

2. Function

- 1) The creation of a calibration curve and the display of a graph are performed on the basis of measurement values obtained on **「DATA PROCESSING STANDARD」**.
- 2) The processing for moving to the origin, PROTECT processing of a calibration curve, and the selection of the form of the calibration curve for three or four points calibration curve are performed.
- 3) The measurement conditions and the result of measurement of each standard solution (the mean value, SD, and CV) are displayed.

3. Operation

Purpose	Operation	Function
To shift to the origin	1 + ENTER by SHIFT TO ORIGIN	When a created calibration curve does not pass the origin, the curve is moved vertically to pass the origin. → Shifting to origin (3.7.3)
PROTECT	1 + ENTER by PROTECT	A calibration curve is not modified by overlaying because the stored calibration curve data is protected by PROTECT processing. However, it is deleted when the operation starts with ALL RESET.
To set the form of the three or four points calibration curve	1 → ENTER , 2 → ENTER by CAL CURVE FORM	The calibration curve is created in a polygonal form. The calibration curve is created in a linear regression form using the least-squares method.
To cancel a measurement value of standard solution	Depress VOID , move the cursor to the value to be cancelled, and then depress ENTER + VOID EXIT .	The designated measurement value of the standard solution is cancelled, and the calibration curve is remade.
To go to the next step 1) Creation of another calibration curve 2) Termination of creating a calibration curve	STANDARD MAIN MENU	The screen goes to 「CALIBRATION/CONDITIONS」 . The screen goes to 「MAIN MENU」 in order to proceed to other work (ex. measurement of sample).
To print-out	PRINT	All display of the screen is printed out.

4. Notice

- 1) **[VOID]** is used to cancel measurement values for multipoint calibration curve if they are doubtful. In a four-point calibration curve, for instance, if three points are aligned on a line with the remaining one point obviously off the line, the measurement value for this offset point may be inappropriate supposedly due to inadequate preparation of standard solution or inadequate concentration setting on the screen. In such a case, cancel the inappropriate measurement value in the following method:
Depress **[VOID]** to move cursor to the line of measurement values at [DATA]. Position the cursor at the value to be canceled and depress **[ENTER]**. A minus sign - is displayed on the left of the value. Then depress **[VOID EXIT]** (When **[VOID]** is depressed, it is changed to **[VOID EXIT]**). Canceling is executed and a new calibration curve is created on the basis of the remaining three measurement values.

『SAMPLE MEASUREMENT/CONDITIONS』

1. Contents of the display

『MAIN MENU』

#2 SAMPLE MEASUREMENT

SAMPLE MEASUREMENT / CONDITIONS << CALIBRATION CURVE FILE LIST >>

SAMPLE# : 1	F#	TYP	HIGH CONC	INJ/SYR μ l	RG	CAT
TC	1	TC	80.0 ppm	25/250	5	NORM
IC	2	TC	400.0 ppm	30/250	30	NORM
NPOC	3	TC	20.0 ppm	20/250	1	NORM
1st CAL CURVE#	4	TC	240.0 ppm	8/250	5	NORM
2nd CAL CURVE#	5	TC	240.0 ppm	8/250	5	NORMNEW
3rd CAL CURVE#						
RANGE($\times 1 \times 5 \times 30$)	5	0	0			
INJ VOL μ l	25	50	50			
SPARGE TIME min	---	---	1			
NO OF WASHES	4	1	1			
DIL FACTOR	1	1	1			
NO OF INJECTS	3	1	1			
MAX NO OF INJ	4	1	1			
SD	100					
CV %	1.0					

NEXT
MAIN MENU
PRINT

SMPL COND

『MEASUREMENT START』

Fig. 6.11 『SAMPLE MEASUREMENT/CONDITIONS』 Screen

- ① SAMPLE#: The sample number is to be input. Number up to 120 can be input.
- ② The condition of each measurement item is to be set.
- ③ CAL CURVE#: Up to three calibration curve numbers can be designated for every measurement item.

At first, the measurement is performed under the condition of the first calibration curve. If this curve is not appropriate, either the second or third one is selected and the measurement is performed again under the condition of the curve selected. Even if the calibration curve number is not input, the measurement is performed. However, the value of a peak area only is displayed, and value of a concentration is not displayed.

- ④ RANGE: A range of NDIR. When the calibration curve number is designated, the range is input automatically in accordance with the condition and is not changeable. If the measurement is carried out without designating the calibration curve number, it can be set optionally together with the next injection volume.
- ⑤ INJ VOL: Injection volume is to be set. It is also input automatically together with the range in accordance with the condition of the calibration curve, if that calibration curve number is designated. It is changeable, unless two or more calibration curves have been set. When it has been changed, the measurement value corrected with the ratio of the injection volume for the calibration curve to the one changed is displayed.
- ⑥ SPARGE TIME: The sparging time is to be set for measurement of NPOC. It can be set for the item of NPOC only.
- ⑦ NO OF WASHES: The number of times to wash the microliter syringe by sample. It is also input automatically in accordance with the condition of the calibration curve when that calibration curve number is designated. The measurement can be carried out, even if that number does not correspond with the one set at 『GENERAL CONDITIONS』. It can be also changed. (Refer to note at next page.)
- ⑧ DIL FACTOR: Dilution factor is to be set. When sample already diluted is measured, if the dilution factor is set (for a dilution factor of two, 2 is set), the value of a concentration corrected in dilution factor is displayed on 『DATA PROCESSING SAMPLE』 screen.
- ⑨ NO OF INJECTS: The number of times to repeat measurement is to be set. It has no relation with the conditions of the designated calibration curve No. The maximum number that can be set is 10. The initial number for repetitive measurement is 1.
- ⑩ MAX NO OF INJ: The same number as set for ⑨ NO OF INJECTS is set automatically.
- When the "automatic measurement to replace abnormal value" function is used, larger number of times than NO OF INJECTS must be set, and values must also be set to SD and CV.

- ⑪ The main conditions of the calibration curve stored in the calibration curve storage file are displayed.

NEW, displayed on the right denotes that it is the latest calibration curve.

Note) A mark of W displayed next to the set value denotes that the value does not correspond with the conditions of the calibration curve (injection volume and the number of times to wash the microliter syringe).

2. Function

- 1) The measurement conditions for sample are to be set.
- 2) The main conditions of the calibration curve stored in the calibration curve storage file are displayed.

3. Operation

Purpose	Operation	Function
To set conditions	Input numerals to each item, and depress ENTER .	<p>"Automatic selection of optimum calibration curve" function can be used by designating up to three calibration curve numbers.</p> <p>If the calibration curve number (CAL CURVE#) is designated, the same injection volume, range, and number of times to wash with those of the first calibration curve are set automatically. The injection volume and the number of times to wash can be changed. When the injection volume is changed, the measurement value which has been corrected by the ratio of the injection volume of the calibration curve to the one changed are displayed on the next [DATA PROCESSING SAMPLE] screen. (The injection volume can be changed only when one calibration curve has been set.)</p> <p>"Automatic measurement to replace abnormal value" function can be used by setting larger number than NO OF INJECTS to MAX NO OF INJ.</p> <p>→ Automatic Selection of Optimum Calibration Curve (Para. 3.15)</p> <p>→ Quantification by Carbon Content (Para. 3.16)</p> <p>→ Automatic Measurement to Replace Abnormal Value (Para. 3.11)</p>
To print-out	Depress PRINT .	Measurement conditions are printed out.
To go to the next step	NEXT	The screen goes to [MEASUREMENT START].
To go to [MAIN MENU]	MAIN MENU	The screen returns to [MAIN MENU].

4. Notice

- 1) When "quantification by carbon content" function is used, only one calibration curve (the first CAL CURVE) can be set.
- 2) When FLOW is set to the item of SPARGE GAS FLOW on [MAINTENANCE] screen, 0 (zero) is set to SPARGE TIME (the sparging time) on this screen.
- 3) Input a new number after deleting it by to change the calibration number already input.

『DATA PROCESSING SAMPLE』

1. Contents of the display

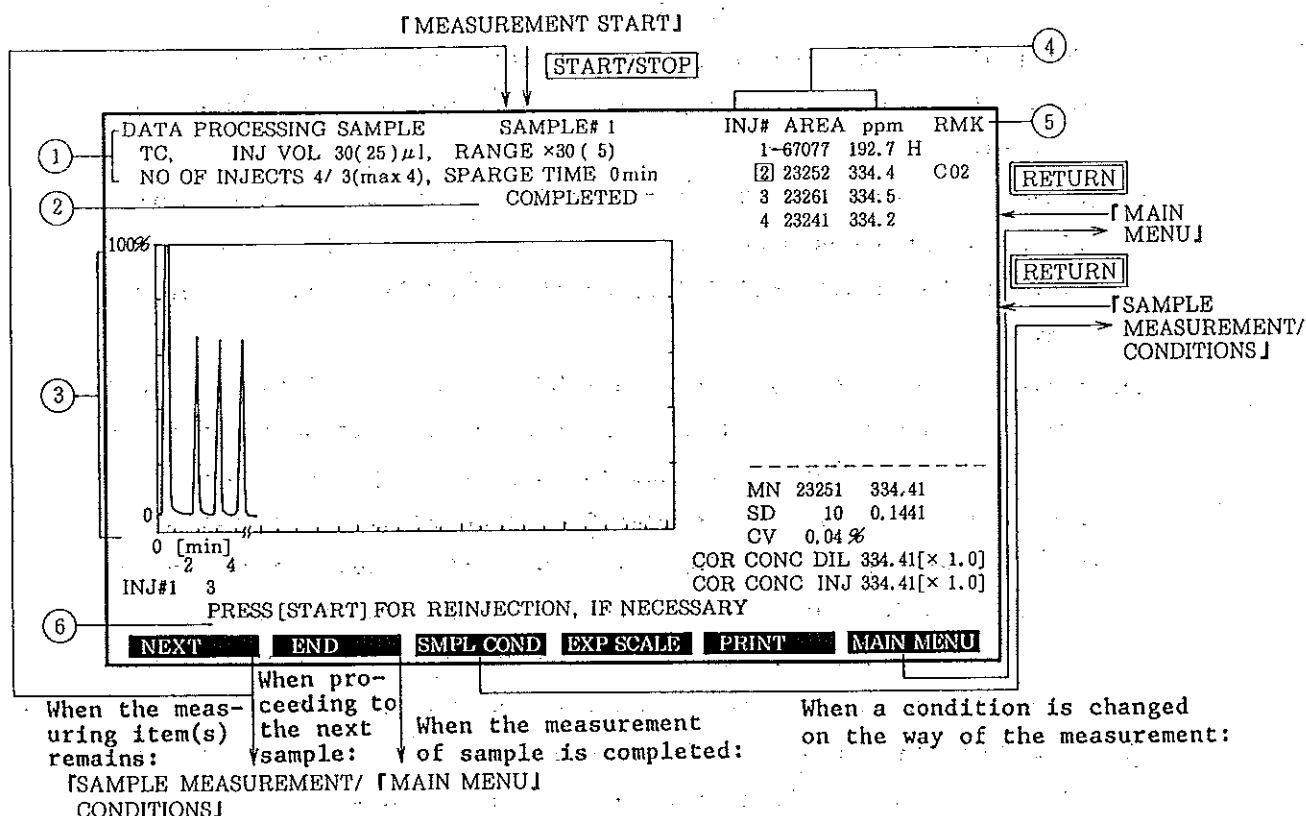


Fig. 6.12 『DATA PROCESSING SAMPLE』 Screen

- ① The outline of measurement conditions set on 『SAMPLE MEASUREMENT/ CONDITIONS』 is displayed.
 INJ VOL (injection volume) and RANGE settings may be changed by the automatic changing function (AUTO RANGING & INJ VOL). In such a case, the first setting is displayed in parentheses (). NO OF INJECTS (the number of repeating times) denotes the number of times of measurement completed.
- ② The progress of measurement program is displayed as follows:
 SPARGINGXX min to end: When SPARGE TIME has been set, the remaining time of sparging treatment is displayed.
 WASHING : Wash of the microliter syringe by sample
 SAMPLING : Measuring off of sample
 INJECTING: Injection of sample
 MEASURING: Peak detection and area measurement

WAITING: 1) The equipment is in the standby state due to unsatisfied conditions of measurement (READY STATE SENS).
 2) **START/STOP** key is depressed during SPARGING, WASHING or SAMPLING.

COMPLETED: Set times of measurement have been completed.

MEASURING/WASHING: Washing for the next measurement starts overlapping peak processing.

- ③ Peaks are displayed. The time display on the transversal axis (in minutes) stops when set times of measurement have been completed. For additional injection (REINJECTION), time is not displayed.
- ④ Injection No. (INJ#), peak area (AREA), concentration, mean value (MN) obtained from the data collected so far, standard deviation (SD) and coefficient of variation (CV) are displayed. When DIL FACTOR has been set, concentration corrected by the dilution factor is displayed at COR CONC DIL. When the injection volume for the calibration curve is different from that for sample measurement, concentration corrected by the ratio of the former injection volume to the latter one is displayed at COR CONC INJ.
- ⑤ Supplementary items of each measurement value are displayed on RMK (the remark). Their contents are as follows:

RMK	
* * * * *	
<div style="border-left: 1px solid black; border-bottom: 1px solid black; height: 100px; width: 100px; margin-bottom: 10px;"></div> <div style="border-left: 1px solid black; border-bottom: 1px solid black; height: 100px; width: 100px;"></div>	<p>Changed range, injection volume or calibration curve number (Ex. R30 = range 30, 0100 = 100 μl, C05 = CAL CURVE F#5)</p> <p>H = The peak height is beyond the full scale.</p> <p>T = Peak is not terminated within the specified time.</p>

- ⑥ Messages
 [PRESS (START) FOR REINJECTION, IF NECESSARY]

Depress **START/STOP**, if the additional measurement is necessary.

[GO TO "MONITOR" DISPLAY (#8) TO SEE READY STATE]

Go to [MONITOR], and see READY conditions. (When the equipment is in standby state due to incompleting READY conditions, this message is displayed. The condition which is wanting is found. In most cases, the message of OK will appear in a short time.)

2. Function

The progress of measurement of sample, peaks, the outline of measurement conditions, and the measurement result are displayed.

3. Operation

Purpose	Operation	Function
Delete/retrieve measured value	Designate INJ# by cursor, and depress ENTER .	"-" displayed at deleted INJ#, and MN, SD, and CV values are recalculated/"-" removed at INJ#, value is retrieved and all values are recalculated.
Additional measurement	Press START/STOP after COMPLETED is displayed.	The additional measurement is performed once, and the measurement value is displayed with a sign of +.
To change conditions on the way of measurement	Go to [SAMPLE MEASUREMENT/CONDITIONS] by [SMPL COND] , and return to this screen by [RETURN] after changing conditions.	For the items being measured, the number of repeating times (NO OF INJECTS), the maximum number of repeating times (MAX NO OF INJ), SD, and CV can be changed. For other items, measurement conditions of IC and NPOC can be changed during TC measurement, and those of NPOC can be changed during IC measurement.
To halt or terminate measurement halfway	START/STOP (The function keys change as shown in Fig. 6.8.) → [ESCAPE] → [CONTINUE] → [PEAK STOP]	WAITING is displayed, and the equipment is set in the standby state. During WASHING or SAMPLING, the standby state begins after the microliter syringe is moved to the zero position or a measuring position. During MEASURING, peak processing is executed.
		The screen returns to [MEASUREMENT START], and the measured values displayed are lost.
		The standby state is removed to continue measurement.
		This operation is possible only when MEASURING is displayed. The measurement of a peak area is stopped with this operation, and its result is displayed.
To magnify the peak display	[EXP SCALE] ↑↓ [STD SCALE]	The height of the peak display is magnified four times (0~25% F.S).
		The magnified display changes back to the original size (0~100% F.S).
To print-out	[PRINT] (The function keys change as shown in Fig. 6.9.) → [ALL PRINT] → [DATA PRINT] → [PEAK PRINT] → [NO PRINT]	
		All display on this screen is printed out.
		All display except peaks is printed out.
		The peak display alone is displayed.
		Print-out is halted.

Purpose	Operation	Function
To go to [MAIN MENU]	[MAIN MENU]	It is possible to go to screens of #3~#6 via [MAIN MENU] during measurement. However, the settings cannot be changed. Be sure to return to this screen, [DATA PROCESSING SAMPLE] to proceed to the next step.
To go to the next step 1) To continue the measurement of sample	[NEXT]	When items to be measured remain, the measurement of such items is performed on [DATA PROCESSING SAMPLE]. For instance, when measurement conditions for TC and IC have been set and TC measurement has been completed, IC measurement is started on [SAMPLE MEASUREMENT/CONDITIONS]. When no items remain for measurement, the screen returns to [SAMPLE MEASUREMENT/CONDITIONS], and the sample number (SAMPLE#) gains one.
2) To complete the measurement of sample	[END]	The screen returns to [MAIN MENU]. Go to #5 [DATA REPORT] to print out the data report.

4. Notice

- 1) Be sure to designate print-out in advance if necessary, because it is impossible to return to this screen after proceeding to the next step by [NEXT] or [END].
- 2) If continuous measurement is taken in the CYCLE MODE, measurement on this screen is repeated. Namely, when the message "COMPLETED" appears, the screen is renewed, and measurement starts again beginning with the 1st injection.

『GENERAL CONDITIONS』

1. Contents of the display

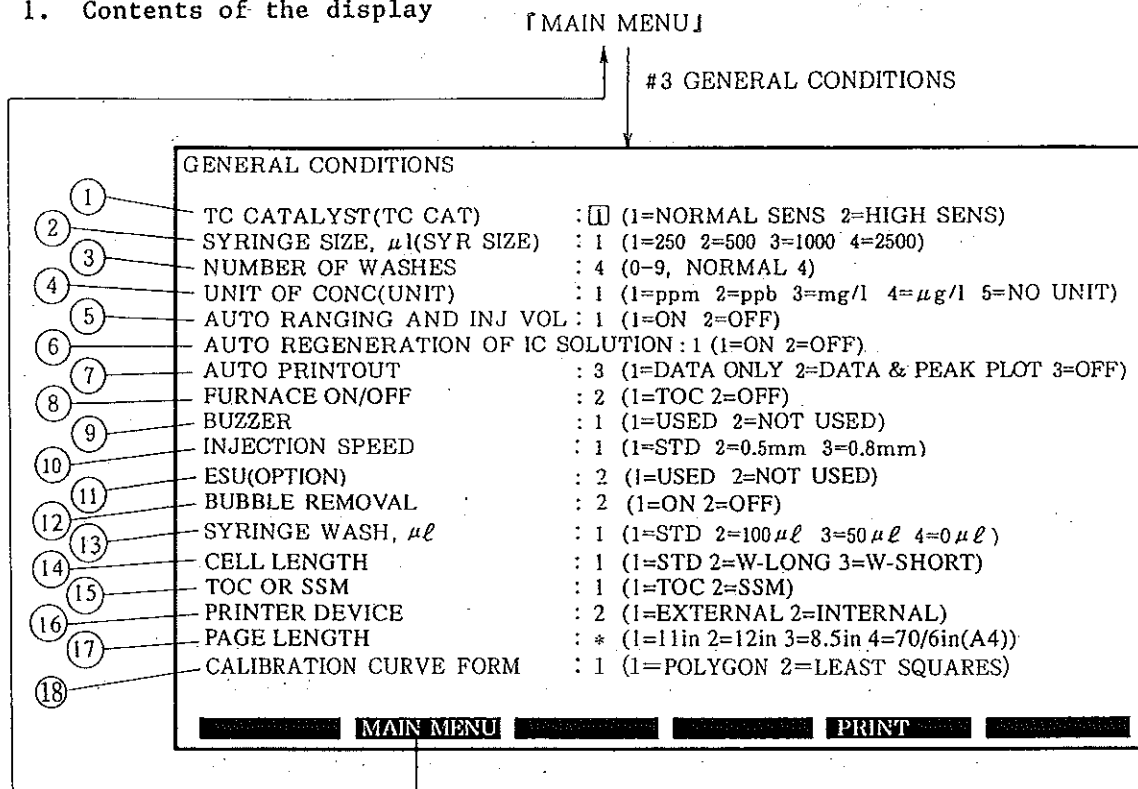


Fig. 6.13 『GENERAL CONDITIONS』 Screen

- ① TC CATALYST: A kind of TC catalyst is to be set. Either normal TC catalyst (NORMAL SENS) or high sensitivity TC catalyst (HIGH SENS) is chosen.
- ② SYRINGE SIZE, μ l: The size of the microliter syringe attached to the syringe pump is to be set.
- ③ NUMBER OF WASHES: The number of times to wash the microliter syringe by sample. For repetitive measurement, the number of times to wash the microliter syringe is always one in the second and subsequent measurement.
- ④ UNIT OF CONC: The unit of concentration is to be set.
- ⑤ AUTO RANGING AND INJ VOL: "Automatic change of range and injection volume" function can be designated.
- ⑥ AUTO REGENERATION OF IC SOLUTION: When ON is selected, IC reagent is supplied automatically in the event of decrease in acid concentration of IC solution.

- ⑦ AUTO PRINTOUT: Automatic printing out in which DATA PROCESSING FOR CALIBRATION screen or DATA PROCESSING FOR SAMPLE screen is printed out automatically can be designated. Numeral data only is printed out by DATA ONLY, and numeral data and peak display are printed out by DATA & PEAK PLOT. (Refer to Para. 6.1.6.)
- ⑧ FURNACE ON/OFF: TC furnace is to be set either ON or OFF.
- ⑨ BUZZER: Use of the buzzer can be designated.
- ⑩ INJECTION SPEED: When a SP KIT (Suspended Particle Kit) is installed, select appropriate injection speed-refer to SP KIT INSTRUCTION MANUAL.
- ⑪ ESU (OPTION): When use of the optional external scrubber unit ESU-1 is intended, set "1=USED". When setting is made to "1", measuring operation changes partly. Details are explained in the ESU-1 Instruction Manual.
- ⑫ BUBBLE REMOVAL: This function is intended to prevent bubbles in the microsyringe as little as possible, when a sample used causes bubbles in the sampling tube.
- ⑬ SYRINGE WASH: Set the volume of the sample used to wash flow line between sample replicates. Volume for washing between samples/analysis mode (TC, IC, NPOC, TOC) is not effected by this setting and remains at a full syringe volume.
- ⑭ CELL LENGTH: The measuring cell of NDIR is to be set. "2=W-LONG" and "3=W-SHORT" are to be selected when use of the optional solid sample module SSM-5000 is intended-refer to the SSM-5000 Instruction Manual.
- ⑮ TOC OR SSM: "1=TOC" is always to be set unless the optional solid sample module SSM-5000 is used.
- ⑯ PRINTER DEVICE:
Either a built-in thermal printer (INTERNAL) or an external printer (EXTERNAL) is chosen. An optional external printer cable set (P/N : 638-70345) must be equipped with to connect an external printer.
The printers which support the standard ESC/P control code are suitable for this purpose-refer to the Instruction Manual of this cable kit.
- ⑰ PAGE LENGTH: Set the length of the paper which is used for the external printer.
- ⑱ CALIBRATION CURVE FORM: The polygonal form (1=POLYGON) or the linear regression form using the least-squares method (2=LEAST SQUARES) can be chosen for the three or four points calibration curve. This selection can also be made on the [CALIBRATION CURVE] screen.

2. Function

General conditions which are common in many kinds of measurement and are seldom changed in each measurement are set.

3. Operation

Purpose	Operation	Function
To set conditions	Input numerals to each item, and depress ENTER .	A condition of each item is set.
To return to MAIN MENU	MAIN MENU	The screen returns to MAIN MENU .
To print out	PRINT	Data of all items are printed out except for AUTO PRINTOUT and BUZZER.

4. Notice

- 1) Be sure to set the same kinds of TC catalyst and the same size of the microliter syringe as attached in this equipment. Wrong setting causes measurement to deteriorate and components to be damaged because the upper limit of injection volume and the speed of the plunger of the microliter syringe are determined by the set data.

2) "BUBBLE REMOVAL"

This item is used to help minimize the bubbles which may accumulate in the microsyringe when measuring samples that have a tendency to degas in the sampling tube. When the sample is drawn into the microsyringe, tiny bubbles may adhere to the microsyringe plunger tip and are not injected with the sample. There is, therefore, no error in the measured sample injection volume and no effect on data reproducibility when the bubbles are small. Large bubbles, however, will act as a damper or buffer at injection, influencing the sample injection and adversely affecting the repetition accuracy. With this item set to 1=ON, the microsyringe will "wait" at a position 16% of its full downward stroke. In this position, bubbles drawn into the microsyringe will not adhere to the plunger tip. Any bubbles in the syringe will typically be expelled to the waste tube when the plunger moves up prior to SAMPLING.

This function minimizes the presence of bubbles. Bubbles may remain in the microsyringe even if the BUBBLE REMOVAL function is used, requiring manual removal by dismounting the syringe.

Sample replacement during WASHING may not be as complete as when this function is not used. Increase number of washes if necessary.

【CALIBRATION CURVE FILE LIST】

1. Contents of the display

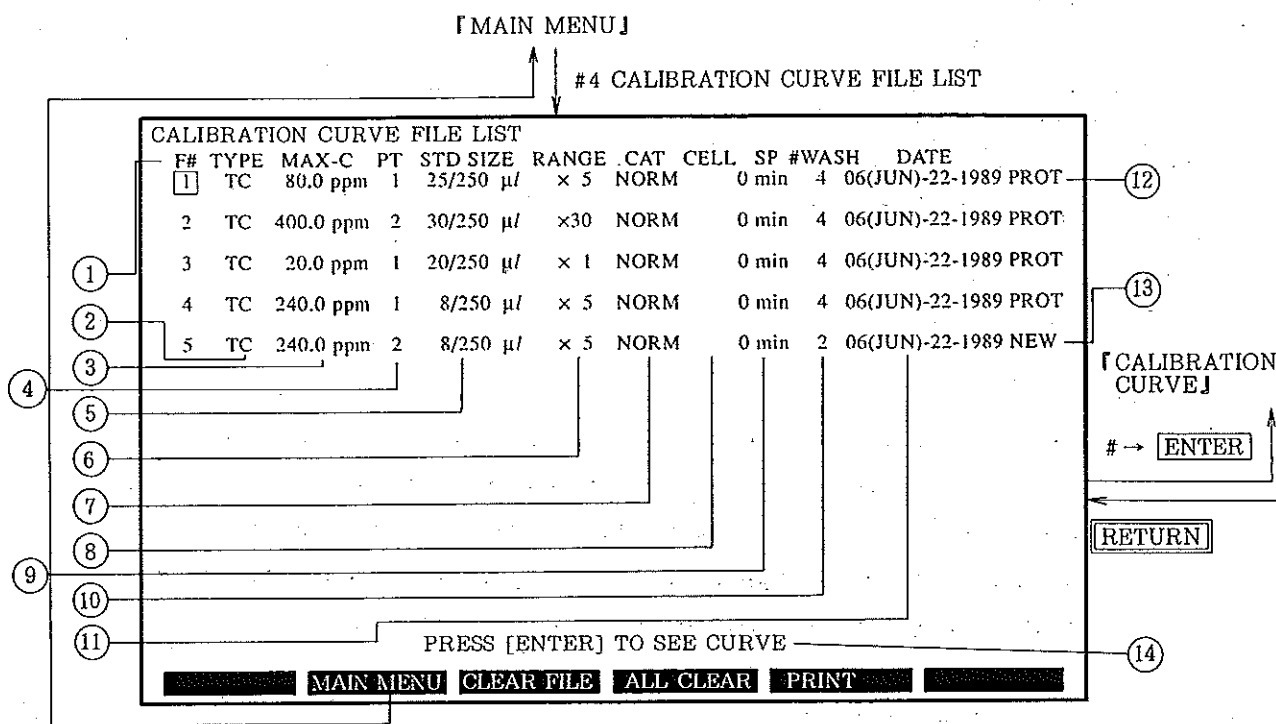


Fig. 6.14 【CALIBRATION CURVE FILE LIST】

- ① F#: File number. Desired number from #1 to #18 can be set.
- ② TYPE: Either TC (TC calibration curve) or IC (IC calibration curve) is displayed.
- ③ MAX-C: The highest concentration of the standard solution used is displayed.
- ④ PT: This indicates number of points of calibration curve.
- ⑤ STD SIZE: Injection volume and the size of the microliter syringe used are displayed.
- ⑥ RANGE: Range for NDIR measurement is displayed.
- ⑦ CAT: The kind of TC catalyst used is displayed.
- ⑧ CELL: The measuring cell of the NDIR used is displayed. This indication is not displayed unless the optional solid sample module SSM-5000 is used.
- ⑨ SP: The sparging time is displayed.
- ⑩ #WASH: The number of times to wash the microliter syringe by sample is displayed.
- ⑪ DATE: Year, month and day when a calibration curve is created.

- ⑫ PROT: It indicates that the data is protected.
- ⑬ NEW: It indicates that the calibration curve has been created newly.

⑭ Message

PRESS (ENTER) TO SEE CURVE

To see the detail data of a 『CALIBRATION CURVE』, move the cursor to F# of that calibration curve, and depress **ENTER**.

2. Function

- 1) Calibration curve data stored is displayed in form of a list.
- 2) Stored calibration curve data can be deleted to make the file free.

3. Operation

Purpose	Operation	Function
To confirm calibration curve data	Move the cursor to F#, and depress ENTER .	『CALIBRATION CURVE』 screen of the designated calibration curve is called.
To delete calibration curve data	Move the cursor to F#, and depress CLEAR FILE ↓ CLEAR	The designated calibration curve data is deleted, and the file turns to be the state of FREE.
	ALL CLEAR ↓ ALL CLEAR	All calibration curve data except the one protected is deleted, and the file turns to be the state of FREE.
	MAIN MENU	All calibration curve data except the one protected is deleted, and the file turns to be the state of FREE.
To go to 『MAIN MENU』	MAIN MENU	The screen returns to 『MAIN MENU』.
To print-out	PRINT	All data displayed on the screen, area (AREA), standard deviation (SD) and coefficient of variation are printed out.

4. Notice

- 1) Cancellation of store protection can be executed on 『CALIBRATION CURVE』 screen only.
- 2) After **CLEAR FILE** or **ALL CLEAR** is depressed, CLEAR operation can be cancelled by depressing **NO CLEAR**.

『DATA REPORT』

1. Contents of the display

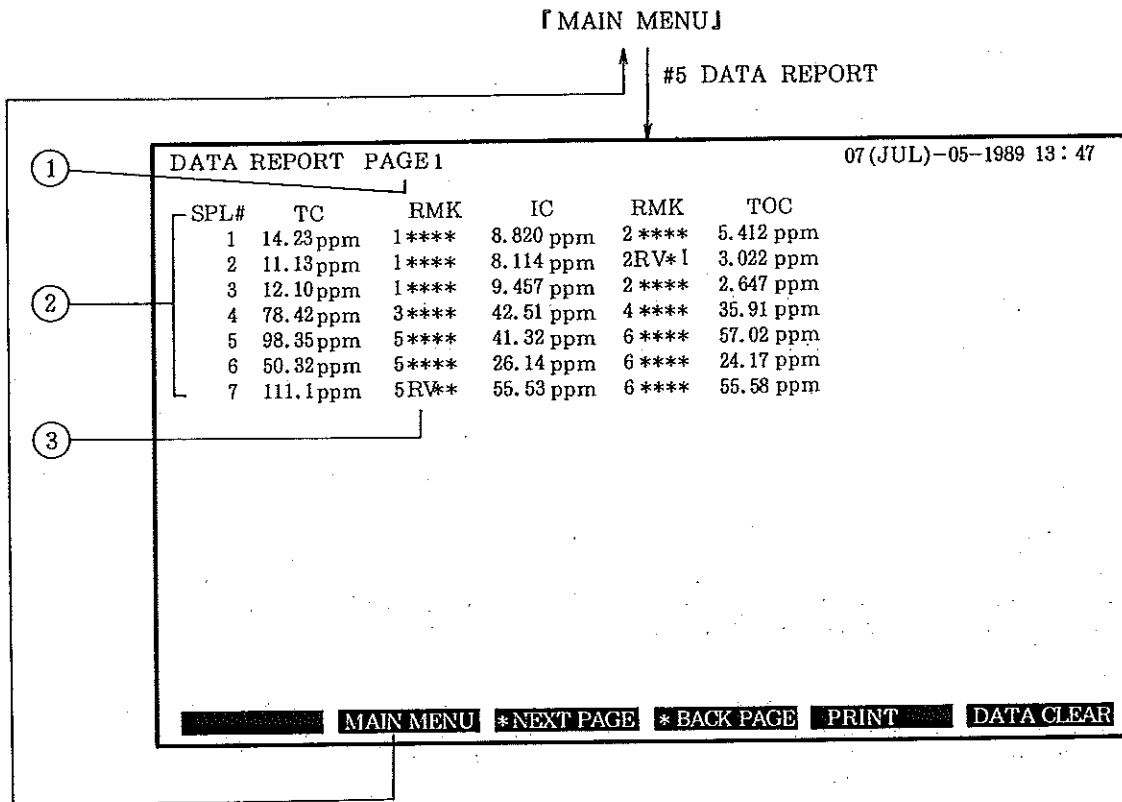
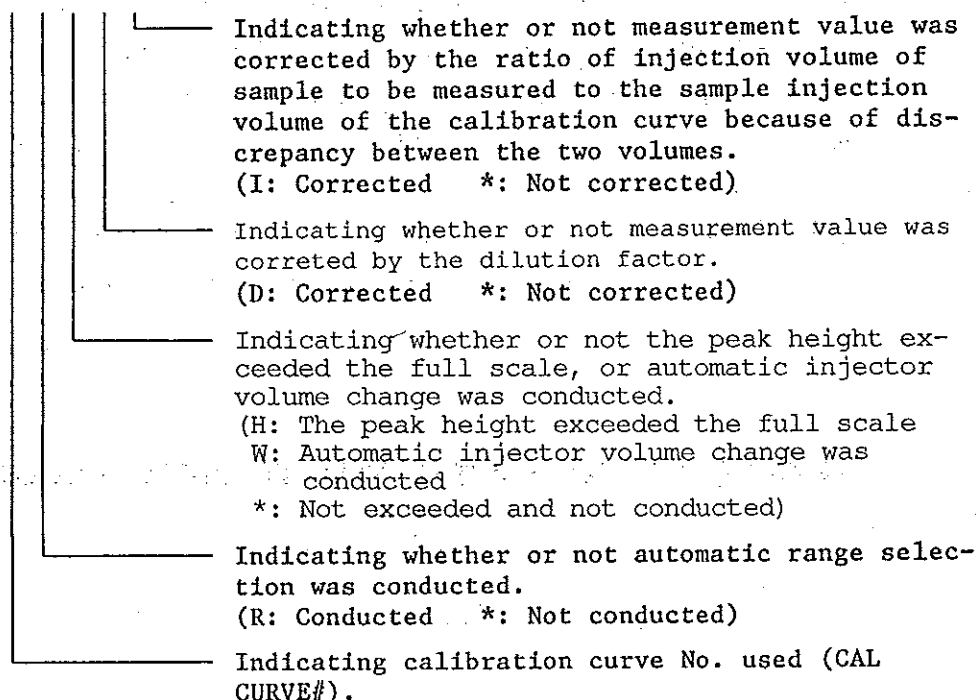


Fig. 6.15 『DATA REPORT』

- ① Page is displayed. The largest page number is 15.
- ② Measurement results are displayed in the order of sample number.
- ③ The following supplementary information is displayed in RMK column:

RMK

* * * * *



2. Function

Measurement results obtained on 『DATA PROCESSING, SAMPLE』 screen are displayed in a report form.

3. Operation

Purpose	Operation	Function
To proceed to next page	NEXT PAGE	Next page is displayed.
To go back to previous page	BACK PAGE	Previous page is displayed.
To clear data	DATA CLEAR	
	(Allocation of function keys is changed as shown below.)	
	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">→</div> <div style="border: 1px solid black; padding: 2px 5px;">DATA CLEAR</div> </div> <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="margin-right: 10px;">→</div> <div style="border: 1px solid black; padding: 2px 5px;">NO CLEAR</div> </div>	<div>All data in the 『DATA REPORT』 is cleared.</div> <div>Data clear is cancelled.</div>
To print out	PRINT	Entire display on the screen is printed out.
To return to 『MAIN MENU』	MAIN MENU	The screen returns to 『MAIN MENU』.

4. Notice

- 1) When the data report has been printed out upon completion of measurement, conduct data clear operation to delete all contents of data report to prepare for next measurement. If next measurement is started without deleting the data report, old data will be replaced with new data. However, for sample Nos. (SPL#) and measurement items (TC, IC, NPOC, etc.) which are not used in the new measurement, old data remains and is mixed with new data.

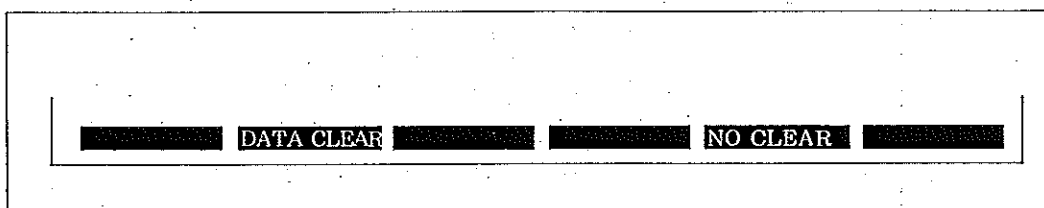


Fig. 6.16 Function Keys for Data Clear

『MONITOR』

1. Contents of the display

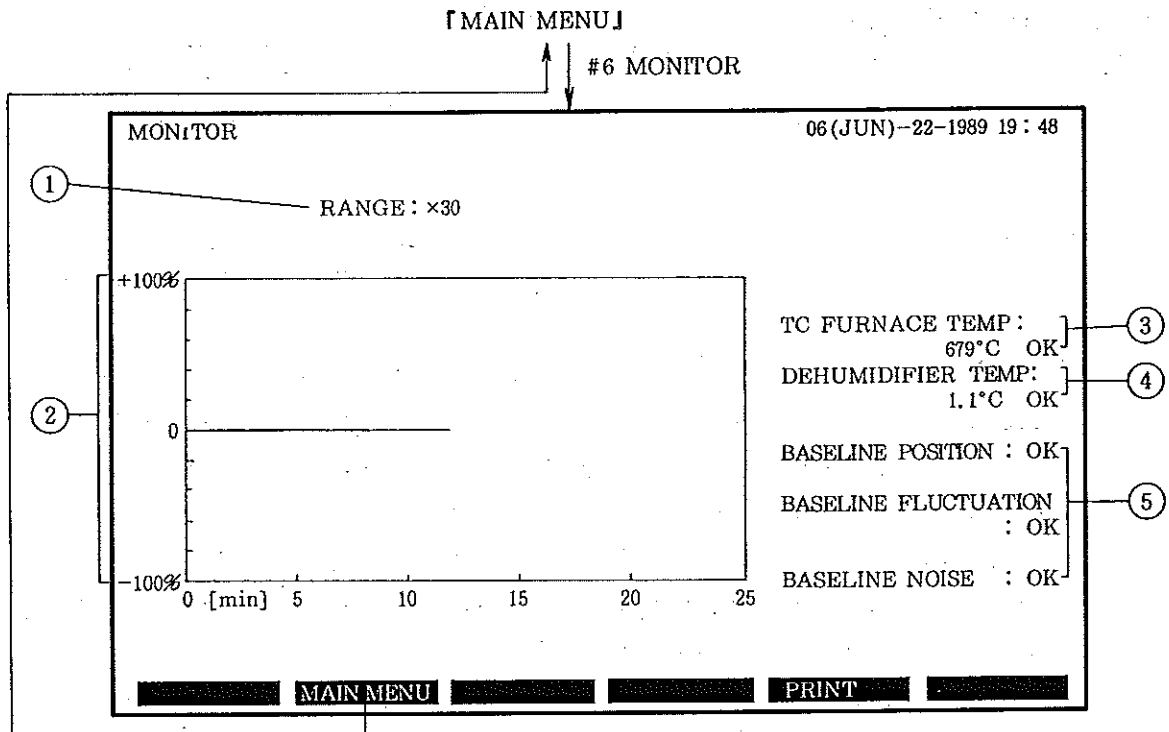


Fig. 6.17 『MONITOR』

- ① Present range setting of NDIR is displayed.
- ② Base line is displayed.
- ③ TC furnace temperature is displayed and READY or not is indicated.
- ④ Dehumidifier temperature is displayed and READY or not is indicated.
- ⑤ READY or not is indicated as for the position, fluctuation and noise of base line.

2. Function

- 1) The analog signal from the detector (the base line) is displayed. Position, fluctuation and noise states of the base line can be checked.
- 2) TC furnace and electronic dehumidifier temperatures are digitally displayed, and whether or not these temperatures and the position, fluctuation and noise of the base line are in READY state is indicated in term of either OK or NG (NO GOOD).

3. Operation

Purpose	Operation	Function
To print-out	[PRINT]	All display on this screen is printed out.
To go to [MAIN MENU]	[MAIN MENU]	The screen returns to [MAIN MENU] .

4. Notice

1) Change RANGE setting, if necessary, by RANGE SET on **[MAINTENANCE]** screen.

2) NG is displayed at BASE LINE POSITION when base line deviates by $\pm 100\%$ for $\times 1$ range setting, by $\pm 50\%$ for $\times 5$, and by $\pm 10\%$ for $\times 30$, from 0%. In such a case, conduct zero adjustment of the optical components of the NDIR. (See Para. 7.4.1.)

Base line may fluctuate while TC furnace is being heated or immediately after new catalyst is set. Wait until base line is stabilized before conducting zero adjustment.

3) When IC measurement is selected, the TC FURNACE TEMP is excluded from the READY conditions.

『STANDBY OPTIONS』

1. Contents of the display

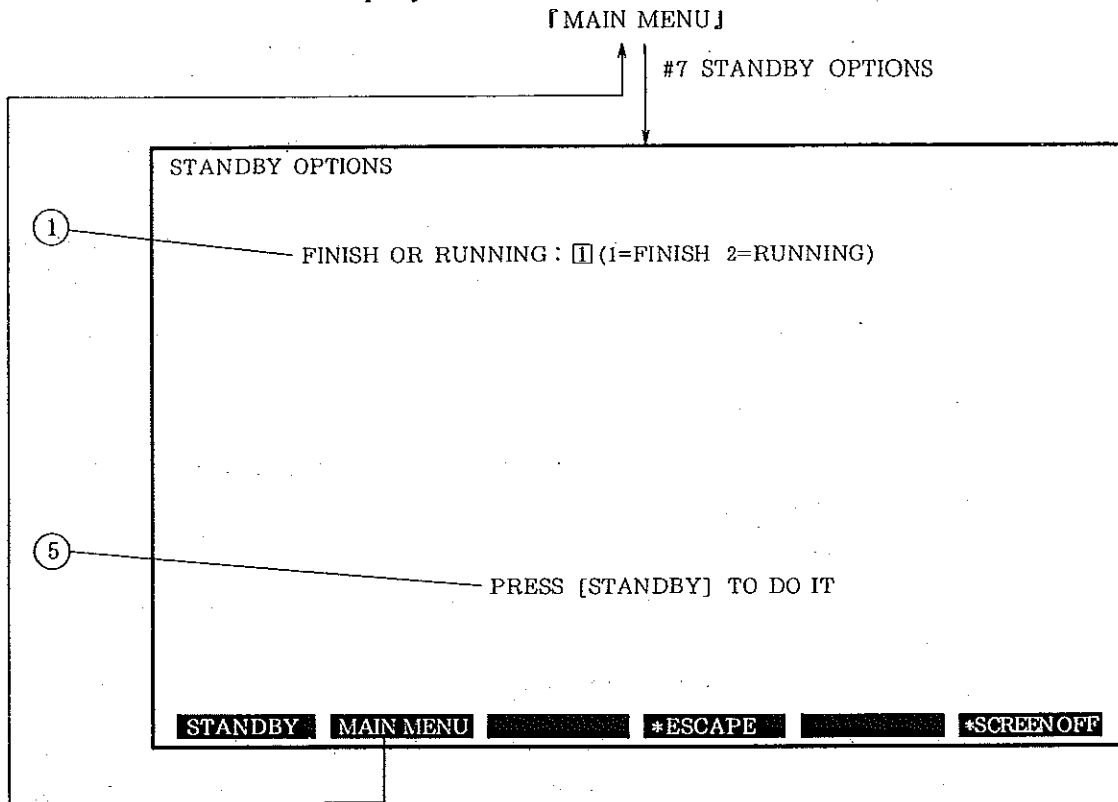


Fig. 6.18 『STANDBY OPTIONS』 Screen

When FINISH is indicated:

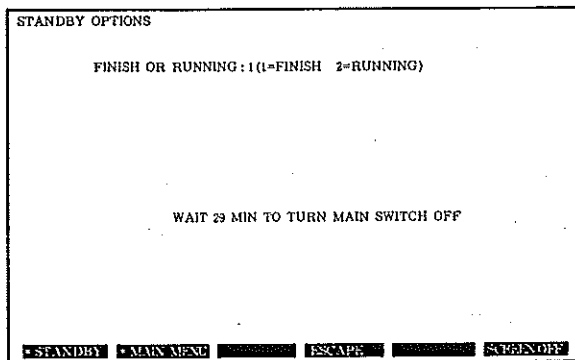


Fig. 6.19 『STANDBY OPTIONS』 (FINISH) Screen

When RUNNING is indicated:

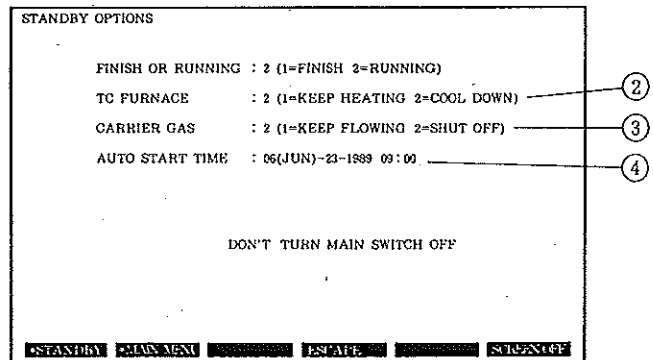


Fig. 6.20 『STANDBY OPTIONS』 (RUNNING) Screen

- ① Designate either FINISH (termination of the operation) or RUNNING (running operation). When RUNNING is designated, the following items are displayed.
- ② TC FURNACE: Designate either to continue heating or to stop heating TC furnace in RUNNING operation.
- ③ CARRIER GAS: Designate either to turn on carrier gas or off, in RUNNING operation.
- ④ AUTO START TIME: If turning off of TC furnace and carrier gas has been designated in RUNNING operation, designate date and time when they are turned on again to be ready for measurement.

⑤ Messages

[PRESS (STANDBY) TO DO IT]

Depress STANDBY to perform the designated operation (either FINISH or RUNNING).

[DON'T TURN MAIN SWITCH OFF]

Do not turn off the power switch. (When RUNNING has been designated)

[WAIT 30MIN TO TURN MAIN SWITCH OFF]

Wait 30 minutes to turn off the power switch. (When FINISH has been designated. Time display counts down from 30 minutes to 0 (zero).)

[WAIT A MOMENT]

Wait a moment. (It is displayed when the operation has been halted by ESCAPE).

2. Function

- 1) This is the screen to halt the operation of this equipment. Either termination or RUNNING operation can be selected.
- 2) In case of termination, turn off TC furnace only first; the heat of TC furnace can cause endurance of the parts of TC injection port to drop if the ventilating fan in the equipment is turned off first.
- 3) If TC furnace and carrier gas supply have been turned off in RUNNING operation, they are turned on an hour before the designated starting time so that the equipment is ready for measurement at the designated time.

3. Operation

Purpose	Operation	Function
To execute either termination or RUNNING operation	<div>1 + ENTER</div> <div>+</div> <div>STANDBY</div>	Termination (FINISH) is executed. (TC furnace and carrier gas supply are turned off first, and then the waiting time before power switch can be turned off is displayed.)
	<div>2 + ENTER</div> <div>+</div> <div>Set RUNNING conditions by 1 or 2 + ENTER when RUNNING conditions are additionally displayed.</div> <div>+</div> <div>STANDBY</div>	RUNNING operation is executed under the set conditions. When TC furnace or carrier gas has been turned off, it will be turned on again one hour before the designated AUTOSTART time.
To halt the execution	ESCAPE	Termination being executed or motion of RUNNING operation is halted.
To stop the screen	<div>SCREEN OFF (Stop)</div> <div>↑</div> <div>Depress any key.</div> <div>(Return)</div>	LCD screen is stopped. It is recommended to use this function because keeping LCD screen turned on during RUNNING operation in particular shortens the life of parts. LCD screen can be turned on again simply by depressing any key.
To go to MAIN MENU	MAIN MENU	The screen returns to MAIN MENU.

4. Notice

- 1) Stop the operation of the equipment by using FINISH on this screen so as not to shorten the life of parts of TC injection port. However, in case of emergency, the equipment can be stopped by turning off the power switch directly, without using this screen.
- 2) When turning off of TC furnace and carrier gas has been designated in RUNNING operation, the components which are kept energized in the equipment are NDIR, electronic dehumidifier, ventilating fan, cooling fan and CPU.
- 3) If date and time for AUTO START function is set, TC furnace temperature starts rising and carrier gas starts flowing one hour before the set time in order to make TC furnace stabilized at specified temperature at the set time. Therefore, one hour or more ahead of the current time must be set for the date and time for AUTO START function.

『MAINTENANCE』

1. Contents of the display

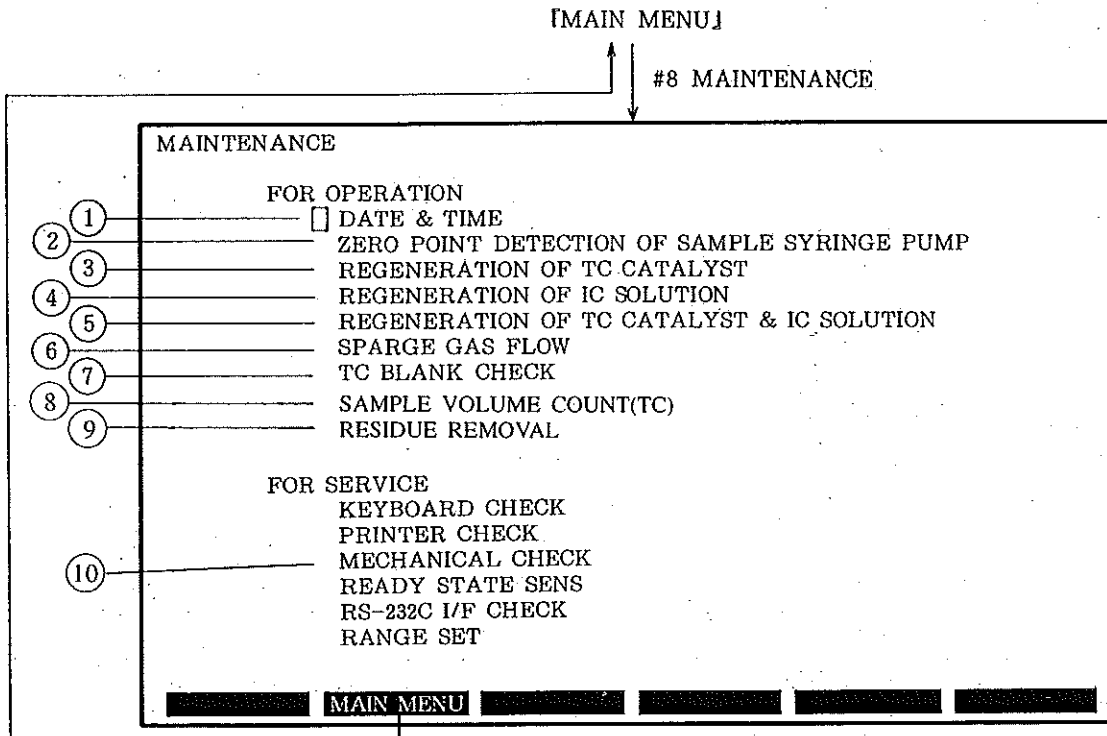


Fig. 6.21 『MAINTENANCE』 Screen

- ① DATE & TIME SET: Set year, month, day, hour and minute.
- ② ZERO POINT DETECTION OF SAMPLE SYRINGE PUMP: Automatic zero point detection of the syringe pump is performed.
- ③ REGENERATION OF TC CATALYST: Regeneration of TC catalyst is performed.
- ④ REGENERATION OF IC SOLUTION: Regeneration of IC solution is performed.
- ⑤ REGENERATION OF TC CATALYST & IC SOLUTION: Regeneration of TC catalyst and IC solution is performed in succession.
- ⑥ SPARGE GAS FLOW: The solenoid valve to sparge gas can be opened and closed.
- ⑦ TC BLANK CHECK: Blank checking program of TC can be performed.
- ⑧ SAMPLE VOLUME COUNT (TC): The sample volume injected into the TC combustion tube at "SAMPLE MEASUREMENT" will be totalled and displayed, and the message is displayed when the accumulated total value exceeds the preset value. (The function related to the ESU-1. Refer to 7.2.4)

- ⑨ RESIDUE REMOVAL: This function is used to eliminate the hydrochloric acid and/or chlorine gas remaining in the flow path components after samples containing hydrochloric acid measurement. (The function related to the ESU-1. Refer to 7.2.5)
- ⑩ MECHANICAL CHECK: Operation of syringe pump plunger, four-port valve, sliders of slidable TC and IC sample injecting blocks and various solenoid valves can be checked with key operation.

2. Function

- 1) The items that the operator should work are setting of year, month, day, hour and minute, zero point detection of syringe pump, re-generation of TC catalyst and IC solution, opening and closing of gas sparging valve, TC blank check, sample volume count (TC) and residue removal.
- 2) For service operation, checking of the keyboard and printer, motion checking of mechanical parts, cancellation of READY state checking, checking of RS-232C I/F, and setting of a range of NDIR can be performed on this screen.

3. Operation

Purpose	Operation	Function
To set date and time	Move the cursor to the appropriate item and, depress ENTER . Input month (two figures), day (two figures), year (four figures in A.D.), hour (two figures), and minute (two figures) by depressing ENTER every time after each item.	When the operation starts with ALL RESET, these items should be set in the sequence mentioned on the left because the date display starts from zero. Once they are set, they are maintained by calendar function in the equipment. Therefore, unless the operation is started with ALL RESET again, they are not required to be set again. Even if these items are not set, measurement can be performed.
To detect the zero position of the microliter syringe	Move the cursor to the appropriate item, and depress ENTER .	Zero point detection of the microliter syringe is performed.
To regenerate TC catalyst	Move the cursor to the appropriate item, and depress ENTER .	Regeneration of TC catalyst is performed. → Regeneration of TC catalyst (Para. 7.2.1)
To regenerate IC solution	Move the cursor to the appropriate item, and depress ENTER .	Regeneration of IC solution is performed. → Regeneration of IC solution (Para. 7.2.2)
To open or close gas sparging valve	Move the cursor to the appropriate item, and depress ENTER + ↑ [FLOW] is displayed. (The valve is open.) ↓ Move the cursor to the appropriate item, and depress ENTER + Nothing is displayed. (The valve is closed.)	When [FLOW] is displayed, the gas sparging valve (or solenoid valve) is opened. Then, adjust gas flow rate by the sparge gas pressure controller. (The normal flow rate is 150 ml/min.) If the operation proceeds from this screen to another screen, the valve is left open. This operation is used when manual sparging processing for IC removal is performed. → Pretreatment for IC Removal (Para. 6.6)
TC blank check	Move the cursor to the appropriate item, and depress ENTER + Input injection volume, then depress START/STOP	TC blank check is performed. → TC blank check (Para. 6.5)
Sample volume count (TC)	Set cursor to intended item, and ENTER ↓ Set value on RESET VOLUME, and ENTER	Volume of sample injected is accumulated on "SAMPLE MEASUREMENT" screen.
Residue removal	Set sampling tube in water. ↓ Set cursor to intended item, and ENTER	Operation is performed for removal of residue.
To go to [MAIN MENU]		The screen returns to [MAIN MENU].

For the operation of the items for service (FOR SERVICE), MECHANICAL CHECK only is used by the user. (It is used when a microliter syringe of the syringe pump is renewed and after finishing sample measurement.) For operation procedure, refer to Para. 5.1.8 and Para. 6.2 (14).

4. Notice

- 1) Be sure to execute zero point detection of a microliter syringe when the operation starts with ALL RESET, or when the microliter syringe was detached. Set the size of the microliter syringe to be used on either [MECHANICAL CHECK] screen or [GENERAL CONDITIONS] screen before execution, since some parts of the contents of zero point detection programs are different depending on sizes of microliter syringes.
- 2) Procedure for zero point detection of syringe pump is as follows:
Put a water-containing bottle on sample pan, and put sampling tube end in it.
Then depress [ENTER] to run the following program.
 - (1) Home position is detected. (The home position which is pre-determined is detected by optical sensor.)
 - (2) Water is sucked and discharged twice by full stroke of plunger to wet the microliter syringe interior with water for smooth movement of plunger.
 - (3) Mechanical backlash amount of plunger-driving system is detected.
 - (4) Plunger is moved up by specified pulses from the home position and then back to the home position. While plunger is returned to the home position, number of pulses required for the return is counted.

The above operation is repeated as the amount of plunger movement is increased little by little. When plunger is moved beyond the zero point of microliter syringe, it cannot be moved any more as it is blocked by the syringe barrel end, and plunger-driving pulse motor is stepped out. In such a case, pulse count for return to the home position is smaller than that for moving up. This pulse count difference is detected and a point a little lower than the detected point is fixed as zero point.

6.4 High Sensitivity Measurement

In measurement of extremely small amount of TOC (Normally, it does not exceed 1 ppm.) in sample, observance to precautionary requirements of measurement is essential for the equipment to show intended performance. For measurement of several hundred or several ten ppb component, it is the most important to isolate sample and measuring parts from external contamination source. This requirement is common for all analyzers including TOC analyzer. Since carbon, measuring object for this equipment, exists everywhere around us, for example in CO₂ in the atmosphere, dust, and in soil on hands and others, protection against contamination as mentioned above is particularly important. Precautionary requirements to be observed for high sensitivity measurement are as follows:

- 1) TC combustion tube filled with high sensitivity TC catalyst must not be used for measurement of high concentration sample but exclusively for high sensitivity measurement. For measurement of high concentration sample, another TC combustion tube specially prepared for that purpose must be used. For storage of TC combustion tube for high sensitivity measurement, seal both ends. Sample of concentration within the measuring range will not affect subsequent measurement of sample of different concentration. If concentration of sample injected exceeds measuring range violently, however, subsequent measurement may be affected. When such effect is suspected, repeat measurement of zero water until the original value is obtained.
- 2) To protect against contamination, it is advisable to prepare a microliter syringe specially for high sensitivity measurement.
- 3) Ultra pure water or the like sample with extremely small carbon content should be measured immediately after being sampled. If immediate measurement cannot be performed, preserve the sample in a dark place at low temperature, and perform the measurement as soon as possible. When sample is to be taken to a container, clean the container thoroughly in advance and fill it with sample so that no space is left in container, and then seal it airtight. As a container for water sampling or relocation of a sample, it is preferable to use 500ml~1l of narrow mouth glass bottle with Teflon liner.