

User Manual of FRE102A



Maintenance and Safety

- While the instrument is operating, be careful not to expose your eyes to the laser beam. Direct exposure to a laser beam for a long time may be hazardous to your eyes. The laser beam is equivalent to a class II.
- Operate this laser so that the laser beam plane avoids impact on the eyes of vehicle drivers or pedestrians.
- Do not try to dismantle the instrument. Have it repaired by your dealer or supplier. Dismantling yourself may worsen the problem or void your warranty.
- When attaching the instrument to a tripod, make sure the instrument is securely fixed. The tripod leg clamps should be securely fastened. If not securely fastened or tightened, the main unit could fall off or the tripod could fall over.
- The laser should not be stored or used in extreme temperature or during rapid temperature change. The laser may not function properly if used out of the ambient temperature range.
- Store inside the carry case and place in a dry area not subject to vibration, dust or high moisture.
- If the storage temperature and ambient temperature for usage vary significantly, leave the laser in its case until it can adjust to the ambient temperature.
- The laser should be transported or carried carefully to avoid impact or vibration.
- The laser should be stored in the carry case and packed with cushioning material. Always handle the laser with care.

1.Principles of Operations

This laser uses a semiconductor diode, which provides excellent beam visibility. The laser beam will rotate freely to form a plane-scanning surface. The rotary beam is emitted as illustrated here:

In upright-setting for horizontal applications



In side-setting for vertical and square applications.

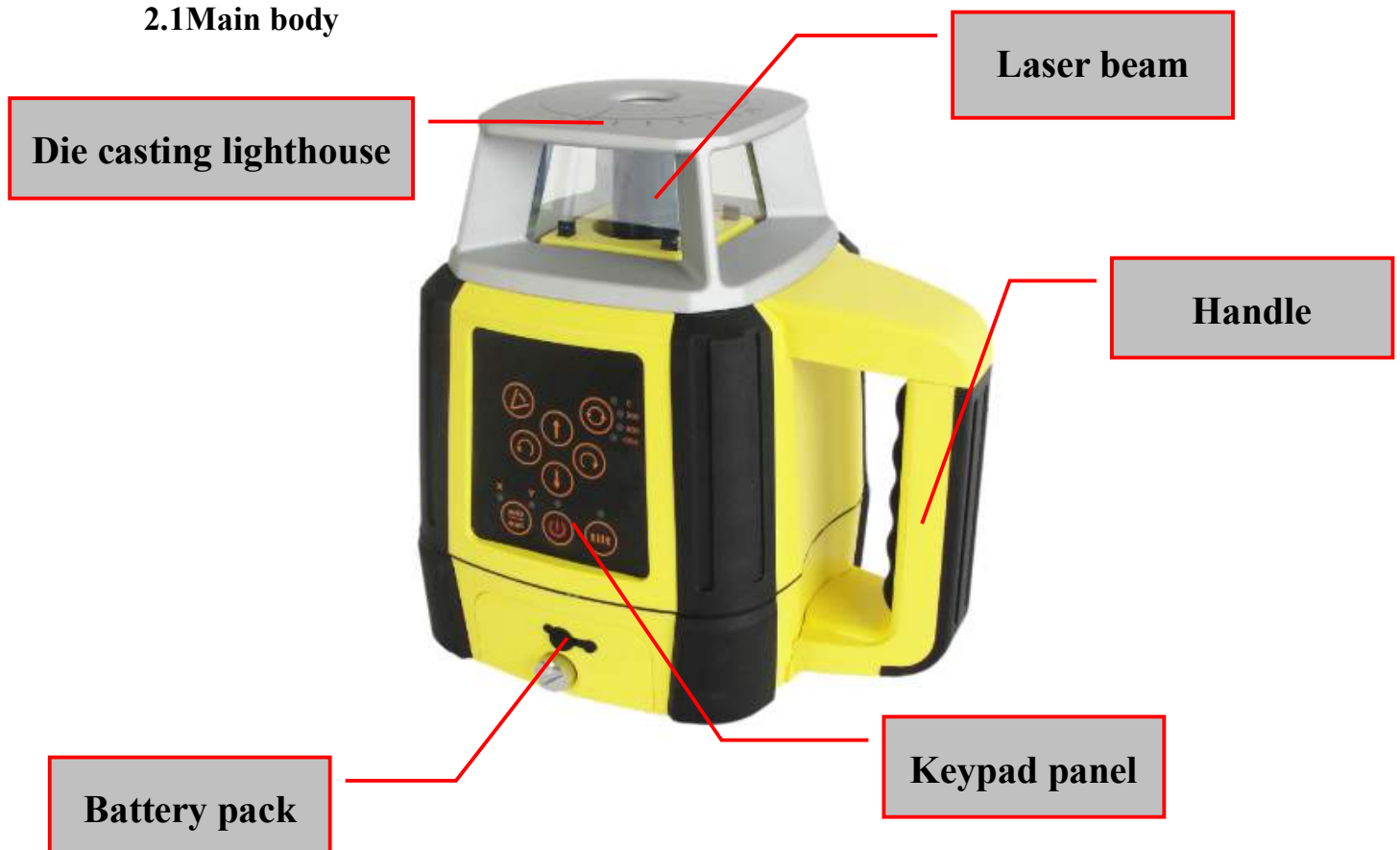


The laser automatically emits a beam to form a horizontal scanning surface and a plumb dot. The laser forms a vertical scanning surface and a horizontal dot.

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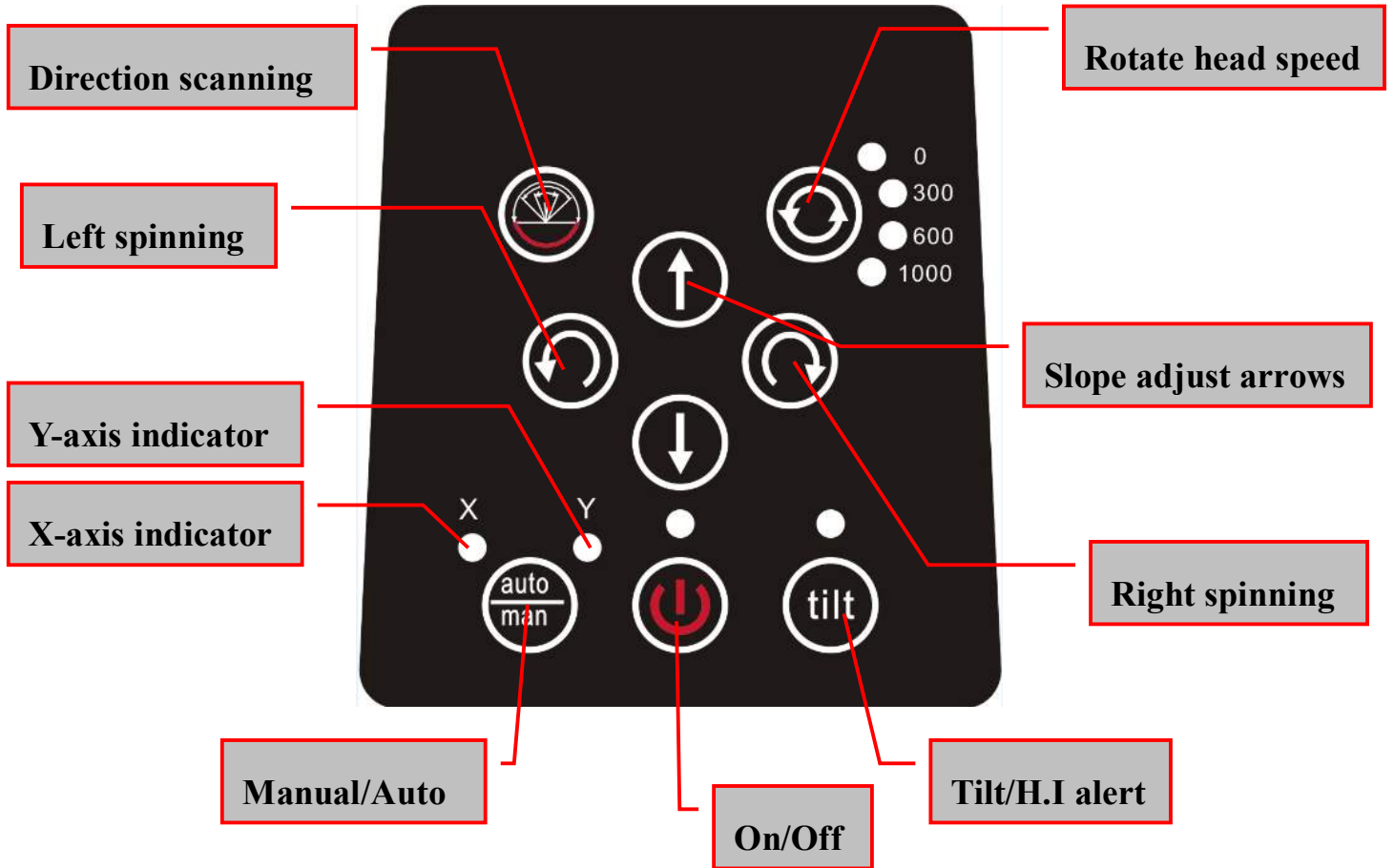
2. Physical Features

2.1 Main body



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2.2 Keypad panel



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2.3 Utilities of Panel

- (1) ON/OFF: Powers the laser up or down.
- (2) Power indicator: When the light is on, the instrument is on.
- (3) Manual/Auto indicator: When X indicator lights, the slope of X axis can be adjust, when Y indicator turns on, the Y-axis slope can be adjusted.
- (4) Tilt/H.I alert: Enabling this mode warns the user if the laser level has been jolted.
- (5) Tilt indicator: When the light is blinking slowly, the laser is in H.I alert mode. When the light is blinking quickly, the laser level will not level as it has been jolted.
- (6) Rotate head speed: it can provide four kinds speed of rotating: 0-300.600.1000 r.p.m.
- (7) Directional scanning: Circling knob. Angle of scanning includes 5 levels: 0-10°-45° -90°-180°
- (8) Manual/Automatic: The laser will initially enter into self leveling mode after be powered on. Press "Manual/Auto" for once, the device enter into manual mode, in the meanwhile the slope of X-direction can be adjusted by up and down arrows on keypad panel, while press "Manual/Auto" again, the data of Y-direction can be set by arrows on panel. In these period, you can use other functions and laser will stay in manual mode. When press "Manual/Auto" the third time, the laser will get back to Auto-level mode.
- (9) Left-spinning: Allows the laser beam to step/move counter-clockwise, only when the unit is in 0 RPM or scan mode.
- (10) Right-spinning: Allows the laser beam to step/move clockwise, only when the unit is in 0 RPM or scan mode.
- (11) Up & Down Arrows: Adjust the slope for both axis by working together with Manual/Automatic button.

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3.Directions:

3.1 Battery Installment

Rechargeable and alkaline battery packs are suitable for use to power this laser. To install:

- 1.Un-screw the battery cover in front of the battery pack.
- 2.Put the batteries into the case according to the right electrode.
- 3.Re-screw the battery cover at the front of the instrument.

3.2Instrument Placement

3.2.1 Horizontal scanning

Lay the instrument on a tripod or stable flat surface, or hang it on a wall. Set the unit upright, and keep the slope of the instrument within the range of -5° to $+5^{\circ}$ self-levelling range.

3.2.2 Vertical scanning

Lay the instrument on the flat surface, and keep the slope of instrument within the range from -5° to $+5^{\circ}$.

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3.3 Operations

3.3.1 Power

Press the ON/OFF key to switch the laser on. If the power indicator light blinks, the voltage of the batteries is low and batteries need to be replaced or recharged.

3.3.2 Leveling

When you turn the laser on, it will automatically level. The leveling process is indicated by a blinking laser beam. After the laser has automatically leveled, the laser rotating head will rotate at the speed of 600 RPM.

If the instrument is placed improperly, or the slope of instrument exceeds the range of -5° to $+5^{\circ}$, the mode indicator and the laser beam will blink at the same time.

Note: The instrument will shut down automatically if the unit exceeds the self-leveling system range for more than 5 minutes.

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3.3.3 Spinning

(1) Continuous spinning

Press the rotating head speed button to control the spinning speed of the laser rotating head. If the key is pressed repeatedly, the spinning speed of the laser module will correspondingly change to the following speeds: 0, 300, 600, 1000 RPM

(2) Stepping spinning

Continue to press the rotating head speed button and set the speed to 0 RPM. The laser beam will stop spinning. To step/move the laser rotating head clockwise, press the right-spin button. To step/move the laser rotating head counter-clockwise, press the left-spin button.



3.3.4 Directional scanning

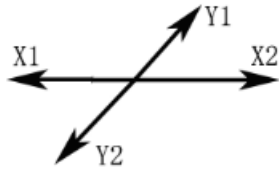
Press the directional scanning button to make the laser beam scan directionally. If the key is repeatedly pressed, the angle of scanning of the laser rotating head will step-change to the following angles: 0° , 10° , 45° , 90° , 180° . Press the left-spin button or the right-spin button to change the position of the scanning.

3.3.5 Slope Adjustment

When the instrument is set upright for horizontal rotation, the slope of the X-axis and Y-axis can be adjusted by using manual mode. To select manual mode, Press the Key Manual/Automatic, the instrument will first enter into the mode of manual adjustment. The X indicator lights.



(1) Slope of X-axis

- a. Aim the X1-beam to the direction of the slope required.
- b. Press the arrow  or  to move the laser beam up or down until the beam/line get to its required position.



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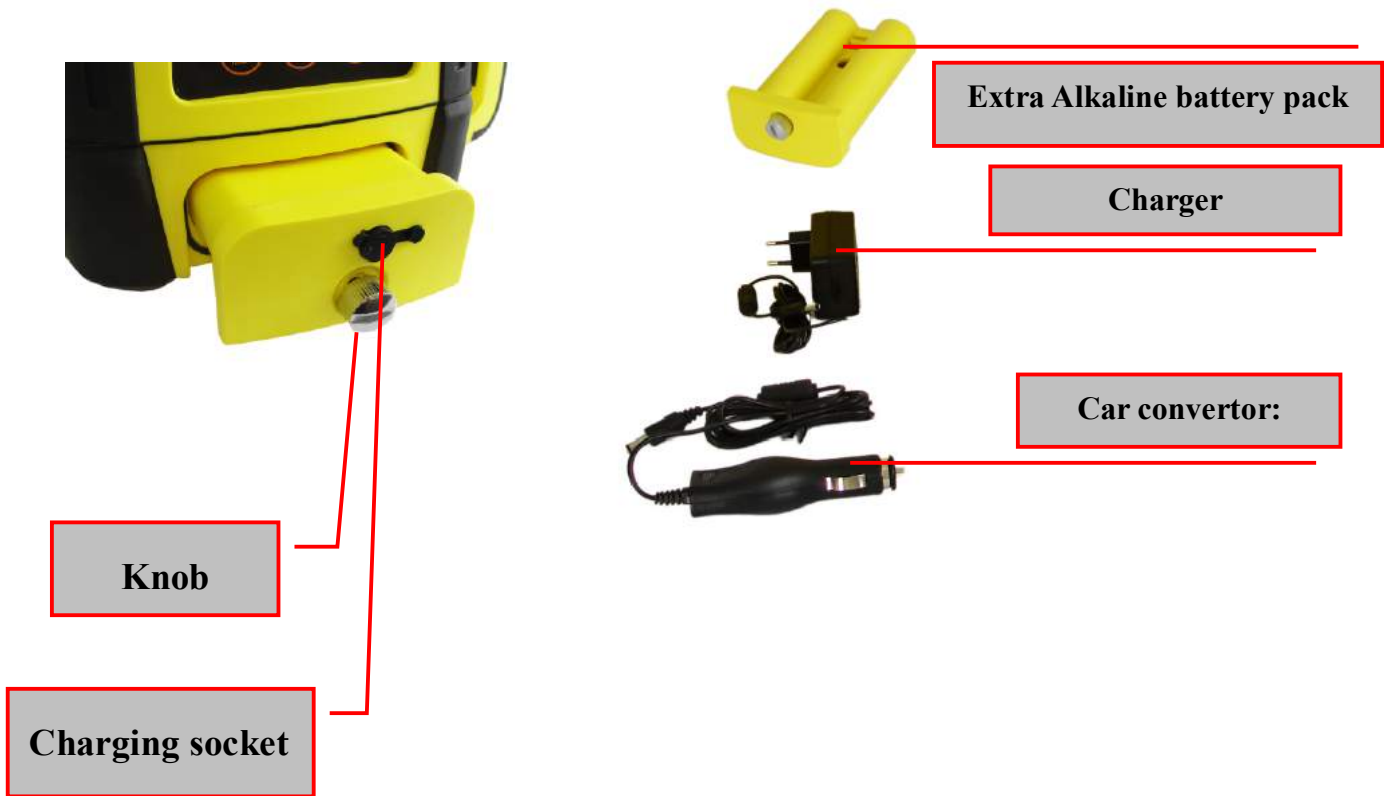
(2) Slope of Y-axis

- a. Press Manual/Auto again to switch laser get into Y axis. At that time, the Y indicator will light. Aim the Y1-beam to the direction of the slope required then to adjust.
- b. Press the Key  or  to move the laser beam up or down until the beam/line get to its required position.

(3) Quit slope adjustment mode

Press Manual/Automatic key again. After both indicators(X&Y) goes off, the instrument will quit the slope adjustment mode/manual model and will self-leveling again.

4.Power



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When the power indicator light is flashing, the laser must be recharged, or if alkaline batteries are used, they should be replaced. The charger plugs in to the laser via the plug hole under the laser, shown above.

If the indicator light of the charger is red, the batteries are being charged.

If the indicator light of the charger is flashing red, the batteries and charger have bad connection.

If the indicator light of the charger is green, the charging cycle has ended and the unit is fully charged

Notices:

- (1) Using the standard rechargeable batteries of the instrument, recharging will be finished within 7 hours.**
- (2) Power required for the charger: Frequency: 50-60HZ; Voltage: 85-265V.**
- (3) Charging and using of the instrument can progress simultaneously.**
- (4) If keeping the instrument in storage (or Leave the instrument unused for a long time), the batteries (dry battery or rechargeable battery) needs to be taken out.**
- (5) Brand-new rechargeable batteries or long-time unused rechargeable batteries need to be recharged and discharged three times to attain the capacity required.**

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5.Remote

The remote control of the instrument adopts the infrared technique.

Aim the aperture of infrared ray to the instrument (as depicted below) to bring remote controlling into function (Available distance: indoor: 30M; outdoor: 20M). The keypad panel includes 9 keys; the indicator on the RC will wink to show the operating signal has been sent out once pressing any key.



Functions fulfilled by the remote as follows:

- (1) Spinning: Operating method referring to 3.3.3
- (2) Directional scanning: Operating method referring to 3.3.4
- (3) Slope adjustment: Operating method referring to 3.3.5

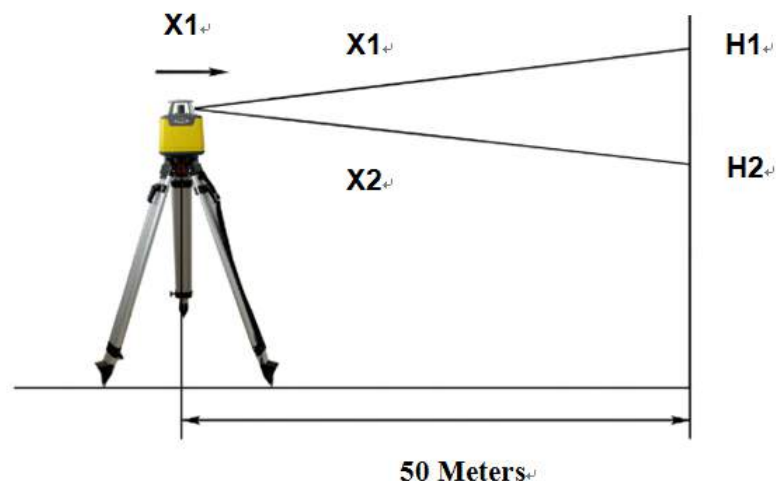
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6.Accuracy Checking

Follow these instructions for checking axis accuracy.

6.1 Horizontal-surface Checking

1. Place the instrument at the point of 50m in front of wall (or set a scale plate at the point of 50m away from the instrument), and then adjust the level of the base approximately to aim the X1 to the wall (or scale plate), as depicted below:



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2. Allow the unit to level and begin rotating. Mark the beam position on the wall or scale plate as H1.
3. Loosen the screw of the tripod, and then turn the laser 180°. Allow the unit to level and rotate, mark the beam position on the wall or scale plate as H2.

The difference between the value of H1 and H2 should be less than 8 mm.

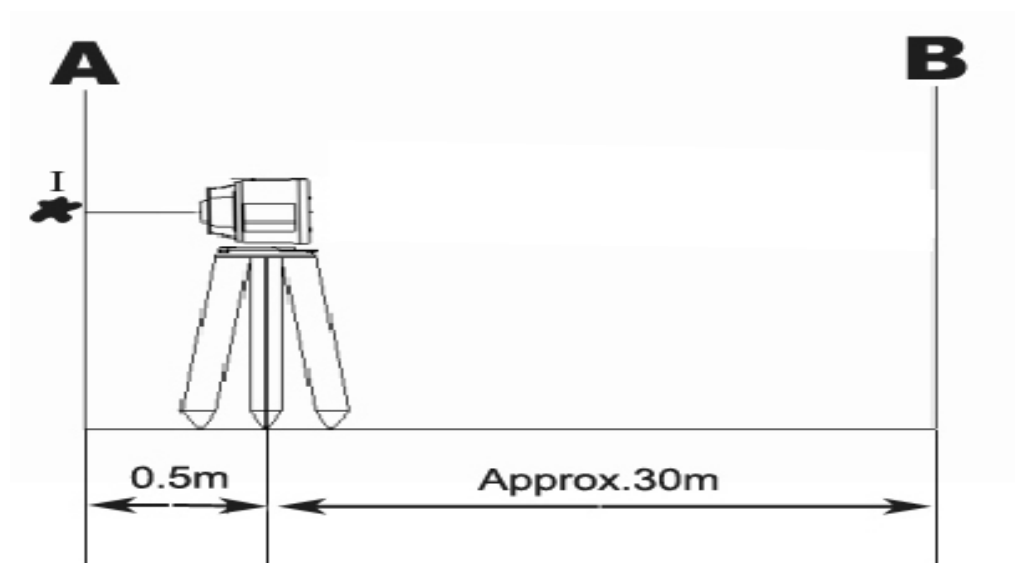
4. Repeat the same process to check your Y-axis beam. Again, the difference between the values of the two measurements should be less than 8 mm.
5. If the difference in either axis is more than 8mm, the laser should be sent to your authorized dealer for service / calibration

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6.2 Horizontal-line checking.

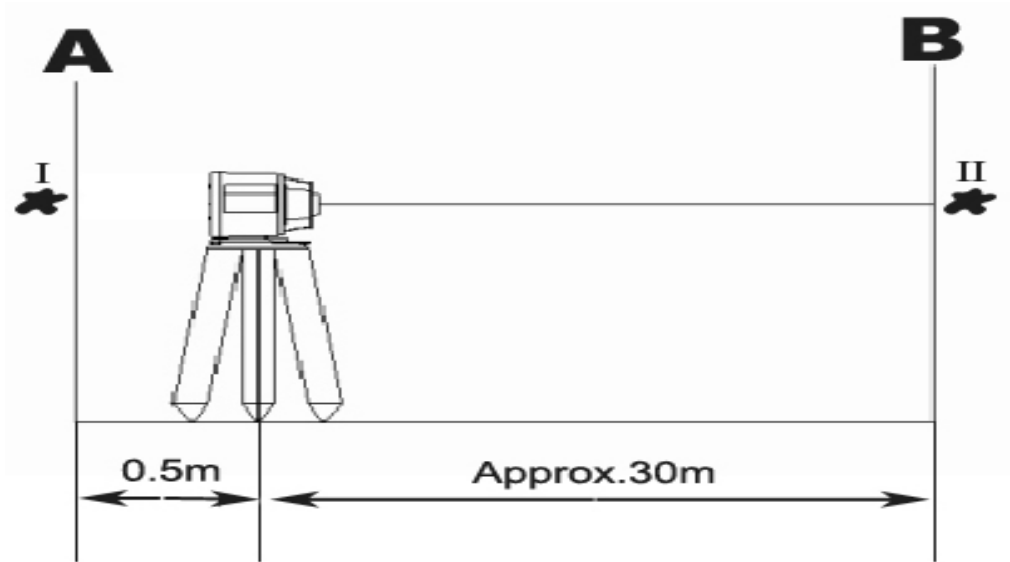
First lay down the instrument:

-Mount the instrument on tripod between A wall and B wall. Tripod near Wall A. Distance should follow the instructions on illustration. Switch the instrument on.



-After leveling, direct the laser beam onto the close wall A. Mark the centre point of the laser beam on the wall (Point I)

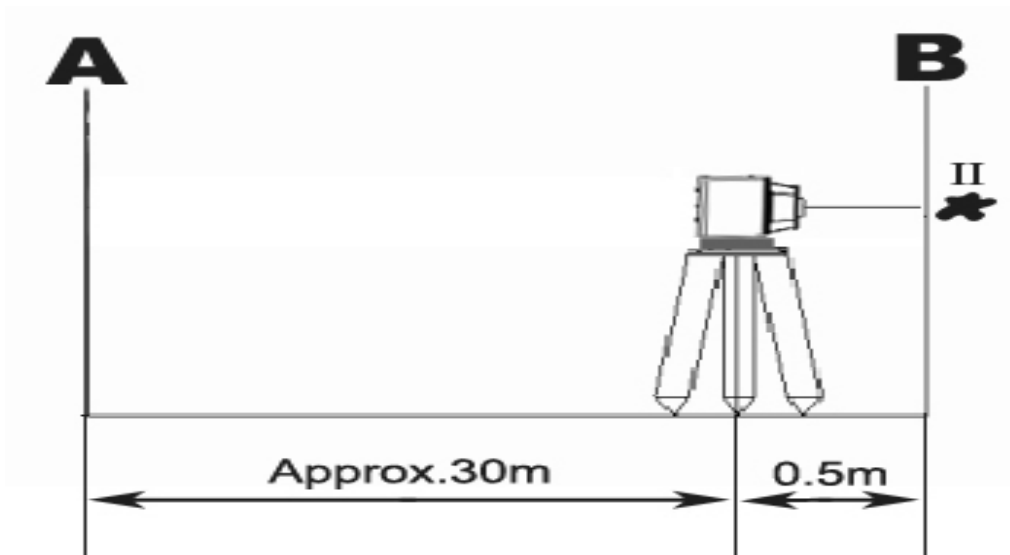
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-Turn the instrument horizontally by 180° .(without changing the height).after leveling, direct the laser beam onto Wall B. Mark the centre point of the laser beam on the opposite wall B(Point II)

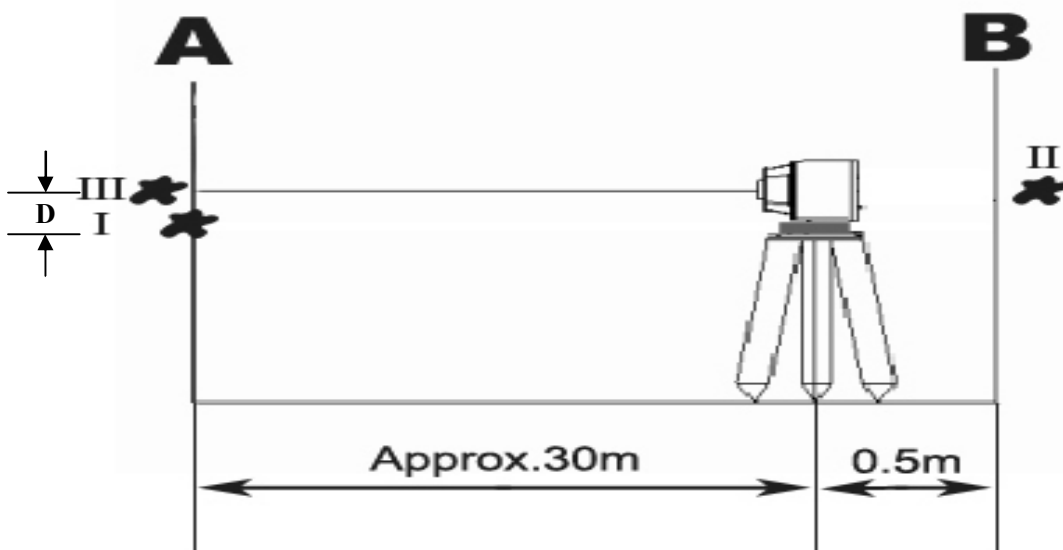
-Without turning the instrument. Position it close to wall B by moving the tripod. Switch on the instrument and let it leveling.

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-After leveling, align the height of the instrument by using tripod or by underlaying if necessary. In such a manner that the centre point of the laser beam is projected exactly located the previously marked point II on wall B.

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-Rotate the instrument by 180° without changing the height. Allow it to level in and mark the centre point of the laser beam on wall A(point III).Tare care that point III is as vertical as possible above or below point I.

-The difference D of both marked points I and III on wall A amounts to the actual deviation of the plumb up beam

D-value should be less than 4mm.

7.Specifications

Accuracy:	±15"(0.75mm per 10m)
Self leveling range:	±5°
Operation range(With detector)	600m(Dia.)
Five head speeds:	0,300,600,1000 R. P. M.
Four scan widths:	10°; 45°; 90°; 180°
Bright, visible beam:	Wavelength 635nm Laser Class II.
IR Remote control:	Available distance:30 m
Operation temperature:	-20°C ~ +50°C (-4°F~+122°F)
Power supply:	DC 4. 8-6V (4*sub-C NI-MH battery or 4*sub-C Alkaline battery)
Continuance working time:	Approx. 50hr.
Waterproof and dustproof:	IP 54
Dimension:	170(L) X 220(W)X 230(H)mm
Weight:	3.6kg