GASTEC

Gastec Detector Tube Systems

Gas Sampling Pump

GV-100S

Gas Sampling Pump with a counter

GV-110S

This manual is translated into five languages.
English/Spanish/French/German/Italian

Instruction Manual

English

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IMPORTANT!

- Read this manual before using the products. Observe special information marked with warning symbols ⚠CAUTION and △NOTE for safe and accurate measurements.
- Always keep this manual handy for easy reference.

1 Introduction

This manual explains how to use the Model GV-100S Gas Sampling Pump or the Model GV-110S Gas Sampling Pump with a counter. This manual contains important notes for assuring proper and safe operation of those products. Be sure to carefully read and make yourself fully familiar with the contents.

- In this manual, "sampling pump" means "gas sampling pump" and "detector tube" means "gas detector tube".
- Figures and illustrations in this manual may not be the same as the actual devices in appearances, sizes, positions, or colours.

2 For Safe Operations

This manual uses symbols and pictograms defined below to assure proper and safe operation of the products.

Definitions of symbols	
⚠CAUTION	If not observed, injuries to the operator or damages to the product may result.
△NOTE	Operational tips for proper use of the product to prevent functional failures.

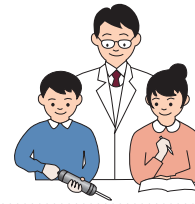
Definitions of pictograms	
	General cautions.
	Any actions that are forbidden.
	The sample at left means "Do not touch."
	General instructions.
	Explanations or cautions about the operation of the Model GV-110 Gas Sampling Pump with a counter.

⚠CAUTION

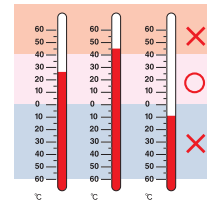
Detector tubes are made of glass and may break. We recommend wearing protective goggles and protective gloves to prevent injuries.



Keep detector tubes out of the reach of children. If they are used in schools, teachers or parents should be responsible for safe operation.

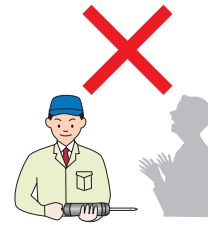


Use sampling pumps only in temperatures ranging from 0° to 40°C (32° to 104°F). Use detector tubes only in the temperature ranges as indicated in the manual for the respective tube. Using the sampling pumps and detector tubers outside their respective operating temperature ranges may cause the pumps to leak or result in erroneous measurements.

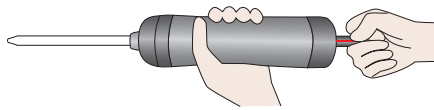


Operating temperature range of the sampling pump

Do not direct the tip of a detector tube toward a person when it is attached to a sampling pump (when inspecting for air-tightness or during measurement). Otherwise you may injure the person with the tube end.



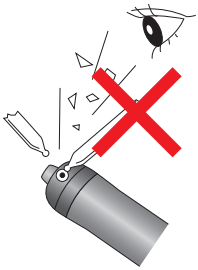
When using a sampling tube, be sure to hold the cylinder and the handle, not just the shaft. If the handle lock is released when inspecting air-tightness or when sampling a specimen gas, the handle may suddenly snap to its original position, pinching or injuring your fingers.



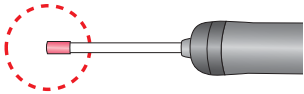
When breaking off the tip of a detector tube, never strongly grasp the tube. Otherwise the detector tube may break and you may injure yourself.



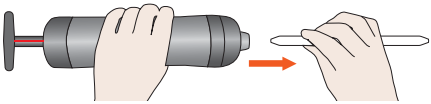
To prevent broken pieces of glass or detecting reagents from injuring your eyes, be sure to keep the detector tube away from your eyes when breaking off its tip. If you do get a piece of glass or detecting reagent in your eyes, do not rub your eyes with your hands. Immediately rinse your eyes with plenty of water and see a doctor.



The ends of the detector tubes with their tips snapped off may cause injuries. We strongly recommend covering the ends with rubber caps (optional).

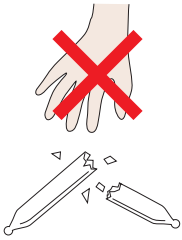


When removing the detector tube from the sampling pump, hold the tube firmly at a point close to the attachment and pull it straight out. Never bend the tube or strongly grasp it. Otherwise you may break the tube and injure yourself.



Do not touch

If you break the detector tube, do not pick up the broken pieces of the detector tube or touch the detecting reagent(s) with your bare hands. Otherwise you may injure yourself. If detecting reagent(s) comes in contact with the skin, immediately rinse the area with water. Sweep away any broken pieces of glass or detecting regent(s). Then wipe the swept area with a damp cloth.

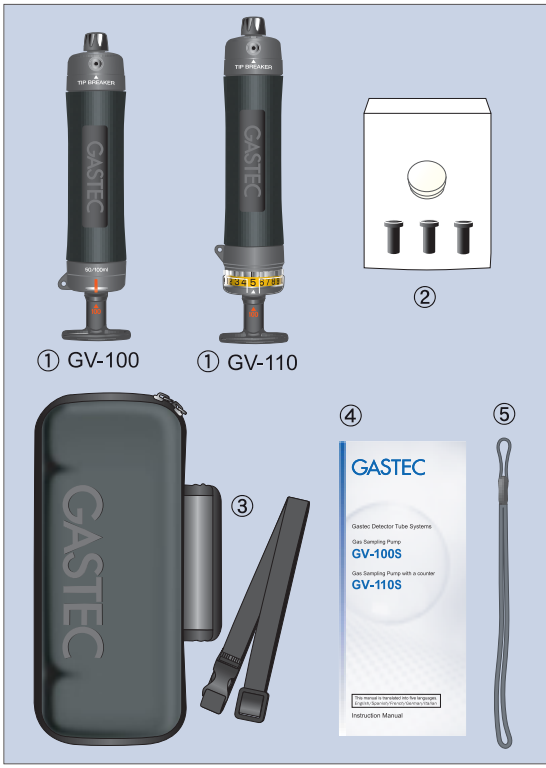


3 Check the included items

The set contains the following items.
Make sure that all of these items are included.

	Item	Model		Qty
		GV-100S	GV-110S	
①	Gas sampling pump	GV-100	GV-110	1
②	Accessory set [Lubricant x 1 rubber inlets x 3]	GV100-1		1 set
③	Carrying case [Case belt x 1]	GV110-31		1
④	Operation manual	GV110-91		1
⑤	Strap			1

※ Detector tubes are sold separately.
※ The case belt can be attached to the handle of the case and its length can be extended. You can then suspend the case from your shoulder like a shoulder bag.



4 What is the gas detector tube system?

The Gastec standard detector tube system mainly consists of the model GV-100/GV-110 gas sampling pump and Gastec standard detector tubes. Several hundred types of detector tubes are available to support different gas/vapour types or concentration ranges. Select the appropriate tube based on specific usage conditions and a gas whose concentration you want to measure.

Gastec standard detector tubes are thin glass tubes with calibration scales printed by which you can directly read concentrations of the substances (gases and vapours) to be measured. Each tube contains detecting reagent(s) that are especially sensitive to the target substance and quickly produce a distinct layer of colour change. To assure a high precision indication, Gastec detector tube's inner diameters are tightly controlled and detecting reagents with long term stability are strictly selected. All detector tubes undergo stringent quality control. Individual production lots are tested and calibrated independently of each other to ensure the highest calibration accuracy for each lot. Each detector tube has its quality control number printed on it.

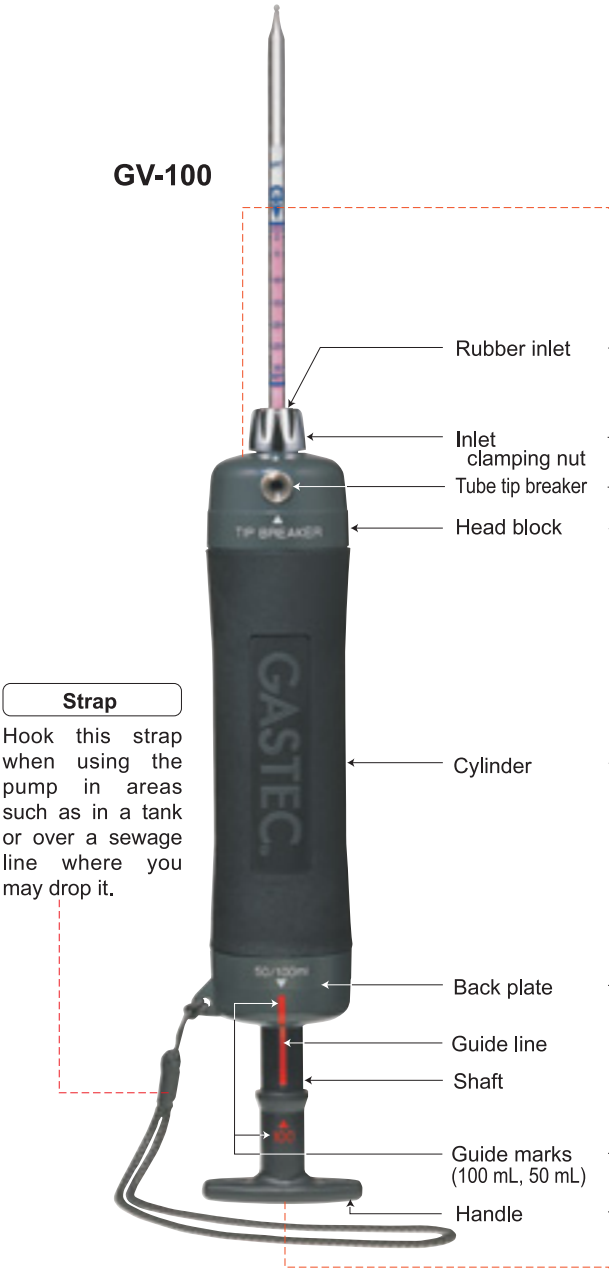
The Model GV-100 /GV-110 Gas Sampling Pump can precisely collect a sample volume for a detector tube. The full-stroke (100mL) and the half stroke (50 mL) positions are marked exactly by the red line on the pump shaft, and the handle is precisely locked at those positions. If you pump fully n times by allowing for sampling time intervals, a volume of 100 mL x n can be sampled. Each detector tube is calibrated based upon a prescribed (standard) volume of sample. Also the pump piston has been designated with a smaller diameter so that the handle can be pulled out with even less effort. Gastec piston sampling pump design proves you with advanced non sparking design and superior features.

※Note that the following conditions apply to the detector tubes listed below.

- The Pyrotubes require an optional Pyrotec.
- Long-term detector tubes, Passive dosi-tubes and Airtec tubes do not require sampling pumps.
- Odorant detector tubes use a special gas sampling pump.
- Injection type detector tubes use a special syringe.
- Detector tubes for school education (air flow: 50 mL) use special sampling pumps (internal volume: 50 mL) for school education.
- Liquid detector tubes (for water quality or waste water) do not require sampling pumps.
- Electric sampling detector tubes use an automatic gas sampling pump (GSP series).

5 Names and functions of parts

● Gas Sampling Pump



Strap

Hook this strap when using the pump in areas such as in a tank or over a sewage line where you may drop it.

GV-110



Dust cap (back side)

Remove this rubber cap to clean out broken pieces of glass.



Counter

For detailed operation procedures, see section 6-4, "How to use the counter" on page 16.



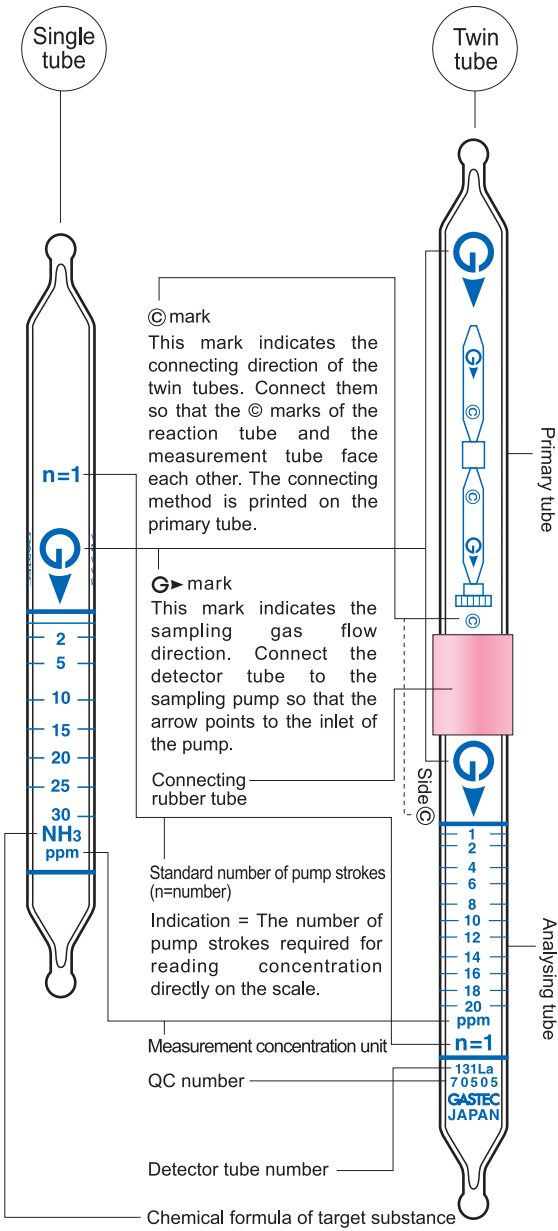
Flow finish indicator

After you have completed sampling, this white indicator will appear telling you that you have finished the sampling.



● Detector tube

Detector tubes consist of a single tube type that use a measurement tube and a twin tube type that connects a primary tube and an analysing tube with an attached rubber tube. Examples of each of them, the No. 3L (single tube) and the No. 131La (twin tube) are shown below.

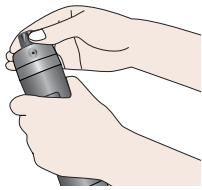


6 Operating procedures

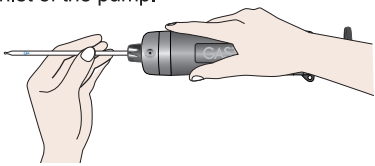
❶ Inspecting the air-tightness of the sampling pump

△NOTE When there is a leak in the sampling pump, you cannot obtain the correct measurement values, e.g. measured values may be lower than the actual values. Be sure to check the sampling pump for air-tightness before doing any measurements. Also, check the operation of the flow finish indicator at this time.

① Confirm that the inlet clamping nut is firmly tightened.

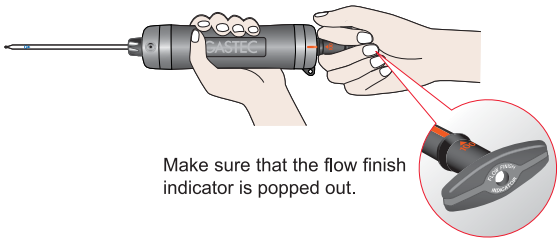


② After confirming that the pump handle is fully in (therefore, the guide line on the pump shaft is not seen), insert a fresh unbroken detector tube into the rubber inlet of the pump.



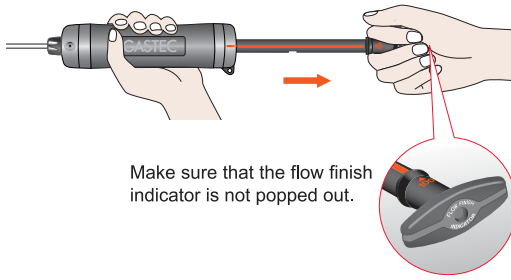
③ Align the guide mark (red line) on the back plate and the guide mark (▲100) on the handle. At this time, make sure that the flow finish indicator is popped out.

When you use the GV-110, align the guide mark with the guide line (red line) below the white △ mark at the counter.



④ Securely hold the cylinder of the sampling pump. Then, pull out the handle fully along the red guide line on the pump shaft to the lock position, and wait 1 minute.
At this time, make sure that the flow finish indicator is not white.

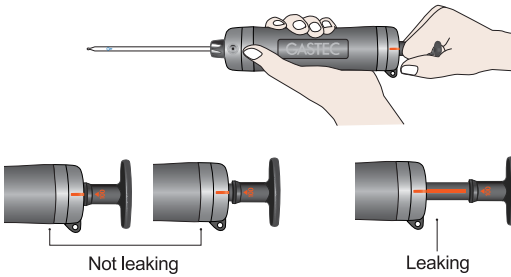
Never hold the counter when using a GV-110. It may hamper proper operation of the counter and may cause a malfunction.



⑤ Unlock the handle by turning it more than 1/4 turn and guide it back gradually. Confirm the handle returns to the initial position and the guide line on the pump shaft is not seen. Also confirm the finish indicator has been popped out again.

When the handle is unlocked, be sure to guide it back gradually by applying a little resistance. Otherwise the handle will spring back due to the vacuum in the pump cylinder and possibly damage internal parts or injure you.

※ If a leak is found, follow the maintenance procedures explained in section "8. Maintenance" (page 20).
※ A functional failure in the finish indicator may lead to a leak. If a failure is found in the indicator, immediately ask your Gastec representative to repair it.



❷ Selecting the detector tube

- Select the Gastec detector tube type most appropriate for your target substance and presumed concentrations.
- Confirm the standard number of pump strokes (n) and the sampling time for the tube, and the connection sequence if a twin tube is selected.
- Check if the detector tube requires correction for temperature, humidity, or atmospheric pressure to the tube reading. If required, read and record the necessary ambient data at the time of measurement. (See "7 How to take readings and calculate the results.")
- Check if any interference gases are present. If they are, measure their concentrations, refer to the detector tube manual and confirm if they will affect the detector tube indication.

△NOTE

- **Be sure to use a detector tube and a sampling pump from the same manufacturer. If you don't, you may end up with erroneous measurements.**

- **Use a detector tube that has been stored under the specified storage conditions and that its "valid until" date has not expired. If the date has expired, the detector tube may produce erroneous readings. You can store in either two places, i.e. in a cool and dark place or in a refrigerator. The temperature of the refrigerator should be between 0° and 10°C (32° and 50°F) or as indicated on the label of the detector tube. A cool and dark place may be a drawer or a locker in a cool room at temperatures ranging between 15° to 25°C (59° to 77°F), free from direct sunshine or fluorescent lights.**

- **When the temperature of the detector tube itself differs from that of the measurement environment, first assimilate the detector tube temperature to the ambient temperature. Otherwise, inaccurate measurement values may result. Particularly leave a detector tube that has been stored in a refrigerator in the measurement place for about 15 minutes to assimilate its temperature to the ambient temperature.**

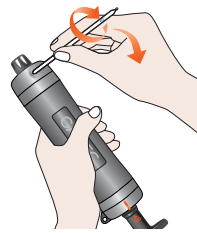
- **Break off both ends of the detector tube immediately before the measurement. Using a detector tube that has been left with its tips broken off may result in erroneous measurement results.**

- **Verify the tube indication immediately after the completion of sampling. Otherwise, the reaction band may extend itself some more or it may lose its colour, resulting in a poor reading.**

- **Each detector tube can only be used once. Measurements with used detector tubes will produce incorrect results even though they did not show any discolouration in the previous measurement.**

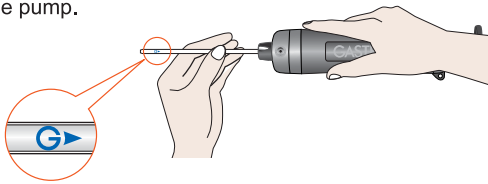
❸ Sampling

① Break off both ends (tips) of the detector tube by using the provided tube tip breaker or the tube tip holder, No. 721 (sold separately). In the case of a twin tube, break off both ends of both tubes and connect the ends of the tubes marked with a © using the rubber connector.



[How to break off the tube tip]
Insert the detector tube end straight into the tube tip breaker, and rotate the tube for one full turn so that the diamond cutter of the tube tip breaker scratches surface of the tube end. Hold the detector tube firmly at a point close to the tube tip breaker and bend the tube toward the handle to break the tube tip.

② Confirm the pump handle is fully pushed in (therefore, the guide line on the pump shaft is not seen). Then insert the detector tube into the rubber inlet of the pump with the arrow (▶) on the tube pointing toward the pump.



③ Align the guide mark (red line) on the back plate and the guide mark (▲100 or ▲50) depending on the handle.

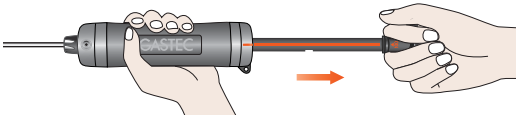
※The guide mark ▲50 means a 1/2 pump stroke (50 mL) while the guide mark ▲100 means a full pump stroke (100 mL). You can confirm the number of pump strokes of a given detector tube by referring to the guide marks on the tube body or by referring to the detector tube's operation manual.



If you need to use the counter with the model GV-110, follow the instructions in section "6-4) How to operate the counter" (page 16).

④ Direct the tube end to the point of measurement and pull out the handle fully (for 100 mL sampling) or halfway (for 50 mL sampling) along the guide line to the lock position.

Do not grasp the counter of the GV-110. Otherwise, the counter will not operate properly and may result in a malfunction.

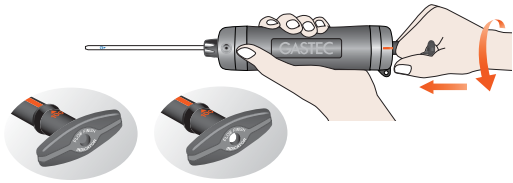


⑤ Wait until the specified sampling time has elapsed. The completion of the sampling of 100 mL or 50 mL can be confirmed by the flow finish indicator on the handle. Unlock the handle by turning it more than 1/4 turn and restore it to the initial position.

※ When the pump handle is pulled out, the white indicator of the flow finish indicator is pulled in by vacuum generated in the pump cylinder. It pops out when the prescribed volume (100 mL or 50 mL) has been fully sampled.

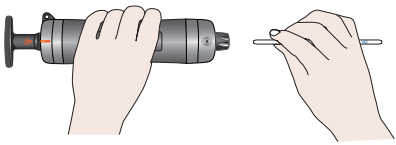
※ The time necessary for one sampling is shown in the operation manual of each detector tube.

※ Repeat steps three through five if more than one pump stroke is required.



During sampling Sampling completed

⑥ Remove the detector tube from the pump. This completes sampling. Read the sampling results of the removed tube according to section "7. How to read and calculate sampling results" (page 17).



Remove broken glass tips in the pump head block before it becomes full. Open the dust cap (on the opposite side of the tube tip breaker of the pump head block) and shake out the broken glass tips and carefully dispose of them. After disposing the broken glass tips, securely close the cap. If you do not securely close the cap, broken glass tips will spill from the dust cap hole.

❹ How to operate the counter

The model GV-110 gas sampling pump with a counter can make up to ten samplings. Do the following steps to set the counter so that the counter increments by one for each sampling.

① Align zero ("0") on the counter ring with the white △ mark.

※Rotate the outer ring of the counter to align the number with the white △ mark.



② Each time you do a sampling, the number will increment by one. After you have completed sampling, the number at the white △ mark indicates the actual number of samplings you have done.

※The maximum number of samplings that can be counted is ten. The number will not increment when the white △ mark indicates "10".



③ To reset the counter to zero, rotate the counter ring in the direction of the arrow as shown at right. Align the zero ("0") on the counter ring with the white △ mark. You can then starting counting the samplings again.



When you do not want to use the counter・・・・・・

Turn the counter ring in the direction of the arrow as shown at right. Align the letter "N" with the white △ mark. You can now use the pump without the counter incrementing.



△**NOTE**

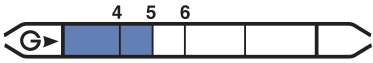
- The counter will not increment if the handle guide mark is at ▲ 50.
- The counter ring cannot be rotated while the handle is pulled out. Do not try to force it to rotate because you may break the counter.
- Do not grasp the counter when sampling. Otherwise, the counter will not operate properly resulting in a malfunction.

7 How to take readings and calculate the results

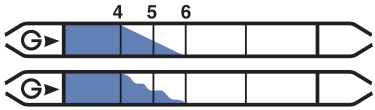
Follow the procedures below on how to read the scale, correct for external factors, and record the results. For corrections, first, you correct for the temperature or humidity against the reading, then correct for the number of samplings (refer to the manual of each detector tube), and then correct for the ambient pressure.
Check to see if there are any interference gases present in the measurement environment. Also, check if there are any external influences such as gas that may affect the detector tube.

❶ How to read the scale

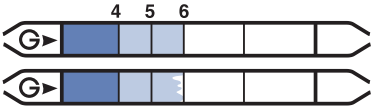
After completing sampling, immediately read the scale at the end of the colour change layer.
※Marking the end of the colour change layer with a pen may be useful for easy reading and later confirmation.



When the end of the colour change layer is flat
Read the value at the end of the layer. In this example, the reading should be 5.



When the end of the colour change layer is slanted
Read the value in the middle of the slanted portion of the slant. In this exaggerated example, the reading should be 5, which is in the middle between 4 and 6.



When the demarcation of the colour change layer is pale
Read the value in the middle between the dark layer end and the pale layer end. In this exaggerated example, the reading should be 5, which is in the middle between 4 and 6.

❷ Correction for temperatures

If the tube reading requires temperature correction within the measurement temperature of 0° to 40°C (32° to 104°F), read the temperature of the sample point at the increment of 5°C (9°F). The measurement temperature refers to the tube temperature, and not the sample temperature, but this is usually the ambient temperature, since the tube temperature must be assimilated of the ambient temperature before measurement.

Example 1: Temperature correction using correction factor

To find the true concentration when the tube reading is 2.5 ppm at 15°C (59°F), first, using the table below, obtain the correction factors for the temperatures 10°C (50°F) and 20°C (68°F). Then, add these two factors and divide the result by two (known as proportional allocation). Finally, multiply the reading by the calculated factor.

Temperature °C (°F)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Compensation factor	1.45	1.20	1.00	0.90	0.85

Proportional allocation: (1.20 + 1.00) ÷ 2 = 1.10

True concentration＝2.5(ppm)×1.10＝2.75(ppm)

Example 2: Temperature correction using correction table

To find the true concentration when the tube reading is 0.5 % at 35°C (95°F), first, using the table below, obtain the true concentration factors for the tube reading at 0.6% at the temperatures of 30°C (86°F) and 40°C (104°F). Then, add these two factors and divide the result by two (known as proportional allocation). Repeat the step again for the tube reading at 0.4%.

	True concentration		
Tube reading	20°C(68°F)	30°C(86°F)	40°C(104°F)
0.6%	0.6	0.55	0.5
0.4%	0.4	0.35	0.3

▼

Next, add the two true concentration values obtained from above and divide them by two (known as proportional allocation). The resulting value, shown in the shaded area in the table below, is 0.425%. This is the true concentration factor at 35°C (95°F) at a reading of 0.5%.

	True concentration		
Tube reading	30°C(86°F)	35°C(95°F)	40(104°F)
0.6%	0.55	0.525	0.5
0.5%		0.425	
0.4%	0.35	0.325	0.3

❸ Correction for humidity

If the tube reading requires humidity correction with the measurement temperature of 0° to 40°C (32° to 104°F), read the ambient humidity at the sample point using the No.6 Gastec water vapour detector tube.

Example of humidity correction
If the reading on the nitric acid detector tube (No. 15L) is 5 ppm and the measured value on the water vapour detector tube is 6mg/L, calculate the true concentration by multiplying the reading with the appropriate correction factor in the table below.

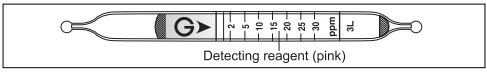
Absolute humidity (mg/L)	4	6	8	10	12	14
Correction factor (f)	0.55	0.68	0.85	1.0	1.13	1.3

True concentration＝5ppm × 0.68＝3.4(ppm)

❹ Correction for the number of pump strokes

Make the following correction when measurements were made for a number of strokes other than the specified number.
Some detector tubes can measure concentrations beyond the printed scale. The operation manual of each tube shows the range of concentration for measurement (measurement range), the number of strokes (n), and the stroke correction factors (see "Example: No.3L" below). Multiply the indicated value by an appropriate factor to obtain the true concentration. However, since the correction factors are fixed in specific numerical values, precise results may not be obtained as in the case of measurement with the standard number of strokes when measurement is made by a number of strokes other than the standard number. Use the results obtained using a correction factor as a reference only. Consult us if you need the same precision as with ordinary detector tubes.

Example) No.3L



Detecting reagent (pink)

Measurement range	0.5～1ppm	1～30ppm	30～78ppm
Number of strokes (n)	2	1 (standard)	1/2
Stroke correction factor	1/2	1	2.6
Sampling time	Approx. 2 min.	Approx. 1 min.	Approx. 30 sec

❺ Correction for atmospheric pressure

Tube readings are affected by significant fluctuations of the atmospheric pressure. All Gastec detector tubes are calibrated based on a normal atmospheric pressure of 1013 hPa (760 mmHg) and their indications will not be affected over the range of ±10% of normal pressure (912 to 1114 hPa or 684 to 836 mmHg). If the pressure at the time of measurement is not within this range, correct the tube reading as follows:

$$\text{True concentration} = \text{Tube reading} \times \frac{1013\ (\text{hPa})}{\text{Atmospheric pressure (hPa)}}$$

or

$$\text{True concentration} = \text{Tube reading} \times \frac{760\ (\text{mmHg})}{\text{Atmospheric pressure (mmHg)}}$$

❻ Possible effects from interference gases

Detector tubes use chemical reactions to indicate colour changes. Therefore, indications on the detector tubes may be affected when there is an interference gas that has similar chemical properties as the target gas. If such interference gas exists, measurement will be incorrect. Be sure to check if interference gases are present in the measurement environment and if present, confirm before measurement with the operation manual of the detector tube and its possible effects on the measurement.
The interference gas table in the manual of each detector tube shows interference properties of each interference gas basically in the same concentration band as the target gas. Some materials or specific concentration not shown in the table may affect the indications under specific conditions and if interference is suspected, consult us beforehand.

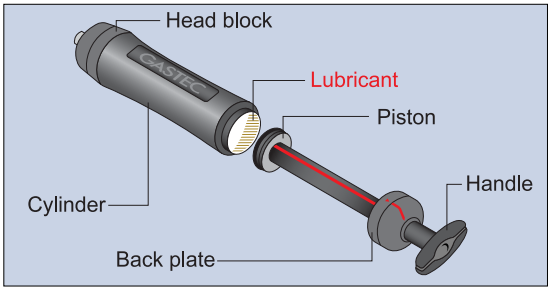
8 Maintenance

Major causes of air leak in sampling pumps include loosened inlet clamping nut, damaged or deteriorated rubber inlet, and deteriorated or insufficient lubricant. The following table shows the possible causes of air leak and available countermeasures. If these countermeasures do not work, contact your Gastec representative for suitable action.

Source of air leak	Possible causes	Countermeasures
Inlet clamping nut	Loose due to insufficient tightening	Re-tighten the nut
Rubber inlet	Damaged or deteriorated	Replace with a new rubber inlet
Cylinder or Piston	Deteriorated or insufficient lubricant	Follow the lubrication procedures.

Lubrication procedures

① Turn the back plate anti-clockwise to remove the piston from the cylinder.
② Remove the old lubricant from inside of the cylinder and around the perimeter of the piston with a soft cloth or paper.
③ Apply lubricant evenly on the inside wall at the opening of the cylinder.
④ Push the piston into the cylinder and then turn the back plate clockwise to tighten.
⑤ Move the handle back and forth about ten times to coat the entire cylinder with lubricant.
⑥ Check the sampling pump for air-tightness to make sure there are no leaks.



The parts listed below are important for proper air-tightness. Therefore, repairs and replacement of parts should be done by Gastec or Gastec representatives.

- **Repair of the flow finish indicator**
  A malfunctioning flow finish indicator may lead to air leaks in the sampling pump. If any abnormality is found, contact your Gastec representative.
- **Replacement of the head block**
  The file in the tube tip breaker can be used for up to about 20,000 detector tubes. When it becomes ineffective for breaking off tube tips, ask your Gastec representative for replacement of the head block.
- **Repair of the counter**
  When any abnormality is found with the counter, contact your Gastec representative.

Never give a strong shock to the sampling pump. Otherwise, a malfunction may result.

△NOTE

- Do not modify the sampling pump. Tampering with pump may invalidate warranty conditions.
- Do not disassemble pump components such as head block, back plate, flow finish indicator, and piston. If assembled, an air leak might result and this may invalidate warranty conditions.
- Use genuine Gastec maintenance parts only. Use of non-genuine Gastec components may invalidate warranty conditions.

9 Maintenance parts

Item	Model	Qty
Rubber inlets	GV100-3P10	10 pcs/package
Lubricant	GV100-2	1
Inlet clamping nut	GV100-6P10	10 pcs/package

10 Optional accessories



■ **Rubber cap**
DTP-1-20 (blue) and DTP-2-20 (pink) Tube Caps
Rubber caps to be put on the opened inlet end of the detector tube to prevent accidental injuries. The blue caps are for the tubes with the largest outer diameter (7 mm), and the pink caps are for other detector tubes. Each of them can be used repeatedly. These caps are available in packages of twenty pieces having the same colour.



■ **Tube tip holder**
No. 721
The holder snaps off detector tube tips and stores them to prevent them from being scattered about. The holder can hold 130 broken-off tube tips.



■ **Operation Adapter**
GV-700 One Hand Operation Adapter
Gastec Model GV-700 adapter can maintain a vacuum of 50mL or 100mL in the pump body. This allows the user to assemble the pump and appropriate tube, and then in situation where it is necessary, to take the sample using one hand. In the body of the adapter there is a small rod which can be moved in or out quite easily with one finger.

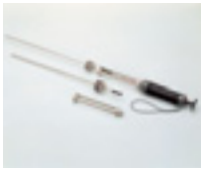


■ **Extension Hose**
No. 350A and No. 350A-10 Extension Hoses with No. 357 Tube Holder
Synthetic rubber hoses suitable for safe and accurate remote sampling of gases and vapours in tanks or manholes. The detector tube is connected to the No. 357 Tube Holder at the end of the No. 350A (5 m in length) or No. 350A-10 (10 m in length) Extension Hose. The other end of the Extension Hose is connected to the sampling pump.

■ **Telescopic sampling bar**
No.350BP-2
A telescope glass fibre probe suitable for horizontal or upward extension to sample gases and vapours in narrow spaces.
The length of the pole can be adjusted from 62.4 cm to 2.84 m (2.1 to 9.3 ft). It weighs only 590g (1.3 lbs).



■ **Hot Probe**
No. 340 Hot Probe and No. 345A Hot Probe Holder
Used to sample very hot gases such as automobile exhaust or flue gases at approximately 60° to 600°C (140° to 1,112°F). The No. 340 Hot Probe can rapidly cool a sample down to an ordinary temperature before the sample enters into the connected detector tube. The hot probe holder firmly supports the hot probe.



■ **Gastec Handbook**
Provides very useful information from beginners to professionals who are interested in health and hygiene programs of work places and public buildings, including air, water and soil. It also introduces an assortment of Gastec detector tube systems, Gastec detector tubes specifications, high-precision calibration tools, tips for effective measurements as well as descriptions of the properties of substances to be measured.



11 Disposal of Gastec Detector Tubes

⚠**CAUTION**: A used or "valid until" date expired detector tubes should be disposed of properly in accordance with your local regulation.
Detector tubes contain sensitive reagents that are ready to react, and may contain some substances that are specified as hazardous industrial wastes. For further information, consult your Gastec representative.

⚠**WARNING**
- Use only Gastec Detector Tubes in a Gastec Pump.
- Interchangeability or use of non-Gastec detector tubes with Gastec pump:
  - may result in property damage, serious injury and death.
  - Voids all warranty.
  - Voids all performance and data accuracy guaranties.

12 After-sales service

If you have questions or requests including below, please contact Gastec or your Gastec representative;

※ Questions about the measured results
※ Leakage continues even after a repair countermeasure based on the procedures in "Maintenance."
※ The head block needs to be replaced.
※ When requesting a repair or asking for regular maintenance

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For all types of gas and vapour SINCE 1970

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