

# PARKER CHEMICAL CONTROLLER

# PCC



Handling Manual

## Index

<b>1. Before use</b>	<b>1-4</b>
1.1. In the beginning	1-5
1.2. How to read this manual	1-6
1.3. Attention in the security	1-7
1.4. Common specifications	1-8
<b>2. Anyway, let's use it</b>	<b>2-9</b>
2.1. Names and functions	2-10
2.2. Anyway, let's use it	2-12
2.2.1. Condition here	2-12
2.2.2. Minimal operation	2-12
2.2.3. Flow of analysis	2-14
2.3. Easy routine operation	2-15
2.3.1. Selector switch	2-15
2.3.2. Change parameters	2-16
2.3.3. pH calibration	2-17
<b>3. Guidance of the operation</b>	<b>3-19</b>
3.1. About Reagents	3-20
3.2. Power to use	3-20
3.3. Mode and Behavior	3-20
3.4. Analysis Value Screen	3-21
3.5. Maintenance screen	3-22
3.5.1 Prepare	3-23
3.5.2 Parameter changes and parameter lists	3-24
3.5.3 Usb Memory	3-24
3.5.4. ph Calibration	3-25
3.5.5. Manual supply	3-25
3.5.6 Manual adjustment	3-26
If you want to match the analytical value analyzed by the instrument with the hand analysis value, manual adjustment is available.	3-26
3.5.7 Help	3-27
3.5.8 Maintenance work	3-27
3.6 System settings	3-32
3.6.1 System options	3-32
3.6.2 Various initialization	3-32
<b>4. Information on various settings and actions</b>	<b>4-33</b>

<b>4.1</b>	<b>Guidance of the parameter setting</b>	<b>4-34</b>
4.1.3	System options	4-49
<b>4.2</b>	<b>Analysis operation and parameter setting</b>	<b>4-50</b>
4.2.1.	Analysis flow and parameters	4-50
4.1.1.	Supply action	4-51
<b>4.2.</b>	<b>Information on various alarms</b>	<b>4-52</b>
4.2.1.	Operation by equipment	4-52
<b>5.</b>	<b><i>For long lasting use</i></b>	<b>5-54</b>
<b>1.</b>	<b>Pump Tube Replacement</b>	<b>5-55</b>
<b>2.</b>	<b>Refill printer paper</b>	<b>5-56</b>
<b>3.</b>	<b>Sample line maintenance</b>	<b>5-57</b>
<b>4.</b>	<b>Guidelines for each maintenance</b>	<b>5-58</b>
<b>6.1</b>	<b>Explanation of analysis and measurement</b>	<b>5-60</b>
6.1.1.	ph measurement	5-60
6.1.2.	Neutralizing titration	5-60
6.1.4.	Absorbance method (Colorimetric titration)	5-62
<b>2.</b>	<b>Analysis value (measured value) combined</b>	<b>5-63</b>
<b>6.1</b>	<b>Drawings and parameters table</b>	<b>5-64</b>
6.1.1	Piping flow diagram	5-64
6.2.3	Rear terminal diagram	5-65
6.2.4.	Internal equipment Arrangement Diagram	5-66

## Index of Fig Figure

<i>Figure 2-1 Name and function of each part.....</i>	<i>2-10</i>
<i>Figure 2-2 Names and functions of side parts.....</i>	<i>2-11</i>
<i>Figure 5-1 Replacing printer paper.....</i>	<i>5-56</i>
<i>Fig 5-2 piping flow.....</i>	<i>5-64</i>
<i>Fig 5-3 Rear terminal panel.....</i>	<i>5-65</i>
Table	
<i>Tal 5-1 Maintenance items.....</i>	<i>5-58</i>

# *Chapter1*

---

*Before use*

---

In the beginning  
How to read this manual  
Attention in the security  
Common specifications

## 1.1. In the beginning

Thank you for purchasing our “ParkerChemicalController(PCC)”.

The systems in the series have been developed for analytical control of chemical treatment solutions including plating solution. They have unique names of their own according to the types of chemical solution for which they are intended.

The systems of this series have the following features.

- 1) We installed only necessary functions for use and devoted ourselves to simple operation.
- 2) Intuitive and intuitive operation using touch panel
- 3) We redesigned the structure of the entire device newly and realized a highly scalable design.
- 4) Separate daily operation and maintenance operation and simply press the button for daily operation.

We manufacture it carefully so that we can use it with confidence, but if you make a mistake in the method of operation you may cause unexpected accidents, so follow the instructions at your company Please do appropriate operation management.

We will explain this manual mainly about operation method of main body analysis section.

## 1.2. How to read this manual

First of all, this book explains the necessary basic ideas and operation methods.

Operations such as maintenance are described later in this document. We recommend that you proceed to Chapter 8 after confirming the basic operations in Chapter 2.

In addition, prompt attention to customers with pictograms as necessary. Please pay particular attention to the safety pictogram shown below.

According to the degree of danger (or the size of the accident), the instruction manual and the machine body delivered from our company are classified into 4 levels according to the following display.

Please understand the meaning of these warning terms and follow the instructions.



On the operation of the equipment, items to be confirmed are indicated by "check pictogram".



Information and operation procedures that are convenient for customers are informed by "Pictogram of Lamp".

### 1.3. Attention in the security

Please observe the following precautions in operation and operate properly.

- 1) Before doing automatic analysis management, always check the movement of the device and confirm that there is no problem.
  - Please check especially for expendable items.
- 2) Be sure to perform regular maintenance when you operate it.
  - Please do regular maintenance every year.
  - To request periodic maintenance, please contact our sales representative.
- 3) Always wear protective glasses when replacing tubes or refilling reagents.
  - Chemicals may jump and chemicals may enter the eyes.
- 4) Be sure to wear protective gloves and masks when handling reagents and calibration solution.
  - Depending on the reagent and calibration solution, there are things of powerful drugs, some of which harm the body.
- 5) Production guarantee and quality assurance due to shutdown of automatic analysis management equipment etc. will be exempted from responsibility.

#### 1.4. Common specifications

Analysis method and accuracy      Absorptiometry  $\pm 4\%$  (repetition n=20)  
Neutralization titration method  $\pm 4\%$  (repetition n=20)  
pH value : Glass electrode method  
Analytical operation is fully automated method using tube pump.

Attention...

With regard to accuracy, it also varies depending on sample conditions. The above values are representative values when nickel sulfate solution and 1% sodium carbonate solution are used as samples, and do not guarantee the accuracy of the analysis value.

Automatic calibration      Concentration calibration : One point calibration with high concentration  
pHvalue : Two-point calibration with standard pH calibration solution

Supply action and pump      Proportional control by target value and analysis value.  
No-voltage contact circuit

Various operations and display      Operation by liquid crystal display and touch panel and thermal paper printer.

Control method      Program control with 16 bit CPU

Usage      Indoor specification    Within 5 °C ~ 35 °C  
There is no dew condensation and mist environment

Driving power and power consumption      Single-phase AC100V 60/50Hz with ground  
Analysis Department    Within200W

External dimensions and mass      Analysis Department  
380W x 370D x 586H (Pat light +209H)  
40kg  
Outer case    430W x 430D x 1050H  
80kg

Dimensions and mass may vary depending on the option.

Depending on the modified specifications, it may not match the common specification. In this case, the remodeling specification by model is given priority.

## Chapter 2

---

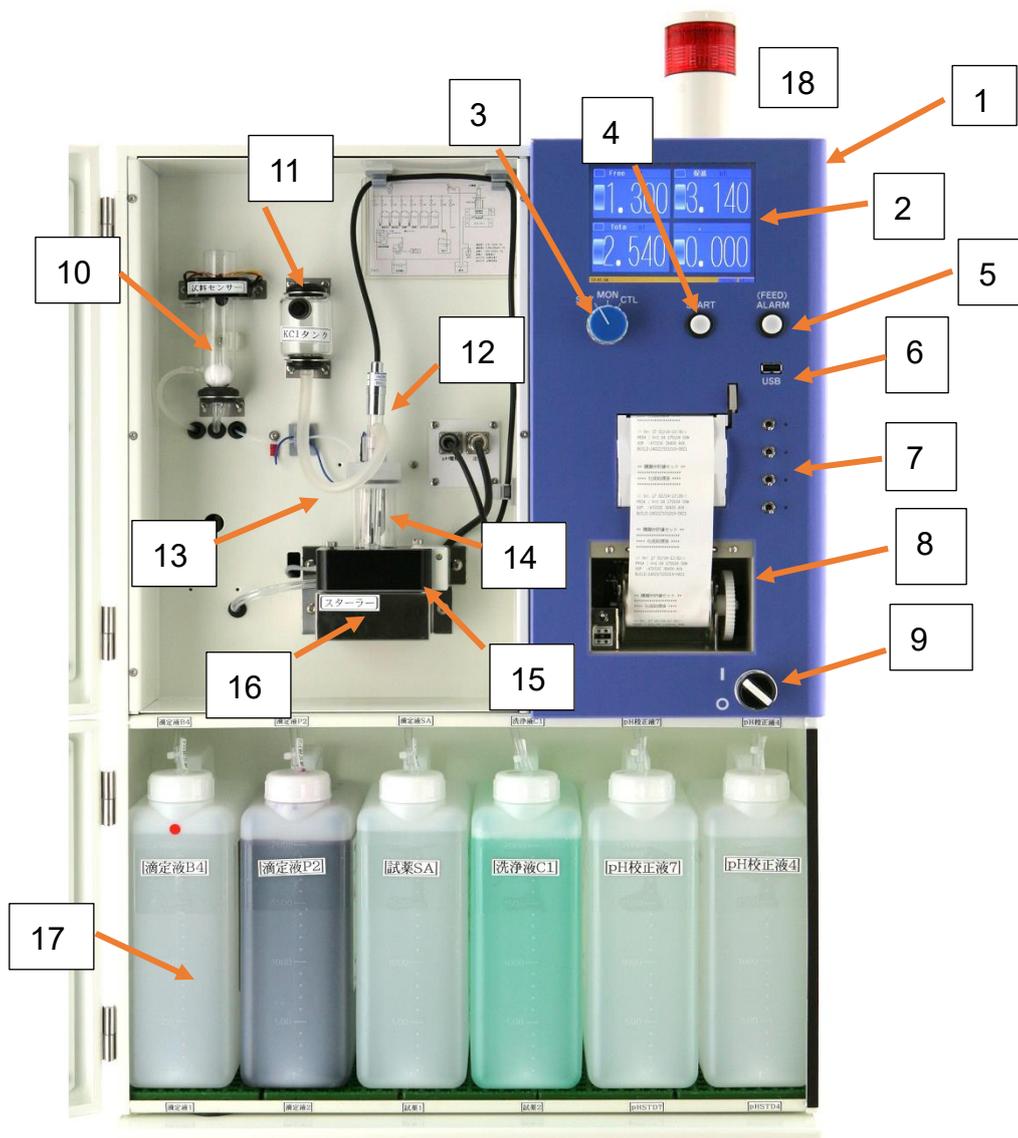
Anyway , let's use it

---

Names and functions  
Anyway let's use it  
Simple daily operation

## 2.1. Names and functions

Indicates the name and function of each part of the device. Depending on the model, some devices are not installed.



**Figure 2-1 Name and function of each part**

001 There is an analysis section on the left of the operation section.

002 LCD display Touch panel to make various settings.

003 Selector switch Wait, monitoring and control modes are selectable.

004 START button Analysis operation start.

005 BUZZ button Buzzer ringing stop.

006 USB connector Insert the USB memory.

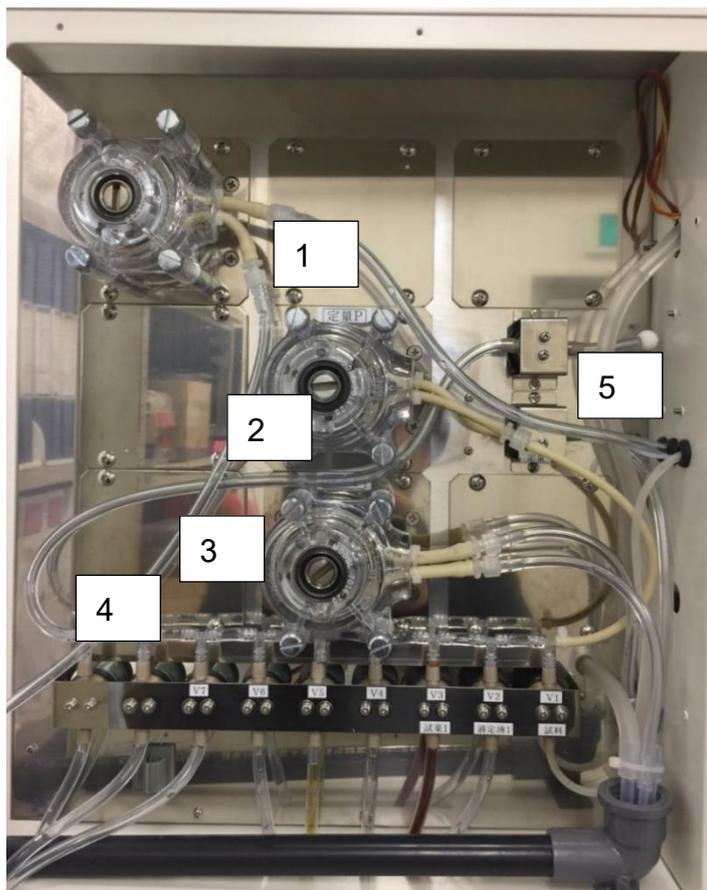
007 Selection switch In the multi-tank type, select the analysis tank.

008 Printer You can print letters including kanji using roll thermal paper.

009 Main power switch Turn on / off the entire device.

010 Sample measuring tube There is a float inside and it detects the arrival of the sample.

- 011 KCl reservoir Replenish the internal liquid of the electrode.
- 012 pH sensor It is a triple compound sensor.
- 013 Liquid shielded wire Reduce the noise in the measurement cell.
- 014 Measurement cell Perform pH measurement and titration here. It is abbreviated as a cell.
- 015 Colorimetric sensor Detects the state of colorimetric titration and pure water sampling.
- 016 Stirrer Stir the inside of the cell with a magnetic stirrer.
- 017 Reagent bottle Reagent level sensor can be installed on the back (optional).
- 018 Warning lamp LED 3 colors. Buzzer built-in.



**Figure 2-2 Names and functions of side parts**

- 1 Tube pump For sample withdrawal  
It is a pump to draw the sample from the tank.
- 2 Tube pump for weighing  
We collect a certain amount of sample and pure water.
- 3 Tube pump For cell drainage  
Drain the sample in the cell.
- 4 Collector solenoid valve port  
It is a solenoid valve to switch calibration solution etc.
- 5 Three way solenoid valve  
It is used to weigh the sample.

## 2.2. Anyway, let's use it

After installing the equipment, I will explain to use it anyway.

Please refer to this chapter and later in order to know the details of the equipment and maintenance.

### 2.2.1. Condition here

The operation is set by the numerical value called the parameter of the device. After installation, it is assumed that the basic parameters are already set. Sometimes it is necessary to adjust the parameters to do the proper operation. Also assume that the reagents are properly set in the equipment and the piping air venting (setup) has also been completed. For additional information on installing the equipment, please refer to additional documents such as installation method.

### 2.2.2. Minimal operation

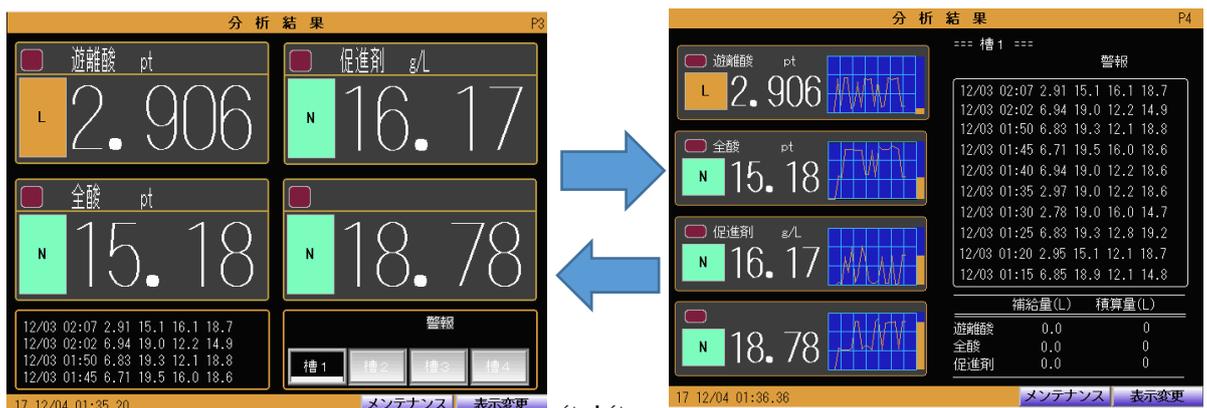
\*Turn on the power supply

here is a power switch on the back of the unit. When this switch is turned on, the unit will start up. The following behaviors are automatically performed from startup to standby state.

- ① Opening information is displayed on the display.
- ② The self-diagnosis screen is displayed, and the status of the device is confirmed in order. If it is normal all OK is displayed.
- ③ Information such as device program version is printed on the printer.
- ④ The display becomes the standby screen, and the current time and the final analysis value are displayed. It enters standby mode.



There are two display methods for display of analysis. You can change it by pressing the display change button.



### \*Start operation

Please check the following items before starting operation of the equipment.



- ✓ Is the sample line and supply tube in a predetermined state?
- ✓ Is the wastewater tank filled with wastewater?
- ✓ Is pure water of the pure water tank sufficient?
- ✓ Is the reagent (titrant and cleaning solution) sufficient, and it is set in the prescribed line?
- ✓ Is there enough liquid in the reserve tank for the internal solution of the pH sensor?
- ✓ Is there anything different from usual, such as leakage?

The operation of the equipment is easy. Select the mode with the selector switch and press the START button to start operation.



There are three modes of the device, standby (SBY), monitoring (MON), control (CTL).

Wait mode does not perform normal operation such as analysis operation, only maintenance and parameter setting is possible.

Monitoring mode repeats analysis operation but does not perform replenishment operation.

The control mode performs replenishment operation based on the analysis value obtained in the analysis operation. However, if an alarm occurs during analysis, supply will not be made (remain in analysis mode).

### \*Alarm

When an alarm occurs, we will inform you of the alarm occurrence with the light and sound of the alarm light. At the same time, the red alarm light switch on the equipment lights up.

When you press the alarm lamp switch, the light and sound stop.

The instrument counts the number of alarms that occurred during the analysis. This count returns to 0 at the beginning of repeated analysis. Even if you press the alarm lamp switch during analysis, the count does not return to 0.

### \*End of operation

To terminate the analysis operation in the usual way When you turn the selector switch from monitoring or control to standby, the unit moves to standby mode. However, if analysis is in progress, it will be in standby mode after this analysis is finished, so please wait for a while.

#### \* Emergency stop

If the device is analyzing, if you want to finish the analysis anyway press the "stop button". Even during the analysis, the analyzer stops analysis and starts washing the inside of the equipment. When this cleaning is completed, it enters standby mode.

If you push the "stop button" further during this cleaning operation, the unit stops at that point.

This unit analyzes reactive samples. Therefore, stopping with the sample remaining in the unit will cause troubles such as internal precipitation of metal. For this reason, do not stop by emergency stop but stop with selector switch. If it is forcibly terminated by an emergency stop, please clean it by manual operation etc. as necessary after stoppage.

### 2.2.3. Flow of analysis

The analyzer operation proceeds in the following order in this unit. The following analysis shows a typical zinc phosphate treatment solution.



#### \* Start analysis

Start sampling Start cleaning of titration cell

Repeat the operation of filling the titration cell with pure water and draining it.

Confirm that pure water has been collected normally.

Collect a sample in a given volume in a titration cell and dilute it with a predetermined amount of pure water.

#### \* Free acid analysis

Diluted sample is contained in the titration cell. Measure its pH and slowly add the titrant to a predetermined pH. Calculate the free acid concentration (FA) in the sample from the amount of the titrant added at this time.

#### \* Total acid analysis

After draining and washing the analysis section, it is sampled in the same way as the free acid analysis above and diluted with a certain amount of pure water. Gradually add the titrant to reach the pH of the sample to the desired pH. Calculate the total acid concentration (TA) from the amount of the titrant added here. The difference between FA and TA is the amount of sample to be collected and the pH value to be reached.

#### \* Accelerator analysis

After draining and washing the analytical section, collect samples and pure water as in the previous analysis. After a certain amount of reagent SA is added to it, a titrant for accelerator analysis is added. The accelerator component in the sample reacts with the titrant and the accelerator component gradually decreases. When the titration solution finally becomes excessive, the color of the solution in the cell turns into a purple color. Calculate the concentration of the accelerator from the amount of titrant added up to this time.

#### \* Start replenishment

At this point all the analysis items have been confirmed. When the selector switch is in control, the unit shifts to the control mode and starts replenishing the replenisher to the processing tank. However, if the number of alarm counts is not 0, control mode will not be entered and analysis mode will remain. In other words, once an alarm occurs, supply at this analysis time will not be made.

#### \*After cleaning

This completes all analysis, so clean the inside of the instrument. After draining the titration cell, it fills with pure water and discharges all the sample and completes a series of analysis. When a series of analysis is completed, it waits until the next analysis start (next analysis standby).

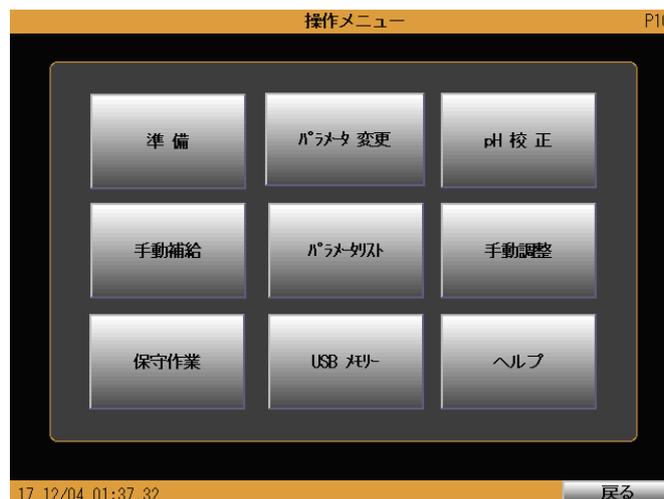
## 2.3. Easy routine operation

### 2.3.1. Selector switch

Select the operation mode of the device. The transition from the monitoring mode to the control mode takes place when the analysis progresses and all the analysis values are obtained. When the selector switch turns from the monitoring position or the control position to the standby position during the next analysis standby mode, it enters the standby mode immediately and the analysis is completed.

### 2.3.2. Change parameters

It is not necessary to change the parameters simply by operating under the specified conditions. However, it may be necessary to change the parameters for setting such as changing the sampling time.



#### \*Operation



Pressing the "maintenance button" at the bottom right of the panel opens the operation

menu screen. When "parameter change" is pressed, parameter operation screen will appear.

The parameter consists of the address value corresponding to the memory storing the contents and the set value which is the content.

Touch the address section, the numeric keypad will appear, you can set the direct address value.

You can also increase or decrease the address value with the "+ button" or "- button".

In addition, the parameter includes abbreviations indicated by alphanumeric characters. Touch the content section, the numeric keypad will appear and you can enter the direct number directly. When you press the "ENT button" on the numeric keypad, the set value is reflected in the memory of the device. When it is reflected, the contents set in the printer are printed.

#### Navigation function

Ten parameters are displayed based on the parameters displayed in the setting section. Touch the parameter shown here, it will be displayed on the setting section and you can quickly set the content. Also, touch the "<< button" or ">> button" to change the display of 10 parameters at a time. Addresses for which parameters are undefined are indicated in gray, and values can not be set for that address.

#### Help function

A "help button" may be displayed in the setting section for parameters for which help information is set. By pressing this button you can get information on the displayed parameters.



### 2.3.3. pH calibration

This instrument uses a pH sensor for pH measurement. This sensor requires periodic calibration. Calibration is an operation to adjust the value obtained by the sensor to the correct value.

Perform pH calibration in standby mode. Pressing the "maintenance button" at the bottom right of the panel opens the operation menu screen. Pressing the "pH calibration button" will display the confirmation screen and the pH calibration operation will start.

After washing the inside of the cell with the pH 7 calibration solution (washing), wash the titration cell with pure water, then fill the cell with pH 7 calibration solution and start pH measurement. When the pH 7 calibration solution has been measured, pH measurement is carried out using pH 4 calibration solution as well as pH 7.

The panel displays the pH measurement results of the two types of calibration fluid. The calibration result obtained by pH calibration is displayed in the result box in the lower right. Here, the change in coefficient changed by this pH calibration is shown.

For general coefficients, the A coefficient is around 58, while the B coefficient is around 0.

The judgment result is displayed on the panel against the reference value preset in the equipment.

If the warning panel is displayed after exceeding the reference value, check the amount and type of pH calibration solution. In some cases there may be a problem with the pH sensor. In that case please replace the pH sensor and perform pH calibration again.





It seems that there is no hindrance to practical use.



There is a possibility of a problem. Action is required.

If it seems that it is being measured without any problem, press "Yes" and replace the pH coefficient with a new coefficient. Please press "No" if you want to discard this calibration result.

Calibration results are also printed on the printer.

# *Chapter 3*

---

Guidance of the operation

---

About Reagents  
Power to use  
Mode and Behavior  
Analysis Value Screen  
Maintenance screen

### 3.1. About Reagents

Depending on the specifications of the equipment, there is a liquid level sensor installed on the back panel of the reagent tank. When the liquid level of the reagent tank reaches about 20 mm or less from the bottom, an alarm is output at the beginning of the analysis operation. Be careful not to supply reagents to another reagent tank by mistake. We recommend that you replace the reagent tank for each tank without adding reagents.

Do not mix reagents absolutely. Harmful gases may be generated depending on the combination of reagents. If mixing incorrectly, dilute it with water immediately and discard it properly.

### 3.2. Power to use

- Do not connect to a power source other than the commercial AC100V power supply. There is a danger of breakdown or burnout of the inside of the equipment due to overvoltage.
- Be careful not to let the power plug come off in the middle.
- Maximum power consumption of this device itself is 200 W or less. However, please avoid avoiding instantaneous drop of power supply voltage in common wiring with equipment with large power consumption.
- Be sure to connect to earth terminal (B type or more) from the viewpoint of security and noise countermeasure.

### 3.3. Mode and Behavior

There are three states of this device. This is called mode. To change the mode, turn the selector switch on the operation panel. The following shows the actions and functions performed for each mode.

**Wait mode** This mode allows you to prepare and maintain the unit. When you turn on the power, this mode first goes on.

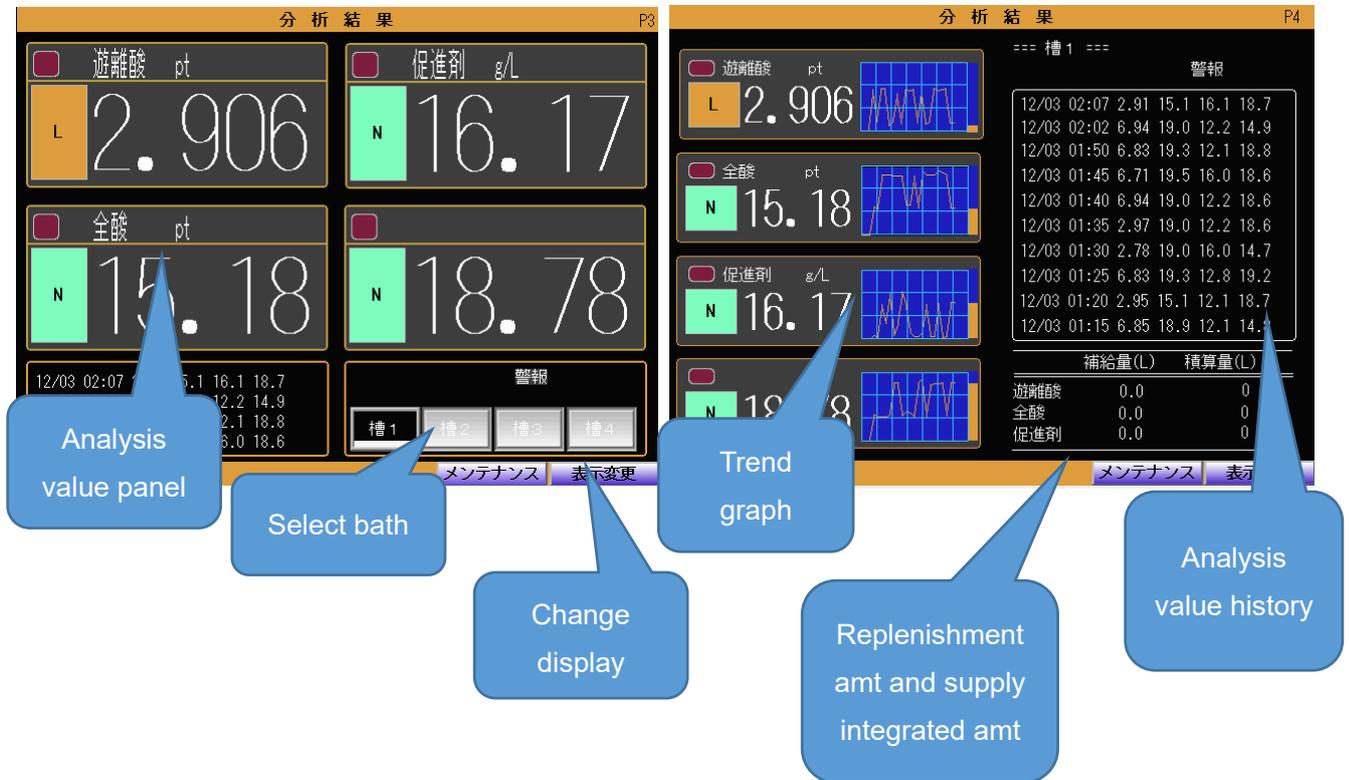
**Monitor mode** The instrument repeatedly executes only the analysis operation according to the setting.

**Control mode** Supply reagent supply operation to the management tank is added to the operation in analysis mode.

You can not enter this mode if an alarm occurs in the analysis.

### 3.4. Analysis Value Screen

Indicates the screen (analysis standby screen) when waiting for the next analysis operation. During the analysis operation, it becomes another analysis screen which is different from this. There are 2 types on the analysis standby screen, and you can switch freely.



#### Select bath button

For double tank type equipment, analysis by tank can be selected with this button.

#### Change display

You can select the screen to display.

The maintenance button will display the maintenance screen instead of the analysis value.

#### Trend graph

Graph shows the change in analysis value. The lower part of the vertical axis of the graph is set to the LL value of the parameter and the upper part is set to 90, 110% of the parameter HH value.

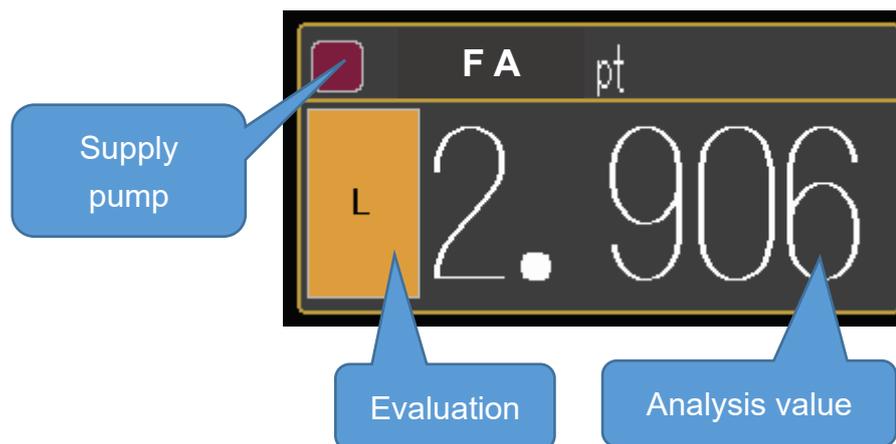
#### Supply amount and supplementary accumulation

It shows the amount of replenishment liquid supplemented by the last analysis replenishment and the accumulated replenishment amount at that time.

#### Analysis value history

The analysis value obtained and the sampling time are displayed in a list format.

## Analysis value panel



### Supply pump

It lights when the pump is driving.

### Evaluation panel

Evaluate the analysis value according to the set value set in the parameter. When HH, LL evaluation occurs in control mode, HH, LL alarm is generated. On the other hand, in the monitoring mode, no alarm will be generated even when it is evaluated as HH or LL.

Evaluation value	Panel color	Relationship between analysis value and setting value
HH, LL	Blinking red	HH,LL above or below
H , L	Orange	Within the range of H and HH Within the range of L and LL
N	Green	Within the rang of L and H

### Analysis value

The analysis value obtained at the end is displayed. Analysis display When the analysis value gets older than the time set in the maximum holding time, the analysis value is not displayed. However, this function does not work if 0 is set.

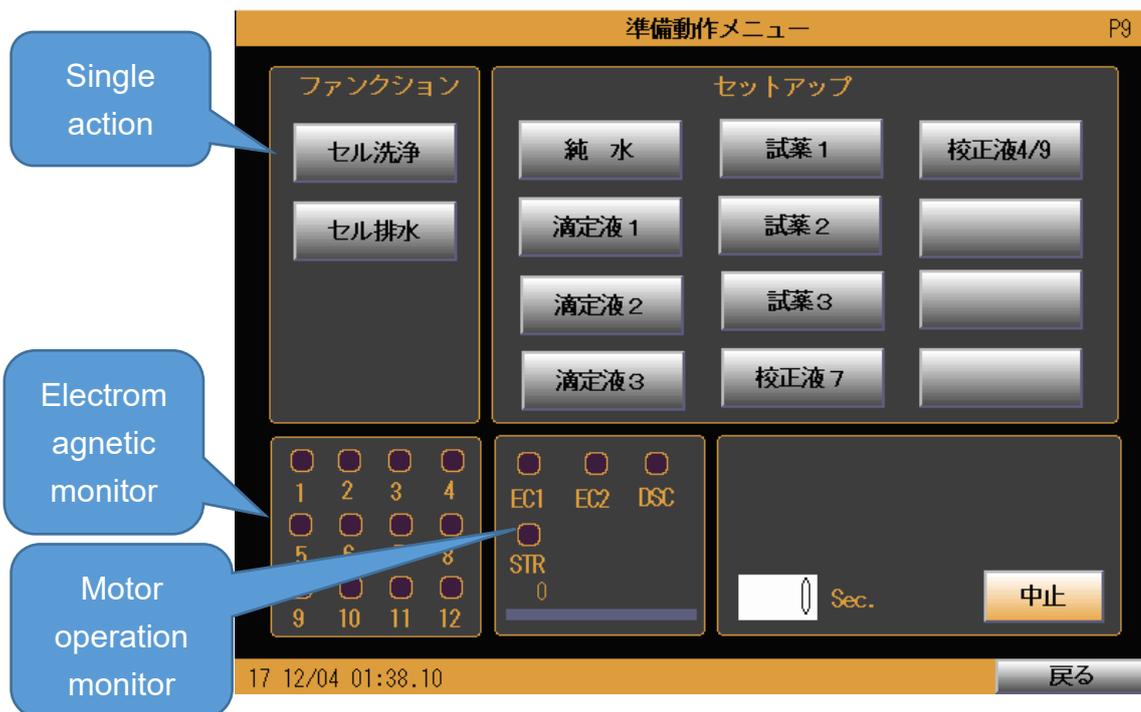
## 3.5. Maintenance screen

When the maintenance button is pushed, the maintenance menu is displayed and the maintenance operation can be executed.



### 3.5.1 Prepare

When you press the preparation button from the maintenance menu, the preparation action menu will be displayed. It is possible to prepare the equipment and perform the cleaning operation.



#### Single action

You can wash and drain the cell in the standby state.

It can be used, for example, when checking the operation of the equipment or stopping in the middle of the analyzing operation, samples are left in the cell, and so on.

#### Solenoid valve monitor and motor operation monitor

Displays the operation of the solenoid valve and motor during operation in real time.

EC1, EC2 Metering pump      DSC Drain pump      STR Stirrer

#### Setup

When installing a new device, the inside of the piping tube set in the tank is completely empty, and it is necessary to fill the inside of the tube with liquid ahead of the analysis operation. Also perform this operation to replace all reagents remaining in the piping to replace the reagent. A simple message will be printed on the printer when setup is done.



### 3.5.2 Parameter changes and parameter lists

Refer to the previous section for parameter change.

#### Parameter list

Print the parameters in a list format on the printer.

You can select the format to print.

In the normal format, the parameter value and a part of the explanatory text are printed.

"Description only" will print all descriptive sentences.

Since printing is cached in the printer, the stop button may not work.



### 3.5.3 Usb Memory

You can export the analysis value stored in the device to the USB memory.

When analyzed and the analysis value is obtained by the analyzer, it is recorded including analysis value, sampling time, supply amount, accumulated amount of supply etc.

A set of information recorded for each analysis is called a record, and 250 to 500 records are recorded in the device.

If it is recorded beyond this, the oldest record will be replaced with the new record sequentially.

Some USB memory devices can not recognize the device.

Small capacity (8 GB or less) is stable. You can check the USB memory with the connection confirmation button before use.



#### Operating procedure

1. Insert the USB memory straight from the panel.
2. Confirm that the USB memory is connected properly with the connection confirmation button.
3. If normal, push the USB export button and start downloading.
4. The process bar will inform you of the completion. It may take up to 1 minute.
5. When complete, pull out the USB memory straight out.

#### Printer printing

This function prints the contents to be written to the USB memory on the printer.USB

### 3.5.4. pH Calibration

For starting the pH calibration, refer to the previous section.

At this time, please make sure calibration solution and pure water are correctly set up. As for the way of thinking about pH, please refer to the technical explanation chapter.

### 3.5.5. Manual supply

If you want to add replenishing liquid to the tank manually, the manual replenishment function of the equipment is convenient.

Press the Manual Supply button on the operation menu to display the setting panel.



This panel also supports devices of multiple tank management type.

In single tank type equipment, only setting in tank 1 is not effective.

A, B, C series correspond in principle to the order in which analytical values can be obtained.

In the case of ordinary chemical conversion treatment liquid,

System A is free acid, system B is total acid, and system C is supplementation of accelerator.

- 
1. Set the amount (L) of replenishment solution manually replenished. Touch the BOX panel and make the setting.  
Automatically calculate the time (seconds) to drive the pump from the quantity (L) set here and the pump discharge quantity (L / min) set for the parameter.
  2. Push the operation start button to drive the pump.
  3. The remaining supply amount panel shows how much further should be replenished and the pump stops when it becomes 0.
  4. A panel will pop up asking if you want to add the amount supplemented by this operation to the accumulated replenishment amount. Please select as necessary.

### 3.5.6 Manual adjustment

If you want to match the analytical value analyzed by the instrument with the hand analysis value, manual adjustment is available.

However, the same result can be obtained by changing the density adjustment coefficient of the parameter without using this function.

With this function you can easily and safely set the density adjustment factor automatically.

However, before the manual adjustment function is executed, the analysis value by the equipment must be obtained.

The apparatus obtains the final analysis value by the following calculation formula.

This analytical value is what is indicated in the supply and display of the equipment.

Evaluation of the analysis value is also done on this value.

Actual analysis value=

Equipment analysis value × Adjustment factor A + Adjustment factor B

If you select the B coefficient button and press the execute button, the adjustment coefficient B is set. If you select the A coefficient button and press the execute button, only the adjustment coefficient A is automatically calculated and set.

Generally, it is recommended that the overall adjustment is the A coefficient and the minute adjustment is done with the B coefficient. The A coefficient is selected by default (it becomes orange when selected).

1. The setting panel is displayed for each analysis item. Set how much you want to adjust the analysis value obtained at the end. Touch the numerical value (set value BOX) on the right side of the arrow to display the keyboard and set the numerical value you want to install.

2. Execution of correction calculation can be executed for each analysis item. When executed, the result is printed on the printer.



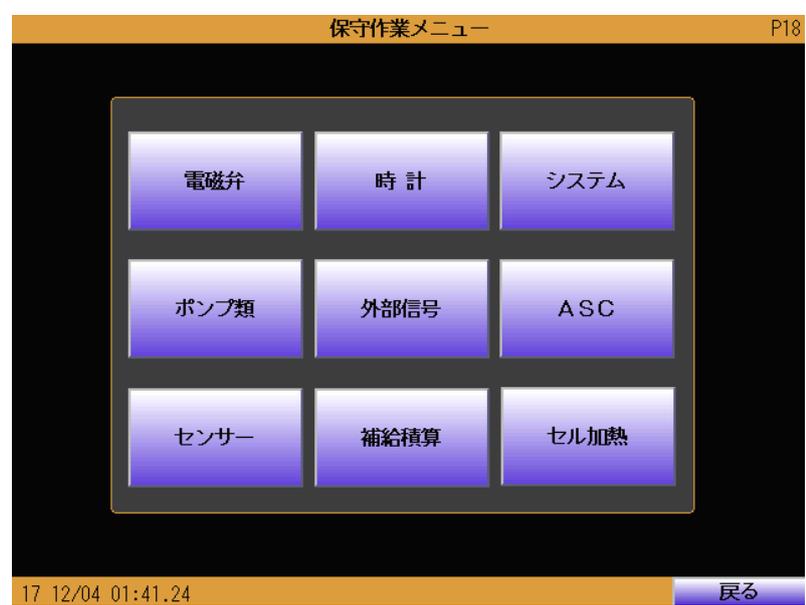
### 3.5.7 Help

You can display the help screen.

Currently you can get help on parameters from the parameter setting panel. The future help is about the whole device.

### 3.5.8 Maintenance work

Functions used for maintenance of the equipment can be selected from the maintenance work menu. We will inform you of frequently used items in order. Some devices do not work. They indicate that the corresponding function is not installed in the device.



## clock fit

You can adjust the clock inside the device. The internal watch is running with batteries and needs to be replaced every few years. By pressing item buttons on the setting panel, you can pop up the keyboard and set it. Also, abnormal years and times are rejected at the key in stage. When setting is completed, press "Setting button" to apply the setting.

If it is not possible to set than the consistency of the numerical value, we will inform you with a warning.



## Replenishment accumulation

When the equipment executes the replenishment operation, we accumulate the amounts we have supplied up to now. When it is necessary to clear this integrated amount, you can execute with this button.

Setting this parameter to 0 without using this function will do the same thing.

## Solenoid valve

You can manually turn ON / OFF all solenoid valves used inside the equipment. You can check whether the solenoid valve is operating correctly, by solenoid valve operation sound and piping fluid movement. Multiple solenoid valves can be turned ON at the same time, but if the number of simultaneous operations exceeds 4 it will not be possible to turn ON at the same time.

When you exit from this menu by pressing the "back button", all valves are turned off.



## Pumps

It is possible to manually drive all the pumps used inside the equipment.

### EP pump (encoder operation)

The combined pump (EP 2) can be connected to a solenoid valve to suction multiple reagents individually. A single pump (EP 1) sucks only one type of reagent.



When touching SET, the keyboard will appear and you can set the amount (mL) of discharge in test drive.

After setting, you can drive the pump by pushing forward rotation (CW) reverse rotation (CCW) button.

As a result of driving, the actual discharge amount is displayed in the Out box.

Normally, it is discharged slightly more than the setting due to the inertia of the motor but there is no problem.

### Sample pump (using AC motor)

Sampling pumps are installed for each tank.

This pump can rotate forward and reverse. The normal rotation button is indicated by N, and the reverse rotation button is indicated by R. When the pump is rotated in the forward direction, the sample is drawn in to the instrument side.

To stop the operation of the pump, press the STOP button.

The number of seconds the pump was driven is also shown. It is also possible to actually measure the number of seconds to draw a sample from the bath into the instrument using this function.

### Drainage pump (AC motor used)

Drain the sample in the analysis cell. The pump can not be reversed.

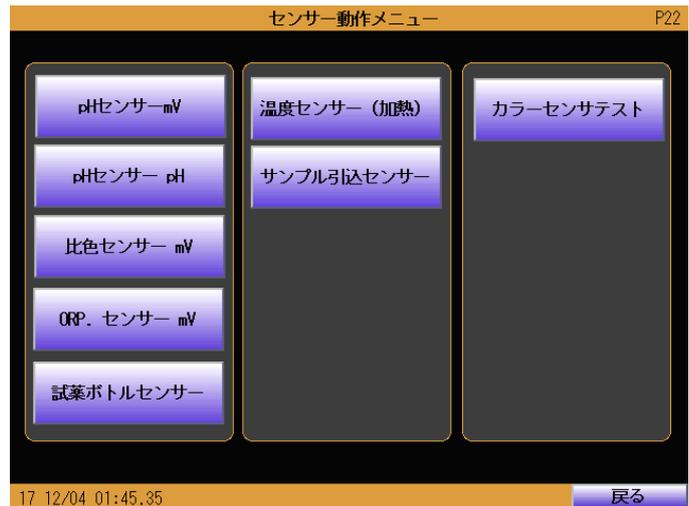
### Stirrer (using AC motor)

Rotate the rotor in the analysis cell.



## Sensor

We operate various sensors built into the device independently. It is used for sensor adjustment and operation check. Pressing this button will display a menu for selecting which sensor to operate. Some buttons do not function depending on the specifications of the device.

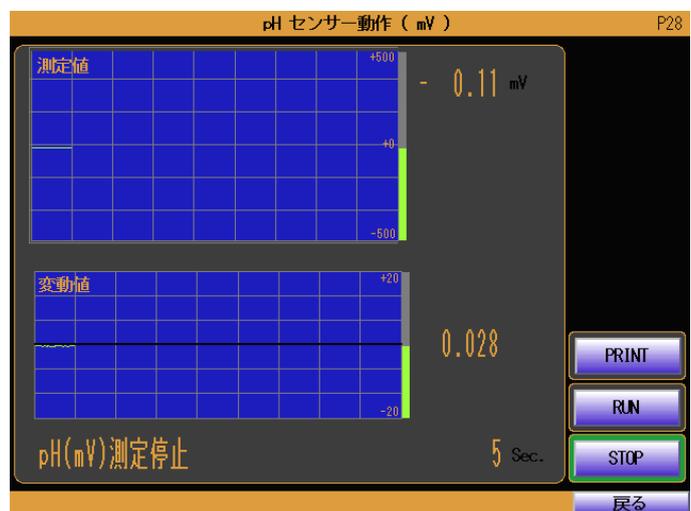


\* \* pH sensor related \* \*

Pressing the "pH sensor mV" button will drive the pH sensor and display the output voltage directly from the sensor.

On the other hand, pressing the "pH sensor pH" button converts output voltage from the sensor to value based on the value set in parameter and displays it.

To start measurement, press the "RUN" button. Then start the measurement and plot the measured value in the graph area on the left. The variable value area shows the variation of measured value.



the  
pH  
the

the

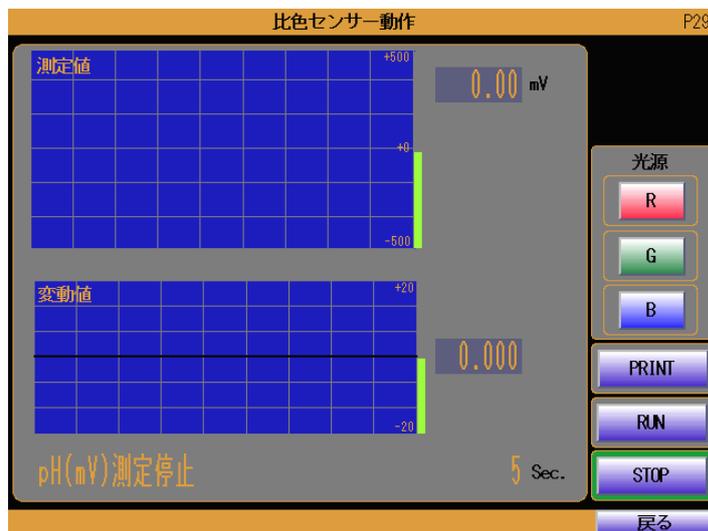
When you press the "PRINT" button, the measured value is printed on the printer periodically.

To stop measurement, press the "STOP" button to stop measurement. The return button does not work during measurement, so always stop measurement.

\* \* Colorimetric sensor \* \*

The colorimetric sensor is in the cell. The light source is an LED lamp, it is possible to light the colors red, green and blue at the same time.

The operation method is the same as the previous pH sensor. It is necessary to select the light source before measurement.



### 3.6 System settings

You can perform settings and tests on the system.

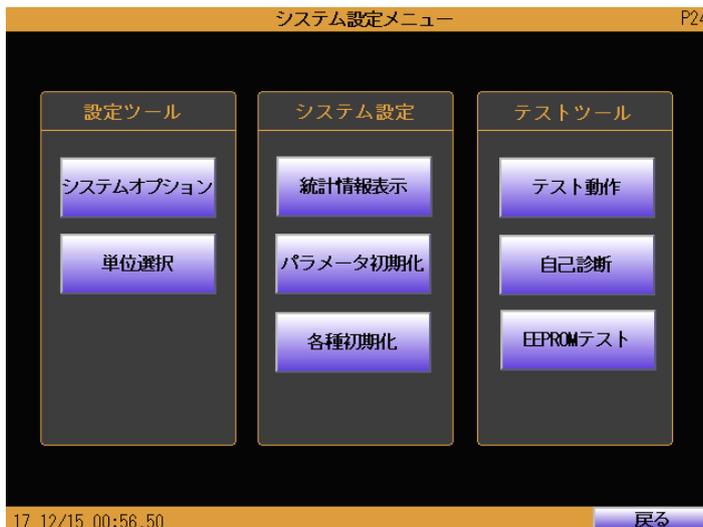
Press the system button on the maintenance operation menu.

You will be prompted to enter the password, so enter the password correctly.



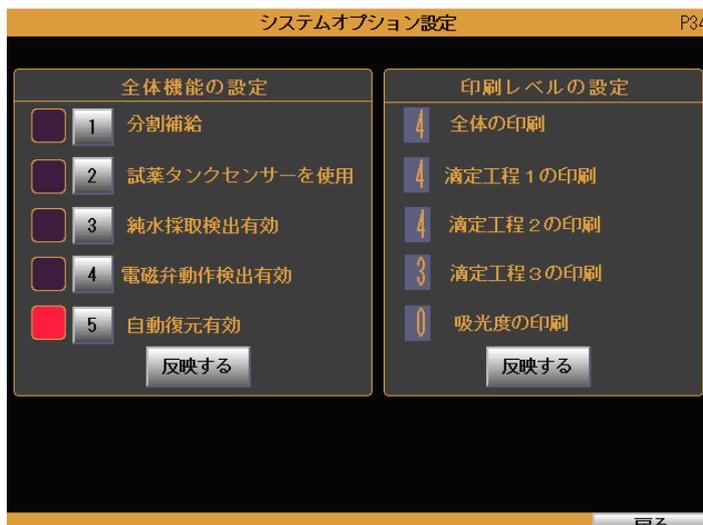
\* \* About password \* \*

"8012" is set as the master password. As a user password, you can set the parameter UPW (154) to a number from 1000 to 9999. Reflecting the user password is done when the device is turned on.



#### 3.6.1 System options

You can set the basic functions of the device.

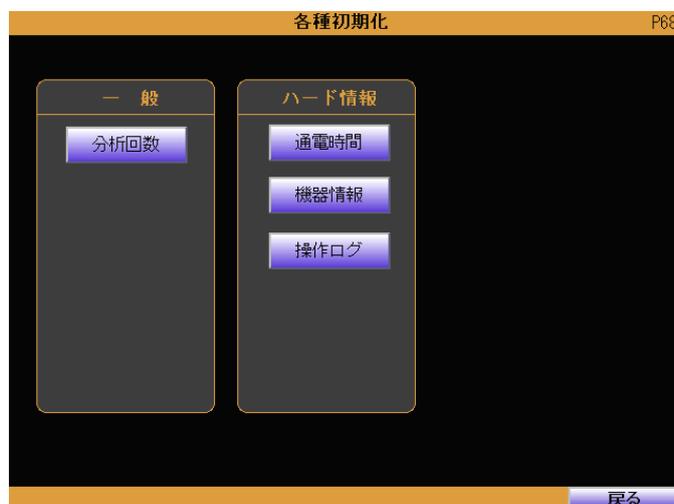


#### 3.6.2 Various initialization

You can initialize the information stored in the system.

The number of analyzes is the number of analyzes analyzed by the equipment so far.

The analysis value is recorded based on this analysis frequency.



# *Chapter 4*

Various setting and operation

---

Parameter setting  
Setting analysis behavior and  
Parameters  
Guidance of various alarms

## 4.1 Guidance of the parameter setting

### 4.1.1. Explanation of each parameter

The contents of the parameters defined in this device are explained.

The parameter table in the final chapter is useful for seeing the whole parameter.



	Short name	Name	Unit	Description
0	AKY	access key		You can select the language to use. 0.Japanese 1.English 2. Traditional Chinese 3. Chinese Simplified Language 4. Hangul
1	SPP	Sample replacement time (Tank 1)	sec	This is the time to draw sample liquid from the treatment tank to the sampling tube. If you do not arrive in time you will get an error.
2	S2P	Sample replacement time (Tank 2)	sec	This is the time to draw sample liquid from the treatment tank to the sampling tube. If you do not arrive in time you will get an error.
3	TSG	Segment water volume	ml	The amount of water when water is put into the sample line from the equipment and it is washed back inside the line by pushing it back into the tank. If set to 0, push back with air.
4	PPF	Print selection		You can set the level of "content printed by the device". Please set it from the system option.
5	APT	Analysis cycle	min	Set the repetition cycle of analysis in minutes. The range that can be set is 0 to 1339. 1339 is equivalent to one day.
6	T1C	TR1 concentration	N	Set the concentration of titrant 1.
7	T2C	TR2 concentration	N	Set the concentration of titrant 2.
8	TKV	Tank capacity (Tank 1)	ton	It becomes the volume of the treatment tank.
9	TK2	Tank capacity (Tank 2)	ton	It becomes the volume of the treatment tank.
10	AHH	Free acid-HH (Tank 1)	pt	It is a setting to issue an alarm at the upper limit on the free acid control range. Supply operation is stopped in the case of automatic supply. Error signal

11	AHC	Free acid-H (Tank 1)	pt	It is setting the upper limit of free acid control range.
12	ASV	Free acid Nominal value (Tank 1)	pt	It is setting of the free acid control range target value.
13	ALC	Free acid-L (Tank 1)	pt	It is setting the lower limit value of the free acid control range.
14	ALL	Free acid-LL (Tank 1)	pt	The lower limit of free acid control range, setting to issue an alarm. Supply operation is stopped in the case of automatic supply. Error signal
15	AMR	Free acid Maximum amount of replenishment at one time (Tank 1)	L	Limit the maximum amount of one supply.
16	ACR	Free acid Metered replenishment (Tank 1)	L	It is set when quantitative supply is carried out.
17	ASC	Free acid Replenishment coefficient (Tank 1)	L/pt	The amount (L) of replenishment liquid necessary for raising the analytical value 1 pt to 1000 L of the treatment liquid --reference-- The relationship between mass (Kg) and volume (L) is $(Kg) / (Sg) = (L)$ - Sg: specific gravity (= density g / cm <sup>3</sup> )
18	ART	Free acid Supply cumulative amount (Tank 1)	L	The device adds the supply amount automatically.
19	APR	Free acid Supply pump (Tank 1)	L/min	This is the discharge amount per minute during maximum discharge of the supply pump.
20	BHH	Total acid -HH (Tank 1)	pt	It is setting to issue an alarm at the upper limit on total acid control range. Supply operation is stopped in the case of automatic supply. Error signal
21	BHC	Total acid -H (Tank 1)	pt	It is setting of the upper limit of total acid control range.
22	BSV	Total acid nominal value (Tank 1)	pt	Total acid management range target value setting.

23	BLC	Total acid -L (Tank 1)	pt	It is setting of the lower limit of total acid control range.
24	BLL	Total acid -LL (Tank 1)	pt	Total acid management range lower limit, setting to issue an alarm. Supply operation is stopped in the case of automatic supply. Error signal
25	BMR	Maximum amount of replenishment of total acid at one time (Tank 1)	L	Limit the maximum amount of one supply.
26	BCR	Total acid Metered replenishment (Tank 1)	L	It is set when quantitative supply is carried out.
27	BSC	Total acid replenishment coefficient (Tank 1)	L/pt	The amount (L) of replenishment liquid necessary for raising the analytical value 1 pt to 1000 L of the treatment liquid, --reference-- The relationship between mass (Kg) and volume (L) is $(Kg) / (Sg) = (L) - Sg$ : specific gravity (= density g / cm <sup>3</sup> )
28	BRT	Total acid Supply cumulative amount (Tank 1)	L	The device adds the supply amount automatically.
29	BPR	Total acid Supply pump (Tank 1)	L/min	This is the discharge amount per minute during maximum discharge of the supply pump.
30	CHH	Fe <sup>2+</sup> -HH (Tank 1)	pt	The upper limit on promoter control range, setting to issue an alarm. Supply operation is stopped in the case of automatic supply.
31	CHC	Fe <sup>2+</sup> -H (Tank 1)	pt	It is setting the upper limit value of accelerator control range.
32	CSV	Fe <sup>2+</sup> nominal value (Tank 1)	pt	It is setting intermediate value of accelerator control range.
33	CLC	Fe <sup>2+</sup> - L (Tank 1)	pt	It is setting of lower limit value of accelerator control range.
34	CLL	Fe <sup>2+</sup> -LL (Tank 1)	pt	Promoter control range lower limit, setting to issue an alarm. Supply operation is stopped in the case of automatic supply.

35	CMR	Fe2+ Maximum amount of replenishment at one time (Tank 1)	L	Limit the maximum amount of supply at one time.
36	CCR	Fe2+ Metered replenishment (Tank 1)	L	It is set when quantitative supply is carried out.
37	CSC	Fe2+ Replenishment coefficient (Tank 1)	pt/L	The amount (L) of replenishment liquid necessary for raising the analytical value 1 pt to 1000 L of the treatment liquid, --reference-- The relationship between mass (Kg) and volume (L) is $(Kg) / (Sg) = (L)$ - Sg: specific gravity (= density g / cm <sup>3</sup> )
38	CRT	Fe2+ Supply cumulative amount (Tank 1)	L	It is integrated amount supplied
39	CPR	Fe2+ Supply pump (Tank 1)	L/min	It is the maximum discharge amount of the supply pump for 1 minute.
40	AH2	Free acid-HH  (Tank 2)	pt	It is a setting to issue an alarm at the upper limit on the free acid control range. Supply operation is stopped in the case of automatic supply. Error signal
41	AX2	Free acid-H (Tank 2)	pt	It is setting the upper limit of free acid control range.
42	AS2	Free acid Nominal value (Tank 2)	pt	It is setting of the free acid control range target value.
43	AL2	Free acid-L (Tank 2)	pt	It is setting the lower limit value of the free acid control range.
44	AL2	Free acid-LL (Tank 2)	pt	The lower limit of free acid control range, setting to issue an alarm. Supply operation is stopped in the case of automatic supply. Error signal
45	AM2	Free acid Maximum amount of replenishment at one time (Tank 2)	L	Limit the maximum amount of one supply.

46	AC2	Free acid Metered replenishment (Tank 2)	L	It is set when quantitative supply is carried out.
47	AS2	Free acid Replenishment coefficient (Tank 2)	L/pt	The amount (L) of replenishment liquid necessary for raising the analytical value 1 pt to 1000 L of the treatment liquid --reference-- The relationship between mass (Kg) and volume (L) is $(Kg) / (Sg) = (L) - Sg$ : specific gravity (= density g / cm <sup>3</sup> )
48	AR2	Free acid Supply cumulative amount (Tank 2)	L	The device adds the supply amount automatically.
49	AP2	Free acid Supply pump (Tank 2)	L/min	This is the discharge amount per minute during maximum discharge of the supply pump.
50	BH2	Total acid -HH (Tank 2)	pt	It is setting to issue an alarm at the upper limit on total acid control range. Supply operation is stopped in the case of automatic supply. Error signal
51	BH2	Total acid -H (Tank 2)	pt	It is setting of the upper limit of total acid control range.
52	BS2	Total acid nominal value (Tank 2)	pt	Total acid management range target value setting.
53	BL2	Total acid -L (Tank 1)	pt	It is setting of the lower limit of total acid control range.
54	BL2	Total acid -LL (Tank 2)	pt	Total acid management range lower limit, setting to issue an alarm. Supply operation is stopped in the case of automatic supply. Error signal
55	BM2	Maximum amount of replenishment of total acid at one time (Tank 2)	L	Limit the maximum amount of one supply.
56	BC2	Total acid Metered replenishment (Tank 2)	L	It is set when quantitative supply is carried out.

57	BS2	Total acid replenishment coefficient (Tank 2)	L/pt	The amount (L) of replenishment liquid necessary for raising the analytical value 1 pt to 1000 L of the treatment liquid, --reference-- The relationship between mass (Kg) and volume (L) is $(Kg) / (Sg) = (L)$ - Sg: specific gravity (= density g / cm <sup>3</sup> )
58	BR2	Total acid Supply cumulative amount (Tank 2)	L	The device adds the supply amount automatically.
59	BP2	Total acid Supply pump (Tank 2)	L/min	This is the discharge amount per minute during maximum discharge of the supply pump.
60	CH2	Accelerator -HH (Tank 2)	pt	The upper limit on promoter control range, setting to issue an alarm. Supply operation is stopped in the case of automatic supply.
61	CX2	Accelerator -H (Tank 2)	pt	It is setting the upper limit value of accelerator control range.
62	CS2	Accelerator nominal value (Tank 2)	pt	It is setting intermediate value of accelerator control range.
63	CL2	Accelerator L (Tank 2)	pt	It is setting of lower limit value of accelerator control range.
64	CL2	Accelerator -LL (Tank 2)	pt	Promoter control range lower limit, setting to issue an alarm. Supply operation is stopped in the case of automatic supply.
65	CM2	Accelerator Maximum amount of replenishment at one time (Tank 2)	L	Limit the maximum amount of supply at one time.
66	CC2	Accelerator Metered replenishment (Tank 2)	L	It is set when quantitative supply is carried out.
67	CS2	Accelerator Replenishment coefficient (Tank 2)	pt/L	The amount (L) of replenishment liquid necessary for raising the analytical value 1 pt to 1000 L of the treatment liquid, --reference--

				The relationship between mass (Kg) and volume (L) is $(Kg) / (Sg) = (L) \cdot Sg$ : specific gravity (= density g / cm <sup>3</sup> )
68	CR2	Accelerator Supply cumulative amount (Tank 2)	L	It is integrated amount supplied
69	CP2	Accelerator Supply pump (Tank 2)	L/min	It is the maximum discharge amount of the supply pump for 1 minute.
72	AWV	Pure water injection amount for cleaning	ml	Amount of water collected when cleaning inside the titration cell.
73	WPT	Drain pump driving time	sec	Time to drive the pump to perform all drainage in the titration cell.
74	VCL	For measuring tube cleaning, cleaning solution addition amount	ml	The amount of washing solution added to wash the pH electrode in the titration cell.
75	SOV	Sample overflow time	sec	It is time to pool the sample in the sampling tube and extrude the sample.
76	SAF	Sample line air cleaning	sec	It is time to wash the inside of the sample line with air blow.
77	SSV	Change value at arrival of sample	mV	It is a numerical value to confirm arrival of sample by the change in potential of the sample sensor.
78	ABP	Air blowing cycle	min	Set the time to perform air blow periodically.
79	DMM	Analysis value Maximum retention time	hr	It is the time to keep the final analysis value on the screen. Up to 24 hours. It changes to X after 24 hours or more.
80	SVA	Free acid Sample volume for analysis	ml	Sample volume taken to analyze free acid.
81	PWA	Free acid Pure water addition amount	ml	Amount of dilution water of sample to analyze free acid
82	AFA	Free acid Initial addition amount	ml	The amount of titrant required to analyze free acid unconditionally added at the beginning.
83	VAA	Free acid Additive factor A	ml	It is the amount of one drop of titrant to be added unconditionally per titration step.

84	VBA	Free acid Additive factor B	ml	Calculation coefficient It is a coefficient used in titration.
85	EPA	Free acid End point determination value	pH	It is a numerical value that decides the end point judgment value of free acid measurement at pH electrode.
86	CVA	Free acid High speed low speed switching value	pH	At first, the titration speed is made faster, but when it comes near the end point, enter a value to titrate slowly.
87	MTA	Free acid Maximum titer	ml	It is a numerical value that determines the maximum amount of titrant to be added
88	TRA	Free acid Load time	sec	Standby time to read free acid measurement. Set the titration interval seconds at the 1st digit and far from the end pH. The tens place is fixed and it is set to 0. Set the titration interval seconds when it is 100 and the end pH approaches.
89	DFA	Free acid Differential value filter		Blindfold the constant titration amount. When it is -1, it is fixed and it stops.
90	SVB	Total acid Sample volume for analysis		It is sample amount for analyzing total acid.
91	PWB	Total acid Pure water addition amount	ml	Amount of dilution water of sample to analyze total acid
92	AFB	Total acid Initial addition amount	ml	The amount of titrant required to analyze total acid unconditionally added at the beginning.
93	VAB	Total acid Additive factor A	ml	It is the amount of one drop of titrant to be added unconditionally per titration step
94	VBB	Toal acid Additive factor B	ml	Calculation coefficient It is a coefficient used in titration.
95	EPB	Total acid End point determination value	pH	It is a numerical value that decides the end point judgment value of total acid measurement at pH electrode.
96	CVB	Total acid	pH	At first, the titration speed is made faster, but when it comes near the end point, enter a value to titrate slowly.

		High speed low speed switching value		
97	MTB	Total acid Maximum titer	ml	It is a numerical value that determines the maximum amount of titrant to be added
98	TRB	Total acid Load time	sec	Standby time to read total acid measurement. Set the titration interval seconds at the 1st digit and far from the end pH. The tens place is fixed and it is set to 0. Set the titration interval seconds when it is 100 and the end pH approaches.
99	DFB	Total acid Differential value filter		Blindfold the constant titration amount. When it is -1, it is fixed and it stops.
100	SVC	Accelerator Sample volume for analysis	ml	It is sample amount for analyzing accelerator.
101	PWC	Accelerator Pure water addition amount	ml	Amount of dilution water of sample to analyze accelerator
102	AFC	Accelerator Initial addition amount	ml	The amount of titrant required to analyze accelerator unconditionally added at the beginning.
103	VAC	Accelerator Additive factor A		It is the amount of one drop of titrant to be added unconditionally per titration step
104	VBC	Accelerator Additive factor B		Calculation coefficient It is a coefficient used in titration.
105	EPC	Accelerator End point determination value		When this value is reached, titration is terminated.
106	CVC	Accelerator High speed low speed switching value		After this value, sensor reading time switches to low speed setting.
107	MTC",	Accelerator Maximum titer	ml	Titration will be forcibly terminated when the shipping charge of added titrant exceeds this value.
108	TRC	Accelerator Load time	sec	It will be the standby time to read the extender measurement. Set the titration interval seconds at the 1st digit and far from the end pH.

				The tens place is fixed and it is set to 0. Set the titration interval seconds when it is 100 and the end pH approaches.
109	DFC	accelerator Differential value filter		Blindfold the constant titration amount. When it is -1, it is fixed and it stops.
110	SVA	Free acid Sample volume for analysis (Tank2)	ml	Sample volume taken to analyze free acid.
111	PWA	Free acid Pure water addition amount (Tank2)	ml	Amount of dilution water of sample to analyze free acid
112	AFA	Free acid Initial addition amount (Tank2)	ml	The amount of titrant required to analyze free acid unconditionally added at the beginning.
113	VAA	Free acid Additive factor A (Tank2)	ml	It is the amount of one drop of titrant to be added unconditionally per titration step.
114	VBA	Free acid Additive factor B (Tank2)	ml	Calculation coefficient It is a coefficient used in titration.
115	EPA	Free acid End point determination value (Tank2)	pH	It is a numerical value that decides the end point judgment value of free acid measurement at pH electrode.
116	CVA	Free acid High speed low speed switching value (Tank2)	pH	At first, the titration speed is made faster, but when it comes near the end point, enter a value to titrate slowly.
117	MTA	Free acid Maximum titer (Tank2)	ml	It is a numerical value that determines the maximum amount of titrant to be added
118	TRA	Free acid Load time (Tank2)	sec	Standby time to read free acid measurement. Set the titration interval seconds at the 1st digit and far from the end pH. The tens place is fixed and it is set to 0. Set the titration interval seconds when it is 100 and the end pH approaches.
119	DFA	Free acid (Tank2)		Blindfold the constant titration amount. When it is -1, it is fixed and it stops.

		Differential value filter		
120	SVB	Total acid Sample volume for analysis (Tank2)		It is sample amount for analyzing total acid.
121	PWB	Total acid Pure water addition amount (Tank2)	ml	Amount of dilution water of sample to analyze total acid
122	AFB	Total acid Initial addition amount (Tank2)	ml	The amount of titrant required to analyze total acid unconditionally added at the beginning.
123	VAB	Total acid Additive factor A (Tank2)	ml	It is the amount of one drop of titrant to be added unconditionally per titration step
124	VBB	Total acid Additive factor B (Tank2)	ml	Calculation coefficient It is a coefficient used in titration.
125	EPB	Total acid End point determination value (Tank2)	pH	It is a numerical value that decides the end point judgment value of total acid measurement at pH electrode.
126	CVB	Total acid High speed low speed switching value (Tank2)	pH	At first, the titration speed is made faster, but when it comes near the end point, enter a value to titrate slowly.
127	MTB	Total acid Maximum titer (Tank2)	ml	It is a numerical value that determines the maximum amount of titrant to be added
128	TRB	Total acid Load time (Tank2)	sec	Standby time to read total acid measurement. Set the titration interval seconds at the 1st digit and far from the end pH. The tens place is fixed and it is set to 0. Set the titration interval seconds when it is 100 and the end pH approaches.
129	DFB	Total acid Differential value filter (Tank2)		Blindfold the constant titration amount. When it is -1, it is fixed and it stops.
130	SVC	Accelerator Sample volume for analysis (Tank2)	ml	It is sample amount for analyzing accelerator.

131	PWC	Accelerator Pure water addition amount (Tank2)	ml	Amount of dilution water of sample to analyze accelerator
132	AFC	Accelerator Initial addition amount (Tank2)	ml	The amount of titrant required to analyze accelerator unconditionally added at the beginning.
133	VAC	Accelerator Additive factor A (Tank2)		It is the amount of one drop of titrant to be added unconditionally per titration step
134	VBC	Accelerator Additive factor B (Tank2)		Calculation coefficient It is a coefficient used in titration.
135	EPC	Accelerator End point determination value (Tank2)		When this value is reached, titration is terminated.
136	CVC	Accelerator High speed low speed switching value (Tank2)		After this value, sensor reading time switches to low speed setting.
137	MTC",	Accelerator Maximum titer (Tank2)	ml	Titration will be forcibly terminated when the shipping charge of added titrant exceeds this value.
138	TRC	Accelerator Load time (Tank2)	sec	It will be the standby time to read the extender measurement. Set the titration interval seconds at the 1st digit and far from the end pH. The tens place is fixed and it is set to 0. Set the titration interval seconds when it is 100 and the end pH approaches.
139	DFC	accelerator Differential value filter (Tank2)		Blindfold the constant titration amount. When it is -1, it is fixed and it stops.
140	PMT	pH Measurement time	sec	It is the time to measure the initial pH value before starting the titration.
141	AMT	Absorbance measurement time	sec	It is the reading time of the photosensor when measuring the absorbance.
142	CLV	Cell liquid level detection value	mV	A value that outputs a warning when the sensor determines that water has been sampled in the titration cell.

				It is not judged to be 0.
143	ZOF	Promoter emptiness titer determination	ml	Amount to bring the titrant to the tip of the titration tube when measuring accelerator.
144	LVL	Limiting luminous intensity	mV	An alarm occurs when the blank potential falls below this value
145	BUP	Bulk potential	mV	The value unconditionally added to the measured potential
146	BU2	Bulk potential 2	mV	The value unconditionally added to the measured potential
150	X1C	AR1 Addition amount	ml	This device adds this amount of reagent AR1 for analysis.
151	WT1	AR1 Reaction waiting time	sec	This device waits for this time after adding reagent AR1.
152	X2C	AR2 Addition amount	ml	This device adds this amount of reagent AR3 for analysis.
153	WT2	AR2 Reaction waiting time	sec	This device waits for this time after adding reagent AR3.
157	WBR	White balance		Adjustment factor for color(Red) sensor.
158	WBG	White balance		Adjustment factor for color(Green) sensor.
159	WBB	White balance		Adjustment factor for color(Blue) sensor.
160	ADB	Free acid Density adjustment factor B		The value added to the free acid value M obtained by analysis (Analytical value = M * ADA + ADB)
161	ADA	Free acid Density adjustment factor A		The value multiplied by free acid M obtained by titration (Analytical value = M * ADA + ADB)
162	BDB	Total acid Density adjustment factor B		The value added to the total acid value M obtained by analysis (Analytical value = M * BDA + ADB)
163	BDA	Total acid Density adjustment factor A		The value multiplied by the total acid M obtained by titration (Analytical value = M * ADA + ADB)
164	CDB	Fe2+		The value added to the accelerator value M obtained by analysis (Analytical value = M * CDA + ADB)

		Density adjustment factor B		
165	CDA	Fe2+ Density adjustment factor A		The value multiplied by the accelerator M obtained by titration (Analytical value = M * ADA + ADB)
168	DBC	pH adjustment factor B	mV	Potential when pH 7 calibration solution is measured.
169	DAC	pH adjustment factor A		A potential corresponding to a change of 1 pH, usually 59 mV / pH.
170	A2B	Free acid Density adjustment factor B		The value added to the free acid value M obtained by analysis (Analytical value = M * ADA + ADB)
171	A2A	Free acid Density adjustment factor A		The value multiplied by free acid M obtained by titration (Analytical value = M * ADA + ADB)
172	B2B	Total acid Density adjustment factor B		The value added to the total acid value M obtained by analysis (Analytical value = M * BDA + ADB)
173	B2A	Total acid Density adjustment factor A		The value multiplied by the total acid M obtained by titration (Analytical value = M * ADA + ADB)
174	C2B	Fe2+ Density adjustment factor B		The value added to the accelerator value M obtained by analysis (Analytical value = M * CDA + ADB)
175	C2A	Accelerator Density adjustment factor A		The value multiplied by the accelerator M obtained by titration (Analytical value = M * ADA + ADB)
180	LMT	Maximum Analysis Time		A function to restart the analysis if it is not completed within the set time
181	SO2	System options		Perform option setting.
185	PBX	pH solution Alkali	pH	When using acalibration solution other than pH9.18
186	PNX	pH solution Neutral	pH	When using acalibration solution other than pH6.86
187	PAX	pH solution acid	pH	When using acalibration solution other than pH4.01

188	APC	Automatic pH correction		
189	SP2	Supply operation		Optional functions for supplying operations
190	PHV	The potential of pH STD-L	mV	The potential of pH STD-L obtained by pH calibration
191	PHA	pH conversion factor A	mV/pH	Record the potential obtained by pH calibration.
192	PHB	pH conversion factor B	mV	Record the potential obtained by pH calibration.
193	SHD	Hardware Selection		Automatically reflected
194	UPW	User password		In addition to the master password, you can set one user password. The password ranges from 1000 to 9999.
195	SIM,	simulator		If you set a numerical value in the range of 5050 to 5052, the device will be in simulator mode.
196	USD	Unit selection		You can set the unit displayed for each analysis value by the number set for each digit. 0 > g /L 1 > ml/L 2 > pt 3 > % 4 > N 5 > g 6 > ml 7 > °C 8 > M 9 > None
197	DTS	Device type selection		You may be able to specify the type of sample to be analyzed on the instrument.
198	SOP	System options		Perform option setting.
199	DAD	Device address		Set the address to identify the device by data communication.

#### 4.1.2. Print format

Number of digits	number	meaning
1	0	Print analysis result I do not print at all
1	1	Print analysis result Print all analysis values on one line
1	2	Print analysis result Large printing for each item
2	0	Titration process I do not print at all
2	1	Titration process 1 or more: EP = xxxxxx End point information 1 line printing
2	2	Titration process 2 or more: Titration initial potential printing
2	3	Titration process Printing at each step (raw potential)
2	4	Titration process Print every step (comparison value)
3	0	Absorbance measurement I do not print at all
3	1	Absorbance measurement 1 or more: One line printing such as Blank = xxxmV
3	2	Absorbance measurement 2 or more: Sensor information addition (ref, smp potential)
4	0	Supply information I do not print at all
4	1	Supply information Turn number 1 line printing and this time supply amount printing
4	2	Supply information Supply integrated amount printing
4	3	Supply information Detailed printing including supply pulses

#### 4.1.3 System options

Number of digits	number	meaning
1	0	
1	1	
2	0	Reagent level leveler do not use
2	1	Reagent level leveler do use

## 4.2 Analysis operation and parameter setting



### 4.2.1. Analysis flow and parameters

When you start the analysis, the analysis proceeds according to a certain procedure. Indicates parameters related to the operation at this time.

#### Start operation

BS drainage	
Cell drainage	WPT(73)
Sampling	SPP(1)SSV(77)

#### Wash cell with pure water

Pure water sampling	AWV(72)
Drain the cell	WPT(73)

#### Free acid measurement

Sampling	SVA(80)
Pure water dilution of sample	SWA(81)
Initial pH measurement	PMT(140)
Titrant addition	AFA(82) VAA(83) MTA(87)
pH measurement	EPA(85) CVA(86) TRA(88)
Free acid concentration calculation	T1C(06) ADA(161) ADB(160)

#### Cell cleaning

Pure water sampling	AWV(72)
Cell drainage	WPT(73)

#### Total acid measurement

Sampling	SVB(90)
Pure water dilution of sample	SWA(91)
Initial pH measurement	PMT(140)
Initial addition	AFB(92)
Titrant addition	VAB(93) MTB(97)
pH measurement	EPB(95) CVB(96) TRB(98)
Total acid concentration calculation	T1C(06) BDA(163) BDB(162)

### Cell cleaning

Pure water sampling	AWV(72)
Cell drainage	WPT(73)

### Fe<sup>2+</sup> measurement

Sampling	SVC(100)
Pure water dilution of sample	SWC(101)
Reagent 1 addition	X1C(150) WTA(151)
Potential measurement	EPC(105) CVC(106) TRC(108) BUP(105)
Titrant addition	AFC(102) VAC(103) MTC(107)
Accelerator concentration calculation	T2C(07) CDA(165) CDB(164)
Return sample to tank	SPP(1)
Wash sample line with pure water	SPP(1) TSG(3)

### Cleaning by finishing treatment

Cell drainage	WPT(73)
	AWV(72)
Cleaner addition	X2C(152)
Washing standby	WT2(153)
BS pure water injection	
Wait until next analysis	APT(05)

#### **4.1.1. Supply action**

The replenishment system of this unit is a proportional replenishing system that adds the replenisher volume proportional to the difference between the analysis value and the set value.

Below is the calculation formula of supply amount in PCC-PK5.

Measured concentration	M	pt
Nominal value	N	pt
Tank capacity	T	ton
Replenishment coefficient	C	L/pt

The L number of replenishing liquid required to raise 1 pt for 1000 L of processing solution

Supply amount of this time                    R            L

$$R = ( N - M ) \times ( C / 1000 ) \times T$$

Pump discharge amount                    P            L/min

Pump drive time                            T            sec

$$T = R / P \times 60$$

Turn on the supply pump according to this number of seconds.

If the supply cycle (second) is set to a value other than 0, supply is completed when the pump turns ON for a fixed time within the supply cycle and the total reaches the pump drive time. On the other hand, if the replenishment cycle (second) is 0, the pump is continuously driven for the refill pump driving time.

## 4.2. Information on various alarms

### 4.2.1. Operation by equipment

"Alarm generated during analysis"

"Alarm due to wear of equipment parts"

"Operation alarm" there is.

When an alarm occurs, its contents are printed on the printer.

All warning messages begin with "!!".

The buzzer or warning light that sounds at the same time as the alarm sounds when the "alarm release button" is pressed.

The contents of the alarm are shown below.



**Table 2 Parameter setting alarm**

!! 701 Printer Pape	No printer paper
!! 717 Mon or Day Check	Clock alignment error
!! 718 CycleTime OV	Analysis cycle is 1441 or more
!! 719 Check Sol.Conc	Setting of calibration value Relationship between H and L is reversed
!! 723 Sample Vol.	Sample quantity is too small
!! 731 Supply SetVal	Supply set value setting

701-731, signal tower red + buzzer operation

**Table 3 Device Hardware Alarm**

!! 502 Printer Error	Printer response	
!! 506 Parameter Area	Parameter not initialized	
!! 512 A/D Response	A / D response abnormality	
!! 513 A/D Adjust	A / D reference value error	
!! 514 EM-Motor Pulse	EM-1 Encoder motor error (EP 2 pump)	
!! 515 EM-Motor Pulse	EM-2 Encoder motor error (EP 3 pump)	
!! 516 RTC COUNT UP	Clock response fault	Resetting the clock
	Second does not advance	
!! 517 RTC SET INCORRECT	Time setting error	

# *Chapter 5*

In order to use forever

---

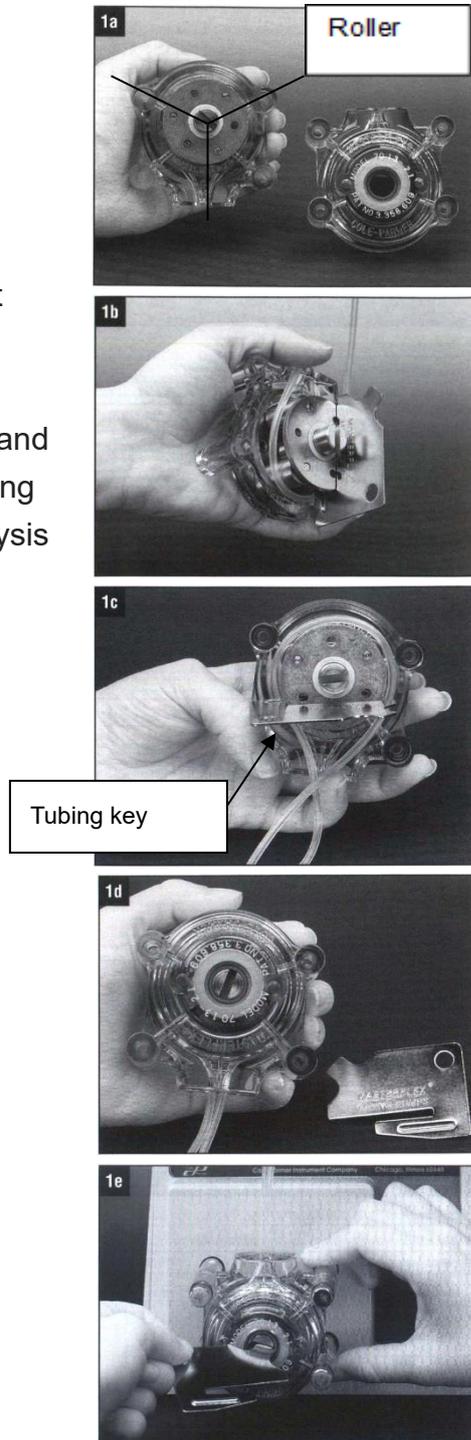
Pump Tube Replacement  
Refill printer paper  
Sample Line Maintenance  
Guidelines for maintenance

# 1. Pump Tube Replacement

Tube that is attached to the metering pump head, please replace the prospect of six months.

The exchange method is shown below. Please work with the supplied tubing key to replace the tube.

t  
Failure to observe the replacement cycle will damage the pump head and tubing, making correct analysis impossible



(Step1)

Hold the pump head as figure, and place three rollers at 2, 6 and 10 o'clock.

(Step2)

Fix the tube along two rollers and grooves. Next, Insert the tubing key behind the roller shaft and set the tubing key parallel to diagonal line of setting hole. Please push the key as you can.

(Step3)

Push the tube to the rotor strongly with turning the tubing key un-clockwise.

(Step4)

Round the rotor with the tube and fix it into groove with a thumb. And fit one side of pump head with a shaft and a snap shaft. (Notes) Please fit to engage the positioning pin correctly.

(Step5)

Pull out the tubing key from the pump head, and insert the pump head to the motor shaft. Turn the shaft until fitting very well, and fix the pump head with the thumbscrew.

After tube setting, the tube mounting on the fixed quantity pump head has to be connected with the tube for solution sending. We can supply the tube pre-mounting the joint. Please contact with our sales division.



## 2. Refill printer paper

A red line comes out on both sides of the paper when the printer paper becomes about 50cm remaining. Please replace the paper with a predetermined heat-sensitive roll.



Figure 5-1 Replacing printer paper

### 3. Sample line maintenance

Usually use the Teflon tube which inner diameter is 2mm or the Polyethylene tube which inner diameter is 4mm. According to the analysis objective liquids, it will be clogged by the dust and/or the precipitation. Once it clogged, sometimes it is difficult to remove the clogging. We recommend a regular "Cleaning". But, in case of the liquid, which has no reason to clog, it is no need to clean.

Show the way using compressed air as a sample for "Cleaning". Please follow your working standard.



Release the sample line at the backside connecting point. Connect the air gun nozzle with the sample line, and blow inside tube.

#### Caution!!

Sometimes the inner liquid of sample line will blow out reason for putting out of joint etc. Please be careful for surround. Please formulate the safety measures such as safety glass.

#### Others

Sometimes the insides of pure water tank get a mold. If the device draw in the mold, sometimes the solenoid valve will break down. Please conduct a regular check for pure water tank and wash it if necessary.



#### 4. Guidelines for each maintenance

Maintenance items necessary for this equipment and rough cycle to be carried out are shown below.

**Tal 5-1 Maintenance items**

Item	Cycle	Reference item
Supply reagent and/or pure water	Supply early timing	Chapter 2 "Fill up reagent"
Supply papers to printer	When red line is printed.	Chapter 7 "Supply papers to printer"
Replace a of the tube pump	6 months	Chapter 7 "Replace a pump tube"
Supply inner liquid of pH electrode	When the liquid surface becomes lower than 5 mm from bottom of KCL tank	Chapter 7 "Supply KCL inner liquid"
Lamp exchange in the absorbance part	1 year A periodic exchange isn't necessary by equipment with an LED.	Chapter 7 "lamp exchange of the absorbance unit"
Confirm sample line	According to site condition	Chapter 7 "Maintenance of sample line"

# *Chapter 6*

---

For better use

---

Explanation of analysis and measurement  
Analysis value (measured value) combined  
Drawings and Parameters Table

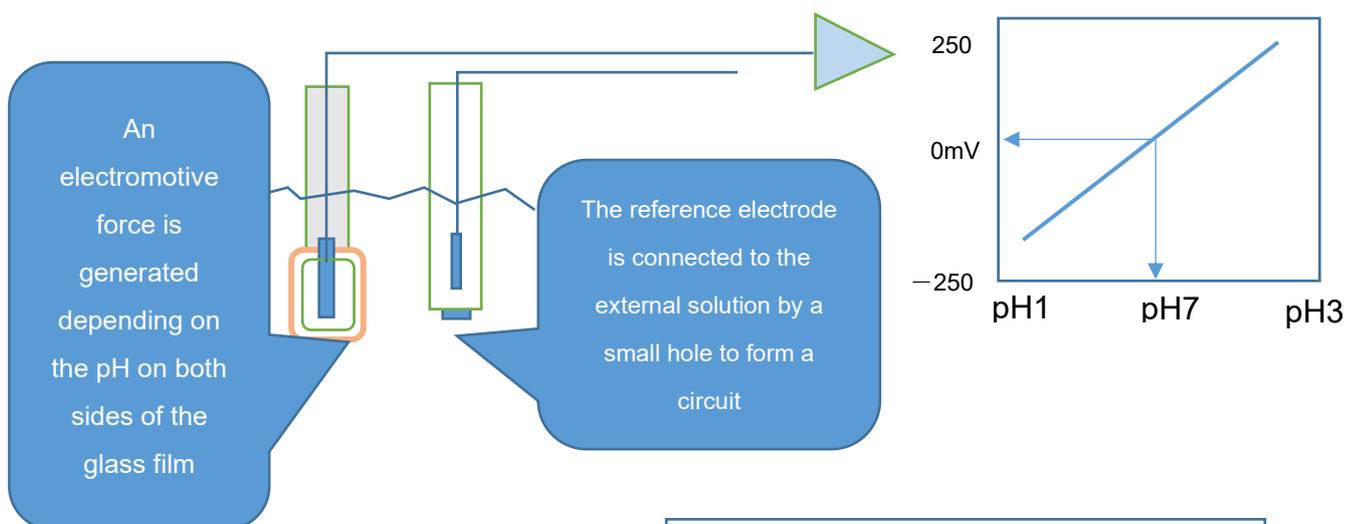
## 6.1 Explanation of analysis and measurement

In normal operation, you do not need to be conscious of this chapter much. However, in order to better understand the operation and contents of the device, we will explain what kind of setting and what kind of operation procedure is being performed here.

### 6.1.1. pH measurement

When the glass electrode (pH sensor) is dipped in sample liquid directly, the electric potential difference (voltage) will generate between the glass electrode and the reference electrode. Regarding to proportional pH with this potential difference, the sample pH will be decided. The potential difference changes 58mV by changing one amount of pH value. The potential difference indicates about 0mV at neutral 0 of pH. In case of acid sample it indicates positive potential. In case of alkaline sample it indicates negative potential.

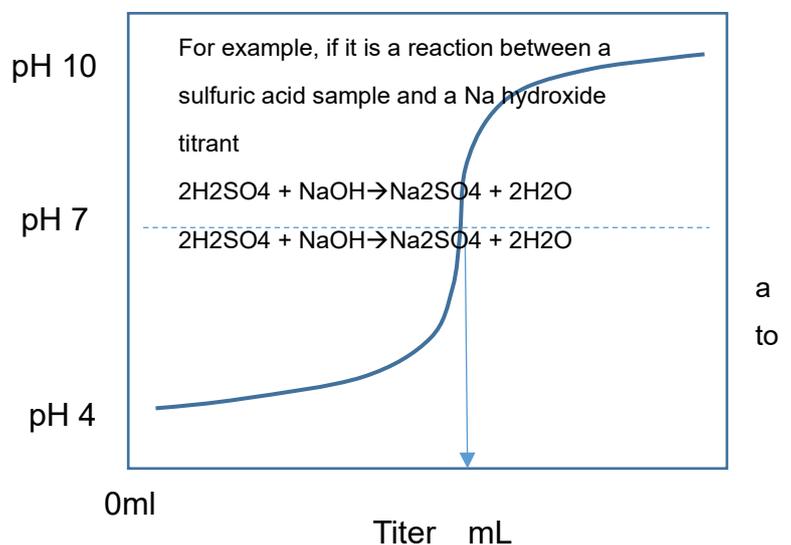
$$\text{Measurement pH} = (\text{Measured potential} - \text{Calibration Solution A potential}) \times \text{Conversion factor} + \text{Calibration Solution A pH}$$



### 6.1.2. Neutralizing titration

An alkaline solution is added to certain amount of acidic sample change the pH to around neutrality.

Alternatively, acidic solution (titrant) is added to a certain



amount of basic sample to change the pH to around neutrality. A method of determining the acidity or basicity of a sample from the amount of titrant required to change the pH to neutral.

MK 2 uses a lot of neutralization titration. Depending on the sample, it may be terminated halfway without titrating to complete neutrality. This prevents hydroxides and the like from being influenced by the titration amount at the same time in the vicinity of neutrality.

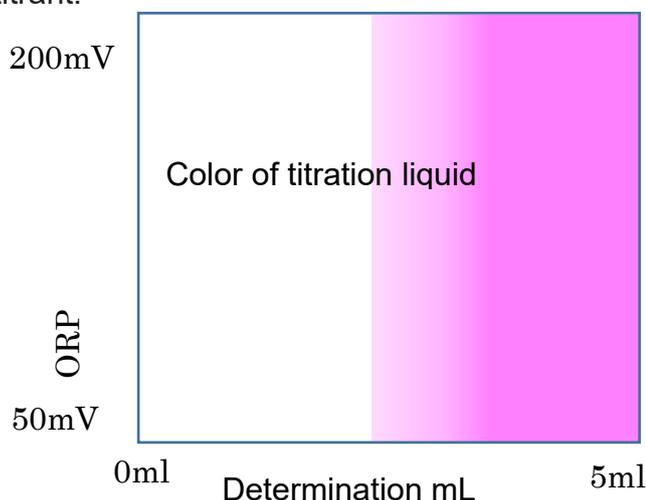
### 6.1.3. Redox titration

Redox reaction with sample and titrant.

The combination of oxidation and reduction depends on the type of sample and titrant.

For example, when the sample is hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), permanganate K (KMnO<sub>4</sub>) is used.

The oxidation-reduction reaction appears as a change in oxidation-reduction potential (ORP).



However, when permanganate K is used as a titrant, coloration due to permanganate K occurs at the time when the oxidation-reduction reaction is completed, so this is detected.

Election of coloration uses a colorimetric sensor mounted in a reaction cell.

For example, the reaction between hydrogen peroxide and permanganate is as follows

$$2\text{KMnO}_4 + 5\text{H}_2\text{O}_2 + 3\text{H}_2\text{SO}_4 \rightarrow 2\text{MnSO}_4 + \text{K}_2\text{SO}_4 + 5\text{O}_2 + 8\text{H}_2\text{O}$$

Per manganic acid immediately turns into colorless MnSO<sub>4</sub>, but when the reaction is complete the per manganic acid becomes excessive and it becomes colored with the color of per manganic acid.

### 6.1.4. Absorbance method (Colorimetric titration)

A method of determining the concentration using a property that a sample absorbs for a specific wavelength of light.

Absorption of light is expressed as absorbance.

Absorbance can be expressed in  $Abs = -\log(S/B)$

S is a sample, B means blank, pure water containing samples is used.

Abs

Abs and concentration follow the Lambert-Beer's law shown below.

$$Abs = K \times L \times C$$

K is the coefficient L, the optical path length C is the concentration

Since L is constant in MK2, if Abs and coefficient K are determined, the concentration C can be obtained.

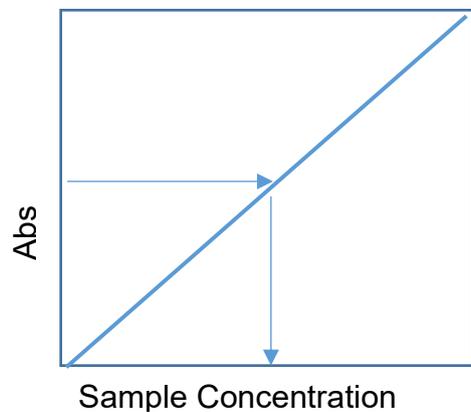
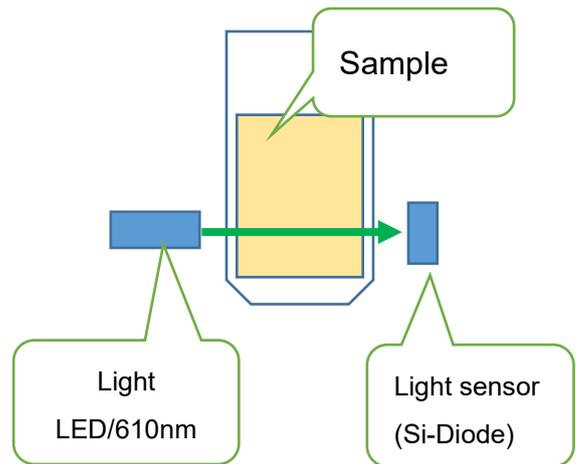
To determine K, you can decide by analyzing the sample whose concentration is known.

Preparation is the creation of a calibration curve.

In MK 2, wavelengths (450, 550, 610 nm) of three types of light sources can be selected depending on the sample.

For measuring the absorbance of Ni<sup>2+</sup> ions, 550 nm (green)

A light source of 610 nm (red) is used for measuring the absorbance of Cu<sup>2+</sup> ions.



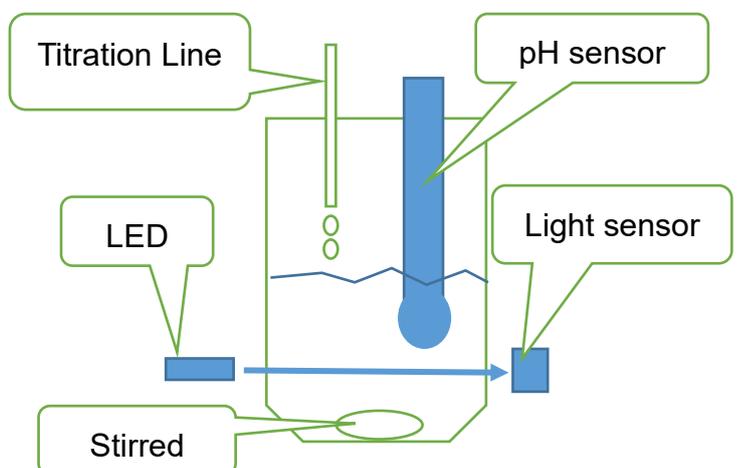
### 6.1.5. The measurement unit used in the equipment

Indicates the measurement part in actual equipment.

It incorporates a pH sensor and a colorimetric sensor that can measure the absorbance method.

The pH sensor may occlude the light path (the part through which light passes) of the light sensor.

Therefore, the mounting position of the pH sensor is important.



## 2. Analysis value (measured value) combined

The analyzed values of the instrument are calculated arithmetically from the set titration solution concentration and sample volume.

However, in fact, analysis values at the site may not agree with analyzed values of the equipment due to differences in analytical methods etc.

(However, the tendency of the concentration change agrees).

Therefore, it is possible to linearly convert the device by setting density adjustment coefficients A and B.

However, irrespective of this coefficient, the calibration operation directly calculates the concentration conversion coefficient from the obtained absorbance, measurement potential, etc.

Actual analysis value = ( analysis value × concentration adjustment factor A ) + concentration adjustment factor B

As can be seen from this equation, when the concentration adjustment coefficient A becomes 0, the actual analysis value becomes the value of the concentration adjustment coefficient B, which is meaningless. For example, when shifting the analysis value, it can be realized by setting adjustment coefficient A to 1 and changing only adjustment coefficient B.

As a way of thinking, if the adjustment coefficient A is 1 and the adjustment coefficient B is 0.01, when the analysis value of the apparatus is lower by 0.02 than the manual analysis, it is necessary to shift to the current adjustment coefficient B. It should be set to  $0.02 + 0.01 = 0.03$  added.

In other words, there is a method of adjusting either "shift" or "slope" as adjustment method.

In addition, the one with the xx conversion coefficient in the parameter represents the parameter for which the device determines the coefficient in the automatic calibration, and the role differs from the xx adjustment factor

Number	Means	
161	Adj. Factor A of FA	Generally an around 1
160	Adj. Factor B of FA	A positive or negative value is entered
163	Adj. Factor A of TA	Generally an around 1
162	Adj. Factor B of TA	A positive or negative value is entered
165	Adj. Factor A of AC	Generally an around 1
164	Adj. Factor B of AC	A positive or negative value is entered

## 6.1 Drawings and parameters table

### 6.1.1 Piping flow diagram

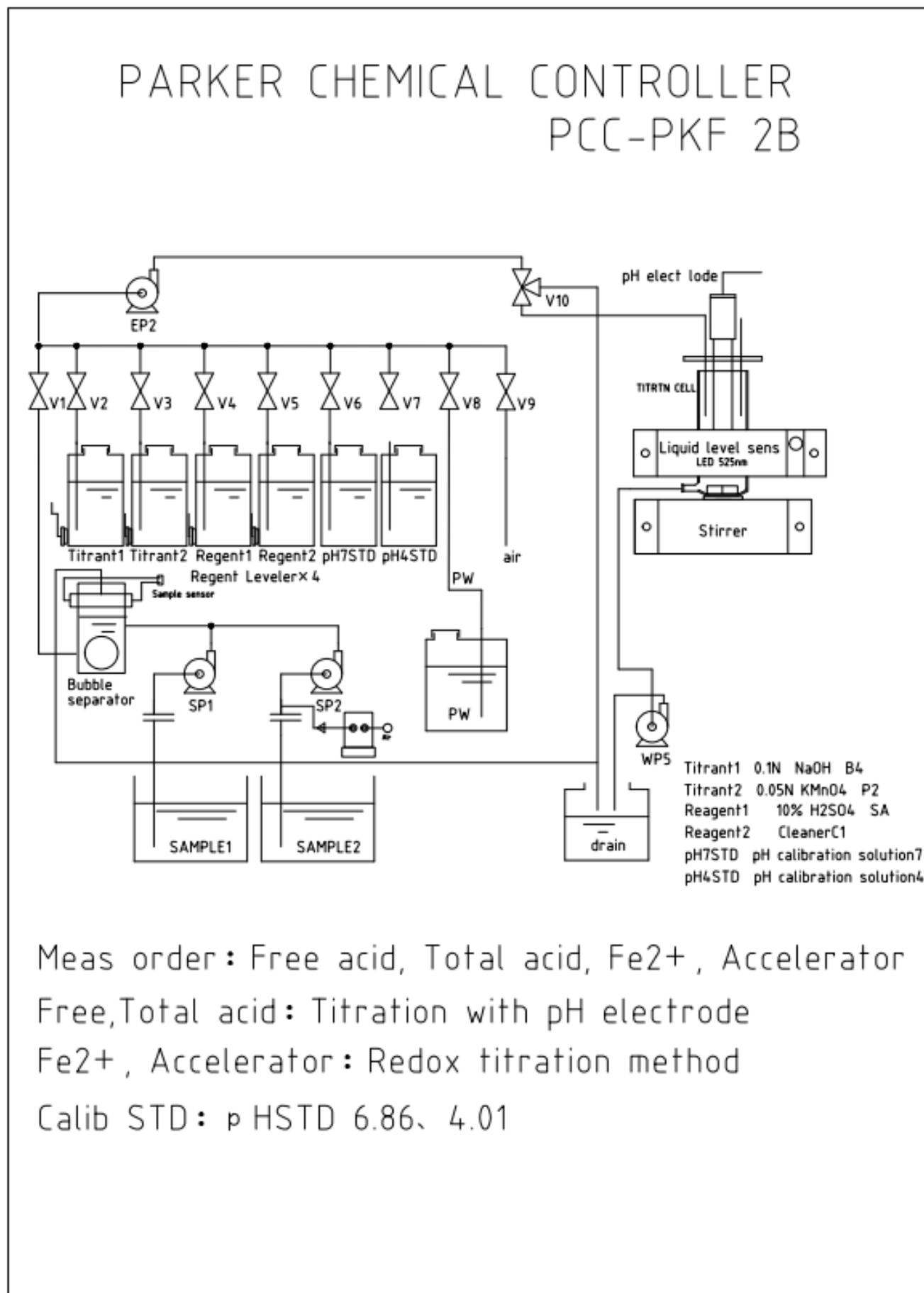
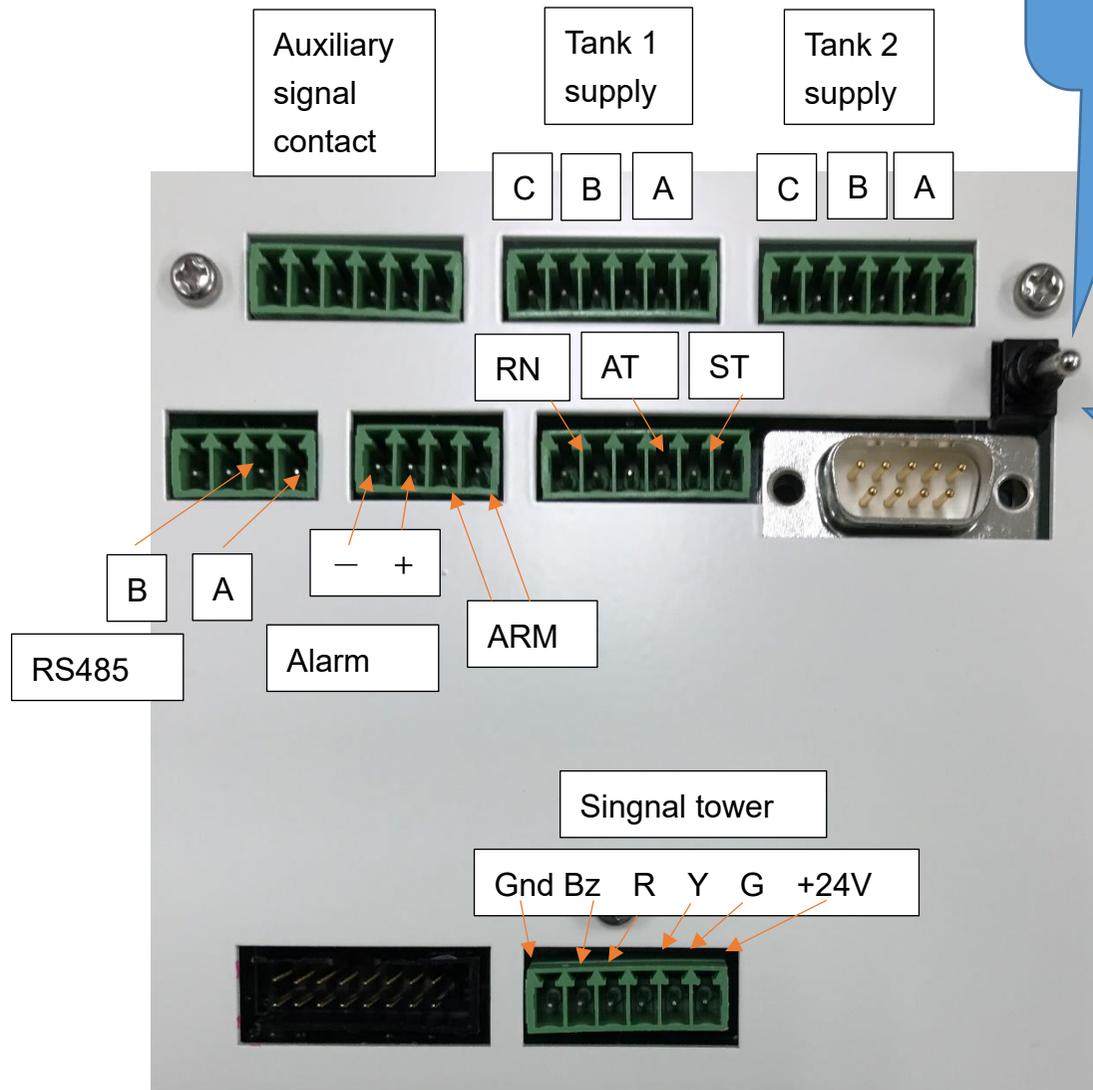


Fig 5-2 piping flow

### 6.2.3 Rear terminal diagram

It shows the rear terminal of the unit and the supply control unit.



Normally program mode setting switch is always downward.

Supply signals are represented by A, B, C series. The signal is a signal specification with no voltage contact. It can not directly drive a power circuit such as a pump.

ST is an external start signal and connects to the no-voltage contact.

AT is a no-voltage contact signal that represents operation.

RN is an OC signal indicating CPU drive.

Alarm output is output as a no-voltage contact from ARM. + - will be output at 24 V when an alarm is issued.

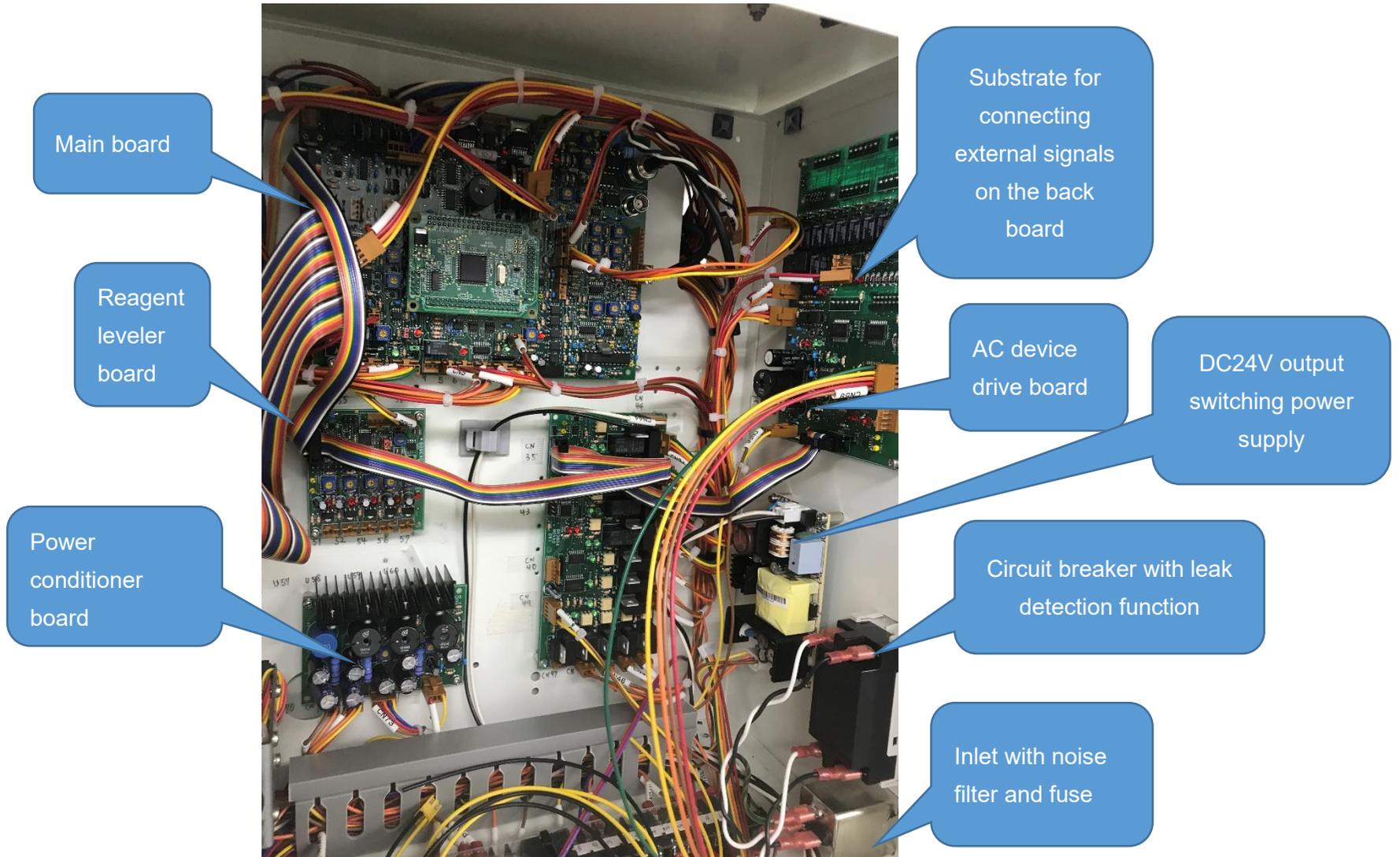
Connect the A and B signals to the RS485.

Connect buzzer, red, yellow, green as control signal of signal tower. G, + 24V.

Fig 5-3 Rear terminal panel

### 6.2.4. Internal equipment Arrangement Diagram

The arrangement of the control equipment on the right side of the main body is shown.



Parameter table (Different Models)

The column represents the tens place and the row represents the 1 place.

Basic device information															
ORDER		Type		Program											
PCC		FK1		PKF2B											
Reagent information															
Reagent 1		Reagent 2		Reagent 3		Titrant 1		Titrant 2		Titrant 3		pH calibration solution		pH calibration solution	
SA		C1				B4	0.1N	P2	0.05N			pH	7	pH	4
Series information															
A series      B series      C series															
	0	1	2	3	4	5	6	7	8	9					
00-09 basic configurati on	access key	Sample replacement time (Tank 1)	Sample replacement time (Tank 2)	Segment water volume	Print selection	Analysis cycle	TR1 concentration (N)	TR2 concentration (N)	Tank capacity (Tank 1)	Tank capacity (Tank 2)					
	AKY	SPP	S2P	TSG	PPF	ATP	T1C	T2C	TKV	TK2					
							min	N	N	ton	ton				
10-19  Upper limit / lower limit setting	Free acid HH	Free acid H	Free acid Nominal value (N)	Free acid L	Free acid LL	Free acid Maximum amount of replenishment at one time (Tank 1)	Free acid Metered Replenishment	Free acid Replenishment coefficient	Free acid Supply cumulative amount	Free acid Discharge amount of pump					
	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)					
	AHH	AHC	ASV	ALC	ALL	AMR	ACR	ASC	ART	APR					
	pt	pt	pt	pt	pt	L	L	pt/L	L	L/min					

20-29 Upper limit / lower limit setting	Total acid HH	Total acid H	Total acid Nominal value (N)	Total acid L	Total acid LL	Total acid Maximum amount of replenishm ent at one time (Tank 1)	Total acid Metered Replenishm ent	Total acid Replenishm ent coefficient	Total acid Supply cumulative amount	Total acid Discharge amount of pump
	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)		(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)
	<b>BHH</b>	<b>BHC</b>	<b>BSV</b>	<b>BLC</b>	<b>BLL</b>	<b>BMR</b>	<b>BCR</b>	<b>BSC</b>	<b>BRT</b>	<b>BPR</b>
pt	pt	pt	pt	pt	pt	L	L	pt/L	L	L/min
30-39 Upper limit / lower limit setting	Fe2+ HH	Fe2+ H	Fe2+ Nominal value	Fe2+ L	Fe2+ LL	Fe2+ Maximum amount of replenishm ent at one time (Tank 1)	Fe2+ Metered Replenishm ent	Fe2+ Replenishm ent coefficient	Fe2+ Supply cumulative amount	Fe2+ Discharge amount of pump
	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)		(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)
	<b>CHH</b>	<b>CHC</b>	<b>CSV</b>	<b>CLC</b>	<b>CLL</b>	<b>CMR</b>	<b>CCR</b>	<b>CSC</b>	<b>CRT</b>	<b>CPR</b>
pt	pt	pt	pt	pt	pt	L	L	pt/L	L	L/min
40-49 Upper limit / lower limit setting	Free acid HH	Free acid H	Free acid Nominal value(N)	Free acid L	Free acid LL	Free acid Maximum amount of replenishm ent at one time (Tank 2)	Free acid Metered Replenishm ent	Free acid Replenishm ent coefficient	Free acid Supply cumulative amount	Free acid Discharge amount of pump
	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)		(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)
	<b>AH2</b>	<b>AX2</b>	<b>AS2</b>	<b>AL2</b>	<b>AY2</b>	<b>AM2</b>	<b>AC2</b>	<b>AZ2</b>	<b>AR2</b>	<b>AP2</b>
pt	pt	pt	pt	pt	pt	L	L	pt/L	L	L/min
50-59 Upper limit / lower limit setting	Total acid HH	Total acid H	Total acid Nominal value (N)	Total acid L	Total acid LL	Total acid Maximum amount of replenishm ent at one time (Tank 2)	Total acid Metered Replenishm ent	Total acid Replenishm ent coefficient	Total acid Supply cumulative amount	Total acid Discharge amount of pump
	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)		(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)
	<b>BH2</b>	<b>BX2</b>	<b>BS2</b>	<b>BL2</b>	<b>BY2</b>	<b>BM2</b>	<b>BC2</b>	<b>BZ2</b>	<b>BR2</b>	<b>BP2</b>
pt	pt	pt	pt	pt	pt	L	L	pt/L	L	L/min

60-69 Upper limit / lower limit setting	Accelerator HH	Accelerator H	Accelerator Nominal Value(N)	Accelerator L	Accelerator LL	Accelerator Maximum amount of replenishm ent at one time (Tank 2)	Accelerator Metered Replenishm ent (Tank 2)	Accelerator Replenishm ent coefficient (Tank 2)	Accelerator Supply cumulative amount (Tank 2)	Accelerator Discharge amount of pump (Tank 2)
	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)
	CH2	CX2	CS2	CL2	CY2	CM2	CC	CZ2	CR2	CP2
	pt	pt	pt	pt	pt	L	L	pt/L	L	L/min
70-79 Basic operation			Pure water injection amount for cleaning	Drain pump driving time	Cleaning fluid addition amount	Sample overflow time	Sample line Air cleaning	Change value at arrival of sample	Air blowing cycle	Analysis value Maximum retention time
			AWV	WPT	VCL	SOV	SAF	SSV	ABP	DMM
			ml	sec	ml	sec	sec	mV	min	hr
80-89 Titration Settings	FA Sample volume for analysis	FA Pure water addition amount	FA Initial addition amount	FA Additive factor A	FA Additive factor B	FA End point determination value	FA High speed low speed switching value	FA Maximum titer	FA Load time	FA Differential value filter
	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)
	SVA	PWA	AFA	VAA	VBA	EPA	CVA	MTA	TRA	DFA
	ml	ml	ml	ml	ml	pH	pH	ml	sec	
90-99 Titration Settings	TA Sample volume for analysis	TA Pure water addition amount	TA Initial addition amount	TA Additive factor A	TA Additive factor B	TA End point determination value	TA High speed low speed switching value	TA Maximum titer	TA Load time	TA Differential value filter
	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)
	SVB	PWB	AFB	VAB	VBB	EPB	CVB	MTB	TRB	DFB
	ml	ml	ml	ml	ml	pH	pH	ml	sec	

100-109 Titration Settings	Fe2+ Sample volume for analysis	Fe2+ Pure water addition amount	Fe2+ Initial addition amount	Fe2+ Additive factor A	Fe2+ Additive factor B	Fe2+ End point determination value	Fe2+ High speed low speed switching value	Fe2+ Maximum titer	Fe2+ Load time	Fe2+ Differential value filter
	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)	(Tank 1)
	<b>SVC</b>	<b>PWC</b>	<b>AFC</b>	<b>VAC</b>	<b>VBC</b>	<b>EPC</b>	<b>CVC</b>	<b>MTC</b>	<b>TRC</b>	<b>DFC</b>
ml	ml	ml	ml	ml				ml	sec	
110-119 Titration Settings	FA Sample volume for analysis	FA Pure water addition amount	FA Initial addition amount	FA Additive factor A	FA Additive factor B	FA End point determination value	FA High speed low speed switching value	FA Maximum titer	FA Load time	FA Differential value filter
	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)
	<b>SVD</b>	<b>PWD</b>	<b>AFD</b>	<b>VAD</b>	<b>VBD</b>	<b>EPD</b>	<b>CVD</b>	<b>MTD</b>	<b>TRD</b>	<b>DFD</b>
ml	ml	ml	ml	ml	pt	pt	ml	sec		
120-129 Titration Settings	TA Sample volume for analysis	TA Pure water addition amount	TA Initial addition amount	TA Additive factor A	TA Additive factor B	TA End point determination value	TA High speed low speed switching value	TA Maximum titer	TA Load time	TA Differential value filter
	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)
	<b>SVE</b>	<b>PWE</b>	<b>AFE</b>	<b>VAE</b>	<b>VBE</b>	<b>EPE</b>	<b>CVE</b>	<b>MTE</b>	<b>TRE</b>	<b>DFE</b>
ml	ml	ml	ml	ml	pt	pt	ml	sec		
130-139 Titration Settings	Accelerator Sample volume for analysis	Accelerator Pure water addition amount	Accelerator Initial addition amount	Accelerator Additive factor A	Accelerator Additive factor B	Accelerator End point determination value	Accelerator High speed low speed switching value	Accelerator Maximum titer	Accelerator Load time	Accelerator Differential value filter
	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)	(Tank 2)
	<b>SVF</b>	<b>PWF</b>	<b>AFF</b>	<b>VAF</b>	<b>VBF</b>	<b>EPF</b>	<b>CVF</b>	<b>MTF</b>	<b>TRF</b>	<b>DFF</b>
ml	ml	ml	ml	ml				ml	sec	

140-149 Titration Settings Other	pH measurement time	Absorbance measurement time	Cell liquid level detection value	Promoter emptiness titer determination	Limiting luminous intensity	Bulk potential	Bulk potential 2			End signal time
	PMT	AMT	CLV	ZOF	LVL	BUP	BU2			
	sec									
150-159 Reagent Settings	AR1 Addition Amount (H2SO4)	AR1 Reaction Waiting time	AR2 Addition Amount (C1)	AR2 Reaction Waiting time				White balance	White balance	White balance
	X1C	WT1	X2C	WT2				WBR	WBG	WBB
	ml	sec	ml	sec						
160-169 Adjustment Factor  (Tank 1)	Free acid Density adjustment factor B	Free acid Density adjustment factor A	Total acid Density adjustment factor B	Total acid Density adjustment factor A	Fe2+ Density adjustment factor B	Fe2+ Density adjustment factor A			pH Density adjustment factor B	pH Density adjustment factor A
	ADB	ADA	BDB	BDA	CDB	CDA			DBC	DAC
170-179 Adjustment Factor  (Tank 2)	Free acid Density adjustment factor B	Free acid Density adjustment factor A	Total acid Density adjustment factor B	Total acid Density adjustment factor A	Fe2+ Density adjustment factor B	Fe2+ Density adjustment factor A				
	A2B	A2A	B2B	B2A	C2B	C2A				

180-189 Others	Maximum Analysis Time	System options 2					pH calibration solution pH(alkali)	pH calibration solution pH(neutral)	pH calibration solution pH(acid)	Automatic Correction	Supply operation
	LMT	SOP					PBX	PNX	PAX	APC	SP2
190-199 pH conversion factor and option setting	The potential of pH STD-L	pH conversion factor A	pH conversio n factor B	Hardware Selection	User password (1000-9999)	simulator 5050	Unit selection	Device type selection	System options	Device address	
	PHV	PHA	PHB	SHD	UPW	SIM	USD	DTS	SOP	DAD	
	mV	mV/pH	mV								

このマニュアルの履歴と変更の記録

この記録は本書制作者のためのもので、お客様には直接関係しません。

日付	記号	内容
09/07/17	1.00	K-Ni 用に編集
10/08/11	1.00	ELCU 用に分岐して編集
11/06/10	1.00	ELCU から EL2 用に分岐して編集
17/12/14	1.00	新しく PCC として編集
18/7/17		英文化に編集
2025/11/14		PK5➡PKF2B へ変更

最終印刷日時 2025/11/14 15:22:00 改版番号1 改訂番号 39

ファイル名 《SR0651 PCC マニュアル.docx》 全ページ数 76

Automatic chemical conversion bath management    Parker Chemical Controller / PCC-PK5  
i n s t r u c t i o n   m a n u a l

化 成 処 理 液 自 動 管 理 装 置  
Parker Chemical Controller / PCC-PK  
取 扱 説 明 書

エイコー電機株式会社

2017. 12

制作者 覚書

パラメータ表 機種別に更新

フィールド部分を更新すること

目次 図版目次 表目次

索引項目

第9章 改訂番号などのフィールド部分更新