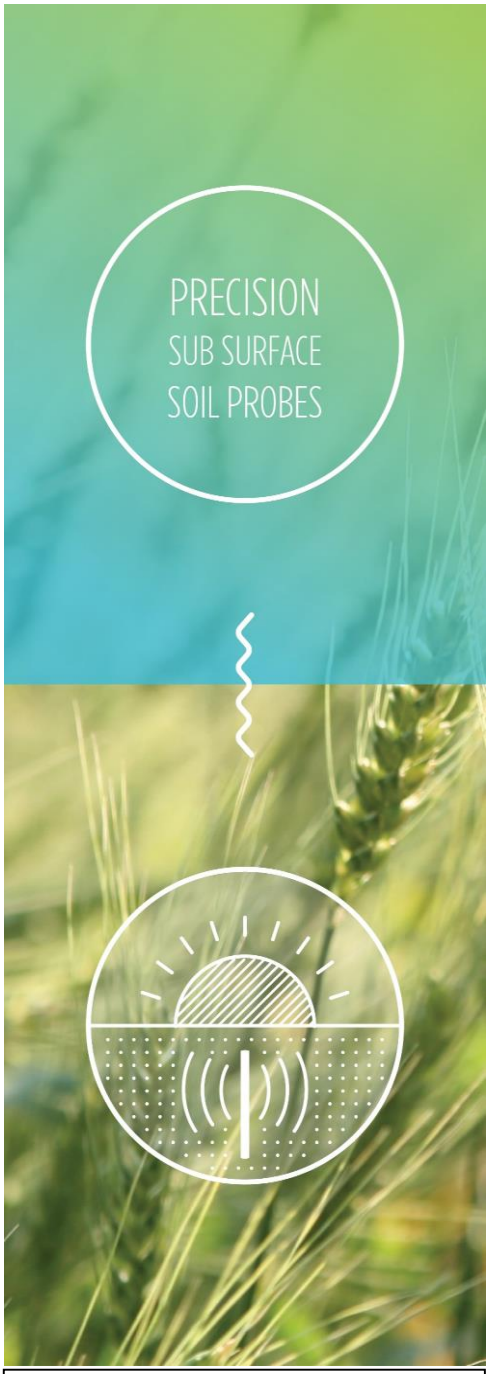
EnviroPro®

BY APCOS



EP100G Series

Installation Manual Version 1.2

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EnviroPro® - Installation

Required Tools and Equipment

The following quantities and method described below will make enough slurry for the installation of two 80c EnviroPro® Soil Probes.

- EnviroPro® 36mm Installation Auger Kit.
- 900 gm of fine sand (eg Unimin AFS85 grade or fine builders sand).
- 200 gm Bentonite (eg Unimin Active Gel 150)
- 1L clean water.
- Small bucket with lid.
- Funnel.
- A means of sieving out rocks and organic matter from the soil
- Two-litre plastic bottle with lid.
- Masking tape/electrical tape or permanent marker

Which Probe to Use

The choice of probe will be determined by the depth of the root zone or profile depth to be monitored, and the parameters to be measured. All EnviroPro® probes can measure soil moisture and soil temperature. EC equipped models also measure electro conductivity (EC) at each depth.

Model	Moisture	Temp	EC	Sensing Points	Length (cm)
EP100FL-04	·	·	-	4	46.5
EP100FL-08	·	·	-	8	86.5
EP100FL-12	·	·	-	12	126.5
EP100FL-16	·	·	-	16	166.5
EP100F-04	·	·	·	4	46.5
EP100F-08	·	·	·	8	86.5
EP100F-12	·	·	·	12	126.5
EP100F-16	·	·	·	16	166.5

The EnviroPro® probe must be installed in a slurry

EnviroPro® sensors are installed in over-sized holes and a slurry mix must be used to ensure good sensor-to-soil contact. The two type of slurry recommended are:

- A soil slurry made of soil obtained from the hole itself and surrounds;
- A slurry made of a bentonite clay and fine sand.

How to Prepare a Soil Slurry

You will need:

- About 1 kilogram of clean soil to install two 80 cm probes.
- About 1 litre of clean water per kilo of soil.
- A means of sieving out rocks and organic matter from the soil.
- A bucket to mix the soil and water together in.
- A funnel to pour the mixture down the hole

Method

1. Pass the soil through a sieve to remove any rocks and organic material.
2. Gradually mix in enough water to form a creamy paste.

How to Prepare a Bentonite Slurry

Method

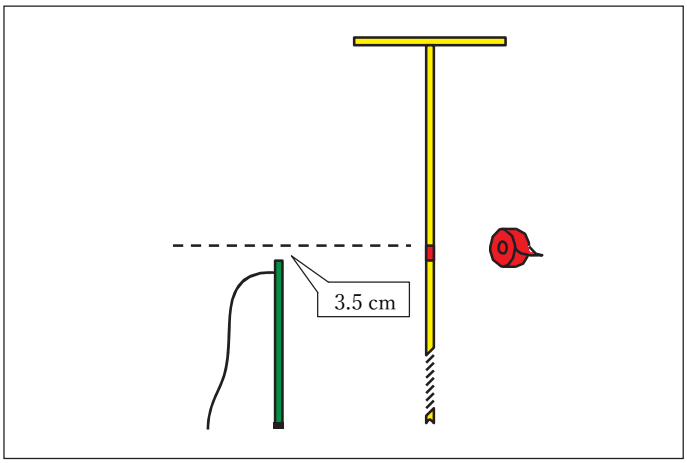
1. Mix 200 gm of Bentonite with 900 gm of fine sand together in a bucket. **Ensure they are dry mixed together before adding any water.**
2. Pour the dry mix through a funnel into a two litre plastic bottle.
3. Pour 1L of clean water into the bottle.
4. Put the lid on and shake until thoroughly mixed.
5. Allow 30 minutes for the Bentonite to swell. The resulting mix should be a 'creamy' consistency.

Please Note: Always shake the mixture before pouring the slurry as the sand may have settled if not used immediately.

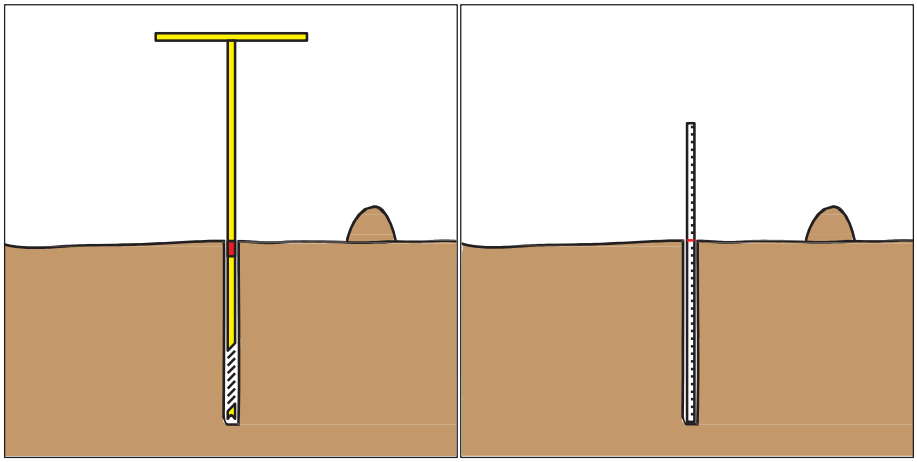
How to Install EnviroPro® Soil Probes

Method

1. Measure the length of the probe. Use the tape measure and the adhesive tape tomark the auger 3.5 cm longer than the probe to be installed.



2. Auger a hole 3.5 cm deeper than the probe to be installed. Use the tape measure to check the depth after the auger is extracted to ensure that part of the hole wall has not collapsed or that other material has not fallen into the hole.
3. A useful method to clean out the bottom of the hole is to pour in a small amount of Bentonite Slurry into the bottom of the hole. The loose soil will stick to the Bentonite and the Auger can then be used to retrieve the soil.

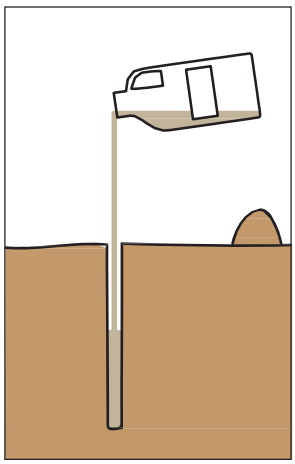


Auger the hole to the required depth.	*Check the depth*

How to Install EnviroPro® Soil Probes

Method (cont.)

4. Pour slurry into the hole until it is half full.



5. Push the probe into the hole until the top is 35 mm (3.5 cm) below the soil surface. Do not apply too much pressure (15kg max) and avoid causing sharp bends in the cable where it enters the probe.
6. The slurry should ooze up around the probe and slightly overflow the hole. If you do not see any slurry, carefully extract the probe, mix up some more slurry and add to the hole.
7. Using the removed soil backfill the hole to cover the probe.
8. Trench the cable in to a depth of 100 mm or deeper to protect it. Leave a loop of cable in the trench to provide 'strain relief' if the cable is snagged by machinery or stretched due to compaction of the ground.

Please Note: If the probe is very difficult to push in the slurry may be too thick. Add 5% more water, mix and test. If the probe goes in too easily the slurry is too thin. Add 5% more bentonite/sand, mix thoroughly and leave for fifteen minutes before testing. Repeat this procedure until you are satisfied with the consistency.

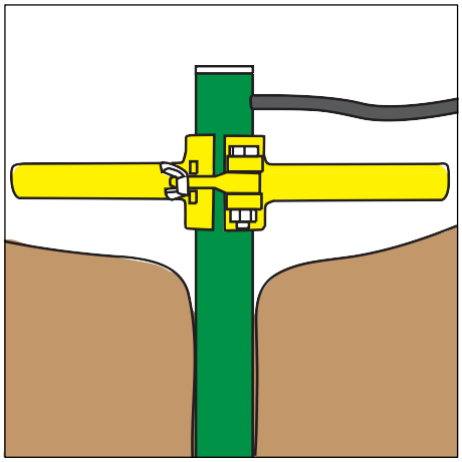
EnviroPro® - Extraction

Required Tools and Equipment

- EnviroPro® Extraction Clamp
- Multi-grip pliers or Vice Grips can be used if an extraction clamp is not available.

Method

1. If the soil is dry, extraction can be made easier by pre-wetting the soil the day before attempting extraction.
2. Use a trowel or small spade to carefully remove the soil around the head of theprobe down to a depth of 15 cm.
3. Clamp the probe removal tool to the probe body 10 mm below the cable.



EnviroPro® - Extraction

Method (cont.)

4. Grip the handles of the probe removal tool. Rotate the probe clockwise and anti-clockwise until you can rotate the probe approximately a quarter-turn.

Make sure the removal tool does not interfere with the probe cable.

5. You should now be able to work the probe free of the soil by pulling upward while continuing the rotating motion.

Ensure the probe is removed as vertical as possible. Off-vertical forces may damage the probe.

Extraction using Multi-Grip Pliers or Vice Grips

Method

If a probe removal tool is not available, multi-grips or vice-grips can be used for extraction. The method and precautions are the same as that for extraction using a probe removal tool (see above).

To avoid damage to the probe cushion the jaws of the pliers or vice with heavy duty electrical / duct tape or rubber. Ensure the probe is removed as vertical as possible. Off-vertical forces may damage the probe.