

HILTI

PM 2-LG

取扱説明書

ja

사용설명서

ko

操作説明書

zh

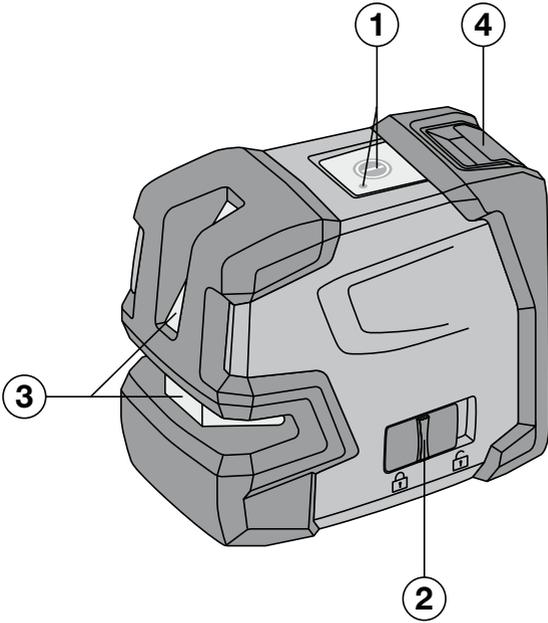
操作说明书

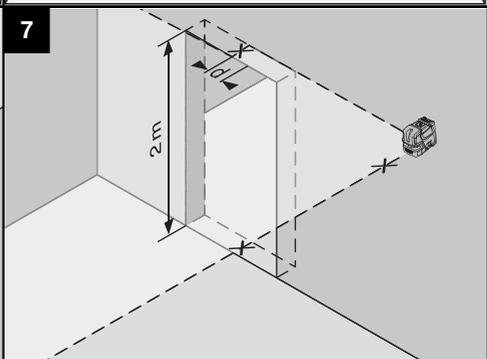
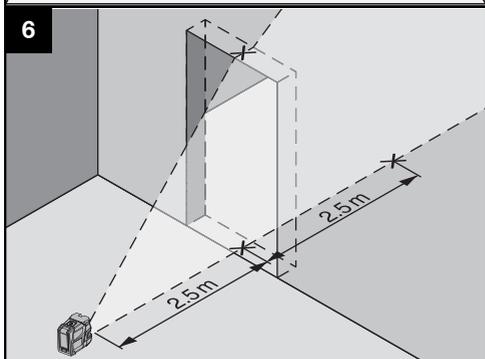
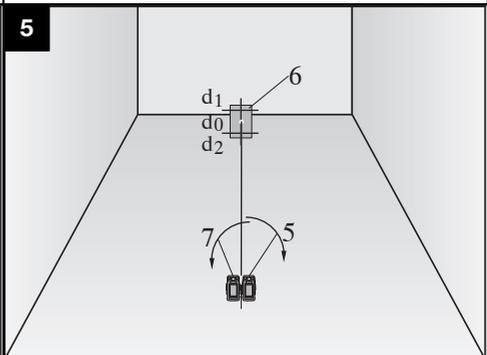
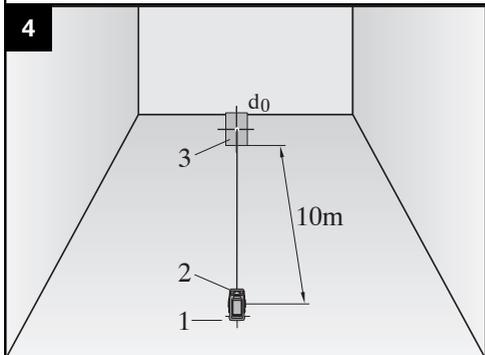
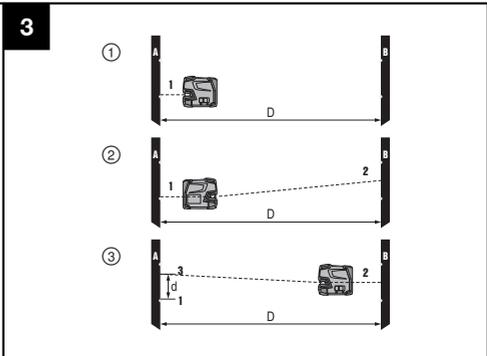
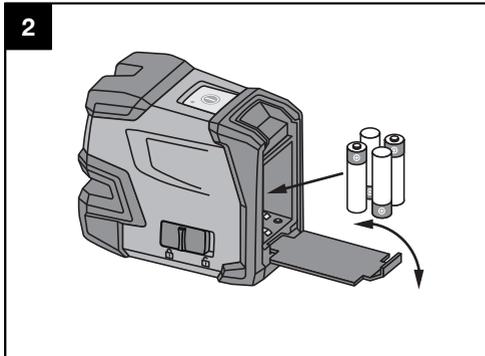
cn

Operating instructions

en







ORIGINAL OPERATING INSTRUCTIONS

PM 2-LG line laser

It is essential that the operating instructions are read before the tool is operated for the first time.

Always keep these operating instructions together with the tool.

Ensure that the operating instructions are with the tool when it is given to other persons.

Contents	Page
1 General information	30
2 Description	31
3 Accessories	32
4 Technical data	32
5 Safety instructions	33
6 Before use	34
7 Operation	34
8 Care and maintenance	35
9 Troubleshooting	36
10 Disposal	36
11 Manufacturer's warranty	37

1 These numbers refer to the illustrations. You can find the illustrations at the beginning of the operating instructions.

In these operating instructions, the designation "the tool" always refers to the PM 2-LG line laser.

Parts, operating controls and indicators **1**

- ① On/off button with LED
- ② Slide switch for pendulum locking mechanism
- ③ Laser exit window
- ④ Battery compartment

1 General information

1.1 Safety notices and their meaning

DANGER

Draws attention to imminent danger that will lead to serious bodily injury or fatality.

WARNING

Draws attention to a potentially dangerous situation that could lead to serious personal injury or fatality.

CAUTION

Draws attention to a potentially dangerous situation that could lead to slight personal injury or damage to the equipment or other property.

NOTE

Draws attention to an instruction or other useful information.

1.2 Explanation of the pictograms and other information

Warning signs



General warning

Obligation signs



Read the operating instructions before use.

Symbols



Disposal of power tools or appliances and batteries together with household waste is not permissible.

On the tool



Do not stare into the beam.
Laser warning notices for USA based on 21 CFR 1040.

On the tool



Class 2 laser radiation. Do not look into the beam.

Laser warning notices based on IEC 60825-1/
EN 60825-1

Location of identification data on the tool

The type designation and serial number can be found on the type identification plate on the tool. Make a note of this data in your operating instructions and always refer to it when making an enquiry to your Hilti representative or service department.

Type: _____

Generation: 01 _____

Serial no.: _____

en

2 Description

2.1 Use of the product as directed

The PM 2-LG is a self-leveling line laser designed for leveling and alignment work. The line laser projects two green laser lines (horizontal and vertical) and a line intersection point.

The line laser can be operated by one person.

Possible applications are: Leveling power outlets, cable trays, radiators and in other items in installation work; Leveling suspended ceilings; Leveling and aligning doors and windows; Transferring heights; Vertical alignment of pipes.

To avoid the risk of injury, use only genuine Hilti accessories and insert tools.

2.2 Items supplied with the cardboard box version

- 1 Line laser
- 1 Soft pouch
- 4 Batteries
- 1 Operating instructions
- 1 Manufacturer's certificate

2.3 Information displayed during operation

LED	Doesn't light.	The tool is switched off.
	Doesn't light.	The batteries are exhausted.
	Doesn't light.	The batteries are inserted incorrectly.
	Lights constantly.	The laser beam is switched on. The tool is in operation.
	Blinks twice every 10 seconds (pendulum not locked) or every 2 seconds (pendulum locked).	The batteries are almost exhausted.
Laser beam	Blinks.	The tool is switched off but the pendulum is not locked.
	Blinks twice every 10 seconds (pendulum not locked) or every 2 seconds (pendulum locked).	The batteries are almost exhausted.

Laser beam	Blinks five times and then remains on permanently.	Automatic power-off has been deactivated (see section "Deactivating the automatic power-off function").
	Blinks with a high frequency.	The tool is unable to level itself (outside the self-leveling range).
	Blinks every 2 seconds.	Inclined line operating mode. The pendulum is locked, as a result of which the lines are not leveled.

3 Accessories

en

Designation	Short designation
Target plate	PRA 54
Wall mount for the magnetic holder	PMA 82
Magnetic holder	PMA 83
Tripod	PMA 20

4 Technical data

Right of technical changes reserved.

Range of the lines and intersection point	20 m
Accuracy ¹	±3 mm at 10 m
Self-leveling time	3 s (typical)
Laser class	Class 2, visible, 510 - 530 nm, ±10 nm (EN 60825-1:2007 / IEC 60825 - 1:2007); class II (CFR 21 §1040 (FDA))
Line width	Distance 5 m: < 2 mm
Self-leveling range	±4° (typical)
Automatic power-off	Activated after: 1 h
Operating status indicator	LED and laser beams
Power supply	AA-size batteries, Alkaline batteries: 4
Battery life	Alkaline battery 2,500 mAh, Temperature +24°C: 8 - 14 h (depending on the number of lines switched on)
Operating temperature	Min. -10°C / Max. +50°C
Storage temperature	Min. -25°C / Max. +63°C
Dust and water spray protection (except battery compartment)	IP 54 in accordance with IEC 60529
Tripod thread (tool)	UNC1/4"
Weight	Including battery: 520 g
Dimensions	65 x 107 x 95 mm

¹ Influences such as particularly high temperature fluctuations, dampness, shock, dropping, etc. can affect accuracy. Unless stated otherwise, the tool was adjusted or calibrated under standard ambient conditions (MIL-STD-810G).

5 Safety instructions

WARNING: Ensure that you read all safety precautions and instructions. Failure to observe the safety precautions and instructions may result in electric shock, fire and/or serious injury. Retain all safety precautions and instructions for future reference.

5.1 General safety measures

- a) Check the accuracy of the tool before use and several times during use.
- b) The tool and its ancillary equipment may present hazards when used incorrectly by untrained personnel or when used not as directed.
- c) Stay alert, watch what you are doing and use common sense when operating the machine. Don't use the machine when you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating machines may result in serious personal injury.
- d) Modification of the tool is not permissible.
- e) Do not render safety devices ineffective and do not remove information and warning notices.
- f) Keep children and other persons away from the area while the tool or appliance is in use.
- g) Take the influences of the surrounding area into account. Do not expose the tool to rain or snow and do not use it in damp or wet conditions. Do not use the tool where there is a risk of fire or explosion.
- h) Maintain the machine carefully. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the machine's operation. If damaged, have the machine repaired before use. Poor maintenance is the cause of many accidents.
- i) Have your power tool serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the power tool is maintained.
- j) The user must check the accuracy of the tool after it has been dropped or subjected to other mechanical stresses.
- k) When the tool is brought into a warm environment from very cold conditions, or vice-versa, allow it to become acclimatized before use.
- l) Make sure that the tool is mounted securely when adapters or accessories are used.
- m) Keep the laser exit aperture clean to avoid measurement errors.
- n) Although the tool is designed for the tough conditions of jobsite use, as with other optical and electronic instruments (e.g. binoculars, spectacles, cameras) it should be treated with care.
- o) Do not use a tool if its switch is defective. A tool that cannot be controlled by the switch (switched on and off) is dangerous and must be repaired.
- p) To achieve maximum accuracy, project the line onto a vertical, flat surface. When doing so, set up the tool at 90° to the surface.

5.2 Proper organization of the workplace

- a) Secure the area in which you are working and take care to avoid directing the beam towards other persons or towards yourself when setting up the tool.
- b) Measurements taken through panes of glass or other objects may be inaccurate.
- c) Ensure that the tool is set up on a steady, level surface (not subject to vibration).
- d) Use the tool only within its specified limits.
- e) If several laser tools are used in the same working area, care must be taken to avoid confusing the beams.
- f) Strong magnetic fields may affect the accuracy of the tool. Magnetic objects should thus be kept away from the measuring tool. Hilti magnetic adapters may be used.
- g) Do not use the tool in the proximity of medical instruments.

5.3 Electromagnetic compatibility

NOTE

Only for Korea: This device is suitable for the electromagnetic radiation encountered in residential environments (Class B). It is intended mainly for use in residential environments but may also be used in other environments.

Although the tool complies with the strict requirements of the applicable directives, Hilti cannot entirely rule out the possibility of the tool being subject to interference caused by powerful electromagnetic radiation, leading to incorrect operation. Check the accuracy of the tool by taking measurements by other means when working under such conditions or if you are unsure. Likewise, Hilti cannot rule out the possibility of interference with other devices (e.g. aircraft navigation equipment).

5.4 Laser classification for laser class 2/class II tools

Depending on the version purchased, the tool complies with Laser Class 2 in accordance with IEC825-1:2007 / EN60825-1:2007 and Class II in accordance with CFR 21 § 1040 (FDA). This tool may be used without need for further protective measures. Nevertheless, as with the sun, one should not look directly into sources of bright light. In the event of direct eye contact with the laser beam, close your eyes and move your head out of the path of the laser beam. Do not direct the laser beam toward persons.

5.5 Electrical

- a) Remove the batteries before storing or transporting the tool.
- b) Keep the batteries out of reach of children.
- c) Do not allow the batteries to overheat and do not expose them to fire. The batteries may explode or release toxic substances.
- d) Do not charge the batteries.

en

- e) Do not solder the batteries into the tool.
- f) Do not discharge the batteries by short circuiting as this may cause them to overheat and present a risk of personal injury (burns).
- g) Do not attempt to open the batteries and do not subject them to excessive mechanical stress.
- h) Do not use damaged batteries.
- i) Do not mix old and new batteries. Do not mix batteries of different makes or types.

- j) Use only the specified batteries in the tool. Use of other batteries may create a risk of injury and fire.

5.6 Liquids

Under abusive conditions, liquid may leak from the battery. **Avoid contact. If contact accidentally occurs, flush with water. In the event of the liquid coming into contact with the eyes, rinse the eyes with plenty of water and consult a doctor.** Liquid ejected from the battery may cause irritation or burns.

en

6 Before use

6.1 Inserting the batteries

1. Open the battery compartment and insert the batteries.
NOTE Correct orientation of the battery poles is shown on the underside of the tool.

2. Close the battery compartment.

7 Operation

NOTE

To achieve maximum accuracy, project the line onto a vertical, flat surface. When doing so, set up the tool at 90° to the surface.

7.1 Operation

7.1.1 Switching the appliance on

1. Unlock the pendulum.
2. Press the on / off button.

7.1.2 Changing the operating mode

Press the on / off button repeatedly until the desired operating mode is set.

7.1.3 Switching the machine off

Press the on / off button.

NOTE

- The tool can be switched off if the on/off button has not previously been pressed for at least 5 seconds.
- The tool switches itself off automatically after approx. 1 hour.

7.1.4 Deactivating the automatic power-off feature

Press and hold the on/off button for approx. 4 sec. until the laser beam blinks five times as confirmation.

NOTE

The tool will be switched off when the on/off button is pressed or when the batteries are exhausted.

7.1.5 Inclined line function

Lock the pendulum.
The tool does not level itself automatically.
The laser beam blinks every two seconds.

7.2 Checking

7.2.1 Checking the leveling of the horizontal laser beam

1. Switch the tool on and make sure that the pendulum lock is disengaged.
2. Mount the tool on a tripod close to the wall (A) or stand it on a solid, flat surface. Bring the tool into alignment with the intersection point of the lines on the wall (A).
3. Mark the point of intersection of the laser lines on the wall (A) with a cross (1).
4. Turn the tool through 180°, allow it to level itself and then mark the point of intersection of the laser lines on the opposite wall (B) with a cross (2).
5. Mount the tool on a tripod close to the wall (B) or stand it on a solid, flat surface. Bring the tool into alignment with the intersection point of the lines on the wall (B).
6. Adjust the height of the tool so that the intersection of the lines lies on the mark previously made. Use the tripod to adjust the height of the tool or insert shims under the tool to bring it to the required height.
7. Turn the tool through 180° and, without altering the height of the tool, mark the point of intersection of the laser lines on the opposite wall (A) with a cross (3).
8. The distance d between the two marked points (1) and (3) on the wall is equal to twice the height deviation of the tool over the distance between the two walls (D).
9. The maximum permissible deviation is 3 mm per 10 m distance.

10. For calculation of deviation in accordance with the above method, the maximum permissible deviation is as follows:

$$d [\text{mm}] < 0,3 \left[\frac{\text{mm}}{\text{m}} \right] * 2 * D [\text{m}]$$

11. The maximum permissible deviation in millimeters must be less than 0.3 mm/m multiplied by twice the distance in meters between the two walls.
 d = twice the measured deviation in millimeters
 D = distance between the two walls in meters

7.2.2 Checking the accuracy of the horizontal line 4 5

- Place the tool at the edge of a room with a length of at least 10 m.
NOTE The floor surface must be even and level.
 - Switch all laser beams on and make sure that the pendulum lock is disengaged.
 - Make a mark at a distance of at least 10 m from the tool, so that the point of intersection of the laser lines lies in the center of the mark (d0) and the vertical line of the mark runs exactly through the middle of the vertical laser line.
 - Pivot the tool clockwise through 45° (as seen from above).
 - Then mark the point (d1) on the mark where the horizontal laser line strikes the vertical line on the mark.
 - Pivot the tool counterclockwise through 90°.
 - Then mark the point (d2) on the mark where the horizontal laser line strikes the vertical line on the mark.
 - Measure the following vertical distances: d0-d1, d0-d2 and d1-d2.
 - For d0-d1, d0-d2 and d1-d2, the following applies:
- $$(d_{\text{max}} - d_{\text{min}}) [\text{mm}] < 0,5 \left[\frac{\text{mm}}{\text{m}} \right] * D [\text{m}]$$
10. The greatest measured vertical distance must be no more than 5 mm at a working distance of 10 m.
 dmax-dmin = distance between the highest mark and the lowest mark in millimeters
 D = distance between the tool and the mark in meters

7.2.3 Checking the accuracy of the vertical line 6 7

To perform this check you require a door opening or similar object with a clear height of at least 2 meters. In addition to this, you require free space of at least 2.5 meters on each side.

- Switch the tool on and make sure that the pendulum lock is disengaged.
- Stand the tool on the floor at a distance of 2.5 m from the door opening and align the tool so that the vertical line is positioned in the middle of the door opening.
- Mark the middle of the vertical line on the floor (1) and at the top edge of the door opening (2) and also on the floor at a distance of 2.5 meters behind the door opening (3).
- Position the tool immediately behind point (3) on the floor and align the laser beam so that it passes through points (3) and (1).
- The deviation between the laser line and point (2) can be read directly at the top edge of the door opening. This value corresponds to the deviation at twice the height.
- Measure the height of the door opening.
- The maximum permissible deviation is 3 mm per 10 m height.
- For calculation of deviation in accordance with the above method, the maximum permissible deviation is as follows:

$$d < 0,3 \text{ mm} * 2 * H [\text{m}]$$

9. The maximum permissible deviation in millimeters must be less than 0.3 mm/m multiplied by twice the height in meters.
 d = twice the measured deviation in millimeters
 H = height of the door opening in meters

7.2.4 Procedure in the event of deviations

In the event of finding deviations, please return the tool to a Hilti Measuring Systems Service Center for servicing.

8 Care and maintenance

8.1 Cleaning and drying

- Blow dust off the glass.
- Do not touch the glass with the fingers.
- Use only a clean, soft cloth for cleaning. If necessary, moisten the cloth slightly with pure alcohol or a little water.
NOTE Do not use any other liquids as these may damage the plastic components.

8.2 Storage

Remove the appliance from its case if it has become wet. The tool, its carrying case and accessories should be cleaned and dried (at maximum 63°C / 145°F). Repack the equipment only once it has dried completely and then store it in a dry place.

Check the accuracy of the equipment before it is used after a long period of storage or transportation.

Remove the batteries from the appliance before storing it for a long period. Leaking batteries may damage the appliance.

Observe the temperature limits when storing your equipment, especially in winter / summer if the equipment is kept inside a motor vehicle (-25°C to +60°C).

8.3 Transport

Use the Hilti toolbox or packaging of equivalent quality for transporting or shipping your equipment.

8.4 Hilti Measuring Systems Service

Hilti Measuring Systems Service checks the tool and, if deviations from the specified accuracy are found, recalibrates the tool and checks it again to ensure conformity with specifications. The service certificate provides writ-

ten confirmation of conformity with specifications at the time of the test.

The following is recommended:

1. The tool should be checked at suitable intervals, depending on the frequency of normal use.
2. The tool should be checked at least once a year by a Hilti Measuring Systems Service Center.
3. The tool should be checked by a Hilti Measuring Systems Service Center if it has been abused in any way.
4. The tool should be checked by a Hilti Measuring Systems Service Center before being used for particularly important work.

Having the tool checked by a Hilti Measuring Systems Service Center does not relieve the user of his/her obligation to check the tool before and during use.

9 Troubleshooting

Fault	Possible cause	Remedy
The tool cannot be switched on.	The battery is exhausted.	Replace the battery.
	The battery is inserted the wrong way round (incorrect polarity).	Insert the battery correctly.
	The battery compartment is not closed.	Close the battery compartment.
The tool can be switched on but no laser beam is visible.	The temperature is too high or too low.	Allow the tool to cool down or warm up.
Automatic leveling doesn't function.	The tool is set up on an excessively inclined surface.	Set up the tool on the level.

NOTE

If the steps listed here do not remedy the error, or if further errors occur, have the tool repaired at a Hilti Measuring Systems Service Center.

10 Disposal

WARNING

Improper disposal of the equipment may have serious consequences:

The burning of plastic components generates toxic fumes which may present a health hazard.

Batteries may explode if damaged or exposed to very high temperatures, causing poisoning, burns, acid burns or environmental pollution.

Careless disposal may permit unauthorized and improper use of the equipment. This may result in serious personal injury, injury to third parties and pollution of the environment.



Most of the materials from which Hilti tools or appliances are manufactured can be recycled. The materials must be correctly separated before they can be recycled. In many countries, Hilti has already made arrangements for taking back old tools and appliances for recycling. Ask Hilti Customer Service or your Hilti representative for further information.



For EC countries only

Do not dispose of electronic measuring tools or appliances together with household waste.

In observance of the European Directive on waste electrical and electronic equipment and its implementation in accordance with national law, electrical appliances and batteries that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.



Dispose of the batteries in accordance with national regulations.

11 Manufacturer's warranty

en

Please contact your local Hilti representative if you have questions about the warranty conditions.



Hilti Corporation

LI-9494 Schaan

Tel.: +423/234 21 11

Fax: +423/234 29 65

www.hilti.com

Hilti = registered trademark of Hilti Corp., Schaan
Pos. 2 | 20140919



2098696