## INDEX

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DESCRIPTION OF THE BALANCING MACHINE</td>
<td>3</td>
</tr>
<tr>
<td>1.1</td>
<td>GENERAL INFORMATION</td>
<td>3</td>
</tr>
<tr>
<td>1.2</td>
<td>TECHNICAL DATA</td>
<td>3</td>
</tr>
<tr>
<td>1.3</td>
<td>WARNINGS</td>
<td>4</td>
</tr>
<tr>
<td>1.4</td>
<td>STANDARD SAFETY DEVICES</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>LIFTING AND INSTALLING</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>POWER SUPPLY</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>FITTING THE WHEEL FIXTURE SHAFT (SEE ATTACHED PROSPECTUS)</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>FITTING THE WHEEL</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>CONTROL PANEL</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>SETTING DIMENSIONS</td>
<td>6</td>
</tr>
<tr>
<td>7.1</td>
<td>USING THE DISTANCE GAUGE EXTENSION</td>
<td>7</td>
</tr>
<tr>
<td>7.2</td>
<td>OPTIONS</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>WHEEL BALANCING</td>
<td>8</td>
</tr>
<tr>
<td>8.1</td>
<td>MEASURING UNBALANCE</td>
<td>8</td>
</tr>
<tr>
<td>8.2</td>
<td>CORRECTING THE UNBALANCE</td>
<td>8</td>
</tr>
<tr>
<td>8.3</td>
<td>RECALCULATING UNBALANCE VALUES</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>OPTIMISING THE UNBALANCE</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>SELF-CALIBRATION</td>
<td>10</td>
</tr>
<tr>
<td>10.1</td>
<td>BALANCING MACHINE</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>ERRORS</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>ORDINARY MAINTENANCE (NON-SPECIALISED STAFF)</td>
<td>11</td>
</tr>
<tr>
<td>12.1</td>
<td>REPLACING PROTECTION FUSES</td>
<td>11</td>
</tr>
<tr>
<td>13</td>
<td>LIST OF RECOMMENDED SPARE PARTS</td>
<td>12</td>
</tr>
</tbody>
</table>
1 - Description of the balancing machine

1.1 - General information
The new model C22 is designed for balancing motor bike wheels.
It can be used to balance wheels dynamically (i.e. on two unbalance correction planes), a service in increasing demand nowadays because of broader tyres. The balancing speed is very low (about 70 rpm, like in the manual spin models) and the operator is obliged to work with both hands and in a well-defined, safe position during machine use. For this reason, the usual wheel protection guard is considered unnecessary in many countries. The machine can be equipped with a series of tools for balancing both vehicle wheels with a traditional attachment (15mm or 12 mm shaft) and thwre wheels of the various makes with special attachments (BMW, Honda etc.). A manual spin version is also available.

**Particular characteristics:**
- Digital correction position reading on the display.
- Unbalance reading rounded to 5 grammes or to 1 gramme (or 0.25 oz).
- Data are set using keys with the fast, simple incremental system.
- **Optimisation programme:** can optimise the position of the tyre on the wheel rim, providing the best compensation for tyre unbalance with the rim unbalance.
- Self-calibration in just 2 spins, using a random wheel, even one that is unbalanced.

1.2 - Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. wheel weight</td>
<td>30 Kg</td>
</tr>
<tr>
<td>Max. power absorbed</td>
<td>0,5 Kw</td>
</tr>
<tr>
<td>Standard power supply</td>
<td>220/240 V monophase</td>
</tr>
<tr>
<td>Balancing accuracy</td>
<td>1 gr</td>
</tr>
<tr>
<td>Min/max balancing speed</td>
<td>45/200 rpm</td>
</tr>
<tr>
<td>Wheel rim diameter</td>
<td>10&quot; - 24&quot; or 265 - 615 mm</td>
</tr>
<tr>
<td>Wheel rim width</td>
<td>1.5&quot; - 20&quot; or 40 - 510 mm</td>
</tr>
<tr>
<td>Cycle time</td>
<td>7 - 12 sec</td>
</tr>
<tr>
<td>Net weight</td>
<td>60 Kg</td>
</tr>
<tr>
<td>Machine bulk</td>
<td>743 x 600 x h = 975 mm</td>
</tr>
<tr>
<td>Acoustic pressure level during cycle</td>
<td>&lt; 70 dB (A)</td>
</tr>
<tr>
<td>Working environment temperature</td>
<td>0° - 59° C</td>
</tr>
</tbody>
</table>
1.3 - Warnings
- Read the instruction manual carefully before using the balancing machine.
- Keep the manual for future reference.
- Do not remove or modify parts of the machine, as this would stop it functioning correctly. Consult the after salesservice for repairs.
- Do not use strong jets of compressed air to clean the machine.
- Use cleaning spirits to clean the plastic panels and shelves (NEVER USE ANY LIQUIDS CONTAINING SOLVENTS).
- Before you start the balancing cycle, make sure that the wheel is blocked onto the flange correctly.
- The balancing machine operator should not wear clothing with any loose parts; make sure that no unauthorised staff approach the balancing machine during a cycle.
- Make sure that no counterweights or other foreign bodies find their way into the base, as they would stop the balancing machine functioning correctly.
- Under no circumstances should the balancing machine ever be used for any purpose other than those indicated in this manual.

1.4 - Standard safety devices
- Two-handed control to start the balancing spin. During the spin, the operator is obliged to stay in a lateral position, away from the wheel.
- Slow rotation speed.

2 - Lifting and installing
To lift the balancing machine, leverage should only be applied to the three support points available on the base. Under no circumstances should any force ever be applied to other points, such as the mandrel, the head or the accessories panel.
Ensure that all three of the support points of the balancing machine rest on the floor. The machine does not need to be fixed to the floor in order to function correctly.

3 - Power supply

**WARNING:** Power connections should only be made by specialised staff. The connection to the monophasic mains should be made between live and neutral, never between live and earth. A good earth connection is vital for the machine to function correctly. All responsibility and its guarantee is considered null and void if the power connections are faulty.

Before connecting the machine to the power mains with the cable supplied, check that the voltage is the same as the value shown on the plate applied to the rear of the balancing machine. The scale of the power connection should reflect the electrical power absorbed by the balancing machine (see plate).
- The machine's power supply cable must be fitted with a plug that conforms to standards.
- We recommend that you provide the machine with a power connection of its own, complete with an automatic switch.
- If you connect the power line direct to the general power panel, without using any intermediate plug, we recommend you close the balancing machine's main switch with a padlock, so that its use is restricted to authorised personnel.

4 - Fitting the wheel fixture shaft  (See attached prospectus)

The G22 bike's main advantage is its fixed shaft tool. This means that when the wheel is fitted on the tool, it is free to turn on its own bearings, exactly reproducing the conditions of use when it is fitted on the motor bike.
- Balancing is not affected by inaccuracies in the wheel-flange-shaft coupling typical of traditional rotating shaft balancing machines. This means that you can achieve the best possible accuracy.
- Use the AF12 or AF15 tools with cones and axial blockage rings for wheels with traditional fixture (through-journal).
- Use the rotating AGF tool for wheels with outboard flanged fixture (BMW, Honda). (See specific brochure for correct assembly).
- Push the chosen tool well home into the balancing machine's hollow shaft and block it in position by tightening the screws accessible from the baseplate hole.

**NOTE ON AGF TOOL:** Remove it from the balancer after use to avoid permanent deformation of brush bristles.
5 - Fitting the wheel

The AF12 and AF15 fixed shaft tools enable you to fit wheels with a maximum hole of 35 mm on their own bearings. Do not overtighten the threaded ring, as this would put excessive axial load on the bearings. When you fit the wheel, you will notice that the brush adapts automatically (axially and radially) to the shape of the wheel hub. During balancing operations, the brush will turn together with the wheel and transmit the motion to the balancing machine’s built-in position transducer. If you use the special AGF tool, the rotating movement will be transmitted to the brush by the rotating part of the tool.

6 - Control panel

1. Digital display of the UNBALANCE VALUE on the inner side
2. Digital display of the UNBALANCE VALUE on the outer side
3. Digital display of the UNBALANCE POSITION on the inner side
4. Digital display of the UNBALANCE POSITION on the outer side
5. Displays showing type of correction selected
6. Key for reading unbalance <5 g. (0.3 oz) (self-calibration, selection g/oz, mm/inches)
7. Key for selecting type of correction
8. Key for recalculating, self-calibration and optimisation
9. Keys for calibrating DISTANCE manually
10. Keys for calibrating WIDTH manually
11. Keys for calibrating DIAMETER manually
7 - Setting dimensions

3 : DISTANCE

Determine the distance ‘a’ on the barycentre of the inner correction weight, then set it as shown in Fig. 2.

4 : WIDTH

It is essential that you determine and set accurately the distance ‘b’ between the barycentres of the weights where they will be applied.

5 : DIAMETER

Set the nominal diameter ‘d’ as shown on the tyre.
7.1 - Using the distance gauge extension

The extension increases the range of measurement of the gauge by 6 cm (fig. 6) and allows distance measurement also when the rim is of special shape (fig. 6a).
Proceed as follows:
- fit the extension on the distance gauge.
- Proceed to the distance measurement in the modes described earlier on.
- After reading value "a" on the index, reset the gauge to "0" and manually preset the value "a + 6".
- Preset the diameter and width manually as described in fig. 2.

7.2 - Options

SELECTIONS KEPT STORED IN THE MEMORY WHEN THE MACHINE IS SWITCHED OFF:

- UNITS of unbalance measurement grammes/ounces

SELECTIONS LOST WHEN THE MACHINE IS SWITCHED OFF:

- UNITS of WIDTH measurement mm/inch (from "SETTING DIMENSIONS" selecting WDTH).
N.B.: default in inches at every machine start-up.

- UNITS of DIAMETER measurement mm/ inch (from "SETTING DIMENSIONS" selecting DIAMETER).
N.B.: default in inches at every machine start-up.

UNBALANCE DISPLAYS:

F ➞ Dynamic
Static ➞ Dynamic
8 - Wheel balancing

8.1 - Measuring unbalance
- Shift the front lever rightwards to bring the pulley into contact with the tyre and press the [START] key at the side, keeping the lever pressed to start the wheel spinning. On the model without a motor, spin the wheel by hand making sure the rotation direction is correct.
- Release the lever and the [START] key when the displays go off, the machine will then start making measurements.
- When the displays show the measurement values, brake the wheel by re-establishing contact with the pulley, which is braked when the motor is off. Instruments 1 and 2 will keep the dynamic unbalance values in their memories. When balancing for static, the value is shown on display 1. On the model without a motor, the external lever operates the brake.
- LEDs on displays 3 and 4 will indicate the correction position. If all the LEDs are alight, this means that the correction weight should be applied to the vertical apex. They mean the same when balancing for static.
- For small diameter wheels (scooters), launch always the wheel by hand in a clockwise direction (see arrow). Measurement always begins when the displays go off.

8.2 - Correcting the unbalance
STATIC: Apply two equal correction weights to the vertical apex of the wheel, one on the inner side and the other on the outer side of the rim. Each weight is half the value indicated by the display.
If you make the correction with lead wire, springs or clamps applied to the spokes, divide it onto one, tow or more spokes, according to the size of the unbalance.
DYNAMIC: Apply the adhesive weights to the shoulders of the wheel rim in the positions indicated by the display for each of the sides.

![Example of dynamic correction on the inner side](image)

8.3 - Recalculating unbalance values
- Set the new dimensions as described above.
- Press [R] without repeating the spin.
- The new recalculated unbalance values will be displayed.
9 - Optimising the unbalance

- Use this function to reduce the amount of weight to be applied to the wheel to balance it.
- Suitable for static unbalance values greater than 30 grammes.
- Improved residual tyre eccentricity can often also be achieved.

Press R + a → r.S. (Press R if you want to cancel the function)

Run a spin

- The display will tell you to turn the tyre on the wheel rim. Make a chalk reference mark on the brush and the wheel rim, so that you can fit the wheel back on the machine in exactly the same position.
- Use a tyre remover to turn the tyre through 180° on the wheel rim.
- Fit the wheel rim back on, making sure that the reference marks on the brush and the wheel rim line up as before.

Run a spin

Right hand display: % value (p symbol) of the possible reduction in unbalance compared to the current situation of the wheel.
Left hand display: current static unbalance value in grammes. This is the value that can be reduced by turning the wheel rim.

Turn the wheel until the outer LEDs light up: mark the tyre at its vertical apex.

Mark the wheel rim in the same way when the inner LEDs light up.

- Now align the two marks.
- In the example, the 45 gramme static unbalance is reduced by 80%, leaving a residual unbalance of about 9 grammes.
10 - Self calibration

10.1 - Balancing machine

Proceed as follows to carry out the machine’s self-calibration facility:
- Fit a random wheel on the shaft, even an unbalanced one, although preferably one of average size.
- Set the exact dimensions of the wheel fitted.

N.B. If you make any mistakes while setting these values, the machine will be incorrectly calibrated, so all the later measurements will be faulty until you next carry out the self-calibration with correct measurements.

- Press \( \leq 5 \text{ g} \) + \( R \) \( \rightarrow \) CAL. \( \rightarrow \) CAL. until the positioning LEDs stop flashing and stay on fixed.

- Spin the wheel until all the displays go off.
- Release the wheel and wait (the self-calibration spin may take as much as a couple of minutes). It is very important that the wheel is not knocked during this spin or re-accelerated after it has been released, as the machine would then not be able to carry out the self-calibration and would stop with an error reading.

- Spin the wheel as already described
- Remove the sample weight and balance the wheel as already described.

Add a 30 gramme (1 oz) weight to the external side in a random angular position.

- MACHINE CALIBRATED

The values that the machine derives from the self-calibration cycle are stored automatically in a special memory, which will also keep them when the machine is switched off, so that every time that the machine is switched on again, it is ready to function correctly. Nevertheless, the self-calibration operation can be repeated as often as you like or whenever there are any doubts about the machine’s correct functioning.
11 - Errors

Machine functioning may be disturbed by various kinds of malfunctions. If these are picked up by the micro-processor, they will be indicated on the display as follows:

```
| Err.  |  | -5- |
```

<table>
<thead>
<tr>
<th>ERRORS</th>
<th>CAUSES</th>
<th>CONTROLS</th>
</tr>
</thead>
</table>
| Err. 1 | No rotation signal. | 1. Verify belt tautness.  
2. Verify the function of the phase pick-up board and, in particular, the reset signal.  
3. Replace the phase pick-up board.  
4. Replace the computer board. |
| Err. 2 | Speed too low during detection.  
During unbalance measurement rotation, wheel speed is less than 42 rpm. | 1. Make sure that a vehicle wheel is mounted on the wheel balancer.  
2. Verify belt tautness.  
3. Verify the function of the phase pick-up board and, in particular, the reset signal.  
4. Replace the computer board. |
| Err. 3 | Unbalance too high. | 1. Verify wheel dimension settings.  
2. Check detection unit connections.  
3. Perform machine calibration.  
4. Mount a wheel with more or less known unbalance (less than 100 grammes) and verify the response of the machine.  
5. Replace the computer board. |
| Err. 4 | Rotation in opposite direction.  
After pressing [START], the wheel begins to rotate in the opposite direction (anticlockwise). | 1. Verify the connection of the UP/DOWN – RESET signals on the phase pick-up board. |
| Err. 7 /  
Err. 8 | NOVRAM parameter read error | 1. Repeat machine calibration  
2. Shut down the machine.  
3. Wait for a minimum time of ~ 1 Min.  
4. Re-start the machine and verify correct operation.  
5. Replace the computer board. |

Other error messages may be communicated by the "DYNAMIC" LED during measuring operations. If this LED flashes once the wheel has been accelerated to regime speed, this means that the regime speed is too fast (>200 rpm). The machine will wait for the speed to drop, when it will cut off the LED and make the measurements. If the same LED flashes at random during the measurement spin at a speed less than 200 rpm, this indicates that the machine is in a waiting mode, probably because the machine has received a knock. The measurement will be repeated automatically in any case, without any further errors.

* If the error is repeated, consult the after sales service.

12 - Ordinary maintenance (Non-specialised staff)

N.B.: Remember to switch off all power connections to the machine before carrying out any maintenance operations.

12.1- Replacing protection fuses

Two protection fuses are set on the supply board, which can be accessed by removing the weights shelf. If you have to replace these fuses, make sure that you use others with the same electricity load. If the fault happens again, consult the After Sales Service.
### List of recommended spare parts (See blow-up tables for references)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>940013515</td>
<td>Brush complete with bristles c22bike series B</td>
</tr>
<tr>
<td>140247801</td>
<td>Mandrel housing in ABS drawing no. 24780G</td>
</tr>
<tr>
<td>181247800</td>
<td>Spring drawing no. 24780P</td>
</tr>
<tr>
<td>036003530</td>
<td>FIBERGLIDE PAI 3530 ferrules</td>
</tr>
<tr>
<td>020601003</td>
<td>6010 - ZZ bearing</td>
</tr>
<tr>
<td>140247811</td>
<td>Motor housing in ABS c22bike drawing no. 24781G</td>
</tr>
<tr>
<td>940513825</td>
<td>Phase pcb complete with cable and jack</td>
</tr>
<tr>
<td>067054210</td>
<td>Grip I 222 / 55 - M10</td>
</tr>
<tr>
<td>182185730</td>
<td>Spring drawing no. 18573P</td>
</tr>
<tr>
<td>507054233</td>
<td>Special monophase motor LM MS 63 C4 0.25 CV B3 220/50</td>
</tr>
<tr>
<td>507054133</td>
<td>Special monophase motor LM MS 63 C4 0.25 CV B3 110/60</td>
</tr>
<tr>
<td>507054234</td>
<td>Special monophase motor LM MS 63 C4 0.25 CV B3 220/60</td>
</tr>
<tr>
<td>050136103</td>
<td>Panel with keyboard model 1351 c22bike</td>
</tr>
<tr>
<td>511231002</td>
<td>Switch KL 1002 + Q 555</td>
</tr>
<tr>
<td>611018463</td>
<td>Transformer 110/220 - 9/9</td>
</tr>
<tr>
<td>940512124</td>
<td>Power supply pcb P11 - P200</td>
</tr>
<tr>
<td>081002000</td>
<td>Fuses 5 x 20 - 2A</td>
</tr>
<tr>
<td>53090353</td>
<td>CEMA series P9 key</td>
</tr>
<tr>
<td>53090011</td>
<td>CEMA series P9</td>
</tr>
<tr>
<td>940513300</td>
<td>C22 bike computer pcb</td>
</tr>
</tbody>
</table>