

# RIKEN

# GAS LEAK TESTER

**SPEEDY  
DETECTION  
FOR A SMALL  
LEAK!**



MODEL SP-205A

MODEL **SP-205A**

■LPG, LNG and TOWN GAS

MODEL **SP-205ALF**

■FLON and LPG

MODEL **SP-205ASC**

■SEMI-CONDUCTOR PROCESSING GAS

- Phosphine
- Arsine
- Hydrogen
- Diborane
- Silane

### FEATURES

- Lightweight, compact, easy to use
- LED lamp flash, intermittent buzzer for a warning
- Intrinsically safe design
- Lamp goes off for low battery voltage
- Sample draw system
- Fast response and high sensitivity



**RIKEN KEIKI CO.,LTD.**



## DESCRIPTION

Riken portable gas leak tester model SP-205A is a standard type high-sensitive beeper which effectively monitors a small leak of wide various gases such as LPG, LNG and town gas etc. Riken also provides you with specially designed SP-205A for LPG and town gas, SP-205ALF for Flon and LPG, and SP-205ASC for semi-conductor processing gases.

The truly portable and personal leak tester model SP-205A/205ALF/205ASC can be conveniently over the shoulder with its carrying strap. These units automatically draw leaking gases with each internal pump. When an optional earphone is used, alarm buzzer sound can be heard in spite of a hard back-ground noise. With model SP-205A/205ALF/205ASC, workers can now be individually protected from potentially dangerous toxic gas leaks. These units are also used as leak checkers at pipe, pump connections. It can give an early warning indication of small leaks before they become large and potentially dangerous.

An intermittent tone sounds and a LED lamp flashes if a gas leak is detected. The tone frequency is proportional to the gas concentration, i.e., low gas concentration is signalled by a slow beep and higher gas concentration by a faster beep.

## PORTABLE GAS LEAK TESTER MODEL SP-205A/SP-205ALF



- Alarm lamp
- Battery lamp
- Buzzer switch
- Gas selection switch
- Power switch
- Alarm set wheel

### SPECIFICATIONS

Model	SP-205A	SP-205ALF
Detection Principle	Catalytic/semiconductor combination. Sample-drawing with special built-in diaphragm pump	
Gases detected	LPG, LNG, Town gases	Flon, LPG
Detectable leak amounts	$3.3 \times 10^{-5} \text{ atm} \cdot \text{cc/sec}$	
Detectable concentration	10 ppm	
Response time	Within three (3) seconds	
Alarm indication	Intermittent buzzer and LED lamp	
Power source	Size "AA" Alkaline battery cells $\times$ 4 pcs Continuous operating time approx. 7 hours at 20 °C Automatic voltage drop indication	
Explosion proof	Intrinsically safe, apply for id2G3 in Japan	
Operating temperature	- 20 °C ~ + 40 °C	
Outer dimensions	68(W) $\times$ 155(H) $\times$ 32(D) mm	
Weight	Approx. 400 g	

- Other applicable batteries: Carbon zinc (RSP), rechargeable Ni-Cd (KR-AA)
- Specifications subject to change without notice.

#### Accessories

Carrying case, Check gas, Filter unit, Filter, Batteries, taper nozzle.

#### Optional accessories

Earphone, Long taper nozzle, Telescopic sampling probe.

# PORTABLE HYDRIDE GAS LEAK TESTER MODEL SP-205ASC

The model SP-205ASC is specially designed for the use of semiconductor industry and to detect the presence of special gas such as gaseous hydride at much higher sensitive level. Low battery alarm and gas alarm lamp are provided. After power on and turning gas selection switch to either side, find an alarm end point by turning alarm set wheel. This is ready to run. When it is necessary to have a gas concentration, turn the alarm setting wheel counterclockwise for additional graduations in clean air after the prior alarm wheel setting. Model SP-205ASC can show you an approximate gas concentration according to tables shown below.

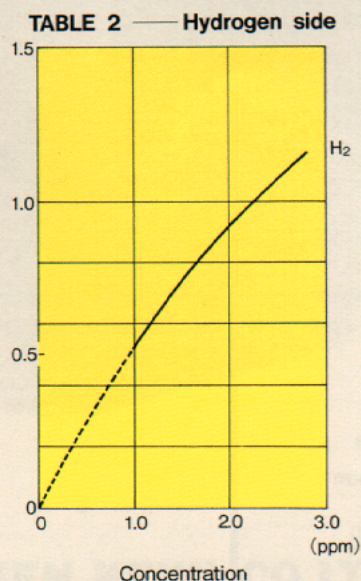
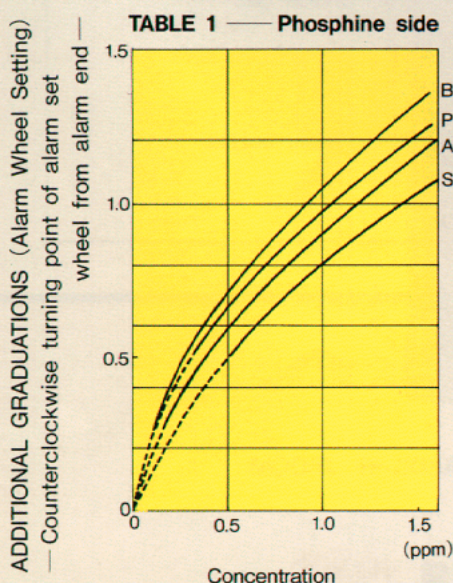
## SPECIFICATIONS

Model	SP-205ASC				
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)	1.5 × 10 <sup>-6</sup>	1.0 × 10 <sup>-6</sup>	0.5 × 10 <sup>-6</sup>	2.5 × 10 <sup>-6</sup>	5.0 × 10 <sup>-6</sup>
Detectable concentration	0.3 ppm	0.2 ppm	0.1 ppm	0.5 ppm	1.0 ppm
Response time	Within ten (10) seconds				
Alarm indication	Intermittent buzzer and LED lamp				
Power source	Size "AA" Alkaline battery cells × 4 pcs Continuous operating time approx. 7 hours at 20 °C Automatic voltage drop indication				
Operating temperature	0 °C ~ +40 °C				
Outer dimensions & Weight	68(W) × 155(H) × 32(D) mm, Approx. 400g				



- Other applicable batteries: Carbon zinc (RSP), rechargeable Ni-Cd (KR-AA)
- Specifications subject to change without notice.

Wheel Setting and Concentration of Gases (Typical value)



### Accessories

Carrying case, Check gas, Filter unit, Filter, Batteries, Taper nozzle.

### Optional accessories

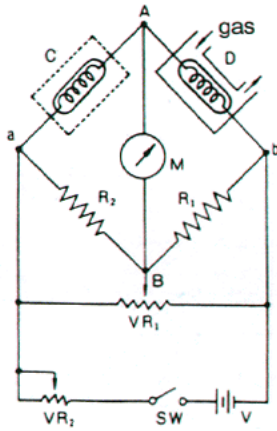
Earphone, Long taper nozzle.

## DETECTION METHOD

An electrical circuit, applying the sensor shown in Fig. a, is based on a wheatstone bridge circuit as shown in Fig. b, 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

The surface of the metal-oxide semiconductor (M.O.S.) readily adsorbs oxygen in air. The chemisorbed oxygen dissociates into  $O^{2-}$  and  $O_2^-$  ions which thereby affect charge density in the semiconductor the electrical conductivity of the M.O.S. correspondingly decreases. However, when a reducing gas (eg.  $H_2$ ) subsequently adsorbs onto the surface, onsequent interaction with chemisorbed oxygen serves to increase charge density with a proportionate increase in electrical conductivity.



- D : Gas detecting element
- C : Compensating element
- R1, R2 : Fixed resistance
- M : Meter
- VR1 : Zero adjust volume
- VR2 : Voltage adjust volume

Fig. a BASIC SENSOR CIRCUIT

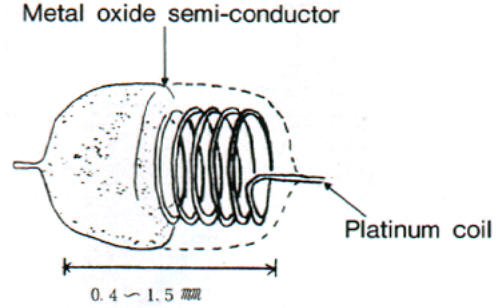


Fig. b SENSOR ELEMENT



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