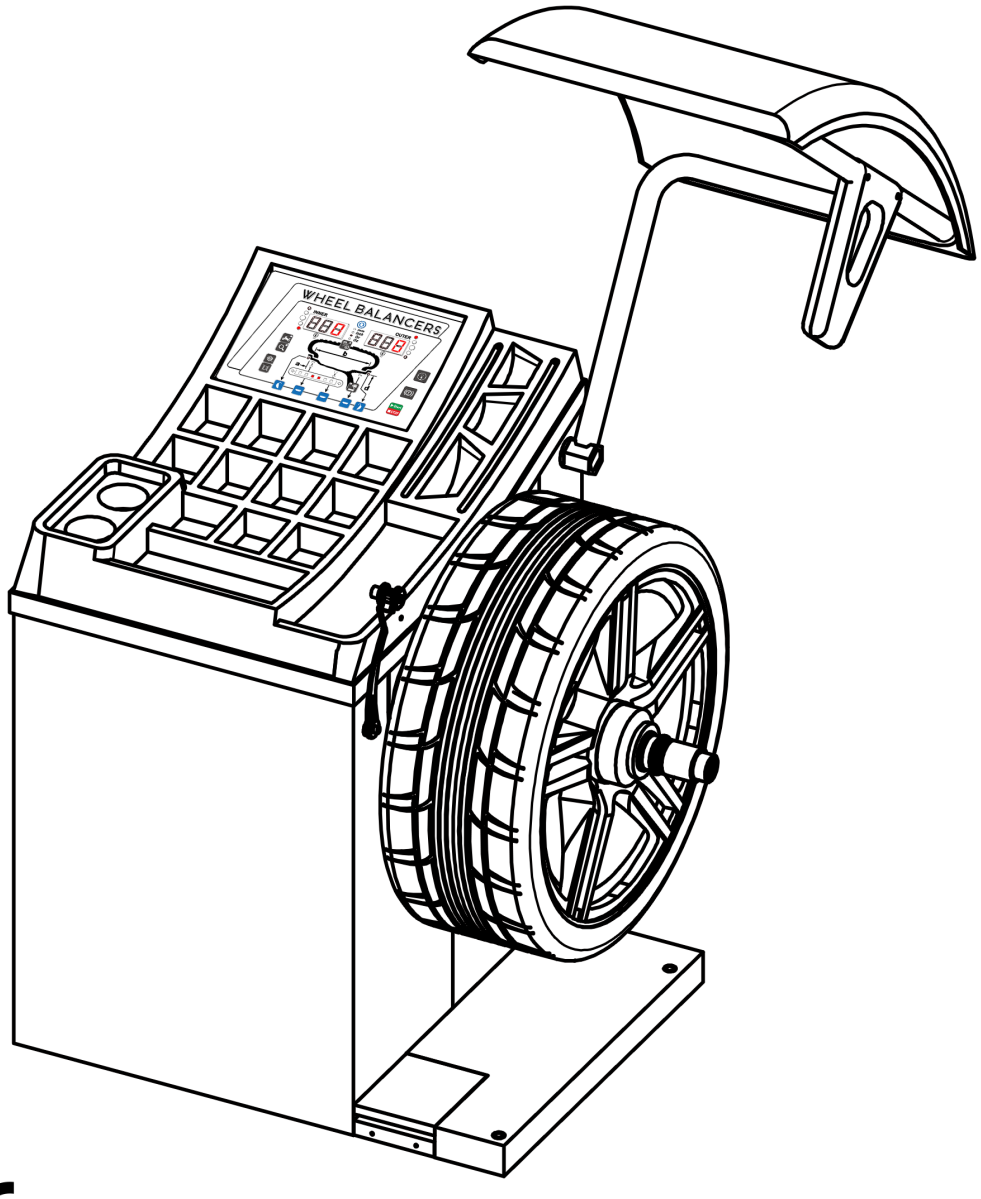
CAR WHEEL BALANCER

Installation/Operation & Maintenance Manual



CE

MODEL: JWB660

Please read through this manual before operation. You must read and understand the precautions for safety to protect your safety and any damage to your property.

Version: HR201806 1.0

NOTE TO THE USER

Thank you for purchasing our products.
Please read this instruction carefully for safe and proper use of the wheel balancer, and keep it handy for future reference.

■ This Manual is for model : JWB660
■ As for the assurance of safety in design and construction of wheel balancer, read this Manual first.
■ Please make sure that this manual is delivered to end users for their implementation of safety.
■ Don't use the wheel balancer in a potentially explosive atmosphere.

1 Safety Regulations

1.0 Relevant Safety Reminders

Lighting
For safety, please keep enough lighting intensity. The intensity should be 200Lux on the site and have no additional risk. Don’ t use the equipment outdoors. Avoid the wind, lightning, rain and other hazards if it is used outdoors. The equipment must be used on a level ground without any slope. Please check the levelness beforehand.

Dismantling and disposal
ENVIRONMENTAL DAMAGE. Only well trained personnel may dismantle and dispose of the equipment. **Dismantling** To dismantle the this product, proceed as follows: ELECTRICAL HAZARD! When carrying out any decommissioning and dismantling work on the equipment, switch off all power supply connections, ensure they cannot be switched on unintentionally and verify that they have been disconnected. Earth and short-circuit them, and cover or isolate any neighboring live parts. Failure to do so may lead to serious injuries or death. HIGH PRESSURE HAZARD.

When carrying out any unit decommissioning and dismantling work, close off and empty all the connection pipes until the pressure is the same as the ambient air pressure. Failure to do so may lead to injury.

PERSONAL INJURY!

Secure the unit against slipping.

The unit is ready for transporting.

It is important that all transport information be observed.

Disposal

Disposal

The unit and individual components must be disposed of by a special company with professional competence. This technical services department must ensure that:

– the components are sorted according to material types.

– the operating materials are sorted and separated according to their properties.

ENVIRONMENTAL DAMAGE.

Dispose of all components and operating materials (such as oil, refrigerant and water-glycol mixture) separately according to material and in line with local laws and environmental regulations.

Declaration

General information

EC Declaration of conformity

The equipment which accompanies this declaration is in conformity with EU Directive(s):

2006/42/EC Machinery Directive

2014/30/EU Electromagnetic Compatibility Directive

Manufacturer:

Name: HAUVREX (HANGZHOU) AUTOMOTIVE EQUIPMENT CO., LTD.

Address: C207, No. 68 Huaqiao Rd. Jincheng Town, Lin'an Hangzhou, 311300 Zhejiang, P.R.C

The undersigned declares that the described products meet the essential requirements of the below mentioned standards as based on above mentioned directives.The item of equipments, which identified below, has been subject to internal manufacturing checks with monitoring of the final assessment by third party.

Noise declaration

Sound power level: L_{WA}<85dB
Accompanied uncertainly K=4 dB
This measurement made in according with EN ISO 3746:2010
Applied operating conditions are:
All the motor is running with normal operation speed.

“The figure quoted are emission levels and are not necessarily safe working levels. Whilst there is a correlation between the emission and exposure levels, this can’t be used reliably to determine weather or nor further precautions are required. Factors that influence the actual level of exposure of the workforce include the characteristics of the working room, the other source of noise etc. i.e. the number of the machines and other adjacent processes. Also the permissible exposure level can vary from country to country. This information, however, will enable the user of the machine to make a better evaluation of the hazard and risk.”

1.1 Safety Instructions

- The machine should only be used by authorized and properly trained personnel. Improper operation will lead to wrong measuring results.
- Calibration must be done in strict accordance with the manual. Incorrect calibration will cause the balancer not to work properly.
- Operational environment should conform to regulations of this manual.
- Power supply and air supply must conform to the requirement of this equipment.
- Wheel guard must be set in the effective protection state.
- Violating the transport and operation instructions in this manual is strictly prohibited. Manufacturer will not take responsibility for any damage or injury caused by such operation.
- Exceeding the measuring range of the equipment might cause damage and inaccurate measurement.
- If the operator fails to follow the safety regulation and causes damage to the equipment by dismounting the safety device, the manufacturer will stop its safety commitment immediately.

1.2 Safety Signs

	Warning! All switches are powered on! Turn off the power when opening the cabinet. There is electricity in the switch node when the switch is turned off. Turn off or cut the external power supply.
	Do not apply any force to the balance shaft when moving the machine!
	Mind your hands when installing and tightening the rim!
	The machine will protectively stop working when opening the guard!
	Safely earthed!
	Laser marker is working. Do not look straight at it lest eyes should be hurt.
	No trampling!
	Mount and dismount the wheel with the foot pedal when the wheel guard is open. Please do not insert hands between clamps and wheel.
	While the protection hood is off, pedal should be used to stop measuring or brake.

2 Technical Specification

2.1 Overall Appearance

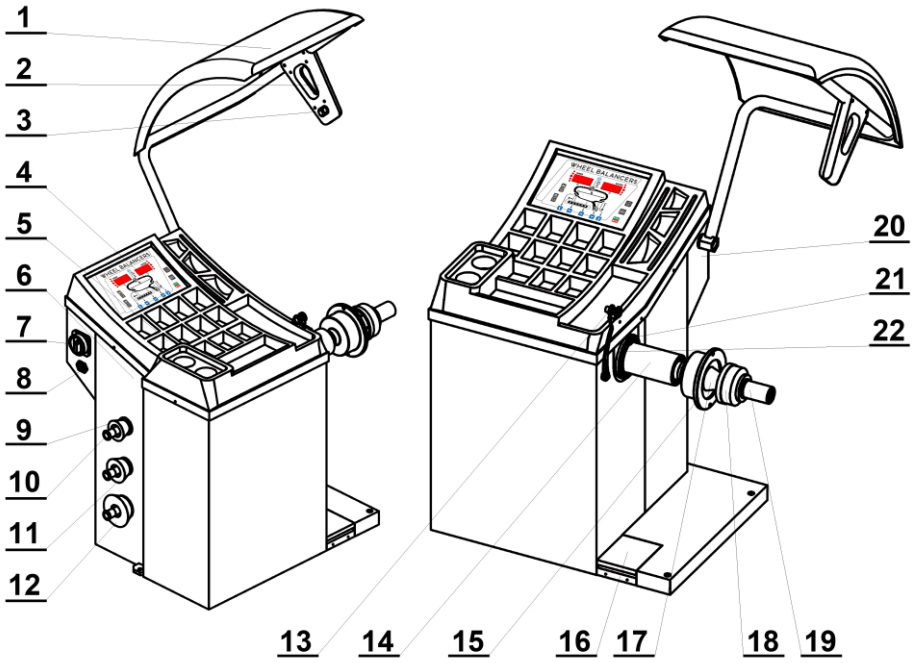


Fig.1 **structure**

Table1 Overall Structure

No.	Description	HW9610	HW9620
1	Wheel guard	√	√
2	Sonar width gauge bracket		√
3	Sonar sensor		√
4	Control panel	√	√
5	ABS weight tray	√	√
6	Cabinet	√	√
7	Power switch	√	√
8	Power socket		
9	2# Cone	√	√
10	Cone handle	√	√
11	3# Cone	√	√
12	4# Cone	√	√
13	Automatic measurement gauge	√	√
14	Balancing shaft	√	√
15	Flange plate	√	√
16	Pedal switch		
17	1# cone	√	√
18	Pressure cup	√	√
19	Quick nut/Adaptor	Quick Nut	Quick Nut
20	Protection hold bracket	√	√
21	Laser marker	√	√
22	Lighting	√	√

2.2Control Panel

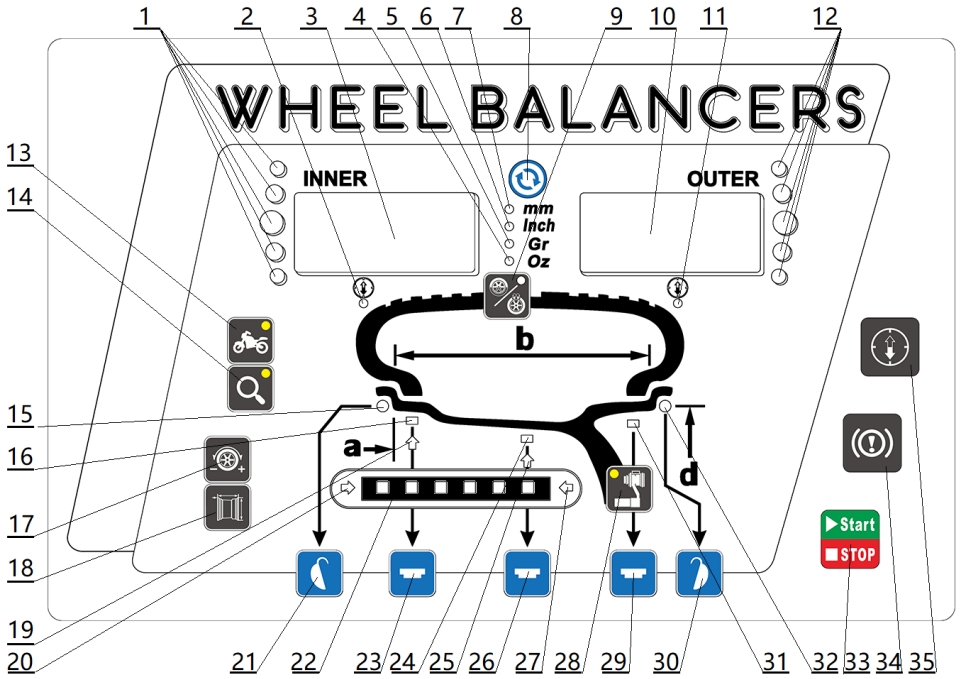


Fig.2 Display Panel

Table2 Control panel functions

No.	description	No.	description
3,10	inner/outer unbalance display window	4,5	Weight display unit: gram/ounce
6,7	Length unit display: mm / inch	8	Weight and length unit shift button
9	In DYN and STA mode (OPT) button / indicator light; In ALU and EALU mode (SPL) button / indicator light;	2,11	Inner/ outer 6 o' clock/12 o' clock sticking weight position indicator light
13	motorcycle/ car balance mode shift button/ indicator light/;	14	Min. unbalance value check button/ indictor light
15,32	inner/outer unbalance point clamping position indicator light	16,24,31	Sticking weight position indicator light in rim sticking weight balance mode
21,30	inner/outer unbalance point clamping position setting button	23,26,29	Sticking weight position setting button in rim sticking weight balance mode
17	Data input button, hold on it and rotate the wheel to increase or decrease the data	18	Wheel parameter a,b,d shift button
22	Automatic gauge assisted sticking weight position indicator light	20,27	Automatic gauge assisted locating status indicator light
19	Automatic gauge assisted inner sticking weight position indicator light	25	Automatic gauge outer assisted sticking weight indicator light
28	EALU Mode setting button/status indication light	33	Start/Stop Button
34	Brake/release the brake	35	12 O' clock/6 O' clock counterweight position switching button

2.3 Main Functions

Table3 Function of each model

Description	HW9610	HW9620
Standard dynamic balance	√	√
Static mode 1-5	√	√
ALU1~ALU7 balance mode	√	√
EALU1~EALU2 balance mode	√	√
OPT balance in dynamic and static balance mode	√	√
SPL in ALU and EALU mode	√	√
Motorcycle standard dynamic balance	√	√
Motorcycle static balance	√	√
Motorcycle accessory reset function	√	√
Gram/oz, mm./in. shift function	√	√
Automatic gauge (a-d) and lighting function	√	√
Ultrasonic automatic gauge (b) function		√
Automatic gauge assisted weight sticking function	√	√
Weight sticking/cleaning position shift function	√	√
12o' clock weight sticking position laser indicating function		√
6o' clock cleaning and sticking position laser indicating function		√
Self- calibration function	√	√
Wheel guard protection function	√	√
Breakdown self check and diagnosis function	√	√

2.4 Main Technical Specifications

Table 4 measurement range

Power voltage(single phase)		220 V / 50 Hz	
		110 V / 60 Hz	
Air pressure （only for HW9630）		0.45-0.8 MPa	
Protection grade		IP 54	
Power consumption		180W	
Max RPM		160 r/min	
Cycle time		Average 7-11s	
Measurement range	length-a-	Measurement	length-a-
	Rim diameter -d-		Rim diameter -d-
	wheel width -b-		wheel width -b-
	wheel diameter		wheel diameter
	wheel weight		wheel weight
Measurement error		≤ ±1g	Measurement error
Phase error		≤ ±1°	Phase error
Automatic gauge error		±1mm	Automatic gauge error
Net weight		82 kg （HW9610，HW9620）	Net weight
		96 kg （HW9630）	
Average noise		<70dB	
Working environment		Temperature: -20℃～50℃	
		Humidity: ≤85%	

3 Transport and Storage

The balancer must be transported and stored in its original package and should be stacked according to the instruction on the package.

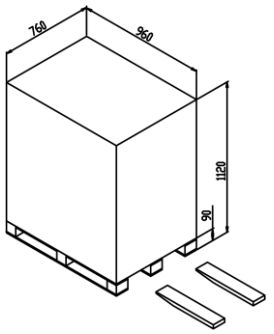


Fig.3 packing and transport

Move the package with a fork lift as shown in Fig.3

4 Installation

4.1 Unpack the package

- Check the package first. If there is any doubt, stop unpacking and contact the supplier and shipping agent immediately.
- Open the packing box. Check to make sure that each component quantity is in accordance with the packing list. Check the machine and accessories.
- Remove the bolts which fix the bottom of the box and machine. Place the balancer steady.
- If there is any question, do not use the machine and contact the supplier immediately.

4.2 Installation Field

- The working environment should comply with the requirement in 2.4. The ground should be level, solid without vibration.
- Power sockets should match the power requirements in 2.4. For HW9630, air supply should be provided too in accordance with requirement in 2.4.
- Space for installation should meet the requirement described in Fig.4 to make sure all the components work without any limitation
- Balancer must not be exposed to sunshine and rain. A shelter should be built if using it outdoors.

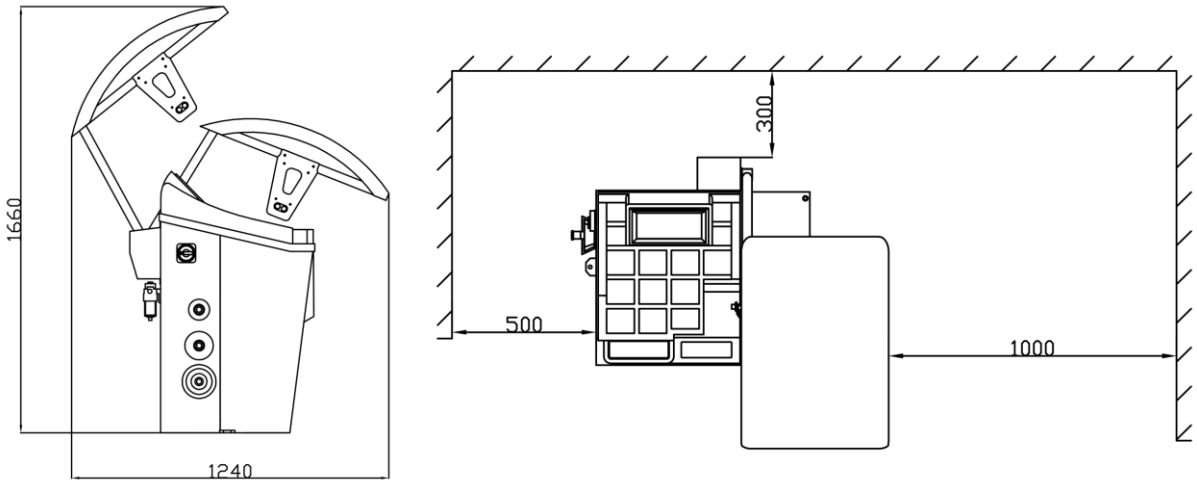


Fig.4 space requirement

4.3 Parts assembly

4.3.1 Shaft assembly

Take out the lead screw(Fig.5) or automatic shaft(Fig.6), assemble as shown in the figures below.

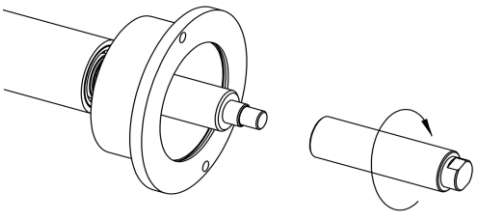


Fig. 5 HW9610，HW9620 shaft assembly

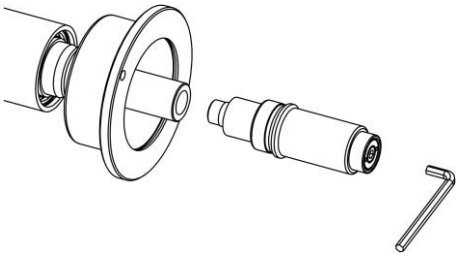


Fig. 6 E13 automatic shaft assembly

4.3.2 Guard assembly

Guard bag assembly as shown in Fig. 7

First, connect the guard switch plug (for HW9620 and HW9630, ultrasonic gauge B should be connected too), then fix the bag in the corresponding place.

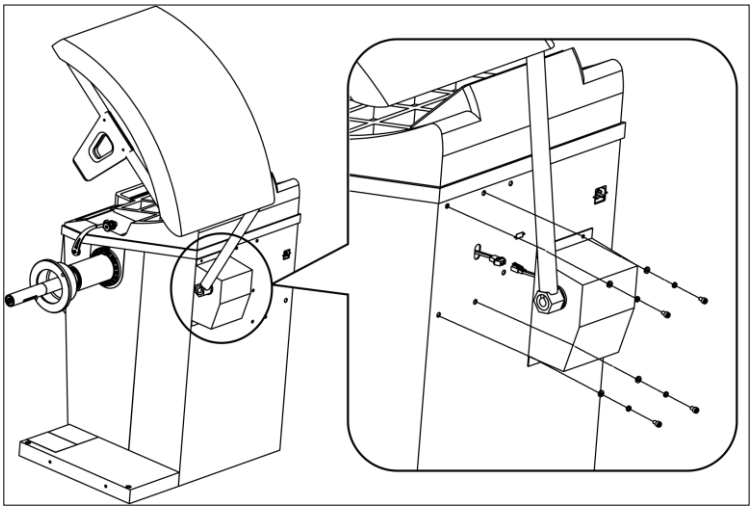


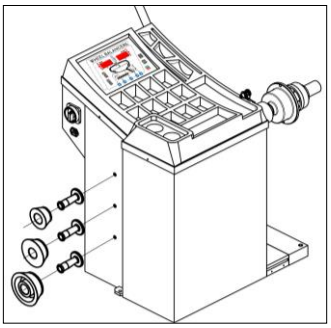
Fig. 7wheel guard assembly

4.3.3 Taper sleeve installation (Fig.8)

4.4 Power and Air supply connection

4.4.1 Power supply connection

See Fig. 9 and plug the other end in the power socket.



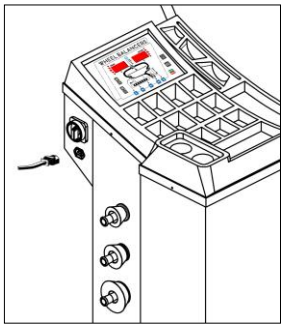


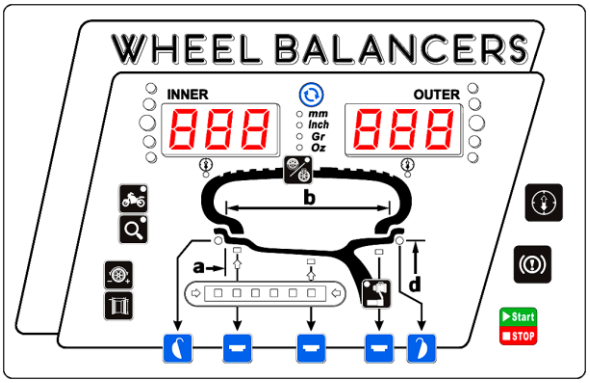
Fig. 8 Taper sleeve installation Fig. 9 Connect power

NOTE: The power socket must comply with the local standard and requirement in point 2.4 in this manual.

5 Starting to Use

5.1 Startup Self-check

Switch on the balancer, system start self-check. (Fig.10) and then enter the preset balancing mode. The default mode is dynamic mode.



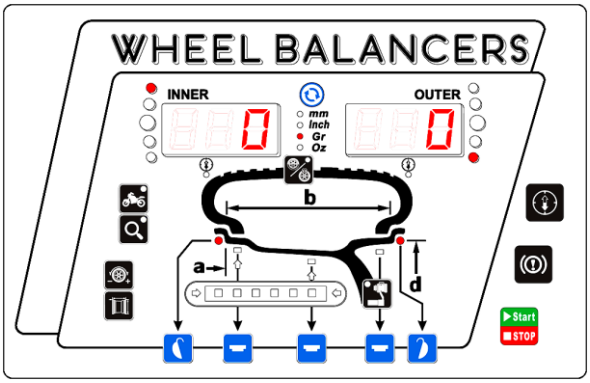


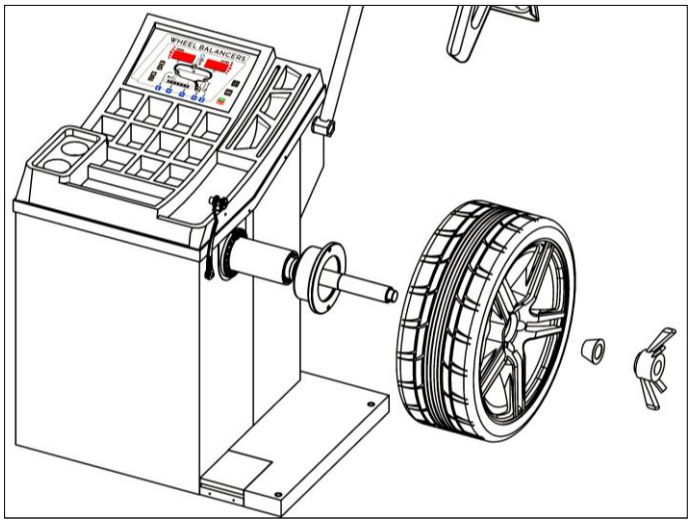
Fig. 10 startup self check

5.2 Wheel Mounting and Dismounting

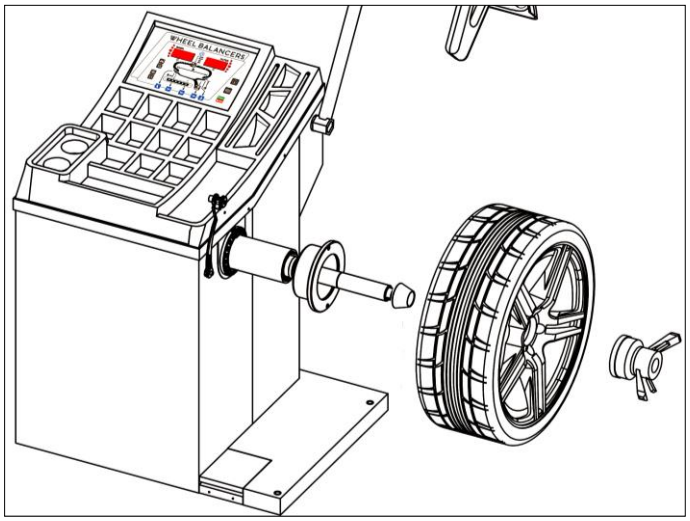
5.2.1 Wheel Mounting and Dismounting

Mount the wheel in two ways. First choose the sleeve that matches the rim hole size to ensure the central hole is within the range of the cone, then mount the wheel as shown in Fig.11 and finally tighten the quick change nut.

Dismount the wheel by screwing off the quick change nut and removing the wheel and sleeve.



Wheel front direction mounting



Wheel reverse direction mounting

Fig.11 Wheel mounting

5.2.3 Mounting special wheels

5.2.3.1 Mounting over-wide wheel

An optional accessory XSTD-2X named extension flange is needed to mount over-wide wheels. Assemble the flange as shown in Fig.12 and then mount the wheel. This accessory can widen the wheel to be measured.。

5.2.3.2 Mounting wheels without central hole

A special accessory XSTD-61 (optional) is needed to mount the wheels without central hole. Mount as shown in Fig.13

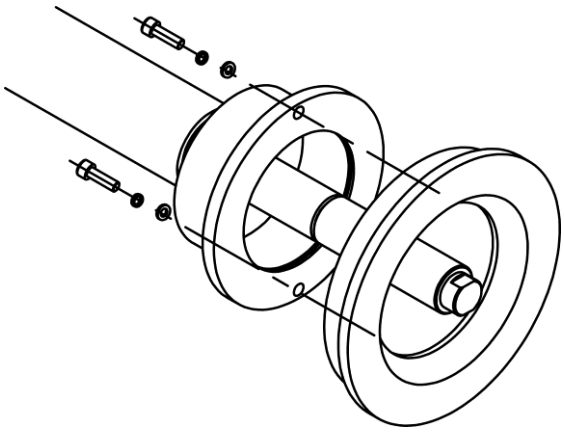


Fig.12 over-wide wheel

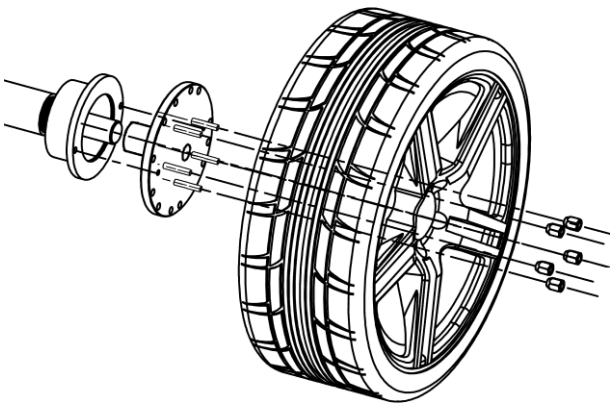


Fig. 13 wheel without central hole

5.3 Balance operation

Fig.14 shows all balance modes, which are available for different wheel types and different customers' preference.

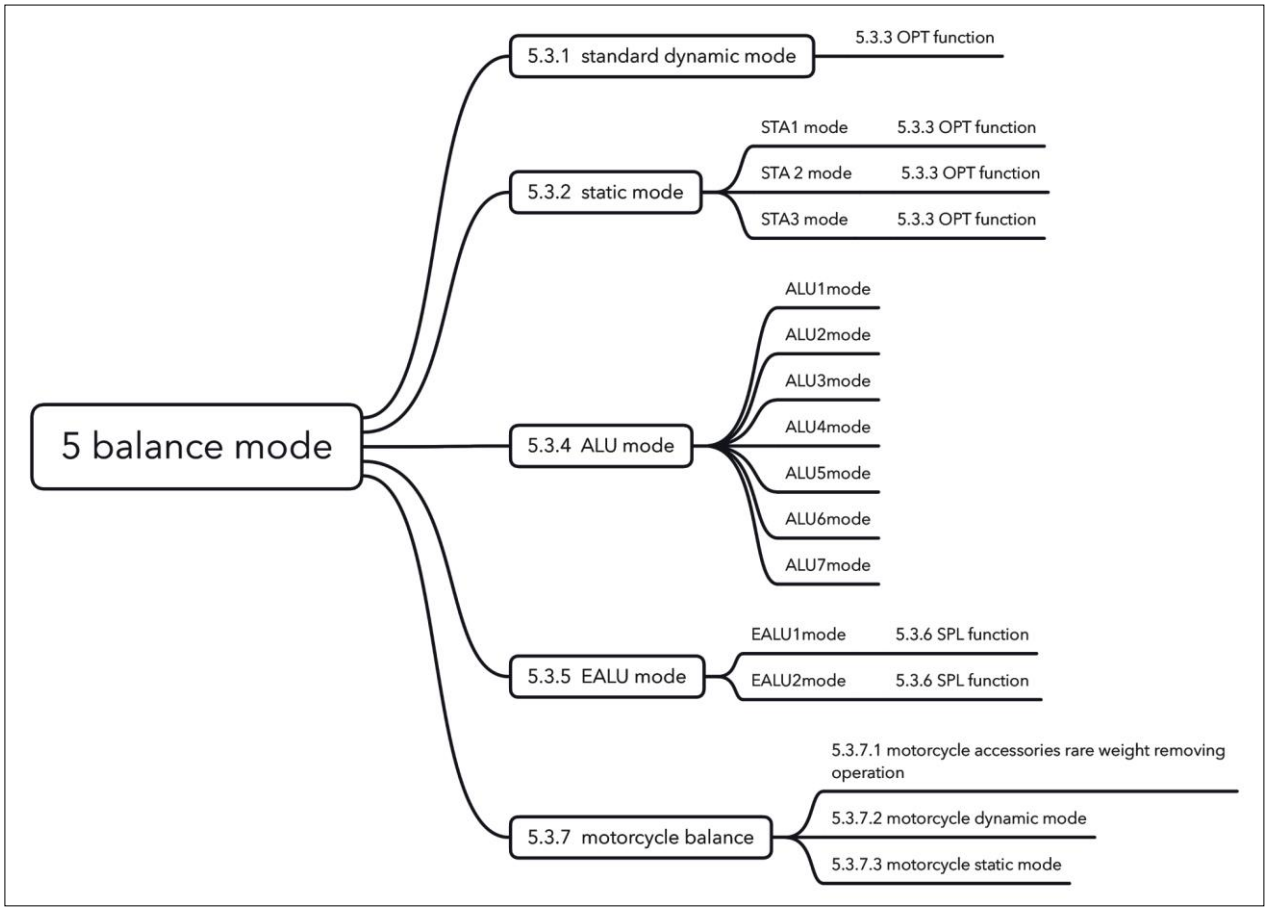


Fig. 14 balance mode

Except static balance, the others belong to standard dynamic balance.

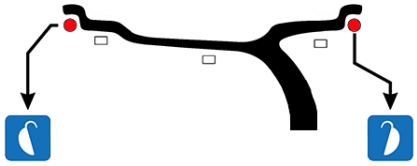
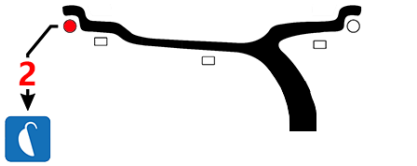
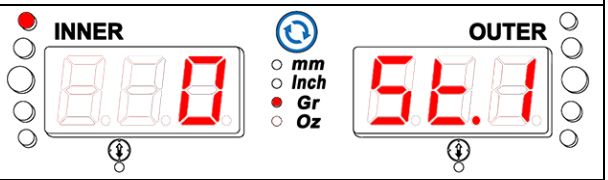
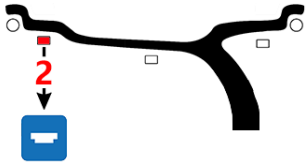
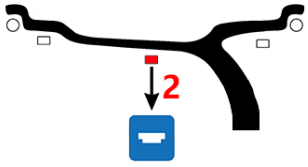
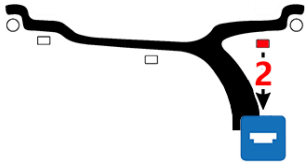
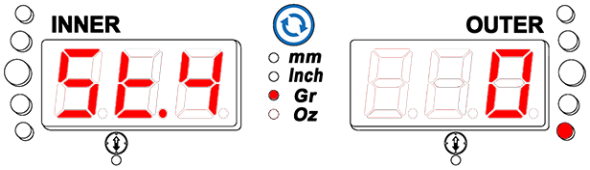
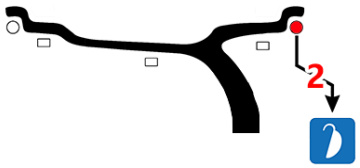
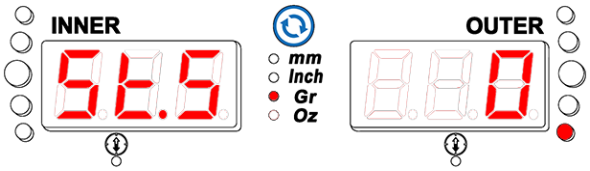
In non –motorcycle balance modes, EALU mode is highly recommended for it is

much more convenient, faster and precise. It is a good substitute for traditional ALU balance mode.。

5.3.0 How to enter different balance modes

5.3.0.1 Car balance mode operation

Refer to Fig. 15 to enter different car balance modes by pressing only two buttons. If pressing one button within 15 seconds or one time wrong operation（Fig.16）, the balance mode will not change.

Mode	Operation	Display
Standard dynamic		
Static 1		
Static 2		
Static 3		
Static 4		
Static 5		

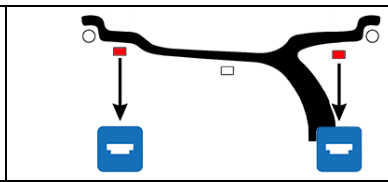
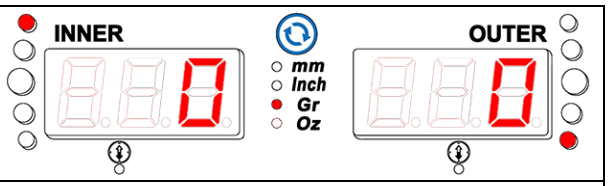
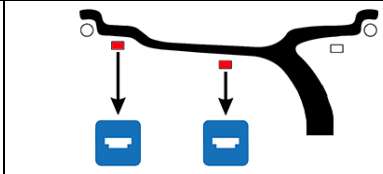
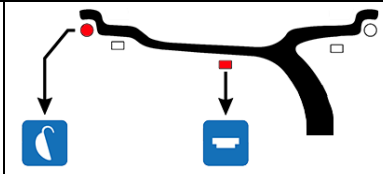
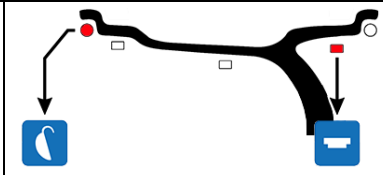
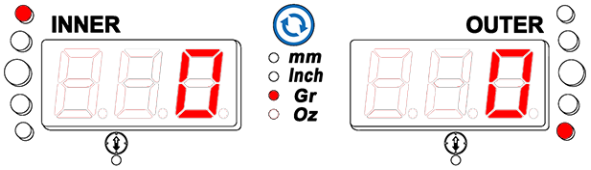
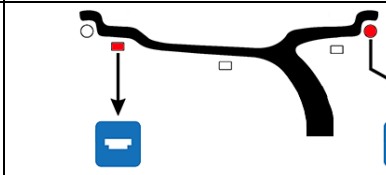
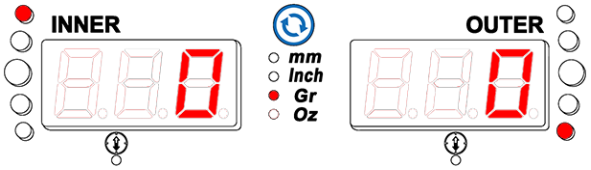
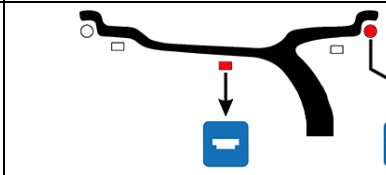
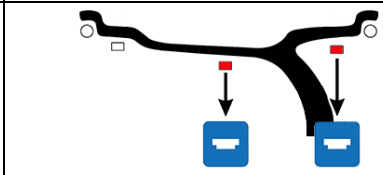
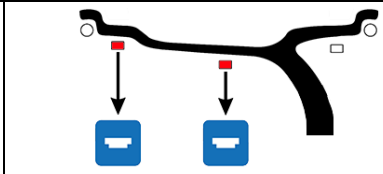
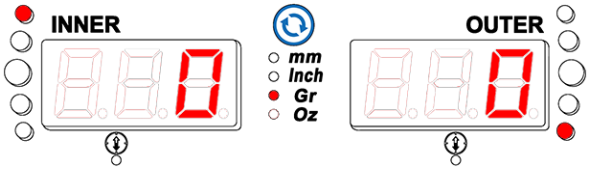
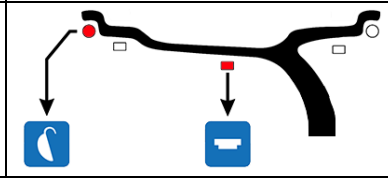
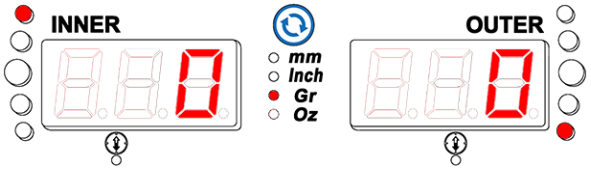
ALU1		
ALU2		
ALU3		
ALU4		
ALU5		
ALU6		
ALU7		
EALU1		
EALU2		

Fig.15 car balance modes

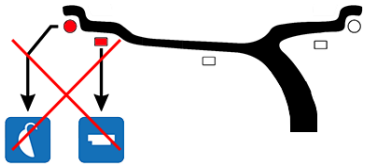
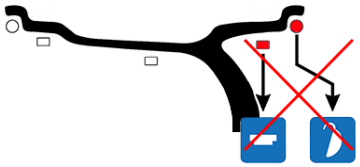
Wrong mode	Operation	Wrong mode	Operation
1		2	

Fig.16 wrong balance operation

5.3.0.2 EALUx operation for car balance

Pull the gauge continuously to two sticking weight positions as shown in Fig.17, it will automatically enter EALU1 or EALU2 mode.

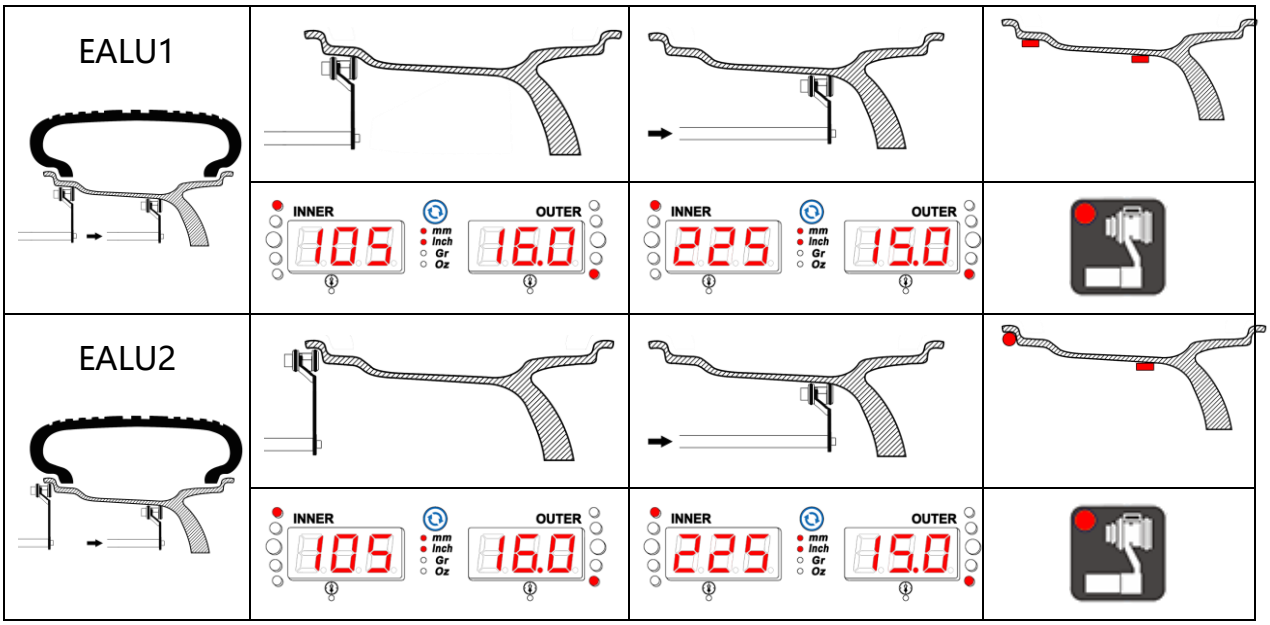
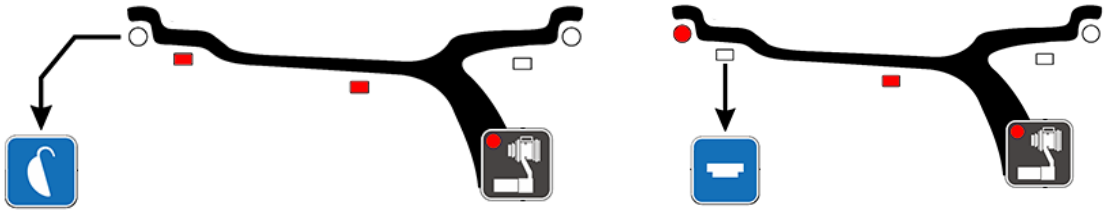


Fig.17 car EALUx balance measurement mode

In EALU1 or EALU2 mode，follow Fig. 18 to shift between EALU1 and EALU2.



EALU1 to EALU2　　EALU2 to EALU1

Fig.18 EALUx　mode shift

5.3.0.3 Motorcycle balance mode

Press  to shift to motorcycle dynamic balance mode. Follow Fig. 19 to shift between dynamic and static modes.

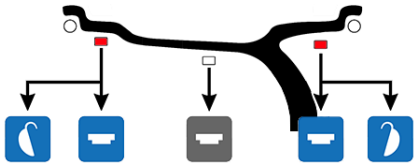
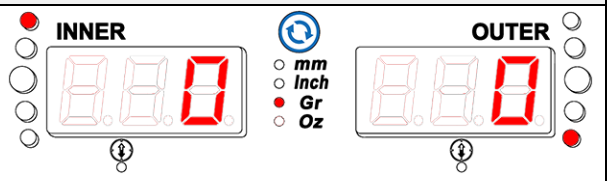
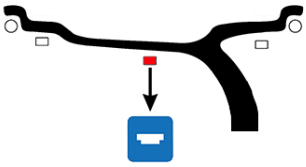
mode	operation	display
Motorcycle dynamic		
Motorcycle static		

Fig.19 Motorcycle balance measurement mode shift

5.3.1 Standard Dynamic Balance

The system default starting model is standard dynamic balance. (Fig.20) . In other modes, Enter standard dynamic mode according to 5.3.0.1.

Dynamic balance is a vector balance mode, so for the wheel which is smaller than 2.5 inches,

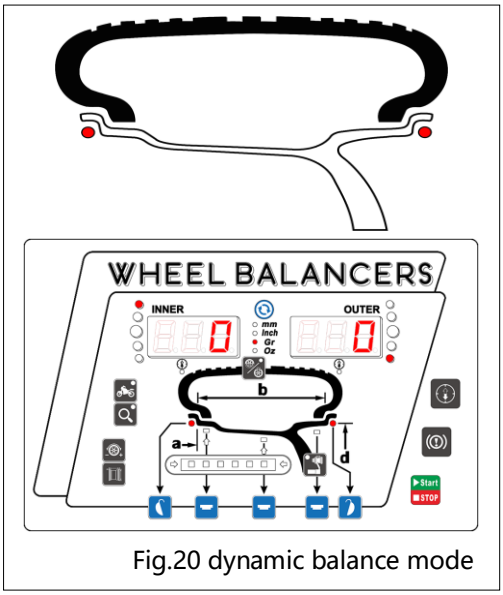
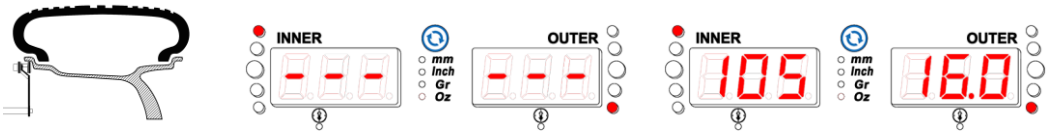


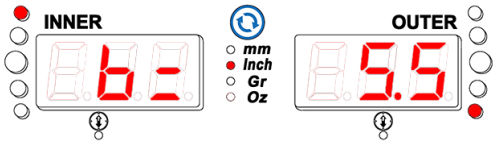
Fig.20 dynamic balance mode

instead of dynamic balance, static balance is recommended.

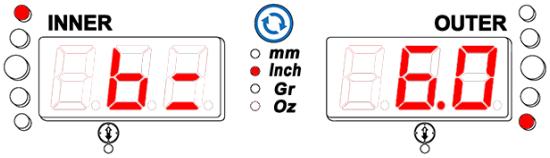
5.3.1.1 Standard Dynamic Balance Measurement

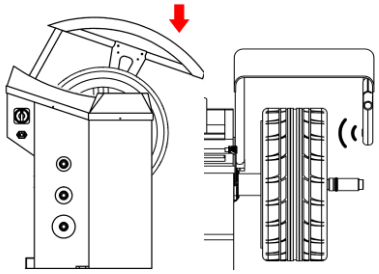
See Fig.21，HW9610 has 4 steps，HW9620 has 3 steps.

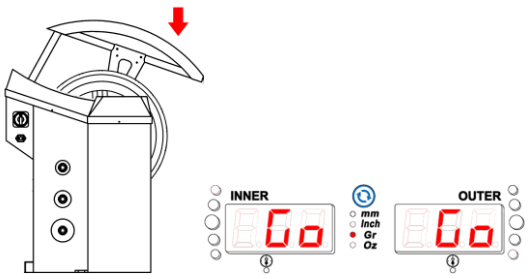
<table>
<tr><th>Step</th><th>HW9610</th><th>HW9620</th></tr>
<tr><td rowspan="2">1</td><td colspan="2"> 

Pull out gauge and attach it to the rim edge　　wait for 1 second　　measurement result a=105mm d=5.5 Inch</td></tr>
<tr><td> 

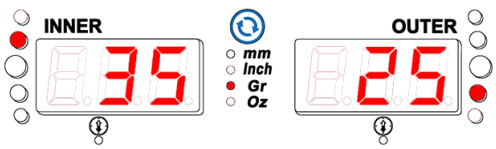
Gauge back，width input</td><td> 

Gauge back, waiting for measurement</td></tr>
<tr><td>2</td><td> 

Press ，rotate wheel to input width B = 6.0 Inch</td><td> 


Close the guard, start wheel rotation measurement, ultrasonic gauge B gets width reading automatically.</td></tr>
<tr><td>3</td><td> 

Close the guard，start wheel rotation measurement</td><td> 

Measurement finished，display result（inner 35g unbalance，outer 25g unbalance）</td></tr>
<tr><td>4</td><td> 

Measurement finished, display result（inner 35g unbalance，outer 25g unbalance）</td><td></td></tr>
</table>

Fig. 21 Standard Dynamic Balancing Measurement

5.3.1.2 Balancing Operation

Open the guard（Fig.22），follow Fig. 23 to operate.

HW9610，HW9620 locate the unbalance point manually.

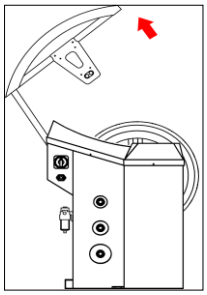


Fig.22 open the guard

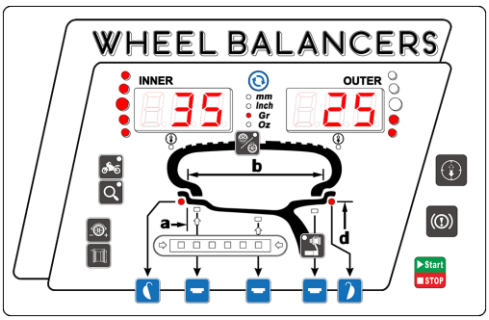
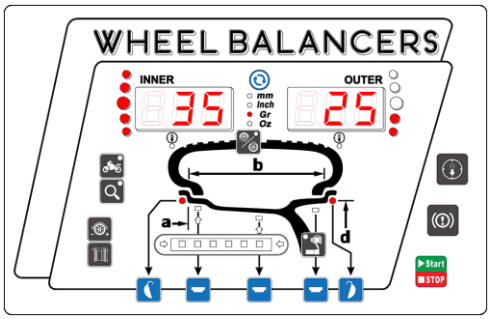
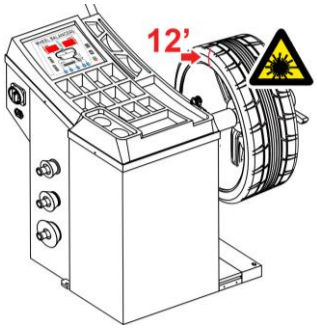
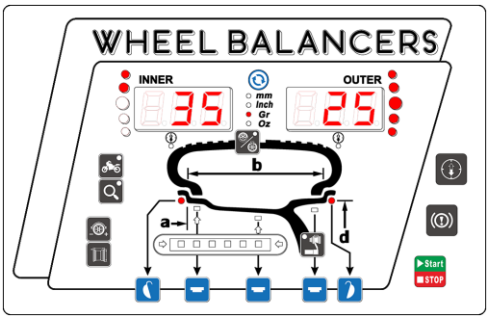
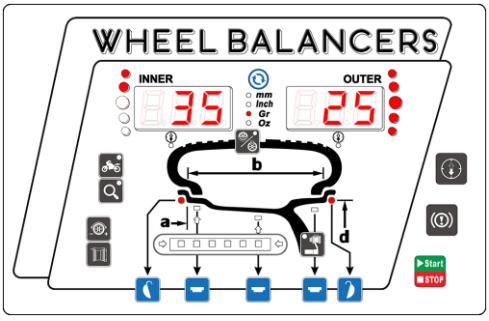
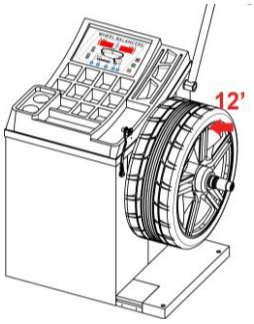
step	HW9610, HW9620operation
1	 Rotate wheel to the inner unbalance position
2	  Hit 35g weight on the inner position indicated by the laser，inner balance is done.
3	 Rotate the wheel to outer unbalance position
4	  Hit a 25g weight on the12 '. outer balance is done. Remove the wheel from the balancer according to 5.2.2

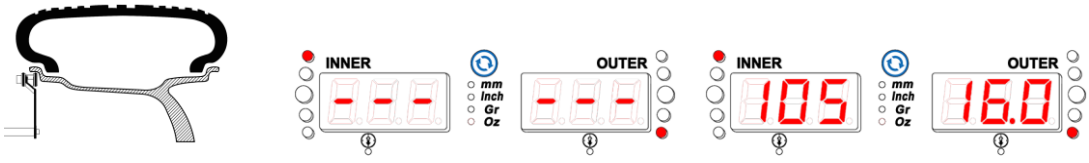
Fig.23 Wheel balancing

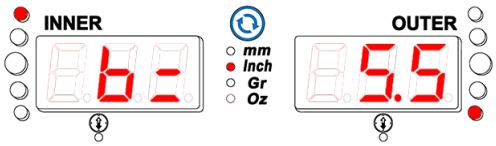
5.3.2 Static balance

In other balance mode, follow Chapter 5.3.0.1 to enter standard dynamic balance mode. Wheels can achieve moment balance with the rotating shaft through static balance. After standard dynamic balance measure -ment, static balance operation can be done directly by skipping the measurement process 5.3.2.1 below

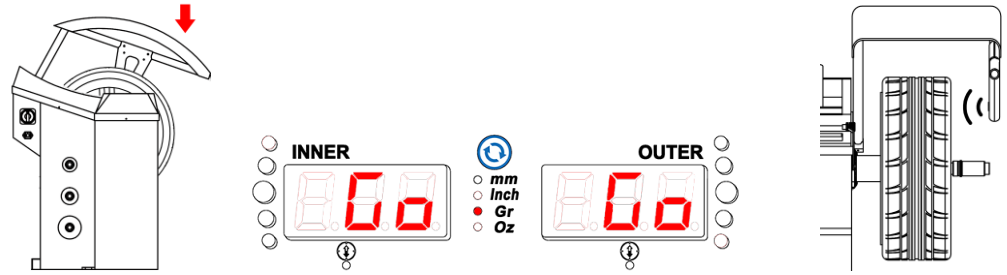
5.3.2.1 Static balance measurement (Taking STA1 as an example)

Follow 3 steps shown in Fig.24 to operate.

<table>
<tr><th>step</th><th>HW9610</th><th>HW9620</th></tr>
<tr><td rowspan="2">1</td><td colspan="2"> 

Pull out gauge and attach it to rim edge wait for 1 second display result a=105mm</td></tr>
<tr><td> 

Gauge back , width input</td><td> 

Gauge back, waiting for measurement</td></tr>
<tr><td>2</td><td colspan="2"> 

Close the guard, start wheel rotation measurement. Only measure the diameter, no need to input width</td></tr>
<tr><td>3</td><td colspan="2"> 

Measurement finished, display result (35g unbalance)</td></tr>
</table>

Fig.24 Static balance measurement

5.3.2.2 Balancing operation

Open the guard（Fig.22），and follow Fig. 25 to operate.

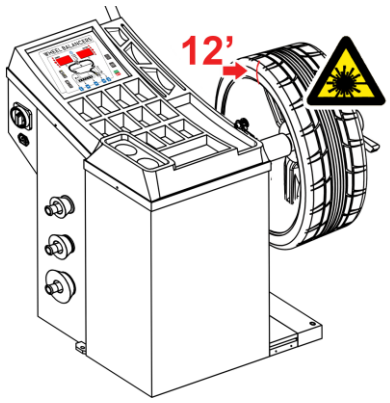
step	HW9610, HW9620 operation
1	 Rotate wheel to the unbalance position
2	  Hit 35g weight on the inner position indicated by the laser，static balance is done.

Fig.25 Balancing operation

5.3.2.3 Difference between STA1, STA2, STA3, STA4 and STA5

The balance positions are different. Due to this, STA1 and STA5 clamps weight on the rim edge，while STA2,STA3,STA4 stick the weight on the inside of the rim. The unbalance values change with the radius.

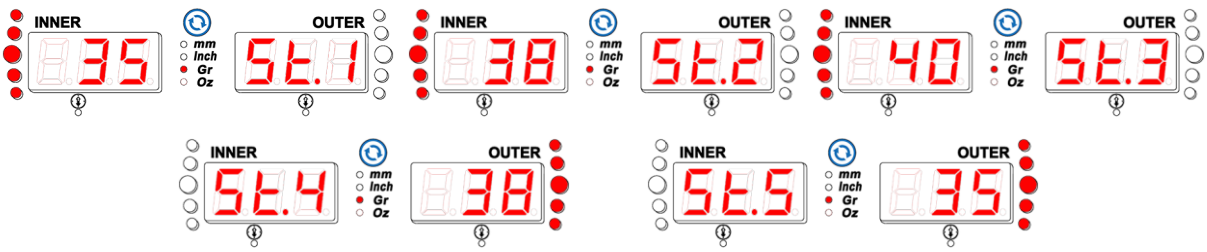
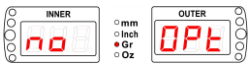


Fig.26　difference between STA1，STA2，STA3，STA4，STA5

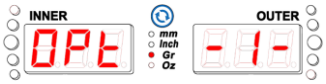
5.3.3 OPT Function

OPT can only be used in standard dynamic mode and static mode. This function is to compensate the unbalance between the wheel and the steel rim so as to reduce the weight to be added as light as possible.

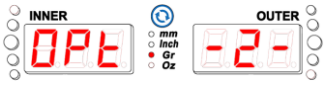
5.3.3.1 Start OPT

In standard dynamic or static mode, press  to start this function. When the total static balance value is less than the set value stated in chapter 6.7, 

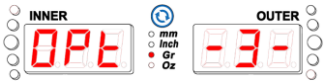
will appear meaning OPT is needed and automatically returns to the current state. When starting OPT 1，if E13 balance position is locked, it will unlock automatically.

5.3.3.2 Step 1 

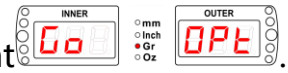
Firstly mark with a chalk a reference point which is corresponding to the nozzle, then rotate the nozzle to 12 o’ clock and stay there，press  to enter OPT2。

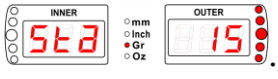
5.3.3.3 Step 2 

Remove the wheel from the balancer, take off the tire from the rim with a tire changer. Mount the rim on the balancer again, rotate the nozzle to 12 o’ clock again and stay there，press  to enter OPT3。

5.3.3.3 Step 3 

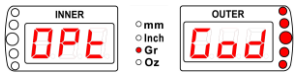
5.3.3.3.1 Doing OPT measurement

Close the guard，start OPT measurement 

. When finished, it shows 15g residual unbalance value (supposed) after OPT 

. Rotate the wheel till all indicators outside are lighted, mark the rim at 12 o’ clock with a chalk.

5.3.3.3.2 Optimizing rim and tire mounting

Remove the rim from the balancer，with the aid of the changer, refit the rim and tire with the reference mark coinciding. The OPT is finished. Press any button, it shows 

and goes back to the previous measurement state.

5.3.3.4 Exit OPT

During measurement，OPT can be stopped by pressing  and go back to the ，previous measurement state.

5.3.4 ALU Balance

In other measurement mode，follow 5.3.0.1 to enter ALU1 ~ ALU7 mode.

After standard dynamic measurement, going directly to ALU mode can skip ALU measurement and performing balancing operation.

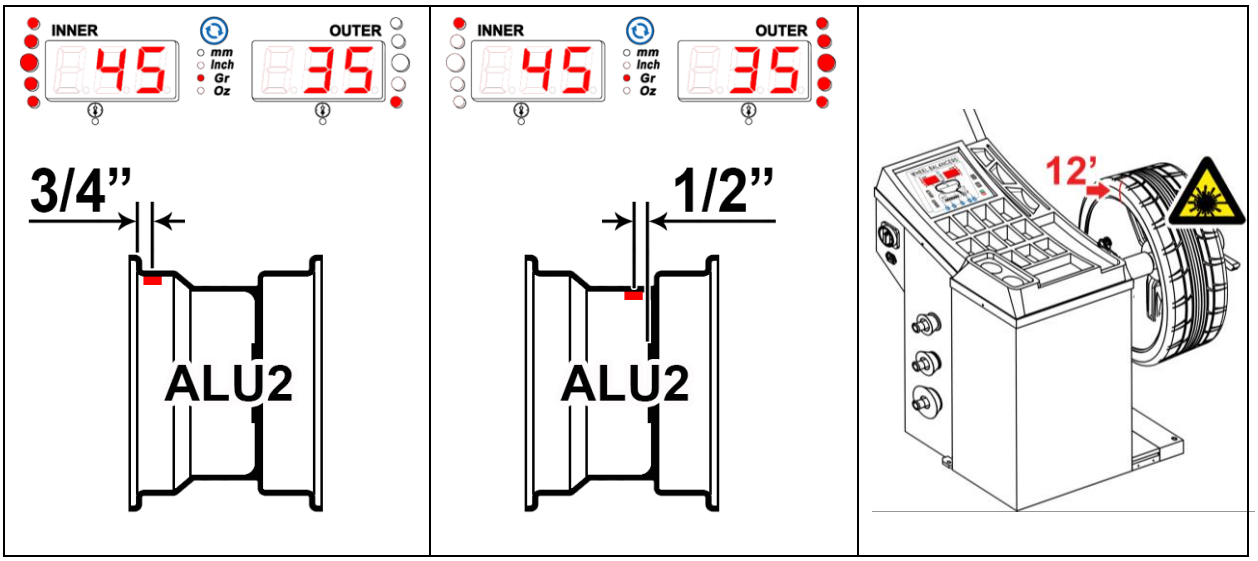
5.3.4.1 ALU Balance measurement

The process of ALU measurement is the same as standard dynamic measurement.Select Alu mode , follow Fig.23 to do ALU measurement.

5.3.4.2 ALU Balance operation

Take ALU2 mode as an example. Open the guard，follow the instructions in Fig. 27.

Where to stick the weight depends on the rim shape. Choose the longer distance



HW9610, HW9620 locates inner and outer unbalance position manually

Fig.27 ALU balance operation

surface to stick and stick or clamp the weight as shown in Fig.28, then ALU balance is completed.

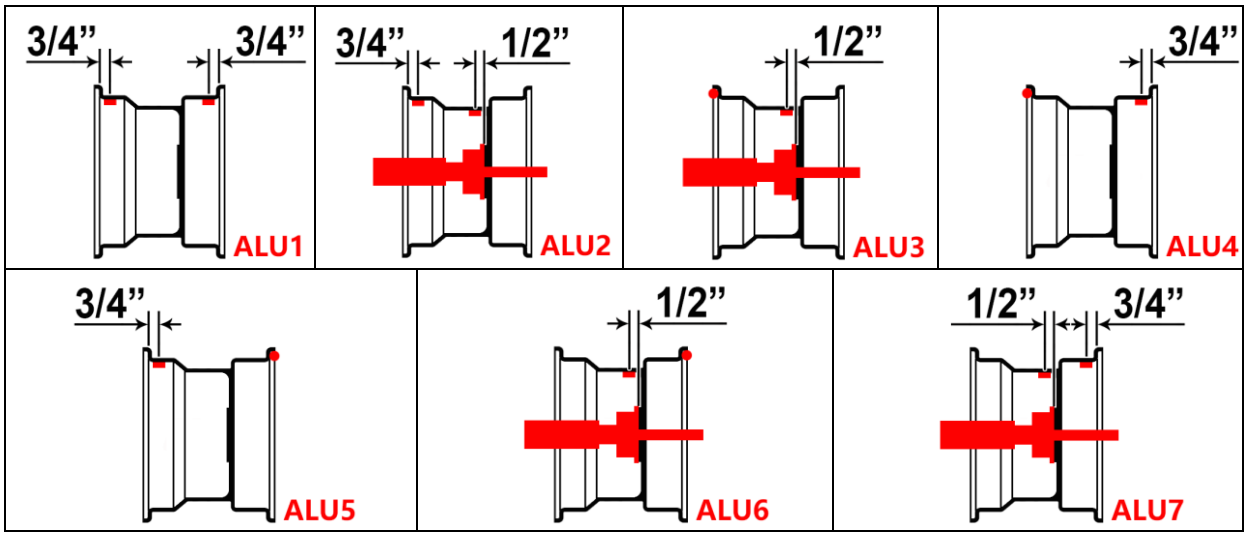


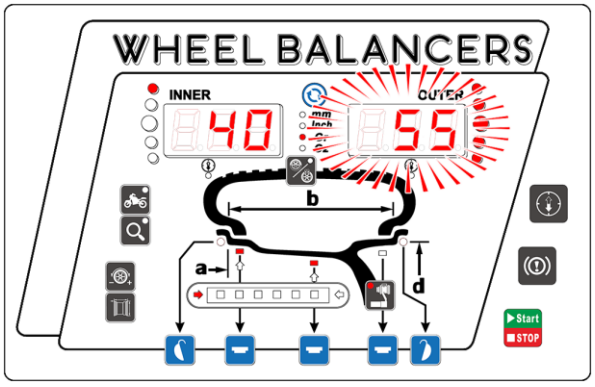
Fig.28 ALU1-7 sticking and clamping position

5.3.5 EALU Balance

EALU balance is a special feature of this balancer. It performs precise AlU balancing with the aid of automatic gauges. There are two modes: EALU1 and EALU2.

5.3.5.1 Enter EALU mode (Fig.17)

In other measurement mode, follow 5.3.0.2 to enter ALU1 ~ ALU7balanc mode and measure the unbalance point parameters.



5.3.5.2 EALU balance measurement

Same as other modes, close the guard to start measurement. When finished (for example EALU1 , Fig.29) , HW9610, HW9620 locate the unbalance position manually.

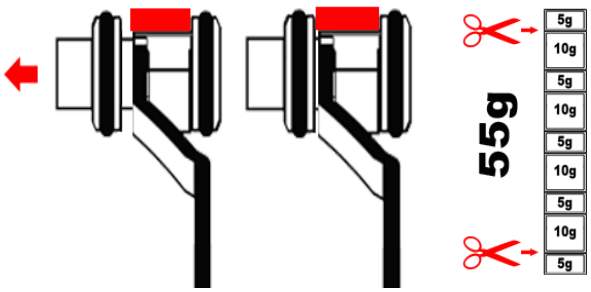


Fig. 29 EALU balance measurement

5.3.5.3 EALU sticking weight operation

5.3.5.3.1 EALU outer sticking weight

At the unbalance position(for example outside 55g), the outer reading flashes and meantime the arrow indicates pulling out the gauge. Take a 55g weight, remove the back cover from the it and clip it on the end of the gauge with the glue face up, (Fig.29)

Pull out the gauge, operate as shown in Fig.30, stick the weight on the indicated position.

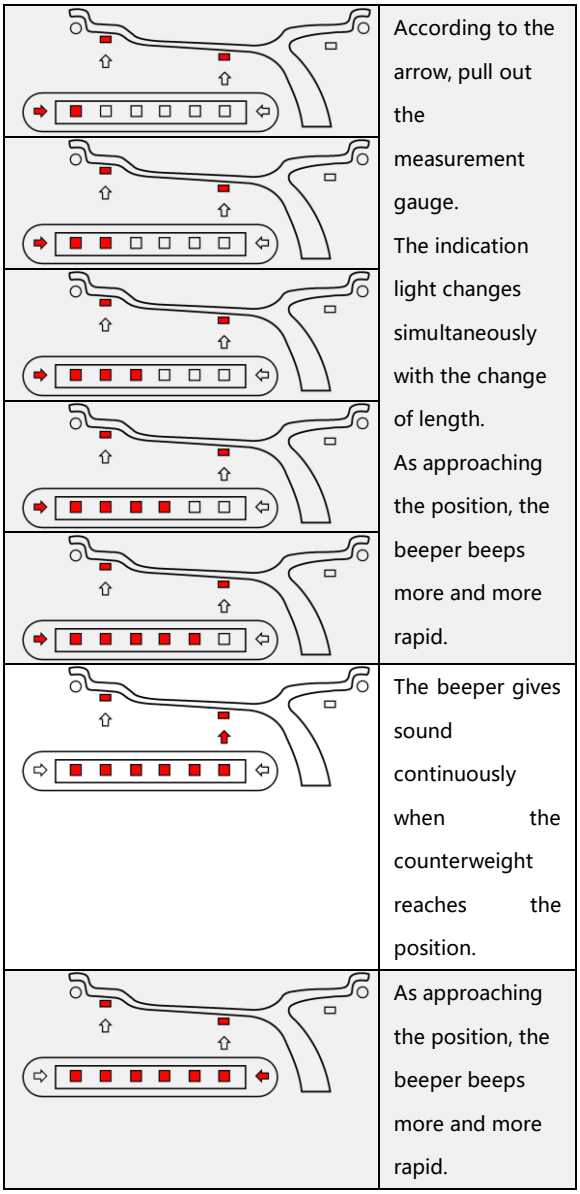


Fig. 30 EALU2 Audio and light indication of counterweight position

5.3.5.3.2 EALU inner sticking weight operation

HW9610, HW9620 locate the inner unbalance point manually.

In EALU1 balance mode, inner and outer balance operation are the same. See Fig.31.

In EALU2 balance mode, inside is clamping weight operation (see Fig.20). Clamp the weight shown in "INNER" on the position indicated by the laser.

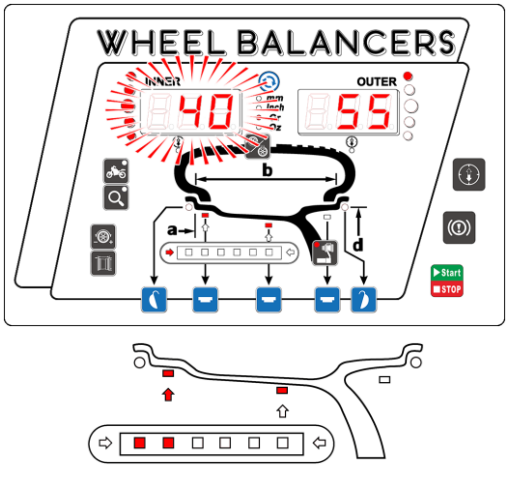


Fig. 31 EALU1 Inside Unbalance Point.

5.3.6 SPL Function

This function is to split an unbalance weight that needs to be stuck on the outside into 2 equivalent weights and hide them behind the two neighboring spokes so as not to affect the rim appearance. It has two modes,SPL1 andSPL2, which can be selected by the settings in chapter 6.8. In EALU mode, if there is unbalance outside, press  to enter SPL. During SPL operation press  can stop.

5.3.6.1 SPL1 mode

The first step in SPL1 mode is to select the number of spokes. (Fig.32)

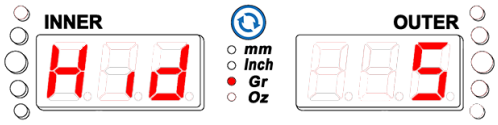


Fig. 32 SPL1 mode select the number spokes

5.3.6.1.1 Select the number of spokes

Hold on  button and at the same time rotate the wheel, the number of spokes (ranging 3-10) can be input fast.

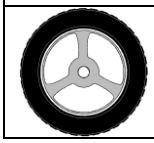
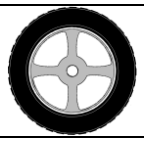
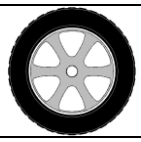
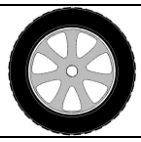
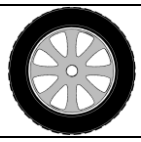
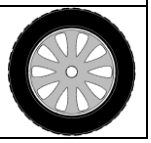
Hid=3	Hid=4	Hid=5	Hid=6	Hid=7	Hid=8	Hid=9	Hid=10
							

Fig.33 split according to the number of spokes

5.3.6.1.2 Confirm spoke phase

Take any spoke as the start one and rotate it to 12 o' clock, , press  to confirm the start point. Split function is finished.

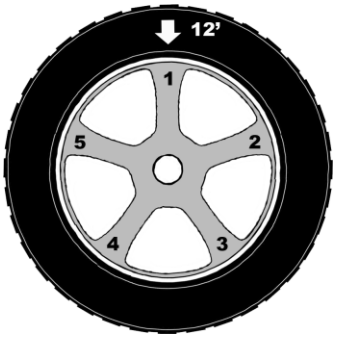


Fig.34 confirm the phase position

After split, two unbalance position will appear on the outside (the original unbalance position is just appear behind one spoke is an exception), both of the sticking position are

behind the spokes and the total weight and positions are equivalent to the original one weight. (Fig.35)

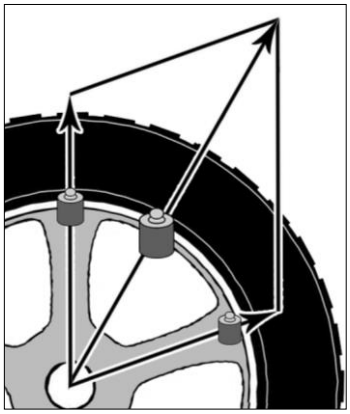


Fig. 35 vector split

SPL1 is convenient to do for regularly distributed spokes. However, there is a limitation for other structure spokes. For instance, in Fig. 36 spokes can only be split in this way while in Fig.37, neighboring spokes cannot be split.

Fig.36 SPL1

Fig.37 SPL2

5.3.6.2 SPL2 mode

SPL2 makes the unbalanced neighboring spokes splitting possible.。

5.3.6.2.1 Select the first spoke

Select Spoke1 near the unbalance position（Fig.38）, at 12o' clock, press  to confirm.

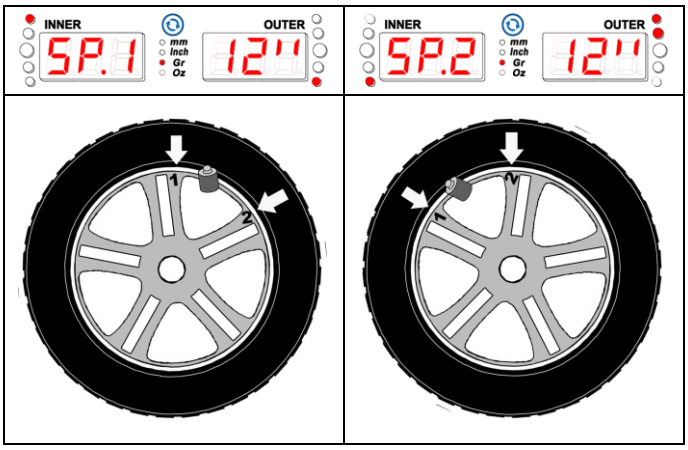


Fig. 38 SPL2 Split Operation

5.3.6.2.2 Select the second spoke

Select Spoke 2 near the unbalance position2（Fig.38）. At 12 o' clock press  to confirm, SPL2 split is finished

Same as SPL1, two unbalance position will appear after split and the sticking positions are behind the spokes. The weight and position of the two counterweights are equivalent to the original one weight.（Fig.35）

5.3.7 Motorcycle balance

Motorcycle balance consists of dynamic and static balance and needs to be performed with special accessories.

Refer to 5.3.0.3 to enter motorcycle balance mode (Fig.39)

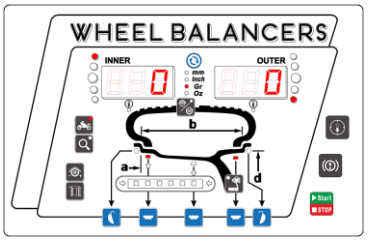


Fig.39 motorcycle balance mode

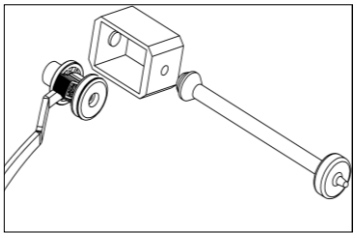


Fig. 40 extension gauge

As instructed in Fig.41, install the special clamps and extension gauge. (fig.40)

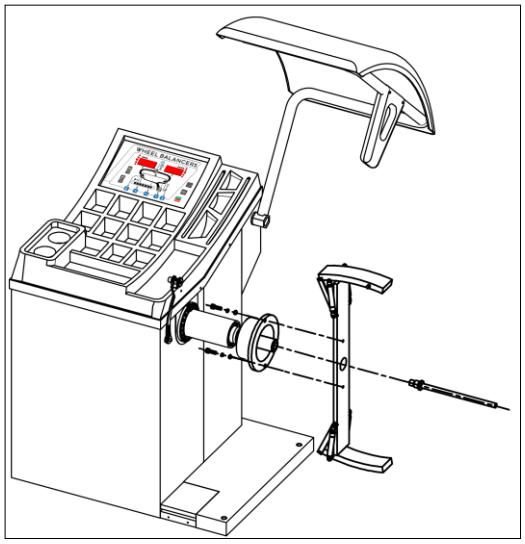


Fig. 41 motorcycle special clamp

5.3.7.1 Accessories tare weight reset operation

The balancer has a special accessories tare weight reset function, which means removing the tare weight of the accessories to ensure more precise measurement.

Hold on  and simultaneously press  to enter tare weight removing operation. (Fig.42) Close the guard to start tare weight removing operation. When measurement finished, both inner and outer display 0,0 . Tare weight removing is finished.

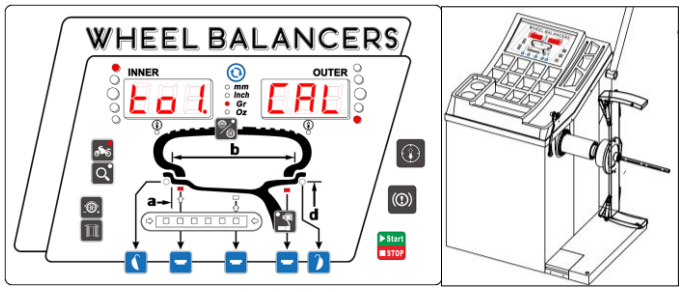


Fig. 42 Zero calibration of motorcycle kit

5.3.7.2 Motorcycle dynamic

balance operation

Mount the motorcycle wheel on the balancer as shown in Fig.43. then follow the steps of standard dynamic in Chapter 5.3.1.

5.3.7.3 Motorcycle static balance operation

Refer to Chapter 5.3.0.3 to enter motorcycle balance mode and follow the instructions of static balance operation in Chapter 5.3.2.

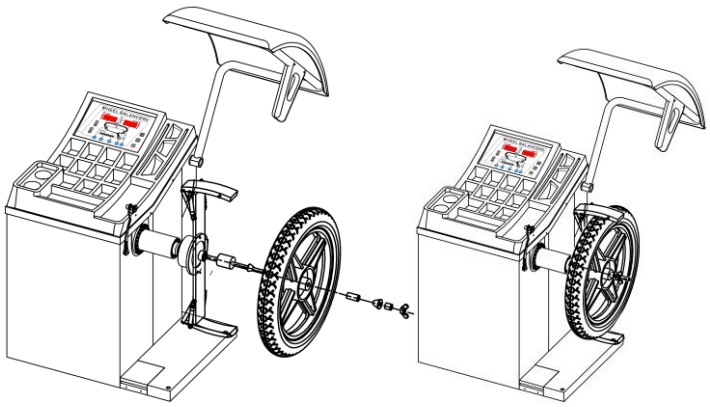


Fig. 43 motorcycle special clamp installation

5.3.8 Additional functions

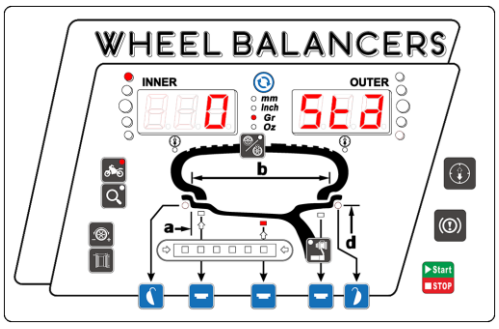
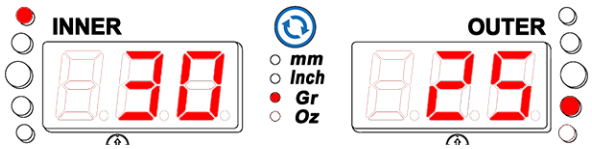


Fig. 44 motorcycle static measurement

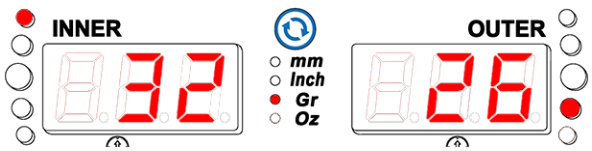
5.3.8.1 Balance value precise display function

During balancing operation, press and do not loosen the button, " INNER" and "OUTER" will display unbalance value. Release ,it will return to quantifying display screen.

If keeping displaying precise status, press and simultaneously.



quantifying display



precise display

Fig. 45 display precise value

5.3.8.2 Wheel cleaning mode

In sticking weight mode, 6 o’ clock position at the inner side of the wheel surface is more convenient to clean. press , the display window will show sticking position is at 12” or 6” (cleaning) position, (Fig. 46), and the laser clearly shows the exact position too.

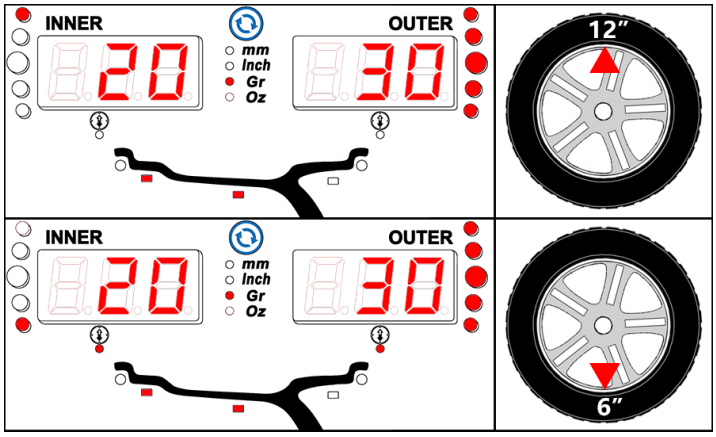


Fig.46 cleaning status

5.3.8.3 Lighting Function

The balancer has a function to light the weight sticking position and gauge measurement position.

In any measurement mode, switch on or off the lighting power by pressing and simultaneously to supply the temporary light. For protection, the light will be off automatically after 100 seconds.

5.3.8.4 Sleeping function

This function can be set as stated in Chapter 6.5.3. If not operated during the set sleeping time, the balancer will sleep automatically, meantime, system will turn off the main electricity powered parts and display sleeping state. Press any key or any operation will wake it up to work again.

5.3.8.5 Precise balance mode and weight saving balance mode

Weight-saving mode can be set in 6.3.3. In dynamic balance mode, for precise balance, when inner and outer unbalance value is <5g(the standard), the total static balance value is <5g too, it will show “0”, “0”. Otherwise it will enter static balance mode automatically to display the static unbalance value. Precise balance

mode can remove the residual unbalance.

Weight -saving balance mode can not only meet requirement of the precision but also save the weight at its best, thus gradually help save money.

5.3.8.6 Real time unit shift function

When doing unbalance measurement or inputting wheel parameter, gram/oz or mm/ inch can be shifted between at any time by pressing

6 System Setting

6.0 System settings navigation

As shown in Fig. 47.1 hold on , press and then release, press again to enter system setting menu. As shown in Fig.47.2, press "Ent" to enter the menu, press "+" "-" or hold on and rotate the wheel to edit or modify, press "Esc" to exit and save.

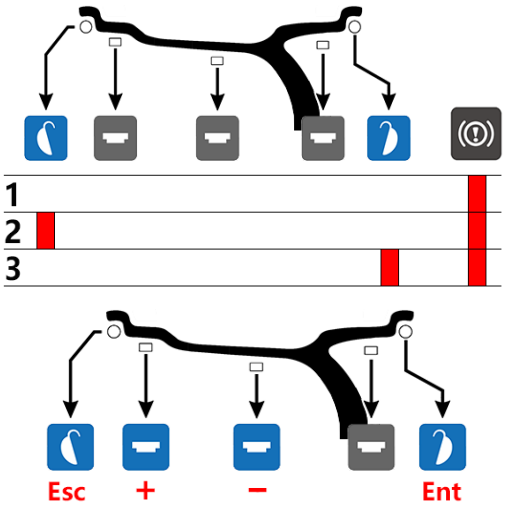


Fig.47 enter system setting and control button function

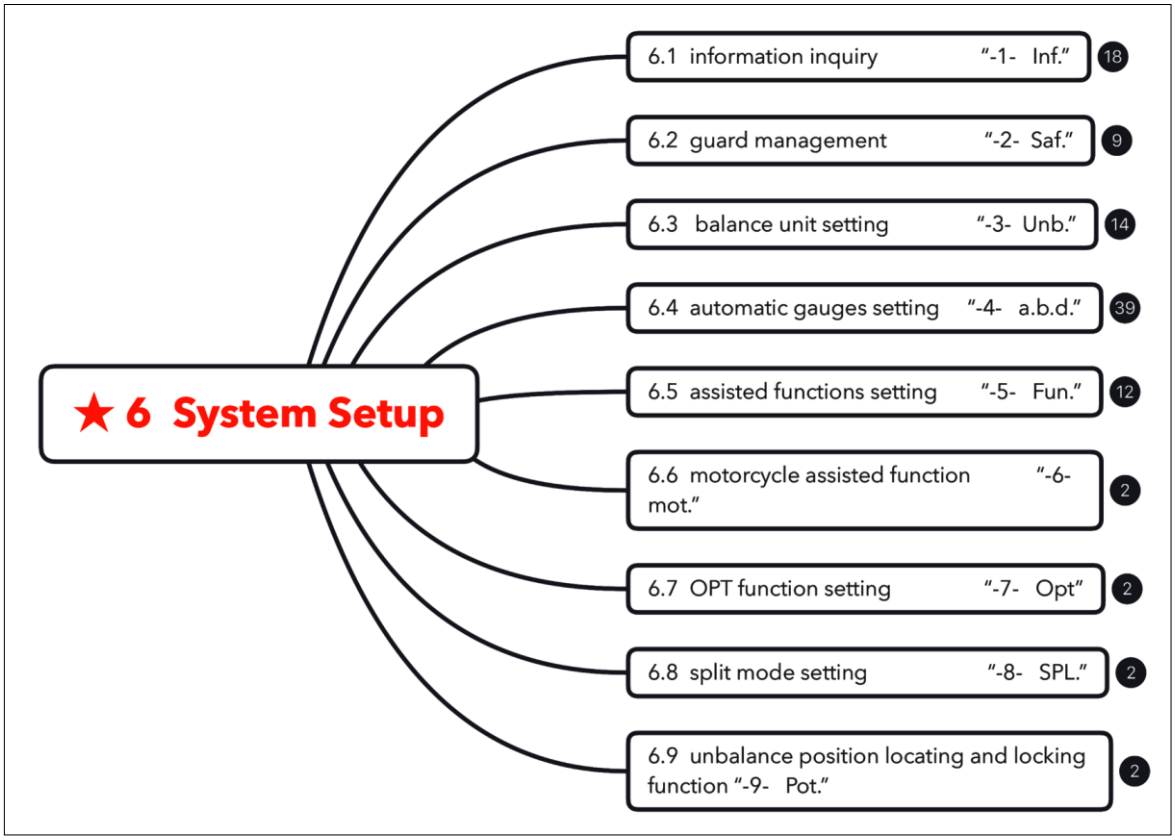


Fig.48 system setting

6.1 Information inquiry (Fig.49)

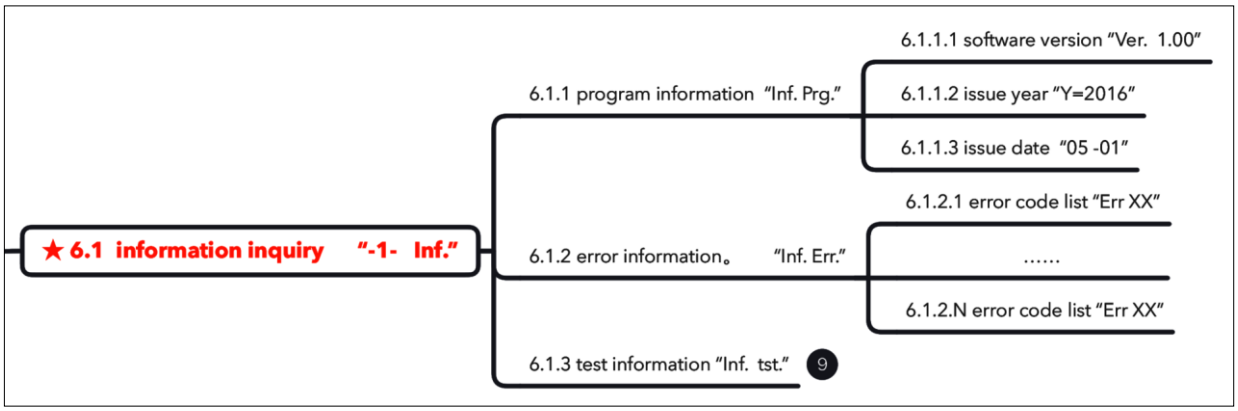


Fig.49 information inquiry

6.1.1 Program information

This setting provides version number and issue date.

6.1.2 Usage information

It provides the total working times of the equipment and the working times of each one to three users.

6.1.3 Error information

This setting is to check the system error through the error code. It is blank if no error exists.

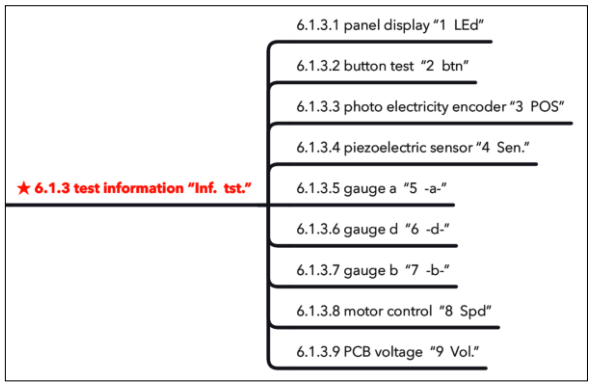


Fig. 50 test information

6.1.4 Test information (Fig.50)

It is a built in tool to diagnose the working state of each unit of the balancer.

6.1.4.1 Display panel test

Entering this setting, the digital tubes and LED indicator will be lit on one by one with the electric beeping.

6.1.4.2 Button test

Entering the setting, press panel buttons, turn on or off the guard switch and the pedal switch, the corresponding buttons and the switch numbers bt= X on the screen will be shown in the "INNER" and "OUTER" window。Press 

and  at the same time to exit button test.

6.1.4.3 Photo electricity encoder test

Entering this setting, rotate the wheel, then, "INNER" "OUTER" will display rotating angle POS = 0°~359°. P0, P1, P2 stand for the real time status of encoder. (Fig.51)

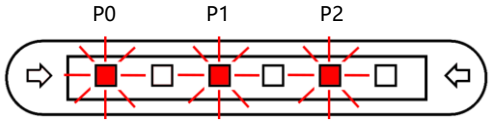


Fig. 51 phase test

6.1.4.4 Piezoelectric sensor test

Entering this setting, the

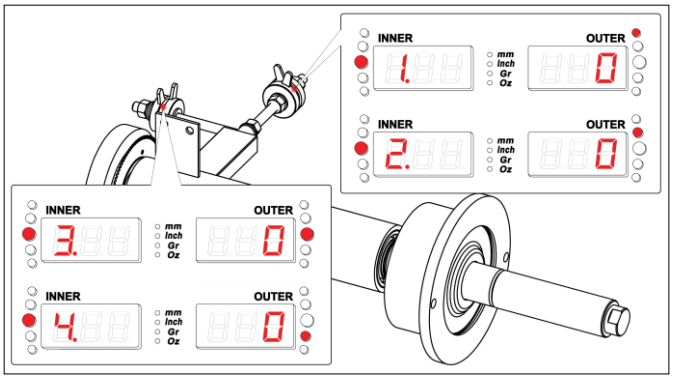
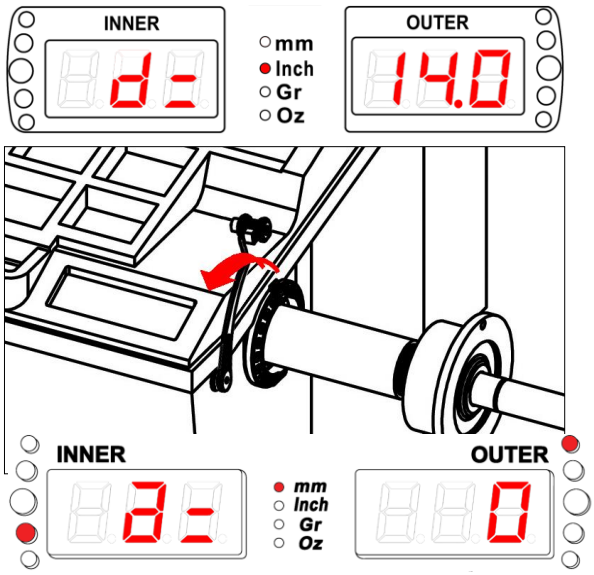


Fig. 52 piezoelectric sensor test

corresponding data of different sensors will be displayed on the screen (Fig.52). Data changes between -2048 +2048 with pressure . Static data is approximate 0. Each sensor has two pathes and converts by pressing "+" "-"



6.1.4.5 Gauge "a" test

Entering this setting, pull "a d", the length pulled out should be the same as the reading ranging a=0~350mm. (Fig.53)

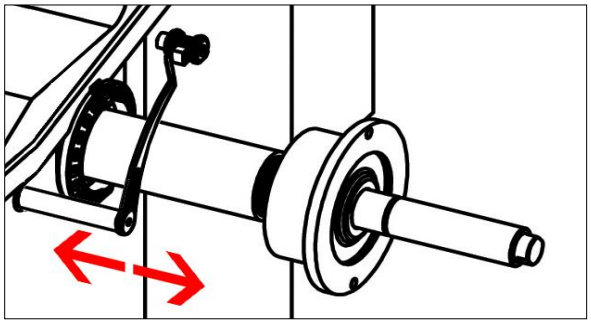


Fig.53 Gauge a test

Press to change the length unit.

6.1.4.6 Gauge "d" test

Entering this setting, raising the gauge "a d", the corresponding rim diameter will be displayed (Fig.54 d=14.0 Inch)

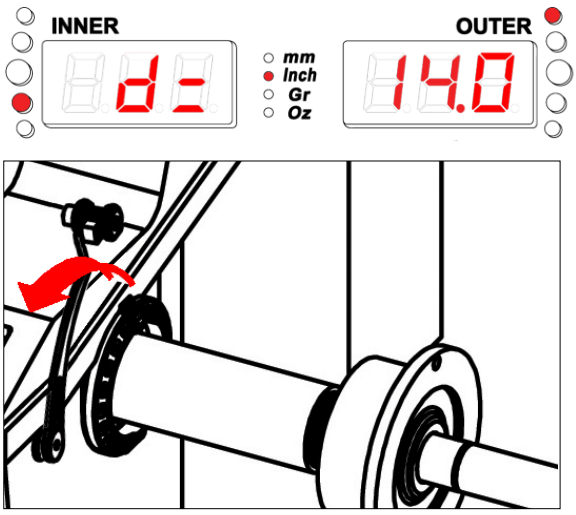


Fig.54 Gauge d test

Press to shift between diameter and angle.

Press to change the diameter unit.

6.1.4.7 Gauge "b" test (only for HW9620)

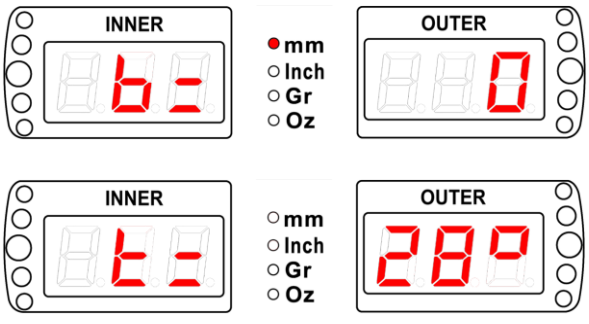


Fig.55 gauge b test

Entering this setting, put the hand or an object near the ultrasonic gauge B,

the reading on the screen will change with the distance between the object and the ultrasonic probe. (Fig.55)

Table 5 PCB voltage

Name	+12V	VCC	VDD	AVCC	AVSS	-12V
Code	"V12"	"Vcc"	"Vdd"	"AVc"	"V5"	"V="
Scope	10.5~13V	4.7~5.3V	3.0~3.4V	4.7~5.3V	-5.3~-4.7V	-13~-10.5V

Press  to shift to the temperature compensation test state. The temperature is the room temperature. Press  to change the width unit.

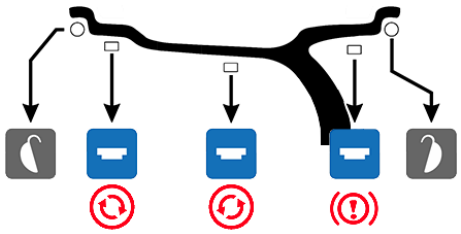


Fig.56 button functions

6.1.4.8 Motor control

Entering this setting, it shows as Fig.57, Control the motor by pressing and not loosening the corresponding button shown in Fig.56, During rotation "INNER" and "OUTER" windows display the balancing shaft real time speed in the unit r/min.

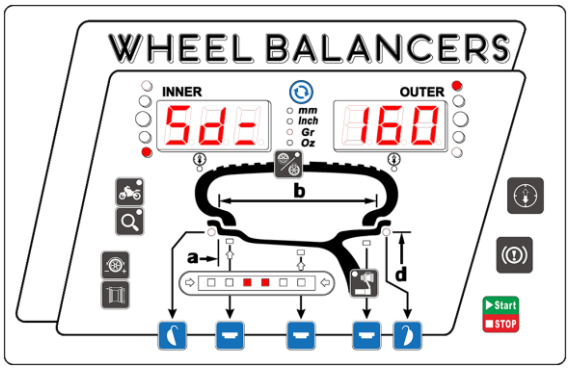


Fig.57 motor control test

6.1.4.9 PCB voltage test

Entering this setting, the voltage of all key nodes on the PCB will be displayed. Refer to Table 5 for the exact voltage range.

6.2 Wheel Guard Management

6.2.1 Guard effectiveness setting

The guard must be set effective to protect the operator according to different local laws.

When set effective, the measurement can be started only when guard is closed. If the guard is opened during measurement, the balancer will be braked and stop automatically.

When set ineffective, the items in 6.2.2 and 6.2.3 will not appear. Whether the guard is installed or not will have no influence on the balancer work.

6.2.2 Guard control effectiveness setting

When set effective, close the guard and at the same time start up guard control to start balance measurement.

6.2.3 Guard pneumatic switch setting (optional)

When installing this accessory, set it effective. Press 

or  , the guard will automatically close or open. Wheel guard can be closed manually too.

6.3 Unit setting

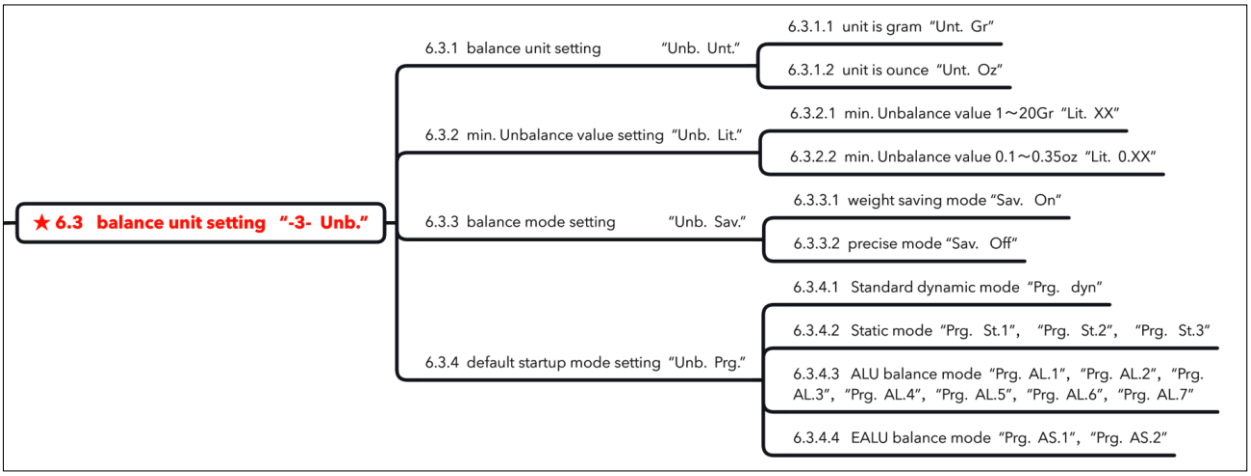


Fig.59 balance unit setting

6.3.1 Default balance unit

Gram or ounce.

6.3.2 Minimum unbalance value setting

The range is 0~50 grams or 0~1.75 oz. Any value less than this is invisible.

6.3.3 Balance mode setting

In this setting “On” means weight-saving mode; “Off” means precise mode.

6.3.4 Default startup mode setting

The factory default startup mode is standard dynamic balance. (Table 6)

Table 6 starup mode setting

	mode code						
Standard dynamic balance	“dyn.”						
Static balance 1~3	“St.1”	“St.2”	“St.3”				
ALU balance 1~7	“AL.1”	“AL.2”	“A.3”	“AL.4”	“AL.5”	“AL.6”	“AL.7”
EALU balance 1~2	“EA.1”	“EA.2”					

6.4 Automatic gauge setting (Fig.60)

Fig.60 automatic gauge setting

6.4.1 Automatic gauge “a” unit

mm/Inch.

6.4.2 Automatic gauge “a” resolution

Metric system:1mm/5mm

British system：0.1”/0.2”

6.4.3 Automatic gauge “a” startup default value

The range of this value is 10~350mm. The default value is 115mm.

6.4.4 Automatic gauge “d” unit

mm/Inch。

6.4.5 Automatic gauge “d” resolution

Metric system：1mm/5mm British system：0.1Inch/0.5Inch

6.4.6 Automatic gauge d startup default value

The range of this value is 254~813mm（10 Inch~ 32 Inch）. The default value is 572mm（22.5 Inch）.

6.4.7 Automatic gauge “b” unit

mm/Inch.

6.4.8 Automatic gauge “b” resolution

Metric system：1mm/5mm British system：0.1Inch/0.5Inch

6.4.9 Automatic gauge “b” startup default value

The range of this value is 38~636mm（1.5 Inch~ 25 Inch）. The default value is 209mm（8.25 Inch）.

6.4.10 Automatic gauge a&d effectiveness setting

Automatic gauge a and d are assembled together. This setting can turn on or off the a&d at the same time. This function is used to turn it off when the automatic gauge has error and then input the a&d values manually.

6.4.11 Automatic gauge a&d lighting control setting

This setting is used to turn on or off the light effectiveness.

6.4.12 Automatic gauge b effectiveness setting（only for HW9620）

This setting is to turn on or off the gauge b effectiveness.

6.5 Assisted functions setting（ Fig.61）

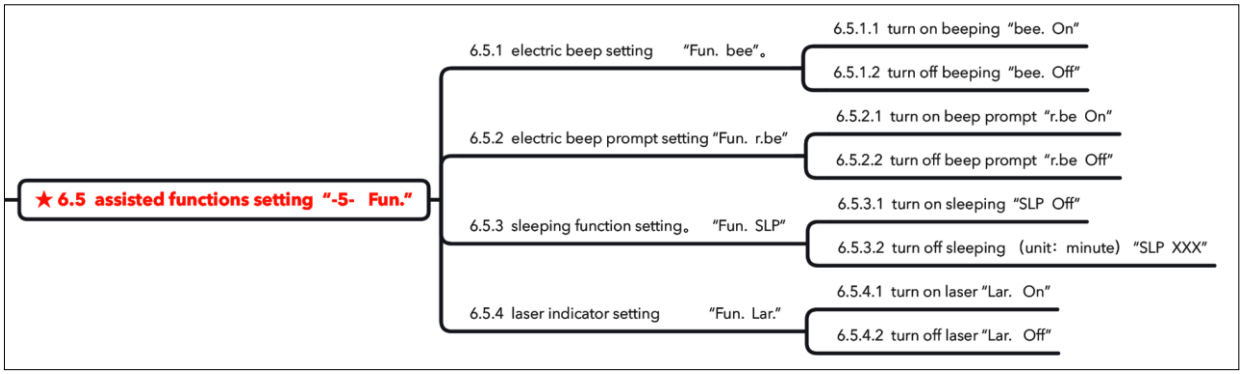


Fig. 61 assisted functions setting

6.5.1 Electric beep setting

This setting is to turn on or turn off electric beep.

6.5.2 Electric beep sound setting

Turn on/off automatic beep while sticking weight.

6.5.3 Sleeping function

Entering the setting, set sleeping off or on or set sleeping time with the roller.（5min，10min，15min，20min，25min，30min，40min，50min，60min，90min，120min）.

6.5.4 Laser indicator function setting

This function is to turn off or on weight clamping or sticking position laser indicator.

6.6 Motorcycle assisted function

This function is to turn off /on motorcycle accessories balance function.

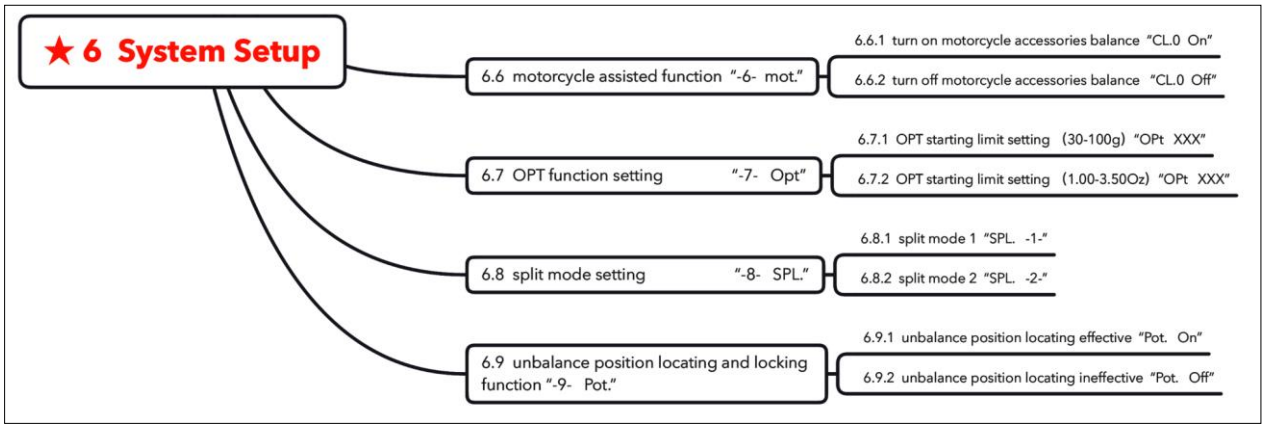


Fig.62 functions setting

6.7 Optimization (OPT) function setting

This function is to set the minimum value for doing OPT. The range is 30gram~100gram (1.00~3.50OZ) . When the maximum static balance value is over this value, OPT can be done.

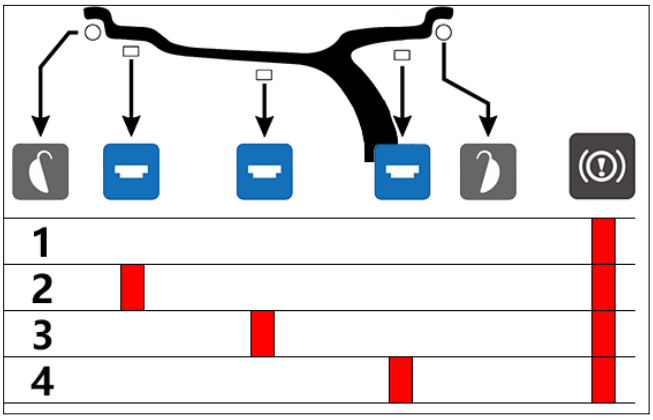
6.8 Split mode setting

The current split modes can be set as "SPL -1-" or "SPL -2-" .

7 Calibration Program

As shown in Fig.63.1 , hold on , and press in turn from the left to the right to enter calibration program, press "+-" to select the corresponding items , press "Ent" to enter.

See Fig.47 for button functions.



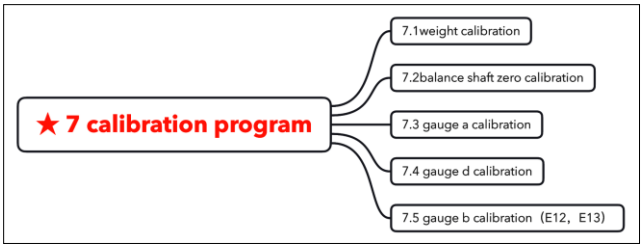


Fig.63 calibration program

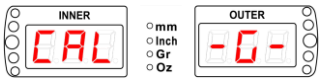
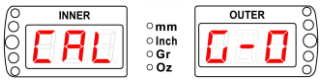
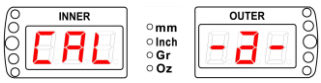
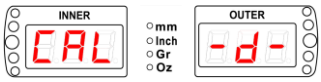
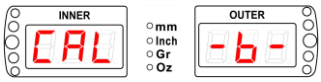
7.0 Calibration Program (Fig.63.2)

7.1Weight Calibration

7.1.0 Calibration tool

A wheel with steel rim (14~17inch suggested) and a 100g (3.50oz) standard weight supplied with the balancer. Entering weight calibration, follow the 3 steps in 7.1.1 ~ 7.1.3. Firstly, zero calibration.

Table 7 calibration program content

Item	Code	Content
☻weight calibration		Calibrate the balance value with standard test weight
☻balance shaft zero calibration		Calibrate the unbalance weight of shaft
☻ gauge a calibration		Gauge a zero calibration
☻ gauge d calibration		Gauge d zero calibration and sticking position calibration
☻gauge b calibration		Gauge b zero calibration

7.1.1 Zero calibration

Mount the wheel on the balancer, close the guard and do zero calibration measurement. After measurement, it will go to outside standard test weight calibration automatically.

7.1.2 Outer standard test weight calibration

As shown in Fig. 64.2, clamp a 100 gram standard test weight at 12 o' clock, close the guard to start calibration measurement. After measurement, it will

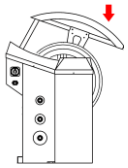
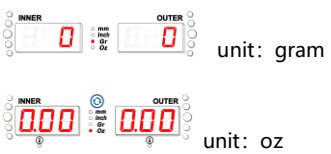
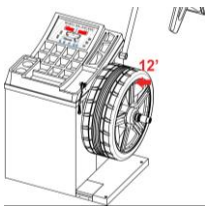
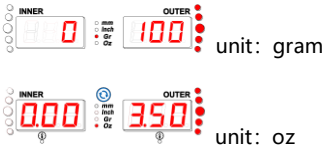
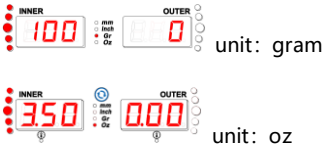
step	operation	display
0 shaft calibration		 unit: gram unit: oz
Outer standard weight calibration		 unit: gram unit: oz
Inner standard weight calibration		 unit: gram unit: oz

Fig.64 weight calibration program

go directly to inside standard test weight calibration

7.1.3 Inner standard test weight calibration

Remove the outside standard test weight from outside (Fig.64.3), clamp it at 12 o' clock inside, close the guard to do calibration measurement. After measurement, weight calibration is finished and system returns to 7.0.

7.2 Balance shaft zero calibration

7.2.0 Calibration tool

A wheel with steel rim（14~17 inch suggested）. Two steps are as below.

7.2.1 Step 1 (Fig.65)

Mount the wheel and mark the inner rim and shaft. Close the guard to start shaft calibration measurement. After measurement loosen the wheel and turn the corresponding position of wheel and shaft by 180 degrees ,then fix it again.

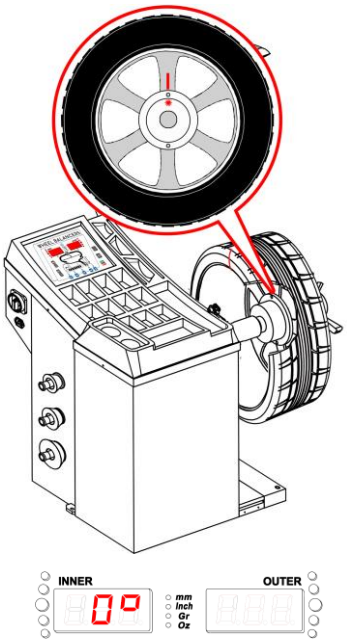


Fig.65 shaft calibration step 1

7.2.2 Step 2 (Fig.66)

Close the guard to start calibration. After measurement, the calibration is completed and system returns to 7.0.

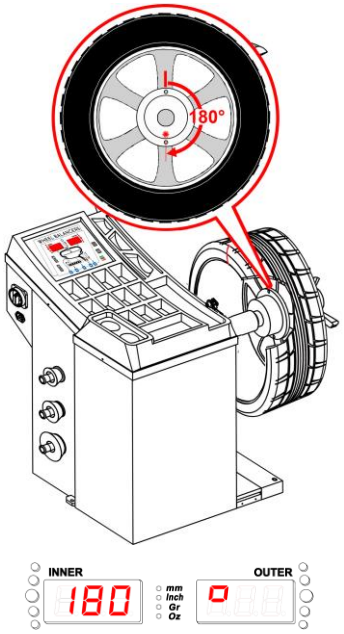


Fig.66 shaft calibration step2

7.3 Gauge “a” calibration

7.3.0 Calibration tool

XSTD-02 ,a calibration caliper equipped with the machine（Fig.67）

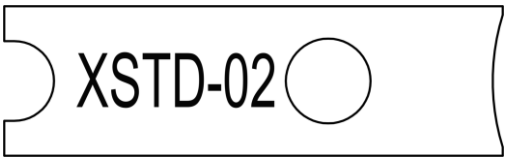


Fig. 67 XSTD-02 caliper

Entering gauge a calibration program, firstly return to zero (Fig.68.1) , press “Ent” button , it shows “CL.a 100” .Put the calibration caliper between the gauge and the balancer cabinet (68.2) and then press “Ent” again, it shows “a= XXX” which is changing with the gauge pulling (Fig.68.3). Return the gauge to zero and finish gauge a calibration and system goes back to 7.0..

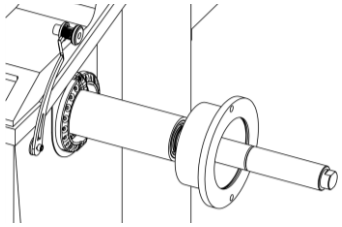
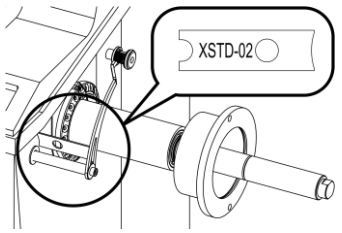
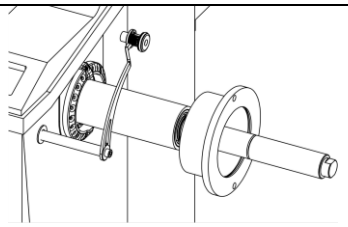
step	display	operation
1		
2		
3		

Fig.68 Gauge a calibration

7.4 Gauge d calibration

7.4.0 Calibration tool

XSTD-02, a calibration caliper equipped with the machine.（Fig.67）.

7.4.1 Gauge d calibration Step1 (Fig. 69.1)

Entering d calibration program, firstly return the gauge to zero (Fig.69.1), it shows "CL.d d0".

7.4.2 Gauge d calibration Step 2 (Fig.69.2)

Press "Ent", it shows "CL.d d1". Put the calibration caliper between the gauge and the balance shaft and then press "Ent", it shows "d= X.XX" which is changing with the gauge pulling.

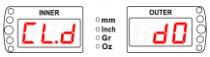
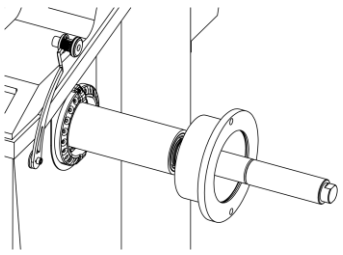
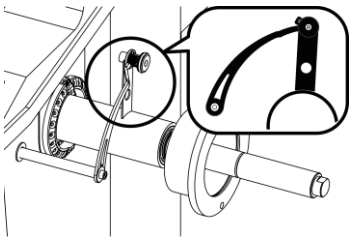
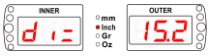
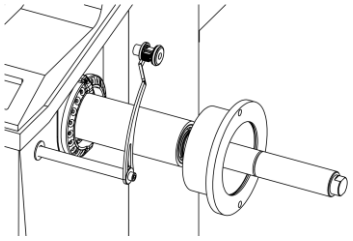
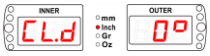
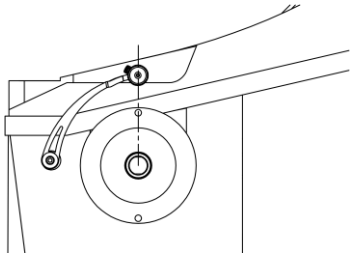
step	display	operation
1		
2		
		
3		

Fig.69 Gauge d calibration

7.4.3 Gauge d calibration Step3 (Fig.69.3)

Press "Ent", laser indicator lights up. Make the gauge head at the same line with the laser indicator and then press "Ent" again, gauge d calibration is finished and system goes back to 7.0.

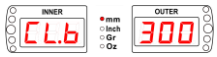
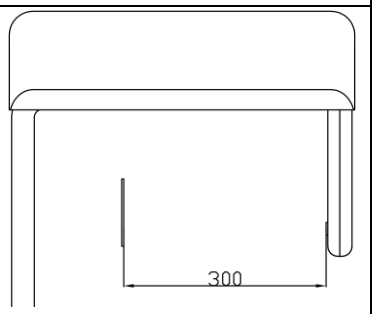
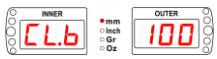
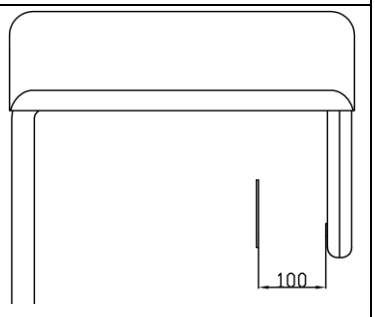
step	display	operation
1		
2		

Fig. 70 Gauge b calibration

7.5 Gauge b calibration

(HW9620)

Entering this setting, put a dam board at the place 300mmb from gauge b (Fig.70.1), press "Ent";

Move the dam board to the place 100mm from gauge b (Fig.70.2), press "Ent", gauge b calibration is finished and system goes back to 7.0.

8 Troubleshooting

8.1 Common code description

Table 8 common code description

No.	Code	Meaning	No.	Code	Meaning
1	"Off Off"	Press it to stop in case of emergency	2	"Go Go"	Measuring…
3	"--- --|"	The automatic shaft is dismounting the wheel	4	"|-- ---"	The automatic shaft is mounting the wheel
5	" - - "	Sleeping status	6	"a= xxx"	Input a
7	"d= xxx"	Input d	8	"b= xxx"	Input b
9	"a1= xxx"	Input a1	10	"a2= xxx"	Input a2
11	"d1= xxx"	Input d1	12	"d2= xxx"	Input d2
13	" 6" "	Cleaning position at 6 o' clock	14	" 12" "	Operate at 12 o' clock position
15	"CAL -G-"	Weight calibration	16	"CAL G-0"	Zero shaft calibration
17	"CAL -a-"	Gauge a calibration	18	"CL.a a0"	Gauge a 0 position
19	"CL.a 100"	Gauge a 100mm position	20	"CAL -d-"	Gauge d calibration
21	"CL.d d0"	Gauge d 0 position	22	"CL.d d1"	Gauge d at1 position
23	"CL.d 0°"	Gauge d head is at 0 position	24	"CAL -b-"	Gauge b calibration
25	"CL.b xxx"	Gauge b xxx mm position	26	"Spd xxx"	Speed xxx r/min
27	" Opt "	Optimizing operation	28	" SPL "	Split operation
29	" Hid "	The number of spokes in SPL 1mode	30	" SP.1 "	The first spoke in SPL2 mode
31	" SP.2 "	The 2nd spoke in Split Mode	32	" tol. CAL "	Zero calibration of motorcycle kit
33	" dyn bal "	Dynamic balancing	34	"St.1" ~ "St. 3"	Static balancing 1~ Static balancing 3
35	"ALU -1-" ~ "ALU -7-"	ALU Balancing mode 1~7	36	"AL.S -1-" ~ "AL.S -2-"	EALU mode 1~2

8.2 Error code description and solution

Table 9 error code and solution

NO.	code	error	solution
1	"Err 00"	Lift car doesn' t return to place.	Put down the lift car on the ground.
2	"Err 01"	Wheel guard is not closed when pressing startup button.	Close the guard. If error still exists, it means guard switch goes wrong.Refer to chapter6.2.1, turn off the guard effective. After replacing the guard switch, turn it on again.
3	"Err 02"	Spinning speed does not reach the standard.	Refer to 6.1.3.8 节 to check motor spinning; Check power board if motor is disabled; Motor is enabled but shaft does not spin, check whether the belt is off or break; If spinning normally but speed is not high, check the optical electricity encoder; If speed display is normal but by eye less than 150r/min, check the power supply is 60Hz or 50Hz. Contact the manufacturer for correctness.
4	"Err 10"	Gauge A disabled	Power off and restart the machine. If error still exists, refer to 6.1.3.5 to check a. If a is abnormal, contact service people; turn off ad function as instructed in 6.4.10 and input a value manually before service.
5	"Err 11"	Gauge A has not been calibrated	Refer to 7.3 to calibrate it.
6	"Err 12"	Gauge A has not return to zero.	Pull back a to the zero.
7	"Err 15"	Gauge D disabled	Power off and restart the machine. If error still exists, refer to 6.1.3.6 to check d. If d is abnormal, contact service people; turn off ad function as instructed in 6.4.10 and input ad value manually before service.
8	"Err 16"	Gauge D has not been calibrated.	Refer to 7.4 to do calibration.
9	"Err 20"	Gauge B disabled	Power off and restart the machine. If error still exists, refer to6.1.3.7to check b. If b is abnormal, check whether the connection is off or not (Fig.7). Contact service if not dealt with properly; turn off b function as instructed in 6.4.12 and input b value manually before service.
10	"Err 21"	Gauge B has not been calibrated.	Refer to 7.5 to do calibration.
11	"Err CAL"	Factory settings has not been done.	Contact the manufacturer for instruction.
12	"Err Dat"	Gauge calibration process is wrong.	It means wrong operation during the calibration. Refer to Chapter 7 for correct calibration operation.
13	" Err SYS "	System error	Contact the after sales service.

9 Maintenance

9.1 Electric parts

Fuses: FU and FS1，FS2 in the power board.

If the motor or the system is blocked, fuses are easy to burn. If this happens, the balancer will not display anything or work when turned on. The solution is repairing the block and replacing the fuses.

9.2 Air supply maintenance

Drain the water in the oil-water separator.

Add the oil to the oil cup regularly.

Check the air hose every two months and make sure there is no leakage.

9.3 Belt replacement

Replace the belt after the unit running 100000 times.

9.4 Taper sleeve and quick change nut

It is recommended that the taper sleeve should be replaced when the wear between sleeve and shaft is over 0.1mm, the surface of the taper is grooved or the unit has been used over 20000 times.

10 Parts list

No.	Code	Name	Remark
1	01.21.50.01	Taper sleeve 1	
2	01.21.50.02	Taper sleeve 2	
3	01.21.50.03	Taper sleeve 3	
4	01.21.50.04	Taper sleeve 4	
5	01.21.50.05	Quick change nut	
6	Q.1.1.1	Oil-water separator	
7	01.23.07.01	Belt	
8	Y.1.19.1.8	Fuses	

11 Appendix

11.1 Electrical Principle

11.1.1 HW9610 principle

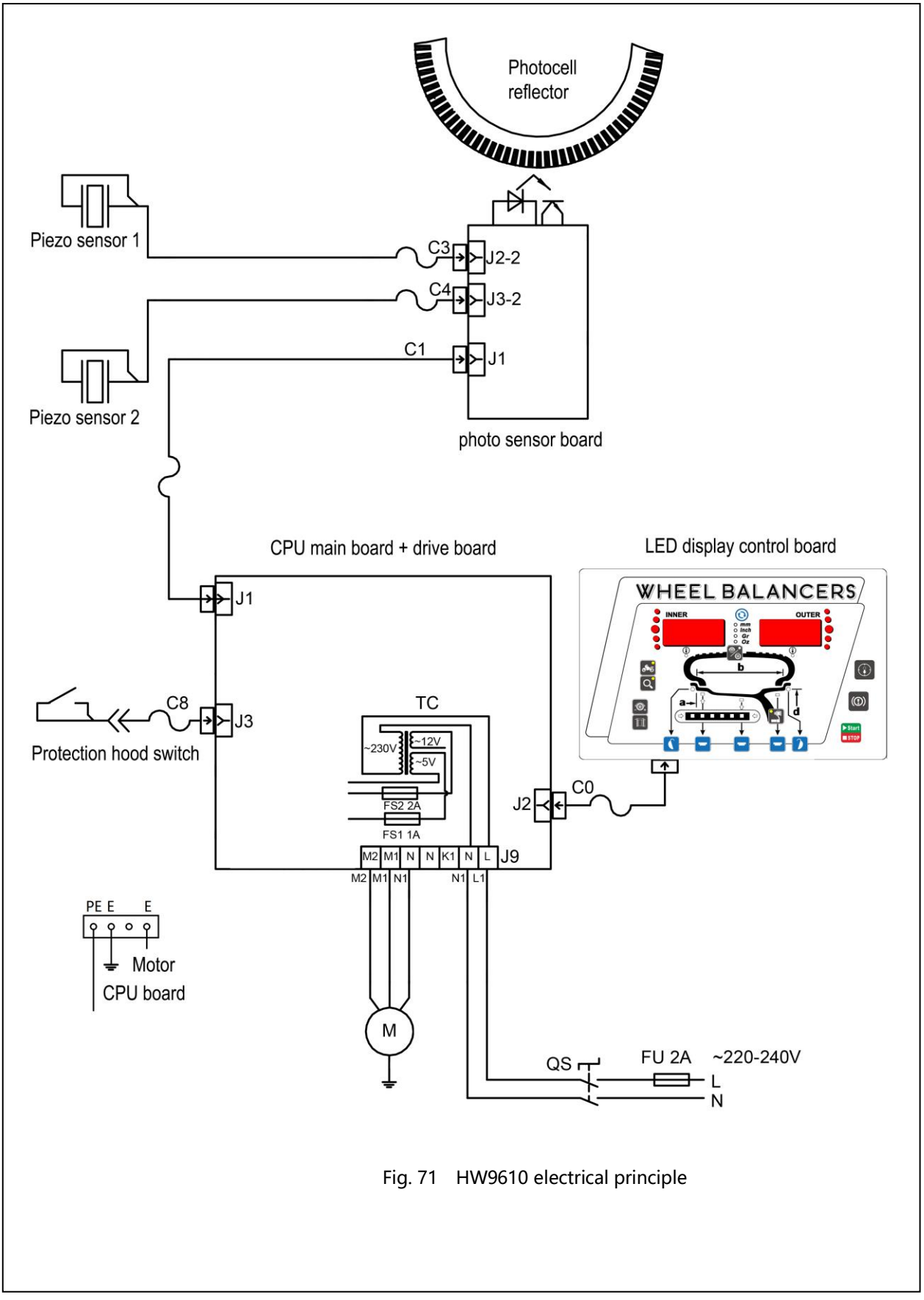


Fig. 71 HW9610 electrical principle

11.1.2 HW9620 principle

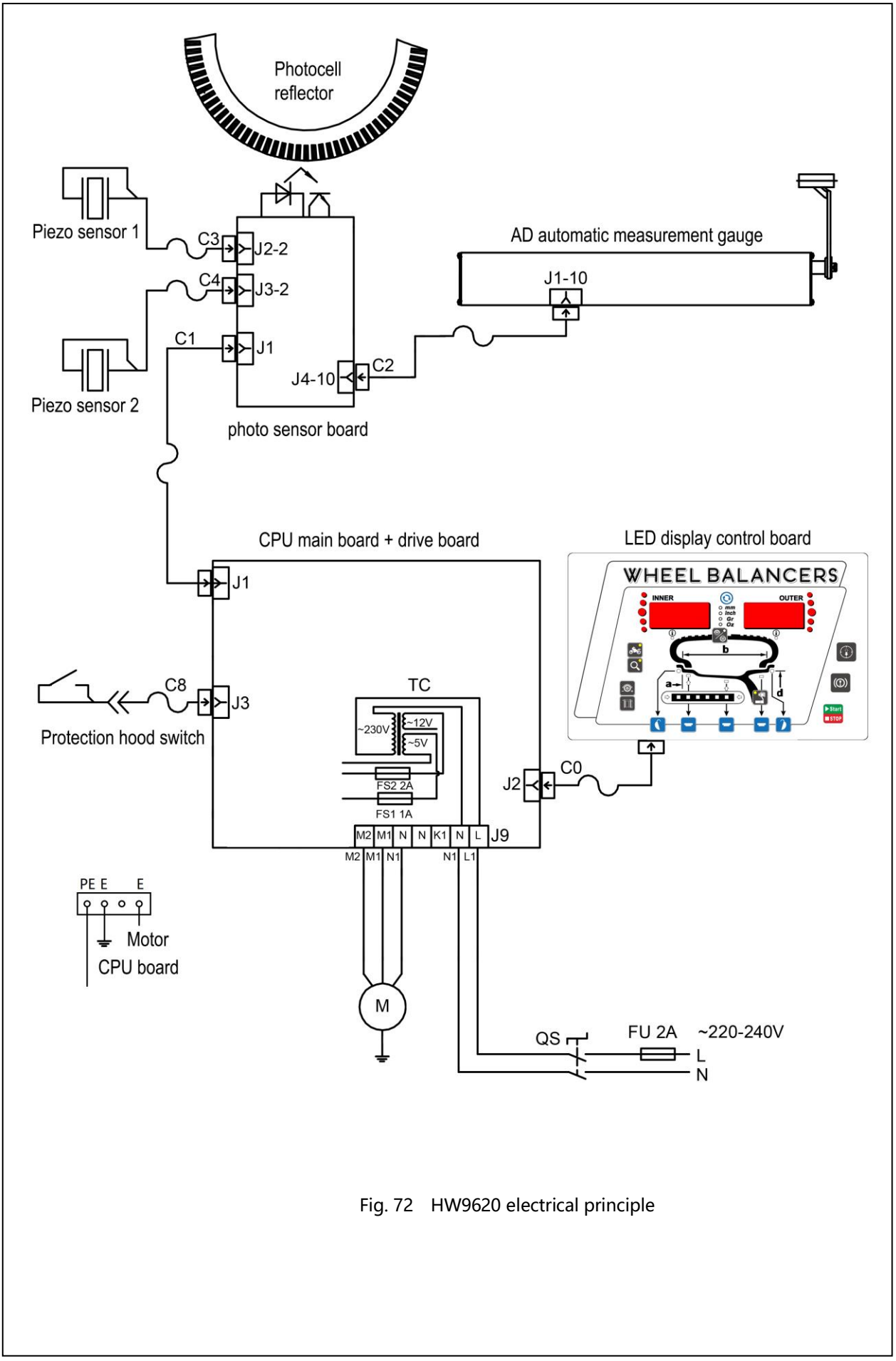


Fig. 72 HW9620 electrical principle