

OPERATING MANUAL

SKC Vac-U-Chamber

Filling SKC sample bags by vacuum with the Small (231-940) and Large (231-939) Vac-U-Chamber: preparing and purging the bag, grab and timed sampling, standard gas samples and ordering information.

AMTC-MN-0046

About this manual

The SKC Vac-U-Chamber is a rigid, airtight case that holds an SKC sample bag. A sample pump draws the air out of the case, and the bag inflates with the sample through the chamber's inlet.

This manual covers the Small Vac-U-Chamber, Cat. No. 231-940, for 1 L bags and the Large Vac-U-Chamber, Cat. No. 231-939, for 8 L bags. Product description (p. 6) names the ports and lists what you need besides the chamber. Operation (p. 8) sets up the pump, fits the bag and purges bag and sample line. Sampling (p. 10) takes you through grab and timed samples, the handling of filled bags and the preparation of standard gas samples. Specifications (p. 13) and Ordering information (p. 14) close with the performance data and the order numbers.

Keep the operating instructions of your sample pump, flow calibrator and sample bags at hand: this manual refers to them for the controls of those devices.

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

Abbreviations

Abbreviation	Meaning
EPA	US Environmental Protection Agency
ID	Inside diameter
OD	Outside diameter
POHC	Principal organic hazardous constituent
PTFE	Polytetrafluoroethylene
SOP	Standard operating procedure
VOC	Volatile organic compound

How this manual marks information

⚠ CAUTION

A hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

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

Note

Information that helps understanding; never a hazard.

Document information

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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 the safety messages in this chapter before you use the Vac-U-Chamber. Each one also appears in the procedure where it applies. The cautions protect you from the sample gas in the pump exhaust; the notices protect the bags and the sample.

Intended use

The Vac-U-Chamber fills an SKC sample bag by vacuum, for grab or timed air and gas sampling and for preparing standard gas samples (see What it is used for (p. 6)). Use the Small Vac-U-Chamber with 1 L bags and the Large Vac-U-Chamber with 8 L bags, with a sample pump for 1 to 5 L/min.

Do not use it in any of these ways:

- filling a bag to more than 80 % of its maximum volume;
- purging or emptying a bag with the pump exhaust released where you or others breathe it;
- sending filled bags by air freight in a cargo hold that is not pressurised.

Pump exhaust

⚠ CAUTION

Air pumped out of a bag carries the sample with it, which can contain harmful gases. Breathing the exhaust can harm your health. Whenever you purge or empty a bag, lead the pump exhaust to a safe place and do not breathe it.

Sample bags

NOTICE

An overfilled bag, or a filled bag in an unpressurised cargo hold, can burst. The sample is then lost.

- Never fill a bag to more than 80 % of its maximum volume. Watch it through the window while it fills (see How full to fill the bag (p. 11)).
- Do not send filled bags by air freight unless the cargo hold is pressurised.

Disposing of used bags

If part of a sample was drawn off into an instrument or a detector tube, empty the rest of the bag before you dispose of it, and lead the pump exhaust to a safe place (see After sampling (p. 11)).

CHAPTER 2

Product description

The Vac-U-Chamber fills a sample bag by vacuum. The bag sits inside the closed case on the chamber's sample inlet; a pump connected outside draws air out of the case, and the falling pressure around the bag pulls the sample in through the inlet.

What it is used for

- Sampling to U.S. EPA Method 18 (VOCs from industrial sources) and Method 0040 (POHCs from stationary sources)
- Soil gas and vapour sampling to U.S. EPA SOP 2042
- Monitoring of indoor air remediation systems for petroleum constituents to U.S. EPA SOPs 2102, 2103 and 2104
- Groundwater testing, stack sampling, ventilation studies and hazmat testing
- Preparing standards and gas mixtures (see Making standard gas samples (p. 12))

Safety rules

⚠ CAUTION

Air pumped out of a bag carries the sample with it, which can contain harmful gases. Breathing the exhaust can harm your health. Whenever you purge or empty a bag, lead the pump exhaust to a safe place and do not breathe it.

NOTICE

An overfilled bag, or a filled bag in an unpressurised cargo hold, can burst. The sample is then lost.

- Never fill a bag to more than 80 % of its maximum volume. Watch it through the window while it fills (see How full to fill the bag (p. 11)).
- Do not send filled bags by air freight unless the cargo hold is pressurised.

Checking the contents

Each chamber comes without a pump. If anything is missing, contact Analyt-MTC (see Service, warranty and contacts (p. 16)).

Order code	Contents	For bags of
231-940	Small Vac-U-Chamber with polypropylene fittings; ¼ in. ID Tygon tubing with polypropylene quick coupling	1 L
231-939	Large Vac-U-Chamber with stainless steel fittings; ¼ in. ID Tygon tubing with stainless steel quick coupling	8 L

What else you need

- **A sample pump** for 1 to 5 L/min, such as the SKC AirChek TOUCH, AirChek XR5000 or a pump of the Universal XR Series.
- **PTFE tubing**, ¼ in. ID (5/16 in. OD), as the sample line.
- **SKC sample bags**: 1 L bags for the Small Vac-U-Chamber, 8 L bags for the Large one. The bags below have a single polypropylene fitting; for the full list see Sample bags and septa (p. 15).

Bag film	1 L, order code	8 L, order code
Tedlar	232-01	232-939
SamplePRO FlexFilm	Ask Analyt-MTC	Ask Analyt-MTC
Standard FlexFoil	262-01	262-08
FlexFoil PLUS	252-01	252-08

The ports

The case has three ports with connector fittings, and a window in the lid to watch the bag. The Large Vac-U-Chamber has all three ports on the front (Figure 1 (p. 7)); the Small Vac-U-Chamber has the vacuum port and the sample inlet port on the front and the purge port on the side (Figure 2 (p. 7)).



Figure 1. Large Vac-U-Chamber, 231-939, with a bag on the sample inlet. Parts numbered as in the table beside it.

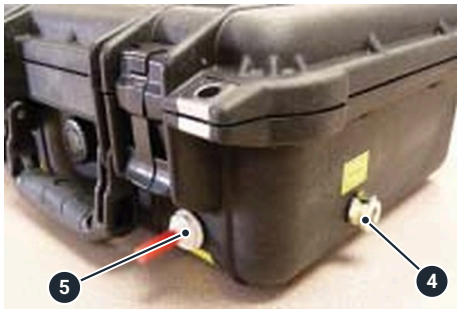


Figure 2. Small Vac-U-Chamber, 231-940: **4** purge port on the side, **5** sample inlet port with red cap on the front (numbers as in Figure 1 and the table).

Part	What it does
1 Window	Lets you watch the bag inflate with the lid closed.
2 Sample inlet	A short piece of PTFE tubing inside the case. The bag's inlet stem fits onto it.
3 Vacuum port	Pump connection for sampling: the pump evacuates the case and the bag inflates.
4 Purge port	Pump connection to empty the bag before sampling and to purge the sample line.
5 Sample inlet port	¼ in. OD fitting outside the case for the sample line or a gas source. Closed with a red cap plug when not in use.

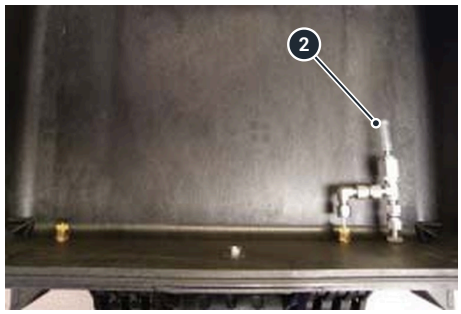


Figure 3. 2 Sample inlet inside the chamber: a short piece of PTFE tubing (number as in Figure 1 and the table).

CHAPTER 3

Operation

Operation runs from preparing the chamber to the filled bag: set the pump's flow rate, fit the bag and, where the method calls for it, purge the bag and the sample line; then take a grab or a timed sample, handle the filled bag, or make a standard gas sample.

Before a sample, set the pump's flow rate, fit a bag on the sample inlet and, where the method calls for it, purge the bag and the sample line. The pump connects to the chamber with the Tygon tubing and quick coupling supplied.

Set the pump flow rate

- A pump of the Universal XR Series must be in high flow mode; its operating instructions show how to switch.
- If the pump has been moved between very different temperatures, let it adjust to the new temperature before you sample.

Choose a flow rate that fills the bag in the time you want to sample (see Timed sampling (p. 11)); the pump's operating instructions describe how to set it. If the analytical method prescribes a flow rate, calibrate the pump to it:

1. Let the pump run for 5 minutes.
2. Connect the pump inlet to the outlet (suction) port of a flow calibrator with flexible tubing.
3. Calibrate the pump to the flow rate the method specifies, as the operating instructions of the pump and the calibrator describe.

Install the sample bag

1. Open the chamber. Push the inlet stem of the bag fitting onto the sample inlet inside the case, the short piece of PTFE tubing (2 in Figure 3 (p. 7)).

   > **Note**
   > **Do not turn the side stem.** Turn only the upper part of the fitting.

2. Open the bag valve: turn the whole upper part of the fitting, septum body and cap together, one full turn counterclockwise (Figure 4 (p. 8)).

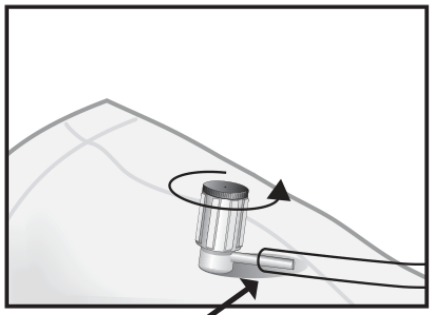


Figure 4. Opening the bag valve. Turn the upper part; the arrow marks the side stem, which stays still.

Purge the sample bag

Purging flushes the bag with clean gas before sampling: you fill it and empty it again, three times or more. You need a cylinder of 99.99 % nitrogen or purified air with a regulator for about 500 mL/min (see Sampling accessories (p. 14)).

⚠ CAUTION

The pump exhausts the air from the bag being purged, and with it the sample gas. Breathing the exhaust can harm your health. Lead the exhaust to a safe place and do not breathe it.

1. Check that the bag is installed and open on the sample inlet (see Install the sample bag (p. 8)).
2. Outside the chamber, connect the nitrogen or purified-air source to the sample inlet port, the ¼ in. OD fitting (5 in Figure 1 (p. 7)). If you wish, put a charcoal filter between the cylinder and the bag.
3. Push the quick coupling of the supplied Tygon tubing into the purge port (4 in Figure 1 (p. 7)), and push the open end of the tubing firmly onto the pump inlet.

   Note
   A pump with flow-fault detection may go into flow fault while it empties the bag. If it does not restart by itself, see the flow-fault section of the pump's operating instructions.

4. Switch the pump on and let it run until the bag is completely empty.
5. Switch the pump off and release the quick coupling from the purge port (Figure 5 (p. 9)): on the Large Vac-U-Chamber, grip the release ring and push it towards the chamber; on the Small Vac-U-Chamber, press the release tab down.



Figure 5a. Large Vac-U-Chamber: push the release ring towards the chamber.



Figure 5b. Small Vac-U-Chamber: press the release tab down.

NOTICE

Do not overfill. An overfilled bag can burst, and the sample is then lost. Watch the bag through the window in the lid and stop before it is more than 80 % full (see How full to fill the bag (p. 11)).

6. Open the valve on the regulator. The gas flows into the bag at about 500 mL/min: a 1 L bag takes about 2 minutes, an 8 L bag about 16 minutes.
7. Close the valve on the regulator.
8. Empty the bag: with the sample inlet port closed — the regulator valve shut, or the gas line removed and the red cap fitted — push the quick coupling into the purge port again, push the tubing onto the pump inlet and run the pump until the bag is completely empty.
9. Repeat steps 3 to 8 at least twice more before you sample. Then purge the sample line if you wish.

Purge the sample line

1. Remove the red cap from the sample inlet port (5 in Figure 1 (p. 7)). Push one end of a long piece of PTFE tubing, the sample line, onto the port and connect its other end to a source of clean air.
2. Push the quick coupling of the supplied Tygon tubing into the purge port and the open end of the tubing firmly onto the pump inlet.
3. Run the pump long enough to flush the line. Repeat as often as you need.
4. Switch the pump off and release the quick coupling from the purge port (Figure 5 (p. 9)).

Sampling

A grab sample fills the bag in one go while you watch; a timed sample fills it at a set flow rate over the time the analytical method specifies. Both start with the same set-up.

Set up the chamber

> **Note**
> Make sure the red cap plug is off the sample inlet port, so that the sample can flow in.



Figure 6. Tygon tubing connected to the vacuum port.

1. Install the bag and open its valve (see Install the sample bag (p. 8)).
2. Purge the bag, the sample line or both if the method requires it (see Purge the sample bag (p. 8)).
3. Outside the chamber, push the quick coupling of the supplied Tygon tubing into the vacuum port (Figure 6 (p. 10)) and the open end of the tubing firmly onto the pump inlet.
4. Close the chamber and fasten both latches.

Grab sampling

> **NOTICE**
>
> **Do not overinflate the bag.** An overfilled bag can burst, and the sample is then lost. Never fill the bag to more than 80 % of its maximum volume. See How full to fill the bag (p. 11).

1. Switch the pump on and watch the bag inflate through the window in the lid. Run the pump until the bag is about 80 % full.
2. When the sample is taken, switch the pump off. Disconnect the pump to release the vacuum and open the chamber at once.
3. Close the bag valve: turn the whole upper part of the fitting, septum body and cap together, one full turn clockwise.
4. Pull the bag fitting off the sample inlet.

Timed sampling

The chamber is not a perfect vacuum, but it leaks so little that it collects the sample efficiently even at low flow rates: a full 8-hour sample at 10 mL/min is possible. As a guide to filling times, a vacuum source at about 1 L/min puts 1 L of sample into a 1 L bag in about 1 minute; other flow rates scale accordingly.

1. Set the pump, and calibrate it if required, to a flow rate that collects enough sample in the time the analytical method specifies (see Set the pump flow rate (p. 8)).
2. Switch the pump on and note the start time. Sample for the time the method specifies, without overinflating the bag.
3. Switch the pump off and note the stop time. Disconnect the pump to release the vacuum and open the chamber at once.
4. Close the bag valve: turn the whole upper part of the fitting one full turn clockwise.
5. Pull the bag fitting off the sample inlet.

How full to fill the bag

Fill a bag to no more than 80 % of its maximum volume. A correctly filled bag lies flat like a cushion, with its edges still spread out. An overfilled bag balloons and pulls its edges in.

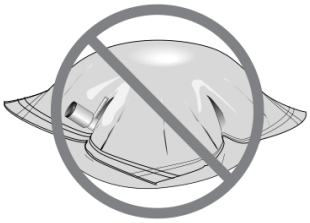


Figure 7a. Wrong: bag overinflated.

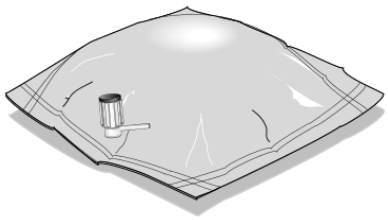


Figure 7b. Right: bag filled to at most 80 %.

After sampling

⚠ CAUTION

When you empty a bag, the pump exhaust carries the rest of the sample. Breathing the exhaust can harm your health. Lead the pump exhaust to a safe place and do not breathe it.

- Keep filled bags out of direct sunlight.
- Pack bags loosely and with padding for shipment, so that they are not punctured.
- If part of a sample was drawn off into an instrument, such as a gas chromatograph, or into a colorimetric detector tube, empty the rest of the bag before you dispose of it: fit it in the chamber and run the pump on the purge port (see Purge the sample bag (p. 8), step 8).

NOTICE

No unpressurised air freight. Filled bags in an unpressurised cargo hold meet a large drop in air pressure. The drop can burst them. Ship bags by air only in a pressurised cargo hold.

Making standard gas samples

The chamber also meters an exact volume of clean gas into a bag, to which you then add a known amount of the compound. Install a bag and open its valve first (see Install the sample bag (p. 8)).

1. Connect a source of 99.99 % nitrogen or purified air to the sample inlet port (5 in Figure 1 (p. 7)).
2. Meter an exact volume of the gas into the bag. At 500 mL/min, 120 seconds give 1 L.
3. Close the bag valve and take the bag out of the chamber.
4. Inject the required amount of the compound through the septum of the fitting. Example: 1 µl of vinyl chloride in a bag holding 1 L of nitrogen gives a standard of 1 ppm vinyl chloride.
5. Knead the bag to mix the contents.

CHAPTER 4

Specifications

Sampling media	1 L bag (Small) or 8 L bag (Large)
Sampling rate	Selected by the user
Sample time	Depends on the method; never fill the bag to more than 80 % of its maximum volume
Sample pump	SKC AirChek TOUCH, AirChek XR5000 or Universal XR, 1–5 L/min
Analysis	Depends on the method

CHAPTER 5

Ordering information

Order from Analyt-MTC with the order codes.

Models

Description	Order code
Small Vac-U-Chamber for 1 L bags, polypropylene fittings; ¼ in. ID Tygon tubing with polypropylene quick coupling	231-940
Large Vac-U-Chamber for 8 L bags, stainless steel fittings; ¼ in. ID Tygon tubing with stainless steel quick coupling	231-939

Accessories and spare parts

Sampling accessories

Description	Order code
PTFE tubing for the sample line, ¼ in. ID (5/16 in. OD), 50 ft	231-924
PTFE tubing for the sample line, ¼ in. ID (5/16 in. OD), 10 ft	231-937
Nitrogen cylinder, 103 L, 99.99 % pure; needs the regulator below	804-9B0994
Regulator for the nitrogen cylinder, 500 mL/min; needs the cylinder above	804-R713050
Charcoal tubes, pack of 50	226-09-50_
Telescoping sample probe, stainless steel, 16 in.–6 ft 5 in.	805-10545
Telescoping sample probe, stainless steel, 14.5 in.–4 ft 5 in.	805-10546
Digital stopwatch	303-01-1

Quick couplings

Description	Order code
Quick coupling male insert, stainless steel, on 3 ft Tygon tubing, for the Large Vac-U-Chamber	P231941
Quick coupling male insert, polypropylene, on 3 ft Tygon tubing, for the Small Vac-U-Chamber	P231941M
Quick coupling female connector, polypropylene, for the Small Vac-U-Chamber	P231942
Quick coupling female connector, stainless steel, for the Large Vac-U-Chamber	Ask Analyt-MTC

Sample bags and septa

Description	Volume	Order code
Tedlar bag, dual stainless steel fitting	1 L	231-01
Tedlar bag, single polypropylene fitting	1 L	232-01
Tedlar bag, single polypropylene fitting	8 L	232-939
Standard FlexFoil bag, single polypropylene fitting	1 L	262-01
Standard FlexFoil bag, single polypropylene fitting	8 L	262-08
FlexFoil PLUS bag, single polypropylene fitting	1 L	252-01
FlexFoil PLUS bag, single polypropylene fitting	8 L	252-08
SamplePRO FlexFilm bag, single polypropylene fitting	1 L	Ask Analyt-MTC
SamplePRO FlexFilm bag, single polypropylene fitting	8 L	Ask Analyt-MTC

Replacement septa	Order code
Septa for dual stainless steel fittings	231-9-04
Septa for single polypropylene fittings	232-01-RS

CHAPTER 6

Service, warranty and contacts

Analyt-MTC is your contact for technical questions, accessories, spare parts and warranty matters. Warranty follows Analyt-MTC's terms of sale.

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www.analyt-mtc.com

Before you contact Analyt-MTC

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

- the catalogue number of the chamber, 231-939 or 231-940;
- the sample pump and sample bags you use;
- the method you sample to and what happened.

Disposal

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

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Sales, service and calibration

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