
User Manual
Radon Soil Gas Probe
(for Analogous Radon Sensor and RTM1688-2 GeoStation)

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Important hint

The unit contains touchable parts which are biased with a high voltage even if the power supply has been interrupted. This can cause a dangerous electrical shock. Only skilled personnel trained in handling this type of equipment should open the enclosure.

Common

The soil gas probe has been designed for continuous soil gas Radon measurements without sampling pump. There are two different versions of the soil gas probe, one for use with the Analogous Radon Sensor and another one for the RTM1688-2 GeoStation. The connector pin assignment varies for both versions. In case of a mismatch the probes will be not damaged but the additional sensors will not work. Please read the following text carefully to avoid problems when using the probe under rough conditions.

Installation

The soil gas probe should not be installed directly in water. The installation should also not be carried out in drains or places where the surface water is potentially collected.

Because water vapour passes the membrane beside Radon, the air inside the probe will be saturated very soon to 100%. This will result in condensation if the temperature drops down. In this situation, the probe may work not properly. It takes sometimes a few days until the inner surfaces of the soil gas probe become dry even if the ambient air is dry. To accelerate the process, the membrane can be removed to get a fast and free air exchange.

The probe must not be exposed to direct ambient light. The membrane and the housing can not ensure complete protection against light. Incoming light will affect the detector operation.

It is recommended to install the soil gas probe inside a PVC tube which has been inserted into the borehole (see sketch beside).

The surrounding soil must be caulked carefully at the wall of the tube to avoid degassing. Seal the top of the tube by a tight cap. The connection cable can be used together with a sealed feedthrough (IP protection) to hang up the probe 5 to 10 cm above the bottom of the borehole.

If it is necessary to draw the cable through holes do never disassemble the cable connector at the probe side. The cable connector is internally protected by a special silicon layer which could be destroyed. Disassemble only the connector at the instrument side (Analogous Radon Sensor or RTM 1688-2).

Check the membrane on scratches, pores, bends etc. before installation. Check up also the cable connection (O-ring seals must well placed). Take care for a straight screwed connector. Some hints are given in the next chapter.

Maintenance

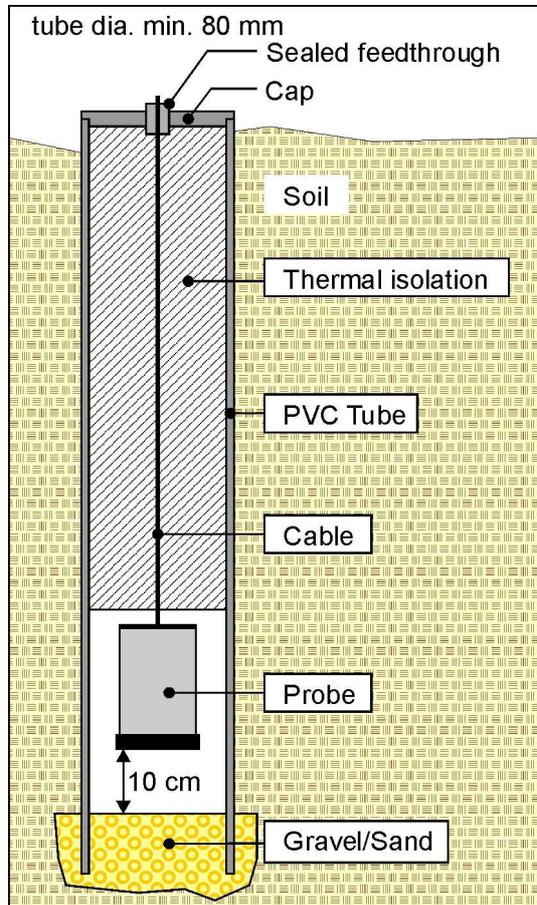
Probes installed in soil over long periods undergo an increased abrasion by moisture and corrosive soil gases. Therefore, a periodical (at least annual) check of the membrane and the seals is required. The membrane should be replaced after any check procedure, independent on its real abrasion state.

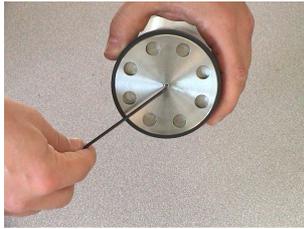
Check also all rubber seals against pores, gaps or cured material. If necessary, they must be replaced by a skilled person.

Replacing the diffusion membrane

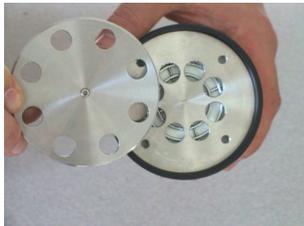
Disconnect the power supply of the electronic unit (Analogous Radon Sensor or RTM1688-2) to avoid erroneous operation states of the microprocessor.

Disconnect the cable between soil gas probe and electronic unit.





Loose the hexagonal screw in the middle of the bottom plate (air inlet) anti-clockwise. The screw need not to be removed completely. The inner sealing plate is pressed uniformly against the membrane by this screw!



Unscrew the bottom plate anti-clockwise. Take care that the black plastic isolation is not screwed out of the tube cover. Internal connections may break in this case. Hold the probe on the isolation while screwing out the bottom plate.



Take away the inner sealing plate and the outer stabilisation grid. Now, the membrane is accessible and can be removed. Do not use sharp edged tools which could damage the sealing surfaces.



ATTENTION! The high voltage is still present at parts of the electronics even if the power supply has been removed earlier. Do not remove the inner protection grid.

Insert the new membrane **with the silicon coated face inside** (woven side faces in direction of the stainless steel sealing plate). All surfaces must be clean, free of dust and without scratches. Clean them carefully if required.

Place the stabilisation grid with their mounting eyes into the slot of the sealing plate.

Place the sealing plate with grid into the plastic isolation. The plane face of the sealing plate must be outside. Check for perfect fit.

Screw the bottom plate into the plastic isolation until the bottom plate touches the sealing plate (the sealing plate can already be pressed slightly against the membrane). Use a little bit petroleum jelly at the thread to ensure an easy removing for the next check up.

Fix the hexagonal screw by using the short end of the tool. In this moment the membrane will be tightened between the sealing surfaces of the sealing plate and the plastic isolation.

Connect the cable and fix (screw in) the lock nut of the cable connector. Make sure that all O-ring seals of the connection are without damages and placed in the right position.

Connect the power supply of the electronics and initialise the set-up/operation parameters by software.