



Precision Electronic Level

LEVEL MASTER **WIRELESS LVM-WL**

OPERATION MANUAL



Read the operation manual before use.

Please read these instructions before use and keep them where the operator may refer to them whenever necessary. We certify this product has passed our rigorous inspections of quality and accuracy.

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1. SPECIFICATIONS

Model	LVM-WL		Battery life	Body	30 hours
Minimum readable value	0.01mm/1m		Dimensions	Receiver	
Wireless system	2.4GHz			Body	ø109×H43
Power supply	Body	Alkaline dry battery LR03 (AAA) × 4 each		Receiver	H141×W81×D43
	Receiver				
Auto-power OFF	Body	The power turns off automatically after 30 minutes.	Weight	Body	990g
	Receiver			Receiver	280g
Operating temperature	0°C - 40°C (Recommended 20°C ± 5°C)		Included items	Operation manual Inspection report Storage box Alkaline dry battery: LR03 (AAA) × 8	

※The model number which ends with a full stop [LVM-WL.] DOES NOT include batteries.

● LED indicators

LOW MODE

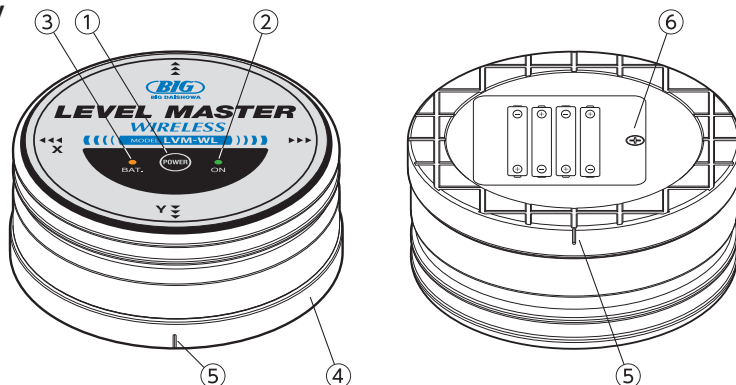
Blinking LED(●): Inclination exceeding 0.8mm/1m
 Continuous LED(●): Inclination of 0.8mm/1m or less
 Continuous LED(●): Inclination of 0.6mm/1m or less
 Continuous LED(●): Inclination of 0.4mm/1m or less
 Continuous LED(●): Inclination of 0.2mm/1m or less
 Continuous LED(●): Inclination of 0.1mm/1m or less

HIGH MODE

Blinking LED(●): Inclination exceeding 0.08mm/1m
 Continuous LED(●): Inclination of 0.08mm/1m or less
 Continuous LED(●): Inclination of 0.06mm/1m or less
 Continuous LED(●): Inclination of 0.04mm/1m or less
 Continuous LED(●): Inclination of 0.02mm/1m or less
 Continuous LED(●): Inclination of 0.01mm/1m or less

2. NAMES OF PARTS AND FUNCTIONS

● Body



① POWER switch ON ↔ OFF

Push the POWER switch to turn ON the power.
 Push it again to turn OFF the power.

② Power LED

LED (green) lights while the power is ON.

③ Battery alarm LED

LED (orange) blinks to notify the battery replacement when voltage falls below the prescribed value.

④ Base

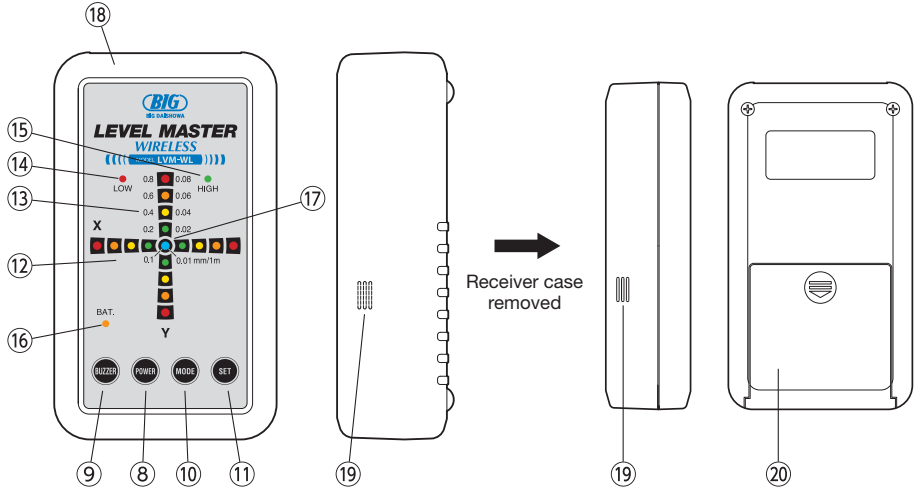
⑤ Matchmarks

They are used for determining the direction of the X and Y axes.

⑥ Battery box

It is the location where the batteries are installed (LR03: AAA ×4).

Receiver



⑧ POWER switch ON ↔ OFF

Push the POWER switch to turn ON the receiver. The LED level indicator lights and measurement becomes ready. Push it again to turn OFF the power.

⑨ Buzzer sound ON ↔ OFF switch

The buzzer sounds when the level is within 0.1 mm/1m (**LOW** mode) and 0.01 mm/1m (**HIGH** mode). Push it to turn OFF the buzzer.

⑩ MODE switch HIGH ↔ LOW

Push the MODE switch to change the precision level. The **LOW** mode is selected when turning ON the receiver.

⑪ SET switch

This switch is used to execute the zero adjustment.

⑫ LED 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.

⑬ LED 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.

⑭ Mode LED

The LED (red) turns on when the **LOW** mode is selected.

⑮ Mode LED

The LED (green) turns on when the **HIGH** mode is selected.

⑯ Battery alarm LED

LED (orange) blinks to notify the battery replacement when voltage falls below the prescribed value.

⑰ LED 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.

⑱ Receiver case

⑲ Buzzer sound

Outlet of buzzer sound.

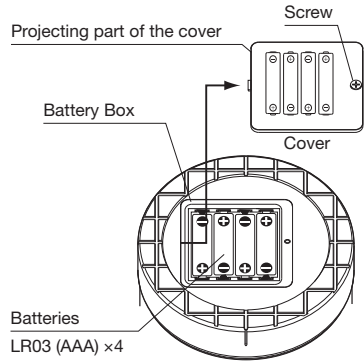
⑳ Battery box

It is the location where the batteries are installed (LR03: AAA ×4).

3. HOW TO INSTALL THE BATTERIES • POWER ON/OFF

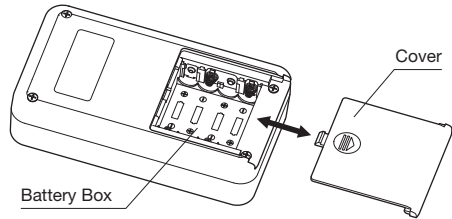
● Body

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



● Receiver

- ① Remove the receiver cover.
- ② Slide to remove the cover of the battery box.
- ③ Insert batteries (LR03: AAA×4) as indicated in the battery box.
- ④ Slide and fit the cover.



⚠ CAUTION

- Make sure the correct direction of the electrode of the batteries. If the polarity of the batteries is in reverse, it may not work properly and may damage the electric circuit inside the device, and become out of order.
- When batteries are inserted into the body, the “ON” light will blink for a few seconds and go off. DO NOT operate the power switch while the light is blinking.
- When batteries are inserted into the receiver, the “LOW” light will blink for a few seconds and go off. DO NOT operate any switches while the light is blinking.
- Turn off the power of the body and the receiver when removing the batteries. Please allow at least 20seconds to reinsert the batteries.

● Power on

Push the power switch to turn on the body and the receiver. The “ON” light on the body and the “LOW” light on the receiver will start blinking. When lights of both devices turn on, they are ready to communicate.

● Power off

When turning off the body, the “ON” light will blink for a few seconds and go off. When turning off the receiver, the “LOW” light will blink for a few seconds and go off.

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).

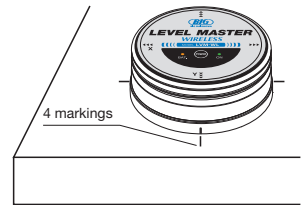
(Example: If the difference in the temperature is 10°C, leave the device for 15-20 minutes.)

4-2. How to execute the zero adjustment

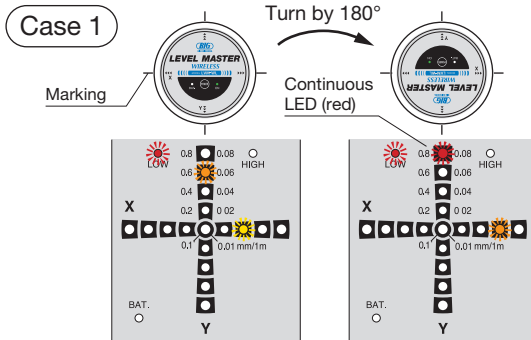
⚠ CAUTION

When the Level Master wireless 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.

- ① Position the body on the reference surface. When placing the body, remove oil and dirt from its base and also remove notches, oil and dirt from the reference surface of the precision plate.
- ② Use the matchmarks on the base of the body as reference and mark 4 points in the X and Y directions on the reference surface.
- ③ Push the POWER switch to turn on the power of the body / receiver.
- ④ Execute the zero adjustment and the levelling checks following the procedures below.



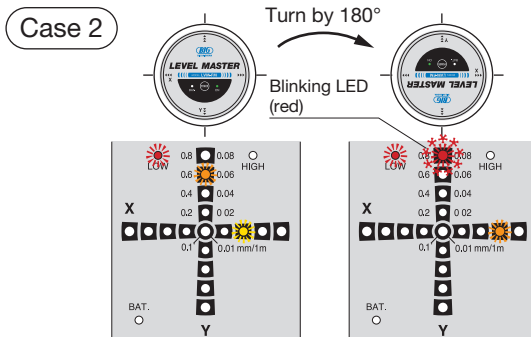
How to check the levelling value in LOW mode



- ① The levelling value of the X and Y axes are within 0.8 after turning on the power.
- ② The levelling value of both axes are within 0.8 after turning the body by 180°.

↓

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

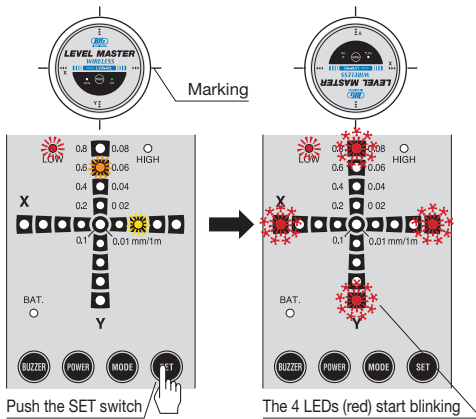


- ① The levelling value of the X and Y axes are within 0.8 after turning on the power.
- ② The levelling value of one of the axes exceeds 0.8 after turning the body by 180°. LED (red) blinks.
- ③ Adjust the level of the reference surface in order to obtain a levelling value within 0.8 for both axes.

↓

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

How to execute the zero adjustment in LOW mode



- ① Place the body on the marked reference surface and push the "SET" switch after 10 seconds.

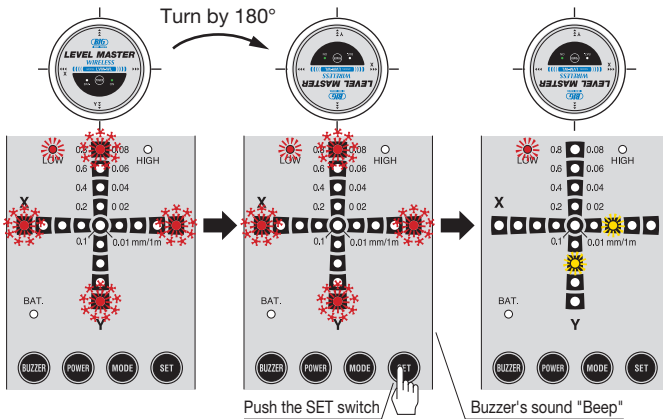
The outmost LEDs (red) start blinking.

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.

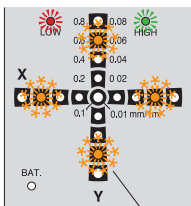
Due to slight individual differences in the sensor, placing it still for 20-30 seconds will increase the stability.



- ② Rotate the body 180° with respect to the markings. Errors in the "zero adjustment" may occur if the body 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".

CAUTION

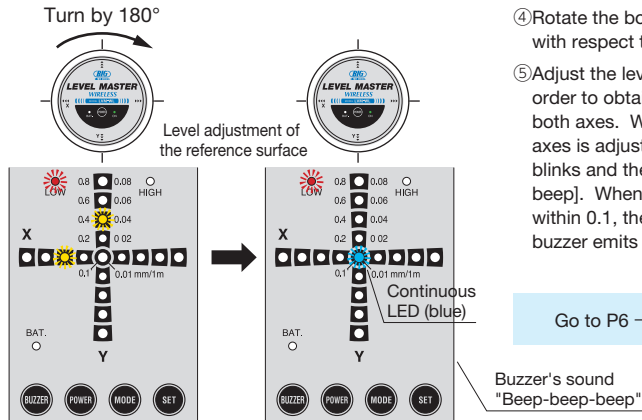


The level exceeds 0.8 when executing the "zero adjustment" in the LOW mode; The level exceeds 0.08 when executing the "zero adjustment" in the HIGH mode;

When rotate the body 180° in the above state and push the "SET" switch again, the 4-orange LEDs (0.6 in LOW mode and 0.06 in HIGH mode) blink 4 times.

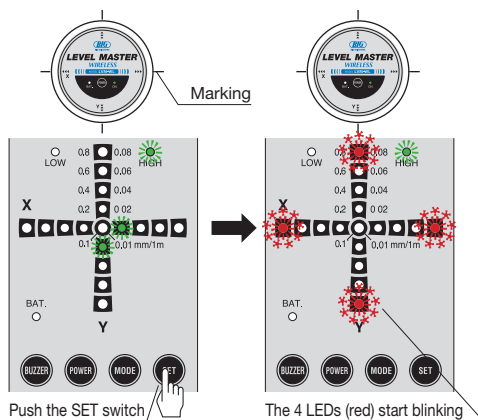
The buzzer sounds "be-be-be" at the same time to notify that it is not possible to execute the setting operation.

Return to P4 **Case 2** and check the level again.



- ④ Rotate the body 180° and align it precisely with respect to the markings.
- ⑤ 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) blinks and the buzzer emits a sound [Beep, beep]. When the inclination of both axes are within 0.1, the LED (blue) turns on and the buzzer emits a sound [Beep-beep-beep].

How to execute the zero adjustment in HIGH mode

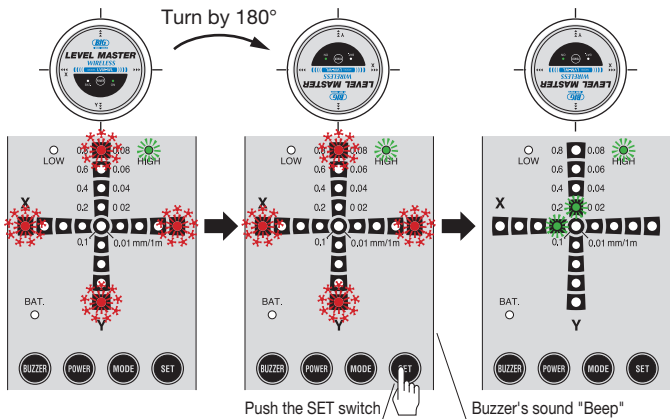


- ① Push the MODE switch to change to the **HIGH** mode.
- ② Make sure the levelling value of the X and Y axes are within 0.08 after switching to the **HIGH** mode.
- ③ Place the body on the marked reference surface and push the "SET" switch after 10 seconds. The outmost LEDs (red) start blinking.

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.

Due to slight individual differences in the sensor, placing it still for 20-30 seconds will increase the stability.



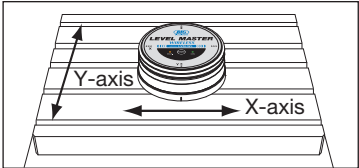
- ④ Rotate the body by 180° using as reference the markings on the reference surface. Errors in the "zero adjustment" may occur if the body is not rotated correctly by 180° or if it is not aligned with the markings.
- ⑤ Push again the "SET" switch after 10 seconds. The buzzer will emit a "Beep" to notify the completion of the zero adjustment".

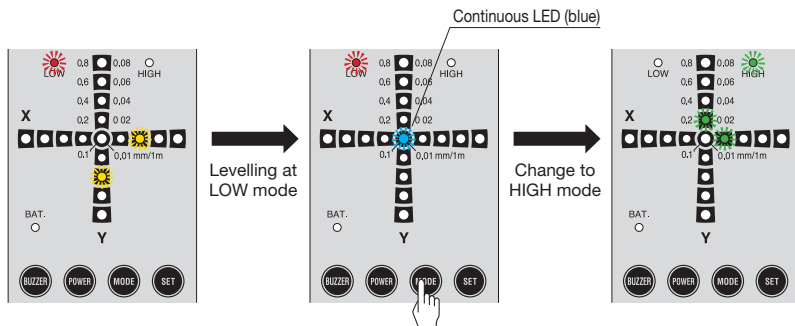
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Execute the levelling operation.

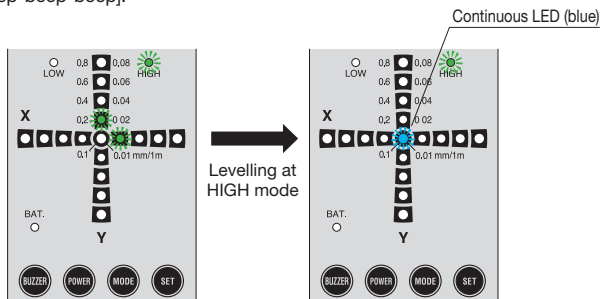
5. OPERATIONS

5-1. Levelling operation

- ① Remove oil, dirt, notches and marks from the surface of the machine table and from the base of the body.
 - ② Place the body carefully on the reference surface parallel to the X and Y axes.
- 
- ③ Push the POWER switch to turn ON the power of body / receiver.
 - ④ When power of the receiver is turned on, **LOW** mode (inclination: 0.1mm - 0.8mm) is selected. If the LED (red) in the 0.8. position blinks, inclination exceeds 0.8.
 - ⑤ Adjust the level in order to turn on the LED (blue) of the central position. When the LED (blue) turns on, the inclination of the both axes are within 0.1. When the inclination of one of the axes is adjusted within 0.1, the LED (blue) blinks and the buzzer emits a sound [Beep, beep]. When the inclination of both axes are 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.

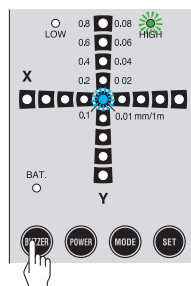


- ⑦ Adjust the level in order to turn on the LED (blue) of the central position. When the inclination of one of the axes is adjusted within 0.01, the LED (blue) blinks and the buzzer emits a sound [Beep, beep]. When the inclination of both axes are within 0.01, the LED (blue) turns on and the buzzer emits a sound [Beep-beep-beep].



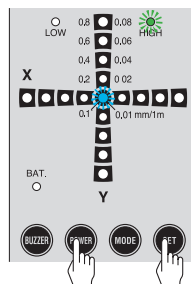
5-2. How to turn on/off the buzzer

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 of the receiver.



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

To reset the device to its default values (delivery condition), turn off the power of the receiver and turn on the power again while pushing the "SET" switch. 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 wireless is $\phi 109$ mm, if only $2\mu\text{m}$ of dirt get caught by the device, a distortion of 0.018 mm 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 an accuracy problem or any malfunctions occur, immediately stop using the device and contact us through distributors.

7. CAUTION ON RADIO WAVE

- DO NOT use this device near medical equipment which may be affected by radio wave.
- This device (body / receiver) uses radio wave. Even within the reach of radio range, exogenous noise may interrupt communication.
- Communication may not be possible due to radio reflection in the following places;
 - where strong magnetic field, electrostatic and radio wave interference are generated.
 - where surrounded with metallic walls or concrete walls which have metallic materials for reinforcement embedded.
- Using another wireless device with the same radio frequency in the communication are of this device may slower the transfer rate and cause communication error. This may result in normal communication fail.

注意!

依據 低功率電波輻射性電機管理辦法

第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

8. EMC INFORMATION

Class and Group Description of EN 55011

This is a group 1, class B product according to EN 55011. This means that this product does not generate and/or use intentionally radio-frequency energy, in the form of electromagnetic radiation, inductive and / or capacitive coupling, for the treatment of material or inspection / analysis purpose and that it is suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

Note : Since this product is battery operated, this product is not connected to this low voltage power supply network.

Manufacturer Name : BIG DAISHOWA SEIKI CO., LTD.

Address : Nishiishikiricho 3-3-39, Higashiosakashi, Osaka, JAPAN

EU Name : BIG DAISHOWA Switzerland AG

Address : Glattalstrasse 516, 8153 Rümlang, Switzerland



BIG DAISHOWA SEIKI CO., LTD.

■ **EXPORT DEPARTMENT**

TEL : (+81)-72-982-8277

E-mail : export@big-daishowa.co.jp