

- ★ READ CAREFULLY THIS INSTRUCTION MANUAL AND THE INSTRUCTIONS OF THE ASPIRATING PUMP PRIOR TO USING THIS PRODUCT.
- ★ DO NOT DISCARD THIS INSTRUCTION MANUAL UNTIL ALL THE TUBES IN THIS BOX ARE USED UP.

1. PERFORMANCE:

Sensing Limit	: See table 1
and Sampling Time	: 20 seconds
Number of pump stroke	: 1 (100mL)
Colour Change	: Orange → Black or Dark green
Operating temperature	: 0 - 40 °C (32-104°F) (No corrections is necessary.)
Aspirating Pump	: Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A

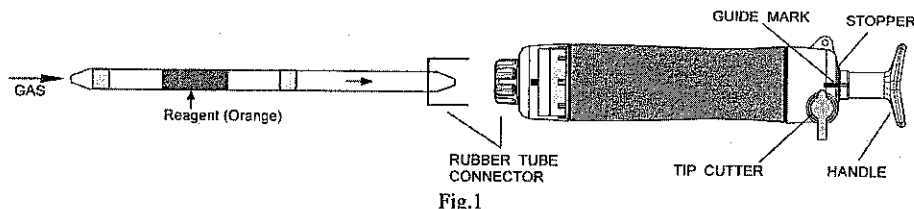
CAUTION

1. DETECTOR TUBE CONTAINS REAGENTS.
2. DO NOT TOUCH THESE REAGENTS DIRECTLY ONCE TUBES ARE BROKEN.
3. KEEP THE TUBES OUT OF THE REACH OF CHILDREN.

NOTICE

1. USE ONLY WITH PUMP MODELS AP-20, AP-20S, 400B, AP-1, AP-1S OR 400A. OTHERWISE, CONSIDERABLE ERROR IN INDICATION MAY OCCUR.
2. BEFORE TESTING, CHECK THE ASPIRATING PUMP FOR LEAKS (REFER TO ITEM 7. INSPECTION OF ASPIRATING PUMP). ANY PUMPS SHOWING SIGNS OF LEAKAGE SHOULD BE CORRECTED BEFORE USE.
3. DO NOT USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
4. STORE TUBES IN A COOL AND DARK PLACE (0-25 °C/32-77°F), AND USE BEFORE EXPIRATION DATE PRINTED ON TOP OF THE BOX.
5. PRIOR TO USE, READ CAREFULLY ITEM 8. USER RESPONSIBILITY.
6. READ THE CONCENTRATION IMMEDIATELY AFTER MEASUREMENT.

2. SAMPLING AND MEASUREMENT:



- ① Break both ends of detector tube.

CAUTION SAFETY GLASSES AND GLOVES SHOULD BE WORN TO PREVENT INJURY FROM SPLINTERING GLASS.

- ② Insert the detector tube into aspirating pump securely as shown in Fig.1. (Arrow mark shall point to the pump.)
- ③ Align the guide marks on the shaft and stopper of the aspirating pump.
- ④ Pull the pump handle at full stroke until it locks and wait for 20 seconds or until the completion of sampling is confirmed with the flow indicator of the pump (See descriptions about the flow indicator in the instructions of the pump).
- ⑤ In case that 1mm to 3mm length of the discoloration (Black or Dark green) of the Reagent is gotten, it shows the presence of organic gas.

SPECIAL NOTE: I. The scale is calibrated at 20 °C (68°F), 50 %R.H. and 1013hPa. Readings obtained in other circumstances should be corrected (REFER TO ITEM 3. CORRECTION FOR AMBIENT CONDITIONS).

II. When the maximum point of the stained layer is unclear or obliquely, read the scale at the centre between the longest and shortest points.

DETECTABLE GAS CONCENTRATION:

The table 1 shows the detectable gas concentration as the presence of single gas.

		table 1		※ A:U.S.A	J:JAPAN
No.	Classification	Detective Gas	Sensing Limit of Gas Concentration (ppm)	TLV (ppm)	※
1	Alcohol	Methanol	20	200 (A,J)	※
		I.P.A	50	200 (A,J)	
		Butanol	50	20 (A,J)	
2	Eater	Ethyl Acetate	400	400 (A,J)	
		Butyl Acetate	200	150 (A) 100 (J)	
3	Ketone	Acetone	600	500 (A) 200 (J)	
		M.E.K.	200	200 (A,J)	
		M.I.B.K.	100	50 (A,J)	
4	Aromatic	Benzene	40	0.5 (A)	
		Toluene	5	50 (A,J)	
		Xylene	5	100 (A,J)	
5	Aliphatic	Propane	1500	2500 (A)	
		Butane	100	800 (A) 500 (J)	
		Pentane	10	600 (A) 300 (J)	
		Hexane	10	50 (A) 40 (J)	
		Heptane	5	400 (A) 200 (J)	
		Octane	5	300 (A,J)	
		Acetylene	2500	-	
		Ethylene	100	-	
		Propylene	10	-	
		Trichloroethylene	25	50 (A) 25 (J)	
6	Chlorination Hydrocarbon	Perchloroethylene	200	25 (A)	
		Gasoline (motor fuel)	10	300 (A) 100 (J)	
7	Mixed solvent	Kerosene	8 (mg/m ³)		
		Mineral Turpentine	8 (mg/m ³)		
		Ethyl acrylate	10	5 (A)	
		Ether (ethyl)	10	400 (A,J)	
8	Others	Ethylene oxide	50	1 (A,J)	

◆ Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 2004.

3. CORRECTION FOR AMBIENT CONDITIONS:

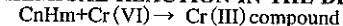
- ① Temperature; No corrections is necessary.
- ② Humidity; No corrections is necessary.
- ③ Atmospheric Pressure;

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

4. INTERFERENCES:

Coexistence of more than 10ppm of hydrogen sulfide discolors reagent to black. Methane, ethane, carbon monoxide, carbon dioxide, sulphur dioxide and hydrogen can not be detected.

5. CHEMICAL REACTION IN THE DETECTOR TUBE:



6. DISPOSAL OF TUBE:

USED TUBES SHOULD BE DISPOSED CAREFULLY ACCORDING TO RELEVANT REGULATIONS, IF ANY.

7. INSPECTION OF ASPIRATING PUMP:

Checking for leaks;

- ① Insert sealed, unbroken detector tube into the pump.
- ② Align the guide marks on the shaft and stopper of the pump.
- ③ Pull the handle to full stroke and wait for 1 minute.
- ④ Unlock the handle and allow it to return slowly into the pump by holding the cylinder and handle securely.

CAUTION HANDLE WILL TEND TO SNAP BACK INTO THE PUMP QUICKLY.

- ⑤ If the handle returns completely to the original position, the performance is satisfactory. Otherwise, refer to maintenance procedure in the pump instructions to correct the fault.

8. USER RESPONSIBILITY:

It is the sole responsibility of the user of this equipment to ensure that the equipment is operated, maintained, and repaired in strict accordance with these instructions and the instructions provided with each Model AP-20, AP-20S, 400B, AP-1, AP-1S or 400A aspirating pump, and that detector tubes are not used which are either beyond their expiration date or have a colour change different to that stated in the Performance specifications.

The Manufacturer and Manufacturer's Distributors shall not be otherwise liable for any incorrect measurement or any damages, whether damages result from negligence or otherwise.