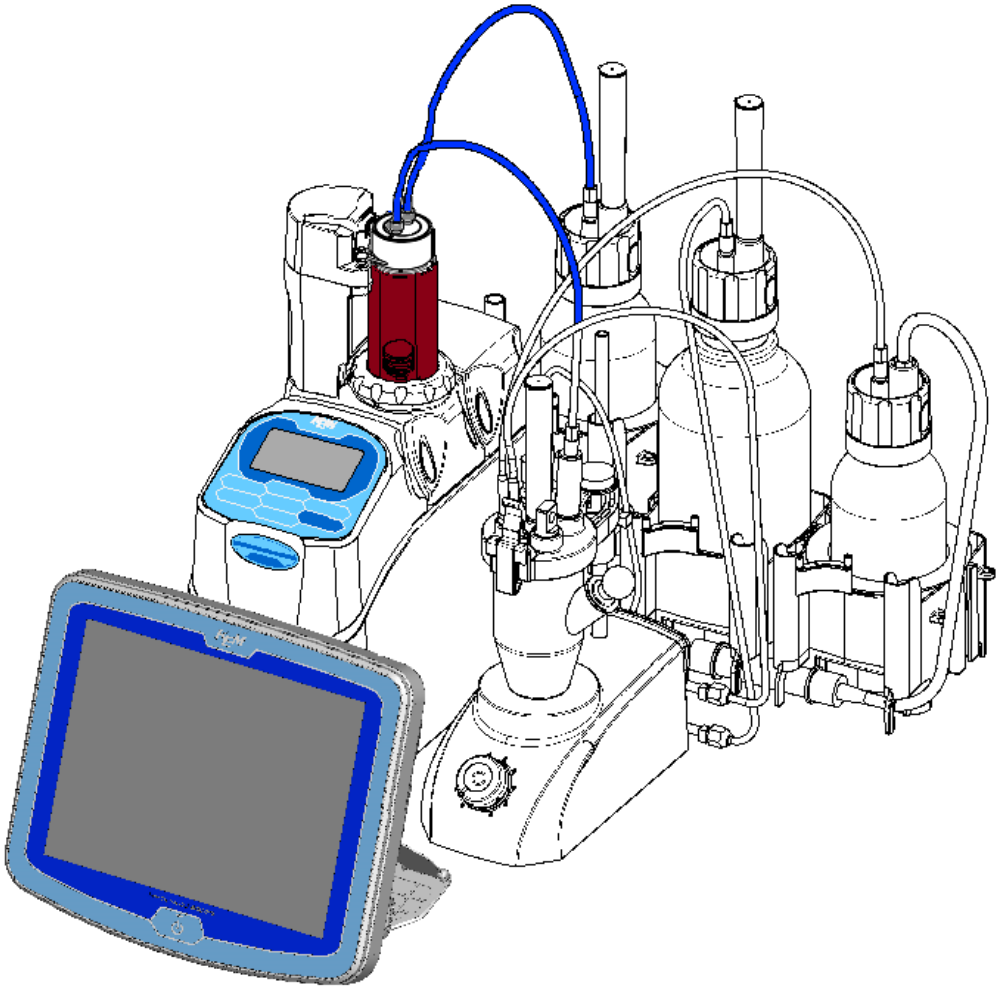
Main Control Unit

MCU-710M/S

(for use with MKV-710)

Function Description



Please read this manual thoroughly in advance for the best performance of the equipment.

KYOTO ELECTRONICS MANUFACTURING CO.,LTD.
http://www.kyoto-kem.com
AN 59-00461-13Ver.00

About the Manual

Read this operation manual thoroughly before use.
It describes all that are required for routine measurements.
Keep this manual beside your equipment so that you can refer to whenever necessary.

For detailed test methods, see the separate Function Description.

The following symbols indicate the important notes that raise your attention.

1. Note

Note

Unless you observe the note, you may not be able to obtain specified performance of the unit, and your unit may not be covered by warranty.

2. Hint

This symbol notes technical tips which are convenient to your measurement work.

※This manual has been prepared to the best of our knowledge;however, if you should find any missing or ambiguous description, please contact your nearest dealer or sale representative.

※Maker will not be liable for any loss or damage caused by use of or the result of the product.

※This manual describes usage according to standard specification. For special version, refer to the accompanying document.

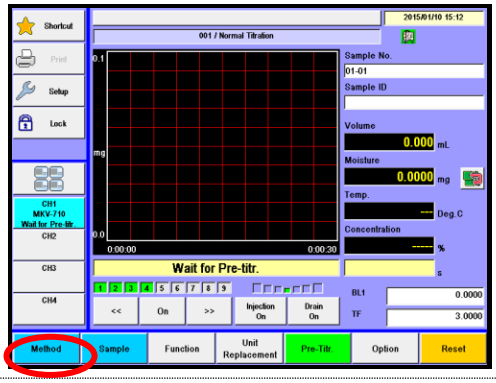
Table of Contents

1. Method

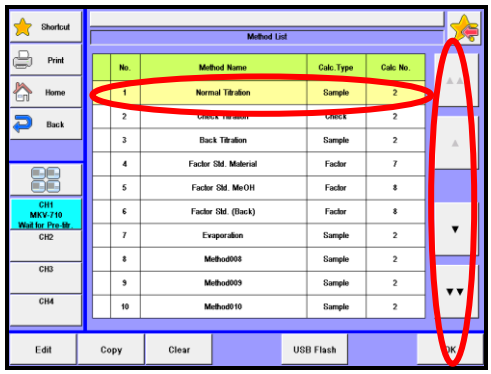
1-1. Method edit

For precise measurement effected in a short span of time, it is necessary to configure conditions appropriate for a sample and a method. The method consists of information on the measuring conditions, calculation of concentration, and the like. MKV-710 can store standard methods (No. 001 through 120). Each method can be named individually.

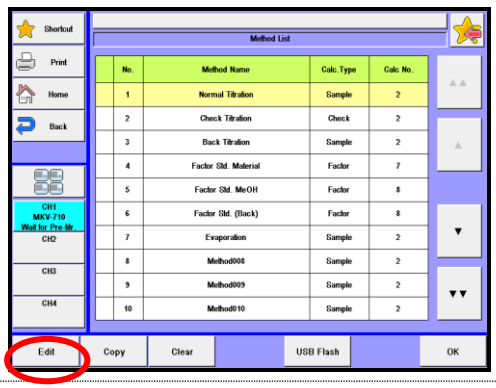
1 Press [Method] button.



2 Select the method you wish to edit [▼], [▲] button.



3 Press [Edit] button.



[▲], [▼]
Moves the cursor on the list.

[▲▲], [▼▼]
These keys are for page turning. The cursor moves to the top of the list after page break.

[Edit]
When "Method Edit" display appears, you can edit the Method (measurement parameters) where the cursor stays on.

[Copy]
On "Select Source" display, you can copy the Method where the cursor stays on. For details of Method copy, refer to "1-1-1. [Copy]."

[Clear]
The Method with cursor on is initialized to default preset at time of shipment in plant. For details of Method Clear, refer to "1-1-2. [Clear] (Method conditions)."

[USB Flash]
Save the method data into USB flash drive. Either load the data stored on USB flash drive into the measuring unit or delete the data stored on USB flash drive. For the details on how to save methods into USB flash drive, see the section, "1-1-3. [USB Flash] (Method conditions)."

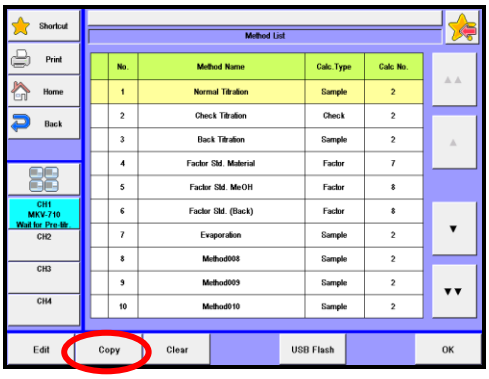
[OK]
The user can choose a Method used for measurements with [▲] or [▼] key and press this button to confirm the change.

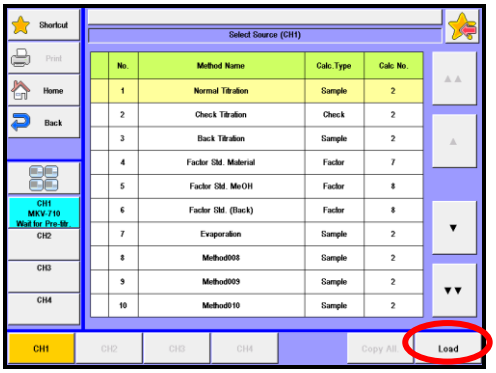
1-1-1.**[Copy]**

The user can copy the currently selected method conditions.

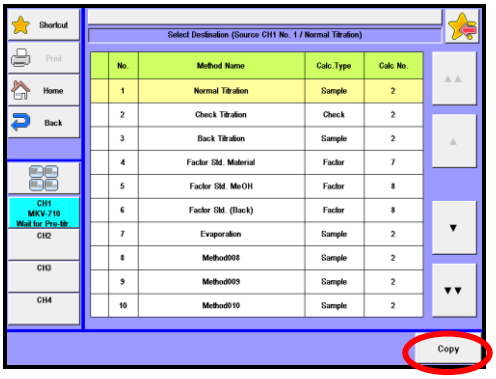
1 Press [Copy] button.
When copy different channel, select source channel on "Select Source" dialog.

Select the source Method and press [Load] button.





2 When "Select Destination" display appears, select a destination where the copied Method will be transferred. Press [Copy] button. Press [Yes] button once a confirmation message appears.



[▲], [▼]
Moves the cursor on the list.

[▲▲], [▼▼]
These keys are for page turning. The cursor moves to the top of the list after page break.

[CH1] 、[CH2] 、[CH3] 、[CH4]
Select the channel number with the method of the origin of copy.

[Copy All.]
Executes copying the all Method. This button gets enabled by the same type measuring unit connected.

[Load]
Select the source Method.

[Copy]
Executes copying the Method

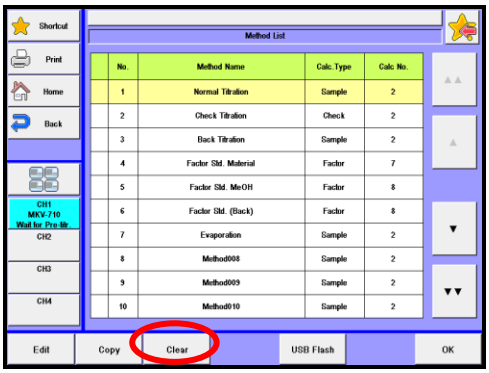
Note

The copied and transferred Method rides over the existing Method. It is recommended to print out the existing Method before it is erased.

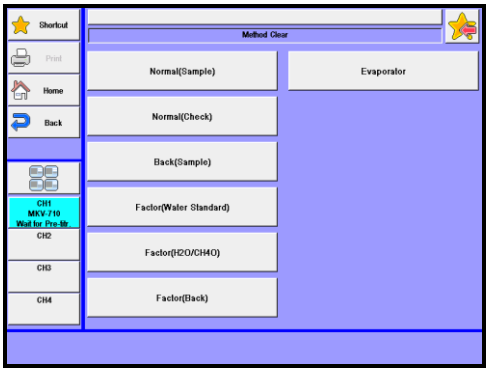
1-1-2.[Clear] (Method conditions)

The user can initialize the currently selected method conditions to the default.

1 Select the method you wish to clear [▼] button [▲]. Press [Clear] button.



2 When "Method Clear" display appears, select an initialized default Method. Press [Yes] button once a confirmation message appears.



[Normal(Sample)]
Method conditions are initialized to "No.1" method conditions.
[Normal(Check)]
Method conditions are initialized to "No.2" method conditions.
[Back(Sample)]
Method conditions are initialized to "No.3" method conditions.
[Factor(Water Standard)]
Method conditions are initialized to "No.4" method conditions.
[Factor(H2O/CH4O)]
Method conditions are initialized to "No.5" method conditions.
[Factor(Back)]
Method conditions are initialized to "No.6" method conditions.
[Evaporator]
Method conditions are initialized to "No.7" method conditions.

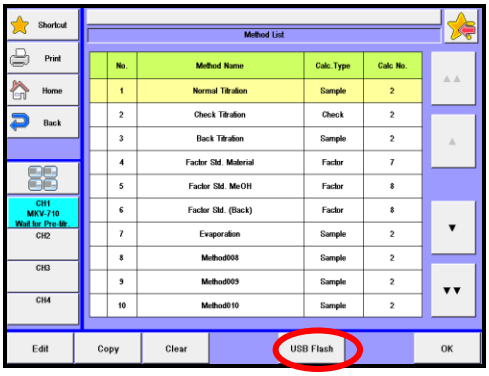
1-1-3.[USB Flash] (Method data)

Save all methods into USB flash drive together. Either load the data stored on USB flash drive into the measuring unit or delete the data stored on USB flash drive.

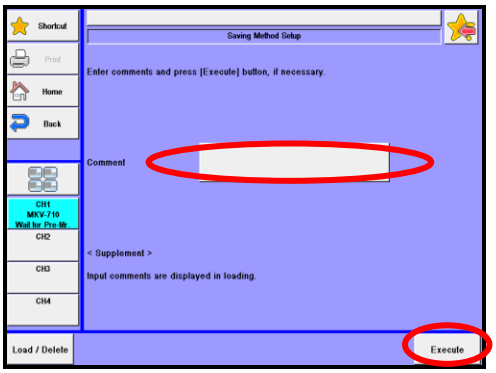
< How to save method >

1 Connect the USB Flash drive to the device.

Press [USB Flash] button to show "Saving Method Setup."



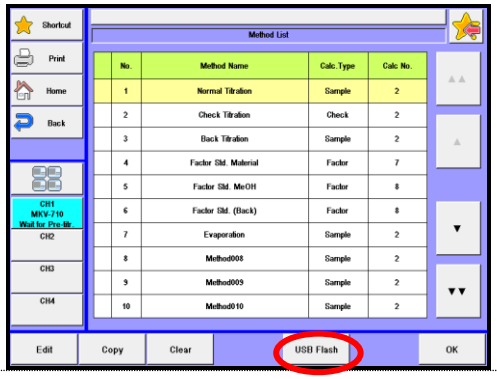
2 When entering comments with the method data to be saved, press the portion where comment is displayed. After confirming the right screen display, enter comments and press [OK] button. Press [Execute] button on the "Saving Method Setup" screen display. Confirming the verifying-entry message, press [Yes] button.
All methods are saved into USB flash drive and the screen display returns to the initial menu.



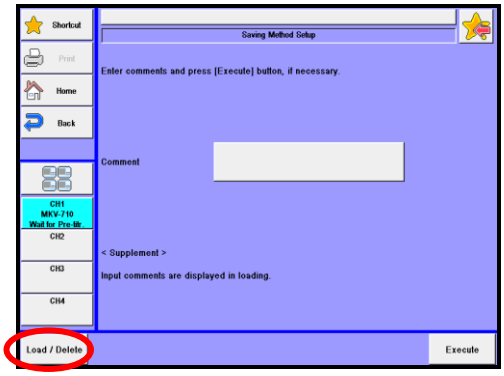
<Load/Delete the Method on USB flash drive>

1 Connect the USB Flash drive to the device.

Press [USB Flash] button to show "Save Method."



2 Press [Load/Delete] button.

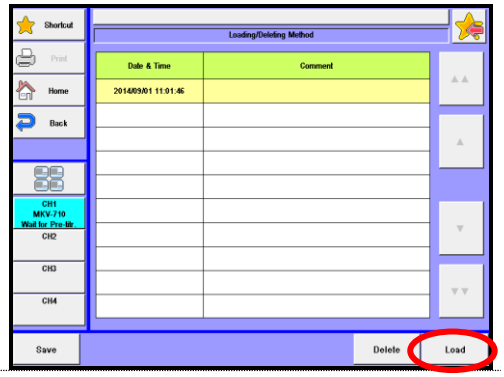


Item	Description
[Load/Delete]	Either load the data stored on USB flash drive into the measuring unit or delete the data stored on USB flash drive.

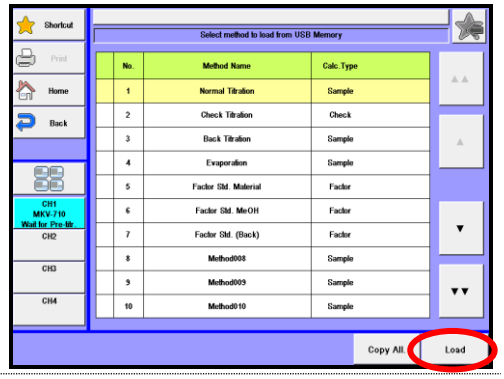
Note Do not detach the USB flash drive from the slot when making access to it.

< How to load the Method >

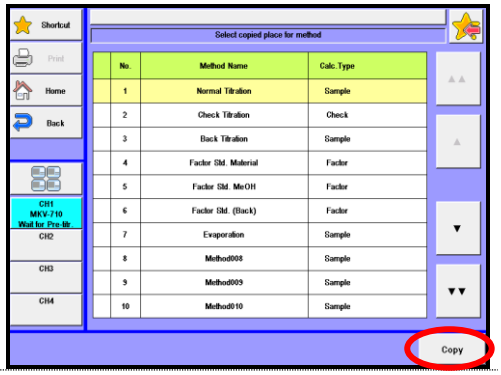
1 Select the method file to be loaded into the measuring unit on the "Loading/Deleting Method" screen display and then press [Load] button.



2 The screen of "Select method loaded from USB flash drive" will be displayed. Then, select the method to be loaded into the measuring unit and press [Load] button.

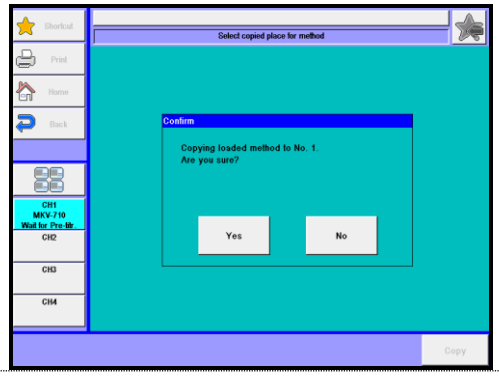


3 The screen of "Select copied place for method" will be displayed. Then, select the method copied to and press [Copy] button.

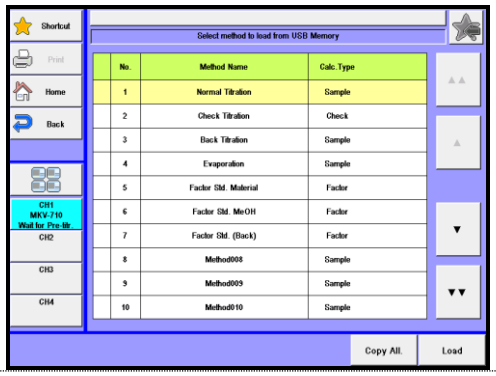


Note The copied and transferred Method rides over the existing Method. It is recommended to print out the existing Method before it is erased.

4 When the confirmation screen is displayed, press [Yes] button.

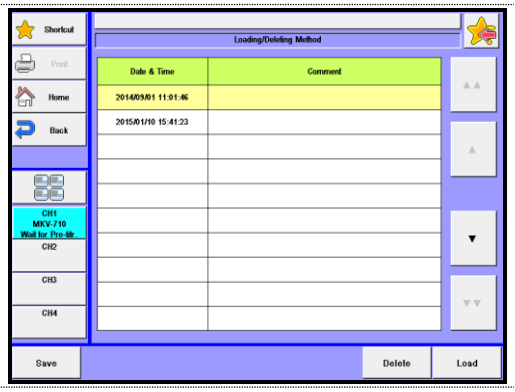


5 The method will be copied onto the method selected in the method list and the screen display will return to "Select method to load from USB flash drive". When loading further methods, repeat the above steps 2 through 4.

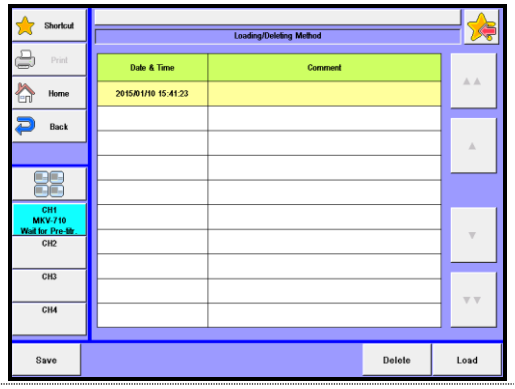


< How to delete method >

1 Select the method file to be deleted on the "Loading/Deleting Method" screen display and then press [Delete] button. The screen display will turn to the confirmation screen. Then, press [Yes] button.



2 The method file selected on USB flash drive will be deleted and the screen display will return to "Loading/Deleting Method". When deleting further method files, repeat the above steps 1).



1-2. Outline of Method

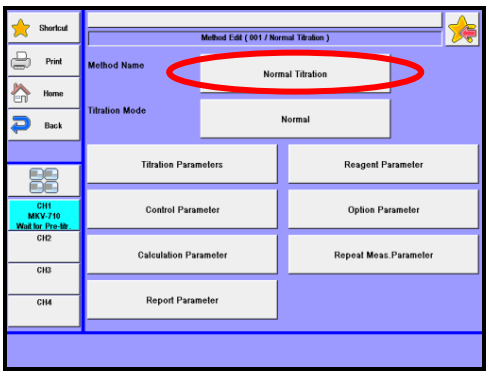
A Method consists of [Titration Mode] [Titration Parameters], [Control Parameter], [Calculation Parameter], [Report Parameter], [Reagent Parameter] ,[Option Parameter] and [Repeat Meas. Parameter].

Item	Description
[Titration Mode]	Set a titration mode.
[Titration Parameters]	Settings for general titration.
[Control Parameter]	Set for your intended titration including titrant dose speed, data sampling mode, EP detection method and its conditions.
[Calculation Parameter]	Equation for concentration calculation is set.
[Report Parameter]	Settings for printing contents.
[Reagent Parameter]	Select a burette to be used in titration and fixed dose.
[Option parameter]	How to purge and time, set the heating temperature when connected option (such as a burette or oven).
[Repeat Meas. Parameter]	Settings for Repeat measurement.

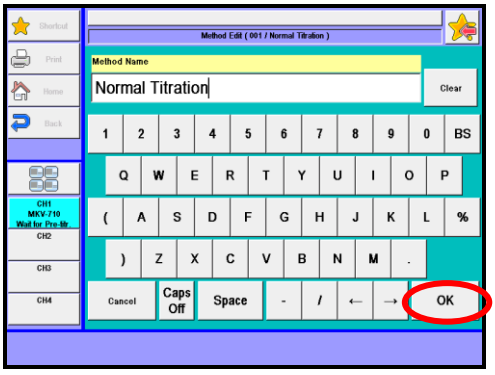
1-3. Method Name

Edit the name of the method.

1 Press [Method Name] button.



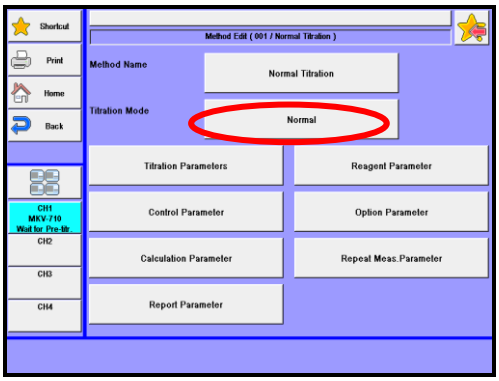
2 Enter the name of the method, please press the [OK] button. Up to 20 characters can be entered.



1-4. Titration Mode

The selection and type of titration, and the selection of the titration mode.

1 Press [Titration Mode] button.
Select the titration mode.

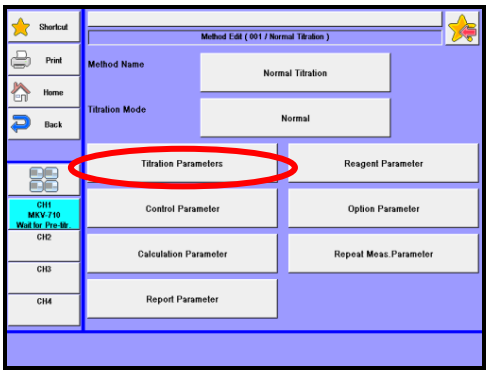


Item	Description
[Titration Mode]	• Normal :This mode is selected for measurement of water content. • Back :Back titration for slow water extraction by dehydrated solvent or slow reaction of KF reagent and water.

1-5. Titration Parameter

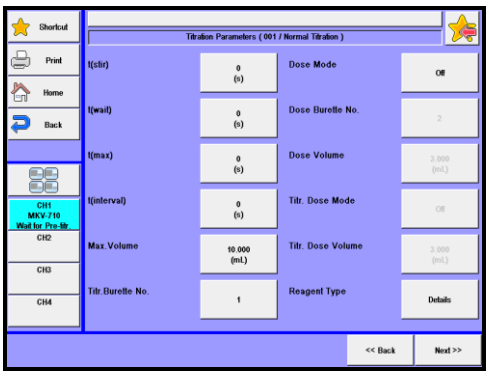
Settings for general titration.

1 Press [Titration Parameter] button.



2 Lease change the mode numbers and select the parameter you wish to edit.

Each parameter is determined by the [OK] button.



Item	Description
[t(stir)]	Select a time length to wait for titration start after a sample is discharged into the titration cell, particularly for those samples which are hard to dissolve in the dehydrated solvent and difficult to extract moisture • 0～99999s
[t(wait)]	Enter the shortest time length for a measurement from start to end. This parameter is necessary when, for example, there are two inflection points but endpoint is determined in between the two points since dehydration is maintained between the two peaks. • 0～99999s
[t(max)]	Limit a time length for a titration. This means the total time length from start to end is [t(stir)] + [t(wait)]+ [t(max)]. The printing covers the measuring process [t(wait)] + [t(max)]. The event during [t(stir)] will not be printed out. [t(max)=0] means titration will not terminate by time limit. This is useful when an Evaporator is connected or when micro amount of moisture continues to be extracted from solvent even after most of water has been titrated. • 0～99999s
[t(interval)]	Enter an intermittent time for dosing reagent. The "t(interval)" appears only when [t(wait)] = 0 is preset. For example, when a titration is started and End time (e.g. 30s) has elapsed where conditions for finding an endpoint are satisfied, the system will wait for preset [t(interval)] length since then. If water is detected during that intermittent time, it will further continue titration, however, if water is not detected, then, the titration will be finished after [t(max)] time has elapsed succeeding End time and intermittent time. If selected [t(interval)] length is longer than titration [t(max)], titration will be finished when the limit time has elapsed. In case [t(max)] = 0 is preset, press [Reset] button to terminate titration. This is useful to complete KF titration for such a sample of which reaction with reagent is slow • 0～99999s
[Max. Volume]	Titration will end when it reaches preset amount of titrated volume regardless of potential changes or time length elapsed in titration for endpoint detection. Such titration results will not be calculated. • 0.005～9999.00mL
[Titr. Burette No.]	Selection of a burette for titration. • 1 : The supplied first burette • 2 : The additional second burette

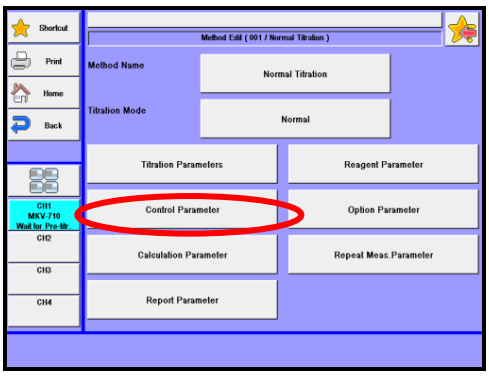
Item	Description
[Dose Mode]	Selection of fixed dose of reagent or water methanol standard before titration is started. • Off : No fixed dose. This appears only when "Titr. mode" is set to"Normal " • Set : The reagent is dosed into the burette for the preset amount of [Dose volume] volume. • Auto: Fixed dose activates by automatically sensing over-dose of KF reagent. This appears only when "Titr. Mode" is set to "Back".
[Dose Burette No.]	Selection of a burette for fixed dose. This appears only when "Dose mode" is set to "Set" or "Auto". • 1 : The supplied first burette • 2 : The additional second burette
[Dose Volume]	Enter the amount of fixed dose, which appears only when "Dose Mode" is set to "Set". • 0.00～9999.00mL
[Titr. Dose Mode]	Enter the amount of fixed dose by Back Titration, which appears only when "Titration Mode" is set to "Back". • Off : No fixed dose. • On : The reagent is dosed into the burette for the preset amount of [Titr. Dose Volume] volume before titration.
[Titr.Dose Volume]	Enter the amount of fixed dose, which appears only when "Titr. Dose Mode" is set to "on". • 0.005～999.000mL

Reagent Type	Selects the reagent type. Check the "Reagent Type" for smart burette set in the Reagent information. If different, an error will occur during measurement. This prevents you from using an incorrect reagent. This function is valid only when "Smart Burette Functionality" - "Other Setting" - "Function" is set "Enable". • Not Check : Not used. • KF Reagent : Set when Karl Fischer reagent .In this setting, the factor is not specified. • KF Reagent Factor 5 : Set when Karl Fischer reagent factor is 5. • KF Reagent Factor 3 : Set when Karl Fischer reagent factor is 3. • KF Reagent Factor 2 : Set when Karl Fischer reagent factor is 2. • KF Reagent Factor 1 : Set when Karl Fischer reagent factor is 1. • Water-Methanol : Set when Water-Methanol. In this setting, the factor is not specified. • Water-Methanol Factor5 : Set when Water-Methanol Factor is 5. • Water-Methanol Factor2 : Set when Water-Methanol factor is 2.

1-6. Control Parameter

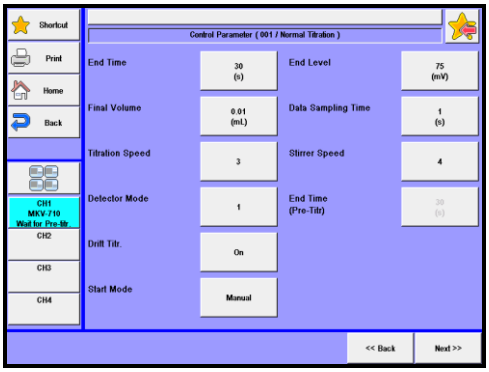
Settings for control of the titration.

1 Press [Control Parameter] button.



2 Please change the mode numbers and select the parameter you wish to edit.

Each parameter is determined by the [OK] button.



1. Method

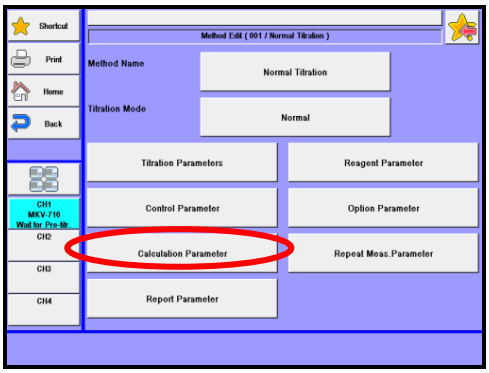
Item	Description
[End Time]	If over-dosing of reagent in the vicinity of endpoint continues longer than preset time length, the titration ends as it is regarded as the endpoint. EP will not be sensed if [End time] = 0. • 0～99s
[Final Volume]	Enter the minimum amount of KF reagent dosed in the vicinity of endpoint. Titration time may be shortened if a larger amount is preferred but the error will increase. Whereas, selection of smaller amount will decrease the error but it will end the titration in a longer time. • 0.01～9.99mL
[Titration Speed]	Optimum titration speed depends on selection of reagent, dehydrated solvent or the sample to be measured. If titration speed is found to cause over-titration, slow down the speed. Recommended: 1 ~ 6 for normal titration and 1 ~ 3 for back titration. • Fast 1 ···· 6 Slow
[Detector Mode]	Selection of electric current for the electrode depending on dehydrated solvent or sample type. • 1 : Typical unless otherwise specified • 2 : For titration using oils or ketones dehydrated solvent or in case of no ending of titration even with excessive KF reagent dosed.
[Drift Titr.]	Selection of drift titration as follows: • Off : Once the titration flask is dehydrated, it will not be re-dehydrated even when water is detected during titration wait-time. For example, when "Drift titration" is set to "On" and "Start mode" is set to "Auto" and in this situation if water content in a sample is extremely of a small amount, the water in the sample, when injected into the flask, is regarded as drift water and, dehydration continues without measurement is performed. In this case, "Off" is preferred for drift titration. Discharge the sample immediately after dehydration in order to avoid increasing positive error due to the drift. • On : This setting is for normal situation where titration starts automatically as soon as water is detected during titration wait time while maintaining the titration flask dehydrated.
[Start Mode]	Selection of titration start. This appears only when "Drift. titr." is set to "On". • Manual : Use this mode for blank test or for samples with a small amount of water. • Auto : Titration starts automatically by sensing water increase in the sample after discharged into the flask.

Item	Description
[End Level]	Select an endpoint potential, usually 75mV for water. • 0 ~ 1000mV
[Data Sampling Time]	Select a time interval for data sampling. Titration volume and accumulated amount will be automatically sampled at the interval of an input time. • 1 ~ 99999s
[Stirrer Speed]	Here you select stirrer speed depending on the sample type: • Slow 0～9 Fast
[End Time (Pre-Titr)]	End time length for Pre-Titr by Back titration. If over-dosing of reagent in the vicinity of endpoint continues longer than preset time length, the titration ends as it is regarded as the endpoint. EP will not be sensed if [End time] = 0. This feature will be effective when the titration mode is "Back". • 0～99s

1-7. Calculation Parameter

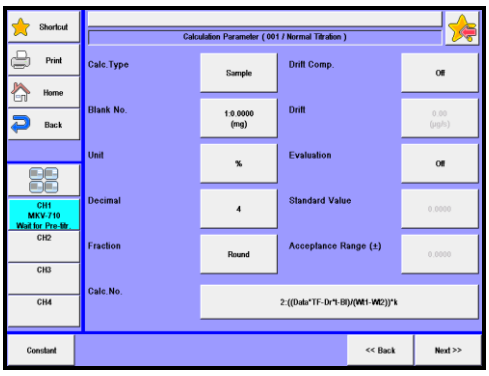
Settings for calculating the result.

1 Press [Calculation Parameter] button.



2 Please change the mode numbers and select the parameter you wish to edit.

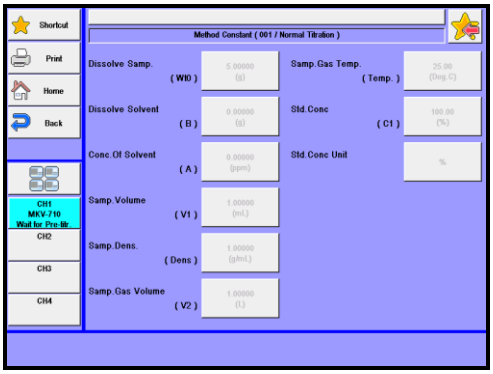
Each parameter is determined by the [OK] button.



Item	Description
[Calc. Type]	Selection of calculation type: • Sample : Set up a Method for sample measurement. • Blank : Set up a Method for blank measurement. • Factor : Set up a Method for factor measurement. • Check : Set up a Method for check measurement with standard substance.

Note When "Check" is chosen, the measurement results will be stored in memory as a check history. When "Factor" is chosen, the measurement results will be stored in memory as a factor history.

[Blank No.]	Number a blank value you use in calculation. Refer to [Function] – [Blank list] for blank values. • 11～20
[Unit]	Here you select a unit used in calculation. • mL :For Calc. No. of "10" • mg :For Calc. No. of "11" • %, ppm, mg/g, mg/kg :For Calc. No. of "12, 13, 14, 15, 16" • mg/mL :For Calc. No. of "17, 18"
[Decimal]	Enter a number of digits after decimal point for calculation results: • 0 ~ 8 place
[Fraction]	Selection of fraction rounding in calculation: • Half adjust : Rounded to nearest preset number of digits after decimal point • Round off : Rounded down to nearest preset number of digits after decimal point • Round up : Rounded up to nearest preset number of digits after decimal point
[Calc. No.]	• Here you select the numbered equation. • 0 :For Calc. type of "Sample" or "Check" • 1 :For Calc. type of "Blank", "Sample" or "Check" • 2～6 :For Calc. type of "Sample" or "Check" • 7, 8 :For Calc. type of "Factor"
[Drift Comp.]	Selection of drift compensation: • Off : No compensation is made. Select this to know total water content including drift. • Manual : Enter offset value. This is used when drift value or blank is determined in titration without sample.

Item	Description
[Drift]	Enter the offset value for correcting the drift level. This is significant only for "Manual" compensation. The unit of a drift level entered here differs from the unit in the time of using it in a calculation formula. • 0.00 ~ 99.99ug/min
[Evaluation]	The measurement results will be evaluated by this function: • Off : The measurement results are not evaluated. • On : The measurement results are evaluated.
[Standard Value]	Enter a standard value to make the evaluation in the following range. • 0.00000000～99999.99999999
[Acceptance Range(±)]	Enter permit error to determine if the calculation result is off the range against the standard value. • 0.0000～99999.9999
[Constant]	Display the Method constant screen. Set the sample-dependent constants used for the measurements on gas samples or samples dissolved with solvents. Method constants can be setup when "Method" is selected in the [Function] – [Other Settings] – [Setup of Constant Properties] , settable only on the constants that are being used for the Calc. No. of the calculation parameters of presently selected method. 

	Set "1.002%" for reference material of 10.02mg/g.

＜Calculation formula＞

Calc. No.	Purpose	Equation
0	Titration volume of burette	Data Unit:mL
1	Calculation of water content	$\mathrm{Data}\times\mathrm{TF}-\mathrm{Drift}\times\mathrm{t}-\mathrm{Blank}$ Unit:mg
2	Concentration of liquid or solid by weighing	$\frac{\mathrm{Data}\times\mathrm{TF}-\mathrm{Drift}\times\mathrm{t}-\mathrm{Blank}}{\mathrm{Wt1}-\mathrm{Wt2}}\times\mathrm{k}$ Unit:%(k=0.1), mg/kg, ppm(k=1000), mg/g(k=1)
3	Concentration of a weighed part of water in liquid or solid dissolved with solvent extraction	$\left(\frac{\mathrm{Data}\times\mathrm{TF}-\mathrm{Drift}\times\mathrm{t}-\mathrm{Blank}}{\mathrm{Wt1}-\mathrm{Wt2}}\times\frac{\mathrm{B}+\mathrm{Wt0}}{\mathrm{Wt0}}-\frac{\mathrm{A}\times\mathrm{B}}{\mathrm{Wt0}}\times10^{-3}\right)\times\mathrm{k}$ Unit:%(k=0.1), mg/kg, ppm(k=1000), mg/g(k=1)
4	Concentration when the volume of liquid sample is measured	$\frac{\mathrm{Data}\times\mathrm{TF}-\mathrm{Drift}\times\mathrm{t}-\mathrm{Blank}}{\mathrm{V1}\times\mathrm{Dens}}\times\mathrm{k}$ Unit:%(k=0.1), mg/kg, ppm(k=1000), mg/g(k=1)
5	Concentration when the volume of gas sample is measured	$\frac{(\mathrm{Data}\times\mathrm{TF}-\mathrm{Drift}\times\mathrm{t}-\mathrm{Blank})\times22.4}{\mathrm{V2}\times18}\times\left(1+\frac{\mathrm{Temp.}}{273}\right)\times\mathrm{k}$ Unit:%(k=0.1), mg/kg, ppm(k=1000), mg/g(k=1)
6	Concentration of a weighed part of water in solid dissolved with solvent extraction (Sample is not soluble)	$\mathrm{X}=\frac{\mathrm{Data}\times\mathrm{TF}-\mathrm{Drift}\times\mathrm{t}-\mathrm{Blank}}{\mathrm{Wt1}-\mathrm{Wt2}}\times\left(\frac{\mathrm{B}}{\mathrm{Wt0}}+\frac{\mathrm{X}}{10^3}\right)-\frac{\mathrm{A}\times\mathrm{B}}{\mathrm{Wt0}}\times10^{-3}$ $\therefore X\times k$ Determine X from this equation Unit:%(k=0.1), mg/kg, ppm(k=1000), mg/g(k=1)
7	Factor measurement of KF reagent with pure water or standard	$\frac{\mathrm{C1}\times(\mathrm{Wt1}-\mathrm{Wt2})}{\mathrm{Data}}\times10\times\mathrm{k}$ Unit: mg/mL(k=1)
8	Factor determination for the Karl Fischer reagent with Water-Methanol Standard or factor determination for Water-Methanol Standard with the Karl Fischer reagent	$\frac{\mathrm{Dose}\times\mathrm{DF}}{\mathrm{Data}}\times\mathrm{k}$ Unit: mg/mL(k=1)

< Calculation of back titration >

The section of Data ×TF in Eq. 1 to 6 is replaced with:

$\mathrm{Dose}\times\mathrm{DF}-\mathrm{Data}\times\mathrm{TF}$

< Calculation of titration after fixed dose of KF reagent >

The section of Data × TF in Eq. 1 to 6 is replaced with:

$\mathrm{Dose}\times\mathrm{DF}+\mathrm{Data}\times\mathrm{TF}$

< Symbols used in calculation formulas >

Data (mL) : The amount of the reagent titrated in the titration flask.

Dose (mL) : The amount of the reagent dosed in the titration flask.

TF (mg/mL) : Factor of the reagent titrated

DF (mg/mL) : Factor of the reagent dosed

Drift (mg/s) : Drift level which changes by ambient moisture and carrier gas permeating into the titration flask

t (s) : Titration time length from start to the end of titration after sample is discharged. When titration ends by preset time, it runs for [t(stir)] + [t(wait)] + [t(max)].

Blank (mg) : Blank level. This is the moisture coming in from other source than sample itself, and must be deducted from titrated water volume.

Wt1 (g) : The total weight of sample and sampler before sample is discharged. The sample actually discharged is ･Wt1 ･ Wt2･.

Wt2 (g) : The total weight of sampler and sample residue after sample is discharged. The sample actually discharged is ･Wt1 ･ Wt2･.

Wt0 (g) : The amount of sample discharged into extracting solvent, a part of which is taken out for measurement

B (g) :Weight of solvent extraction to dissolve a sample, a part of which is taken out for measurement by indirect method

A (ppm) :Water concentration of solvent extraction before the sample is discharged into the solvent in Indirect method.

V1 (mL) : The amount of sample discharged by volume

Dens (g/mL) : Density of sample discharged by volume

V2 (L) : The volume of gas sample

Temp. (°C) : Temperature of gas sample when measured

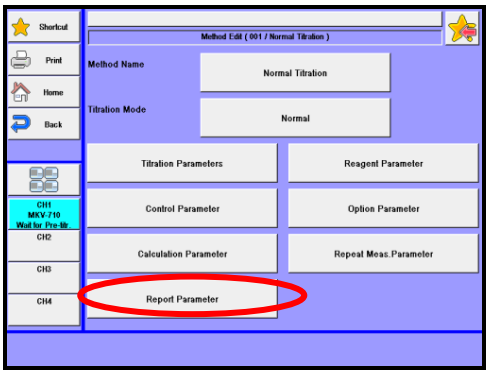
k : Unit conversion coefficient

C1 (%) : Concentration (%) of standard

1-8. Report Parameter

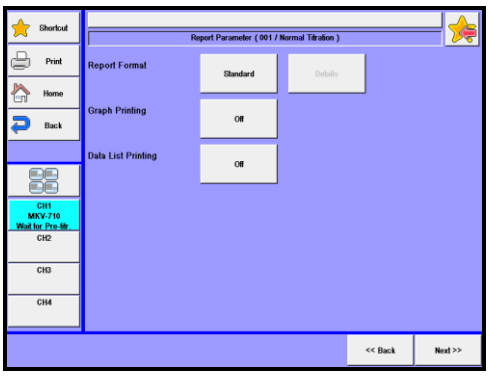
Settings for printing contents.

1 Press [Report Parameter] button.



2 Please change the mode numbers and select the parameter you wish to edit.

Each parameter is determined by the [OK] button.



1. Method

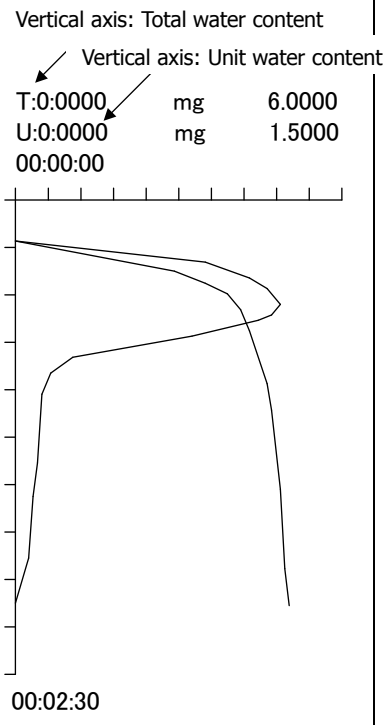
Item	Description
[Report Format]	Selection of print format: • Off : No printout • GLP : Prints all of measurement parameters and results • Short : Prints sample number, measurement date, sample size, measurement results, drift level, titration time • Variable : You can choose from printing items from [Details] button when pressed.
[Details]	The display "Report format" appears where you can select those items you wish to print out. This buttons works only when the above "Variable" for report format is chosen.
[Graph Printing]	Selection of graphic print together with measurement results when they are printed out. Graphic printout is significant when it is set in "Graph setting" on "Function". • Off : No printout of graph • On : Printout of graph
[Date List Printing]	Selection of printout of the data list, which is significant with data sampling time preset on "Control parameter". • Off : No printout of data list • On : Printout of data list

<Print format>	Print format			
Item	Off	Short	GLP	Variable
Model/Serial	Off	Off	On	On/Off
Sample No.		On		On/Off
Date & Time		On		On/Off
Sample Name		Off		On/Off
Sample ID		Off		On/Off
Method Name		Off		On/Off
Titration Mode		Off		On/Off
Calc. No.		Off		On/Off
Sample Size		On		On/Off
Result		On		On/Off
Drift		On		On/Off
Blank		Off		On/Off
Reagent Name		Off		On/Off
Factor		Off		On/Off
Titration Time		On		On/Off
End Time		Off		On/Off
Init.potential		Off		On/Off
Init.Resistance		Off		On/Off
Operator		Off		On/Off

< Example of printout >

[Data list]

Time	Unit	Total
00:00:10	0.2750	0.2750
00:00:20	1.5000	1.7750
00:00:30	1.2250	3.0000
00:00:40	0.5250	3.5250
00:00:50	0.8750	4.4000
00:01:00	0.3250	4.7250
00:01:10	0.3500	5.0750
00:01:20	0.1750	5.2500
00:01:30	0.1250	5.3750
00:01:40	0.0500	5.4250
00:01:50	0.0000	5.4250
00:02:00	0.0000	5.4250
00:02:09	0.0000	5.4250

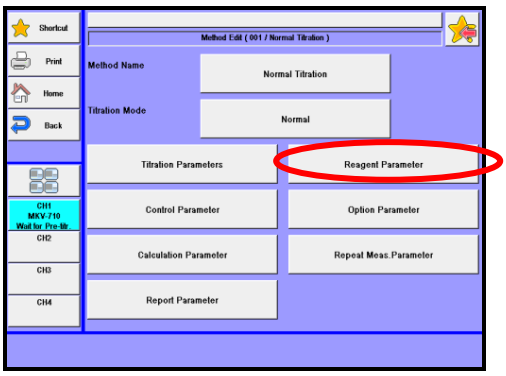


Model:MKV-710(MCU-710)	← Model
Serial No. : YYY99999	← Serial number
Print :2014/10/14 17:18	← Printed date
*** R e s u l t ***	← Method name
Method No./Name : 001/Normal Titration	
Sample No. : 01-01	← Sample number
Sample Name:Sample x	← Sample name
Sample ID: 99-03-26532	← Sample ID
Date 2014/09/01 17:18	← Titration date
Titr.reagent name	← Titration reagent name
Factor 5	← Titration reagent factor
Titr.factor 5.0000	← Calculation number.
mg/mL	← Moisture
Calc.No. : 2	← Result
Moisture 5.4250 mg	← Evaluation
Result : 1.11763 %	← Titration volume of Burette 1
Evaluation : OK	← Titration time
Burette 1 : 1.0850 mL	← End time
Titr.time : 00:02:09	← Initial potential
End time : 30 s	← Initial resistance
Init.pot. : 28 mV	←
Init.res. : 0 Kohm	
Wt1 : 36.89950 g	Net weight
Wt2 : 36.41410 g	← Blank
Net : 0.48540 g	
Blank : 0.00000 mg	←
(Wt input after titr.)	
Operator :KEMTARO	← Operator: when re-calculated, its person's name appears here.

1-9. Reagent Parameter

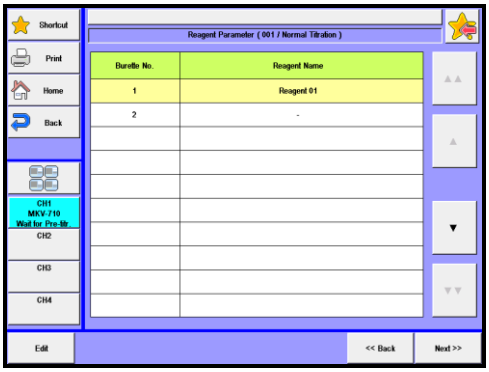
Select a burette to be used in titration and fixed dose.

1 Press [Reagent Parameter] button.



2 Please change the mode numbers and select the parameter you wish to edit.

Each parameter is determined by the [OK] button.



[Burette No.]
Display burette number where the reagent information is to be stored.

[Reagent Name]
Display reagent name registered in reagent information on the numbered burette. For the burette numbers not in use under the current method, "-" will be displayed in the reagent name column.

[▲], [▼]
You can move the cursor on the list of reagent parameters.

[Edit]
Here you can select the reagent information for the numbered burette. Put the cursor on the burette number set in reagent parameters and press this button to have "Reagent" screen display. Now, you can select the desired reagent information among from No.1 to No. 20 that has been preset on "Function"–"Reagent Information."

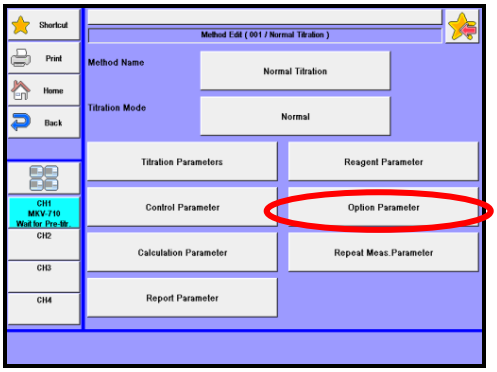
Notre

When "Smart Burette Functionality" of Function-Other Settings is "Enable", information of set burette No. will automatically be displayed.

1-10. Option Parameter

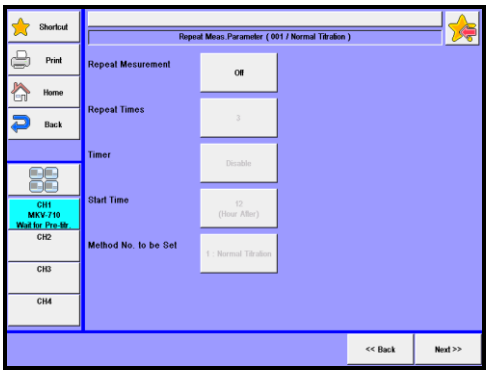
This parameter is provided for measurement with an oven connected to Mains.

1 Press [Option Parameter] button.

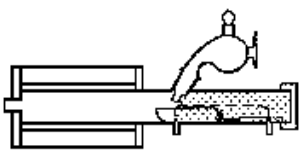


2 Please change the mode numbers and select the parameter you wish to edit.

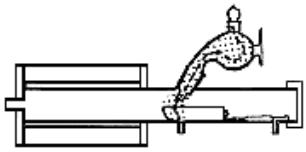
Each parameter is determined by the [OK] button.



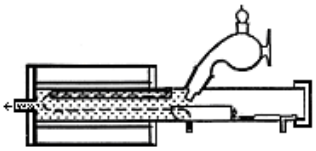
Item	Description
[Pre Treat]	Selection of sampling into the oven: • Pre treat 1 : An optional eggplant shape sampler is used for sampling and discharge into the sample inlet. It begins with back purge, sample purge and cell purge, and then, starts measurement process when the drift level becomes stable while carrier gas is flowing through the system. • Pre treat 2 : This is direct discharge of sample into the oven. It Begins with back purge and cell purge, and then, starts measurement process when the drift level becomes stable while carrier gas is flowing through the system. • Pre treat 3 : Use the sample boat. Weigh the dried sample boat with a sample on it, and weigh it, and then, move it into the oven. It begins with back purge and cell purge, and then, starts measurement process when the drift level becomes stable while carrier gas is flowing through the system.



Back purge



Sample purge



Cell purge

* Put a port plug onto the eggplant sampler for Pre treat 2 or 3

[Cell Purge]	Select a purge time to dry up the line from sample inlet of heating unit to the titration cell with carrier gas. • 0～99999s
[Back Purge]	Select a purge time to dry up the sample inlet of heating unit and the sample boat outlet with carrier gas. • 0～99999s
[Sample Purge]	Select a purge time to dry up the inside oven with carrier gas. • 0～99999s
[Heating Mode]	Select a heating method for the oven. • Set : This is for a sample of which vaporizing point is known. • Scan : This is for scanning temperature characteristic of a sample. Heating process depends on heating speed from the "start temp." up to the "end temp.". After measurement is over, a recommended temperature appears on display with measurement results just for information.

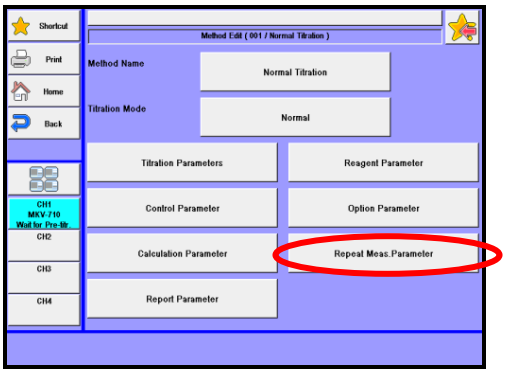
1. Method

Item	Description
[Oven Temp.]	Select a temperature to heat up the oven. This is for a sample of which vaporizing point is known. Turn on the above "Set" option. • 0～300°C
[Heating Speed]	Select a heating speed of the oven. Turn on the above "Scan", typically at 20s/°C. If the test material is thermally slow conductive, select a degree between 30 ~ 60s/°C span of range. • 1～99999s/°C
[Start Temp.]	Select a degree of temperature to start with. This is significant when "Scan" is chosen. When measurement is started, the oven temperature goes up to the "start temp.". Typically set it to 100°C. Any degree higher than the "end temp." cannot be selected. • 0～300°C
[End Temp.]	Select a degree of finishing temperature. This is significant when "Scan" is chosen. When the temperature reaches preset degree in measurement, it stops heating. Typically set it to 300°C. Any degree lower than "start temp." cannot be selected. • 0～300°C
[Option]	Here you choose On if you use an optional oven or the Multiple sample changer.This setting is enabled when selecting "Specify Method" in [Sample]-[Option] setting. • Off : No options to be used. • ADP- : Selected when measuring combined with the Drying oven. Such device will work to the Option parameter preset on Method.

1-11. Repeat Meas. Parameter

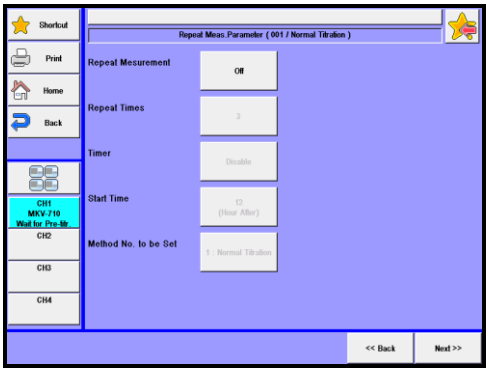
Settings for Repeat measurement.

1 Press [Repeat Meas. Parameter] button.



2 Please change the mode numbers and select the parameter you wish to edit.

Each parameter is determined by the [OK] button.



Item	Description
[Repeat Measurement]	Repeat measurement is the automatically reciprocating measurements for a preset number of cycles. This is useful for factor validation with water methanol standard using the additionally installed burette. • Off : Repeat measurement is off. • On : Repeat measurement is on.
[Repeat Times]	Sect a number of cycles for repeated measurements: • 2~99

Note

To enable the function of the Repeat Measurement, please set as follows:
[Start Mode] ··· Auto
[Sample] ··· Option Off

Item	Description
[Timer]	Set whether reagent factor is measured in repeated measures when pre-titration is automatically performed. This setting is enabled when the titration parameter of Calculation parameters is set to "Reagent factor". • Enable :Timer is enabled. • Disable :Timer is disabled.
[Start Time]	Set up in how many hours Pre-titration will start. • 0～999(hours)
[**Method No.to be Set**]	Set up Method No. to be switched when repeated measures end. • 1～120

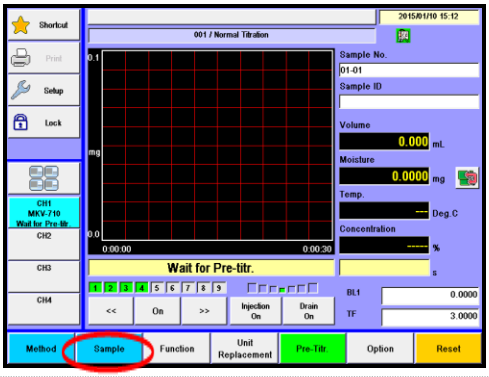
Note Select the post-titration Method where "Repeat Measurement" setting is "Off".

2. Sample

2-1. Sample Settings

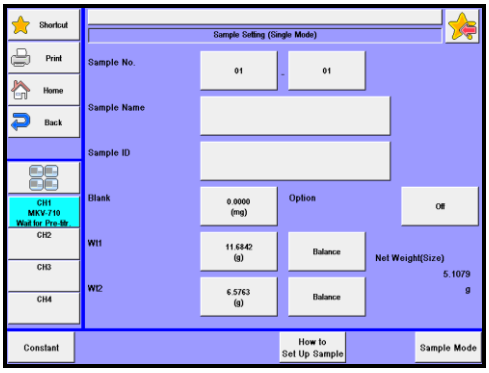
Setting for the sample parameters

1 Press [Sample] button.

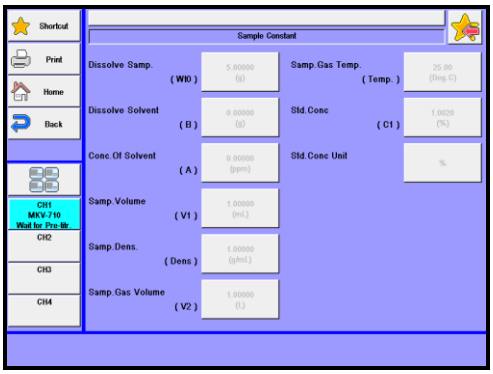


2 Please select the parameter you wish to edit.

Each parameter is determined by the [OK] button.



2. Sample

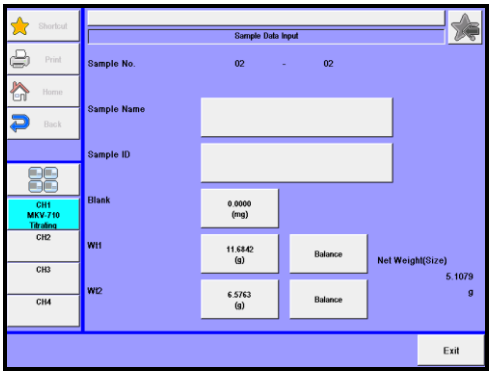
Item	Description
[Sample No.]	Here you select a number for the sample. The numbers consist of High order number and Low order number, and the samples when grouped are numbered with High order number. Lower number represents individual sample identification. • 00 ~ 99
[Sample Name]	Here each sample can be named with characters up to 20 letters.
[Sample ID]	The samples can be identified with ID or Lot number with up to 20 characters.
[Blank]	Here you enter the blank value. The blank value selected for the Blank No. in Method calculation parameter will be taken in automatically. • 0.00000 ~ 99999.99999ug
[Option]	Here you choose On if you use an optional oven or a multiple sampler. • Off : No options to be used. • ADP- : Selected when measuring combined with the Drying oven. Such device will work to the Option parameter preset on Method. • CHK- : Selected when measuring combined with the Multiple sample changer. Such device will work to the Option parameter preset on Method.
[Wt1]	Here you enter the total weight of tare and sample. • 0.00000000 ~ 99999.99999999g
[Wt2]	Here you enter the tare weight after sample is discharged. • 0.00000000 ~ 99999.99999999g
[Balance]	Here you can enter the weight direct from an electronic balance.
[Constant]	Here you enter the constant particular to those measurements for gas or samples, which are dissolved with solvent extraction before titration. Sample constants can be setup when "Sample" is selected in the [Function] – [Other settings] – [Constant properties], settable only on the constants that are being used for the Calc. No. of the calculation parameters of presently selected method. 

Item	Description
[How to Set UP Sample]	You define sample settings. For details of sample setting, refer to the Section 2-2.
[Sample Mode]	You define sample mode. For details of sample mode, refer to the Section 2-3.

For details of sample variable, refer to "1-7. Calculation Parameter".
The number of digits for SIZE differs depending on the sample size preset on [Function] – [Decimal Edit].

< Sample setup after titration starts >

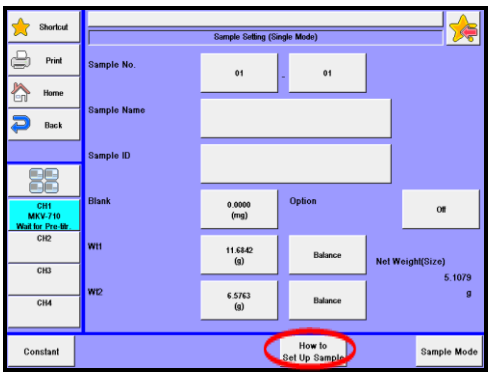
While titrating, press [Sample] button to display the screen display as shown below and make the entry of sample setup. After entering necessary setup parameters, press [Exit] button.



2-2. Sample Setting method

Settings for sample settings.

1 Press [Sample] button.
Press [How to Set UP Sample] button on "Sample Setting."



2 The screen on the right will appear.

Select and edit the item you wish to edit.

Each parameter is determined by the [OK] button.

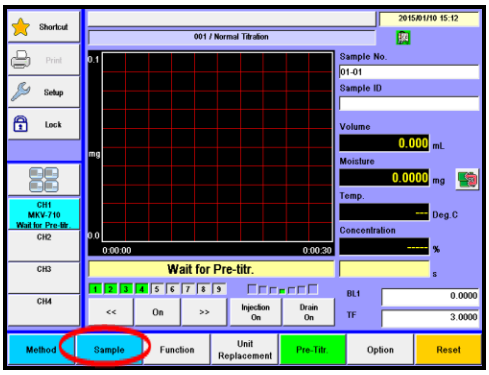
Item	Description
[Sample Before Input]	Here you select sampling mode before titration; • Off : Titration starts with [Start] button. • On : "Sample settings" display appears with [Start] button. On "Sample Setting", you enter the sample name and ID, sample size, etc.
[Weight After Input]	Here you select sample size entry mode after titration is over: • Off : Water content is calculated and displayed for the sample size currently defined. • On : After measurement is over, "Sample settings" display appears. • Auto : After titration is started, it automatically determines if sample size is entered, and if not, the display for sample size entry appears. In the case of sample file mode, it is automatically judged whether a sample has been put between the time after the power was turned on and the time when a titration is completed.
[Size Input Mode]	Select entry method for sample quantity. The unit determines whether the sample quantity is already input or not. • Size 1 only : Entry of Size 1 reads as the sample quantity is already input. • Size 1, 2 : Entry of both Size 1 and Size 2 reads as the sample quantity is already input.

2-3. Sample File Mode

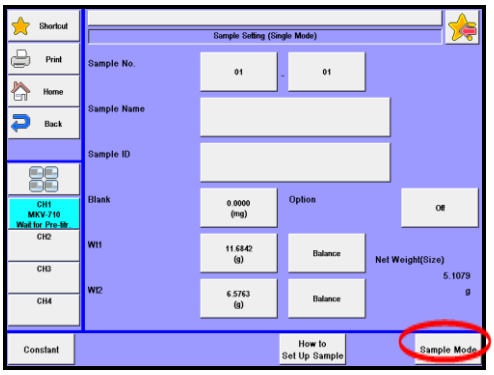
This mode is useful when a multiple sample changer is connected or when you wish to preset sample parameters in advance.

Settings for sample mode.

1 Press [Sample] button.

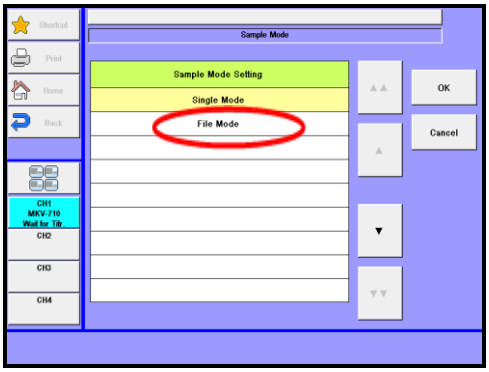


2 Press [Sample Mode] button on "Sample Setting."



3 The screen on the right will appear.

Select File Mode.



Outline of Sample File

The sample file consists of the following elements shown in the below chart.

Example: When you set the number of samples to 99, and 5 for the next measurement number:

		Sample parameter						
	No.	Sample No.		Sample Name	Sample ID	·····	Size 1	Size 2
	1	01	01	Blank		·····	0.0000	0.0000
	2	01	02	Blank		·····	0.0000	0.0000
Max sample No.	3	01	03	Blank		·····	0.0000	0.0000
	4	12	01	Sample A	20030501	·····	5.5213	4.5123
Next sample No.->	5	12	02	Sample A	20030501	·····	5.5312	4.5111
	:	:	:	:	:	·····	:	:
	:	:	:	:	:	·····	:	:
	95	21	02	Sample A	20030506	·····	5.5216	4.5122
Measured samples	96	21	03	Sample A	20030506	·····	5.5315	4.5121
	97	33	01	Standard B	990123	·····	1.0201	0.0000
	98	33	02	Standard B	990123	·····	1.0121	0.0000
	99	33	03	Standard B	990123	·····	1.0341	0.0000

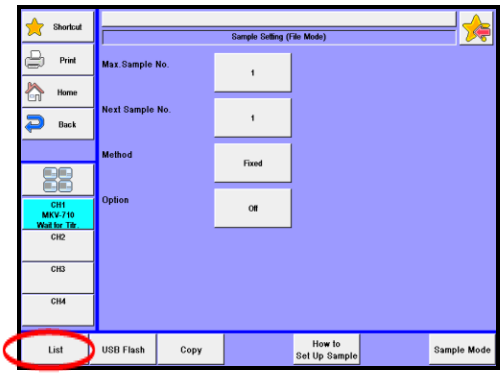
When measurement is started, it begins with sample parameters of No. 5, and continues the series of measurements up to No. 99 under the conditions preset in advance.

Item	Description
[Max. Sample No.]	Here you enter the largest number of samples for Sample File. • 1 - 100
[Next Sample No.]	The number for the next measurement is selected here. • 1 - 100
[Method]	Here you select the mode for measurement method. • Fixed : Measure with preset Method. • Variable : You can define individual Method for each sample. This useful for continuous measurement of blank and sample as well as measurement with an oven of which evaporation temperature is to be changed from time to time.
[Option]	Here you choose On if you use an optional oven or a multiple sampler. • Off : No options to be used. • ADP- : Selected when measuring combined with the Drying oven. Such device will work to the Option parameter preset on Method. • Set by Method: Specify Method to set up a drying oven.
[List]	Here the list for sample parameters appears where you select sample conditions for each sample. For details of sample list, refer to the Section 2-3-1.
[USB Flash]	The sample files can be stored in an optional USB flash drive. Either load the data stored on USB flash drive into the measuring unit or delete the data stored on USB flash drive. For the details on how to save sample setting into USB flash drive, see the section, "2-3-3. [USB Flash] (Sample settings)."
[Copy]	Executes copying the sample setting. This button gets enabled by the same type measuring unit connected.
[**How to Set Up Sample**]	You define sample settings. For details of sample setting, refer to the Section 2-2.
[**Sample Mode**]	You define sample mode. For details of sample mode, refer to the Section 2-3.

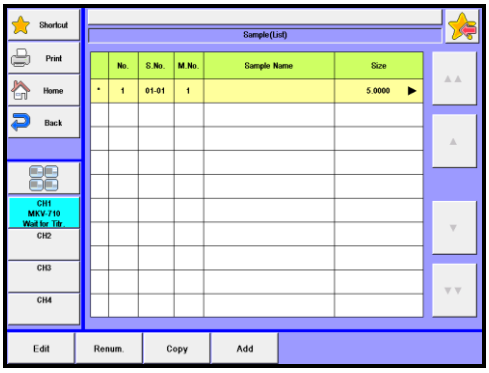
2-3-1.Sample (list)

You can batch edit sample parameters and sample numbers (S.No.).
To use this mode, select "File Mode" on Sample Mode in Sample.

1 Press [List] button on "Sample Setting"



2 The screen on the right will appear.
Select and edit the item you wish to edit.



[▲], [▼]
Use these keys to move the cursor on the list.

[▲▲], [▼▼]
These keys begin a new page of the list. The cursor moves to the top number on the list after page break.

[Edit]
Here you can edit sample parameters. Point the cursor on the number where you want to edit the list. The display will change to "Sample" with this button.
For details of edit sample list, refer to the Section 2-3-2.

[Renum.]
You can batch edit sample numbers (S.No.).
The batch edit begins with the sample number on the list with cursor on and selects numbers in series down to the sample of lower in number.

[Copy]
This key allows the user to apply the sample conditions for the number that the cursor lies in the list to the sample conditions for the rest samples from it.

[Add]
Sample conditions can be added with the sample conditions for the number that the cursor lies.

2-3-2.Edit sample list

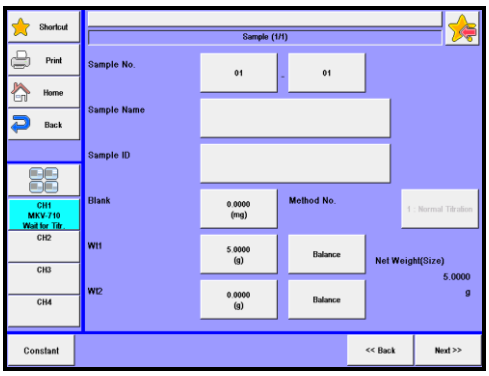
Settings for Sample list.
To use this mode, select "File Mode" on Sample Mode in Sample.

1 Press [Edit] button on "Sample Setting (List)." Sample volume (Wt1) can directly be input on the Sample Setting (List) screen by pressing a number of the sample volume (Size). Sample volume (Wt1) can be input for Balance to point the cursor on the number on the Sample Setting (List) screen.

2 The screen on the right will appear.

Select and edit the item you wish to edit.

Each parameter is determined by the [OK] button.



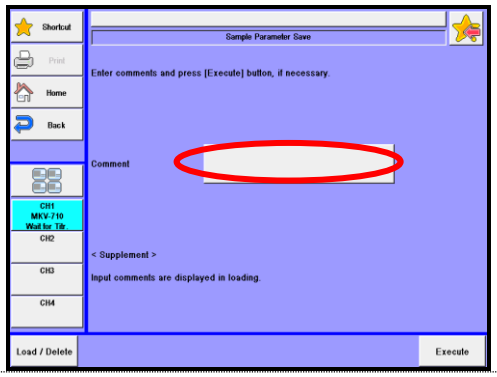
Item	Description
[Sample No.]	Here you select sample number. The high order number represents the group number, and the low order number shows individual sample. Samples can be grouped by a high order number. • 00 ~ 99
[Sample Name]	You can name a sample with characters up to 20 letters.
[Sample ID]	Samples can be identified with individual ID code or Lot number with characters up to 20 letters.
[Blank]	Here you enter the blank value. The blank value selected for the Blank No. in Method calculation parameter will be taken in automatically as default. • 0.00000 ~ 99999.99999ug, mg
[Method No.]	Here you select Method number, which becomes significant only when "Variable" is chosen for method on sample file parameter. • 01 ~ 50
[Wt1]	Here you enter the total weight of tare and sample. • 0.00000000 ~ 99999.99999999g
[Wt2]	Here you enter the tare weight after sample is discharged. • 0.00000000~ 99999.99999999g
[Balance]	Here you can enter the weight direct from an electronic balance.
[Constant]	Here you enter the constant particular to those measurements for gas or samples, which are dissolved with solvent extraction before titration. Sample constants can be setup when "Sample" is selected in the [Function] – [Other settings] – [Constant properties] , settable only on the constants that are being used for the Calc. No. of the calculation parameters of presently selected method.
[Next >>]	The next of sample setup display appears with this button.
[<< Back]	The preceding page appears with this button when pressed.

2-3-3.[USB Flash] (Sample settings)

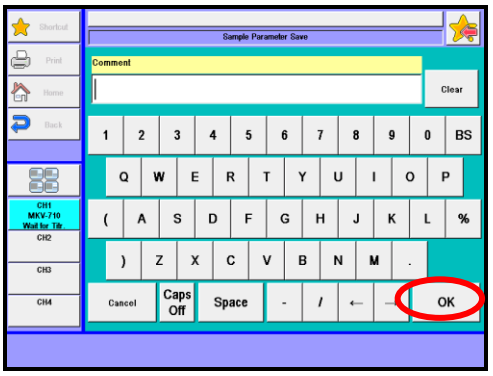
Save the sample settings into USB flash drive together. Either load the data stored on USB flash drive into the measuring unit or delete the data stored on USB flash drive.

< How to save sample settings >

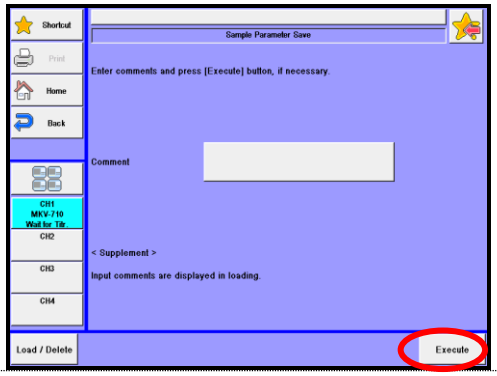
1 Press [USB Flash] button to show "Sample Parameter Save." When entering comments with the sample settings to be saved, press the portion where comment is displayed.



2 After confirming the right screen display, enter comments and press [OK] button.



3 Press [Execute] button on the "Sample Parameter Save" screen display. Confirming the verifying-entry message, press [Yes] button.

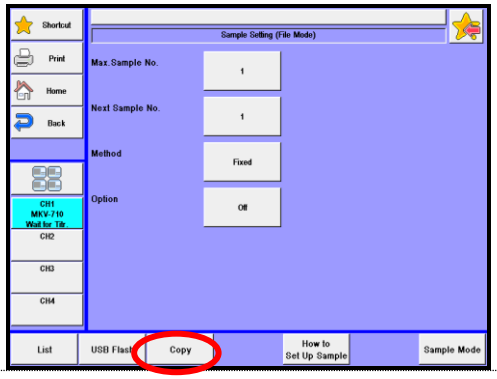


4 The sample settings are saved into USB flash drive and the screen display returns to the initial menu.

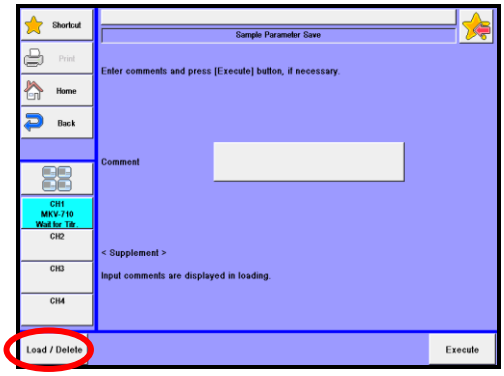
<Load/Delete the sample settings on USB flash drive>

1 Connect the USB Flash drive to the device.

Press [USB Flash] button to show "Sample Parameter Save."



2 Press [Load/Delete] button.

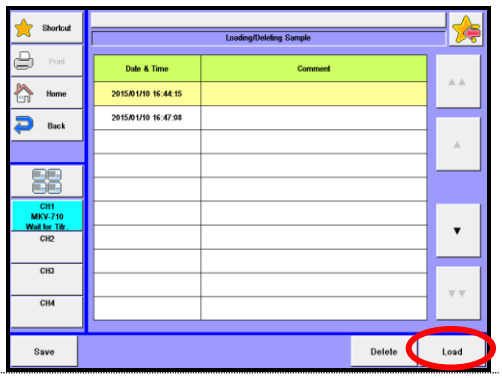


Item	Description
[Load/Delete]	Either load the data stored on USB flash drive into the measuring unit or delete the data stored on USB flash drive.

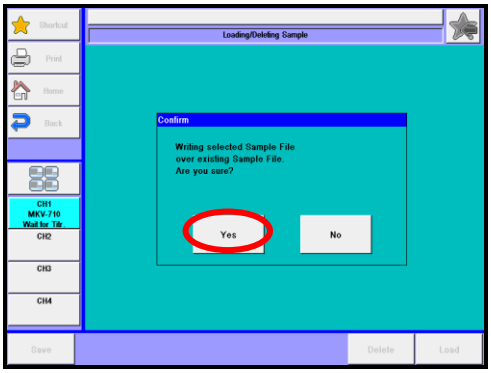
Note Do not detach the USB flash drive from the slot when making access to it.

< How to load the sample setting >

1 Select the sample setting to be loaded into the measuring unit on the "Loading/Deleting Sample" screen display and then press [Load] button.

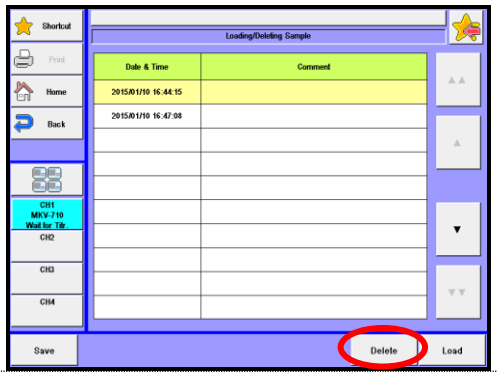


2 When the confirmation screen is displayed, press [Yes] button.
The sample setting will be copied onto the sample setting and the screen display will return to "Loading/Deleting Sample."

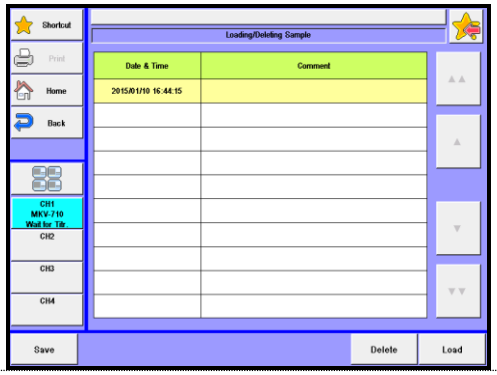


< How to delete the sample setting >

1 Select the file to be deleted on the "Loading/Deleting Sample" screen display and then press [Delete] button. The screen display will turn to the confirmation screen. Then, press [Yes] button.



2 The file selected on USB flash drive will be deleted and the screen display will return to "Loading/Deleting Sample". When deleting further files of sample setting, repeat the above steps 1).

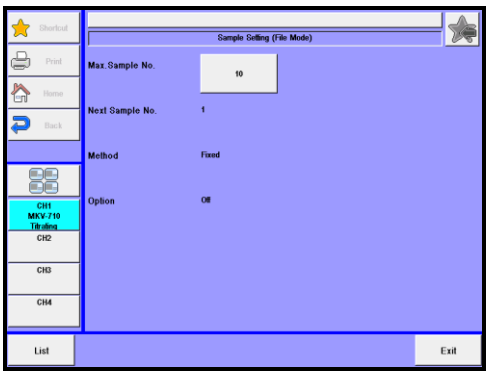


2-3-4.Sample setup after starting titration

With a File Mode in use, configure sample setup and add samples with [Sample] button after starting a titration.

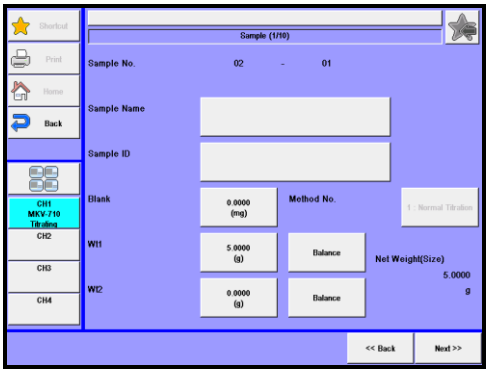
1 After starting a titration, pressing [Sample] button will lead to the "Sample Settings" screen display, where you can change "Max. Sample No."

Press [List] button.



2 When the "Sample (list)" screen appears, point the cursor on the sample setup to edit.
Use [▲], [▼], [▲▲] or [▼▼] button to move the cursor or you can select a sample setup directly on the list.
Press [Edit] button. (When changing the max sample number, press [Max No.] button to return to the above Step 1.)

3 Enter setup parameters.
Press [Next] button for sample setup in the same manner as above.
Press [List] button to return to "Sample (list)" screen.
Press [Exit] button.



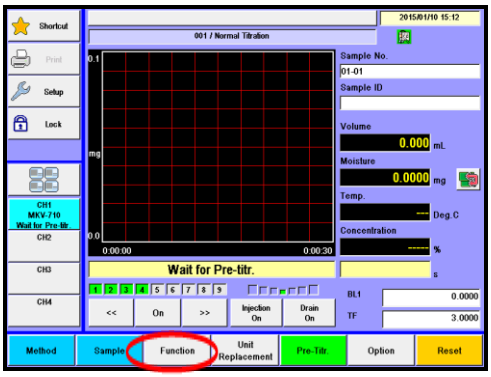
Note Sample No. and Method No. for currently ongoing measurement cannot be modified. Those samples added during ongoing measurement cannot undergo pre-treatment process. Also, for the samples added during the last measurement underway, pre-dosing and measuring of the following added sample alone won't be performed.

3. Function

3-1. Selection of the function

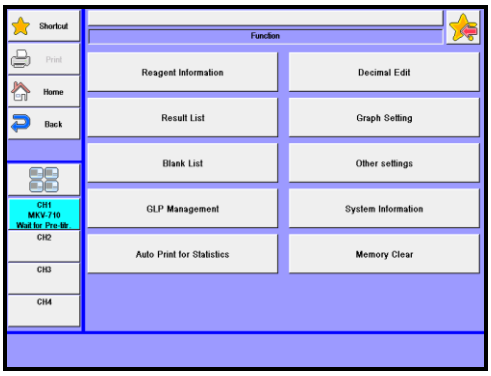
Selection of the function.

1 Press [Function] button on Main display.



2 The screen on the right will appear.

Please select the parameter you wish to edit.

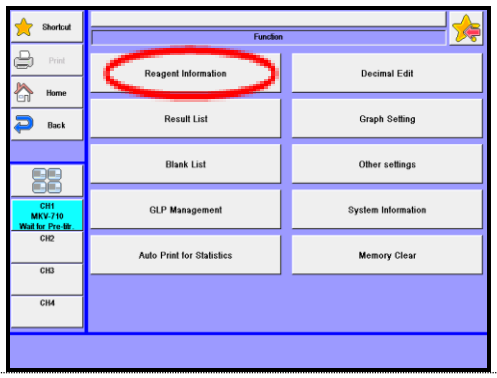


Item	Description
[Reagent Information]	Here you set in the information on reagents including their names, reagent factor, shelf life, replacement date, etc.
[Result List]	You can view the list of measurement results where you can re-calculate or batch-calculate them.
[Blank List]	This is the list of blank values including 10 different ones you can store
[GLP Management]	Here you set up functions to meet with GLP requirements including periodic check, advance notice of check date at intervals, etc.
[Auto Print for Statistics]	The series of measurements performed under the same conditions (Method) can be automatically printed out by this function.
[Decimal Edit]	This function includes setting the number of decimal places for a sample size, Statistics, Blank and Factor when printed out or displayed on screen as well as how to round off in calculation.
[Graph Setting]	A graphic curve can be depicted for water content per time vs. unit time as well as integrated water amount.
[Other Settings]	This includes the auto input of averaged values and the alarm function, etc.
[System Information]	You can view the list of equipment presently connected to the channels in work as well as the information on software version
[Memory Clear]	With this function, you can erase measurement results, methods or sample parameters selectively by individual sample.

3-2. Reagent Information

By setting reagent information, you can control and manage the information on each burette unit including reagent name, concentration, factor and calculation constant. Up to 20 information files on reagents can be stored. Reagent information of a smart burette can be set up when its functionality is set to "On."

1 Press [Reagent Information] button on "Function".



2 The screen on the right will appear.

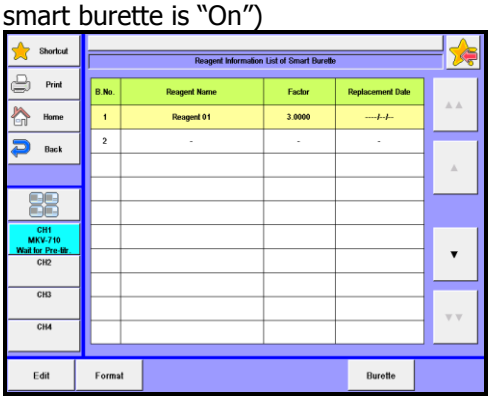
"-" will be shown on the burette No. not currently recognized as the smart burette.

[▲], [▼]
Moves the cursor on the list.

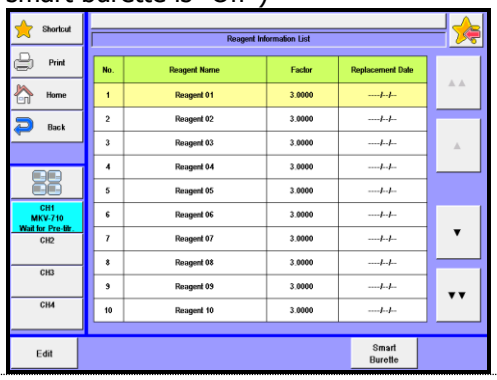
[▲▲], [▼▼]
These keys are for page turning. The cursor moves to the top of the list after page break.

[Edit]
With this button, the display of "Reagent information" appears where you can edit the information on the reagent with the cursor pointed on. Such information includes reagent name, reagent factor, consumption volume, alarm setting, replacement date, etc.

(Function – Other settings – When smart burette is "On")



(Function – Other settings – When smart burette is "Off")



[Format] (Only with "Reagent Information List of Smart Burette")
Initializes information recorded on the smart burette.

[Burette]
Switches to the "Reagent Information List" screen.

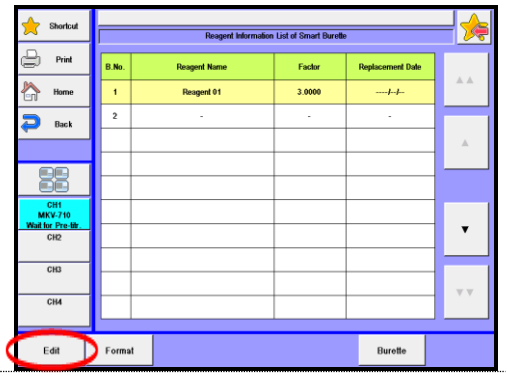
[Smart Burette]
Switches to the "Reagent Information List of Smart Burette" screen.

Note When functionality of the smart burette is "Enable," "Reagent Information List of Smart Burette" will be displayed. When functionality of the smart burette is "Disable," "Reagent Information List" will be displayed.

3-2-1.**[Edit]** – **[Reagent information]**

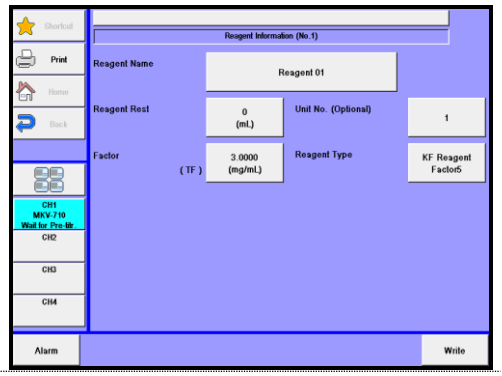
Set the Reagent information.

1 Select the Reagent Information, press [Edit] button.



2 Please change the mode numbers and select the parameter you wish to edit.

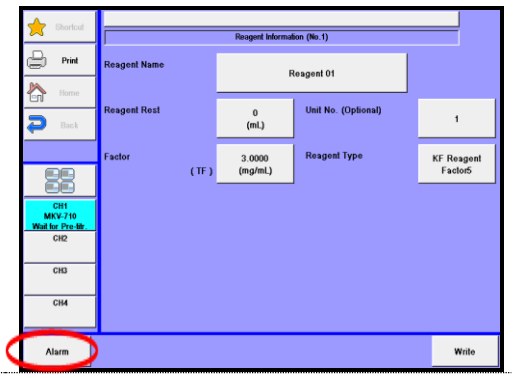
Each parameter is determined by the [OK] button.



Item	Description
[Reagent Name]	Here you enter the name of reagent. Press the button with reagent name for entry.
[Reagent Rest]	Enter the amount of remaining reagent at the present time.
[Unit No. (Optional)]	**(Only with "Reagent Information List of Smart Burette")** Set up a control No. of the unit. Enter No. in order to distinguish when there is more than one unit. • 1 - 99
[Factor]	Enter the factor of reagent. Factor can be determined by statistical calculation results. (See the section 3-3-2.) • 0.0000～99.9999mg/mL
[Reagent Type]	Selects the reagent type. Check the "Reagent Type" for current Method. If different, an error will occur during measurement. This prevents you from using an incorrect reagent. This function is valid only when "Smart Burette Functionality" - "Other Setting" - "Function" is set "Enable". • Not Check : Not used. • KF Reagent Factor 5 : Set when Karl Fischer reagent factor is 5. • KF Reagent Factor 3 : Set when Karl Fischer reagent factor is 3. • KF Reagent Factor 2 : Set when Karl Fischer reagent factor is 2. • KF Reagent Factor 1 : Set when Karl Fischer reagent factor is 1. • Water-Methanol Factor5 : Set when Water-Methanol factor is 5. • Water-Methanol Factor2 : Set when Water-Methanol factor is 2.
[Alarm]	Select the alarm type with this button. When pressed, it shows currently significant alarms.

<[Alarm]>

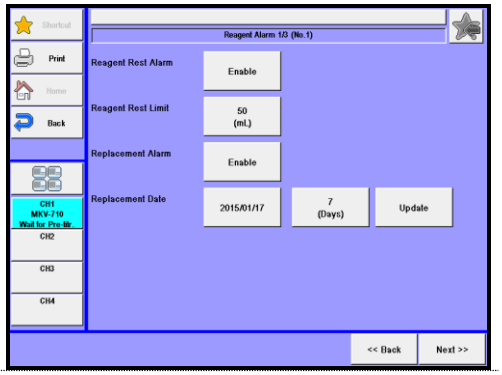
1 Press [Alarm] button on "Reagent Information" display.



2 The screen on the right will appear.

Please change the mode numbers and select the parameter you wish to edit.

Each parameter is determined by the [OK] button.



Item	Description
[Reagent Rest Alarm]	Select to activate this alarm or not. • Off : No alarm • On : Alarm is on
[Reagent Rest Limit]]	Select the alarm of lower limit of remaining reagent. • 0 ~ 9999mL
[Replacement Alarm]	Here you can choose from on or off for alarming reagent replacement. • Off : No alarm • On : Alarm is on
[Replacement Date]	Here you can set up a time length by a number of days for next replacement of reagent. • [xx (Days)] : Set a time interval by a number of days • [[Update] : Set the next date for replacement as preset intervals
[Piston Alarm]	Select the alarm about the date for changing the burette piston or not. • Off : No alarm • On : Alarm is on.
[Piston Replacement Date]	Here you can set up a time length by a number of days for next replacement of burette piston. • [xx (Days)] : Set a time interval by a number of days • [Update] : Set the next date for replacement as preset intervals
[Piston Stroke Count]	The number of operation of the burette piston will be displayed. The number can be reset to "0" by pressing ［Clear］. Press [Clear] when piston head is replaced.
[Stroke Count Alarm]	Select the alarm about the number for the burette piston or not. • Off : No alarm • On : Alarm is on.
[Stroke Count Upper Limit]	Set the alarm of the movement number of burette piston strokes. • 0 - 60000
[Cylinder Alarm]	Select the alarm about the date for changing the piston cylinder or not. • Off : No alarm • On : Alarm is on.
[Cylinder Replacement Date]	Here you can set up a time length by a number of days for next replacement of piston cylinder. • [xx (Days)] : Set a time interval by a number of days • [[Update] : Set the next date for replacement as preset intervals
[Cylinder Stroke Count]	The number of operation of the piston cylinder will be displayed. The number can be reset to "0" by pressing ［Clear］. Press [Clear] when glass cylinder is replaced.

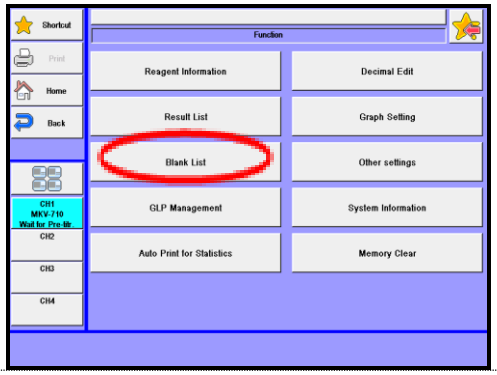
Item	Description
[Stroke Count Alarm]	Select the alarm about the number for the piston cylinder or not. • Off : No alarm • On : Alarm is on.
[Stroke Count Upper Limit]	Set the alarm of the movement number of piston cylinder strokes. • 0 - 60000

To use the alarm function, make "Alarm" turned "On" when you set up on [Function] – [Other Settings].

3-3. Results List

You can view the list of measurement results where you can re-calculate or batch-calculate them. Up to 500 samples measurement results can be stored.

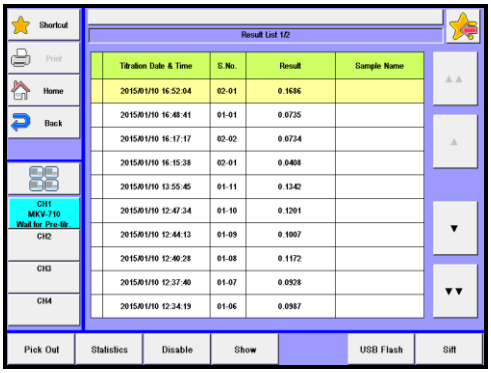
1 Press [Results List] button on "Function."



2 The screen on the right will appear.

Select and edit the result you wish to edit.

Each parameter is determined by the [OK] button.



[▲], [▼]
Moves the cursor on the list.

[▲▲], [▼▼]
These keys are for page turning. The cursor moves to the top of the list after page break.

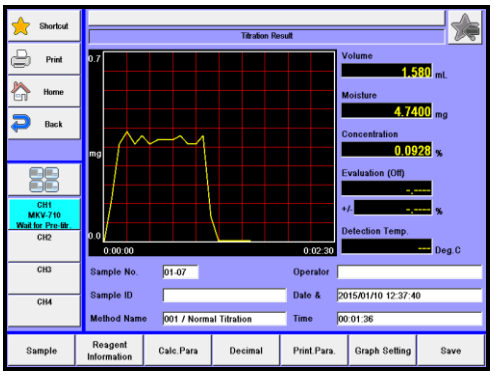
Note
As for combined titration results, the number of combined methods is stored. When it exceeds 500, note that data will be erased on the first-in first-out basis.

Item	Description
[Pick Out]	On this screen you can select the results you are looking for among the data in the list.

For details of Pick out, refer to "3-3-1. [Pick Out]."

[Statistics]	The measurement results in the list are batch calculated. If the data are selected in Pick out, those selected data will be calculated.

For details of Statistics, refer to "3-3-2. [Statistics]."

[Disable]	You can delete the data to void batch calculation. Point the cursor on the data and press this button. Those data will be marked with "*"on display.
[Show]	You can view the data with cursor pointed on. This is useful in re-calculation or for re-print. 

For details of resulting data, refer to "3-3-3. View Titration results・recalculation."

[USB Flash]	Save the measurement data on USB flash drive. When data is narrowed with [Pick Out], the narrowed data will be saved on USB flash drive.

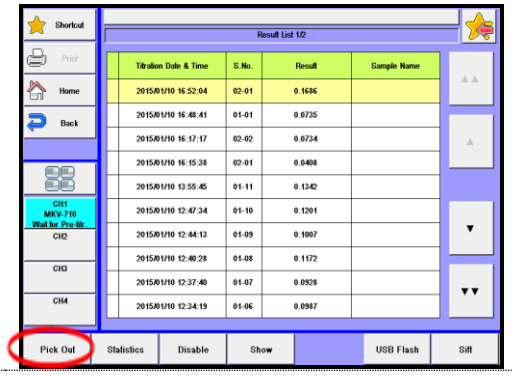
For the details on saving measurement data on USB flash drive, refer to "3-3-4 [USB Flash] (Titration results)."

[All] or [Sift]	Here you choose from All or Sift in search for measurement results. For setting search conditions, press the [Pick Out] button.

3-3-1.[Pick Out]

Set the pick out condition of measurement result data.
You can narrow down measurement results with Calc. type, High Sample No., Method No., Sample ID, Titration date or Unit.

1 Press [Pick Out] button on "Titration Results List."

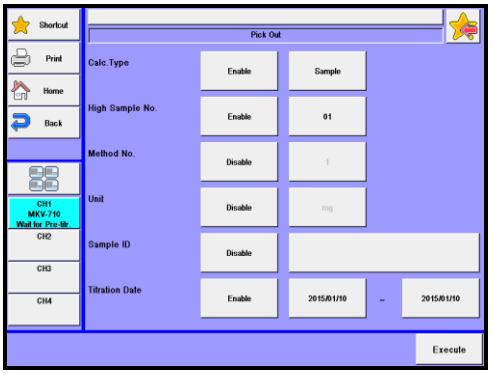


2 The screen on the right will appear.

Select the condition you wish to edit.

Each parameter is determined by the [OK] button.

Matching data will be picked out from the list by pressing [Execute].



< Search conditions >

You can narrow down the data by selecting the following conditions:

Item	Description
Calc. Type	The titration parameters preset on Calculation Parameter.
High Sample No.	The high order number for grouping the samples.
Method No.	The number of Method particular to it.
Unit	The unit used in calculation results.
Sample ID	The identification code particular to the sample.
Titration Date	The date of measurement when it was performed.

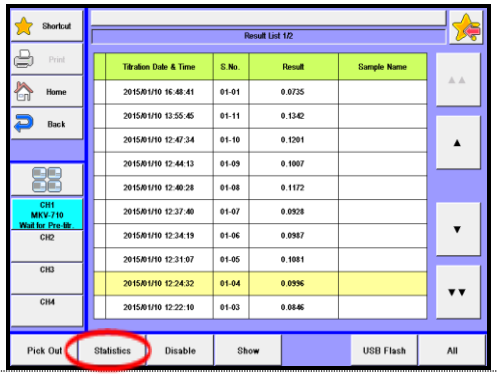
3-3-2.[Statistics]

Calculate the statistics of titration data.

1 Select the data on [Pick Out].

Press [Statistics] on "Result List" screen to execute.

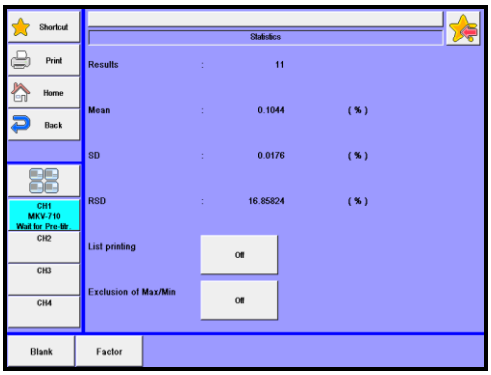
If you wish to view all results, press [All].



2 The screen on the right will appear.

The statistics result is printed by pressing [Print].

Return to main display by pressing [Home].



< About statistics >

The batch calculation determines Mean value, Standard deviation (SD) and Relative standard deviation (RSD), which is the same as coefficient variance (CV).
Those values are calculated by the built-in processor as follows:

Where n number of data (X1, X2, ….. , Xn):

Mean value $\overline{X} = \frac{(X_1 + X_2 + \cdots + X_n)}{n}$

Standard deviation $SD = \sqrt{\frac{\sum_{i=1}^{n}(X_i - \overline{X})^2}{n-1}}$

Relative SD $RSD(\%) = \frac{SD}{\overline{X}} \times 100$

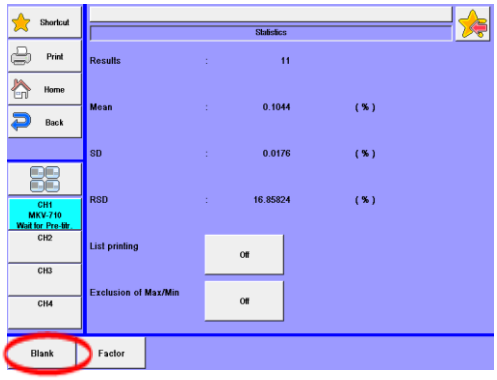
Item	Description
[List Printing]	You can choose from Yes or No to print the statistical data: • Off : No printout. • On : Print the results list.
[Exclusion of Max/Min]	Sets up exclusion of maximum value and minimum value of statistic data. • On : Excludes maximum value and minimum value. • Off : Does not exclude maximum value and minimum value.

Note Statistics calculation should set up and perform search conditions.
If the mean value is zero "0", RSD will appear on display and be printed out as "– –" symbols not as zero "0".

[Blank]	Save the mean value obtained through statistical calculation to the blank value after selecting [Function] – [Blank List]. Selecting the blank value number to be saved and pressing [Execute] button allows to store the mean value on the Blank value n. 
[Factor]	Save the mean value obtained through statistical calculation to the factor value after selecting [Function] – [Reagent Information]. Selecting the Reagent information number to be saved and pressing [Execute] button allows to store the mean value on the Reagent information factor of No. n. 

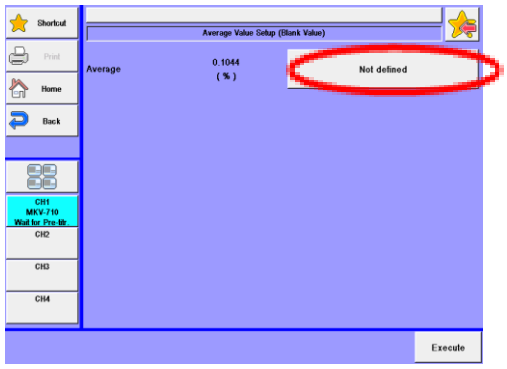
<Registering the statistic result to the factor>

1 Press [Factor] on "Statistics" screen if you wish to set the average value of statistic results in the factor.



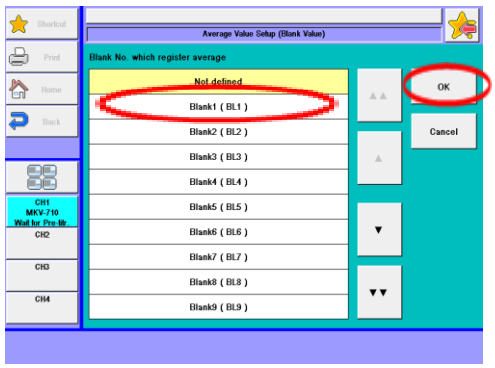
2 [Average Value Setup (Factor Value)] screen will appear.

Press button on the right of the average value.



3 Press a factor in the list and move the cursor to "R.No.01/Reagent 01".

Press [OK] button.

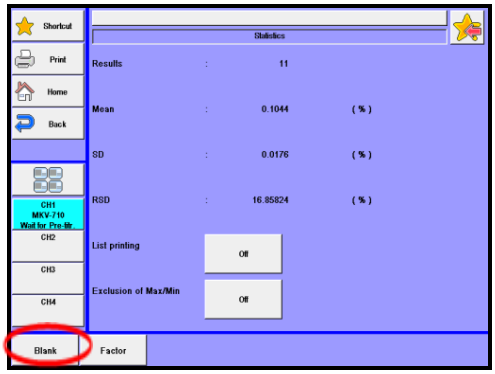


4 Press [Execute] button.

The average value is registered to "No.01" on [Function]-[Reagent Information] screen.

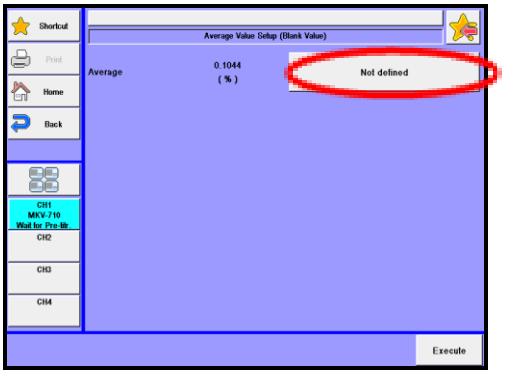
＜Registering the statistic result to the blank＞

1 Press [Blank] on "Statistics" screen if you wish to set the average value of statistic results in the blank.



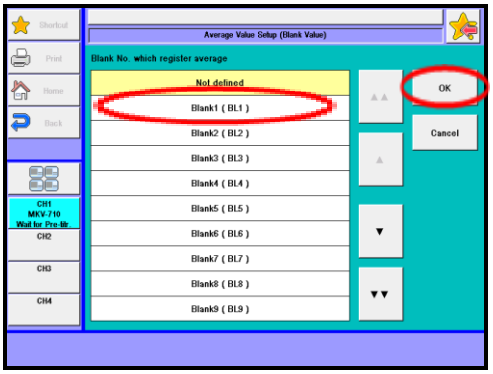
2 [Average Value Setup (Blank Value)] screen will appear.

Press button on the right of the average value.



3 Press a blank value in the list and move the cursor to "Blank1 (BL1)".

Press [OK] button.



4 Press [Execute] button.

The average value is registered to "Blank1 (BL1)" on [Function]-[Blank List] screen.

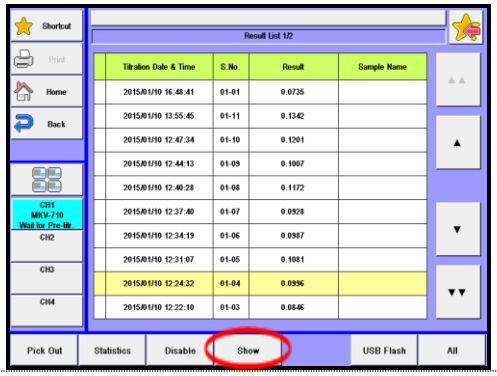
3-3-3.[Titration results • recalculation]

Check the record of result data.

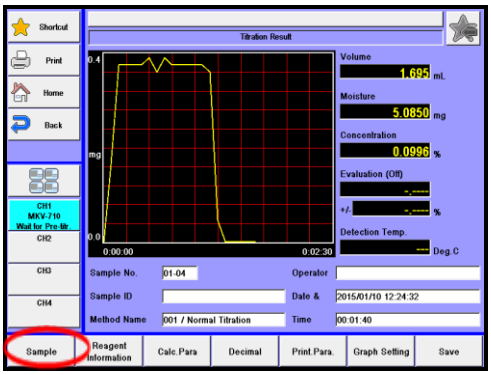
1 Press [Pick out] button. Here you sort out the data for batch calculation.

Press the [Show] button on "Result list".

If you wish to view all of the results, press [All] button.



2 The results of measurements will appear, and press the items for recalculation accordingly.



Note

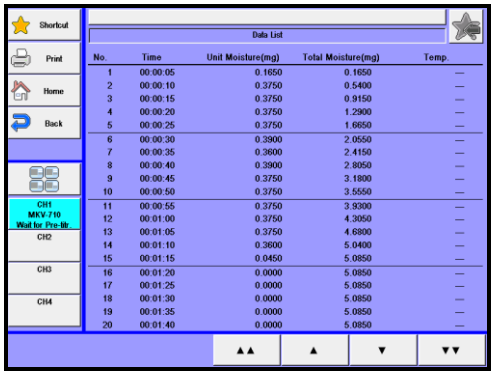
For details of resulting data, refer to "Operation Manual 4-3. Re-calculate titration data."

Note

To save the contents once changed with [Re-Calc.] or [Apply] button, press [Save] button.
Press [Print] button to print out the results of titration or recalculation. The results of recalculation are printed out with sample number (Sample No.) headed with (#) mark.

<Data list of titration results>

When anywhere on the line graph is pressed, the data list of the touched area will appear. Press [Back] to return to the previous page.



[▲], [▼]

Press these to move up/down the data one by one.

[▲▲], [▼▼]

Press these to go to the previous/next page.

Item	Description
[Sample]	You can change sample parameters including sample ID, sample name and sample size. These changes will be reflected on recalculation and recorded.
[Reagent Information]	You can change information on a reagent used in titration or dose on this setup display. If any changes are made, the results will be recorded as recalculation results.
[Calc. Para]	The equation used in calculation for a measurement appears here. If any changes are made, the results will be recorded as recalculation results.
[Decimal]	You can change the number of digits after decimal point. If any changes are made, the results will be recorded as titration results.
[Print. Para]	The parameters for printing are shown here. If any changes are made, the results will be recorded as recalculation results.
[Graph Setting]	You can change the conditions for depicting a graph. If any changes are made, the results will be recorded as titration results.
[Save]	Those changes that have been made are saved in memory.

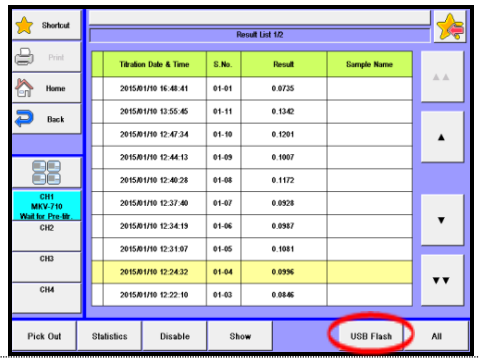
3-3-4.[USB Flash] (Results)

Save the titration results on USB flash drive.
There are three file formats available, "MKV-710 type", "PDF type" and "CSV type. Either load the data stored on USB flash drive into the measuring unit or delete the data stored on USB flash drive.

< How to save titration results >

1 Select the data on [Pick Out].

Press [USB Flash] button.



2 "Save Titration Results" screen will appear.

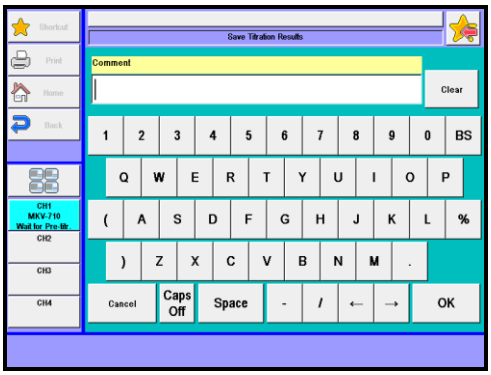
Select the file format to save.

[File format]
Select a file saving format.

- MKV-710 type : Select this if you wish to check data on the MCU-710.
- PDF type : Saved in a PDF file.
- CSV Type : Saves in a CSV file format. Select this if you wish to perform your own analysis or to make a report with commercially available spreadsheet software (Microsoft® Excel® etc.), database software (Microsoft® Access®, etc.) or word-processing software (Microsoft® Word, etc.). The same results as printout are saved except for titration parameters, control parameters and line chart.
- CSV Type (List) : Saves in a CSV file format into a list form in one file. Select this if you wish to perform your own analysis or to make a report with commercially available spreadsheet software (Microsoft® Excel® etc.), database software (Microsoft® Access®, etc.) or word-processing software (Microsoft® Word, etc.). The same results as printout are saved except for titration parameters, control parameters and line chart.

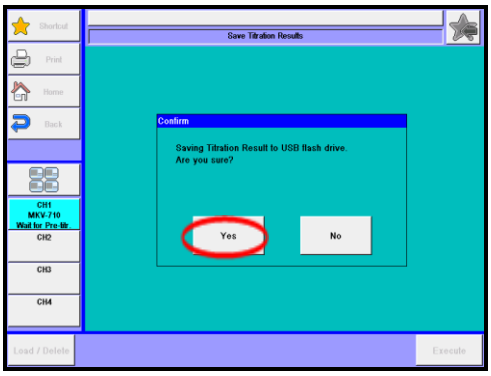
3 If you wish to enter your comment regarding the titration results to be stored, press the comment column on display.

The display shows the right screen, and then, press [OK].



4 When saving in a CSV format, enter the folder name (input range: 0000 ~ 9999). Press [Execute] button on the "Save titration results" screen display. Then, the confirmation screen will be displayed and press [Yes] button.

Narrowed titration results are saved on USB flash drive, followed by returning to the "Result List" screen display.



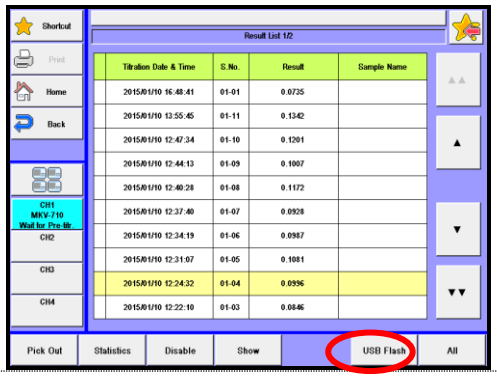
Note

USB of FAT16 and FAT32 format can be used. However all operation of USB is not guaranteed.
Remove USB only after saving data is complete.
When data reading is underway, all buttons stop functioning.
Never remove it halfway. Otherwise, it may be broken.
There is no guarantee of data stored in USB flash memory regardless of any failure source. Make sure to backup data routinely as necessary with your responsibility.

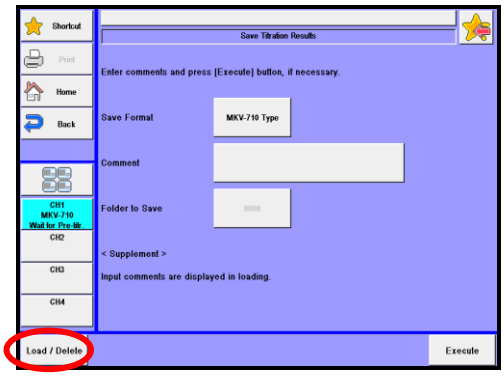
Load/Delete the Titration results on USB flash drive>

1 Connect the USB Flash drive to the device.

Press [USB Flash] button to show "Save Titration Results."



2 Press [Load/Delete] button.

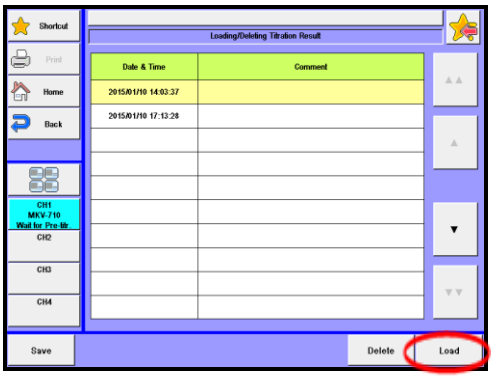


Item	Description
[Load/Delete]	Either load the data stored on USB flash drive into the measuring unit or delete the data stored on USB flash drive.

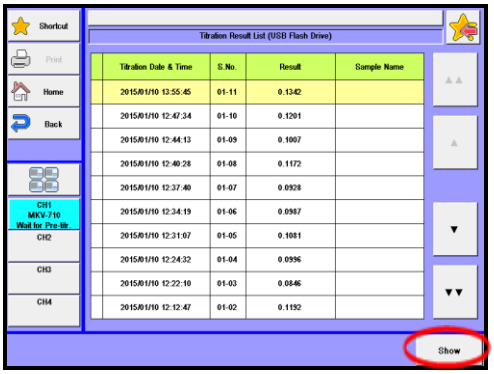
Note Do not detach the USB flash drive from the slot when making access to it.

< How to load the titration results >

1 Select the titration result to be loaded into the measuring unit on the "Loading/Deleting Titration Result" screen display and then press [Load] button.



2 The screen of "Titration Results List (USB Flash Drive)" will be displayed. Then, select the titration result to be displayed on the measuring unit and press [Load] button.

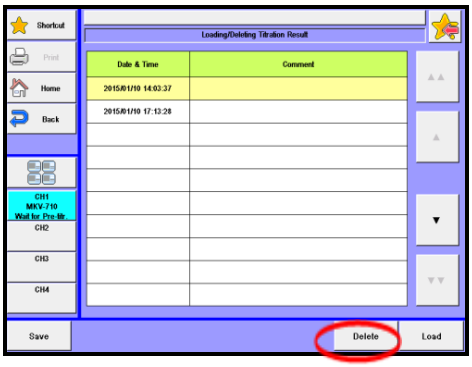


3 The selected titration results will be displayed on the measuring unit.

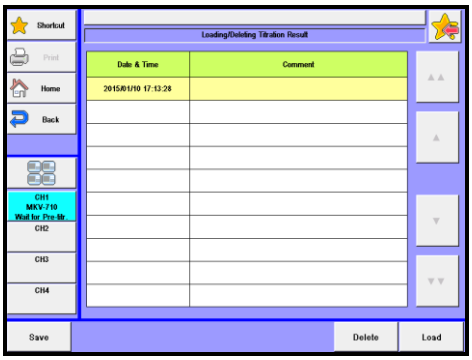
Note Read results can be printed out by changing [Print. Para.]. Note that the changed [Print. Para.] cannot be saved.

< How to delete titration results >

1 Select the file to be deleted on the "Loading/Deleting Titration Result" screen display and then press [Delete] button. The screen display will turn to the confirmation screen. Then, press [Yes] button.



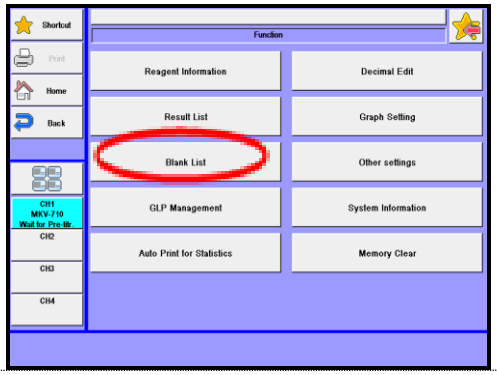
2 The file selected on USB flash drive will be deleted and the screen display will return to "Loading/Deleting Titration Result". When deleting further files of titration results, repeat the above steps 1).



3-4. Blank list

Blank list is used to correct the moisture value that mixes when the sample is added.
Up to 10 blank values can be preset.

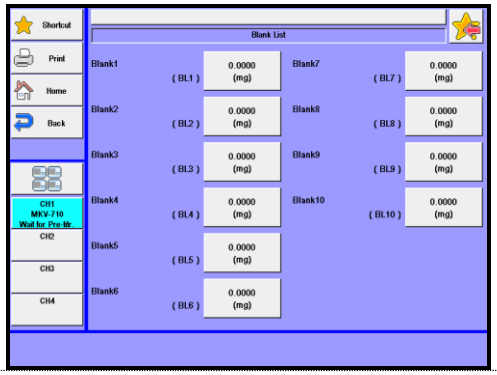
1 Press [Blank List] button on "Function".



2 The screen on the right will appear.

Select and edit the value you wish to edit.

Each parameter is determined by the [OK] button.



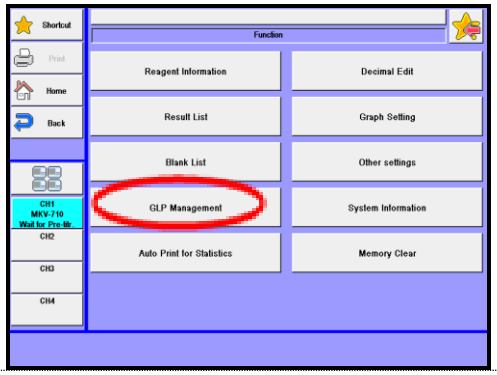
[BL1],... [BL10]	Here you enter blank values. Such numbered blank values can be selected and used in concentration calculation on Method parameter for calculation parameter. Changing the blank value specified by the "Blank No." of the calculation parameter of the presently selected method will reflect the "Blank" in the sample setup. "Blank" can be also set through the statistical calculation results. • 0.00000000～99999.99999999

When a blank level is entered on Sample Settings, the value registered on Blank List is changed accordingly.

3-5. GLP Management

Here you set up functions to meet with GLP requirements including periodic check, advance notice of check date at intervals, etc.

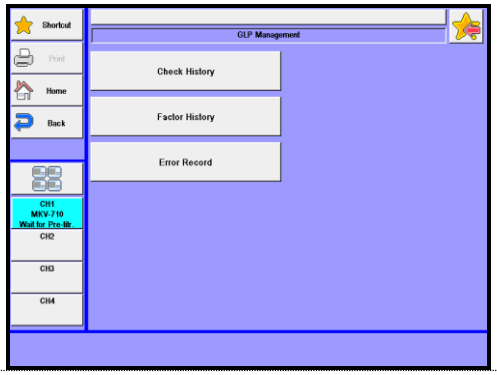
1 Press [GLP Management] button on "Function."



2 The screen on the right will appear.

Select and edit the item you wish to edit.

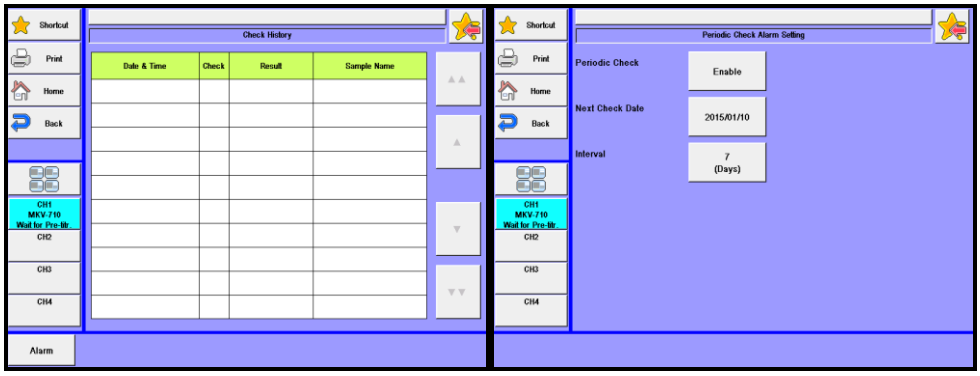
Each parameter is determined by the [OK] button.



Item	Description
[Check History]	You can view the periodic check record. Up to 100 check records can be stored.
[Factor History]	Can have a view of the history of factor measurements record. Up to 100 check records can be stored.
[Error Record]	Can have a view of the history of error record. Up to 100 check records can be stored.

Note When it exceeds 100, the data will be erased in the order of occurrence.

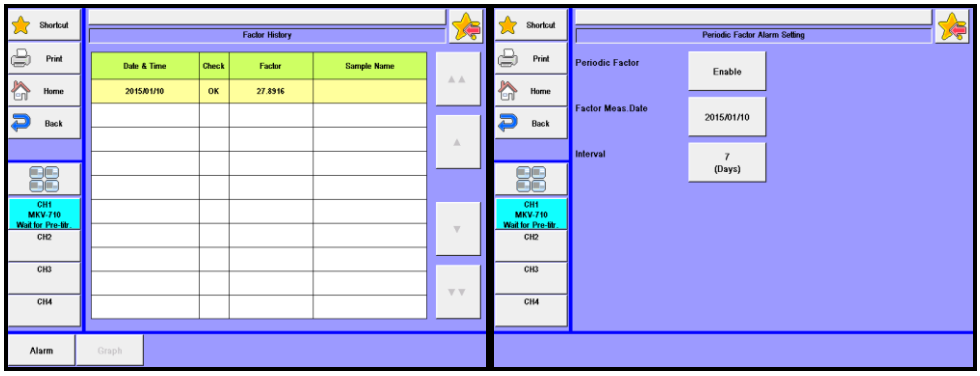
Check History -[Alarm]



Item	Description
[Periodic Check]	Here you can set check alarm at intervals: • Disable : No alarm will work for periodic check. • Enable : Advance notice of check appears when the date becomes due. The check results can be viewed with [CK. History] button.
[Next Check Date]	You can select a next check day.
[Interval]	The next check day is updated automatically at preset intervals.

To use the alarm, turn on "Alarm" on [Function] – [Other Settings].

[Factor History]-[Alarm]



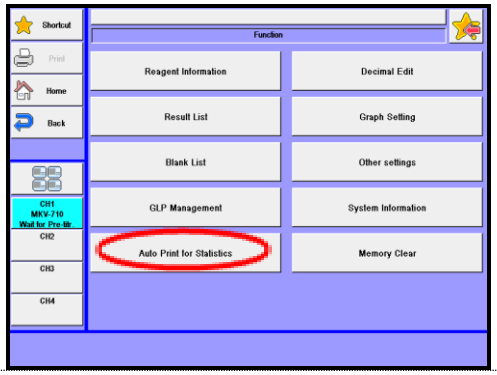
Item	Description
[Periodic Factor]	Here you can set check alarm at intervals: • Off : No alarm will work for periodic check. • On : Advance notice of check appears when the date becomes due. The check results can be viewed with [Factor history] button.
[Factor Meas. Date]	You can select a next check day.
[Check Interval]	The next check day is updated automatically at preset intervals.

To use the alarm, turn on "Alarm" on [Function] – [Other Settings].

3-6. Auto Print for Statistics

The series of measurements performed under the same conditions (Method) can be automatically printed out by this function.

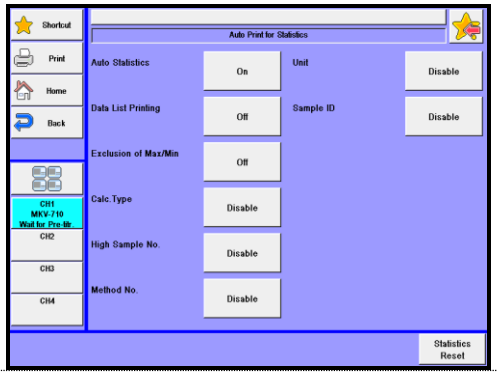
1 Press [Auto Print for Statistics] button on "Function."



2 The screen on the right will appear.

Select and edit the value you wish to edit.

Each parameter is determined by the [OK] button.



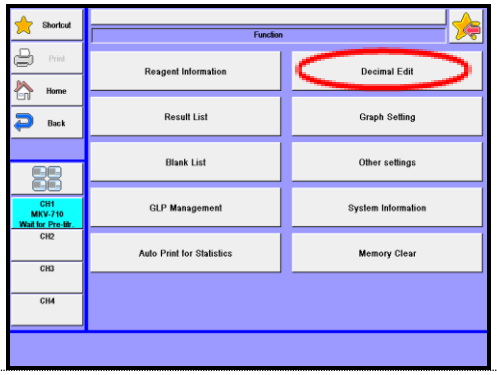
Item	Description
[Auto statistics]	Here the results of measurements performed under the same conditions are automatically batch calculated: • Off : No batch calculation. • On : The results of measurement performed under different conditions will be batch calculated as soon as the measurement is over. Otherwise, the results of measurements performed under the same conditions are automatically batch calculated. After batch calculated, the following data will be calculated. Once power is turned off, this setting will be cleared off.
[Data List Printing]	Here you can choose from on or off for printout of statistics data list. • Off : No printout • On : Print out the list.
[Exclusion of Max/Min]	Sets up exclusion of maximum value and minimum value of statistic data for statistic calculation. • On :Calculation is performed to the exclusion of maximum value and minimum value of statistic data. • Off : Calculation is performed with statistic data.
< Conditions for statistics >	A series of consecutive measurements will be batch calculated and printed out provided the following parameters are preset under the sample conditions: • Calc. Type : Calculation parameter preset on Method • High Sample No.: High order number for sample group • Method No.: The Method number used in measurement • Unit : Preset as a calculation parameter on Method • Sample ID : The identification code present on Sample settings
[Statistics Reset]	You can erase the statistical data.

For details of statistics, refer to "3-3-2. [Statistics]."

3-7. Decimal Edit

This function includes setting the number of decimal places for a sample size when printed out or displayed on screen as well as how to round off in calculation.

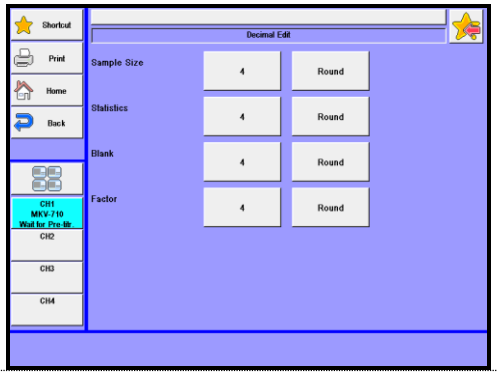
1 Press [Decimal Edit] button on "Function."



2 The screen on the right will appear.

Select and edit the value you wish to edit.

Each parameter is determined by the [OK] button.



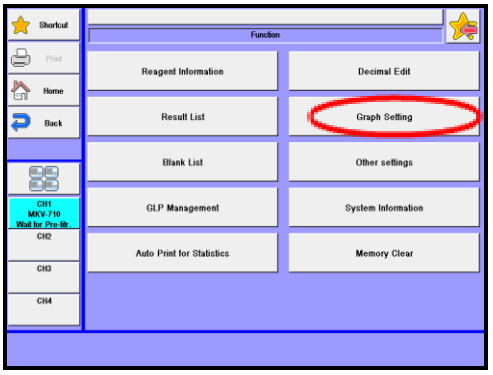
Item	Description
[Sample Size]	Here you select a number of decimal place and fraction rounding for sample size as follows: • Round : rounded to nearest preset number of digits after decimal point. • Round Off : rounded down to nearest preset number of digits after decimal point. • Round Up : rounded up to nearest preset number of digits after decimal point.
[Statistics]	Here you select a number of decimal place and fraction rounding for sample size as follows: • Round : rounded to nearest preset number of digits after decimal point. • Round Off : rounded down to nearest preset number of digits after decimal point. • Round Up : rounded up to nearest preset number of digits after decimal point.
[Blank]	Here you select a number of decimal place and fraction rounding for sample size as follows: • Round : rounded to nearest preset number of digits after decimal point. • Round Off : rounded down to nearest preset number of digits after decimal point. • Round Up : rounded up to nearest preset number of digits after decimal point.
[Factor]	Here you select a number of decimal place and fraction rounding for sample size as follows: • Round : rounded to nearest preset number of digits after decimal point. • Round Off : rounded down to nearest preset number of digits after decimal point. • Round Up : rounded up to nearest preset number of digits after decimal point.

The above setting of a number of decimal place appears on display and in printing.

3-8. Graph Setting

Arrange graphic display and printout.

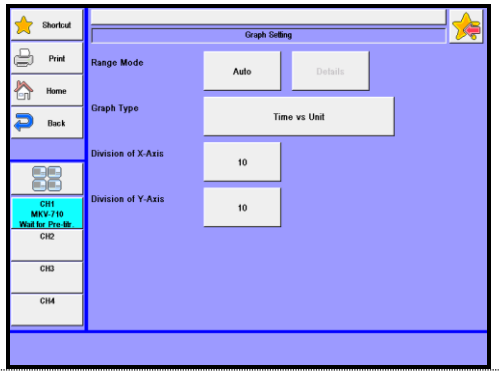
1 Press [Graph Setting] button on "Function."



2 The screen on the right will appear.

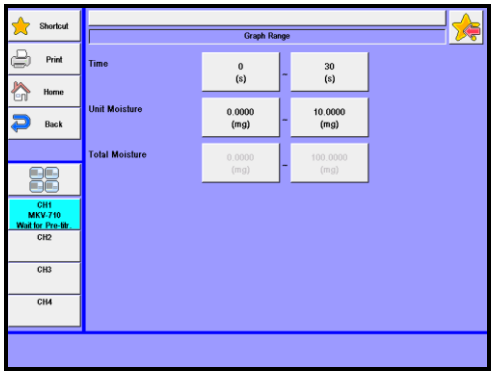
Select and edit the value you wish to edit.

Each parameter is determined by the [OK] button.



Item	Description
[Range Mode]	The graphic range mode can be selected as follows. • Auto : Graphic range is automatically set up. • Fixed : You can choose a fixed range by pressing [Details] button. • Auto Horizontal Axis : Locks vertical axis of Graph range. Press [Details] button, and "Graph Range" screen will appear. Set up locked range.
[Range Mode] -[Details]	Set the fixed range for graph. With this button, "Graph Range" screen will be displayed. This becomes significant when "Fixed" or "Auto Horizontal Axis" is chosen for "Range Mode."

<Graph range setup>



[Short Time (Stat Titration)], [Long Time (Stat Titration)]

Set the shortest and longest time in stat titration.

- 0～1728000s

[Low Unit Moisture (mg)], [High Unit Moisture (mg)]

Set the lowest and highest Unit Moisture.

- 0.0000～99999.9000mg

[Low Total Moisture (mg)], [High Total Moisture (mg)]

Set the minimum and maximum Total Moisture.

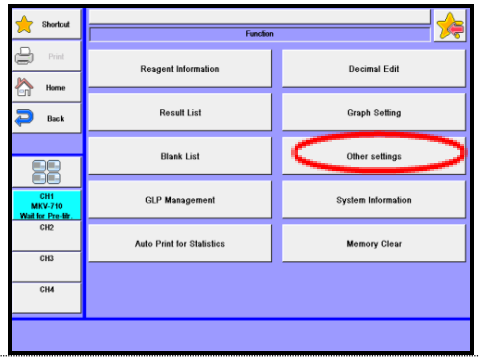
- 0.0000～99999.9000mg

Item	Description
[Graph Type]	Graphic type for vertical and level axis can be selected as follows: • Time vs Unit :Water content per unit time on vertical axis is plotted with time on level axis. • Time vs Total :Accumulated water content on vertical axis is plotted with time on level axis. • Time vs Unit&Total :Water content per unit time and accumulated amount are plotted on vertical axis with time on level axis.
[Division of X-Axis]	Select the division number of X-axis on a graph. • 2 - 20
[Division of Y-Axis]	Select the division number of Y-axis on a graph. • 2 - 20

3-9. Other Settings

Set the operation of automatic dispensing pump, the auto input of average values, and the alarm function, etc.

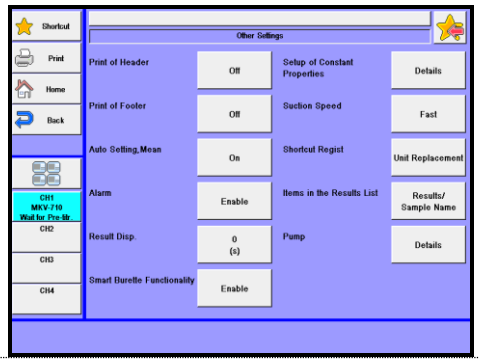
1 Press [Other Settings] button on "Function".



2 The screen on the right will appear.

Select and edit the value you wish to edit.

Each parameter is determined by the [OK] button.



Item	Description
[Print of Header]	You can select the header printed together with measurement results, which shows the model name, serial number and printed date. This setup is made on Print parameter of Method parameter. • Off : No header is printed. • On : Header is printed.
[Print of Footer]	You can select the footer printed together with measurement results, which shows the printer's name. This setup is made on Report parameter of Method parameter. • Off : No footer is printed. • On : Footer is printed.
[Auto Setting, Mean]	The average value of a plural number of blank levels that have been measured will be automatically set into the blank value to be used in sample setup. • Off : No blank setting. • On : Auto set in the blank. • Exclude First : Auto set the value excluding the first result for two measurements or more. Auto set the first result for one measurement. • Exclude Maximum And Minimum Result : Auto set the value excluding the maximum and minimum results for three measurements or more. Auto set the same setting as in the case of "On" for two measurements.

Note

In the automatic setting of the mean value, the data of the unexpected value is not adopted.
(As for the factor value, neither a negative value nor the value of 100mg/mL or more are adopted. As for the blank value, neither a negative value nor the value of 100000mg or more are adopted.)

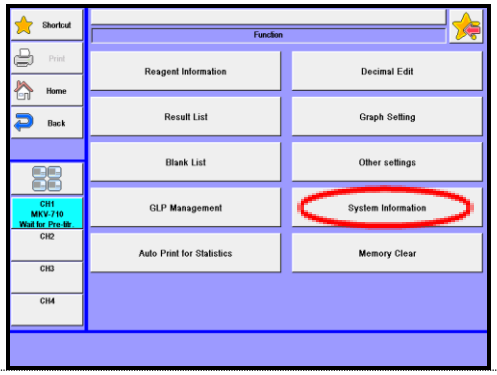
[Alarm]	This gives the alarm about reagent factor measurement, periodic check, etc. • Off : No alarm. • On : Alarm is on.
[Result Disp.]	You can select the display time length of measurement results. Zero "0" second means the display is to be held on screen. • 0～3600s
[**Smart Burette Functionality**]	Selects use of functionality of smart burette. • Enable : Enables functionality of smart burette. • Disable : Disables functionality of smart burette.

Item	Description
[Setup of Constant Properties]	Concerning the constants used in the method calculation, select them on either the method or the sample. Pressing [Details] button leads to the display of the "Setup of constant properties" screen. • Sample: Set constants on the sample. (See the section "2. Sample.") • Method: Set constants on the "Method constant" screen display for the calculation parameter of the method. (See the section 1-7. Calculation parameter.)
[Suction Speed]	Set the speed of filling the built-in burette with reagent or when reset. Slow down the speed for titration liquid like alcoholic solution that can easily generate air bubbles. • Fast : Burette operates at its maximum speed. Ordinary setting. • Medium : Burette operates at its medium speed. • Slow : Burette operates at its low speed.
[Shortcut Regist]	From shortcuts, select one you wish to place to the position of the shortcut button on the main screen. "Unit Replacement" is set as default. • Unit Replacement : Places a button for replacing burette units to the position of the shortcut button on the main screen. When pressed, it will reset. • Shorcut1～12 : Places a button registered on each shortcut to the position of the shortcut button on the main screen.
[Item in the Results List]	Sets up display items of the titration result list. • Method : Displays a method. • Results/Sample Name : Displays the result and the Sample name.
[Pump]	Set the operation of automatic dispensing pump. ＜Injection＞ • Manual : The pump is operated by pressing [Injection] button on main display, and stopped by pressing [Injection] button again. • Auto : The operation time of dispending pump can be set. 1～999s The pump is operated by pressing [Injection] button on main display, and stopped after the set time. ＜Drain＞ • Manual : The pump is operated by pressing [Drain] button on main display, and stopped by pressing [Drain] button again. • Auto : The operation time of drain pump can be set. 1～999s The pump is operated by pressing [Drain] button on main display, and stopped after the set time.

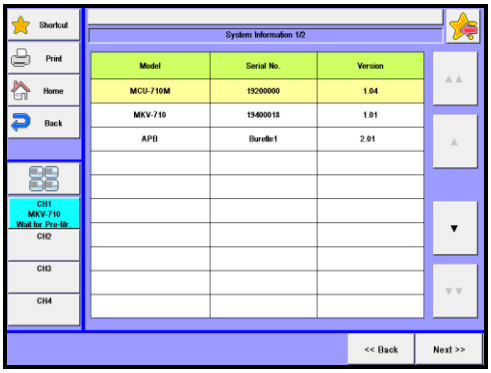
3-10. System Information

You can view the list of equipment presently connected to the channels in work as well as the information on software version.

1 Press [System Information] button on "Function".



2 The screen on the right will appear.
The information on the list of equipment presently connected to the channel and the software version.

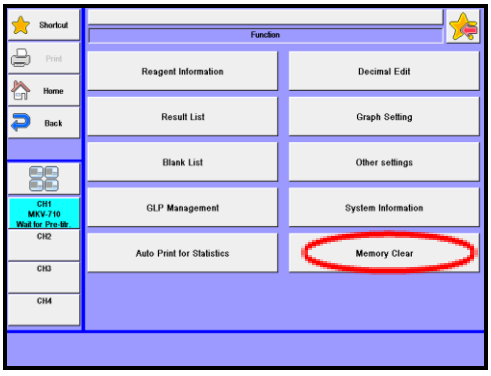


3 Press [Next] button. Operating Hours, Piston Stroke Count and Cylinder Stroke Count are displayed.

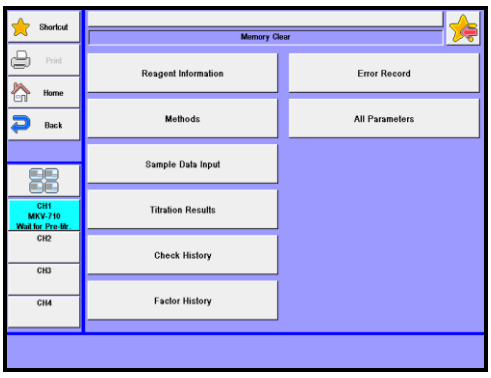
3-11. Memory Clear

With this function, you can erase measurement results, methods or sample parameters selectively by individual sample.

1 Press [Memory Clear] button on "Function."



2 The screen on the right will appear.



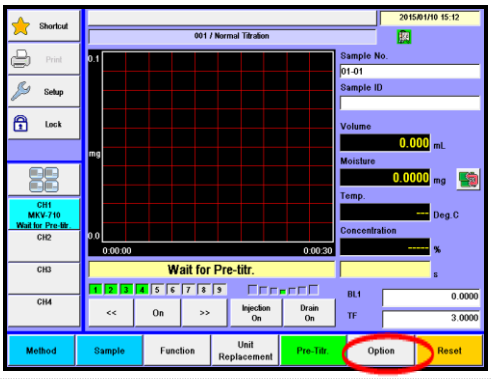
Item	Description
[Reagent Information]	You can erase all the information about reagents.
[Method]	You can erase all of the Methods.
[Sample Data Input]	All the set up contents are erased.
[Titration Result]	All the titration results are erased.
[Check History]	All the check records are erased.
[Factor History]	All the factor records are erased.
[Error Record]	All the error records are erased.
[All Parameters]	All the information and data other than setup contents are erased.

4. Option

4-1. Option

There are two optional functionalities available: manual operation of burette; and oven purge with optional Evaporator ADP-611 connected.

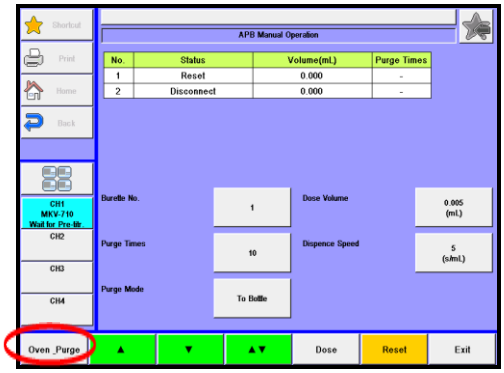
1 Press [Option] button on Main display.



2 The screen on the right will appear.

Select items you wish to set up.

Press [Oven Purge] if you wish to perform manual operation of the Evaporator.

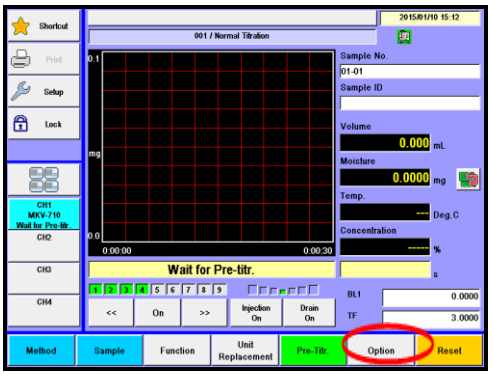


Item	Description
[APB]	The burette can be manually operated for filling or fixed dosing the burette with reagent or to purge the burette.
[Oven Purge]	When the oven for evaporation is connected, ageing is necessary to purge out moisture inside the heating unit and other tube lines. Follow the below descriptions for ageing setup and ageing procedure.

4-1-1.APB Manual Operation

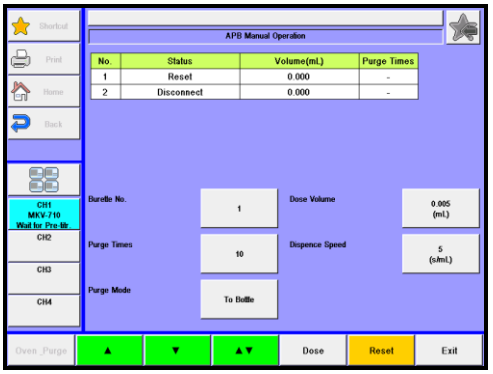
The burette can be manually operated for filling or fixed dosing the burette with reagent or to purge the burette. You can manually operate the burette like these only when the unit is in "Wait for Pre-Titr." mode.

1 Press [Option] button on Main display.



2 The screen on the right will appear.

Select the items you wish to set up, and operate the burette.



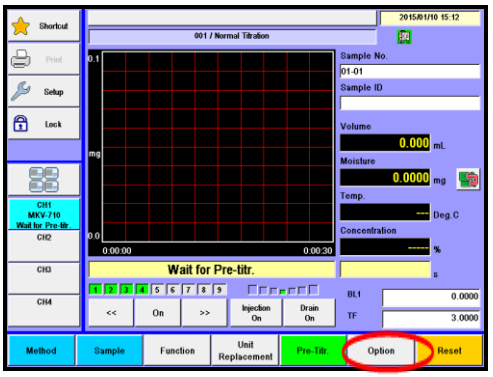
Item	Description
[Burette No.]	Select the burette for use in titration: • Both : Two burettes can be operated at a time. • 1 : The supplied one burette works. • 2 : Additionally installed second burette works.
[Purge Times]	Select a number of purge cycles. "0" setting means unlimited number of cycles. • 0～99
[Purge Mode]	You can select a purge mode: • To bottle : Reagent moves back and forth between the reagent bottle and burette in order to degas the burette and to homogenize the reagent. • To nozzle : Nozzle is degassed and the reagent is discarded. The operation is the same as discharge and can be repeated by the preset number of purge cycles.
[Dose Volume]	Select how much reagent is dosed from burette: • 0.0005～999.0000mL
[Dispense Speed]	Selection of dispense, suction and purge speed in APB manual operation display: • 1～999s/mL
[▲]	This button once pressed pushes out the reagent to the nozzle, and stops the piston when it reaches the upper limit top position. The piston also stops when pressed again. The switching valve is turned to discharge direction during this event.
[▼]	This button lowers the piston to aspirate the reagent from the bottle. When pressed again, the piston stops.
[▲▼]	Once pressed, it purges for a number of preset times, and stops by filling the burette with reagent. When pressed again, it stops purging and sets in standby for discharge position.
[Dose]	It doses the preset amount of reagent. This is for degassing the burette or volumetric validation.
[Reset]	This button stops discharge, suction or fixed dosing, and returns to reset condition.
[Exit]	Returns to Main display.
[Oven Purge]	This button changes the display to "Oven purge".

Item	Description
Status Display	The various burette positions are shown below: Reset : Piston is in lower limit bottom position. Upper limit : Piston is in upper limit top position. Replace : Piston is in a position where the burette unit can be removed. The front lamp blinks. Up : Piston is moving upward to discharge reagent. Down : Piston is moving downward to aspirate reagent. Stop : Piston is stopping at any point in burette. Purge : Piston is moving for purge event. Dose : Piston is dosing now. Disconnect : The burette is not connected for use.
Volume Display	The display shows the amount of dosed reagent.

4-1-2.Oven Purge

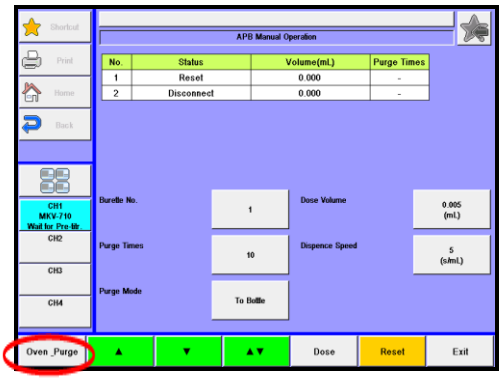
When the oven for evaporation is connected, ageing is necessary to purge out moisture inside the heating unit and other tube lines. Follow the below descriptions for ageing setup and ageing procedure.

1 Press [Option] button on Main display.



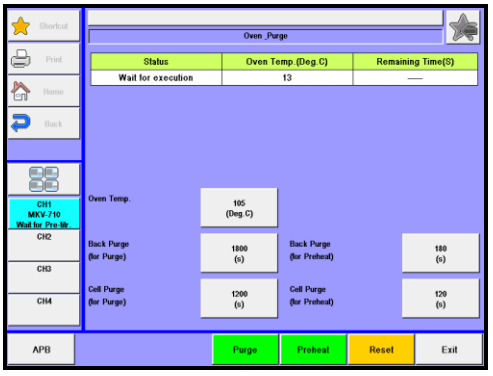
2 The screen on the right will appear.

Press [Oven Purge] button.



3 The screen on the right will appear.

Select the items you wish to set up.



Item	Description
[Oven Temp.]	Select an oven temperature. Setting heating temperature will automatically transfer the temperature to Evaporator. • 0～300℃
[Back Purge (for Purge)]	The sampling line from sample inlet in the oven to the sample boat is purged with carrier gas. Select a time length in seconds: • 0～99999s
[Cell Purge (for Purge)]	Enter a time length for purging the sample inlet in the oven to the titration cell with carrier gas. • 0～99999s
[Back Purge (for Preheat)]	Select a time length to purge the sample inlet in the oven to the sample boat with carrier gas. • 0～99999s
[Cell Purge (for Preheat)]	Enter a time length for purging the sample inlet in the oven to the titration cell with carrier gas. • 0～99999s
[Purge]	Moisture inside the heating unit and other tube lines are extracted under the preset conditions.
[Preheat]	The sample boat is blank heated in the oven to purge out the adhered moisture at a preset temperature.
[Reset]	Halt purging and Preheating.
[Exit]	The display returns to Main.
[APB]	This button changes the display to "APB manual operation".
Status Display	Will indicate the operating state on Evaporator. • Wait for execution • Back purging • Purging in cell • Sample boat moving
Oven Temp. Display	Will indicate the present oven temperature. The oven temperature is automatically loaded from the currently selected method file (temperature set in optional parameter settings).
Remaining Time Display	Will display the remaining time for purging or preheating.

5. Shortcut

Use registered shortcuts, and set up.

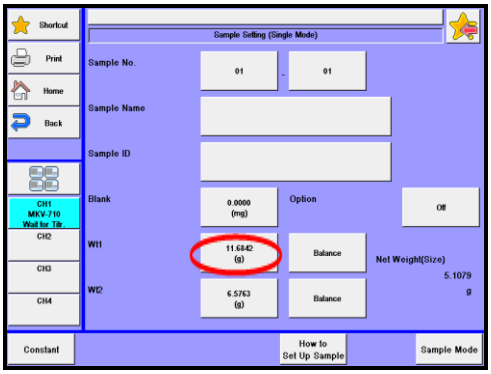
5-1. Register/Delete shortcut

Register/Delete shortcut buttons.

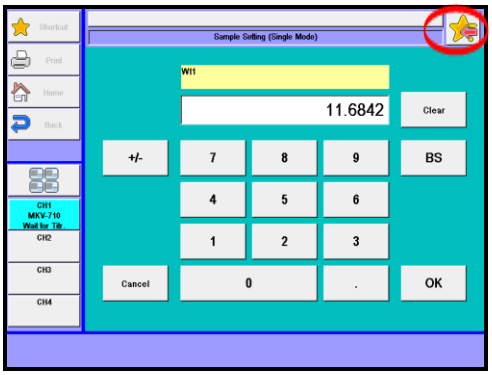
<Registration>

1 Display a screen to be registered as shortcut.

Example: Register the screen of Sample size (Wt1) as shortcut by pressing [Sample] button and then the button of Sample size (Wt1).



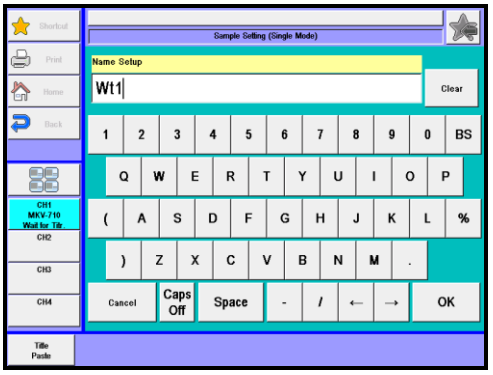
2 Press the button in the upper right corner.



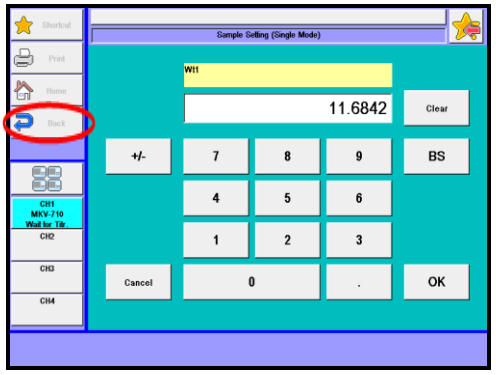
3 When the screen for Shortcut Registration is displayed, choose a positon of shortcut to be registered.

4 Enter a name to be registered as shortcut and press [OK] button. (In initial registration, the title of screen display is displayed.)

[Title Paste]: Copy the title name of the present item to a name field.

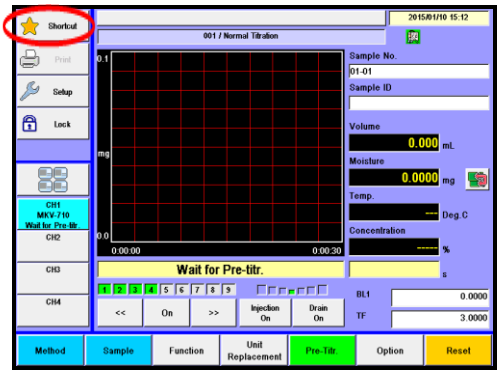


5 Press [OK] button.



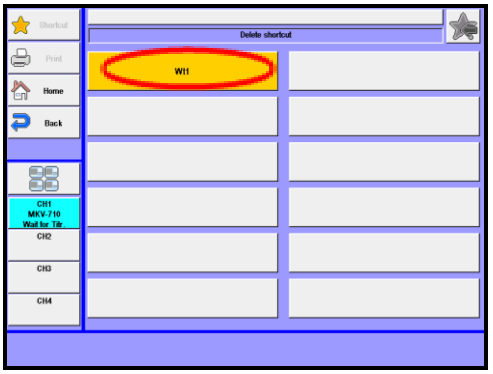
<Deletion>

1 Press [Shortcut] button on Main display.



2 Registered shortcut buttons will be displayed.
Press [Delete] button.

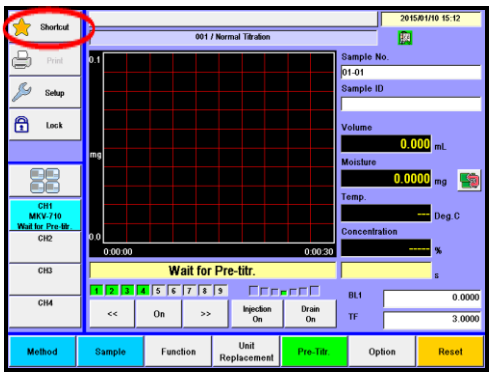
3 Press shortcut button to be deleted.
Press [Yes] button.



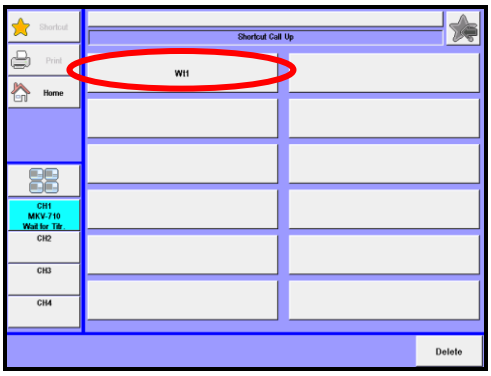
5-2. Usage of registered shortcuts

Usage of registered shortcuts.

1 Press [Shortcut] button on Main display.



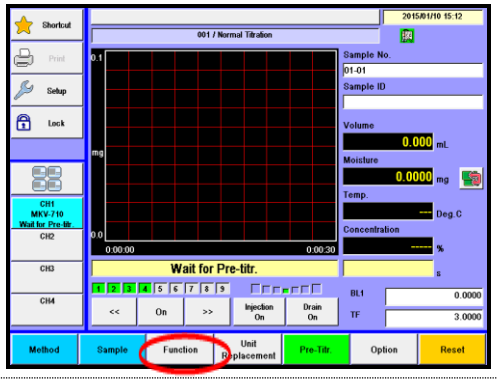
2 Registered shortcut buttons will be displayed. Press a button to be used.



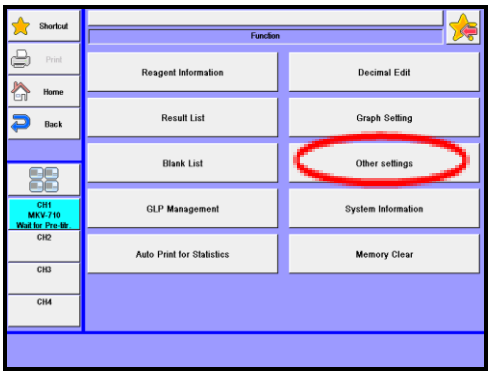
5-3. Registration of free button

From shortcuts, select one you wish to place to the position of the shortcut button on the main screen.

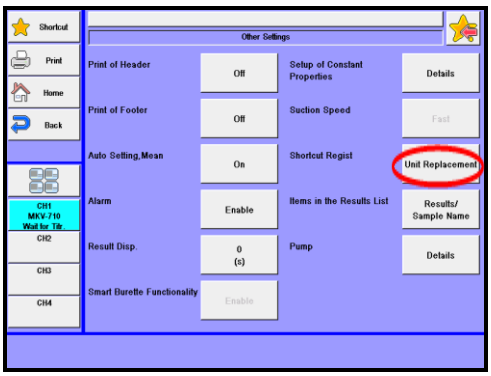
1 Press [Function] button on Main display.



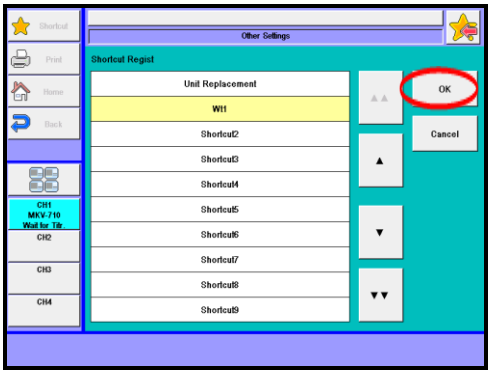
2 Press [Other Settings] button.



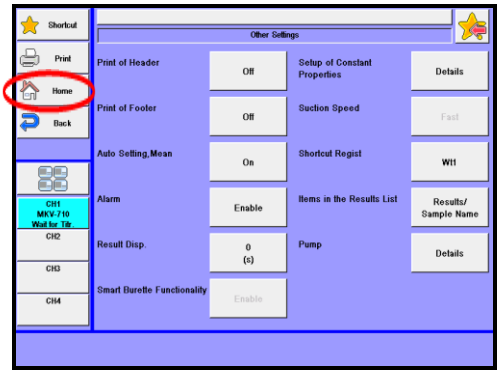
3 Press the button for Shortcut Regist.



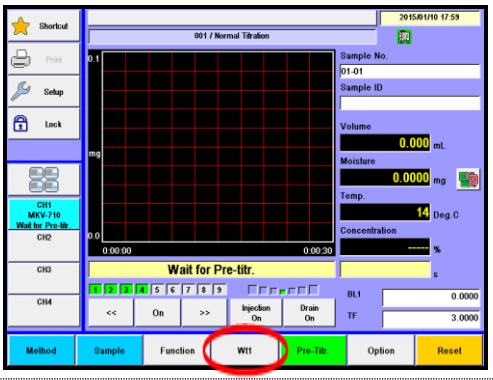
4 Choose the registered shortcut and then press [OK] button.



5 Press [Home] button.



6 The right screen will be displayed, and the set item is registered on Main display.

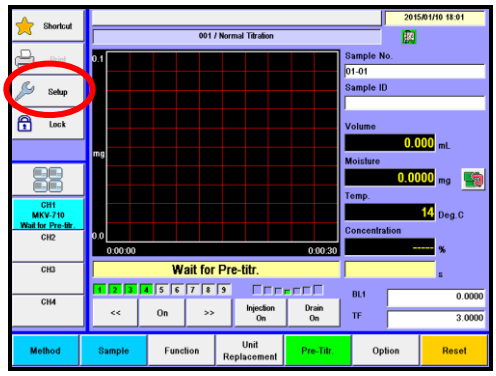


6. Setup

6-1. About Setup

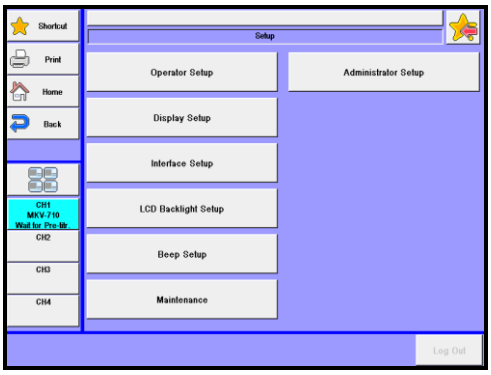
You can configure system setup using the function of Setup.

1 Press [Setup] button.



2 Here you will see the screen on display.

Please select the parameter you wish to edit.

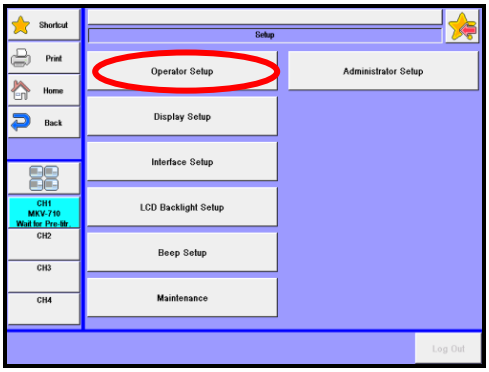


Item	Description
[Operator Setup]	Here the operator is defined for identification.
[Display Setup]	Languages, date and clock time can be set.
[Interface Setup]	Here you configure settings for your printer, output to a PC, the balance, a LAN and Bluetooth.
[LCD Backlight Setup]	Here the backlight of LCD can be adjusted.
[Beep Setup]	Beep tone for alarm can be selected on this display.
[Maintenance]	Deletes information of the instrument connected to CH1-CH4 or clears all memories. Also calibrates the touchscreen.
[Administrator Setup]	Sets up the functionality of hierarchical management for operation menus by user ID or password.

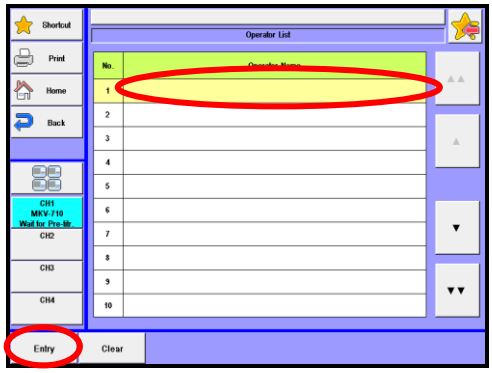
6-2. Operator Setup

Up to 50 operators can be registered with individual names.
The registered name will be automatically printed out together with measurement results. (Characters: alphanumeric including capital and small letters)

1 Press [Operator Setup] button.



2 Press [Entry] button on "Operator List" to display "Operator Registration" dialog box.



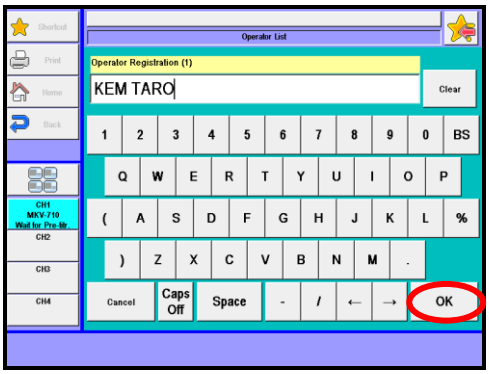
[▲], [▼]
Moves the cursor on the list page.

[▲▲], [▼▼]
The list page turns with these buttons. The cursor moves to the top number after page break.

[Entry]
Here the operator is registered. The display for "Operator Registration" will appear with this button after pointing the cursor on the operator's number on the list.

[Clear]
With the cursor pointed on the number you wish to clear, the display will appear to prompt your confirmation.

3 Enter the operator's name in below display, and press [OK] button.
Press [Caps On] button to use capital letter and [Caps Off] button for small letter.
Up to 64 characters can be entered.



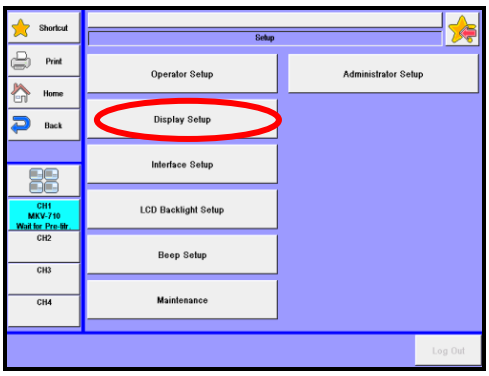
Note

When there is a lot of character of registered name, a part of the character can not be displayed on "Operator List" screen or the main screen.

6-3. Display Setup

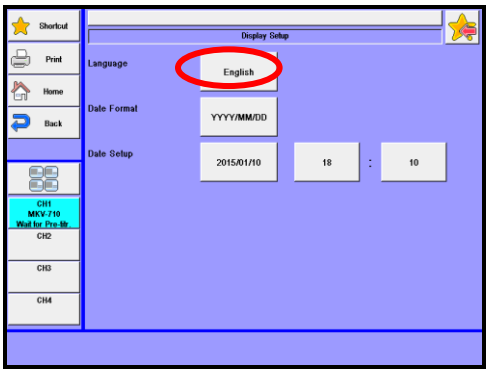
Languages, date and clock time can be set.

1 Press [Display Setup] button.



2 **[Language]**
Choose a language either English or Japanese you wish to view and use in operation, and press [OK] button.

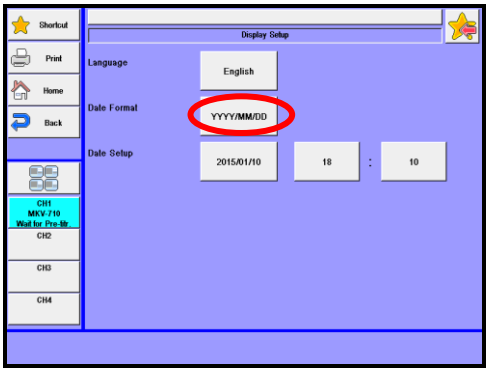
The language you have selected will appear after the power is turned off and on again.
English : Shows in English.
Japanese : Shows in Japanese.
Mandarin : Shows in Mandarin Chinese.
Korean : Shows in Korean.
Russian : Shows in Russian



Note If there is no language you'd like to choose, contact your local dealer.

3 **[Date Format]**
Here you select and update the date of year, month and day. Press [OK] button.

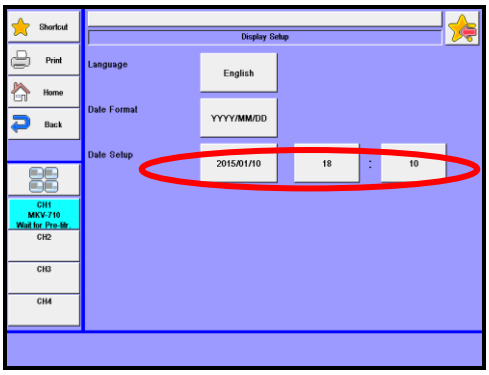
YYYY/MM/DD : Christian year/month in number/day of the month
MM/DD/YYYY : month in number/day of the month/Christian year
DD/MM/YYYY : day of the month/month in number/Christian year



4 **[Date Setup]**

Here the date and time are updated. Press the date button for calendar and select the present date and time. The hour and minute can be entered with numerals which appear on display. Then, press [OK] button.

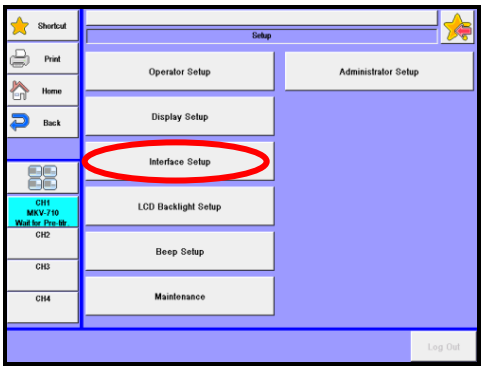
Date : 2010/01/01 - 2099/12/31
Time : 00:00～23:59



6-4. Interface Setup

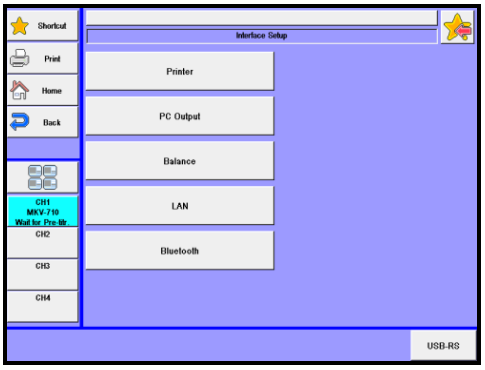
Here you configure settings for your printer, output to a PC, the balance, a LAN and Bluetooth.

1 Press [Interface Setup] button on "Setup."



2 Press interface button you wish to set up.

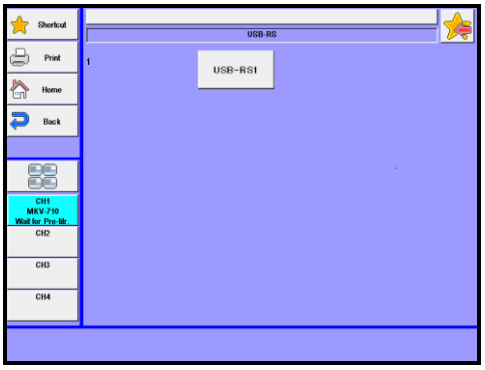
Printer	: Refer to Section 6-4-1.
PC Output	: Refer to Section 6-4-2.
Balance	: Refer to Section 6-4-3.
LAN	: Refer to Section 6-4-4.
Bluetooth	: Refer to Section 6-4-5.



[USB-RS]

The USB port can be used as RS-232C (COM) port by connecting an optional USB serial converter (US232R-10 [64-00177-00]) to the USB port of MCU-710.

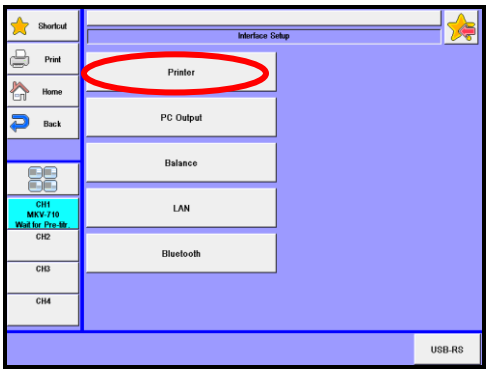
When your titrator recognizes the USB serial converter, it displays "USB-RS1."



6-4-1. **[Printer]**

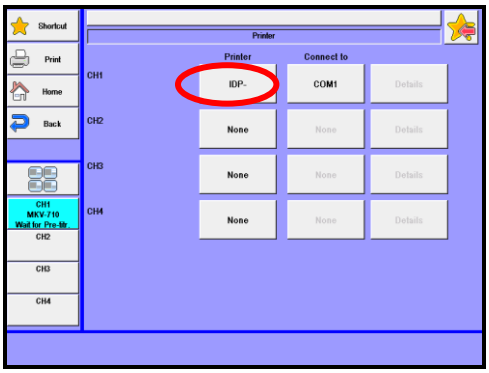
Set up a printer, and print out results and parameters.

1 Press [Printer] button on "Interface Setup." Set up a printer per each channel.



2 **[Printer]**
Select a type of printer you are going to use.

None :Printer is not connected.
IDP- :KEM's impact dot printer model IDP-100.
DP-USB :KEM's thermal printer (DP-600) to USB port.
A4Printer : KEM's recommended A4-sized printers to LAN port.
Other :Other printer than the above.



Note For printer type and configurations, refer to the Table 6-4-1. The communication protocol between your printer and titration unit must match. Otherwise, printing may fail and halt halfway. For digital configurations for your printer, refer to the operation manual for the printer.

When any other printer is to be connected, check with your local dealer to see if it can be used with this instrument. The "other" printer will not print out graphs.

3

[Connect to]

Select the destination of output data for printing. Only ports without PC or balance connection settings can be selected. Note that COM2 port cannot be used for printer connection.

This setting is enabled when "IDP" or "Other" is selected in [Printer] settings.

Unit : Make printer settings on COM1 port of measuring unit (AT-710, MKC-710 or MKV-710).

COM1 : Make printer settings on COM1 port of MCU-710. When more than one unit is connected, measurement results will be printed in the order that they are output.

USB-RS1 :This will be displayed when the optional USB-RS converter is connected to the USB port of MCU-710. Make printer settings on the USB-RS converter. When more than one unit is connected, measurement results will be printed in the order that they are output.

4

[Details] - [Baud Rate]

If you use other printer as defined on "Printer", you have to select baud rate for your printer.

1200 bps/ 2400 bps/ 4800 bps/ 9600 bps/ 19200 bps/ 38400 bps

5

[Details] - [Parity]

If you use other printer as defined on "Printer", you have to select parity for your printer.

None / Even / Odd

6

[Details] - [Stop Bit]

If you use other printer as defined on "Printer", you have to select parity for your printer.

1bit /1.5bit / 2bit

7

[Details] - [Data Bit]

If you use other printer as defined on "Printer", you have to select data bit for your printer

7bit / 8bit

Table 6-4-1

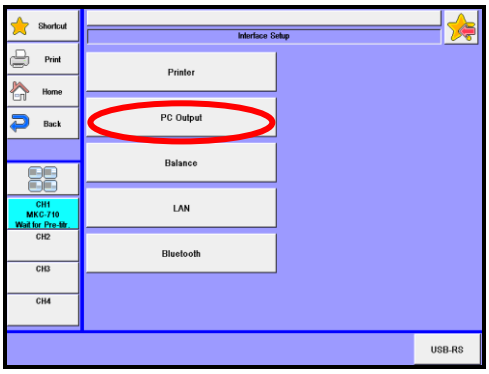
Printer	Cables	Titrator setup	Printer settings
Citizen CBM-910 CBM-910 Type Ⅱ	Connecting cable 64-00625 12-02013	Printer IDP-	Digital configurations for printer: Baud rate : 4800 Parity : none Stop Bit : 1 Data Bits : 8
Citizen CBM-270	Connecting cable 64-00625 12-02013	Printer Other	No titration curve is available. Match protocol between printer and unit.
EPSON A4 Printer	USB Cable for Printer	Printer A4 Printer	Can print measurement results on A4-sized paper. Connect a cable to USB port of MCU-710.

6-4-2. **[PC Output]**

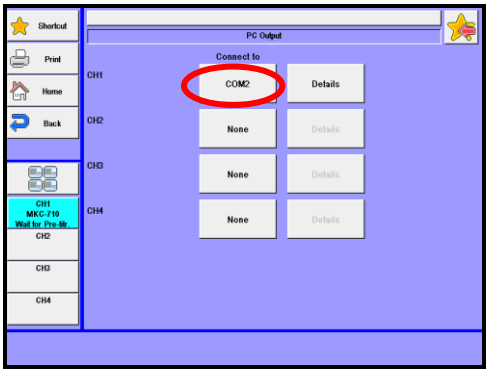
Make settings for outputting data to PC.

When you want to transfer the output data to a personal computer, you need to purchase our optional Data Acquisition Software (SOFT-CAPE). But you have to check the version of the Data Acquisition Software because some software cannot be compatible with the titrator. For more information, please contact your sales representative nearest to or local dealer.

1 Press [Pc Output] button on "Interface Setup." Set up output to a PC per each channel.



2 **[Connect to]**
Select the destination of output data to PC. Can select only ports where an output setting for printer or balance is not made.



None : Does not set up output.
COM1 : Sets up PC output on the COM1 port of the MCU-710.
COM2 : Sets up PC output on the COM2 port of the MCU-710.

USB-RS1 : Displayed when an optional USB-RS converter is put to the USB port of the MCU-710. Sets up PC output on the USB-RS converter.
LAN1 : Displayed on the MCU-710M only. Sets up PC output on the LAN port.
LAN2 : Displayed on the MCU-710M only. Sets up PC output on the LAN port.
LAN3 : Displayed on the MCU-710M only. Sets up PC output on the LAN port.
LAN4 : Displayed on the MCU-710M only. Sets up PC output on the LAN port.

If you set up channels you wish to use on the same port, you will be able to obtain all results on one PC.

3 **[Details] - [Baud Rate]**

Set up communication protocol (baud rate) between a connected PC and the instrument. This settings is enabled when "COM1, COM2, USB-RS1" is selected in [Destination] settings.

1200 bps/ 2400 bps/ 4800 bps/ 9600 bps/ 19200 bps/ 38400 bps

4 **[Details] - [Parity]**

Set up communication protocol (parity) between a connected PC and the instrument.This settings is enabled when "COM1, COM2, USB-RS1" is selected in [Destination] settings.

None / Even / Odd

5 **[Details] - [Stop Bit]**

Set up communication protocol (Stop Bit) between a connected PC and the instrument.This settings is enabled when "COM1, COM2, USB-RS1" is selected in [Destination] settings.

1bit/ 1.5bit/ 2bit

6 **[Details] - [Data Bit]**

Set up communication protocol (Data Bit) between a connected PC and the instrument. This settings is enabled when "COM1, COM2, USB-RS1" is selected in [Destination] settings.

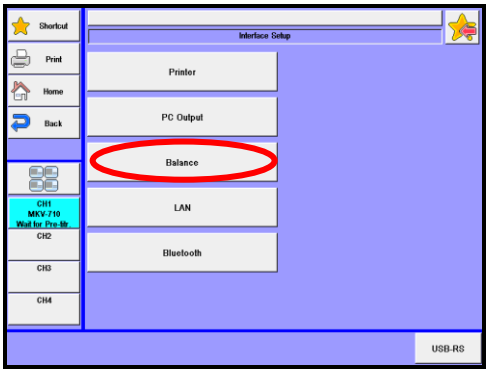
7bit/ 8bit

6-4-3. **[Balance]**

Connection of balance allows to input sample size automatically

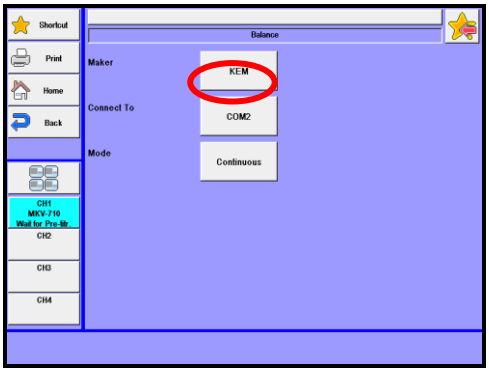
Note Make sure to contact your local dealer to see if any particular connecting cable may be required.

1 Press [Balance] button on "Interface Setup."



2 **[Maker]**
Select the maker of balance to be connected. For details of communication protocol, refer to table 6-4-3.

None
KEM
Mettler
A&D
Shimadzu
Sartorius
Mettler-Old



3 [**Connect to**]
Select the destination of output data from balance.
Can select only ports where an output setting for printer or PC is not made.

COM1 : Make balance settings on COM1 port of MCU-710.
COM2 : Make balance settings on COM2 port of MCU-710.
USB-RS1 : Displayed when the optional USB-RS converter is connected to the USB port of MCU-710. Make balance output settings on USB-RS converter.

4 [**Mode**]

Select receiving mode from balance.

Continuous : Input mass on balance from the titrator by setting at "Continuous" mode on balance.

Print : Input mass from balance by pressing "Print" key on balance.

Note For some types of balances, "Print" mode will not work when it is set up.

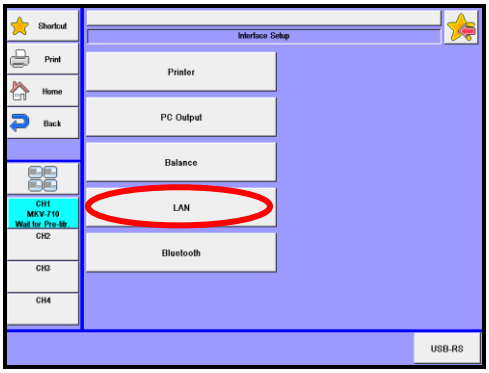
Table 6-4-3. Balance setting

Maker	KEM	Mettler	Mettler-Old	A&D	Shimadzu	Sartorius
Baud Rate	2400	9600	2400	2400	1200	1200
Parity	Even	None	Even	Even	None	Odd
Data Bits	7	8	7	7	8	7
Stop Bits	1	1	1	1	1	1
Handshake					H-oFF	
Delimiter	CR/LF	CR/LF	CR/LF	CR	CR	CR/LF

6-4-4. **[LAN]**

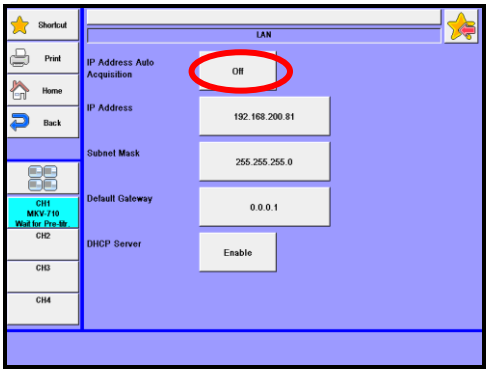
LAN connection allows to control instruments or acquire measured data using the browser (Internet Explorer) - a standard accessory of Windows® OS.

1 Press [LAN] button on "Interface Setup."



2 Make settings for LAN connection.

[IP Address Auto Acquisition]
Off : Manual settings of IP address
On : Automatic acquisition from DHCP server



The settings below will be enabled when "Off" is selected in [Automatic acquisition of IP address] settings.
[IP Address]
0.0.0.1 - 255.255.255.254
[Subnet Mask]
0.0.0.1 - 255.255.255.254
[Default Gateway]
0.0.0.1 - 255.255.255.254
[DHCP Server]
Enable :Enable DHCP server.
Disable :Disable DHCP server.

Basic setup is that "Off" is selected at [Automatic acquisition of IP address] and "On" is selected at [DHCP server]. Further, Select "Obtain an IP address automatically" to configure "Internet Protocol (TCP/IP) Properties" in Windows. (Default of Windows)

3 Connect the unit with a PC using a LAN crossing cable.

At least Category 5 10Base-T cable must be used.
Plug in the LAN cable to the LAN port on the back of the unit.

Some combination of PC and LAN cable cannot establish connection. In this case, use HUB with straight cable for connection.

4 Start Internet Explorer, and enter IP address (e.g. http://192.168.200.81/) or "http://MCU-710" in the address bar. Then, the screen for MCU-710 Network Operation will be displayed.

Note

"http://MCU-710" can be used when "DHCP server" is set at "On."

5 Click on the Channel button to operate.

6 Controls the titrator or imports measurement data.

[**Capture**]
Captures a screen displayed on the MCU-710. The screen currently on the titrator will be captured and displayed on Internet Explorer. You may use the captured image when creating your own manual. Select a screen you wish to capture, and click [Capture]. Point the cursor to the screen image. Right-click and select "Save Picture As..." to save the screen image. Press Fn+F5 and refresh the display to capture the next screen image.

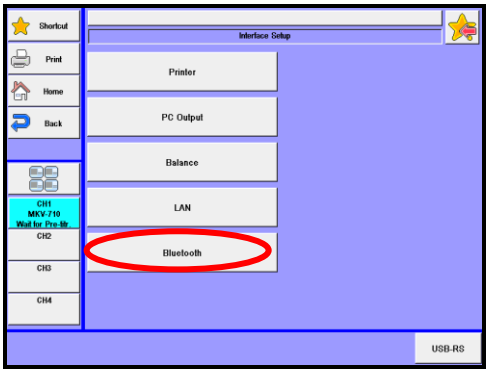
[CSV]
Obtains a CSV file of the result list.

[Delete]
Deletes all result data of the channel currently selected. Click [Delete] and then select [Yes]. Results will be deleted.

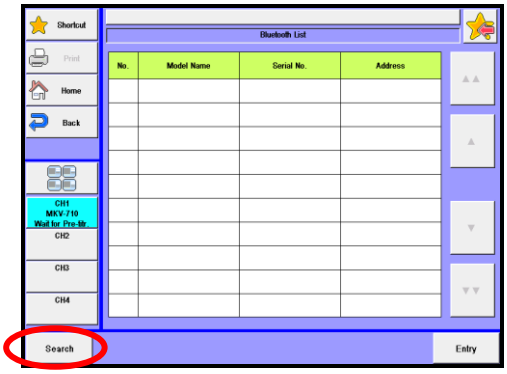
6-4-5. **[Bluetooth]**

Set up Bluetooth. The MCU-710M only.

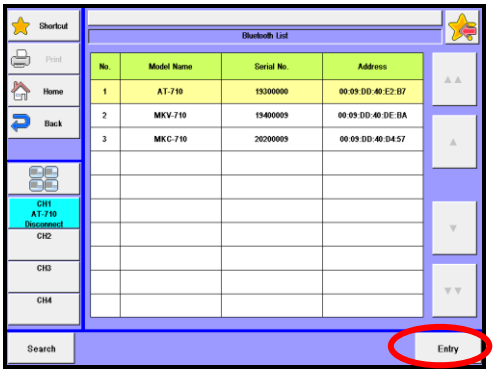
1 Press [Bluetooth] button on "Interface Setup."



2 Screen of Bluetooth list will be displayed. Turn on the device to which a Bluetooth adapter is connected, and then press the [Search] button. When connectable Bluetooth in the vicinity of the MCU-710 is retrieved and then the AT-710, the MKV-710 and the MKC-710 are retrieved, they will be displayed on the screen list.



3 Select a Bluetooth enabled device you wish to use, and press the [Entry] button to register. (You can select more than one.)
Return to the "Bluetooth List" screen, and devices will be connected.



Note When you turn on the power but the registered equipment (AT-710, MKV-710, MKC-710) with the MCU-710 is not connected, select the equipment once again and press the [Entry] button.

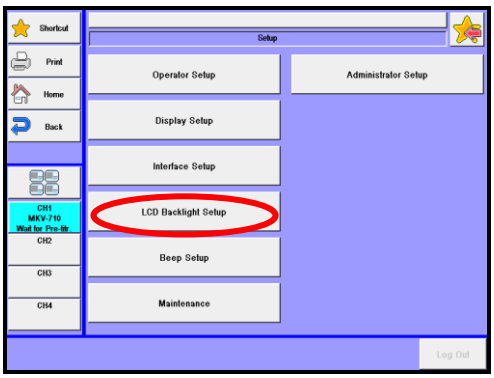
Note When you have more than one MCU-710M units and register a measuring unit for another MCU-710, you have to turn off and on the measuring units.

Registration of the registered equipment will be cancelled if you press the [Entry] button without selecting such equipment.

6-5. LCD Backlight Setup

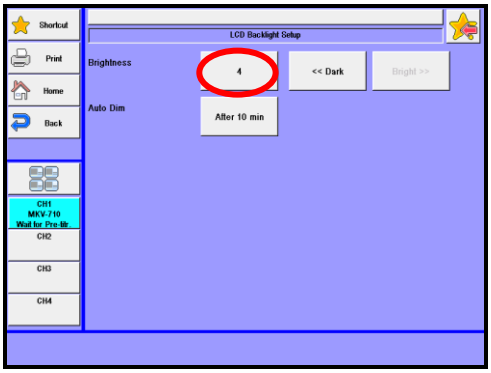
Here the brightness of backlight for LCD and its auto dimmer can be adjusted.

1 Press [LCD Backlight Setup] button on "Setup."



2 **[Brightness]**
Adjust brightness of backlight.
Enter number directly by pressing numerical button or adjust brightness with [<< Dark] or [Bright >>] button.

(Dark) 1/2/3/4 (Bright)



3 **[Auto Dim]**
Select auto dimming time for display backlight.
The backlight of display will automatically dim after the preset time elapses without operation.

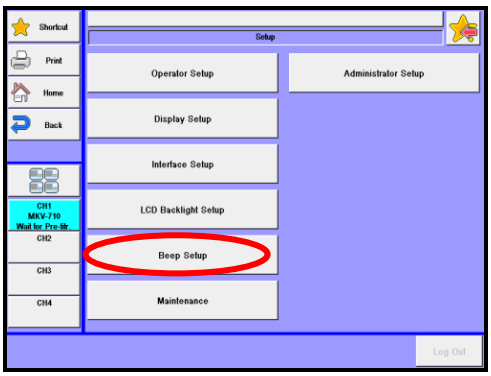
Off / After 10min / After 20min /
After 30min / After 1 hour / After 2 hours

When 'Auto Dim' is selected and no key entry has been made for three hours, the backlight will eventually go out following auto dimmer feature. In this event, the backlight feature will recover to the state before the dimmer utility was on by touching the screen panel.

6-6. Beep Setup

Here you can select the beep and its tone as follows.

1 Press [Beep Setup] on "Setup."

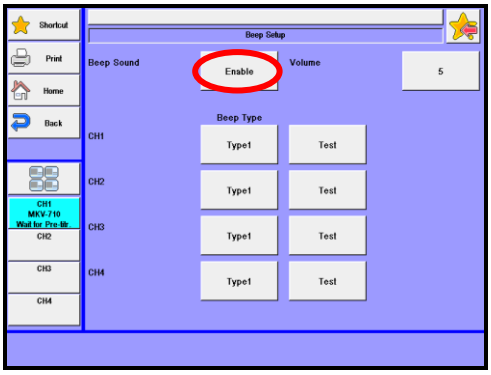


2 **[Beep Sound]**

Sets up a touchscreen tone and a beep of at the end of measurement.

Enable : Enables the beep.

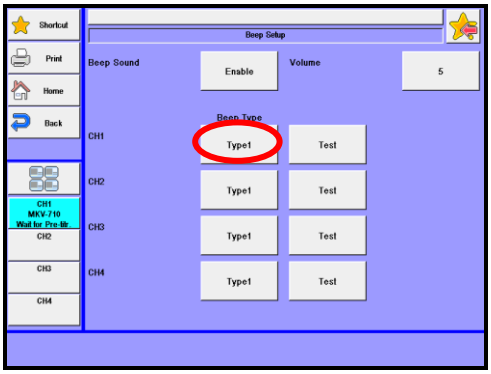
Disable : Disables the beep.



3 **[Beep Type]**

There are five types of beep tone you can choose from

Set up the beep per each channel. You can set this up only when selecting "Enable" on the [Beep Sound] setting.



Off : Setting of beep sound is cancelled. Beep sound is muted even for key operations.

Type 1 : Beep sound lasts for about two seconds: "pi, pea-pea-pea-pea"

Type 2 : Beep sound lasts for about four seconds: "pi-pi-pi-pi-pi-pi"

Type 3 : Beep sound lasts for about ten seconds: "pi, pea-pea-pea-pea"

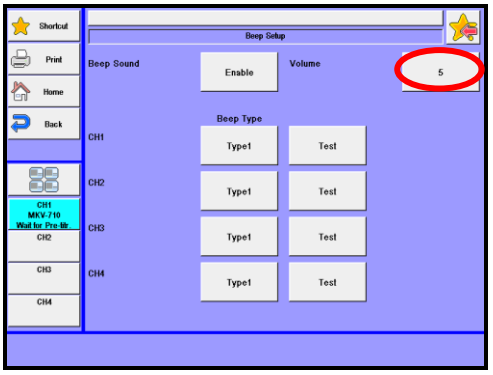
Type 4 : Beep sound lasts for about one second: "pi-pi-pi-pi-pi-pi"

Type 5 : Beep sound lasts for about one second: "pi, pea-pea-pea"

4 **[Volume]**

Select the volume of beep sound by pressing the button.
(Low) 0/1/ 2/ 3/ 4/ 5(High)

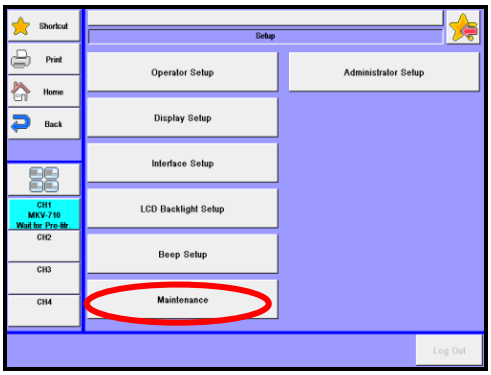
Press [Test] button.
The selected beep tone can be tested here.



6-7. Maintenance

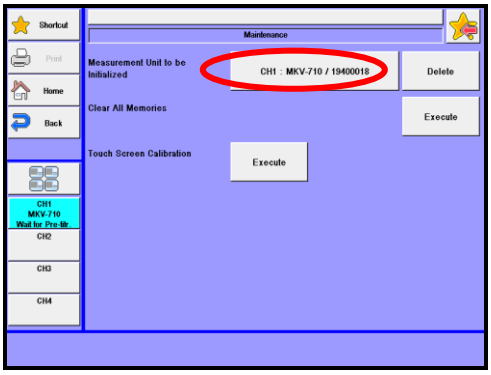
Initializes the measurement unit, and clears all memories. Also calibrates the touchscreen.

1 Press [Maintenance] on "Setup."



2 **[Measuring Unit to be initialized]**

The following procedures are necessary when a different measuring unit or units are registered where CH1, CH2, CH3 and CH4 are occupied by measuring units such as AT-710, MKC-710 or MKV-710 and another measuring unit is newly registered.



The first step is the selection of information on the measuring unit to be initialized

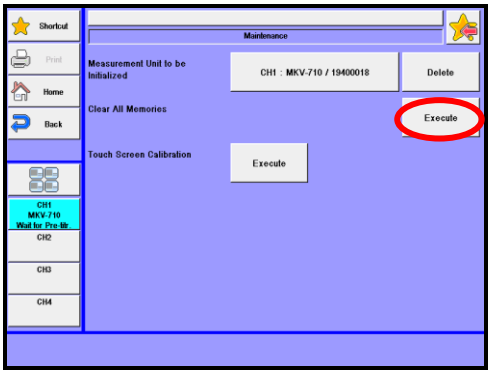
CH1 :(Unit name)/ (Serial No.): Select information set on CH1.
CH2 :(Unit name)/ (Serial No.): Select information set on CH2.
CH3 :(Unit name)/ (Serial No.): Select information set on CH3.
CH4 :(Unit name)/ (Serial No.): Select information set on CH4.

Pressing [Delete] button will lead to deleting the device information on the selected measuring unit.

3 **[Clear All Memories]**

Here you can initialize all data and setup configurations stored on the measuring units occupying from CH1 to CH4.

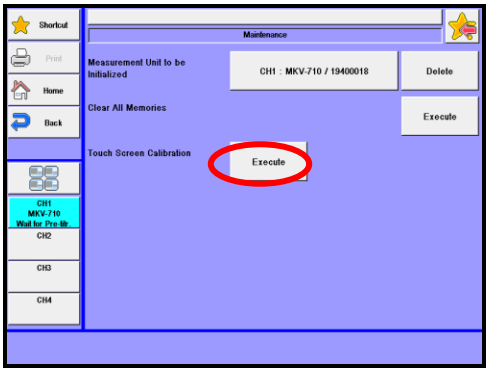
Pressing [Execute] button will allow to initialize all data on the units.



Be sure to save all necessary measurement and method data to a USB flash drive before initializing measuring units or executing all memory clear.

4 **[Touch Screen Calibration]**

Use this function when the touch position deviates from the corresponding screen position during touch panel operations.
Press [Execute] button.
Confirmation message for execution will be displayed. Select "Yes."
Touch '+' mark position in order following the instructions on the screen.
After confirming all positions, touch any place on the touch panel. Touch panel calibration will then be completed.
If the calibration fails, '+' mark will be displayed again. Then, retry to perform the calibration.

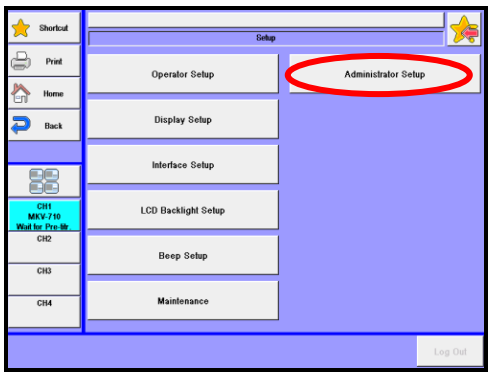


6-8. Administrator Setup/User Setup

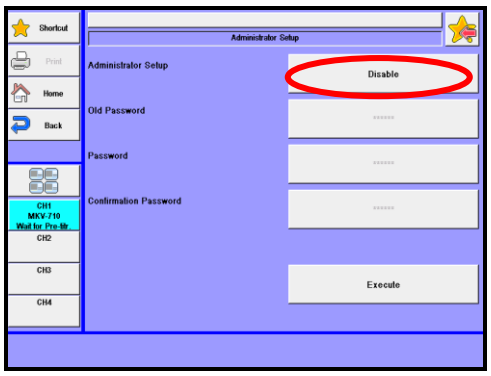
This functionality clearly distinguishes the administrator (one person) and operators. The administrator and operators can separately be set up with clear distinction of the user level. With this functionality, it is always required to log off or log on every time users (those who use the equipment) are changed.
Users may use this functionality to protect the equipment with a password for security. Like PCs, users can be changed or a unique password can be used for log-on and log-off.

6-8-1.Setting up user management

1 Press the [Administrator Setup] button on the [Setup] screen. (When user management is already enabled and you have logged in as an operator, the [User Setup] button will appear.)



2 User management screen will be displayed.
Press button of user management.
Select "Disable" and press [OK] button.
[Administrator Setup]
Disable : Disables administrator authority.
On : Enables administrator authority.



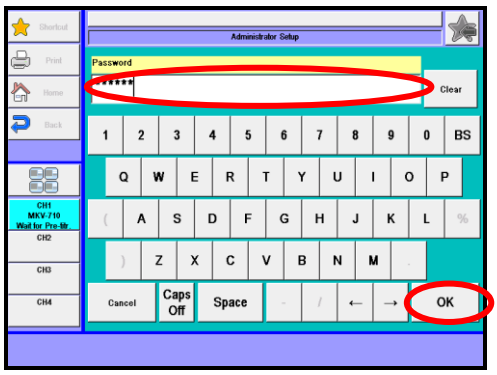
3 Enter your password.

Press the password button. Enter a new password and press the [OK] button.

Enter the same password in confirmation password to prevent false input.

Press the button of confirmation password. Enter the password and press the [OK] button.

No need to enter the previous password when changing user management from "Disable" to "On."

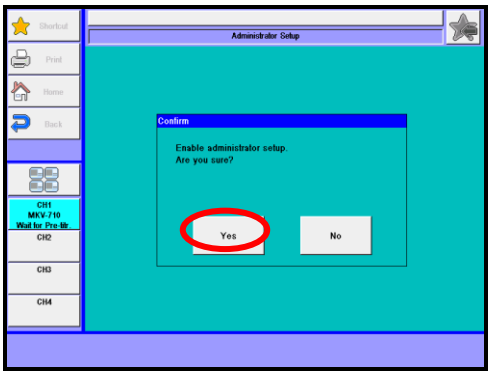


4 [Execute] button will be enabled after confirmation password is correctly entered. Press [Execute] button.

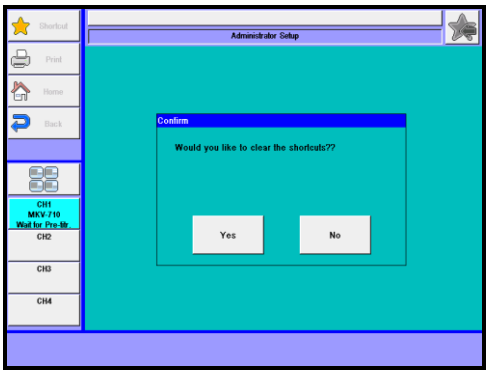
In order to enable user management, you are required to set up a password of the administrator.

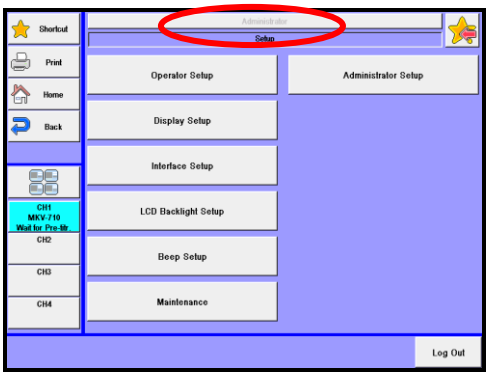
5 A screen shown on the right will be displayed.

Press [Yes] button. Enter confirmation password and press [OK] button.



6 You will be asked if you wish to clear registered shortcut. Select [Yes][No]. Operator name will be "Administrator," and you can now change everything. Refer to Table.6-8 for range of administrator authority.





Note If you set a function to a shortcut as Administrator, the set function can be operated by any operator.

Table.6-8. Limits of changeable measurement parameters

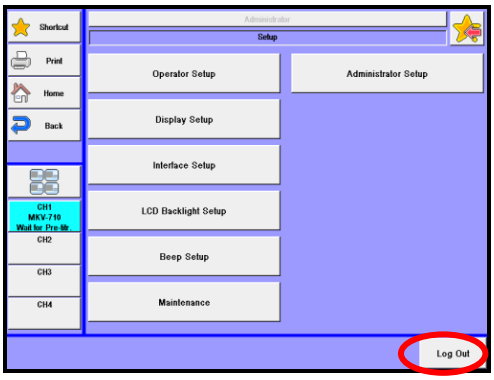
Item		Operator	Administrator
Method	Selection	○	○
	Edit	×(only inspect)	
Sample	Edit	○	○
	Mode switching	×	
	Sample mode	×	
	Changer settings	×	
Function	Reagent Information - Factor Settings	△	○
	Blank List	△	
	Other Settings	△	
	Other Items	×	
Setup	Management settings	×	○
	User settings	○	
	Login / Logout	○	
	Other items	×	
Burette		○	○
Titration / Reset		○	○
Lock		○	○
Shortcut		○	○

Note If you set a function to a shortcut as Administrator, the set function can be operated by any operator.

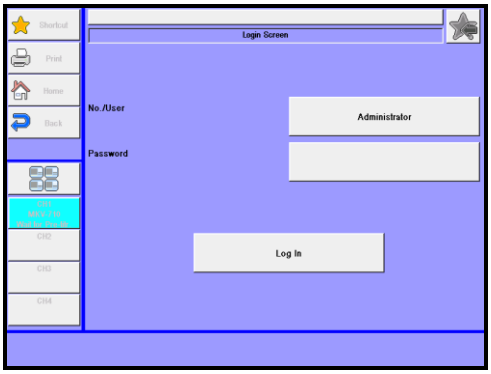
6-8-2.Log out

1 The right screen will be displayed when [Setup] button is pressed while the management setting is executed. Press [Logout] button.

[Logout]
This button is enabled when the management settings is set to 'On.'

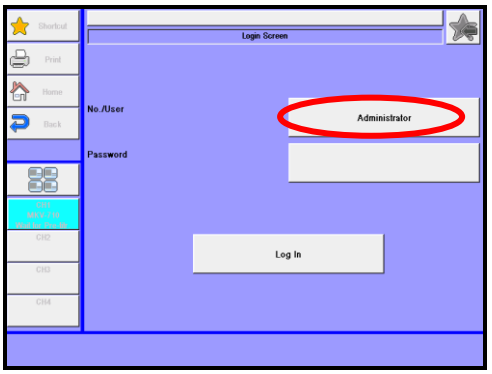


2 The right screen - login prompting screen – will be displayed.

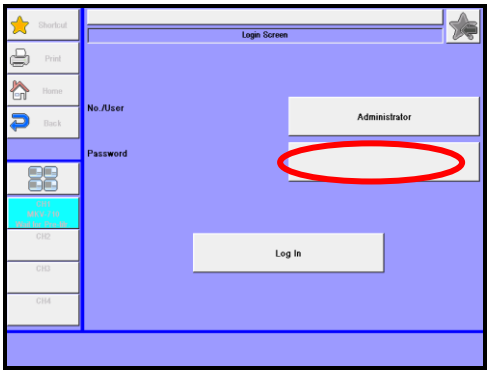


6-8-3.Log in

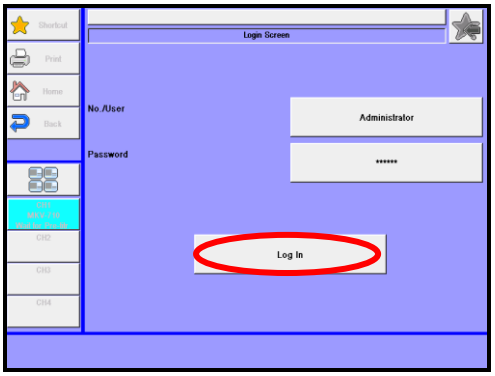
1 Press 'User name' button, select a user name, and press [OK] button.
Be sure to preset user names of operators other than the Administrator, referring to '1-2. Operator Setup.'

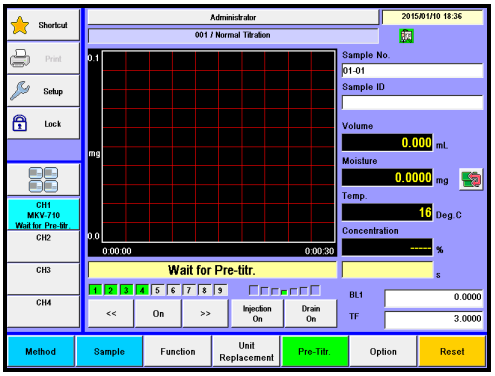


2 Enter a password.
Press 'Password' button, enter the preset password, and press [OK] button.
When an operator logs in the first time, a password will not be required.



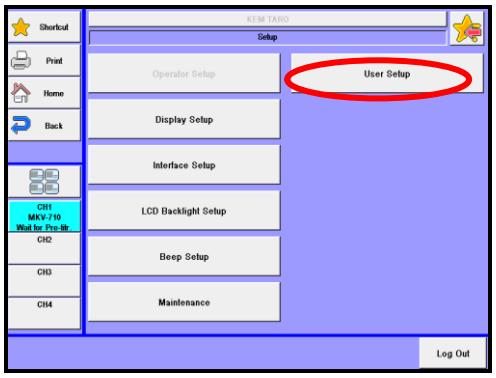
3 Press [Login] button.
On login, the display will go back to the main screen.



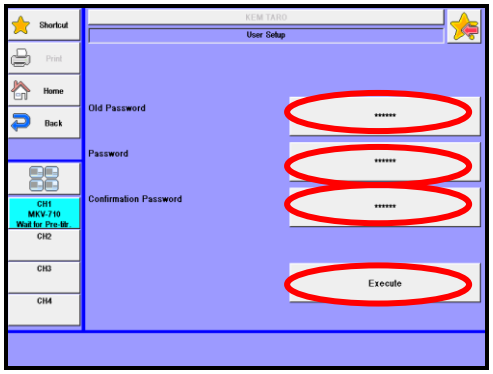


6-8-4.Set up operator password

1 The right screen will be displayed when [Setup] button is pressed on the "Home" screen in the operator login status. Press [User] button.



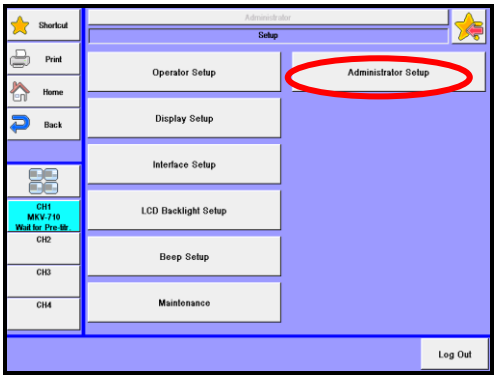
2 Press 'Old password' button, enter an old password, and press [OK] button.
Press 'Password' button, enter a new password, and press [OK] button.
In order to prevent an erroneous password entry, enter the same password in password confirmation field.
Press button for password confirmation, enter the password, and press [OK] button.
Press [Execute] button. When confirmation screen is displayed, select [Yes].



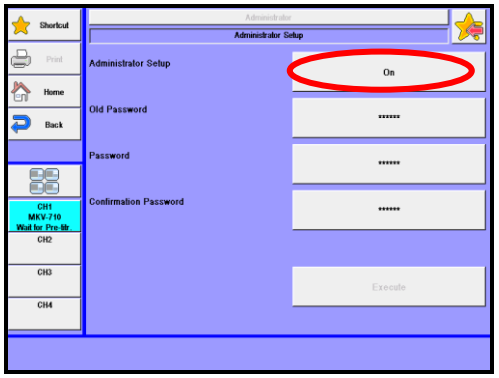
Note The initial password for operator is set to "Blank."

6-8-5.Cancel administrator settings

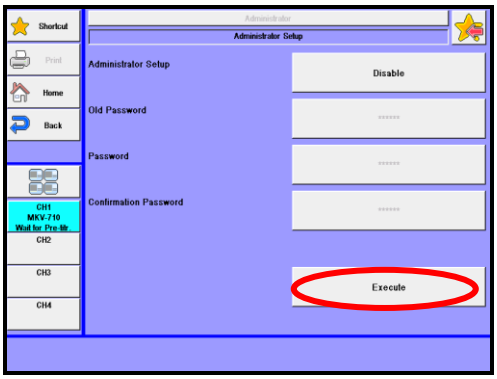
1 Press [Setup] button on the [Home] screen while keeping the Administrator login status. Press [Management] button.



2 The screen for management settings will be displayed.
Press 'Management ' button.
Select "Off" and press [OK] button.



3 Press [Execute] button.
Confirmation screen will be displayed and select [Yes].

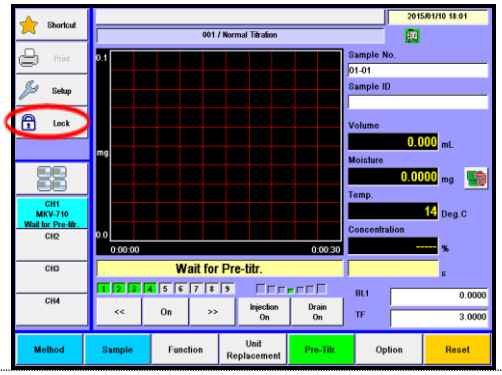


Note All passwords will be deleted when the management settings is set to "Off."

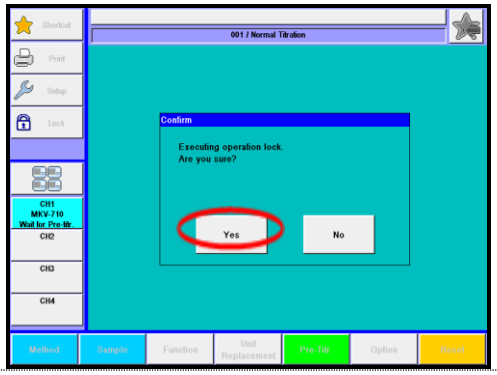
7. Lock

Operations on the screen display are banned. This feature prevents erroneous operations in careless screen touching.

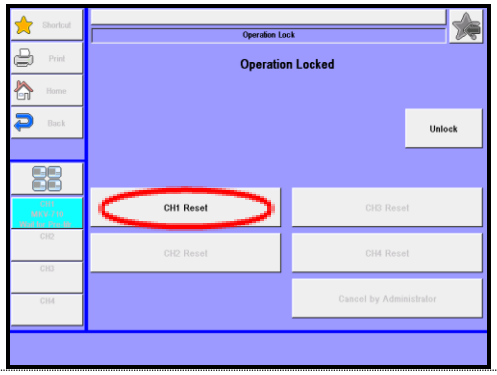
1 Press [Lock] button on the main screen.



2 The right screen will be displayed.
Press [Yes] button.
When [No] button is selected, the display returns to the main screen.

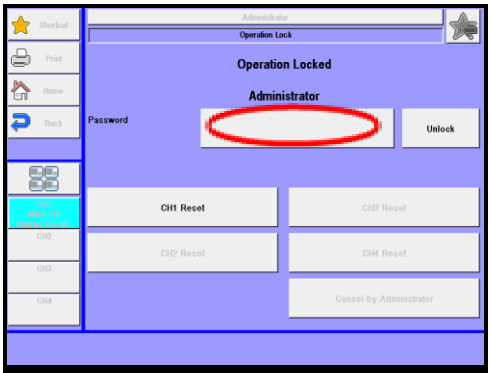


3 The right screen will be displayed and the operation has been locked.
While the screen display is locked, only resetting operation can be done by pressing [CH1 Reset], [CH2 Reset], [CH3 Reset] or [CH4 Reset] button.

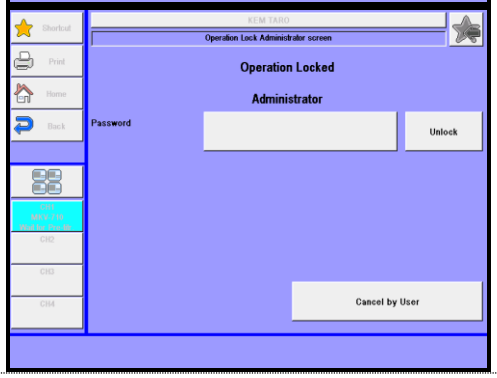


Release lock
<The case where the administrator authority is preset>

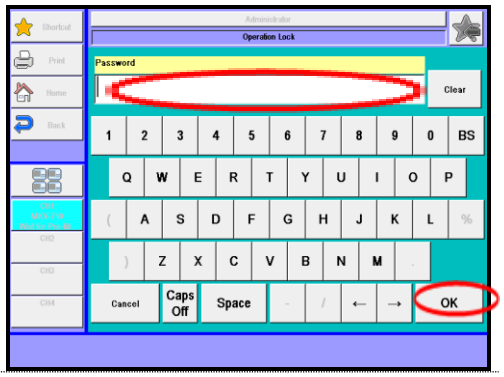
1 Press password entry button.



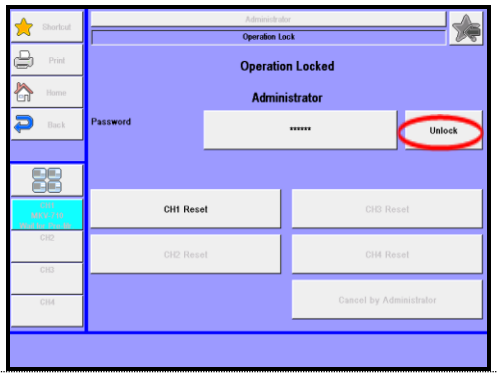
When an operator locks the system, the Administrator presses [Cancel by Administrator] button.
Press password entry button.



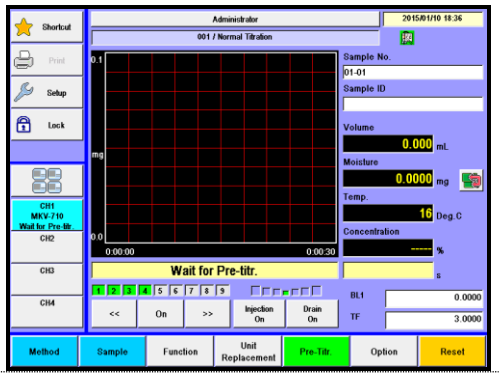
2 The right screen will be displayed.
Enter the password and press [OK] button.
You can switch lowercase and uppercase characters using [Caps On] or [Caps Off] button.



3 The right screen will be displayed.
Press [Unlock] button.



4 When the password is correct, the lock will be released.
If the password is incorrect, the message "Incorrect password" will be displayed.

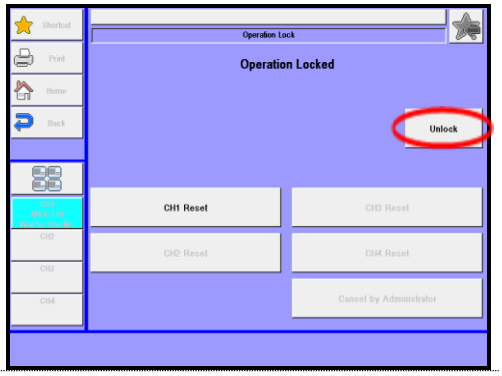


Note

If you forget your lock password, contact your local dealer.

<The case where the administrator authority is not preset>

1 Press [Unlock] button.
Lock will be released.

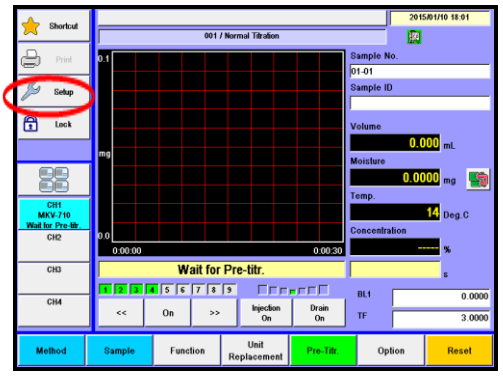


8. Other usage

8-1. Connecting Balance

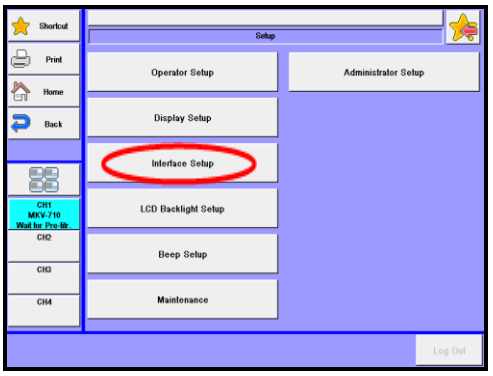
When an electronic balance is connected and set up appropriately, the sample size (weight) is automatically input into the measuring unit.

1 Press [Setup] button on Main display.

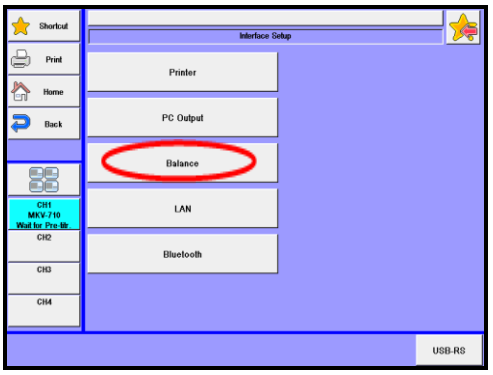


2 The screen on the right will appear.

Press [Interface Setup] button.



3 Press [Balance] button on "Interface Setup."



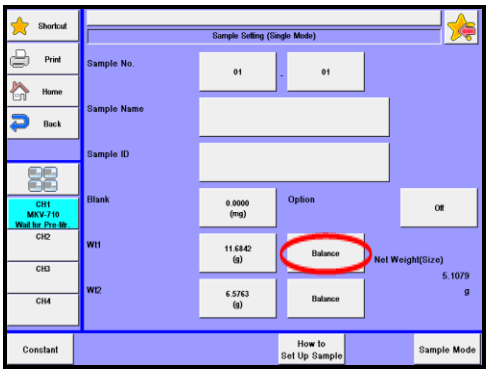
4 Choose the maker of your balance from the list on display.

Note Check with your local dealer to see if your balance needs a special cable to be connected.

8-1-1.**Input sample size on balance**

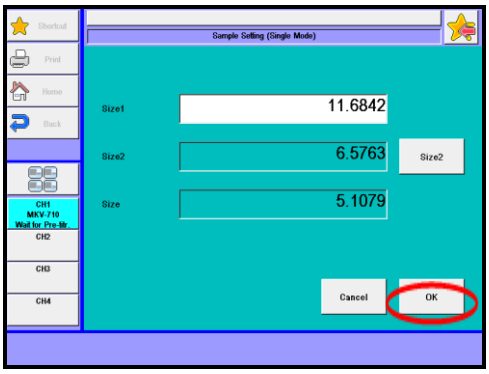
Sample size (weight) can automatically be input.

1 Press [Sample] button on Main display to show "Sample settings."
Press [Balance] button for sample size (Wt1).



2 The present input data in balance appears on "Sample settings" on display.

When the reading becomes stable, press [OK] button. The display returns to "Sample settings."



3 When "Size 1, 2" is selected in "Sample Input Mode" by choosing [Sample] – [How to Set Up Sample] and sample weight is continuously input, press [Wt 2] button on the (Wt 2) row and allow the weight to be input from the balance.

When the "Weight After Input" is selected on sample mode, the display for sample size input appears after titration is over. Press [Balance] button likewise for balance input**.**

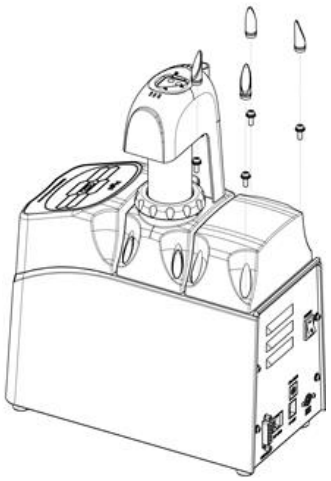
8-2. Adding a Built-in Burette

This titration unit can control max 10 burette drives.

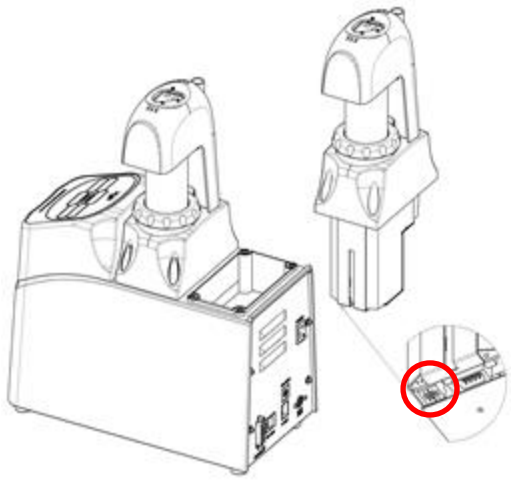
8-2-1. Adding a Built-in Burette

Up to two (2) burettes can be connected to the MKV-710.

1 Remove the rubber caps and the screws as shown below.



2 Remove the cover, and install the additional burette. Make sure that the address switch of the burette is No. 2 at this time.

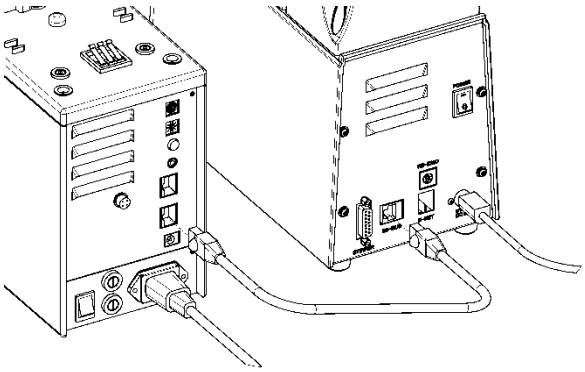


Caution **Be sure to turn off the unit before plugging in or out the cable.**

8-2-2. **Connecting additional burette**

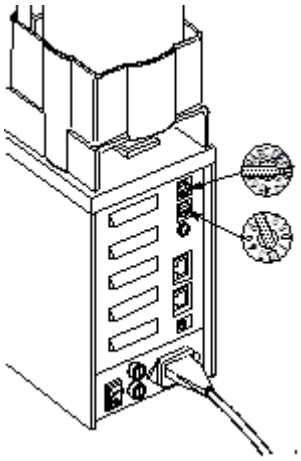
This titration unit can command and activate up to 8 Auto piston burettes.

1 Connect each SS-BUS port on the back of measuring unit and additional burette with connection cable.



2 Turn the "Mode No." switch on the back of the additionally connected burette to "8" position.
Turn the "APB No." switch on the back of the additionally connected burette to "2" position.

Turn on the power.



Note

To connect the additional burette, you may need to upgrade the version of additional burette.

8-3. Connecting a plural number of measuring unit

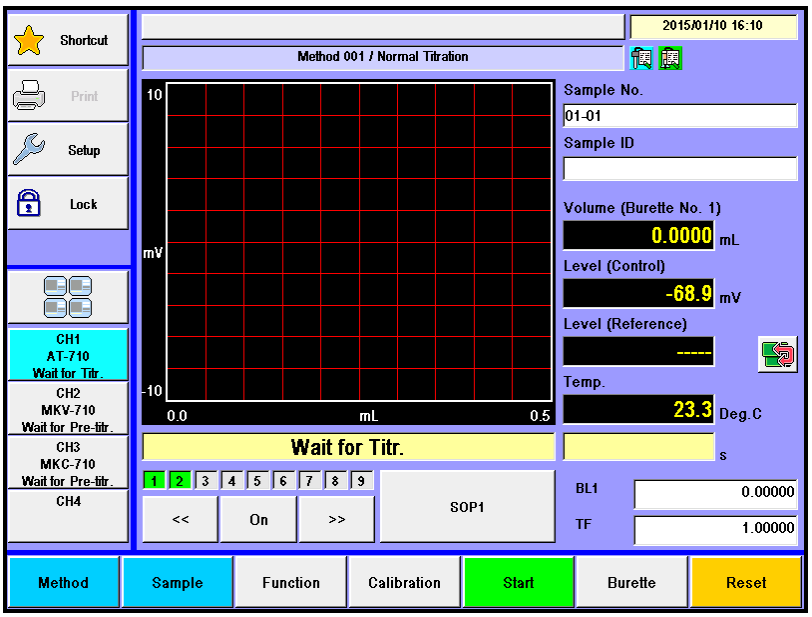
Four (4) measuring units can be connected by MCU-710M.

1 Connect the USB cable of the additional measuring units to USB hub to the USB port on the back side of MCU-710.

Note Make sure that power of peripheral equipment is on before turning on the MCU-710. Do not turn ON simultaneously the power supply of measuring units and optional peripherals.

All channels can be displayed as shown below.

< When AT-710/MKV-710/MKC-710 are connected >



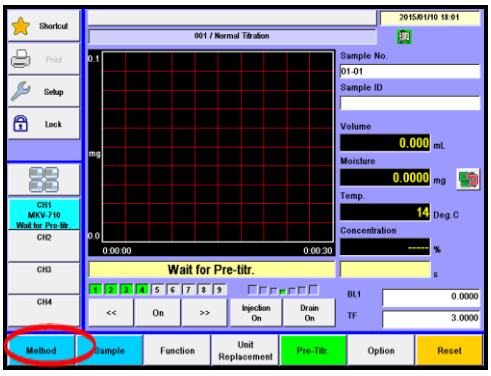
8-4. Back Titration

Perform back titration with the volumetric method when water extraction to dehydrating solvent is very slow or when reaction of KF reagent and moisture is very slow.

8-4-1.Parameter setting

Setting of measurement conditions is required for back titration of the volumetric method.

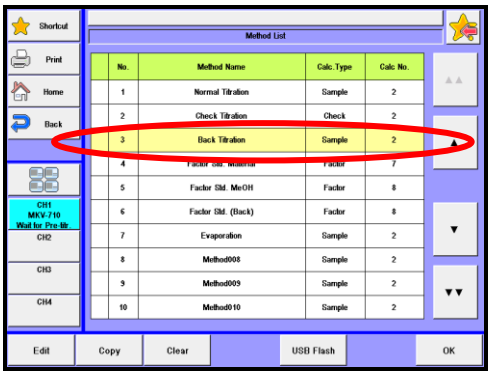
1 Press [Method] button on Main display.



2 The screen on the right will appear.

Select No.3 Vo Back Titration.

Make sure that each parameter is as follows:



[Titration Mode]
Back

[Titration parameter]
t(stir) : 120s

[Control Parameter]
End Time : 10s
Detector Mode : 1
End Level : 75mV
End Time (Pre-Titr.) : 30s

[Calculation Parameter]
Calc. No. : No.2

8-4-2.Preparation of reagent and apparatus

Prepare the reagents for back titration with the volumetric method.

Prepare the following reagents for back titration with the volumetric method.

Solvent	: Select the suitable solvent to your sample.
Measurement of reagent	: Use as titrant. Use for factor measurement of water-methanol standard
Water·methanol standard	: Use as titrant for back titration.
Preparation of apparatus	: Install the burette for water-methanol standard.

Once completed, measure the factor of titration reagents.
Then, measure the factor of water-methanol standard.

8-4-3.Measurement procedure

Perform measurement of back titration of the volumetric method.

1 Press [Pre-Titr.] button to dehydrate the titration flask.
When dehydrated, the message will appear prompting "Drift" , and the button for [Pre-Titr.] changes to [Start] button.

2 Press [Sample] button and enter the collection quantity.

3 Press [Start] button, and discharge the sample into the cell.

Again press [Start] button for titration to start.

4 After titration is over, the measurement results appear on display with printout when a printer is connected.

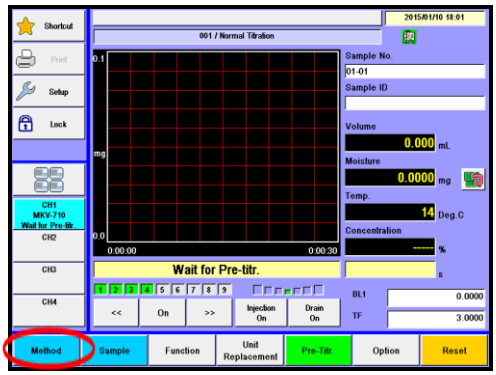
8-5. Factor measurement with water methanol standard

Measure the factor of KF reagent with optional additional burette; use water-methanol standard as reference material.

8-5-1. Factor measurement of reagent with water·methanol standard

This method for factor measurement using water·methanol standard.

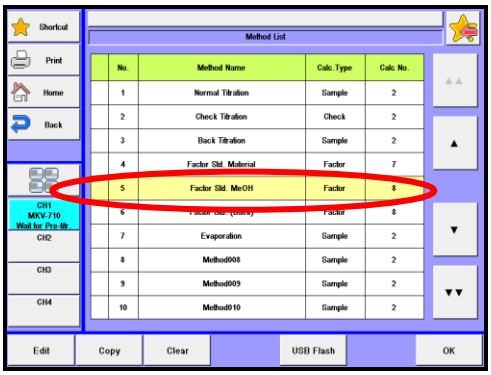
1 Press [Method] button on Main display.



2 The screen on the right will appear.

Select Method No.5 default for factor measurement.

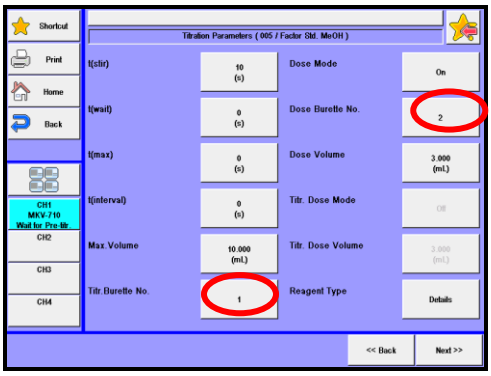
Make sure the calculation formula number on display shows "8".



3 Press [Edit] – [Reagent Parameter] button.

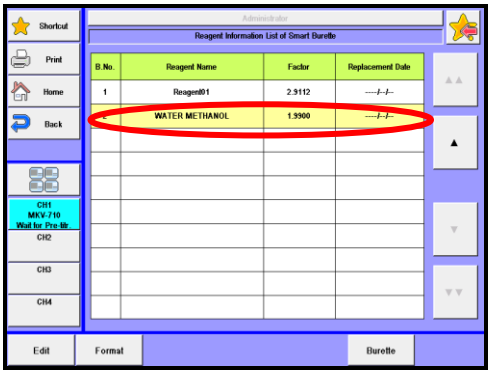
Check titration burette No. and dose burette No.

Titration unit=KF reagent
Dose unit= MeOH

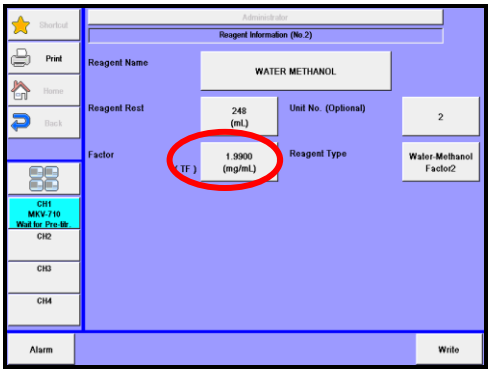


4 Press [Function] – [Reagent Information] button.

Select the reagent for fixed dose from [Reagent List] where it is listed as the reagent parameter for "Dose unit" on Method, and press [Edit] button.



5 Enter the factor of water·methanol standard for reagent factor.

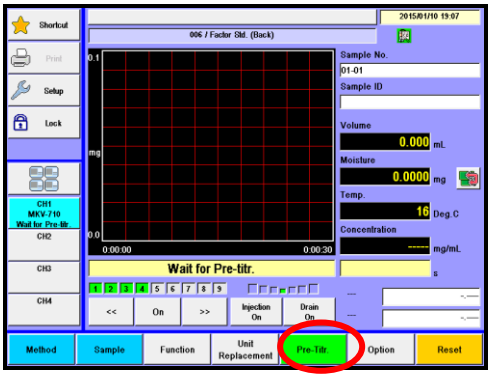


6 Press [Pre-Titr.] button to dehydrate the titration flask.

Only when "Repeat Measurement" is set to "Off", press [Start] button.

The burette starts dosing the water·methanol standard automatically to start titration.

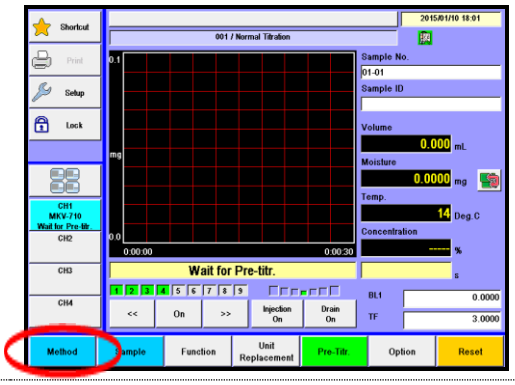
When the titration comes to the end, the measurement results are printed out.
Repeat the above steps for a few times.



8-5-2.Factor measurement of water·methanol standard with KF reagent

Measure the factor of water-methanol standard.

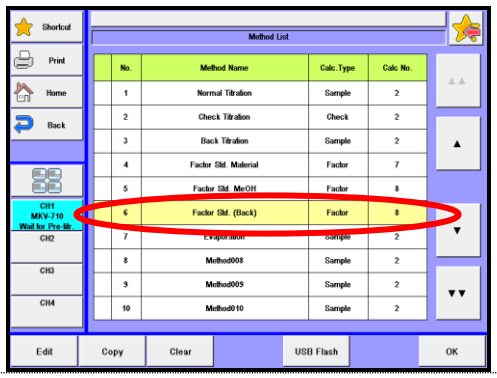
1 Press [Method] button on Main display.



2 The screen on the right will appear.

Select Method No.6 default for factor measurement (back).

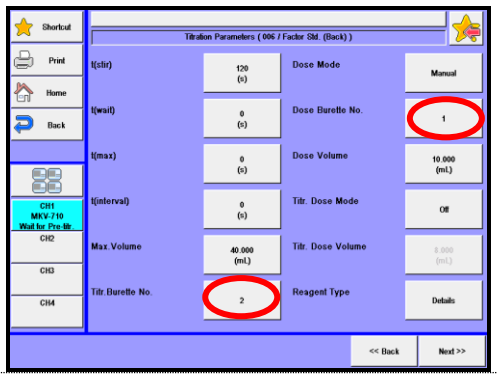
Make sure the calculation formula number on display shows "8".



3 Press [Edit] – [Reagent Parameter] button.

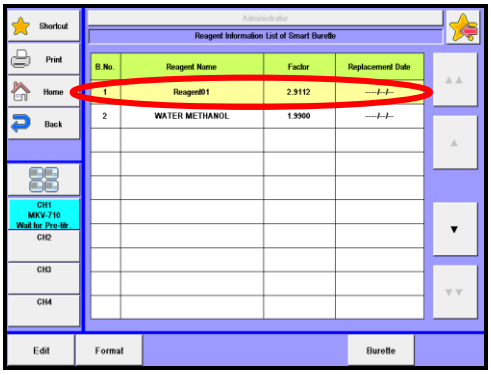
Set titration burette No. and dose burette No.

Titration unit= MeOH
Dose unit= KF reagent

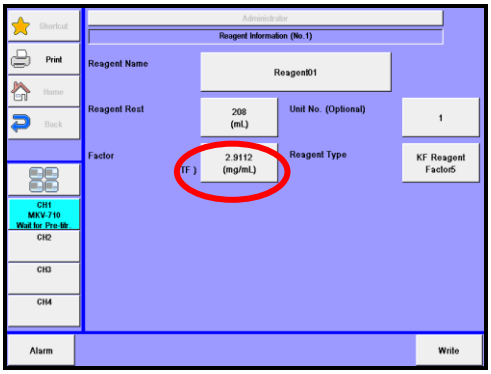


4 Press [Function] – [Reagent Information] button.

Select the reagent for fixed dose from [Reagent List] where it is listed as the reagent parameter for "Dose unit" on Method, and press [Edit] button.



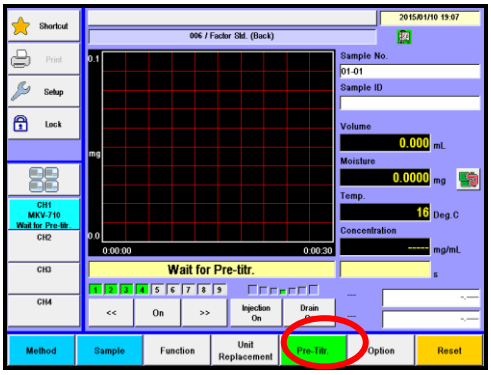
5 Enter the factor of KF reagent for reagent factor.



6 Press [Pre-Titr.] button to dehydrate the titration flask.

Press [Start] button. Again, press [Start] button. The burette starts dosing the KF reagent automatically to start titration.

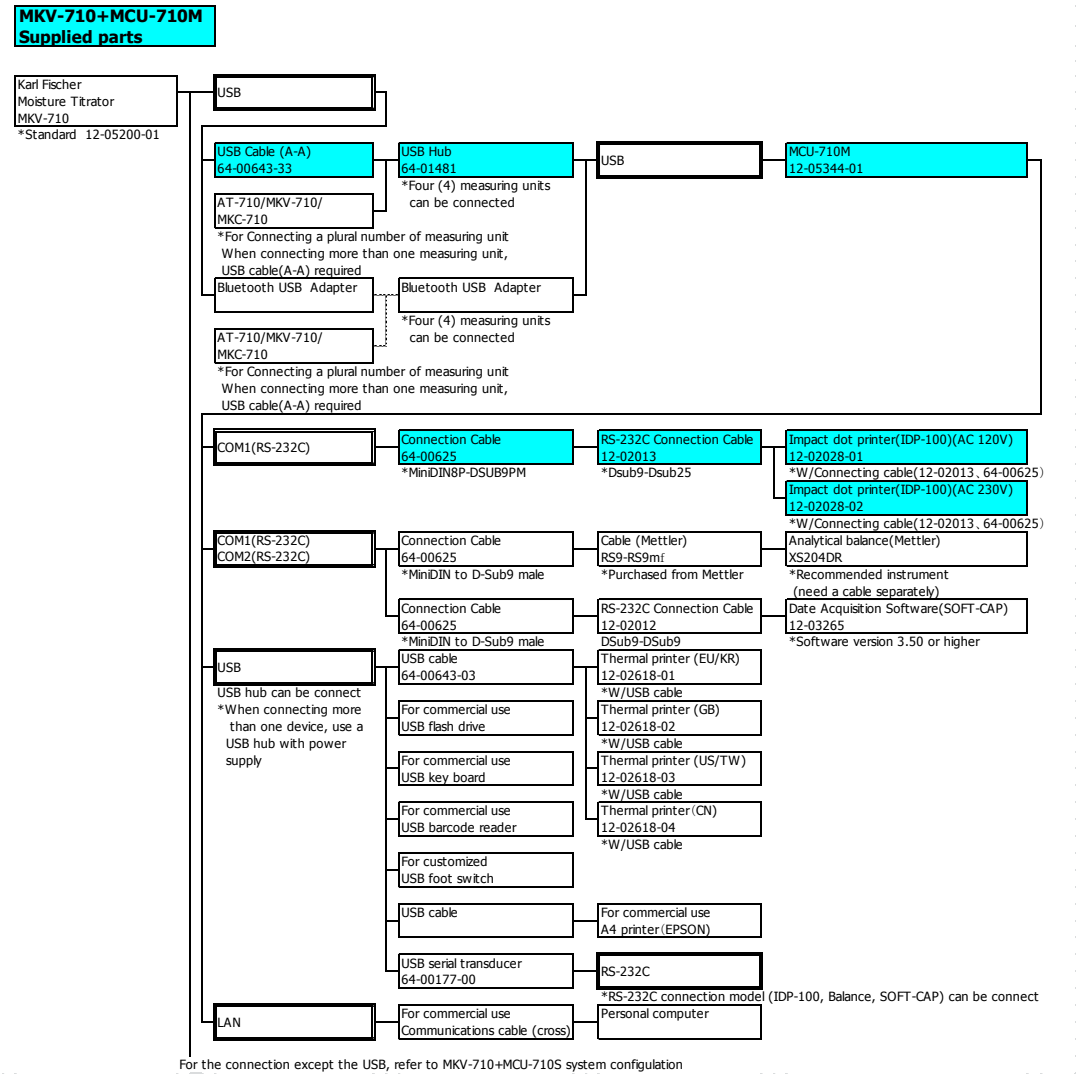
When the titration comes to the end, the measurement results are printed out. Repeat the above steps for a few times.



9. Others

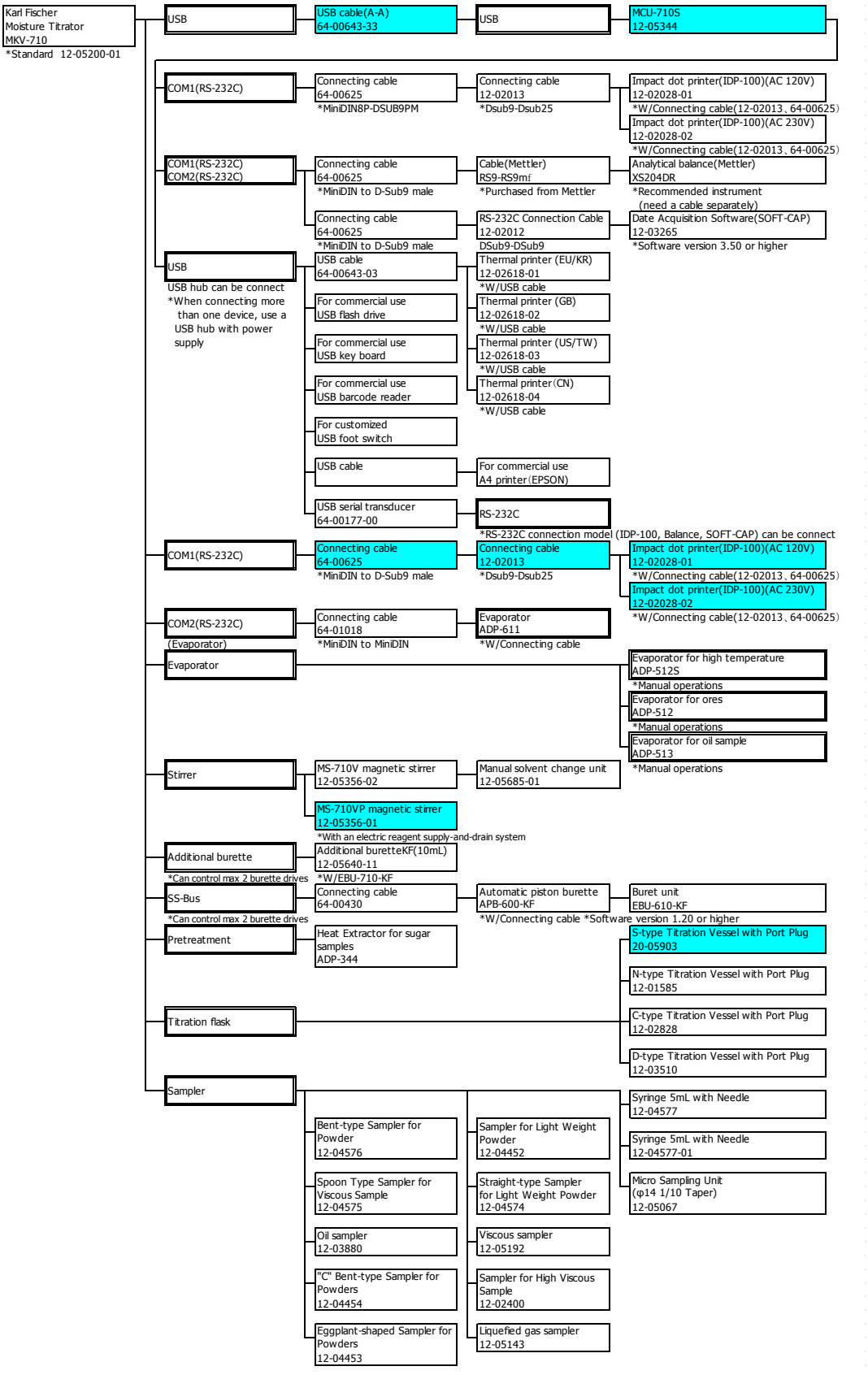
9-1. System Configuration

＜MCU-710M+MKV-710＞



<MCU-710S+MKV-710>

MKV-710+MCU-710S Supplied parts



9-2. Parameter list

9-2-1. Setup Parameters

[Operator Setup]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
Operator Name	-	Within 64 characters A-Z,a-z,+,-,/,*,(,),., ,,%	User name	As displayed

[Display Setup]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
Language	-	English /Japanese/ Mandarin / Korean/ Russian	Language	English / Japanese/ Mandarin / Korean/ Russian
Date format	YYYY/MM/DD	YYYY/MM/DD MM/DD/YYYY DD/MM/YYYY	Date format	As displayed
Date Setup	Present date and time	2010/01/01 00:00 ～2099/12/31 23:59	Date & time	As displayed

[Interface Setup]-[Printer]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
Printer	None	IDP-/DP-USB/A4 Printer/Other	COMn	As displayed
Connect to	-	Unit/COM1/USB-RS1	Port to con.	As displayed
Baud rate	4800bps	1200bps/2400bps /4800bps/9600bps /19200bps /38400bps	Baud rate	As displayed
Parity	None	None/Even/Odd	Parity	As displayed
Stop Bit	1bit	1bit/1.5bit/2bit	Stop bit	As displayed
Data Bit	8bit	7bit/8bit	Data bit	As displayed

[Interface Setup]-[PC Output]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
Connect to	None	None /COM1/COM2 /USB-RS1/LAN1 /LAN2/LAN3 /LAN4	Port to con.	As displayed
Baud rate	4800bps	1200bps/2400bps /4800bps/9600bps /19200bps /38400bps	Baud rate	As displayed
Parity	None	None/Even/Odd	Parity	As displayed
Stop Bit	1bit	1bit/1.5bit/2bit	Stop bit	As displayed
Data Bit	8bit	7bit/8bit	Data bit	As displayed

[Interface Setup]-[Balance]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
Maker	None	None /KEM /Mettler/A&D /Shimadzu /Sartorius /Mettler-Old	Maker	As displayed
Connect to	None	None /COM1/COM2 /USB-RS1	Port to con.	As displayed
Mode	Continuous	Continuous/Print	Mode	As displayed

[Interface Setup]-[LAN]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
IP Address AuotAcquisition	Off	Off/On	LANIP Auto.	As displayed
IP Address	192.168.11.21	0.0.0.1～ 255.255.255.254	IP Address	As displayed
Subnet Mask	255.255.255.0	0.0.0.1～ 255.255.255.254	SubNET MASK	As displayed
Default Gateway	0.0.0.0	0.0.0.1～ 255.255.255.254	Def. GateWay	As displayed
DHCP Server	Enable	Enable / Disable	DHCP Server	As displayed

[LCD Backlight Setup]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
Brightness	4	1/2/3/4	Brightness	As displayed
Auto Dim	10min	Off / After 10min / After 20min / After 30min / After 1 hour / After 2 hours	A.dimaming	As displayed

[Beep Setup]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
Beep Sound	On	Off/On	Mode	As displayed
Volume	5	0～5	Volume	As displayed
Beep Type	Type1	Off/Type1 /Type2/Type3 /Type4/Type5	Beep	As displayed

9-2-2.Function Parameters

[Reagent Information]

Parameter and default			Printout	
Item	Default	Item	Default	Item
Volumetric	Reagent01	No.1-No.20	-	As displayed

[Blank List]

Parameter and default			Printout	
Item	Default	Item	Default	Item
Blank1-10	0.0000	0.00000-99999.9999	Blank No.1	As displayed

[GLP Management]

Parameter and default			Printout	
Item	Default	Item	Default	Item
Periodic check	Off	Off /On	Periodic check	As displayed
Next check date	-	Day intervals	Next check	As displayed
Check Interval	(7Day)	1–999 Day	Interval	As displayed
Factor meas. date	-	Day intervals	F.meas. date	As displayed
Interval	(7Day)	1–999 Day	Interval	As displayed
Factor meas. date	-	Day intervals	F.meas. date	As displayed

[Auto Statistics]

Parameter and default			Printout	
Item	Default	Item	Default	Item
Auto statistics	Off	Off/On	Auto statis.	As displayed
List printing	(Off)	(Off/On)	List printing	As displayed
Exclusion of Max/Min	(Off)	(Off/On)	EX.OfMax/Min	As displayed
Calc. type	(Off)	(Off/On)	Calc.type	As displayed
High sample No.	(On)	(Off/On)	High No.	As displayed
Method No.	(Off)	(Off/On)	Method No.	As displayed
Unit	(Off)	(Off/On)	Unit	As displayed
Sample ID	(Off)	(Off/On)	Sample ID	As displayed

[Decimal Edit]

Parameter and default			Printout	
Item	Default	Item	Default	Item
Sample Size	4	0-8	＜Sample size＞ Decimal	As displayed
	Round	Round up /Round /Round off	Fraction	As displayed
Statistics	5	0-8	＜Statistics＞ Decimal	As displayed
	Round	Round up /Round /Round off	Fraction	As displayed
Blank	5	0-8	＜Blank＞ Decimal	As displayed
	Round	Round up /Round /Round off	Fraction	As displayed
Factor	5	0-8	＜Factor＞ Decimal	As displayed
	Round	Round up /Round /Round off	Fraction	As displayed

[Graph Setting]

Parameter and default			Printout	
Item	Default	Selection	Item	Default
Range Mode	Auto	Auto/Fixed/ X-Auto	Range Mode	As displayed
Graph type	Time vs Unit&Tota l	Time vs Unit /time vs Total /time vs Unit&Total	Graph type	Unit only/Total only /Unit&Total
Division of X-Axis	10	2-20	Division of X axis	As displayed
Division of Y-Axis	10	2-20	Division of Y axis	As displayed

[Other Settings]

Parameter and default			Printout	
Item	Default	Item	Default	Item
Print of header	Off	Off/On	Print Header	As displayed
Print of footer	Off	Off/On	Print Footer	As displayed
Auto setting, mean	On	Off/On Ex. First/ Ex. MaxMin	A.Set.mean	As displayed
Alarm	Off	Off/On	Alarm	Off/On
Result disp.	0s	0–3600s	Disp.time	As displayed
Smart Burette functionality	Enable	Disable/Enable	Smart burette	As displayed
Constant properties				
Dissolve samp. (Wt0)	Sample	Sample/Method	Wt0	As displayed
Dissolve solvent (B)	Sample	Sample/Method	B	As displayed
Conc. of solvent (A)	Sample	Sample/Method	A	As displayed
Samp. volume (V1)	Sample	Sample/Method	V1	As displayed
Samp. dens. (Dens)	Sample	Sample/Method	Dens	As displayed
Samp. Gas volume (V2)	Sample	Sample/Method	V2	As displayed
Samp gas temp. (Temp)	Sample	Sample/Method	Temp.	As displayed
STD.Conc(C1)	Sample	Sample/Method	C1	As displayed
Suction speed	1s/mL	1-999	Suct.speed	As displayed
Free Button	Unit	Unit / Shortcut	Free Button	Unit/ Shortcut
Item in the Result List	Result/Sample	Method/ Result/Sample	Titr.List Item	As displayed
Pump			Setting Pump	
Injection	Manual	Auto/Manual	Injection	As displayed
Stop Time	15s	1-999s	Stop time	As displayed
Drain	Manual	Auto/Manual	Drain	As displayed
Stop Time	120s	1-999s	Stop time	As displayed

9-2-3.Sample Parameters

[Sample] — [How to Set Up Sample]

Parameter and default			Printout	
Item	Default	Item	Default	Item
Sample Before Input	Off	Off/On	Before enter	Off/On
Weight After Input	Auto	Off/On/Auto	After enter	As displayed
Size Input Mode	Size1	Size 1/ Size 1,2	Sizeinput	Wt1,Wt2

9-2-4.Method Parameters

Default Method parameters

Method No.	01	02	03	04	05	06	07	08-120
Method name	Normal Titration	Check Titration	Back Titration	Factor Std. Material	Factor Std. MeOH	Factor Std. (Back)	Evaporation	Method XX
Mode	Normal	Normal	Back	Normal	Normal	Back	Normal	Normal
[Titration Parameter]								
t(stir)	0s	0s	120s	0s	10s	120s	0s	0s
t(wait)	0s	0s	0s	0s	0s	0s	0s	0s
t(max)	0s	0s	0s	0s	0s	0s	1200s	0s
t(interval)	0s	0s	0s	0s	0s	0s	0s	0s
Max. volume	10.0000 mL	10.0000 mL	10.0000 mL	10.0000 mL	10.0000 mL	10.0000 mL	10.0000 mL	10.0000 mL
Titr.burette No.	1	1	2	1	1	2	1	1
Dose mode	Off	Off	Auto	Off	set	set	Off	Off
Dose burette No.	(2)	(2)	1	(2)	2	1	(2)	(2)
Dose volume	(3.000mL)	(3.000mL)	(3.000mL)	(3.000mL)	3.000mL	10.000mL	(3.000mL)	(3.000mL)
[Control Parameter]								
End time	30s	30s	10s	30s	30s	10s	0s	30s
Final volume	0.01mL	0.01mL	0.01mL	0.01mL	0.01mL	0.01mL	0.01mL	0.01mL
Titration speed	3	3	3	3	3	3	3	3
Detector mode	1	1	1	1	1	1	1	1
Drift titr.	On	On	On	On	On	On	On	On
Start mode	Manual	Manual	Manual	Manual	Auto	Manual	Auto	Manual
End level	75mV	75mV	75mV	75mV	75mV	75mV	75mV	75mV
Data sampling time	5	5	5	5	5	5	10	5
Stirrer speed	4	4	4	4	4	4	4	4

Method No.	01	02	03	04	05	06	07	08-120
Method name	Normal Titration	Check Titration	Back Titration	Factor Std. Material	Factor Std. MeOH	Factor Std. (Back)	Evaporation	Method XX
[Calculation Parameter]								
Calc. type	Sample	Check	Sample	Factor	Factor	Factor	Sample	Sample
Blank No.	1	1	1	1	1	1	1	1
Calc. No.	2	2	2	7	8	8	2	2
Unit	%	%	%	mg/mL	mg/mL	mg/mL	%	%
Decimal	4	4	4	4	4	4	4	4
Fraction	Round	Round	Round	Round	Round	Round	Round	Round
Drift comp.	Off	Off	Off	Off	Off	Off	Off	Off
Evaluation	(0.00ug/s)	(0.00ug/s)	(0.00ug/s)	(0.00ug/s)	(0.00ug/s)	(0.00ug/s)	(0.00ug/s)	(0.00ug/s)
Standard value	Off	Off	Off	Off	Off	Off	Off	Off
Permit. error	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Permit.err.	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
[Report Parameter]								
Report format	Short	Short	Short	Short	Short	Short	Short	Short
Graph printing	Off	Off	Off	Off	Off	Off	Off	Off
Data list printing	Off	Off	Off	Off	Off	Off	Off	Off
[Reagent Parameter]								
Titration unit	Reagent 01	Reagent 01	Reagent 02	Reagent 01	Reagent 01	Reagent 02	Reagent 01	Reagent 01
Dose unit	Reagent 02	Reagent 02	Reagent 01	Reagent 02	Reagent 02	Reagent 01	Reagent 02	Reagent 02
[Option Parameter]								
Pre treat	2	2	2	2	2	2	2	2
Cell purge	120s	120s	120s	120s	120s	120s	120s	120s
Back purge	180s	180s	180s	180s	180s	180s	180s	180s
Sample purge	(180s)	(180s)	(180s)	(180s)	(180s)	(180s)	(180s)	(180s)
Heating mode	Set	Set	Set	Set	Set	Set	Set	Set
Oven temp.	105℃	105℃	105℃	105℃	105℃	105℃	105℃	105℃
Heating speed	(20s/℃)	(20s/℃)	(20s/℃)	(20s/℃)	(20s/℃)	(20s/℃)	(20s/℃)	(20s/℃)
Start temp.	(70℃)	(70℃)	(70℃)	(70℃)	(70℃)	(70℃)	(70℃)	(70℃)
End temp.	(300℃)	(300℃)	(300℃)	(300℃)	(300℃)	(300℃)	(300℃)	(300℃)
[Repeat meas.parameter]								
Repeat measurement	Off	Off	(Off)	Off	On	(Off)	Off	Off
Repeat times	(3)	(3)	(3)	(3)	3	(3)	(3)	(3)

Selection of Method parameters and printout

[Mode]

Displays		Printout	
Item	Selection	Item	Selection
Mode	Normal/Back	Titr.mode	Normal/Back

[Titration Parameter]

Displays		Printout	
Item	Selection	Item	Selection
t(stir)	0-99999s	t(stir)	As displayed
t(wait)	0-99999s	t(wait)	As displayed
t(max)	0-99999s	t(max)	As displayed
t(interval)	0-99999s	t(interval)	As displayed
Max.volume	0.005-999.000mL	Max.volume	As displayed
Titr.bur.No.	1-2	Titr.bur.No.	As displayed
Dose mode	Off/Set/Manual/Auto	Dose mode	Off/Set/Manual/Auto
Dose bur.No.	1-2	Dose bur.No.	As displayed
Dose volume	0.005-999.000mL	Dose volume	As displayed
Titr.dose mode	Off/On	Titr.dose mode	Off/On
Titr.dose volume	0.005-999.000mL	Titr.dose volume	As displayed
Reg.type	No Check/KF Reagent/ KF Reagent factor 5/ KF Reagent factor 3/ KF Reagent factor 2/ KF Reagent factor 1/H2O/CH4O / H2O/CH4O factor5/ H2O/CH4O factor2	Reg.type（Titr.） Reg.type（Dose）	No Check/KF Reagent/ KF Reagent factor 5/ KF Reagent factor 3/ KF Reagent factor 2/ KF Reagent factor 1/H2O/CH4O / H2O/CH4O factor5/ H2O/CH4O factor2

[Control Parameter]

Displays		Printout	
Item	Selection	Item	Selection
End time	0-99s	End time	As displayed
Final vol.	0.01-9.99mL	Final vol.	As displayed
Titr.speed	1-6	Titr.speed	As displayed
Detect.mode	1-2	Detect.mode	As displayed
Drift titr.	Off/On	Drift titr.	Off/On
Start mode	Manual/Auto	Start mode	Manual/Auto
End level	200-1000mV	End level	As displayed
Samp.time	1-99999s	Samp.time	As displayed
Stir.speed	0-9	Stir.speed	As displayed
End time	0-99s	End time	As displayed

[Calculation Parameter]

Displays		Printout	
Item	Selection	Item	Selection
Calc. Type	Sample/Blank/ Factor/Check	Calc. Type	Sample/Blank/ Factor/Check
Blank No.	1-10	Blank No.	As displayed
Calc. No.	%,ppm,mg/kg,mg,mL mg/g,mg/mL	Unit	As displayed
Unit	0-8	Decimal	As displayed
Decimal	Round off/ Round/ Round up	Fraction	Round off/ Round/ Round up
Fraction	0-8	Calc. No.	As displayed
Drift comp.	Off/Manual	Drift comp.	Off/Manual
Drift	0.00-99.99µg/s	Drift	0.00-99.99ug/s
Evaluation	Off/On	Evaluation	Off/On
Std.value	0.00000000-99999.99999999	Std.value	As displayed
Permit.err.	0.00000000-99999.99999999	Permit.err.	As displayed

[Report Parameter]

Displays		Printout	
Item	Selection	Item	Printing
Report format	Off/GLP/Short/Variable	Report format	Off/GLP/Short/Variable
Report format Details			
Model/Serial	Off/On	Model/Serial	Off/On
Sample No	Off/On	Sample No	Off/On
Titr.date	Off/On	Titr.date	Off/On
Sample name	Off/On	Sample name	Off/On
Sample ID	Off/On	Sample ID	Off/On
Method name	Off/On	Method name	Off/On
Titr. mode	Off/On	Titr. mode	Off/On
Calc.No.	Off/On	Calc.No.	Off/On
Sample size	Off/On	Sample size	Off/On
Result	Off/On	Result	Off/On
Drift	Off/On	Drift	Off/On
Blank	Off/On	Blank	Off/On
Reagent name	Off/On	Reagent name	Off/On
Factor	Off/On	Factor	Off/On
Titr.time	Off/On	Titr.time	Off/On
End Time	Off/On	End Time	Off/On
Init.pot.	Off/On	Init.pot.	Off/On
Init.res	Off/On	Init.res	Off/On
Operator	Off/On	Operator	Off/On
Graph	Off/On	Graph	Off/On
Data list	Off/On	Data list	Off/On

[Reagent Parameter]

Displays		Printout	
Item	Selection	Item	Selection
Titr.unit	As selected	Titr.unit	As displayed
Dose unit	As selected	Dose unit	As displayed

[Option Parameter]

Displays		Printout	
Selection	Item	Selection	Item
Pre treat	1/2/3	Pre treat	As displayed
Cell purge	0-99999s	Back purge	As displayed
Back purge	0-99999s	Cell purge	As displayed
Sample purge	0-99999s	Samp.purge	As displayed
Heating mode	Set/Scan	Heat.mode	As displayed
Oven temp.	0-300℃	Oven temp.	As displayed
Heating speed	1-99999s/℃	Heat.speed	As displayed
Start temp.	0-300℃	Start temp.	As displayed
End temp.	0-300℃	End temp.	As displayed

[Repeat Parameter]

Displays		Printout	
Selection	Item	Selection	Item
Repeat meas.	Off/On	Repeat meas.	Off/On
Repeat times	2-99	Repeat times	As displayed
Timer	Off/On	Timer	Off/On
Start time	0-999 hour after	Start time	0-999hour after
Method No.	1-120	Method No.	As displayed