



# Accurate digital levelling device

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# LVM-01

## Operation manual

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Thank you for using **BIG** Level Master (LVM-01).  
Please handle it as a measuring instrument and utilize it for long time.  
Please be sure to read this manual before using the device and also keep it in a location where all the operators may consult it in case of necessity.

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# 1. SPECIFICATIONS

Specifications	
Model	LVM-01
Minimum readable value	0.01mm/1m
Power supply	Alkaline dry battery: LR03 (AAA) x4
Auto-power OFF	The power turns OFF automatically after 30 minutes.
Operating temperature	0°C ~ 40°C (Recommended temperature 20°C ±5°C)
Battery life	50 continuous hours
Dimensions	φ 109 x H56
Weight	995g
Included items	Alkaline dry battery: LR03 (AAA) x4, warranty Operation manual and inspection report card

### ● LED indicators

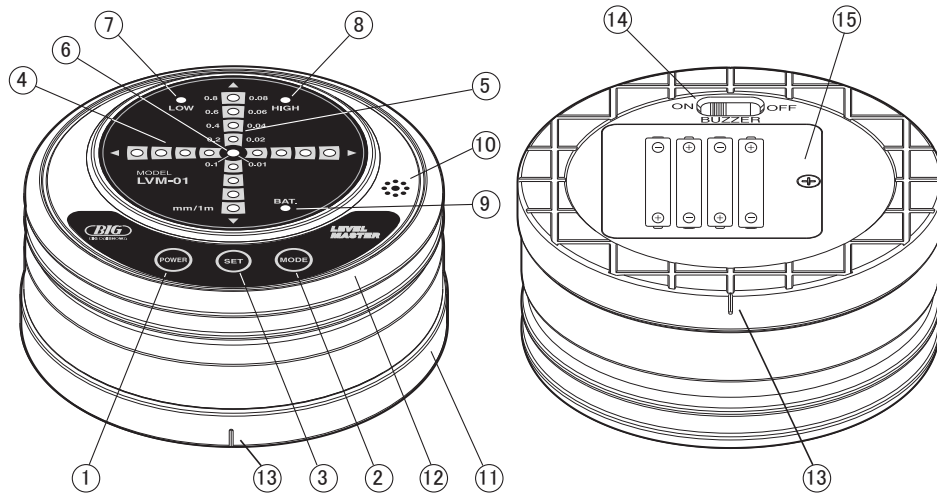
#### LOW mode

- Blinking LED (red) : Inclination exceeding 0.8mm/1m
- Continuous LED (red) : Inclination of 0.8mm/1m or less
- Continuous LED (orange) : Inclination of 0.6mm/1m or less
- Continuous LED (yellow) : Inclination of 0.4mm/1m or less
- Continuous LED (green) : Inclination of 0.2mm/1m or less
- Continuous LED (blue) : Inclination of 0.1mm/1m or less

#### HIGH mode

- Blinking LED (red) : Inclination exceeding 0.08mm/1m
- Continuous LED (red) : Inclination of 0.08mm/1m or less
- Continuous LED (orange) : Inclination of 0.06mm/1m or less
- Continuous LED (yellow) : Inclination of 0.04mm or less
- Continuous LED (green) : Inclination of 0.02mm/1m or less
- Continuous LED (blue) : Inclination of 0.01mm/1m or less

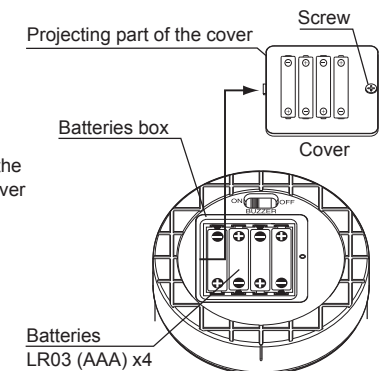
# 2. NAMES OF PARTS AND FUNCTIONS



- ①POWER switch **ON↔OFF**  
Push the POWER switch to turn ON the power and the LED level indicators. It is now possible to execute the levelling operation.
- ②MODE switch **HIGH↔LOW**  
Push the MODE switch to change the precision level. The "HIGH" mode is selected when turning ON the device.
- ③SET switch  
This switch is used to execute the zeroadjustment.
- ④LED level indicators (X-axis)  
They indicate the level status.  
The inclination is between 0.8mm/1m and 0.1mm/1m in case of the **LOW** mode.  
The inclination is between 0.08mm/1m and 0.01mm/1m in case of the **HIGH** mode.
- ⑤LED level indicators (Y-axis)  
They indicate the level status.  
The inclination is between 0.8mm/1m and 0.1mm/1m in case of the **LOW** mode.  
The inclination is between 0.08mm/1m and 0.01mm/1m in case of the **HIGH** mode.
- ⑥LED level indicator (Central position)  
The LED (blue) turns on when the level status reaches the central position.  
The inclination is 0.1mm/1m or less in case of the **LOW** mode.  
The inclination is 0.01mm/1m or less in case of the **HIGH** mode.
- ⑦Mode LED  
The LED (red) turns on when the **LOW** mode is selected.
- ⑧Mode LED  
The LED (green) turns on when the **HIGH** mode is selected.
- ⑨Battery alarm LED  
If the voltage of the batteries decreases to 4V or less, the LED(orange) blinks notifying the necessity of replacing the batteries.
- ⑩Buzzer  
The buzzer emits a sound and the LED (blue) described on point ⑥ turns on when the level status reaches the central position.
- ⑪Base
- ⑫Body case
- ⑬Line markers  
They are used for determining the direction of the X and Y axes.
- ⑭Buzzer sound **ON↔OFF** switch  
This switch is used for turning on/off the buzzer.
- ⑮Batteries box  
It is the location where the batteries are installed (LR03: AAA x4).

# 3. HOW TO INSTALL THE BATTERIES

- ①Loose the screw of the cover of the batteries box.
- ②Insert the 4 batteries included (LR03: AAA) in the base of the batteries box as indicated on the figure on the right.
- ③After have installed the batteries, insert the projecting part of the cover into the recess of the batteries box. Then, secure the cover by tightening the screw.



**Caution**  
Always check the polarity of the batteries. If the batteries are inserted with the polarity inverted, the device may not work and the internal electric circuit may get damaged making the device not utilizable.

## 4. BEFORE USING THE DEVICE

### 4-1. Environmental settings

If there is a difference in the temperature between the storage location and the utilization location, leave the device for a certain amount of time in the utilization location to perform the average environmental settings (temperature, humidity).  
(Example: If the difference in the temperature is 10°C, leave the device for 15~20 minutes.)

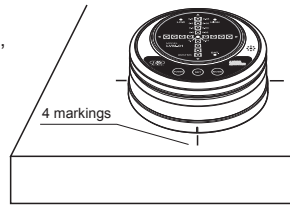
### 4-2. How to execute the zero adjustment



Caution

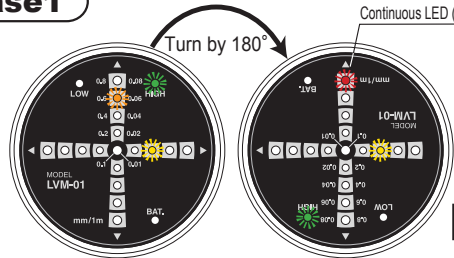
When the Level Master is turned on, depending on the utilization environment and on the status of the reference surface measured, the level position may not be always the "0" position (continuous blue LED). Execute every time the reference settings by means of zero adjustment in accord with the utilization environment.

- Position the device on the reference surface. When placing the device, remove oil and dirt from its base and also remove notches, oil and dirt from the reference surface of the precision plate.
- Use as reference the line markers on the base of the device and mark 4 points in the X and Y directions on the reference surface.
- Push the POWER switch to turn ON the power.
- Execute the zero adjustment and the levelling checks following the procedures below.



#### How to check the levelling value in HIGH mode

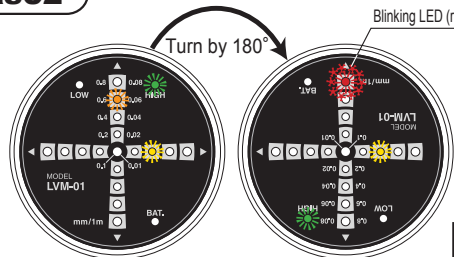
#### Case1



- The levelling value of the X and Y axes is within 0.08 after turning ON the power.
- The levelling value of both axes is within 0.08 after turning the device by 180°.

Go to P6 → How to execute the zero adjustment in HIGH mode

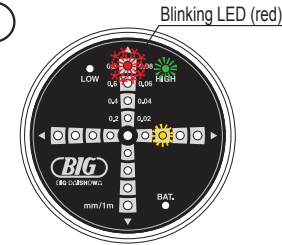
#### Case2



- The levelling value of the X and Y axes is within 0.08 after turning ON the power.
- The levelling value of one of the axes exceeds 0.08 after turning the device by 180°. The LED (red) is blinking.

Go to P4 → How to check the levelling value in LOW mode

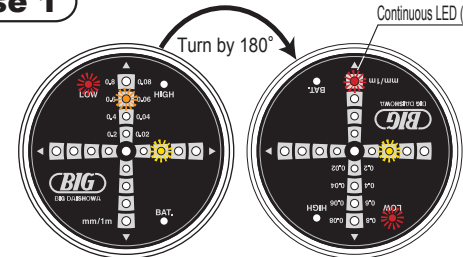
#### Case 3



- The levelling value of one of the axes exceeds 0.08 after turning ON the power. The LED (red) is blinking.

Go to P4 → How to check the levelling value in LOW mode

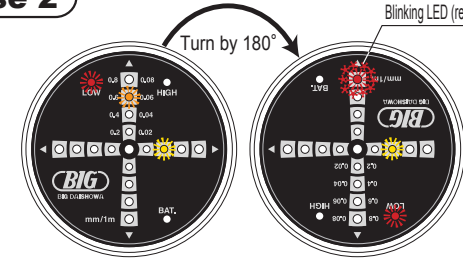
#### Case 1



- Switch to **LOW** mode.
- The levelling value of the X and Y axes is within 0.8 after switching to the **LOW** mode.
- The levelling value of both axes is within 0.8 after turning the device by 180°.

Go to P5 → How to execute the zero adjustment in LOW mode

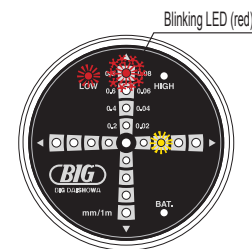
#### Case 2



- Switch to **LOW** mode.
- The levelling value of the X and Y axes is within 0.8 after switching to the **LOW** mode.
- The levelling value of one of the axes exceeds 0.8 after turning the device by 180°.
- Adjust the level of the reference surface in order to obtain a levelling value within 0.8 for both axes.

Go to P5 → How to execute the zero adjustment in LOW mode

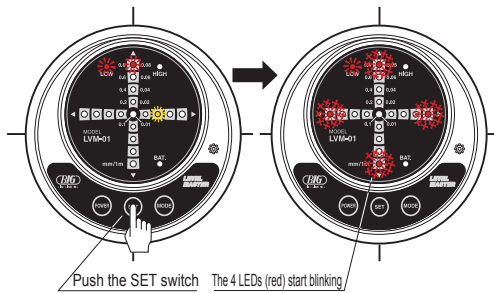
#### Case 3



- Switch to **LOW** mode.
- The levelling value of one of the axes exceeds 0.8 after switching to the **LOW** mode. The LED (red) is blinking.
- Adjust the level of the reference surface in order to obtain a levelling value within 0.8 for both axes.

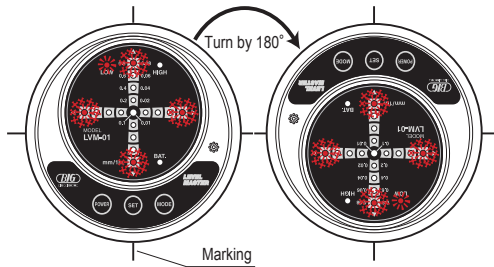
Go to P5 → How to execute the zero adjustment in LOW mode

**How to execute the zero adjustment in LOW mode**



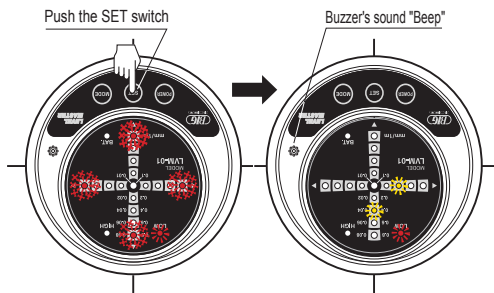
① Push the "SET" switch after 10 seconds.  
The 4 external LEDs (red) start blinking.

**Caution**  
When executing the "zero adjustment" in the LOW mode, adjust the level in order to obtain an inclination of the reference surface within 0.8 and then execute the "zero adjustment". It is not possible to execute the "zero adjustment" if the inclination exceeds 0.8.

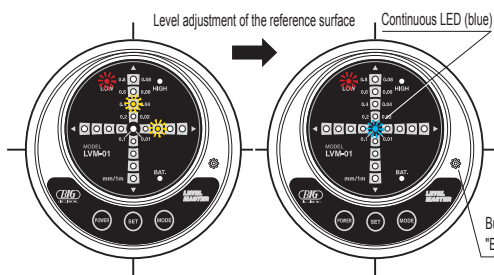


② Rotate the device by 180° using as reference the markings on the reference surface.

Errors in the "zero adjustment" may occur if the device is not rotated correctly by 180° or if it is not aligned with the markings.



③ Push again the "SET" switch after 10 seconds. The buzzer will emit a "Beep" to notify the completion of the "zero adjustment".

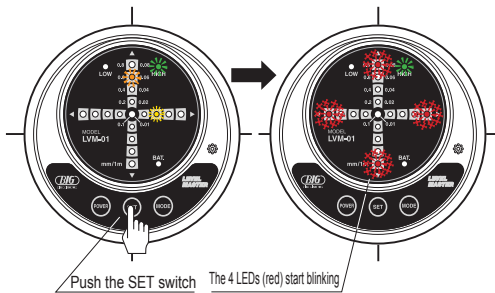


④ Adjust the level of the reference surface in order to obtain an inclination within 0.1 for both axes.

When the inclination of one of the axes is adjusted within 0.1, the LED (blue) turns on and the buzzer emits a sound [Beep, beep]. When the inclination of both axes is within 0.1, the LED (blue) turns on and the buzzer emits a sound [Beep-beep-beep].

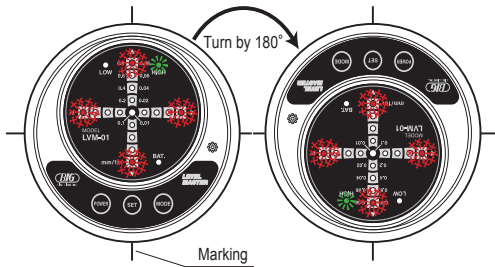
Go to P6 → How to execute the zero adjustment in HIGH mode

**How to execute the zero adjustment in HIGH mode**



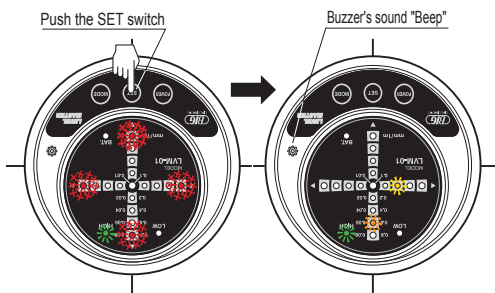
① Push the "SET" switch after 10 seconds.  
The 4 external LEDs (red) start blinking.

**Caution**  
When executing the "zero adjustment" in the HIGH mode, adjust the level in order to obtain an inclination of the reference surface within 0.08 and then execute the "zero adjustment". It is not possible to execute the "zero adjustment" if the inclination exceeds 0.08.



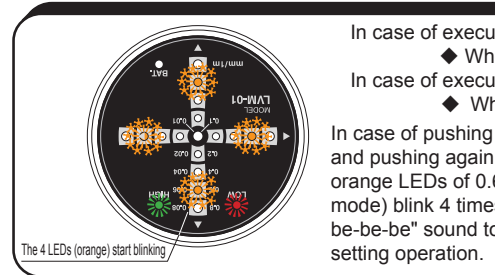
② Rotate the device by 180° using as reference the markings on the reference surface.

Errors in the "zero adjustment" may occur if the device is not rotated correctly by 180° or if it is not aligned with the markings.



③ Push again the "SET" switch after 10 seconds. The buzzer will emit a "Beep" to notify the completion of the "zero adjustment".

Execute the levelling operation.



In case of executing the "zero adjustment" in the LOW mode:  
◆ When the level exceeds 0.8  
In case of executing the "zero adjustment" in the HIGH mode:  
◆ When the level exceeds 0.08

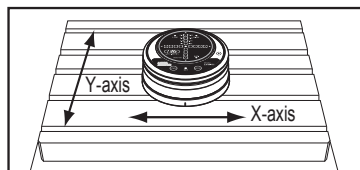
In case of pushing the "SET" switch, turning the device by 180° and pushing again the "SET" switch in the above situations, the 4 orange LEDs of 0.6 (for the LOW mode) / 0.06 (for the HIGH mode) blink 4 times and at the same time the buzzer emit a "be-be-be" sound to notify that it is not possible to execute the setting operation.

## 5. OPERATIONS

### 5-1. Levelling operation

① Remove oil, dirt, notches and marks from the machine table's surface and from the base of the device.

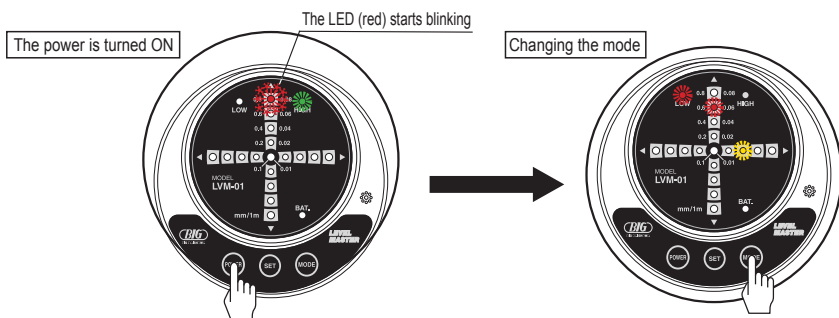
② Place the device carefully on the reference surface parallel to the X and Y axes.



③ Push the POWER switch to turn ON the power.

④ The **HIGH** mode (inclination between 0.01mm and 0.10mm) is set when the power is turned ON. If the LED (red) in the 0.08 position blinks, the inclination exceeds 0.1. Use the MODE switch to change to the **LOW** mode (inclination between 0.1mm and 1mm).

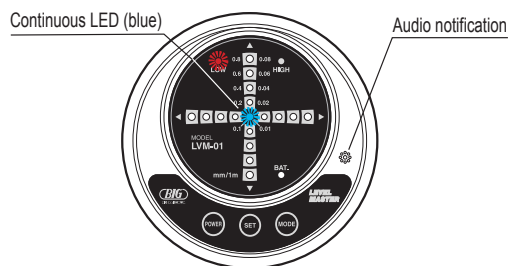
If the LED (red) or other LEDs turn on, the inclination is within 0.08. If this situation occurs when the **HIGH** mode is selected, execute the operation of point ⑦.



⑤ Adjust the level in order to turn on the LED (blue) of the central position in the **LOW** mode. When the LED (blue) turns on, the inclination is within 0.1.

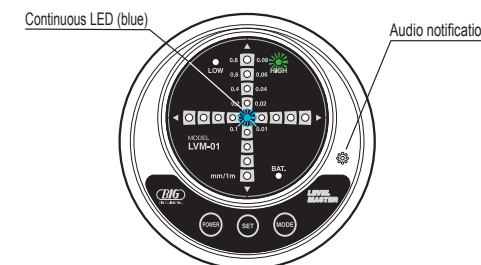
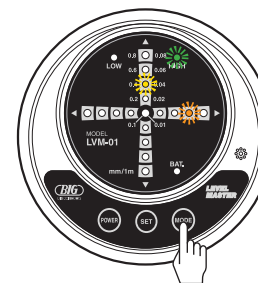
When the inclination of one of the axes is adjusted within 0.1, the LED (blue) turns on and the buzzer emits a sound [Beep, beep].

When the inclination of both axes is within 0.1, the LED (blue) turns on and the buzzer emits a sound [Beep-beep-beep].



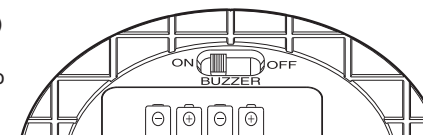
⑥ Push the MODE switch to change to the **HIGH** mode. ⑦ Adjust the level in order to turn on the LED (blue) of the central position.

When the inclination of one of the axes is adjusted within 0.01, the LED (blue) turns on and the buzzer emits a sound [Beep, beep]. When the inclination of both axes is within 0.01, the LED (blue) turns on and the buzzer emits a sound [Beep-beep-beep].



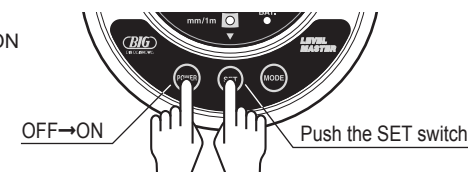
### 5-2. How to turn on/off the buzzer

When the inclination is within 0.01 (**HIGH** mode) or within 0.1 (**LOW** mode), the LED (blue) turns on and the buzzer emits a sound. It is possible to turn on/off the buzzer's sound by using the switch on the base of the device.



### 5-3. How to reset the device to its default values

To reset the device to its default values (delivery condition), push the "SET" switch while turning ON the power. The internal data are cleared.



## 6. SAFETY NOTES

- Use a plate with good surface flatness to be sure to obtain a level within 0.01.
- Since the diameter of the Level Master is  $\phi$  109mm, if only  $2\mu$  of dirt get caught by the device, a distortion of 0.018mm for 1m will be generated.
- This device is a precision instrument. Do not drop it or cause shocks to it. Also, after the use, always apply antirust oil to its base and store it using the exclusive storage case.
- When storing the device, store it in an environment with a temperature between 0°C and 40°C.
- Since the device is a precision instrument, do not apply coolant to it. Also, after the use, do not leave it on the machine table, plate or installation jig.
- Since the device is a precision instrument, do not disassemble or modify the device. Otherwise, its efficiency or lifespan may worsen and the warranty annulled.
- Remove the batteries if the device is not used for a long period.
- If accuracy problems or malfunctions occur, stop using the device and send it to **BIG** using our distributors for inspections and repairs.

## 7. WARRANTY

### Warranty period: 1 year from the delivery

However, the below situations are excluded from the warranty.

- If the device is subject to shocks or vibrations of 3G or more.
- If the device is intentionally disassembled.
- If damages and breakdowns are caused by unreasonable repairs or modifications or in case of utilization errors.
- If after the purchase, damages and breakdowns are caused by moving, transporting or dropping the product.
- In case of damages and breakdowns caused by fires, earthquakes, storms, floods, lightning, seawater or other natural disasters.



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