DaveBell™
ELECTRONIC EQUIPMENT LIMITED

Self-leveling Laser Marker (2V1HXL)

Congratulations on your choice of this DaveBell Self-leveling Laser Marker. For the purpose of long-term use of this instrument, we suggest you to read this instruction manual carefully before using it.

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1. Features and Functions

A new generation multi-functional laser marker, which can separately or simultaneously project one horizontal laser line and three vertical laser lines in right angle for leveling. Its extensive functions bring great convenience to set accurate horizontal and vertical references for indoors lay out and calibration. This kind of product is featured by easy manipulation and wide applications.

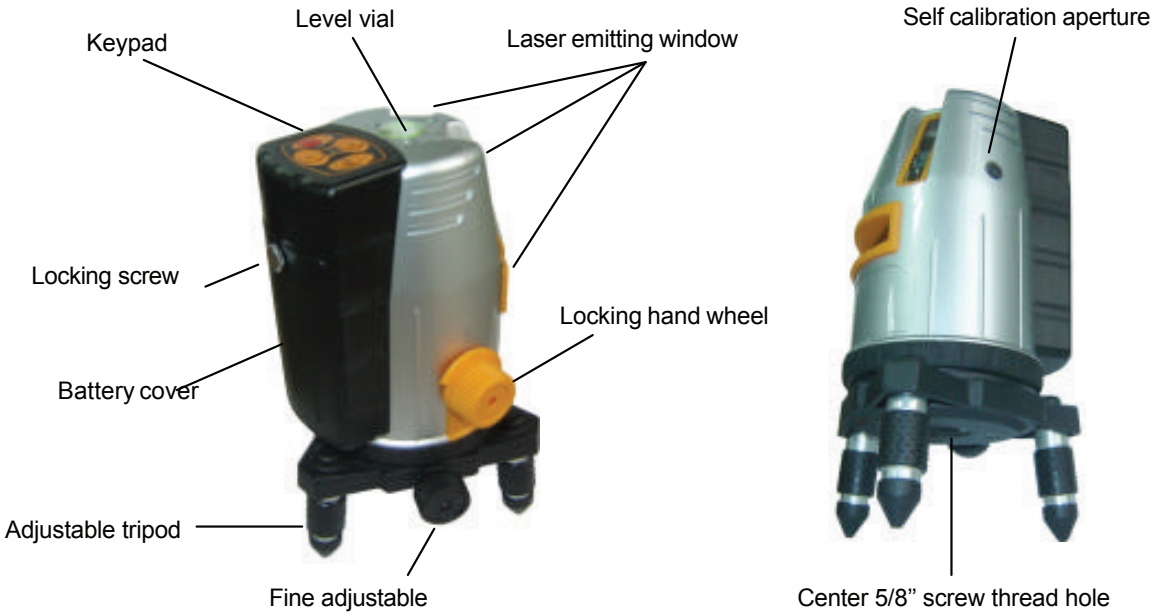
Features:

- Able to project 3 laser lines and 1 laser dot
- Self-leveling, with laser flashing and sound alarm indication if beyond range
- Able to supply 2 horizontal cross laser lines, 1 cross line on the ceiling and 1 plumb-down laser beam.
- 5/8” screw thread in the center to be connected with tripod
- 360°graduated circle to indicate turning angle of the instrument
- Tripod base is adjustable

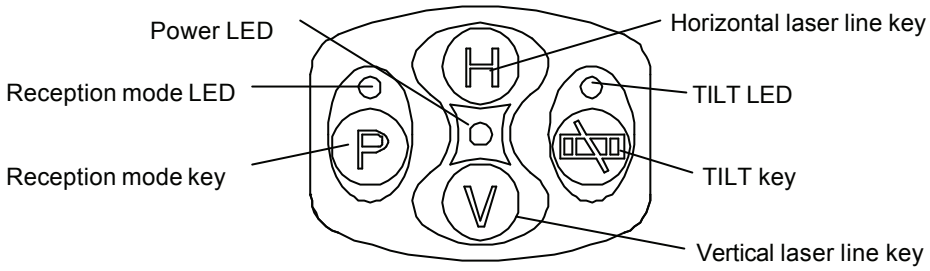
2. User Safety

- Laser output sign is located near the output window.
- Do not stare into laser beam directly.
- Do not disassemble the instrument or attempt to perform any internal servicing. Repairs and servicing could be performed only by authorized service centers.
- The instrument complies with the safety classification standards of laser radiation.

3. Nomenclature



4. Operation Instruction



1: **Power LED**

Lock Unlock

Set the instrument to “UNLOCK” position, the power LED will light.
Set the instrument to “LOCK” position, the power LED will extinguish.

If laser flashing and sound alarming when the instrument is turned on, that mean it is beyond the self-leveling range. Please take this instrument on the level place.

2: Receive mode

Receive mode on, the LED is light , laser beam become dim, and it could be received by laser detector.

Receive mode off, LED is off, and it couldn't be received by laser detector.

Received mode could just work when the laser is projecting, it there's not laser, the mode doesn't work.

Reception mode

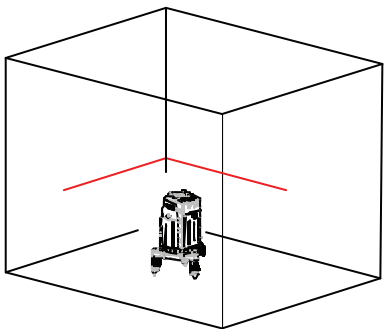
Switch on the reception mode, the reception mode LED will light and the laser line will become dim, which means that now the laser line could be received by the receiver.

Switch off the reception mode, the reception mode will extinguish and now it is impossible to receive the laser line with the receiver.

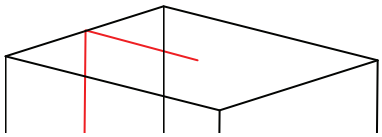
Reception mode could only be used when the laser is emitting, if there's no laser emitting, then the key is unusable

3: **Output form of the laser line**

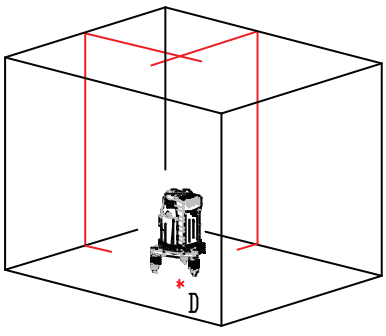
Press "H" key, the output form of laser line line is shown as below:



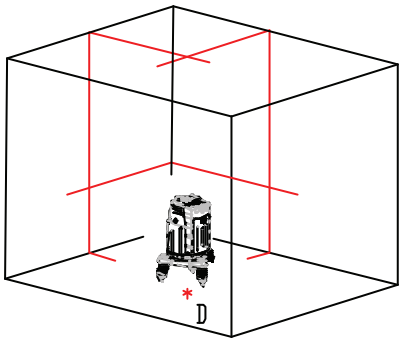
Press "V" key, the output form of laser is shown as below:



Press "V" key again the output form of laser line shown as below:



Press all keys the output form of laser line is is shown as below:



4: **TILT mode**

When the instrument is locked, Press TILT key to turn on the TILT mode. Power LED and level vial is light and TILT LED flashing.

The usage of H, V keys and calibration mode are same as the description above.

With the press of TILT key again, the instrument will power off.

Note: When the instrument is in unlock status, press TILT key without any response. If set the instrument to unlock position when the instrument is working in the TILT mode, the instrument will exit TILT mode and enter self-leveling mode.

5. Instrument Usage

1: **Usage for Batteries**

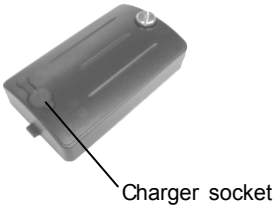
Take off the alkaline battery case, put 3 x AA alkaline batteries into the battery case according to the polarity indication shown in the battery case. Or take off the alkaline battery case, and use rechargeable battery pack.

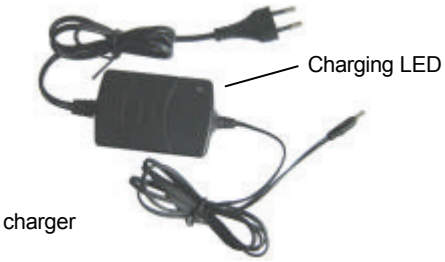
Alkaline battery case

Rechargeable battery pack

2: Usage of rechargeable battery

Connect the instrument with the adapter through the outlet socket on the battery case. The LED is red when charging, after the battery is full charged, the LED turn to green from red.





Note: in order to extend the useful life, please charge the battery after it is empty(when the weak voltage LED is lighted)

3：**Adjusting the adjustable support legs**

While using the instrument, it is necessary to adjust the three adjustable support-legs to make the round bubble centered. If the instrument is so tilted as to exceed the self-leveling range, the laser line will flash. Here we should adjust the adjustable support-legs to make the round bubble centered.

4：**Instrument rotating and fine adjustment**

360 degree rotating

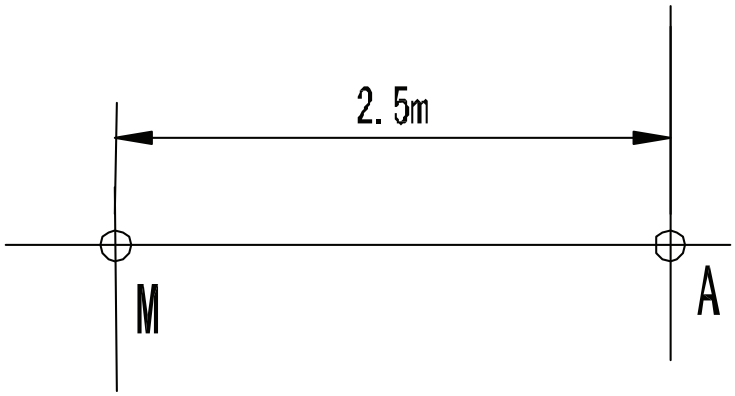
Fine adjustment

5: **Connecting with the tripod**

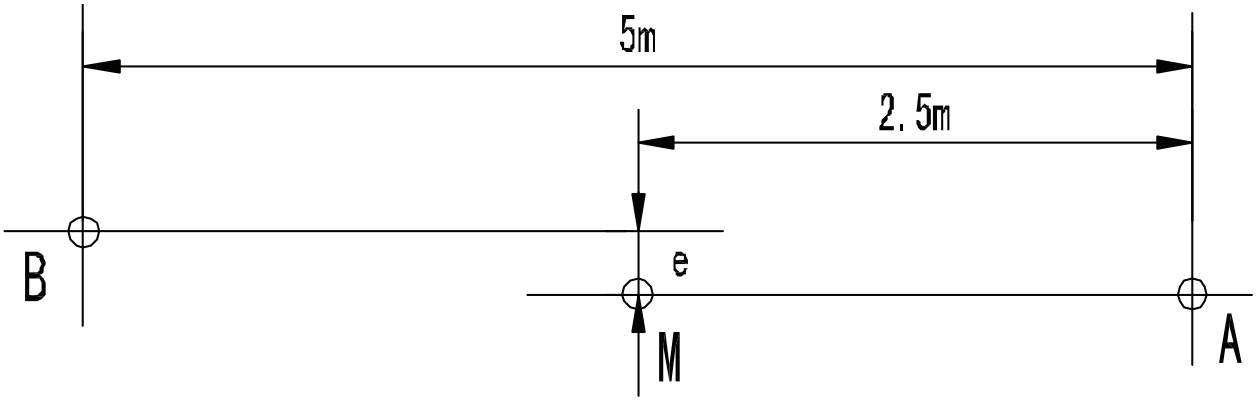
6. Self-check and Calibration

1: Horizontal Laser Line Accuracy Self-check (horizontal)

a). Find a smooth wall, set up the unit at 5 meters away from the wall and leveling the vial.
b). Set the instrument on the tripod or support pole, and orient it at the wall.
c). Press the keys H, V1 to project laser lines H, V1, take the cross on the wall as point A.
d). Make out point A and point M on the horizontal line (the distance between the two points s about 2.5m)



a) Turn the unit to move the cross to point B which is 5m away from point A.



b) Measure the distance e between point M and the laser line.

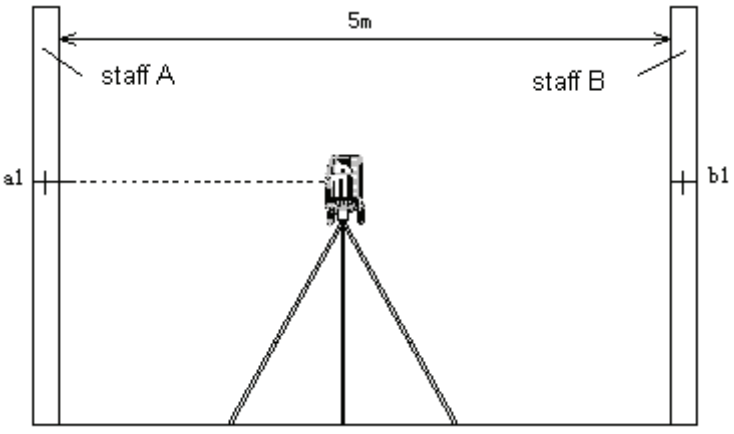
c) If e>2mm, the unit accuracy is beyond tolerance. Please send it to dealer for maintenance.

2: Self-check of horizontal accuracy (vertical)

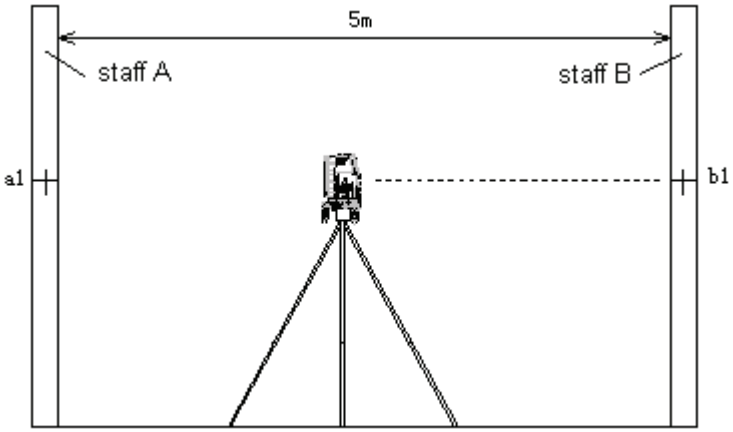
1. Setup two survey-staff which is 5 meters away from each other (or two parallel-wall which is more than 5m away from each other).

2.Set the instrument on the tripod or support pole, then place the unit at the center between the two survey-staff and leveling the vial.

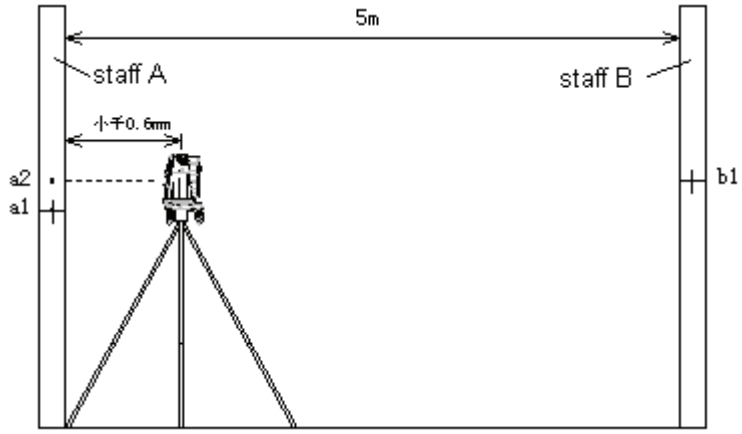
3. Press the keys H, V1 to project laser lines H, V1, have their cross located on staff A and note down the value of a1.



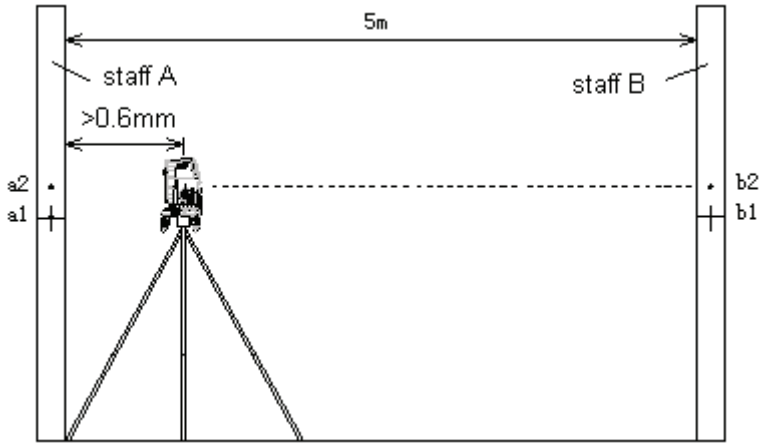
a) Turn the unit 180°, have the cross located on staff B and note down the value of b1.



b) Move the tripod to change the distance between the unit and staff A to 0.6m, have the cross located on staff A and note down the value of a2.



c) Turn the unit 180°,have the cross located on staff B and note down the value of b2



d) Calculate: (a1-a2)-(b1-b2)=e. If the absolute value of e exceeds 1.5mm, the unit accuracy is beyond tolerance. Please send it to dealer for maintenance.

3: Self-calibration（repair by distributor）

There are two self-calibration aperture on the instrument, aperture A is for horizontal direction calibration (for the error which is from **1:** Horizontal Laser Line Accuracy Self-check (horizontal)), aperture B is Vertical direction calibration (for the error which is from **1:** Vertical Laser Line Accuracy Self-check (vertical)).

Note:

1). Use hexangular spanner which subtense is 2mm on place A and which is 1.5mm on place B when calibrating the instrument;

2). The calibrations of the 2 direction may influence each other sometimes, when fine adjust the horizontal direction, the vertical direction may change, in the same way, when fine adjust the vertical direction, the horizontal direction may change; so, when doing the fine adjustment, the calibration on the 2 directions should calibrate again and again.

3). Self-check calibration screw should not adjust more than 4 rounds(clockwise or anticlockwise), if that doesn't work, the instrument need a further service by opening the housing

7. Technical Specifications

1. Accuracy: ± 1.5mm/10m(± 1°,the bubble in the top vial is within the range of scale)
2. Self-leveling range: ± 3°(The emitting laser beam will flash if beyond range)
3. Laser diode: Class Ⅱ 635nm : horizontal line and vertical line
   Class Ⅱ 650nm : plumb-down point
4. Sector angle: 120°
5. Working temperature: -10 °C ～ +45 °C
6. Power supply: 3*AA alkaline batteries/ special rechargeable battery pack
7. Battery life: 10 h (all of the laser lines are emitting)
8. Low Voltage Indication: Power indicator lamp twinkle
9. Size: F85x 190mm(size of bottom: F122mm)
10. Weight: 0.8Kg

8. Maintenance

- Avoid being wet with water and rain.
- The instrument should be carefully operated and properly preserved, and any violent shock or falling will possibly result in the damage of instrument.
- Before moving or transporting the instrument, please keep it in the locked situation to avoid depressing the accuracy.
- Do not attempt to disassemble the instrument, and the unprofessional disassembly will result in the damage of instrument.
- Keep the cleanness of instrument, especially the laser output window, and remove dust by the gentle operation of soft clean cloth.
- Take the batteries out when the instrument is not in use for a long time, and keep the instrument in the carrying case when it is unused.

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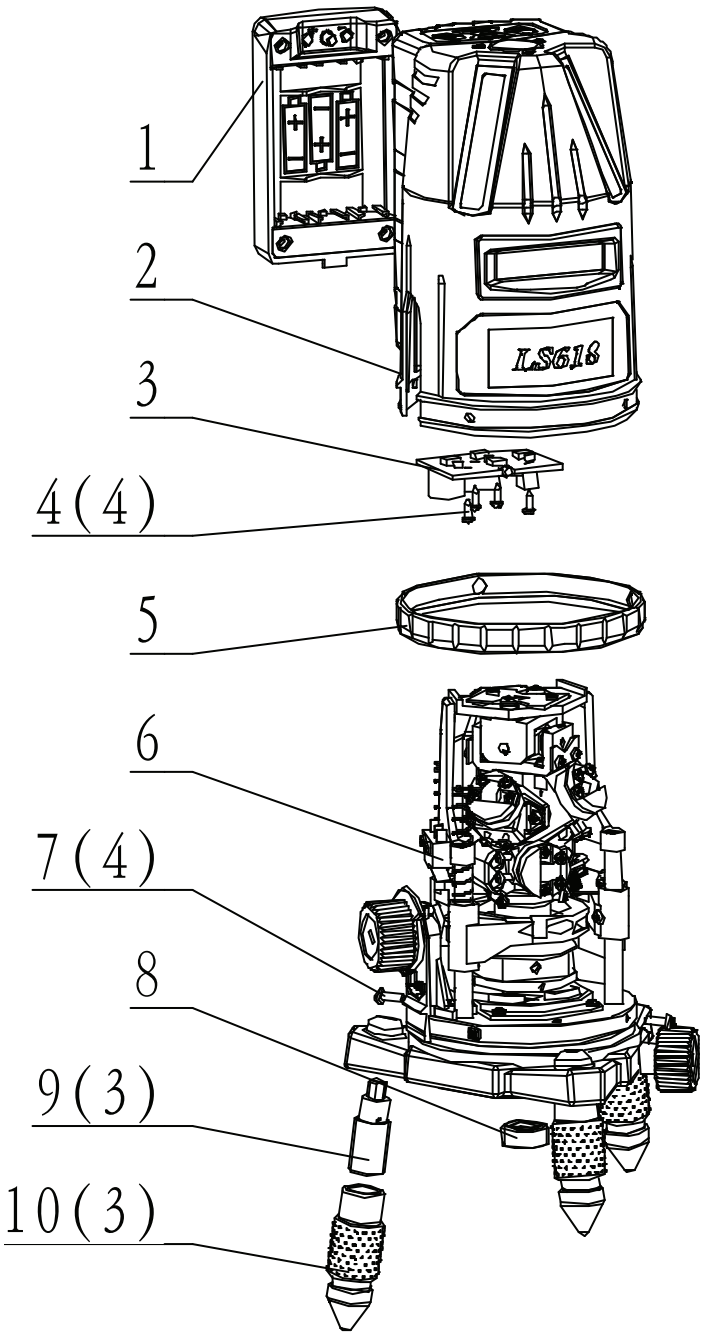
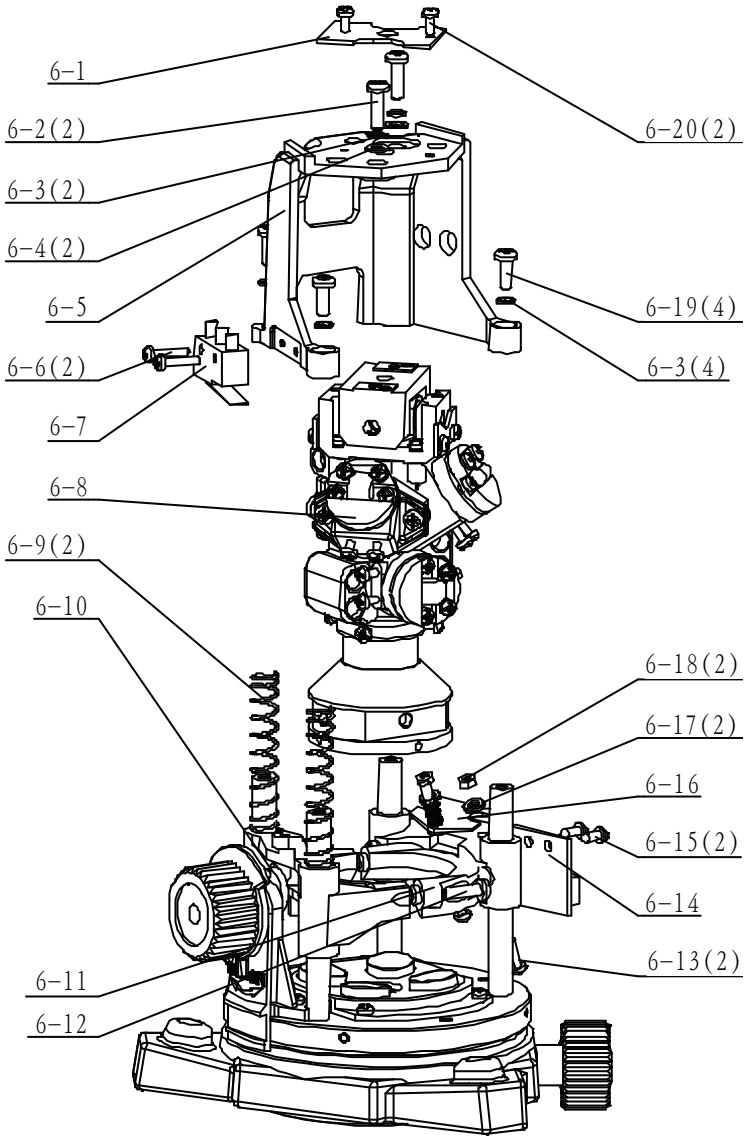
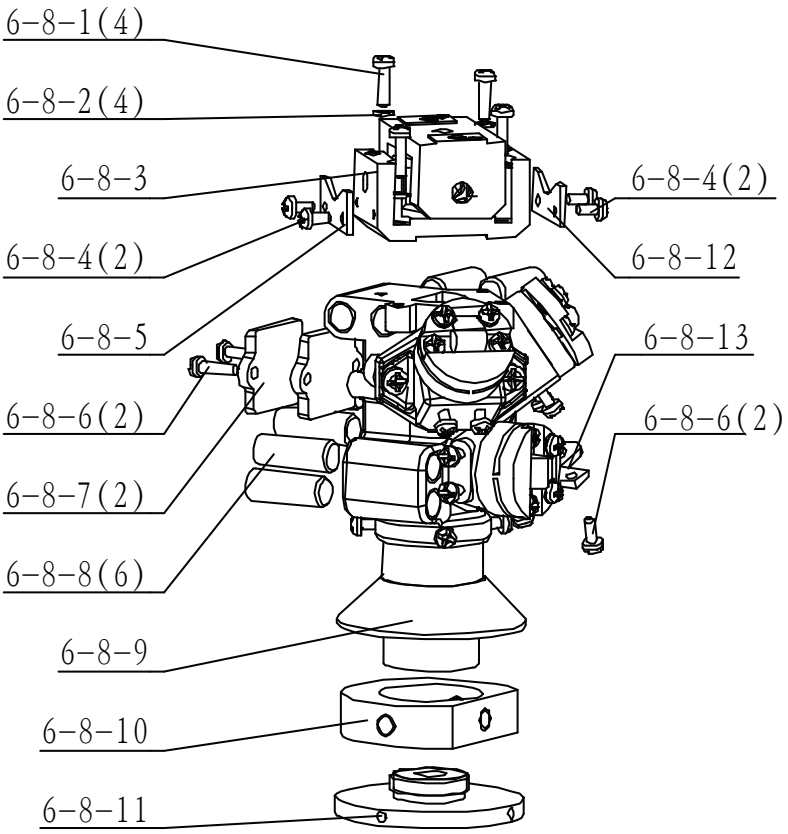
Self-leveling Laser Marker (Exploded View) (2V1HXL)



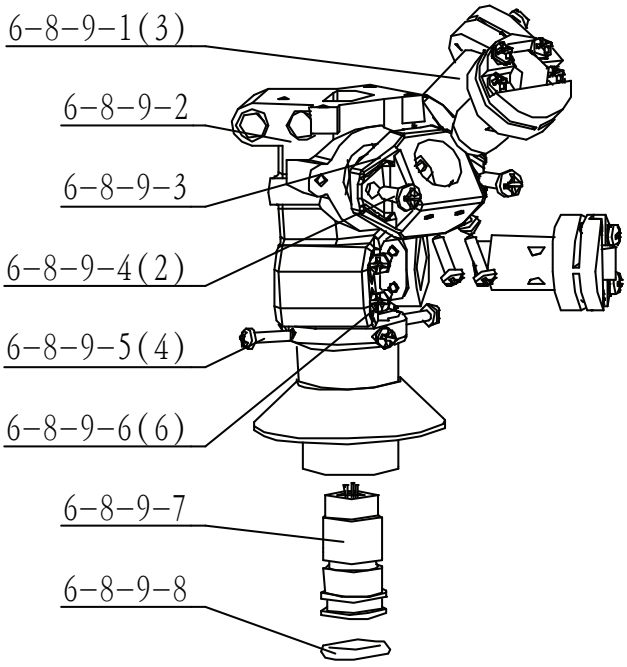
1	Battery box part
2	Housing module
3	1# main PC board
4	Cross-head plate tapping screw ST2.2X6.5（4）
5	Rubber ring
6	Instrument body module
7	Cross-head plate screw M2.5X8（4）
8	Lens base part
9	Support leg screw（3）
10	Support leg screw cover part（3）



6-1	3# connecting PC board
6-2	Cross-head plate screw M3X10(2)
6-3	Elastic gasket f 3(6)
6-4	Flat gasket f 3(2)
6-5	Bracket
6-6	Cross-head plate screw M2X10(2)
6-7	Fine switch
6-8	Core module
6-9	Press spring (2)
6-10	Base part
6-11	Locking ring
6-12	Cross-head plate screw M2.5X8(2)
6-13	Cross-head plate screw M2X8(2)
6-14	2# connecting PC board
6-15	Cross-head plate tapping screw ST2.2X6.5(2)
6-16	7# alarming bracket PC board
6-17	Big gasket (2)
6-18	Nut M2(2)
6-19	Cross-head plate screw M3X8(4)
6-20	Cross-head plate screw M2X5(2)



6-8-1	Cross-head plate screw M2X8(4)
6-8-2	Elastic gasket f 2（4）
6-8-3	Gimbal module
6-8-4	Cross-head plate screw M2X4(4)
6-8-5	5# connecting PC board
6-8-6	Cross-head plate screw M2X6(4)
6-8-7	Piece with weight （according to need）
6-8-8	Screw with weight（6）
6-8-9	Core part
6-8-10	Pendulum
6-8-11	Spherical tray
6-8-12	4# connecting PC board
6-8-13	8# alarming PC board



6-8-9-1	Laser module（3）
6-8-9-2	Base
6-8-9-3	Adjusting base
6-8-9-4	Cross-head plate screw M2.5X8（2）
6-8-9-5	Cross-head plate screw M2X8（4）
6-8-9-6	Special screw 2（6）
6-8-9-7	Plumb down source module
6-8-9-8	O ring

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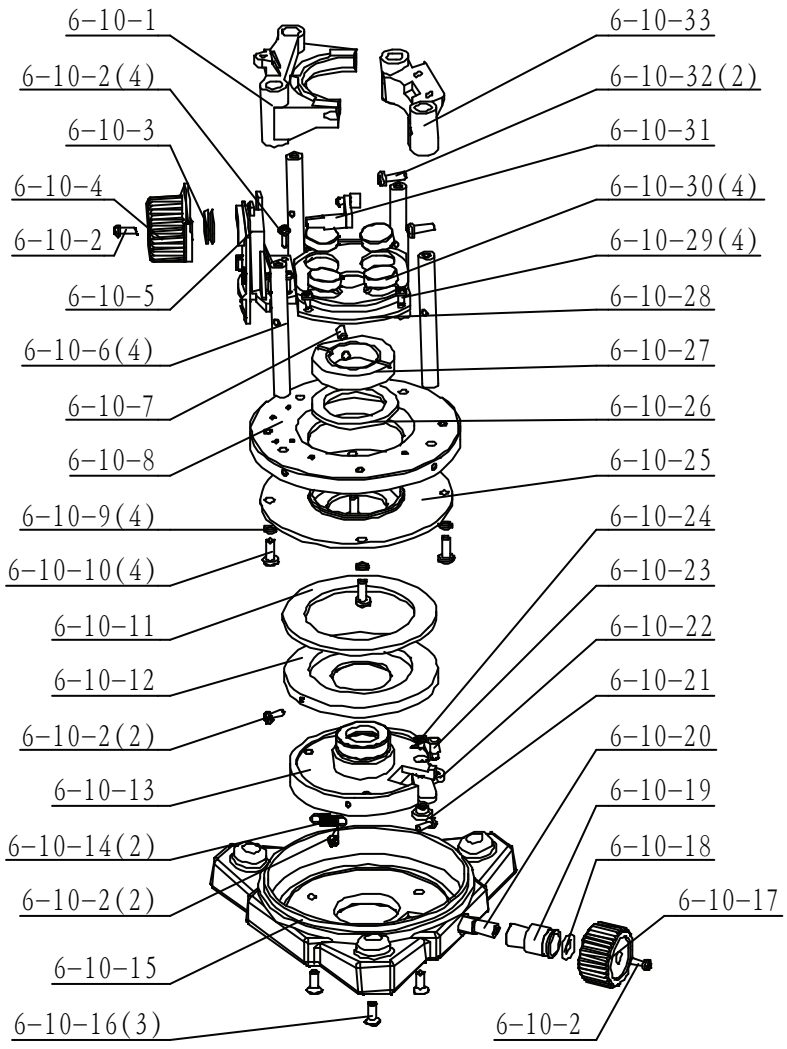

6-10-1	Slip ring
6-10-2	Cross-head plate screw M2X6(10)
6-10-3	Airproof ring
6-10-4	Locking handwheel
6-10-5	Locking bracket
6-10-6	Underpinng（4）
6-10-7	Inner hexagon notched tighten screw M3X5
6-10-8	Underpan
6-10-9	Elastic gasket f 3(4)
6-10-10	Cross-head plate screw M3X8(4)
6-10-11	Slip piece
6-10-12	Slip pan
6-10-13	Base axis
6-10-14	Tension spring（2）
6-10-15	Base
6-10-16	Cross-head sunk screw M3X8(3)
6-10-17	Fine adjustment handwheel
6-10-18	O shape ring
6-10-19	Axis sleeve
6-10-20	Fine adjustment screw
6-10-21	Axis
6-10-22	Dial board
6-10-23	Dial pole
6-10-24	Cross-head sunk screw M2.5X5
6-10-25	Connecting pan
6-10-26	Cushion
6-10-27	Locking nut
6-10-28	Magnet base
6-10-29	Cross-head plate screw M2X5(4)
6-10-30	Magnet（4）
6-10-31	Crank axis
6-10-32	Cross-head plate screw M2.5X6(2)
6-10-33	Bracket base