, then press [F+P9]  +  to confirm the selection.

Note:

The test programs listed are mainly reserved for technical support personnel but may also

be run by end user as it does not impair machine operation.

17.12.1 EnC EnC Encoder disc test

This test allows controlling the function of the encoder which informs the machine on the angular position of the shaft. A number indicating the angular position will appear on the right display; this number must be between 0 and 255.

Press [F+P9]  +  to exit the test program.

17.12.2 rPM number of shaft RPMs test

This test allows controlling the number of shaft RPMs during the launch. A number indicating the speed of the shaft will be viewed on the right display.
By pressing [P8] the machine will run a launch and at the end of this, it will display the number of shaft RPMs.

To exit the testing program, press [F+P9].

17.12.3 SIG Pick-up signals test;

This programme allows checking the pick-up signal. To run the test, you will need to mount a balanced wheel with steel rim, 15" in diameter and 6" in width (or more similar as possible), on the machine. A 50 g weight must be applied the external side of the wheel. By pressing [P8], the machine will run continuous spinning and the pick-up signals respect to the three attenuation processes (Attenuation 1, Attenuation 2, Attenuation 4) will appear on the display in sequence.

To complete the test, press [P10] or raise the wheel guard.

To exit the test programme, press [F+P9].

17.12.4 dPy Display test

The display test program will light up all the LEDs and the 7-segment displays in sequence so you can check their functioning. To turn on all the LEDs and display segments in sequence, press [P4]  or [P5] .

To exit the test programme, press [F+P9]  + .

17.12.5TAS Keypad test

The keypad test programme is used to check the operation of all the keys on the control panel. Every time a button is pressed, the code of the same key will appear on the display: for example, pressing [P8]  the code "P8" will be viewed, pressing [P10]  the code "P10" will viewed and so on. The code of the key [P7]  is not displayed.

To exit the test programme, press [F+P9]  + .

17.15.6UFc Converter voltage-frequency test

The converter voltage-frequency test shows two numbers on the displays that represent the values of the internal conversion to the CPU-C1 electronic control circuit board. These values are used by technical support personnel to determine the functioning state of the circuit board. To exit the test programme, press [F+P9]  + .

17.12.7Ret Returns to the Service mode

This Test Programme menu option sets the machine back to the SERVICE mode

18. SIGNALS

18.1 Error codes

The machine reports error conditions by showing an error code on the display. The list of the error codes is shown in table T18.1.

T18.1 –Error codes

Code	Description	Notes
000 to 009	Machine parameters	Contact technical support.
010	Reverse rotation of the wheel	Contact technical support.

011	Wheel speed too low	Check the mains voltage. If the checks do not lead to any results, contact technical support.
012	The wheel cannot be stopped at the end of the launch	Check the mains voltage. If the checks do not lead to any results, contact technical support.
013	Wheel speed too high	Contact technical support.
014	The wheel does not spin	Contact technical support.
015	Keys pressed or jammed at start-up	Release all buttons, then turn off or restart the machine. If the error persists, contact technical support.
016	Distance sensor not in rest position when the machine is switched on	Set the sensor to its rest position: the error should disappear. If the error persists, contact technical support.
017	Width sensor not in rest position when the machine is switched on	Set the sensor to its rest position: the error should disappear. If the error persists, contact technical support.
018	Reserved	
019	Communication processor failure	Turn the machine off or on. If the error persists, contact technical support. The machine can still be used but all functions related to the USB port are disabled.
020	Lack of communication with the eeprom memory	Turn the machine off and then on again. If the error persists, contact technical support.
021	Lack of machine calibration data or incorrect calibration data	Carry out calibration for the CAR/SUV Wheel Type and/or for the MOTO Wheel Type. If the error persists, contact technical support. See also ERR030 and ERR031.
022	Pick-up channel A too high	Excessive imbalance or anomaly. Turn the machine off and then on again. If the error persists, contact technical support.
023	Pick-up channel B too high	Excessive imbalance or anomaly. Turn the machine off and then on again. If the error persists, contact technical support.
024	Internal timer channel too high	Excessive imbalance or anomaly. Turn the machine off and then on again. If the error

		persists, contact technical support.
025	Presence of weight during the Cal0 calibration phase	Remove the weight and repeat the launch of the Cal0 phase. If the error persists, contact technical support.
026	A launch without weight or failure of the pick-up A signal in the Cal2 calibration phase.	Apply the intended weight and repeat the launch. If the error persists, contact technical support.
027	A launch without weight or failure of the pick-up B signal in the Cal2 calibration phase.	Apply the intended weight and repeat the launch. If the error persists, contact technical support.
028	A launch with weight on the internal side during the Cal3 calibration phase. In this phase, the weight must be on the external side.	Remove the weight from the internal side and repeat the launch. If the error persists, contact technical support.
029	RESERVED	
030	Lack of calibration data for the CAR/ SUV (auto-vehicle and off-road) Wheel Type	Carry out calibration for the CAR/SUV wheel Type.
031	Lack of calibration data for the MOTO (motorbike) Wheel Type	Carry out machine calibration for the MOTO Wheel Type.
032	Diameter sensor not calibrated.	Calibrate the Diameter sensor.
033	Width sensor not calibrated.	Calibrate the width sensor.
034	The MOTO Wheel Type is activated: a different Programme Type other than ALU1 cannot be used.	Other Programme Types cannot be selected.
035	The electromagnetic clamping brake is disabled. it is not possible to run the low speed SWI procedure.	Enable the electromagnetic clamping brake (if provided).
036	Absence of wheel imbalance in DYNAMIC mode. It is not possible to run the low speed SWI procedure.	

037	Absence of wheel imbalance in STATIC mode. It is not possible to run the low speed SWI procedure.	
038	The MOTO Wheel Type is active. It is not possible to run the low speed SWI procedure.	The low speed SWI procedure is disabled for safety reasons.
039	The wheel guard is open: the requested action cannot be performed.	Check guard MICRO switch.
042	The SWI procedure did not reach the imbalance angular position.	The error can occur occasionally depending on the wheel and environmental conditions. If this error occurs on a frequent basis, contact technical support.
043	The flange for motorbikes was not exactly vertical when [P8] Start was pressed during the MOTO Cal2 and Cal3 calibration phases.	Put the flange for motorbikes exactly vertical (and with the CAL reference on the upper part) then press [P8] Start.
044	Diameter sensor disabled or missing. It is not possible to perform the action required.	Make sure that the sensor is connected and enabled.
045	Width sensor disabled or missing. It is not possible to perform the action required.	Make sure that the sensor is connected and enabled.
046	The Diameter sensor is enabled but disconnected.	if [F+P2] is pressed the machine acquisition system is temporarily disabled and operation can be continued. The disabled status will last until the machine has been turned off. The red LED [6] in figure F3.1 flashes to indicate the temporary disabled status.
047	The Width sensor is enabled but disconnected.	if [F+P2] is pressed the machine acquisition system is temporarily disabled and operation can be continued. The disabled status will last until the machine has been turned off. The red LED [6] in figure F3.1 flashes to indicate the temporary disabled status.
048	The Diameter sensor is too far from the calibration point.	Re-position the Diameter sensor into the correct calibration position.

050	Absence of wheel external imbalance. It is not possible to use the Hidden Weight program.	
051	Hidden Weights programme: the selected point is too far from the external imbalance position.	The point must be included up to 120° from the external imbalance position.
052	Hidden Weights programme: the external imbalance position is not between the selected W1 and W2 points.	Choose W1 and W2 points so that they include the external imbalance position.
055	The static imbalance of the wheel is too low: the Optimisation programme cannot be used.	
061	Serial control not acknowledged.	The serial control sent to the machine has not been acknowledged as valid.
062	The pressed key is not permitted or an incorrect password has been entered.	Press the permitted key or enter the correct password.

18.2 Acoustic signals

The machine emits different acoustic signals based on its status. Acoustic signals are listed in table T18.2.

T18.2 –Acoustic signals

Signal	**Meaning**	**Notes**
Short beep	Selecting a programme or a function	
Long beep	Acquisition	Acquisition of a value (e.g. acquisition of wheel dimensions).
Double beep	Warning	A particular condition has occurred that requires the operator's attention.
Triple beep	Function not available or Error	The requested function is not available or that an error condition has occurred.

Short beep + long beep	Storing one or more values in the permanent memory (eeprom) of the circuit board	One or more values have been stored in the permanent memory of the circuit board (for example, at completion of calibration phases).
Intermittent beep	Adjustment	Signal used in some service programmes to simplify the adjustment of sensors.

The acoustic signal is also heard for about two seconds at machine start up allowing the operator to check the operation of the alarm (buzzer).

18.3 Special visual signals

The machine gives special visual signals in certain cases. The special visual signals are listed in table T18.3.

T18.3 –Special visual signals

Signal	Meaning	Notes
Three dots lit on one or both displays	Imbalance exceeds 999 grams	This signal can be triggered due to: • Lack of machine calibration; • Incorrect measures of the wheel dimensions. • incorrect setting of the Wheel Type; • Incorrect setting of the Programme Type.
Flashing green STBY LED	The machine is in the STAND-BY mode	All LEDs and displays are switched off. To exit the STAND-BY mode, press any button (with the exception of [P7] )
The left (or right) display is flashing	a) Attending the user's command b) The Diameter or Width sensor is not calibrated.	a) The user's command may be the pressing a key to confirm or continue the procedure in progress or the selecting of a value or a menu option. b) Call the technical support to carry on with the calibration of the Diameter and Width sensor. To continue with the operation, you can temporarily disable

		the sensors by pressing [F+P2]  .

19. 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 center.

Machine does not switch on (monitor remains switched off)

No power at the socket.

- Make sure that the mains power is present.
- Check the electrical power circuit in the workshop.

The machine plug is defective.

- Check if the plug is working properly and replace it if necessary.

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

- Replace the blown fuse.

The monitor has not been switched on (only after installation).

- Switch on the monitor by pressing the button located on the front of the monitor.

The monitor's power supply connector (located on the rear of the monitor) is not correctly inserted.

- Check for proper insertion of the connector.

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.

- Perform the sensor calibration procedure. See warning instructions at the end of the SENSOR CALIBRATION section.

The automatic measuring devices are not working

The sensors were not at rest at start-up (A10) and the Manual data entry icon was selected, thus disabling the automatic sensor management (E10).

- Return the sensors to the correct position.

The wheel balancer provides unsteady unbalance values
The machine was jolted during the spin.
- Repeat the wheel spin while making sure that nothing affects machine operation while acquisition 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 locking ring nut firmly.

Several spins are to be performed to balance the wheel
The machine was jolted during the spin.
- Repeat the wheel spin while making sure that nothing affects machine operation while acquisition 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 locking ring nut firmly.
- Make sure that the accessories used for centering are suitable and original.

The machine has not been calibrated correctly.
- Perform the sensitivity calibration procedure.

The entered geometric data are not correct.
- Make sure that the entered data correspond to the wheel dimensions and correct them if necessary.
- Carry out the external sensor calibration procedure (width).

20. MAINTENANCE



WARNING

The producer declines all responsibility for claims deriving from the use of non-original spare parts or accessories.



WARNING

Unplug the machine from the power supply and make sure that all moving parts have been locked before performing any adjustment or maintenance operation.
Do not remove or modify any part of the machine (except for service interventions).



CAUTION

Keep the work 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 centering cones and flange clean. These components can be cleaned using a brush previously dripped in environmentally friendly solvents.
Handle cones and flanges carefully so as to avoid accidental dropping and subsequent damage that would affect centering 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.

21. 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.

22. ENVIRONMENTAL INFORMATION

The following disposal procedure shall be exclusively applied to the machines having the crossed-out bin symbol on their data plate. 
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, minimize the use of landfills for product disposal and improve the quality of life, preventing potentially hazardous substances from being released in the environment.

23. FIRE PREVENTION MEANS TO USE

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

Dry materials

Water YES

Foam YES

Powder YES*

CO2 YES*

YES* * can be used if more appropriate fire extinguishing materials are not available or for minor fires.

 **WARNING**

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.