

## ■ Gas sampling methods

- Vacuum method

Most widely used in the world for gas detector tube systems. Sample air is aspirated into the detector tube manually by operating the attached vacuum pump.

- Injection method

Two gas detector tubes (No.2HT for CO<sub>2</sub> & No.100B for propane) are available. Sample air is first drawn into a syringe (No.601 or No.611) before being injected into the detector tube.

- Motor-driven pump method

Used for both gas detector tube systems and sensor systems. Sample air is automatically aspirated by the motor-driven pump at a prescribed rate for a prescribed time.

- Diffusion method

Used for both gas detector tube systems and sensor systems. Sample air is not aspirated. With detector tube systems, gases diffuse into the detector tubes where the diffuser accelerates the gas diffusion rate to produce a longer colour change layer. With sensor systems, gases reach the sensor surface and enter the sensor by diffusion.

## ■ Special measurement methods for ground or water pollutant analysis

- Boring method

Gastec's unique method. A hole is bored in the ground for subsurface sampling. The gas or vapour within that hole is drawn into an appropriate detector tube connected at the end of an extension probe which is attached to the Model GV-100 Gas Sampling Pump.

- Reagent adding method

A specific reagent is added to the sample to change the target substance into a gas that is easy to measure. The generated gas is sampled into an appropriate detector tube by the Model GV-100 Gas Sampling Pump. Tube readings should be corrected by multiplying by prescribed factors. This method is useful to measure pollutants in sludge or waste water.

- Vapour-liquid equilibrium method

When a solution is put in a sealed container, its solvent is partly evaporated and diffused until the solvent concentrations in the solution and in the vapour equilibrate at a specific ratio that is unique to the solvent. To get the true solvent concentration in the solution :

- ① draw the vapour into an appropriate detector tube by using the Model GV-100 Gas Sampling Pump and read the tube, then
- ② multiply the reading by the correction factor unique to the solvent or
- ③ correct the reading by using the correction graph for the solvent.

This method is useful when substances in the liquid are difficult to be directly measured.

● **Capillary method**

This method utilizes capillary action which causes a sample liquid to rise up a narrow detector tube. With this method, measurements are quite simple:

- ① break off both ends of an appropriate detector tube,
- ② immerse the tube end vertically into the sample liquid (directional arrow ► pointing upward)
- ③ read the tube after a prescribed sampling time has elapsed.