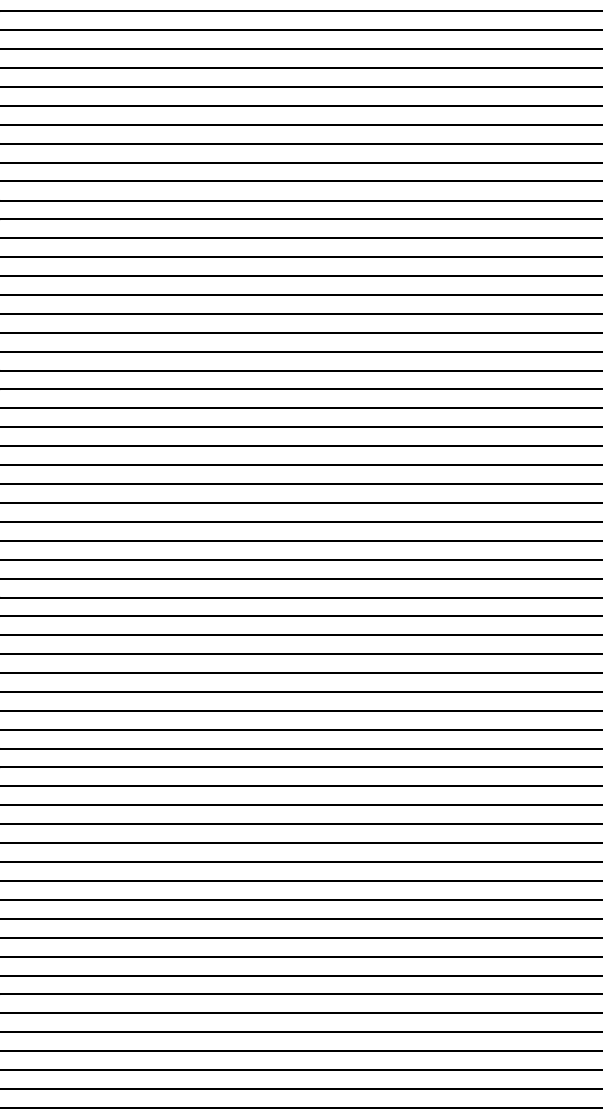


SCREEN

Wet Station
WS-620/820 series
REFERENCE MANUAL



Introductory Note

Thank you very much for choosing our product. We sincerely hope that you will enjoy using this equipment, and fully utilize all its functions and capabilities.

This equipment is to be utilized solely for the processing of wafers for semiconductor production and should not be employed for any other end. Use of this equipment for any purpose other than that specified above may cause serious injury and is expressly forbidden.

This manual describes the basic instructions and precautions for setting or changing wafer processing recipes.

Before reading this manual, be sure to read the OPERATION MANUAL. The instructions given in this manual should be strictly followed to ensure safe operation of the equipment.

Obey all local laws and ordinances regarding the health and safety of persons using the equipment. Waste chemicals, gasses, by-products, and other materials must be disposed of with proper regard for the natural environment and in accord with all relevant local laws and ordinances.

International transfer of this equipment, any of its parts and/or its software must be carried out in compliance with the relevant laws and ordinances of the country of export and the country of equipment end-use.

We do not assume any responsibility or liability for equipment transferred without regard to proper export/import procedures.

Some sections of your equipment may not conform to this manual because of modified specifications or subsequent equipment improvements. For equipment with unique, non-standard specifications, we may later request that the manual delivered to the customer with the equipment be suitably modified or augmented to reflect the new specifications.

We shall not be held responsible for any damage caused by conditions beyond our control such as customer modification, disassembly or misuse of the equipment, programs or software, or their use in a defective or deficient environment.

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Although this manual was created with the utmost care, if you discover any errors, omissions or unclear sections, please contact our nearest sales office (listed at the end of this manual).

WS-820/MTR series manuals

The manuals for the WS-820/MTR series are described below.

INSTALLATION MANUAL

This manual describes the basic instructions and precautions for equipment transport, storage, and installation.

OPERATION MANUAL

This manual describes the basic instructions and precautions for operations relating to wafer processing using the specified procedures. It describes the basic design and construction of the equipment, as well as the name and function of each part. It also provides explanations of how to load and unload wafers, how to stop the equipment in case of trouble and also the meanings of alarms or errors that may appear on the monitor display.

MAINTENANCE MANUAL

This manual describes the basic instructions and precautions for startup and shutdown of the equipment, periodic inspections, consumable parts replacement, and other adjustments. Make sure to always follow the instructions in this manual when performing such work.

REFERENCE MANUAL

This manual describes the basic instructions and precautions for wafer processing system control, such as the setting of processing recipes or the modification of these settings.

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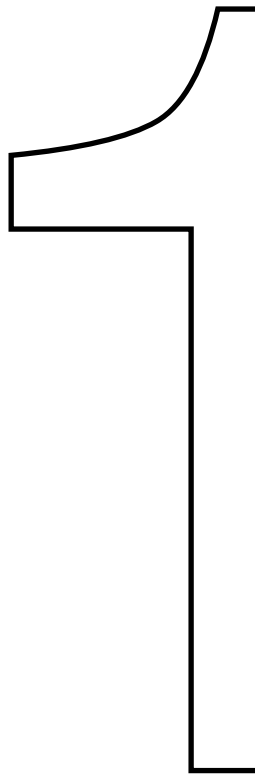
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Chapter 1 Basic operation of windows

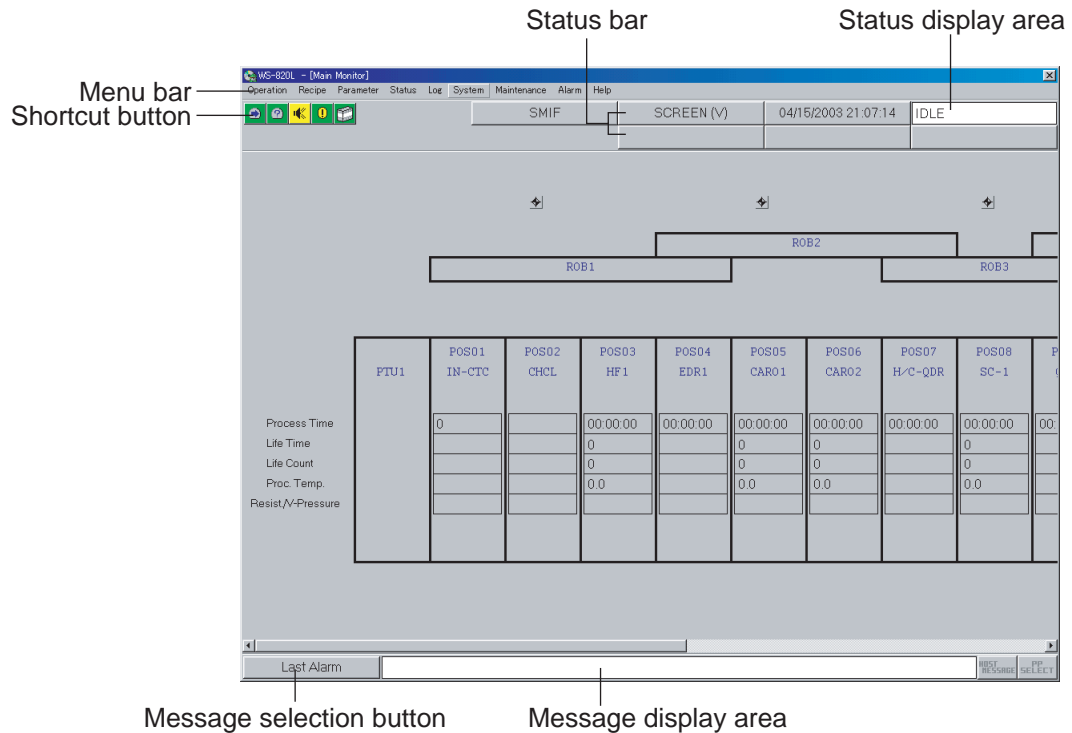
This chapter describes the basic operation of the main operation panel.

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1 Window operation

1.1 Description of window during startup of the equipment

When you startup the equipment and turn ON the computer, the equipment control application will startup.



Menu bar

Displays the menus used for equipment setting.

Shortcut buttons

The shortcut buttons include: Lot Start, Lot Tracking, Buzzer Off, Alarm, and Status (overview).

Status bar

The current settings, such as the Date/Time setting, Login/Logout, Host online, SMIF, are displayed on the buttons. Clicking these buttons also displays the setup windows.

Status display area

Displays the operation status of the equipment. (Refer to “Operation status”).

Message selection button

Displays the message selection window so that the message to be displayed in the message area can be selected.

Message	Description
Latest alarm	Displays the latest uncanceled alarm.
Terminal service	Displays the communication messages from the host computer.

Message display area

Displays the message selected in the message selection window.

1.1.1 Operation status

During operation, the equipment can be in any of the following three statuses. The current status is always displayed in the status display area of the window.

(1) **IDLE**

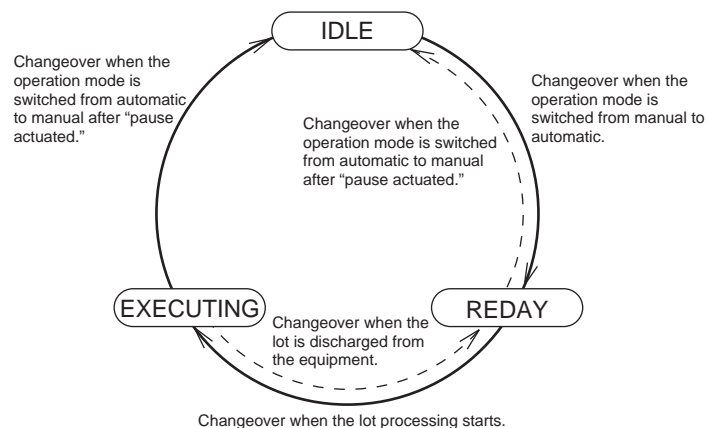
IDLE indicates that the equipment is in manual mode and is unable to perform lot processing.

(2) **READY**

READY indicates either that the equipment is in automatic mode and is ready to process lots, or that it is still in standby since no lots have been delivered.

(3) **EXECUTING**

EXECUTING indicates that the equipment is processing lots automatically.



* "Pause actuated" means that the equipment has entered either the TRANSFER PAUSE, STEP PAUSE or CYCLE PAUSE state.

1.2 Menu configuration

There are five operation levels for authorized operators. Menus and commands that can be accessed vary depending on the operation level. The degree of authorization and corresponding operation level is determined by the ID and password entered by an operator before the log-in which is necessary to use the equipment. Then, the operator is permitted to log into the system at the appropriate level.

Operation levels

- O : Operator
- P : Process Engineer
- M : Maintenance Engineer
- S : Supervisor
- V : Vendor

The following table shows the commands that can be executed by operators at each operation level.

When registering a user, choose an operation level appropriate to the operator's qualifications.

Menu command		O	P	M	S	V
Operation	LOGIN	×	×	×	×	×
	LOGOUT	○	○	○	○	○
	SHUTDOWN	×	○	○	○	○
	PROCESS_START	○	○	○	○	○
	LOT_TRACKING	○	○	○	○	○
	LOT_TRACKING_ALLDELETE	×	○	○	○	○
	LOT_TRACKING_DELETE	×	○	○	○	○
Recipe	RECIPE_VUP	○	○	○	○	○
	RECIPE_VUP_NEW	×	○	○	○	○
	RECIPE_VUP_SAVE	×	○	○	○	○
	RECIPE_VUP_SAVES	×	○	○	○	○
	RECIPE_VUP_DELETE	×	○	○	○	○
	RECIPE_VUP_FOLDER	×	○	○	○	○
	RECIPE_SELECT	○	○	○	○	○
	RECIPE_SELECT_SEARCH	○	○	○	○	○
	RECIPE_SELECT_ALLDISP	○	○	○	○	○
RECIPE_SELECT_FOLDER	○	○	○	○	○	

Window operation

Menu command		O	P	M	S	V
Parameter	PARAM_USER	○	○	○	○	○
	PARAM_USER_WRITE	×	○	○	○	○
	PARAM_USER_NEW	×	○	○	○	○
	PARAM_USER_OPEN	×	○	○	○	○
	PARAM_USER_SAVE	×	○	○	○	○
	PARAM_USER_DELETE	×	○	○	○	○
	PARAM_MAINT	○	○	○	○	○
	PARAM_MAINT_WRITE	×	○	○	○	○
	PARAM_MAINT_NEW	×	○	○	○	○
	PARAM_MAINT_OPEN	×	○	○	○	○
	PARAM_MAINT_SAVE	×	○	○	○	○
	PARAM_MAINT_DELETE	×	○	○	○	○
	PARAM_TEMP	○	○	○	○	○
	PARAM_TEMP_WRITE	×	○	○	○	○
	PARAM_TEMP_NEW	×	○	○	○	○
	PARAM_TEMP_OPEN	×	○	○	○	○
	PARAM_TEMP_SAVE	×	○	○	○	○
	PARAM_TEMP_DELETE	×	○	○	○	○
	PARAM_HOSTCOMM	×	×	○	○	○
Status	STAT_WHOLE	○	○	○	○	○
	STAT_UNIT	○	○	○	○	○
Log	LOG_OP	○	○	○	○	○
	LOG_OP_FIND	○	○	○	○	○
	LOG_OP_SORT	○	○	○	○	○
	LOG_OP_ADD	○	○	○	○	○
	LOG_OP_SAVE	×	○	○	○	○
	LOG_OP_DELETE	×	×	○	○	○
	LOG_EVENT	○	○	○	○	○
	LOG_EVENT_FIND	○	○	○	○	○
	LOG_EVENT_SORT	○	○	○	○	○
	LOG_EVENT_ADD	○	○	○	○	○
	LOG_EVENT_SAVE	×	○	○	○	○
	LOG_EVENT_DELETE	×	×	○	○	○
	LOG_ALARM	○	○	○	○	○
	LOG_ALARM_FIND	○	○	○	○	○
	LOG_ALARM_SORT	○	○	○	○	○
	LOG_ALARM_ADD	○	○	○	○	○
	LOG_ALARM_SAVE	×	○	○	○	○
	LOG_ALARM_DELETE	×	×	○	○	○
	LOG_RESULT	○	○	○	○	○
	LOG_RESULT_FIND	○	○	○	○	○
	LOG_RESULT_SORT	○	○	○	○	○
	LOG_RESULT_SAVE	×	○	○	○	○
	LOG_RESULT_DELETE	×	×	○	○	○

Window operation

Menu command		O	P	M	S	V	
Log	LOG_TRACE	○	○	○	○	○	
	LOG_TRACE_FIND	○	○	○	○	○	
	LOG_TRACE_SORT	○	○	○	○	○	
	LOG_TRACE_ADD	○	○	○	○	○	
	LOG_TRACE_SAVE	×	○	○	○	○	
	LOG_TRACE_DELETE	×	×	○	○	○	
	LOG_TEMPTRACE	○	○	○	○	○	
	LOG_TEMPTRACE_FIND	○	○	○	○	○	
	LOG_TEMPTRACE_SORT	○	○	○	○	○	
	LOG_TEMPTRACE_ADD	○	○	○	○	○	
	LOG_TEMPTRACE_SAVE	×	○	○	○	○	
	LOG_TEMPTRACE_DELETE	×	×	○	○	○	
	LOG_HOST	○	○	○	○	○	
	LOG_HOST_FIND	○	○	○	○	○	
	LOG_HOST_SORT	○	○	○	○	○	
	LOG_HOST_ADD	○	○	○	○	○	
	LOG_HOST_SAVE	×	○	○	○	○	
	LOG_HOST_DELETE	×	○	○	○	○	
	LOG_MERGE	○	○	○	○	○	
	LOG_MERGE_FIND	○	○	○	○	○	
	LOG_MERGE_SORT	○	○	○	○	○	
	LOG_MERGE_ADD	○	○	○	○	○	
	LOG_MERGE_SAVE	×	○	○	○	○	
LOG_SAVE	×	○	○	○	○		
System	SYSTEM_DATE	×	×	○	○	○	
	SYSTEM_USER	×	×	×	○	○	
	SYSTEM_HOST	×	○	○	○	○	
	SYSTEM_AGV	×	○	○	○	○	
	SYSTEM_SMIF	×	○	○	○	○	
	SYSTEM_HOST_COMM	×	○	○	○	○	
	SYSTEM_ACTION_MODE	×	×	○	○	○	
	SYSTEM_DEBUG_MODE	×	×	○	○	○	
	SYSTEM_DISPLAY_MODE	SYSTEM_STATUSMODE_REMAIN	○	○	○	○	○
		SYSTEM_STATUSMODE_PROGRESS	○	○	○	○	○
		SYSTEM_STATUSMODE_PAR	○	○	○	○	○
	SYSTEM_TERMSVC_SEND		○	○	○	○	○
	SYSTEM_TERMSVC_RECV		○	○	○	○	○
	SYSTEM_SPOOLING		×	○	○	○	○
Maintenance	MAINTE_HS	○	○	○	○	○	
	MAINTE_IO	○	○	○	○	○	

Window operation

Menu command		O	P	M	S	V
Alarm	ALARM_LIST	○	○	○	○	○
		×	○	○	○	○
		○	○	○	○	○
		○	○	○	○	○
		○	○	○	○	○
	ALARM_DETAIL	○	○	○	○	○
		×	○	○	○	○
		○	○	○	○	○
		○	○	○	○	○
Help	HELP_INDEX	○	○	○	○	○
	HELP_VERSION	○	○	○	○	○
	HELP_PRODUCT	○	○	○	○	○

1.3 User registration

To add or change the user registration during the initial startup of the equipment, select [User Reg] from the [System] menu. The following window appears.

The screenshot shows the 'User Reg.' dialog box with the following fields and controls:

- (1) User Name input field
- (2) User ID input field
- (3) Password input field
- (6) Personal Folder checkbox
- (4) Comment input field
- (5) Group selection area with radio buttons for:
 - Operator
 - Process Engineer
 - Maintenance Engineer
 - Supervisor
 - Vender** (selected)
- Buttons: Add, Modify, Delete, OK, Cancel
- (7) User List table showing a single entry:

User Name	User ID	Group	Password	Personal Folder
		Vender		Yes

- (1) **User Name**. Enter the user name. The name entered here appears on the status bar button after login.
- (2) **User ID** Enter the login user ID.
- (3) **Password** Enter the login password.
- (4) **Comment**. Enter comments concerning the registered user.
- (5) **Group** Specify the group to which the registered user belongs.
- (6) **Personal Folder** Checking this box and registering it during user registration creates a folder for the user in which parameters and recipes can be stored. This folder cannot be accessed by the same level group and lower level groups, but can be accessed by the upper level group.

! NOTE

New data items are not registered until "OK" has been clicked. Deleting a Personal Folder deletes all the files in that folder as well.

- (7) **User List** Displays a list of registered users.

1.3.1 User registration

- 1) Enter User Name, User ID, and Password.
- 2) Select a group.
- 3) Check the Personal Folder box if necessary.
- 4) Clicking “Add” adds a new user to the list.
- 5) When more than two users are registered, the procedures noted above are repeated.
- 6) Clicking “OK” registers the new user, and closes the user registration window.

! NOTE

New data items are not registered until “OK” has been clicked.

1.3.2 User correction

- 1) Select a user that you wish to correct from the user list.
- 2) The currently registered data appears. Correct items as needed.
- 3) Clicking “Modify” updates the list.
- 4) Clicking “OK” registers the new data, and closes the user registration window.

! NOTE

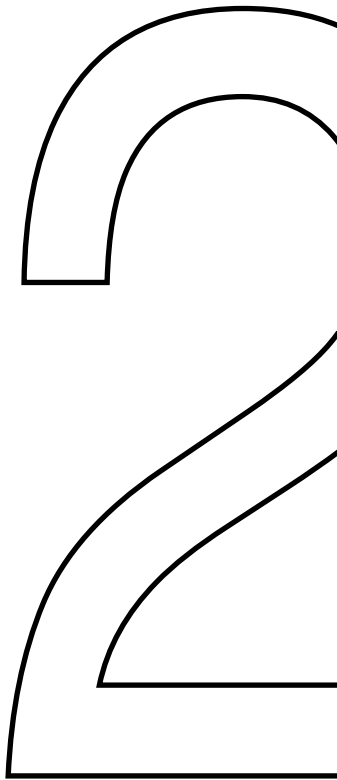
New data items are not registered until “OK” has been clicked.
Deleting a Personal Folder deletes all the files in that folder as well.

1.3.3 User deletion

- 1) Select a user that you wish to delete from the user list.
- 2) Clicking “Delete” updates the list.
- 3) Clicking “OK” registers new data, and closes the user registration window.

! NOTE

New data items are not registered until “OK” has been clicked.
Deleting a Personal Folder deletes all the files in that folder as well.



Chapter 2 Recipe Setting

This chapter describes how to set recipes for wafer processing.

1	Recipes	2-2
1.1	Recipe setting	2-2

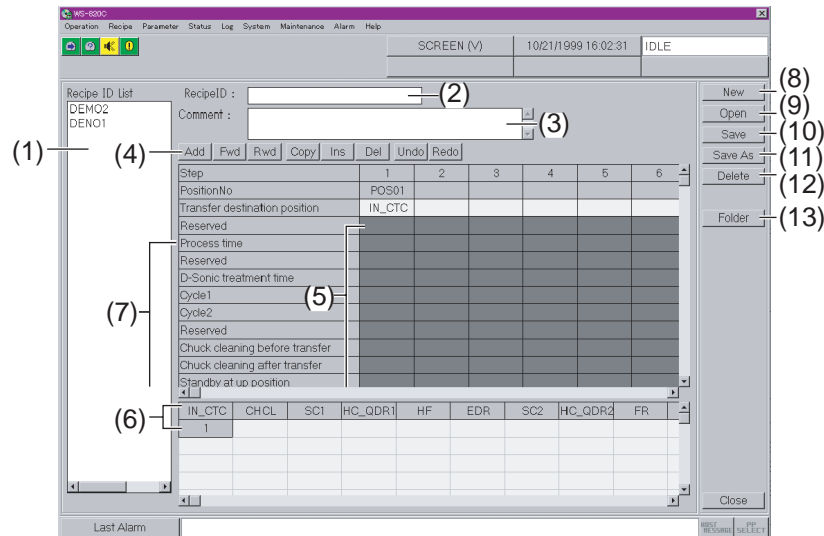
1 Recipes

In order to process lots in the equipment, data such as lot transfer flows, the process time in each processing unit, and the transfer method should be specified.

1.1 Recipe setting

Selecting the [Recipe] menu displays the recipe setting window.

In the Recipe ID List field in the initial window, recipe IDs that can be selected appear. The other fields show the defaults (the same state as when [New] is pressed).



(1) Recipe ID List

- Displays in a list the recipe IDs stored in the recipe storage folder designated as the default.
- When a recipe ID is selected, the contents in the recipe registered as the recipe ID appear. The recipe ID list stored in another folder can be also displayed using the [Folder] button.

(2) Recipe ID

- Enter the recipe ID to be edited. If you have selected one from the Recipe ID List, the recipe ID automatically appears. If a new recipe is to be created, enter a new recipe ID.

(3) Comment

- Enter a comment for the recipe within a maximum of 75 characters.

(4) Recipe edit buttons

- These buttons are active only when the recipe edit field is active.

1) [Add] button

Click this button to set in the next step the same type of module as the currently selected one. The same position is automatically specified in the next step.

(Before [Add] is pressed)

1	2	3	4	5
LD	SC1	HQDR		

(After [Add] is pressed)

1	2	3	4	5
LD	SC1	HQDR	HQDR	

2) [Fwd] button

When there is a downstream position (module) suitable to be designated as the next transfer destination, the position is automatically specified in the next step when this button is clicked. If there are two or more possible positions, that closest to the current position is selected.

(Before [Fwd] is pressed)

1	2	3	4	5
LD	SC1	HQDR		

(After [Fwd] is pressed)

1	2	3	4	5
LD	SC1	HQDR	HF	

- * If the HF and EDR can both be used as the next step position from the HQDR, the HF is selected in this case.

3) [Rwd] button

When there is an upstream position (module) suitable to be designated as the next transfer destination, the position is automatically specified in the next step when this button is clicked. If there are two or more possible positions, that closest to the current position is selected.

(Before [Rwd] is pressed)

1	2	3	4	5
LD	SC1	HQDR		

(After [Rwd] is pressed)

1	2	3	4	5
LD	SC1	HQDR	SC1	

- * If the CHCL and SC1 can both be used as the next step position from the HQDR, the SC1 is selected in this case.
- 4) [Copy] button
Copies the currently selected step data. Used before inserting the same data with the [Ins] button.
 - 5) [Ins] button
Inputs the data which was saved with [Copy] in the step next to the currently selected one.
 - 6) [Del] button
Deletes a selected step. Note, however, that deletion is executed only when the wafer transfer flow is still valid even after the step has been deleted.
 - 7) Returns to the previous setting of a recipe editing field. This button can be used for editing operations of the recipe data, as well as for operations using any recipe editing buttons except for “Undo” and “Redo”.
 - 8) [Redo] button
Returns the data to as it was before [Undo] is pressed.

(5) Recipe edit field

- In this field, detailed data for the recipe can be input.
 - 1) Transfer Destination Position
Module names corresponding to positions appear. Data cannot be directly entered in the fields. To specify a position, a bath select pop-up window should be used. Click a field when this row is active. A bath select window is brought up. Select a module from the window.

1	2	3	4
LD			

3 : CARO1
 4 : HC_QDR1
 5 : CARO2
 6 : CARO3
 7 : HC_QDR2

! NOTE

A bath select pop-up window displays modules to which wafers can be transferred from the previous (and next, if data has been input) step module(s).

- 2) Numerical value input fields
Numerical values can be input. If an entered value is outside of the permitted range, an error message appears and the field returns to as it was before the data entry.
- 3) on/off input fields
Set to ON or OFF. To set, double-click the field, or put the cursor on the field and press the space bar. “●” appears when the field is ON. The field is empty when it is OFF.

(6) Recipe step configuration table

- Displays the steps and positions which were specified in the recipe edit field.
(Example)

LD	CHCL	CAR01	HC_QDR1	CAR02	CAR03	HC_QDR2	FR	SD	UL
1		2	3			4	5	6	7

(7) Parameters for processing

Specify the parameters for processing.

When fields are displayed in gray, you cannot input data.

If it is required (or possible) to specify the parameters for the units designated for each step, the relevant parameters are not displayed in gray. When you click the field, a red circle ● appears, indicating that processing in the unit is specified. Clicking the fields again cancels the processing.

[Process time]

Specifies the processing time for the step.

[Chuck cleaning before transfer]

Specifies whether or not a pre-transfer chuck cleaning operation is performed.

This operation (Chuck cleaning prior to lot transport) is normally performed only before the transfer unit goes to the loader to receive a lot. When this parameter is set to ON, the chuck is cleaned before the transfer unit moves. If, however, the transfer unit has not transported any lot since the chuck was cleaned last, chuck cleaning is not performed. If the transfer unit is not equipped with a chuck cleaning bath, the chuck is cleaned in the specified rinsing bath. The chuck is cleaned by shower when the QDR bath is used, any by up-flow when the OR bath is used.

[Chuck cleaning after transfer]

Specifies whether or not a post-transfer chuck cleaning operation is performed.

When this parameters is set to ON, chuck cleaning is performed after the transfer unit finishes the transportation of a lot. For a transfer unit without a chuck cleaning bath, the chuck is cleaned in the specified rinsing bath just as in the case of PRE CLN.

[Standby at up position]

Specifies whether or not the transfer unit waits above the bath.

For modules such as etching modules which require short and highly accurate processing times: after delivering the lot, the transfer unit can stand by above the bath without returning to its home position.

[Standby at down position]

Specifies whether or not the transfer unit waits in the bath.

When highly accurate processing time is required as in “UP WAT”, the transfer unit can stand by at the lower position without lifting its chuck after delivering the lot.

[Slow speed lift up]

Specifies whether or not slow speed lifting is performed.

For modules such as etching modules and IPA vapor units which should have as little moisture as possible carried in from the previous rinsing bath, the transfer unit can be set to lift the lot in the previous bath at low speed by turning on this parameter. The lifting speed should be set in the Rob's user parameters.

[High speed lift up]

Specifies whether or not high speed lifting is performed.

When this parameter is set to ON, the lot is lifted from the etching bath at a high speed. The lot can be lifted from the previous bath at 15000 PPS (Customized specification).

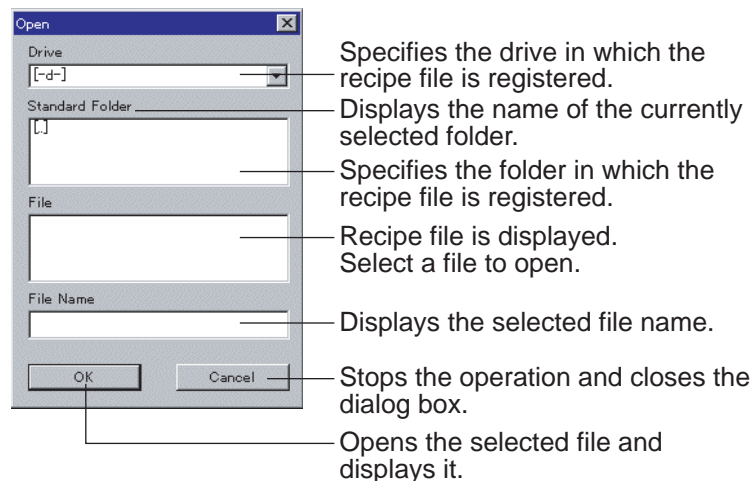
(8) New

Clicking this button cancels the values specified in the current window and creates defaults.

(9) Open

Registered recipe file is read in the window.

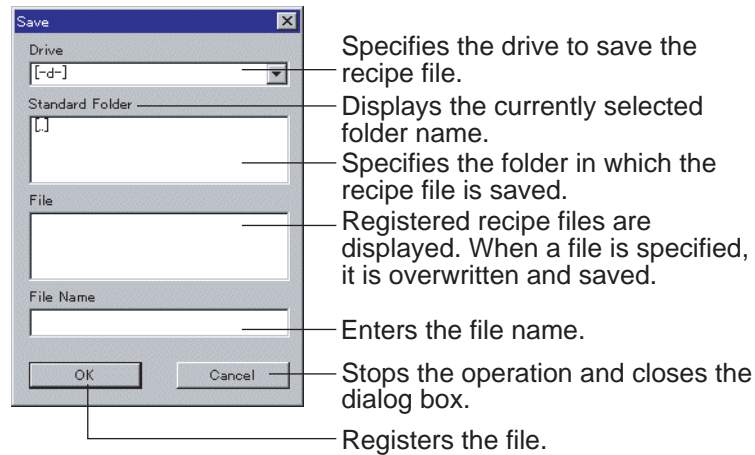
Clicking this button calls up a dialog box to specify a recipe file to read.

**(10) Save**

The recipe data is overwritten with that currently displayed in the window.

(11) Save As

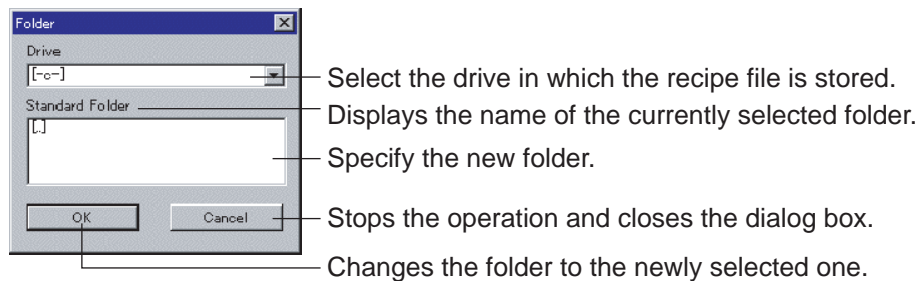
The recipe data currently displayed in the window are saved as a file. Clicking this button calls up a dialog box to select a location for saving the data.

**(12) Delete**

A registered recipe file is deleted. Select a recipe file you wish to delete, and then click this button.

(13) [Folder] button

- Changes the folder used during recipe edit. Recipes are read or deleted from, or registered to the folder selected with this button. The selected folder remains valid until the window is switched to another menu window.

**! NOTE**

While a recipe is being modified in the recipe edit field, the system monitors whether the position settings are appropriate for wafer transfer. An edit operation (including recipe edit button operations) which will cause an inappropriate transfer flow cannot be executed.

1.1.1 Creating new recipe data

- 1) The folder in which the new recipe will be registered should be specified.
This specification is not necessary if the current folder is used. Click the [Folder] button. When the folder specification window appears, specify a drive and a folder, and click [OK].

! NOTE

The folder specification should be performed before recipe information is input. If this order is reversed, the entered recipe information data will be cleared when the folder specification is performed.

- 2) In the Transfer Destination Position row, specify the modules in order of transfer. At the same time, the corresponding step No. appears under the module name in the recipe step configuration table at the bottom of the window.

There are two methods for specifying a module.

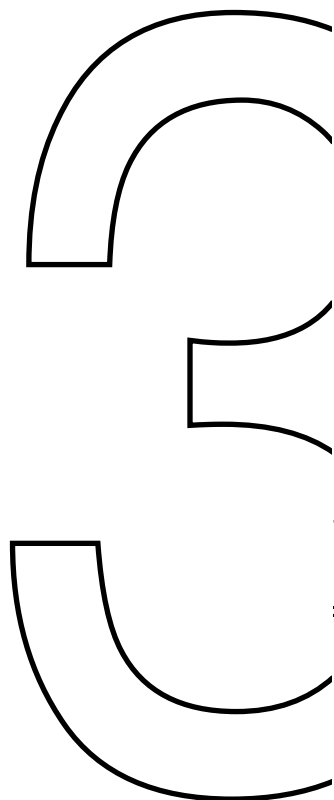
- (1) Click an input field. A list of modules that can be specified appears. Select a module from the pop-up list window.
 - (2) Enter a module name from the keyboard.
- 3) Processing parameters should be set.
Data cannot be entered for a grayed out parameter. The parameters necessary for the module that you specified for each step appear clearly.
 - 4) Save the recipe following the procedure below.
 - (1) Enter an ID in the Recipe ID field.
 - (2) Enter a comment if any in the Comment field.
 - (3) Click [Save].
 - (4) A confirmation dialog appears.
 - (5) Click [OK] to register the recipe. The recipe also appears in the Recipe ID List.

1.1.2 Modifying a registered recipe

- 1) Specify the folder which includes a recipe data to be modified following the procedure below.
 - (1) Click [Folder].
 - (2) A folder specification window appears.
 - (3) Specify the drive and the folder in which the recipe is saved, and click [OK].
- 2) Specify the recipe by clicking it from the list. The recipe information appears.
- 3) Modify the recipe data. For the procedure, refer to “2.1.1 Creating new recipe data”.
- 4) Save the modified recipe with the procedure below.
 - (1) Click [Save].
 - (2) A confirmation dialog appears.
 - (3) Click [OK] to register the modified recipe data.

1.1.3 Deleting a registered recipe data

- 1 Specify the folder which includes a recipe data to be deleted following the procedure below.
 - (1) Click [Folder].
 - (2) A folder specification window appears.
 - (3) Specify the drive and the folder in which the recipe is saved, and click [OK].
- 2) Specify the recipe by selecting it from the list. The recipe information appears.
- 3) Delete the recipe data following the procedure below.
 - (1) Click [Delete].
 - (2) A confirmation dialog appears.
 - (3) Click [OK] to delete the recipe data. The recipe also disappears from the Recipe ID List.



Chapter 3 Parameter Setting

This chapter describes how to set parameters for equipment control.

1	Parameters	3-2
1.1	IN-CTC	3-3
1.2	Chemical bath modules	3-4
1.3	Rinsing bath modules	3-13
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1 Parameters

The following parameters are used to control the equipment.

User parameter

Control parameters required for wafer processing

Maintenance parameter

Parameters required for equipment control

Parameter for temperature control devices

Parameters required for equipment control

SECS parameter

Parameters required for equipment control

Open the parameter setting window from the menu. Setting items are displayed for each processing module or transfer module. From this window, you can specify each parameter.

The standard parameters for each module are listed below. Note that the following lists include some parameters not necessarily provided for customized equipment. For the parameters preset in your equipment, refer to the parameter list in Chapter 9.

1.1 IN-CTC

1.1.1 Maintenance parameter list

No.	Parameter	Unit
1	Overflow time 1 (HF) *1	0.1S
2	Overflow time 2 (small) *1	0.1S
3	Overflow time 3 (large) *1	0.1S

*1 This parameter may not be specified (or is not required) in the customer's equipment.

- 1 Overflow time 1 (HF) (0.1 S)**
- 2 Overflow time 2 (small) (0.1 S)**
- 3 Overflow time 3 (large) (0.1 S)**

Specifies the delay time for checking the designated amount of chemical in the measuring tank. When a chemical is supplied from a measuring tank, the supply valve closes when the delay time specified in this parameter expires. There are three different parameters: for HF measuring tanks, for small measuring tanks and for large measuring tanks. Delay timers for each module are as shown in the table below.

	Overflow time 1	Overflow time 2	Overflow time 3
CARO bath module	—	H ₂ O ₂ measuring tank	H ₂ SO ₂ measuring tank
SC bath module	—	NH ₄ OH measuring tank	DI water measuring tank
		HCL measuring tank	
		H ₂ O ₂ measuring tank	
HF bath module	HF measuring tank	—	DI water measuring tank
H ₃ PO ₄ bath module	—	DI water measuring tank	H ₃ PO ₄ measuring tank

1.2 Chemical bath modules

1.2.1 User parameter list

No.	Parameter	Unit
1	Lifetime	min.
2	Life count	times
3	(Chemical) Pre-Repl.	shot
4	(Chemical) Interval	sec.
5	(Chemical) Spike C	shot
6	H ₂ O ₂ Pre-Repl.	sec.
7	H ₂ O ₂ Interval *2	sec.
8	H ₂ O ₂ Spike C *2	shot
9	Filter cleaning	sec.
10	Sensor cleaning	sec.
	Spike-P check C	shot
11	# of bath clean	times
12	DIW Pre-repl. *1	shot
	Heater on ratio *1	%
13	DIW interval *1	sec.
	Heater on lot-in *1	sec.
14	DIW spike C *1	shot
	Heater on repl. *1	sec.
15	Auto chem change	0/1
16	Tank auto drain	0/1
17	Drain change	0/1
18	Pump start temp.	°C
	Heater off temp.	deg
19	Pump stop temp.	°C
	Heater-off time	sec.

*1 This parameter may not be specified (or is not required) in the customer's equipment.

*2 Use parameters Nos.7 or 8 in the case of DI water replenishment for H₃PO₄.

1 Life time (min.)**2 Life count (times)**

The “Life time” parameter is used to specify the lifetime of a chemical solution in a processing bath. The chemical lifetime expiration signal turns ON when the time from the completion of supply during the previous chemical exchange exceeds the time specified in this parameter.

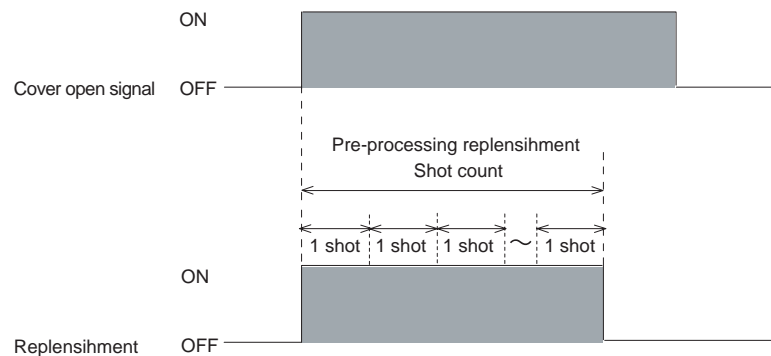
The “Life count” parameter is used to specify the lifetime of a chemical solution in a processing bath in terms of cumulative lot processings. The chemical lifetime expiration signal turns ON when the number of processings since the previous chemical exchange operation reaches the value specified in this parameter.

If “9999” is specified for these parameters, chemical exchange based on lifetime or life count will not be performed. Either lifetime or life count can be specified as the chemical life index, or both parameters can be set simultaneously. If both are used, chemical exchange will be performed at both times that the values of the parameters expire.

3 [Chemical] Pre-Repl. (shot)

When the lot processing time in the previous module has elapsed and the command to open the cover for the current bath has turned ON, the replenishment pump starts to replenish the chemical, pumping the number of strokes specified in this parameter.

SC-1 bath: NH_4OH , SC-2 bath: HCL

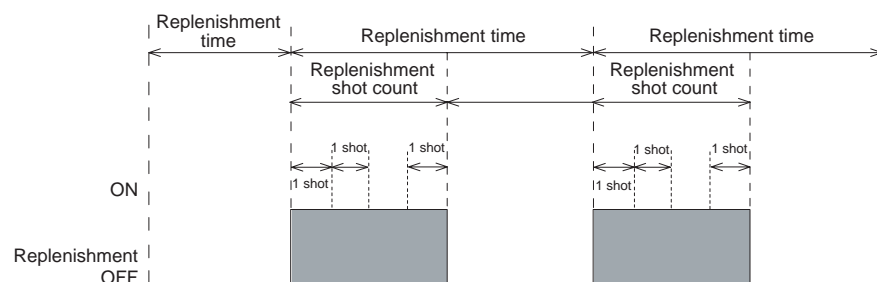
**4 [Chemical] Interval (sec.)****5 [Chemical] Spike c (shot)**

Number of replenishment pump strokes during the specified interval.

If “0” is set in the “**** Spike c” parameter, replenishment will not be performed.

Conversely, if “0” is set in “**** Interval”, replenishment will be continuously performed. The replenishment interval setting is operative from the time the chemical lifetime is reset after an exchange, and it will continue to perform replenishment even during lot processing and chemical heating after a chemical change.

SC-1 bath: NH_4OH , SC-2 bath: HCL



6 H₂O₂ pre-repl (shot)

As in the “(Chemical) Pre-Repl.” parameter, when the lot processing time in the previous bath has elapsed and the command to open the cover for the current bath has turned ON, the replenishment pump starts to replenish H₂O₂, pumping at the number of strokes specified in this parameter.

7 H₂O₂ interval (sec.)**8 H₂O₂ spike C (shot)**

As in the “(Chemical) interval” and “(Chemical) Spike c” parameters, the number of H₂O₂ replenishment pump strokes during the specified interval is specified. If “0” is set in the “H₂O₂ spike C” parameter, replenishment will not be performed. Conversely, if “0” is set in “H₂O₂ interval”, replenishment will be continuously performed.

The replenishment interval setting is operative from the time the chemical lifetime is reset at the expiration of chemical lifetime. Also, it will continue to perform replenishment even during lot processing and chemical heating after a chemical exchange (except for DI water replenishment in the H₃PO₄ bath, which only starts when heat-up is completed).

! NOTE

Use parameters Nos.7 or 8 in the case of DI water replenishment for the H₃PO₄ bath.

9 Filter cleaning (sec.)

This parameter is active during bath cleaning operations in the manual mode when “Chemical control” is OFF. After supply of DI water for bath cleaning is completed, the circulation pump operates for the period specified in this parameter to clean the solution filter.

If “0” is specified in this parameter, no filter cleaning operations will be performed.

10 Sensor cleaning (sec.) (BHF bath only)

During solution drainage, DI water is supplied to the pressure sensor tube for the period specified in this parameter to clean its interior. If “0” is specified in this parameter, no sensor cleaning operations will be performed.

11 Spike-P check C (Shot)

If the replenishment operation is not completed within the number of times specified in this parameter during DI water replenishment into the measuring tank, an alarm is generated.

12 # of bath clean (times)

This parameter is active during bath cleaning operations in the manual mode when “Chemical control” is OFF. The sequential bath cleaning operations (Drainage - DI water supply - Drainage) will be repeated for the number of times specified in this parameter.

13 Heater on ratio (%)

This parameter is used to specify the inline heater ON ratio for each 20-second interval during the normal temperature control operation.

When 80% is specified, for example, the cycle in which the heater is ON for 16 seconds and OFF for 4 seconds is repeated at the 20-second interval.

14 Heater on lot-in (sec.)**15 Heater on reple (sec.)**

During lot supply, the heater is ON for the time specified in the “Heater on lot-in parameter”.

During level replenishment, the heater is ON for the time specified in the “Heater on reple” parameter.

If the temperature of the processing bath is below the specified level even after the set time has elapsed, the temperature control operation continues. Once the temperature control is completed, the heater is turned ON at the cycle specified in the “Heater on ratio” parameter.

16 Auto chem change (0/1)

This parameter is used to select whether chemical change should be performed automatically (“1”) or manually (“0”). In the automatic mode, the chemical change sequence will start automatically when the processing bath is ready for chemical change (after its chemical life expires). In the manual mode, an alarm is generated when the bath’s chemical life expires, and the chemical change operation is started by pressing the “EXCH” switch on the overhead bath operation panel.

17 Tank auto drain (0/1)

This parameter is available only for baths whose drainage configuration includes the pump and “cooling tank” system, and is active only in manual mode when “Chemical control” is OFF. If “0” is specified in this parameter when “Chemical control” is OFF, solution in the cooling tank will not be drained automatically. However, if “1” is specified, the solution in the cooling tank drains automatically when the solution temperature falls below the specified temperature, just as when “Chemical control” is ON.

18 Drain change (0/1)

This parameter is available only for baths that have drainage line switching functions, and is active only in manual mode when “Chemical control” is OFF.

If a solution is to be drained in manual mode when “Chemical control” is OFF and “1” is specified in this parameter, drainage is automatically switched to the dilute Drain Line (not to the cooling tank). If “0” is specified, line switching is performed according to the same drainage sequence followed when “Chemical control” is ON.

19 Pump start temp. (°C)**20 Pump stop temp. (°C)**

These parameters are available only for H_3PO_4 baths. Since H_3PO_4 is highly viscous at low temperatures and is thus difficult to filter, the chemical is circulated to the outer bath by opening the filter's air vent valve when temperature control starts.

Before the temperature reaches the pump (circulation) start temperature, chemical circulation bypasses the filter. When the temperature reaches the pump (circulation) start temperature, the path is switched back to the ordinary path so that the chemical passes through the filter. If the temperature again falls below the pump (circulation) stop temperature while the chemical is circulating along the ordinary path, the path is again switched back and circulates the chemical along the “air vent” path.

19 Heater-off temp. (°C)**20 Temp cont. off T (sec.)**

The “Heater off temp.” parameter is available only for baths using such chemicals as H_2SO_4 which generate reactive heat when mixed with H_2O_2 .

After the chemical heating, when the chemical temperature reaches the level specified in this parameter, the power to the heater is automatically turned OFF.

When the “Temp cont. off T (sec.)” parameter is specified, temperature control remains OFF until the time specified in this parameter after the completion of chemical supply.

1.2.2 Maintenance parameter list

No.	Parameter	Unit
1	Filter air vent *1	sec.
2	Bath cleaning *1	times
3	Tank drain TO	min.
4	Chemi-supply TO	min.
5	Drain time-out	min.
6	Heat up time-out	min.
7	Bath cleaning TO *1	min.
8	(Chemical 1) demand TO	min.
9	(Chemical 2) demand TO	sec.(min.)*2
	Tank cooldown TO	min.
10	(Chemical 3) demand TO	min.
11	Pump delay time	sec.
12	Temp. check time	sec.
13	Pre-heat time *1	min.
14	Pre-heat count *1	times
15	Temp. AL defeat	sec.
16	DIW spike delay *1	sec.
17	Circul. pump vol.	ml
18	Chemical control	0/1
19	Module down	#
20	Robot standby	sec.

*1 This parameter may not be specified (or is not required) in the customer's equipment.

*2 For the parameters of the chemical (e.g., BHF) that can be supplied directly into the processing bath, "min" is used as a unit, instead of "sec".

1 Filter air vent (sec.)

When the circulation pump is running, air vent operations and normal circulation operations are alternated at certain intervals. This parameter specifies the duration of normal circulation. If "0" is specified in this parameter, the air vent operation is not performed.

2 Bath cleaning (times)

Specifies the number of chemical changes between bath cleaning operations. When the number of changes since the previous bath cleaning reaches the number specified in this parameter, bath cleaning is performed during the chemical change. If "0" is specified in this parameter, no bath cleaning operations are performed.

3 Tank drain TO (min.)

Available only for baths whose drainage configuration includes a “pump and cooling tank” system. After the cooling tank starts drainage, if chemical drainage is not completed within the time specified in this parameter, an alarm is generated and drainage is aborted.

4 Chemi-supply TO (min.)

If chemical supply during a chemical change sequence is not completed within the time specified in this parameter (after the operation starts), an alarm is generated and supply is aborted.

5 Drain time-out (min.)

If chemical drainage in a drainage sequence is not completed within the time specified in this parameter, an alarm is generated and drainage is aborted.

6 Heat up time-out (min.)

If chemical heating after a chemical change is not completed within the time specified in this parameter, an alarm is generated but the heating operation continues.

7 Bath cleaning TO (min.)

Available only for chemical baths with bath cleaning functions. If a bath cleaning operation is not completed within the time specified in this parameter, an alarm is generated and bath cleaning is aborted.

8 [Chemical 1] demand TO (min.)**9 [Chemical 2] demand TO (sec.)****10 [Chemical 3] demand TO (min.)**

The name of the relevant solution (chemical or DI water) for a particular module is indicated in “****”. If the supply of a solution to a measuring tank is not completed within the duration specified in this parameter, an alarm is generated and supply is aborted.

Bath	Chemical 1	Chemical 2	Chemical 3
CARO	H ₂ SO ₄	—	H ₂ O ₂
SC-1	DIW	NH ₄ OH	H ₂ O ₂
SC-2	DIW	HCL	H ₂ O ₂
H ₃ PO ₄	H ₃ PO ₄	—	DIW
HF	DIW	HF	—
BHF	—	BHF	—

9 Tank cooldown TO (sec.)

If the waste chemical temperature during chemical cooling sequence in the cooling tank does not fall below the specified level within the time specified in this parameter, an alarm is generated.

11 Pump delay time (sec.)

To cool a heater after it is shut off, the circulation pump continues operation for the period specified in this parameter. Even if a value less than 60 (sec.) is specified, "60" will be automatically set.

12 Temp. check time (sec.)

Designed to prevent both overshooting and undershooting of the optimum chemical temperature during temperature control.

Following chemical exchange, temperature control begins. During chemical control, when the chemical temperature enters the non-detectable range for a temperature alarm and holds within that range for the calculated period (specified time + 120 sec.), temperature control is considered complete. Therefore, even when this parameter has been set to "0", temperature control is monitored for 120 seconds.

13 Pre-heat time (min.)**14 Pre-heat count (times)**

These parameters are available only for chemical baths that is equipped with the measuring tanks with pre-heating functions.

The Pre-heat time is used to specify the lead time preceding the expiration of the chemical lifetime in the processing bath required for chemical pre-heating in the measuring tank.

The Pre-heat count is used to specify the lead time in terms of lot processings preceding the expiration of the chemical life count in the processing bath required for chemical pre-heating in the measuring tank.

If "0" is specified in these parameters, pre-heating is not performed.

15 Temp. AL defeat (sec.)

Even if a chemical temperature falls below its specified lower limit, an alarm will not be generated if the temperature returns to its specified range within the period specified in this parameter.

16 DIW spike delay (sec.)

Available only for H_3PO_4 baths. After temperature control is completed, even if DI water replenishment is specified, it will not start before the period set in this parameter elapses.

17 Circul. pump vol. (1 shot) (ml)

Available only for baths using pneumatic circulation pumps. Flow rate per stroke for the circulation pump should be specified in this parameter. This parameter displays the flow rate of a circulation pump on the process detail window of the status display.

18 Chemical control (0/1)

Specifies whether the chemical control function is turned on ("1") or off ("0").

19 Module down (#)

Set this parameter to “1” (Module down) when a lot being processed should bypass this module. An alarm is generated if lot processing starts in the bath for which “1” is specified.

! NOTE

This parameter should be set with four characters using “0”, “1” and/or “2”. Set “1” (Module disconnected) for the first digit to perform lot processing without this bath. If a lot processing is attempted using a recipe that includes a bath for which “1” is set, an alarm is activated.

The following table describes where and how the pump flow rates should be set for each type of replenishment pump.

	Thousands digit	Hundreds digit	Tens digit	Ones digit
Values that can be set	0/1/2	0/1/2	0/1/2	0/1
SC-1 module	DIW pump flow rate	Chemical pump flow rate	H ₂ O ₂ pump flow rate	Module disconnected or not
SC-2 module	DIW pump flow rate	Chemical pump flow rate	H ₂ O ₂ pump flow rate	Module disconnected or not
CARO module	DIW pump flow rate	—	—	Module disconnected or not
H ₃ PO ₄ module	DIW 1 pump flow rate	DIW 2 pump flow rate	—	Module disconnected or not

- If “0” is set as the first digit, the “Module disconnected” setting will be set to OFF (this bath is to be used). The following replenishment flow rates can be set for three types of pumps according to the values (0, 1, or 2) entered for the second, third and fourth digit.
 “0”:200 cc/min.
 “1”:120 cc/min.
 “2”:20 cc/min.

20 Robot standby (sec.)

Specifies the lead time preceding the completion of a bath process for generating the lot discharge preparatory demand signal. When a transfer unit receives the lot discharge preparatory demand signal, it starts preparing to discharge the lot from the relevant bath (descending to the lower bath position and closing its chuck), and then finally discharges the lot when the lot discharge demand signal is turned on.

1.3 Rinsing bath modules

1.3.1 User parameter list

No.	Parameter	Unit
1	T1 Delay time	sec.
2	T2 Drain time	sec.
3	T3 Up-flow time	sec.
4	T4 Standby time	sec.
5	TDR Drain change *1	sec.
6	T5 Drain time	sec.
7	T6 Up-flow time	sec.
8	T0 Hot up-flow	sec.
9	DIW Recovery *1	sec.
10	Drain change *1	0/1

*1 This parameter may not be specified (or is not required) in the customer's equipment.

1 T1 Delay time (sec.)

After lot delivery, upflow and bubbling are performed for the duration specified in this parameter. In the H/C-QDR bath, upflow of DIW (normal temperature) is performed.

2 T2 Drain time (sec.)

Upflow and bubbling stop and quick drainage of DI water is performed. During drainage, the shower also operates.

3 T3 Up-flow time (sec.)

The valve for quick drainage closes and upflow is performed. Shower operation continues during this period.

4 T4 Standby time (sec.)

Shower operation stops and bubbling is performed. Upflow continues during this period.

5 TDR Drain change (sec.)

This parameter is available only for the bath that is equipped with the drain line switching function. In such QDR baths, the drainage line is switched to the drain side when the bath receives a lot delivery demand signal. When the time since lot delivery matches the period specified in this parameter, the line is switched to the collection/recycling side.

6 T5 Drain time (sec.)

Quick drainage and water supply (upflow) are performed after each lot is discharged. Quick drainage starts when lot discharge is completed. The upflow operation stops for the time specified in this parameter and the quick drain valve opens.

7 T6 Up-flow time (sec.)

This parameter is available only for the EDR, QDR, and H/C-QDR baths.

For the EDR bath, the following sequence is used.

After the period specified in T5, the quick drain valve closes and upflow operation is performed.

For the QDR or H/C-QDR bath, the following sequence (option) is used.

When the process time is set at "0" (in order to transfer the lot while the bath is empty), water is supplied after the lot is discharged from the bath.

8 TO Hot up-flow (sec.)

This parameter is available only for the H/C-QDR bath. In the H/C-QDR bath, upflow of hot DI water starts after the period specified in T2 (drain time before lot delivery).

Then, bubbling and hot DI water upflow continue after lot delivery is completed for the period specified in this parameter.

9 DIW Recovery (sec.)

This parameter is available only for the FR bath. When resistivity at the completion of lot processing exceeds the alarm value, upflow continues for the period specified in this parameter. If resistivity recovers within this period, the lot is discharged at the time of recovery and upflow stops when lot discharge is completed. If resistivity does not recover within this period, an alarm is generated.

10 Drain change (0/1)

This parameter is available only for baths that have drainage line switching functions, and is active only in manual mode when "Chemical control" is OFF.

If a solution is to be drained in manual mode when "Chemical control" is OFF and "1" is specified in this parameter, drainage is automatically switched to the collection/recycling line. If "0" is specified, line switching is performed according to the same drainage sequence followed when "Chemical control" is ON.

1.3.2 Maintenance parameter list

No.	Parameter	Unit
1	Drain start time	sec.
2	Module down	0/1
3	Robot standby	sec.

1 Drain start time (sec.)

Available only for H/C-QDR baths. In the H/C-QDR bath, quick drainage starts a certain period before processing in the previous bath has finished. This parameter sets that period. (Refer to “T2: DRAIN TIME” in “User parameters”)

2 Module down (0/1)

Set this parameter to “1” (Module down) when a lot being processed should bypass this module. An alarm is generated if lot processing starts in the bath for which “1” is specified.

3 Robot standby (sec.)

Specifies the lead time preceding the completion of a bath process for generating the lot discharge preparatory demand signal. When a transfer unit receives the lot discharge preparatory demand signal, it starts preparing to discharge the lot from the relevant bath (descending to the lower bath position and closing its chuck), and then finally discharges the lot when the lot discharge demand signal is turned on.

1.4 Spin dryer

1.4.1 User parameter list

No.	Parameter	Unit
1	Life count *1	times
2	Spin dry time	sec.
3	Bowl rinse time *1	sec.
4	Bowl dry time *1	sec.

*1 This parameter may not be specified (or is not required) in the customer's equipment.

1 Life count (times)

Specifies the number of lot processings before bath cleaning is to be performed. When the number of lots processed after the previous bath cleaning reaches the value specified in this parameter, the bath cleaning signal is turned on.

If "9999" is specified, bath cleaning will not be performed according to the Life count parameter.

2 Spin dry time (sec.)

Specifies the processing time for the specified rotation speed in the spin dryer. The specified time should include the acceleration time.

3 Bowl rinse time (sec.)

Specifies DIW showering time during bath cleaning.

4 Bowl dry time (sec.)

Specifies the high speed spin-drying time after shower during bath cleaning.

1.5 IPA vapor dryer

1.5.1 User parameter list

No.	Parameter	Unit
1	Life time	min.
2	Life count	times
3	T1 Lowering time	sec.
4	T2 Vapor time	sec.
5	T3 Lifting time	sec.
6	T4 Dry time	sec.
7	T5 Lift-up time	sec.
8	Auto chem change	0/1
9	Tank auto drain *1	0/1

*1 This parameter may not be specified (or is not required) in the customer's equipment.

1 Life time (min.)

2 Life count (times)

The "Life time" parameter is used to specify the lifetime of IPA solution. The chemical lifetime expiration signal turns ON when the time from the completion of supply during the previous chemical exchange exceeds the time specified in this parameter.

The "Life count" parameter is used to specify the lifetime of IPA solution in a processing bath in terms of cumulative lot processings. The chemical lifetime expiration signal turns ON when the number of processings since the previous chemical exchange operation reaches the value specified in this parameter.

If "9999" is specified for these parameters, chemical exchange based on lifetime and life count will not be performed. Either lifetime or life count can be specified as the chemical life index, or both parameters can be set simultaneously. If both are used, chemical exchange will be performed at both of the times that the values of the parameters expire.

3 T1 Lowering time (sec.)

Specifies the IPA lifter descends to its lower position after receiving a lot at the lot supply position from the transfer unit. The duration for this movement is specified in this parameter.

4 T2 Vapor time (sec.)

The time for the lifter to wait at its lower position is specified in this parameter.

5 T3 Lifting time (sec.)

The lifer rises up to its middle position after the period specified in T2. The duration for this movement is specified in this parameter.

6 T4 Dry time (sec.)

Specifies the time for the lifter to wait at its middle position.

7 T5 Lift-up time (sec.)

The lifter rises up to its upper position after the period specified in T4. The duration for this movement is specified in this parameter.

8 Auto chem change (0/1)

Select whether chemical change should be performed automatically (“1”) or manually (“0”). In the automatic mode, the chemical change sequence will start automatically when the processing bath is ready for chemical change (after its chemical life expires). In the manual mode, an alarm is generated when the chemical life expires, and the chemical change operation is started by pressing the “EXCH” switch on the overhead bath operation panel.

9 Tank auto drain (0/1)

Available only for baths whose drainage configuration include a “cooling tank” system, and is active only in manual mode when “Chemical control” is OFF.

If “0” is specified in this parameter when “Chemical control” is OFF, solution in the cooling tank will not be drained automatically. However, if “1” is specified, the solution in the cooling tank drains automatically when the solution temperature falls below the specified temperature, just as when “Chemical control” is ON.

1.5.2 Maintenance parameter list

No.	Parameter	Unit
1	Lift up (×10) *1	PPS
2	IPA Demand TO	min.
3	IPA Drain TO	min.
4	IPA Heat-up TO	min.
5	Tank drain TO *1	min.
6	Tank cooldown TO *1	min.
7	Chemical control	0/1

*1 This parameter may not be specified (or is not required) in the customer's equipment.

1 Lift up (×10) (PPS)

When processing in the FR bath finishes, the IPA lifter moves to the wafer delivery position at high speed. This parameter specifies the ascent speed.

2 IPA Demand TO (min.)

After an IPA supply operation starts, if it is not completed within the time specified in this parameter, an alarm is generated and the operation is aborted.

3 IPA Drain TO (min.)

If IPA drainage in a drainage sequence has not completed within the time specified in this parameter, an alarm is generated and drainage is aborted.

4 IPA Heat-up TO (min.)

If chemical heating after a chemical change is not completed within the time specified in this parameter, an alarm is generated but the heating operation continues.

5 Tank drain TO (min.)

If IPA drainage from a cooling tank is not completed within the time specified in this parameter, an alarm is generated and drainage from the cooling tank is aborted.

6 Tank cooldown TO (min.)

After IPA chemical drainage to a drainage tank is completed, if the IPA has not cooled to its specified temperature within the time specified in this parameter, an alarm is generated.

7 Chemical control (0/1)

This parameter specifies whether the chemical control function is turned on ("1") or off ("0").

1.6 Low pressure dryer unit (LPD)

1.6.1 User parameter list

No.	Parameter	Unit
1	Lifetime	min.
2	Life count	times
3	Purge standby T	sec.
4	Lifter standby T	sec.
5	Lowering time	sec.
6	Rinse time	sec.
7	Lift up time	sec.
8	Drain time	sec.
9	Vacuum time	sec.
10	Dry time	sec.
11	Vacuum release	sec.
12	IPA purge	sec.
13	Post IPA purge	sec.
14	Up-flow time	sec.
15	Auto chem change *1	0/1
16	Slow up-flow	sec.
17	Drain change	sec.

*1 This parameter may not be specified (or is not required) in the customer's equipment.

1 Lifetime (min.)

2 Life count (times)

The "Lifetime" parameter is used to specify the lifetime of IPA in the IPA vapor generating bath. The chemical life expiration signal turns ON when the time from the completion of chemical supply during the previous chemical exchange exceeds the time specified in this parameter.

The "Life count" parameter is used to specify the lifetime of IPA in terms of cumulative lot processings. The chemical life expiration signal turns ON when the number of processings since the previous chemical exchange operation reaches the value set in this parameter.

If "9999" is specified for these parameters, chemical exchange based on lifetime or life count will not be performed. Either lifetime or life count can be specified as the chemical life index, or both parameters can be set simultaneously. If both are used, chemical exchange will be performed at both of the times that the values of the parameters expire.

3 Purge standby T (sec.)

The time to start the N₂ purge in the LPD bath expressed in terms of seconds before completion of processing in the preceding FR bath.

4 Lifter standby T (sec.)

The lifter begins to move from the lower position to the upper position when a lot is delivered to the preceding FR bath. This parameter specifies the period of lifting time.

5 Lowering time (sec.)

When receiving a lot from the transfer unit, the lifter begins to move downward into the rinsing bath (to its lower position). This parameter specifies the period of lowering time.

6 Rinse time (sec.)

Period of time for rinsing with upflowing DI water.

7 Lift up time (sec.)

Period of time the lifter moves from the lower position to the upper position after rinsing is completed.

8 Drain time (sec.)

Upflow operation in the rinsing bath stops when the lifter reaches the upper position, and drainage begins. This parameter specifies the period of time for draining. During drainage, N₂ purge is also performed.

9 Vacuum time (sec.)

The bath starts to be depressurized by the vacuum pump when drainage is completed. This parameter specifies the period of time for operating the pump until the pressure in the bath is stabilized.

10 Dry time (sec.)

Period of time for operating the vacuum pump to dry the lot after the expiration of vacuum time.

11 Vacuum release (sec.)

Period of time for releasing the pressure in the bath and returning it to atmospheric pressure by stopping the vacuum pump after the dry operation is completed.

12 IPA purge (sec.)

Specifies the period of time for IPA blow during drainage from the processing bath after the lifter has moved to the upper position. IPA blow continues for the period of time set in this parameter, then N₂ purge begins.

13 Post IPA purge (sec.)

Specifies the time when the N₂ purge is switched to IPA purge. The N₂ purge stops and the IPA purge begins “n” (value set here) seconds before the rinsing time has elapsed.

14 Up-flow time

Period of time for DI water upflow after the completion of slow trickling.

15 Auto chem change (0/1)

Specifies whether chemical exchange is performed in the automatic mode (1) or manual mode (0). When “1” is set, chemical exchange automatically begins whenever conditions are met after a chemical life is expired. When “0” is set, an alarm is activated when chemical life is expired, then chemical exchange can be performed by pressing the [EXCH] switch on the overhead operation panel.

16 Slow up-flow (sec.)

DI water slow trickling begins when the cover opens during lot discharge. This parameter specifies the period of time for slow trickling (upflow at a lower rate than ordinary upflow), which is performed to prevent DI water from splashing. Set this parameter so that the slow trickling is performed until the fluid level reaches the outlet of the upflow piping.

17 Drain change (sec.)

Delay time before changing the drainage line from the drainage side to the collection side after the completion of lot discharge.

1.6.2 Maintenance parameter list

No.	Parameter	Unit
1	Vacuum upper – (×10)	kPa
2	Vacuum lower – (×10)	kPa
3	IPA demand TO	min.
4	IPA drain TO	min.
5	IPA heat up TO	min.
6	UP-flow select 1	0 to 2
7	UP-flow select 2	0 to 2
8	IPA purge select	0/1
9	IPA temp check	sec.
10	Vapor temp check	sec.
11	N ₂ temp check	sec.
12	Cleaning interval	min.
13	Cleaning count	#
14	Circul. pump vol.	ml
15	Chemical control	0/1
16	Start-up clean *1	0/1

*1 This parameter may not be specified (or is not required) in the customer's equipment.

1 Vacuum upper – (×10) (kPa)

2 Vacuum lower – (×10) (kPa)

The “Vacuum upper” parameter is used to specify the pressure to be used as the atmospheric pressure level during processing at the atmospheric pressure in the LPD. The “Vacuum lower” parameter is used to specify the pressure to be used as the low pressure during low pressure processing in the LPD.

3 IPA demand TO (min.)

Time limit for IPA demand when performed during chemical exchange or controlled manually. If IPA demand is not completed within the time set in this parameter, an alarm is activated and the demand stops.

4 IPA drain TO (min.)

If IPA drainage in a drainage sequence has not completed within the time specified in this parameter, an alarm is generated and drainage is aborted.

5 IPA heat up TO (min.)

Time limit for IPA heat-up after chemical exchange. If the IPA temperature does not reach the specified value within the time set in this parameter, an alarm is activated and the IPA continues to be heated.

6 UP-flow select 1 (0 to 2)

Sequence to be performed in the bath during pre-IPA blow.

0: Upflow. During pre-IPA blow, DI water is supplied to the processing bath while upflowing.

1: Slow trickling During pre-IPA blow, DI water is supplied to the processing bath at the minimum flow rate.

2: Dip. During pre-IPA blow, no DI water is supplied to the processing bath.

7 UP-flow select 2 (0 to 2)

Sequence to be performed in the bath during lifting.

0: Upflow. During lifting, DI water is supplied to the processing bath while upflowing.

1: Slow trickling During lifting, DI water is supplied to the processing bath at the minimum flow rate.

2: Dip. During lifting, no DI water is supplied to the processing bath.

8 IPA purge select (0/1)

Selects whether IPA blow is to be performed or not during lifting.

0: IPA blow is performed.

1: IPA blow is not performed.

9 IPA temp check (sec.)

Period of time for confirming the completion of temperature control in the temperature control baths to prevent overshoot or undershoot of chemical temperatures.

During temperature control, if the chemical temperature is kept within the specified range for the period of time set in this parameter plus an additional two minutes, completion of temperature control can be confirmed.

10 Vapor temp check (sec.)

Period of time for confirming the completion of temperature control in the vapor piping to prevent overshoot or undershoot of chemical temperatures.

During temperature control, if the chemical temperature is kept within the specified range for the period of time set in this parameter plus an additional two minutes, completion of temperature control can be confirmed.

11 N₂ temp check (sec.)

Period of time for confirming the completion of temperature control in IPA vapor-generating baths and in heated areas of the piping for IPA vapor and N₂. These settings are provided to prevent overshoot or undershoot of chemical temperatures during temperature control.

During temperature control after chemical exchange, if the chemical temperature is maintained within the specified range for the period of time set in this parameter plus an additional two minutes, completion of temperature control can be confirmed.

12 Cleaning interval (min.)**13 Cleaning count (#)**

The “Cleaning interval” parameter is the counterpart to “Lifetime” for the processing bath and specifies the lifetime of a chemical. The chemical lifetime expiration signal turns ON when the time from the completion of supply during the last chemical exchange exceeds the time specified in the parameter.

The “Cleaning counter” parameter is the counterpart to “Life count” for the processing bath and specifies the lifetime of a chemical in terms of cumulative lot processings. The chemical lifetime expiration signal turns ON when the number of processings from the completion of the previous chemical exchange reaches the value specified in this parameter.

If “9999” is specified for these parameters, chemical exchange based on cleaning time or cleaning count will not be performed. Either cleaning time or cleaning count can be specified as the chemical life index, or both parameters can be set simultaneously. If both are used, chemical exchange will be performed at both of the times that the values of the parameters expire.

14 Circul. pump vol. (ml)

Specifies the flow rate of the circulation pump per stroke. This parameter displays the flow rate of a circulation pump on the process detail window of the status display.

15 Chemical control (0/1)

Specifies whether the chemical control function is to be used (“1”) or not (“0”).

16 Start-up clean (0/1)

Specifies whether or not the pre-cleaning is to be performed when the first lot processing begins after the equipment is started up.

0: No pre-cleaning is performed.

1: Pre-cleaning is performed.

During pre-cleaning, the following are performed.

- QDR with N₂ blow until the processing bath empty level sensor turns ON
- Slow trickling DI water supply for the specified time period
- Upflowing DI water supply for the specified time period

1.7 ROB

1.7.1 User parameter list

No.	Parameter	Unit
1	R* DIW shower *1	sec.
2	R* N ₂ blow *1	sec.
3	R* lift up (×10) *1	PPS
4	IPA pause time *1	sec.

* The transfer unit numbers are displayed in the menu reflecting the number of available

*1 This parameter may not be specified (or is not required) in the customer's equipment.

1 R* DIW shower (sec.)

The duration of DI water showering to rinse a chuck in the chuck cleaning bath should be specified in this parameter.

2 R* N₂ blow (sec.)

The duration of N₂ blowing on a chuck in the chuck cleaning bath should be specified in this parameter.

3 R* lift up (×10) (PPS)

When “Slow speed lift up” is specified for the transfer unit operation in the recipe editing window, the lot is lifted at the speed specified in this parameter. If “0” is specified, “9000PPS” is automatically specified in this parameter.

Allowable setting range: 70 to 1500 (700 to 15000 rpm)

4 IPA pause time (sec.)

This is the parameter for the lifter operation of the IPA vapor dryer. When processing in the FR bath is completed, the transfer unit starts discharging the lot from the FR bath. Simultaneously, the IPA lifter moves to the delivery position to the transfer unit and waits on standby at this position for the time specified in this parameter.

1.8 Temperature parameter

1.8.1 Temperature parameter list

No.	Parameter	Unit
1	Target Temperature	°C
2	Proportion Range	%FS
3	Integral Time	sec.
4	Differential Time	sec.
5	Anti Rest Wing Up	%
6	Upper Temperature	°C
7	Lower Temperature	°C
8	PV Bias	°C
9	PID_ Autothunning	0/1
10	Cooling Rate	%
11	Dead Band	%FS

1 Target Temperature (°C)

Specifies the temperature of the chemical in the processing bath.

2 Proportion Range (%FS)

Used to control output power in proportion to the amount of deviation from “Target Temperature.” This parameter is related to heatup control.

3 Integral Time (sec.)

Used to eliminate the offset (deviation from “Target Temperature”) generated by the proportion control. The output power is controlled according to the amount of the value obtained by integrating with respect to time the deviation from “Target Temperature” using this parameter.

4 Differential Time (sec.)

Used to control output power effectively when the temperature abruptly fluctuates. The output power is controlled according to the amount of the value obtained by differentiating the deviation from “Target Temperature” using this parameter.

5 Anti Rest Wing Up (%)

Used for eliminating overshooting caused by over-integration when the temperature has not reached the value set in “Target Temperature” or when the value for “Target Temperature” is changed.

6 Upper Temperature (°C)

Specifies the permissible upper deviation from the value set in “Target Temperature” (for determining the temperature upper limit). When the chemical temperature rises from the value set in “Target Temperature” more than the amount set in this parameter, an alarm will be issued.

7 Lower Temperature (°C)

Specifies the permissible lower deviation from the value set in “Target Temperature” (for determining the temperature lower limit). When the chemical temperature drops below the value set in “Target Temperature” more than the amount set in this parameter, an alarm will be issued.

8 PV Bias (°C)

Offsets the temperature shown in the display.

9 PID_ Autothunning (0/1)

Specifies whether or not to set the automatic tuning function.

If “0” is set, the function is activated, and if “1” is set, the function is deactivated.

10 Cooling Rate (%)

The proportional band with regard to cooling control (against the heating control). Set a percentage against the value specified for the heat proportion range.

11 Dead Band (%FS)

Specifies the maximum deviation from the specified unit temperature within which temperature control is inactive.

1.9 SECS parameter

The SECS Parameter display is used to specify the parameters for communications between the equipment and host computer.

Select the [Parameter] and then the [SECS Parameter] menus. The following display appears.

Normally, it is not necessary to change the default settings. Customers are not allowed to change the settings.

SECS Parameter

Device ID (0 - 7FFF Hex)

Baud Rate

Transaction ID (0 - FFFF Hex)

Transaction Type Increment Fix

Timer

T1 (0.1 - 10.0 sec)

T2 (0.2 - 25.0 sec)

T3 (1 - 120 sec)

T4 (1 - 120 sec)

Retry Count (0 - 31)

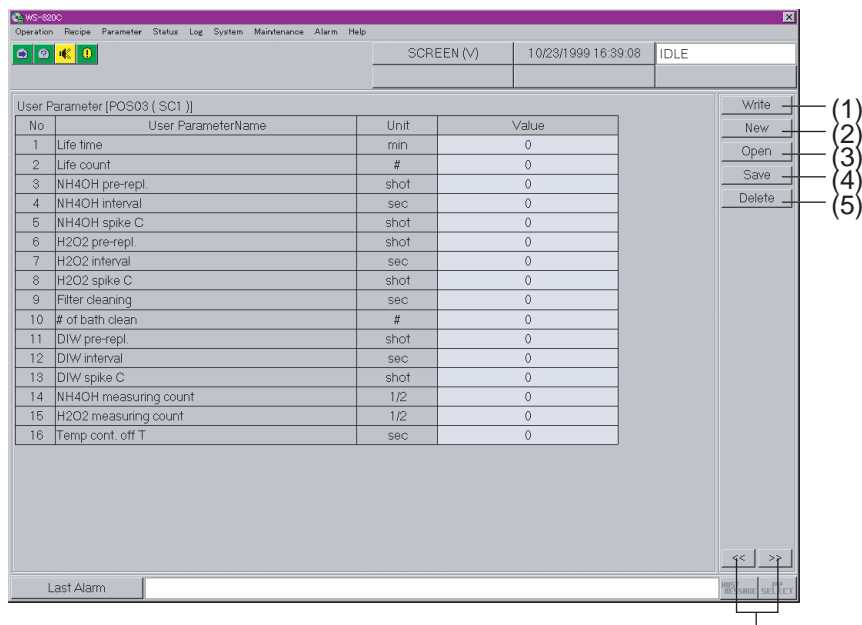
Master Slave

2 Parameter setting procedure

Select a menu from the [Parameter] menu. The parameter setting window appears.

NOTE

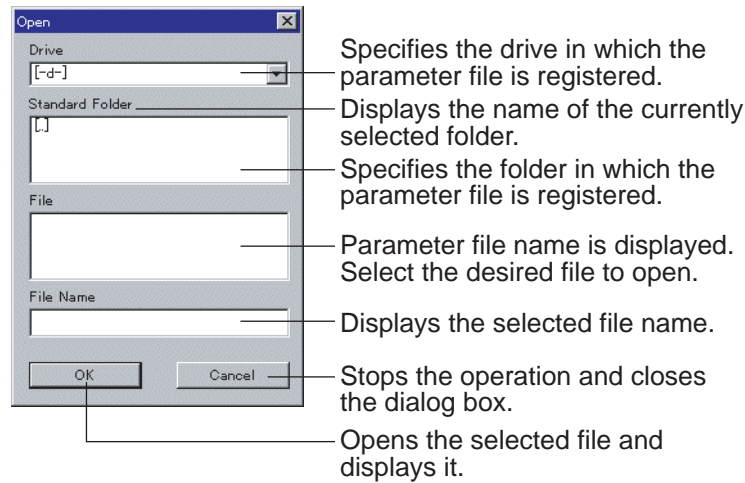
Each parameter is activated when a new lot is supplied.



Displays the previous/following parameters

- (1) **Write** When this button is clicked, the specified values displayed in the current window are memorized by the equipment for subsequent operations. After this Write operation is completed, the specified values become effective.
- (2) **New** Clicking this button cancels the specified values displayed in the current window and creates defaults.

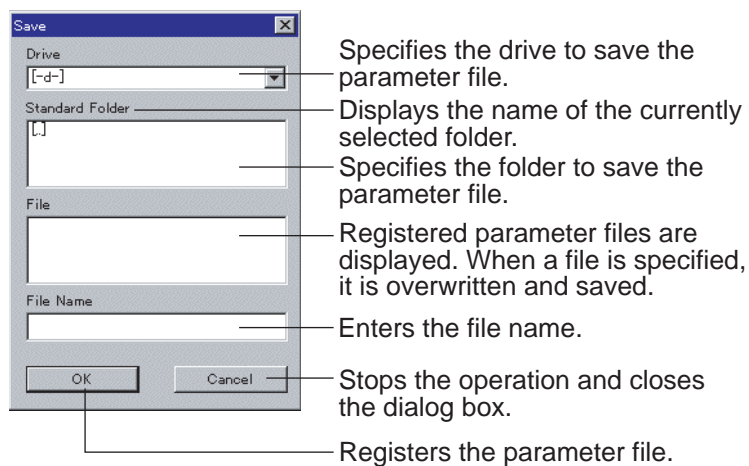
- (3) **Open** Registered parameter information is read in the window.
Clicking this button displays the dialog box for specifying the parameter file to read.



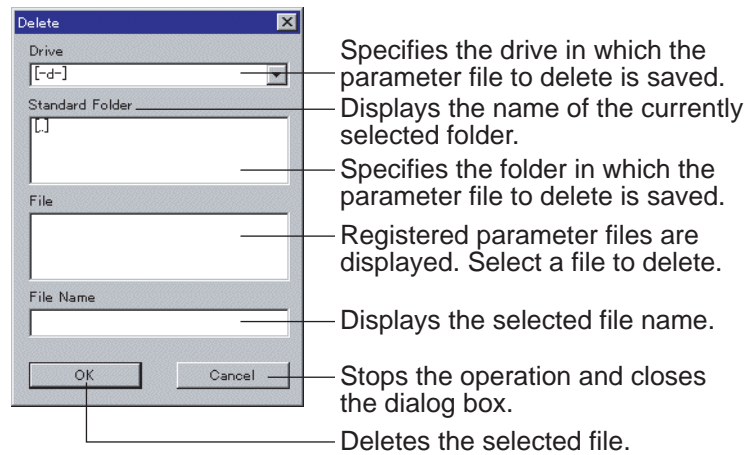
NOTE

New data is not activated for the equipment until "Write" is clicked.

- (4) **Save** The specified values currently displayed in the window are saved as a file.
The specified values become effective for the equipment by clicking "Write". When this button is clicked, a dialog box appears to select the location in which to save the parameter file.



- (5) **Delete** The registered parameter file is deleted. Clicking this button calls up a dialog box to delete the selected parameter file.

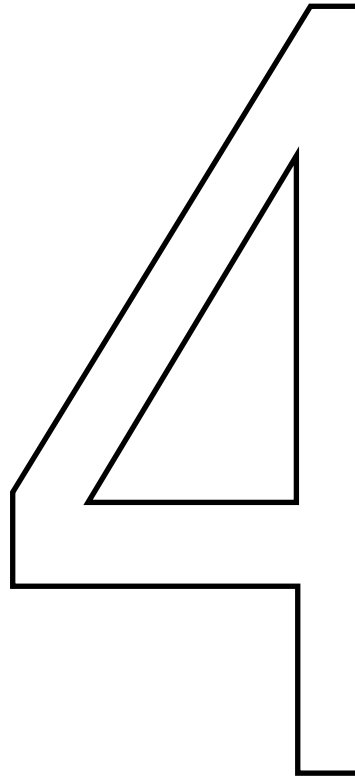


2.1 Parameter setting

- 1) To specify a user parameter, select [Parameter] and then [Use Param.] and select the unit for which parameters are to be set. The parameters for the selected unit appear. Set the parameters with one of the following methods.
 - Modify the currently displayed parameters
 - Set from the beginning after clearing the currently displayed parameters
 - Use an existing file
- 2) Click the setting field for a parameter to be set (modified).
With the up and down keys, you can go to another parameter.
- 3) Enter a new value.
- 4) Click [Write].

! NOTE

Maintenance and temperature control parameters can be set in the same way.



Chapter 4 Operation Mode Switching

This chapter describes the conditions required for switching the operation mode.

1	Definition of each operation mode	4-2
1.1	Automatic and manual modes	4-2
2	Switching to automatic mode	4-3
2.1	Conditions required for switching to the automatic mode	4-3
3	Switching to manual mode	4-4
3.1	Conditions required for switching to manual mode	4-4

1 Definition of each operation mode

The equipment may be in either of two possible states when power is first turned on.

1.1 Automatic and manual modes

In the automatic mode, the equipment itself manages the data and operations for functions such as bath temperature control and chemical exchange. Once you send the command to start processing, lot transfer and bath cleaning operations can be performed automatically according to preset data.

In the manual mode, on the other hand, the transfer unit is controlled from the remote control box and the processing modules are each independently controlled from their overhead operation panels. While in manual mode, you cannot send a command to start processing. Moreover, even if you are in manual mode, you cannot control a processing module from its overhead operation panel if the “CHEMICAL CONTROL” setting in the maintenance parameters is set to “1: ON.” Change the setting to “0: OFF” to allow manual control from the overhead operation panels.

2 Switching to automatic mode

2.1 Conditions required for switching to the automatic mode

Modes can be switched by pressing the “AUTO” key on the main operation panel when the following conditions are met. When the lamp of “AUTO” is lit, it indicates that the equipment is in automatic mode.

! NOTE

If the lamp remains off even after the “AUTO” key is pressed, one possible cause is that a moving section is still not located at its home position. Retry home return and check if the alarm is still activated.

Possible in one of following states when cover interlocks are in the “NORMAL” state.

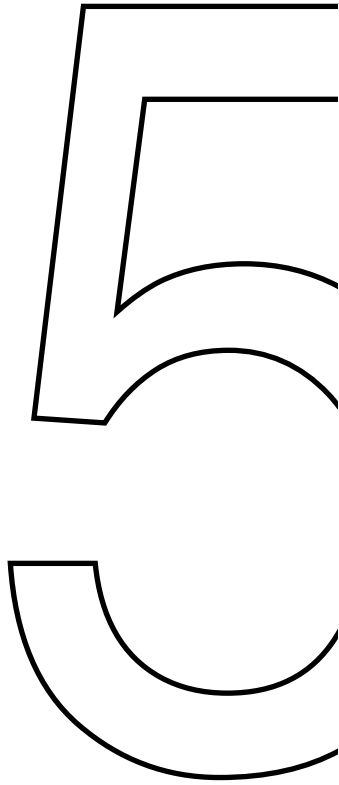
- all moving sections are at their respective home positions (the lamp of the HOME key is ON) and there are no lots in the equipment; or
- the equipment has stopped and is in the Step Pause state.

3 Switching to manual mode

3.1 Conditions required for switching to manual mode

Possible during one of following pause states.

- ROBOT PAUSE
- CYCLE PAUSE (completely stopped)
- STEP PAUSE (completely stopped)



Chapter 5 Lot Processing Status Check and Process Interruption

This chapter describes the lot information control menus.

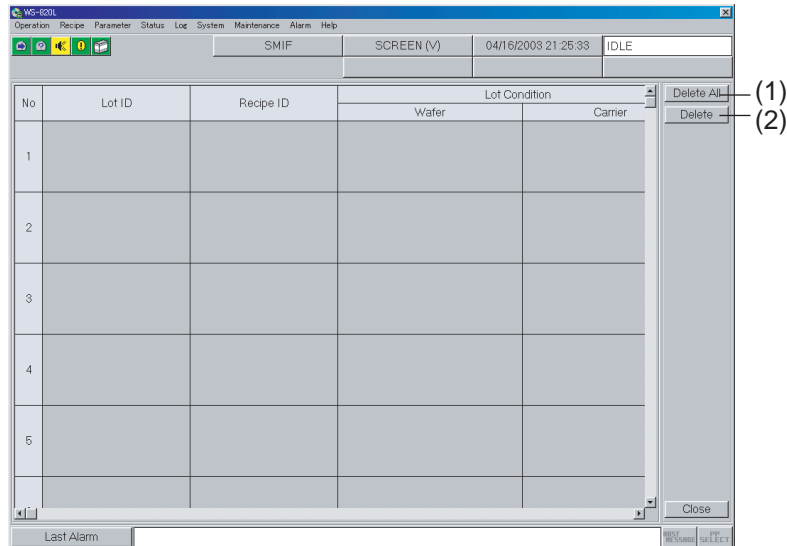
1	Lot processing status check	5-2
1.1	Lot tracking	5-2

1 Lot processing status check

1.1 Lot tracking

The status of a lot in a bath is displayed. You can delete lots and interrupt the processing in this display.

Select [Lot Tracking] from the [Operation] menu. The following window appears. From this window, you can check the current lot position, name of the recipe used, and the processing status.



Item		Description
Lot ID		Displays the ID of the currently processed lots in the equipment for each batch individually. If only one lot is displayed in one field, it indicates that processing of one lot has been started as one batch. If two lots are displayed, it indicates that processing of two lots have been started as one batch.
Recipe ID		Displays the recipe ID selected for the processing.
Lot Condition	Wafer	Displays the current wafer status.
	Carrier	Displays the current cassette status.

(1) Delete All

Used to delete all the lots at once. When you click this button, the dialog, which asks you to confirm the deletion of all lots, appears.



If all of the lots can be deleted, click “OK”.

! NOTE

“Delete All” can only be used in the manual mode.

(2) Delete

Used when canceling the lot processing on the stage.

Select the lots which you wish to delete and then click this button.

! NOTE

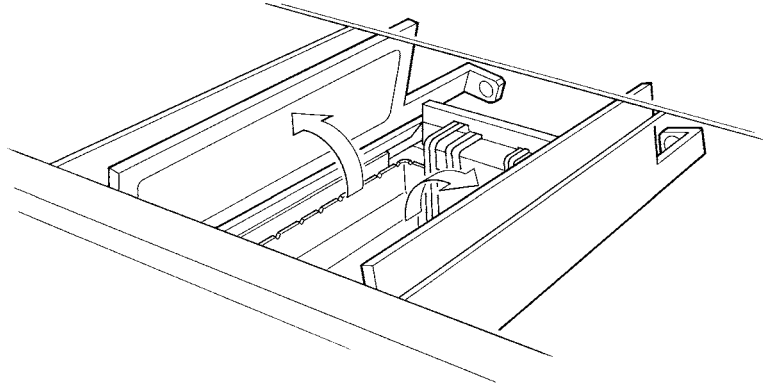
“Delete” cannot be executed unless the step pause is completed.

! CAUTION

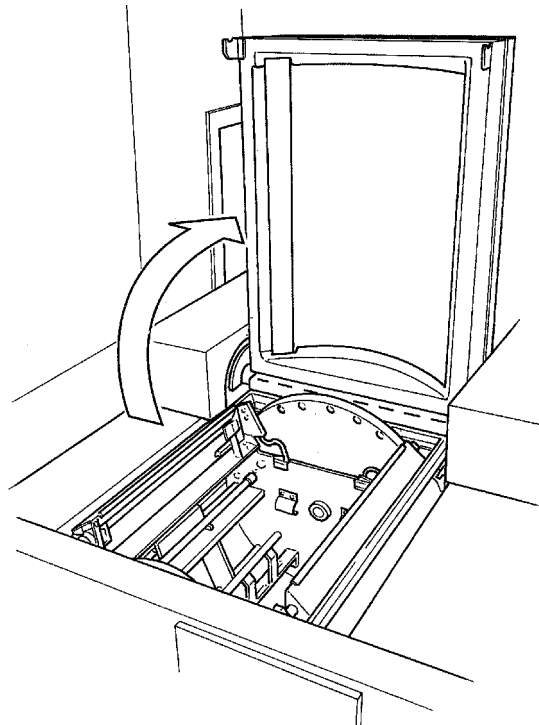
Lot deletion, which requires that you interrupt processing to remove a lot, requires great care. This task may damage other in-process lot(s) as well as the lot to be removed. Be sure, therefore, that you perform lot deletion under the supervision of a maintenance engineer or supervisor.

<Processing bath with auto-cover>

For processing baths with auto-covers, open the cover by pressing the “COVER OPEN/CLOSE” key on the overhead operation panel and check that no lots remain in the bath. After checking, press the “COVER OPEN/CLOSE” key again to close the cover. If the cover will not open after you press the “COVER OPEN/CLOSE” key, perform the home return operation and try again to open the cover.

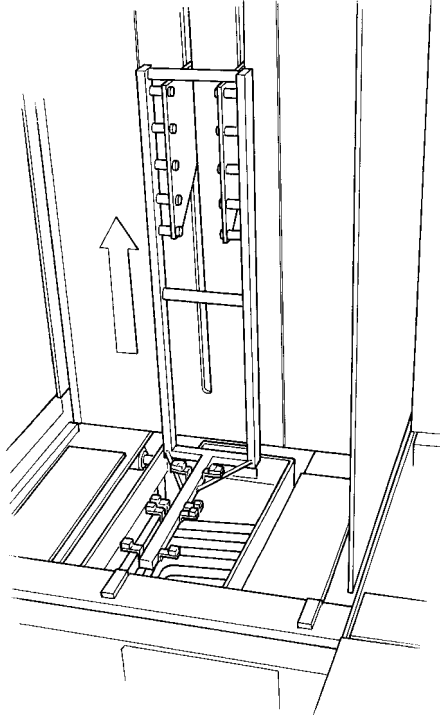
**<Spin dryer>**

Open the cover by pressing the “COVER OPEN/CLOSE” key on the overhead operation panel, and then check that no lots are left inside. After checking, press the key again to close the cover. If the cover will not open after you press the “COVER OPEN/CLOSE” key, perform the home return operation and try again to open the cover.



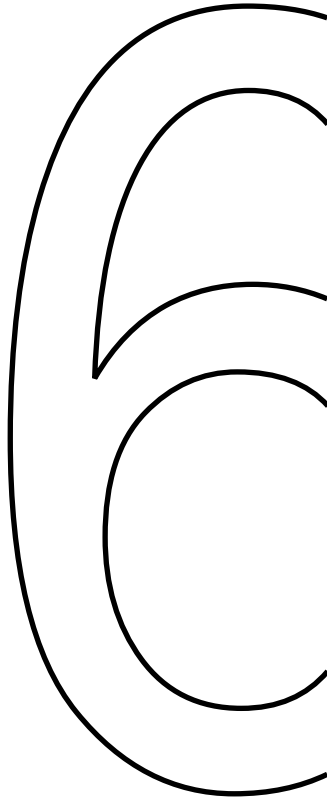
<IPA vapor dryer>

Press the “LIFTER UP” key to raise the lifter’s platform, and check that no lots are left on the platform. After checking, lower the platform by pressing the “LIFTER DOWN” key. If the lifter will not move after you press the key, perform the home return operation and retry.

**<Low pressure dryer (LPD)>**

Open the cover with the “COVER OPEN/CLOSE” key and raise the lifter with the “LIFTER UP” key. Check that no lot remains in the unit. Then, lower the lifter with the “LIFTER DOWN” key and close the cover with the “COVER OPEN/CLOSE” key.

If the cover or the lifter will not move after you press the corresponding key, perform home return and retry.



Chapter 6 Log display

This chapter describes the log display menus.

1	Log display	6-2
1.1	Log display	6-2
1.2	Operation log	6-6
1.3	Event log	6-7
1.4	Alarm log	6-7
1.5	Process log	6-8
1.6	Trace log	6-8
1.7	Host Comm. Log	6-10
1.8	Compound log	6-10

1 Log display

1.1 Log display

Various types of history information such as the equipment status, processing time and error occurrence time can be displayed.

The following types of log can be displayed.

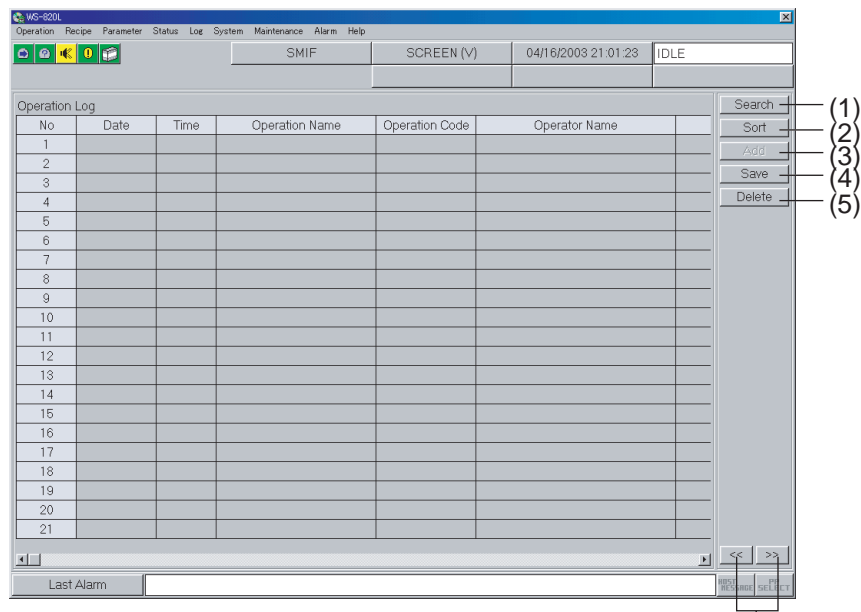
- Operation log
- Event log
- Alarm log
- Process log
- Trace log
- Temp trace log
- Host communication log
- Compound log

Any log can be displayed according to a common basic procedure. The procedure is described here using the operation log as an example.

Select [Operation Log] from the [Log] menu. The operation log appears.

NOTE

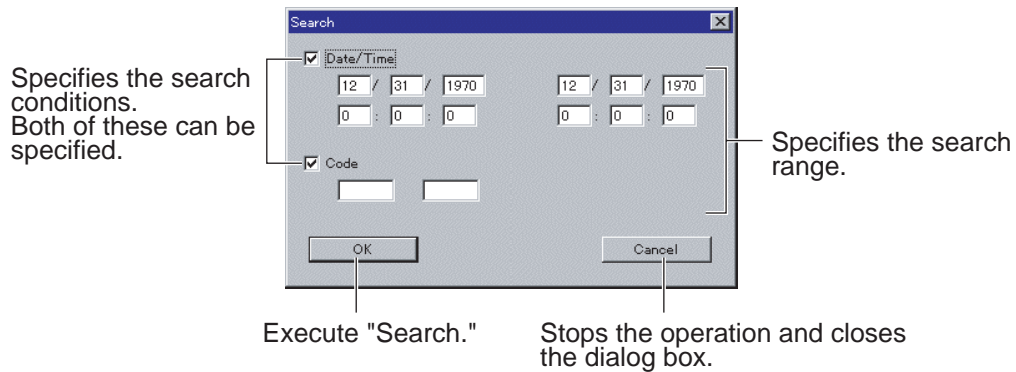
The trace log and the temperature controller log can be displayed for each module. To do this, select either "Trace Log" or "Temp. Cont. Log" under the Log menu and select a module.



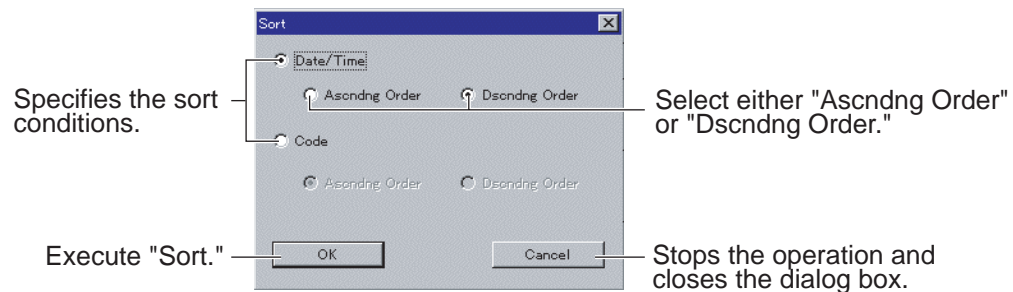
Displays the previous/following log window.

(1) Search

Searches log information displayed in the window by date/time and code.

**(2) Sort**

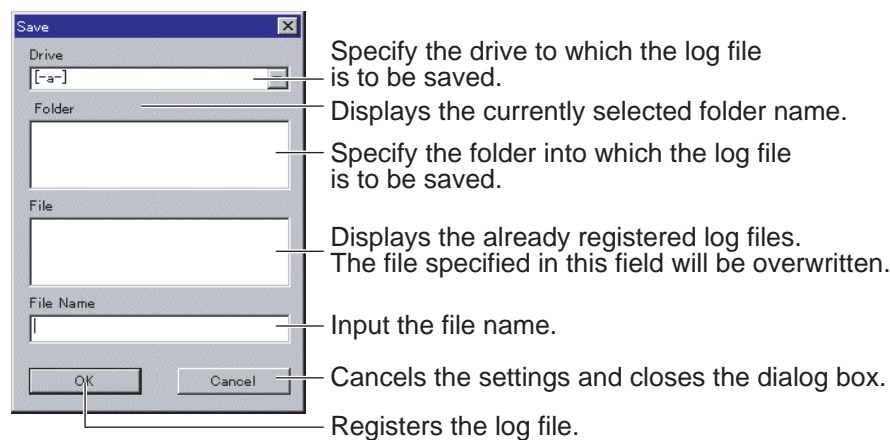
Sorts the log information displayed in the window by date/time and code.

**(3) Add**

Displays the log information that is currently not being displayed in the window, in addition to the currently displayed log information.

(4) Save

The log information currently displayed in the window is saved as a file. Files are saved as text data in the CSV (comma-separated) format with an automatically affixed ".csv" extension. This format data can be edited with spreadsheet software.



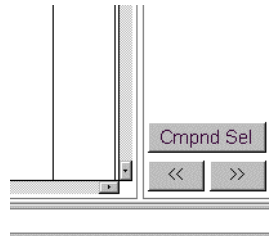
(5) Delete

Deletes the log information that is currently displayed in the window.

Cmpnd Select

This button exists only for the compound log display window. The log to display in the compound log can be selected.

Clicking this button calls up the dialog box to select the log.



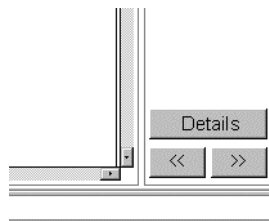
Select (Check) the desired log to display.

**Details**

This button exists only for the processing results log display window.

It displays the details of the listed log.

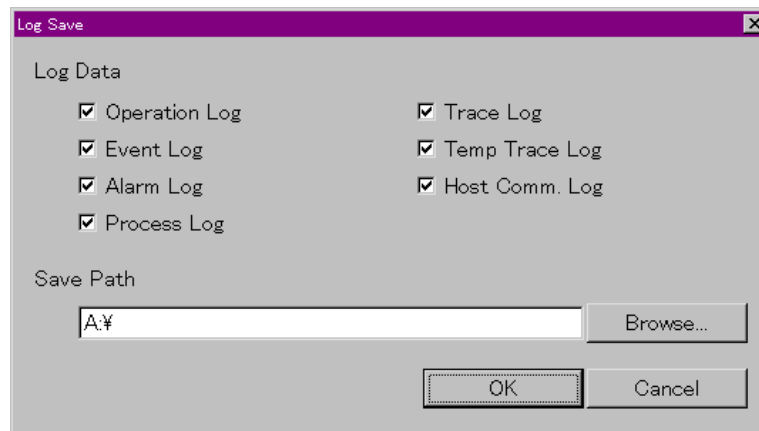
When a log is selected, clicking this button calls up the detailed log window.



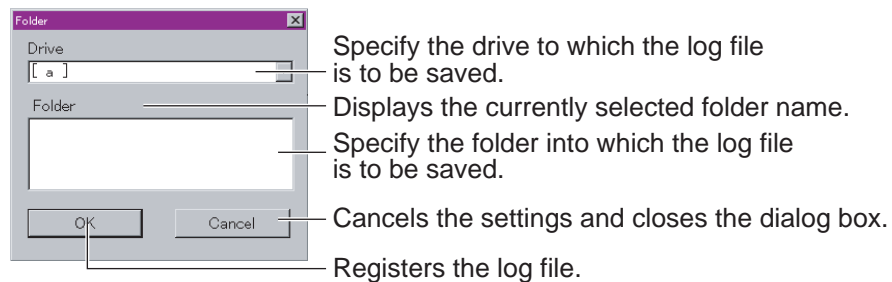
Log Save

This function is used to save log data.

Select [Log Save] from the [Log] menu. The log saving dialog box appears.



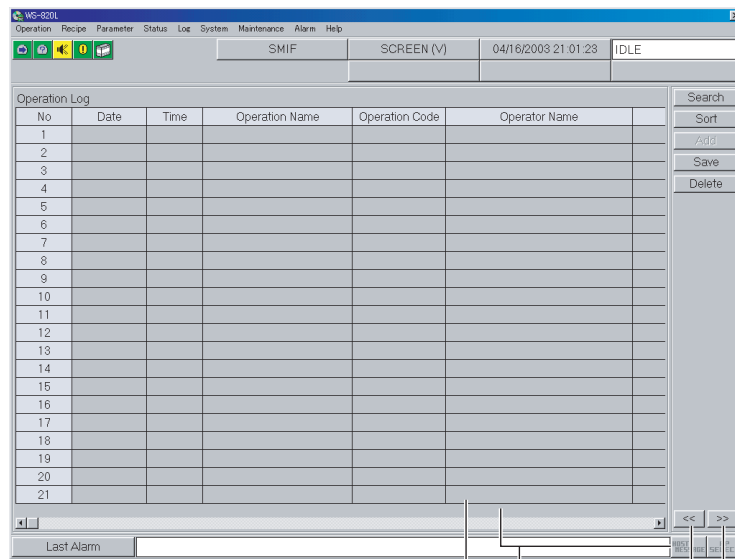
- 1) Check-mark the log data you want to save.
- 2) Enter the destination folder for the log data in the [Save Path] field. Or click the [Browse] button to open the dialog box where the destination can be specified.



- 3) Click the [OK] button to save the log data.

1.2 Operation log

This window is used to check the details of the operation as well as the name of the user that operated the window.



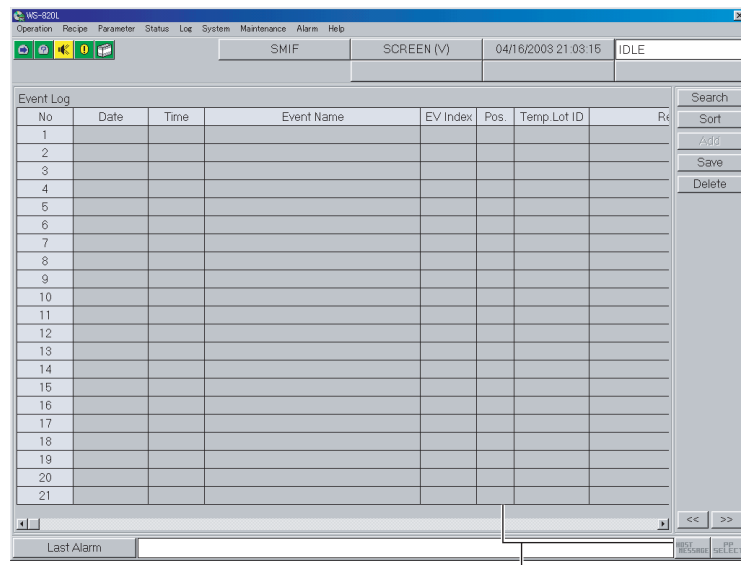
Displays the code number allocated to each operation.

Displays concrete information on individual log.

Displays other log data.

1.3 Event log

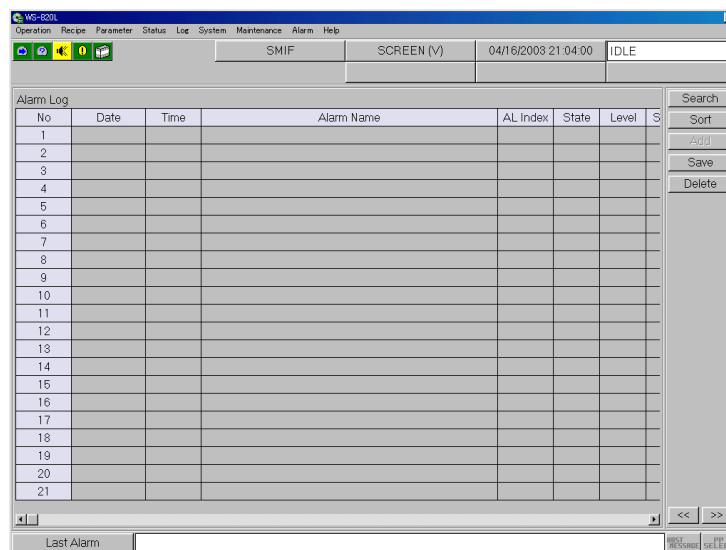
This window is used to check the details of processing performed in the equipment.



Displays concrete information on individual events.

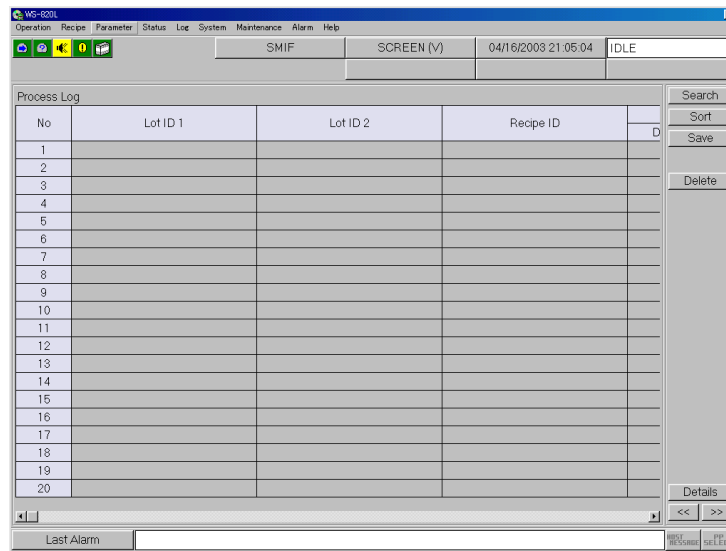
1.4 Alarm log

This window is used to check the alarms that have occurred.



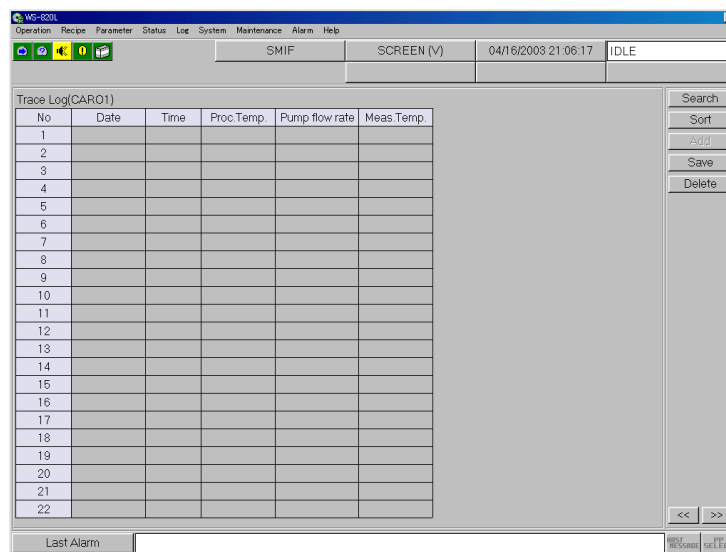
1.5 Process log

This window is used to check the processing of lots that have been supplied to the equipment.



1.6 Trace log

This window is used to check the information concerning the processing bath, such as temperature and chemical concentration.



Graph display (Option)

The log data that is currently displayed in the window can also be shown in a graph. Click the [Graph] button in the bath detail window. The following window appears.

Displays the graph that has been made previously.

Displays the current graph.

In this field, specify the minimum value on the vertical axis.

In this field, specify the maximum value on the vertical axis.

In this field, specify the time that the graph to be displayed was made.

In this field, specify the date that the graph to be displayed was made.

Click the [Graph] button. The current log data appears. Input the maximum and minimum values of the graph and then click the [SET] button. The vertical axis of the graph will be changed.

To display the previous log data, click the [OLD] button. Input the date and time that the graph to be displayed was made, and then the maximum and minimum values of the graph. When you click the [SET] button, the previous log data appears.

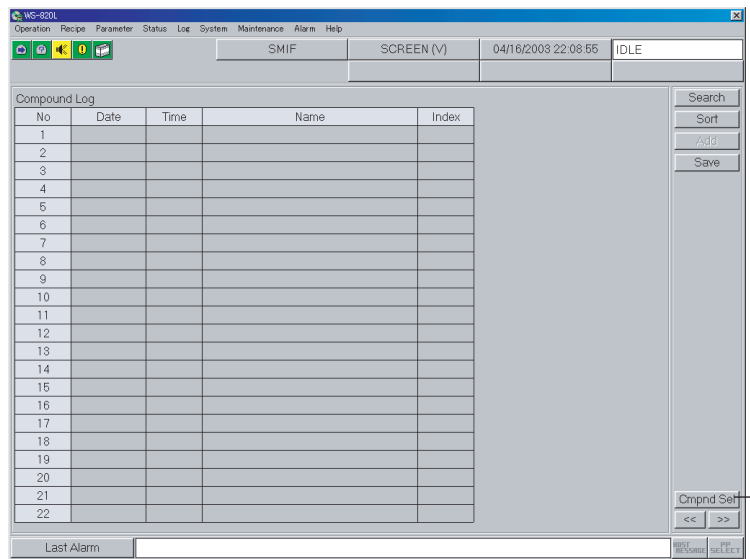
To switch the display from the previous log data to the current log data, select the [NOW] button and then click the [SET] button.

1.7 Host Comm. Log

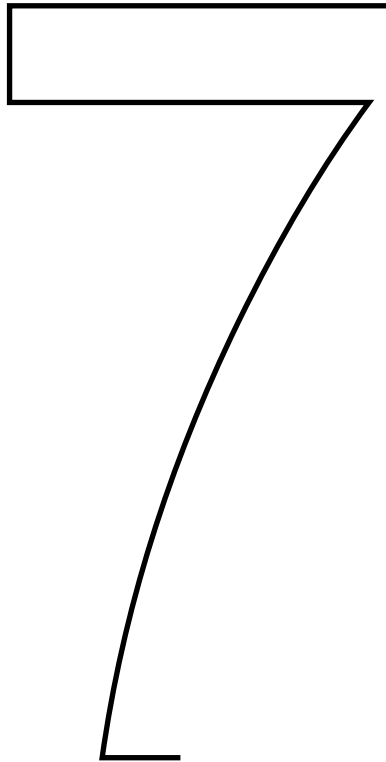
This window is used to check the information concerning the communication with the host computer.

1.8 Compound log

Several log items can be displayed all at once.



Compound selection button



Chapter 7 System Setting

This chapter describes the system menus.

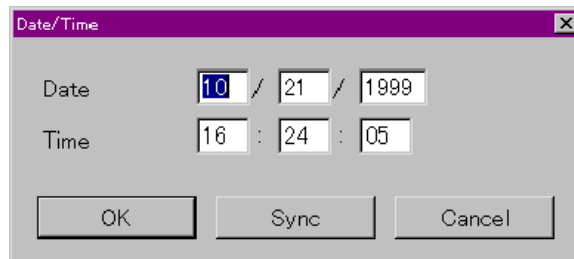
1	System setting	7-2
1.1	Date and time setting	7-2
1.2	Host online	7-2
1.3	Host communication	7-3
1.4	AGV online	7-4
1.5	SMIF control	7-4
1.6	Operation mode status	7-5
1.7	Debug mode status	7-5
1.8	Status display setting	7-6
1.9	Terminal service	7-6

1 System setting

1.1 Date and time setting

The controller internal clock can be set.

Selecting [Date/Time] from the [System] menu enables you to change the internal timer settings.

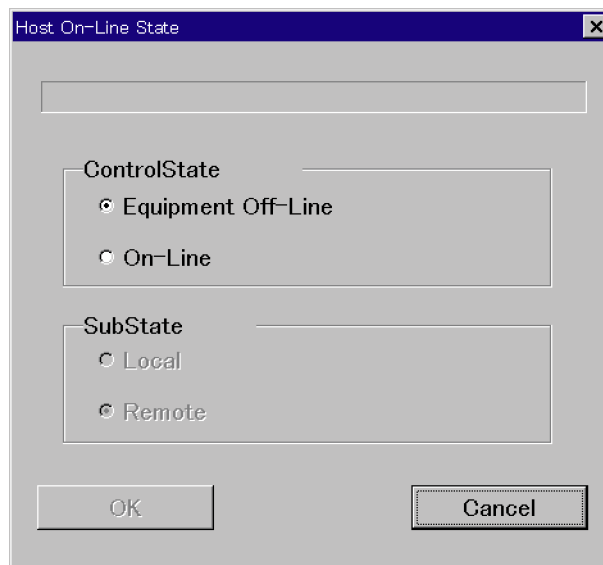


- 1) Set the day, month, year and time.
Clicking the [Sync] button enables you to set the time, year, month, and date which are currently set in the host computer.
- 2) Click the [OK] button.

1.2 Host online

The host communication mode can be switched in the “Host On-Line State” dialog box.

Selecting [Host Online] from the [System] menu enables you to set the communication state with the host computer.



- 1) Check the check box of the communication state you wish to set.

- 2) Click the [OK] button. The setting is changed and the window is closed.

On-line remote mode	This mode allows communication with the host computer. When a lot is to be processed, its recipe is sent from the host computer.
On-line local mode	This mode allows communication with the host computer, but when a lot is to be processed, its recipe selection and the sending of the start command must be performed by the operator. The process event data such as the operation log and processing status are sent to the host computer.
Off-line mode	This mode closes the communication line with the host. To start lot processing, the operator must select the recipe and send the start command.

The selected communication mode is displayed in the status bar of the window.

! NOTE

Host communication modes can be switched at any time. Note, however, that communication between the Sead- α and the host must terminate normally to switch the mode from on-line (remote/local) to off-line.

1.3 Host communication

Communication with the host computer can be switched between active and inactive with the procedure below.

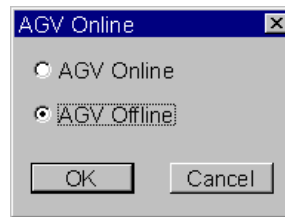
Select [Host Comm] from the [System] menu. The following window appears.



- 1) Check the check box of either “Communication disable” or “Communication enable”.
- 2) Click the [OK] button. The setting is changed and the window is closed.

1.4 AGV online

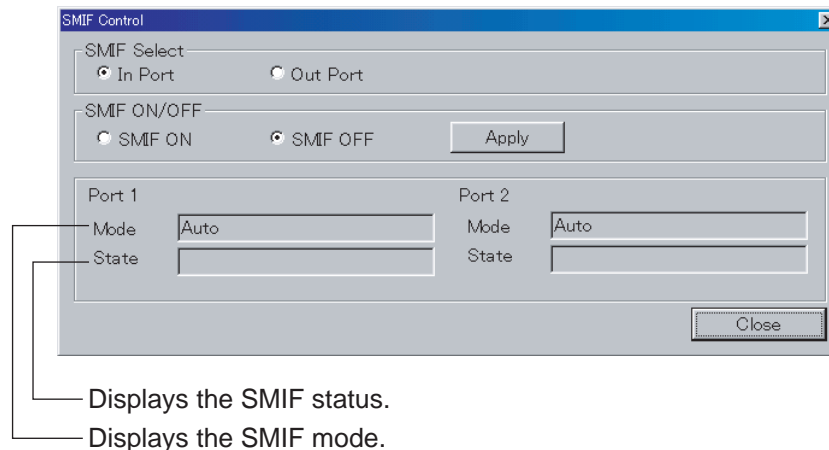
Selecting [AGV Online] from the [System] menu enables you to turn ON/OFF the communication line with the AGV (option).



- 1) Check the check box of either “AGV Online” or “AGV Offline”.
- 2) Click the [OK] button. The setting is changed and the window is closed.

1.5 SMIF control

The SMIF can be turned ON/OFF and the SMIF status can also be checked. Select [SMIF control] from the [System] menu. The following window appears (option).



- 1) Check the check box of the port you wish to set.
- 2) Check the check box of either “SMIF ON” or “SMIF OFF” in the “SMIF ON/OFF” area.
- 3) Click the [Apply] button to change the settings. Click the [Close] button to close the window.

! NOTE

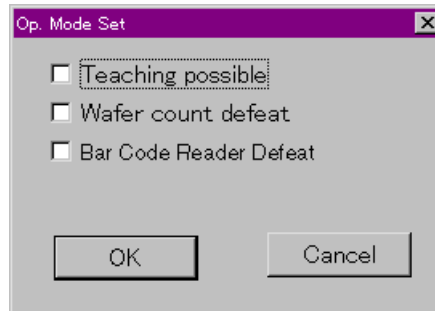
The SMIF has two types: 1-port and 2-port types. The above window is for the SMIF of the 2-port type.

1.6 Operation mode status

The Op. Mode Set menu can be used during equipment maintenance. This menu enables you to perform the teaching operation.

Select “Op. Mode Set” from the System menu.

Select [Op. Mode Set] from the [System] menu. The following window appears.



Teaching possible Operations can be performed in the teaching mode.

Wafer count defeat (Option) Wafer counter is not used.

Bar Code Reader Defeat (Option) . . Bar code reader is not used.

- 1) Check the check box of the operation mode you wish to set.
- 2) Click the [OK] button.

The setting is changed and the window is closed.

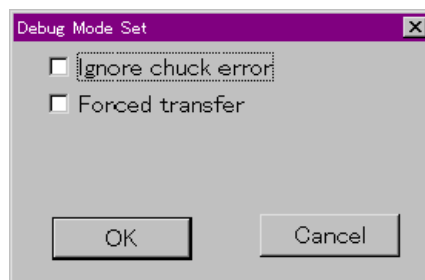
! NOTE

After maintenance is completed, be sure to remove the check from the check box.

1.7 Debug mode status

In the debug mode, lots can be transferred regardless of the state of the processing bath chemical (e.g., chemical presence, temperature and remaining life) or the cassette sensor signal status. It is helpful during an operation adjustment or maintenance of the equipment.

Select [Debug Mode Set] from the [System] menu. The following window appears.



- 1) Check the check box of the debug mode you wish to set.
- 2) Click the [OK] button.

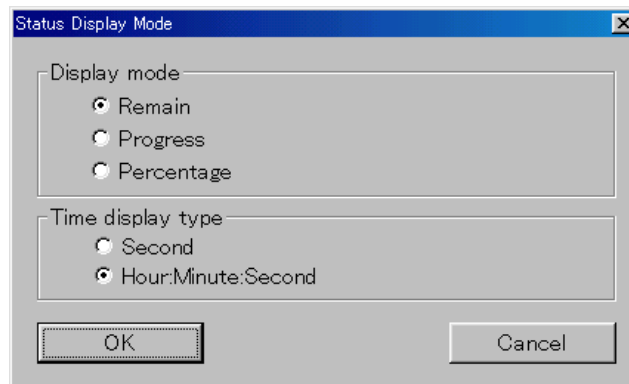
The setting is changed and the window is closed.

! NOTE

After an adjustment or maintenance is completed, remove the check from the check box(s).

1.8 Status display setting

Selecting [Status display setting] from the [System] menu enables you to change the processing time to be displayed for the status display.

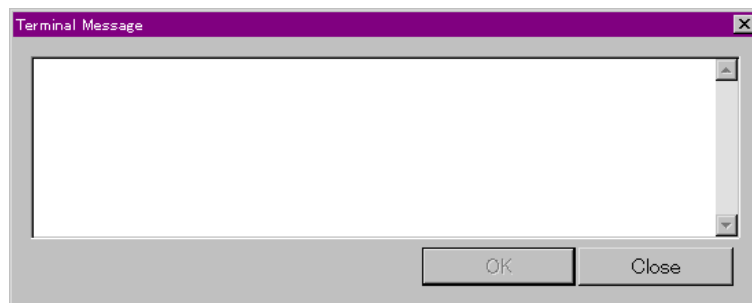


- Remain**Displays the remaining time required for the processing.
- Progress**Displays the elapsed time for the processing.
- Percentage**Displays the percentage of process completion in percentage figures.
- Time display type**Switches the time display for processing time and chemical lifetime.

1.9 Terminal service

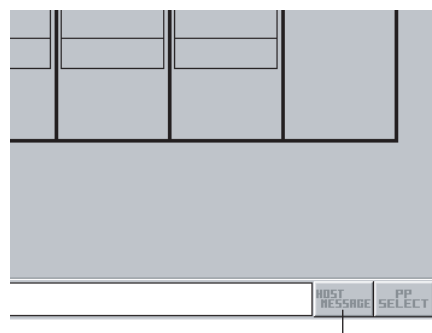
Displays the information from the host computer.

Select [Send Message] in [Terminal Service] from the [System] menu. The following window appears.

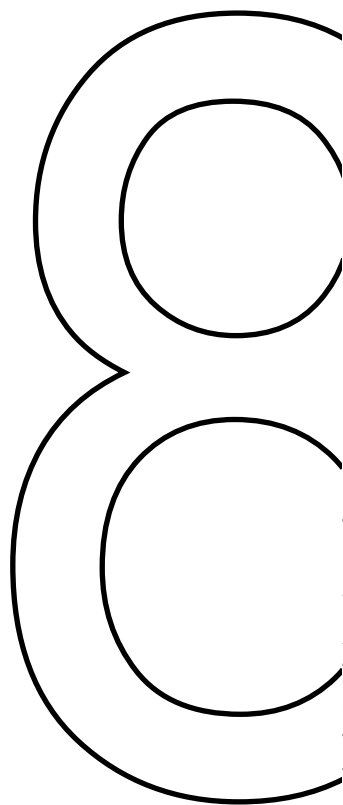


Receipt of message

Click the terminal service indicator to receive the sent message.



Click the terminal service indicator to receive the sent message.



Chapter 8 Remote Control Operation

This chapter describes manual operations using the remote control. Manual operations are required when making periodic inspections and maintenance. As the explanations in this manual have been made for WS-620/820 series equipment with standard specifications, please understand in advance that the illustrations and module configurations used in this manual may differ from your actual equipment.

1	Manual operation	8-2
2	Remote control box	8-3
	2.1 Connection of remote control box	8-3
	2.2 Configuration of remote control box ...	8-3
3	Operation of remote control box	8-6
	3.1 Interlocks during manual operation	8-6
	3.2 Operation code	8-7
	3.3 Manual operation of the transfer unit ..	8-10
	3.4 Manual operation of moving sections in the main equipment	8-13

1 Manual operation

Each section of this machine can be operated manually to adjust the equipment, check its operations or remove lots after errors. The manual control of fluids in the chemical and rinsing baths can be performed on the overhead operation panel. For the transfer system, it can be done on the remote control box.

The equipment can be operated manually when it is in one of following states.

- (i) During equipment startup:
After home return during the startup operation.

- (ii) When the equipment is stopped by the operator:
In the state in which the LED of "AUTO" is off when "AUTO" is pressed after the equipment has entered any state of TRANSFER, STEP, or CYCLE PAUSES, which were selected by the operator.

- (iii) When the equipment stops due to an error:
In the state in which the LED of "AUTO" is off when "AUTO" is pressed after the equipment has automatically entered any state of TRANSFER, STEP, or CYCLE PAUSES by error.

! NOTE

- To control fluids manually in STEP PAUSE, a specific operation is required.
 - In principle, all lots remaining in the equipment when the mode has changed to manual must be deleted by executing "All Delete." Then, perform home return and change the mode to automatic again.
-

2 Remote control box

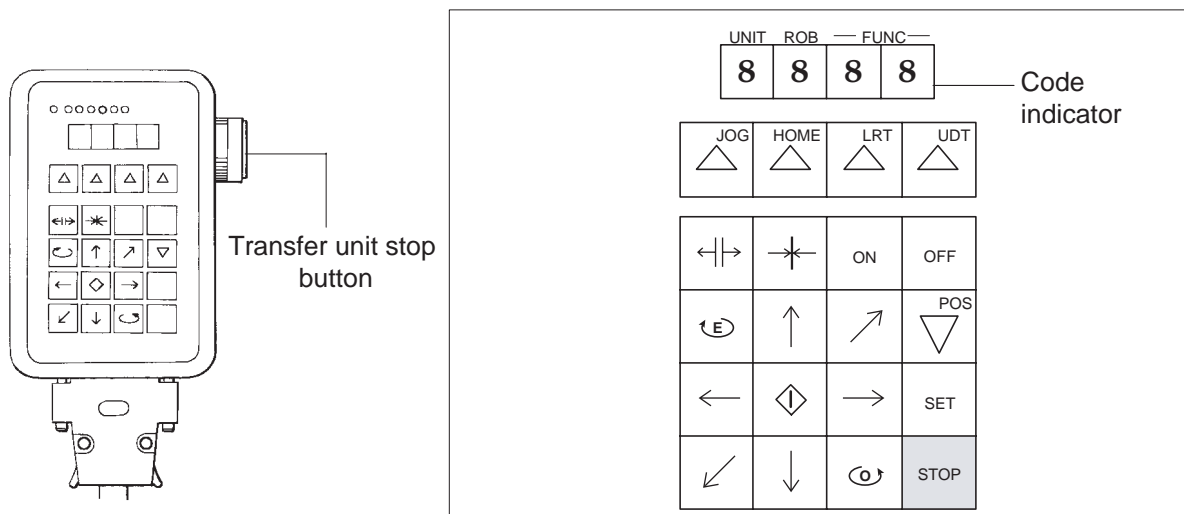
2.1 Connection of remote control box

Connect the remote control box cable to the connector for the remote control panel. After connecting the cable, turn the connection toggle switch to the “CONNECT” side. If the connection is successfully completed, an LED on the remote control box lights indicating that operation is now possible.

For the remote control panel position, refer to “Appendix O2.3.1”.

2.2 Configuration of remote control box

2.2.1 Remote control box for transfer system



Code indicator

Displays unit numbers, transfer unit numbers and function codes.

△ JOG

Each press of this key advances the unit number by 1. Press this key while pressing the “STOP” key to change to the JOG mode.

△ HOME

Each press of this key advances the transfer unit number by 1. Press this key while pressing the “STOP” key to change to the home return mode.

△ LRT

Each press of this key advances the ten’s place (second digit on left) of the function code number by 1. Press this key while pressing the “STOP” key to change to the right/left teaching mode.

△ UDT

Each press of this key advances the initial digit of the function code number by 1. Press this key while pressing the “STOP” key to change to the up/down teaching mode.

← || → → | ←

These keys respectively open and close chucks or covers.

ON OFF

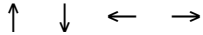
These keys start or stop operations such as rotation of the orientation flat roller or vacuum suction to the wafer case opener.



Moves the arm rotation mechanism to the end position.



Moves the arm rotation mechanism to the home position.



These keys move the transfer unit vertically or horizontally viewed from the front of equipment.



These keys move the transfer unit forward and back viewed from the front of equipment.

◊ (Dead man's switch)

Used with an arrow key during positioning.

▽ (POS)

Pressing the △ key while holding this key down decreases the relevant value by 1.

SET

Used to confirm data after teaching or to start sequential operations.

STOP

Used to stop an operation.

Transfer unit stop button

Turns off the power to the equipment and immediately stops all moving sections.
(both main and peripheral units)

2.2.2 Remote control box (For the horizontal rotation type only)

To operate this module manually with the following keys, connect the remote control box cable to its connector on the front of the equipment, and set the “MAINTENANCE” switch on the box to ON (a red LED lights). After the operation is finished, set the “MAINTENANCE” switch to OFF (the LED goes out).

Switch	Function (interlock)	LED display
POSITION LOCK/ FREE	Locks the position of a rotor. Set it to “LOCK” to lock the position, and to “FREE” to unlock it. (The locking operation is only possible while a rotor is not rotating and the rotor home position sensor (PHS1) is turned ON).	During locking operation: Blinking When operation is completed: Light on
COVER OPEN/ CLOSE	Opens and closes a cover. Set it to “OPEN” to open the cover, and to “CLOSE” to close. (The opening operation is only possible when the cover is unlocked, and the closing operation is only possible when the retainer is extended and the cover is unlocked.)	During closing operation: Blinking When operation is completed: Light on
COVER LOCK/ FREE	Locks and unlocks the cover. Set it to “LOCK” to lock the cover, and to “FREE” to unlock it. (The locking operation is only possible when the cover is closed.)	During locking operation: Blinking When operation is completed: Light on
RETAINER THRUST/RETURN	Extends and retracts a retainer. Set it to “THRUST” to extend the retainer, and to “RETURN” to retract it.	During extension: Blinking When operation is completed: Light on
RETAINER OPEN/ CLOSE	Opens and closes a retainer. Set it to “OPEN” to open the retainer and to “CLOSE” to close it. (The opening operation is only possible when the retainer is extended and the cover is open, and the closing operation is also only possible when the retainer is extended.)	During closing operation: Blinking When operation is completed: Light on
STATIC CONTROL ON/OFF	Turns an ionizer on and off. Set it to “ON” to turn on the ionizer, and to “OFF” to turn it off.	During ionizer operation: Light on
DI WATER ON/OFF	Turns a solenoid valve on and off to dispense DI water for bath cleaning. (The operation is only possible when the cover is closed and the ionizer and N ₂ blowing are both turned OFF.)	During solenoid operation: Light on
N ₂ ON/OFF	Turns a solenoid valve on and off to perform N ₂ blowing for bath cleaning. (The operation is only possible when the cover is closed and the ionizer and DI water dispensing are both turned OFF.)	During solenoid operation: Light on
EXTH DUMP.1 ON/OFF	Opens and closes damper 1 for exhaust ventilation. Set it to “ON” to open damper 1, and to “OFF” to close it.	When damper 1 is open: Light on
EXTH DUMP.2 ON/OFF	Opens and closes damper 2 for exhaust ventilation. Set it to “ON” to open damper 2, and to “OFF” to close it.	When damper 2 is open: Light on

! NOTE

A remote controller is not provided for the vertical rotation-type spin dryer.

3 Operation of remote control box

WARNING

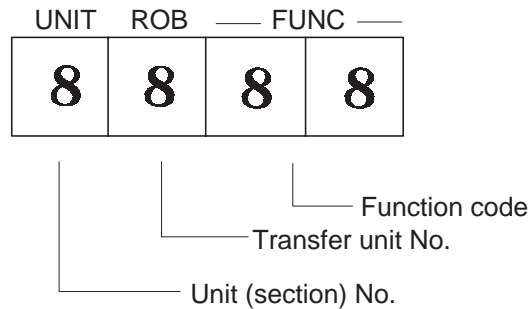
Before operating a transfer unit or other moving section with the remote control box, make sure there are no people or obstacles near its movement range. If a moving section such as a transfer unit hits a person or obstacle, it can cause very serious injury or equipment damage. If problems occur which require you to stop the equipment immediately, press the emergency stop button on the right side of the remote control box (or the emergency power-off button on the equipment itself).

3.1 Interlocks during manual operation

The following interlocks are operative during manual operation with the remote control box. However, since they are ignored in the JOG and teaching modes, pay careful attention when operating in these modes.

- Positioning operations are not possible unless the transfer unit is first returned to its home position.
- For two transfer units located side by side, both of them must be returned to their respective home positions. If both have not returned to their home positions, neither can move to a wafer delivery position between them.
- The chuck cannot be opened when the transfer unit is at its upper position, or when it is holding a cassette or wafer.

3.2 Operation code



Unit (section) No.

Specifies a unit or section to be manually operated.

Unit No.	Applicable section
0	Transfer unit for processing modules
2	Peripheral transfer unit (on the loader side)
3	Peripheral transfer unit (on the unloader side)
5(6)	When operating a moving section other than a transfer unit (i.e., shutter, IPA lifter, etc.), the position should be specified as a two-digit numerical value using the unit number and the transfer unit number. Positions should be specified by adding 50 to the POS number (ex. "58" should be set for POS 8, and "61" for POS 11.)

Transfer unit No.

Unit No.	Applicable unit	Meaning of the transfer unit number
0	Transfer unit for processing modules	Specify a transfer unit number for the processing modules. Transfer units are designated No. 1, 2, from the loader side.
2	Peripheral transfer unit (on the loader side)	Specify a peripheral transfer unit number.
3	Peripheral transfer unit (on the unloader side)	Specify a peripheral transfer unit number.
5(6)	Moving section of processing module	Refer to the explanation of unit numbers in the above table.

! NOTE

When manually operating the peripheral transfer unit, connect the remote control box cable to the connector for the peripheral transfer unit.

Function code

Code No.	Function
00	Positioning
99	JOG operation (high speed)
98	Home return
80	Chuck open/close operation
10	Chuck cleaning sequence operation
11	Agitation sequence operation

3.2.1 Main unit remote control operation code table

	UNIT	ROB	FUNC	FRONT/ REAR	RIGHT/ LEFT	UP/ DOWN	OPEN/ CLOSE	ON/ OFF	ORIGIN/ DESTINATION	STOP	SET	deadman-sw
ROB1 ~ 5	0	1 ~ 5	00		○	○	○			○		○
			10	Chuck rinsing sequence		○						○
			99	Hi-speed jog	○	○						
			98	Home return	○	○				○		○
Auto-cover	X*1	X*1	00	Positioning			○					○
Shutter	X*1	X*1	01	Positioning			○					○

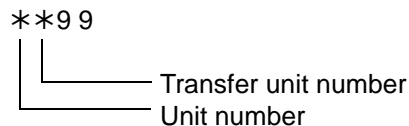
*1: For operating auto-cover and shutter between two baths, add 50 to each bath position number and input the number in each digit of the result into the digit for unit number and for robot number respectively. The shutter between two baths belongs to the bath of the lower position number.Example)
As for auto-cover of POS 3, the UNIT No. will be 5 and the ROB No. will be 3 (3 + 50 = 53).

3.3 Manual operation of the transfer unit

3.3.1 JOG operation

In the JOG mode a transfer unit moves only while a cursor key (indicating the direction of movement) is held down, and stops when the key is released. There are high speed and low speed JOG operations. Using low speed operation, finer positioning for teaching and other purposes is possible.

(1) High speed JOG mode



Press “JOG” while holding down “STOP” to change to the code above. In the unit number field, enter a unit (or an section) for operation, and enter a transfer unit number (or the number assigned to a moving section) in the transfer unit number field. While this display is shown, the transfer unit can be moved horizontally or vertically with the cursor keys in high speed JOG mode. Note that horizontal movement is only possible when the transfer unit is in its upper position (i.e., when the upper position sensor is ON). And vertical movement is possible only when the horizontal position sensor in ON.

⚠ CAUTION

During JOG operations, the interlocks only operate if the positioning sensors are switched to OFF. Therefore, if the sensors are ON, even if a shutter between positions is closed, its interlock will not operate. Before using a JOG operation, make sure that there are no cassettes, wafers or other obstacles within the unit's movement range.

3.3.2 Home return mode

This mode returns a transfer unit to its home position for subsequent operations. If a transfer unit is not at its home position, neither teaching nor positioning operations are possible. Home return must be completed in both the horizontal and vertical directions.



Press “HOME” while holding down “STOP” to change the code to the above value. Enter the transfer unit number to be operated in “*”.

(1) Horizontal home return

Press either the ← or → key (whichever points to the loader side) while holding down the ⬠ key. The transfer unit returns to its home position in the horizontal direction.

(2) Vertical home return

Press the ⬠ key while holding down the ↑ key. The transfer unit returns to its home position in the vertical direction.

3.3.3 Positioning operation

In this mode, a transfer unit can be moved to each stop position. This operation is not possible if the home return has not been completed.

0 *0 0
 └── Transfer unit number

Press “POS” while holding down “STOP” to change to the code above. Enter the number of the transfer unit to be operated in “*”.

Pressing the cursor key for the desired direction while holding down \diamond moves the transfer unit to the next position. When the movement is completed, a buzzer sounds. However, if \diamond is released while the transfer unit is still moving, the unit will simply slow down and stop at a random position.

3.3.4 Chuck operation

In this mode, the chuck in a transfer unit can be opened or closed. The chuck open/close operation is not affected by normal interlocks (Cassetteless type: By transfer unit stop position, Cassetteless type: By cassette detection sensor).

0 *8 0
 └── Transfer unit number

First, specify the number of the transfer unit to be operated in “*”. Pressing \diamond while holding down \leftarrow || \rightarrow opens the chuck, and pressing \diamond while holding down \rightarrow | \leftarrow closes the chuck.

3.3.5 Chuck cleaning

0 *1 0
 └── Transfer unit number

Specify the number of the transfer unit to be operated in “*”. To perform this operation, home return must first be completed and the transfer unit should be at the upper position of the chuck cleaning bath.

Press \diamond while holding down <SET> to start operation. When the sequential operation is completed, the equipment stops. The chuck may be either open or closed when starting the operation.

3.3.6 Agitation

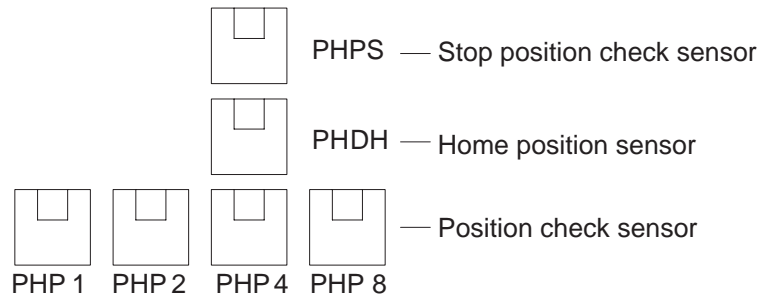
0 *1 1
 └── Transfer unit number

Specify the number of the transfer unit to be operated in “*”. To perform this operation, horizontal home return must first be completed and the transfer unit should be at the process bath position. The unit may be at any vertical position.

Press “SET” while holding down \diamond to continue oscillating the transfer unit between its upper and lower agitation limits. Press “STOP” to stop the operation.

3.3.7 Display of LEDs

Photosensors are attached in the transfer unit for positioning and confirming stop locations. Light baffles are installed at each stop position along the frame, and the stop position is confirmed when the baffle(s) breaks the photosensor beam. During manual operation, the stop position can be confirmed with the 8 LEDs on the remote control box.



- LED 0 Lights up when PHP1 turns ON (binary code value: 1).
- LED 1 Lights up when PHP2 turns ON (binary code value: 2).
- LED 2 Lights up when PHP4 turns ON (binary code value: 4).
- LED 3 Lights up when PHP8 turns ON (binary code value: 8).
- LED 4 Lights up when PHPS turns ON.
- LED 5 Lights up when PHDH turns ON.
- LED 6 Lights up when the chuck open sensor turns ON.
- LED 7 Lights up when the chuck close sensor turns ON.

Binary code values 1, 2, 4 and 8 are assigned to LEDs 0, 1, 2 and 3 respectively. The current position of a transfer unit can be checked by adding the values of all lighted LEDs. For example, if LEDs 0 and 1 are lighted, the current position of the transfer unit is POS 3 (binary code values $1 + 2 = 3$).

3.4 Manual operation of moving sections in the main equipment

3.4.1 Auto-cover operation

Opening and closing an auto-cover can be performed from the remote control box.

Code: **00

Enter the number of the unit to be operated in the highest two decimal places (**) after adding 50 to the unit's number. For example, when operating the auto-cover at POS 8, enter "5800", and for POS 11 enter "6100".

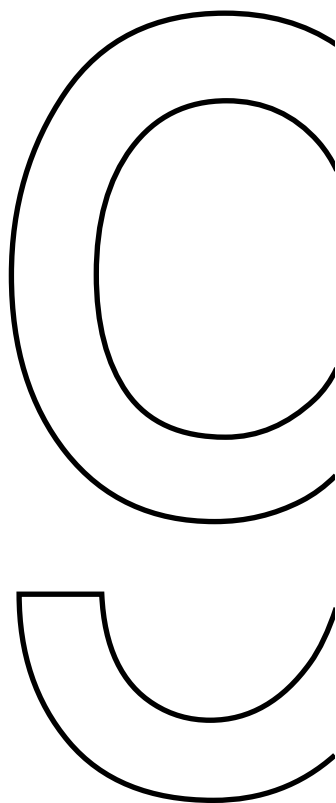
Pressing ← || → in this state opens the designated auto-cover, and pressing → | ← closes it.

3.4.2 Shutter operation

Shutters between modules can be opened and closed from the remote control box.

Code: **01

Specify the number of the unit to be operated in the same manner as for auto-cover operation. Note that shutters between modules are considered to belong to the unit with the lower POS number (closer to loader side). For example, the shutter between POS 8 and POS 9 belongs to POS 8. Therefore, specify "5801" to operate it. Pressing ← || → in this state opens the designated shutter, and pressing → | ← closes it.



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1 Customized functions

1.1 Chemical request

When the chemical ready input signal for a chemical is turned ON, a chemical request signal is issued for the utility section. If the input signal is OFF, chemical request is not issued.

Alarms

Bath main No. 16 “Chemical demand (HF)”

Alarm level: 5 (Buzzer only)

Alarm occurrence condition: This alarm occurs when the chemical request signal turns ON. It is cancelled when the chemical request signal turns OFF.

Bath main No. 17 “Chemical demand (HF) Close”

Alarm level: 5 (Buzzer only)

Alarm occurrence condition: This alarm occurs when the chemical request signal turns ON. It is cancelled when the chemical request signal turns OFF.

Bath main No. 18 “Chemical demand (PreMix)”

Alarm level: 5 (Buzzer only)

Alarm occurrence condition: This alarm occurs when the chemical request signal turns ON. It is cancelled when the chemical request signal turns OFF.

Bath main No. 19 “Chemical demand (PreMix) Close”

Alarm level: 5 (Buzzer only)

Alarm occurrence condition: This alarm occurs when the chemical request signal turns ON. It is cancelled when the chemical request signal turns OFF.

Bath main No. 1A “Chemical demand (IPA)”

Alarm level: 5 (Buzzer only)

Alarm occurrence condition: This alarm occurs when the chemical request signal turns ON. It is cancelled when the chemical request signal turns OFF.

Bath main No. 1B “Chemical demand (IPA) Close”

Alarm level: 5 (Buzzer only)

Alarm occurrence condition: This alarm occurs when the chemical request signal turns ON. It is cancelled when the chemical request signal turns OFF.

1.2 CTC type for LD/UL

- In this equipment, a CTC is installed for the loader/unloader. A wafer is retrieved from the cassette and then processed without a carrier.
- The loader is called the “IN-CTC”, and the unloader is called the “OUT-CTC”.
- Only one cassette can be set.

Alarms

LD/UL bathNo. 00“Upper limit overrun error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the upper limit sensor turns OFF.

LD/UL bathNo. 01“Lower limit overrun error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the lower limit sensor turns OFF.

LD/UL bathNo. 02“Vertical movement time-out error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the movement operation is not completed within the specified period.

LD/UL bathNo. 03“Vertical movement positioning error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs if the position check sensor is not turned ON when the movement is completed.

LD/UL bathNo. 04“Vertical motor error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when there is a problem with the motor driver.

LD/UL bathNo. 05“Vertical out of position error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs if the position check sensor is turned OFF when the movement is stopped.

LD/UL bathNo. 08“Carrier sensor1 error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the status of the carrier check sensor does not conform to the internal data.

LD/UL bathNo. 0A“Wafer sensor error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the status of the wafer check sensor does not conform to the internal data.

LD/UL bathNo. 0B“Home return time-out error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the home return operation for the entire equipment is not completed within the specified period.

LD/UL bathNo. 10“Door opening/shutting error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the door open/close status does not conform to the internal data.

LD/UL bathNo. 11“Door lock time-out error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the door lock/unlock operation is not completed within the specified period.

The following alarm is provided only for the LD side.

LD bathNo. 0C“ROB_QD75 unit error”

Alarm level: 5

Alarm occurrence condition: This alarm occurs when the error signal for the positioning unit (QD75) turns ON.

The following alarms are provided only for the UL side.

UL bathNo. 0D “No carrier”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when a carrier is not set on the unloader while wafers are ready to be discharged to the unloader.

1.3 CTC door interlock

- Concerning the CTC door interlock, the door can be opened/closed only while the shutter is closed in both the automatic and manual modes.
- If you wish to open/close the door even while the shutter is not closed in the manual mode (e.g., for maintenance), disable the cover interlock ON/OFF key switch on the power supply panel.

1.4 Fire extinguisher

The fire extinguisher may issue the following alarms:

Alarms

Bath main No. 0A “Fire detected”

Alarm level: 4. Cycle pause

Bath main No. 0B “Fire detector trouble”

Alarm level: 4. Cycle pause

1.5 Chemical supply for the PS bath

- There are two types of chemical supply: supply of DIW, 49%HF, and IPA from the measuring tank and the Pre-Mix (DIW, 49%HF, and IPA) direct supply.
- The chemical supply type can be switched between the measuring tank (0) and PreMix (1) for direct supply according to the parameter setting.
- For the direct supply, chemical is supplied up to the designated (outer bath level 4) level.
- As the capacity of the measuring tank is small (6 L), while each chemical is being supplied from the measuring tank, chemical demand is also performed concurrently.
- The chemicals are supplied in the order of DIW, 49%HF, and IPA, up to inner bath levels 3 and 5 (occasionally up to outer bath level 3).
- The chemical replenishment can be switched between pump replenishment (0) and level replenishment (1) according to the parameter setting.
- The pre-processing replenishment and interval replenishment are performed for each of DIW, 49%HF, and IPA.

Alarm

Chemical bath No. 12 “POS_PreMix supply time-out error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the designated level sensor does not turn ON within the time specified in the maintenance parameter during chemical demand for the processing bath.

1.6 PS electrode bath

- There are three inner baths for the PS bath: front electrode bath F, processing bath, and rear electrode bath R. In addition to the ordinary parameters, the lifetime and life count parameters are also provided for the front and rear electrode baths.
- The same automatic chemical exchange and chemical control parameters are used for F and R.
- 1% HF chemical is used. After DI water is supplied up to the DI water designated level (level 3), 49%HF is supplied from the measuring tank.
- The chemical demand is performed for the measuring tank up to the designated (level 4) level.
- The gravity drainage is performed.
- The bath cleaning function is provided.
(As there is no circulation system, drainage is performed when DI water is accumulated.)
- N₂ bubbling is performed according to the settings of the ON and OFF times and the mixing time after chemical exchange.
(However, bubbling is stopped when the equipment power is ON in the automatic mode or the chemical control is ON.)
- The “El. bath life time”, “El. bath life count”, and “CURRENT” settings are displayed on the bath monitor.
- “CURRENT” and “Volt” have been added to the log title.
- The following switches are provided on the overhead operation panel.
[HF DEMAND_F] [HF SUPPLY_F] [DIW DEMAND_F] [CHEMICAL CHANGE_F]
[BATH CLEAN_F] [DRAIN_F] [BUBBLING_F]
[HF DEMAND_R] [HF SUPPLY_R] [DIW DEMAND_R] [CHEMICAL CHANGE_R]
[BATH CLEAN_R] [DRAIN_R] [BUBBLING_R]
(As only one valve is provided, when either “BUBBLING_F” or “BUBBLING_R” is pressed, both buttons are turned ON.)
- Level replenishment is performed. When the level 4 sensor remains OFF for 10 consecutive seconds, chemical is replenished up to level 4.

Alarms

“POS03 EL-F bath chemical level upper error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the electrode bath F upper limit sensor (level 6) turns ON.

“POS03 EL-F bath chemical level lower error”

Alarm level:4. Cycle pause

Alarm occurrence condition: This alarm occurs when the electrode bath lower limit level sensor (level 2) turns OFF.

“POS03 49%HF-F meas. tank level upper error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the measuring tank chemical upper limit level sensor (level 6) turns ON.

“POS03 49%HF-F meas. tank level lower error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the level 2 sensor turns OFF while the chemical level 3 sensor for the measuring tank is ON.

“POS03 EL-F bath chemical supply time-out err”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the chemical supply operation for chemical exchange is not completed within the time specified in the maintenance parameter.

“POS03 EL-F bath drain time-out error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the chemical drainage operation is not completed within the time specified in the maintenance parameter.

“POS03 EL-F bath cleaning time-out error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the DI water supply operation for bath cleaning is not completed within the time specified in the maintenance parameter.

“POS03 49%HF-F demand time-out error

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the designated level sensor for the measuring tank does not turn ON within the time specified in the maintenance parameter during chemical demand for the measuring tank.

“POS03 49%HF-F tank determination level err”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the designated level sensor (level 5) is OFF for more than one second in 15 seconds after the completion of chemical demand for the measuring tank.

“POS03 EL-F bath Chemical life expired”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when either the lifetime or life count parameter has reached the specified value.

(In the manual chemical exchange specification, an alarm is issued; in the automatic chemical exchange specification, an alarm is only displayed on the screen.)

“POS03 EL-R bath chemical level upper error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the electrode bath F upper limit sensor (level 6) turns ON.

“POS03 EL-R bath chemical level lower error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the electrode bath lower limit level sensor (level 2) turns OFF.

“POS03 49%HF-R meas. tank level upper error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the measuring tank chemical upper limit level sensor (level 6) turns ON.

“POS03 49%HF-R meas. tank level lower error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the level 2 sensor turns OFF while the chemical level 3 sensor for the measuring tank is ON.

“POS03 EL-R bath chemical supply time-out err”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the chemical supply operation for chemical exchange is not completed within the time specified in the maintenance parameter.

“POS03 EL-R bath drain time-out error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the chemical drainage operation is not completed within the time specified in the maintenance parameter.

“POS03 EL-R bath cleaning time-out error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the DI water supply operation for bath cleaning is not completed within the time specified in the maintenance parameter.

“POS03 49%HF-R demand time-out error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the designated level sensor for the measuring tank does not turn ON within the time specified in the maintenance parameter during chemical demand for the measuring tank.

“POS03 49%HF-R tank determination level err”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the designated level sensor (level 4) is OFF for more than one second in 15 seconds after the completion of chemical demand for the measuring tank.

“POS03 EL-R bath Chemical life expired”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when either the lifetime or life count parameter has reached the specified value.

(In the manual chemical exchange specification, an alarm is issued; in the automatic chemical exchange specification, an alarm is only displayed on the screen.)

1.7 Current adjustment and recipes for the PS bath

- For the PS bath, the processing bath is located between electrode bath F and electrode bath R. Processing is performed by selecting from patterns 1 and 2 specified in the parameter in a recipe.
- Each pattern consists of settings for the electric current value, ON and OFF times, and the repeat count from steps 1 to 20.
- The current value can be set within a range from -35 A to 35 A. When a negative value is set, the polarity changes.
(As there is a two-second switching time for each step, the actual processing time is the “set time + 2 seconds”.)

- The counting for the normal processing time starts when the transfer unit opens its chuck. For the PS bath, however, the counting starts when the current starts flowing. Due to this, the post-supply standby time (Wait for start time) parameter is provided to adjust the total processing time.
- The power does not turn ON if an N₂ flow rate lower limit or cooling water flow rate lower limit alarm is activated.
- In the manual mode, the processing of the pattern specified in the parameter is performed when the [1CYCLE PROCESS] switch is pressed on the overhead operation panel.
- A manual power supply switch is provided next to the overhead operation panel. When the switch is pressed in the manual mode, the following operation is performed.
- “CV, CC LOCAL”: The current control for the DC power supply can be adjusted from the main unit VR.

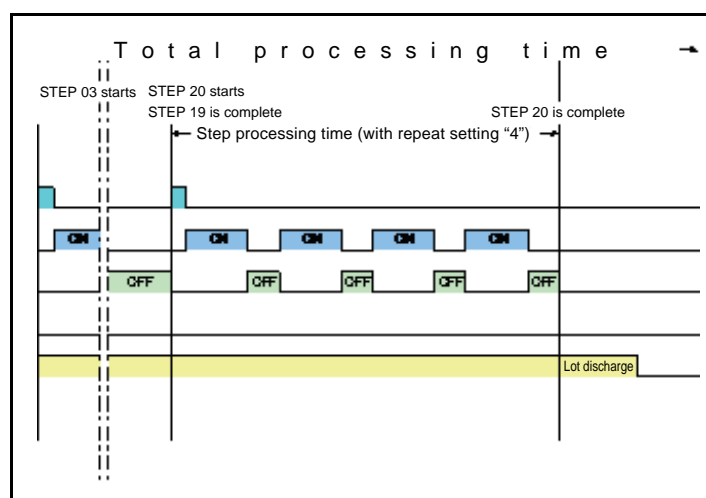
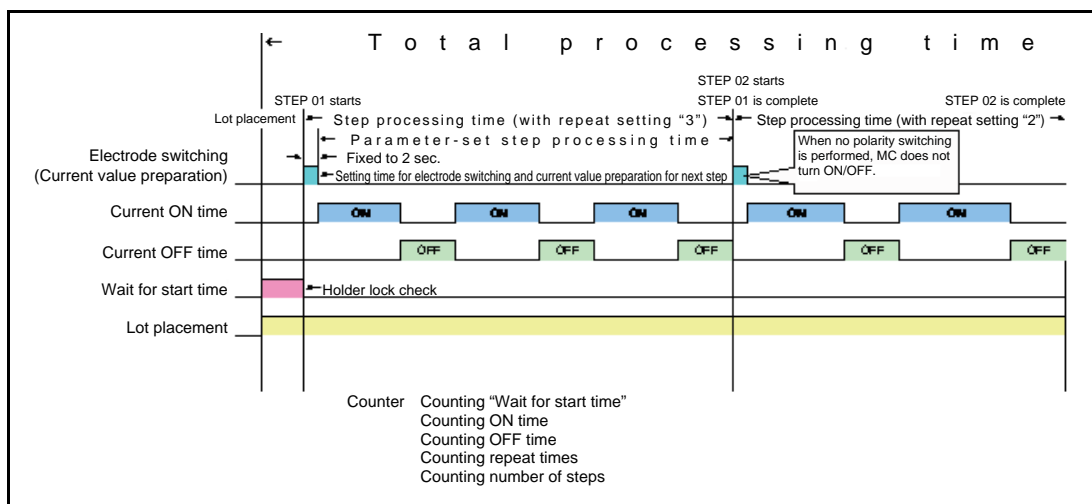
“F (+) R (-) CURRENT”: The polarity of the electrode is switched from F to R (front to rear).

“F (-) R (+) CURRENT”: The polarity of the electrode is switched from R to F (rear to front).

“DC POWER OUTPUT”: The current is output from the DC power supply.

(The current is output according to the VR value or the value set in STEP1.)

The above switch is a momentary switch. It is reset when the mode is switched to automatic or when a single cycle is performed.)



Alarms**POS18 No. 20 “POS03 DC power supply alarm”**

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the power supply output normal signal from the constant-current generator does not turn ON within 0.5 seconds after the output signal has turned ON, or the “Power ON for power suppl” signal automatically turns OFF.

POS18 No. 21 “POS03 DC power supply power off”

Alarm level: 4. Cycle pause

Alarm occurrence condition: The alarm occurs when the power of the constant-current generator turns OFF.

Chemical bath No. 2B “POS_N₂ purge low flow error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the N₂ purge flow rate has dropped.

Chemical bath No. 2C “POS_Cooling water low flow error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when the cooling water flow rate has dropped.

1.8 Chemical drainage from the PS bath

Only the gravity drainage is performed.

1.9 PS bath separation

When chemical bath maintenance parameter No. 19 “Module down (1: All, 2: Ei_bath)” is set to “2”, only the electrode bath will not be used.

During drainage from the PS bath, drainage is also performed from the electrode bath at the same time.

1.10 Supply control

The supply control time is not applied. The supply of the next lot is prohibited until the current wafers are supplied into the drying bath.

(If there are wafers at POS3 or POS4, no lot can be supplied.)

1.11 Wafer center alignment mechanism

- At the IN-CTC, the wafer size is measured and the difference from the reference size is calculated in the TRAY bath. The chuck center of the robot and the center position of the wafer are then aligned with each other by using the vertical movement mechanism.
- When the supply check button is pressed after a cassette is set on the CTC, the cassette lowers and the sensor arm moves, so that the moving sensor head measures the wafer size.
- If the measured value exceeds the value set in the user parameter (wafer limit size), an alarm occurs. In this case, the cassette is to be removed.
- If the measured value is within the specified range, it is saved on the memory. When the wafer is transferred to the TRAY bath, the robot is moved up by the distance of “measurement value $\times 0.707 (\sqrt{2}/2)$ ”.
- The wafer size limit error and wafer size sensor read error cannot be reset until the lot supply is cancelled. In addition, if the above alarms are not reset after the cancellation of the lot supply, new lots cannot be supplied.

Parameter**LD bath user parameter No. 01 “Wafer limit size.”****Alarms****LD bath No. 1C “Wafer size limit error”**

Alarm level: 6 (Transfer stop in the relevant section)

Alarm occurrence condition: This alarm occurs when the measurement value of the sensor exceeds the value specified in the parameter.

LD bath No. 1D “Wafer Sensor read error”

Alarm level: 6 (Transfer stop in the relevant section)

Alarm occurrence condition: This alarm occurs when the sensor amplifier data cannot be read correctly.

LD bath No. 1E “Sensor arm time-out error”

Alarm level: 6 (Transfer stop in the relevant section)

Alarm occurrence condition: This alarm occurs when the sensor arm movement is not completed within the specified period.

LD bath No. 1F “Sensor head time-out error”

Alarm level: 6 (Transfer stop in the relevant section)

Alarm occurrence condition: This alarm occurs when the sensor head movement is not completed within the specified period.

Rinsing bath No. 23 “POS_Robot Cylinder Controller error”

Alarm level: 5 (Buzzer only)

Alarm occurrence condition: This alarm occurs when there is an error in the controller.

1.12 Robot 2 common chuck for processing

The chuck of robot 2 performs both transfer and processing.

Instead of the guide position, the chuck open/close position is provided 125 mm above the bottom position. When the chuck is above this position, it is always closed.

The chuck open/close possible area is checked by a sensor. An interlock is provided so that the chuck cannot be opened.

The chuck opens/closes at the bottom position and the chuck open/close position.

1.13 Robot 2 processing

Robot 2 stops at the bottom position when a wafer is transferred from the TRAY bath to the PS bath, and processing is then started. Once the processing is completed, the wafer is then transferred to the QDR bath.

1.14 N₂ drying system

Instead of the conventional drying system, an N₂ dryer unit is installed in the equipment.

Alarms

N₂ bath No. 0A “POS_N₂-2 overheat”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when an overheat error is detected in the N₂ purge piping.

N₂ bath No. 0B “POS_N₂-2 high temp. error”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when an overheat error is detected in the N₂ purge piping.

N₂ bath No. 0C “POS_N₂-2 low temp. error”

Alarm level: 4. Cycle pause

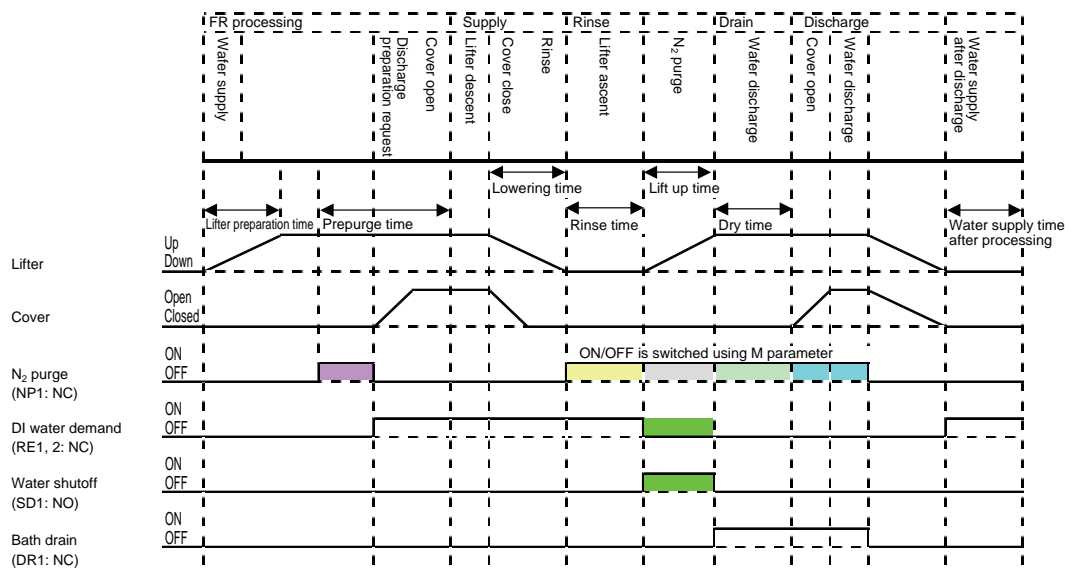
Alarm occurrence condition: This alarm occurs when an overheat error is detected in the N₂ purge piping.

N₂ bath No. 21 “POS_N₂-2 heater opened”

Alarm level: 4. Cycle pause

Alarm occurrence condition: This alarm occurs when a heater wire breakage is detected in the relevant section.

Time chart



1.15 Ground fault monitor alarm

A ground fault monitor is connected to the “+” and “-” terminals of the 24 V DC power supply line. An alarm occurs if the “+” or “-” terminal falls off due to faulty wiring, etc.

Alarm

Bath main No. 0D “DC control DC24V ground fault error”

Alarm level: 3 (Step pause)

Alarm occurrence condition: This alarm occurs when the short circuit signal (X09E) turns OFF for 5 or more seconds.

1.16 Change of wafer delivery in the QDR bath

As the chuck section of ROB2 floats during wafer setting, the chuck interferes with the holder when the chuck is closed. In order to avoid this, DI water in the bath is drained completely. Water drainage before lot supply is performed.

2 Parameter list

This section lists parameters used in customized equipment. For the definition of each parameter, refer to chapter 3, and refer to the inspection report for their respective setting values.

2.1 PS

User Parameter

User Parameter Name	Unit
Life time	min
Life count	#
49%HF pre-repl.	shot
49%HF interval	sec
49%HF spike C	shot
IPA pre-repl.	shot
IPA interval	sec
IPA spike C	shot
El. bath life time	min
Filter cleaning	sec
El. bath life count	#
# of bath clean	#
DIW pre-repl.	shot
DIW interval	sec
DIW spike C	shot
Auto chem change	0/1
El. bath bubbling ON time	sec
El. bath bubbling OFF time	sec
El. bath mixing time of bubble	sec
1CYCLE PROCESS recipe No.	1-2

Maintenance Parameter

Maintenance Parameter Name	Unit
El. bath cleaning	#
Bath cleaning	#
PreMix supply time-out	min
Chemi-supply time-out	min
Drain time-out	min
Temp. time-out	min
Bath cleaning time-out	min
DIW demand time-out	min
49%HF demand time-out	min
IPA demand time-out	min
El. bath 49%HF demand time-out	sec
Temp. check time	sec

Maintenance Parameter Name	Unit
El. bath chemi-supply time-out	min
Supply change	0/1
Reple change	0/1
El. bath drain time-out	min
Circul. pump vol	ml
Chemical control	0/1
Module down (1:All 2:El_bath)	0-2
Wait for start time	sec

2.2 TRAY

User Parameter

User Parameter Name	Unit
Guide Shower time	sec
POS3 Drain Change	0/1

Maintenance Parameter

Maintenance Parameter Name	Unit
Centering robot offset(x0.01)	mm
DC power supply Volt value (x0.1)	V

2.3 QDR

User Parameter

User Parameter Name	Unit
T1 Delay time	sec
T2 Drain time	sec
T3 Up-flow time	sec
T4 Standby time	sec
TDR Drain change	sec
T5 Drain time	sec
T6 Up-flow time	sec
Drain change	0/1

Maintenance Parameter

Maintenance Parameter Name	Unit
Robot standby	sec

2.4 PTN1,2

User Parameter

User Parameter Name	Unit
Step1 Current value (x0.1)	A
Step2 Current value (x0.1)	A
Step3 Current value (x0.1)	A

User Parameter Name	Unit
Step4 Current value (x0.1)	A
Step5 Current value (x0.1)	A
Step6 Current value (x0.1)	A
Step7 Current value (x0.1)	A
Step8 Current value (x0.1)	A
Step9 Current value (x0.1)	A
Step10 Current value (x0.1)	A
Step11 Current value (x0.1)	A
Step12 Current value (x0.1)	A
Step13 Current value (x0.1)	A
Step14 Current value (x0.1)	A
Step15 Current value (x0.1)	A
Step16 Current value (x0.1)	A
Step17 Current value (x0.1)	A
Step18 Current value (x0.1)	A
Step19 Current value (x0.1)	A
Step20 Current value (x0.1)	A
Step1 ON time (x0.1)	sec
Step2 ON time (x0.1)	sec
Step3 ON time (x0.1)	sec
Step4 ON time (x0.1)	sec
Step5 ON time (x0.1)	sec
Step6 ON time (x0.1)	sec
Step7 ON time (x0.1)	sec
Step8 ON time (x0.1)	sec
Step9 ON time (x0.1)	sec
Step10 ON time (x0.1)	sec
Step11 ON time (x0.1)	sec
Step12 ON time (x0.1)	sec
Step13 ON time (x0.1)	sec
Step14 ON time (x0.1)	sec
Step15 ON time (x0.1)	sec
Step16 ON time (x0.1)	sec
Step17 ON time (x0.1)	sec
Step18 ON time (x0.1)	sec
Step19 ON time (x0.1)	sec
Step20 ON time (x0.1)	sec
Step1 OFF time (x0.1)	sec
Step2 OFF time (x0.1)	sec
Step3 OFF time (x0.1)	sec
Step4 OFF time (x0.1)	sec

User Parameter Name	Unit
Step5 OFF time (x0.1)	sec
Step6 OFF time (x0.1)	sec
Step7 OFF time (x0.1)	sec
Step8 OFF time (x0.1)	sec
Step9 OFF time (x0.1)	sec
Step10 OFF time (x0.1)	sec
Step11 OFF time (x0.1)	sec
Step12 OFF time (x0.1)	sec
Step13 OFF time (x0.1)	sec
Step14 OFF time (x0.1)	sec
Step15 OFF time (x0.1)	sec
Step16 OFF time (x0.1)	sec
Step17 OFF time (x0.1)	sec
Step18 OFF time (x0.1)	sec
Step19 OFF time (x0.1)	sec
Step20 OFF time (x0.1)	sec
Step1 Repeat	#
Step2 Repeat	#
Step3 Repeat	#
Step4 Repeat	#
Step5 Repeat	#
Step6 Repeat	#
Step7 Repeat	#
Step8 Repeat	#
Step9 Repeat	#
Step10 Repeat	#
Step11 Repeat	#
Step12 Repeat	#
Step13 Repeat	#
Step14 Repeat	#
Step15 Repeat	#
Step16 Repeat	#
Step17 Repeat	#
Step18 Repeat	#
Step19 Repeat	#
Step20 Repeat	#

2.5 INCTC**User Parameter**

User Parameter Name	Unit
Wafer limit size (x0.01)	mm

2.6 N₂ DRY**User Parameter**

User Parameter Name	Unit
Purge standby T	sec
Lifter standby T	sec
Lowering time	sec
Rinse time	sec
Lift up time	sec
Dry time	sec
Up-flow time	sec

Maintenance Parameter

Maintenance Parameter Name	Unit
N ₂ blow (Rinse)	0/1
N ₂ blow (Dry)	0/1
N ₂ blow (Carry out)	0/1
N ₂ blow (Lift up)	0/1
Up flow (Lift up)	0/1
N ₂ temp check	sec

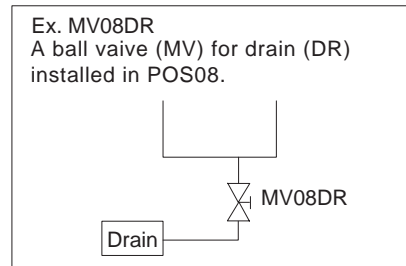
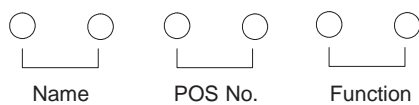
3 Flow sheet

The flow sheet for customized equipment is appended at the end of this manual. The flow sheet may include parts that are illegible since it is a miniature copy of the flow sheet attached to the Mutual Agreed and Confirmed Specifications. In such cases, refer to the original flow sheet. This section describes how to read the flow sheet.

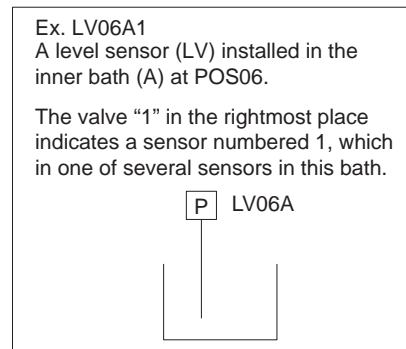
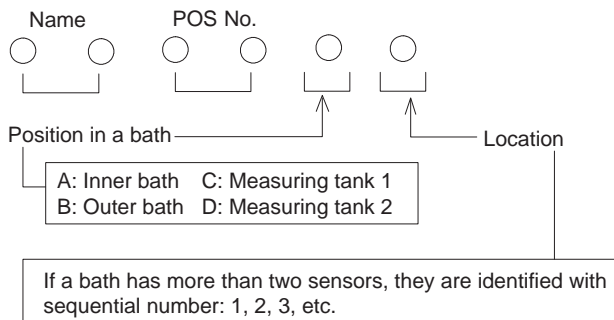
3.1 How to read the flow sheet

The flow sheet allows you to confirm the location of all components (including sensors, motors and valves) used in modules and piping connections. The pictograms and alphanumeric characters for each component in the flow sheet have the following meanings.

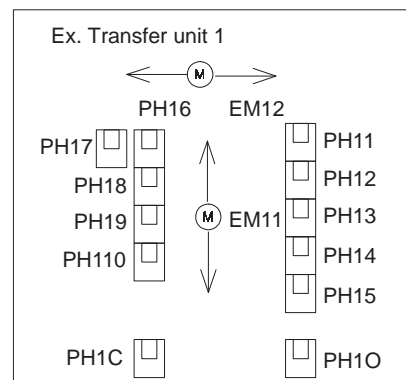
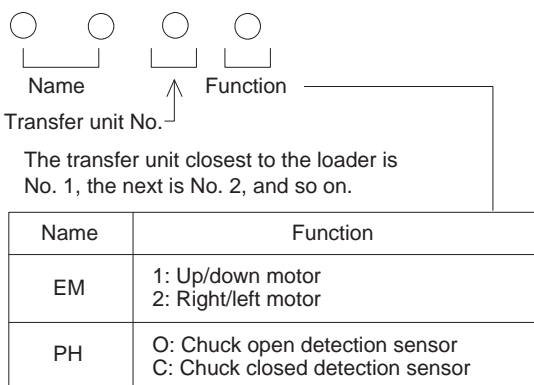
Basic



Level sensor



Position sensor for transfer unit

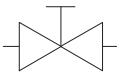

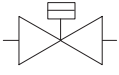

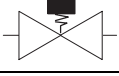



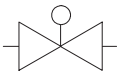


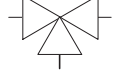
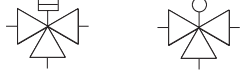

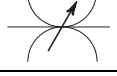
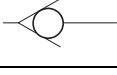
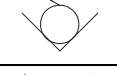
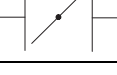
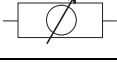
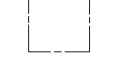

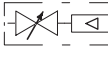
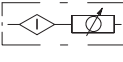
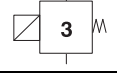




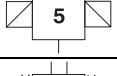
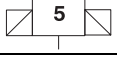

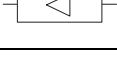
* For names and functions, refer to the following list




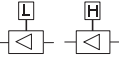


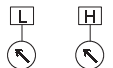



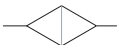




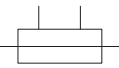




3.1.1 Component function list






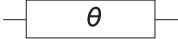











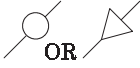


Code	Component/Function	Code	Component/Function
AH	Air Heater	PT	Pressure Feed
AI	Air In	RA	Rotary actuator
AN	Air Knife	RE	Regulator
AO	Air Out	RT	Recovery
AP	Air Pump	SD	Supply Water
AS	Aspirator	SF	Side Flow
BY	Bypass	SG	N ₂ Gun
CD	Conductivity Meter	SH	Shower
CH	Change	SL	DI Gun
CI	Circulation	SP	Sampling
CO	Cooling	SU	Supply
CY	Cylinder	TC	Bath Washing
DR	Drain	TH	Load In
NB	Bubbling	UP	Upflow
NP	Nitrogen Purge		

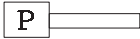

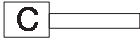



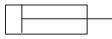











3.1.2 Component code list













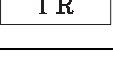
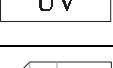




Code	Name	Note	
	MV	Open/close valve	Ball valve, etc.
	RV	Flow control valve	Diaphragm valve. Needle valve, etc.
	AV	Air valve	Single operation valve
	AV	Air valve	Double-operation air valve
	AV	Air valve	Relief air valve
	AV	Air valve	Air valve for quick water drain

Code	Name	Note
	SV	Solenoid valve
	SV (or AV)	Solenoid valve (or air valve) N.O(Normal open) solenoid valve Air valve ( Air valve)
	TV	Three-way valve 
	KV	Control valve
	FV	Constant-flow valve
	CV	Check valve
	RF	Relief valve
	BV	Butterfly valve For exhaust control
	RE	Regulator
	As shown in the following examples. This symbol is used in the illustrated part of the unit	 Dead water type (Air valve)  Attached Needle (Flow meter)  Filter (Regulator)
	SV	3 port solenoid valve Single solenoid
	SV	4 port solenoid valve Single solenoid
	SV	4 port solenoid valve Double solenoids
	SV	4 port solenoid valve Double solenoids 3 of 4 ports are open. (Center one is closed.)
	SV	5 port solenoid valve Single solenoid
	SV	5 port solenoid valve Double solenoids
	SV	5 port solenoid valve Double solenoids 3 of 4 ports are open. (Center one is closed.)
	FL	Flow meter For liquid
	FL	Flow meter For gases

Code	Name	Note
	FL	Flow meter
		Digital type ( For liquid  For gases)
	FS	Flow meter w/contact
		H: Upper limit level M: Designated chemical level L: Lower limit level (A digital flow meter is also included.)
	FS	Flow switch
	PG	Pressure gauge
	PS	Pressure gauge w/contact
		H: Upper limit level L: Lower limit level
	PS	Pressure transducer
	MG	Manometer gauge
	MM	Manometer switch
	FI	Filter
	EP	Electric pump
	AP	Air pump
	HE	Heater
	CI	Thermo-electric cooling
	CI	Cooling Unit
	TP	Thermo-sensor
		Platinum resistor (Pt100Ω)
	TP	Thermo-sensor
		Platinum resistor (2 pair set) (Pt100Ω)
	TP	Thermo-protector
		Platinum resistor (Pt100Ω)
	TC	Thermo-sensor
		CA Thermo-couple

Code		Name	Note
	TC	Thermo-protector	CA Thermo-couple
	TR	Thermo-sensor	Thermostat
	TR	Thermo-protector	Thermostat
	TT	Thermo-sensor	Thermistor
	TT	Thermo-protector	Thermistor
	TF	Temperature fuse	
	AS	Aspirator	
	PD	Pulse damper	
	MW	D-sonic	
	US	Ultrasonic generator	
	LV	Level-sensor	Pressure detection type
	LV	Level-sensor	Electrode type
	LV	Level-sensor	Electrostatic type
	LV	Level-sensor	Float type
	LV	Level-sensor	Air type
	SL	DI gun	
	SG	N ₂ gun	
	—	Air knife	 Blowout drill hole  Blowout slit

Code		Name	Note
	PC	PH meter cell	
	CM	Conductivity meter	
	CC	Conductivity meter	
	CO	Concentration meter	For liquid
	DE	Gas detector	For gasses (i.e., IPA and O ₃)
	SC	Speed controller	
	CY	Cylinder	
	CY	Cylinder with sensor	
	CY	Pneumatic cylinder	
	RA	Rotary actuator	
	EM	Electric motor	
	AM	Air motor	
	FM	Fan motor	
	MB	Magnetic brake	
	MC	Magnetic clutch	
	AC	Rotary encoder	
	SO	Solenoid lock	
	—	Movement (vertical or swinging)	

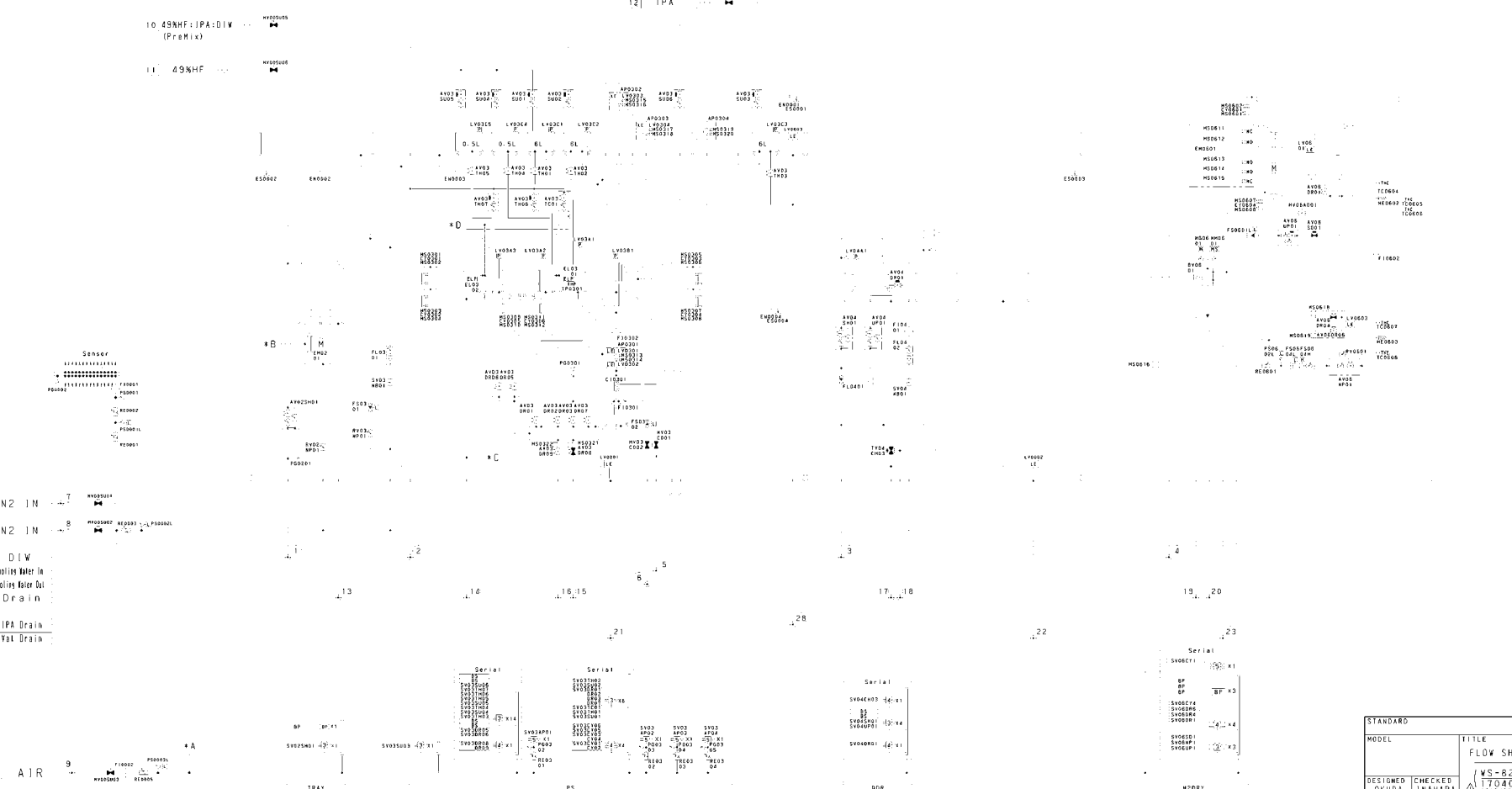
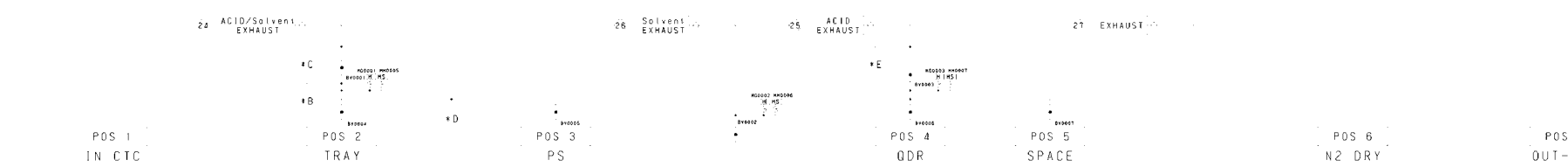
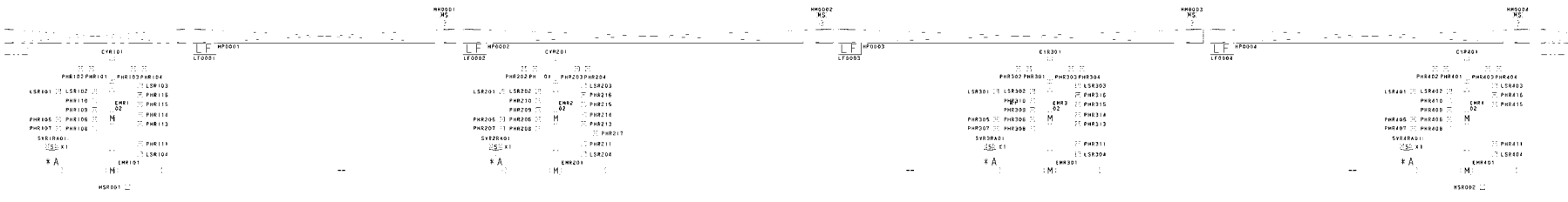
Code	Name	Note	
	PH	Photo-sensor	Transparent type
	PH	Photo-sensor	Reflection type
	PH	Photo-sensor	Integrated type
	PH	Wafer counter	
	MS	Proximity switch	
	LS	Limit switch	
	VS	Vibration sensor	
	ES	Sensor for extinguisher	T. Thermo-sensor F. Flame sensor C. Concentration sensor
	EN	Nozzle for extinguisher	
	HP	Fan filter unit	
	LF	Light fixture	
	AE	Ionizer	
	IR	IR heater	
	UV	UV heater	
	EC	Exhaust cleaner	
	OI	Oiler	
	ST	Steam trap	
	PBEM	Emergency stop switch	

3.2 Flow sheets for different types of customized equipment

The flow sheets for this equipment are appended from the next page.

(These flow sheets are subject to revision. For the latest edition of the flow sheets, refer to the Mutually Agreed and Confirmed Specifications)

NO.	UTILITY	CONNECTION	MATERIAL	PRESSURE	TEMPERATURE	QTY	REMARKS



N2 IN 7
N2 IN 8
DIW
Cooling Water In
Cooling Water Out
Drain
IPA Drain
Val Drain

AIR 9

Serial

SV03100	10
SV03101	11
SV03102	12
SV03103	13
SV03104	14
SV03105	15
SV03106	16
SV03107	17
SV03108	18
SV03109	19
SV03110	20
SV03111	21
SV03112	22
SV03113	23
SV03114	24
SV03115	25
SV03116	26
SV03117	27
SV03118	28
SV03119	29
SV03120	30

Serial

SV04001	1
SV04002	2
SV04003	3
SV04004	4
SV04005	5
SV04006	6
SV04007	7
SV04008	8
SV04009	9
SV04010	10

Serial

SV05001	1
SV05002	2
SV05003	3
SV05004	4
SV05005	5
SV05006	6
SV05007	7
SV05008	8
SV05009	9
SV05010	10

07/25/11	1.1	1	Correct the number product.
REV	NO.	DATE	REVISION

STANDARD		TITLE	
MODEL		FLOW SHEET	
DESIGNED	CHECKED	17040008A	
DKUDA	INAHARA		
DRAWN	APPROVED	SCALE	DATE 06/07/11
DKUDA	INAHARA		
DAINIPPON SCREEN		DRAWING NO.	
MFG CO. LTD.		F-E1-00153	

CONFIDENTIAL

Wet Station
WS-620/820 Series REFERENCE MANUAL

Control No. 170400068A

First Edition published in October 2011

- Publication TechInTech Co., Ltd.
- Editing/Printing Tec Communications Co., Ltd.