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INSTRUCTION MANUAL  
**FLUE GAS SAMPLER**

MODEL P-10FG

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NEVER FAIL TO READ THIS INSTRUCTION MANUAL FOR CORRECT USE

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## **Foreword**

Thank you very much for purchasing MODEL P-10FG FLUE GAS SAMPLER. This system is for analysis of flue gas like Nitrogen oxides, Sulphur dioxide, Oxygen, and so on, and quite available for prevention of pollution easily and quickly. This system consists of Sampling probe, Electric sampling pump, Model AP-20 Aspirating pump, and so on. For safe and correct use, read carefully this instruction manual and that of each pump and detector tubes prior to use. Ensure that this instruction manual is stored in a convenient location so that you can refer at any time. Never use the MODEL P-10FG FLUE GAS SAMPLER for any purpose other than stated above.

**The Model P-10FG does not contain gas detector tubes.  
Please purchase each gas detector tube for measurement.**

## **Range of warranty**

- ① The period of warranty for this product is one year from the date of delivery.
- ② Defects caused by faults in manufacturing within the period of warranty will be replaced (except articles for consumption) or repaired free of charge.
- ③ Contact with our dealer if any defect occurred within the period of warranty.
- ④ Invoices will be issued for the actual expenses of repairs or replacement parts even if within the period of warranty in the following cases :
  - \* Faults caused by purpose of application or methods of usage other than stipulated in this manual.
  - \* Faults caused by the device having taken apart, remodeled or repaired by people other than our dealer.
  - \* Faults caused by disasters or accidents unable to avoid by manufacturer.
  - \* Replacement of articles for consumption.
- ⑤ 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 Model AP-20 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 of each detector tube instruction manual.

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.

### **Safety precautions**

For the purpose of using this instrument correctly or preventing unexpected danger to operators and other personnel, and damage to assets, this instruction manual explains procedures with notations of which meanings are interpreted below.

#### **⚠ Caution**

This indicates that failure to observe the contents of the item or mistaken use may result in possibility of injury to personnel or damage to property.

#### **⚠ Caution for safety**

- ① Please use protection gloves when you use P-10FG, because Sampling probe, Ribbon heater, and so on, are heated.
- ② Safety Glasses and gloves should be worn to prevent injury from splintering glass.
- ③ The detector tube contains chemical reagents. Do not touch these reagents directly once tubes were broken.
- ④ Keep the P-10FG, accessories and detector tubes out of the reach of children.

#### **⚠ Caution for use**

- ① Before testing, check the sampling pump or aspirating pump for leaks. Any pumps showing sign of leakage should be corrected before use.
- ② Do not leave detector tubes at the place of high temperature or direct sunlight. That may cause deterioration of reagent, so store tubes in a cool and dark or refrigerated place. (Storing procedure of each tube is written in the instruction manual.)
- ③ Use the detector tube before expiration date printed on the top of the box.
- ④ Read the concentration immediately after measurement.
- ⑤ Detector tubes may possibly produce similar discolouration against other substances (coexistence gases, etc.) than objective substances, or affect indication.
- ⑥ Used tubes should be disposed carefully according to relevant regulations, if any.
- ⑦ In case that amount of water vapour in the flue gas is very small, heat-up of the sampling probe by the ribbon heater is not necessary.
- ⑧ In case that amount of water vapour is very much, condensed water is stayed in the drain trap "7"(See page 7) of the electric sampling pump kit. After the measurement, pour out the condensed water from the drain trap. The drain trap can be taken out from the electric sampling kit by turning it counter clockwise.
- ⑨ Replace charcoal in the charcoal filter "8"(See page 7) of the electric sampling pump kit with new one after the operating time of the pump becomes to approximately 100 hours. (Please use attached seal tape for exchange to prevent a leak in Electric sampling pump kit.)

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### 1. Composition

- (1) Sampling probe (3 - pipe serial connection)  
Inner diameter        9.5 mm  
Outer diameter       14.0 mm  
Length                980.0 mm (as 3 - pipe connection)
- (2) Electric sampling pump kit  
Sampling: Diaphragm method  
Flow rate: 3 L / min. or more (as non-load)  
Power source: AC220V, 50/60 Hz
- (3) Connection tube (Rubber)  
Inner diameter        : 6 mm  
Outer diameter       : 9~10 mm  
Length                : 1.5 m
- (4) Aspirating pump (Model AP-20)
- (5) Ribbon heater  
Power source         : AC220V, 50W
- (6) Thermometer (for 0~300°C) with an attached tube
- (7) Carrying case (made of Aluminum)  
Dimensions           : 450×300×110 mm
- (8) Other standard accessories  
Tweezers  
Seal tape  
Lubricant and rubber tube connector  
D/T (detector tube) connection tube  
Glass wool  
Gauze

## 2. Sampling and Measurement

### 2.1 Preparation

#### (1) Connect the sampling probe.

In accordance with the length of the flue, A-B-C or A-C connection is available. (See Fig. 1)

Note that the top of the sampling probe should be positioned in the centre of the flue.

Length of A-B-C : 980 mm

Length of A-C : 660 mm

Glass wool is attached inside the 2nd part of "A" pipe. In case that much soot is included in the flue gas, it is recommended to replace the glass wool with new one earlier than plugging is occurred. (Please use attached tweezers to change the glass wool.)

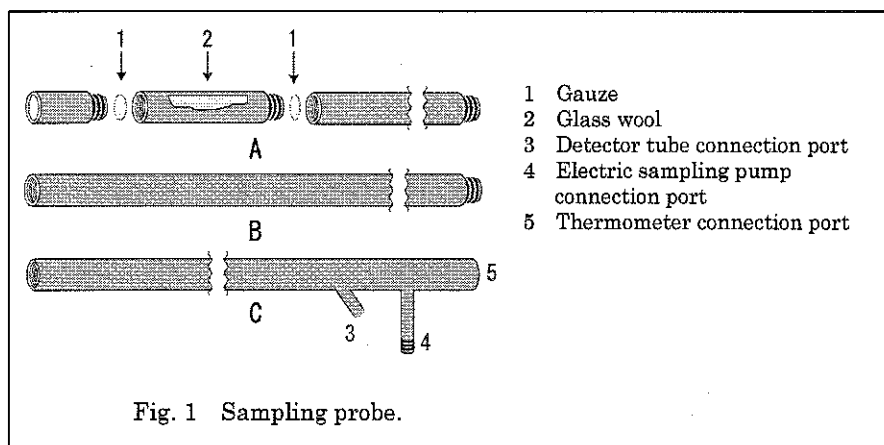


Fig. 1 Sampling probe.

#### (2) Attach the thermometer.

Confirm that an attached tube is provided on the thermometer and attach them into the part "5" of Pipe "C" on the sampling probe. (See Fig. 2)

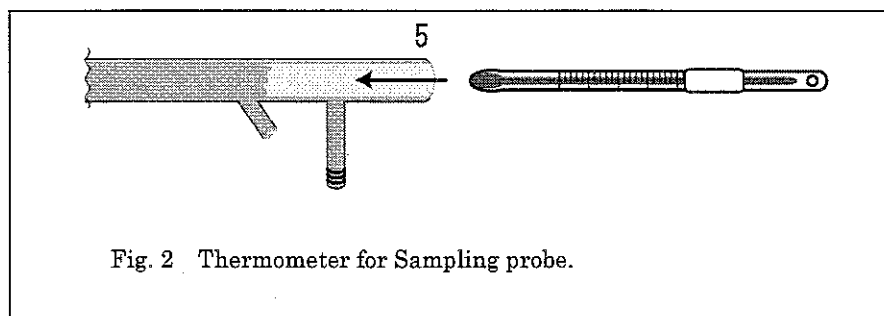


Fig. 2 Thermometer for Sampling probe.

#### (3) Set the sampling probe into the flue

Set the sampling probe into the flue as the top of the sampling probe is positioned at the centre of the flue.

#### (4) Heat up the sampling probe by the ribbon heater.

Wrap a ribbon heater around on a part of the sampling probe appeared outside the flue. Heat up the part of the sampling probe with the ribbon heater. The ribbon heater is of AC220V operation.

#### (5) Draw the flue gas.

Connect the part "4" of Pipe "C" on the sampling probe (See Fig.1) to the part "6" of the Electric sampling pump kit (See Fig. 3) by using the connection tube, and connect an unopened detector tube through the D/T connection tube onto the part "3" of Pipe "C" on the sampling probe (See Fig. 1). Switch "ON" the power of the Electric sampling pump kit.

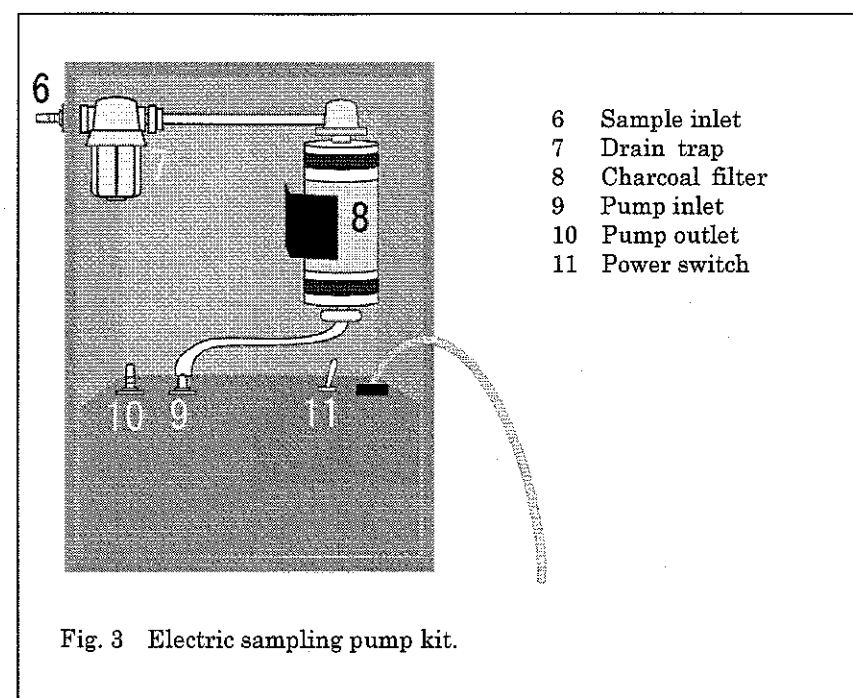


Fig. 3 Electric sampling pump kit.

#### (6) Start the measurement after the temperature becomes over 120°C

In order to prevent absorption of gas in condensed water, wait until the indication of the thermometer becomes over 120°C, then start the measurement.

## 2.2 Measurement

- (1) Break both ends of a new detector tube.  
(Open a detector tube.)
- (2) Remove the unopened detector tube from "3" of Pipe "C" on the sampling probe. Insert the opened detector tube end securely according to the direction of the printed arrow mark into the rubber tube connector of the AP-20 and connect the other tube end through the D/T connection tube onto the "3". (See "Caution for safety")
- (3) Details of the operation should be referred to each instruction manual of gas detector tubes.

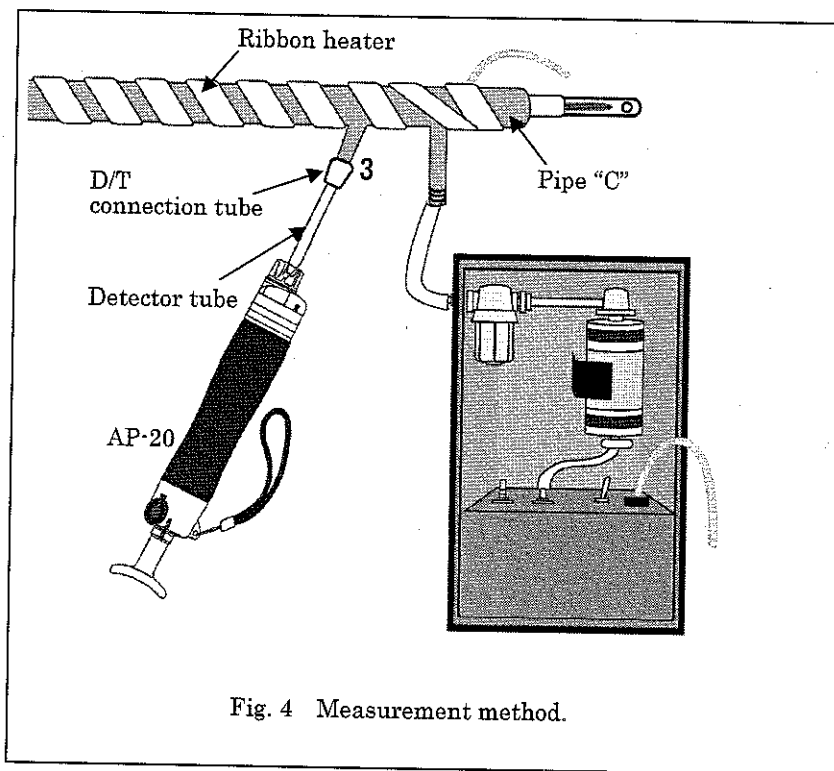


Fig. 4 Measurement method.

## 3. Disposal of product

This product (Model P-10FG) must be treated as industrial waste for disposal purposes. Used tubes should be disposed carefully according to relevant regulations, if any.

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