

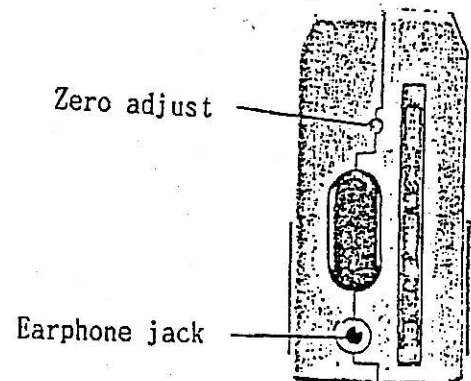
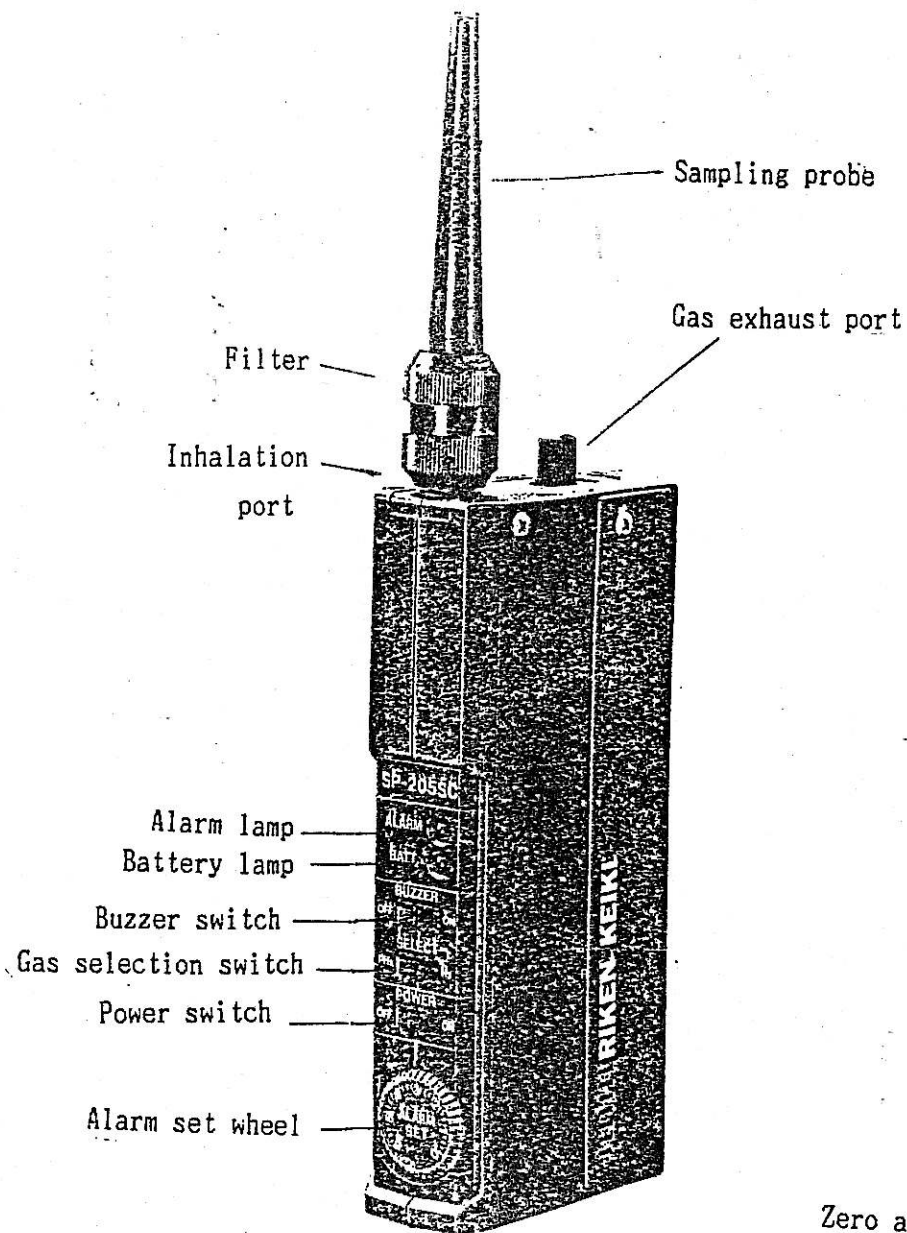


INSTRUMENTS  
Gas Detection for Life!

# **INSTRUCTION MANUAL RKI INSTRUMENTS, INC.**

**Model SP-205ASC  
Portable Gas Monitor For PH<sub>3</sub> and H<sub>2</sub>**

## ★ PARTS NAMES AND FUNCTIONS ★



## ★ OPERATING INSTRUCTIONS ★

- (1) Insert batteries.

Available batteries are;

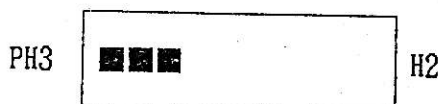
- \* AA size Alkaline/Manganese battery
- \* AA size Manganese battery
- \* AA size Ni-Cd rechargeable battery

- (2) Install a filter and a sampling probe to inhalation port.

- (3) Turn power switch on.

Sampling pump is activated automatically, and battery lamp lights simultaneously. Allow about 30 seconds after the unit is turned on for warm-up.

- (4) Set-up the gas selection switch either for Phosphine or Hydrogen.



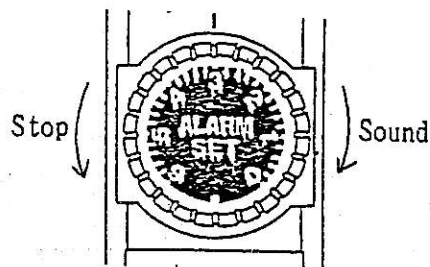
Select!!

(Notice) PH3 and other gases can be detected on H2 side of this switch, though, since the sensitivity become higher, it may not show adequate stability at an alarm stop point. This side of the switch shall be Hydrogen detection only.

On the other hand, Hydrogen can be detected on PH3 side, though, it shows inferior sensitivity. ( Refer to data material 1-1 & 1-2 ).

- (5) Alarm set ( Object to detect a gas leak. )  
30 seconds after turn-on, find an alarm stop point by taking following procedure.

- a. Turn an alarm set wheel counterclockwise or clockwise slightly.
- b. Locate the wheel at the point where a buzzer sounds by turning the wheel clockwise and stops by turning it counterclockwise. The wheel should locate at the limiting point.
- c. The unit is ready to run.



#### (6) Gas leak detection

When a gas leak is detected, an internal buzzer sounds and an alarm lamp flashes. The higher the gas concentration, the faster the buzzer sounds. The alarm lamp flashes in synchronization with the buzzer.

#### 《BUZZER SWITCH》

Turning the Buzzer switch off silences the buzzer, while the alarm LED lamp continues flashing.

#### 《EARPHONE》

When a earphone ( sold separately ) is plugged in, the buzzer silences and it can now be heard through the earphone.

#### (7) Alarm set ( Object to measure a leak gas concentration. )

The alarm wheel can be set as following special procedure to have an exact gas concentration.

- a. Set-up an alarm stop point in fresh air by taking said procedure.
- b. Turn the alarm set wheel counterclockwise for additional graduations.
- c. The number of added graduation varies upon object gases and their object concentration. Refer a correlative chart of data 1-1 and 1-2.
- d. For example, when you plan to detect Phosphine gas at approx. 1ppm, refer data charts and find a number of graduation to turn. Phosphine for 1 ppm detection needs one graduation, therefore, turn the wheel for one graduation counterclockwise.

## ★ DAILY INSPECTION ★

When any abnormality is found during the said inspection, follow the trouble-shooting to cope with the problem.

(1) Sensitivity check with check gas

By following said operation procedure, set-up the unit for ready to operate.

Uncover away a check gas dial and insert a sampling probe port into it.

Verify that a buzzer sounds and an alarm flashes. This should be done in a short time.

(2) Alarm set point adjustment

Before delivery, an alarm set point ( alarm start point ) has been adjusted between "2~4" on the setting wheel. Should this alarm set point does not lie within this range, reset the alarm set point in fresh air with the following procedure;

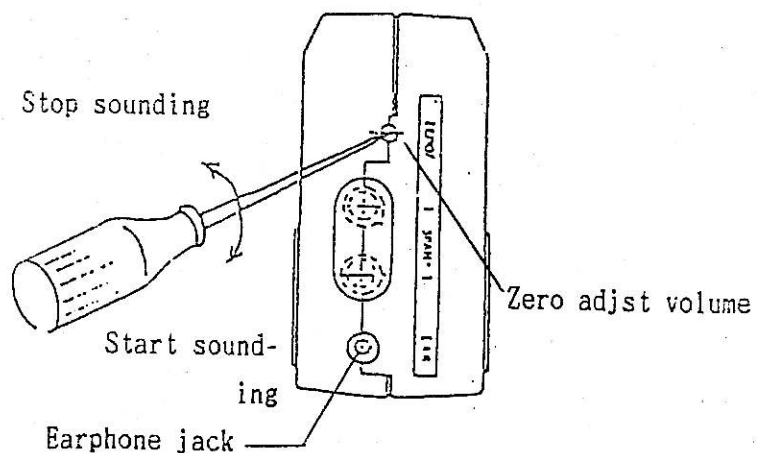
- a. Turn a zero adjust screw on the unit bottom slowly with a screw.

Find a point where a buzzer starts sounding and locate at that point.

Turning the wheel counterclockwise decreases the buzzer rate and clockwise increases it. ( Refer a below figure. )

- b. Turn the wheel counterclockwise to stop the buzzer.

Confirm if a buzzer starts sounding in a graduation range "2 ~4" by turning the wheel clockwise. When a buzzer does not sound, repeat the above procedure for adjustment.



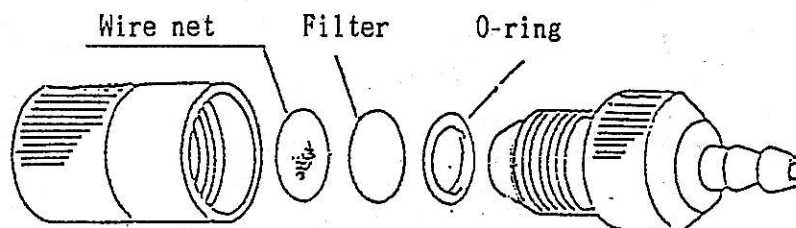
(3) Inspection for gas flow route

a. Internal inhalation pump

At the said inspection of gas sensitivity, when a buzzer is dispatched within 4 seconds, the inhalation pump is normal.

b. Filter inspection

At the above inspection of inhalation pump, if a buzzer responds slowly, confirm the filter for a suspected contamination. When the filter is polluted or discolored, replace it with a new one. When the filter has dusts or particles on it, remove them. If it contains water, drain and dry it up.



## ★ TROUBLESHOOTING ★

Before contacting RIKEN for repair of suspected malfunctions, check the unit in accordance with the following countermeasure.

- ◆ When turn on the unit, sampling pump and lamp do not activate.

Reasons	Countermeasure
Poor battery contact.	Check batteries for contact failure.
Low battery voltage.	Replace or charge the battery.
Batteries inserted with incorrect polarity.	Insert batteries with correct polarity.

- ◆ The unit responds slowly and is suspected low sensitivity.

Reasons	Countermeasure
Clogged filter	Replace the filter with a new one.
Low inhalation by pump	Ask us/nearest agent for inspection.
Inferior sensitivity of sensor	Ask us or nearest agent for inspection.

## ★ SPECIFICATIONS ★

Model:	S P - 2 0 5 ASC				
Detection Principle:	Catalytic/semiconductor combination Sample-drawing with special built-in diaphragm pump				
Gases detected:	Phosphine (PH <sub>3</sub> )	Arsine (AsH <sub>3</sub> )	Diborane (B <sub>2</sub> H <sub>6</sub> )	Silane (SiH <sub>4</sub> )	Hydrogen (H <sub>2</sub> )
Detectable leak amounts: (atm · cc/sec)	1.5x10	1.0x10	0.5x10	2.5x10	2.5x10
Detectable concentration:	0.3ppm	0.2ppm	0.1ppm	0.5ppm	0.5ppm
Response time:	Within ten (10) seconds				
Detection indication:	Intermittent buzzer and LED lamp				
Power source:	Size "AA" Alkaline battery cells x 4 pce Continuous operating time approx 7 hours at 20°C Automatic voltage drop indication				
Operating temperature:	0°C ~ +40°C				
Outer dimensions:	68(W) x 155(H) x 32(D)mm				
Weight:	Approx. 400g				
Accessories:	Carrying case, Check gas vial, Filter (2pcs), Battery (4pcs), Sampling probe.				
Optional accessories:	Earphone, Long sampling tube.				

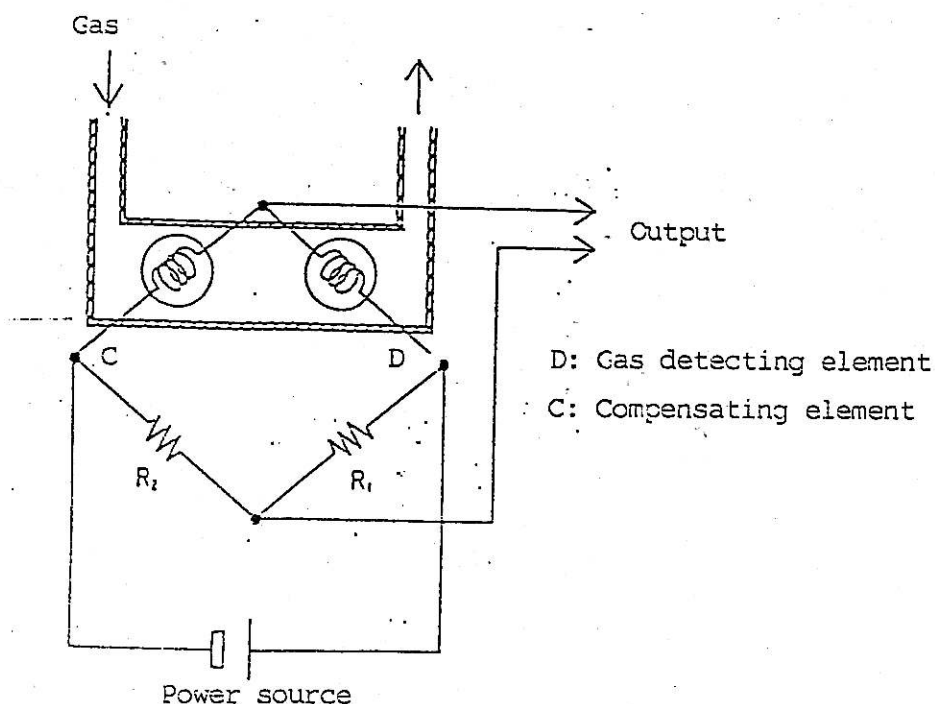
※ Contact us for other object gases.

※ Specifications subject to change without notice.

## ★ OPERATION PRINCIPLE ★

An electrical circuit, applying the sensor shown in Fig. a, is based on a Wheatstone bridge circuit including the detecting and compensating elements and the fixed resistors. The sensor elements are formed from sintered metal oxide semiconductors (n-type semiconductors; tin oxide, zinc oxide, etc.) on coils of fine platinum wire as shown in Fig. a. The sensor elements are heated up to several hundred degrees Centigrade. As a reducing gas is chemically adsorbed on the surface of the sensor elements, the electrical conductivity of the semiconductor increases and the resultant resistance of the coil and semiconductor combination decreases. As a result, the bridge circuit becomes unbalanced and the meter gives a deflection in proportion to the gas concentration.

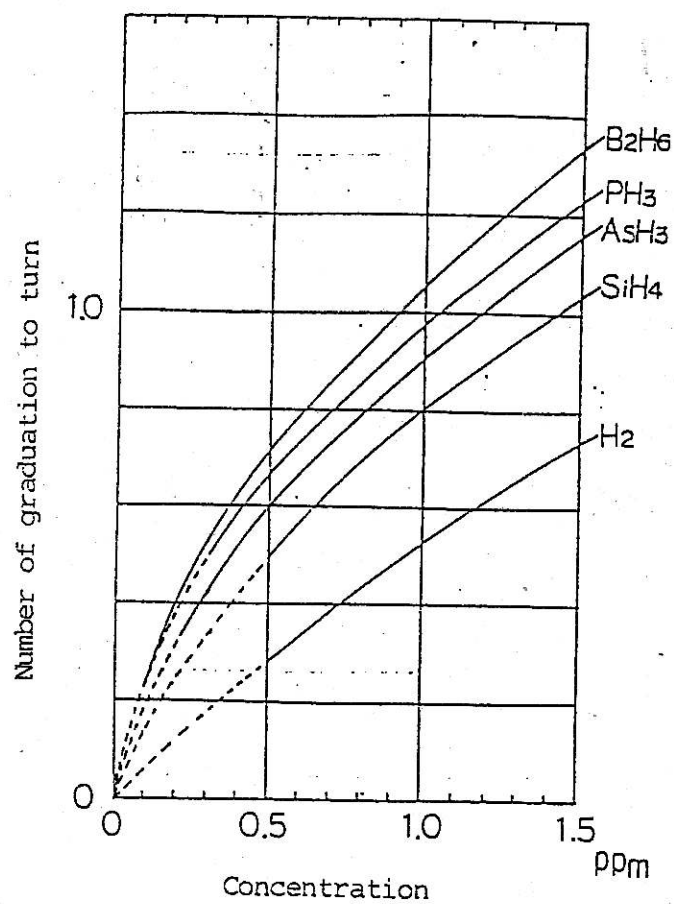
Figure a.



## ★ DATA CHARTS ★

◆ Relationship between the wheel setting and the concentration of each gas

1-1 Gas changeover switch at  
PH<sub>3</sub> side



1-2 Gas changeover switch at H<sub>2</sub>  
side

