

INSTRUCTIONS FOR USE

GASTEC CG-1 Compressed Breathing Air Measurement Kit

Step-by-step testing of compressed breathing air for carbon monoxide, carbon dioxide, water vapour and oil mist with the GASTEC CG-1 kit, and with single GASTEC Airtec tubes.

AMTC-IN-0068

Rev. 2 · October 2026

About this document

These instructions take you step by step through a test of compressed breathing air with GASTEC Airtec detector tubes. Read them completely before you start. They cover two set-ups:

- the **GASTEC CG-1 compressed breathing air measurement kit**, which measures carbon monoxide, carbon dioxide, water vapour and oil mist at the same time, without electricity or any other power source (Product and supplied items (p. 6), Before use (p. 7) and Procedure (p. 9));
- a **single Airtec tube** on a pressure reducer with a flowmeter, for any one of the Airtec tubes, including the nitrogen oxides tube (Measuring with a single Airtec tube (p. 10)).

Both work on air from a cylinder, a compressor or an air line. Breathing air for self-contained breathing apparatus and other respiratory protective equipment needs particular care: contaminants drawn into a compressor, or produced by it, can harm the wearer and damage the equipment.

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

⚠ 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

Title	GASTEC CG-1 Compressed Breathing Air Measurement Kit — Instructions for use
Document number	AMTC-IN-0068
Revision	Rev. 2 — October 2026
Applies to	GASTEC CG-1 compressed breathing air measurement kit with measuring device 370; GASTEC Airtec tubes No. 1A, 2A, 2Ag, 6AH, 6A, 6Ag, 11A, 109AD and 109A
Language	English
Manufacturer	GASTEC Corporation

Revision history

Rev.	Date	Change
2	October 2026	Quality programme: new document type, number and identity pages. Rebuilt on GASTEC's current instructions for tubes No. 1A, 2A, 6A and 109AD: new Safety, After use and Specifications chapters, the correction factor 0.5 for the lower oil mist range, the flow rate tolerances and the reading corrections.
1	October 2026	First issue.

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CHAPTER 1

Safety

Read these instructions and the instructions supplied with each Airtec tube before you measure. The caution below protects you from injury; the notice and the note keep the result reliable.

Handling detector tubes

⚠ CAUTION

Protect your eyes and hands from broken glass. Detector tubes are glass, and you break off their tips to open them. If you do not take care, you may be injured. Keep the tube away from your eyes while you break off its tips. Do not touch broken tubes, glass fragments or the tube reagent with bare hands.

Conditions of use

NOTICE

Outside its conditions of use, or after the validity date printed on its box, a tube does not give a reliable result. Use tubes No. 1A, 2A, 6A and 109AD at 0–40 °C (32–104 °F), and tubes No. 1A and 2A at 0–90 % relative humidity. Use each tube before the validity date on its box.

Note

Store the tubes in a cool, dark place. The shelf life and the storage condition of each tube are marked on the label of its box.

CHAPTER 2

Product and supplied items

The CG-1 kit checks compressed breathing air for four contaminants in one run. The measuring device connects to the pressure reducer on the air source and holds one Airtec tube per contaminant, each in its own rubber shroud.

What is in the kit

Item	Model	Qty
Measuring device	370	1
Rubber shrouds, pack of 4	CG1-02	1
Carbon monoxide Airtec tube	No. 1A	1
Carbon dioxide Airtec tube	No. 2A	1
Water vapour Airtec tube	No. 6A	1
Oil mist Airtec tube	No. 109AD	1
Stopwatch	CG1-04	1
Tube tip holder	722	1
Carrying case	CG1-03	1
Deep socket	CG1-05	1
Instruction manual	CG1-09	1



Figure 2-1. The CG-1 kit with its carrying case.

Check the delivery against the list.



Figure 2-2. The measuring device with its four tubes on a pressure reducer, which is connected to a cylinder or compressor.

CHAPTER 3

Before use

A CG-1 test has five stages: check the connection for leaks, fit the rubber shrouds, purge the supply line, insert the tubes and start, then stop and read.

Airtec tubes for the CG-1

In the CG-1 kit each tube runs at the flow rate and for the sampling time below. A single tube on a flowmeter runs under other conditions (see Airtec tubes and sampling conditions (p. 11)).

Contaminant	Tube No.	Measuring range	Flow rate mL/min	Sampling time, min	Colour change	Shelf life months
Carbon monoxide, CO	1A	5–50 ppm	100	5	yellow → blackish brown	36
Carbon dioxide, CO_2	2A	250–3000 ppm	190	5	yellowish orange → yellow	36
Water vapour, H_2O	6A	10–80 mg/m³	120	5	yellow → green	36
Oil mist	109AD	0.2–5.0 mg/m³	3000	10	pale vermilion → pale blue	24
		0.1–0.2 mg/m³	3000	20		

Colour change: colour of the unused tube → colour of the stained layer. The 20-minute oil mist run is the one for 0.1–0.2 mg/m³; multiply its reading by the correction factor 0.5 (see Correcting the reading (p. 10)). Make sure that the measuring device is preset to these flow rates: ±10 mL/min for No. 1A, 2A and 6A, ±250 mL/min for No. 109AD.

Store the tubes in a cool, dark place. The storage condition of each tube is marked on the label of its box.

Stage 1 — Check for leaks

1. Connect the measuring device fully to the pressure reducer on the air source, until it locks, **without fitting the rubber shrouds yet**.
2. Open the compressed air supply slowly and wait 1 minute.
3. Close the compressed air supply completely and wait 6 minutes.
4. Confirm on the pressure gauge that the pressure drop is less than 5 %.

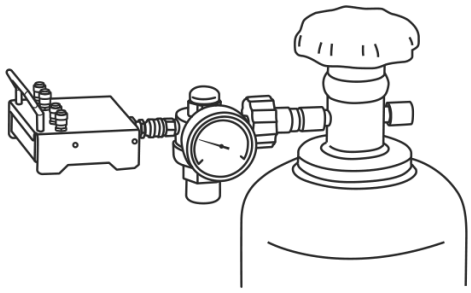


Figure 3-1. Leak check: measuring device on the pressure reducer, no shrouds fitted.

Stage 2 — Fit the rubber shrouds

1. Keep the main valve of the air source closed.
2. Connect each of the four rubber shrouds fully to the measuring device, until it locks.

> **Note**
> Air escapes from the measuring device while the shrouds are connected.

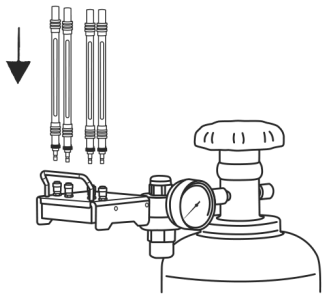


Figure 3-2. Connecting the four rubber shrouds.

Stage 3 — Purge the supply line

1. Open the compressed air supply valve slowly. Compressed air flows out through the shrouds and cleans the air supply system.
2. After 5 minutes, close the valve.

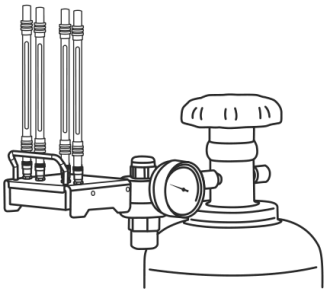


Figure 3-3. Purging through the fitted shrouds.

CHAPTER 4

Procedure

Stage 4 — Insert the tubes and start

1. Take one fresh Airtec tube each of No. 1A, 2A, 6A and 109AD.

> **⚠ CAUTION**
>
> **Protect your eyes and hands from broken glass.** Detector tubes are glass, and you break off their tips to open them. If you do not take care, you may be injured. Keep the tube away from your eyes while you break off its tips. Do not touch broken tubes, glass fragments or the tube reagent with bare hands.

2. Break off both tips of each tube with the tube tip holder: put the tip into the opening of the holder, turn the tube, then bend it to snap the tip off.
3. Insert each tube into the rubber shroud that the markings on the measuring device assign to it. Both ends of every tube must be covered firmly by the shroud.
4. Open the valve of the compressed air source to start the measurement, and start the stopwatch at the same moment.

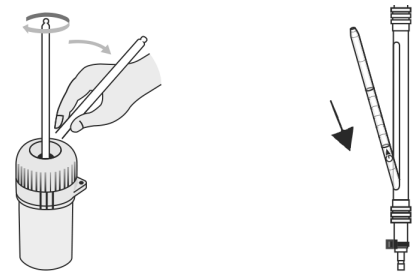


Figure 4-1. Left: breaking a tip with the tube tip holder. Right: inserting a tube into its shroud.

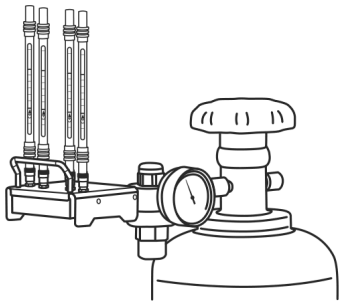


Figure 4-2. Starting the measurement: the tubes sit in their shrouds on the measuring device and the valve of the air source is opened.

Stage 5 — Stop and read

1. After 5 minutes, disconnect the three shrouds holding tubes No. 1A, 2A and 6A from the measuring device.
2. After 10 minutes, or after 20 minutes to measure the lower oil mist range, 0.1–0.2 mg/m³, disconnect the shroud holding tube No. 109AD.
3. Close the compressed air supply.
4. Take the tubes out of the shrouds and read each tube at once (see Reading the result (p. 10)).

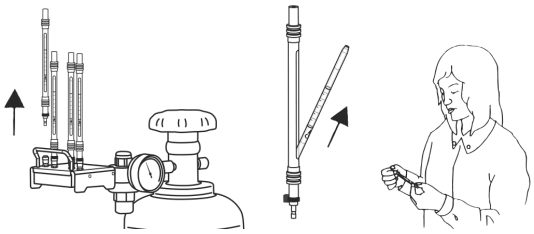


Figure 4-3. Left: disconnecting a shroud from the measuring device. Right: reading a tube.

Reading the result

Airtec tubes are direct-reading: the contaminant stains a layer of the tube filling, and the concentration is read off the scale printed on the tube. Note where the stain stops and read the scale value there, in the unit of the tube (ppm or mg/m³). The colour of an unused tube and of the stain are listed in Airtec tubes for the CG-1 (p. 7).

Tube No. 6A may turn purple at higher concentrations, and below 20 mg/m³ its stain can be pale. Above an absolute humidity of 3 mg/L the reagent of No. 109AD turns yellow; this does not affect the reading.

> **Note**
> **Read immediately.** Read each tube as soon as its sampling time is over and it is out of the shroud. Use only tubes within their shelf life (36 months for No. 1A, 2A and 6A, 24 months for No. 109AD).

Correcting the reading

Tubes No. 1A, 2A, 6A and 109AD need no temperature correction, and No. 1A, 2A and 109AD no humidity correction. Correct the reading where one of these cases applies:

- **Oil mist, lower range.** After the 20-minute run in the CG-1 kit, or the 40-minute run of a single tube, multiply the reading of No. 109AD by the correction factor 0.5.
- **Sample volume, single tube.** If the volume drawn through the tube differs from its sample volume (Specifications (p. 14)), the concentration is the reading × the sample volume ÷ the volume drawn, in mL. Use this result as a guide value only. For No. 109AD, apply the correction factor first.
- **Atmospheric pressure.** Multiply the reading by 1013 hPa and divide it by the atmospheric pressure in hPa. For No. 109AD, do this after the other corrections.

For the other Airtec tubes, follow the instructions supplied with the tube.

Measuring with a single Airtec tube

Any Airtec tube can also be used on its own, on a pressure reducer with a pressure gauge and a flowmeter. This set-up covers nitrogen oxides and the alternative carbon dioxide and water vapour tubes, which the CG-1 kit does not hold. The example below tests air from a cylinder.

Airtec tubes and sampling conditions

Tube No.	Measuring range	Flow rate mL/min	Sampling time, min	Colour change	Shelf life months
CARBON MONOXIDE, CO					
1A	5–50 ppm	100	3	yellow → blackish brown	36
CARBON DIOXIDE, CO_2					
2A	250–3000 ppm	100	5	yellowish orange → yellow	36
2Ag	200–3000 ppm	100	1.5	pale blue → purple	36
WATER VAPOUR, H_2O					
6AH	500–5000 ppm	300	1	green → purple	36
6A	10–80 mg/m³	100	5	yellow → green	36
6Ag	150–3000 mg/m³	300	1	green → purple	36
NITROGEN OXIDES, NO + NO_2					
11A	0.06–2 ppm	100	2	white → bluish green	36
	0.02–0.7 ppm	100	5		
OIL MIST					
109AD	0.2–5.0 mg/m³	1000	20	pale vermilion → pale blue	24
	0.1–0.2 mg/m³	1000	40		
109A	0.3–1.5 mg/m³	1000	60	white → greenish brown	30

Each tube is named after its contaminant, for example "Carbon monoxide Airtec tube" for No. 1A. Colour change: colour of the unused tube → colour of the stained layer. The optional flowmeters GST_CG1-18 have full scales of 200 mL/min and 5 L/min.

Procedure

> **Note**
> **Read immediately, use fresh tubes.** Read the tube as soon as the sampling time is over. Use a fresh tube for every measurement, and only within its shelf life.

1. Fit a pressure reducer with a pressure gauge and a flowmeter to the cylinder, compressor or air line.
2. Set the flowmeter to the flow rate of the tube you use (table above).

> **⚠ CAUTION**
> **Protect your eyes and hands from broken glass.** Detector tubes are glass, and you break off their tips to open them. If you do not take care, you may be injured. Keep the tube away from your eyes while you break off its tips. Do not touch broken tubes, glass fragments or the tube reagent with bare hands.

3. Take a fresh tube and break off both tips with the tube tip breaker.
4. Insert the tube into the rubber tube holder.
5. Attach the tube holder to the outlet of the flowmeter, with the arrow on the tube pointing down.
6. Open the cylinder valve or start the compressor.
7. Check that the flowmeter shows the flow rate of the tube.
8. Time the sampling with a stopwatch.
9. To measure below 0.2 mg/m³ with No. 109AD, sample for another 20 minutes, 40 minutes in total.
10. As soon as the sampling time is over, close the cylinder valve or stop the compressor.
11. Take the tube out of the holder and read it at once: note where the stain stops and read the scale value there.

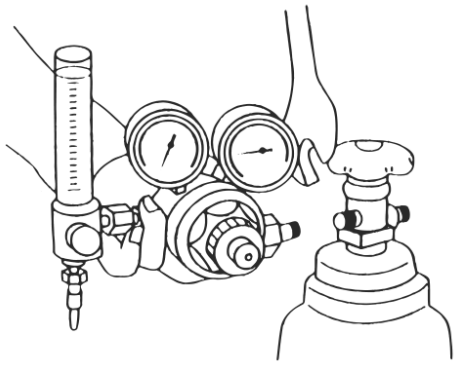


Figure 4-4. Step 1: pressure reducer with gauge and flowmeter on a cylinder.

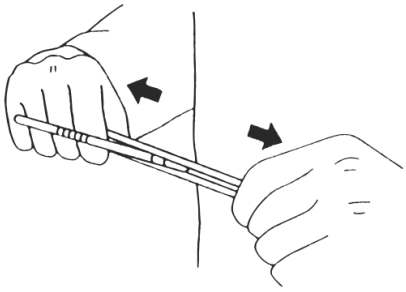


Figure 4-5. Step 3: breaking the tube tips.

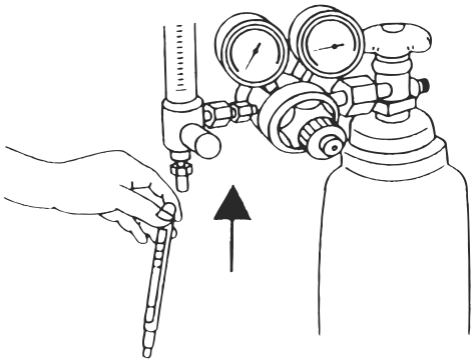


Figure 4-6. Step 5: pushing the tube holder onto the flowmeter outlet, tube arrow pointing down.

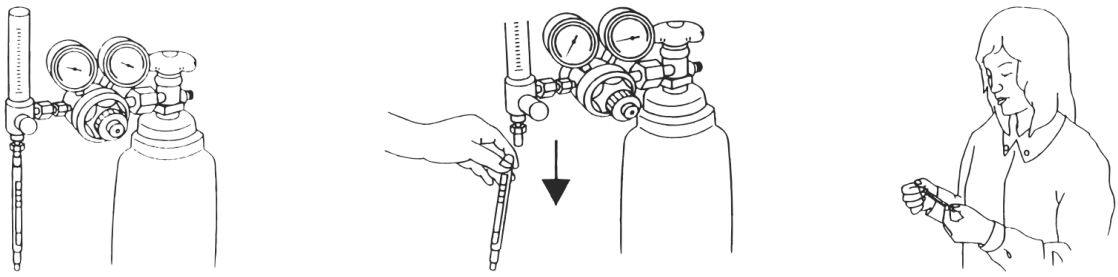


Figure 4-7. Steps 7, 8 and 11: checking the flow, timing the sampling, reading the tube.

CHAPTER 5

After use and sample handling

Disposing of the tubes

Each tube is read at once at the end of its run (Reading the result (p. 10)); no sample is kept. Dispose of Airtec tubes, used or unused, according to local regulations. The reagent of tube No. 109AD contains a small amount of hexavalent chromium; the reagents of No. 1A, 2A and 6A contain no toxic substances.

Disposal

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

CHAPTER 6

Specifications

Data of the four Airtec tubes of the CG-1 kit, for a single tube on a flowmeter. The flow rates and sampling times in the kit are in Airtec tubes for the CG-1 (p. 7), those of a single tube in Airtec tubes and sampling conditions (p. 11).

Tube No.	1A	2A	6A	109AD
Contaminant	Carbon monoxide, CO	Carbon dioxide, CO_2	Water vapour, H_2O	Oil mist (mineral oils)
Measuring range	5–50 ppm	250–3000 ppm	10–80 mg/m³	0.2–5.0 mg/m³; 0.1–0.2 mg/m³
Sample volume	300 mL	500 mL	500 mL	20 000 mL; 40 000 mL for 0.1–0.2 mg/m³
Correction factor	1	1	1	1; 0.5 for 0.1–0.2 mg/m³
Relative standard deviation	10 % (5–10 ppm), 5 % (10–50 ppm)	10 % (250–1000 ppm), 5 % (1000–3000 ppm)	5 % (20–80 mg/m³)	15 % (0.2–1.0 mg/m³), 10 % (1.0–5.0 mg/m³)
Temperature range of use	0–40 °C (32–104 °F)	0–40 °C (32–104 °F)	0–40 °C (32–104 °F)	0–40 °C (32–104 °F)
Relative humidity range of use	0–90 %	0–90 %	—	—
Colour change	yellow → blackish brown	yellowish orange → yellow	yellow → green; purple at higher concentrations	pale vermilion → pale blue
Reaction principle	$CO + Na_2Pd(SO_3)_2 \rightarrow Pd + CO_2 + SO_2 + Na_2SO_3$	$CO_2 + 2KOH \rightarrow K_2CO_3 + H_2O$	$H_2O + Mg(ClO_4)_2 \rightarrow Mg(ClO_4)_2 \cdot H_2O$	oil mist + $Cr^{6+} \rightarrow Cr^{3+}$
Threshold limit value, time-weighted average (TLV-TWA), ACGIH 2016	25 ppm	5000 ppm	—	—
Explosive range	12.5–74 %	—	—	—

The data are those of the tubes' own instructions. Because GASTEC improves its products continuously, the data may change without notice.

CHAPTER 7

Ordering information

Order from Analyt-MTC with the order codes.

The kit

Item	Order code
GASTEC CG-1 compressed breathing air measurement kit, complete	GST_CG-1

What else you need

The measuring device connects to a **pressure reducer with a pressure gauge** on the air source; the gauge is needed for the leak check. The pressure reducer is not part of the kit. GASTEC offers a dedicated one, and adapters for the common cylinder valve connections. The carrying case has room for the optional pressure reducer, the flowmeters and one adapter.

Optional accessory	Order code
Pressure reducer; inlet ISO 12209 male, outlet 21KAAK13MPN	GST_CG1-10
Flowmeters, full scale 200 mL/min and 5 L/min, with rubber tubing (for single-tube tests)	GST_CG1-18
Adapter ISO 12209 female × ISO 12209 female, for 232 bar	CG1-11
Adapter ISO 12209 female × ISO 12209 female, for 300 bar	CG1-12
Adapter CGA 347 female × ISO 12209 female	CG1-14
Adapter CGA 347 male × ISO 12209 female	CG1-15
Adapter CGA 346 female × ISO 12209 female	CG1-16
Adapter CGA 346 male × ISO 12209 female	CG1-17

CHAPTER 8

Service and contacts

The GASTEC CG-1 compressed breathing air measurement kit and the Airtec tubes are made by GASTEC. Analyt-MTC is your contact for them.

Contact and support

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Ordering

Analyt-MTC supplies GASTEC Airtec tubes and CG-1 kits. Contact Analyt-MTC for these and for the optional accessories.

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