

深达威® 手持式激光测距仪

Laser Distance Meter

用户手册

User Manual



中 文 ----- 03~16

English ----- 17~30



产品执行标准: GB/T 14267-2009




2024L379-44

安全条例

初次使用仪器前，请先仔细阅读安全条款和操作指南

- ⚠ 在使用仪器之前请仔细阅读本手册中的所有操作指南和安全条例，没有按照本手册所指引的操作方法使用仪器有可能会造成仪器的损害、影响测量精度、对使用者或第三者的人身伤害。
- ⚠ 不要用任何方式自行打开或修理仪器，严禁非法改装或改变仪器激光发射器的性能。请妥善保管仪器，不要放置在儿童可以接触到的地方，避免无关人员的使用。
- ⚠ 严禁用仪器激光器照射自己或他人的眼睛及身体其他部位，严禁将激光器照射在高反光的物体表面上。
- ⚠ 仪器电磁辐射可能对其他设备和装置造成干扰，请不要在飞机或医疗设备附近使用本仪器，不要在易燃、易爆的环境中使用仪器。
- ⚠ 仪器更换的废旧电池和报废的仪器不可与生活垃圾一同处理，请按国家或者当地的相关法律规定处理废旧电池和报废仪器。
- ⚠ 仪器出现任何的质量问题，或对使用仪器有任何疑问时请及时联系当地经销商或深达威仪器厂家，我们将第一时间为您解决。

感谢您购买  **SNOWAY**
深达威® 仪器 手持式激光测距仪系列产品!

专业铸造品质 品质成就品牌

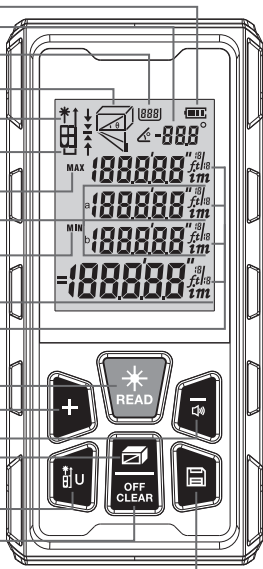
显示屏、键盘

● 显示屏

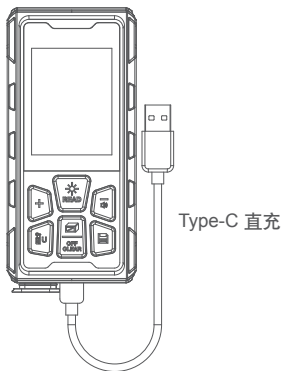
- 电量指示
- 角度指示
- 数据存储指示
- 长度/面积/体积/
三角测量模式
- 激光发射指示
- 基准指示
- 最大值指示
- 辅显示区
- 最小值指示
- 主显示区
- 单位

● 键盘

- 开机、测量键
- 累加键
- 累减、声音键
- 面积/体积/三角
模式键
- 测量基准/单位选择
- 关机、清除键
- 存储键





锂电池充电



锂电池

内置3.7V 2000mAh 锂电电池供电，不可拆装。

仪器自带充电电路，具有明晰的欠压指示、充电指示。
电池充电：充电头要用质量好的充电头，DC5V 1A输出，建议用手机充电头充电。


电池用过一段时间后容量不足时，开不了机或开机后，
电池符号空白闪烁显示，需要及时充电。插入USB充电，
电池符号条形柱滚动显示 ，充满电后会显示 ，且闪烁。


电池保养

长时间不使用时，先把产品充满电，并每半年再充电一次，以免电池放电损坏。


启动仪器、菜单设置

● 启动仪器和关闭仪器

关机状态下，按  键，仪器和激光同时启动，仪器进入待测模式。

开机状态下长按  键3秒关闭仪器。150秒内未对仪器进行任何操作，仪器将自动关闭。

● 单位设定

长按  键，进入测量单位调整状态，可重置当前测量单位，本机默认的单位为：0.000m，该仪器提供了6种单位可供选择。





测量单位：

	长 度	面积	体积
1	0.000 m	0.000 m ²	0.000 m ³
2	0.00 m	0.00 m ²	0.00 m ³
3	0.0 in	0.00 ft ²	0.00 ft ³
4	0 1/16 in	0.00 ft ²	0.00 ft ³
5	0'00" 1/16	0.00 ft ²	0.00 ft ³
6	0.00 ft	0.00 ft ²	0.00 ft ³

● 测量基准设置

短按  基准键进行设置前端基准、中端基准和末端基准的相互转换，系统默认为末端基准。

● 延时测量

长按  键开启延时测量模式，屏幕显示“SEC”默认延时时间为5秒，可通过   键对数值进行调整。按  键开始倒计时，倒计时结束开始测量。

● 背光灯开启/关闭






本仪器背光灯为自动开和关。仪器在键入任一按键后，背光灯会持续打开15秒，15秒后，仪器无操作将自动关闭背光灯，以节省电源。

● 声音开启/关闭

长按  键可开启或关闭蜂鸣器的提示音。

自助校准功能

为保证仪器的精准度，提供了自助校准功能。

校准方法：在关机状态下，持续按住  键，再按  键开机，松开  键，直到屏幕出现‘CARL’下端有闪烁的数字，进入自助校准模式。此时用户可根据仪器的误差用   键对这个数值进行调整。调整范围为：-9~9mm。

例如：实际距离为3.780m

若本机测量值为3.778m，比实际值小2mm，则可进入校准模式，用 $\boxed{+}$ 键将校准值在现有基础上，上调2mm。

若本机测量值为3.783m，比实际值大3mm，则可进入校准模式，用 $\boxed{-}$ 键将校准值在现有基础上，下调3mm。调整完毕后，按 $\boxed{*}$ \boxed{READ} 键保存校准结果。

距离测量、面积，体积，勾股间接测量，累加，累减测量

● 单次测量：



待测模式下按 $\boxed{*}$ \boxed{READ} 键，仪器激光发射，锁定测量点。再按 $\boxed{*}$ \boxed{READ} 键进行单次距离数据的测量，测量结果显示在主显示区。

● 连续测量：


待测模式下长按 $\boxed{*}$ \boxed{READ} 键，进入连续测量状态，屏幕上辅助显示区会显示此次连续测量过程中的最大测量值和最小值。


主显示区会显示当前测量值，短按 $\boxed{*}$ \boxed{READ} 键或 \boxed{OFF} \boxed{CLEAR} 键退出连续测量模式。

● 面积测量：

按  键一次，屏幕会显示 ，长方形一条边闪烁。

根据提示完成下列操作：

按  键进行第一条边的测量（长）



按  键进行第二条边的测量（宽）


仪器会自动进行面积运算，结果显示在主显示区。

辅助显示区显示长方形的长和宽的测量值。

在测量过程中，还可以键入  清除本次测量结果重新测量。

● 体积测量：

按  键二次，系统进入体积测量状态，仪器进入体积状态，屏幕上会有一个立方体闪烁 ，根据提示完成下列操作：

按  键进行第一条边的测量（长）

按  键进行第二条边的测量（宽）



按  键进行第三条边的测量（高）

仪器会自动进行体积运算，结果显示在主显示区。

辅助显示区显示立方体的长宽高的测量值。

在测量过程中，还可以键入  清除本次测量结果重新测量。

● 墙面面积测量：

短按  三次，屏幕显示 ，根据提示完成下列操作。

按  键，测得墙面的高度；


按  键，测得墙面1的宽度1；

仪器会自动计算墙面的面积=高度x宽度1；

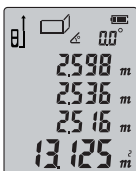
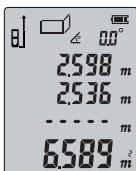
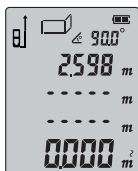
按  键，测得墙面2的宽度2；

仪器会自动计算墙面的面积总和

面积总和=高度x(宽度1+宽度2)

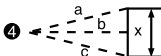
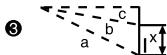
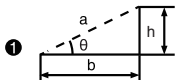
依次类推，按  键，测得墙面n的宽度n；

面积总和=高度x(宽度1+宽度2+.....+宽度n)；



在测量过程中，还可以键入  清除本次测量结果重新测量。

● 勾股定理间接测量：



仪器预设四种利用勾股定理测量三角形单边距离模式，方便用户在特定复杂环境下进行间接测量。

① 测角测高

仪器短按 键四次进入三角测角测高模式：

按 键依屏幕提示先测出虚线斜边的长度(a)
同时测出斜边与底边夹角 θ 。

仪器自动计算水平距离b与垂直高度h。

② 测量直角三角形两直角边，间接测量斜边长度





点击 键五次，屏幕显示： 直角边闪烁


按 键依屏幕提示测出一条虚线的长度(a)


按 键测出另一条虚线角边的长度(b)

仪器自动计算实线斜边的长度(x)

③ 点击  键六次，屏幕显示： 斜边闪烁

按  键依屏幕提示先测出一条虚线的长度(a)


按  键测出中间一条虚线边的长度(b)


按  键测出另一条虚线边的长度(c)

仪器自动计算出实线三角形一条边的长度(x)

④ 点击  键七次，屏幕显示： 斜边闪烁

按  键依屏幕提示测出一条虚线边的长度(a)




按  键测出如图虚线边的长度(b)


按  键测出如图另一条虚线斜边的长度(c)

仪器自动计算出实线直角边的长度(x)

勾股测量模式下，直角边必须小于斜边长度仪器才能计算，否则仪器会显示错误信号。在勾股测量模式下，为保证测量的精度，须确保从同一个起始点测量，并按斜边、直角边测量顺序测量。

● 加减测量功能：

单段距离测量可通过加/减运算进行累加或累减操作。用户在测量单段距离得到一次测量结果后，再通过   键进入累加累减功能选择，短按  键，屏幕测量主显示区出现“+”，进入累加测量模式，屏幕显示上次测量值与当次测量值的累加值。

短按  键，屏幕测量主显示区出现“-”，进入累减测量模式，屏幕显示上次测量值与当次测量值的差值。

不仅距离可累加累减，面积和体积也可进行累加累减。下面举例说明面积的累加累减功能，体积的累加累减与此类似。

面积累加：测量第一个面积，得到结果如下图1所示。然后按下 **[+]** 键，再测量第二个面积，得到结果如下图2所示，在左下角会显示一个加号。最后，按下 **[*]** 键得到两次面积求和的结果，结果如图3所示。

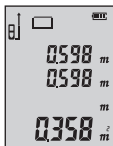


图1



图2

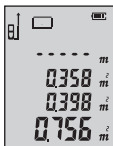









图3

测量记录存储功能

测量模式下若当前数据有效时，长按 **[☐]** 键3秒，当前测量数据自动存储到仪器内存中。

在面积，体积，三角形间接测量模式下，当所有测试结束后，也可进行存储，此时仪器会保存该测量模式下，该次测量的完整记录。

● 浏览/删除记录：

短按  键，查询已储存的测量数据，用  键向前翻记录，用  向后翻记录。在查看记录过程中，短按  删除当前记录，长按  键清除所有记录。可按  键或  键退出该状态。

● 角度测量

显示屏上方时刻显示有角度信息，角度的测量范围是 $-90^{\circ} \sim 90^{\circ}$ 。

提示信息

使用过程中，主显示区可能会出现如下提示信息

信息	原因	解决方法
Err	超出距离测量范围	让仪器在量程范围内使用
Err1	信号过弱	测量反射能力强的目标点
Err2	信号过强	测量反射能力弱的目标点
Err3	电池电压过低	对电池进行充电
Err4	超出工作温度范围	让仪器在指定环境中使用
Err5	勾股测量违规	重新测量，确保斜边大于直角边
Err6	角度传感器错误	返厂进行维修

技术参数

项目	SW-80GS	SW-120GS	SW-150GS
距离测量范围	80m	120m	150m
距离测量精度	$\pm(2\text{mm}+d \times \text{万分之一})^*$		
连续测量功能	✓		
面积体积测量	✓		
勾股测量功能	✓		
加减测量功能	✓		
面积体积加减	✓		
墙面面积测量	✓		
最大/最小值	✓		
自助校准功能	✓		
声音提示	✓		
激光类型等级	2级 500-800nm, <1mW		
防水等级	IP68		
存储记录笔数	99笔		
自动切断激光	20秒		
自动关机	150秒		
满电工作时间	15000次		
存储温度范围	-20°C~60°C		
工作温度范围	0°C~40°C		
存储湿度范围	20%~80% RH		
电池容量	3.7V 2000mAh锂电池		
Type-C充电	约3小时		
倾角测量范围	$\pm 90^\circ$		
角度精度	$\pm 1^\circ$		
外形尺寸	128x60x29.5mm		

* “d” 表示实际距离

** 在恶劣环境下如:阳光过于强烈。环境温度波动过大, 反射面反射效果较弱, 电池电量不足的情况下测量结果会有较大的误差, 此种情况配合目标反射板使用效果更佳。

仪器日常保养

- 禁止将仪器长期放置在高温高湿的环境中储存，长期不使用仪器时，请把仪器放置在随机的仪器套内，放在阴凉干爽处存放。
- 请保持仪器表面清洁，可用湿的软布擦拭表面灰尘，不可用带有腐蚀性洗液清洁仪器。可按照擦拭光学器件表面的方法擦拭激光器窗口和聚焦镜。

装箱清单

购买仪器时请按下列清单认真检查仪器所有附件是否完整？

项目	名称	单位	数量	备注
1	主机	台	1	
2	布包盒	个	1	
3	挂绳	条	1	
4	锂电池	块	1	内置不可拆
5	说明书	本	1	
6	保修合格证	张	1	
7	彩盒	个	1	
8	USB Type-C线	条	1	







检验员：

日期：



Safety Regulations

Please Read The Safety Regulations And Operation Guide Carefully Before Operating.

-  Please read all of the operational guide and safety regulations in this manual before operation. Improper operations without complying with this manual may cause damage to the device, influence measurement results or cause user injury.
-  The instrument is not allowed to disassemble or repair in any ways. It is forbidden to do any illegal modification or performance change for laser emitter. Please keep it out of reach of children and avoid being used by any irrelevant person.
-  It is strictly prohibited to shoot eyes or other parts of body with the laser; It is not allowed take the laser to shoot any objects' surface with strong reflecting.
-  Due to electromagnetic radiation interference to other equipment and devices, please don't use the meter in the plane or around medical equipment, don't use it in inflammable, explosive environment.
-  Discarded batteries or device should not be processed just like household garbage, please handle them in line with related laws and regulations.
-  Any quality issues or any questions on the meter, please contact local distributors or manufacturer in time, we are ready to offer solutions for you.

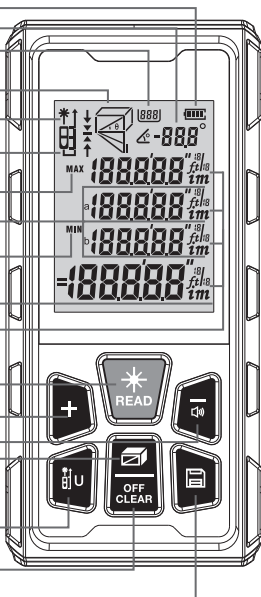
Display/Keyboard

● Display

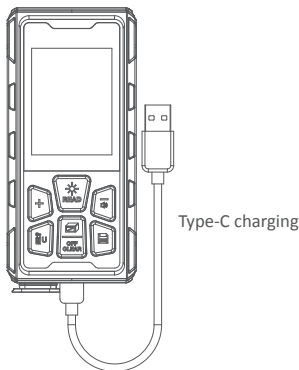
- Power Supply
- Angle
- Record
- Length, Area, Volume and Pythagorean Mode
- Laser on
- Reference
- Maximum Value
- Auxiliary Display
- Minimum Value
- Major Display
- Unit

● Keyboard

- Turn on/Measuring
- Addition
- Subtraction/Sound
- Area/Volume/Pythagorean Measuring
- Reference Point/Unit Switch
- Turn off/Remove
- Save





Li-ion Charging



Batteries Installation

The product is equipped with 3.7V/2000mAh lithium battery which is built-in and non-removable. Please charge it if it can not be turned on or there is low battery indication after starting up. Please use adapter with DC5V and 1A to charge it, the port is Type-C port.

(We recommend to use phone charger).



The battery icon  will be displayed in scrolling way during charging process. The battery icon  will be displayed and flashing when the charging is completed.

Battery Maintenance


Keep it with full power if no operations for a long time; And charge it once every half year to avoid battery damage.

Start Instrument/Menu Setting

● Turn on/off the Instrument

Under off status, press button  , device and laser start simultaneously and the instrument enters the test mode. Under on status, long press button  for 3 seconds to turn the device off. The device will also shut down without any operation within 150 seconds.


● Unit Setting

Long press button  , to reset current measurement unit. The default unit is: 0.000m. There are 6 units for selection.





Units:

Length	Area	Volume
0.000 m	0.000 m ²	0.000 m ³
0.00 m	0.00 m ²	0.00 m ³
0.0 in	0.00 ft ²	0.00 ft ³
0 1/16 in	0.00 ft ²	0.00 ft ³
0'00"1/16	0.00 ft ²	0.00 ft ³
0.00 ft	0.00 ft ²	0.00 ft ³

● Reference Point

Short press  to change the reference point.
System default reference point is bottom.


● Delay Measurement

Long press  to enable the delay measurement mode and "SEC" is displayed on the screen. The default delay time is 5 seconds. User can press  or  to adjust the time. Press  to start count down, the instrument starts measuring when the time turns to 0.

● Backlight On/Off






The backlight automatically turns on and off.
The backlight can be on for 15s while operating, and it will be shut off automatically in 15s when there is no operation to the device.

● Sound On/Off


Long press  button to turn on or off the buzzer.


Self-Calibration

This function can keep the precision of the device.

Instruction: Power off, long press button , and then press . Release the button , then "CAL" and a figure shows on the screen. User can adjust the figure with button   according to the accuracy of the meter. Adjusting range: -9 to 9mm.

For example, the actual distance is 3.780m.



If the measured value is 3.778m, 2mm smaller than the actual value, the calibration value can be adjusted up by 2mm on the existing basis with  through the calibration function.

If the measured value is 3.783m, 3mm larger than the actual value, the calibration value can be lowered by 3mm on the existing basis with  through the calibration function.




After the adjustment, press  to save the calibration result .

Length Measurement & Calculation

● Single Distance Measurement:

Turn on the laser beam by short press of the button  under measuring mode, press the button  again for single measurement of length, then the measured results displayed in the major display area.

● Continuous Measurement:


Long press button  under measuring mode and enter into continuous measuring mode. Maximum measuring result is displayed in auxiliary display area, present result is displayed in major display area. Short press button  or  to exit continuous measuring mode.

● Area Measurement:

Press button  ,  shows on the screen.


One of the side of rectangle blinking on the display, please follow the below instructions for area measuring:

Press  once for length



Press  again for width

The device calculates and shows the result in the major display area.


The measuring result of length is showed in the auxiliary display area. Press  to clear the result and measure again if necessary.


Press  again to exit the mode.

● Volume Measurement


Press button  twice to enter volume measurement mode. A  will shows on the top of screen. Please follow the below instruction for volume measuring:


Press  for Length

Press  again for Width



Press  thirdly for Height


The device calculates and shows the result in the major display area.


Press  to clear the result and measure again if necessary.

Press  again to exit the mode.


● Wall Area Measurement

Press button  three times till  shows in the display. Complete the following operations as prompted.

Press  to measure the height of the wall;


Press  to measure the width 1 of the wall 1;

The instrument will automatically calculate the area of the wall = height \times width 1;

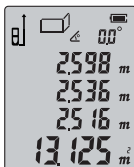
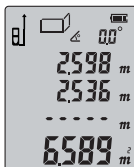
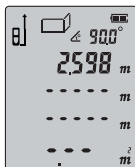
Press  to measure width 2 of the wall 2.


The instrument will automatically calculate the total area of the walls:

Total area = Height \times (Width 1 + Width 2)

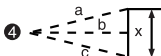
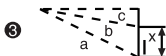
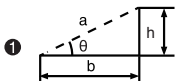
By analogy, press  to measure the width n of the wall n;

Total area = Height \times (Width 1 + Width 2 + + Width n)



Press  to clear the result and measure again if necessary.

● Pythagoras Measurement



There are four Pythagoras modes so users can make indirect measurements in specific complex environments.

① Measure the angle and height of

Short press four times, to enter angle and height measuring mode.

Press , measure the length of hypotenuse (a) and the angle (θ) between the hypotenuse and the bottom edge at the same time.

Device automatically calculates the horizontal distance (b) and vertical height (h) .



② Calculate the hypotenuse by measuring the length of two legs.


Short press five times, then one leg of will blink.


Press , measure the length of one leg (a)


Press , measure the length of another leg (b)

Device automatically calculates the length of hypotenuse (x)



③ Press  six times, then one side of , will blink on the screen.


Press , measure the length of line (a)


Press , measure the length of the median line (b)


Press , measure the length of another line (c)

Device automatically calculates the length of the leg in full line (x)

④ Press  seven times, then the hypotenuse of  will blink on the screen.

Press , measure the length of line (a)



Press , measure the length of line (b)


Press , measure the length of line (c)


Device automatically calculates the length of the leg in full line (x)

In Pythagoras measurement mode, legs must be shorter than hypotenuse, or there will be "err" shows on screen. In order to guarantee the accuracy, please make sure all measurements are start from the same point.



● Addition / Subtraction

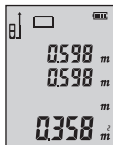
The device can be used for length addition and subtraction. Press   to select the function once get the length measuring result.

Short press , "+" shows in the major display area, entering addition mode. The sum of the last and current measurement value will be showed on the screen.

Short press , "-" shows in the major display area, entering subtraction mode. The difference between the last and current measurement value will be showed on the screen.

Not only length can be added or subtracted, but also area and volume. Take area as example:

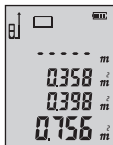
Area addition: Measure the first area as showed in PIC1. Then press button  , to measure the second area as showed in PIC2, there is a "+" in the left bottom. At last, press button  to get the sum of these two areas which is showed in PIC3.



PIC1




PIC2










PIC3

Record Function

Long press button  for 3s to store your measuring result under measuring mode.

It can also store the results under Area, Volume and Pythagoras mode.

● Browse/Delete Records:

Short press  to browse the stored measurement data. Press the  key to turn the record forward, press the  key to turn the record backward. Short press  to delete current record and long press  to delete all records. Press  or  to exit the current mode.

● Angle Measurement

The angle information is displayed at the top of the screen, and the angle measurement range is -90.0° to 90.0° .

Tips

You may get some warning information as below:

Info	Cause	Solution
Err	Out of measurement range	Use the device within the range
Err1	Signal is too weak	Chose the surface with stronger reflectance.
Err2	Signal is too strong	Chose the surface with weaker reflectance.
Err3	Low battery voltage	Charge the battery
Err4	Out of working temperature	Use the device in the proper temperature.
Err5	Pythagoras measuring error.	Re-measure and ensure that Hypotenuse is longer than legs.
Err6	Angle sensor error	Return to factory for repair

Technology specifications:

ITEM	SW-80GS	SW-120GS	SW-150GS
Working range	80m	120m	150m
Precision	$\pm(2\text{mm}+d * 1/10000)^*$		
Continuous measurement	yes		
Area measurement	yes		
Volume measurement	yes		
Pythagorean measurement	Full mode		
Wall area measurement	yes		
Addition/subtraction	yes		
Area&Volume addition/ subtraction	yes		
Min/Max value	yes		
Self-calibration	yes		
Sound prompt	yes		
Laser level	II		
Laser type	500-800nm,<1mW		
Protection grade	IP68		
Max storage	99 units		
Auto laser-off	20s		
Auto power-off	150s		
Battery life	15000 times for single measurement		
Storage temperature	-20°C~60°C		
Working temperature	0°C~40°C		
Storage humidity	20%~80% RH		
Battery	3.7V 2000mAh Lithium Battery		
Type-C charging	About 3h		
Angle range	$\pm 90^\circ$		
Angular accuracy	$\pm 1^\circ$		
Dimension	128x60x29.5mm		

* "d" indicates the actual distance

** In harsh environment, such as: sunlight is too strong, the ambient temperature fluctuates excessively, the reflection effect of the object's surface is weak, the battery is low, then the measurement results will have a large error, so a reflecting plate is needed.

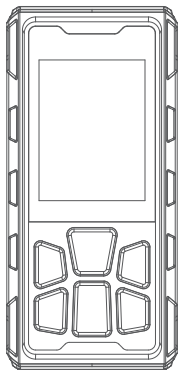
Instrument Maintenance:

- The meter should not be stored in high temperature and strong humidity environment for long time; if it is not used very often, please place the meter in the portable bag and store it in cool and dry place.
- Please keep the device surface cleaning. Wet soft cloth is applied to clean dust, but erosion liquid is not allowed to use for the meter maintenance. Laser window and focus lens can be maintained according to maintenance procedures for optical device.

Packing List

Please check if the accessories are completed according to the below list.

NO.	Item	Unit	QTY	Note
1	Laser distance meter	pc	1	
2	Portable bag	pc	1	
3	Hand strap	pc	1	
4	User manual	pc	1	
5	Gift box	pc	1	
6	USB Type-C	pc	1	



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