



# Operating Instructions

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## GS-3 Multiple-inlet Cyclone Catalog Nos. 225-100 & 225-103

### Description

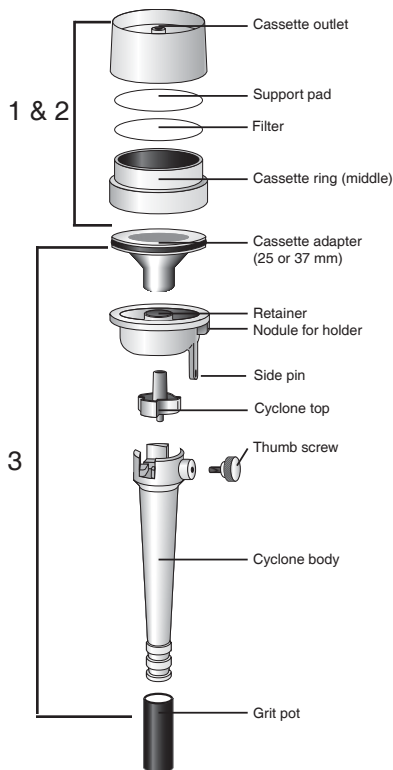
The GS-3 Cyclone is a 10-mm, lightweight, multiple-inlet, conductive plastic sampler that uses a standard three-piece cassette and filter for the collection of respirable dust particles. Designed to meet the ACGIH-CEN-ISO size-selection curve, the GS-3 Cyclone has a 50% cut-point of  $4.0\ \mu\text{m}$  (with bias within ISO/NIOSH requirements) at  $2.75\ \text{L}/\text{min}^*$  and  $3.5\ \mu\text{m}$  at  $3.7\ \text{L}/\text{min}^\dagger$

The GS-3 Cyclone can be used with a 25 or 37-mm three-piece cassette with the corresponding cassette adapter and filter.

### Assembly (Figure 1)

1. Disassemble three-piece cassette and set aside inlet section (usually marked "inlet"). Keep inlet section for closing cassette after sampling.
2. Select a filter and support pad as specified in the sampling method. Place support pad into cassette outlet and place filter on top of support pad. Insert cassette ring (middle) section into cassette outlet.
3. Place cassette adapter onto retainer of cyclone top and press it firmly into place. Insert cassette adapter/cyclone assembly into cassette ring.

**The grit pot must remain on the cyclone body during sampling.**



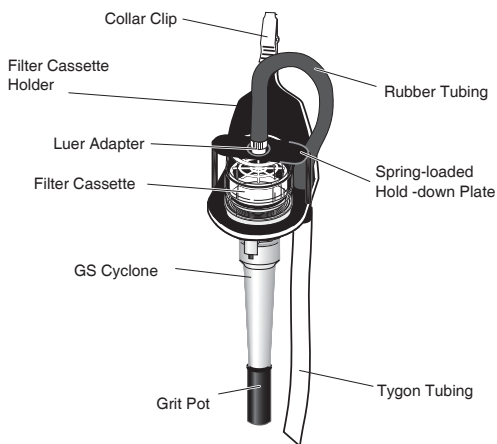
**Figure 1**  
GS-3 Cyclone with Filter  
Cassette — Exploded View

\* Calibrated at U.K. Health and Safety Laboratories.

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

4. Insert the cyclone body through the large opening of the filter cassette holder. Ensure the assembly is seated firmly in the holder by inserting the cyclone's small round nodule on the rim into the notch in the filter cassette holder.

5. Remove the plug from the cassette outlet. Secure the assembly in the holder by stretching the spring-loaded hold-down plate over the cassette. Insert the Luer adapter of the filter cassette holder (located on the end of the rubber tubing) into the cassette outlet (see Figure 2).



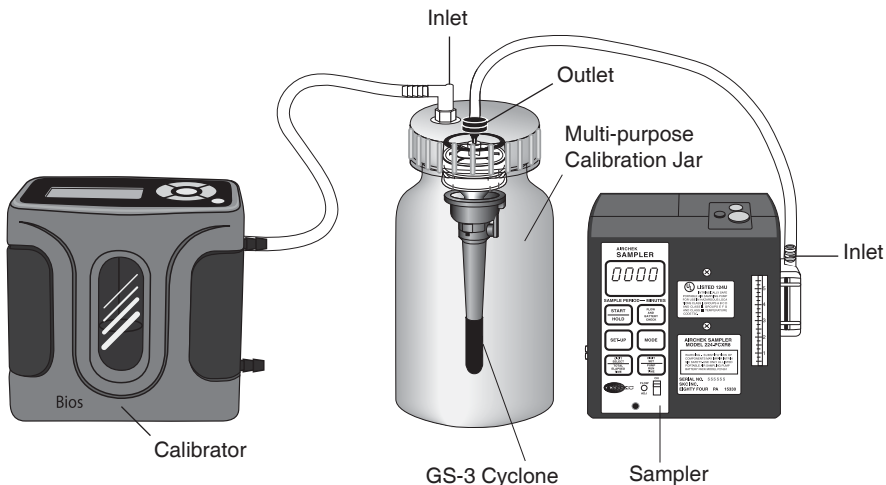
**Figure 2**  
GS-3 Cyclone/Filter Cassette Assembly in Holder

### Calibration (Figure 3)

1. Prepare a cassette-cyclone assembly (see Assembly, steps 1-3). The grit pot must remain on the cyclone body during calibration.

**Note:** Do **not** use filter cassette holder during calibration.

2. Remove the plug from the cassette outlet. Place the cyclone assembly in the SKC Multi-purpose Calibration Jar (see Figure 3).



**Figure 3**

- Using flexible tubing, connect the tubing from the calibrator to the inlet of the calibration jar. Run the tubing from the outlet of the cyclone assembly through the outlet of the calibration jar, and connect it to the inlet of the sampling pump.
- Calibrate to the desired flow rate using the directions in the pump and calibrator operating manuals.

**Flow rate:** 2.75 L/min for a 4.0 µm cut-point\*  
3.7 L/min for a 3.5 µm cut-point†

- After calibration, disconnect the calibrator, remove the cyclone from the calibration jar, and replace the filter used to set the flow with a fresh filter for sample collection.

## Sampling

- Ensure the flow rate has been set properly (*see Calibration*).

**Warning:** Leave grit pot in place during calibration and sampling.

**Flow rate:** 2.75 L/min for a 4.0 µm cut-point\*  
3.7 L/min for a 3.5 µm cut-point†

- Insert fresh filter cassette into the filter cassette holder (*see holder instructions*).
- Connect the Tygon® tubing attached to the filter cassette holder to the inlet of a constant flow personal sampling pump.
- Clip the holder with the cassette/cyclone assembly onto a worker's collar or pocket as close to the breathing zone as possible.
- Clip the pump onto the worker's belt or place it in a protective pouch. Start the pump and record the start time, worker location, and flow rate.
- At the end of the sampling period, stop the pump and record the finish time. Remove the cassette/cyclone assembly from the cassette holder. Separate the cyclone from the cassette. Replace the inlet section of the cassette, seal the inlet and outlet sections with the provided plugs, and send the cassette and all data to a laboratory for analysis.

**Note:** Particles collected in the grit pot do not represent any part of the respirable dust sample and should be discarded.

\* Calibrated at U.K. Health and Safety Laboratories.

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

## 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.

**Caution:** Do not use strong solvents to clean the GS-3 Cyclone.

## References

Gautam, M. and Sreenath, A., "Performance of a Respirable Multi-Inlet Cyclone Sampler", *J. Aerosol Sci.*, Vol. 28. No. 7, pp. 1265-1281, 1997 (copy available from SKC)

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

## Ordering Information

Description	Catalog No.
<b>GS-3 Cyclone with Cassette Adapter</b>	
25 mm	<b>225-103</b>
37 mm	<b>225-100</b>
<b>Replacement Cassette Adapter</b>	
25 mm	<b>225-101</b>
37 mm	<b>225-102</b>
<b>Three-piece Filter Cassette Blanks</b>	
25 mm	<b>225-3-25LF</b>
37 mm	<b>225-3LF</b>
<b>Filter Cassette &amp; Cyclone Holder</b> for attaching cassette and cyclone assembly to worker's clothing	
25 or 37 mm	<b>225-1</b>
<b>Multi-purpose Calibration Jar</b>	<b>225-111</b>

*Notice: This operating instruction may not address all safety concerns (if any) associated with this product and its use. The user is responsible for determining and following the appropriate safety and health practices and regulatory limitations (if any) before using the product. The information contained in this document should not be construed as legal advice, opinion, or as a final authority on legal or regulatory procedures.*