

SOIL GAS HELIUM SHROUD OPERATIONAL GUIDE

2655 Park Center Drive, Suite A • Simi Valley, CA 93065 • +1 805 526 7161

Shroud Schematic and Supplies

- Clear plastic shroud equipped with three ports
 1. Port 1 connecting the helium cylinder into the shroud
 2. Port 2 attaching the shroud to the helium analyzer (Part I)
 3. Port 3 connecting the helium analyzer to the manifold (Part II)
- Sampling manifold: equipped with stainless steel tubing, compression fittings, in-line filter and restrictor, vacuum gauge and a 3-way compression fitting valve
- Non-refillable steel container filled with ultra-pur helium, provided by ALS Environmental from the vendor Matheson. For available size options, please inquire with the laboratory for more information.
- Needle valve fitting for laboratory-provided helium cylinder
- MGD 2002 Helium Gas Analyzer, supplied by Ashtead Rentals

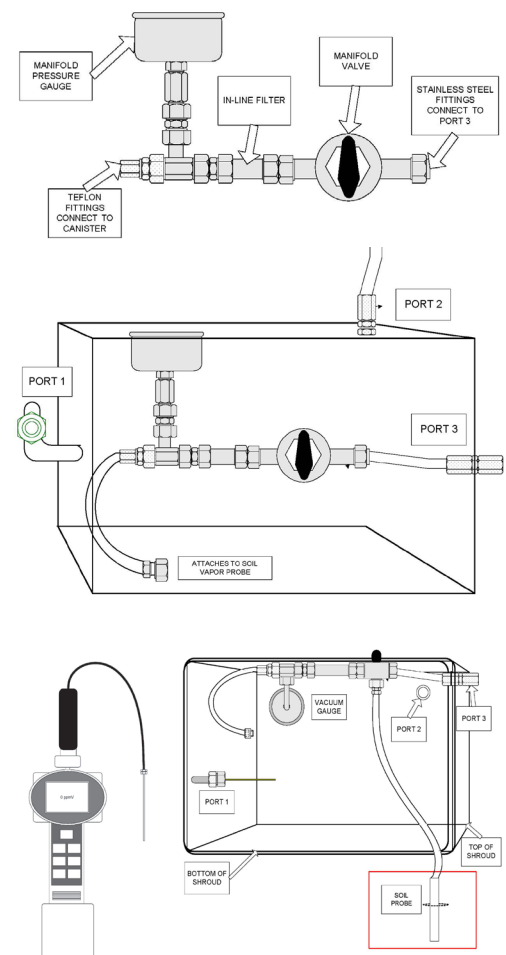
Assembling the Equipment

1. Turn on the MGD 2002 helium analyzer to begin equilibration; this should take a few minutes. The analyzer is considered to be equilibrated when it reads zero ppmV.
2. After removing the shroud from the shipping container, turn the shroud on the side (with the manifold on top) and connect the manifold tee located inside the shroud to the soil probe. The manifold tee is on the side with the Teflon fittings, opposite the valve.
3. Ensure the manifold valve is turned with the arrow pointed down in the vertical position. This creates a “closed system” with the probe.
4. Connect the sample line on the left side of the manifold to the summa canister.

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Performing the Manifold Leak Check

Prior to sampling, the shroud components should be connected and tested for any leaks. The following steps will demonstrate that the equipment is connected properly and is leak-tight.

5. With the shroud still on its side (and the manifold arrow still pointed down to “closed”), note the initial pressure reading on the manifold vacuum gage.
6. In order to perform a leak check between the canister and manifold valve, turn the canister valve counter-clockwise 1 ¼ turns to open it, and then quickly close it. Wait five minutes and then read the vacuum gauge again. If the vacuum gauge needle has not moved more than 0.5 in Hg, the system is considered to be leak-tight between the canister and manifold valve.

Filling the Shroud with Helium

7. After the leak check has been performed, open the canister valve all the way and place the shroud over the canister. Since the manifold valve is in the downward position, the system is still closed between the canister and manifold; no air will flow into the canister.
8. Connect the equilibrated analyzer probe to the silicone tubing at the top of Port 2, and open the pinch valve. Since the helium source has not been connected yet, the probe should continue to read “0 ppmV”.
9. Ensure that the needle valve on Port 1 is tuned all the way clockwise (closed). Connect the helium cylinder to Port 1 and open the cylinder valve.
10. To begin the flow of helium into the shroud, slowly turn the shroud needle valve counter clockwise to open.
11. Once the analyzer reads 20% helium (200,000 ppmV), turn the needle valve clockwise to close Port 1 and re-pinch the Teflon valve on Port 2 to close the shroud environment. Please note that if helium conservation is a concern, the shroud may be filled with 10% helium (100,000 ppmV) instead.
12. Remove the analyzer from Port 2 and allow it to re-equilibrate in the presence of the ambient air.

Performing Probe Leak Check

Since the helium analyzer has a built-in low-flow pump, it can be used to reveal leaks between the manifold and the soil gas probe prior to the sample being collected. If helium is detected during the following steps, then there is a leak between the soil gas probe seal and the shroud environment. The shroud must be disassembled, the connections must be checked and/or the seal repaired.

13. Connect the equilibrated analyzer probe to Port 3.
14. Turn the manifold valve counter-clockwise to open the flow between the soil gas probe and the helium analyzer. The analyzer will now be measuring the helium concentration between the soil probe and the manifold valve.
15. If the analyzer reads less than 1000 ppmV after five minutes, the components are considered to be leak-tight between the probe and the valve.

To Begin Sampling

16. To begin sampling, turn the manifold valve clockwise to connect the soil gas probe to the canister. The manifold is calibrated to sample at approximately 200mL/min, so sampling will be complete after 30 minutes for a 6L canister or five minutes for a 1L canister.
17. Open the shroud and turn the canister valve clockwise to close.
18. Disconnect the helium cylinder, analyzer and canister. Place all items back in their original boxes to return equipment to the laboratory.



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