SKC

Operating Instructions

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GS-1 Single-inlet Cyclone
Cat. No. 225-105

Description

The GS-1 Cyclone is a 10-mm, lightweight, single-inlet, conductive plastic cyclone designed for use with either a Diesel Particulate Matter (DPM) Cassette or a standard 37-mm 3-piece filter cassette (25 mm with adapter accessory). This cyclone can be used with the SKC Filter Cassette Holder (Cat. No. 225-1) for personal sampling in the breathing zone.

Performance Profile

Media: 37-mm 3-piece cassette with filter (25-mm with adapter accessory) or DPM Cassette

Flow Rate:
- 2.0 L/min for 4.0 µm 50% cut-point *(see Reference)*
- 3.0 L/min for 3.5 µm 50% cut-point*
- 1.7 or 2.0 L/min for sampling with DPM Cassette

Tubing: 1/4-inch ID

* *Determined using experimental data obtained at flows from 2.0 to 4.0 L/min.*

Assembly with Standard 37 or 25-mm 3-piece Cassette (Figure 1)

The GS-1 Cyclone is supplied fully assembled with bowl adapter and 37-mm cassette adapter. A 25-mm cassette adapter is sold separately as Cat. No. 225-101.

1. Determine cassette diameter to be used with cyclone.
   a. If using a 37-mm cassette, proceed to Step 2.
   b. If using a 25-mm cassette, remove 37-mm cassette adapter assembled on cyclone (pull it off the top of the cyclone) and replace with the 25-mm cassette adapter accessory (align with cyclone top and press on until firmly seated).
2. Disassemble a three-piece cassette and set aside the inlet section (usually marked "inlet"). Keep the inlet section for closing the cassette after sampling.
3. Select a filter and support pad as specified in the sampling method. Place support pad into cassette outlet section and place filter on top of support pad. Insert cassette ring (middle) section into cassette outlet section. Ensure a firm seal.

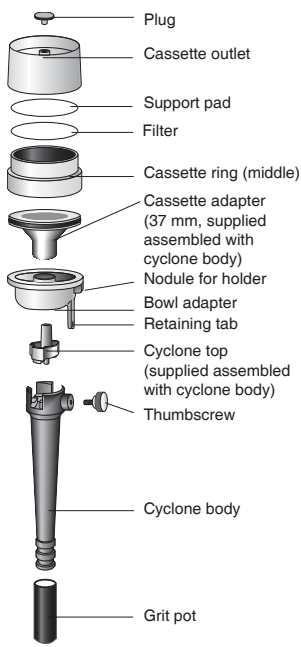

Figure 1
GS-1 Cyclone with standard 37-mm cassette installed - exploded view

4. Hold cyclone upside down (cassette adapter facing downward). Insert cassette adapter into cassette middle ring section. Press until a firm seal is established.
5. Ensure thumbscrew on cyclone is secure and that the grit pot remains on the cyclone body during sampling.

Assembly with Diesel Particulate Matter (DPM) Cassette (Figure 2)

The GS-1 Cyclone is supplied fully assembled with bowl adapter and 37-mm cassette adapter.

1. Remove cassette adapter from cyclone.
2. Remove inlet plug from DPM Cassette and gently push cassette inlet on top of cyclone until seated firmly.

For secure sampling, use DPM Cassette/GS-1 Cyclone assembly with SKC Cassette Holder (Cat. No. 225-1) during sampling. *See DPM Cassette Operating Instructions.*

Leave grit pot in place during calibration and sampling.

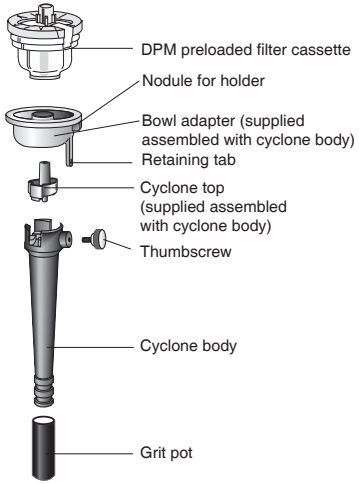

Figure 2
GS-1 Cyclone with cassette adapter removed and preloaded DPM filter cassette installed - exploded view

Calibration

Flow rate:
- **2.0 L/min for 4.0 µm 50% cut-point** *(see Reference)*
- **3.0 L/min for 3.5 µm 50% cut-point***
- **1.7 or 2.0 L/min for removing large particles when sampling with the DPM Cassette** *(flow rates used by MSHA)*

* *Determined using experimental data obtained at flows from 2.0 to 4.0 L/min.*

Option 1: Using a Calibration Jar

1. Prepare a cyclone/cassette assembly (*see Figures 1 and 2*). **Ensure grit pot remains on cyclone body during calibration.**

SKC recommends using the smallest calibration jar possible. To achieve this, do NOT use Cassette Holder 225-1 during calibration.

2. Place cyclone/cassette assembly into an airtight calibration jar that contains an inlet and outlet (SKC Cat. No. 225-111; *see Figure 3*).
3. Using flexible tubing, connect inlet of calibrator to inlet of calibration jar.
4. Run tubing from outlet of cyclone/cassette assembly through outlet of calibration jar and to the inlet of a sample pump. If using the SKC 225-111 jar, connect the Luer adapter inside the jar to the cyclone/cassette outlet. Connect jar outlet to inlet of a sample pump.
5. Turn on pump and calibrate to desired flow rate following directions in the pump and calibrator operating instructions.
6. After calibration, disassemble calibration jar, remove cyclone/cassette assembly, and replace cassette used for calibration with a fresh (unused) cassette to be used for sampling.

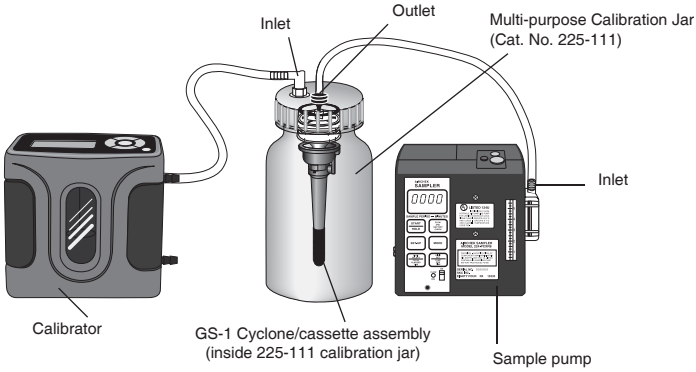

Figure 3
GS-1 Cyclone/cassette assembly in calibration jar

Option 2: Jarless Calibration - Figure 4
This calibration option is recommended when using a Defender primary standard calibrator to calibrate personal air sample pumps for size-selective particulate sampling using particulate samplers that do not have their own calibration adapters.

1. Use a length of flexible tubing to attach the inlet of the sample pump to the suction port of a Defender calibrator.
2. Use the shortest length of tubing possible to attach the outlet of the cassette in a cyclone/cassette assembly to the pressure port of the Defender.
3. Set the Defender to take at least 20 flow measurements in order to average out the flow variations caused by direct connection of the pump to the calibrator. *See calibrator operating instructions for details.*

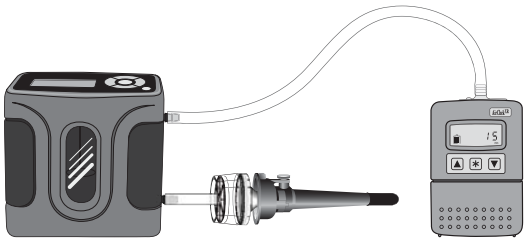

Figure 4
Jarless calibration with cyclone/cassette assembly and AirChek XR5000 pump

Sampling

Check the sampling method being used for flow rate and sampling media requirements.

1. Calibrate pump to desired flow rate using representative sampling media (*see Calibration*).

Leave grit pot in place during calibration and sampling.

2. Ensure fresh cassette has been installed on the cyclone and the cyclone/cassette assembly has been inserted into the cassette holder (*see holder instructions*).
3. Using the flexible tubing attached to the cassette holder, connect the holder containing the cyclone/cassette assembly to the inlet of the calibrated sample pump.
4. Clip holder near the breathing zone and clip pump to the worker's belt.
5. Start pump and record pertinent details.
6. Sample for the time specified in the method.
7. Turn off pump when sampling is complete and record pertinent details.
8. Remove cyclone/cassette assembly from holder and immediately cap cassette outlet.
9. Separate cassette from cyclone and immediately cap cassette inlet (if using a standard cassette, replace the inlet section of the cassette, then cap the inlet with the plug provided).
10. Discard particles that collected in the cyclone's grit pot.
11. Package cassette and send it with all data to a laboratory for analysis.

Cleaning

After sampling, clean all parts of the cyclone, including the interior of the grit pot, with mild soapy water. The cyclone can be wiped with a clean dust-free tissue, air dried, blown dry, or wiped with isopropyl alcohol.

Do not use strong solvents to clean the cyclone.

Reference

Trakumas, S., et. al., Performance Assessment of Personal Respirable Cyclone Samplers, AIHce Presentation 191, 2003

Ordering Information

Description	Cat. No.
GS-1 Single-inlet Cyclone includes bowl adapter, 37-mm cassette adapter, and grit pot	**225-105**
Filter Cassette/Cyclone Holder, for attaching a DPM or standard filter cassette to a worker's clothing in the breathing zone. May be used with or without a cyclone, *required when using DPM Cassette with GS-1 Cyclone*	**225-1**
Replacement Cassette Adapters	
25-mm cassettes	**225-101**
37-mm cassettes (*supplied with cyclone*)	**225-102**
Replacement Bowl Adapter	**225-108**
Replacement Grit Pots, pk/25	**P225012**
Multi-purpose Calibration Jar	**225-111**

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