

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

## 1. PERFORMANCE:

Measuring Range	0.02 - 0.3 %
and Sampling Time:	1 minute (1 pump stroke)
Colour Change:	White → Orange
Detectable Limit:	10 ppm
Operating temperature:	0 - 40 °C (32-104°F) (No temperature correction is necessary.)
Aspirating Pump:	Model AP-20, AP-20S, AP-1 or AP-1S

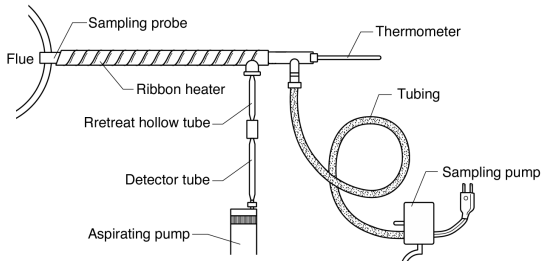
### ▲ CAUTION

1. DETECTOR TUBE CONTAINS REAGENTS.
2. DO NOT DIRECTLY TOUCH THESE REAGENTS 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, AP-1 OR AP-1S. OTHERWISE, CONSIDERABLE ERROR IN INDICATION MAY OCCUR.
2. DO NOT USE FLOW CONTROL ORIFICE WITH THIS TUBE. (FOR MORE DETAIL, REFER TO THE INSTRUCTIONS OF THE ASPIRATING PUMP.)
3. BEFORE TESTING, CHECK THE ASPIRATING PUMP FOR LEAKS (REF. ITEM 8). ANY PUMPS SHOWING SIGNS OF LEAKAGE SHOULD BE CORRECTED BEFORE USE.
4. DON'T USE THIS TUBE OUTSIDE THE STATED OPERATING TEMPERATURE RANGE.
5. 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.
6. PRIOR TO USE, CAREFULLY READ ITEM 9 "USER RESPONSIBILITY".

## 2. SAMPLING AND MEASUREMENT:



1. Attach a proper sampling apparatus (refer to figure above) to flue stack.
2. To prevent absorption of SO<sub>2</sub> by condensed water, keep the sampling probe at temperature above 248°F (120 °C)
3. before sampling thoroughly, purge flue gas into the sampling probe.

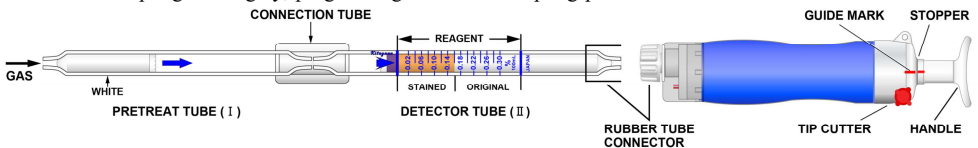


Fig.1

- ① Break both ends of detector tube and pretreat tube, and connect each end of the detector tube and pretreat tube with rubber tube connector as shown in Fig.1.

**⚠ 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 1 minute 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 On completion of sampling, read the scale at the maximum point of the stained layer

**SPECIAL NOTE:** I. The scale is calibrated at 20 °C (68°F) and 1013hPa. Readings obtained in other circumstances should be corrected (REF. ITEM 3).

II. When the maximum point of the stained layer is unclear or slanted, read the scale in the middle between the longest and shortest points.

### 3. CORRECTION FOR AMBIENT CONDITIONS:

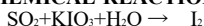
- ① Temperature; No corrections are necessary.
- ② Humidity; No corrections are necessary.
- ③ Atmospheric Pressure ;

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

### 4. INTERFERENCE:

Coexistence of more than 100 ppm of Hydrogen Sulphide will give higher readings.

### 5. CHEMICAL REACTION IN THE DETECTOR TUBE:



### 6. DISPOSAL OF TUBE:

**USED TUBES SHOULD BE DISCARDED OF CAREFULLY ACCORDING TO ANY RELEVANT REGULATIONS.**

### 7. HAZARDOUS AND DANGEROUS PROPERTIES OF SULPHUR DIOXIDE:

TLV. ◆ : 0.25 ppm

Explosive range in air : —

◆ Threshold Limit Value established by American Conference of Governmental Industrial Hygienists 2023.

### 8. 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 3 minutes.
- 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.

### 9. 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, AP-1 or AP-1S 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 Distributor shall not be otherwise liable for any incorrect measurement or any damages, whether damages result from negligence or otherwise.**