Continental
The Future in Motion

FDR1080 Wheel Balancer

Operation & Maintenance Manual

www.continental-aftermarket.com/gb-en

Manufacturer

Continental Automotive Trading UK Ltd
36 Gravelly Industrial Park
Birmingham
B24 8TA

Sales
Tel: 0121 725 1400
Email: salesorders@continental-corporation.com

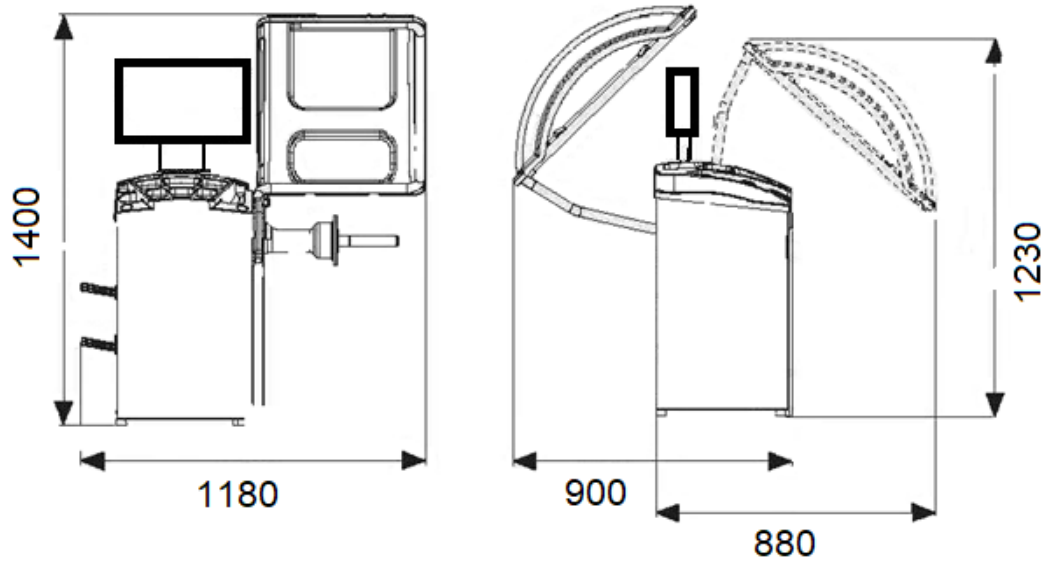
Technical Services
Tel: 0121 725 1366
Email: uksupport@continental-corporation.com

Document Information

Document Revision	Title	Operation & Maintenance Manual
	Type	FDR1080
	Version	325084 Iss 1
	Date	1/5/2023
	History	325084 Iss 1_Initial Draft UK_ Rel 3.1 07/19

Contents

Machine dimensions



Picture F1.1

1 Introduction

Thank you for purchasing a Continental Wheel Balancer. The equipment has been manufactured in accordance with the very best quality principles. Follow the simple instructions provided in this manual to ensure the correct operation and long life of the machine. Carefully read each section of this manual before using the machine. The manufacturer is not responsible for damages and/or injury caused by failure to follow the instructions of this manual.

We also recommend:

- Keep the manual near wheel balancer for easy access.
- Keep the manual in a place protected from dirt.
- Do not damage the manual.

We reserve the right to make any change to products and documentation without notice.

In the manual the following symbols are represented:

Operations that require special attention

Prohibitions

Possible Danger for the operator

1.1 Warranty

1.1.1 Terms of Warranty and limitations of responsibility

The information in the present manual have been released with the maximum attention, and nothing reported may modify the terms and the general conditions of the contracts of purchase, of leasing or of rental, in which the equipment mentioned in this manual had been acquired, neither it increases in some way the responsibility towards the customer or of bystanders.

FOR THE READER

The machine remains a working aid to the operator's activity.

Basing on the evaluations coming both from the unit and his visual control of the wheel, supported by his experience, the operator remains the one deciding what to do and responsible of the final actions on the wheels.

Continental standard terms of warranty apply to this product, in addition the terms below are also in effect.

1.1.2 Warranty Duration

From the date of shipment from Continental 36 months

1.1.3 Who gives this warranty

Continental Automotive Trading UK Ltd, Unit 36, Gravelly Industrial Park, Birmingham, B24 8TA.

1.1.4 Who receives this warranty

The original Purchaser (other than for purpose of resale)

1.1.5 What products are covered by this warranty

Any Continental branded tire changer or wheel balancer.

1.1.6 What is covered under this warranty

Manufacturer defects due to material and/or workmanship with the exceptions noted below.

1.1.7 What is not covered under this warranty

1.1.7.1 Any failure that results from Purchaser's abuse, neglect or failure to operate, maintain or service product in accordance with instructions provided in the owner's manual(s) supplied

1.1.7.2 Any damage caused by using equipment beyond rated capacity and/or capability

1.1.7.3 Items or service normally required to maintain the product, i.e. lubricants, oil, etc.

1.1.7.4 Items considered general wear parts such as rubber or plastic pads/protectors, cutting tips, plastic trays, etc. unless wear or failure is a direct result of manufacturer defect due to material and/or workmanship

1.1.7.5 Any component damaged in shipment or any failure caused by installing or operating equipment under conditions not in accordance with installation and operation guidelines or damaged by contact with tools or surroundings

1.1.7.6 Motor or other component failure caused by rain, excessive humidity, corrosive environments or other contaminants

1.1.7.7 Rusted components due to improper maintenance or corrosive environments

1.1.7.8 Cosmetic defects that do not interfere with product functionality

1.1.7.9 Damage due to incorrect voltage or improper wiring

1.1.7.10 Any incidental, indirect, or consequential loss, damage, or expense that may result from any defect, failure, or malfunction of a product.

1.1.7.11 All electrical components are guaranteed for one year against defects in workmanship and/or materials when the lift is installed and used according to specifications

1.2 Responsibilities of Warrantor

Repair or replace with either new or reconditioned unit at Warrantor's option, component and/or unit which is defective, has malfunctioned and/or failed to conform within duration of the warranty period.

1.3 Responsibilities of Purchaser

Provide dated proof of purchase and maintenance records.
Use reasonable care in the operation and maintenance of the products as described in the owner's manual.

1.4 Repair & Replacement

The Warrantor will perform repair or replacement under this warranty: Repair or replacement will be scheduled and serviced according to the normal work flow at the servicing location, and depending on the availability of replacement parts.

2 Intended Use

This manual is an integral part of product.
Read carefully warnings and instructions contained in this manual because they provide important information about SAFE USE and MAINTENANCE.

KEEP WITH CARE THIS MANUAL NEAR THE MACHINE TO FACILITATE ANY CONSULTATION BY OPERATORS.

The wheel balancers have been made to be used in balancing of wheels cars (CAR), off-road vehicles (SUV), motorcycles (MOTO). These wheel balancers are not designed for balancing wheels for transportation vehicles (light or heavy) and for special vehicles (agricultural, forestry, mining, etc). The machines can work on wheels with diameter from 1" to 35" (or from 25 to 890 mm) and width from 2" to 20" (or from 50 to 500 mm). All functions and controls are set through a series of buttons arranged on a panel. The data are displayed on a led display.

3 General Safety Rules

The wheel balancer must be used exclusively for the purpose it was designed for. Any other use is considered INCORRECT and UNREASONABLE.

The use of wheel balancer is allowed only to authorized and trained personnel.
Do not put objects in the base which may affect the correct operation of wheel balancer.

THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY UNAUTHORIZED PERSONNEL OR FROM IMPROPER, INCORRECT AND UNREASONABLE USE OF THE WHEELBALANCER.

THE WHEEL BALANCER SHOULD NOT BE MODIFIED OR TAMPERED WITHOUT PERMISSION OF MANUFACTURER. ANY UNAUTHORIZED MODIFICATION MADE TO THE EQUIPMENT RELIEVES THE MANUFACTURER FROM ANY LIABILITY IN CASE OF DAMAGE ATTRIBUTABLE TO SUCH ALTERATIONS. TAMPERING OR REMOVAL OF SAFETY DEVICES IS A BREACH OF THE UK/EUROPEAN RULES RELATING TO SAFETY AT WORK.

3.1 Safety devices

The machine is equipped with the following safety devices:
- Wheel guard support.
- Wheel guard.

- Micro switch actuated by wheel guard support.

It is forbidden to tamper with, bypass or remove the safety devices installed because this is a violation for the directives on safety and health at work.

THE REMOVAL OR TAMPERING WITH A SAFETY DEVICE IS A VIOLATION OF THE SECURITY EUROPEANDIRECTIVES.

4 Transport & Handling

The wheel balancer is packed in a carton box on a pallet.
Transport and handling must be carried out ONLY BY AUTHORIZED PERSONNEL, with pallet truck or forklift and adopting the appropriate safety measures.

	Net Weight (Kg)	Gross Weight (Kg)	Length (mm)	Width (mm)	Height (mm)
FDR1080	170-178	178-186	600	560	1400

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 LENGTH AND WITH A HIGHER FLOW RATE OF 3000 kg.

DO NOT FORCE ON SHAFT AND/OR FLANGE (See pictures F4.1 and F4.2).

Picture F4.1

Picture F4.2

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

The environmental conditions of work must be conform to the following requirements:

- Temperature from 0° C to + 45° C
- Relative humidity from 20% to 95%

5 Unpacking

After removing packing, check integrity of machine making sure there are no damaged parts. In case of doubt DO NOT USE THE MACHINE and consult qualified personnel (dealer or manufacturer). The packaging materials (plastic bags, nails, screws pieces of wood, etc.) must not be left within reach of children as they are potential sources of danger. Packaging materials should be stored in the appropriate collection points if non-biodegradable pollutants.

CHECK THE PRESENCE OF THE BOX CONTAINING THE ACCESSORIES TO AVOID THROWING IT WITH PACKING.

6 Installation & switching on

6.1 Installing display support

Figure F 6.1 and Figure F6.2: Unscrew nr. 4 M6 screws. Position the sheet metal support and clamp it on with 4 M6 screws.

Figure F6.3: Prepare the plastic covers (front and rear).

Figure F6.4: Place the plastic front cover onto support.

Figures F6.5, F6.6 and F6.7: Fix the monitor with no. 4 M4 screws at the front plastic cover.

Figure F6.8 and Figure F6.9: Fix the rear plastic cover onto support with no. 3 M6 screws.

6.2 Installing external sensor (if present)

When present, the external sensor must be installed according to the figures provided below.

Figure F6.10: Remove external sensor from the packaging.

Figure F6.11 and Figure F6.12: There are holes at the back of the wheel balancer to attach the external sensor. Place the flange of
external sensor on the three holes.

Figure F6.13: Square the external sensor using a level. Tighten the 3 M6 screws.

Figure F6.14: Connect the cable of the external sensor to the machine and screw on the connector.

6.3 Installing wheel guard + wheel guard support

The wheel guard and its support must be installed as shown in following figures.

Figure F6.15 and Figure F6.16: Place the tube inside the relative pin and secure it with 2 M8 bolts.

Figure F6.17 and Figure F6.18: Remove the wheel guard from the packaging and place it on the tube.

Figure F6.19: Secure the wheel guard to the tube using the relative ties.

6.4 Installing SONAR device (if present)

The SONAR device must be installed as shown in following pictures.

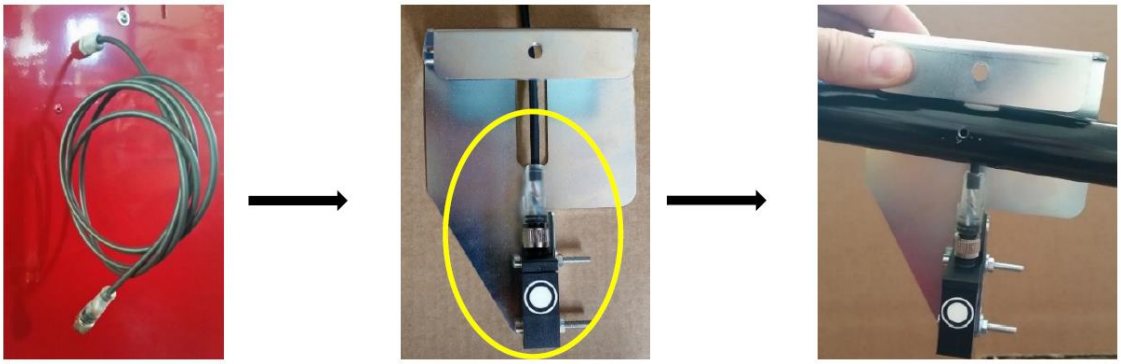


Figure F6.20 – Figure F6.21 – Figure F6.22: Connect the cable to SONAR device. Mount the device on the pipe following the holes as available on it.

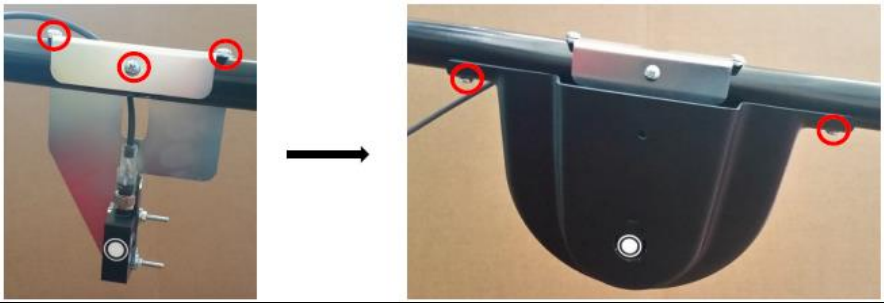


Figure F6.23 – Figure F6.24: Fix the SONAR device to the tube. Mount the plastic carter fixing with the relevant screws.

Figure F6.25

Figure F6.26: Once the device is mounted on the pipe, fit the plastic carter as described on the 6.3.

6.5 Electrical connection

The standard version of the machine must be connected to a mains 230V Single Phase. It is not possible to change the power supply. 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 corresponds to the voltage indicated 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.

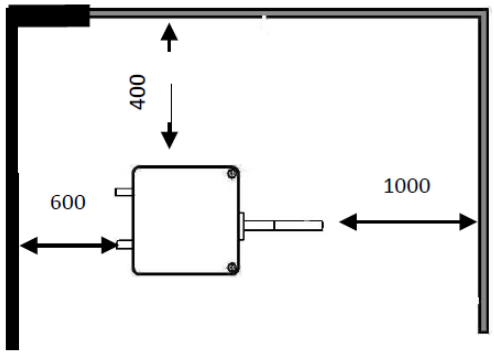
DO NOT REMOVE, DAMAGE AND MAKE ILLEGIBLE THE STICKERS OF DANGER, WARNING, INSTRUCTIONS AND CAUTION. REPLACE ANY MISSING, DAMAGED OR ILLEGIBLE STICKERS. THE STICKERS CAN BE FOUND AT THE NEAREST DEALER OF MANUFACTURER.

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.

7 Installation

7.1 Installation Area

To install the machine you need a useful space on the basis of the information given in picture F7.1.



Picture F7.1

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 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.

7.2 Fixing the machine to the ground

GROUND FIXINGS ARE MANDATORY

1. Drill with manual drill to a depth of 35 mm.
2. Clean the hole.
3. Push the expansion plugs into the holes with small hammer blows.
4. Tight the nuts with torque wrench calibrated on 23 Nm (if you are not able to achieve this value the reason could be the hole is too wide or the concrete is not solid enough).

Figure F7.3

8 Suspension of 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.

9 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).

Your help is critical to reduce 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.

10 Technical Data

General features

Power supply voltage	1Ph 230 V 50/60 Hz
Power consumption	100 W
Balancing speed	140 RPM
Maximum unbalance calculated	999 g.
Accuracy	X1 (1 g. or 0.1 ounce)
	X5 (5 g. or 0.25 ounces)
Shaft diameter	40 mm.
Working environment temperature	from 0 to +45 °C
Storage temperature	from -10 to +60 °C
Storage relative humidity	20% ÷ 95%
Machine weight (without accessories)	170 - 178 Kg
Noise level	< 70 dB(A)

10.1 Machine dimensions

Depth with closed wheel guard	mm. 960
Depth with open wheel guard	mm. 850
Width with wheel guard	mm. 1150
Height with closed wheel guard	mm. 1400
Height with open wheel guard	mm. 1400

10.2 Working range

Rim size set manually

	mm.	inches
Wheel – machine distance	2 ÷ 460	
Wheel width	50 ÷ 500	2.0 ÷ 20.0
Wheel diameter	25 ÷ 890	1.0 ÷ 35.0

Rim size set automatically

	mm.	inches
Wheel width	Max. 500	Max. 20.0
Wheel diameter	235 ÷ 710	9.5 ÷ 28.0

Wheel features

Max. wheel diameter (with guard)	1120 mm.
Max. wheel width (with guard)	590 mm.
Max. wheel weight	75 kg.
Machine weight (without accessories)	170 – 178 Kg
Noise level	< 70dB(A)

Table T10.1: Functions for machine model

Functions	FDR1080	NOTES
Distance and diameter automatic acquisition	•	
Width automatic acquisition	•	
Balancing accuracy	± 0,5 g.	
FMB Parking brake pedal	•	
MBA Electromagnetic parking brake	•	
SWI Automatic search for imbalance positions	•	SWI = Stop the Wheel on Imbalance
Distance gauge with weight-tray support	•	
CFC Car wheels calibration with zero-settings of the unbalance in the flange	•	
MFC Motorbike wheels calibration with zero-settings of the unbalance in the flange	•	
Static/Dynamic balancing	•	
OPT Optimization program	•	
Grams/ounces selection	•	
Inches/mm selection	•	
AAP - AUTOMATIC ALUMINUM PROGRAM	•	
Car wheels programs (CAR) STD, ALU1,2,3,4,5, ALS1, ALS2	•	
Off-road wheels programs (SUV) STD, ALU1,2,3,4,5, ALS1, ALS2	•	
Programs for wheels MOTO ALU1	•	
STATIC program	•	
DYNAMIC program	•	
HIDDEN WEIGHTS program	•	
STAND BY function	•	
MSO Multi operators management	•	
GSW Iron/Zinc/Lead weights selection	•	
LWH Led lighting	•	
LASER	Optional	
USB port for software update	•	
Service programs	•	
Sonar	•	

• = Present/Available

10.3 Presentation of the machine

1. Keyboard.
2. Weight-tray.
3. Monitor.
4. Wheel guard with support.
5. Rocking unit.
6. Distance/Diameter sensor.
7. Pins for cones.
8. Switch

11 Identification Data

A complete description of the “Wheel Balancer Model” and the “Serial number” will make it easier for our technical assistance to provide service and will facilitate delivery of any required spare parts. This information can be found on the product serial plate.

12 Maintenance

To ensure the efficiency of machine and its proper functioning is essential to follow the manufacturer’s instructions by performing periodic cleaning and routine maintenance.

CLEANING AND ORDINARY MAINTENANCE MUST BE PERFORMED BY THE AUTHORIZED PERSONNEL IN ACCORDANCE WITH THE MANUFACTURER INSTRUCTIONS PROVIDED BELOW.

Always keep the flanges clean and tidy (non-lubricated). In addition, during the handling, pay the best attention to not damage. For cleaning the machine, especially for the weight-ray, use a soft cloth moisten with ethyl alcohol.

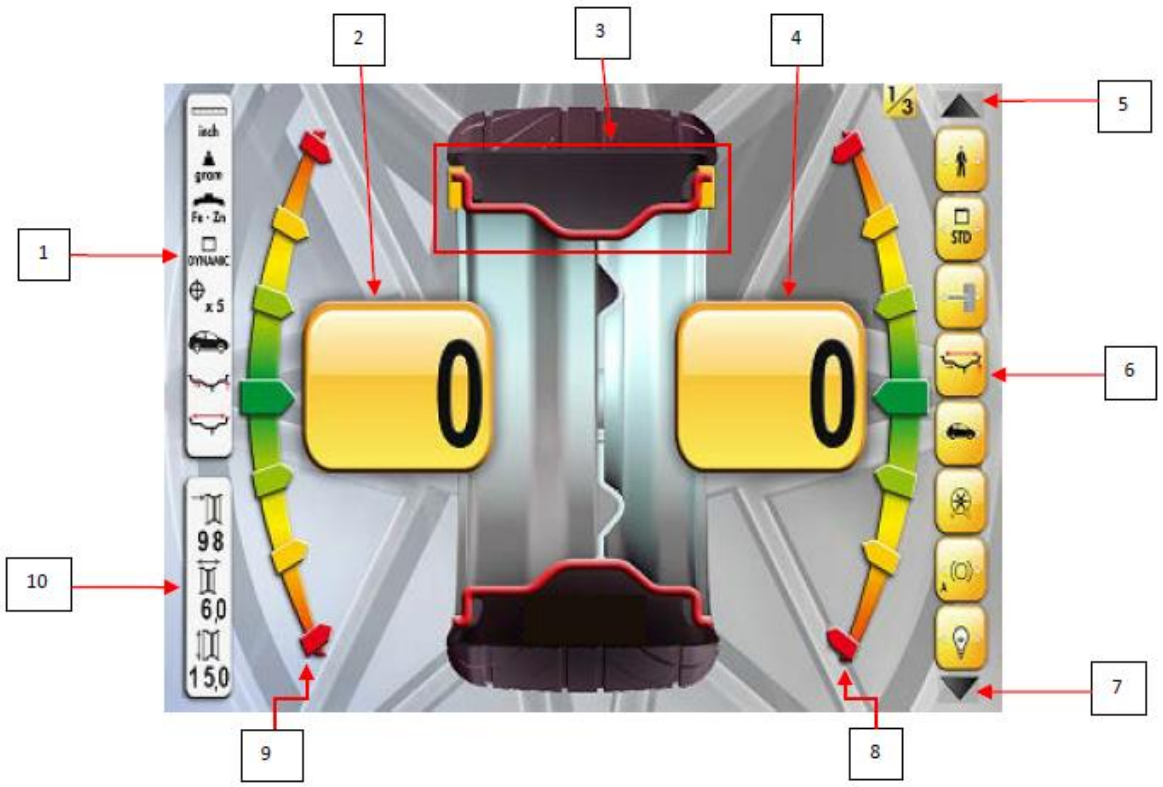
EVERY OPERATION MUST BE DONE ONLY AFTER THE CABLE HAS BEEN DISCONNECTED FROM ITS POWER SUPPLY.

DO NOT BLOW COMPRESSED AIR TO CLEAN THE MACHINE AND LASER POINTER.
DO NOT USE WATER OR OTHER LIQUIDS FOR CLEANING THE MACHINE.

13 Monitor

The machine's control monitor is illustrated in figure F13.1. The control monitor is used by the operator to view the applied controls and the data entered with the keyboard. The same control panel displays the balancing results and machine messages. The functions of the various parts of the monitor are described in table T13.1 while the control key functions are described in table T13.2.

Figure F13.1: Control monitor



T

Pos.	Description
1	Status icon band.
2 – 4	Display shows unbalance value inside – outside.
3	Imbalance Position indicator. Position depends by the Program and Wheel Type selected.
5	Previous page.
6	Control icon band.
7	Next page.
8 – 9	Indicator shows angular unbalance position inner - outer.
10	Wheel dimensions data band.

The programs can be selected in NORMAL mode by pressing [P1] or [P3] 

.
The control icons are equipped with two white arrows, therefore, by pressing [P2] or [P4] 

you select the required option.

Table 13.2: CONTROL ICONS key

Icon	Meaning

	Operator number selection icon.
	Program type selection icon (STD, ALU1, ALU2, ALU3, ALU4, ALU 5, ALS1, ALS2).
	Automatic plane acquisition activation icon on program ALS1 and ALS2.
	Icon to activate the manual wheel data entry function.
	AUTO, SUV, MOTO work program selection icon.
	HIDDEN WEIGHTS program activation icon.
	Electromagnetic brake activation/deactivation icon (ONLY ON MEC 820VD).
	Illuminator activation/deactivation icon (when applicable).
	DYNAMIC/STATIC work program selection icon.
	Work resolution selection icon (X5/X1).
	OPTIMISATION program activation icon.
	GRAMS/OUNCES imbalance display selection icon.
	INCHES/MM display selection icon.
	Icon to select the material of the weights to be applied (Fe/Zn or Pb).
	AUTO/SUV calibration program activation icon.
	MOTO calibration program activation icon.

14 Keyboard

For convenience the keys are numbered from [P1] to [P9] as shown in figure F14.1. The nine keys have a single main function.

Table T14.1: Key functions

Key	Setting/Program or Menu
P1	Function selection key.
P2	Function selection key.
P3	Function selection key.
P4	Function selection key.
P5	“Back” key to go back to the previous view.
P6	“OK” key to confirm selection.
P7	Key to access the on-line guide.
P8	Start key to start the motor.
P9	Stop key to stop the motor.
	STAND BY led.
	Machine status led.

Keys [P8] 

Start and [P10] 

Stop have different effects depending on the position of the wheel guard as indicated in table T14.2.

Table T14.2: Effects of the Start and Stop keys in relation to the status of the wheel guard

Pressed key	Wheel guard position	Result
[P8] 	OPEN/HIGH	If the stopping brake is disabled the machine doesn't spin and emit three beeps to alert the required function cannot be taken If the stopping brake is enabled and the machine shows imbalance positions the machine performs a low speed spin (SWI procedure. See paragraph SWI wheel stop procedure on the positions of imbalance). NOTE: for operator safety purposes, the SWI procedure will not be run when the MOTO Wheel Type is enabled.
	CLOSED/LOW	The machine will run the balancing or testing spin.
[P9] 	OPEN/HIGH	No action
	CLOSED/LOW	No action if the wheel is spinning Spinning stops if this is in progress

15 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 without user activity, the machine automatically switches to STAND-BY mode to reduce electrical consumption (both with wheel guard raised or lowered). The STAND-BY green led on the control keyboard is blinking it means 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.
- Turn manually the wheel.
- Remove the Distance and Diameter sensor from the rest position.
- Pull out the Width sensor from the rest position (only for the models with automatic acquisition of Width).

Note: the machine exits the STAND-BY mode also by pressing the key [P8] Start or lowering the wheel guard. In these cases simultaneously, will be start also the spinning (if you press key [P8] Start the spin will start only if the wheel guard is already lowered).

15.1 Temporary disabling of the diameter and distance sensor

If the machine displays the error code ERR 016 (Distance/Diameter sensor not in the rest position) at switching on, although being in rest position, it means that an anomaly occurred in the acquisition system. However, it is possible to temporarily disable the acquisition system by pressing [P5]  . The disabling condition is highlighted by the  status icon, indicating that the automatic acquisition system is disabled and that the machine is ready for use. As it is not possible to use the automatic acquisition system, the wheel dimensions must be entered manually. By turning the machine off and back on again, the error code will re-appear and you will once again need to proceed as described above. If the automatic acquisition system is malfunctioning and it blocks the machine in a permanent acquisition function, the temporary disabling could be done also after the machine is switched on.

Note: the temporary disabling of the Distance/Diameter sensor also acts on the sensor for the

automatic acquisition of width.

15.2 Temporary disabling of the width sensor (where applicable)
If the machine displays error code ERR 017 (Width sensor not in the rest position) when powered up, even if in rest position, it means that an anomaly occurred in the acquisition system.

However, it is possible to temporarily disable the width sensor by pressing [P5] 

. The disabling condition is highlighted by the  status icon, indicating that the automatic acquisition system is disabled and that the machine is ready for use. As it is not possible to use the width sensor, the width dimensions must be entered manually. By turning the machine off and back on again, the error code will re-appear and you will once again need to proceed as described above. If the width sensor is malfunctioning and it blocks the machine in a permanent acquisition function, the temporary disabling could be done also after the machine is switched on.

Note: the temporary disabling of the Distance/Diameter sensor also acts on the sensor for the automatic acquisition of width.

16 Machine Calibration

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

16.1 When to carry out machine calibration

Table T16.1 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 T16.1: Conditions for machine calibration

Condition	Status	Who must perform
When the machine is first installed.	Mandatory	Technical Service Engineer
When the CPU-C1 electronic circuit board is replaced.	Mandatory	Technical Service Engineer
When a mechanical part linked to the pick-up signals (pick-up, pick-up compression springs, suspension unit + shaft) is replaced.	Mandatory	Technical Service Engineer
When the pick-up compression springs adjustment are modified.	Mandatory	Technical Service Engineer
When the encoder disc is replaced.	Mandatory	Technical Service Engineer
When a different motorbike adaptor is used since the last calibration for MOTO Wheel Type.	Mandatory	End User
When the machine doesn't show accurate results for balancing.	Recommended	End User
When there are wide and constant variations due to environmental humidity and temperature (for example seasonal changes).	Recommended	End User

The machine requires two independent calibrations:

- Calibration for the CAR/SUV Wheel Type (calibration is the same for both types of wheel).
- Calibration for the MOTO Wheel Type (wheels for motorbike).

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

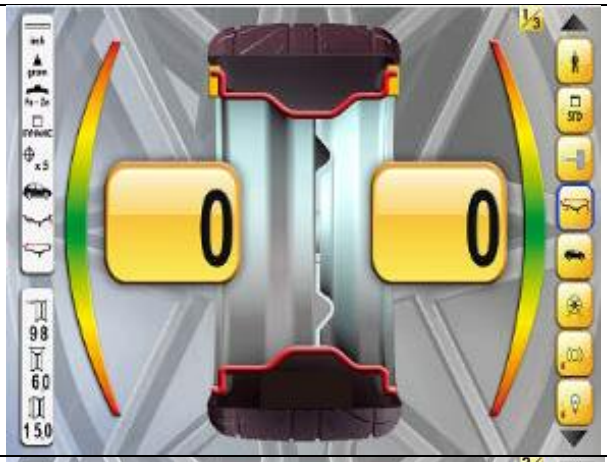
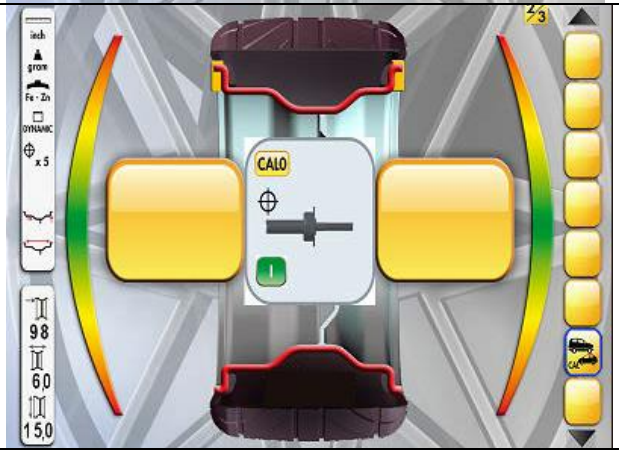
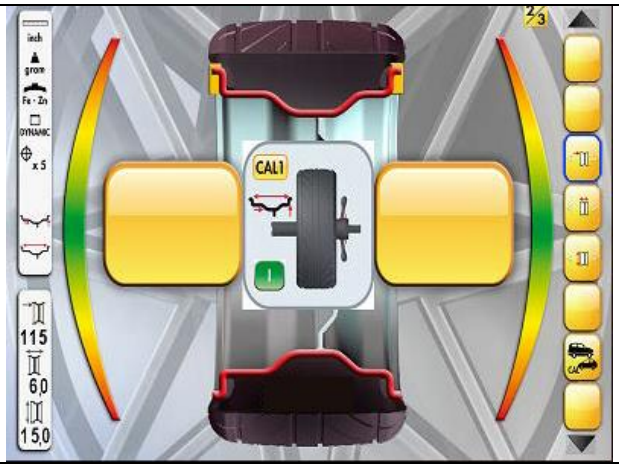
16.2 Machine calibration for the CAR/SUV Wheel Type

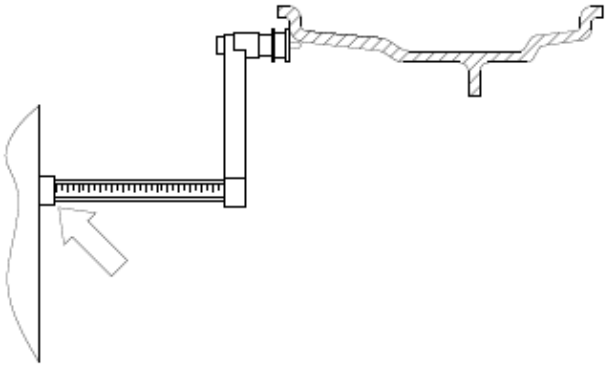
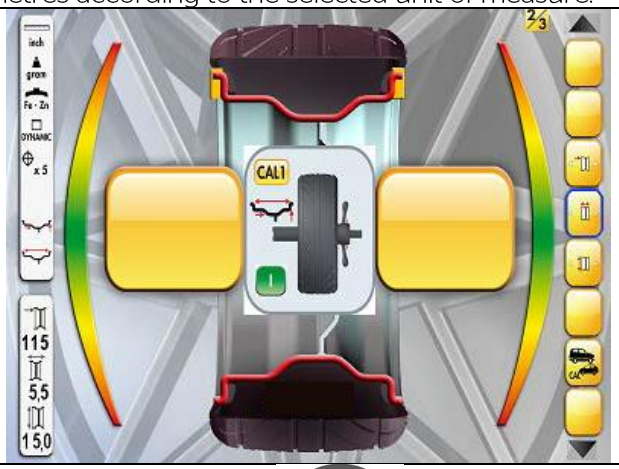
The calibration for the CAR wheel type and SUV wheel type is the same.
To perform machine calibration, you must first provide for the following material:

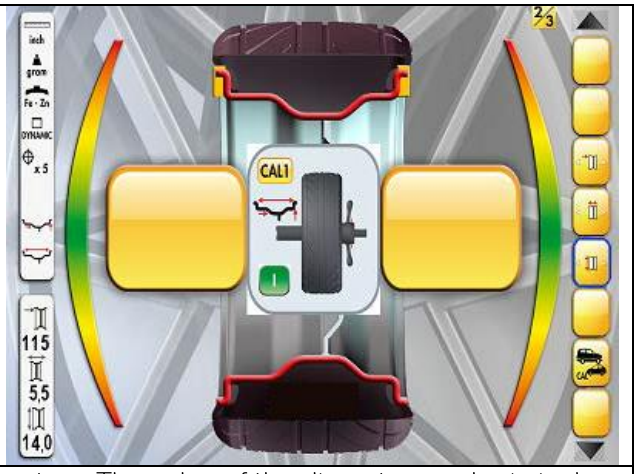
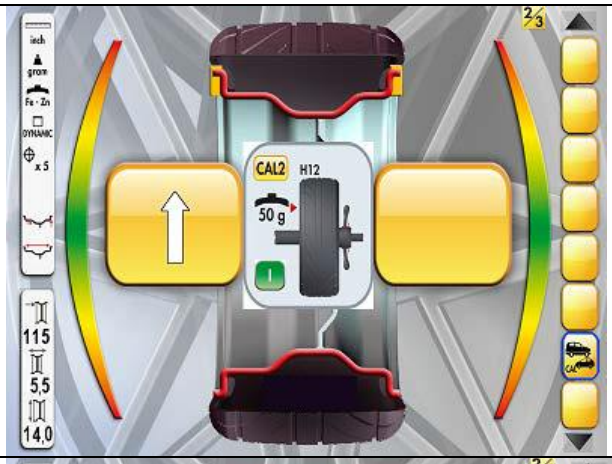
- A balanced wheel with steel rim that has the following dimensions: 14" ÷ 16" diameter. 5" ÷ 5.5" width. Do not use wheels with aluminium rims.
- A 50 grams weight (preferably in Iron or Zinc).

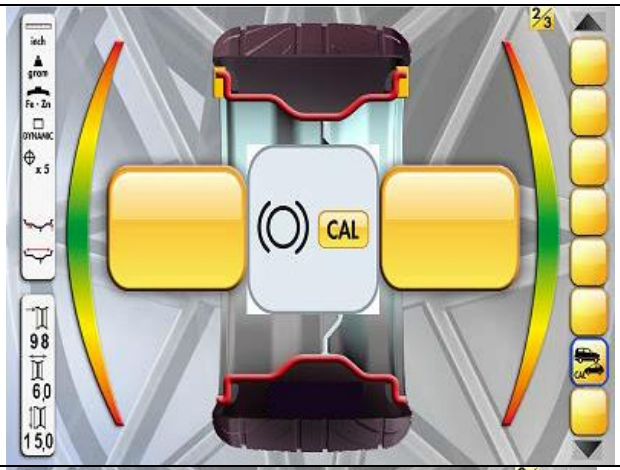
To calibrate the machine, proceed as described below:

Phase	Description	

010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the AUTO/SUV calibration program by selecting  which will turn blue.	
030	Confirm activation of the AUTO/SUV calibration program by pressing [P6]  on the keyboard.	
040	Remove the wheel and any other accessories from the shaft.	
050	Lower the wheel guard: the machine will run a launch.	
060	Fit the wheel on the shaft. Manually enter the wheel dimensions. If the dimensions of the wheel were introduced before entering the calibration program, this step can be skipped. It is not possible to enter the data with the automatic acquisition system.	

070	Extract the distance sensor and place it on the wheel as shown here. Read the distance value on the graduated scale. The distance value is always expressed in millimetres. 	
080	Select which type of dimension to enter by pressing [P1] or [P3]  on the keyboard  and activate the wheel - machine distance insertion function by selecting  which will turn blue.	
090	Enter the detected value by pressing [P2] or [P4]  on keyboard 	
100	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.	
110	Select which type of dimension to enter by pressing [P1] or [P3]  on the keyboard  and activate the wheel width insertion distance insertion function by selecting  which will turn blue.	
120	Enter the detected value by pressing [P2] or [P4]  on keyboard 	

130	Select which type of dimension to enter by pressing [P1] or [P3]  on the keyboard  and activate the wheel diameter insertion function by selecting  which will turn blue.	
140	Read the value of the diameter indicated on the rim or tyre. The value of the diameter can be in inches or millimetres according to the selected unit of measure.	
150	Enter the detected value by pressing [P2] or [P4]  on keyboard 	
160	Lower the wheel guard: the machine will run a launch.	
170	**By hand, turn** the wheel in the direction marked by the arrow until you see 50 g on the left display.	
180	On the inner side of the wheel, at 12 o'clock, apply the 50 g weight.	
190	Lower the wheel guard: the machine will run a launch.	

200	Take off the 50 g weight applied to the inner side (identified by the red X in the figure). **By hand, turn** the wheel in the direction marked by the arrow until you see 50 g on the right display.	
210	On the outer side of the wheel, at 12 o'clock, apply the 50 g weight.	
220	Lower the wheel guard: the machine will run a launch.	
225	keep the wheel guard lowered.	
230	If the FDR1080 is equipped with the electromagnetic brake for positioning, at the end of the previous spin the machine will perform a set of short spins to calibrate the function of automatic stop on imbalance position (see chapter SWI Stop the wheel on imbalance). Do not lift the wheel guard and do not press [9]  during this procedure.	
240	Calibration is finished: the machine automatically exits the calibration program and returns to the NORMAL mode, ready to perform the balancing.	

How to exit the CAR/SUV wheel type calibration of the machine

At any time it is always possible to exit the calibration procedure during its progress by pressing [P5] 

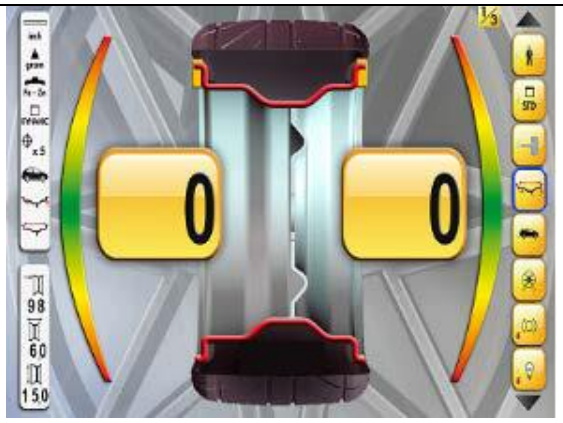
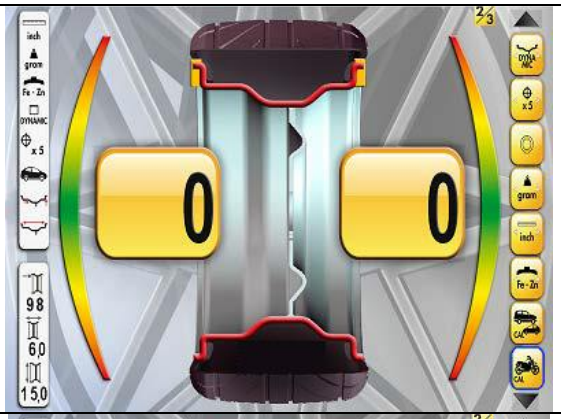
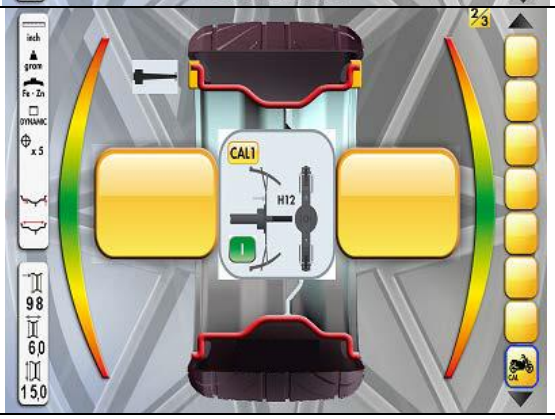
.

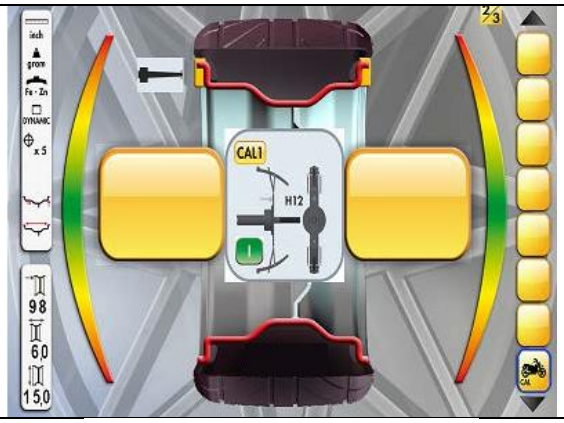
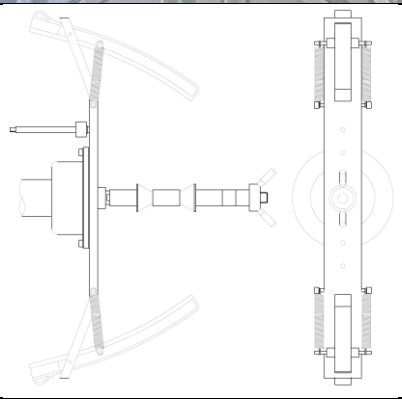
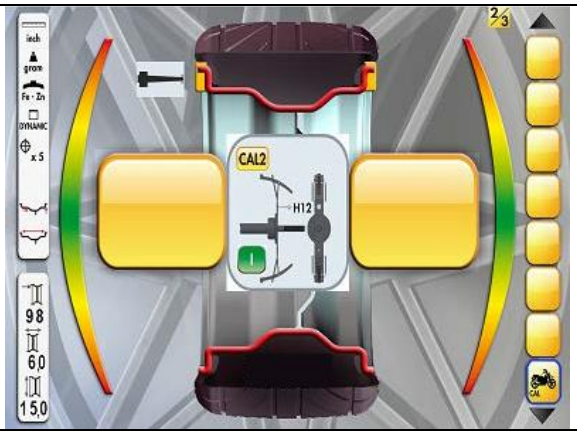
16.3 Machine calibration for the MOTO wheel type

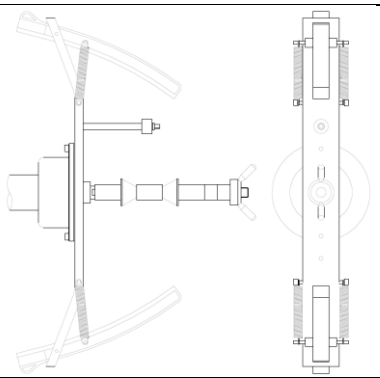
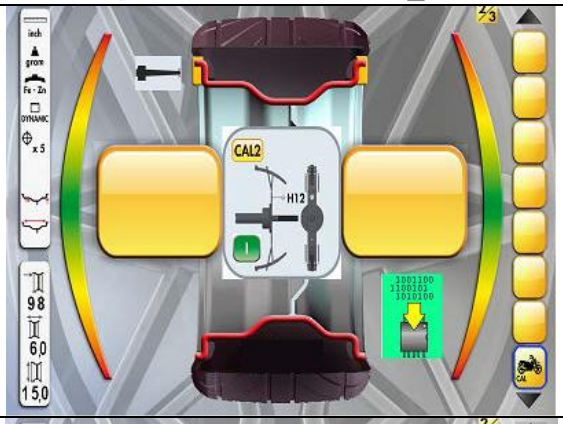
The calibration for MOTO wheel type (motorcycle wheels) is completely separated from CAR/SUV wheel type because in the calibration for MOTO a specific adaptor for motorcycle wheels is used and this slightly the shaft balancing.

If the calibration for MOTO wheel type has not been done and the user try to spin the wheel for balancing in the MOTO wheel type mode, the machine will not run and will display an error code ERR 031.

To perform machine calibration for the motorbike flange, proceed as described below:

Phase	Description	
010	  Press [P1] or [P3] on keyboard and select the icon relative to the program to be used.	
020	Activate the MOTO calibration program by selecting  which will turn blue.	
030	Confirm activation of the MOTO calibration program by pressing [P6]  on the keyboard.	

040	Mount the motorcycle adaptor on the shaft as shown here. The flange for motorbike wheels must be installed so that the “CAL” markings on the shaft flange and the flange for motorbikes line up.	
050	Lower the wheel guard: the machine will run a launch.	
060	At the end of the launch, the machine will display the message shown here. Apply the calibration weight to the inner side, as shown. The calibration weight must be applied on the hole marked with the “CAL” inscription.	
070	Move the motorcycle adaptor to a stable vertical position with the calibration weight at the top as shown in the figure. If the weight position is significantly different from the vertical position, the machine will refuse to perform the spin and it will display an error code ERR 043. If the motorcycle adaptor is near to the vertical position but not in the precise vertical position, the machine will spin but at the end of the calibration each balancing spin will have an error in the balancing angular position of the weights.	
080	Lower the wheel guard: the machine will run a launch.	
090	At the end of the launch, the machine will display the message shown here. Apply the calibration weight to the outer side as shown here. The calibration weight must be applied on the hole marked with the “CAL” inscription.	

100	Move the motorcycle adaptor to a stable vertical position with the calibration weight at the top as shown in the figure. If the weight position is significantly different from the vertical position, the machine will refuse to perform the spin and it will display an error code ERR 043.	
110	Lower the wheel guard: the machine will run a launch.	
120	At the end of the spin, the MOTO wheel type calibration is finished and the machine will switch to NORMAL mode, ready to run the balancing.	

When the calibration is finished the MOTO wheel type and ALU1 Program Type value are set. Also the wheel data are automatically set by machine for this type of calibration.
If you have anomalies during the calibration procedure, the machine will display the error message (for example ERR 025). See chapter "22. Error codes" to solve the problem and continue/repeat/cancel the calibration in progress. Launches that are interrupted by lifting the wheel guard can be repeated by lowering the wheel guard back down.

How to exit the MOTO wheel type calibration of the machine

At any time it is always possible to exit the calibration procedure during its progress by pressing [P5] 

. The calibration in progress will be cancelled and the machine will use the values of MOTO wheel type calibration which were previously stored. Also in this case the MOTO wheel type and the ALU1 Program Type will remain set. The wheel dimensions will be those which were automatically set by the machine for this kind of calibration.

17 Use of the machine in Normal Mode

To use the machine, you must select or set as follows:

- Program Type (program for wheels with steel, aluminum or special aluminum rim). Default = program 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 fully entered Automatically.

- Dynamic or Static balancing. Default = Dynamic.
- Display resolution X1 or X5. Default = X5.

The selections described above can be entered before or after the spin. For any variation of the selection or data settings, the machine will run a calculation by displaying the new values of imbalance.
When the required selections/settings have been made it is possible to perform a launch by lowering the wheel guard. At the end of the spin, the machine displays the wheel imbalance values.

Apply the weights displayed by the machine at the indicated positions and then run a second test spin. Normally, the weights should be applied at the 12 o'clock with the exception of special programs for ALS1 and ALS2 aluminum.
The machine allows the choice between eight different Program Type of balancing as listed in table T17.1.

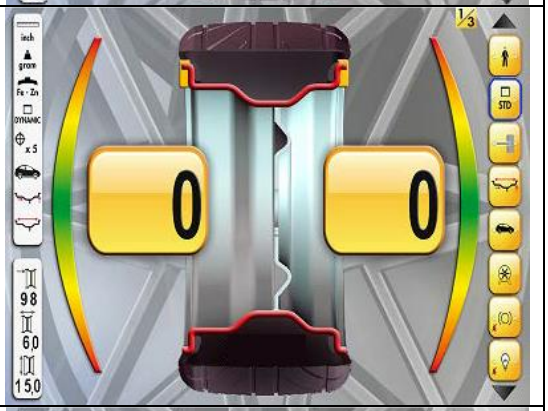
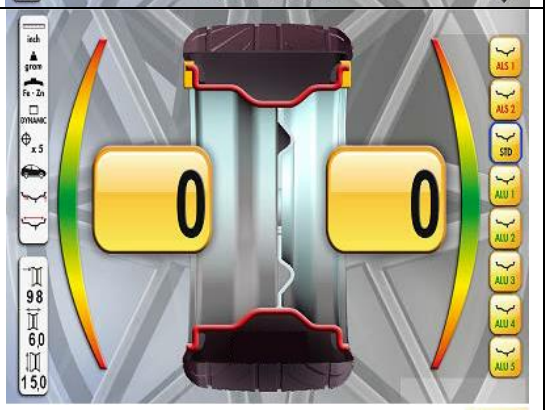
Table T17.1: Program types available

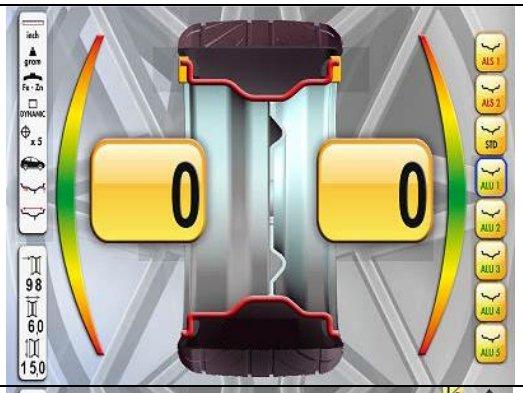
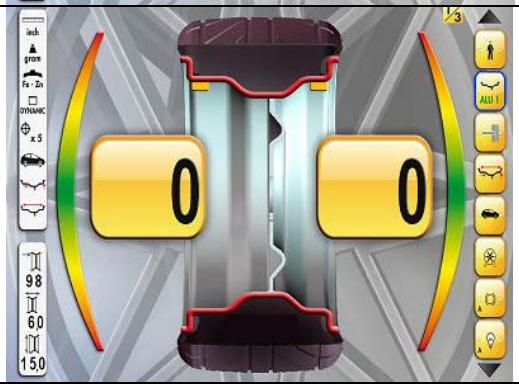
Program Type	Wheel Material	Weight Position along the rim selection	Automatic acquisition(1)	Notes
STD	Steel	Default	2 Sensors	Default at power on
ALU1	Aluminum	Default	2 Sensors	Forcibly set when the Motorbike Program Type is selected
ALU2	Aluminum	Default	2 Sensors	
ALU3	Aluminum	Default	2 Sensors	
ALU4	Aluminum	Default	2 Sensors	
ALU5	Aluminum	Default	2 Sensors	
ALS1	Aluminum	Default inner weight, outer weight provided by user.	1 Sensor	
ALS2	Aluminum	Provided by user	1 Sensor	

(1) Available on some models.

17.1 Program Type Selection (Program Type)

The programs can be selected in NORMAL mode as described below:

Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the STANDARD program by selecting the icon  (by default at power on) which will be outlined in blue. Press  on the keyboard  to confirm.	
030	Press [P1] or [P3]  on the keyboard  to select the icon relative to the required program which will be outlined in blue.	 

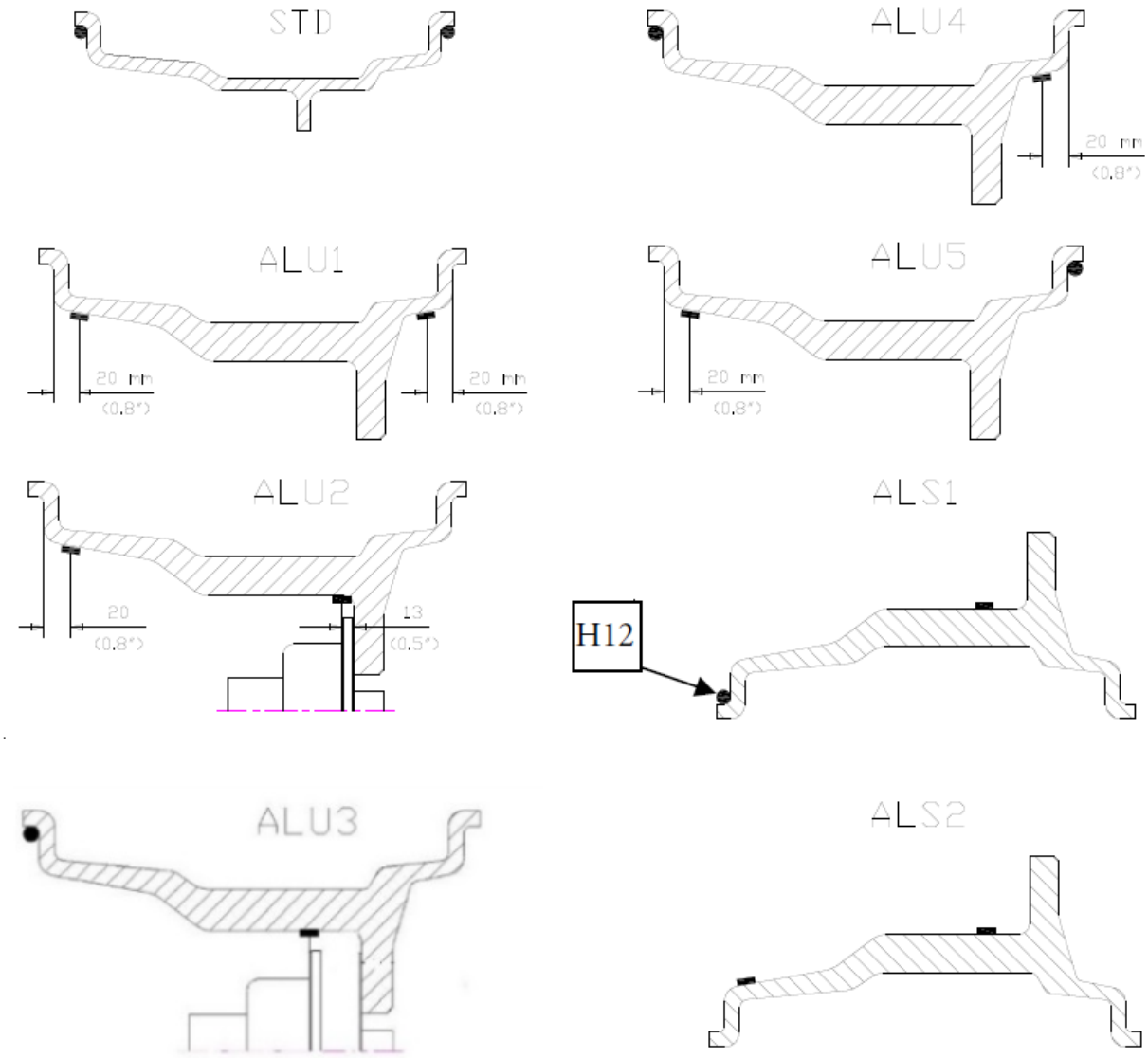
040	Press  on the keyboard  to confirm and to activate the required balancing program.	
050	Based on the selected Program Type, will be displayed the Program Type status icon and the position of the imbalance weights.	

Based on the active Program Type, the Program Type status and the position of the imbalance weights are displayed on the icon band.
Note: the selection of the Program Type STD removes the visualization of Static Imbalance.

Acquisition through a sensor only uses the Distance/Diameter sensor.

The position of the balancing weights along the section of the rim in the various Program Types is shown in figure F17.1.

Figure F17.1: Position of the weights in the various Program Types along the section of the rim



The angular position of the balancing weights in the various Program Types is shown in table T17.2.

Table T17.2: Angular position of the balancing weights in the various program types

	Program type								
Machine data acquisition system	STD, ALU1			ALS1			ALS2		
	Internal plane	External plane	Static plane	Internal plane	External plane	Static plane	Internal plane	External plane	Static plane
Semi-automatic FDR1060	H12	H12	H12	H12 Clip Weight	Sensor-rim contact point(1) with sticker weight	H6	Sensor-rim contact point(1) with sticker weight	Sensor-rim contact point(1) with sticker weight	H6
Automatic FDR1080	H12	H12	H12	H12 Clip Weight	Sensor-rim contact point(1) with sticker weight	H6	Sensor-rim contact point(1) with sticker weight	Sensor-rim contact point(1) with sticker weight	H6
Laser	/	/	/	H12 Clip Weight	H6 Sticker weight	H6	H6 Sticker weight	H6 Sticker weight	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 T17.2 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:

- Semi-automatic when the Distance and Diameter data are automatically acquired with the Distance/Diameter sensor while the data on the width must be manually entered;
- Automatic when all data of the rim is automatically acquired with the two sensors.

Automatic or Semi-automatic machines with disabled sensors (due to malfunctions or other reasons) become fully manual machines.
The data rim must be entered manually and the angular position of the weight follows the rules of the manual machines.

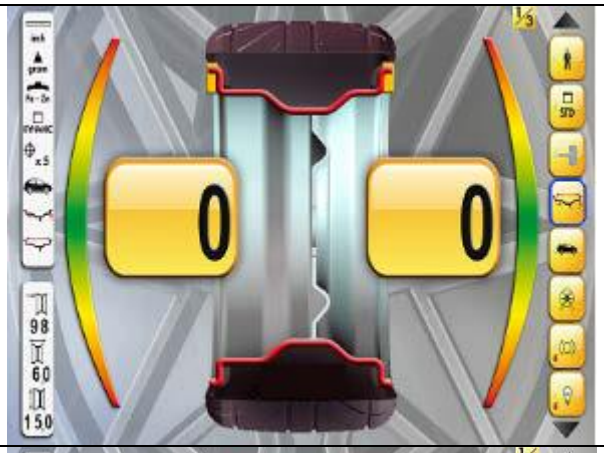
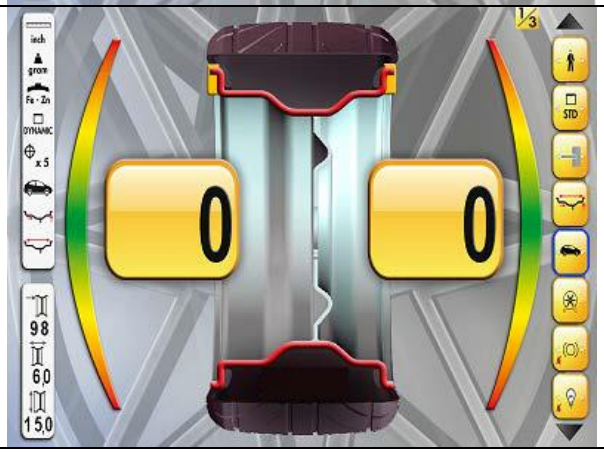
17.2 Wheel Type selection (Wheel Type)

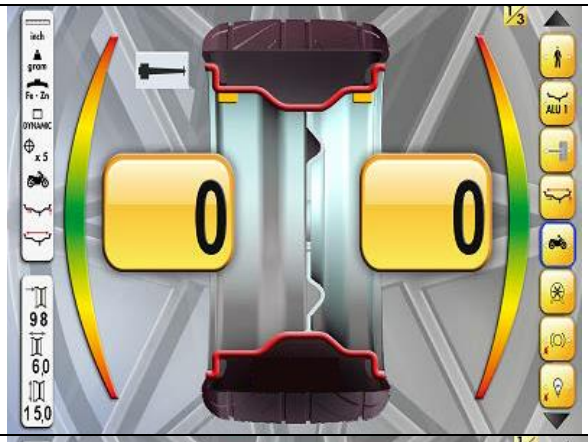
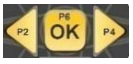
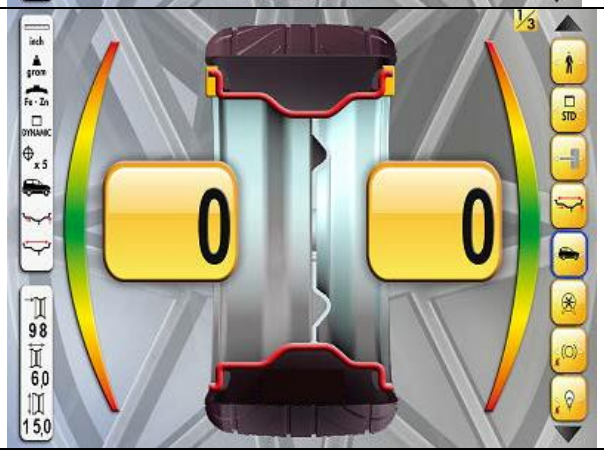
The machine allows choosing between three different Wheel Types as listed in table T17.3.

Table T17.3: Wheel Types to select

Wheel Type	Vehicle	Notes
CAR 	Auto-vehicles	Default power on
MOTO 	Motorbikes	Forcibly set the ALU1 program Type
SUV 	Off-Road vehicles	Not suitable for balancing truck wheels

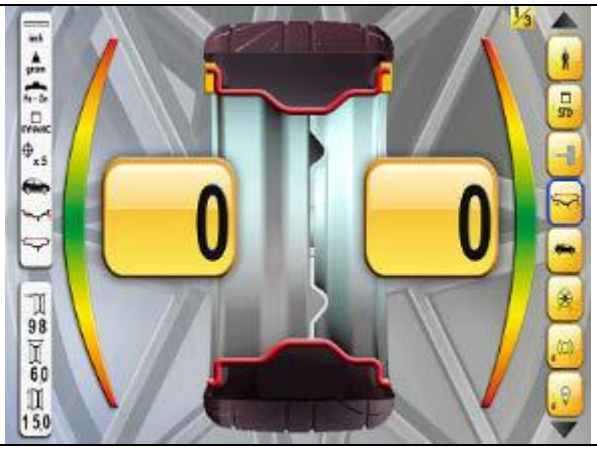
To select a specific Type of Wheel, proceed as described below:

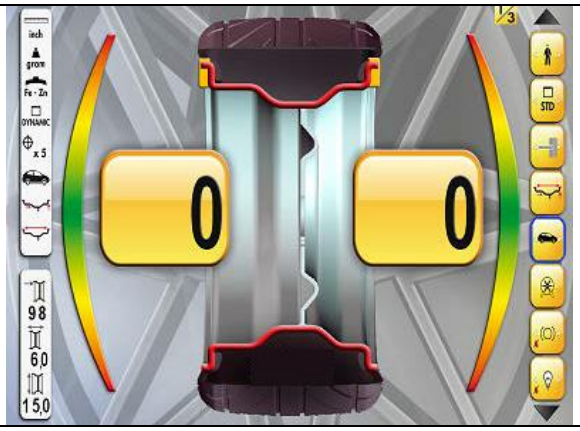
Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the AUTO program by selecting  (by default at power on) which will turn blue.	

030	Scroll through the list of available programs by pressing [P2] or [P4]  on keyboard  and activate the MOTO program by selecting 	
040	Scroll through the list of available programs by pressing [P2] or [P4]  on keyboard  and activate the SUV program by selecting 	

17.2.1 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, proceed as described below:

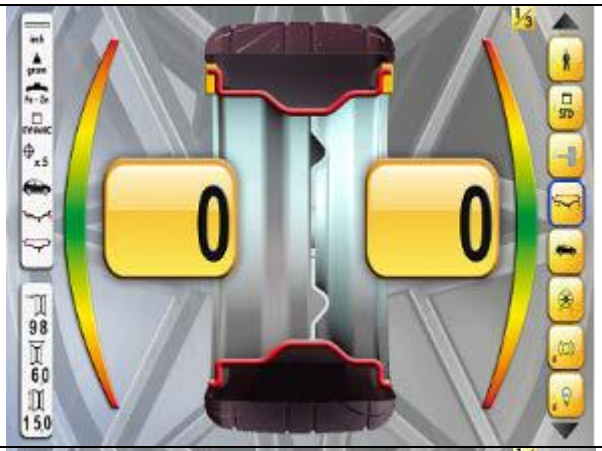
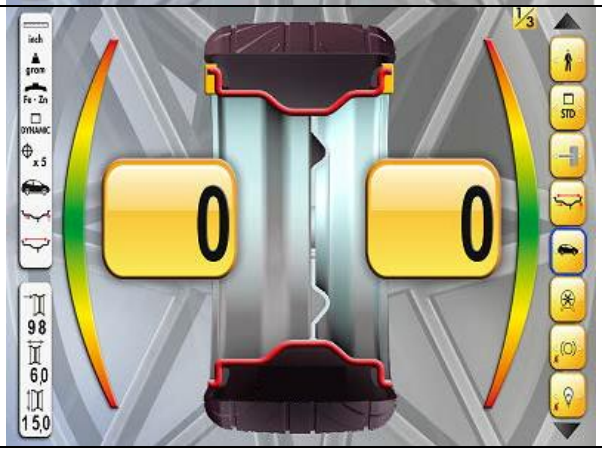
Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	

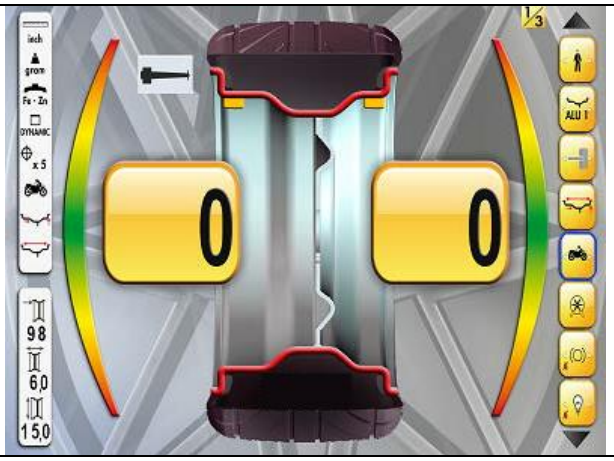
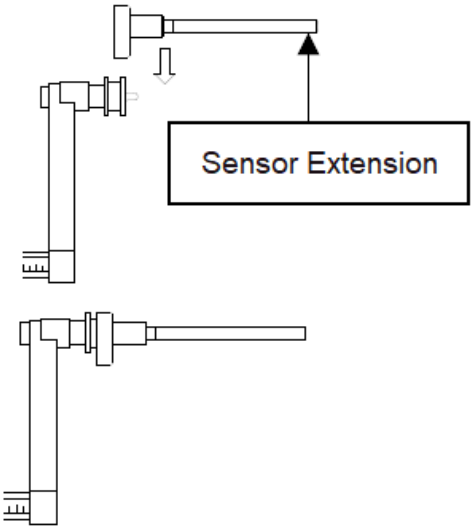
020	Activate the AUTO program by selecting  (by default at power on) which will turn blue. Ensure that the status icon  is activated.	

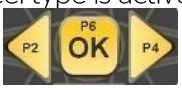
17.2.2 MOTO wheel type (motorbikes)

The selection of MOTO wheel type allows the balancing for the motorbike wheels.
These wheels must be fit on the shaft by using a specific motorcycle wheel adaptor. Since the motorcycle adaptor keeps farer the wheel from the machine, it is necessary to install an appropriate extension for the distance sensor.

To select the MOTO wheel type, proceed as described below:

Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the AUTO program by selecting  (by default at power on) which will turn blue.	

030	Scroll through the list of available programs by pressing [P2] or [P4]  on keyboard  and activate the MOTO program by selecting  . Ensure that the status icon  is activated.	
040	To acquire automatically the geometrical wheel data by Distance/Diameter and Width sensors, it is necessary to keep the same reference points on the rim as Program Type ALU1. Furthermore, when the Wheel Type MOTO is selected, the actual distance value is increased of 150 mm due to the extension length for the Diameter/Distance sensor.	

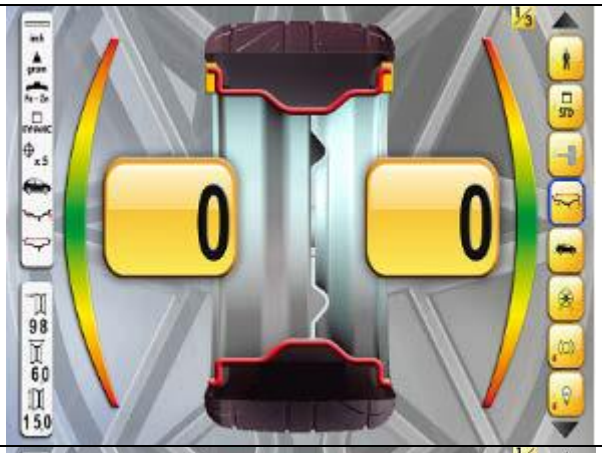
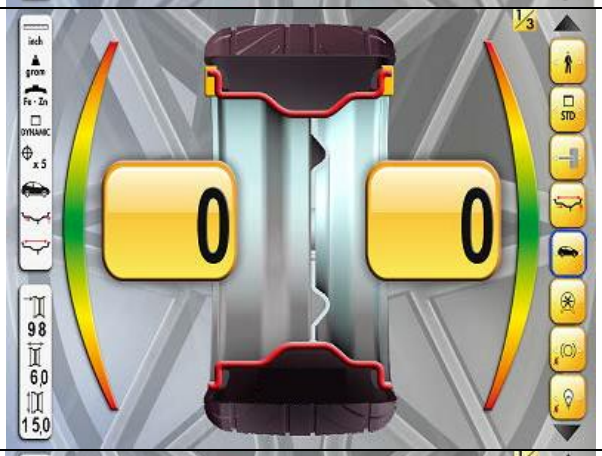
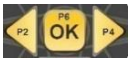
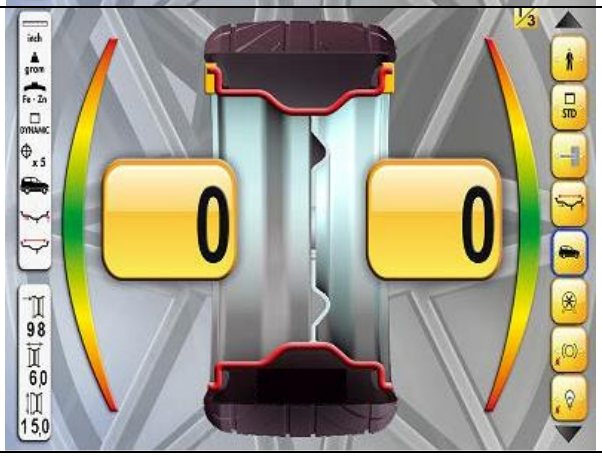
When MOTO wheel type is active, ALU1 Program Type is selected automatically; if you try to select any other using [P2] or [P4]  the machine will display error code ERR 043.
To acquire automatically the geometrical wheel data by Distance/Diameter and Width sensors, it is necessary to keep the same reference points on the rim as Program Type ALU1.
Furthermore, when the Wheel Type MOTO is selected, the actual distance value is increased of 150 mm due to the extension length for the Diameter/Distance sensor.
Every time the flange for motorbikes is taken down (for example, to balance wheels for vehicles) and then put back in, it is always necessary to line up the “CAL” markings on the flange and flange for motorbikes. If this is not observed, balancing precision may be compromised.

17.2.3 SUV wheel type (Off-Roads vehicles)

The selection of SUV wheel type allows the balancing of wheels for 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 (that means not the low profile or super low profile types).

The selection for this wheel type doesn't allow to balance the truck wheels, because the profiles for those rims are considerably different. The choice of the CAR or SUV wheel type is at the discretion of the operator who should run balancing test to determine which wheel type gives the best results for the particular wheel that is subject to balancing.

To select the SUV wheel type, proceed as described below:

Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the AUTO program by selecting  (by default at power on) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on keyboard  and activate the SUV program by selecting  . Ensure that the status icon  is activated.	

For SUV wheel type all Programs Type listed in table T17.1 are available. The positions of the weights along the section of the rim are the same as those shown in figure F17.1.

17.3 Entering wheel dimensions

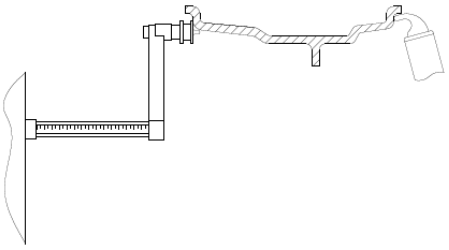
The dimensions of the wheel requiring balancing can be entered automatically (partial or total).

Note: all the machines are equipped with a graduated scale for manually measuring the distance.

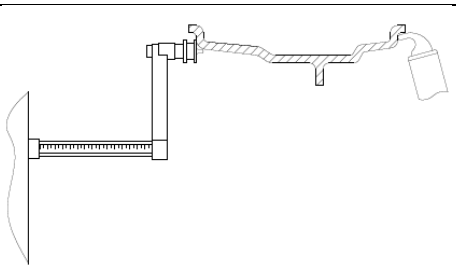
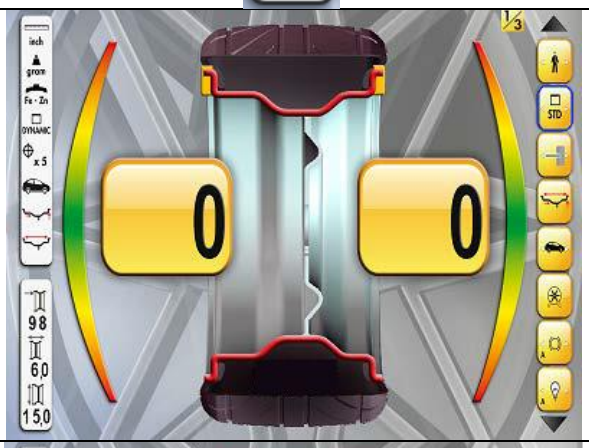
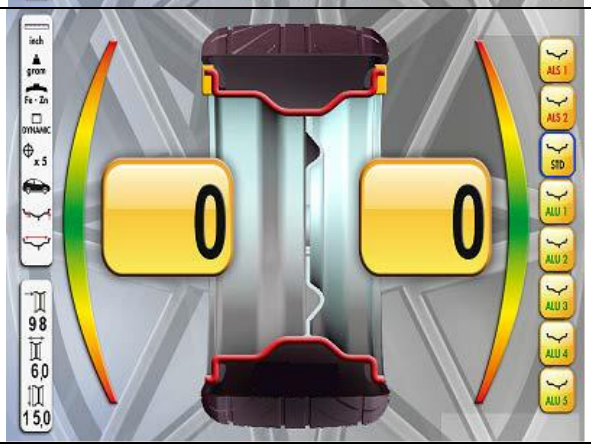
17.3.1 Automatic acquisition of the wheel dimensions for the STD and ALU1, 2, 3, 4, 5 Program Types

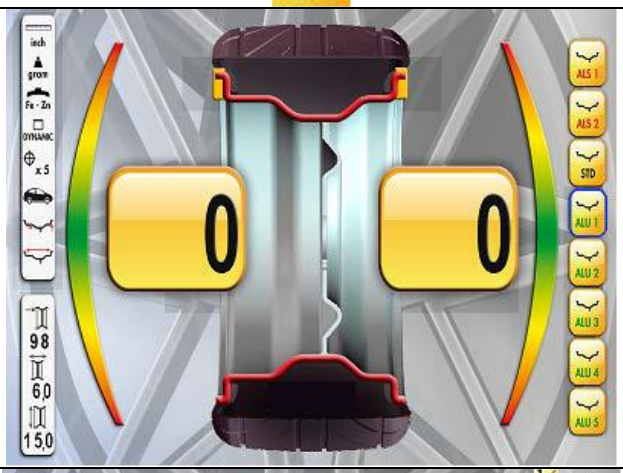
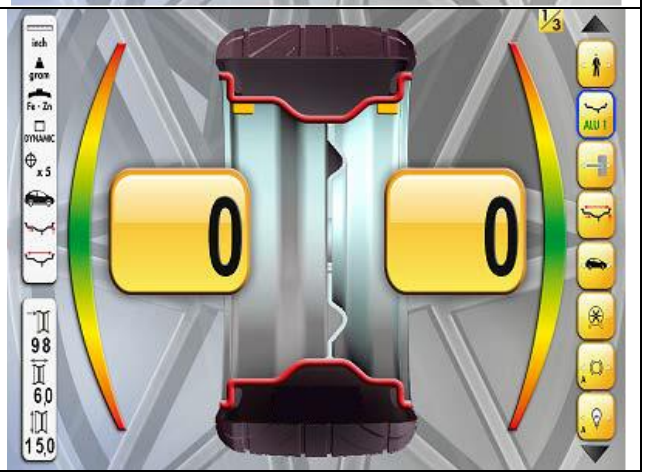
17.3.1.1 Machine with width sensor (if present)

To acquire the wheel dimensions, proceed as described below:

Phase	Description	
010	Fit the wheel on the shaft and tighten with the ring nut.	
020	Only for programs STD, ALU1, ALU2, ALU3, ALU 4, ALU5; Take out first the width sensor and THEN the distance/diameter sensor and place them on the rim, as shown here. When the both sensors come back in rest position, it is automatically activated the STANDARD program 	 
030	Wait to hear the long acquisition beep and then set the sensors back to the rest position. During acquisition the distance and diameter values are displayed on the wheel dimension data band.	

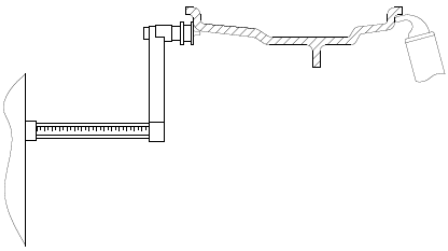
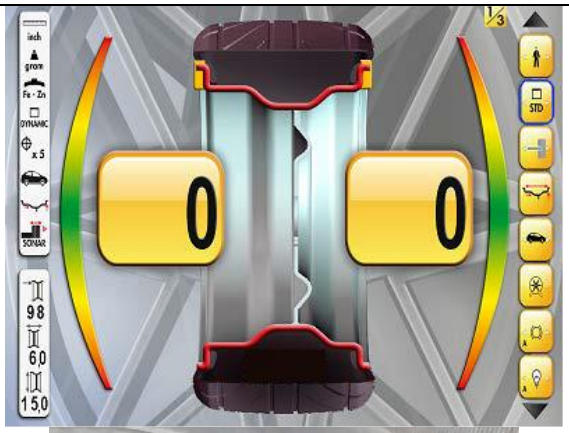
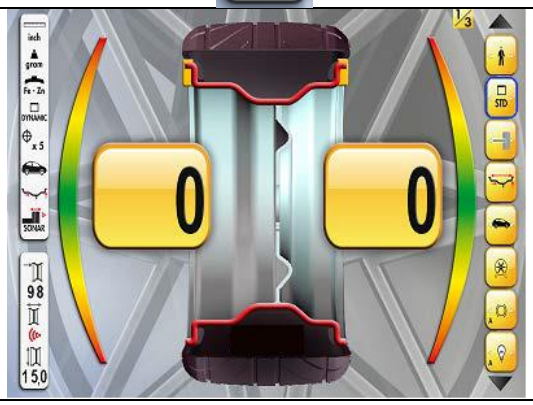
ALU1, 2, 3, 4, 5 Program Type selection

Phase	Description	
010	Fit the wheel on the shaft and tighten with the ring nut.	
020	Only for programs STD, ALU1, ALU2, ALU3, ALU 4, ALU5; Take out first the width sensor and THEN the distance/diameter sensor and place them on the rim, as shown here. When the both sensors come back in rest position, it is automatically activated the STANDARD program.	
030	Wait to hear the long acquisition beep and then set the sensors back to the rest position. During acquisition the distance and diameter values are displayed on the wheel dimension data band.	
040	Activate the STANDARD program by selecting the icon  (by default at power on) which will be outlined in blue. Press  on the keyboard  to confirm.	
050	Press [P1] or [P3]  on the keyboard  to select the icon relative to the required program which will be outlined in blue.	

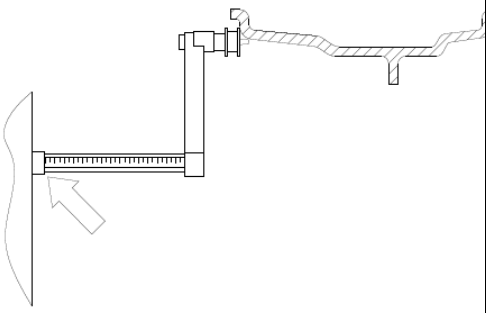
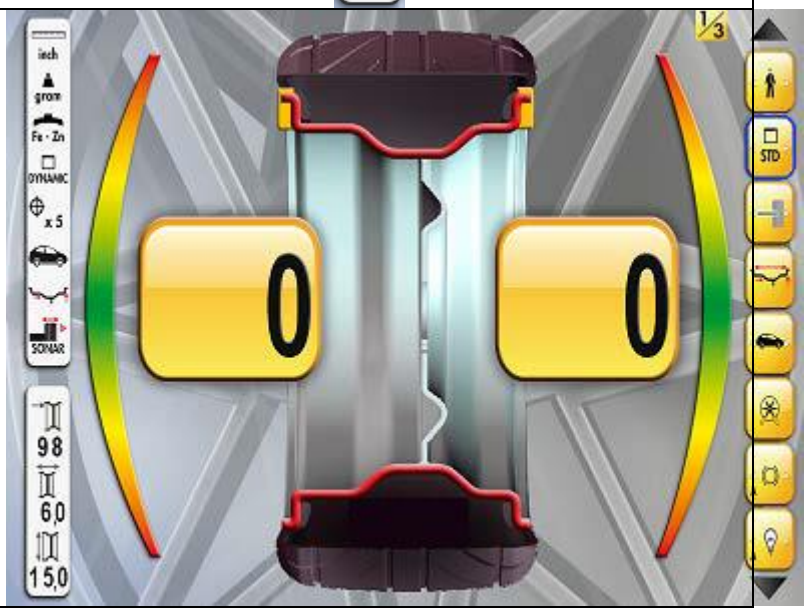
		
060	Press  on the keyboard  to confirm and to activate the required balancing program.	
070	Based on the selected Program Type, will be displayed the Program Type status icon and the position of the imbalance weights.	

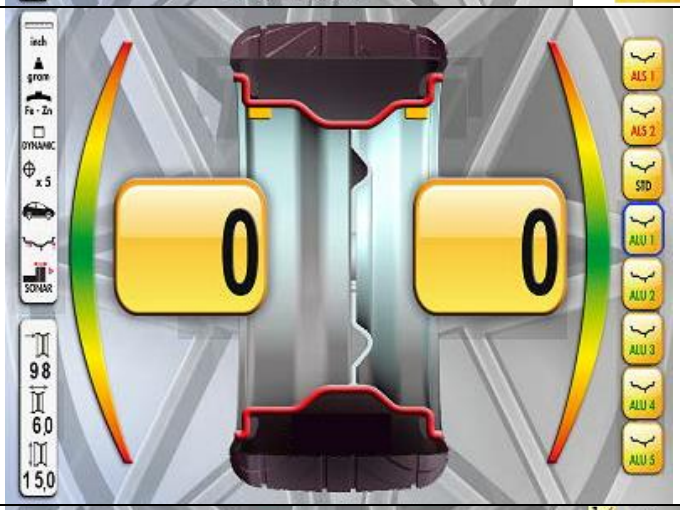
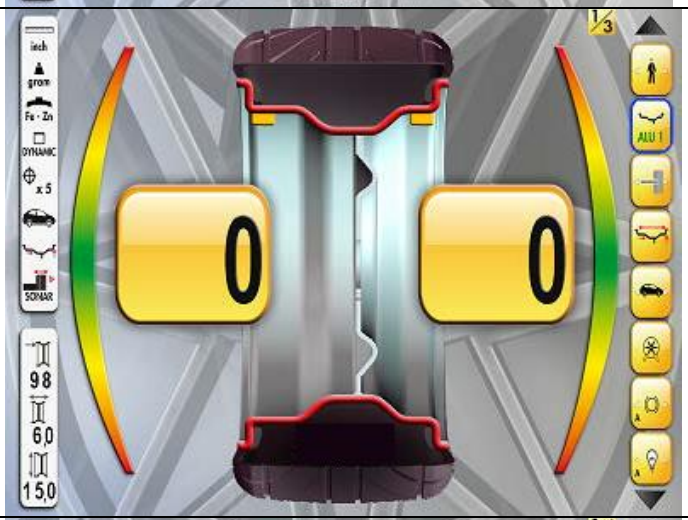
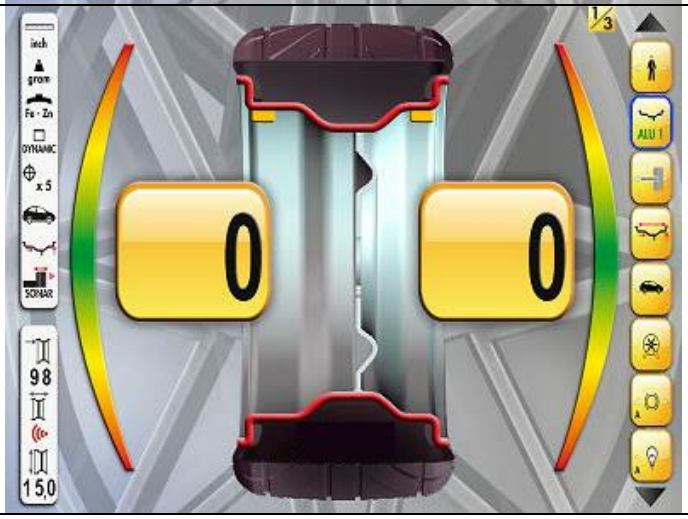
Machine with SONAR device (if present)

Phase	Description	
010	Fit the wheel on the shaft and tighten with the ring nut.	

020	Take out the distance/diameter sensor and place it on the rim, as shown here. When the distance/diameter sensor come back in rest position, it is automatically activated the STANDARD program  . 	 
030	Wait to hear the long acquisition beep and then set the Distance/Diameter sensor back to the rest position. During acquisition the distance and diameter values are displayed on the wheel dimension data band.	
040	Lower the wheel guard to run the balancing launch and to activate the SONAR device (in this way you automatic enter the width of the wheel). 	

ALU1, 2, 3, 4, 5 Program Type selection

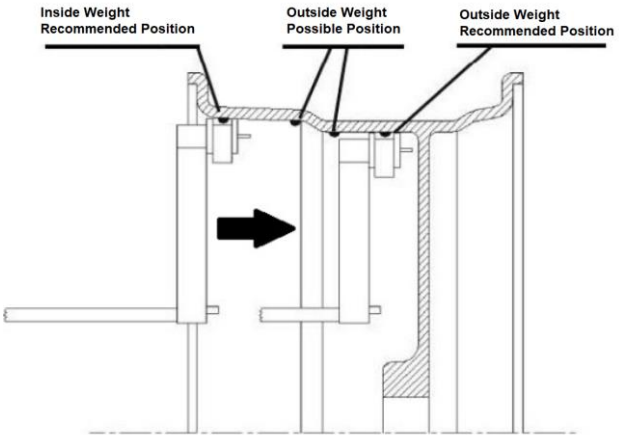
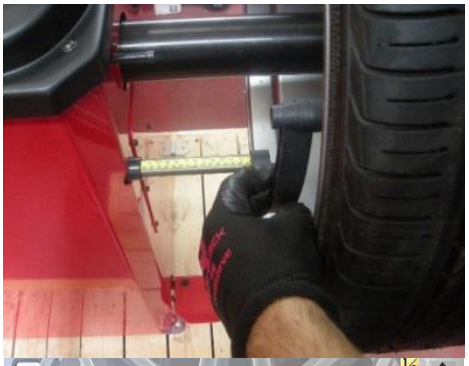
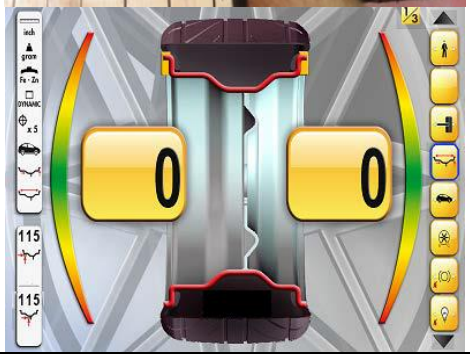
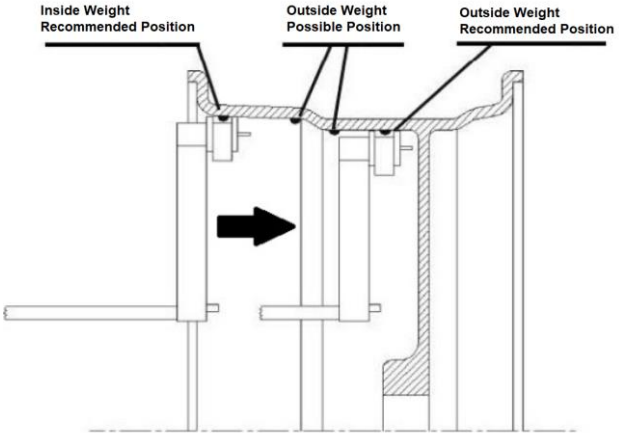
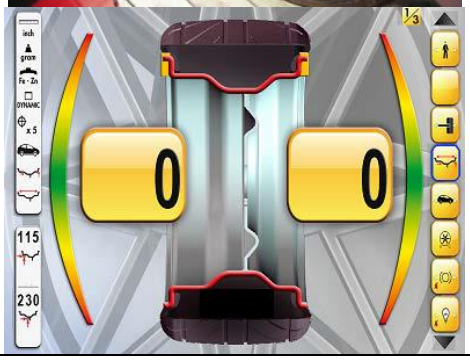
Phase	Description	
010	Fit the wheel on the shaft and tighten with the ring nut.	
020	Extract the distance/diameter sensor and place it on the rim as shown here. When the distance/diameter sensor come back in rest position it is automatically activated the STANDARD program  . 	
030	Wait to hear the long acquisition beep and then set the sensor back to the rest position. During acquisition the distance and diameter values are displayed on the wheel dimension data band.	
040	Activate the STANDARD program by selecting the icon  (by default at power on) which will be outlined in blue. Press  on the keyboard  to confirm.	

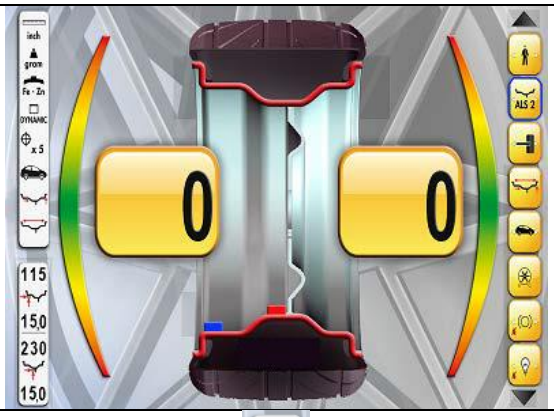
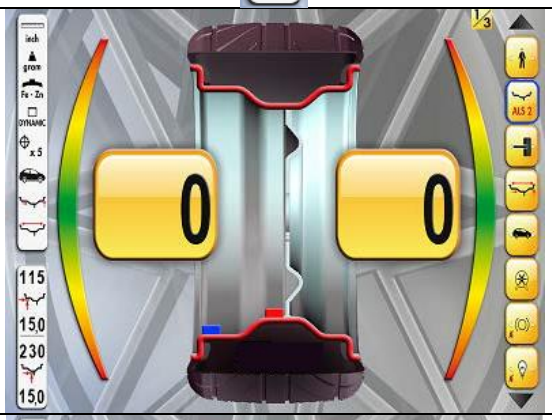
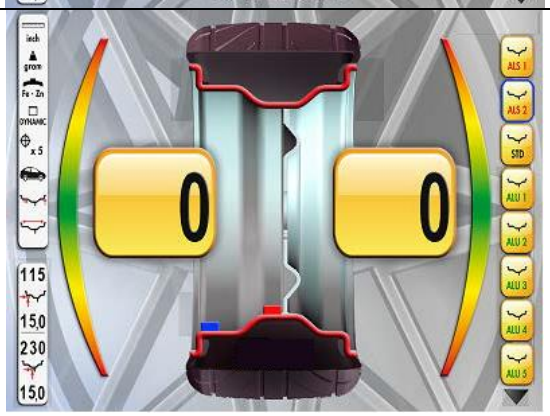
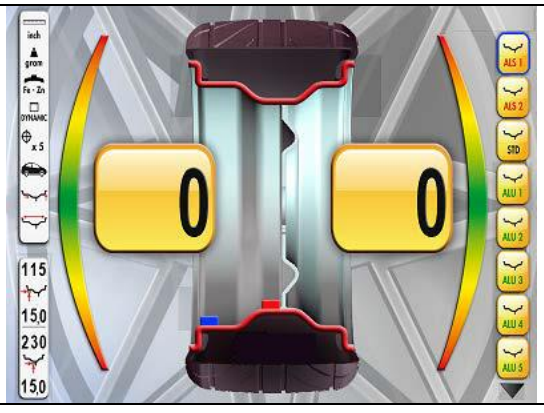
050	Press [P1] or [P3]  on the keyboard  to select the icon relative to the required program which will be outlined in blue.	
060	Press  on the keyboard  to confirm and to activate the required balancing program.	
070	Based on the selected Program Type, will be displayed the Program Type status icon and the position of the imbalance weights.	
080	Lower the wheel guard to run the balancing launch.	

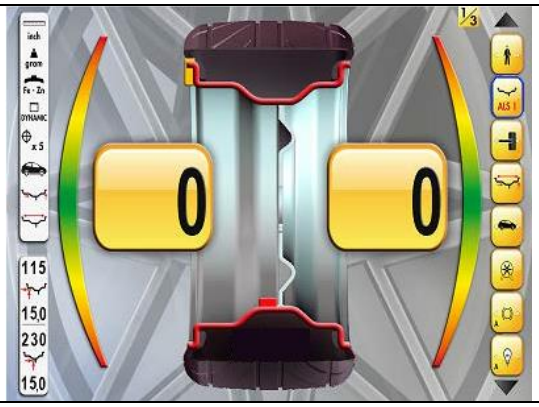
Please notice: the SONAR device only works with the STD program for steel wheels. In order to have a new width reading, it is necessary to take again the
distance/diameter value before lowering the carter.

17.3.2 Automatic acquisition of the wheel dimensions for the ALS1, ALS2 program types

To automatically enter the dimensions of the wheel in the ALS1 and ALS2 program types proceed as described below:

Phase	Description	
010	Fit the wheel on the shaft and tighten with the ring nut.	
020	Extract the Distance/Diameter sensor and place it on the plane chosen as the internal plane. Wait to hear the short acquisition beep. 	ALS2 program automatic activation: Automatic acquisition of the internal plane distance and diameter.  
030	Keep on sliding the Distance/Diameter sensor and place it on the plane chosen as the external plane. 	ALS2 program automatic activation: Automatic acquisition of the external plane distance and diameter  

040	Wait to hear the long acquisition beep and then set the sensor back to the rest position. The machine automatically starts the ALS2 program.	
050	The wheel dimensions have been acquired and the values can be displayed on the wheel dimensions data band.	
060	ALS1 PROGRAM ACTIVATION Check that the required program icon is selected;  then press  on the keyboard to confirm.	
070	 Press [P1] or [P3] on the keyboard  to select the icon relative to the required program  which will be outlined in blue.	
080	  Press on the keyboard to confirm and to activate the required balancing program.	

090	Based on the selected Program Type, will be displayed the Program Type status icon and the position of the imbalance weights.	

17.4 Use of the special program types for ALS1 aluminum wheels

The machine has two special Program Types for aluminum wheels called ALS1.
These two programs are different from standard Program Type for aluminum wheels (ALU1 up to ALU5) because the user is allowed to select the position where to apply the weights. This allows balancing aluminum wheels having particular shapes, difficult to perform with standard program where the weight are applied in precise positions. The difference between ALS1 and ALS2 program is that in ALS1 Program Type the user could select freely the outer balancing positions (inner position) instead in ALS2 Program Type the user could select freely both of balancing positions.

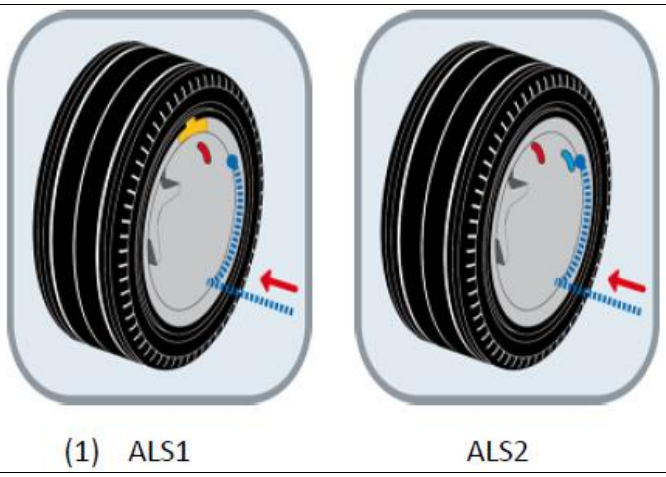
The ALS1 or ALS2 program types use only the Distance/Diameter sensor to acquire and search for the balancing planes chosen by the user. The width sensor is not used.
The use of the ALS1 program types is divided into three parts:

- Guided acquisition of balancing planes (See paragraph 17.3.2).
- Balancing spin.
- Search of the balancing planes for weight application.

17.4.1 Balancing spin

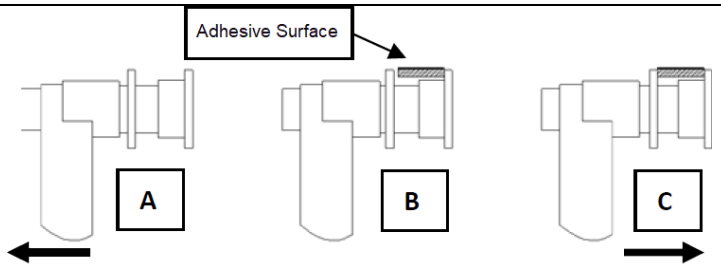
To launch balancing, proceed as described below:

Phase	Description	
010	Lower the wheel guard to run the balancing launch. Once the spin cycle is completed, the imbalance values calculated, according to the balancing planes chosen, will be displayed.	

020	In addition, the machine automatically sets ALS1 mode and searches for balancing planes. In ALS 1 mode the weight must be applied at 12 o'clock (see pic. 1).	

17.4.1 Search of the balancing planes with distance/diameter sensor gauge

The purpose of the balancing planes research is to find the balancing planes which were previously selected by the operator in order to apply the balancing weights. Proceed as described below:

Phase	Description	
010	Apply the weight shown on the left display (internal position) on top of the Distance/Diameter sensor gauge as shown here.	
020	Manually rotate the wheel until all the internal imbalance position leds light up (see figure here). Block the wheel in this position with the help of the pedal brake (if installed) or the electromagnetic brake.	
030	Slowly extract the sensor until you hear the continuous beep indicating that the internal balancing plane has been reached. The blue band represents the application point of the internal weight.	

040	Block the Distance/Diameter sensor at this distance, then, rotate it until the adhesive weight sticks on the rim. The sensor contact point will be a midway position between 12 o'clock and 6 o'clock, depending on the rim diameter.	
050	Release the wheel and turn it by hand until all of the external imbalance position leds light up. Slowly extract the sensor until you hear the continuous beep indicating that the external balancing plane has been reached. The red band represents the application point of the external weight.	
060	Block the Distance/Diameter sensor at this distance, then, rotate it until the adhesive weight sticks on the rim. The sensor contact point will be a midway position between 12 o'clock and 6 o'clock, depending on the rim diameter.	
070	Lower the wheel guard to run the balancing launch. At the end of the launch, the imbalance data will be displayed.	

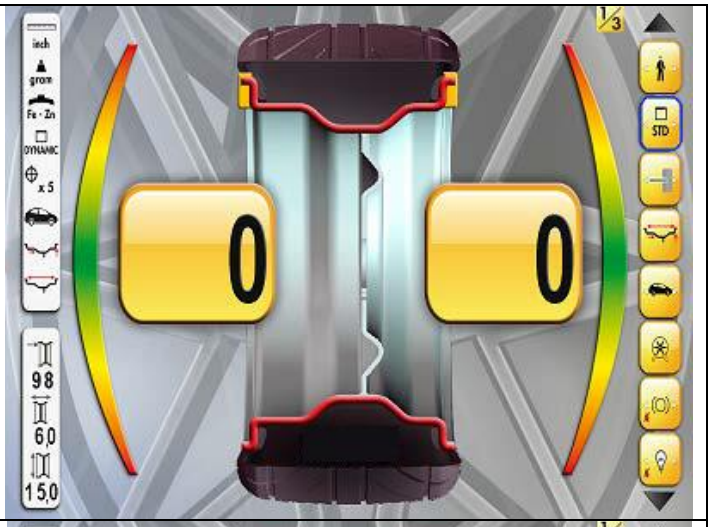
If you have to balance an identical wheel, it is possible to skip the data acquisition of the balancing planes and perform immediately with the balancing spin and then with the search for balancing planes. The balancing planes used for the calculation will be the same as stored before by the machine.

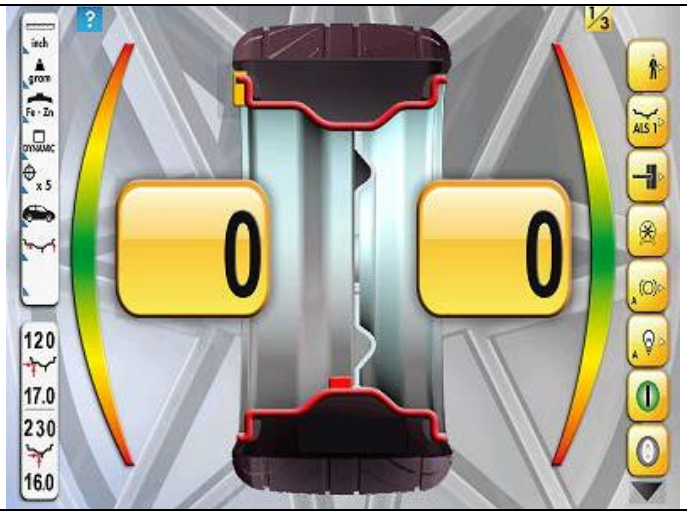
NOTE: if the machine has been set to display the Static imbalance, the single weight will always be applied at 6 o'clock on each point of the rim plane. Accordingly, the guided Search phase of the balancing planes is not carried out.

17.5 Use of the special Program Types for ALS2 and ALS1 aluminum wheels with laser

Proceed as described below:

Phase	Description	
010	Fit the wheel on the shaft and tighten with the ring nut.	

020	Activate the STANDARD program by acquiring the wheel dimensions as described in chapter 17.3.2.	
030	Lower the wheel guard to run the balancing launch. At the end of the launch the imbalance data calculated based on the balancing planes will be displayed, and the LASER function will be activated in automatic.	
040	The laser pointer will identify the weight application positions on both internal and external (for ALS2) or only external (for ALS1) imbalance points. **The weights must always be applied at 6 o'clock.**	

050	Lower the wheel guard to perform a balancing spin. At the end of the spin the unbalance data will be displayed. The laser line indicates the position where to apply the external weight at 6 o'clock while the internal weight must be applied at 12 o'clock. The weights must be applied at 6 o'clock (on the laser line) external side, and at 12 o'clock internal side. To activate ALS1 program see page 45, paragraph 60.	

18 Optimisation

The optimization program is used to minimize 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 access the OPTIMIZATION program, proceed as described below:

Phase	Description	
010	Lower the wheel guard: the machine will run a launch.	
020	Press [P1] or [P3]  on keyboard  and select icon relative to the program to be used.	
030	Activate the OPTIMIZATION program by selecting  (which will be outlined in blue) and confirm by pressing [P6]  on the keyboard.	
040	If the wheel's static imbalance is less than 12 grams, the ERR 055 error message will appear and it will	

	automatically exit the OPTIMIZATION program. If, on the other hand the wheel's static imbalance is greater than 12 grams, the machine will start the OPTMIZATION program.	
050	Position the valve at 12 o'clock, make a mark on the tyre where the valve is and press [P6]  on the keyboard.	
060	Remove the wheel from the shaft, remove the tyre bead, rotate it so that the mark is at 180° with respect to the valve. Re-install the wheel on the shaft, and erase the mark made previously. Lower the wheel guard: the machine will run a launch.	
070	At the end of the launch, place the valve at 12 o'clock and press [P6] on the keyboard to continue. In this case the message seen in figure for the next phase will appear.	

080	Rotate the wheel until all position arrow LEDs light up and then mark the 12 o'clock position and press key [P6]  on the keyboard.	
090	Remove the wheel from the balancing machine, remove the bead from the tyre and rotate it until the valve matches the mark on the tyre. Optimization is finished: exit the optimization menu by pressing [P5] 	
100	Remount the wheel on the balancing machine and balance it with the normal procedure.	

NOTE: it is possible to exit the optimization procedure at any time by repeatedly pressing [P5] 

19 Hidden Weight Program

This program divides the external weight "W" in two weights W1 and W2 (smaller than the initial external weight W) located in any two positions selected by the operator.
The two weights W1 and W2 must form a maximum angle of 120° including the external weight W. 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 used to divide the static weight into two separate weights (especially useful with wheels for motorbikes).

NOTE: the screen relative to phase 050 indicates the position of the external weight at the 12 o'clock position but this is valid only for certain Program Types. Table T17.2 shows the actual position of the external imbalance based on the Program Type and on the enabling state of Distance/Diameter sensor.

19.1 Hidden Weights Program with distance/diameter sensor gauge (without LASER)
To access the HIDDEN WEIGHTS program, proceed as described below:

Phase	Description	
010	Apply the internal weight, stated on the left display, on the rim.	
020	Turn the wheel by hand until all of the external imbalance search LEDs light up.	
030	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	

040	Activate the HIDDEN WEIGHTS program by selecting  (which will be outlined in blue and confirm by pressing [P6]  on the keyboard. If the wheel is balanced on the external side, the machine will display error code ERR 050 to signal that the operation is not allowed.	
050	Manually rotate the wheel anticlockwise and position the sensor behind the first selected spoke. Confirm by pressing [P6]  on the keyboard.	
060	Manually rotate the wheel anticlockwise passing the imbalance point and position the sensor behind the second selected spoke. Confirm by pressing [P6]  on the keyboard.	

070	Using the sensor, apply the weight behind the first selected spoke W1.	
080	Using the sensor, apply the weight behind the second selected spoke W2.	
090	The procedure of the Hidden Weights Program is finished: press [P5]  to exit and launch the balancing test.	

19.2 Hidden Weights Program (machines WITH LASER)

To access the HIDDEN WEIGHTS program, proceed as described below:

Phase	Description	
010	Apply the internal weight, stated on the left display, on the rim.	
020	Turn the wheel by hand until all of the external imbalance search LEDs light up at 6 o'clock.	

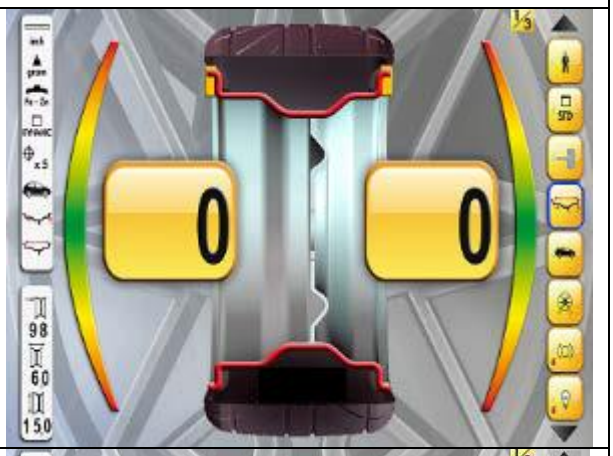
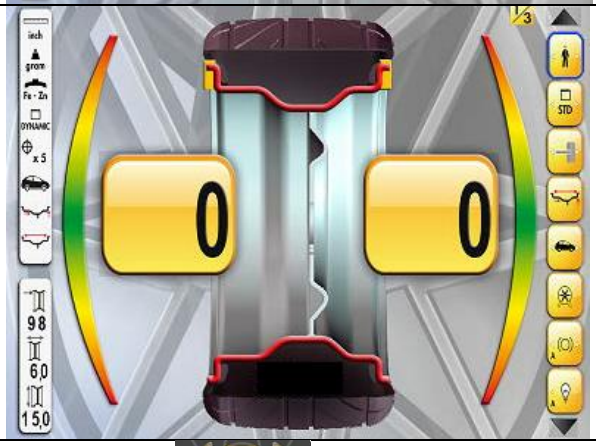
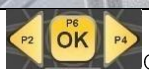
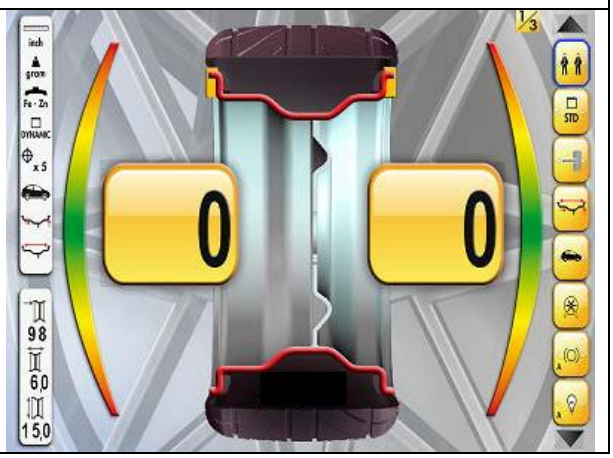
030	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
040	Activate the HIDDEN WEIGHTS program by selecting  (which will be outlined in blue and confirm by pressing [P6]  on the keyboard. If the wheel is balanced on the external side, the machine will display error code ERR 050 to signal that the operation is not allowed.	
050	Manually rotate the wheel anticlockwise and with the sensor behind the first selected spoke at 6 o'clock. Confirm by pressing [P6]  on the keyboard.	

060	Manually rotate the wheel anticlockwise passing the imbalance point and with the sensor behind the second selected spoke at 6 o'clock. Confirm by pressing [P6]  on the keyboard.	
070	Apply the weight behind the first selected spoke W1 at 6 o' clock.	
080	Apply the weight behind the second selected spoke W2 at 6 o' clock.	
090	The procedure of the Hidden Weights Program is finished: press [P5]  to exit and launch the balancing test.	

20 Second Operator

The machine has two separate memories allowing two operators to work simultaneously with different settings. This feature can make operations at the workshop quicker because when, for example, an operator is busy with removing or remounting a tyre, the other operator can use the machine to perform balancing operations and vice versa. In this manual, the two operators are defined as operator 1 and operator 2. When operator 1 has completed his tasks on the machine or is involved in other activities, operator 2 can work with the machine using the settings for the wheel type he is working on without altering the settings entered by operator.

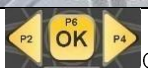
1. When the machine is switched on, the two memories are set with the same values by default.
To select the TWO OPERATORS program, proceed as described below:

Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the program for nr. 1 OPERATOR by selecting  (by default at power on) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on the keyboard 	
040	Activate the program for nr. 2 OPERATORS by selecting 	

21 Utility Programs
Utility Programs are available only in NORMAL mode.
21.1 Selection 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 unit of weight as indicated in table T21.1.

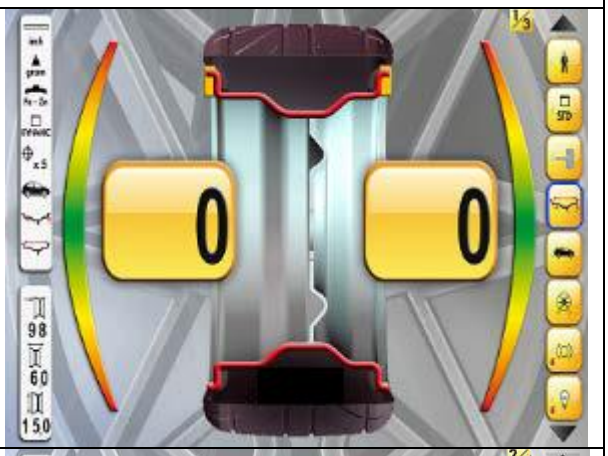
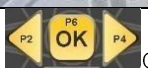
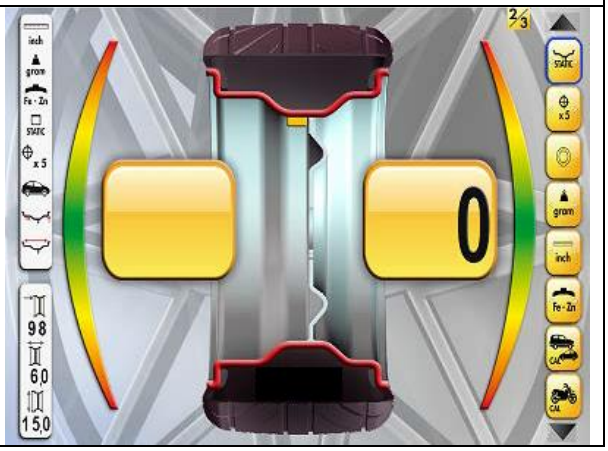
Set resolution	Imbalance unit of measurement	Display resolution	Notes
	Grams	1 Gram	
X1 (high)	Ounces	0.1 Ounce	
	Grams	5 Gram	
X5 (low)	Ounces	0.25 Ounce	The X5 resolution is set by default at start-up

To change the imbalance RESOLUTION, proceed as described below:

Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the WORK RESOLUTION program by selecting  (by default at power on) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on the keyboard 	
040	Activate the “X1” RESOLUTION program by selecting  . Ensure that the status icon  is activated.	

21.2 Selection of the static imbalance display

To view the STATIC IMBALANCE proceed as described below:

Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the DYNAMIC program by selecting  (by default at power on) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on the keyboard 	
040	Activate the STATIC program by selecting  . Ensure that the status icon  is activated.	

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 4.5 inches, the machine will automatically set the static imbalance display.

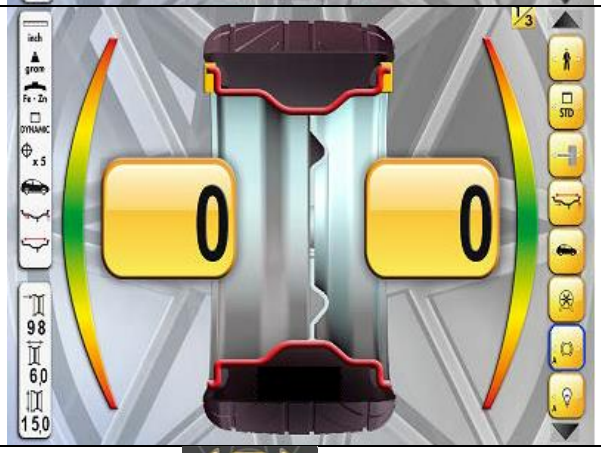
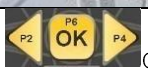
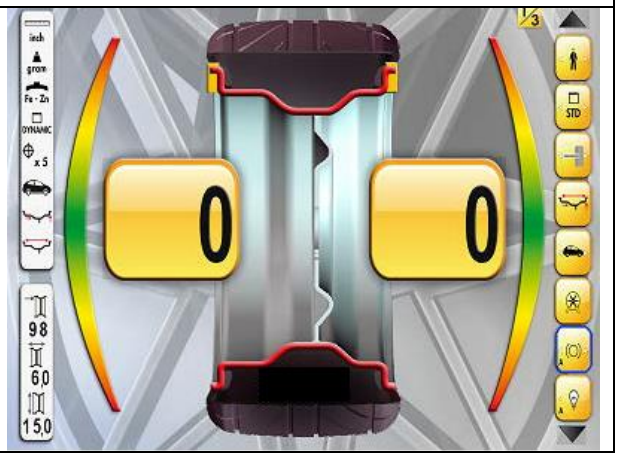
21.3 Electromagnetic clamping brake (only on FDR1080)

The electromagnetic clamping brake is useful to block the wheel in any position defined by the user and to simplify some operations such as the application or removal of balancing weights.

The electromagnetic clamping brake is also used in the automatic or manual stopping of the wheel on imbalance positions described in chapter 21.5 SWI Wheel stop procedure on the positions of imbalance.

To activate and/or deactivate the ELECTROMAGNETIC CLAMPING BRAKE, proceed as described below:

Phase	Description	

010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the BRAKE ENABLING program by selecting  (by default at power on only for FDR1080) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on the keyboard 	
040	Activate the BRAKE DISABLING program by selecting  .	

The electromagnetic clamping brake is deactivated automatically in the following cases:

- Every time a balancing launch is run.
- Every time a SWI procedure is performed (stop of the wheel on the imbalance position) at low speed.
- After one minute of continuous activation (to avoid overheating of the brake itself).

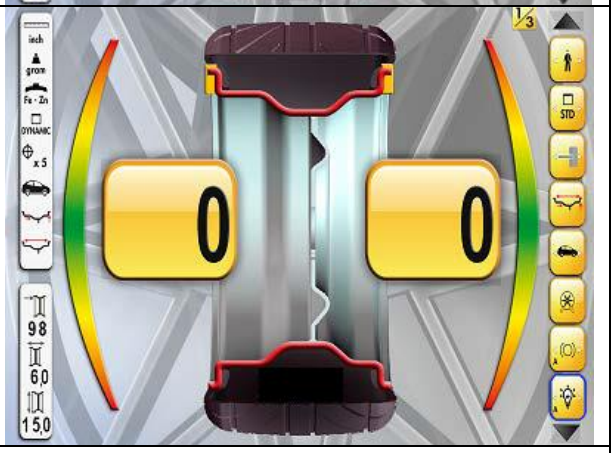
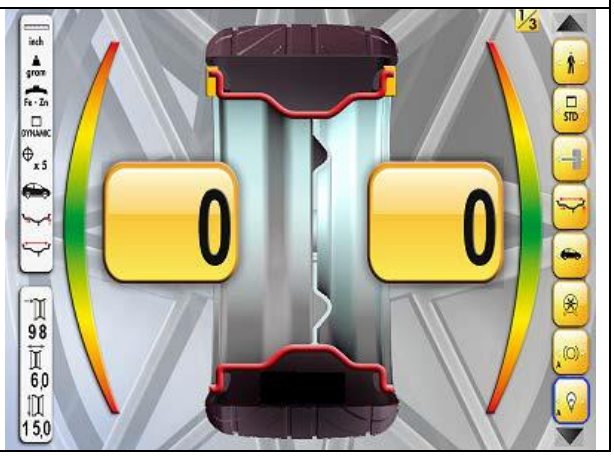
The electromagnetic clamping brake can be used manually only in NORMAL mode. It cannot be used in the SERVICE mode.

21.4 Illuminator (if fitted)

The illuminator is particularly useful as it lights up the inner part of the rim.

To activate and/or deactivate the ILLUMINATOR, proceed as described below:

Phase	Description	

010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the ILLUMINATOR ENABLING program by selecting  (by default at power on only for FDR1080) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on the keyboard 	
040	Activate the ILLUMINATOR DISABLING program by selecting 	

The illuminator is also automatically manage 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.

21.5 SWI wheel stop procedure on the positions of imbalance

Machines equipped with the electromagnetic clamping brake are capable of automatically stopping the wheel at the first imbalance angular position that is reached during rotation. This allows the operator to have the wheel in position ready for the application of the balancing weight thus increasing work and productivity speeds.

The procedure is referred to with the short English acronym SWI (Stop the Wheel on Imbalance). Within this manual, this acronym will be used to refer to the wheel stop procedure on the positions of imbalance. The SWI procedure has three different operating modes indicated in table T21.2.

Table T21.2: Types of SWI procedures available

SWI Mode	When it is or can be run	Who can run	Notes
Automatic	At every launch	Machine	This is performed only if there is at least one imbalance value on the wheel. Otherwise, conventional braking will occur.
Low Speed	At the end of the launch, when the wheel is stationary and the wheel guard is raised.	Operator	The procedure is started by pressing [P8] Start  : the wheel starts at low speed until it reaches the first imbalance angular position.
Manual	At the end of the launch by manually rotating the wheel with wheel guard raised.	Operator	At each passage of the wheel in an angular position of imbalance, the electromagnetic clamping brake will be enabled for 30 seconds.

The three SWI modes have functions that are slightly different one from the other although, in all modes, the ultimate goal is to block the wheel at an angular position of imbalance and make operator's tasks quicker.

21.5.1 Automatic SWI procedure

During the automatic SWI procedure, the machine will measure rotational speed during braking at completion of the launch and, when this reaches a predetermined value, it will release the brake allowing the wheel to spin freely by inertia. When the speed is low enough, the machine will wait until the wheel passes through one of the angular positions of imbalance, therefore, it will enable the electromagnetic clamping brake.

Note: for operator safety purposes, the SWI procedure will not be run when the MOTO Wheel Type is enabled.

21.5.2 SWI procedure at low speed

In the low speed SWI procedure, the wheel has already run the launch and is stationary. If the operator presses [P8] key Start with the wheel guard raised, the machine will apply slight acceleration to the wheel and then let it spin by inertia. When the speed
is low enough, the machine will wait until the wheel passes through one of the angular positions of imbalance, therefore, it will enable the electromagnetic clamping brake.
Note: for operator safety purposes, the SWI procedure will not be run when the MOTO Wheel Type is enabled.

21.5.3 Manual SWI procedure

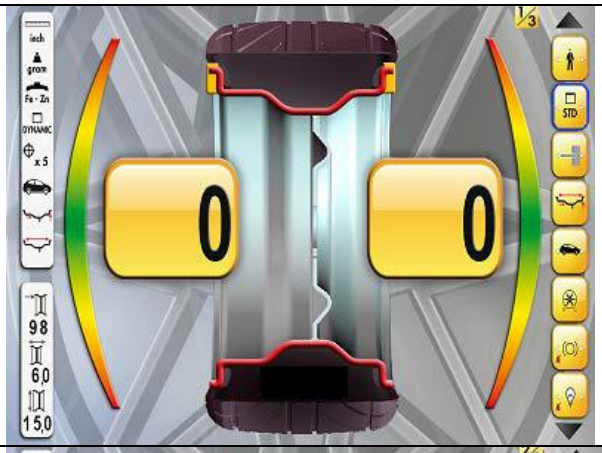
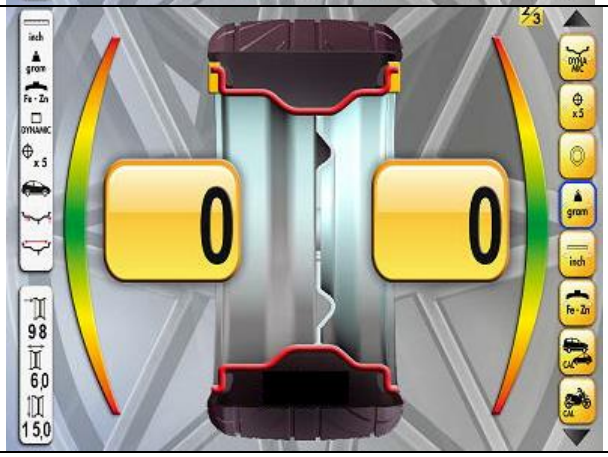
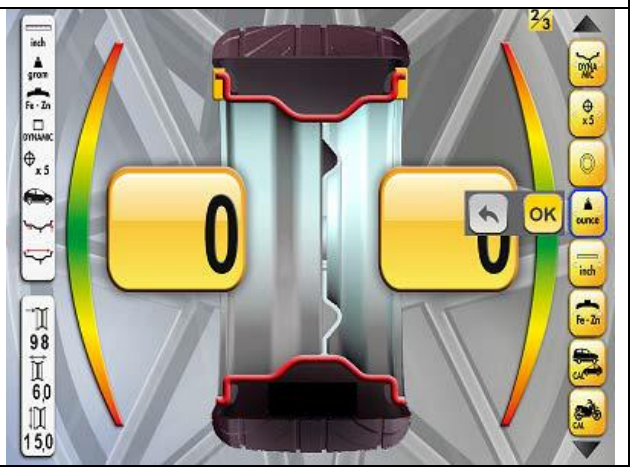
In this mode, the SWI procedure is activated by manual rotation of the wheel if the wheel guard is raised. When the wheel passes through an angular position of imbalance, the machine will enable the electromagnetic clamping brake.
Angular positioning accuracy depends on many factors. The main ones being: wheel dimensions and weight, electromagnetic brake adjustment, temperature, belt tension. In all cases, consider the following:

- If the electromagnetic clamping brake is disabled, the SWI procedure will not be run in any of three modes;
- If rotation speed decreases abruptly due to wheel inertia during the automatic SWI procedure or the low speed SWI (e.g. due to excessive friction with rotating mechanical parts) the machine applies a little extra acceleration to the wheel itself in order to reach the first angular position of imbalance. If, despite this, the wheel does not reach this position, the SWI procedure is aborted after 5 seconds and the machine displays the error code ERR 042;
- When using the manual SWI procedure, precision also depends on the speed that the operator turns the wheel at: excessively high or low speeds reduce precision.

21.6 Select grams/ounces

This button allows you to display and/or change the unit of weight currently selected. The units available are grams (GRAM) and ounces (OUNCE).
To change the UNIT OF MEASURE OF THE WEIGHT, proceed as described below:

Phase	Description	

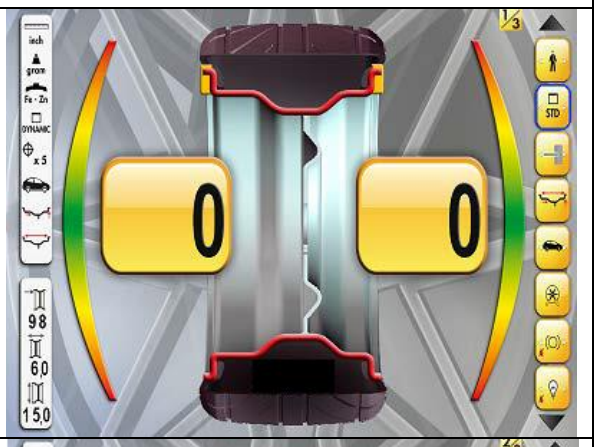
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the work program in GRAMS by selecting  (by default at power on) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on the keyboard 	
040	Confirm activation of the OUNCES work program by pressing [P6]  on the keyboard	

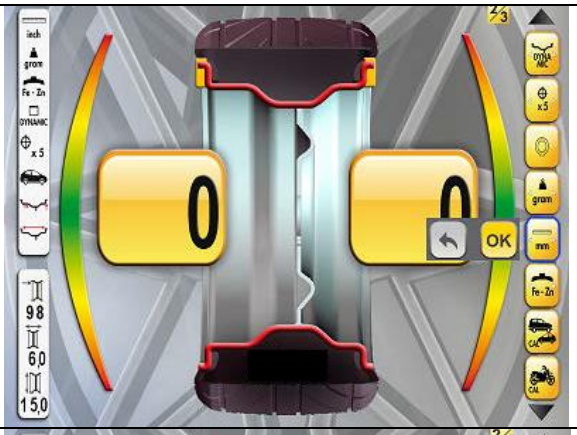
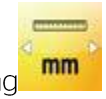
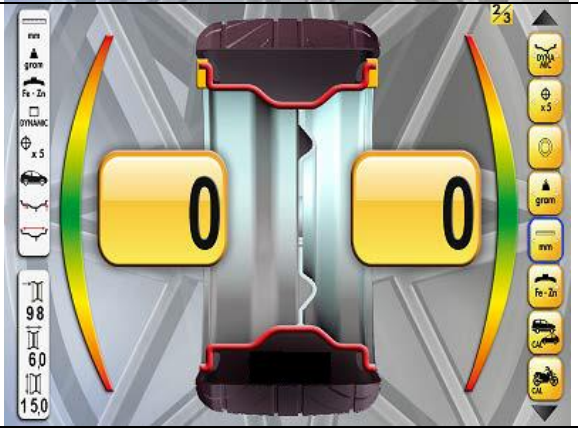
050	Activate the work program in OUNCES by selecting  , ensure that status icon  is activated.	

21.7 Select inches/millimeters

This button allows you to display and/or change the wheel's unit of dimension currently selected. The units available are inches (INCHES) and millimeters (MILLIM).

To change the UNIT OF MEASURE OF THE WHEEL DIMENSIONS, proceed as described below:

Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	
020	Activate the work program in INCHES by selecting  (by default at power on) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on the keyboard 	

040	Confirm activation of the MILLIMETERS work program by pressing [P6]  on the keyboard 	
050	Activate the work program in MILLIMETERS by selecting  , ensure that status icon  is activated.	

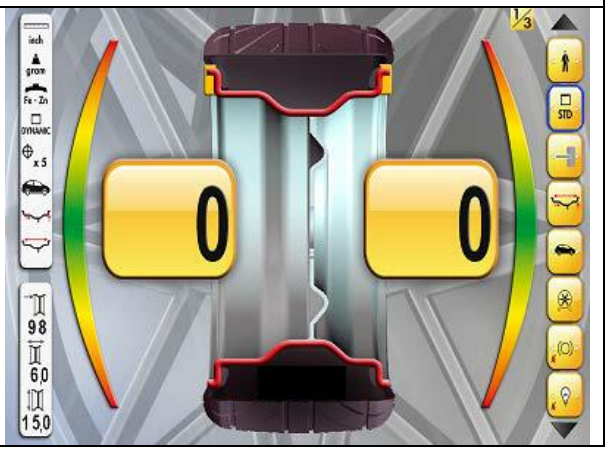
21.8 Select weight material in Fe/Zn or Pb

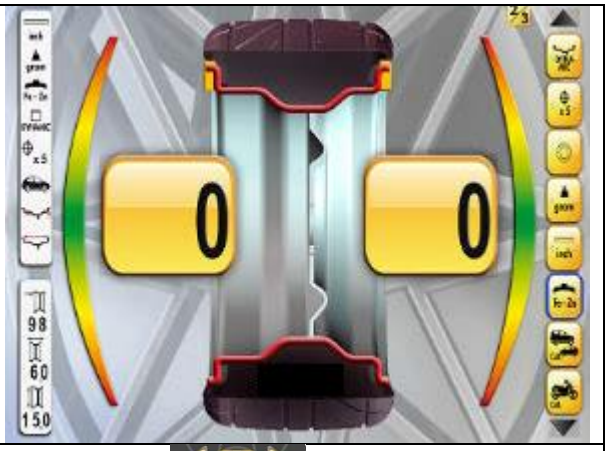
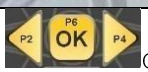
This button allows you to select the balancing weight material. The options available are listed in table T21.3. The selection of the material type slightly changes the balancing results because the weights in Iron/Zinc are lighter than those in Lead and therefore are larger. The machine takes account of these differences when calculating the imbalance.

Table T21.3: Balancing weights materials

Option	Type of balancing weight material	Notes
Fe	Iron or Zinc	This material has been set by default.
Pb	Lead	In some countries (such as those of the European Community), Lead weights are prohibited by law.

To change the MATERIAL OF THE BALANCING WEIGHTS, proceed as described below:

Phase	Description	
010	Press [P1] or [P3]  on keyboard  and select the icon relative to the program to be used.	

020	Activate the work program with WEIGHTS in IRON/ZINC by selecting  (by default at power on) which will turn blue.	
030	Scroll through the list of available programs by pressing [P2] or [P4]  on the keyboard 	
040	Confirm activation of the WEIGHTS in LEAD work program by pressing [P6]  on the keyboard 	
050	Activate the work program in WEIGHTS in LEAD by selecting  , ensure that status icon  is activated.	

22 Error Codes & Solutions

The Error signal is always accompanied by a triple beep indicating that the machine cannot run the command given by the operator, or, during operation, conditions were encountered that prevent the action in progress from continuing. The machine reports error conditions by displaying an outline of the description of the cause of the error. The list of error codes and description outlines is provided in table T22.1.

Table T22.1: Error codes

INTERNAL ERRORS		
Code	Description	Notes
000 to 020	000 to 020 Machine parameters internal error.	Contact technical support.
099	CPU internal error.	Turn the machine off and then on again. If the error persists, contact technical support.
G00	Communication failure between graphics card and CPU.	Turn the machine off and then on again. If the error persists, contact technical support.
SENSOR ERRORS		
Code	Description	Notes
016	Distance sensor is not in rest position at start-up of the machine or when [P8] Start is pressed.	Place the sensor back in its rest position: the error should disappear. If the error persists, contact technical support. NOTE: if key [P5] 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.
017	Width sensor is not in rest position at start-up of the machine or when Start key [P8] is pressed.	Place the sensor back in its rest position: the error should disappear. If the error persists, contact technical support. NOTE: if key [P5] 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.
046	The Diameter sensor is enabled but disconnected.	Press key [P5]: the machine acquisition system is temporarily disabled and operation can be continued. The disabled status will last until the machine has been turned off.
047	The Width sensor is enabled but disconnected.	Press key [P5]: the machine acquisition system is temporarily disabled and operation can be continued. The disabled status will last until the machine has been turned off.
CALIBRATION ERRORS		
Code	Description	Notes

021 - 030 - 031	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.
022 to 024	Error during calibration.	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	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.
034	The MOTO Wheel Type: it is not possible to use a Program Type other than ALU1.	Other Program Types cannot be selected.
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.
GENERIC ERRORS		
Code	Description	Notes
039	The wheel guard is open: it is not possible to perform the requested action.	
051 - 052	Hidden Weights program: the selected point is too far from the external imbalance position. Hidden Weights program: the external imbalance position is not between the selected W1 and W2 points.	The point must be included up to 120° from the external imbalance position. See chapter 18. Choose W1 and W2 points so that they include the external imbalance position. See chapter 18.
055	The static imbalance of the wheel is too low: it is not possible to use the Optimization program.	

NOTE: For the error codes that are not reported in table T22.1, CONTACT TECHNICAL SERVICE.

(1) The error code can be exited in the following ways:

OPERATOR CONFIRMATION - The machine exits from the error code display when the operator presses any key.
OPERATOR ACTION - The machine exits from the error code display when the operator performs an action linked to said error code (for example, ERR 016 brings the Distance sensor back to the rest position).
ONCE - The machine displays the error code and its brief description once, the nit returns to the previous status.
PERMANENT - The machine permanently displays this error code until its turn-off therefore the error code cannot be exited.

22.1.1 Replacement of the fuse

10	Turn the machine off and disconnect the power supply cable from the connector.	 
20	Remove the fuse holder.	
30	Replace the damaged fuse with a similar one (same amperage).	
40	Set back the machine working condition following backwards the steps described above.	

23 Warning Codes

Table T23.1: Warning codes

Warning Code	Description	Warning Displayed	Description	Notes
000			Reserved	
001	DO OPT	Once	Excessive wheel imbalance: use of Optimization program is recommended.	
002 to 010			Reserved	

23.1 Acoustic signals

The machine emits different acoustic signals based on its status. The acoustic signals are listed in table T23.2.

Table T23.2: Acoustic signals

Signal	Meaning	Notes
Short Beep	Selecting a program or a function	
Long Beep	Acquisition	Acquisition of a value. Acquisition of the wheel dimensions in the STD, ALU1, Program Types.
Long Beep + 1 Short Beep		Acquisition of internal plane in ALS1 or ALS2 Program Types.
Long beep + 2 Short beep		Acquisition of external plane in ALS1 or ALS2 Program Types.
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 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	Adjustmen	Signal used in some service programs 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).

23.2 Special visual signals

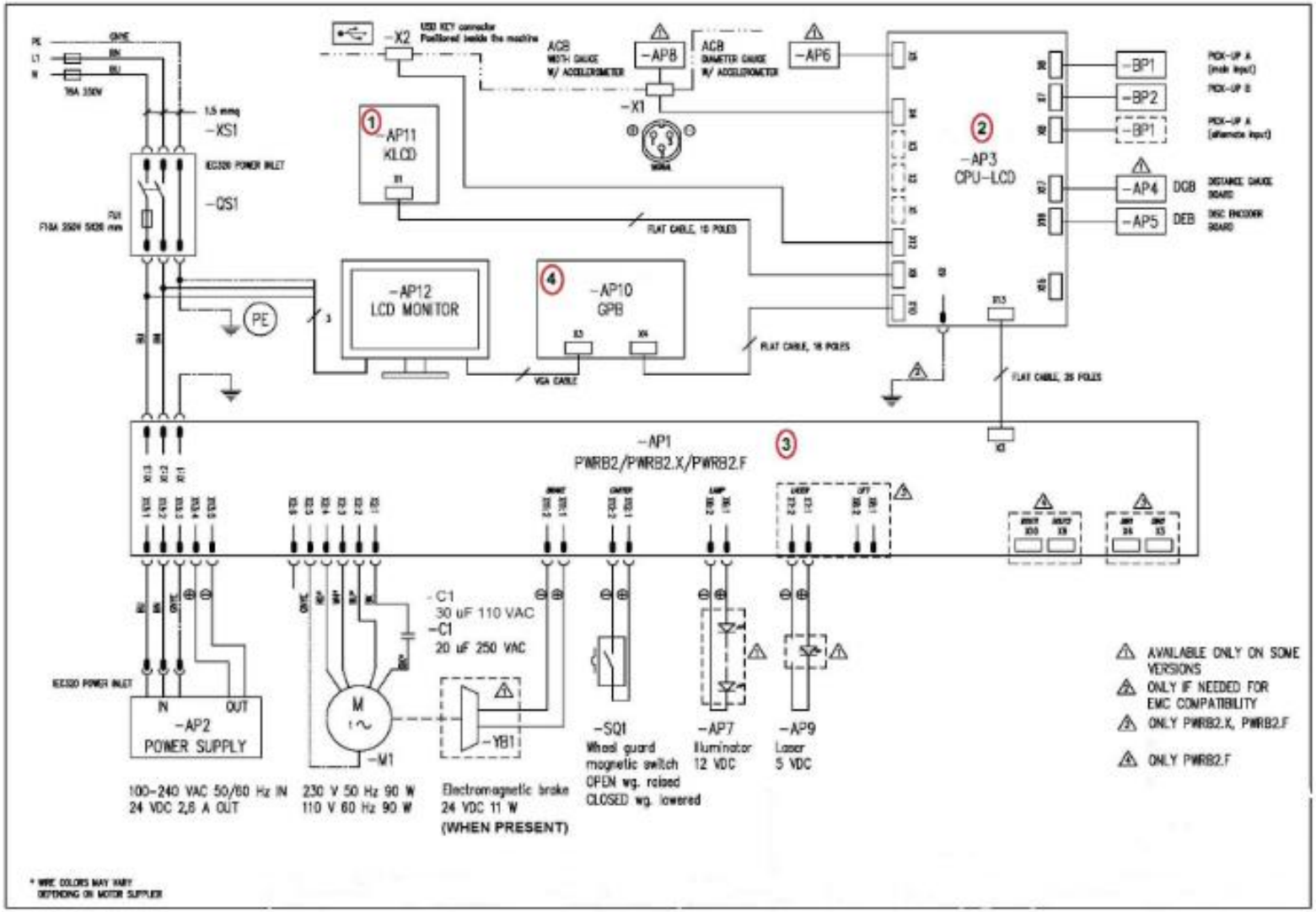
The machine gives special visual signals in certain cases. The special visual signals are listed in table T23.3.

Table T23.3: Special visual signals

Signal	Meaning	Notes
Three dots lit on one orboth 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 Program 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.

24 Diagnostics & Efficiency of Accessories

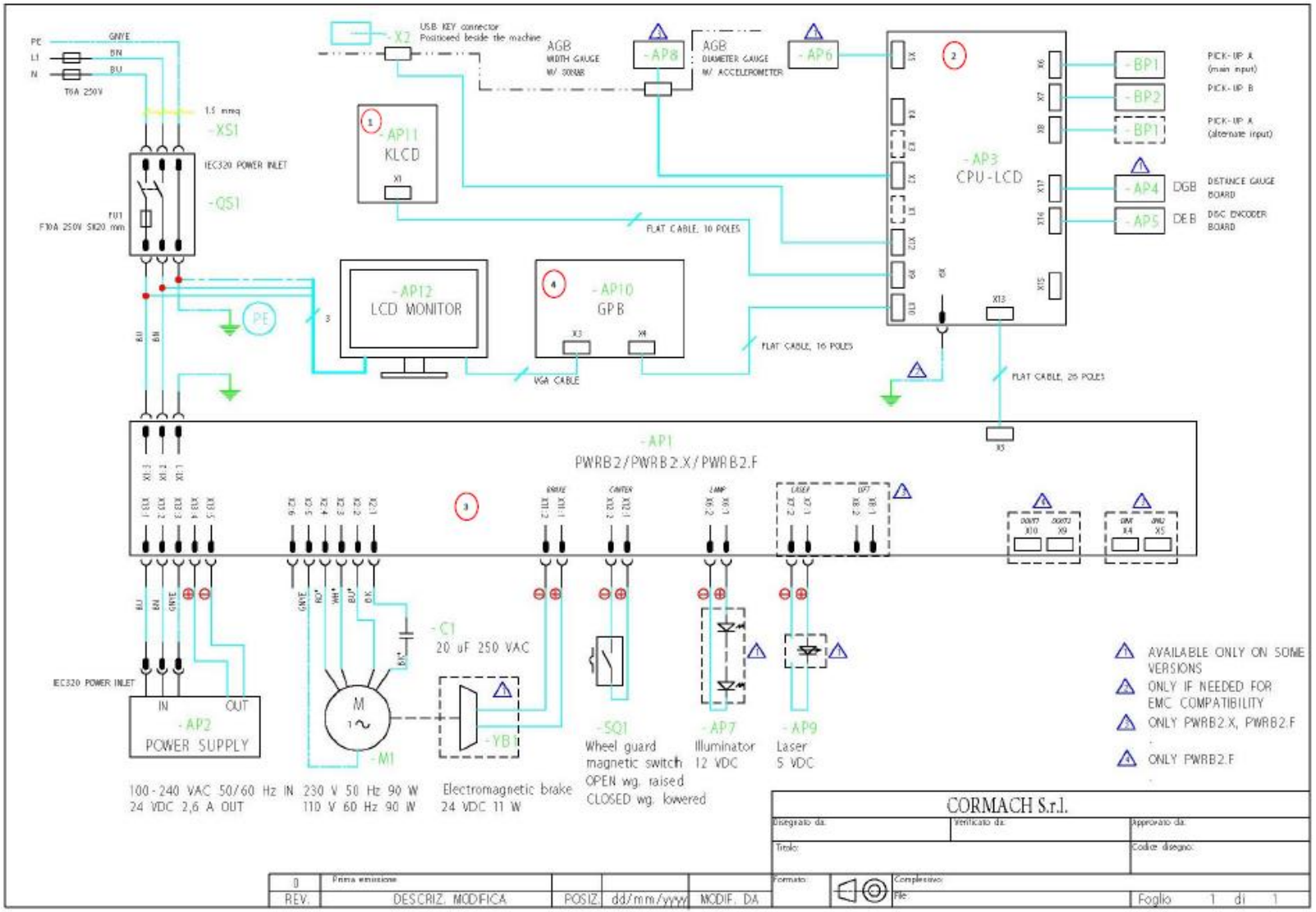
In some cases, by refitting the wheel on the wheel balancer, the machine could show some more unbalance which is for sure due to the not equal fitting of the tyre on the machine shaft as originally.
Some little differences in weight within 15gr (matter of fact it is always half the shown value: i.e. 10 shown gr = 5 unbalance gr) could be considering normal as for the wheels fixed on the cone. And it also depends on the tolerance of the counterweights.
Whether remounting a zero balanced wheel some unbalance value over 10 gr are displayed, it is necessary to check the conditions of the accessories and replace on them the parts which are no longer in perfect conditions due to bending, hurts, use, unbalance of the flanges.
The accessories check enables to control whether their use had modified the mechanical clearance.
Kindly do not forget that when using the centering cone, the repeated results could be similar only if the central hole is not ovalized and consequently not centered. Should this is the situation, better results could be obtained centering by the fixing holes (see the flange below).



1 – KLCD board (Keyboard)
2 – CPU-LCD board
3 – PWRB power supply board
4 – GPB board (Graphic board)

1 – KLCD board (Keyboard)
2 – CPU-LCD board

3 – PWRB power supply board
4 – GPB board (Graphic board)



	Dry materials	Flammable liquids	Electrical equipment
Hydraulic	YES	NO	NO
Foam	YES	YES	NO
Powder	YES*	YES	YES
CO_2	YES*	YES	YES

YES*: Can be used in the absence of more appropriate means or for small fires.

The information in the table above is general and can be used as a rough guide. The responsibility for the use of each type of extinguisher must be obtained from the manufacturer.

Continental Automotive Trading UK Ltd
36 Gravelly Industrial Park,
Birmingham,
B24 8TA
Tel: 0121 725 1234
Email: salesorders@continental-corporation.com
www.continental-aftermarket.com/gb-en

Legal notice

Continental
The Future in Motion