

Manual Conductivity Penetration Probe

This manual is about how to use the Conductivity (EC) Penetration Probe, used for measuring the EC in soil, meat or other non fluid substances.

Connecting the probe

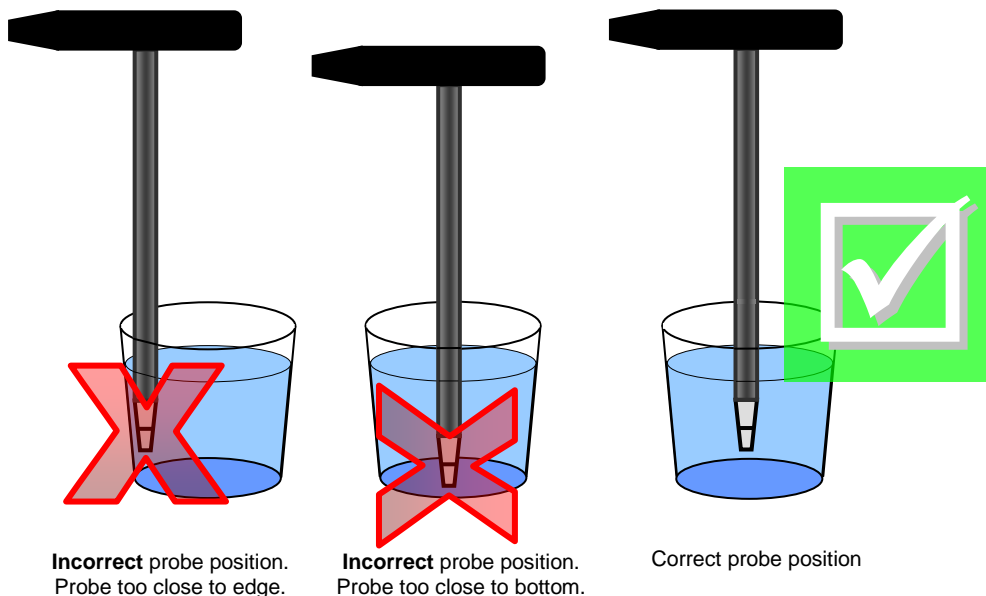
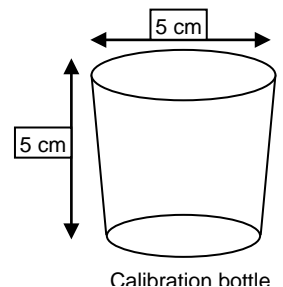
1. Connect the probe to the meter
2. Switch the meter on.

Calibrating the probe

Before starting calibration, make sure you are in the correct measurement mode. For best results, select a standard value close to the sample value you are measuring.

Calibration should be performed approximately 1 x per month, or if you suspect that the measured value is incorrect.

1. Connect the probe to the meter and switch it on
2. Rinse the electrode with de-ionized water or a rinse solution.
3. Take a **plastic** (not glass or others) bottle with a diameter of approximately 5 cm and a depth of about 5 cm.
4. Dip the electrode into the buffer. Immerse the probe about 3 to 5 cm. Stir gently to create a homogeneous sample.
5. Wait for the reading to stabilize. This can take a few minutes because it takes time for the temperature to reach the temperature of the buffer solution.
6. Hold the probe in the middle of the bottle, not touching the sides or bottom.

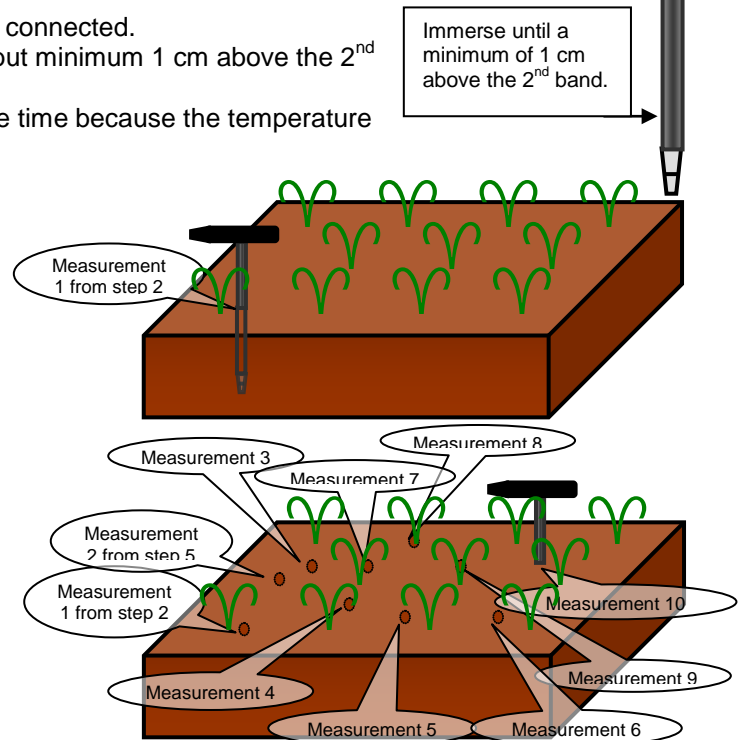
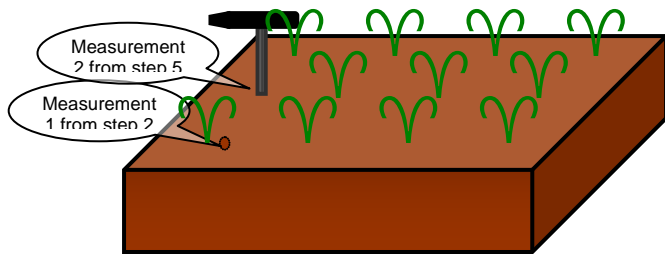


7. Go through the calibration sequence as described in the meter's manual.

Taking measurements

Most commonly this probe is used for measurement in soil, therefore only this will be explained. Please contact us if you have questions regarding measuring in other media. EC measurements in soil are as accurate as laboratory measurements, but you need to know how to interpret them. Following these steps will give you the base.

1. Switch the meter on and make sure the probe is connected.
2. Put the probe in the soil to the preferred depth, but minimum 1 cm above the 2nd band
3. Wait for the value to stabilize; this can take some time because the temperature probe needs to compensate the temperature reading.
4. Take the reading and write this down.
5. Put the probe in another place in the soil, at approximately the same depth, and write the reading down.
6. Repeat step 5 eight times, so in total you have taken 10 measurements.
7. Now you have to calculate the average EC.



Calculating the average EC value

1. Suppose you have measured the following 10 values during your 10 measurements:

Measurement	1	2	3	4	5	6	7	8	9	10
EC value	2,4	3,5	2,3	2,6	2,1	2,8	1,6	2,5	2,4	2,0

2. You now have to ignore the highest and the lowest value, in this case in measurement 2 (highest at 3,5) and at measurement 7 (lowest at 1,6).

Measurement	1	2	3	4	5	6	7	8	9	10
EC value	2,4	3,5	2,3	2,6	2,1	2,8	1,6	2,5	2,4	2,0

3. Add up the remaining values:
 $2,4 + 2,3 + 2,6 + 2,1 + 2,8 + 2,5 + 2,4 + 2,0 = 19,1$
4. The total is 19,1, this value has to be divided by the number of correct measurements, so 8. The sum of this is: $19,1 : 8 = 2,4$. This means that the average EC value in the soil is 2,4 EC, or 2,4 mS/cm.

Indications

The following table list out some indications as a result of your measurement. However, please note that these values are just an indication for an average application. It could be that, for your application, these values are higher or lower. You can find out your best value by trial and error.

Conductivity	Meaning of value	What to do?
0 – 100 μ S	Very low	Add fertilizer as long as the growth needs it
100 – 200 μ S	Low	
200 – 400 μ S	Moderate	
400 – 800 μ S	Good	
800 – 1600 μ S	High	Be sure that you always supply enough water
1600 μ S – 2.4 mS	Very high	Add plenty of clean water to discharge an over supplied fertilizer
2.4 – 2.8 mS	Critical high	
>2.8 mS	Harmful, there will be visual damage	