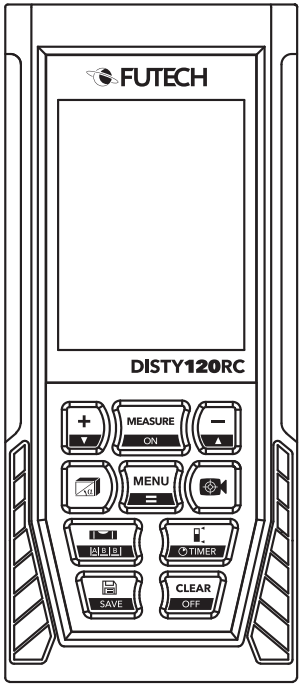
USER MANUAL

250.120RC DISTY 120RC



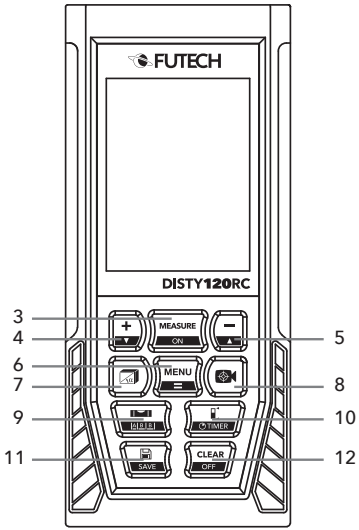
EN ENGLISH

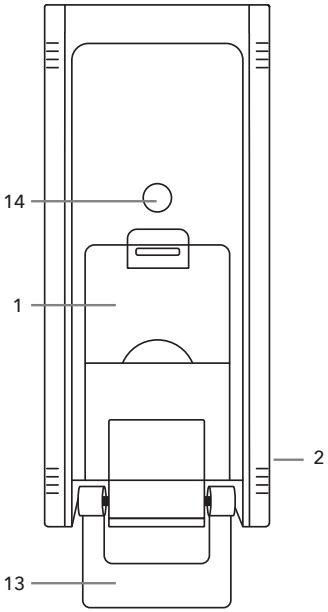
Manual
in your language?

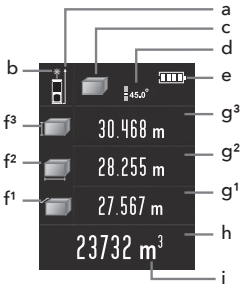
Check the back cover

FUTECH
futech-tools.com

OVERVIEW


FUTECH
DISTY120RC
MEASURE
ON
MENU
M1 M2 M3
TIMER
SAVE
CLEAR
OFF
3
4
5
6
7
8
9
10
11
12


14
1
2
13


a
c
d
b
e
45.0°
f3
30.468 m
g3
f2
28.255 m
g2
f1
27.567 m
g1
23732 m3
h
i

▪ CASE

1 Battery compartment
2 Micro USB socket
3 Measure / ON
4 Plus / Up (*)
5 Minus / Down (*)
6 Menu/Equal
7 Measuring modes
8 Camera
9 Digital bubble / Staking-out
10 Reference point / Timer
11 Records / Save
12 Clear / OFF
13 End piece
14 1/4" tripod connection

▪ SCREEN

a Reference point setting
b Laser indicator
c Measuring mode
d Tilt angle
e Power supply
f Measuring mode: dimension
g Auxiliary display area: value + unit
h Major display area
i Unit of the major display

(*) It is possible that on your device the up and down arrows printed on the keys are swapped.
We apologise for the inconvenience.

SAFETY

Please read the complete safety instructions in the booklet delivered with this device.

Use extreme caution when the laser beam is turned on.

Do not let the beam enter your eyes, another person's eyes or the eyes of an animal. Be careful that reflections of the beam (on a reflective surface) do not strike your eyes.

LASER RADIATION
Class 2, Do not stare into beam

Do not aim the laser beam at any gas that may explode.

DO NOT USE THE MICRO USB SOCKET **[2]** IN COMBINATION WITH ALKALINE BATTERIES.

FIRST USE

Remove protective films where applied.

Open the battery compartment **[1]** on the back of the product and insert the recommended batteries.

Type of battery: 3 x 1,2V AAA Ni-MH batteries (recharcheable) or 3 x 1,5V AAA Alkaline batteries (not recharcheable). Never use two types of batteries at the same time!

Using the micro-USB socket **[2]** and the supplied (micro-)USB cable you can charge the recharcheable Ni-MH batteries. Don't use the micro-USB socket **[2]** in combination with Alkaline batteries!

Switch on the device by holding the Measure / ON button **[3]** for 1 second. The screen lights and the major interface is shown.

The product is turned off in two ways.

The product can be turned off by holding the Clear / OFF button **[12]** for 3 seconds.

When not being used, the meter will be turned off automatically after 150 seconds. This setting can be changed in the menu.

SETTINGS

Enter the menu by pressing the Menu / Equal button **[6]**. The settings menu will be visible.

Navigate in the menu using the Plus / Up **[4]** and the Minus / Down **[5]** button.

Select the item you like to change pressing the Menu / Equal button **[6]**.

Change the value using the Plus / Up **[4]** and the Minus / Down **[5]** button.

Press the Menu / Equal button **[6]** again to confirm.

Repeat these steps to change other settings or exit the Menu using the Clear / OFF button **[12]**.

Backlight

Determine how long the display remains fully lit after the last touch. After this time, the display will dim.

5 seconds ~ 60 seconds

Laser Lasting

Determine how long the laser is activated after activation without measuring.

20 seconds ~ 120 seconds

Auto Power OFF

Determine how long the device remains switched on after the last manipulation. After this time the device will turn itself off.

100 seconds ~ 300 seconds

Tone

(De-)Activate the sound

Distance Unit

Choose the preferred unit to display the measuring results.

0.000m
0.00m
0.0 in
In 1/32
0' 00" 1/32
0.000 米
0.00 米
0.00 ft

Angle Unit

Choose the preferred unit to display angles.

° (degrees)
%

Calibration

NOTE

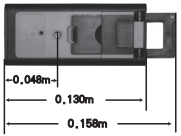
Calibration function may affect precision of the device! This item cannot be adjusted in default mode. User need to follow below steps to enter calibration.

- Turn off the device.
- Hold the Records / Save button **[11]** and press the measure / ON **[3]** button shortly. The device will start-up.
- Release the Records / Save button **[11]** after the start-up screen has disappeared. The mainscreen is visible.
- Enter the menu and navigate to Calibration like described above. Now the Calibration function is free to enter.

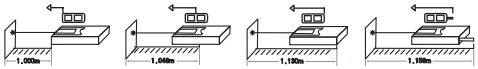
- 0.009m ~ +0.009m

USAGE

▪ REFERENCE POINT



Four different reference points can be used.



Front Middle (screw) Back End-piece

Different reference points can be chosen using the Reference point / Timer button **[10]**. The Reference point setting **[a]** will be visible on screen.

▪ MEASURING MODES

NOTE

These two operations can be done in all modes below.

- To undo the last measurement, press the Clear / OFF button **[12]**.
- To save the measured values/results, hold the Records / Save button **[11]** for 1 sec.

For all Pythagoras measurements the user must follow the instructions' order strictly!

We recommend to mount the instrument on a tripod with tilting head to increase the accuracy of your measurement.

DISTANCE MEASUREMENT (SINGLE / CONTINUOUS)

Single measurement

For a single measurement: press the Measure / ON button **[3]** and focus on the target.

Press the Measure / ON button **[3]** a second time for a single measurement.

The result is displayed in the Major display area **[h]**. The previous 3 measurements are displaced above in the auxiliary displays **[g^1, g^2, g^3]**.

Continuous measurement (minimum/maximum)

Hold the Measure / On **[3]** and focus on the target point.

To know the minimum and maximum distance, slightly move the focus left / right / up / down.

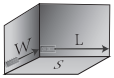
During measuring the actual maximum distance is displayed in the auxiliary display area **[g^2]**, the minimum actual distance is displayed in the auxiliary display area **[g^1]**. The mayor display area **[h]** shows the actual distance measured during continuous measuring.

Press the Measure / On button **[3]** again to end the continuous measuring.

You can read the maximum measured distance in the auxiliary display area **[g²]**, the minimum actual distance in the auxiliary display area **[g¹]**. The mayor display area **[h]** shows the last distance measured.

AREA MEASUREMENT

Press the Measuring modes button **[7]** that number of times needed until the Area Measurement symbol appears on the measuring mode area **[c]** on the screen.



S = L x W

Measure the area in 2 steps:

Press the Measure / ON button **[3]** to measure the first side

*Length of side 1 appears on auxiliary display area **[g³]***

Press the Measure / On button **[3]** a second time to measure the second side

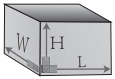
*Length of side 2 appears on auxiliary display area **[g²]***

*The Major display Area **[h]** and it's unit **[i]** shows the result of the area calculation.*

(m²)

VOLUME MEASUREMENT

Press the Measuring modes button **[7]** that number of times needed until the Volume Measurement symbol appears on the measuring mode area **[c]** on the screen.



V = L x W x H

Measure the Volume in 3 steps:

Press the Measure / ON button **[3]** to measure the first side

*Length of side 1 appears on auxiliary display area **[g³]***

Press the Measure / On button **[3]** a second time to measure the second side

*Length of side 2 appears on auxiliary display area **[g²]***

Press the Measure / On button **[3]** a third time to measure the third side

*Length of side 3 appears on auxiliary display area **[g¹]***

*The Major display Area **[h]** and it's unit **[i]** shows the result of the volume calculation.*

(m^3)

PAINTER FUNCTION

This function can be used for example to know the total area of all the walls in one room.

Press the Measuring modes button **[7]** that number of times needed until the Painter function symbol appears on the measuring mode area **[c]** on the screen.

Measure the Volume in 3 steps:

Press the Measure / ON button **[3]** to measure the height of the room

*The height appears on auxiliary display area **[g³]***

Press the Measure / On button **[3]** a second time to measure the first wall

*Length of wall1 appears on auxiliary display area **[g²]***

*The Major display Area **[h]** and it's unit **[i]** shows the result of the area calculation. (m^2)*
(height x wall¹)

Press the Measure / On button **[3]** a third time to measure the second wall

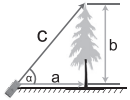
*Length of wall² appears on auxiliary display area **[g¹]***

*The Major display Area **[h]** and it's unit **[i]** shows the updated result of the area calculation. (m^2)*
(height x wall¹)+(height x wall²)

You can repeat this last step and continue measuring additional walls for as long as necessary. The height always remains visible in secondary display **[g³]**, the previously measured walls move up one place each time. After each additional wall measured, the Major display area **[h]** will show the new, updated total area of all walls measured.

SIMPLE PYTHAGORAS: TWO LEGS (BASED ON HYPOTHENUSE AND ANGLE)

Only 1 measurement is needed. Pointing the distance meter along the axis of interest (c), the angle (α) and length of c will be calculated.



$a = c \times \cos\alpha$
$b = c \times \sin\alpha$

Press the Measuring modes button **[7]** that number of times needed until the "Simple Pythagoras" symbol appears on the measuring mode area **[c]** on the screen.

Press the Measure / ON button **[3]** to measure the length of the hypotenuse (c).

*The angel (**α**) appears on auxiliary display area **[g³]***

*Length of Hypothenuse **(c)** appears on auxiliary display area **[g²]***

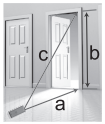
*The length of the horizontal side (a) appears on auxiliary display area **[g¹]***

*The Major display Area **[h]** shows the length of side (b).*

PYTHAGORAS: SECOND LEG (BASED ON HYPOTHENUSE AND ONE LEG)

Calculate the third leg, by measuring the hypothenuse and base leg of a right (90°) triangle.

Press the Measuring modes button **[7]** that number of times needed until the "Pythagoras, second leg" symbol appears on the measuring mode area **[c]** on the screen.



$$b = \sqrt{c^2 - a^2}$$

The device uses your measured values a and b to determine the dimension of c. The device assumes a triangle with a right angle (90°).

Press the Measure / ON button **[3]** to measure the length of the hypotenuse **(c).**

*The length of the hypotenuse **(c)** appears on the auxiliary display area. **[g²]***

Press the Measure / ON button **[3]** a second time to measure the length of one side **(a)**.

*The length of side (a) appears on the auxiliary display. **[g¹]***

*The Major display Area **[h]** shows the length of side **(b)**.*

PYTHAGORAS: HYPOTHENUSE (BASED ON TWO LEGS OF A RIGHT TRIANGLE)

Calculate the hypothenuse (c) by measuring two legs of a right (90°) triangle.

Press the Measuring modes button **[7]** that number of times needed until the "Pythagoras: Hypothenuse" symbol appears on the measuring mode area **[c]** on the screen.

$$c = \sqrt{a^2 + b^2}$$

The device uses your measured values a and b to determine the dimension of c. The device assumes a triangle with a right angle (90°).

Press the Measure / ON button **[3]** to measure the length of the first side (a).

The length of side (a) appears on the auxiliary display area. ***[g²]***

Press the Measure / ON button **[3]** a second time to measure the second length, side (b).

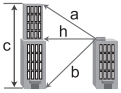
The length of side (b) appears on the auxiliary display. ***[g¹]***

The Major display Area ***[h]*** *shows the length of the hypothenuse (c).*

PYTHAGORAS: SUM OF 2 TRIANGLES (BASED ON TWO LEGS AND DISTANCE)

Calculate the third side of a triangle by measuring the other two sides and the altitude.

Press the Measuring modes button **[7]** that number of times needed until the "Pythagoras: Sum of 2 triangles" symbol appears on the measuring mode area **[c]** on the screen.



$$c = \sqrt{a^2 - h^2} + \sqrt{b^2 - h^2}$$

The device asks for the dimensions a, h & b. The display always shows which dimension is asked. The device calculates and displays the dimension of c.

Press the Measure / ON button **[3]** to measure the length of the first side (a).

The length of side (a) appears on the auxiliary display area. ***[g³]***

Press the Measure / ON button **[3]** a second time to measure the horizontal distance (h).

The horizontal distance (h) appears on the auxiliary display. ***[g²]***

Press the Measure / ON button **[3]** a third time to measure the second side (b).

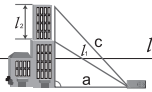
The length of second side (b) appears on the auxiliary display. ***[g¹]***

The Major display Area ***[h]*** *shows the length of third side (sum of 2 triangles) (c).*

PYTHAGORAS: SUBTRACTION OF 2 TRIANGLES (BASED ON HYPOTHENUSE, AUXILIARY LINE AND BASE LEG OF RIGHT TRIANGLE)

Calculate the length of the highlighted side by measuring hypothenuse, auxiliary line and base leg of the right (90°) triangle.

Press the Measuring modes button **[7]** that number of times needed until the "Pythagoras: subtraction of 2 triangles" symbol appears on the measuring mode area **[c]** on the screen.



$$l_2 = \sqrt{c^2 - a^2} - \sqrt{l_1^2 - a^2}$$

The device uses your measurements c, l_1 and a (respectively) to determine the height l_2.

Press the Measure / ON button **[3]** to measure the length of the hypothenuse (c).

The length of the hypothenuse (c) appears on the auxiliary display area. ***[g³]***

Press the Measure / ON button **[3]** a second time to measure the auxiliary line (l_1).

The length of auxiliary line (l1) appears on the auxiliary display. ***[g²]***

Press the Measure / ON button **[3]** a third time to measure the altitude (a).

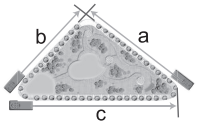
The length of the altitude (a) appears on the auxiliary display. ***[g¹]***

The Major display Area ***[h]*** *shows the length of (l_2), the part between auxiliary line (l_1) and hypothenuse (c).*

AREA OF AN IRREGULAR TRIANGLE (BASED ON 3 SIDES)

Calculate area of an irregular triangle by measuring the length of 3 sides.

Press the Measuring modes button **[7]** that number of times needed until the "Area of triangle" symbol appears on the measuring mode area **[c]** on the screen.



The dimensions of a, b & c are asked respectively. The device calculates the total area of the triangle.

Press the Measure / ON button **[3]** to measure the first leg (a).

The length of leg (a) appears on the auxiliary display. ***[g³]***

Press the Measure / ON button **[3]** a second time to measure the second leg (b).

The length of leg (b) appears on the auxiliary display. ***[g²]***

Press the Measure / ON button **[3]** a third time to measure the third leg (c).

The length of leg (c) appears on the auxiliary display. ***[g¹]***

The Major display Area ***[h]*** *shows the area of the measured triangle.*

NOTE:
"ERR 5" will be displayed in the event that a measurement contradicts the characteristics of a triangle (e.g. c is shorter than b). The measurement must be redone.

CALCULATION OPTIONS

ADDITION / SUBTRACTION DISTANCES

Add ***Subtract***

Measure the distance as described above at '1. Distance measurement, single measurement'.

To add a measurement to this result, press the Plus / Up button **[4]**. *The result moves to the auxiliary display* **[g²]**, *a + appears in front of the major display area* **[h]**

To subtract a measurement to this result, press the Minus / Down button **[5]**. *The result moves to the auxiliary display* **[g²]**, *a – appears in front of the major display area* **[h]**

Measure the second distance as described above.

The last measurement appears on auxiliary display **[g³]**, the result of the calculation will be visible on the major display area **[h]**

➞ To add / subtract additional measurements, just continue with the next measurement.

TIP
You can switch between Addition and Subtraction by pressing the Plus / Up button **[4]** (to add a measurement) or the Minus / Down button **[5]** (to subtract a measurement) just before measuring an additional measurement.

ADDITION / SUBTRACTION OF AREAS

Add ***Subtract***

Measure the area as described above at '2. Area measurement'.

To add a measurement to this result, press the Plus / Up button **[4].** The result of the previous measurement disappears, a + appears in front of the major display area **[h]**

To subtract a measurement to this result, press the Minus / Down button **[5]**. The result of the previous measurement disappears, a – appears in front of the major display area **[h]**

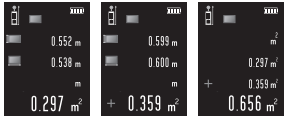
Measure the second area as described above.

The results of the new measurement will be visible.

➞ Option 1: To add / subtract additional measure-

ments, just continue with the next measurement.

➙ Option 2: To see the result of all added / subtracted area measurements, press the Menu / Equal button **[6]**.



TIP

You can switch between Addition and Subtraction by pressing the Plus / Up button **[4]** (to add a measurement) or the Minus / Down button **[5]** (to subtract a measurement) just before measuring an additional measurement.

ADDITION / SUBTRACTION OF VOLUMES

Add | ***Subtract***

Measure the volume as described above at '3. Volume measurement'.

To add a measurement to this result, press the Plus / Up button **[4]**. The result of the previous measurement disappears, a + appears in front of the major display area **[h]**

To subtract a measurement to this result, press the Minus / Down button **[5]**. The result of the previous measurement disappears, a – appears in front of the major display area **[h]**

Measure the second volume as described above.

The results of the new measurement will be visible.

➙ Option 1: To add / subtract additional measurements, just continue with the next measurement.

➙ Option 2: To see the result of all added / subtracted volume measurements, press the Menu / Equal button **[6]**.

TIP

You can switch between Addition and Subtraction by pressing the Plus / Up button **[4]** (to add a measurement) or the Minus / Down button **[5]** (to subtract a measurement) just before measuring an additional measurement.

OTHER OPTIONS

MULTI-DIRECTION ELECTRONIC LEVEL BUBBLE

Press the Digital bubble / Staking out button **[9]** to enter the Multi direction electronic bubble.

The left-bottom side shows the vertical angle of the device, the right bottom side the horizontal angle of the device.

Press the Digital bubble / Staking out button **[9]** again to exit the Multi direction electronic bubble.

DELAY MEASUREMENT

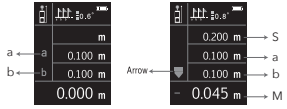
To delay a measurement, hold the Reference point / Timer button **[10]**.

The delay time is shown on the top of the screen (in seconds). This value can be adjusted using Plus / Up **[4]** or Minus / Down **[5]** button. Delay times between 3 and 60 seconds can be chosen.

To start the delay measuring, press the Measure / On button **[3]** and the timer will start counting down before measuring.

STAKING OUT

This function is used to measure positions with a fixed distance.



S: Staking out value. The distance to the nearest, measured from the start.

a: Value a Distance between Start and the first target

b: Value b Distance between two targets, except start

M: Distance to the next target (in the direction of the arrow)

Arrow: Shows the direction to the nearest step

Hold the Digital bubble / Staking-out button **[9]**. The staking out symbol appears as measuring mode **[c].**
Use the Plus / Up **[4]** and Minus / Down **[5]** button to set value a.
Confirm with the Measure / ON button **[3]**.
Use the Plus / Up **[4]** and Minus / Down **[5]** button to set value b.
Confirm with the Measure / On button **[3]**.

Place the device in its start position. The device measures continuously and shows in the Major display area **[h]** the distance to the nearest targets (M).

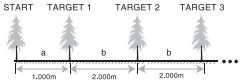
The arrow shows the direction to the nearest target.

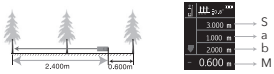
: Move forward

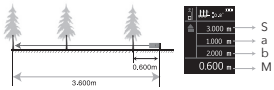
: Move backward

: Match the position

Example:



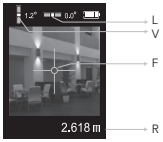




To exit the Staking out function, press the Clear / OFF **[12]** button.

CAMERA

When you are not able to see the laser spot, for example in very sunny weather or over long distances, the build-in camera can be turned on using the camera button **[8]** and help you to find the laser spot.



L: Level angle
V: Vertical angle
F: Focus cross
R: Measuring result (in Mayor display area **[h]**)

NOTE

Camera measuring assistant is only useful when the distance is more than 10 meters.

Single distance measuring

Press the Camera button **[8]** to turn on the camera in single measuring mode.
Make the cross, which is on the screen, point exactly your target.
Press the measuring / ON button **[3]** to measure the distance.

The result will be visible in the Major display area **[h].**

Area / Volume / Pythagoras measuring

Choose the function you like to use with the Measuring modes button **[7]**.

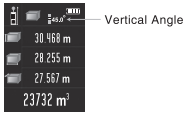
Press the camera button **[8]** to turn on the camera.
Make the cross, which is on the screen, point exactly your target.
Press the measuring / ON button **[3]** to activate the measuring tool, press the measuring / ON button **[3]** a second time to measure the distance.
Press the camera button **[8]** to deactivate the camera. The measuring result is now registered and will be shown on the first Auxiliary display line **[g³]**

Activate the camera again with the camera button **[8]** to measure the second distance.
Make the cross, which is on the screen, point exactly your target.
Press the measuring / ON button **[3]** to activate the measuring tool, press the measuring / ON button **[3]** a second time to measure the distance.
Press the camera button **[8]** to deactivate the camera. The measuring result is now registered and will be shown on the second Auxiliary display line **[g²]**

(Repeat this last step if your function requires a third value. The result of this third value will be visible on the third Auxiliary display **[g¹])**

After measuring the last needed distance, deactivate the camera. The result of the function will be shown on the Mayor display area **[h]**.

ANGLE VALUES ON TOP OF THE SCREEN



The device shows the tilt angle **[d]**.
The range of this angle is always between -90.0° and 90.0°.
The unit, which can be chosen in the settings, is ° of % (slope).

TIPS

The device can be used with AAA batteries, alkaline of NiMh rechargeable batteries.

ONLY IN CASE NiMH BATTERIES ARE USED, you may charge this batteries using the Micro USB socket **[2]** on the side of the device.

DO NOT USE THE MICRO USB SOCKET IN COMBINATION WITH ALKALINE BATTERIES

You may get some warning information.

MESSAGE	MEANING	SOLUTION
ERR 1	Received signal is too weak	Chose a surface with a stronger reflectance or use a reflector
ERR 2	Received signal is too strong	Chose a surface with a weaker reflectance or use a reflector
ERR 3	Low Power	Replace (or recharge in case of rechargeable batteries) the batteries DO NOT RECHARCHE WHEN ALKALINE BATTERIES ARE USED
ERR 4	Fail of memorizer	Please contact the manufacturer
ERR 5	Pythagoras measuring error	Please re-measure
ERR 6	Exceed the measuring range	
ERR 7	Fail of tilt	Contact the manufacturer

SPECIFICATIONS

	250.120RC DISTY 120RC
Working range	≤ 120 m
Smallest unit displayed	0,001 m
Measurement accuracy	± 0,002 m Note: use a reflector to increase the measurement range in case of too much light/poor reflective area.
Laser	Class 2: 635 nm, < 1mW
Continuous distance measuring (tracking)	Yes
Area/Volume/Pythagoras (simple & complex)	Yes
Optional units	m, inch, ft
	°, %
Addition/Subtraction of measurements	Yes
Maximum/Minimum values	Yes
Staking-Out	Yes
Delay measurements	Yes
Self-calibration	Yes
Angle of tilt	±90°
Multi-direction electronic level bubble	Yes
Auxiliary sight (camera)	Yes
USB-connector	Yes
Storage temperature range	-20°C < T < 60°C
Working temperature range	0°C < T < 40°C

	250.120RC DISTY 120RC
Batteries	3 x 1,2V AAA NiMH batteries (rechargeable) or 3 x 1,5V AAA Alkaline batteries
Dimensions	130 x 56 x 29 mm
Weight	0,15 kg
Tripod connector	¼"
Dust-/waterproofness	IP54

Typical Tolerance: ±2mm, when reflectivity 100% (white surface), environment light <2000 LUX. 25 °C
Tolerance is usually affected by the distance, reflectivity, and environment light etc. It probably gets tolerance around ±(2mm+0.2mm/m).

USER MANUAL

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