ANALYT MESSTECHNIK



INSTRUCTIONS FOR USE

SKC GS-1 Cyclone

Assembly, flow-rate verification, sampling and cleaning for the SKC GS-1 single-inlet respirable dust cyclone, Cat. No. 225-105, with 25 mm and 37 mm filter cassettes.

AMTC-IN-0016

About this document

The SKC GS-1 is a single-inlet 10 mm cyclone for personal sampling of respirable dust. It sits in front of a filter cassette, removes the particles too large to be respirable and lets the respirable fraction through to the filter. These instructions take you through fitting the cyclone to a 25 mm or 37 mm three-piece filter cassette, mounting it in the filter cassette holder, verifying the flow rate, taking a sample and cleaning the cyclone afterwards.

Start with Safety (p. 5) and Product and supplied items (p. 6), then follow Before use (p. 7), Flow-rate verification (p. 8) and Procedure (p. 10) in that order; After use and sample handling (p. 11) covers sealing and sending the sample and cleaning the cyclone. The sampling method you work to sets the filter, the flow rate, the sampling time and the analysis; these instructions do not replace it.

These instructions apply to the GS-1 single-inlet cyclone, Cat. No. 225-105. Analyt-MTC supplies and supports it; for questions and spare parts see Ordering information (p. 13).

Keep these instructions for the lifetime of the product. The current revision is on the product page at analyt-mtc.com.

How these instructions mark information

NOTICE

Practices not related to personal injury — damage to the product, the process or the sample.

Note
Information that helps understanding; never a hazard.

Tip
A shortcut or recommendation; never a hazard.

Numbers in brackets, such as (13), refer to the parts in Figure 2-1 (p. 6).

Document information

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Applies to	SKC GS-1 single-inlet cyclone, Cat. No. 225-105
Language	English
Manufacturer	SKC Inc.

Revision history

Rev.	Date	Change
2	October 2026	Quality programme: new document type, number and identity pages.
1	October 2026	First issue.

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CHAPTER 1

Safety

Read this chapter before you use the cyclone. It states what the cyclone is intended for and brings together the safety messages of these instructions.

Intended use

The GS-1 cyclone collects respirable dust on the filter of a standard three-piece 37 mm filter cassette, or of a 25 mm cassette with the 25 mm cassette adapter 225-101. With the SKC DPM Cassette it removes the large particles ahead of the cassette for diesel particulate sampling. Use it with a sample pump, close to the breathing zone of a worker, at the flow rate your sampling method sets (see Flow rates and cut-points (p. 12)).

Safety messages

The messages in these instructions protect the sample and the cyclone. Each one is repeated at the step it concerns, in Before use (p. 7) and Procedure (p. 10).

NOTICE

Removing the grit pot changes the air path through the cyclone. The flow-rate verification and the sample are then invalid. Keep the grit pot on the cyclone body during flow-rate verification and during sampling.

NOTICE

Strong solvents can damage the cyclone. Do not clean the cyclone with strong solvents. Use mild soapy water or isopropyl alcohol.

CHAPTER 2

Product and supplied items

The GS-1 is a light 10 mm cyclone in conductive plastic with a single inlet. It collects respirable dust on the filter of a cassette fitted on top of it.

Air enters the cyclone body (12) through its inlet. Particles too large to be respirable spin out and fall into the grit pot (13); the respirable fraction rises through the cyclone top and the cassette adapter to the filter (4). The cyclone is supplied fully assembled with the 37 mm cassette adapter (6), the bowl adapter (8) and the grit pot.

The GS-1 takes a standard three-piece 37 mm filter cassette, or a 25 mm cassette with the 25 mm cassette adapter 225-101. It also works with the SKC DPM Cassette for diesel particulate matter; the filter cassette holder 225-1 is then required, and the separate DPM Cassette instructions (AMTC-IN-0015; ask Analyt-MTC) describe the assembly.

The grit pot stays on the cyclone during flow-rate verification and during sampling. What it collects is not part of the respirable sample.

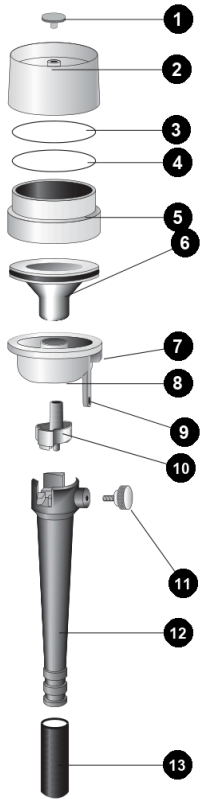


Figure 2-1. GS-1 cyclone with a 37 mm three-piece cassette, exploded. (1) Plug. (2) Cassette outlet. (3) Support pad. (4) Filter. (5) Cassette ring (middle section). (6) Cassette adapter, 37 mm. (7) Nodule for the holder. (8) Bowl adapter. (9) Retaining tab. (10) Cyclone top. (11) Thumbscrew. (12) Cyclone body. (13) Grit pot. Parts 6 and 10 come assembled on the cyclone body.

The flow rates and the cut-points they give are in Flow rates and cut-points (p. 12).

What you need

- the GS-1 cyclone, with its cassette adapter, bowl adapter and grit pot;
- three-piece filter cassettes (225 series), 37 mm or 25 mm, with the filter and support pad your sampling method specifies; for 25 mm cassettes, the 25 mm cassette adapter 225-101;
- the filter cassette holder 225-1;
- a sample pump that delivers the flow rate your method specifies;
- for flow-rate verification: an electronic flowmeter, the calibration jar 225-111 and Tygon tubing, 1/4 inch inside and 3/8 inch outside diameter.

Catalogue numbers of all accessories: see Accessories and spare parts (p. 13).

CHAPTER 3

Before use

Fit a filter cassette to the cyclone, then mount the assembly in the filter cassette holder for sampling. Flow-rate verification uses the assembly without the holder.

Fit the cassette to the cyclone

NOTICE

Removing the grit pot changes the air path through the cyclone. The flow-rate verification and the sample are then invalid. Keep the grit pot on the cyclone body during flow-rate verification and during sampling.

1. Check which cassette size you will use.
   - **37 mm:** the cyclone is ready; go on with step 2.
   - **25 mm:** pull the 37 mm cassette adapter (6) off the top of the cyclone. Line the 25 mm cassette adapter 225-101 up with the cyclone top (10) and press it on until it sits firmly.
2. Take a three-piece cassette apart. Put the inlet section aside (it is usually marked “inlet”); you need it to close the cassette after sampling.
3. Choose the filter and support pad your sampling method specifies. Lay the support pad (3) in the cassette outlet (2) and the filter (4) on top of it. Push the cassette ring (5) into the outlet so that it seals firmly.
4. Turn the cyclone upside down, with the cassette adapter pointing down. Push the adapter into the cassette ring and press until it seals firmly.
5. Check that the thumbscrew (11) is tight and that the grit pot (13) is on the cyclone body.

Mount the assembly in the holder

1. Push the cyclone body through the large opening of the filter cassette holder 225-1 (Figure 3-1 (p. 8)).
2. Seat the assembly firmly: the small round nodule on the rim of the bowl adapter must sit in the notch of the holder.
3. Pull the plug out of the cassette outlet.
4. Stretch the spring-loaded hold-down plate of the holder over the cassette outlet to hold the assembly in place.
5. Push the Luer adapter at the end of the spring-supported rubber tubing into the cassette outlet.

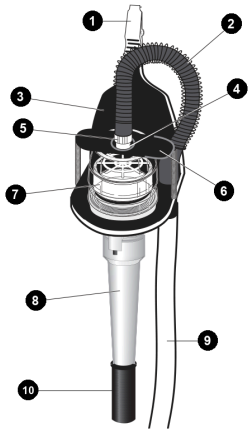


Figure 3-1. GS-1 cyclone and cassette in the filter cassette holder 225-1. (1) Collar clip. (2) Rubber tubing. (3) Filter cassette holder. (4) Cassette outlet. (5) Luer adapter. (6) Spring-loaded hold-down plate. (7) Filter cassette. (8) GS-1 cyclone. (9) Tygon tubing, to the pump. (10) Grit pot.

Flow-rate verification

Verify the flow rate through a complete cyclone and cassette assembly before you sample, at the flow rate your method specifies (Flow rates and cut-points (p. 12)). The assembly sits in an airtight calibration jar, so that the flowmeter measures the air that passes through the cyclone and the filter (Figure 3-2 (p. 9)). With an SKC chek-mate flowmeter you can also work without a jar; see Without a calibration jar (p. 9).

> **Tip**
> **Verify without the holder.** Use the smallest calibration jar possible. For that reason, do not put the filter cassette holder 225-1 on the assembly for flow-rate verification.

With the calibration jar

1. Prepare a cyclone and cassette assembly as in Fit the cassette to the cyclone (p. 7). **Leave the grit pot on the cyclone body.**
2. Place the assembly in an airtight calibration jar with an inlet and an outlet, such as the multi-purpose calibration jar 225-111.
3. Connect the outlet of the flowmeter to the inlet of the calibration jar with flexible tubing.
4. Connect the cassette outlet, through the outlet of the jar, to the inlet of the sample pump. In the calibration jar 225-111, push the Luer adapter inside the lid into the cassette outlet, then run tubing from the jar outlet to the pump inlet.
5. Switch on the pump and set the flow through the sampling train to the required flow rate, as the operating instructions of your pump and flowmeter describe.
6. Open the jar and take out the assembly. Replace the cassette you used for verification with a fresh, unused cassette for sampling.

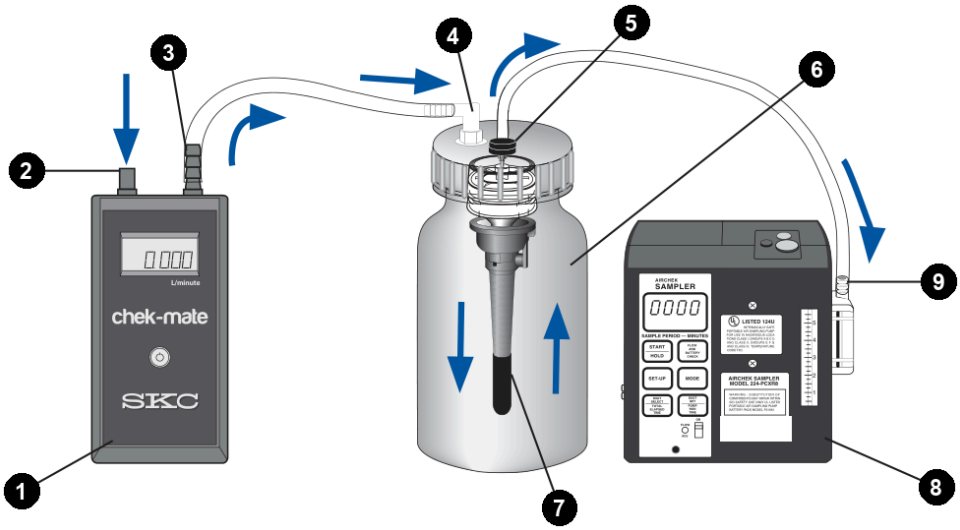


Figure 3-2. GS-1 cyclone and cassette in the calibration jar. (1) Flowmeter. (2) Flowmeter inlet (pressure port). (3) Flowmeter outlet (suction port). (4) Jar inlet. (5) Jar outlet. (6) Multi-purpose calibration jar 225-111. (7) GS-1 cyclone and cassette assembly, without the holder. (8) Sample pump. (9) Pump inlet. The arrows show the air flow: through the flowmeter into the jar, through the cyclone and the filter, and out to the pump.

Without a calibration jar

This method works only with an SKC chek-mate flowmeter. It is meant for samplers that have no calibration adapter, and connects the cyclone directly to the flowmeter inlet (Figure 3-3 (p. 9)).

1. Prepare a cyclone and cassette assembly as for the jar method, grit pot on.
2. Connect the pump inlet to the outlet (suction port) of the chek-mate, with the pulsation dampener 375-100 in the line between pump and flowmeter.
3. Connect the cyclone and cassette assembly to the inlet of the chek-mate, with the shortest possible length of tubing.
4. Continue with steps 5 and 6 of With the calibration jar (p. 8), following the operating instructions of your pump.

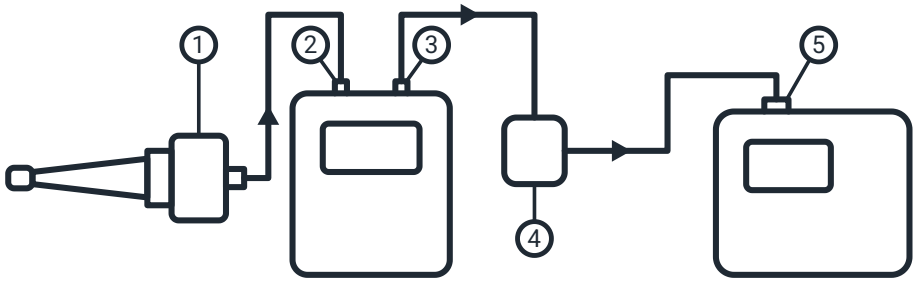


Figure 3-3. Flow-rate verification without a calibration jar. (1) GS-1 cyclone and cassette assembly, grit pot on. (2) chek-mate inlet, short tubing from the assembly. (3) chek-mate outlet (suction port). (4) Pulsation dampener 375-100. (5) Pump inlet. The arrows show the air flow.

CHAPTER 4

Procedure

Your sampling method sets the flow rate, the filter and the sampling time. Check them before you start.

NOTICE

Removing the grit pot changes the air path through the cyclone. The flow-rate verification and the sample are then invalid. Keep the grit pot on the cyclone body during flow-rate verification and during sampling.

Take the sample

1. Check that the flow rate has been set (Flow-rate verification (p. 8)).
2. Check that a fresh cassette is fitted to the cyclone and that the assembly is mounted in the filter cassette holder (Mount the assembly in the holder (p. 8)).
3. Connect the Tygon tubing of the holder to the inlet of the sample pump.
4. Clip the holder close to the worker’s breathing zone.
5. Clip the pump to the worker’s belt.
6. Start the pump.
7. Record the start time and the other details your method asks for.
8. Sample for the time your method specifies.

End the sample

1. Switch off the pump when the sampling time is over.
2. Record the stop time and the other details.

Then seal the cassette and send it to the laboratory (Seal and send the sample (p. 11)).

CHAPTER 5

After use and sample handling

Seal and send the sample

1. Take the cyclone and cassette assembly out of the holder.
2. Cap the cassette outlet straight away.
3. Separate the cassette from the cyclone.
4. Fit the inlet section back on the cassette at once.
5. Close its inlet with the plug supplied.
6. Pack the cassette and send it, with all the sample data, to a laboratory for analysis.

Note
The particles in the grit pot are not part of the respirable sample. Discard them; do not send them to the laboratory.

Clean the cyclone

Clean the cyclone after each sample, before you use it again.

NOTICE

Strong solvents can damage the cyclone. Do not clean the cyclone with strong solvents. Use mild soapy water or isopropyl alcohol.

1. Wash every part of the cyclone, the inside of the grit pot included, in mild soapy water.
2. Dry the parts: wipe them with a clean, dust-free tissue, let them dry in air or blow them dry. Alternatively, wipe them with isopropyl alcohol.

Disposal

Dispose of the cyclone under local regulations; separate metal, glass and plastic parts for recycling where possible.

Further reading

- Trakumas, S., et al.: Performance Assessment of Personal Respirable Cyclone Samplers. AIHce presentation 191, 2003. Source of the 4 µm cut-point at 2 L/min.
- OSHA final rule on respirable crystalline silica.

CHAPTER 6

Specifications

Cyclone

Property	Value
Size	10 mm
Material	Conductive plastic
Inlets	One

Flow rates and cut-points

The flow rate sets the particle size the cyclone separates. Take the flow rate from your sampling method.

Flow rate	Result	Typical use
2 L/min	4 µm 50 % cut-point, with minimum bias to the ISO 7708 / CEN respirable convention	respirable dust
3 L/min	3.5 µm cut-point	MSHA respirable silica standard
1.7 or 2 L/min	removes large particles ahead of the DPM Cassette	MSHA diesel particulate (DPM) sampling

CHAPTER 7

Ordering information

Order from Analyt-MTC with the order codes.

Accessories and spare parts

Description	Order code
CYCLONE	
GS-1 single-inlet cyclone, supplied with 37 mm cassette adapter, bowl adapter and grit pot	225-105
SPARE PARTS	
Cassette adapter for 25 mm cassettes	225-101
Cassette adapter for 37 mm cassettes (supplied with the cyclone)	225-102
Bowl adapter	225-108
Grit pots, pack of 25	P225012
ACCESSORIES	
Filter cassette / cyclone holder, for the DPM Cassette or standard 25 or 37 mm three-piece cassettes, with or without a cyclone; required when the GS-1 is used with the DPM Cassette	225-1
Multi-purpose calibration jar, standard size	225-111
Pulsation dampener, for flow-rate verification without a jar	375-100
Three-piece filter cassettes, 25 and 37 mm	225 series

CHAPTER 8

Service and contacts

Contact and support

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Before you contact Analyt-MTC

Have the following at hand so Analyt-MTC can help you quickly:

- the catalogue number of the cyclone, 225-105;
- the filter cassettes, sample pump and flowmeter you use with it;
- the sampling method and the flow rate you are working to.

Analyt-MTC is your contact for spare parts, technical questions and warranty matters concerning your SKC GS-1 cyclone. Warranty is handled under Analyt-MTC's terms of sale. Analyt-MTC's contact details are above and on the back cover.

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