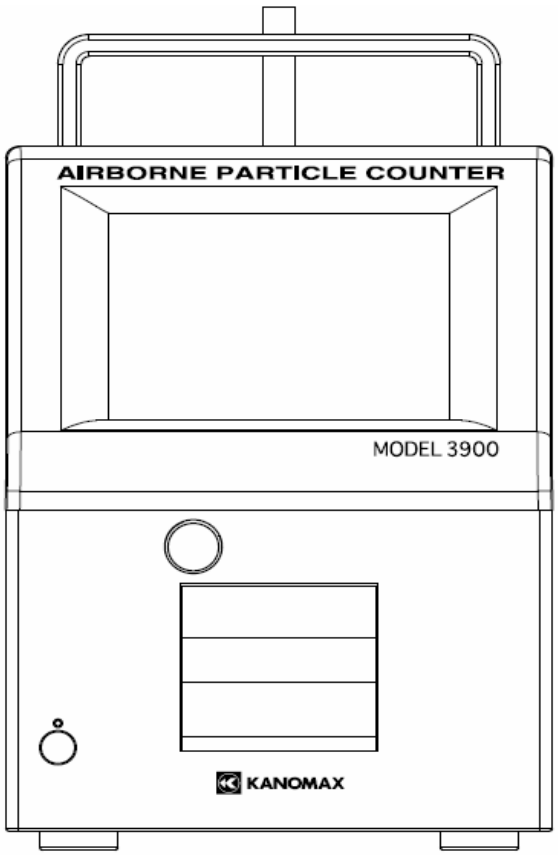
KANOMAX

Airborne Particle Counter

MODEL 3900

Operation Manual



Please read this operation manual carefully and
understand the warnings described within
before operating this instrument.
Keep this manual handy for future reference.

03001
08.09

Component List

■ Standard

ITEM	MODEL	QTY
Main Unit	3900	1
Power Cord (with NEMA plug)	-	1
Standard Inlet	3900-06	1
Isokinetic Suction Probe	3900-07	1
Zero Filter	3900-04	1
Tygon Tube (2M)	-	1
Printer Paper (Dust Free Paper)	3900-05	2
Measurement Software	-	1
Operation Manual	-	1
Test Certificate	-	1
Fuse	0217002.MXP	2
CF Card – 512MB (installed in the instrument)	-	1

* Make sure to use the designated fuse specified below for proper operation.
  Manufacturer: Littlefuse
  Model Name: 0217002.MXP

■ Optional Extras

ITEM	MODEL	QTY
Carrying Case	3900-21	1
Lithium-ion Battery	BSA2-06	1
Battery Charger	BSA2-10	1
Air Velocity Probe	0843	1
Temperature and Humidity Probe	0844	1
Differential Pressure Sensor	C264 0-100Pa	1
Differential Pressure Sensor Cable	3900-02	1
Contact Output Cable	3900-03	1

Important Safety Information

In this manual, warning types and classifications are defined as follows.

[Classification]

WARNING: To Prevent Serious Injury or Death

Indicates a potentially hazardous situation which, if not avoided, may result in serious injury or death.

CAUTION: To Prevent Damage to the Product

Indicates a potentially hazardous situation which, if not avoided, may result in damage to the product that may void the product warranty.

[Description of Symbols]

△ Indicates the condition (including danger) that requires caution. The subject of each caution is illustrated inside the triangle (e.g., the symbol shown on the left is high temperature caution).

⃠ Indicates prohibition. Do not take the prohibited action shown inside or near this symbol (e.g., the symbol shown on the left prohibits disassembly.)

- Indicates a mandatory action. A specific action is given near the symbol.

⚠ WARNING

Do not modify/disassemble

¤ Do not disassemble, modify or repair the instrument.

…… A 3B laser diode is used as the optical source inside the instrument. Therefore, never attempt to disassemble the instrument as it is extremely dangerous Also disassembling the unit may result in short circuit and malfunction.

Handle Properly

¤ Use the instrument properly by carefully following this operation manual.

…… Misuse of the instrument may result in electric shock, fire, damage to the instrument, etc.

¤ If any abnormal noise, unusual odor or smoke is emitted, or any liquid enters into the instrument, turn the power off immediately, remove the battery and disconnect the power cable.

…… It may result in electric shock, fire, or damage to the instrument. Return the instrument to your distributor or to your KANOMAX service center for repair.

Prohibited Installation

¤ Do not use this instrument in an ambient temperature above 40 °C.

…… The performance may deteriorate significantly.
Also, dielectric degradation may occur, which may result in short circuit or fire.

⚠ WARNING

¤ Unplug the power cord when the instrument is not in use.
…… Failure to observe the above may result in electric shock, fire or damage to internal circuitry.

¤ When using the AC adapter, ensure there is no dust on the adapter. The AC outlet used must be within the specified power requirement of 100 ~ 240V.
…… Failure to observe the above may result in fire.

¤ When using an AC adapter, only use the adapter specified for this instrument.
…… Other commercially available adapters may have different voltage specifications, which could result in short circuit, fire or damage to the instrument.

⚠ CAUTION

Handle Properly

¤ Remove battery when the instrument is not to be used for an extended period of time. Also do not leave discharged battery inside the instrument.

…… Failure to observe the above may result in battery leakage and damage to the instrument.

Prohibition

¤ Do not perform measurements in environments exceeding the specified temperature and RH levels of the instrument.
The instrument should not be exposed to direct sunlight for prolonged period.

…… The instrument may not function properly outside the specified environment.
(10~40°C, 20~85%RH, non condensing)

Prohibition

¤ Do not wipe the instrument with volatile solvents.

…… The body may be deformed or deteriorated. Use soft dry cloth to remove stains. If stains persist, soak the cloth in a neutral detergent or water and wipe the instrument with the cloth. Never use volatile solvents such as thinner or benzene.

Prohibition

¤ Do not subject the instrument to strong shock. Do not place heavy objects on the instrument or sensor.

…… Failure to observe the above may cause damage to the instrument.

¤ Do not touch the instrument when it is electrically charged.

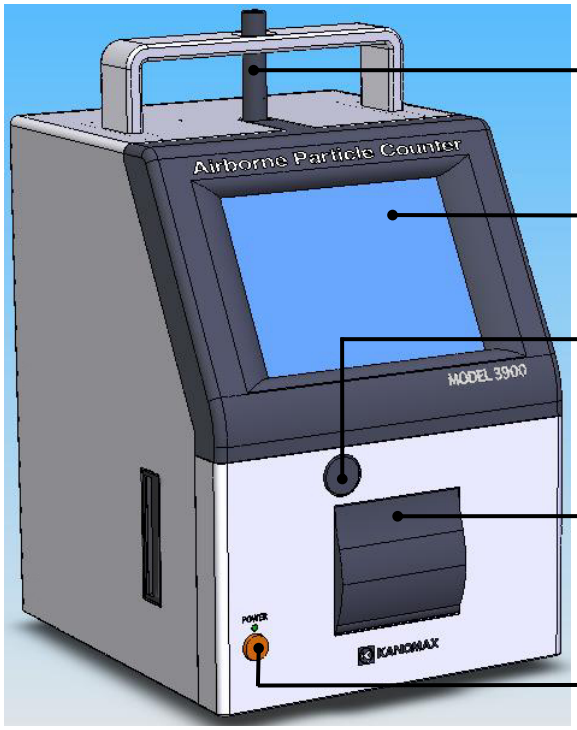
…… Failure to observe above may affect measurement value and cause damage to the instrument circuitry.

Table of Contents

1. Part Names and Functions

1.1 Airborne Particle Counter

FRONT



Inlet
--- Particles enter the unit here. Attach the provided standard inlet. To use the provided isokinetic suction probe, attach Tygon tube on the end of the standard inlet.

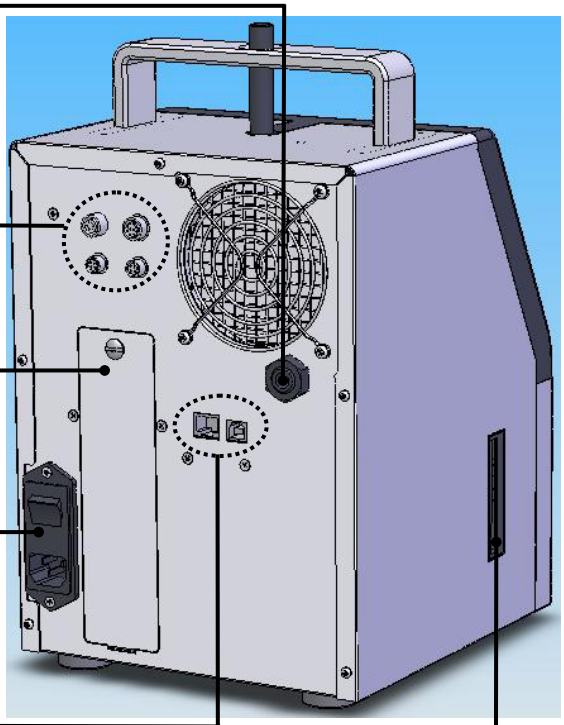
LCD Touch Panel
--- This touch panel allows you to setup and control all instrument functions.

Paper Cover Open Button
--- Press this button to open the cover when changing the printer roll-paper.

Printer
--- For printing measurement data. Set the printer roll-paper here.

Power Switch
--- When the main power located on the rear of the unit is ON, you can turn ON/OFF the power using this button.

BACK/LEFT



Outlet
--- Filtered sample air is exhausted at this port. Do not block the pump as it may result in the damage to the instrument.

Optional Sensor Connecting Terminal
--- Terminal to connect the optional sensor. Refer to **4. Connecting Optional Extras** for details.

Battery Compartment
--- Insert rechargeable battery here. Refer to **2.1 Power Supply** for how to install the battery.

Main Power Switch (For AC)
--- Use this switch to turn ON/OFF the main power. You can also connect the provided AC cord to supply the power.

USB Connector (Right) **Factory Use Only**
Ethernet Connector (Left)
--- To be used when controlling the instrument by the software. For details, refer to the operation manual for the software.

CF Card Insertion Slot
--- Insert the CF card using the provided card reader to store measurement data.

2. Getting Started

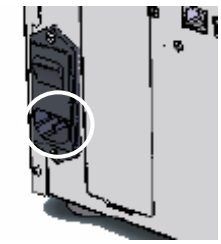
2.1 Power Supply

Supply power to the main unit.

There are two ways to supply power; using AC cord or battery.

-- AC Cord --

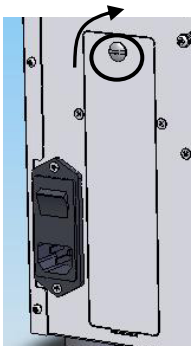
Plug the AC cord into the connecting port located under the main power switch on the rear of the unit.
AC100V~240V power supply line shall be used.



-- Battery --

Charge the battery in advance. You cannot charge the battery when it is installed in the instrument. (Refer to **6. Battery Charge** for charging the battery.)

Open the battery compartment cover on the rear of the instrument. To open the cover turn the knob around 90 degrees. (Use a coin or something similar to turn it easily.)
Connect the battery to the connecter for rechargeable battery inside the compartment.

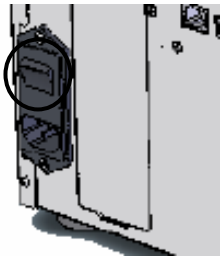


To install the battery, align the notch in the battery socket with the notch on the instrument's battery connector cable.

Insert the battery as shown on the right picture (the connecter end should go to the rear of the compartment), and turn the knob back to the original location to close the cover.

After supplying power using the AC cord, switch ON the main power located on the rear of the instrument. When using battery, turn the switch OFF.

When both the AC cord is connected and the battery is installed, the instrument will utilize AC power and will not discharge the battery.



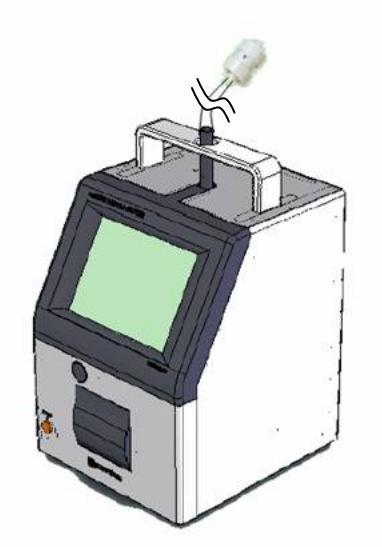
After pressing the POWER switch on the front of the instrument, you will hear a beep sound and the LED will light up. If the power is supplied by the AC line, the LED is green and if supplied by battery, the LED is red.

Several seconds later, the initial screen appears automatically. Refer to **3. Display Description and Operation Procedure** for the details about the operation screen.

2.2 Zero Check

If the internal optical system is dirty, you may not be able to perform an accurate measurement.
To confirm the cleanliness of the internal optical system, perform a Zero Check before measuring.

Attach the standard inlet to the instrument.
Next, attach the zero filter to the standard inlet using the supplied Tygon tube.
The length of the tube is not critical. However, make sure that the tube is not bent. (Approx. 60cm)

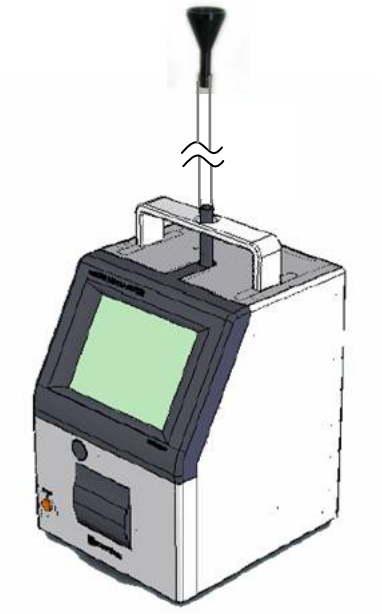


Follow the above procedure in order to prevent all particles from entering the instrument.
Perform a measurement for one minute and then perform Zero Check.
(Refer to **3.3 MONITOR** for the operation method.)

Perform Zero Check at least once a day.
It is recommended a Zero Check be done before and after each measurement.

2.3 Isokinetic Suction Probe

Use the Isokinetic Suction Probe to ensure the sampling air velocity is equivalent to the operating environment air velocity. This allows you to perform a measurement without significantly disturbing the normal air flow.

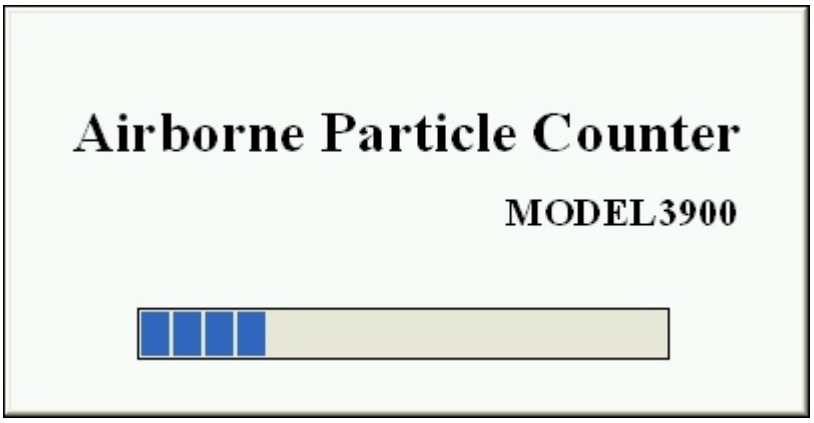


Attach the standard inlet to the main body of the instrument.
Next, attach the Isokinetic Suction Probe to the standard inlet by using the provided Tygon tube.

When using the Tygon tube, cut the tube to the most suitable for your measurement requirements.

3. Display Description and Operation Procedure

3.1 Boot Screen

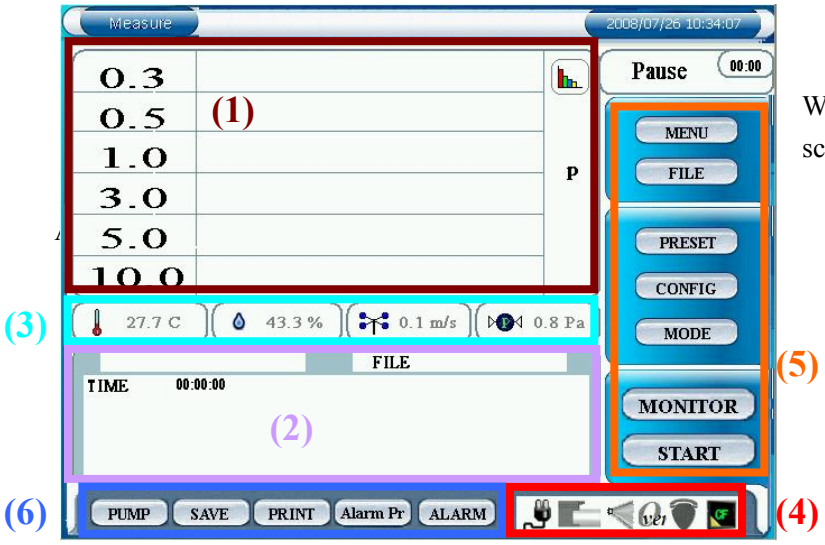


A few seconds after the instrument is turned ON, the screen on the left will be displayed.

The system is initializing. Please wait for a few moments.

3.2 Initial Screen

3.2.1 Initial Screen



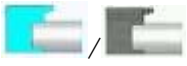
When the instrument is booted up, the initial screen on the left will be displayed.

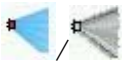
(1) Data Display: Displays numeric value and chart.
(2) Measurement Condition: Displays measurement mode, measurement setting and measurement status.
(3) Environment Data: Displays the current status when using option sensors.
(4) Status Display: Displays the status of power source, pump, LD, Over, Alarm and CF card.
(5) MENU: Configures chart setting, alarm setting and system setting.
FILE: Loads, prints and deletes stored measurement data.
PRESET: Loads stored measurement setting file.
CONFIG: Configures advanced setting in the currently selected mode. Items such as INTERVAL, SAMPLE T. and CYCLES can be set in each mode.
MODE: Selects measurement mode setting. Select either SINGLE, SEQUENCE, INTERVAL, REPEAT, STAT or STANDARD mode.
MONITOR: Performs a measurement and displays a measurement value. This mode does not save measurement results. Measurement display value is updated every second.
START: Starts measuring in the configured mode. This button becomes "STOP" button after sampling starts. Tap "STOP" button to stop sampling.
(6) PUMP: Tap "PUMP" button to turn ON/OFF the pump manually.
SAVE: Tap "SAVE" button to turn ON/OFF the data storage function while sampling.
PRINT: TAP "PRINT" button to turn ON/OFF the data printing function while sampling.
Alarm Pr: Tap "Alarm Pr" button to turn ON/OFF the alarm printing function while sampling.
ALARM: Tap "ALARM" button to turn ON/OFF data alarm function while sampling.

<Icons in the Status Display>


To switch to display chart.


Indicates if the instrument is powered by AC power cable or battery. If battery-powered, the remaining battery level is also shown.


Indicates the pump status and pump error. When the pump is operating properly, the icon is in blue. When the pump is off, the icon is in gray.

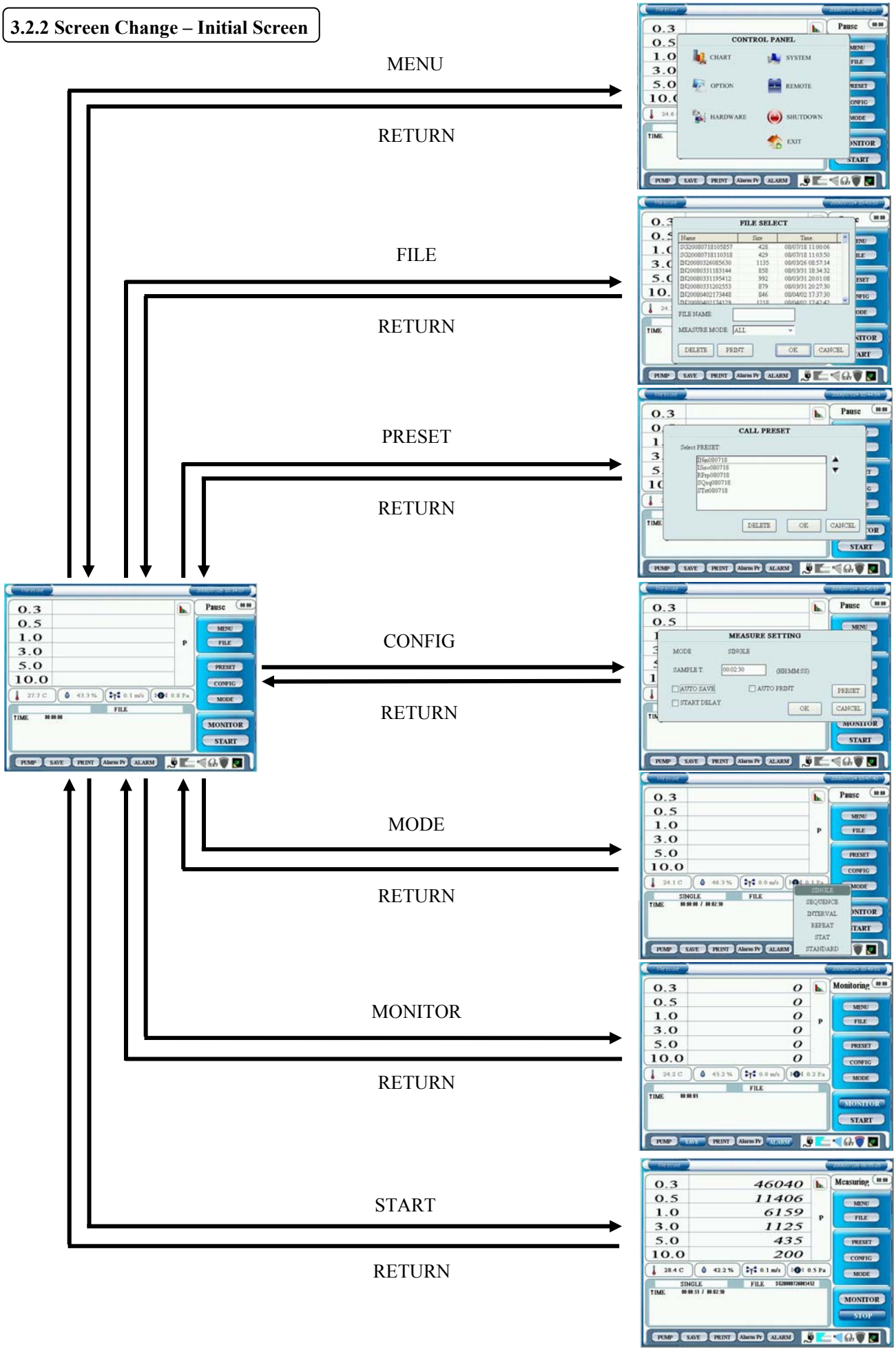

Indicates the LD status and LD error. When the LD is operating properly, the icon is in blue. When the LD is off, the icon is in gray.


Indicates if the measurement count per one second exceeds the maximum measurable concentration or not.

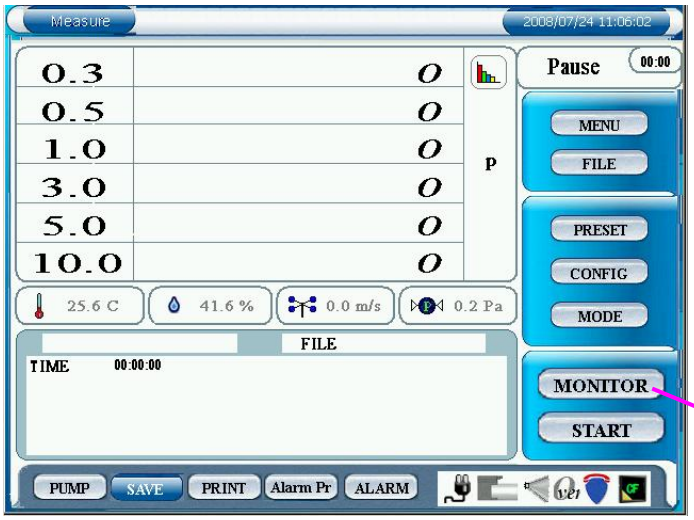

Indicates if an instrument error is occurring or not. Tap this icon to display the error details.


Indicates the CF card status and CF card error.

3.2.2 Screen Change – Initial Screen

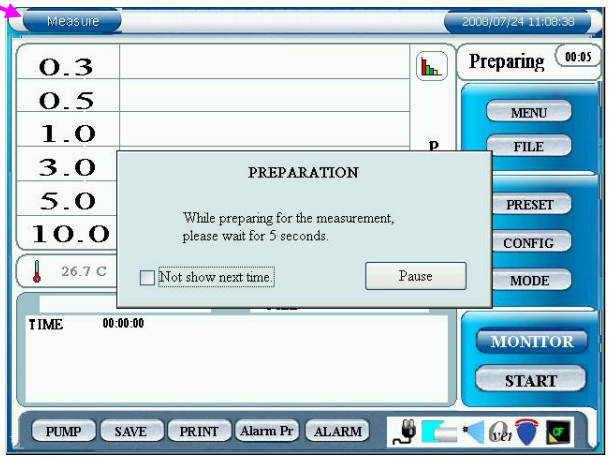


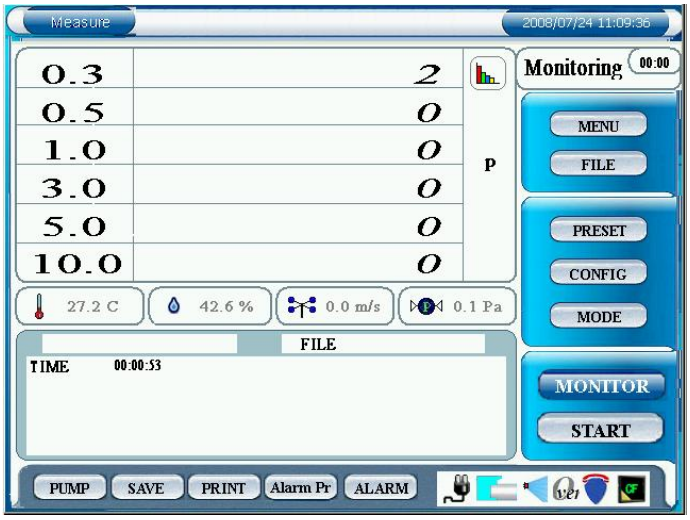
3.3 MONITOR

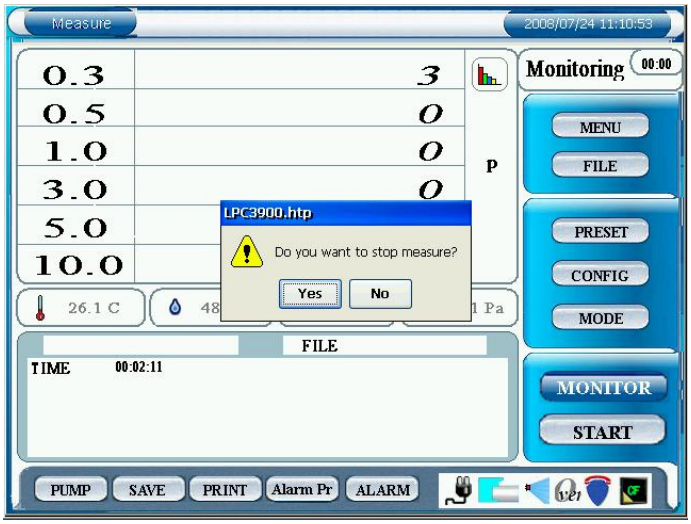


Tap [MONITOR] on the initial screen to start monitoring. Sampling will start 10 seconds after the pump starts operating.

* Note that if the pump is already operating, sampling will start immediately when you tap [MONITOR].
* Note that the instrument is capable of 180 hours of continuous operation.



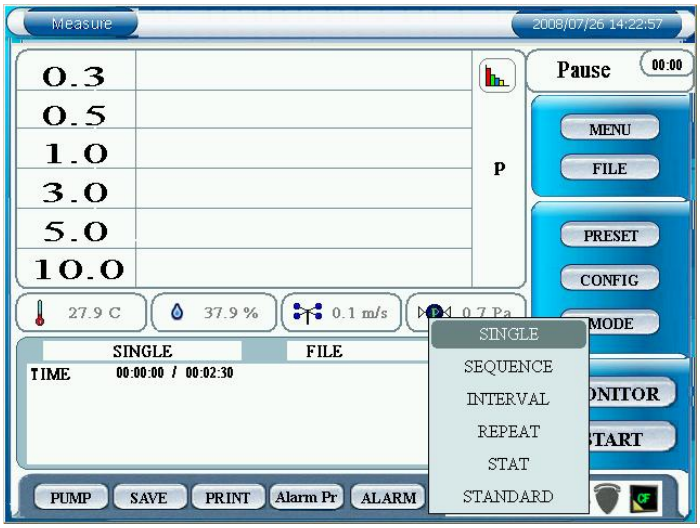




While measuring, tap [MONITOR] again. A dialog will be displayed asking you if you want to stop monitoring. Tap [Yes] to stop monitoring.

Note that you cannot save measurement data or display chart when you are monitoring.

3.4 MODE



Tap [MODE] to display the mode selection window.
Choose a mode from the below selection and tap it: SINGLE, SEQUENCE, INTERVAL, REPEAT, STAT or STANDARD.

Note that the instrument is capable of 180 hours of continuous operation in every measurement mode.

Mode Description

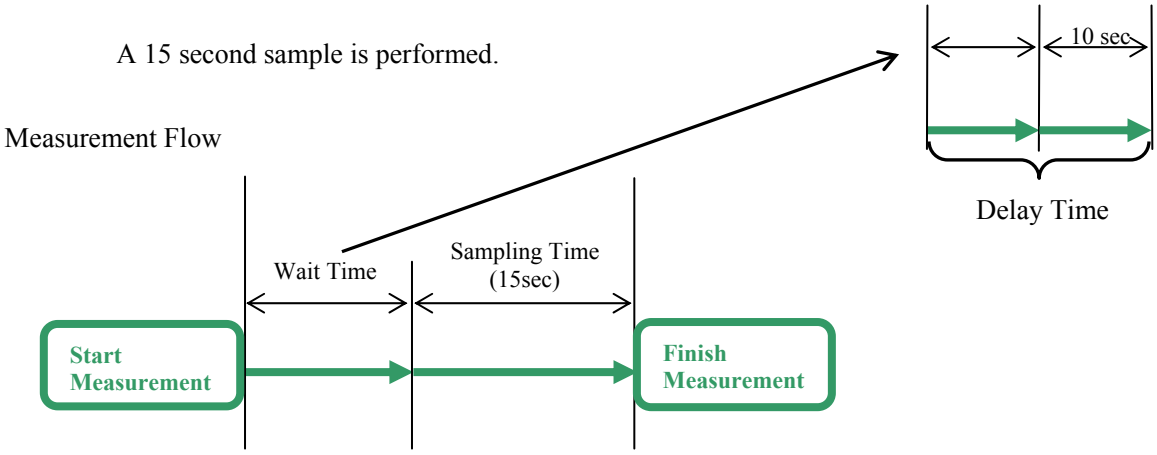
[SINGLE MODE]

Perform a measurement once within the pre-set time frame.

Example: If the setting is as follows in "CONFIG" menu (Refer to **3.6.1 SINGLE**):

INTERVAL : N/A
SAMPLE T. : 00:00:15
CYCLES : N/A

A 15 second sample is performed.



* Delay Time: For time set in START DELAY window referring to **3.9.2 OPTION**.

[SEQUENCE MODE]

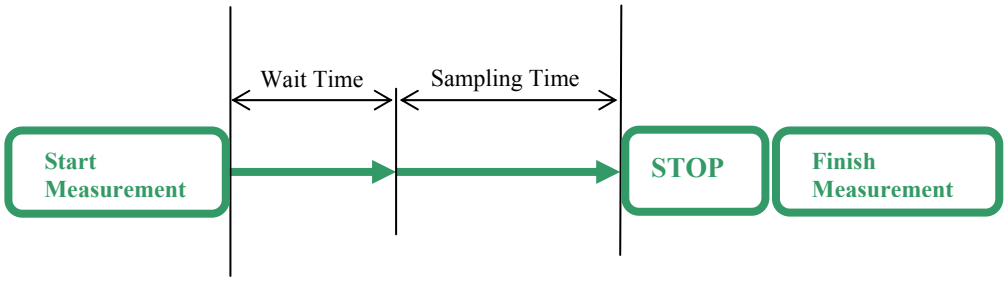
Start/Stop measuring manually.

Example: If the setting is as follows in "CONFIG" menu (Refer to **3.6.2 SEQUENCE**):

INTERVAL : N/A
SAMPLE T. : N/A
CYCLES : N/A

A continuous measurement is performed until you manually stop.

Measurement Flow



[INTERVAL MODE]

Configure INTERVAL, SAMPLE T and CYCLES, and repeat measuring.

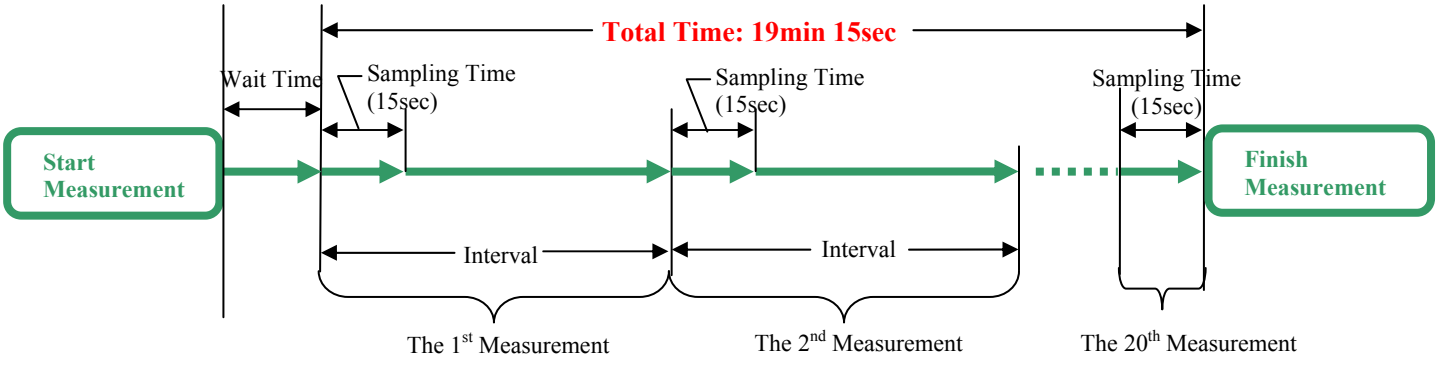
Example: If the setting is as follows in "CONFIG" menu (Refer to **3.6.3 INTERVAL**):

INTERVAL : 00:01:00
SAMPLE T. : 00:00:15
CYCLES : 20

A total of 20 samples are performed at one minute intervals.

Note: Sampling time is 15 seconds and standby time is 45 seconds.

Measurement Flow



[REPEAT MODE]

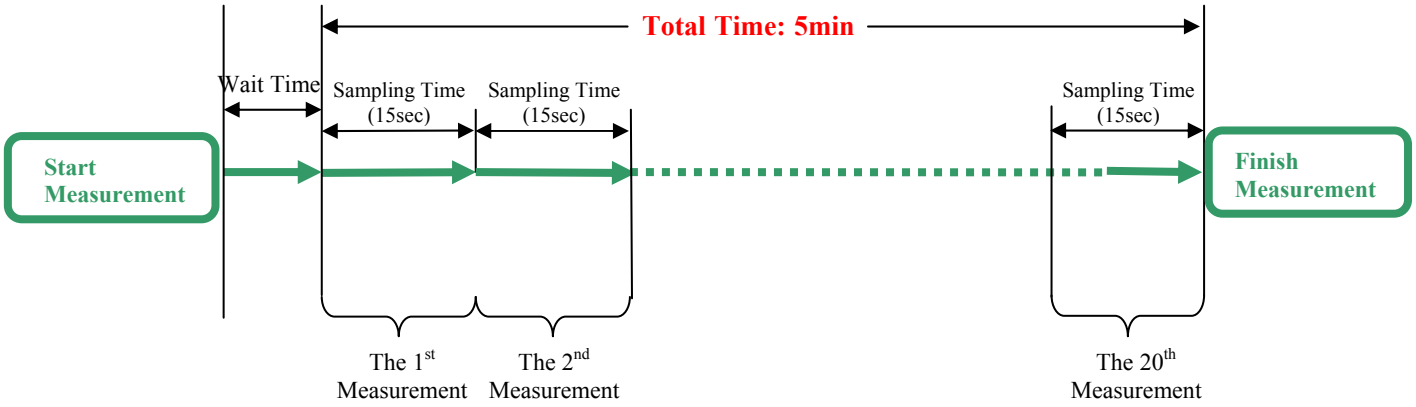
Configure SAMPLE T and CYCLES, and repeat measuring.

Example: If the setting is as follows in "CONFIG" menu (Refer to **3.6.4 REPEAT**):

INTERVAL : N/A
SAMPLE T. : 00:00:15
CYCLES : 20

20 measurement cycles lasting 15 seconds each are taken.

Measurement Flow



[STAT MODE]

Configure SAMPLE T., CYCLES and SAMPLE POINT, and repeat measuring.

Measurement at each point is same as the one in Repeat Mode.

As for the measurement condition, you can configure the settings referring to **3.6.5 STAT** in **3.6 CONFIG**.

[STANDARD MODE]

You can perform a measurement which complies with 7 measurement standards as follows:

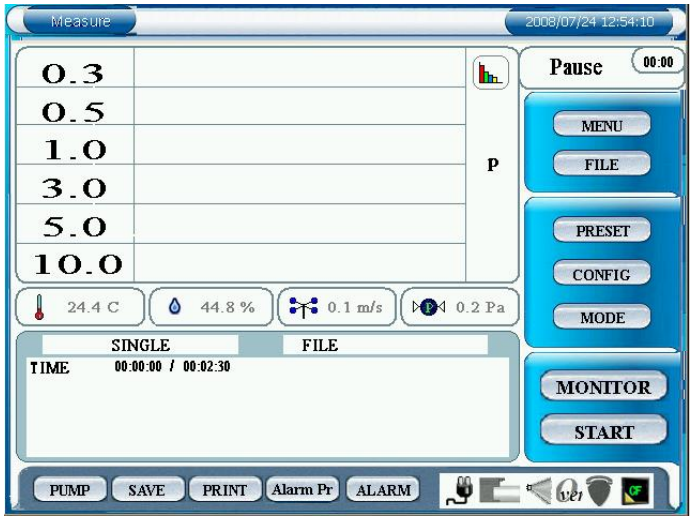
- ISO14644-1
  (International Standard) Refer to ISO14644-1.
- ISO 14644-1 SEQUENTIAL SAMPLING
  (International Standard) Refer to ISO14644-1.
- FEDERAL STANDARD (m)
  (The US Standard) Refer to FEDERAL STANDARD 209E.
- FEDERAL STANDARD (ft)
  (The US Standard)
- BRITISH STANDARD
  (British Standard) Refer to BS-5295.
- EC GMP
  (European Standard) Refer to EC GMP.
- GB/T 16292-1996
  (Chinese Standard) Refer to GB/T 16292-1996.

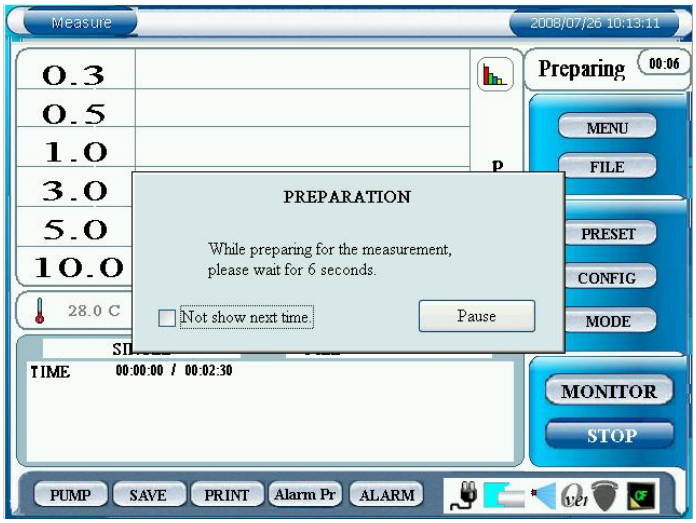
Select and set one of the above measurement standards referring to **STANDARD** in page 35 in **3.9.2 OPTION**.

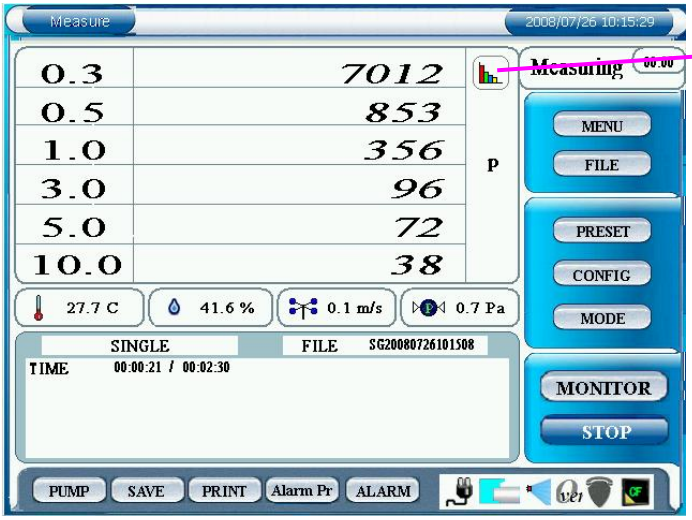
As for the measurement condition, you can configure the settings referring to **3.6.6 STANDARD** in **3.6 CONFIG**.

3.5 START

3.5.1 SINGLE, SEQUENCE, INTERVAL, REPEAT







<SINGLE>

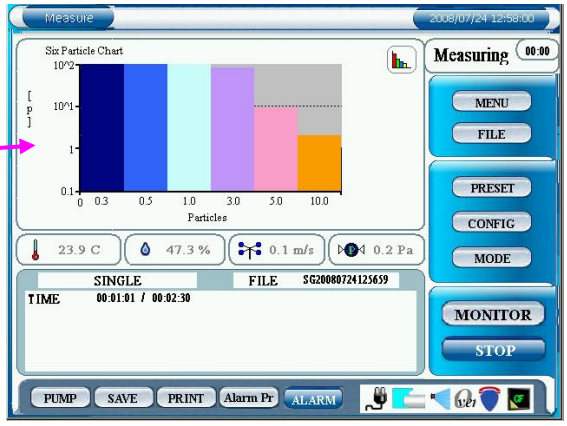
Tap [START] on the main screen to start a measurement in the setting configured in **3.4 MODE** and **3.6 CONFIG**.

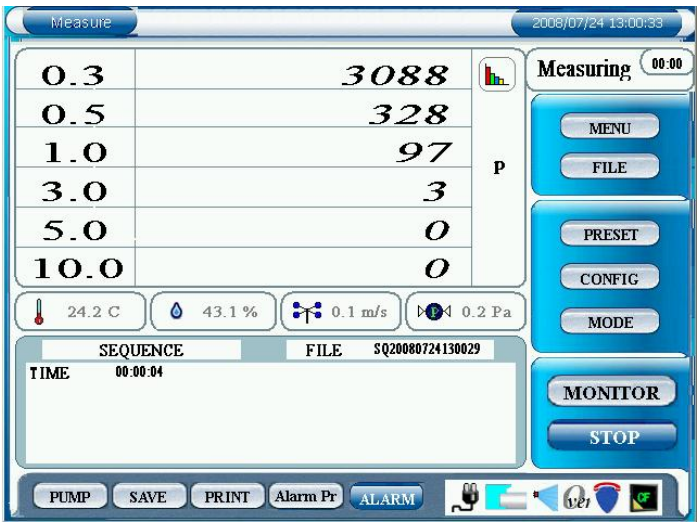
- **If "START DELAY" is NOT checked in "CONFIG" setting:**
  Upon tapping [START], the pump will begin running. After the pump has run for 10 seconds to stabilize, the measurement will begin.

- **If "START DELAY" is checked in "CONFIG" setting:**
  Upon tapping [START] the Delay Time configured in **3.9.2 CONTROL PANEL – OPTION – START DELAY** begins. During the last 10 seconds of that Delay Time the pump will run to stabilize, after which the measurement will begin.

Tap [STOP] to stop a measurement.

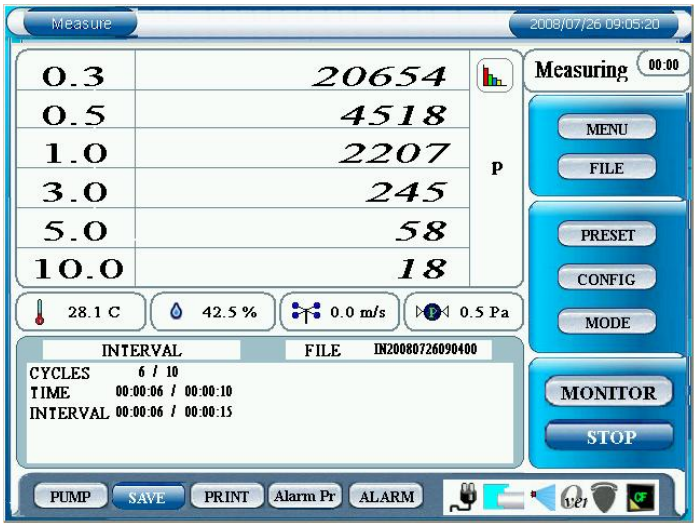
Tap  button while measuring to display a chart.



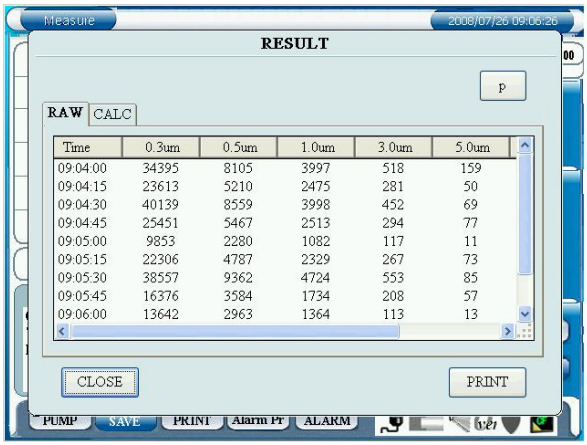


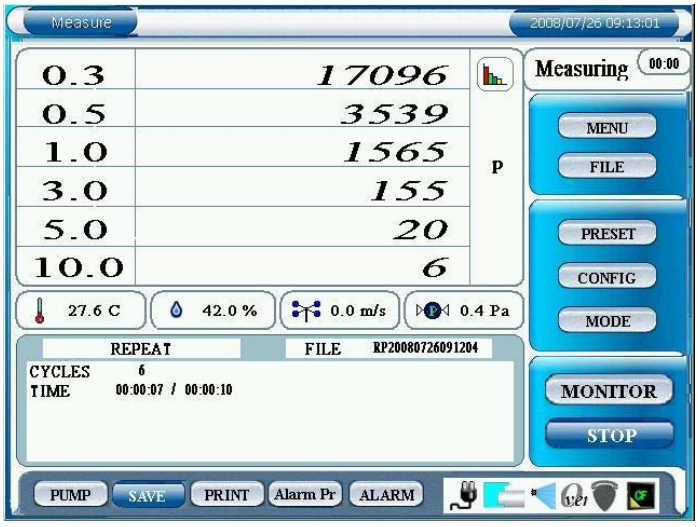
<SEQUENCE>

After a measurement in REPEAT mode or INTERVAL mode is finished, the measurement result will be displayed.

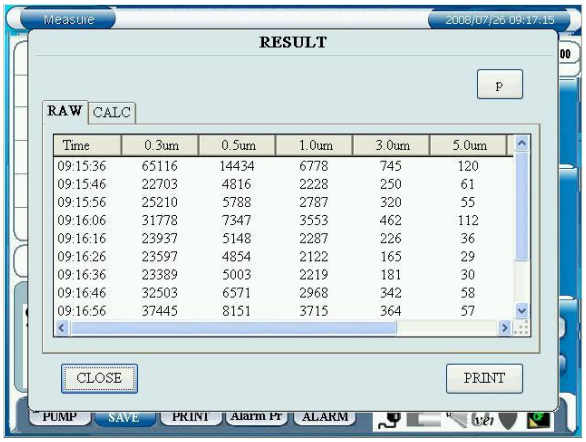


<INTERVAL>



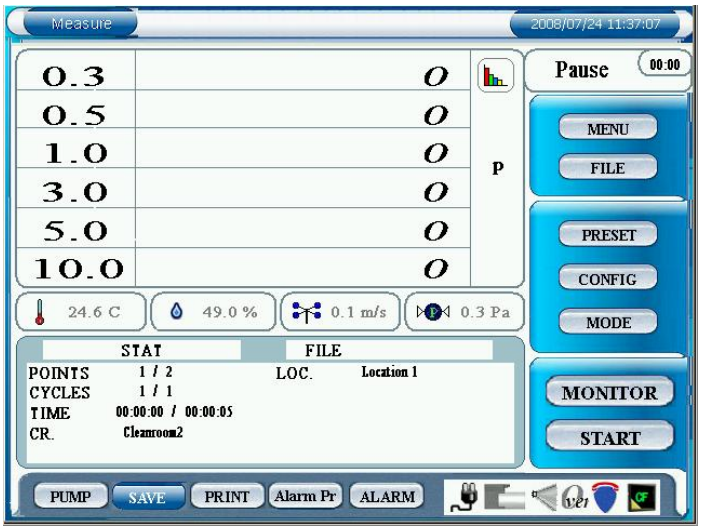


<REPEAT >



3.5.2 STAT

- When not using MAP (Refer to **3.6 CONFIG** for using a MAP.)

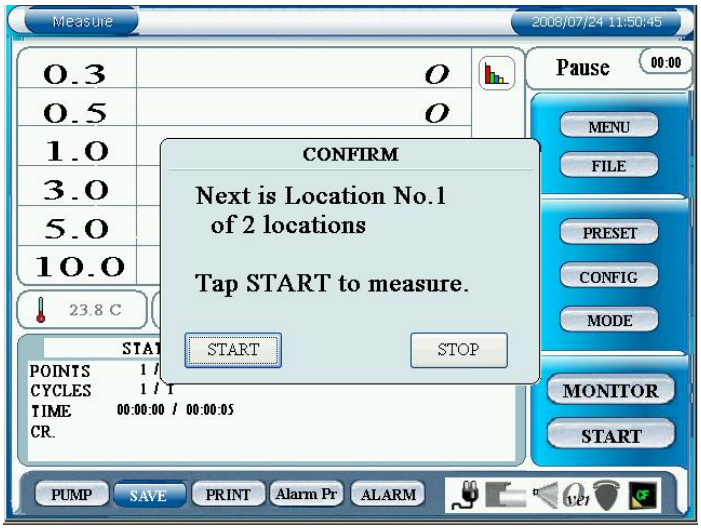


Tap [START] to display "CONFIRM" window.

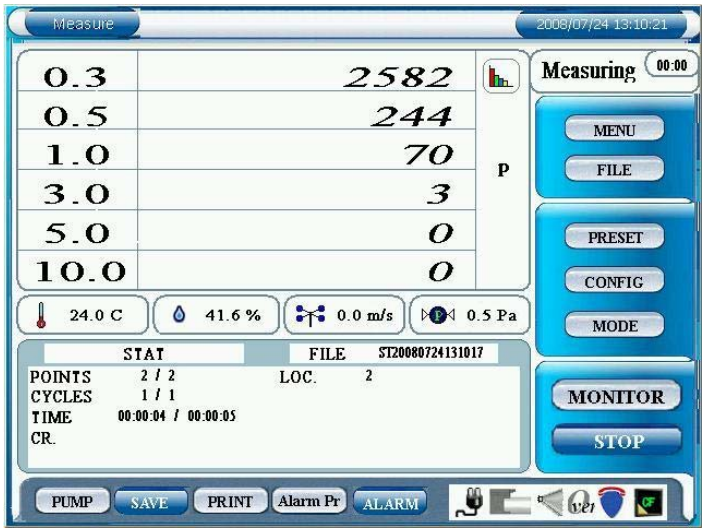
A measurement will start based on the setting configured in "3.4 MODE " and "3.6 CONFIG".

- **If "START DELAY" is NOT checked in "CONFIG" setting:**
  Upon tapping [START], the pump will begin running. After the pump has run for 10 seconds to stabilize, the measurement will begin.

- **If "START DELAY" is checked in "CONFIG" setting:**
  Upon tapping [START] the Delay Time configured in **3.9.2 CONTROL PANEL – OPTION – START DELAY** begins. During the last 10 seconds of that Delay Time the pump will run to stabilize, after which the measurement will begin.

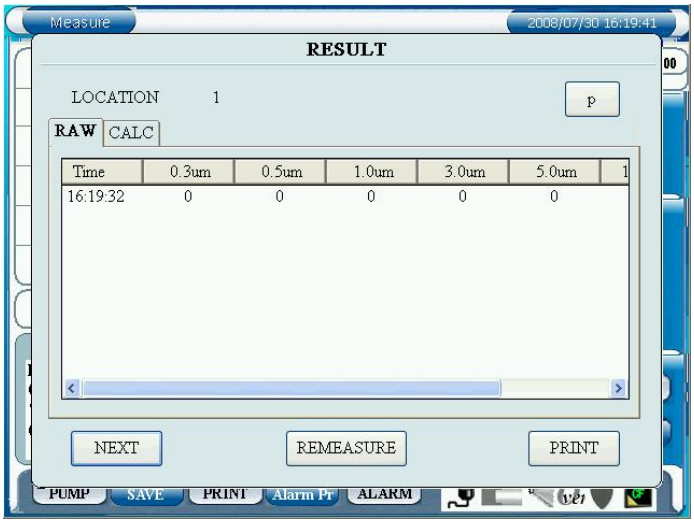


Tap [START] to start a measurement.
Tap [STOP] to stop a measurement.



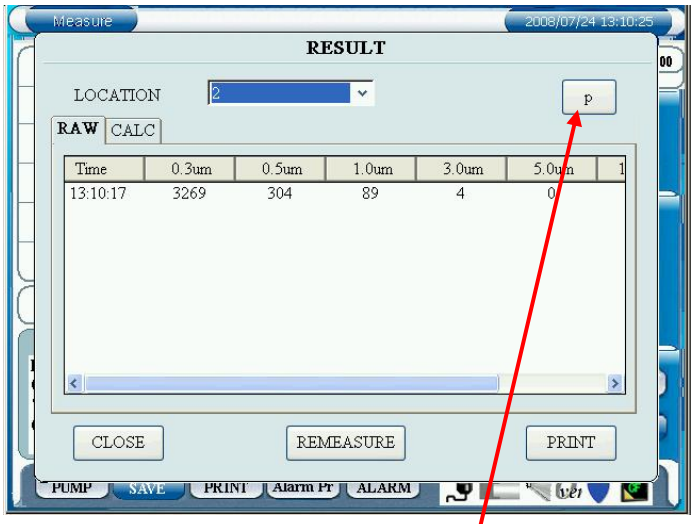
Tap  button while measuring to display a chart.

Tap [STOP] to stop a measurement.



When a measurement is finished at each measurement point, a measurement result window will be displayed each time.

Tap [NEXT] to display "CONFIRM" window informing you the next measurement point, and wait for the next measurement.
Tap [REMEASURE] to perform a remeasurement.
Tap [PRINT] to print a measurement result.



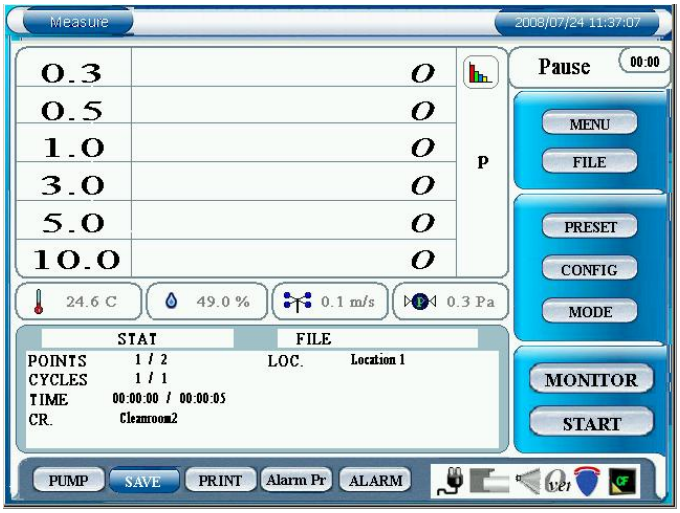
When all of the measurements are finished, a measurement result will be displayed.

Select LOCATION to display the measurement data of the selected LOCATION POINT.

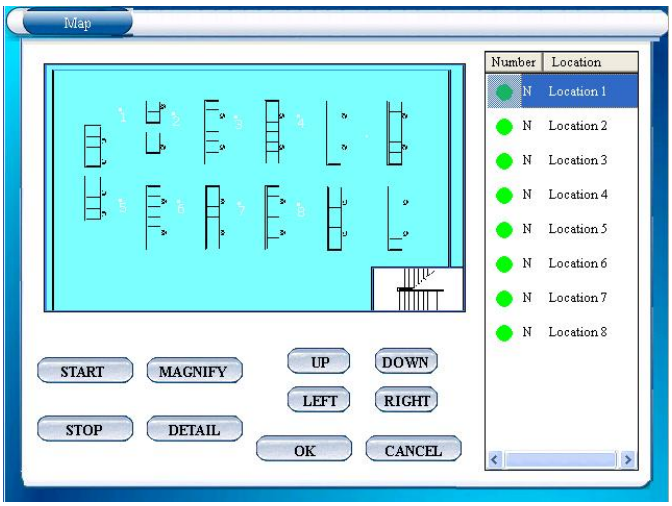
Tap [CLOSE] to stop a measurement.
Tap [REMEASURE] to perform a measurement again at the last measurement point.
Tap [PRINT] to print a measurement result at the last measurement point.

Every time you tap this button, the particle unit changes in the order of: **p -> p/cf -> p/m³**.

- When using MAP (Refer to **3.6 CONFIG** for using a MAP.)

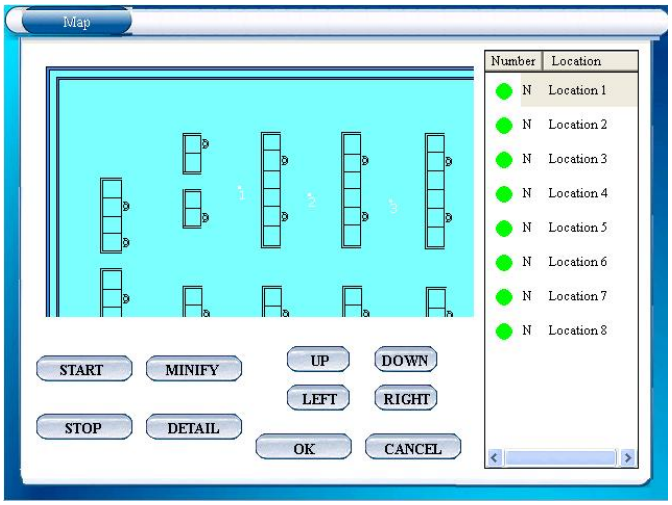


Tap [START] to display MAP.

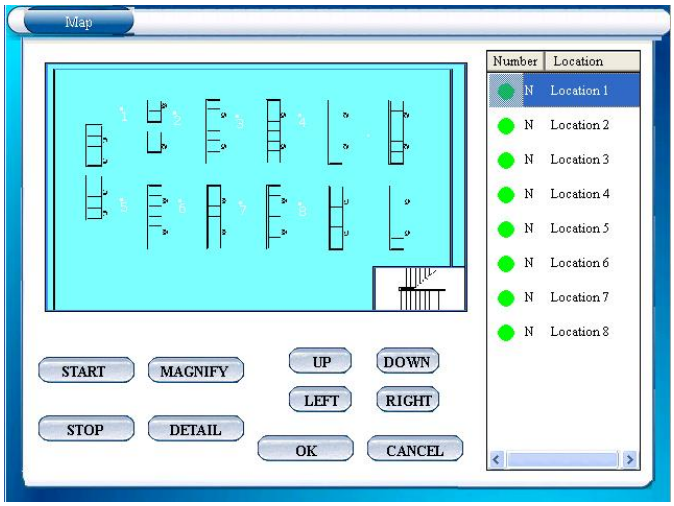


Select a measurement point and tap [START].
Tap [STOP] to stop a measurement.
Tap [MAGNIFY] to enlarge a MAP.
(This button will become [MINIFY] button. Press [MINIFY] to display an entire MAP when a map is magnified.)

([OK] and [CANCEL] buttons are inactive.)



When a MAP is magnified, [UP], [DOWN], [LEFT] and [RIGHT] buttons will be activated, which enables you to move MAP.

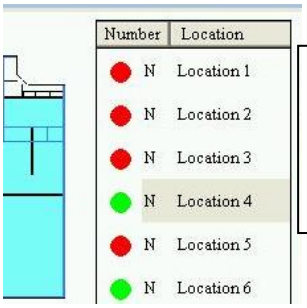


Select a measurement point and tap [DETAIL] to display the details of the selected measurement point.

Tap [START] to start a measurement based on the setting configured in **3.4 MODE** and **3.6 CONFIG**.

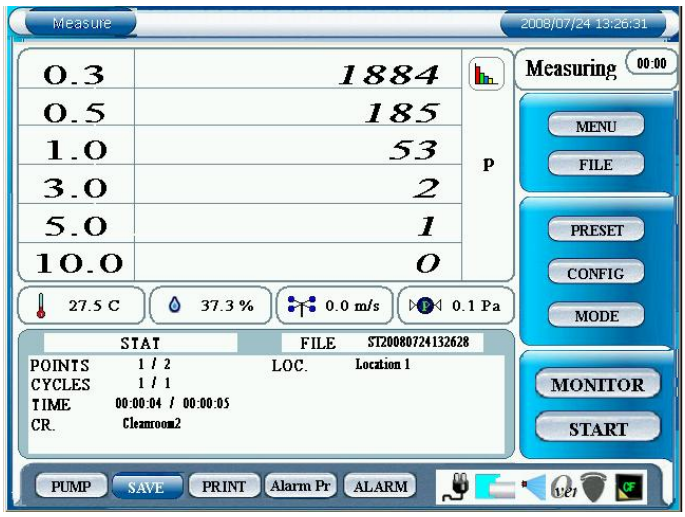
- **If "START DELAY" is NOT checked in "CONFIG" setting:**
  Upon tapping [START], the pump will begin running. After the pump has run for 10 seconds to stabilize, the measurement will begin.

- **If "START DELAY" is checked in "CONFIG" setting:**
  Upon tapping [START] the Delay Time configured in **3.9.2 CONTROL PANEL – OPTION – START DELAY** begins. During the last 10 seconds of that Delay Time the pump will run to stabilize, after which the measurement will begin.

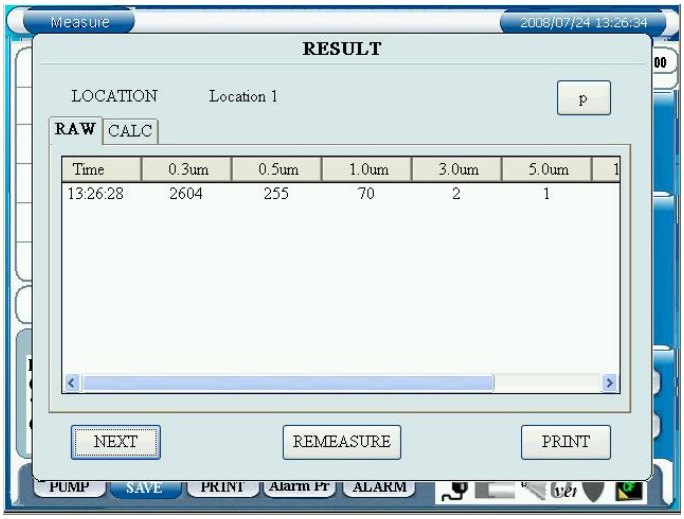


* When a measurement is finished, the measurement point changes from green to red.

Tap  button while measuring to display a graph.



Tap [STOP] to stop a measurement.



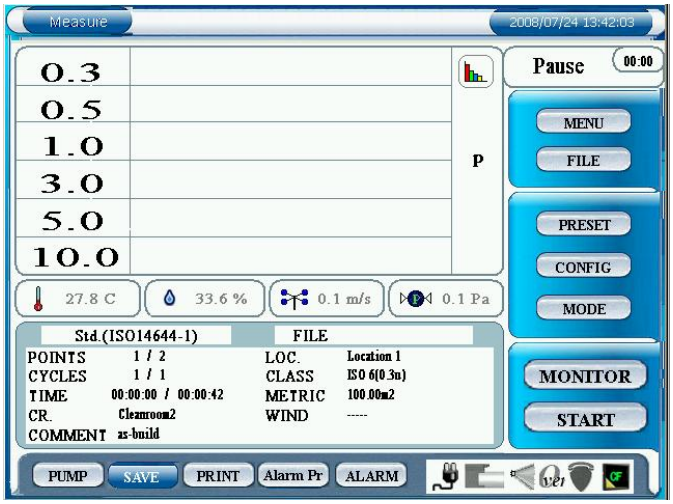
When a measurement is finished, a measurement result window will be displayed.

Tap [NEXT] to display MAP again. Then the instrument waits for the next measurement point to be selected.
Tap [REMEASURE] button to perform a remeasuremet.
Tap [PRINT] to print a measurement result.

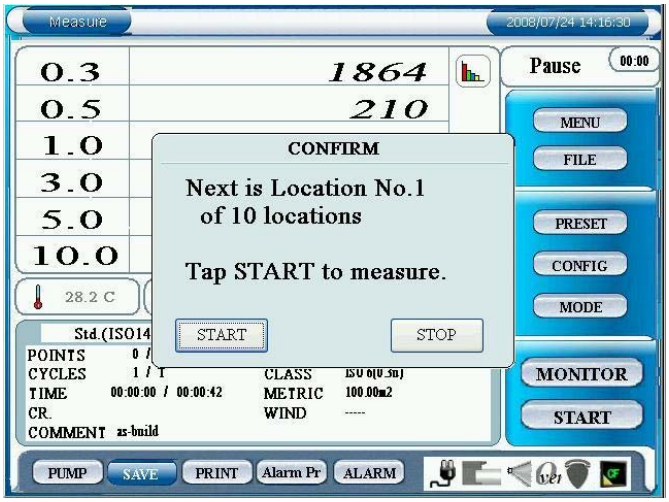
When all measurements are finished, the measurement result will be displayed.

3.5.3 STANDARD

- When not using MAP (Refer to **3.6 CONFIG** for using a MAP.)



Tap [START] to display “CONFIRM” window.

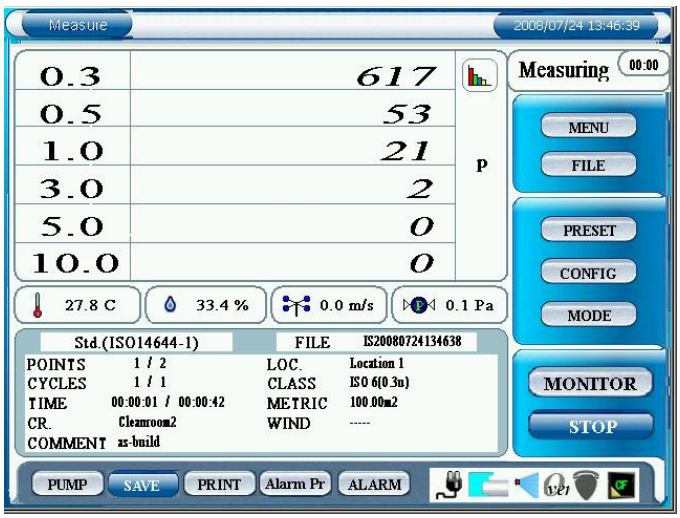


Tap [START] to start a measurement based on the setting configured in **3.4 MODE** and **3.6 CONFIG**.

- **If “START DELAY” is NOT checked in “CONFIG” setting:**
  Upon tapping [START], the pump will begin running. After the pump has run for 10 seconds to stabilize, the measurement will begin.

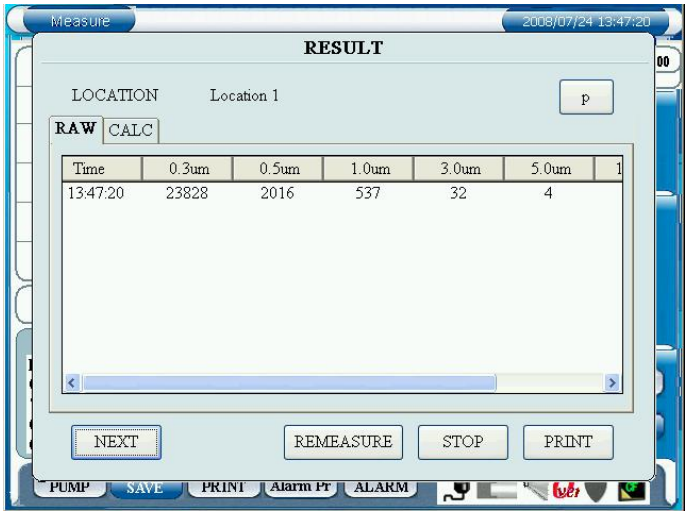
- **If “START DELAY” is checked in “CONFIG” setting:**
  Upon tapping [START] the Delay Time configured in **3.9.2 CONTROL PANEL – OPTION – START DELAY** begins. During the last 10 seconds of that Delay Time the pump will run to stabilize, after which the measurement will begin.

Tap [STOP] to stop a measurement.



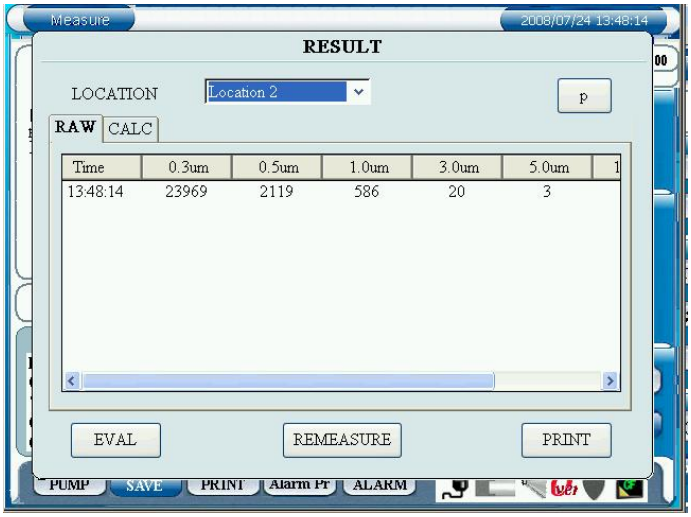
Tap  button while measuring. Then a chart will be displayed.

Tap [STOP] to stop a measurement.



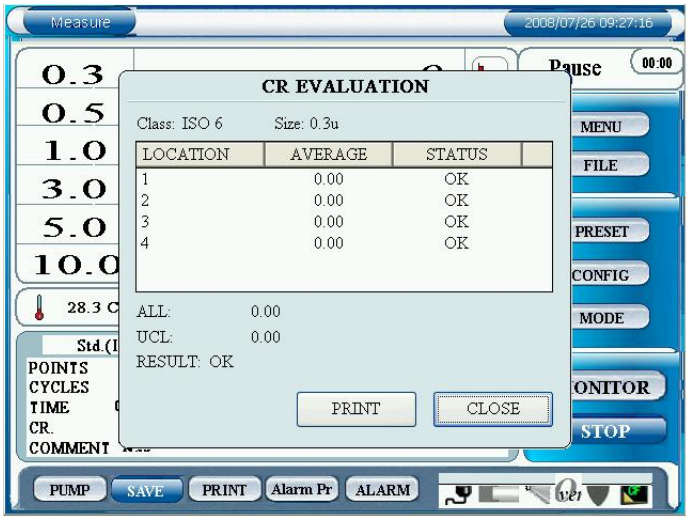
After a measurement at each location is finished, a measurement result will be displayed.
In [RAW] tab, measurement data will be displayed.
In [CALC] tab, calculated data of minimum (MIN), maximum (MAX) and average (AVE) will be displayed.

Tap [NEXT] to display a "CONFIRM" window informing you of the next measurement point, and wait for the next measurement.
Tap [REMEASURE] to perform a remeasurement.
Tap [STOP] to stop a measurement.
Tap [PRINT] to print a measurement result.



When all measurements are finished, the measurement result will be displayed.
Select [LOCATION] to display the result of the specific location.

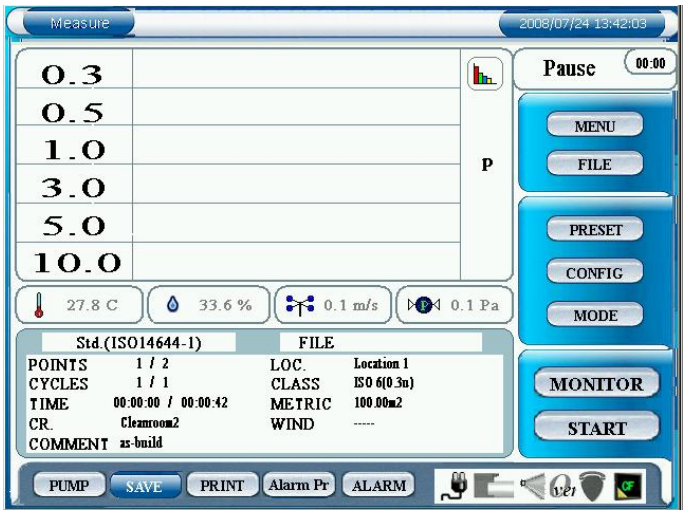
Tap [EVAL] to display an CR EVALUATION window.
Tap [REMEASURE] to perform a remeasurement.
Tap [PRINT] to print a measurement result.



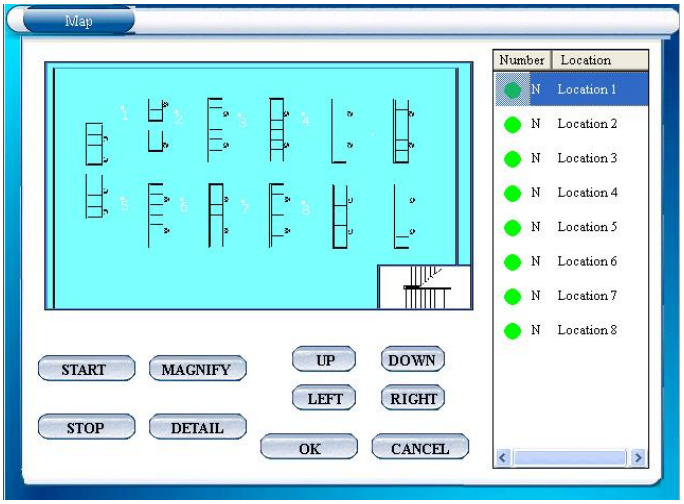
Tap [PRINT] to print a measurement result.

Tap [CLOSE] to close window.

- When using MAP (Refer to **3.6 CONFIG** for using a MAP.)



Tap [START] to display MAP.

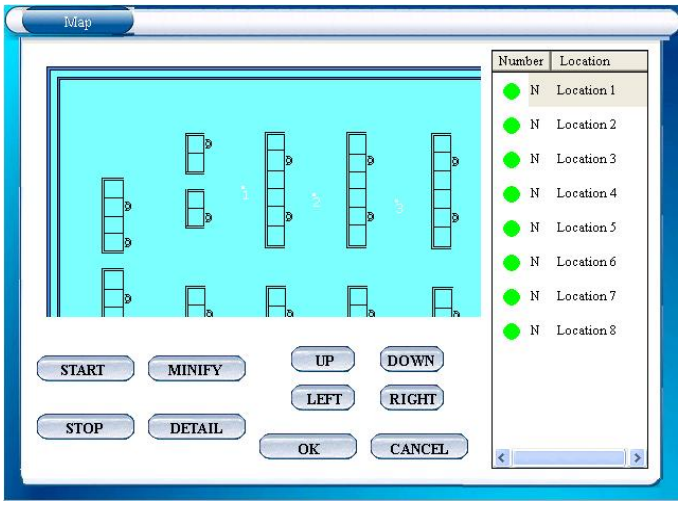


Select a measurement point and tap [START].

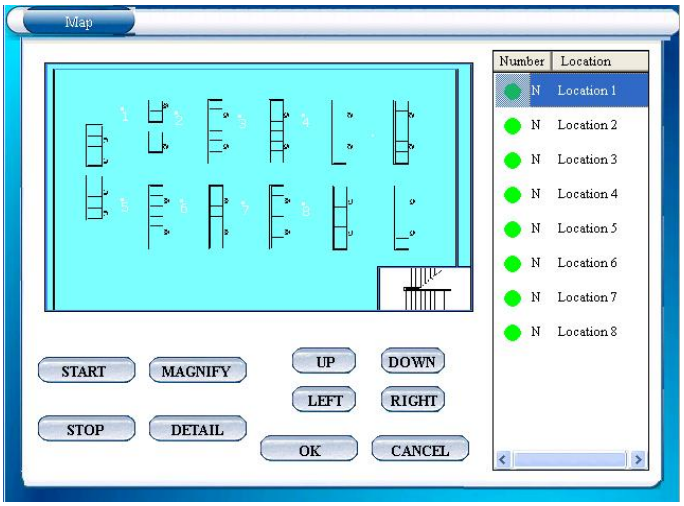
Tap [STOP] to stop a measurement.

Tap [MAGNIFY] to enlarge a MAP.
(This button will become [MINIFY] button. Press [MINIFY] to display an entire MAP when a map is magnified.)

([OK] and [CANCEL] buttons are inactive.)



[UP], [DOWN], [LEFT] and [RIGHT] buttons will be activated, which enables you to move MAP.

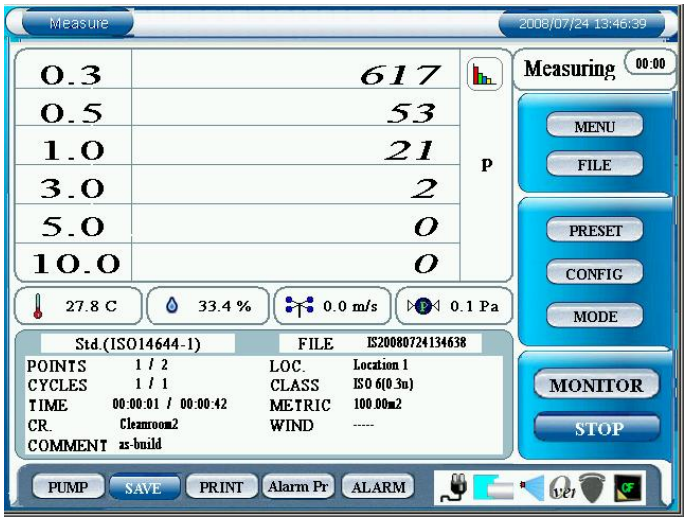


Select a measurement point and tap [DETAIL] to display the details of the selected measurement point.

Tap [START] to start a measurement based on the setting configured in **3.4 MODE** and **3.6 CONFIG**.

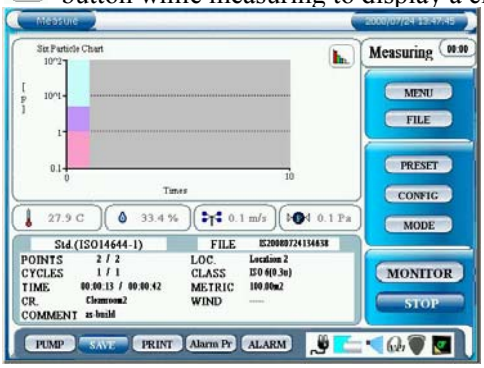
- **If "START DELAY" is NOT checked in "CONFIG" setting:**
  Upon tapping [START], the pump will begin running. After the pump has run for 10 seconds to stabilize, the measurement will begin.

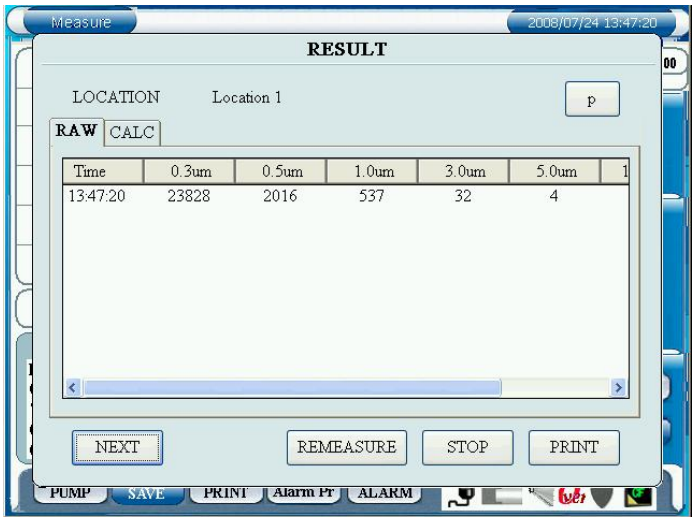
- **If "START DELAY" is checked in "CONFIG" setting:**
  Upon tapping [START] the Delay Time configured in **3.9.2 CONTROL PANEL – OPTION – START DELAY** begins. During the last 10 seconds of that Delay Time the pump will run to stabilize, after which the measurement will begin.



Tap [STOP] to stop a measurement.

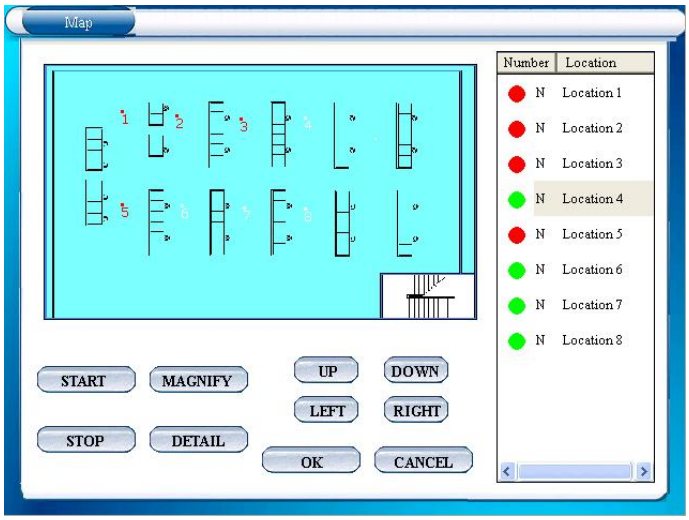
Tap  button while measuring to display a chart.



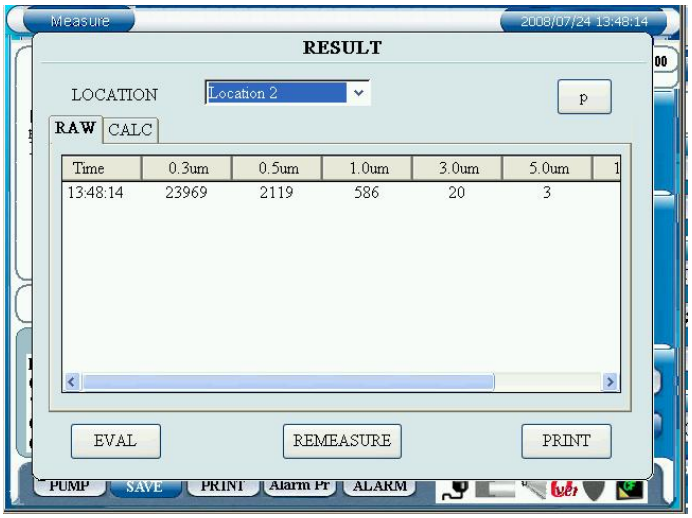


After a measurement at each location is finished, a measurement result will be displayed.
In [RAW] tab, measurement data will be displayed.
In [CALC] tab, calculated data of minimum (MIN), maximum (MAX) and average (AVE) will be displayed.

Tap [NEXT] to display MAP again and wait for the next point to be selected.
Tap [REMEASURE] to perform a remeasurement.
Tap [STOP] to stop a measurement.
Tap [PRINT] to print a measurement result.



When a measurement is finished, the measurement point changes from green to red.



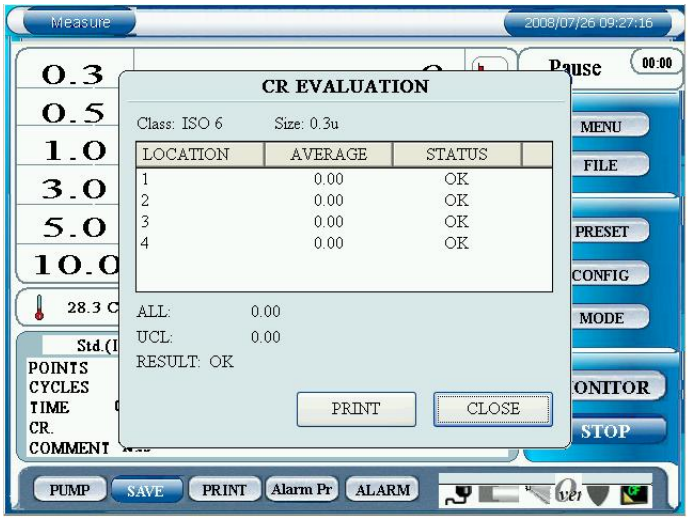
When all measurements are finished, the measurement result will be displayed.

Select [LOCATION] to display the result of the specific location.

Tap [EVAL] to display an evaluation screen.

Tap [REMEASURE] to perform a remeasurement.

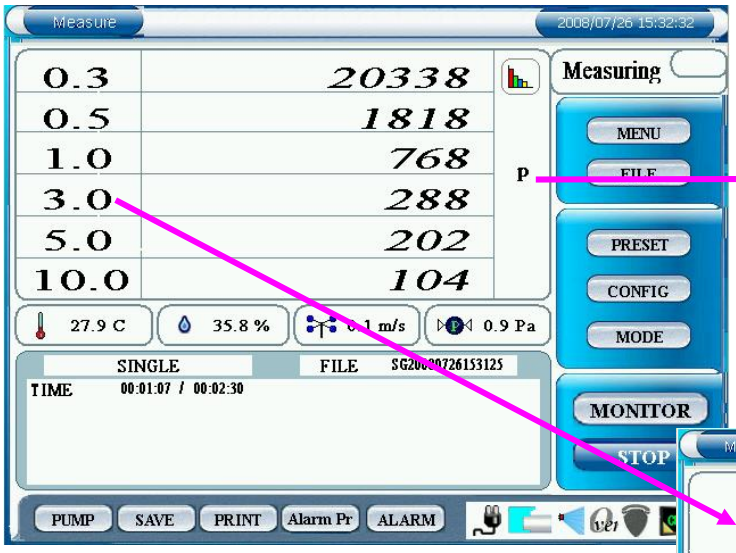
Tap [PRINT] to print a measurement result.

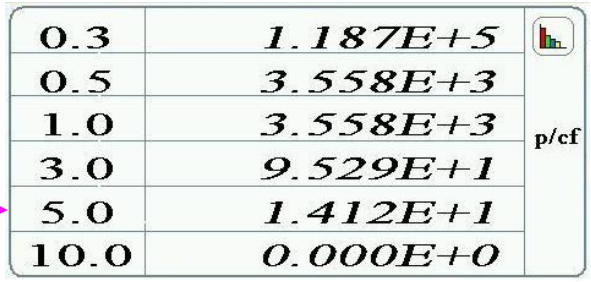


Tap [PRINT] to print a measurement result.

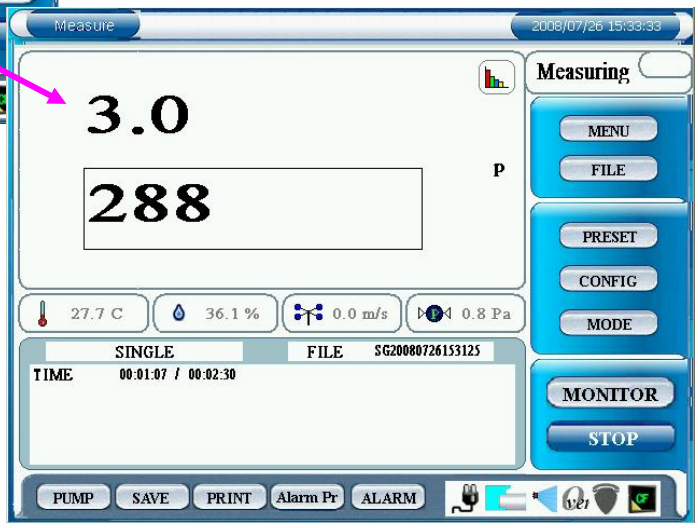
Tap [Close] to close the window.

3.5.4 Interlocking Operations

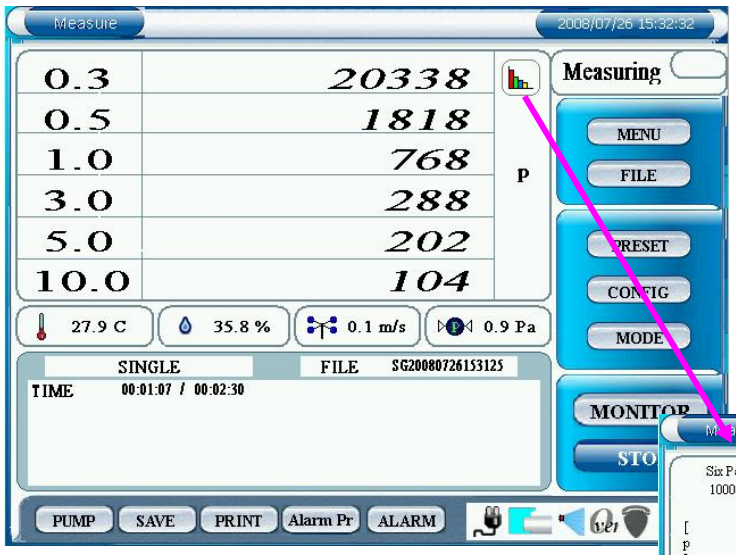


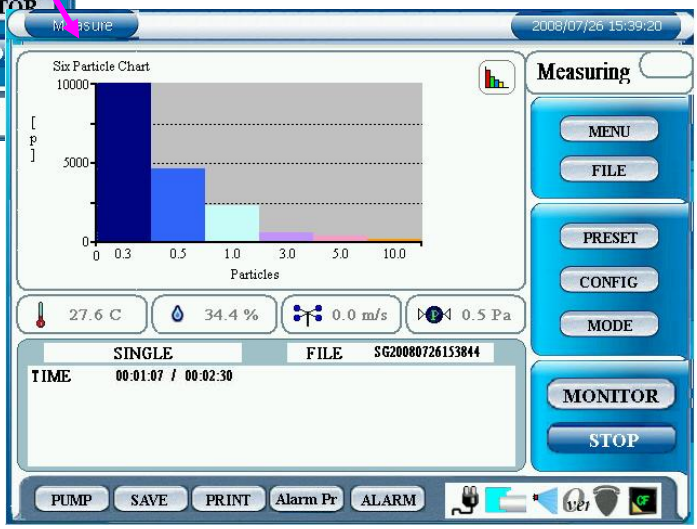


Every time you tap the particle unit, it changes in the order of:
p -> p/cf -> p/m³.



On the screen displaying data for 6 particle sizes while sampling, tap a particle size on the screen to display the data of the particular particle size. Then to display data for 6 particle sizes back again, tap the particle size on the screen.





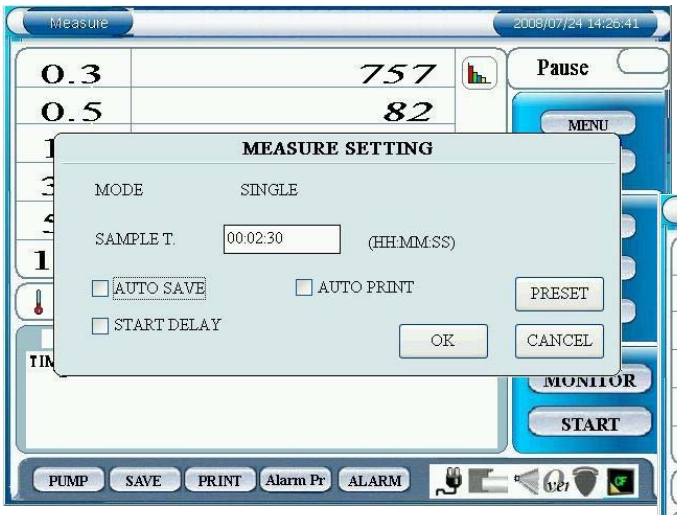
On the screen with data of each particle size, tap  to switch to display a chart.

Tap  again to go back to the display with data for 6 particle size.

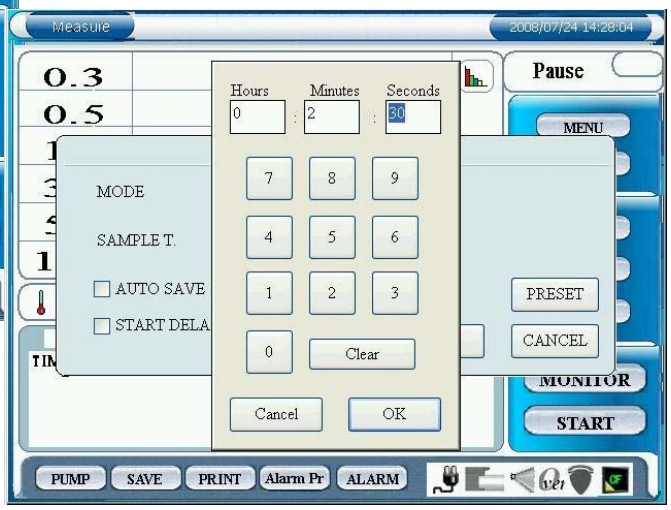
3.6 CONFIG

In CONFIG setting screen you can configure measurement settings in each mode.
You can set INTERVAL, SAMPLE T., CYCLES, MANUAL STOP, AUTO SAVE, AUTO PRINT and START DELAY. Please note that the setting item varies depending on the measurement mode.

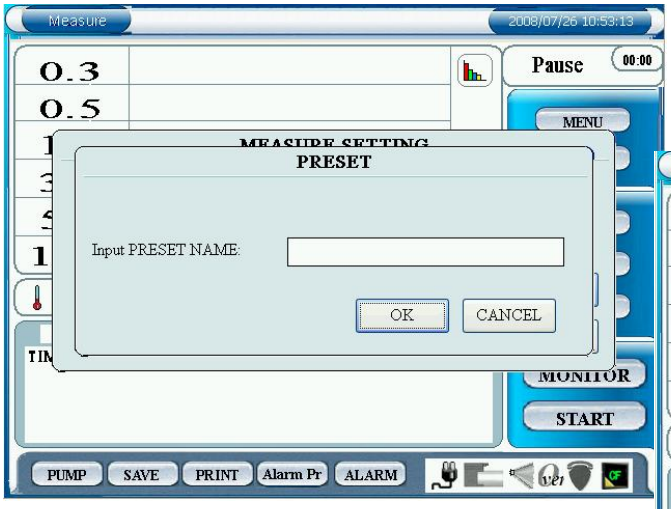
3.6.1 SINGLE

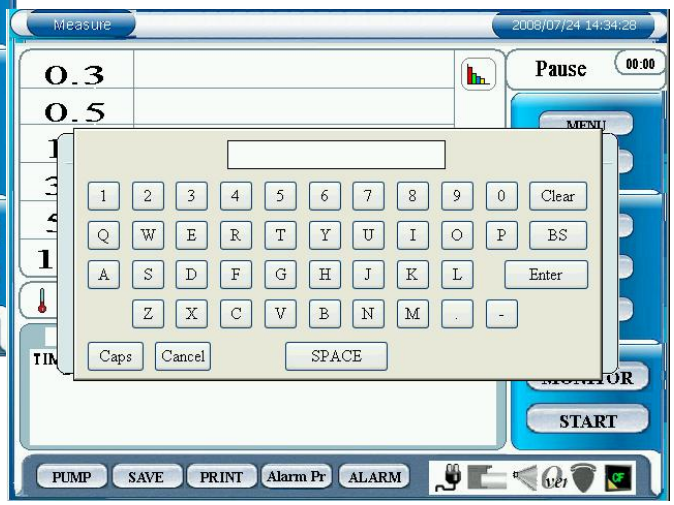


You can set **SAMPLE T**. (sampling time).
Tap the entry field to display a numeric keypad. Enter "hour", "minute" and "second" on the numeric keypad and tap [OK].



Check "AUTO SAVE" to store data automatically.
Check "AUTO PRINT" to print data automatically.
Check "START DELAY" to use delay time prior to a measurement.
Tap [OK] to save and activate the settings.



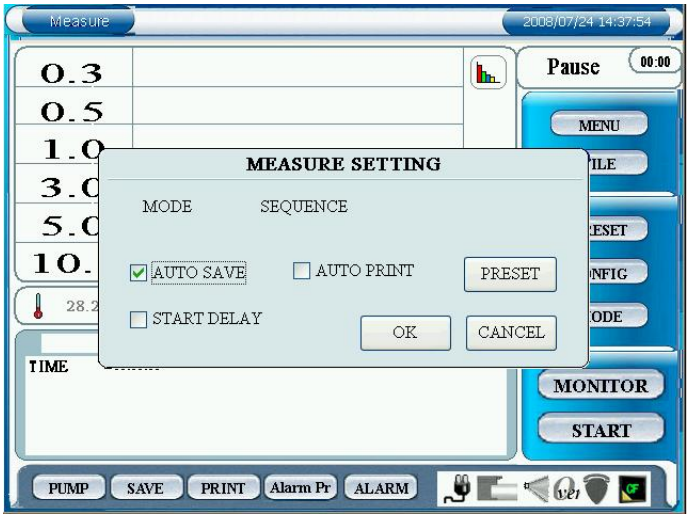


Tap [PRESET] to display a window asking you to input PRESET NAME.
Tap the entry field to display the keyboard. Enter the file name and tap [Enter].

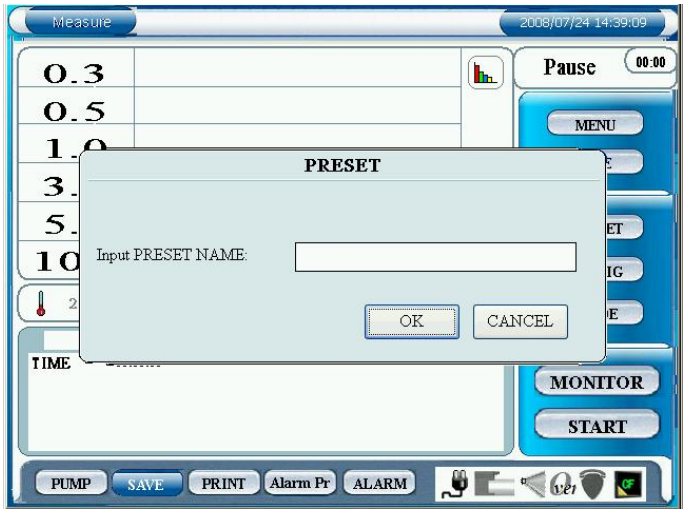
Tap [OK] to save the current settings (including AUTO SAVE, AUTO PRINT and START DELAY) on the CF card.

* In the future you can automatically load the configuration saved here as a PRESET. Refer to **3.8 PRESET**.

3.6.2 SEQUENCE



Check “AUTO SAVE” to store data automatically.
Check “AUTO PRINT” to print data automatically.
Check “START DELAY” to use delay time prior to a measurement.
Tap [OK] to save and activate the current settings.

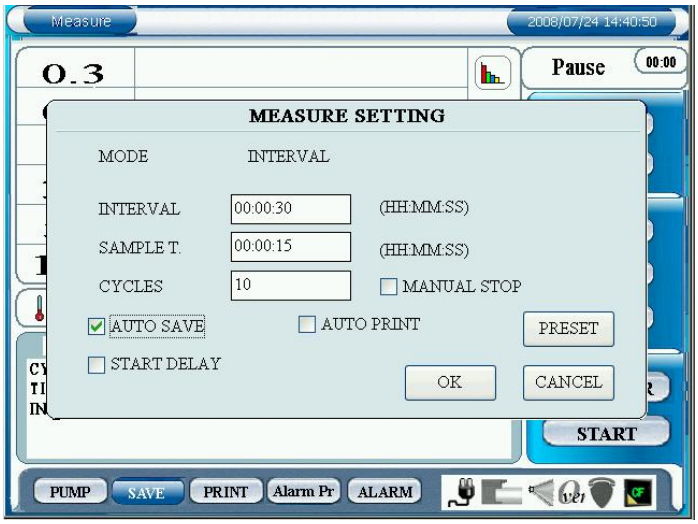


Tap [PRESET] to display a window asking you to input “PRESET NAME”.
Tap the entry field to display the keyboard. Enter the file name and tap [Enter].

Tap [OK] to save the current settings (including AUTO SAVE, AUTO PRINT and START DELAY) on the CF card.

* In the future you can automatically load the configuration saved here as a PRESET. Refer to **3.8 PRESET**.

3.6.3 INTERVAL



You can set INTERVAL, SAMPLE T., CYCLES and MANUAL STOP.

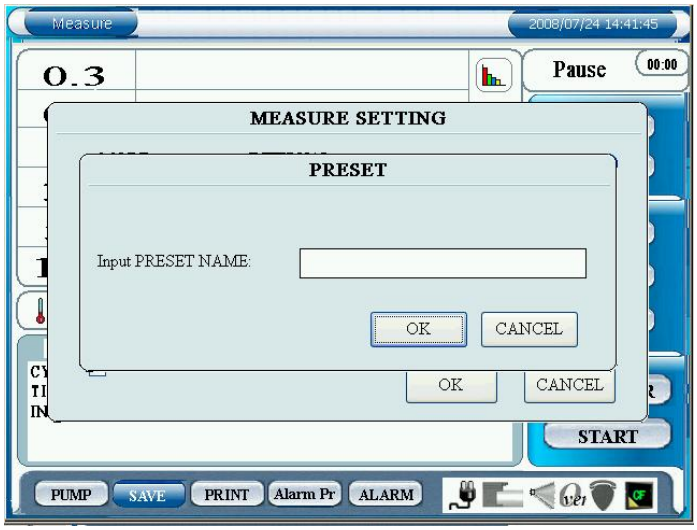
To set INTERVAL and SAMPLE T, tap the entry field to display a numeric keypad. Enter “hour”, “minute” and “second”, and tap [OK].

Tap entry field for CYCLES to display a numeric keypad. Tap the value you want to enter and tap [Enter].

Check “MANUAL STOP” to continue measuring until you stop the measurement regardless of the CYCLES setting.

Check “AUTO SAVE” to store data automatically.
Check “AUTO PRINT” to print data automatically.
Check “START DELAY” to use delay time prior to a measurement.

Tap [OK] to save and activate the settings.

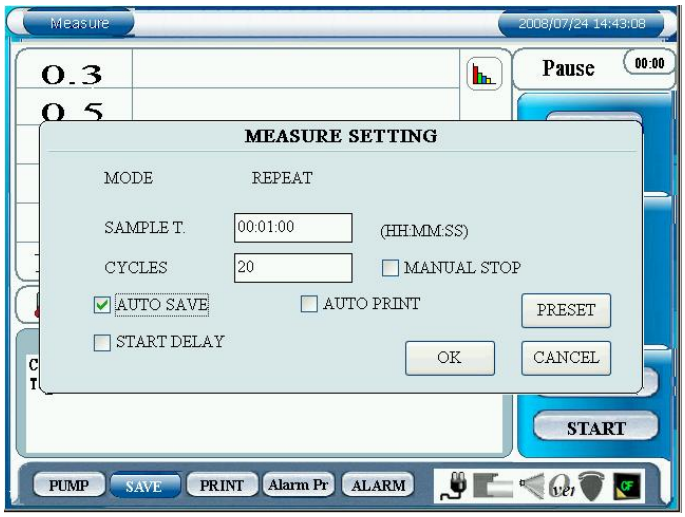


Tap [PRESET] to display a window asking you to input “PRESET NAME”.
Tap the entry field to display the keyboard. Enter the file name and tap [Enter].

Tap [OK] to save the current settings (including AUTO SAVE, AUTO PRINT and START DELAY) on the CF card.

* In the future you can automatically load the configuration saved here as a PRESET. Refer to **3.8 PRESET**.

3.6.4 REPEAT



You can set SAMPLE T., CYCLES and MANUAL STOP.

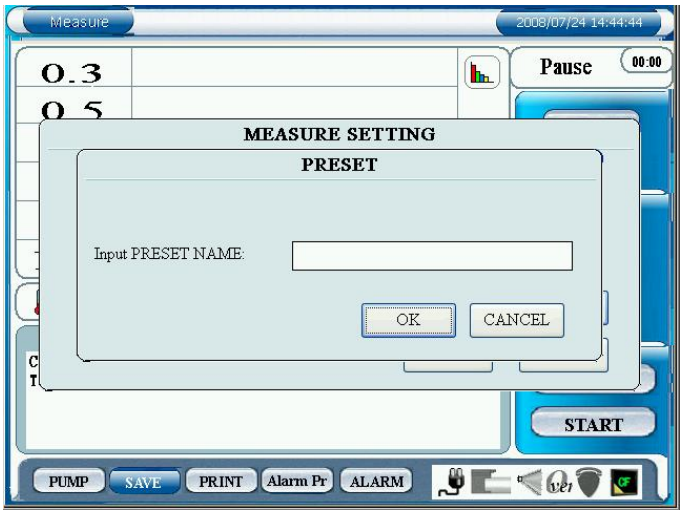
Tap the entry field of SAMPLE T. to display a numeric keypad. Enter “hour”, “minute” and “second” and tap [OK].

Tap the entry field of “CYCLES” to display a numeric keypad. Enter a value and tap [Enter].

Check “MANUAL STOP” to continue measuring until you stop the measurement, regardless of the CYCLES setting.

Check “AUTO SAVE” to store data automatically.
Check “AUTO PRINT” to print data automatically.
Check “START DELAY” to use delay time prior to a measurement.

Tap [OK] to save and activate the settings.

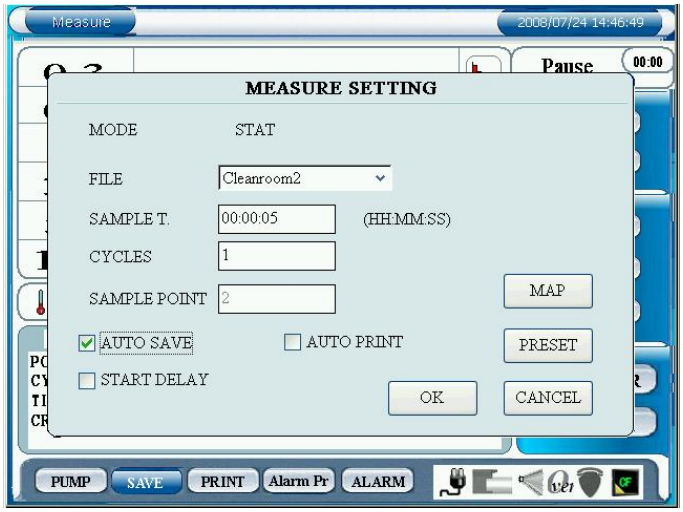


Tap [PRESET] to display a window asking you to input “PRESET NAME”.
Tap the entry field to display the keyboard. Enter the file name and tap [Enter].

Tap [OK] to save the current settings (including AUTO SAVE, AUTO PRINT and START DELAY) on the CF card.

* You can automatically configure measurement settings by loading a saved PRESET. Refer to **3.8 PRESET**.

3.6.5 STAT



If there are any MAP files saved, select the FILE to load it.

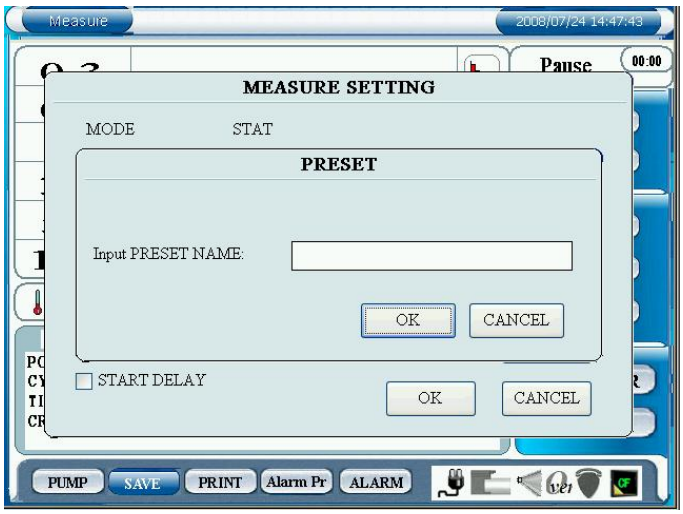
Tap the entry field for “SAMPLE T”. to display a numeric keypad. Enter “hour”, “minute” and “second” on the numeric keypad and tap [OK].

Tap the entry field of “CYCLES” to display a numeric keypad. Enter a value and tap [Enter].

Once a MAP file is loaded, you cannot change the settings for SAMPLE POINT. (The configured number of measurement points in the MAP file will be applied.)
When a MAP file is not loaded, tap an entry field of “SAMPLE POINT” to display a numeric keypad. Enter a value and tap [Enter].

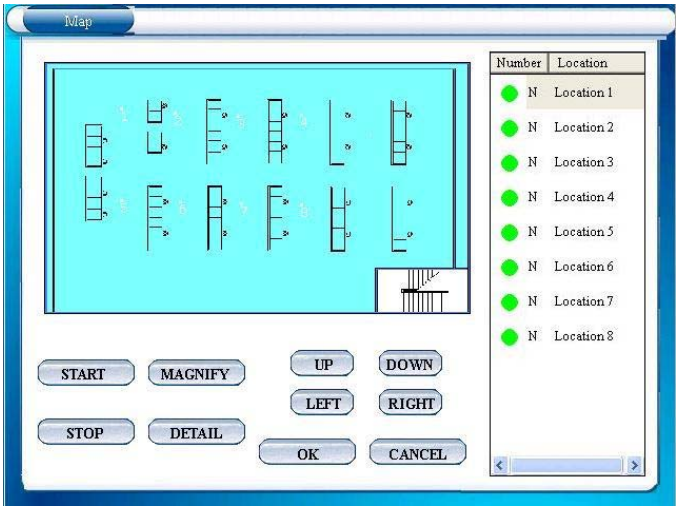
Check “AUTO SAVE” to store data automatically.
Check “AUTO PRINT” to print data automatically.
Check “START DELAY” to use delay time prior to a measurement.

Tap [OK] to save and activate the settings.



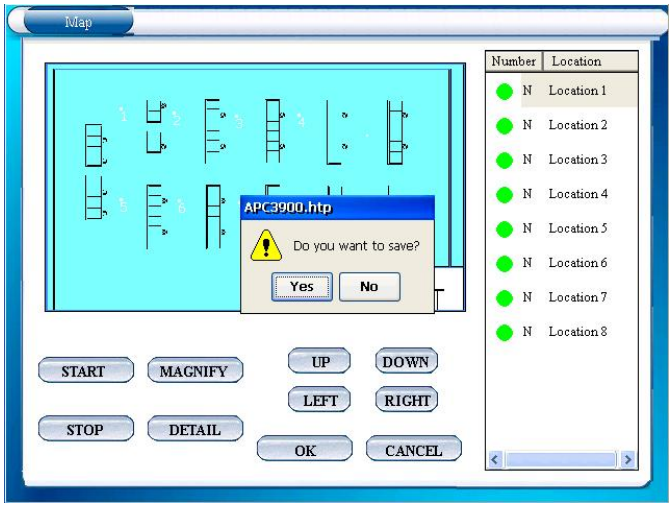
Tap “PRESET” to display a window asking you to input “PRESET NAME”.
Tap the entry field to display the keypad. Enter the file name and tap [Enter].
Tap [OK] to save the current settings (including AUTO SAVE, AUTO PRINT and START DELAY) on the CF card.

* In the future you can automatically load the configuration saved here as a PRESET. Refer to **3.8 PRESET**.



When a MAP file is specified in “FILE”, tap [MAP] to display a MAP.
([START] and [STOP] buttons are inactive.)

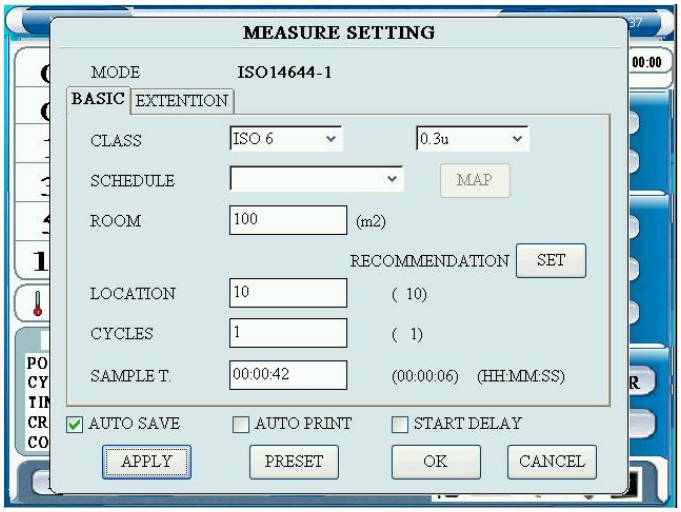
You can change the location order.
Tap the Location to be changed. Use [UP] and [DOWN] buttons to change the order.



Tap [OK]. Then a window will be displayed asking if you want to save the new order of the Location.
Tap [YES] or [NO].
Tap [YES] to set the changes and go back to “CONFIG” setting screen.
Tap [NO] to go back to MAP screen.

Tap [CANCEL] to discard the changes and go back to “CONFIG” setting screen.

3.6.6 STANDARD



STANDARD Measurement Setting

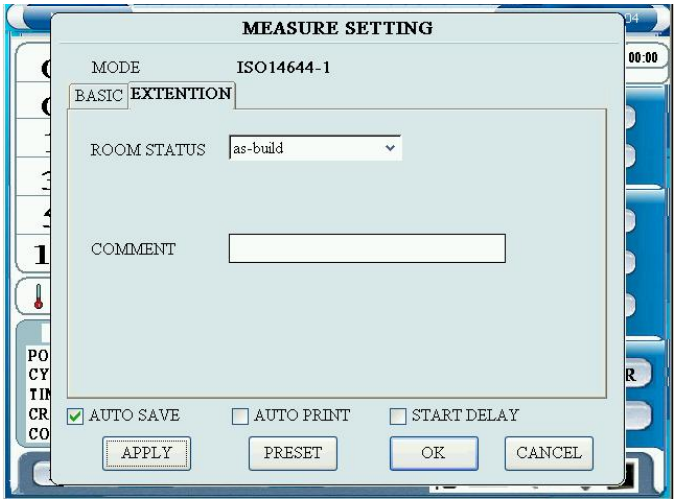
Based on the STANDARD setting configured in **3.9.2 OPTION**, the setting items for CLASS and items in EXTENTION tab varies.

In the BASIC tab;

Configure the setting of CLASS, SCHEDULE, ROOM, LOCATION, CYCLES and SAMPLE T.

CLASS Set the cleanliness level of the cleanroom to be measured. After configuring this setting, the appropriate particle size for the configured CLASS can be selected.
SCHEDULE You can load a MAP file. If you select the file, the MAP function will be activated and the MAP will be displayed.
ROOM Input the size of the room to be measured.
LOCATION Input the number of measurement point.
CYCLES Input the measurement cycles.
SAMPLE T. Input the sampling time.

The numeric value shown next to the each entry field is the minimum value based on CLASS and ROOM. Tap [SET] to use the recommendation value.



Tap [APPLY] to activate the new settings in each tab.

Tap [OK] to activate all the new settings.

Tap [CANCEL] to discard the changes and close the window.

In the EXTENTION tab;

Configure the ROOM STATUS, and COMMENT settings.

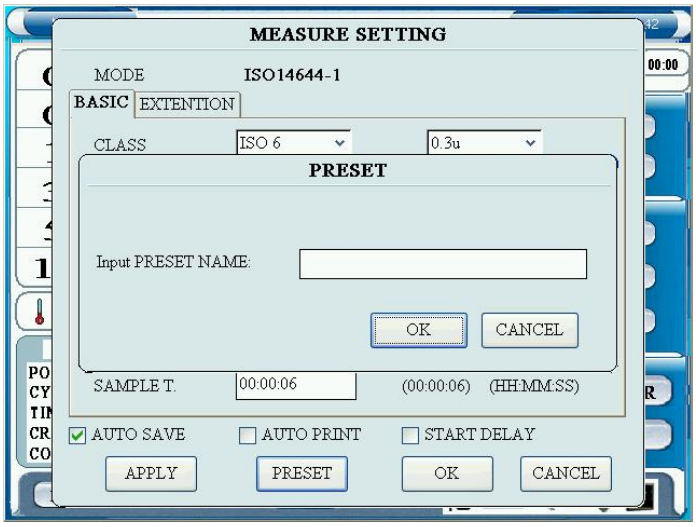
[ROOM STATUS]

Select either **as-built**, **as-rest** or **operational**.

- Select **as-built** when the cleanroom is setting up.
- Select **as-rest** when the cleanroom function is off.
- Select **operational** when the cleanroom function is on.

[COMMENT]

Tap the entry field to display a keypad. Enter comment and tap [Enter].

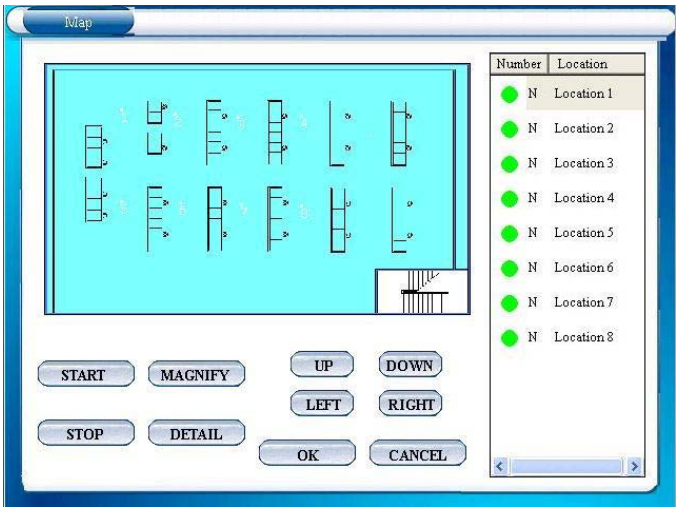


Check “AUTO SAVE” to store data automatically.
Check “AUTO PRINT” to print data automatically.
Check “START DELAY” to use delay time prior to a measurement.

Tap [OK] to store and activate the settings.

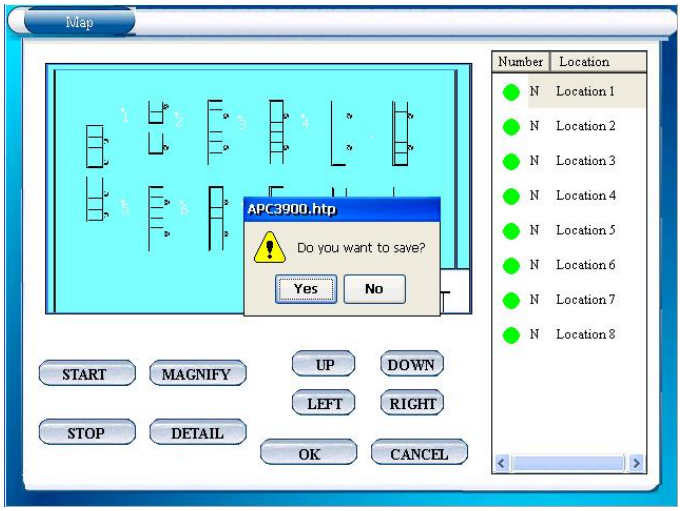
Tap [PRESET] to display a window asking you to input “PRESET NAME”.
Tap the entry field to display the keyboard. Enter the file name and tap [Enter].

Tap [OK] to save the current settings on the CF card.



When specifying a MAP file in “SCHEDULE”, tap [MAP] button to display MAP.
([START] and [STOP] buttons are inactive.)

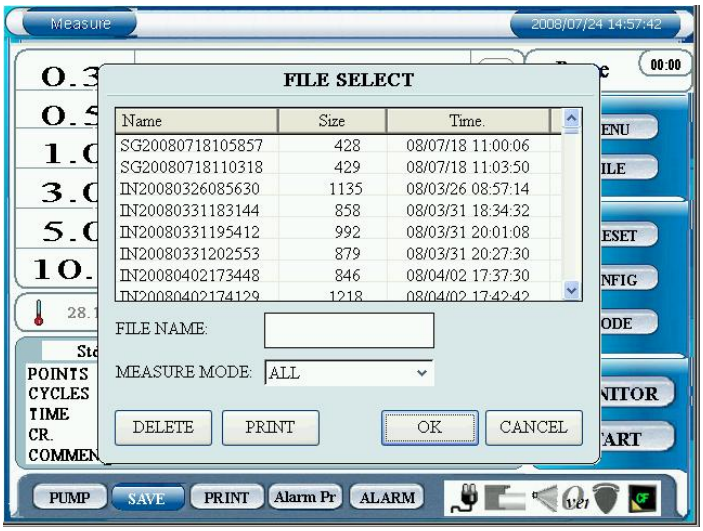
You can change the location order.
Tap the Location to be changed. Use [UP] and [DOWN] buttons to change the order.



Tap [OK]. Then a window will be displayed asking if you want to save the new order of the Location.
Tap [YES] or [NO].
Tap [YES] to set the changes and go back to [CONFIG] setting screen.
Tap [NO] to go back to display MAP.

Tap [CANCEL] to discard the changes and go back to [CONFIG] setting screen.

3.7 FILE



Select [FILE] on the initial screen. Then a screen shown on the left will be displayed.

The file name consists of abbreviation of the measurement mode + Date + Time.

The measurement mode abbreviations are;

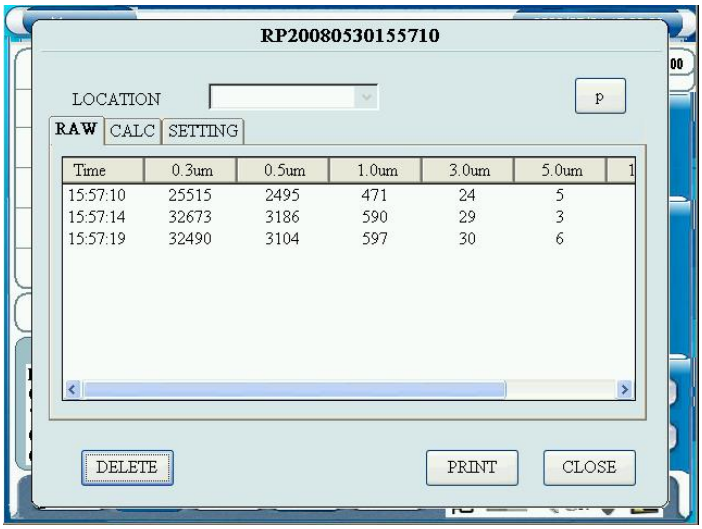
SG: SINGLE	IS: ISO
SQ: SEQUENCE	FS: FEDERAL STANDARD
IN: INTERVAL	BS: BRITISH STANDARD
RP: REPEAT	EC: EC GMP
ST: STAT	GB: GB/T

You can display, print or delete data here.

To delete data, select the file that you want to delete and tap [DELETE].

To print data, select the file that you want to print and tap [PRINT].

Use “MEASURE MODE” to reduce the number of files displayed.



<RAW TAB>

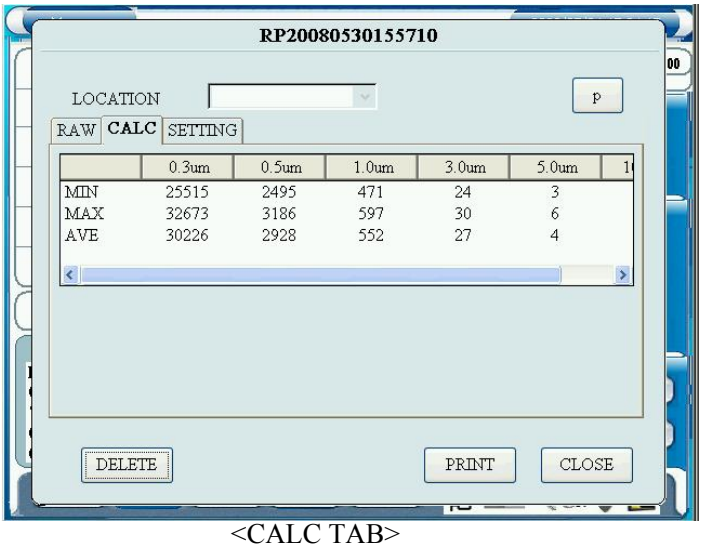
Select the data that you want to display and tap [OK]. Then the data display screen will be displayed.

After tapping [DELETE], a dialog will be displayed asking you if you want to delete it or not. Tap [YES] to delete the data file displayed.

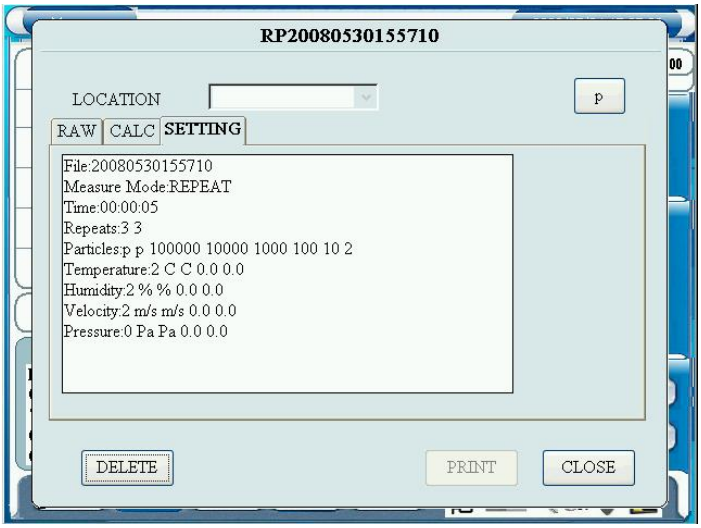
Tap [PRINT] to print the data.

Tap [CLOSE] to close a window.

In STAT mode and STANDARD mode, you can change the displayed data by selecting LOCATION.



<CALC TAB>



<SETTING TAB>

3.8 PRESET

Select “PRESET” on the initial screen to display CALL PRESET screen.

The selected PRESET file will be reflected in the MODE and CONFIG setting.

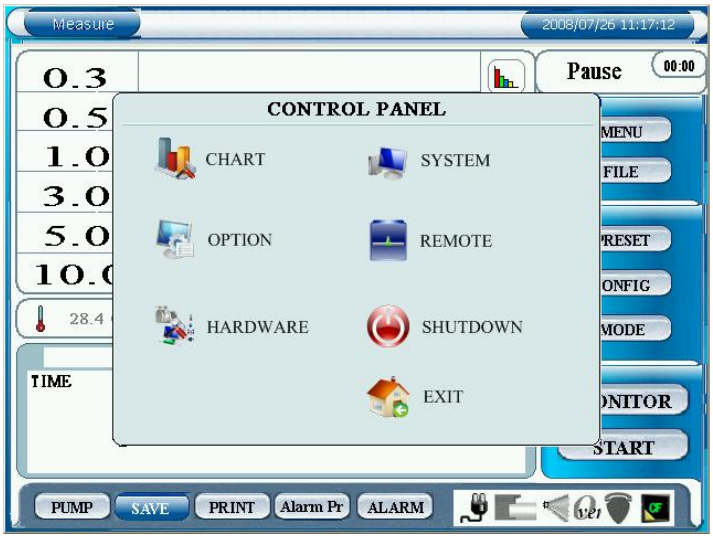
The first two letters in the file name indicates the mode type.

SG: SINGLE MEASUREMENT
SQ: SEQUENCE MEASUREMENT
IN: INTERVAL MEASUREMENT
RP: REPEAT MEASUREMENT
ST: STAT MEASUREMENT
IS: STANDARD MEASUREMENT

Select the item that you want to load or delete.
Tap [OK] to display the measurement screen with the selected PRESET settings (MODE and CONFIG settings)
Tap [DELETE] to delete the selected PRESET setting.

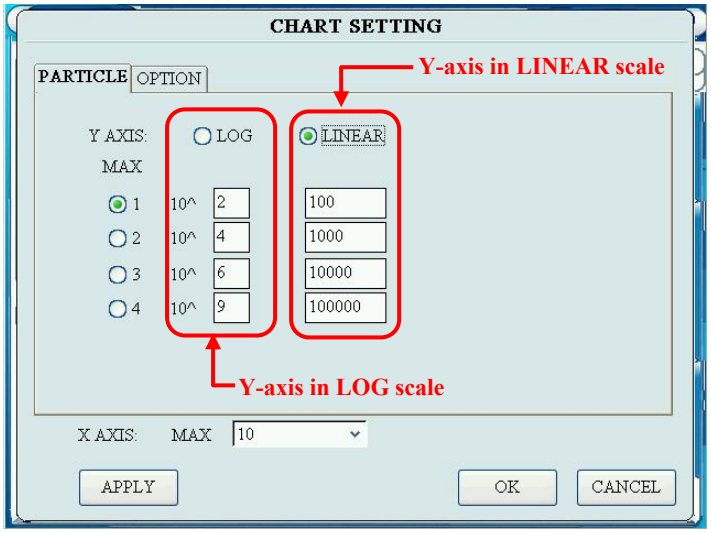
Refer to 3.6 CONFIG for setting procedure.

3.9 MENU



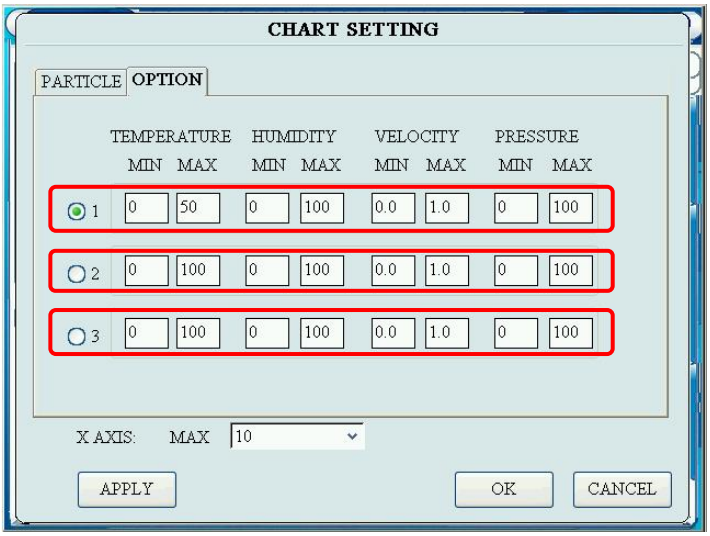
Select “MENU” on the initial screen to display the CONTROL PANEL window.

3.9.1 CHART



Configure the axis of the chart and range setting.
For X Axis select either “10”, “20”, “50”, “100”, “150” or “300”.

For Y Axis in PARTICLE tab select either “LOG” or “LINEAR”.
You can set 4 different max values each for “LOG” and “LINEAR”.

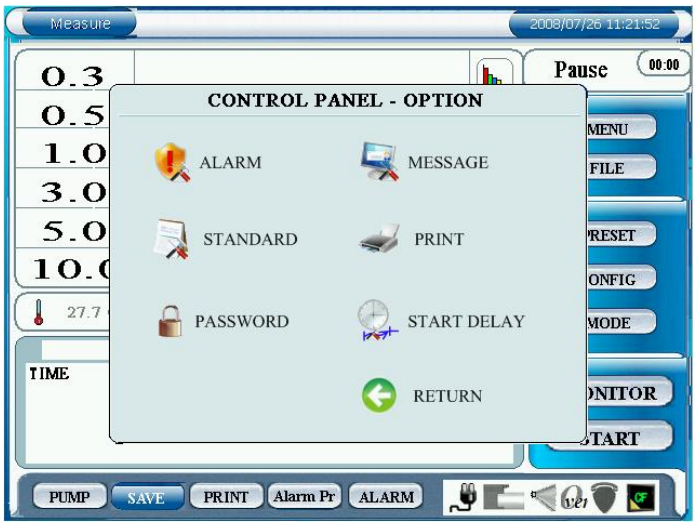


In OPTION tab, configure “MIN” and “MAX” setting for each sensor.
For each sensor you can set three different values.

Tap [APPLY] to save the setting value that is displayed in the tab.
Tap [OK] to save the setting value and close the window.
Tap [CANCEL] to discard the configure settings, and the previous settings will be applied.

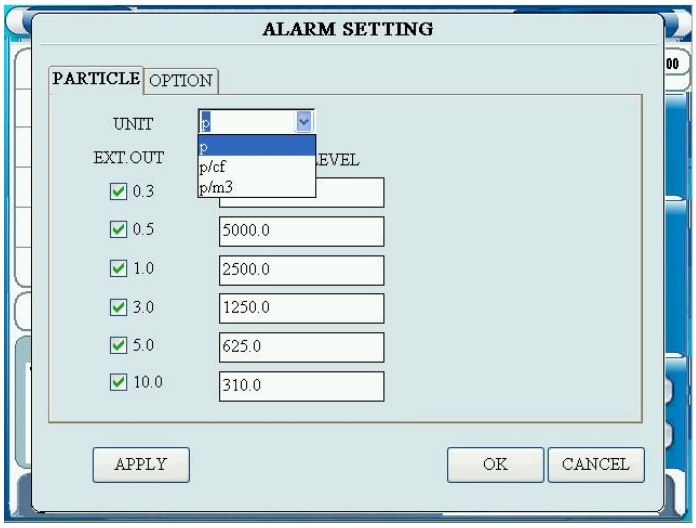
In the chart, you can change the MIN and MAX values of the Y axis based on the three different settings configured in this tab.

3.9.2 OPTION



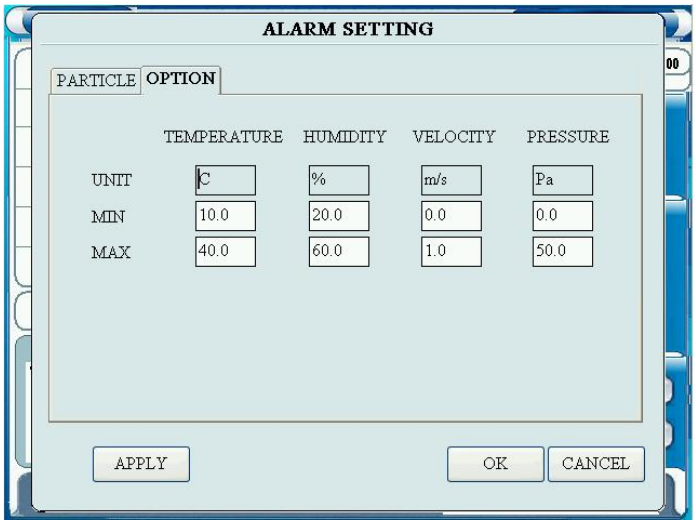
In the OPTION window you can configure “ALARM”, “STANDARD”, “PASSWORD”, “MESSAGE”, “PRINT” and “START DELAY” settings.

· ALARM



In ALARM SETTING set threshold for particle alarm and option sensor alarm.

In the PARTICLE tab, configure the unit and threshold for each particle.
Check the particle size that you want to alarm by external contact output and audible alarm.
Also enter the threshold that you want to alarm.
Tap entry field to display a numeric keypad. Enter a value and tap [Enter].



In the OPTION tab, you can set alarm threshold for TEMERATURE, HUMIDITY, VELOCITY and PRESSURE.

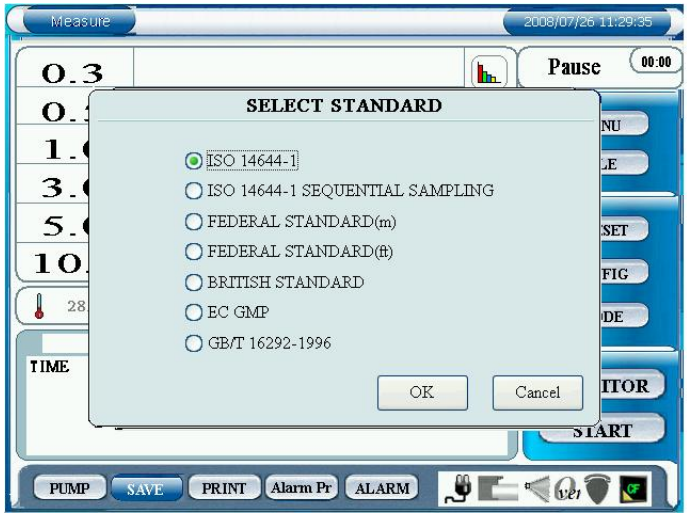
Tap the entry field to display a numeric keypad. Enter value and tap [Enter].

Tap [APPLY] to save the setting value that is displayed at the moment.

Tap [OK] to save the setting values both in PARTICLE tab and OPTION tab, and to close the window.

Tap [CANCEL] to discard the configured settings, and the previous settings will be applied.

· STANDARD



In the SELECT STANDARD window, select a measurement standard to be applied in the STANDARD mode.

There are 7 types of standard as follows:

- ISO14644-1
- ISO14644-1 SEQUENTIAL SAMPLING
- FEDERAL STANDARD (m)
- FEDERAL STANDARD (ft)
- BRITISH STANDARD
- EC GMP
- GB/T 16292-1996

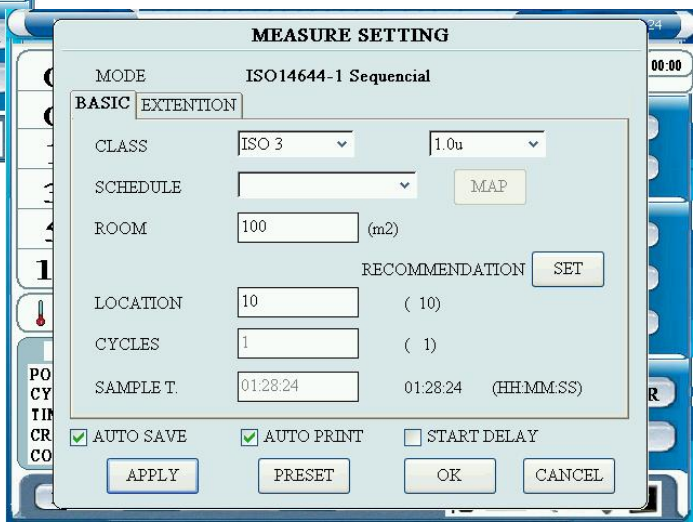
* Refer to page 10 for the measurement standard.

Tap [OK] to activate the setting.

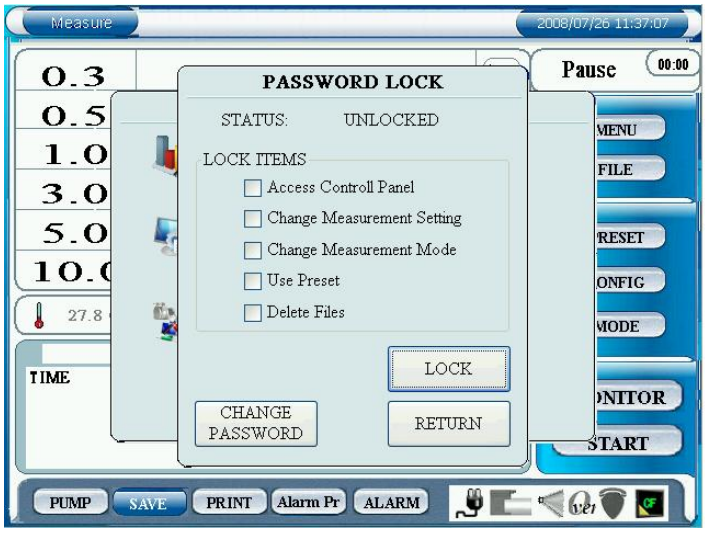
Change the settings and tap [OK]. Then a dialog will be displayed saying “Because standard is changed, standard measurement setting dialog will open.” Tap [OK] at the upper right.

CONFIG setting screen will be displayed. Then configure the settings.

Refer to **<u>3.6.6 STANDARD</u>** for setting procedure.



· PASSWORD



In the PASSWORD LOCK window, you can select the functions to be restricted by password. The below functions can be restricted by checking the LOCK ITEMS box;

*** <u>Access Control Panel</u>**

- The following settings in the CONTROL PANEL will be restricted:
  - CHART SETTING
  - OPTION SETTING
    - ALARM
    - STANDARD
    - MESSAGE
    - PRINT
  - HARDWARE SETTING
    - OPTION SENSOR
    - PUMP
  - SYSTEM
    - DATE/TIME
    - LCD
    - SOUND
    - COMMUNICATION
  - REMOTE

*** <u>Change Measurement Setting</u>**

- CONFIG Setting will be restricted.

*** <u>Change Measurement Mode</u>**

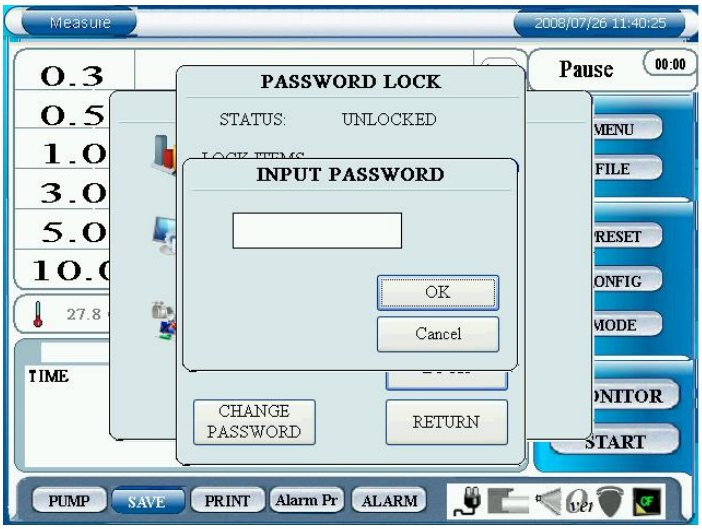
- Measurement MODE will be restricted.

*** <u>Use Preset</u>**

- Preset Setting will be restricted.

*** <u>Delete Files</u>**

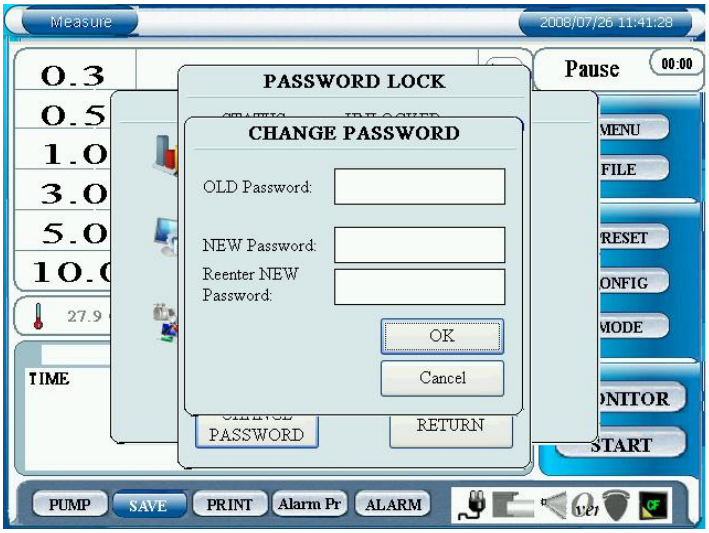
- You will not be able to delete any files.



Check the item that you want to restrict and tap [LOCK]. Then enter the password. If the password is entered correctly, the item is locked and the [LOCK] button becomes [UNLOCK] button.

In order to release the restriction, uncheck the item that you want to release the restriction and tap [UNLOCK]. Then your will be asked to enter the password. If the password is entered correctly, the item will be unlocked. When all the items are unlocked, the [UNLOCK] button will become [Lock] button.

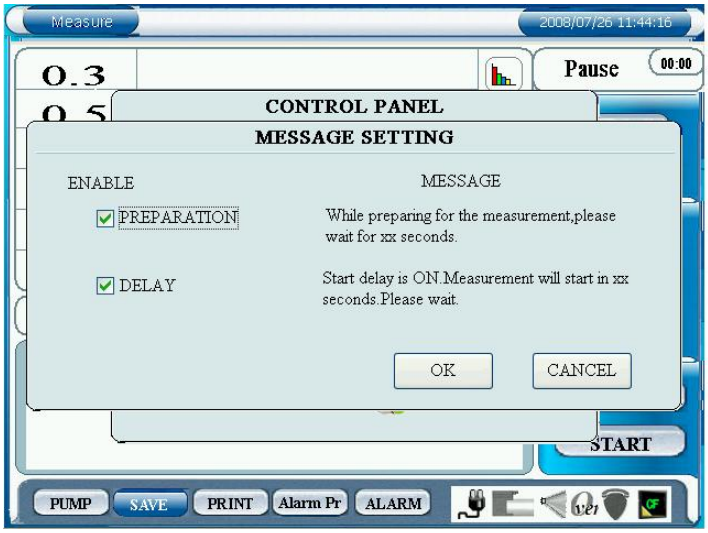
The default password is set as “password”.



When the items are unlocked, tap [CHANGE PASSWORD] to change the password.

You will be asked to enter the old password and new password and reenter the new password. If the entry is properly done, the password will be changed.

· MESSAGE



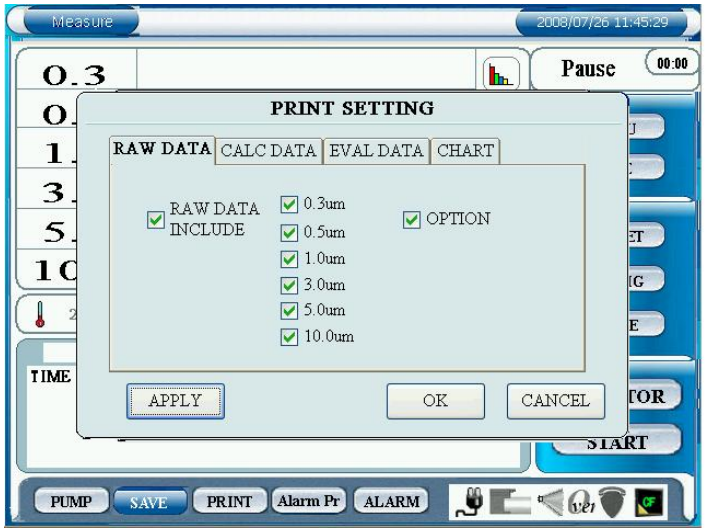
In the MESSAGE SETTING window, you can choose to display or not display a message of “PREPARATION”, and “DELAY”.

Tap [OK] to activate the settings.

Each message is;

- PREPARATION:
  To be displayed after the pump is ON before sampling starts.
- DELAY:
  To be displayed before sampling starts when START DELAY function is ON.

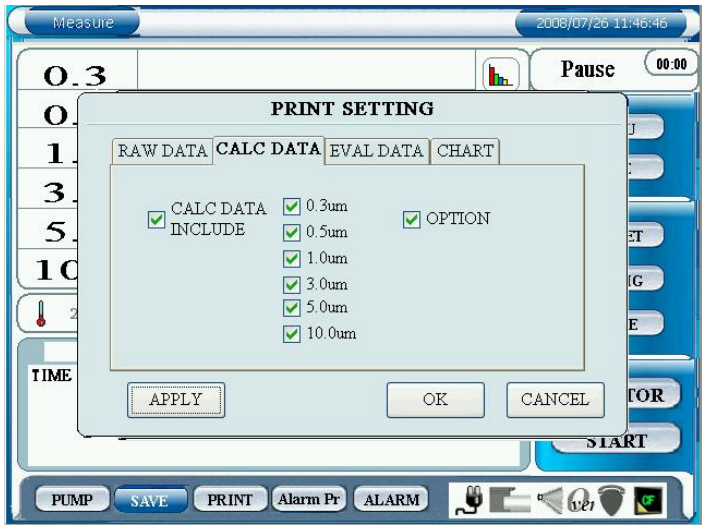
· **PRINT**



In the PRINT SETTING window set the output items for printing.

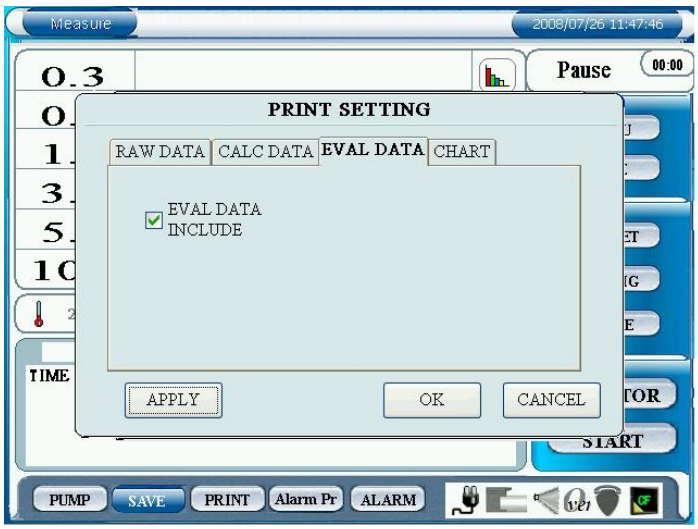
In RAW DATA tab, configure the following settings:
- RAW data printing ON/OFF
- Particle size to be printed
- Option sensor data printing ON/OFF

Check “RAW DATA INCLUDE” to print RAW data.
Check the particle size of the data that you want to print.
Check “OPTION” to output data of the option sensor.



In CALC tab, configure the following setting;
- CALC data printing ON/OFF
- Particle size to be printed out
- Option sensor data printing ON/OFF

Check “CALC DATA INCLUDED” to print CALC data.
Check the particle size of the data that you want to print out.
Check “OPTION” to output data of the option sensor.



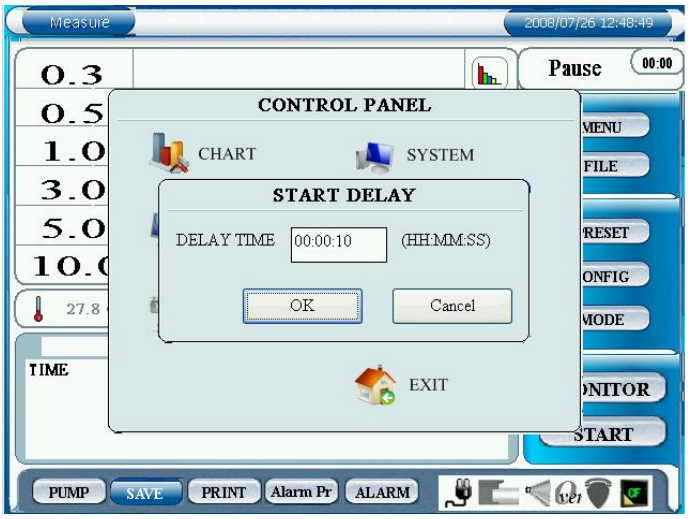
IN EVAL DATA tab, configure the following setting;
- EVAL data printing ON/OFF
  Check “EVAL DATA INCLUDED” to print out the EVAL data.

Tap [APPLY] to save the setting value that is displayed at the moment.

Tap [OK] to save the setting values both in all the tabs, and to close the window.

Tap [CANCEL] to discard the configured settings, and the previous settings will be applied.

· START DELAY

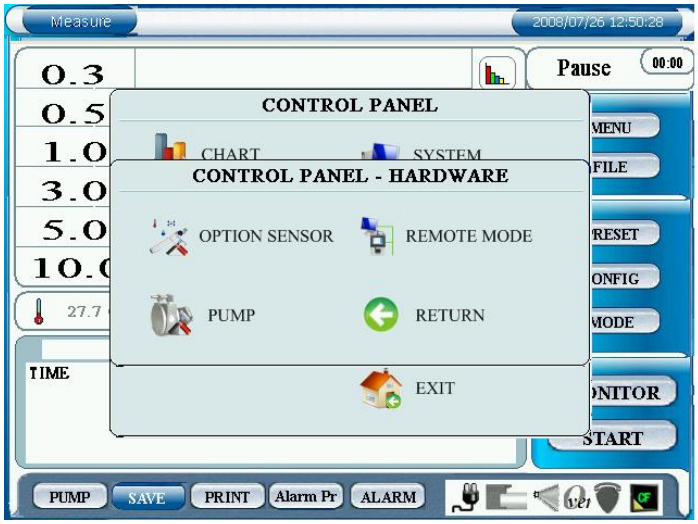


In START DELAY window set a measurement delay time.

Tap the entry field to display a keyboard. Enter “hour”, “minute” and “second” and tap [OK].

Tap [OK] in order to activate the setting.

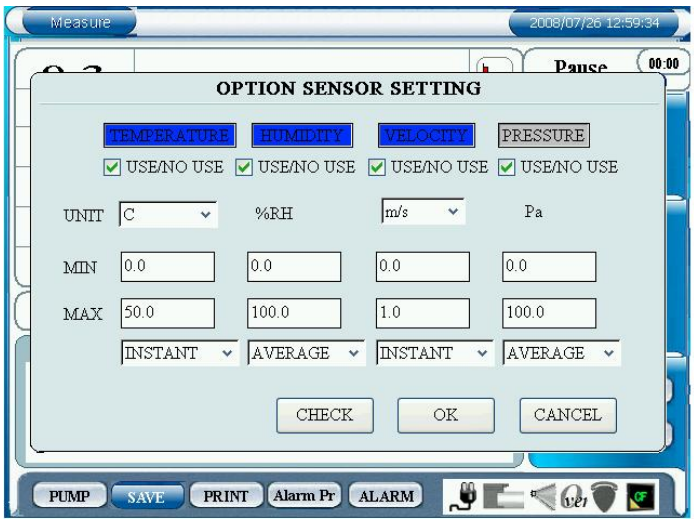
3.9.3 HARDWARE



In HARDWARE setting, you can configure the following settings;

- OPTION SENSOR
- PUMP
- REMOTE MODE

· OPTION SENSOR



In the OPTION SENSOR SETTING window you can confirm if the option sensor is connected or not, and set to use or not use the sensor. You can also set the unit and MIN/MAX range value for each sensor. MIN/MAX value should be the spec range for each sensor.

When the sensor is connected, it is displayed in blue and if not, it is displayed in gray.

To use the option sensor, check USE/NO USE box.

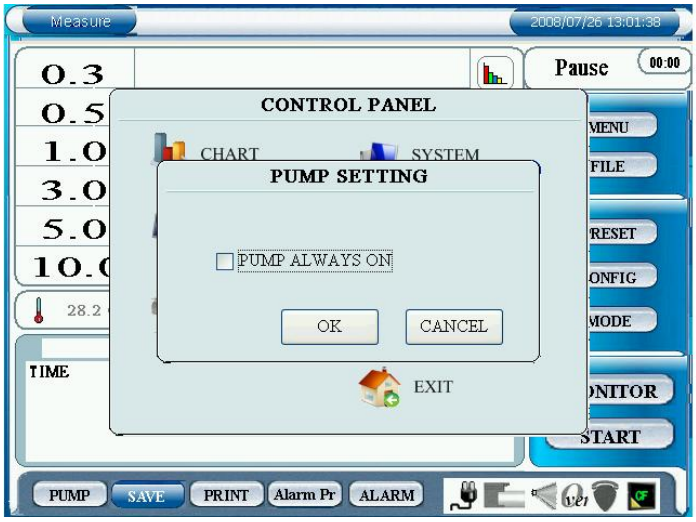
UNIT:
Set the unit for TEMPERATURE and VELOCITY.
For TEMEPRATURE, select °C or °F
For VELOCITY, select m/sec or FPM.

MIN/MAX:
Set the measurable range of the sensor connected according to the spec of the each option sensor.
Tap the entry field to display a numeric keyboard. Enter a value and tap [Enter].

INSTANT/ AVERAGE:
Select INSTANT or AVERAGE for measurement value display format.

CHECK button:
Tap [CHECK] to confirm if the option sensor is connected or not.

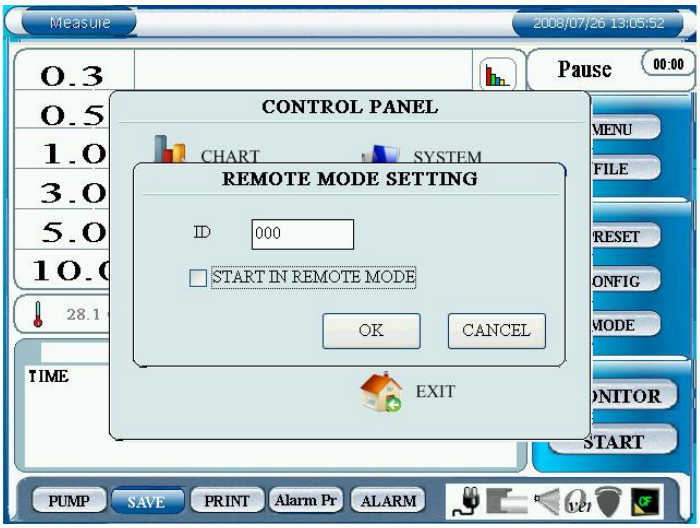
· PUMP



In the PUMP setting, set to turn the pump ON all the time or not.

To turn the pump ON all the time, check the check box “PUMP ALWAYS ON”.
If you check this box, you can eliminate the PREPARATION time before sampling.

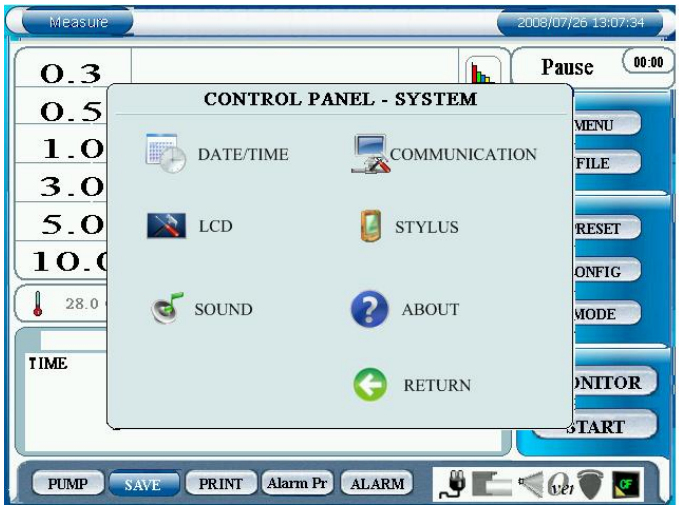
· REMOTE MODE



In the REMOTE MODE SETTING, check “START IN REMOTE MODE” to activate remote mode automatically when the instrument is turned ON.

Enter remote address in the entry field for ID.

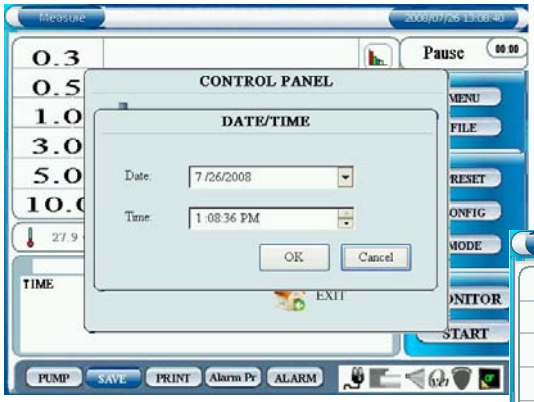
3.9.4 SYSTEM



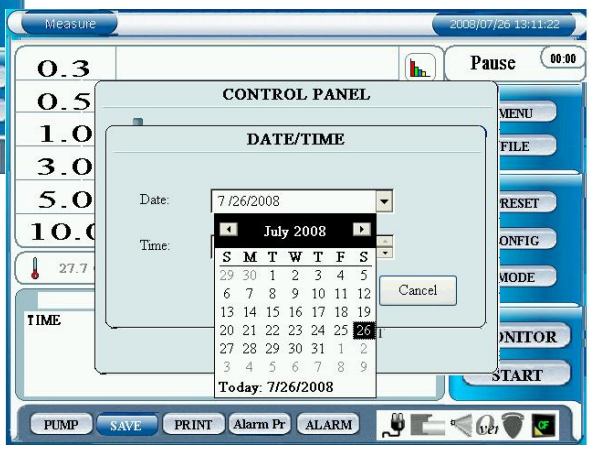
In the SYSTEM setting, configure the following settings:

- DATE/TIME
- LCD
- SOUND
- COMMUNICATION
- STYLUS
- ABOUT

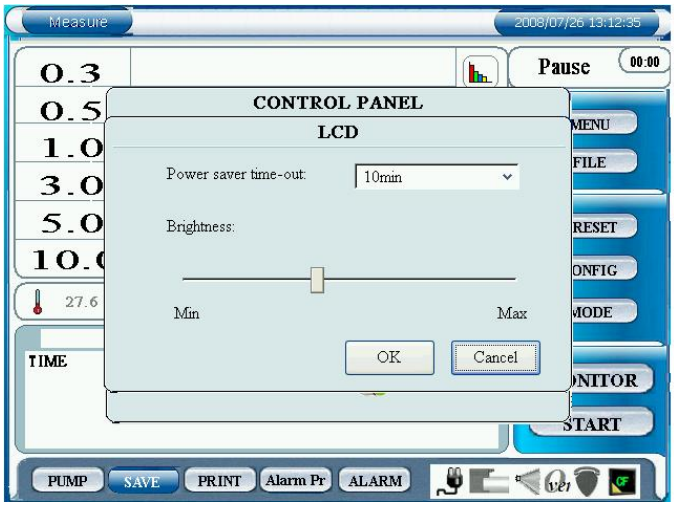
· DATE/TIME



DATE/TIME setting;
To adjust DATE, tap [▼] to display a calendar and set the date.
To change the TIME, tap "hour", "minute" and "second" using [▲/▼] buttons.
Tap [OK] to activate the settings.



· LCD



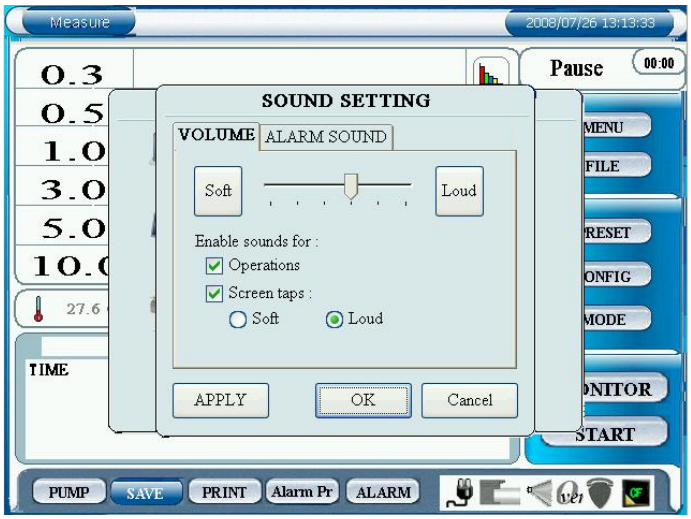
In LCD setting, configure Power Save time and brightness setting.

For Power Save setting, select one among 1min, 2min, 3min, 5min, 10min, and 30min.

To configure the brightness setting, move the slider from side to side.

Tap [OK] to activate the settings.

· SOUND

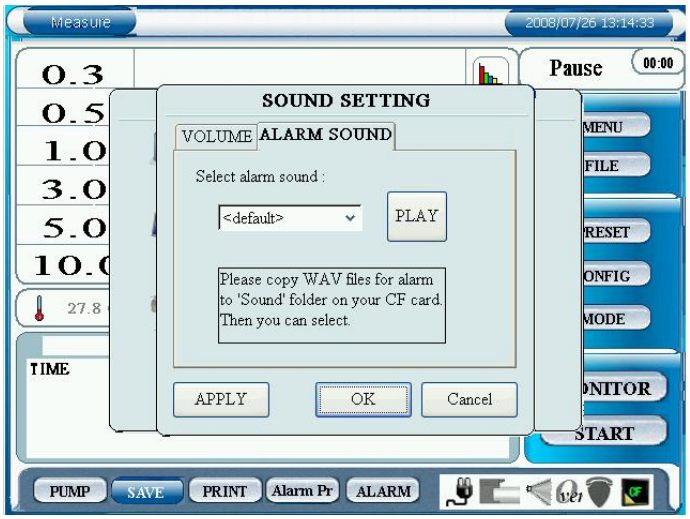


In SOUND setting, configure the following settings;

- VOLUME
- ALARM SOUND

On VOLUME tab, adjust the tap volume using sound volume slider or “Soft” and “Loud” buttons.
To mute tap sound, uncheck “Operations” and “Screen taps”.

“Operations” indicates the sound when displaying error message.
“Screen taps” indicates the sound when tapping the screen.
Use “Soft” and “Loud” buttons to change the tone.

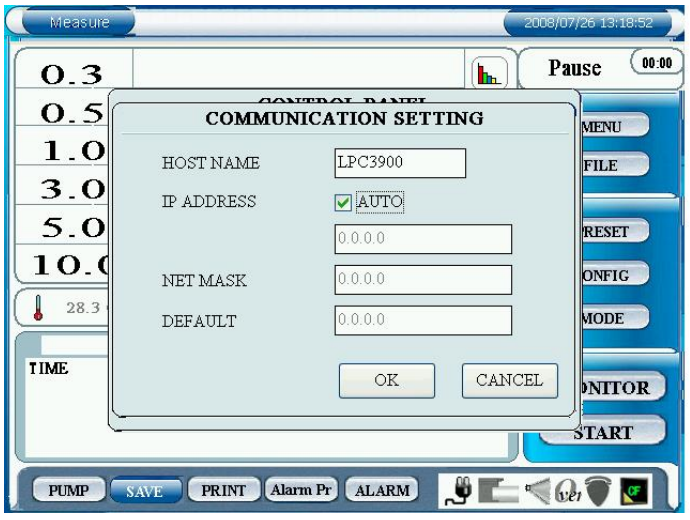


In the ALARM SOUND tab, configure an alarm setting.
Select an alarm sound from WAV file stored in CF card.

Tap [PLAY] to play the selected WAV file.

Tap [APPLY] to save the setting value that is displayed at the moment.
Tap [OK] to save the setting values in all the tabs, and to close the window.
Tap [CANCEL] to discard the configured settings, and the previous settings will be applied.

· COMMUNICATION



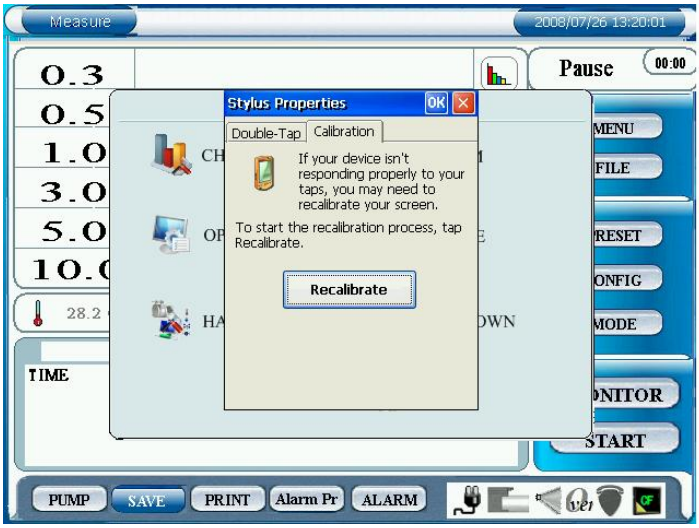
In the COMMUNICATION SETTING, configure the setting for Ethernet connection. This setting shall be configured when connecting the instrument to PC using remote console or remote mode.

For the HOST NAME, enter the instrument name to be used when it is connecting by Ethernet.

FOR IP ADDRESS, check AUTO to acquire IP ADDRESS automatically. If AUTO is unchecked, enter IP ADDRESS and NET MASK.

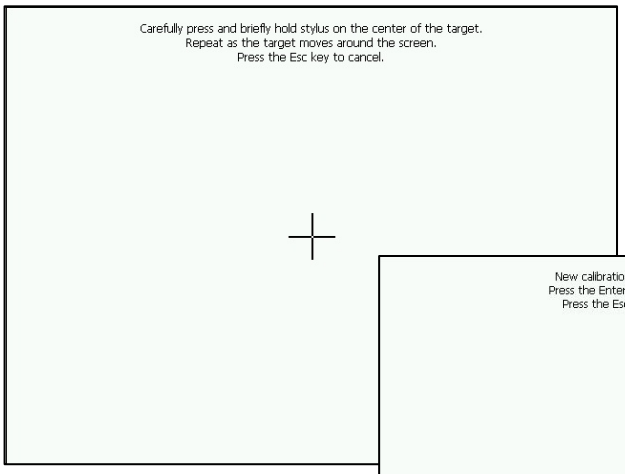
Tap [OK] to save the settings and to close the window.
Tap [CANCEL] to discard the configured settings, and the previous settings will be applied.

・STYLUS

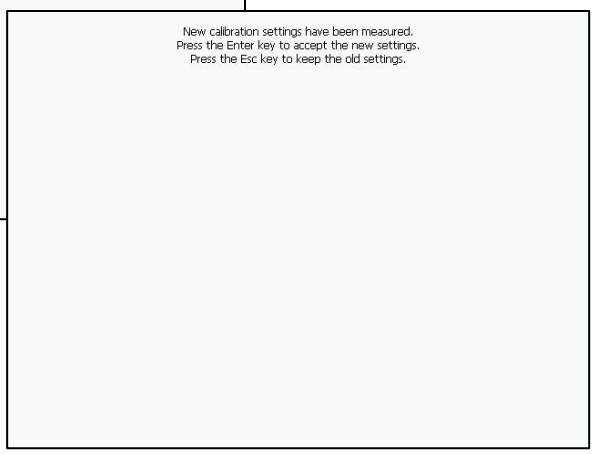


In Stylus setting you can correct tap accuracy.
Tap [Recalibrate] button.

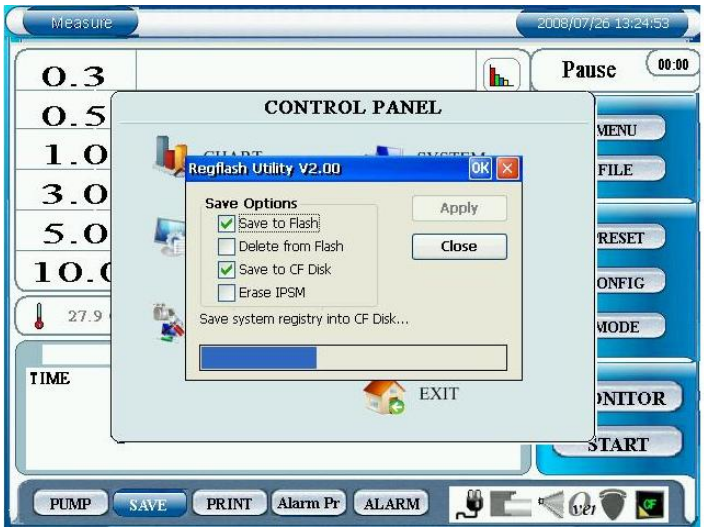
After using the instrument for a prolonged time, tap accuracy may degrade. Use this menu to correct the tap location.



Tap the center of the cross by stylus.
There are 5 setting locations in total.

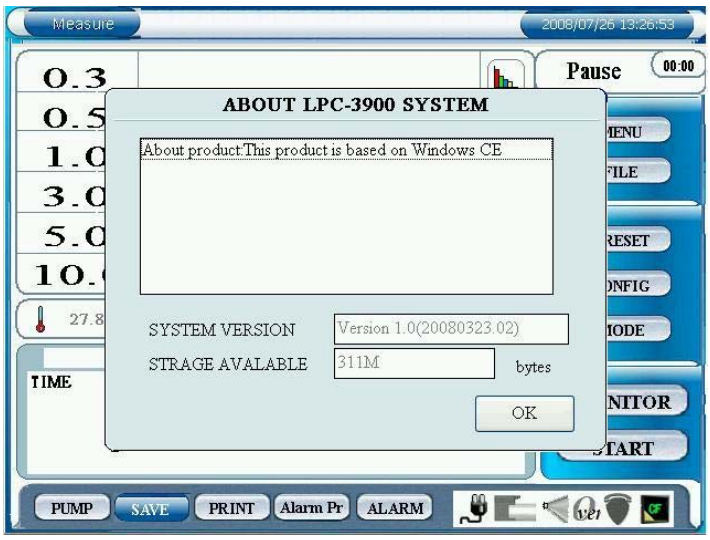


After adjusting the tap location, tap the screen, and go back to the Stylus setting screen.



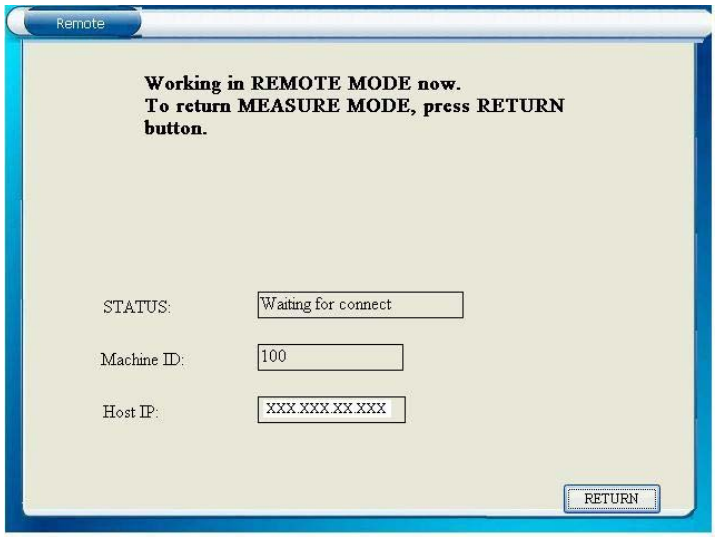
Tap [OK] to save the settings.

・ABOUT



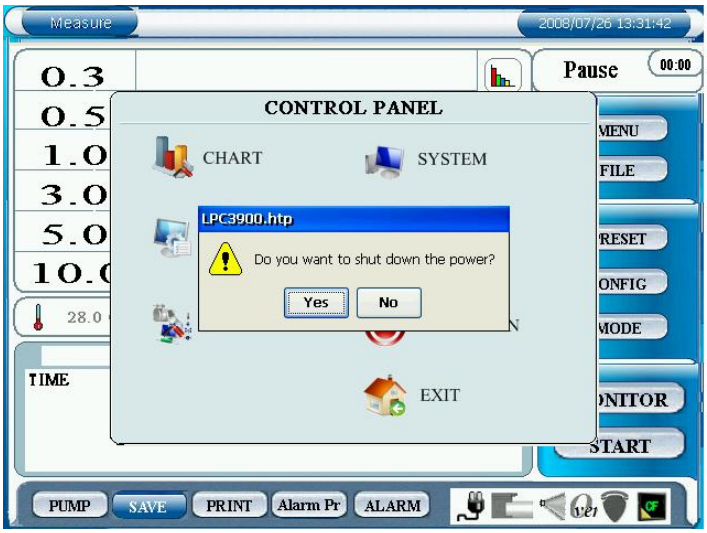
Tap [ABOUT]. The firmware version of the instrument and remaining capacity of the memory card will be displayed.

3.9.5 REMOTE



Change to REMOTE MODE.

3.9.6 SHUTDOWN



Tap [SHUTDOWN]. A window will be displayed asking “Do you want to shut down the power?”
5 seconds after tapping [YES], the instrument will shut down.

3.9.7 EXIT

Go back to the main screen.

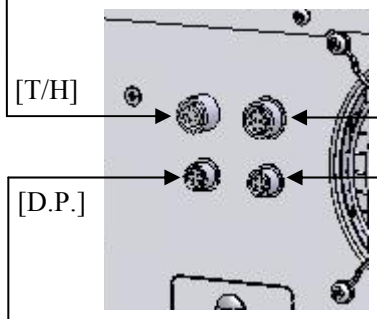
4. Connecting Optional Extras

4.1 Connecting Optional Extras

3 types of sensors are available as optional extras for this instrument.
By connecting sensors to 4 different connectors on the rear of the unit, you can perform 3 kinds of measurement and one contact output simultaneously.

Temperature and Humidity Probe - Model 0844	
Temp. Range	0~50 °C (32~122 °F)
Temp. Accuracy	±0.5 °C (at the air velocity of 0.2m/s or more)
Humidity Range	3~98%RH
Humidity Accuracy	±3%RH (±5% when the humidity level is outside the 30-85%RH)
Dimension	φ20 × 150mm

Air Velocity Probe - Model 0843	
Velocity Range	0~1m/s (0~197FPM)
Velocity Accuracy	±0.05m/s (10FPM)
Dimension	φ20×150 mm Curl Cord: 0.2m (Max:1.5m)



Pressure Transmitter - Model C264 0-100Pa	
Pressure Range	0~100Pa
Pressure Accuracy	±1%F.S.
Guaranteed Temp	5~65°C
Output	4~20mA

Contact Output Cable - Model 3900-03	
When the alarm function is ON and the threshold is exceeded, the contact closes.	
Spec	Photocoupler Maximum rating: 60V/400mA Red: + / Black: -

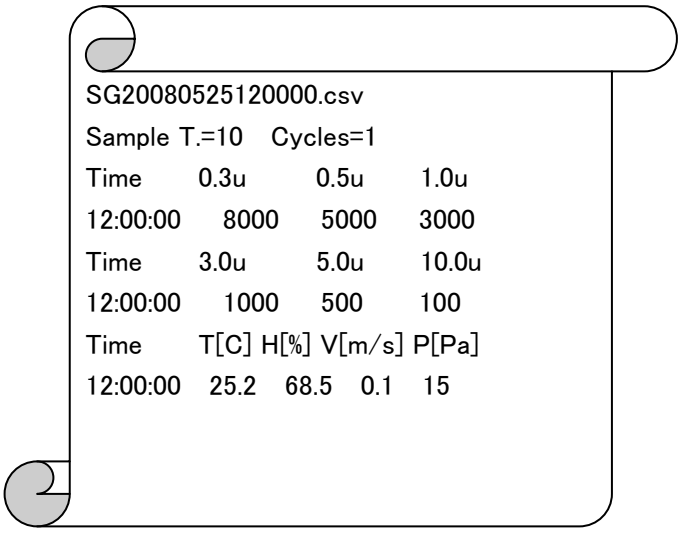
* When connecting the pressure transmitter, cable MODEL 3900-02 is required separately. Please check with your sales representative.

* Note: The alarm output is a single set of contacts that activates upon any sensor threshold being exceeded. It can be used to activate a dialer, alarm light, etc.

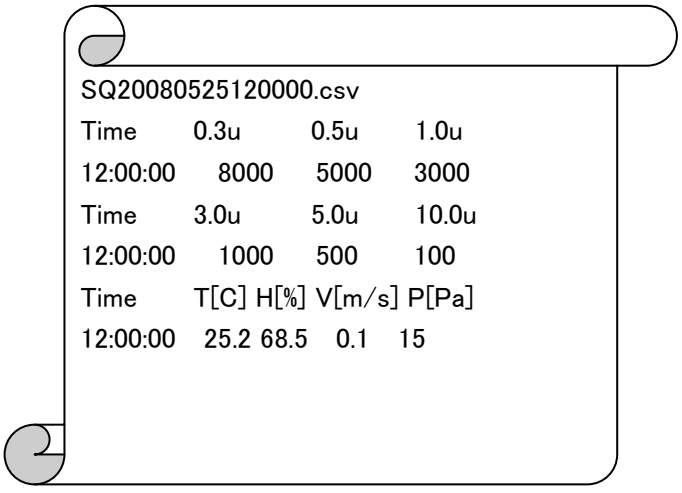
5. Printing Example

5.1 Printing Example for Each Measurement Mode

5.1.1 SINGLE



5.1.2 SEQUENCE



5.1.3 INTERVAL

IN20080525120000.csv
Sample T.=5 Cycles=5
0.3u
AVE=162.8 MIN=137 MAX=185
0.5u
AVE=16.8 MIN=13 MAX=25
1.0u
AVE=3.8 MIN=2 MAX=6
3.0u
AVE=0.0 MIN=0 MAX=0
5.0u
AVE=0.0 MIN=0 MAX=0
10.0u
AVE=0.0 MIN=0 MAX=0
Temperature
AVE=25.6 MIN=23.5 MAX=27.5
Humidity
AVE=63.0 MIN=58.9 MAX=68.5
Velocity
AVE=0.20 MIN=0.13 MAX=0.31
Press
AVE=5.4 MIN=4.8 MAX=6.5

Time	0.3u	0.5u	1.0u
12:00:00	137	13	5
12:00:10	185	25	3
12:00:20	175	16	2
12:00:30	159	15	6
12:00:40	158	15	3

Time	3.0u	5.0u	10.0u
12:00:00	0	0	0
12:00:10	0	0	0
12:00:20	0	0	0
12:00:30	0	0	0
12:00:40	0	0	0

Time	T[C]	H[%]	V[m/s]	P[Pa]
12:00:00	23.5	58.9	0.31	5.2
12:00:10	27.5	68.5	0.25	4.8
12:00:20	25.5	62.8	0.15	6.5
12:00:30	25.6	63.5	0.13	5.2
12:00:40	25.7	61.5	0.15	5.2

5.1.4 REPEAT

RP20080525120000.csv
Sample T.=5 Cycles=5
0.3u
AVE=162.8 MIN=137 MAX=185
0.5u
AVE=16.8 MIN=13 MAX=25
1.0u
AVE=3.8 MIN=2 MAX=6
3.0u
AVE=0.0 MIN=0 MAX=0
5.0u
AVE=0.0 MIN=0 MAX=0
10.0u
AVE=0.0 MIN=0 MAX=0
Temperature
AVE=25.6 MIN=23.5 MAX=27.5
Humidity
AVE=63.0 MIN=58.9 MAX=68.5
Velocity
AVE=0.20 MIN=0.13 MAX=0.31
Press
AVE=5.4 MIN=4.8 MAX=6.5

Time	0.3u	0.5u	1.0u
12:00:00	137	13	5
12:00:05	185	25	3
12:00:10	175	16	2
12:00:15	159	15	6
12:00:20	158	15	3

Time	3.0u	5.0u	10.0u
12:00:00	0	0	0
12:00:05	0	0	0
12:00:10	0	0	0
12:00:15	0	0	0
12:00:20	0	0	0

Time	T[C]	H[%]	V[m/s]	P[Pa]
12:00:00	23.5	58.9	0.31	5.2
12:00:05	27.5	68.5	0.25	4.8
12:00:10	25.5	62.8	0.15	6.5
12:00:15	25.6	63.5	0.13	5.2
12:00:20	25.7	61.5	0.15	5.2

5.1.5 STAT

ST20080525120000.csv
Sample T.=5 Cycles=5
Location 1
0.3u
AVE=162.8 MIN=137 MAX=185
0.5u
AVE=16.8 MIN=13 MAX=25
1.0u
AVE=3.8 MIN=2 MAX=6
3.0u
AVE=0.0 MIN=0 MAX=0
5.0u
AVE=0.0 MIN=0 MAX=0
10.0u
AVE=0.0 MIN=0 MAX=0
Temperature
AVE=25.6 MIN=23.5 MAX=27.5
Humidity
AVE=63.0 MIN=58.9 MAX=68.5
Velocity
AVE=0.20 MIN=0.13 MAX=0.31
Press
AVE=5.4 MIN=4.8 MAX=6.5

Time	0.3u	0.5u	1.0u
12:00:00	137	13	5
12:00:05	185	25	3
12:00:10	175	16	2
12:00:15	159	15	6
12:00:20	158	15	3

Time	3.0u	5.0u	10.0u
12:00:00	0	0	0
12:00:05	0	0	0
12:00:10	0	0	0
12:00:15	0	0	0
12:00:20	0	0	0

Time	T[C]	H[%]	V[m/s]	P[Pa]
12:00:00	23.5	58.9	0.31	5.2
12:00:05	27.5	68.5	0.25	4.8
12:00:10	25.5	62.8	0.15	6.5
12:00:15	25.6	63.5	0.13	5.2
12:00:20	25.7	61.5	0.15	5.2

Location 2
.
.

5.1.6 STANDARD

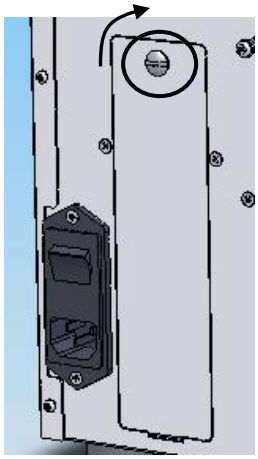
```
1
0.3u
AVE=162.8 MIN=137 MAX=185
0.5u
AVE=16.8    MIN=13    MAX=25
1.0u
AVE=3.8     MIN=2     MAX=6
3.0u
AVE=0.0     MIN=0     MAX=0
5.0u
AVE=0.0     MIN=0     MAX=0
10.0u
AVE=0.0     MIN=0     MAX=0
Temperature
AVE=25.6 MIN=23.5 MAX=27.5
Humidity
AVE=63.0 MIN=58.9 MAX=68.5
Velocity
AVE=0.20    MIN=0.13    MAX=0.31
Press
AVE=5.4    MIN=4.8    MAX=6.5

Sample T.=5    Cycles=5
Time       0.3u        0.5u        1.0u
12:00:00     137          13           5
12:00:05     185          25           3
12:00:10     175          16           2
12:00:15     159          15           6
12:00:20     158          15           3
Time       3.0u        5.0u        10.0u
12:00:00        0           0           0
12:00:05        0           0           0
12:00:10        0           0           0
12:00:15        0           0           0
12:00:20        0           0           0
Time       T[C] H[%] V[m/s] P[Pa]
12:00:00   23.5   58.9   0.31   5.2
12:00:05   27.5   68.5   0.25   4.8
12:00:10   25.5   62.8   0.15   6.5
12:00:15   25.6   63.5   0.13   5.2
12:00:20   25.7   61.5   0.15   5.2
                    .
```

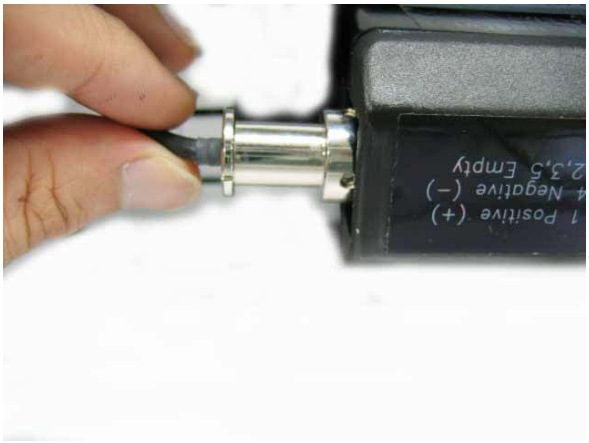
```
[Judgement]
No,Location,Mean,Result
1,1,68798.59,NG
2,2,71236.75,NG
ALL,70017.67
UCL,73863.87
Result,NG
```

6. Battery Charge

6.1 Charging Battery

You cannot charge the battery when it is installed in the instrument.





Open the battery compartment cover on the rear of the instrument. To open the cover turn the knob around 90 degrees. (Use a coin or something similar to turn it easily.)

To disconnect the cable from the battery, hold the sides of the cable connector as shown in the picture below.

Connect the battery to the provided charger to recharge the battery. It takes about 4 hours to charge the battery fully.

After the battery is charged, install it into the instrument reversing the above procedure.
(Refer to **2.1 Power Supply** for installing the battery.)

7. Main Specifications

Product name	Airborne Particle Counter
Model	Model 3900
Optical Source	Laser Diode (two-year warranty)
Particle Size Distribution	0.3 / 0.5 / 1.0 / 3.0 / 5.0 / 10.0 μm (6 Channels)
Rated Flow	28.3L/min.
Counting Efficiency	50±20% (Compliant with ISO 21501-4)
Spurious Count	0.3 counts/cf or less (Compliant with ISO 21501-4)
Max Detectable Concentration	500,000 counts/cf (=17,667.8 counts/L)
Sampling Time	1sec ~ 23hours 59min 59sec (Configurable)
Interval Time	11sec ~ 23hours 59min 59sec (Configurable)
Delay Time	10sec ~ 1hour (=3,600sec) (Configurable)
Repeat Times	1 ~ 9,999 times (Continuous) (Configurable)
Location Number	Configurable in the range of 0~999 (Schedule can also be configured.)
Alarm Setting	1 ~ 9,999,999 count (= count/cf, count/m³) (Unit is Configurable)
Measurement Mode	SINGLE Mode, SEQUENCE Mode, INTERVAL Mode, REPEAT Mode, STAT Mode, STANDARD Mode
Display	Color LCD Dot Matrix
Data Retention Capacity	512MB (Provided CF card) 1 data = Appro.100 bite (For example, Repeat measurement × 1,000 times → 100 bite × 1,000 times = 100k bite)
Printer	Built-in (Compatible with Dust-free Paper)
Interface	Ethernet / USB
Power Supply	AC 100 ~ 240V (50/60Hz) Rechargeable Lithium-ion battery Continuous duty time: 4 hours or longer (User replaceable)
Dimension	W 210 × D 220 × H 320 mm (Excluding Handle)
Weight	Approx. 8kg
Standard Accessory	Operation Manual / Calibration Certificate / Isokinetic Suction Probe / Standard Inlet / Power Cord (with Nema Plug) / Tygon Tube (2M) / Printer roll-paper×2 / Zero Filter / Airborne Particle Counter Software / CF Card / Fuse
Operation Environment	Temperature 10~40C° / Humidity 20~85%RH (No condensing)
Storing Environment	Temperature -20~50 C° / Humidity 0~98%RH (No condensing)
Optional Extras	Temperature & Humidity Probe / Air Velocity Probe/ Differential Pressure Sensor / Contact Output Cable / Battery / Battery Charger / Carry Case / Differential Pressure Sensor Cable

8. Troubleshooting

Symptom	Possible Cause	Maintenance
Cannot obtain Zero Count (When using a filter)	1) Inside the optical system may be dirty.	Attach the zero filter and perform aging for a prolonged time. After performing a measurement in the highly concentrated environment, attach the zero filter and perform aging.
	2) The filter's air tightness may be deteriorated.	Replace your zero filter.
	3) Leaks may be occurring inside the instrument.	Return the instrument to your distributor or to your KANOMAX service center for repair.
Count value is too high (Higher than the expected)	1) The particle concentration at the measurement site may be high.	-
	2) Inside the optical system may be dirty.	Attach the zero filter and perform aging for a prolonged time. After performing a measurement in the highly concentrated environment, attach the zero filter and perform aging.
	3) The instrument may be being used outside the operating environment in the specifications. (Measurement Environment Temperature / Humidity / Concentration etc)	Use the instrument under the environmental condition set in the specifications.
	4) The instrument may require calibration or repair. Even after you checked the above 1), 2) and 3), the instrument readings are still too high.	Return the instrument to your distributor or to your KANOMAX service center for repair.
Count value is too low (Lower than the expected)	1) The particle count at the measurement site may be low.	-
	2) The pump vacuum is low.	Pay attention to the pump performance. Check if the error status is displayed on the screen.
	3) The instrument may be being used outside the operating environment in the specifications. (Measurement Environment Temperature / Humidity / Concentration etc)	Use the instrument under the specified environmental condition.
	4) The instrument may require calibration or repair. Even after you checked the above 1), 2) and 3), the instrument readings are still too low.	Return the instrument to your distributor or to your KANOMAX service center for repair.
The output of the option sensors is not displayed.	1) The sensor may not be connected.	Check the option sensor connection.
Touch panel becomes unresponsive	1) The touch panel may be damaged.	Return the instrument to your distributor or to your KANOMAX service center for repair.

Symptom	Possible Cause	Maintenance
【LD ERR】 	The laser may be damaged.	Return the instrument to your distributor or to your KANOMAX service center for repair.
【FLOW ERR】 	The flow channel may be interrupted.	Make sure that the inlet or outlet is not blocked.
	The pump may be damaged.	Return the instrument to your distributor or to your KANOMAX service center for repair.
【BATTERY ERR】 	Power capacity is low.	If using a rechargeable battery, charge the battery. If using AC line, the line may have problems.
【OVER ERR】 	The instrument may be being used outside the operating environment in the specifications.	Inside the optical system may be dirty. Attach the zero filter to the inlet and perform aging.
【STORAGE ERR】 	The remaining capacity of CF card is too low.	Delete unnecessary data inside the CF card.
【Alarm】 	Reading exceeds the Alarm setting value.	-

9. Warranty and After-sales Service

KANOMAX Limited Warranty

The limited warranty set below is given by KANOMAX with respect to the KANOMAX brand Airborne Particle Counter, its attachment parts including Probe and other accessories (hereafter referred to as “PRODUCT”) that you have purchased. PRODUCT you have purchased shall be the only one that the limited warranty stated herein applies to.

Your PRODUCT, when delivered to you in new condition in its original container, is warranted against defects in materials or workmanship as follows: for a period of one (1) year from the date of original purchase, defective parts or a defective PRODUCT returned to your sales representative, as applicable, and proven to be defective upon inspection, will be exchanged for a new or comparable rebuilt parts, or a refurbished PRODUCT as determined by your sales representative. Warranty for such replacements shall not extend the original warranty period of the defective PRODUCT.

This limited warranty covers all defects encountered in normal use of the PRODUCT, and does not apply to the following cases:

(1) Use of parts or supplies other than the PRODUCT sold by your sales representative, which cause damage to the PRODUCT or cause abnormally frequent service calls or service problems.
(2) If any PRODUCT has its serial number or date altered or removed.
(3) Loss of damage to the PRODUCT due to abuse, mishandling, improper packaging by the owner, alteration, accident, electrical current fluctuations, failure to follow operating, maintenance or environmental instructions prescribed in the PRODUCT's instruction manual provided by KANOMAX, or service performed by other than KANOMAX.

NO IMPLIED WARRANTY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, APPLIES TO THE PRODUCT AFTER THE APPLICABLE PERIOD OF THE EXPRESS LIMITED WARRANTY STATED ABOVE, AND NO OTHER EXPRESS WARRANTY OR GUARANTY, EXCEPT AS MENTIONED ABOVE, GIVEN BY ANY PERSON OR ENTITY WITH RESPECT TO THE PRODUCT SHALL BIND KANOMAX. KANOMAX SHALL NOT BE LIABLE FOR LOSS OF STORAGE CHARGES, LOSS OR CORRUPTION OF DATA, OR ANY OTHER SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY THE USE OR MISUSE OF, OR INABILITY TO USE, THE PRODUCT, REGARDLESS OF THE LEGAL THEORY ON WHICH THE CLAIM IS BASED, AND EVEN IF KANOMAX HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL RECOVERY OF ANY KIND AGAINST KANOMAX BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT SOLD BY KANOMAX AND CAUSING THE ALLEGED DAMAGE. WITHOUT LIMITING THE FOREGOING, THE OWNER ASSUMES ALL RISK AND LIABILITY FOR LOSS, DAMAGE OF, OR INJURY TO THE OWNER AND THE OWNER'S PROPERTY AND TO OTHERS AND THEIR PROPERTY ARISING OUT OF USE OR MISUSE OF, OR INABILITY TO USE, THE PRODUCT NOT CAUSED DIRECTLY BY THE NEGLIGENCE OF KANOMAX. THIS LIMITED WARRANTY SHALL NOT EXTEND TO ANYONE OTHER THAN THE ORIGINAL PURCHASER OF THE PRODUCT, OR THE PERSON FOR WHOM IT WAS PURCHASED AS A GIFT, AND STATES THE PURCHASER'S EXCLUSIVE REMEDY.

After-sales Service

If the PRODUCT is malfunctioning, please check with “Troubleshooting” to find possible cause first.

Repair parts are retained for a minimum period of five (5) years after production cessation of the PRODUCT. This storage period of repair parts is considered as the period during which KANOMAX can provide repair service.

For more information, please contact your sales representative. When you make a call, please have the following information of your PRODUCT at hand:

(1) PRODUCT name;
(2) Model number;
(3) Serial number;
(4) Probe number;
(5) Description of Symptom, and;
(6) Date of purchase

KANOMAX

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