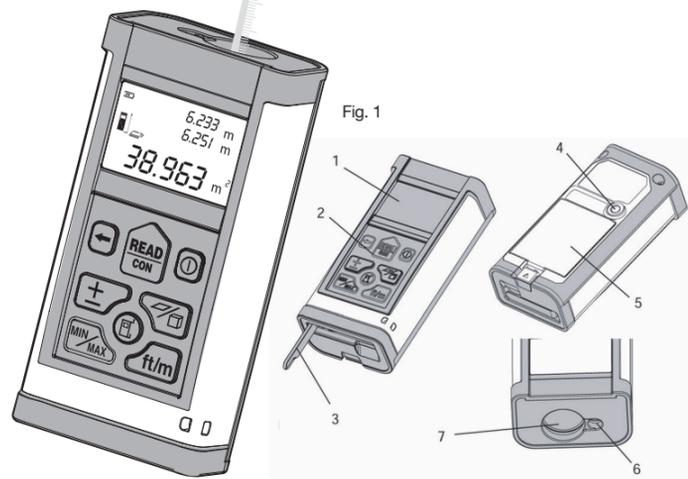


LASER DISTANCE METER LD 50



Technical specifications

Recommended use	Indoors
Measuring range	0,1 - 50 m*
Measuring accuracy	± 2 mm*
Smallest unit displayed	1 mm
Laser class	2
Laser type	$\lambda = 635\text{nm}$ $P < 1\text{mW}$
Automatic switch off:	- Laser: 20 seconds - Measuring device: 5 minutes
Estimated battery life (use alkaline AAA batteries)	Up to 5,000 individual measurements
Battery	4 x 1.5 volt AAA batteries
Optimum operating temperature	-5° C to 40° C
Storage temperature	-20° C to 60° C
Dimensions	113 x 56,4 x 35 mm
Weight	155g (without batteries)



RoHS ✓

*Important: The measuring range and accuracy of the device is reduced in the event of unfavourable conditions, such as in bright sunlight or when measuring poorly reflective or very rough surfaces; please use a reflector in such cases (not included).

Safety precautions



The device possesses a voltage range which can pose an electrical hazard to humans and animals. This should only be screwed and / or disassembled by authorised personnel. Similarly, maintenance and repair work should only be conducted by electrical specialists and authorised service centres. The buyer / user operates the device at their own risk and under their own responsibility.

MAKE SURE you have read and understood all of the instructions in this manual before using the product. Failure to follow all instructions may result in exposure to laser radiation, electric shock, and/or bodily injury.

CAUTION: Do not attempt to modify the performance of the laser device in any way. This may result in hazardous exposure to laser radiation.

LASER RADIATION. Do not stare into the beam. This is a class 2 laser product. Only switch the laser on when using the device.

Improper execution of operational procedures or the use of operating and adjusting elements in a way other than that specified in this manual can result in hazardous exposure to radiation.

The use of optical instruments such as telescopes, tachymeters or other similar devices to view the laser beam can increase the risk of eye damage.

This measuring tool has a built-in laser light. The laser is a Class 2 and emits output power of a maximum 1mW and 635 wavelengths. These lasers do not normally present an optical hazard.

However, do not look directly into the beam as this can cause flash blindness.



The following label can be found on your laser distance meter:

This indicates the location from which the digital laser distance meter emits the laser light. You should be familiar with the location of the laser when using this device. Make sure that all persons present are aware of the risks that are associated with direct eye contact with the laser beam.

- Do not remove or modify any of the product labels.
- The digital laser distance meter is not a toy. Keep it out of the reach of children at all times. The laser light generated by this device should never be directed towards any person under any circumstances.
- Do not use the device in the presence of children or allow children to operate the device.
- Do not position the device in such a way that can result in a person staring into the laser beam intentionally or by accident.
- Do not use the device on shiny or reflective surfaces such as sheet steel. The reflective surface could direct the beam back towards the operator.

- Always switch off the Digital laser unit when it is not in use. If it is left switched on, it increases the risk of someone inadvertently staring into the laser beam.
- Do not attempt to repair or disassemble the laser distance meter. If repairs are attempted by unqualified personnel, it could result in serious injury. Any repair work required on this laser meter should only be conducted by customer service stations that are authorised by KWB.
- Do not operate the device in combustible areas, for example, in the vicinity of flammable liquids, gases, or dust.
- Use of accessories that have been designed for other laser devices could result in serious injury.
- Keep batteries out of the reach of children.

Device description

- Digital laser - OVERVIEW (fig. 1)

- LCD display- The large LCD display with white backlight makes it easy to read the large-digit measurements clearly, even in poor lighting conditions.
 - The water and dust-proof keypad ensures safe and trouble-free operation
 - Positioning aid for conducting measurements from wall corners
 - 1/4 inch tripod socket - for securing to a tripod (not included in delivery)
 - Battery compartment for four AAA batteries.
 - Laser aperture - emits the laser beam
 - Receiving lens - receives the reflected laser beam for determining the distance
- The Digital laser digital laser distance meter is a highly accurate measuring tool that is quick and easy to use.

Intended use

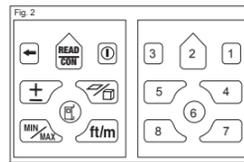
- Measuring distances, lengths, heights, and clearances
- Difficult measuring situations: The Pythagorean Theorem mode enables indirect measurement
- Calculating areas and volumes

The automatic power-off function switches the device off after 5 minutes of inactivity to preserve the batteries.

Keypad functions

Please refer to the „Operation“ section of this manual for further information about the following functions and calculations.

- The „Power“ button switches the device on/off.
- The „Read / Con“ button switches on the laser and conducts measurements; activates continuous measurement.
- The „Arrow“ button deletes the previous measurement; resets the last entry.
- Switch between the following modes: Single distance measurement, area, volume, single Pythagorean Theorem mode, double Pythagorean Theorem mode.
- „Plus / Minus“ button - for adding and subtracting measurements.
- Switch the measuring reference point: Rear of the device, position of the tripod socket, front of the device, and positioning pin (for conducting measurements from internal corners).
- The unit conversion button alternates between: Metres, millimetres, decimal feet, 1/16 inch increments, decimal inches and 1/16 inch increments.
- The „Min / Max“ button activates the mode for minimum or maximum measurement.



LCD display

- Full battery indicator
- Empty battery indicator
- Indicates that the measurement has been taken from a positioning pin.
- Indicates that the measurement has been taken from the bottom of the device.
- Indicates that the measurement has been taken from the position of the tripod socket.
- Indicates that the measurement has been taken from the front of the device.
- Laser beam indicator
- Single distance measurement
- Area measurement
- Volume measurement
- Single Pythagorean Theorem measurement
- Double Pythagorean Theorem measurement
- min Minimum measurement indicator
- max Maximum measurement indicator
- Continuous measurement indicator

Operation

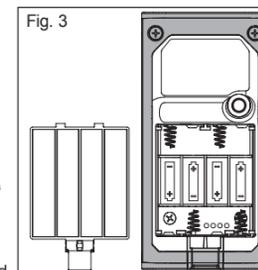
Your digital laser distance meter is a precision instrument. Please observe the following guidelines to ensure optimum performance:

- Do not direct the Digital laser unit towards the sun or other sources of bright light. This may cause a faulty reading or result in inaccurate measurements.
- Do not operate the device in wet, dusty, sandy or other adverse environments. Such conditions may damage internal components and impair the accuracy of the measurement.
- If the digital laser distance meter is transferred to a warm environment from very cold conditions, or vice versa, allow it to acclimatise before use.
- Measuring errors can occur when conducting measurements against transparent liquids (e.g. water), clear objects (glass) or other similar translucent or low-density materials.
- Highly reflective surfaces deflect the laser beam and result in faulty measurements.
- Extremely bright surroundings combined with a poorly reflective surface will reduce the measuring range and accuracy of the device.
- Do not immerse the device in water. Wipe off any dirt using a damp, soft cloth. Do not use abrasive cleaning agents or solutions. Treat the surfaces of the device with the same care that you would apply to spectacle lenses or cameras.
- The accuracy of the device must be checked if it has been dropped or subjected to other mechanical stresses.

Inserting the batteries

This digital laser distance meter requires four AAA 1.5 V batteries.

- Press the catch to open the battery compartment.
 - Insert four new AAA alkaline batteries into the battery compartment in accordance with the polarity markings. Pay attention to the correct polarity (+/-)!
 - Close the cover and secure it in place.
- Note: Replace the batteries as soon as the „Empty“ battery indicator appears.
- Remove the batteries from the device if it is not going to be used for a prolonged period.
 - The 4 AAA batteries should all be the same brand and type.
 - Do not use a mixture of old and new batteries.
 - Remove depleted batteries immediately and dispose of them in accordance with the local regulations. Never dispose of batteries in a fire.



Switching on/switching off the digital laser distance meter

- Press the Power button (1) to switch on the device. The device will automatically revert to the single distance measuring mode, indicating that it is ready for use.
- Press the Power button for approx. 2 seconds to switch off the device.
- If a button is not pressed for 5 minutes, the device will switch off automatically to preserve battery power.

Changing the measuring reference point:

The default reference point is the rear of the device. By pressing the measuring/reference point button (6) this setting can be alternated between the tripod socket, the front of the device, the positioning pin and the rear of the device; the next measurement will thereby be conducted from the selected reference point.

When the device is switched off the reference point will automatically revert back to the rear setting.

Changing the units

Press the unit conversion button (7) to alternate between metres, millimetres, decimal feet, 1/16 inch increments, decimal inches and 1/16 inch increments, as shown below.

Setting	Distance	Area	Volume
Metres	Metres	m ²	m ³
Millimetres	Millimetres	m ²	m ³
Decimal feet	Feet (decimal)	Feet ²	Feet ³
1/16 inch increments	Feet & 1/16 inch	Feet ²	Feet ³
Decimal inches	Inches (decimal)	Feet ²	Feet ³
1/16 inch increments	Inches & 1/16 inch	Feet ²	Feet ³

Conducting measurements

Hold the device at the point from which you want to measure, press the „Read“ button (2) to switch on the laser and then press it again to conduct the measurement.

Note:

The laser will switch off after 20 seconds of inactivity. If a measurement is not conducted within the 20 seconds, press the „Read“ button again to switch the laser back on.

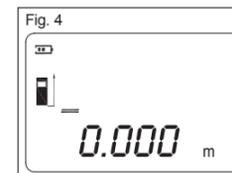
Do not aim the laser at persons or animals and do not stare into the laser beam or view it directly with optical instruments.

Delete function:

To delete the current measurement and display the previous measurement press the „Delete/Arrow“ button (3). If the device is currently in the area, volume or Pythagorean Theorem mode, press the Delete button repeatedly to revert back to the mode for single distance measurement.

Single distance measurement

- Press the Power button (1) to switch on the device; it will default to the single distance measurement mode (fig. 4).
- Press the Read button to activate the laser; the laser indicator will now flash from top to bottom. Direct the laser at the point you want to measure;
- Press the Read button again to conduct the measurement.



- The length is displayed on the bottom line of the screen in large digits and the laser beam switches off (fig. 5).
- To conduct a second measurement press the Read button again to activate the laser; the first measurement is now displayed in the upper line of the screen (fig. 6).
- Aim at the new target.
- Press the Read button again to conduct the second measurement.
- The second length is displayed on the bottom line of the screen in large digits and the laser beam switches off (fig. 7).
- To conduct a new measurement repeat steps 5 to 8.

Note:

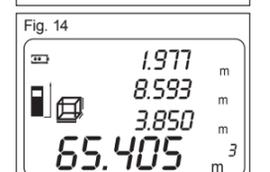
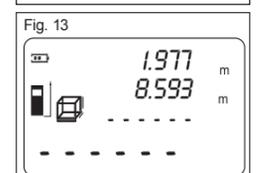
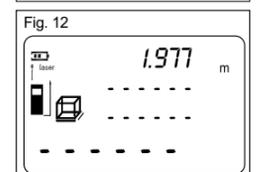
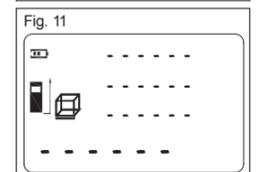
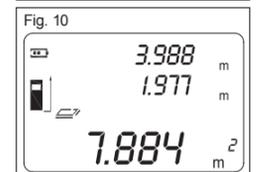
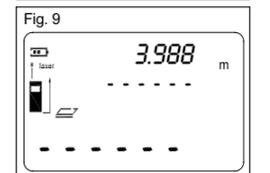
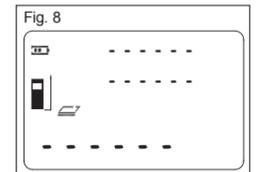
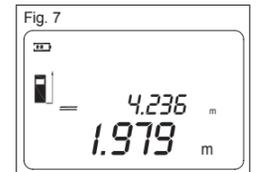
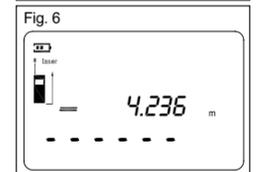
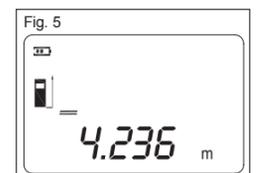
After selecting the area, volume or Pythagorean Theorem measurement mode press the Delete button to revert back to the single distance measurement mode.

Area measurement

- Press the Mode button (4) to access the area measurement mode; the flashing line in the symbol indicates the length to be measured (fig. 8).
- Press the Read button to activate the laser beam; the laser indicator will flash.
- Position the device in such a way that the laser is aimed at the point to be measured.
- Press the Read button to display the measured length on the first line of the screen. (fig. 9).
- The line for the width in the symbol starts to flash.
- Position the device in such a way that the laser is aimed at the point to be measured.
- Press the Read button again to display the area unit on the bottom line of the screen; the width is simultaneously displayed on the second line (fig. 10).
- Press the Read button to conduct a new measurement.

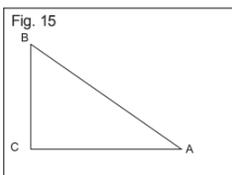
Volume measurement

- Press the Mode button (4) to select the volume measurement mode. The flashing line in the symbol indicates the length to be measured (fig. 11).
- Press the Read button to activate the laser; the laser indicator will now flash from top to bottom.
- Position the device in such a way that the laser is aimed at the point to be measured.
- Press the Read button to display the measured length on the first line of the screen. The line for the width in the symbol will start to flash (fig. 12).
- Position the device in such a way that the laser is aimed at the point to be measured.
- Press the Read button again to display the width on the second line of the screen. The line for the height in the symbol will start to flash (fig. 13).
- Press the Read button again to display the volume on the bottom line of the screen; the height is simultaneously displayed on the third line (fig. 14).
- Press the Read button to conduct a new measurement.

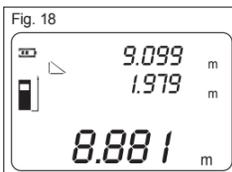
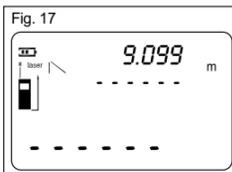
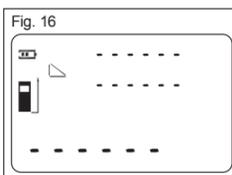


Single Pythagorean Theorem measurement mode

The Pythagorean Theorem measurement mode is used to measure distances that cannot be measured directly due to an obstacle obstructing the laser beam or if no target surface is suitable as the reflector. Correct results can only then be achieved if the laser beam and the relevant distance produce a precise right angle (90°). The length of BC is to be determined in the illustrated example (fig. 15). The section AB and AC must be measured for this purpose. AC and BC must form a right angle.



1. Press the Mode button (4) to select the single Pythagorean Theorem measurement mode (fig. 16).
2. The flashing line in  indicates the distance AB to be measured.
3. Press the Read button to activate the laser beam; the laser indicator will flash.
4. Position the device in such a way that the laser is aimed at point B.
5. Press the Read button to display the measured length of AB on the first line of the screen (fig. 17).
6. The flashing line in  indicates the distance AC to be measured.
7. Without changing device position A aim the laser perpendicularly at target C.
8. Press the Read button again to display the calculated length of BC on the bottom line of the screen; the distance AC is simultaneously displayed on the second line (fig. 18).
9. Press the Read button to conduct a new measurement.

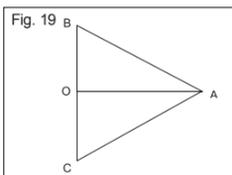


Notes:

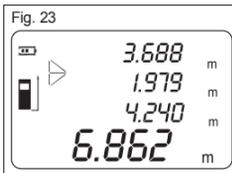
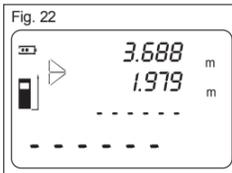
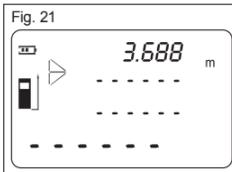
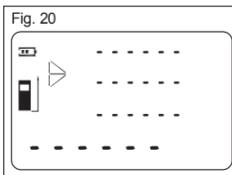
- The distance AC must be shorter than the hypotenuse (AB); if not, „Err008“ will appear on the display reminding you to measure the distance of AC again.
- When conducting the two measurements make sure they are taken from the same starting point (A) and that the second measurement is perpendicular to the target (C). Accuracy when conducting the measurements will help to produce the most accurate distance calculation.

Double Pythagorean Theorem measurement

Use the double Pythagorean Theorem measurement mode if one end of a section to be measured is indirectly higher than the measuring position and the other end of this section is lower than the measuring position. The section BC is to be determined in the illustrated example (fig. 19); A is the measuring position. The sections AB, AO and AC must be measured for this purpose. AO and BC must form a right angle.



1. Press the Mode button (4) to select the double Pythagorean Theorem measurement mode (fig. 20).
2. The flashing line in  indicates the distance AB to be measured.
3. Press the Read button to activate the laser beam; the laser indicator will flash.
4. Position the device in such a way that the laser is aimed at point B.
5. Press the Read button to display the measured length of AB on the first line of the screen (fig. 21).
6. The flashing line in  indicates the distance AO to be measured.
7. Without changing device position A aim the laser perpendicularly at target O.
8. Press the Read button to display the measured length of AO on the second line of the screen (fig. 22).
9. The flashing line in  indicates the distance AC to be measured.
10. Without changing device position A aim the laser at target C.
11. Press the Read button again to display the indirect length of BC on the bottom line of the screen; the section AC is simultaneously displayed on the third line (fig. 23).
12. Press the Read button to conduct a new measurement.

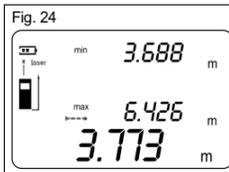


Continuous measurement (positioning)

The continuous measurement function (positioning) is used for transferring measurements e.g. from construction plans. In the continuous measurement mode the measuring device can be moved relative to the target, whereby the measured value is updated approx. every 0.5 seconds in the display.

For example, the user can measure the distance between the device and a wall and then move away from the wall while the current distance is updated continuously on the screen; the user is then informed when the correct distance has been reached.

1. Press the Mode button (4) to select the single distance measurement mode. If the device is currently in another mode, press the Delete button to revert back to the single distance measurement mode.
2. Press and hold the Read button for approx. 3 seconds to activate the continuous measurement mode.
3. Move the device until the required distance is displayed at the bottom of the screen.
4. Press the Read button to interrupt the measurement. The current measured value is displayed on the bottom line of the screen. The minimum and maximum values are displayed on the first and second lines of the screen (fig. 24).
5. Press the Read button again to start a new continuous measurement.



Minimum/Maximum measurement

This function allows the user to determine the minimum or maximum distance from a fixed reference point. As a rule it is used to measure diagonal distances (maximum values), horizontal distances or vertical distances (minimum values). The function can be transferred to the area, volume, Pythagorean Theorem measurement and single distance measurement modes. The Min/Max function can help to eliminate measuring deviations that are caused by holding the device or aiming it at the target incorrectly. It can help to produce an accurate calculation of the area, volume and indirect length.

1. Press the Mode button (4) to select the area, volume or Pythagorean Theorem measurement mode.
2. Press the Min/Max button (8) to transfer the Min/Max function.
3. Press the Read button to activate the laser, then aim the laser beam at the target you wish to measure and press the button again to start the minimum or maximum measurement.
4. Slowly sweep the laser left and right or up and down over the desired target point.
5. Press the Read button to interrupt the Min/Max measurement; the minimum or maximum value is displayed on the corresponding line of the screen as the exact length for the calculation.

Addition and subtraction

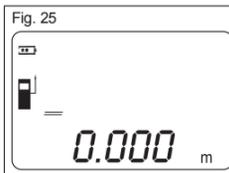
The single distance, area, volume and indirect length can be added or subtracted by the addition and subtraction function.

1. Conduct the first measurement.
2. Press the „Plus/Minus“ button; the „+“ or „-“ symbol appears after the battery indicator.
3. Conduct the second measurement.
4. The sum of the measurements is displayed on the bottom line of the screen and the last measurement results are displayed simultaneously on the upper line of the screen.

Using a tripod (not included)

The use of a tripod is particularly helpful for measuring larger distances. The measuring device can be screwed onto a commercially available tripod by using the 1/4" thread located on the bottom of its housing.

1. Mount the device on the tripod.
2. Set the thread as the measuring reference point by pressing button 6 (fig. 25).
3. Conduct the measurement.



Error signals

which can appear on the LCD display during the measuring process:

Error code	Cause	Solution
Err001	The reflected laser light is too intense.	Do not direct the laser at a highly reflective surface; cover the surface with white paper if necessary.
Err002	Out of range; the measuring range for this device is between 0.1 and 50 m.	Conduct measurements within a range of 0.1 to 50 m.
Err003	The target surface does not reflect the laser sufficiently.	Select another target surface or cover it with white paper.
Err004	The temperature is too high.	Wait until the device has reached the permitted operating temperature (-10° to 50° C)
Err005	The temperature is too low.	Wait until the device has reached the permitted operating temperature (-10° to 50° C)
Err006	Low battery; a reminder to replace the batteries.	Insert new batteries
Err007	Heavy vibration, or the device was moved too quickly during the measurement.	Always ensure the device is kept steady.
Err008	Incorrect input; the measured length of one side of the right-angled triangle is longer than the hypotenuse.	Conduct the measurement again; the hypotenuse must always be longer than the first side length.

Troubleshooting

Problem	Cause	Solution
The device will not switch on	The batteries have not been inserted correctly	Re-insert the batteries in accordance with the polarity markings in the battery compartment
	Batteries exhibit insufficient voltage;	Replace with new batteries
	Contact problems with the Power button.	Press the button using more force or send the device for repair
The device emits an audible click when conducting a measurement	This is caused by the optical path inside the device; it is completely normal	n/a
Error codes on the LCD display while measuring	Please refer to the „Error signals“ section above	Please refer to the „Error signals“ section above

Maintenance

The Digital laser unit is a low-maintenance device. However, in order to maintain its performance the following simple guidelines must be observed.

1. Always handle the device with care. It is an optical instrument like a camera and should be treated as such.
2. Avoid exposing the device to shock, continuous vibration or extreme hot and cold temperatures.
3. Always store the device indoors. When it is not in use ALWAYS store the device in its protective case.
4. Always keep the device away from dust and moisture. Only use a clean, soft cloth when cleaning. If necessary, moisten the cloth lightly with pure alcohol or some water.
5. Never touch the lens with your fingers.
6. Check the batteries on a regular basis to prevent premature aging. If the device is not going to be used for a prolonged period, ALWAYS remove the batteries.
7. Replace the batteries when the empty battery symbol is displayed on the LCD screen.
8. Do not disassemble the device under any circumstances; doing so can expose the user to hazardous radiation.
9. Never attempt to modify any part of the laser lens.

Warranty

Warranty conditions:

A warranty period of 12 months from the date of purchase/date of invoice applies to our tools for commercial customers. If we have granted an extended warranty period, this said period will be noted separately in the operating manual for the tool in question.

Claims:

If you wish to claim under our warranty or guarantee, please return the entire tool and your invoice to us, postage paid, or send it to one of our authorised service centres.

Your rights under our warranty or guarantee:

Claims for repairs only relate to materials or manufacturing defects and are subject to the intended use of the tool. Wear parts are not covered by such claims. Installation of third party components, improper use and storage, as well as obvious failure to observe the operating instructions will void your warranty.

Repairs:

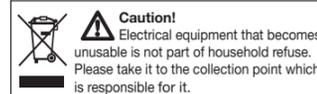
All repairs must be conducted on our premises or by an authorised KWB service centre.



Results obtained by using the laser distance measurer must always be checked. kwb cannot assume liability for measurement errors and consequential damages resulting from the same.

Laser beam, do not look into beam!

Laser class 2 pursuant to EN 60825-1:2007



DECLARATION OF CONFORMITY

We, kwb tools GmbH & Co. KG, make sole responsibility in declaring that the Laser distance meter referred to in this declaration complies with the following standards: EN 60825-1:2007, EN 61010-1:2001, EN 61326/A3:2003, EN 6100-4-2/A2:2001, EN 6100-4-3:2002 and the 2004/108/EC guideline's provisions.

kwb Development

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Member of the Cinhell Group