SUPER ORITECTOR®

SUPER ORITECTOR® is able to determine minute quantities of residual hydrogen peroxide in food rapidly and selectively by using a sensitive oxygen electrode method.

Feature:

1. Small amount of hydroxy peroxide can be measured to the level of 0.01ppm in liquid /0.1ppm in solid.

2. It takes only about 10 minutes (liquid) or about 20 minutes (solid) including preparation time. 'Comparing with taking 3 hours by conventional improved a 4-aminoantipyrine (4-AA) colorimetric method'

3. Preparation of material is simple (Not necessary for milk). Muddiness and color will not effect the result.

4. It selectively detects hydroxy peroxide.

5. The measured value is displayed in digit for simple reading.

6. It can be easily handled with guidance indicator.

7. No recorder necessary as the data can be printed out by a printer.

Main Purpose:

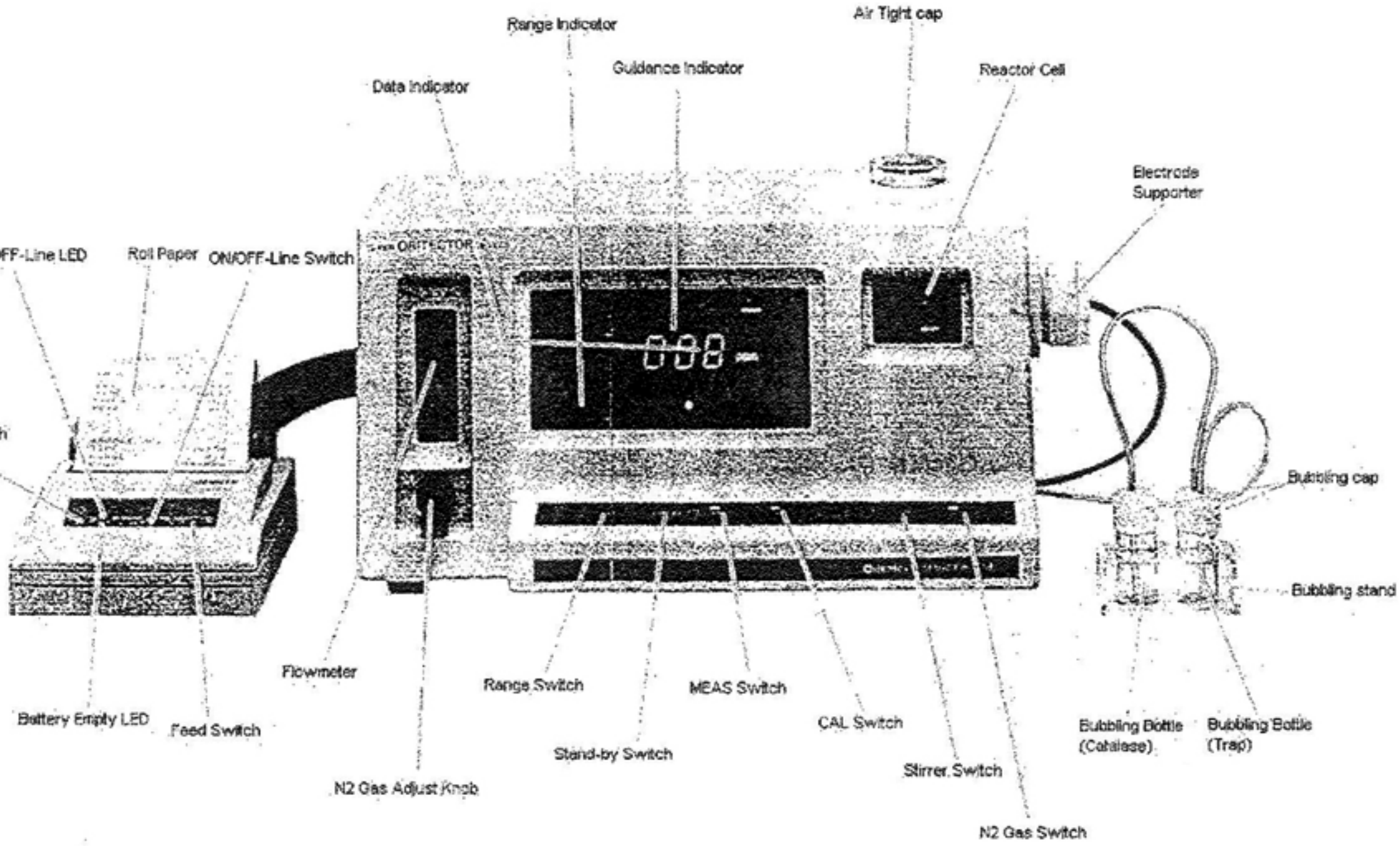
- To check residual hydroxy peroxide in food
- Sanitary control of Packing materials

Specs:

‡OXYGEN ELECTRODE	Polarograph type film oxygen electrode
REACTOR CELL CAPACITY	about 2.0ml
DATA INDICATOR	indicate data in three digit
RECORDER OUTPUT	0 – 100mV
THERMO CONTROL	thermoconsistent water cycle
POWER SOURCE	AC 100V 50/60Hz
MACHINE SIZE	300 x 190 x 163
MACHINE WEIGHT	about 3.5kg

Standard Attachments:

‡CATALASE	1	50ml
‡ANTIFOAMING SILICONE	1	15ml
‡MICROSYRINGE	1	MS-50(Itoh Co.)
‡BUBBLING BOTTLE	2	
‡BUBBLING CAP	2	cut pipe attached
‡BUBBLING TABLE	1	acryl
‡SCEPTAM	2	silicone rubber
PLASTIC TUBE	1	2.0mm x 3.0mm 30cm
PLASTIC TUBE	2	3.0mm x 5.0mm 1m
POLY PIPETTE	2	5ml
TUBE CONNECTOR	1	polypropylene
‡STIRRING BAR	2	10mm acryl
‡FILM	1	1 mil, 10 sheets
‡ELECTROLYTE FOR POLARO	2	50ml
‡O RING	1	nitryl rubber S8 x 2, P8 x 2
‡POLISHER	2	50g
‡MACHINE COVER	1	


Range Indicator
Air Tight cap
Guidance Indicator
Data Indicator
Reactor Cell
Electrode Supporter
ON/OFF-Line LED
Roll Paper
ON/OFF-Line Switch
Power Switch
Bubbling cap
Bubbling stand
Flowmeter
Range Switch
MEAS Switch
CAL Switch
Battery Empty LED
Feed Switch
Stand-by Switch
Stirrer Switch
Bubbling Bottle (Catalase)
Bubbling Bottle (Trap)
N2 Gas Adjust Knob
N2 Gas Switch

1. ELECTRODE SETTING

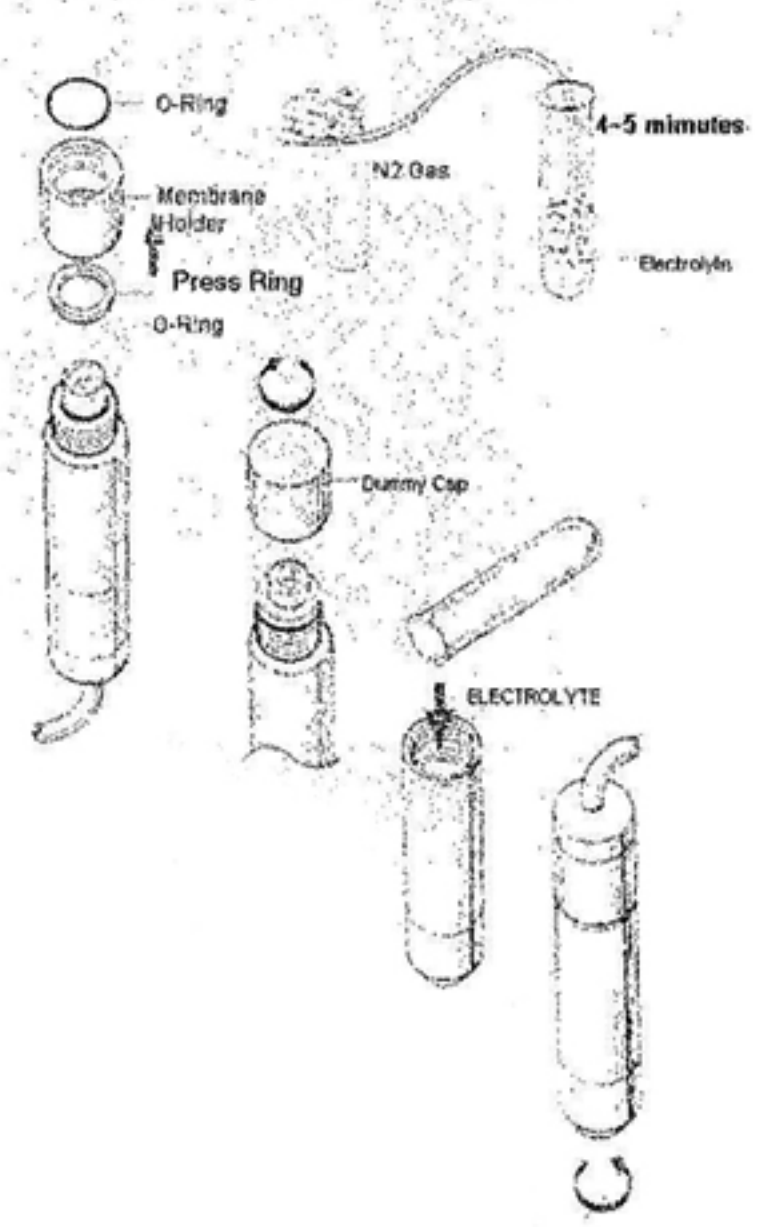
◆FILLING ELECTRODE

Pour about 5ml of electrolyte into test tube and put N_2 gas through for 4 to 5 minutes, purging dissolved oxygen in the electrolyte.

(1) Remove O ring and separation film holder. Also remove press ring and take used film away.

(2) Screw the dummy cap on to avoid leaking out the electrolyte.

(3) Screw the dummy cathode holder off in the direction of the arrow.



(4) Pour the electrolyte into the electrolyte tube to fill.

(5) Screw on the cathode holder lightly.

◆EQUIPPING SEPARATION FILM

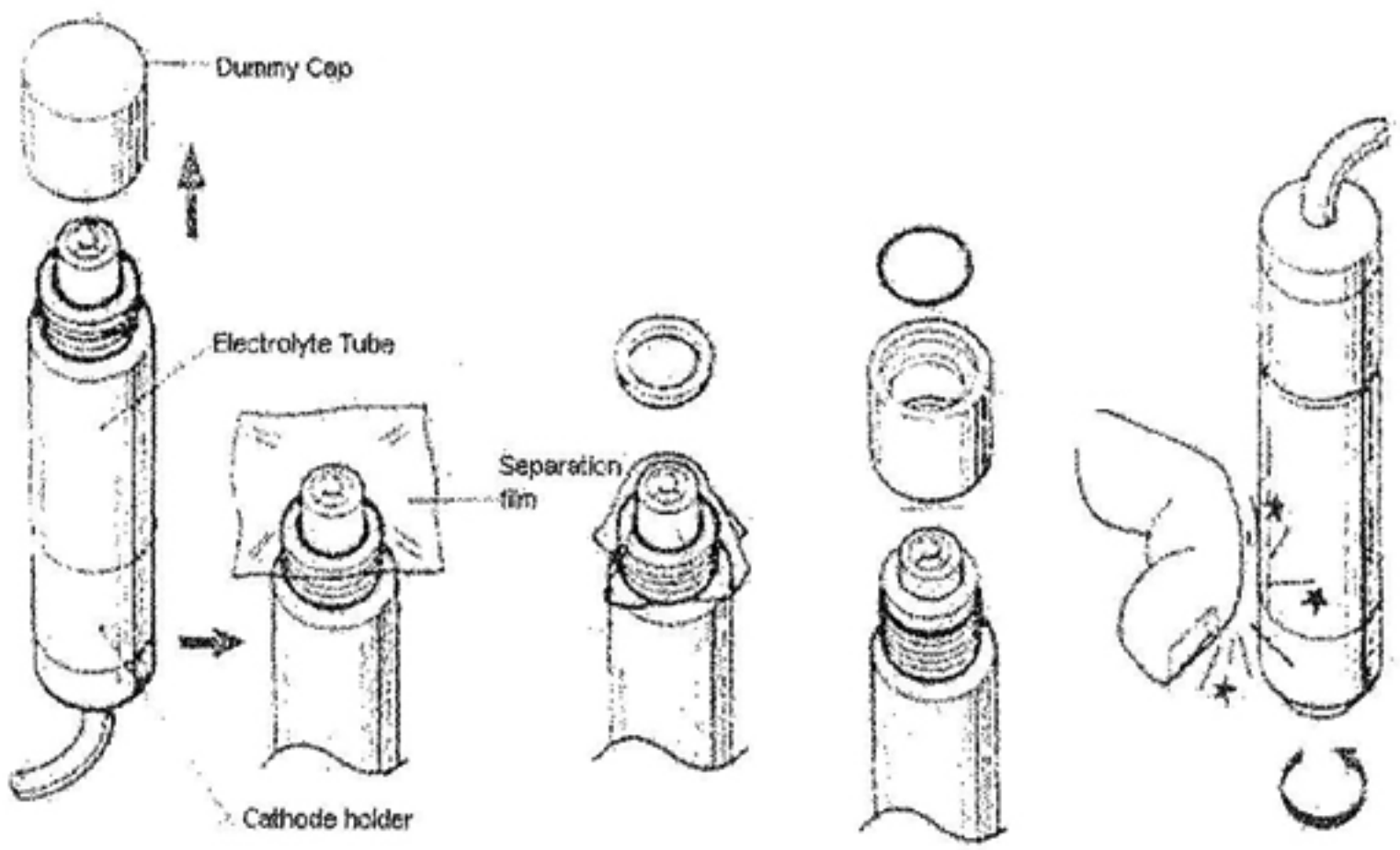
(1) Remove the dummy cap. Wipe off the drop of electrolyte that adheres to the end of the electrolyte tube, carefully with a paper etc. not to touch the cathode.

(2) Spread a suitable size (cut into about 35mm x 30mm) of separation film carefully over the end of electrode without any wrinkle or crumpling.

(3) Put the press ring to hold. Screw on the separation film holder and fix with the O ring.

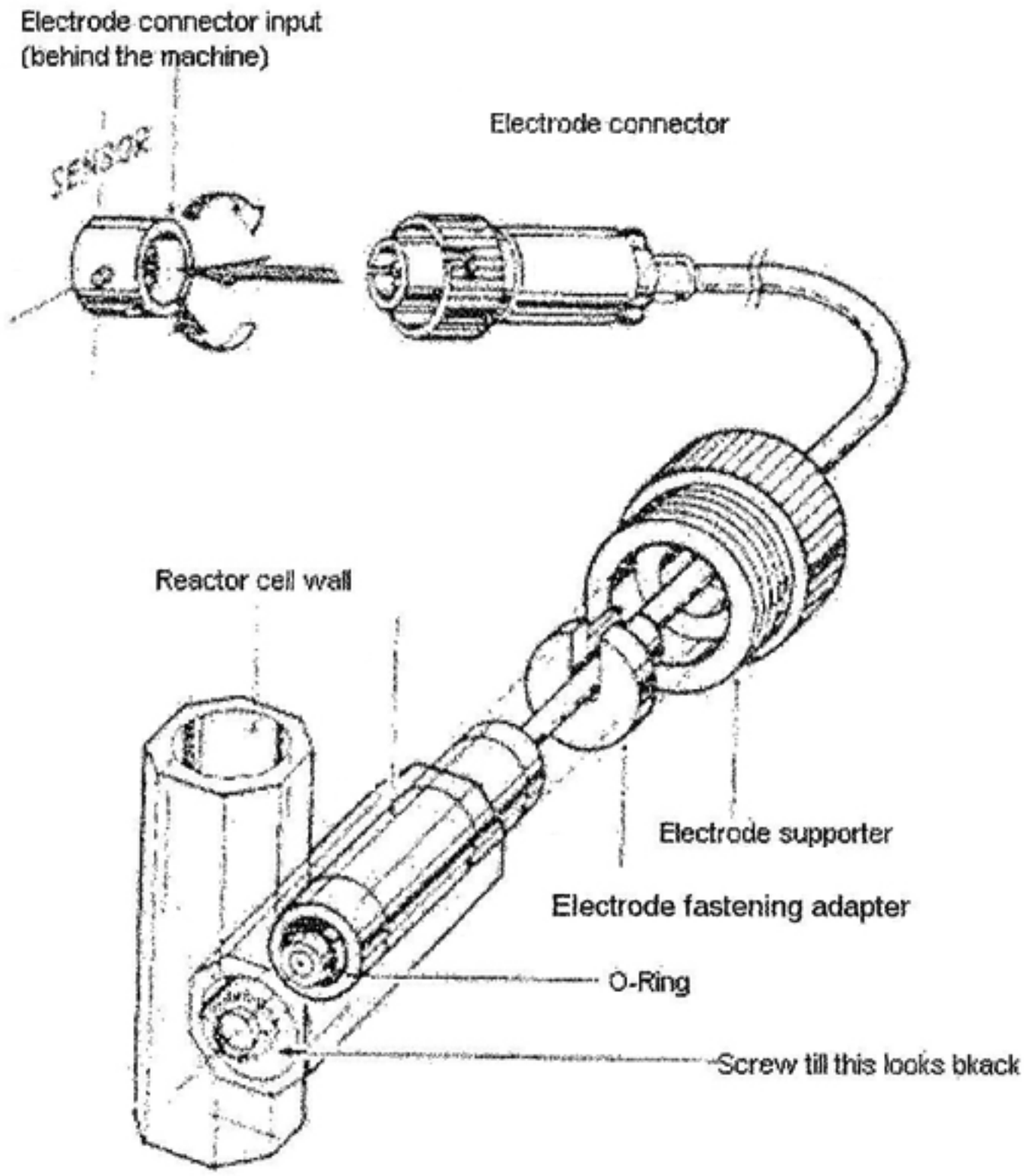
(4) Let the electrode end be the bottom and flipping the tube lightly to remove bubbles that adheres to the end of the cathode, screw on the holder.

☆PLEASE CHECK TO BE SURE THE FILM IS FREE FROM ANY WRINKLE OR BREAK.



◆SETTING INTO REACTOR CELL

(1) Attach the electrode supporter and the electrode fixing adapter so as the O ring stucks so tight on the reactor cell wall that it looks black.



◆RENEWING ELECTROLYTE AND SEPARATION FILM

(1) It is recommended to renew the electrolyte solution and the separation film about once a week or a couple of.

2. WARMING UP THE MACHINE

(1) Fill water in the tub, catalase in the bubbling bottle. Switch on each equipment.

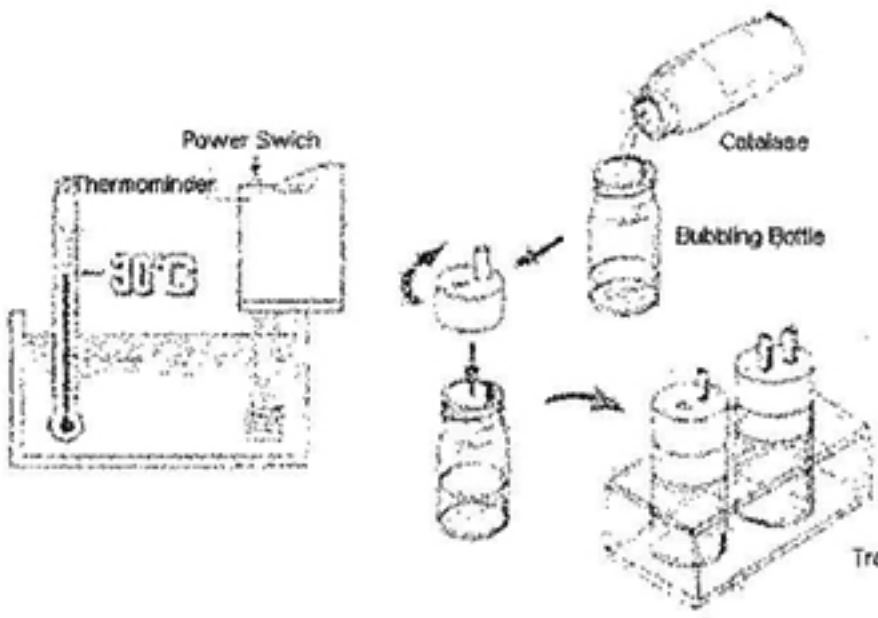
(2) Wait 20 minutes to complete warming up. Time is shown on the data indication.

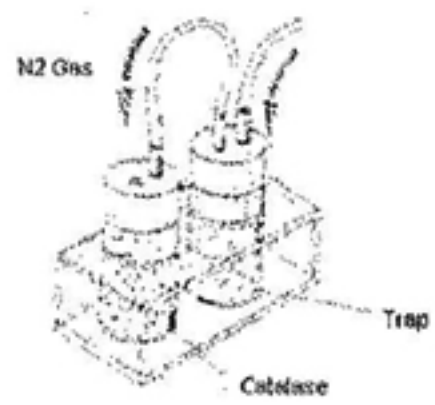
☆SET THE THERMOMINDER TEMPERATURE AT 30℃

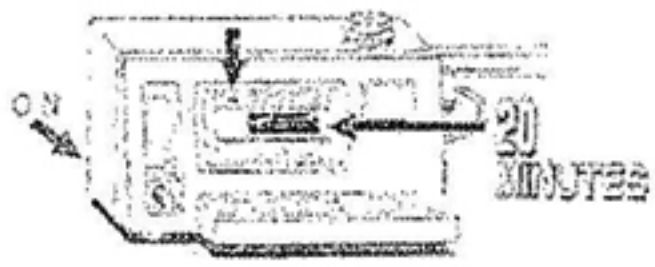
(3) Adjustment of N_2 gas flow
Fill distilled water into reactor cell and seal airtight put N_2 gas through adjustment the flowmeter to indicate 75(ml/min) with adjusting knob.

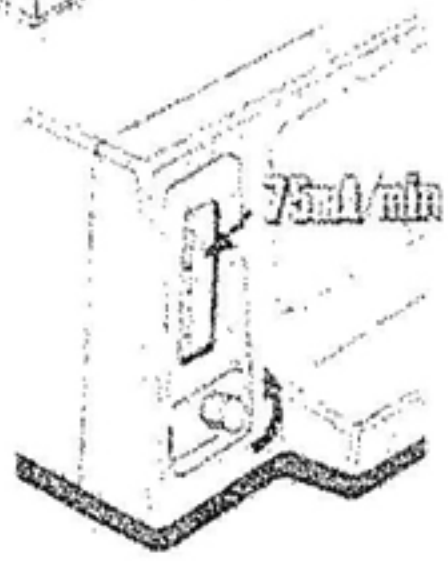
(4) Nitrogen exposure of catalase
Check that catalase is exposed to N_2 gas.

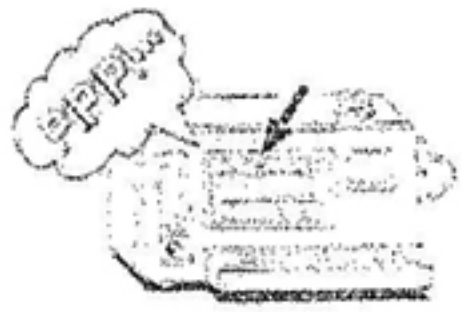
(5) When warming up is completed, "WARM-UP" LED at guidance indicator goes off, with sound 'pee-pee-pee'.
Upon "STAND-BY" LED turns on, measurement can be started.











3. PREPARATION OF MEASUREMENT

◆PREPARATION OF EXTRACT SOLUTION

(1) Dissolve KH_2PO_4 10.20g, $NaHPO_4$, $12H_2O$ 44.8g $KBrO_3$ 5.0g in 1litter of distilled water.

(2) Chilling on ice, expose the solution to N_2 gas for 1 hour or more before use.

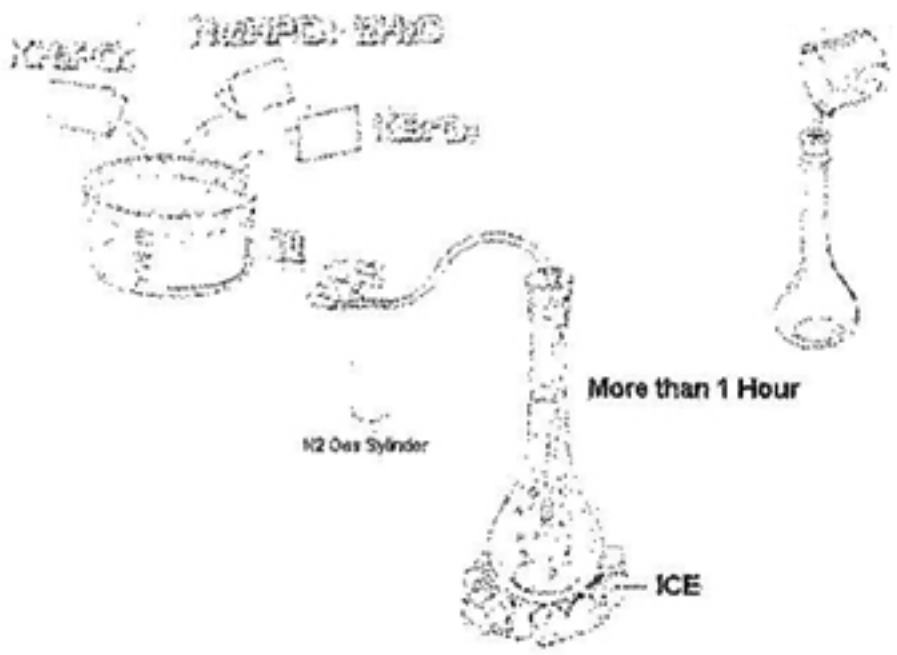
◆PREPARATION OF STANDARD SOLUTION

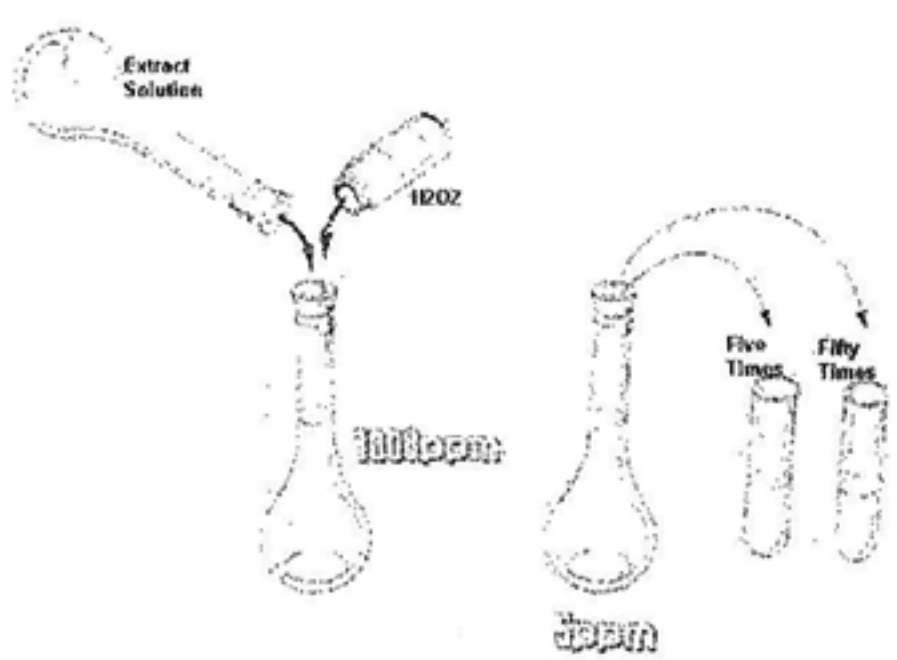
(1) Dilute H_2O_2 (30% Special grade) to 300 times or 1,000ppm with the extract solution. This solution can be kept in cool and dark place.

(2) Dilute above (1) to 200 times or 5ppm with the extract solution. This is 5ppm standard solution.

(3) Dilute 5ppm standard solution to 5 times, 50 times each with the extract solution. This is 1ppm, 0.1ppm solution respectively.

Note: This H_2O_2 solution is easily decomposed. Above (2), (3) is for use within the date only when it is kept refrigerated or chilled on ice.





◆PREPARATION OF MATERIAL

Note: Prepare material just before starting analysis. Never leave it in room temperature. In case it is forced to be kept for a while, be sure to keep it refrigerated or chilled on ice.

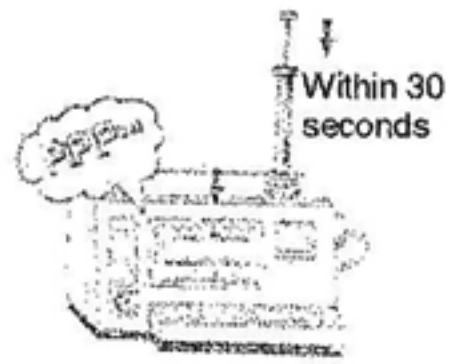
(1) Liquid material
Measure as it is.

(2) Alcoholic drink
Alcohol inhibits the reaction. Dilute the alcoholic material with the extract solution so that alcohol density is less than 0.3%.

(3) Solid material
Take about 5g of the material in a homogenizing cup and add about 40ml of the extract solution.
Stir by homogenizer for 3minutes, keeping the homogenizing cup iced so that the material is broken up.
Upon the material is broken, remove bubbles adding small amount of antifoaming oil. Washing the cup and blender with small amount of the extract solution, make the solution 50ml, and then filter it through filter paper (5-A).
This is the testing material. (Keep iced while filtration and pour out the filtrate 5ml at beginning.)

4. ADVICE ON THE MEASUREMENT

(1) Measure the standard solution and the material accurately when hole pipette is used.

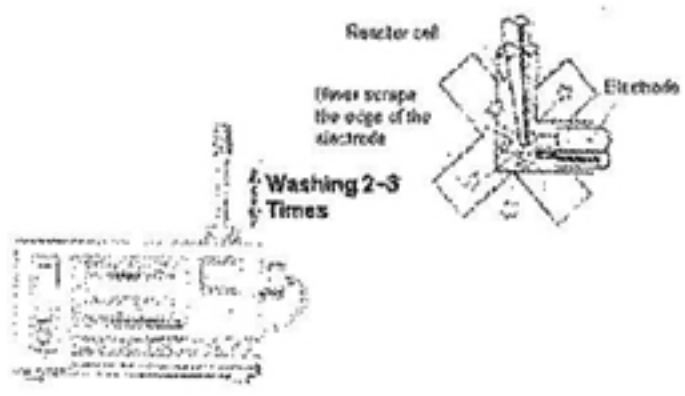


(2) Pour catalase into the machine gradually but within 30 seconds upon LED starts flashing on and off.

Note: Before catalse is poured into remove bubbles on stirring bar by turning the stirrer switch on.
Keep the reactor cell clean according to the following maintenance term, as it becomes hard to remove bubbles as the reactor cell get dirty.

(3) Reactor cell cleaning; Pour water (distilled water) twice or three times into the reactor cell and out. Be careful not to scrape the electrode head by plastic pipette.

Note: Any residue of the material of previous Measurement will effect the result.
Be sure that cleaning is sufficiently done.



(4) Be sure that the sceptam is attached to the airtight cap. When the sceptam get old and N_2 gas should leak out, Change it with a new one.

(5) In case of measuring the materials which easily foams (like milk), Drop the antifoaming silicone into the cell before the material is Poured into. (Be careful not to drop too much, applying the top Of a toothpick or something.)

(6) In case the measurement is not executed accurately, an error code and the comment shall be indicated at the data indicator and printed out during the measurement or afterward.

5. ADJUSTMENT AND MEASURING OPERATION

(1) Wash the reactor cell twice to three times with cleaning (distilled) water.

(2) Push the RANGE switch on and determine the measurement range.

NOTE: The range indicator makes following cycle change once a push.
10 → 1 → 0.1 → 10...

(3) Measure the standard solution 2ml with a hole pipette, pour it into the machine and cap airtight.

(4) Push the CAL switch. (Data indicator shows the output of the electrode.)

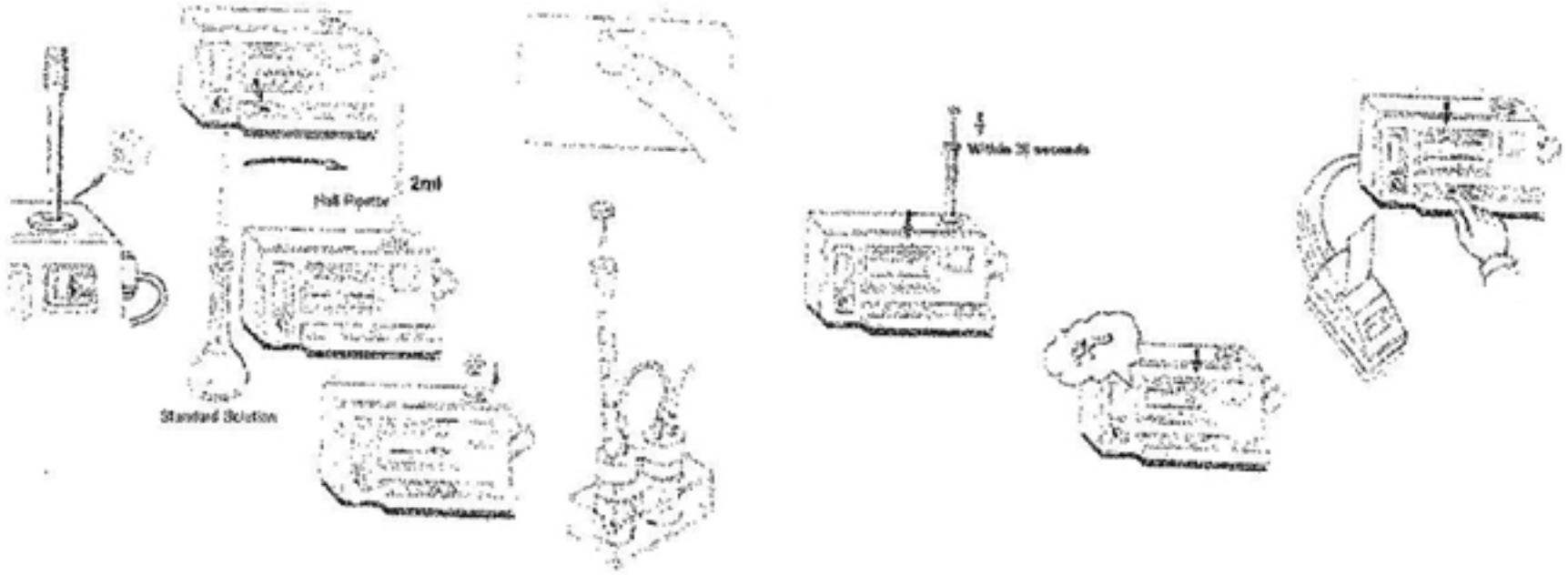
(5) Measure 20μl of catalase aside by micro syringe.

(6) Wait a white until the machine stabilizes and catalase LED turns on and off with sound 'Pee-Pee-Pee'. Then thrust the micro syringe through the sceptam and inject the catalase, never opening the airtight cap.

(7) After a while (about 30 seconds), 'END' LED turns on with sound 'Peee'. Then data indicator shows the figure of the standard solution at the range selected.

Range	10	1	0.1
Standard	5	1	0.1

(8) Push STAND-BY switch on. 'STAND-BY' LED turns on and the data indicator shows electrode output. In case a printer is equipped, adjustment data is printed out.



●MEASURING OPERATION

Make the adjustment at suitable range Prior to the measurement. The measuring operation is basically the same. The followings are the different points.

(1) Same as above

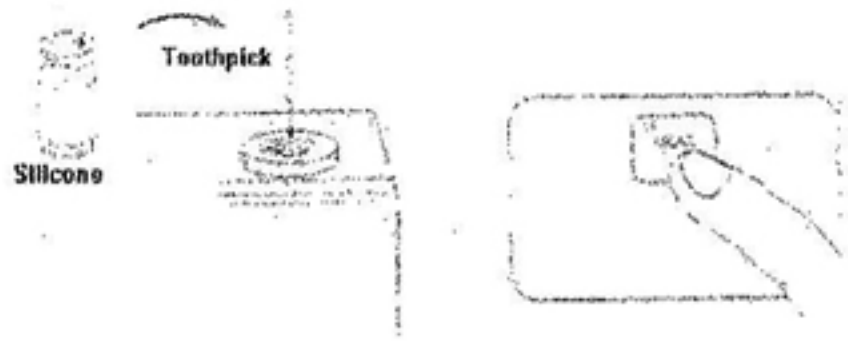
(2) Drop the antiforming oil into the cell in case the material easily foams.

(3) Same as above

(4) Push 'MEAS' switch on. (The data indicator shows electrode output.)

(5) ~(8) Same as above

(9) Push 'MEAS' switch with pushing 'STAND-BY' switch. Then the data history is printed out.



6. AFTER THE MEASUREMENT IS DONE

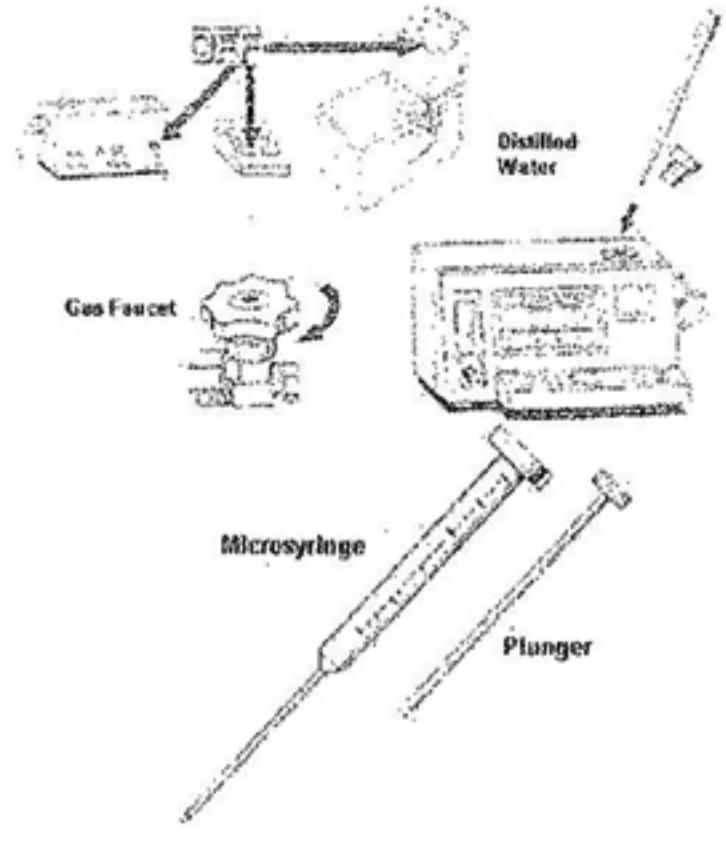
(1) Turn off the power of the machine, the thermominder and printer.

(2) Turn the N_2 gas faucet off.

(3) Fill distilled water in the reactor cell and keep it capped airtight.

Note: Be careful not to dry the electrode separation film. If it is not expected to use soon, keep it according to the electrode maintenance term.

(4) Keep the micro syringe and the holl pipette after cleaning well.



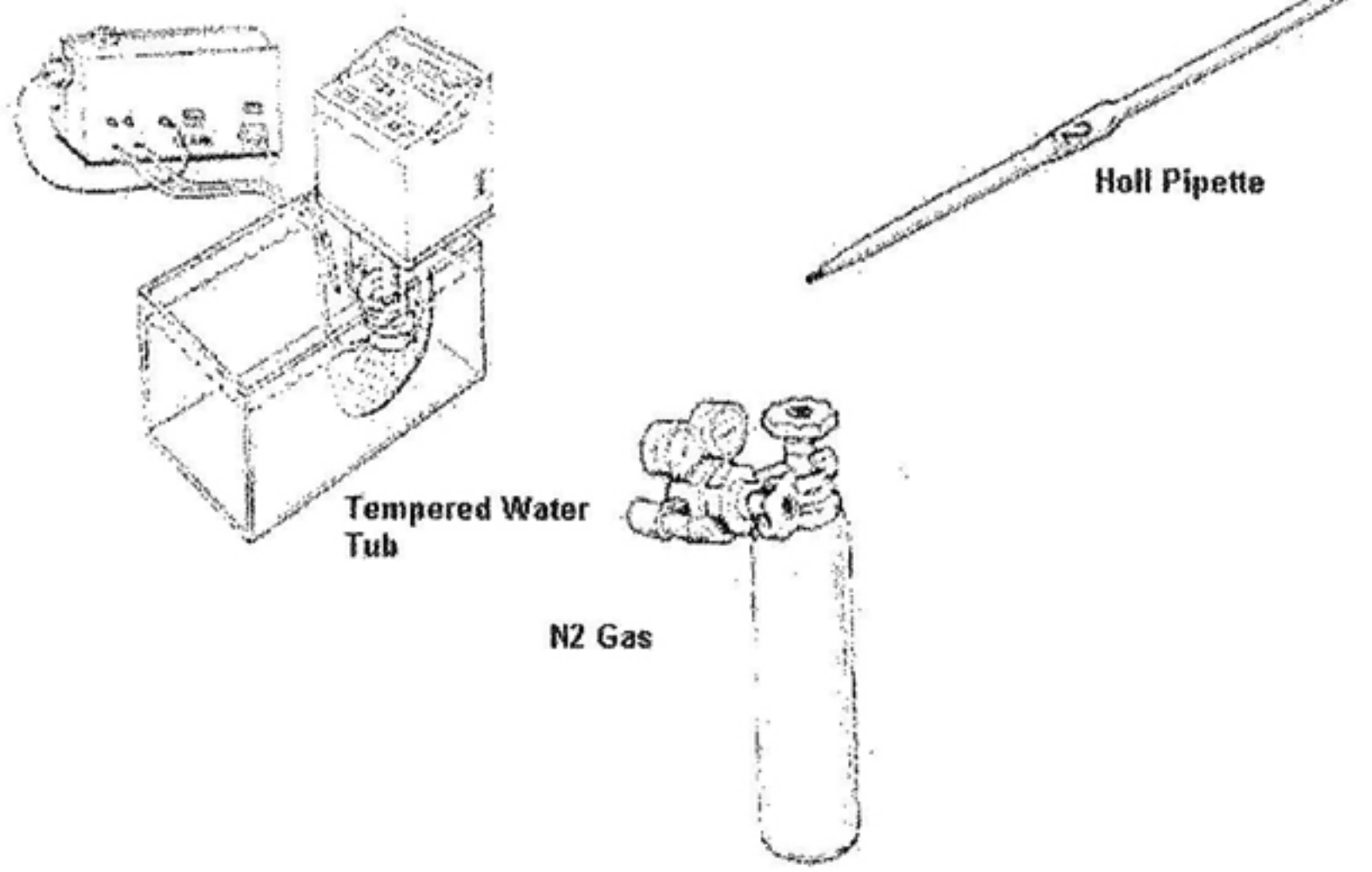
◆Items necessary for the measurement

Following equipment is necessary for the measurement additionally to the standard equipment.

☆Water tub
Used to keep the temperature of the reactor at the same level.
Prepare what is able to set at 30℃ and supply the tempered water out of it.

☆N_2 gas
Used to purge dissolved oxygen in the material. Prepare what is min. 99.9% purity and the supplying pressure is about 1kg/cm².

☆Holl pipette: 2ml



ERROR Message & Trouble Shooting

This instrument can indicate Alarm when it detected error of operation and measuring value.
Do refer to the following table and solve the problems.

Kinds and measures of alarm ◆ Indication of display
☆ Output to the printer

◆E 01
☆Nil
Electrode is not connected to main body.
Electrode output exceeds than range of normal level.
(Displayed when the error occurs)

Cause of Error	Solutions
Electrode can't output	
● Connector is not connected	Do confirm whether surely connected or not
● Mistake of assemble of the electrode	Do replace the membrane and electrolyte and re-assemble the electrode.
● Cable's being broken	Do replace the electrode.
● Degrade of the electrode	Do replace the electrode
Excessive input or little input	
● Degrade of the electrode	Do replace the electrode

◆E02
☆Nil
Calibration data is not recorded.
(Displayed when the error occurs)

Cause of Error	Solutions
Not doing the calibration by standard Solution at the range of measurement.	Do calibration.

◆E03

☆ Can't range up

The value doesn't fit into the selected range.

Cause	Solution
Electrode output and or Oxygen level is not down till to selected level. ● Flow rate of N2 gas isn't adequate. ● Spinning of Stirrer isn't enough. ● Degrade of the electrode	 Do adjust the flow rate of N2 Gas. Please contact us. Do Replace the electrode

◆E04

☆ ERROR 4 can not start

Output of electrode is not stable.

Cause	Solution
● Bubble is mixing with the reaction cell.	Do confirm the reaction cell before pouring the catalase, whether the bubbles are mixed in the cell or not.
● Warming up of electrode is not enough.	Do measure, after making a reaction cell to empty by blowing N2 gas for 10 minutes.
● Mistake of assemble of the electrode	Do replace the membrane and electrolyte. After exchange, always do a warm-up according to the manual.
● Impropriety of the spinning by the effect of magnetic force decline of the stirrer.	Do replace the stirrer
● The sample is containing interference materials.	Please check by standard solution.

◆E05

☆ERROR 5　Less than the measuring limit

After pouring catalase, reaction is less than the measuring limit.

Cause	Solution
● Density of H2O2 is less than 0.01ppm. ● Degrade of catalase	Normal. But can not trust the measuring value. Do replace the catalase

◆E06

☆ERROR6 Less than the detecting limit

Cause	Solution
● H2O2 is not contained in the sample ● Forgetting to add catalase. ● Degrade of catalase	No problem Do measure again. Do replace the catalase

◆E07

☆ERROR7　Over Range

Measuring value is too large.

Cause	Solution
● Selected range is improper. ● Density of the sample is too high.	Do set the measuring range again. Do dilute the sample or change the measuring range.

◆E08

☆ Can not calibration

Calibration value is not normal

Cause	Solution
Can not gain the normal output (Peak) ● Mistake of the making of standard solution ● Error of the electrode ● Degrade of the electrode	 Do make standard solution again. Do replace electrolyte and membrane again Do maintenance regularly according to manual. Do replace the electrode

◆E09

☆ ERROR9 Abnormality of the catalase

After pouring catalase, reaction is abnormal.

Cause	Solution
● Aeration of N2 gas in the catalase is not enough. ● Degrade of catalase ● Spinning of Stirrer isn't enough. ● The viscosity of sample is too high.	Do aeration of the catalase. Do replace the catalase Please contact us. Do dilute the sample by extraction solution.

*If sample is containing interference materials, same symptom is often happened.

NOTE

If you have any questions, please feel free to contact us.