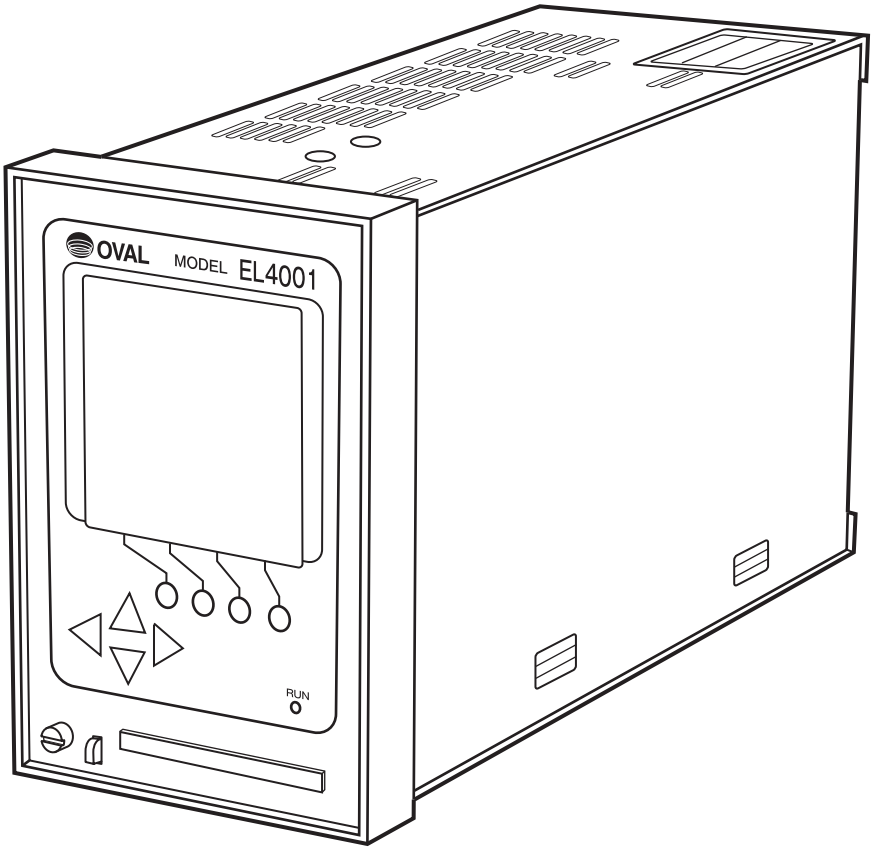
OVAL INSTRUCTIONS

Ins. No. E-880TM-5-E

FLOW COMPUTER EL4001 SERIES

KEY OPERATION MANUAL



Every OVAL Flow Computer is fabricated and shipped from our factory under stringent quality control. To derive maximum benefit from the computer, we recommend that you become familiar with this instruction manual before you place it in service and retain a copy at the field location for ready reference.

BEFORE YOU BEGIN

This manual has been prepared for OVAL flow computers of the EL4001 series. Making sure of your model number and good understanding of the input/output and calculation process according to the instruction manual for the model, refer only to the specific topics of interest.

In the EL4001 series, mode selection is simple with keystrokes on the front-panel keypad. However, we recommend you to become thoroughly familiar with the procedure described in this manual before you reconfigure parameters.

If you have something to inquire, contact the sales office from which you purchased the product, or the nearest OVAL representative in our customer service network.

(When you inquire, please supply us with the product name, model No., serial No., and other pertinent information.)

This communication manual applies to the following models:

- EL4101 Steam Flow Computer (saturated steam service)
- EL4111 Steam Flow Computer (superheated steam service)
- EL4121 Temperature/Pressure Compensated Flow Computer (gas service)
- EL4131 Temperature Compensated Flow Computer (liquid service)
- EL4201 Temperature/Pressure Compensated Gas Flow Computer (mass units)
- EL4211 Temperature Compensated Liquid Flow Computer (mass units)
- EL4301 Density Computer for Mass Flowmeter
- EL4311 Density Computer for Mass Flowmeter (with solids proportion calculation feature)
- EL4321 Density Computer for Spool Densitometer (gas service)
- EL4401 Blend Oil Temperature Compensated Flow Computer
- EL4501 Multipoint Temperature Compensated Flow Computer (liquid service)

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The indications **NOTE**, **CAUTION**, and **WARNING** shown throughout this manual are to draw your attention to specific items:

➡ NOTE

Notes are separated from the general text to bring user's attention to important information.

⚠ **CAUTION**

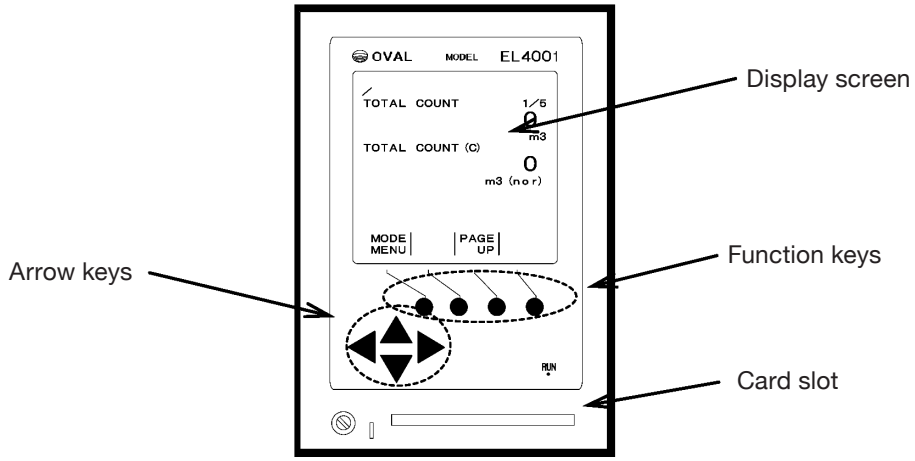
Caution statements call attention to user about hazards or unsafe practices that could result in minor personal injury or property damage.

⚠ **WARNING**

Warning statements call attention to user about hazards or unsafe practices that could result in serious personal injury or death.

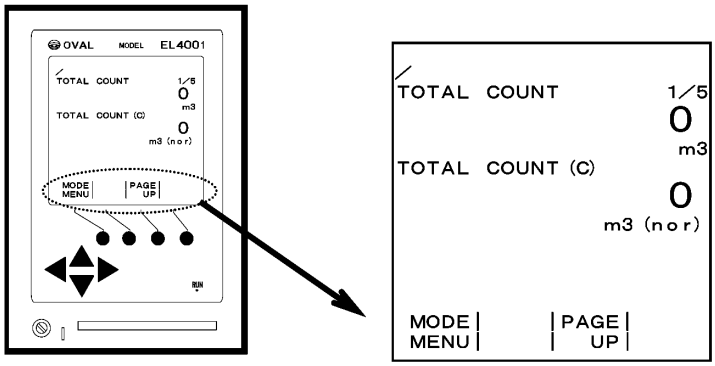
1. KEY ARRANGEMENT

1.1 Front Panel Part Names



1.2 Function Keys

In the EL4001 series, software-defined function keys are used: they have different functions as the user moves from screen to screen. The four round keys located directly below the display are the functions keys. The functions assigned to individual keys are indicated in the bottom line of each screen.



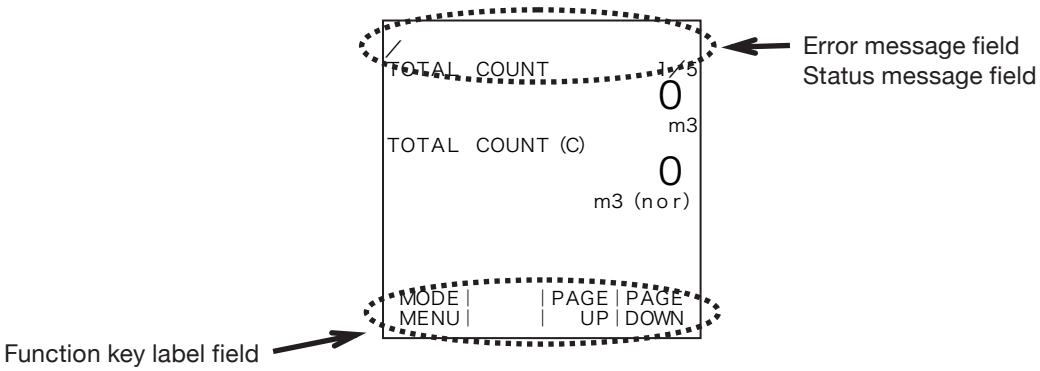
Labels to show functions assigned to function keys in RUN mode (example)

1.3 Arrow Keys

In the SET and SYS modes, the arrow keys are primarily used for moving the cursor ("▶") (up and down arrow keys) at a menu, for moving the cursor (highlighted) (left arrow and right arrow keys) at a variable setup menu, and for increasing or decreasing the number pointed by the cursor (highlighted) (up arrow and down arrow keys).

In the RUN mode, the up arrow and down arrow keys correspond to the "PAGE UP" and "PAGE DOWN." (In the RUN mode, the right arrow and left arrow keys are not used.)

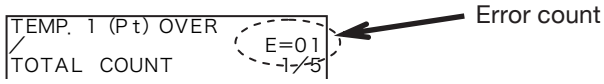
2 . DISPLAY SCREEN



2.1 Error Message Field

The top line of the screen shows an error message appears. Error messages appear in the RUN mode and in the SET mode.

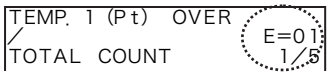
・Temperature input (Pt) over



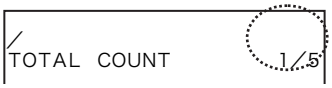
2.1.1 Error Count

The count of errors that have occurred is indicated.

・Message: An error has occurred.
(Temp. input (Pt 100Ω) over)



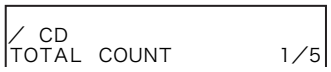
・Hidden: Free of any errors.
(Nothing is shown on the screen.)



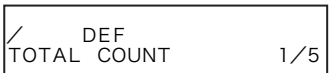
2.2 Status Message Field

The line second from top of the screen shows a status message of a card or parameters. If errors occur, the number of errors found appears.

・IC card installed in place

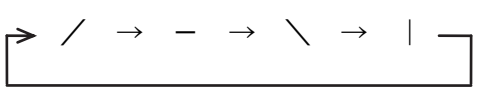


・Parameters set to default settings.

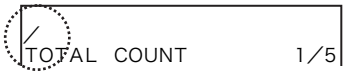


2.2.1 Corrected Calculation Run

While calculation is in progress, a short line segment keeps on revolving at left to indicate that calculation is being done. Included in the calculation run range are the RUN mode, mode select menu, SET mode, and two 1C card support screens.



・Calculation being implemented (RUN mode)



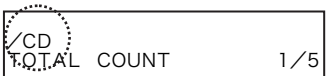
・Calculation being interrupted (SET mode)

2.3 Card Insertion

The status of 1C card insertion is indicated.

・Hidden: IC card not inserted in place

・Message: IC card inserted in place

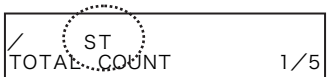


2.4 Parameter Setup

The status of parameter configuration is indicated.

・Hidden: Parameters have been set up

・ST: Parameters that have previously been set up



・Default setting

2.5 Communication Mode

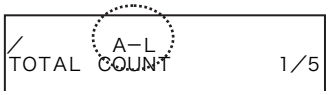
Provision of a communication interface and the status of communication are indicated.

※ Not shown in models without communication capabilities.

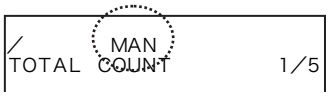
・Hidden: Communication interface not provided

・A – R: Communication interface provided and in the remote mode

・A – L: Communication interface provided and in the local mode



・MAN: Communication interface provided; communication is interrupted.

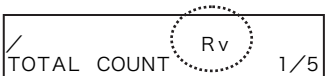


2.6 Status of Reception

With communication interface provided, reception of a communication command is shown.

※ Not shown in models without communication capabilities.

・Receive: Home address of a communication command is the operator himself.



・Receive: Home address of a communication command is other than the operator.

2.7 On-screen Function Key Label Field

The labels for individual software-defined function keys appear.

・In the RUN mode

・MODE menus are shown.

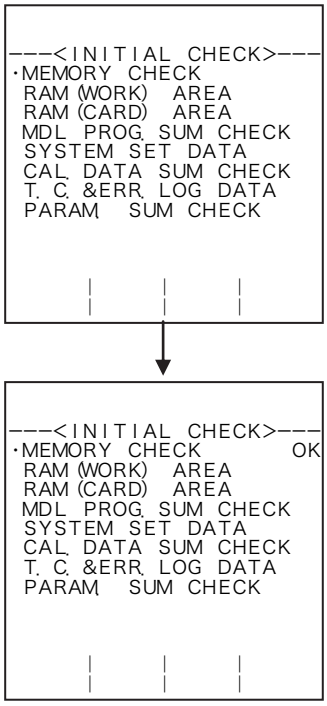
3 . ABOUT INITIAL CHECKS

Each EL4001 series computer runs a series of initial performance checks at startup or power cycling. In this initiation process, tests are performed on possible problems associated with CPU performance in the computer, parameters and process variables stored in the memory, problems in the memories themselves, and memory read/write.

The test items subject to the initial checks are:

1) Memories (data/hardware)

3.1 Memory (data/hardware) Check



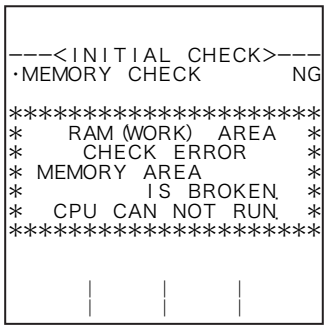
←A screen during a memory check

In the initial check, a memory check covers both the hardware and data. Individual memory check items appear sequentially.

←A screen upon completion of a memory check

If found all right upon completion of a check, an “OK” appears. However, if errors are found in certain (some) check items, corresponding error messages will appear.

3 1.1 RAM (work area) Hardware Check.



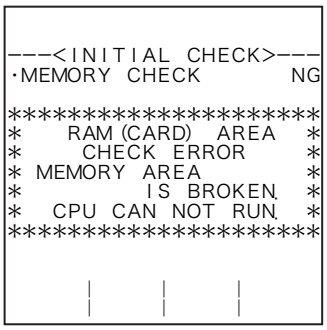
←A screen showing a memory check error

In the RAM (work area) check, proper read/write in and out of the memory is verified. If an error condition is found in this check, an error message appears and the CPU stops processing.

While this message appears, the CPU stops processing and does not accept any command by keystrokes.

To restart, power cycling is required.

3.1.2 RAM (extended program area) Hardware Check



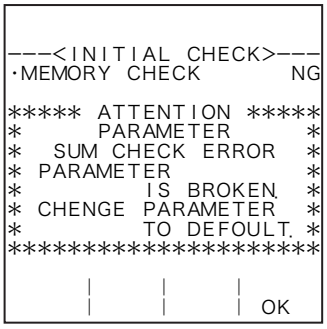
←A screen showing a memory check error

In the RAM (extended program area) check, proper read/write in and out of the memory is verified. If an error condition is found in this check, an error message appears and the CPU stops processing.

While this message appears, the CPU stops processing and does not accept any command by keystrokes.

To restart, power cycling is required.

3.1.3 E²PROM (parameter area) Data Check

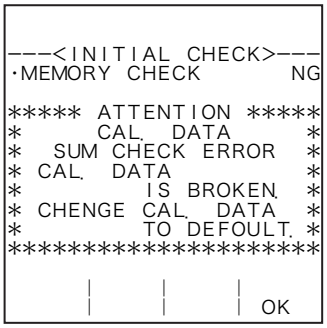


←A screen showing a memory check error

In the E²PROM (parameter area) data check, whether or not the data stored in the memory are free from any damage is verified. In this check, sumcheck data created at data writing is compared against the sumcheck data created from the data currently stored in the memory. If an error is found during this check, parameter configuration will be replaced with default settings.

After seeing this message, pressing the function key “OK” causes the data to go to default setting.

3.1.4 E²PROM (calibrtion data area) Data Check



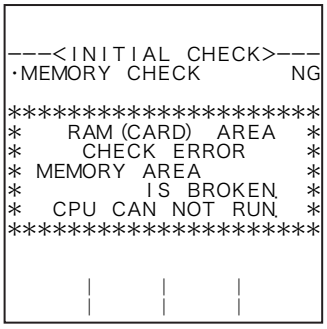
←A screen showing a memory check error

In the E²PROM (calibration data area) data check, whether or not the data stored in the memory are free from any damage is verified. In this check, sumcheck data created at data writing is compared against the sumcheck data created from the data currently stored in the memory. If an error is found during this check, parameter configuration will be replaced with default settings.

After seeing this message, pressing the function key “OK” causes the data to go to default setting.

※ With calibration data set in default, the temp, input, pressure input, and analog output will not function properly. So be sure to make recalibration.

3.1.5 E²PROM (parameter area) Hardware Check



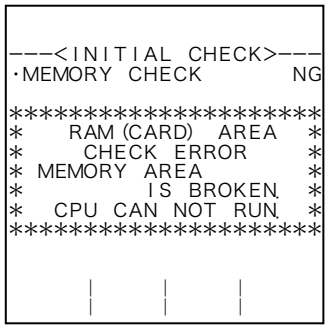
←A screen showing a memory check error

An E²PROM(parameter area) data check is performed if parameters remain undefined (remain in default settings), in this check, proper read/write in and out of the memory is verified. If an error condition is found during this check, an error message appears and the CPU stops processing.

While this message appears, the CPU stops processing and does not accept any command by keystrokes.

To restart, power cycling is required.

3.1.6 E²PROM (calibration data area) Hardware Check

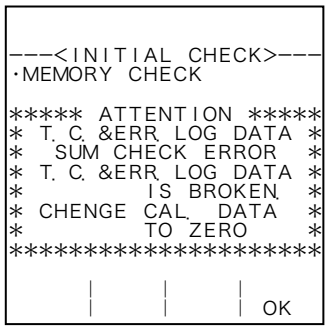


←A screen showing a memory check error

An E²PROM (calibration data area) check is performed if calibration data remain undefined (remain in default settings), in this check, proper read/write in and out of the memory is verified. If an error condition is found during this check, an error message appears and the CPU stops processing.
While this message appears, the CPU stops processing and does not accept any command by keystrokes.
To restart, power cycling is required.

⚠CAUTION: If the same error message persists after several repetitions of power cycling, a fault in the internal circuitry is suspected; seek our service at the nearest OVAL representative in your area.

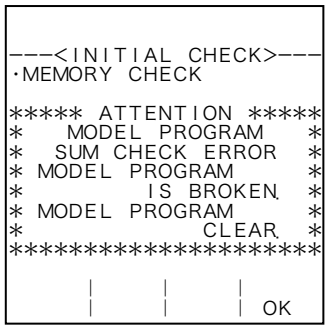
3.1.7 E²PROM (total count and error logging data area) Data Check



←A screen showing a memory check error

In an E²PROM (total count and error logging data area) data check, whether or not the data stored in the memory are free from any damage is verified. In this check, sumcheck data created at data writing is compared against the sumcheck data created from the data currently stored in the memory. If an error is found during this check, totals and error logging data will be cleared.
After seeing this message, pressing the function key “OK” causes the data to be cleared (“0”).

3.1.8 E²PROM (model setup program area) Data Check

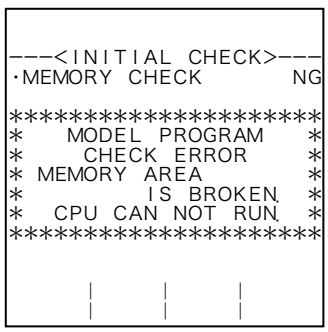


←A screen showing a memory check error

In an E²PROM(model setup program area) data check, whether or not the data stored in the memory are free from any damage is verified. In this check, sumcheck data created at data writing is compared against the sumcheck data created from the data currently stored in the memory. If an error is found during this check, error logging data will be cleared, bringing up an undefined status in the model configuration.
After seeing this message, pressing the function key “OK” causes the data to be cleared.

⚠CAUTION: Once the model setup program has been cleared, computation cannot be performed. If this is the case, reload the model setup program from the model setup card. Seek our service at the nearest OVAL representative in your area.

3.1.9 E²PROM (model setup program area) Hardware Check

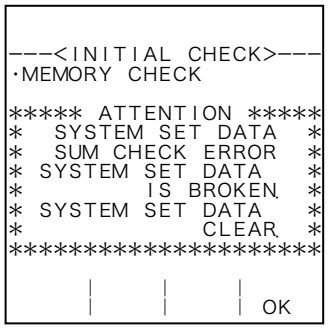


←A screen showing a memory check error

In an E²PROM(model setup program area) check, proper read/write in and out of the memory is verified. If an error condition is found during this check, an error message appears and the CPU stops processing.
While this message appears, the CPU stops processing and does not accept any command by keystrokes.
To restart, power cycling is required.

⚠CAUTION: If the same error message persists after several repetitions of power cycling, a fault in the internal circuitry is suspected; seek our service at the nearest OVAL representative in your area.

3.1.10 E^2PROM (system con fig area) Data Check



←A screen showing a memory check error

In an E^2PROM (system config area) data check, whether or not the data stored in the memory are free from any damage is verified. In this check, Sumcheck data created at data writing is compared against the sumcheck data created from the data currently stored in the memory. If an error is found during this check, model config program will be cleared, bringing up an undefined status in the model configuration.

After seeing this message, pressing the function key “OK” causes the data to be cleared.

⚠**CAUTION: Once the model setup program has been cleared, computation cannot be performed. If this is the case, reload the model setup program from the model setup card. Seek our service at the nearest OVAL representative in your area.**

4. ABOUT MODE SELECTION

4.1 Mode Select Menu Screen

In the EL4001 series, the user can change from one mode to another at the mode select menu. From this menu screen, he can select one of the available options, such as the RUN mode, SET mode, SYS mode, EXTD mode, or 1C card support screen (a parameter setup card inserted).

By establishing a password for the SET mode, the computer can be configured to ask the user for a password each time when attempted to change modes. This configuration will safeguard the computer against inadvertent mode changes. (See the section on PASSWORD SETTING for the SET mode.)

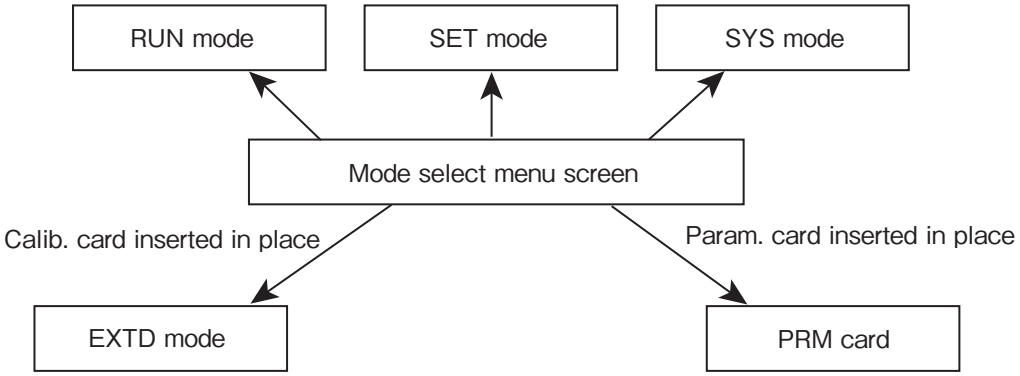
※ **Normally, the password setting is ON and at default "1111". If the user wants to establish a new setting by changing modes, thoroughly read this manual before you start.**

By selecting DIP switch settings, you can inhibit switching in the SET mode and SYS mode. In this case, reconfiguration of settings in the SET mode and SYS mode remain disabled unless DIP switch settings are OFF.

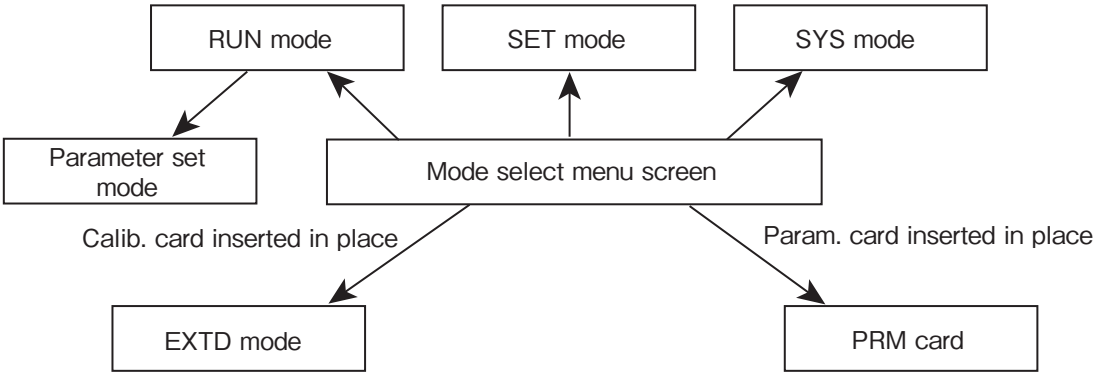
4.2 Mode Tree

Shown below is a mode select menu relative to individual modes.

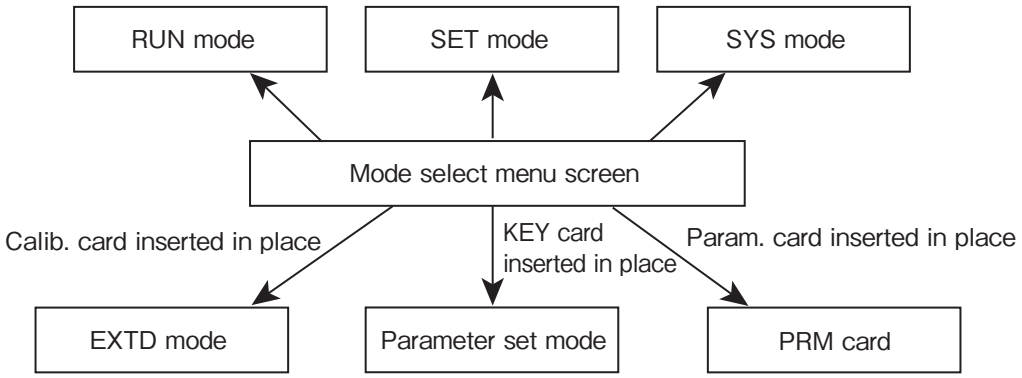
On Models EL4101, EL4111, EL4121, EL4131, EL4201, EL4211, EL4301, EL4311 and EL4321



On Model EL4401

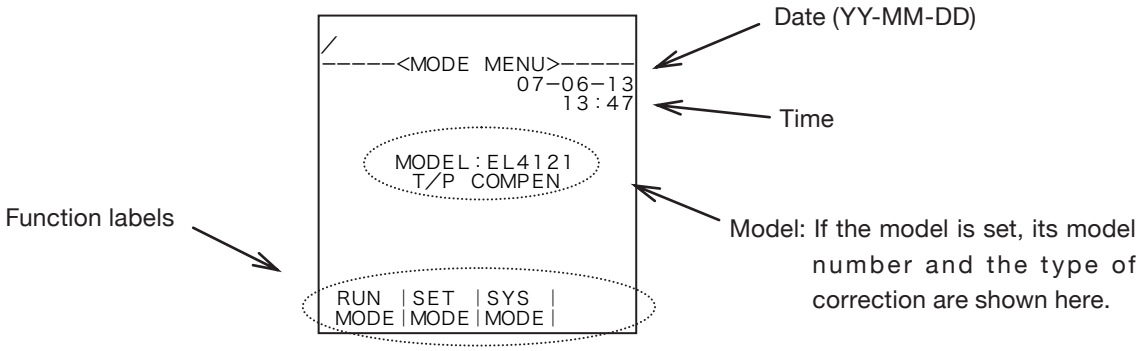


On Models EL4501



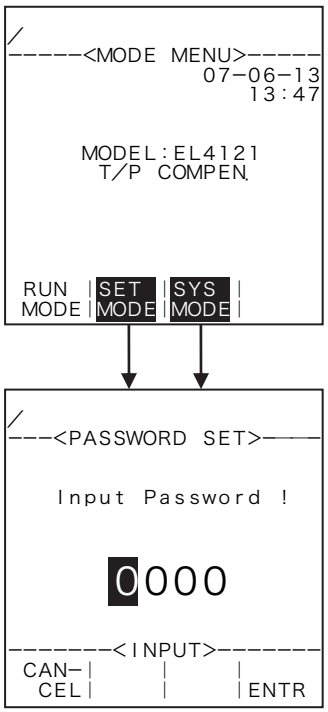
4.3 On-Screen Fields

Shown below is the mode select menu screen.



4.3.1 When Password Setting is ON

When the password setting is ON, some labels indicating the functions of function keys appear highlighted. (About the password setting, see the section on PASSWORD SETTING for the SYS mode.)



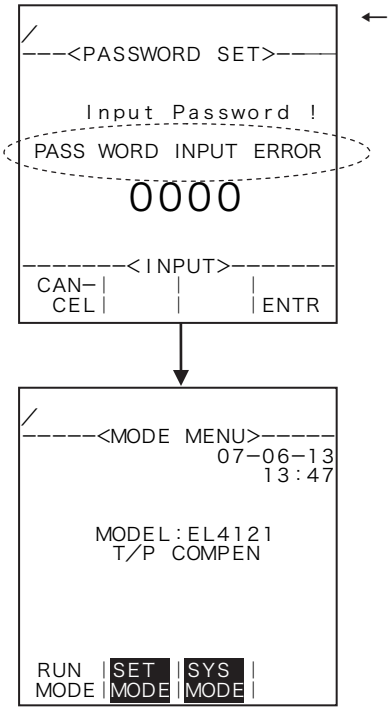
←Mode select menu screen

When the user attempts to switch to the SET mode or SYS mode from this status, a screen asking the user for a password appears as shown below.
(Switching to the RUN mode does not raise this inquiry.)

←Password entry screen

Move the cursor with the left arrow and right arrow keys; increase or decrease the numerical value with the up arrow and down arrow keys. When a desired numerical value appears, establish it at the touch of the function key “ENTR”.
If the numerical value entered agrees with the value set in the SET mode, switching to the mode desired takes place. If not, an error message appears as shown below and the screen goes back to the mode select menu screen.

If a new password that has just been entered proves to be unacceptable upon function key “ENTR” depression, the following message will appear.



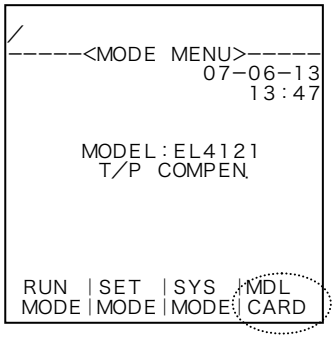
←Password entry error message

If the numerical value entered fails to agree with the value set in the SET mode, an error message appears and the screen goes back to the mode select menu screen.

4.3.2 Inserting a Card into the Drive

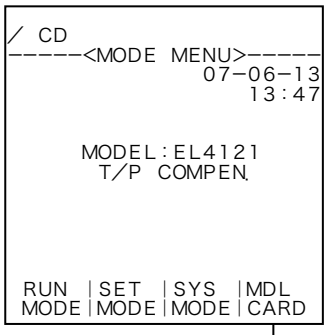
When a card is inserted into the drive, a label, identifying the type of the card, appears at the bottom right of the function key field.

Example: When the model setup card is inserted.



(1) When Model Setup Card is Inserted (MDL CARD)

In response to model setup card insertion, the screen changes as shown below.

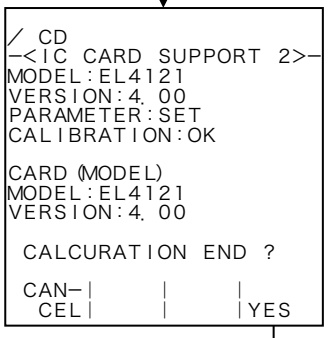


←Mode select menu screen

When Model Setup card is popped into the drive, a label "MDL CARD" appears in the function key field as shown at left.

Upon depression of function key "MDL CARD", the screen changes into IC card support 2 screen.

(MDL CARD stands for MODEL CARD.)



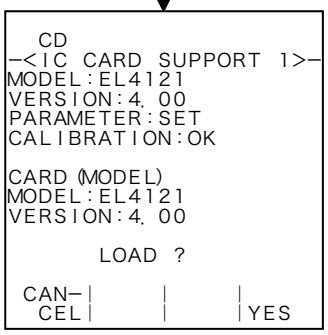
←IC card support 2 screen

With the model setup card, due to the need to interrupt calculation process, the computer prompts the operator whether to interrupt calculation or not.

Pressing function key "YES" stops calculation and the screen switches to the IC card support 1 screen.

At the touch of function key "CANCEL", the screen goes back to the mode select menu screen.

⚠CAUTION: Switching into the IC card support screen 1 causes the computer to stop updating calculation.



←IC card support 1 screen

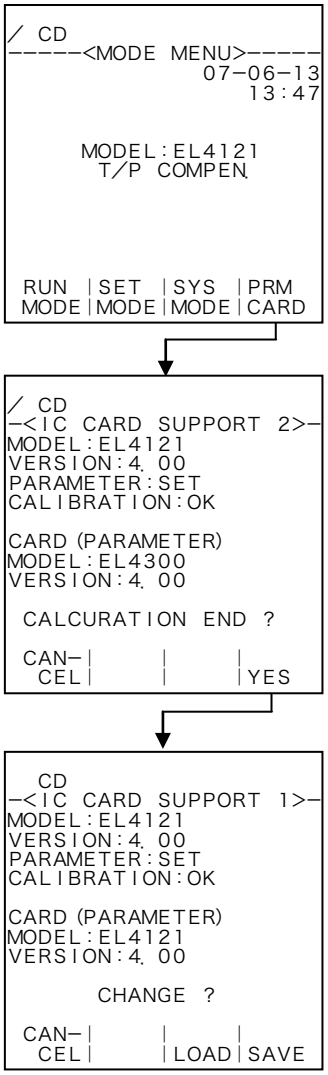
This confirms whether the downloading of model data is acceptable or not.

The loading of model data starts by pressing "YES" of function key and the model is set.

Screen returns to the mode select menu screen by pressing the function key "CANCEL".

(2) When parameter setup card is inserted

When parameter setup card is popped into the drive, a label “PRM CARD” appears in the function key field as shown below.



←Mode select menu screen

Upon depression of function key “PRM CARD”, the screen changes into IC card support 2 screen.
(PRM CARD stands for PARAMETER CARD.)

←IC card support 2 screen

With parameter setup card, due to the need to interrupt calculation process, the computer prompts the operator whether to interrupt calculation or not.
Pressing function key “YES” stops calculation and the screen switches to the IC card support 1 screen.
At the touch of function key “CANCEL”, the screen goes back to the mode select menu screen.

⚠ **CAUTION: Switching into the IC card support screen 1 causes the computer to stop updating calculation.**

←IC card support 1 screen

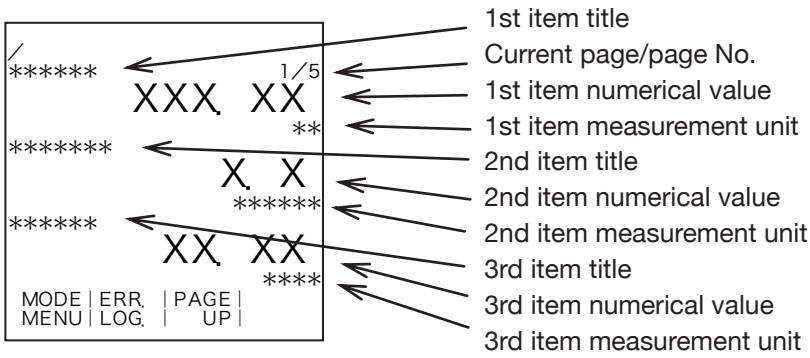
At the touch of function key “CANCEL”, the screen goes back to the mode select menu screen.

※ **If the model number set in the computer does not agree with the model number stored in the card, function key label “LOAD” will not appear..**

5. RUN MODE SCREEN

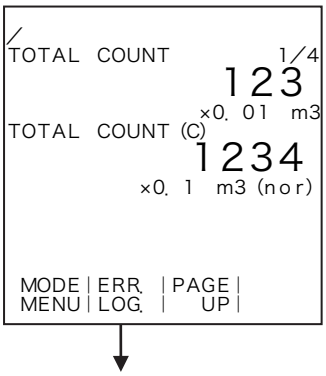
5.1 On-Screen Fields

The RUN mode is a mode in which the instant flowrate in instant flowrate calculation, temperature and pressure input values, correction factors, total flow, and their measurement units. Up to three items can be indicated on a single screen. (On-screen information to be displayed are fixed per model and the number of items displayed vary from page to page.)



5.2 Error Logging Screen (ERROR LOGGING)

Error logging is a feature to record a maximum of 20 errors that have occurred and removed in the past. The user can review the history of errors, their types, year, month, date, time of occurrence, as well as their duration until error removal.

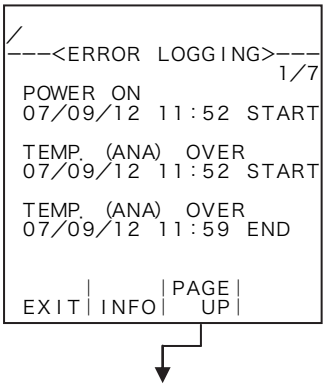


Error logging list screen

←A switch to error logging list screen

At RUN mode screen, pressing function key “ERR. LOG” brings up the error logging list screen.

5.2.1 List Review Screen



You can flip through the pages to 7.

←Error logging list screen

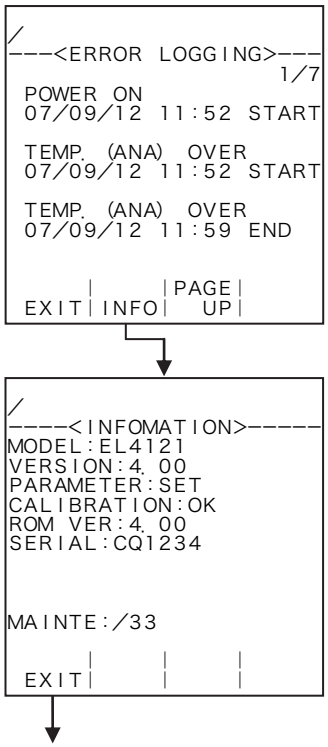
An error logging list appears.

Pressing function key “PAGE UP” brings up the next screen while function key “PAGE DOWN” brings up the previous screen.

At the touch of function key “EXIT”, the screen goes back to the RUN mode screen.

5.3 Device Information Screen (INFO)

From the error logging screen, you can access the device information screen.



To error logging list review screen

←Error logging list screen, review, history

Pressing function key “INFO” at the error logging list screen brings up the device information screen.

Pressing function key “EXIT” causes the screen to go back to the RUN mode screen.

←A switch to the device information screen

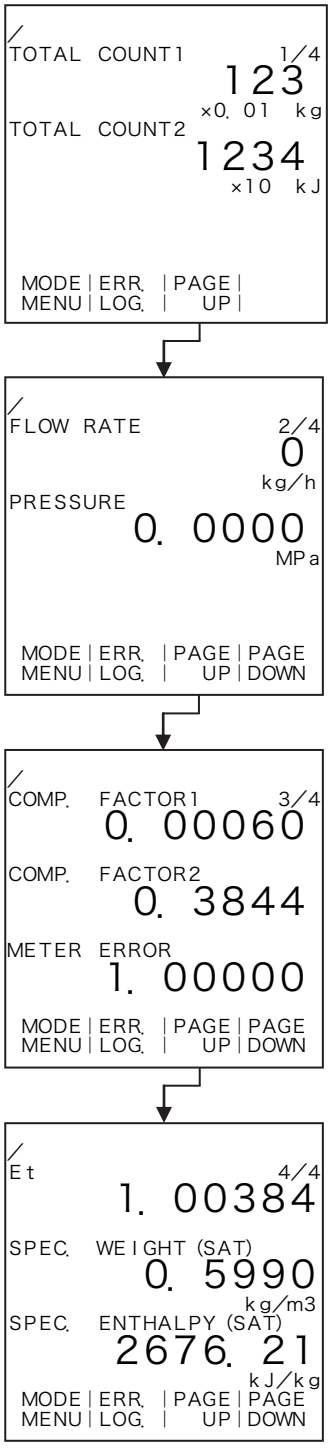
At the RUN mode screen, pressing function key “ERR. LOG” causes the screen to go to the error logging list review screen.

MODEL: EL4121	Model set
VERSION: 4.00	Model version set (that has been set)
PARAMETER: SET	Parameter state
CALIBRATION: OK	State of calibration condition
ROM VER: 4.00	ROM version
SERIAL: CQ1234	Serial number
MAINTE: /33	Maintenance data

5.4 On-screen Information of Respective Models

On-screen information in the RUN mode are described on the pages that follow.

5.4.1 EL4101 Steam Flow Computer (saturated steam service)



←RUN mode screen 1

Pressing function key “PAGE UP” switches the screen to the next screen.
“TOTAL COUNT 1”: Total (corrected mass) flow
“TOTAL COUNT 2”: Total (corrected heat quantity) flow

※ **Measurement units, exponent, and indicated values vary with actual settings (SET mode).**

←RUN mode screen 2

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“FLOW RATE”: Instant (corrected mass) flowrate
“PRESSURE” : Pressure

※ **The placement of decimal point in pressure reading varies with the measurement unit selected. (For the decimal point of pressure, see “① Pressure input unit setup (UNIT)” on page 57.)**

←RUN mode screen 3

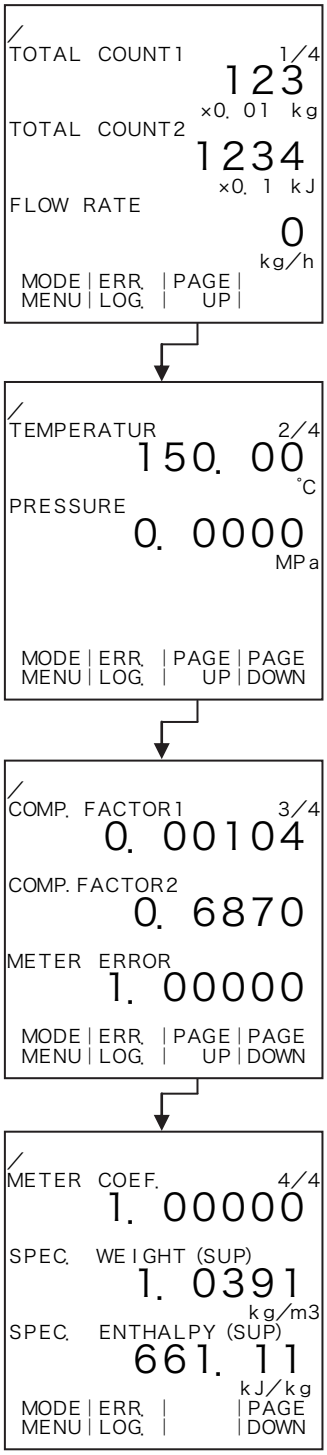
Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“COMP. FACTOR 1”: Correction factor 1 = Meter error corr. factor× ε t ×relative density
“COMP. FACTOR 2”: Correction factor 2 = Meter error corr. factor× ε t ×relative density × sp. enthalpy
“METER ERROR”: Meter error correction factor

←RUN mode screen 4

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“Et.” Meter correction factor (ε t)
“SPEC. WEIGHT (SAT)”: Relative density (specific weight)
“SPEC. ENTHALPY (SAT)”: Specific enthalpy

※ **The placement of decimal point in relative density (sp. weight) and specific enthalpy readings varies with the measurement units selected. (For the decimal point of relative density (sp. weight), see “① Saturated steam density unit setup (UNIT)” on page 91. For the decimal point of specific enthalpy, see “① Saturated steam specific enthalpy unit setup (UNIT)” on page 93.)**

5.4.2 EL4111 Steam Flow Computer (superheated steam service)



←RUN mode screen 1

Pressing function key “PAGE UP” switches the screen to the next screen.
“TOTAL COUNT 1”: Corrected total mass flowrate
“TOTAL COUNT 2”: Corrected total heat quantity flow
“FLOW RATE”: Corrected instant mass flowrate

※ **Measurement units, exponent, and indicated values vary with actual settings (SET mode).**

←RUN mode screen 2

Pressing (the) function key “PAGE UP” switches the screen to the next screen; pressing (the) function key “PAGE DOWN” switches the screen to the previous screen.
“TEMPERATURE”: Temperature
“PRESSURE”: Pressure

※**The placement of decimal point in temperature or pressure reading varies with the measurement unit selected. (For the decimal point of pressure, see “① Temperature input unit setup (UNIT)” on page 51. For the decimal point of pressure, see “① Pressure unit setup (UNIT)” on page 57.)**

←RUN mode screen 3

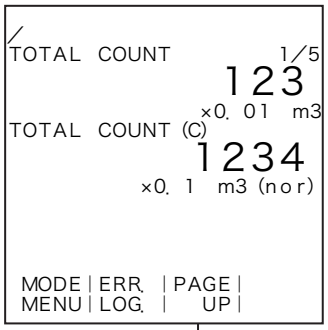
Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“COMP. FACTOR 1”: Correction factor 1 = Meter error corr. factor×3 α ×relative density
“COMP. FACTOR 2”: Correction factor 2 = Meter error corr. factor×3 α ×relative density × sp. enthalpy
“METER ERROR”: Meter error correction factor

←RUN mode screen 4

Pressing function key “PAGE DOWN” switches the screen to the previous screen.
“METER COEF.”: Meter correction factor
“SPEC. WEIGHT (SAT)”: Relative density (specific weight)
“SPEC. ENTHALPY (SAT)”: Specific enthalpy

※ **The placement of decimal point in relative density (sp. weight) and specific enthalpy readings varies with the measurement units selected. (For the decimal point of relative density (sp. weight), see “① Superheated steam density unit setup (UNIT)” on page 92. For the decimal point of specific enthalpy, see “① Superheated steam specific enthalpy unit setup (UNIT)” on page 94.)**

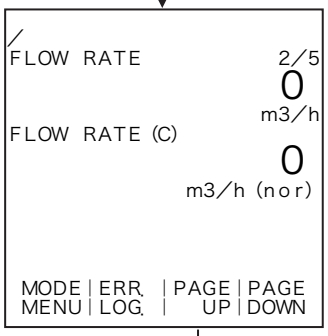
5.4.3 EL4121 Temperature/Pressure Compensated Flow Computer (gas service)



←RUN mode screen 1

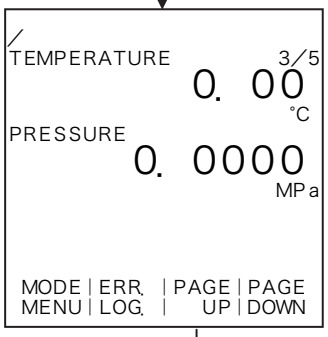
Pressing (the) function key “PAGE UP” switches the screen to the next screen.
“TOTAL COUNT”: Total flow
“TOTAL COUNT (C)”: Total (corrected) flow

※ Measurement units, exponent, and indicated values vary with actual settings (SET mode).



←RUN mode screen 2

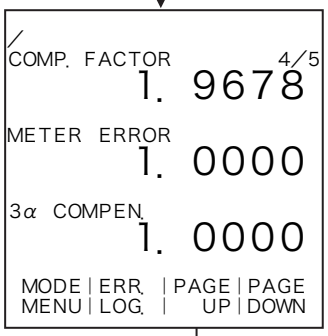
Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“FLOW RATE”: Instant flowrate
“FLOWRATE (C)”: Instant (corrected) flowrate



←RUN mode screen 3

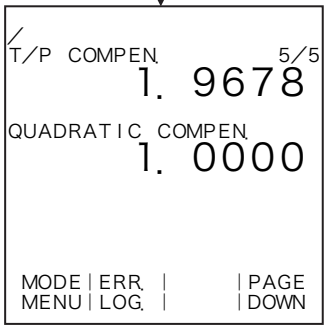
Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“TEMPERATURE”: Temperature
“PRESSURE”: Pressure

※ The placement of decimal point in temperature or pressure reading varies with the measurement unit selected. (For the decimal point of temperature, see “① Temperature input unit setup (UNIT)” on page 51. For the decimal point of pressure, see “① Pressure unit setup (UNIT)” on page 57.)



←RUN mode screen 4

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“COMP. FACTOR”: Correction factor = meter error corr. factor×T/P corr. factor× quadratic corr. factor
“METER ERROR”: Meter error correction factor
“3α COMPEN.”: 3α correction factor

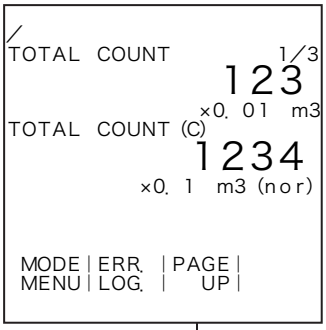


←RUN mode screen 5

Pressing (the) function key “PAGE DOWN” switches the screen to the previous screen.
“T/P COMPEN.”: Temperature/pressure correction factor
“QUADRATIC COMPEN.”: Quadratic correction factor ※

※ When the additional code is DA2, “COMPRESSION FACTOR” is compression deviation factor.

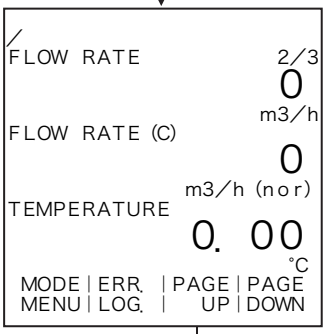
5.4.4 EL4131 Temperature Compensated Flow Computer (liquid service)



←RUN mode screen 1

Pressing function key “PAGE UP” switches the screen to the next screen.
“TOTAL COUNT”: Total flow
“TOTAL COUNT (C)”: Total (corrected) flow

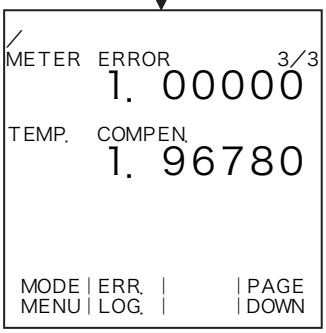
※ Measurement units, exponent, and indicated values vary with actual settings (SET mode).



←RUN mode screen 2

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“FLOW RATE”: Uncorrected instant flowrate
“FLOWRATE (C)”: Uncorrected instant flowrate
“TEMPERATURE”: Temperature

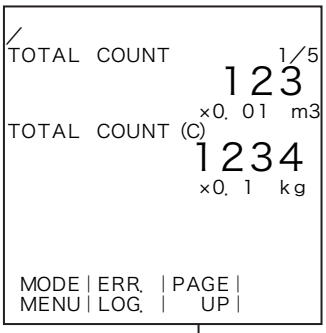
※ The placement of decimal point in temperature reading varies with the measurement unit selected. (For the decimal point of temperature, see “① Temperature input unit setup (UNIT)” on page 51.)



←RUN mode screen 3

Pressing (the) function key “PAGE UP” switches the screen to the next screen; pressing (the) function key “PAGE DOWN” switches the screen to the previous screen.
“METER ERROR”: Meter error correction factor
“TEMP. COMPEN.”: Temperature compensation

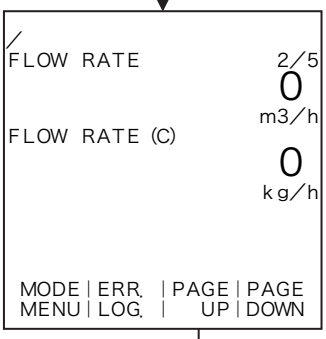
5.4.5 EL4201 Temperature/Pressure Compensated Gas Flow Computer (mass units)



←RUN mode screen 1

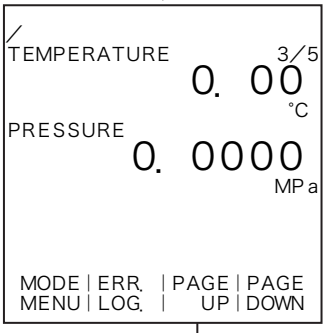
Pressing (the) function key “PAGE UP” switches the screen to the next screen.
“TOTAL COUNT”: Uncorrected total flow
“TOTAL COUNT (C)”: Corrected total mass flow

※ Measurement units, exponent, and indicated values vary with actual settings (SET mode).



←RUN mode screen 2

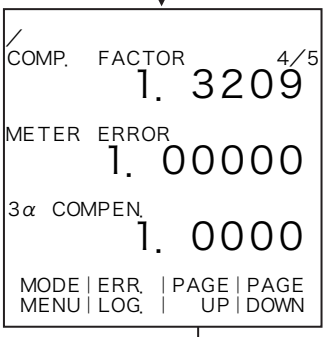
Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“FLOW RATE”: Uncorrected instant flowrate
“FLOWRATE (C)”: Corrected instant mass flowrate



←RUN mode screen 3

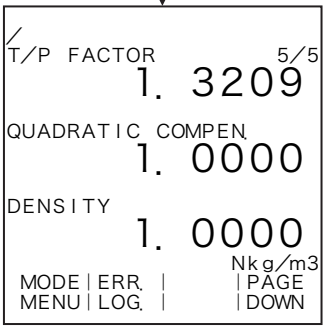
Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“TEMPERATURE”: Temperature
“PRESSURE”: Pressure

※ The placement of decimal point in temperature or pressure reading varies with the measurement unit selected. (For the decimal point of temperature, see “① Temperature input unit setup (UNIT)” on page 51. For the decimal point of pressure, see “① Pressure unit setup (UNIT)” on page 57.)



←RUN mode screen 4

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“COMP. FACTOR”: Correction factor = meter error corr. factor×3α corr. factor × T/P correction factor×quadratic corr. factor×weight conversion factor
“METER ERROR”: Meter error correction factor
“3α COMPEN.”: 3α correction factor



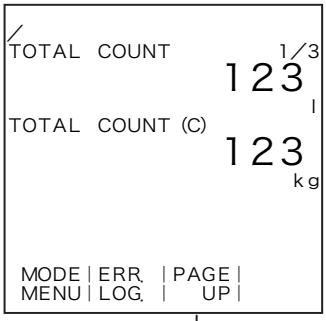
←RUN mode screen 5

Pressing function key “PAGE DOWN” switches the screen to the previous screen.
“T/P FACTOR”: Temperature/pressure correction factor
“QUADRATIC COMPEN.”: Quadratic correction factor ※
“DENSITY”: Density

※ The placement of decimal point in density reading varies with the measurement unit selected. (For the decimal point of density, see “① Density unit setup (UNIT)” on page 100.)

※ When the additional code is DA2, “COMPRESSION FACTOR” is compression deviation factor.

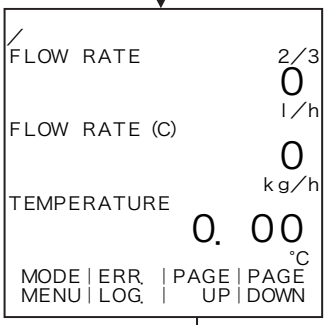
5.4.6 EL4211 Temperature Compensated Liquid Flow Computer (mass units)



←RUN mode screen 1

Pressing function key “PAGE UP” switches the screen to the next screen.
“TOTAL COUNT”: Uncorrected total flow
“TOTAL COUNT (C)”: Corrected total mass flow

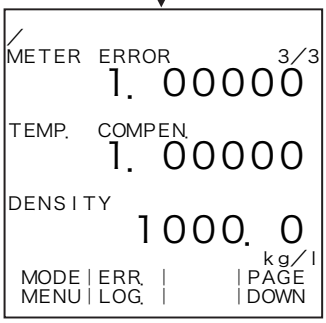
※ Measurement units, exponent, and indicated values vary with actual settings (SET mode).



←RUN mode screen 2

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“FLOW RATE”: Uncorrected instant flowrate
“FLOWRATE (C)”: Corrected instant mass flowrate
“TEMPERATURE”: Temperature

※ The placement of decimal point in temperature reading varies with the measurement unit selected. (For the decimal point of temperature, see “① Temperature input unit setup (UNIT)” on page 51.)

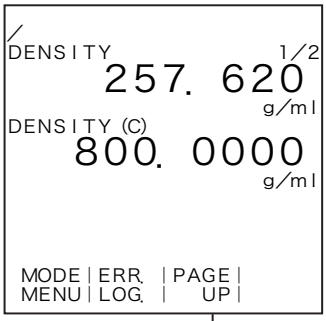


←RUN mode screen 3

Pressing function key ”PAGE DOWN” switches the screen to the previous screen.
“METER ERROR”: Meter error correction factor
“TEMP. COMPEN.”: Temperature correction factor
“DENSITY”: Density

※ The placement of decimal point in density reading varies with the measurement unit selected. (For the decimal point of density, see “① Density unit setup (UNIT)” on page 100.)

5.4.7 EL4301 Density Computer for Mass Flowmeter

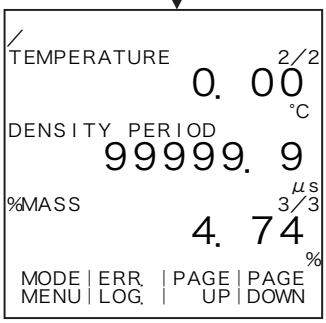


←RUN mode screen 1

Pressing function key “PAGE UP” switches the screen to the next screen.
“DENSITY”: Density
“DENSITY (C)”: Density (corrected)

※ Measurement units, exponent, and indicated values vary with actual settings (SET mode).

※ The placement of decimal point in uncorrected and corrected density readings varies with the measurement units selected. (For the decimal point of uncorrected and corrected density, see “① Density calculation unit setup (UNIT)” on page 105.)

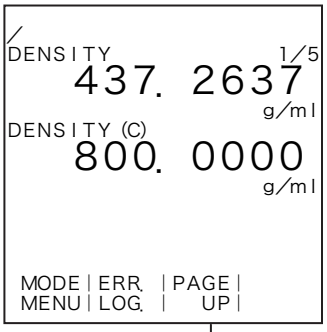


←RUN mode screen 2

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“TEMPERATURE”: Temperature
“DENSITY PERIOD”: Density period
“%MASS”: Solids content weight concentration

※ The placement of decimal point in temperature or density period reading varies with the measurement unit selected. (For the decimal point of temperature, see “① Temperature input unit setup (UNIT)” on page 51. For the decimal point of density period, see “① Density pulse input unit setup (UNIT)” on page 72.)

5.4.8 EL4311 Density Computer for Mass Flowmeter (with solids proportion calculation feature)

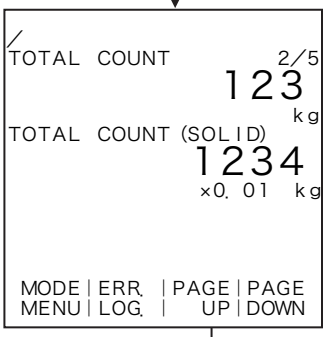


←RUN mode screen 1

Pressing function key “PAGE UP” switches the screen to the next screen.
“DENSITY”: Density
“DENSITY (C)”: Density (corrected)

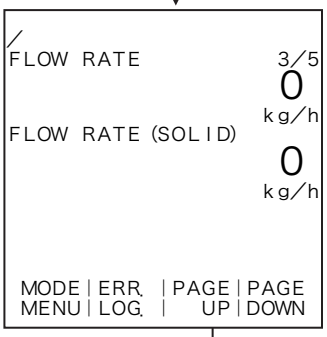
※ Measurement units, exponent, and indicated values vary with actual settings (SET mode).

※ The placement of decimal point in uncorrected and corrected density readings varies with the measurement units selected. (For the decimal point of uncorrected and corrected density, see “① Density calculation unit setup (UNIT)” on page 114.)



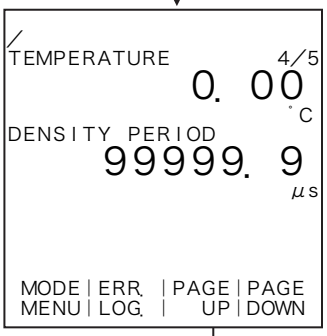
←RUN mode screen 2

Pressing (the) function key “PAGE UP” switches the screen to the next screen.
“TOTAL COUNT”: Total flow (mass)
“TOTAL COUNT (SOLID)”: Total (solids content in terms of mass) flow



←RUN mode screen 3

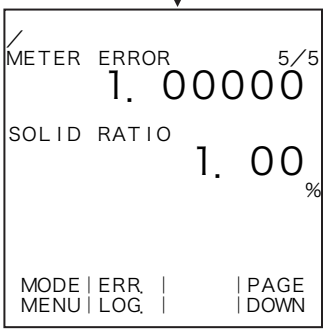
Pressing function key “PAGE UP” switches the screen to the next screen; pressing (the) function key “PAGE DOWN” switches the screen to the previous screen.
“FLOW RATE”: Instant flowrate (mass)
“FLOWRATE (SOLID)”: Instant (solids content in terms of mass) flowrate



←RUN mode screen 4

Pressing function key “PAGE UP” switches the screen to the next screen; pressing (the) function key “PAGE DOWN” switches the screen to the previous screen.
“TEMPERATURE”: Temperature
“DENSITY PERIOD”: Density period

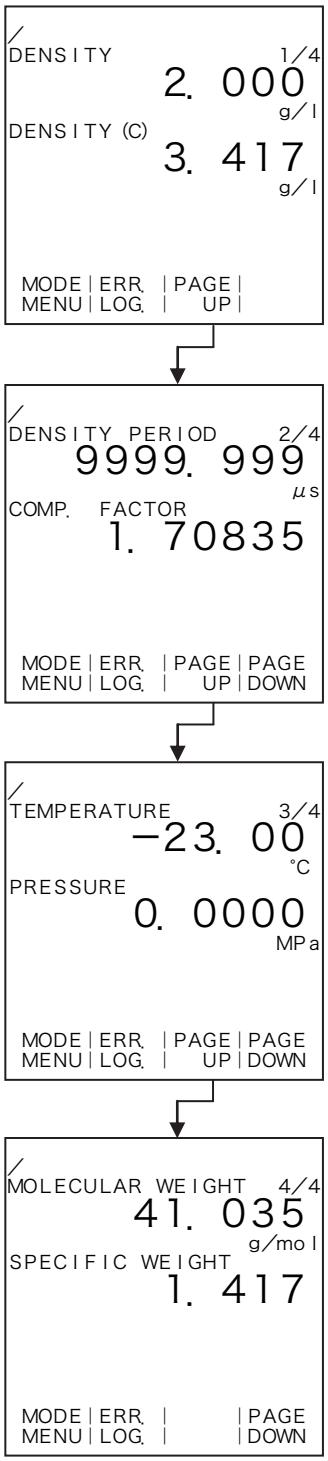
※ The placement of decimal point in temperature or density period reading varies with the measurement unit selected. (For the decimal point of temperature, see “① Temperature input unit setup (UNIT)” on page 51. For the decimal point of density period, see “① Density pulse input unit setup (UNIT)” on page 72.)



←RUN mode screen 5

Pressing function key “PAGE DOWN” switches the screen to the previous screen.
“METER ERROR”: Meter error correction factor
“SOLID RATIO”: Solids content ratio

5.4.9 EL4321 Density Computer for Spool Densitometer (gas service)



←RUN mode screen 1

Pressing function key “PAGE UP” switches the screen to the next screen.
“DENSITY”: Density
“DENSITY (C)”: Density (corrected)

※ Measurement units, exponent, and indicated values vary with actual settings (SET mode).

※ The placement of decimal point in uncorrected and corrected density readings varies with the measurement units selected. (For the decimal point of uncorrected and corrected density, see “① Density calculation unit setup (UNIT)” on page 125.)

←RUN mode screen 2

Pressing (the) function key “PAGE UP” switches the screen to the next screen.
“DENSITY PERIOD”: Density period
“COMP. FACTOR”: T/P correction factor×quadratic correction factor ※

※ The placement of decimal point in density period reading varies with the measurement unit selected. (For the decimal point of density period, see “① Density pulse input unit setup (UNIT)” on page 72.)

※ When the additional code is DA2, a temperature and pressure compensation factor is multiplied by compression deviation factor.

←RUN mode screen 3

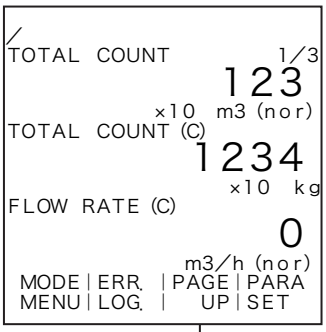
Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“TEMPERATURE”: Temperature
“PRESSURE”: Pressure

※ The placement of decimal point in temperature or pressure reading varies with the measurement unit selected. (For the decimal point of temperature, see “① Temperature input unit setup (UNIT)” on page 51.) For the decimal point of pressure, see “① Pressure input unit setup (UNIT)” on page 57.)

←RUN mode screen 4

Pressing function key “PAGE DOWN” switches the screen to the previous screen.
“MOLECULAR WEIGHT”: Molecular weight
“SPECIFIC WEIGHT”: Specific weight

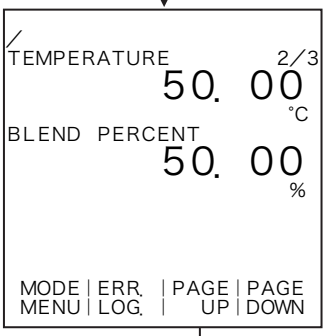
5.4.10 EL4401 Blend Oil Temperature Compensated Flow Computer



←RUN mode screen 1

Pressing function key “PAGE UP” switches the screen to the next screen.
“TOTAL COUNT”: Total flow
“TOTAL COUNT (C)”: Total (corrected) flow
“FLOW RATE”: Instant (corrected) flowrate

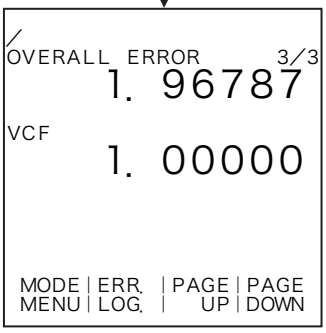
※ Measurement units, exponent, and indicated values vary with actual settings (SET mode).



←RUN mode screen 2

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“TEMPERATURE”: Temperature
“BLEND PERCENT”: Blend proportion

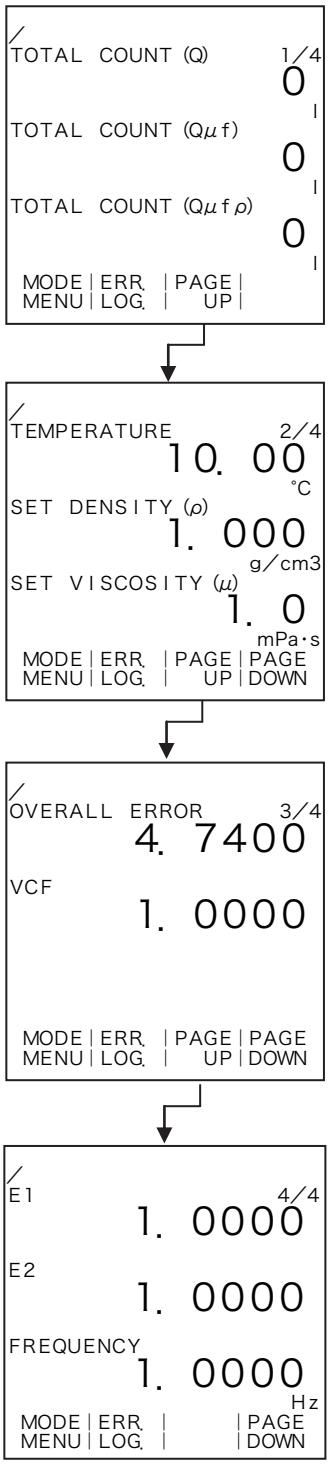
※ The placement of decimal point in temperature and blend input reading varies with the measurement unit selected. (For the decimal point of temperature, see “① Temperature input unit setup (UNIT)” on page 51. For the decimal point of blend input, see “① Blend input unit setup (UNIT)” on page 63.)



←RUN mode screen 3

Pressing function key “PAGE UP” switches the screen to the next screen; pressing function key “PAGE DOWN” switches the screen to the previous screen.
“OVERALL ERROR”: Correction factor = 3α correction factor×meter error correction factor
“VCF”: Compression coefficient

5.4.11 EL4501 Multipoint Temperature Compensated Flow Computer (liquid service)



←RUN mode screen 1

Pressing function key "PAGE UP" switches the screen to the next screen.
"TOTAL COUNT (Q)": Uncorrected total flow
"TOTAL COUNT (Qμf)": Total flow corrected for viscosity
"TOTAL COUNT (Qμfρ)": Total flow corrected for temperature and viscosity

※ **Measurement units, exponent, and indicated values vary with actual settings (SET mode).**

←RUN mode screen 2

Pressing function key "PAGE UP" switches the screen to the next screen.
"TEMPERATURE": Temperature
"SET DENSITY (ρ)": Density set (ρ)
"SET VISCOSITY (μ)": Viscosity set (μ)

※ **The placement of decimal point in temperature, density, and viscosity readings varies with the measurement units selected. (For the decimal point of temperature, see "① Temperature input unit setup (UNIT)" on page 51. For the decimal point of density, see "① Density parameter unit setup (UNIT)" on page 130. For the decimal point of viscosity, see "① Viscosity correction (μ) unit setup (UNIT)" on page 135.)**

←RUN mode screen 3

Pressing function key "PAGE DOWN" switches the screen to the previous screen.
"OVERALL ERROR": Overall error
"VCF": Volume conversion factor

←RUN mode screen 4

Pressing function key "PAGE DOWN" switches the screen to the previous screen.
"E1": Meter error correction factor dependent on flow velocity and viscosity
"E2": 3α correction factor
"FREQUENCY": Pulse input frequency

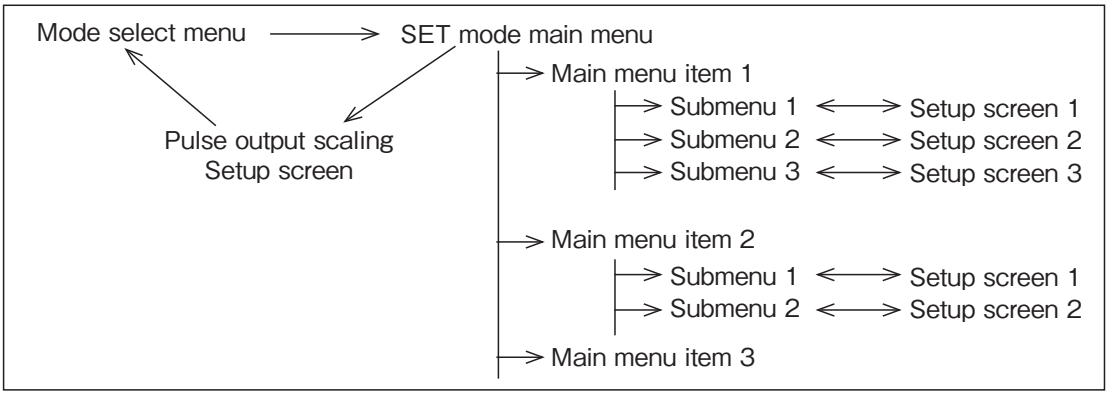
6. SET MODE

The SET mode is a mode to set up parameters, such as the parameters required for calculation, input/output base/full scale, and measurement units. SET mode related processes are carried out while executing the calculation process.

6.1 SET Mode Menu Tree

The SET mode consists of the following four levels:

1. Main menu
2. Submenu
3. Setup screen (numerical value setup or option select screen)
4. Pulse output scale factor setup screen

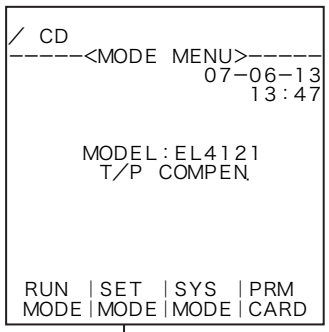


6.2 SET Mode Main Menu Screen

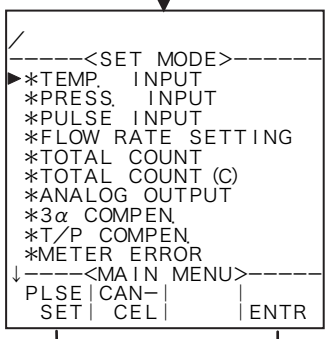
At the mode select menu, switching to the SET mode brings up this SET mode main menu screen.

From this menu screen, the user selects his option of menu item.

Example



←**Mode select menu screen**



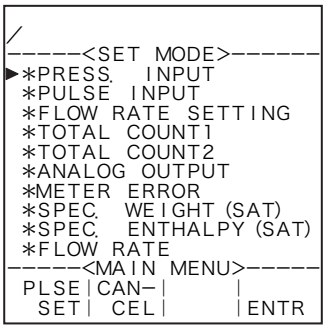
←**SET mode main menu screen**

Temp. input submenu screen

Pulse output scaling set screen ⇒ See 6.4.27 Pulse output scaling setup (PULSE OUT DIVIDE) p. 138.

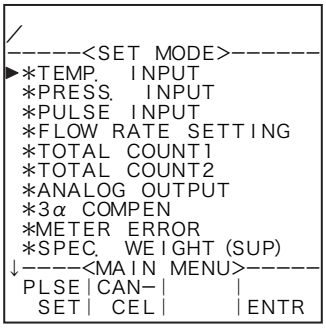
6.2.1 SET Mode Main Menu Setup Items by Model

(1) EL4101 Steam Flow Computer (saturated steam service)

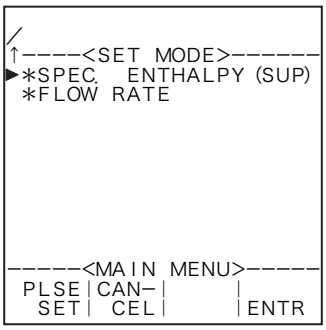


- ＊PRESS. INPUT (pressure input setup) p. 65
- ＊PULSE. INPUT (pulse input setup) p. 66
- ＊FLOW RATE SETTING (instant flowrate measurement setup) p. 67
- ＊TOTAL COUNT 1 (total count 1 setup) p. 74
- ＊TOTAL COUNT 2 (total count 2 setup) p. 74
- ＊ANALOG OUTPUT (analog output setup) p. 76
- ＊METER ERROR (meter error correction setup) p. 85
- ＊SPEC. WEIGHT (SAT) (relative density (sp. weight) setup) p. 91
- ＊SPEC. ENTHALPY (SAT) (specific enthalpy setup) p. 93
- ＊FLOW RATE (instant flowrate setup) p. 95

(2) EL4111 Steam Flow Computer (superheated steam service)

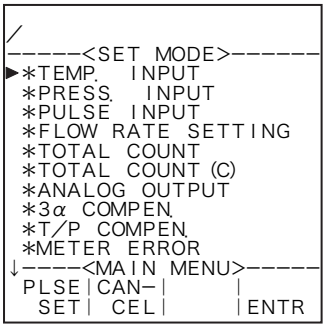


- ＊TEMP. INPUT (temperature input setup) p. 48
- ＊PRESS. INPUT (pressure input setup) p. 55
- ＊PULSE. INPUT (pulse input setup) p. 66
- ＊FLOW RATE SETTING (instant flowrate measurement setup) p. 67
- ＊TOTAL COUNT 1 (total count 1 setup) p. 74
- ＊TOTAL COUNT 2 (total count 2 setup) p. 74
- ＊ANALOG OUTPUT (analog output setup) p. 76
- ＊3 α COMPENSATE (3 α compensate setup) p. 80
- ＊METER ERROR (meter error correction factor setup) p. 85
- ＊SPEC. WEIGHT (SUP) (relative density (sp. weight) setup) p. 92

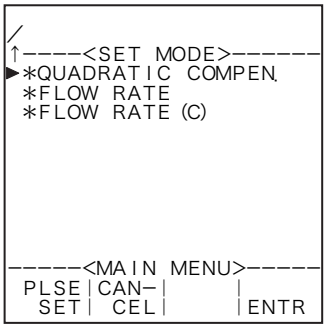


- ＊SPEC. ENTHALPY (SUP) (specific enthalpy setup) p. 94
- ＊FLOW RATE (instant flowrate setup) p. 95

(3) EL4121 Temperature/Pressure Compensated Flow Computer (gas service)



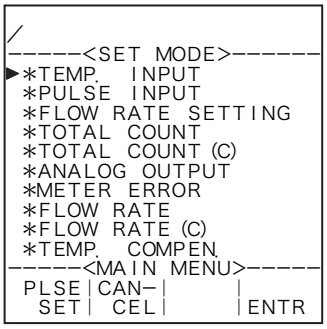
- ＊TEMP. INPUT (temperature input setup) p. 48
- ＊PRESS. INPUT (pressure input setup) p. 55
- ＊PULSE. INPUT (pulse input setup) p. 66
- ＊FLOW RATE SETTING (instant flowrate measurement setup) p. 67
- ＊TOTAL COUNT 1 (total count 1 setup) p. 74
- ＊TOTAL COUNT (C) (total count (corrected) setup) p. 74
- ＊ANALOG OUTPUT (analog output setup) p. 76
- ＊3 α COMPENSATE (3 α compensate setup) p. 80
- ＊T/P COMPENSATE (temp./press. correction factor setup) p. 83
- ＊METER ERROR (meter error correction factor setup) p. 85



* QUADRATIC COMPNSATE (quadratic correction factor setup) ※ p. 88
* FLOW RATE (instant flowrate calculation setup) p. 95
* FLOW RATE (C) (instant flowrate (corrected) calculation setup) p. 95

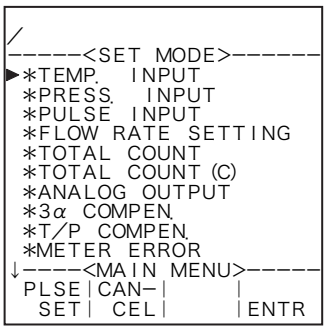
※ **When the additional code is DA2, the item for setting the quadratic compensation factor disappears and COMPRESSION FACTOR (compression deviation setting), P.138, is added.**

(4) EL4131 Temperature Compensated Flow Computer (liquid service)

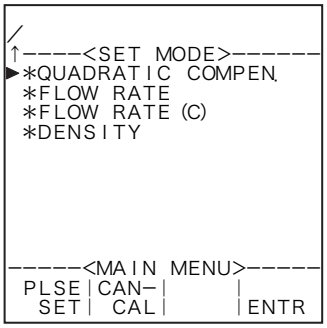


* TEMP. INPUT (temperature input setup) p. 48
* PULSE. INPUT (pulse input setup) p. 66
* FLOW RATE SETTING (instant flowrate measurement setup) p. 67
* TOTAL COUNT (total count setup) p. 74
* TOTAL COUNT (C) (total count (corrected) setup) p. 74
* ANALOG OUTPUT (analog output setup) p. 76
* METER ERROR (meter error correction setup) p. 85
* FLOW RATE (instant flowrate calculation setup) p. 95
* FLOW RATE (C) (instant flowrate (corrected) setup) p. 95
* TEMP. COMPENSATE (temp./press. correction factor setup) p. 97

(5) EL4201 Temperature/Pressure Compensated Gas Flow Computer (mass units)



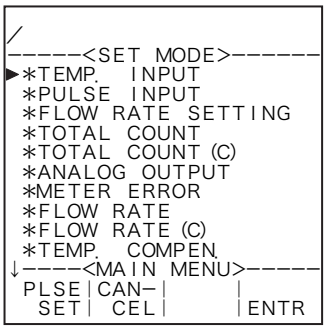
* TEMP. INPUT (temperature input setup) p. 48
* PRESS. INPUT (pressure input setup) p. 55
* PULSE. INPUT (pulse input setup) p. 66
* FLOW RATE SETTING (instant flowrate measurement setup) p. 67
* TOTAL COUNT (total count setup) p. 74
* TOTAL COUNT (C) (total count (corrected mass) setup) p. 74
* ANALOG OUTPUT (analog output setup) p. 76
* 3 α COMPENSATE (3 α correction factor setup) p. 80
* T/P COMPENSATE (temp./press. correction factor setup) p. 83
* METER ERROR (meter error correction setup) p. 85



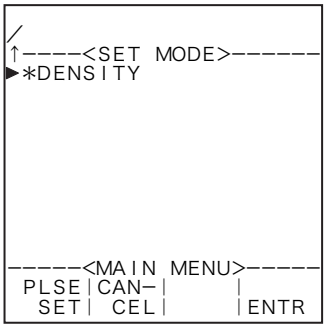
* QUADRATIC COMPENSATE (quadratic corr. factor setup) ※ p. 88
* FLOW RATE (instant flowrate calculation setup) p. 95
* FLOW RATE (C) (instant flowrate (corrected mass) setup) p. 95
* DENSITY (density setup) p. 100

※ ***When the additional code is DA2, the item for setting the quadratic compensation factor disappears and COMPRESSION FACTOR (compression deviation setting), P.138, is added.**

(6) EL4211 Temperature Compensated Liquid Flow Computer (mass units)

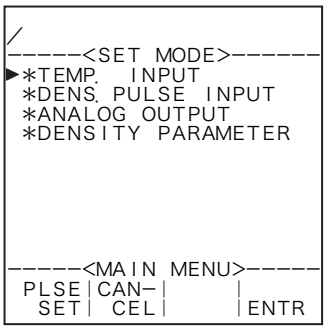


- ＊TEMP. INPUT (temperature input setup) p. 48
- ＊PULSE. INPUT (pulse input setup) p. 66
- ＊FLOW RATE SETTING (instant flowrate measurement setup) p. 67
- ＊TOTAL COUNT (total count setup) p. 74
- ＊TOTAL COUNT (C) (total count (corrected mass) setup) p. 74
- ＊ANALOG OUTPUT (analog output setup) p. 76
- ＊METER ERROR (meter error correction setup) p. 85
- ＊FLOW RATE (instant flowrate calculation setup) p. 95
- ＊FLOW RATE (C) (instant flowrate (corrected mass setup) p. 95
- ＊TEMP. COMPENSATE (temperature correction factor setup) p. 83



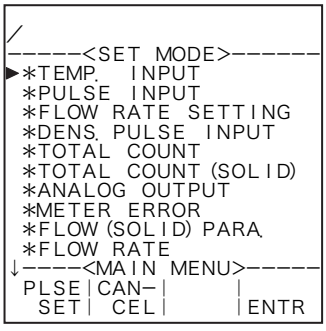
- ＊DENSITY (density setup) p. 100

(7) EL4301 Density Computer for Mass Flowmeter

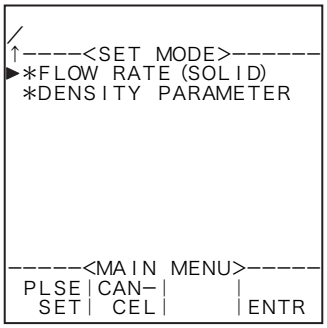


- ＊TEMP. INPUT (temperature input setup) p. 48
- ＊DENSITY PULSE. INPUT (density pulse input setup) p. 72
- ＊ANALOG OUTPUT (analog calculation setup) p. 76
- ＊DENSITY PARAMETER (density calculation setup) p. 102

(8) EL4311 Density Computer for Mass Flowmeter (with solids proportion calculation feature)

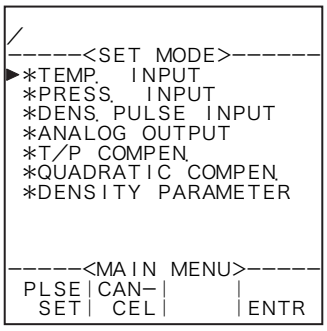


- ＊TEMP. INPUT (temperature input setup) p. 48
- ＊PULSE. INPUT (pulse input setup) p. 66
- ＊FLOW RATE SETTING (instant flowrate measurement setup) p. 67
- ＊DENS. PULSE INPUT (density input setup) p. 72
- ＊TOTAL COUNT (total count setup) p. 74
- ＊TOTAL COUNT (SOLID) (total count (solids content) setup) p. 74
- ＊ANALOG OUTPUT (analog output setup) p. 76
- ＊METER ERROR (meter error correction setup) p. 85
- ＊FLOW (SOLID) PARA. (solids content flow calculation setup) p. 120
- ＊FLOW RATE (C) (instant flowrate correction setup) p. 95



* FLOW RATE (SOLID) (instant flowrate (solids content) setup) p. 95
* DENSITY PARAMETER (density calculation setup) p. 111

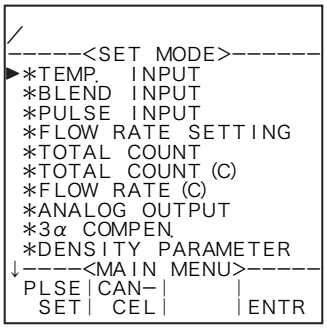
(9) EL4321 Density Computer for Spool Densitometer (gas service)



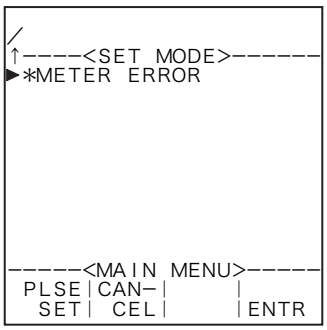
* TEMP. INPUT (temperature input setup) p. 48
* PRESS. INPUT (pressure input setup) p. 55
* DENSITY PULSE INPUT (density pulse input setup) p. 72
* ANALOG OUTPUT (analog output setup) p. 76
* T/P COMPENSATE (temp./press. correction factor setup) p. 83
* QUADRATIC COMPENSATE (quadratic correction factor setup) ※ p. 88
* DENSITY PARAMETER (density calculation setup) p. 123

※ ***When the additional code is DA2, the item for setting the quadratic compensation factor disappears and COMPRESSION FACTOR (compression deviation setting), P.138, is added.**

(10) EL4401 Blend Oil Temperature Compensated Flow Computer

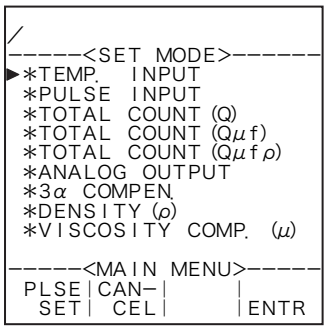


* TEMP. INPUT (temperature input setup) p. 48
* BLEND INPUT (blend input setup) p. 62
* PULSE. INPUT (pulse input setup) p. 66
* FLOW RATE SETTING (instant flowrate measurement setup) p. 67
* TOTAL COUNT (total count setup) p. 74
* TOTAL COUNT (C) (total count (corrected) setup) p. 74
* FLOW RATE (C) (instant flowrate (corrected) calculation setup) p. 95
* ANALOG OUTPUT (analog output setup) p. 76
* 3 α COMPENSATE (3 α cmpensation setup) p. 80
* DENSITY PARAMETER (density setup) p. 130



* METER ERROR (meter error correction setup) p. 85

(11) EL4501 Multipoint Temperature Compensated Flow Computer (liquid service)

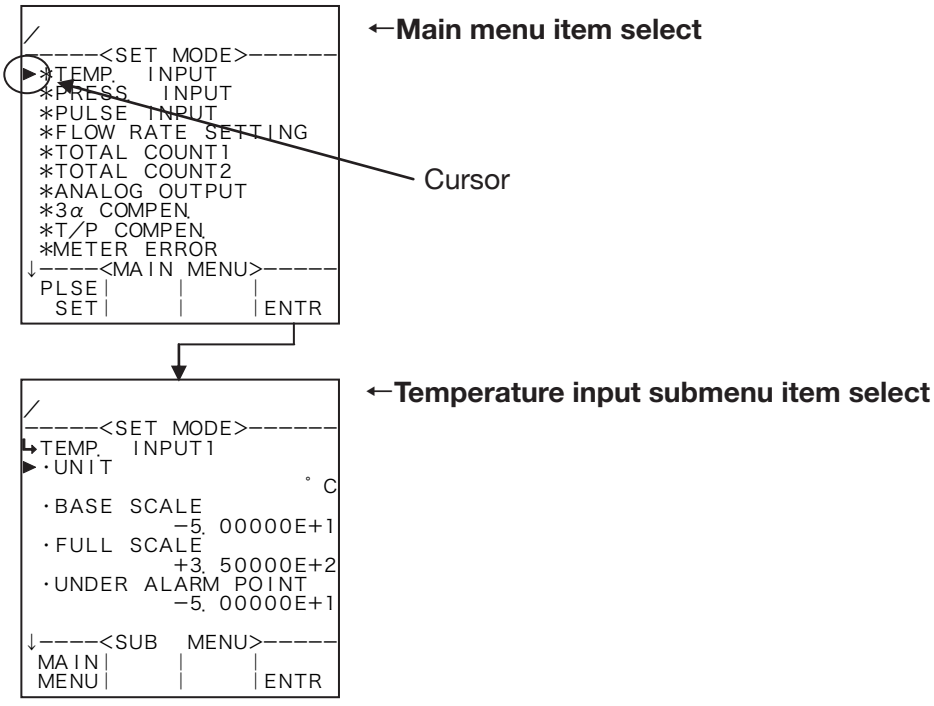


- *TEMP. INPUT (temperature input setup) p. 48
- *PULSE. INPUT (pulse input setup) p. 66
- *FLOW RATE SETTING (instant flowrate measurement setup) p. 74
- *TOTAL COUNT (Q) (total count setup) p. 74
- *TOTAL COUNT (Qμf) (total count (corrected for viscosity) setup) p. 74
- *TOTAL COUNT (Qμf ρ) (total count (corrected for viscosity and temperature) setup) p. 76
- *ANALOG OUTPUT (analog output setup) p. 80
- *3 α COMPENSATE (3 α compensation factor setup) p. 80
- *DENSITY (ρ) (density (ρ) setup) p. 132
- *VISCOSITY COMPENSATE (μ) (visc. correction (μ) setup) p. 134

6.3 SET Mode Submenu Screen

Pressing the function key “ENTR” at the main menu changes the current screen to a submenu screen of the menu item pointed by the cursor. Detailed submenu items in the option and their settings appear. The user can review current settings on this screen.

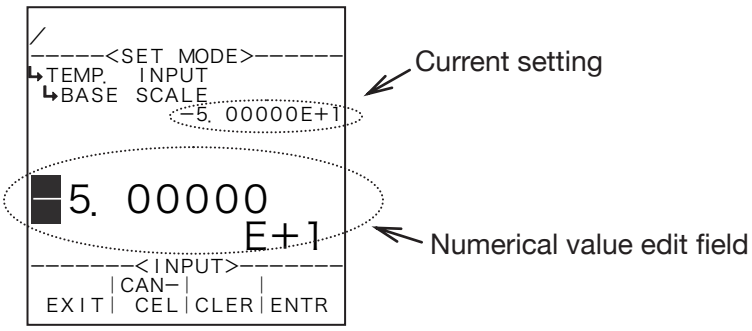
Example: Temperature input 1



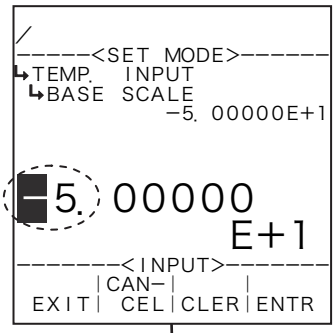
(1) Numerical value setup screen (INPUT)

When an item of numerical value setup is chosen at a submenu, this screen appears.
The user enters a new setting of numerical value and establishes it on this screen.
First, the current value is changed in the numerical value edit field. To do this, move the cursor with the left arrow and right arrow keys; increase or decrease the numerical value with the up arrow and down arrow keys. (Signs "+"and "–"appear alternately at touch of the key.)
Pressing the function key "ENTR"establishes the new value indicated in the numerical value edit field. Pressing the function key "EXIT"causes the screen to go back to the submenu screen and the baseline setup for temperature input 1 is now complete.

Example: The baseline of temperature input 1

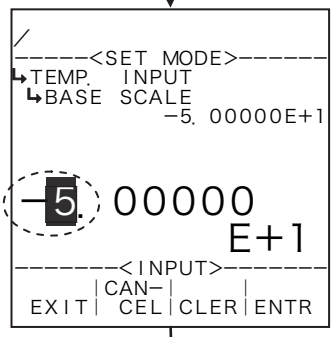


Example: Modifying the baseline of temperature input 1 from –50℃ to –30℃ .



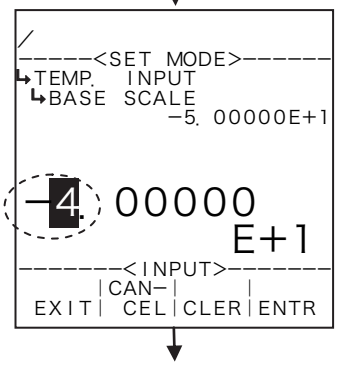
←**A screen after an item selection**

Selecting the baseline at the temperature input submenu brings up this screen.



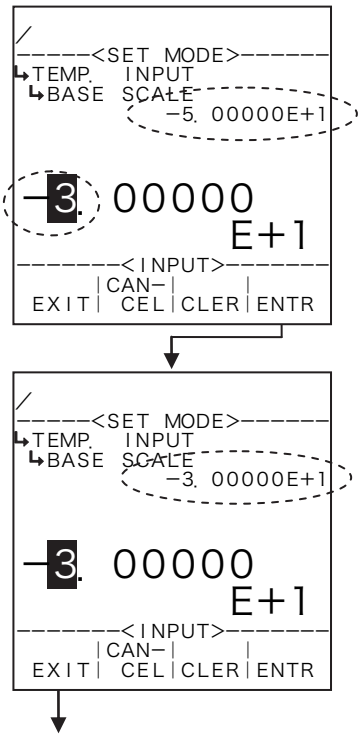
←**Numerical value edit**

The current numerical value can be changed in the numerical value edit field. Move the cursor to a desired value with the left arrow and right arrow keys; increase or decrease the value with the up and down arrow keys.



←**Numerical value edit**

Increase or decrease the numerical value with the up and down arrow keys.



←Numerical value edit

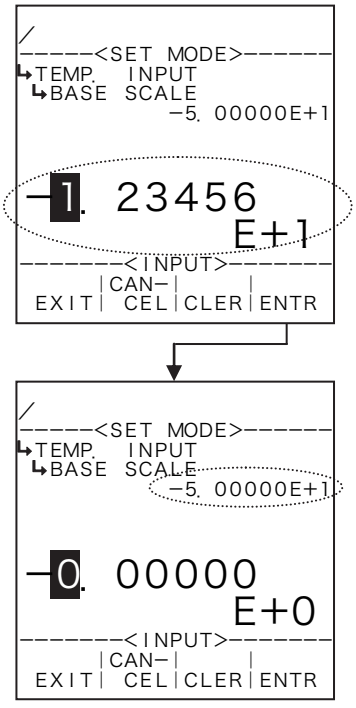
Increase or decrease the numerical value with the up and down arrow keys.
Press the function key “ENTR” to activate the setting.

←Numerical value edit

Press the function key “EXIT” to complete the setup.
The user may abort the setup by pressing the function key “CANCEL”, ending the setup with the previous setting unchanged (–50℃ in the example here).

① When “CLER” is depressed

Pressing the function key “CLER” resets the numerical value in the numerical value edit area to zero.

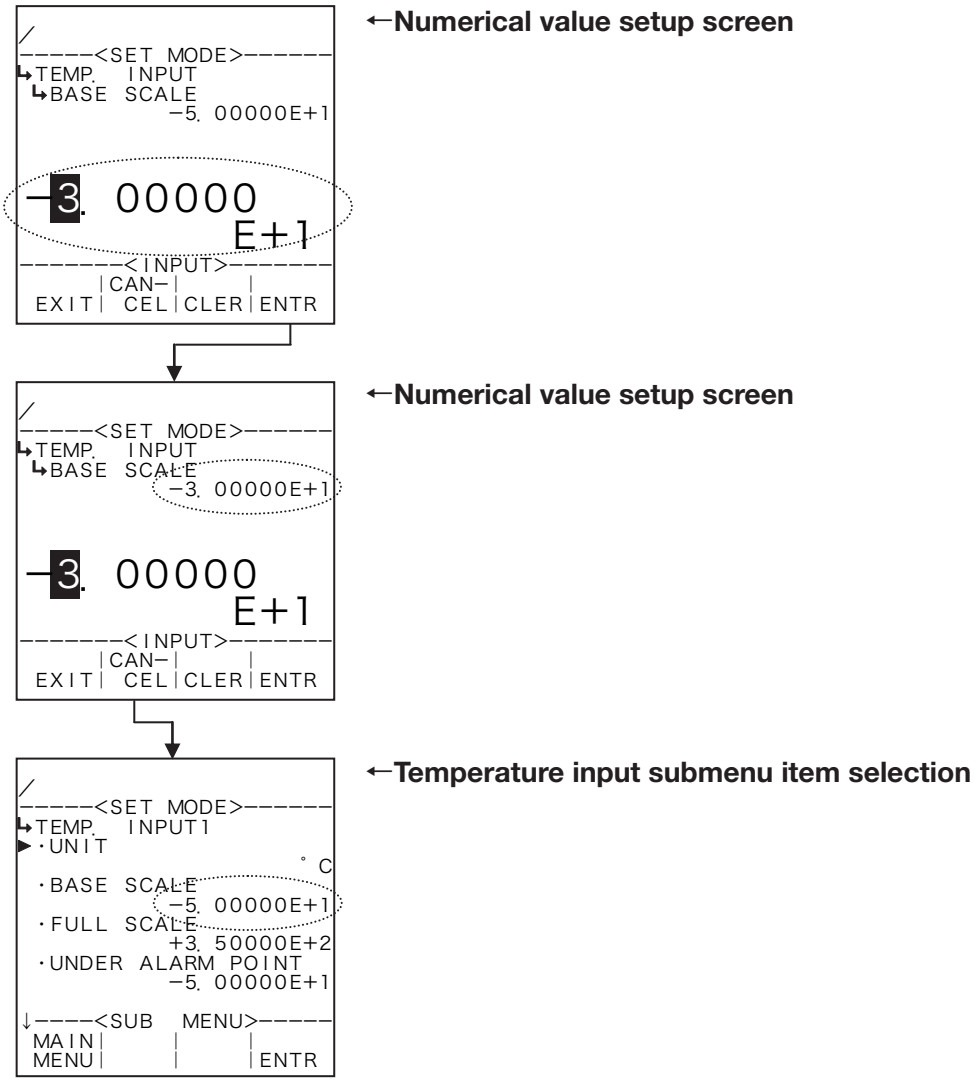


←Numerical value setup screen

By pressing function key “CLER”, you can reset the numerical value in the numerical value edit area to zero.

② When “CANCEL” is depressed

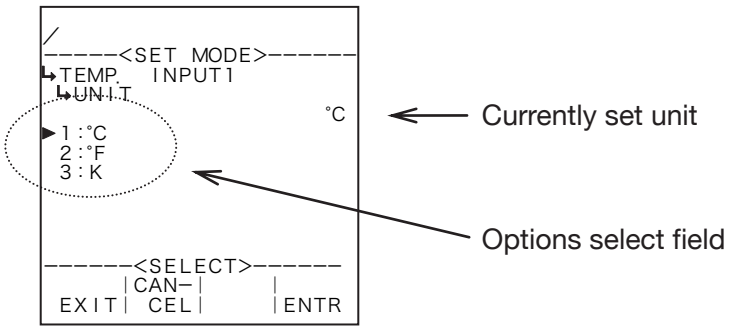
Pressing the function key “CANCEL” causes the screen to go back the submenu screen, aborting the value that has just been modified - even if the on-screen reading set by pressing the function key “ENTR” has been changed to the one modified in the numerical value edit field.



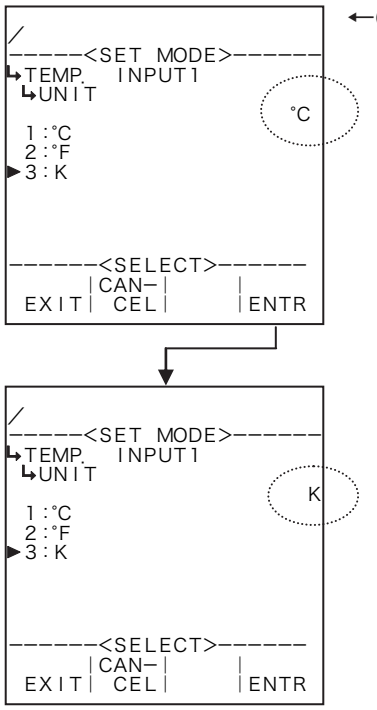
(2) Option select screen (SELECT)

When option item select is selected at the submenu screen, this window appears. Your selection from among the options available is set up at this screen.
First, the current setting appears below the title of the menu screen. In the following lines at left, options are shown in the option select field. Move the cursor with the up and down arrow keys to the option desired. Pressing function key “ENTR” replaces the current setting with the new option indicated by the cursor. Upon confirmation of the new setting, press function key “EXIT” to complete the setup of this option. Pressing function key “CANCEL” instead of function key “EXIT” causes the previous setting to be retained and complete the setup even if the current setting has once been changed by pressing function key “ENTR”.

Example: The unit setup screen of temperature input 1



① When “ENTR” is pressed



←Option setup screen

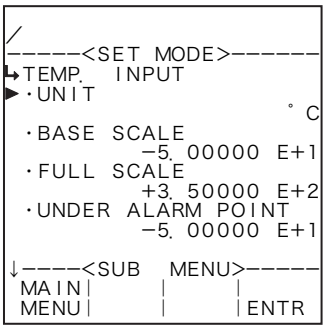
Move the cursor to the desired item (unit of measure) for setup and press function key “ENTR”.
Pressing function key “ENTR” establishes the unit chosen.

6.3.2 About On-screen Submenu Items

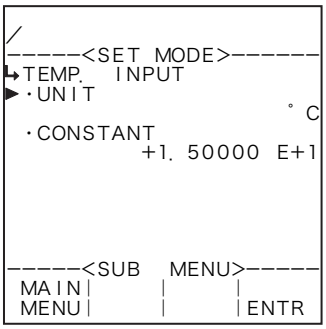
On the submenu screen, submenu items corresponding to respecttive main menu items are shown. The items shown here are only those necessary for setup with respect to the current settings; items not necessary for setup are not shown.

Example: When the input type of temperature input in the SYM mode are 1 to 5V and NONE (constant), the submenu items for temperature input setup in the SET mode, with the temperature input set at “NONE”, will be the measurement unit and a constant. With the “1 to 5V” selected, on the other hand, the measurement unit, baseline, full scale, under alarm point, over alarm point, under fallback level, and over fallback level will be shown.

① Input type is 1 to 5V



② Input type is None (fixed value)



6.4 Submenu Setup Items

6.4.1 Temperature Input Setup (TEMP. INPUT)

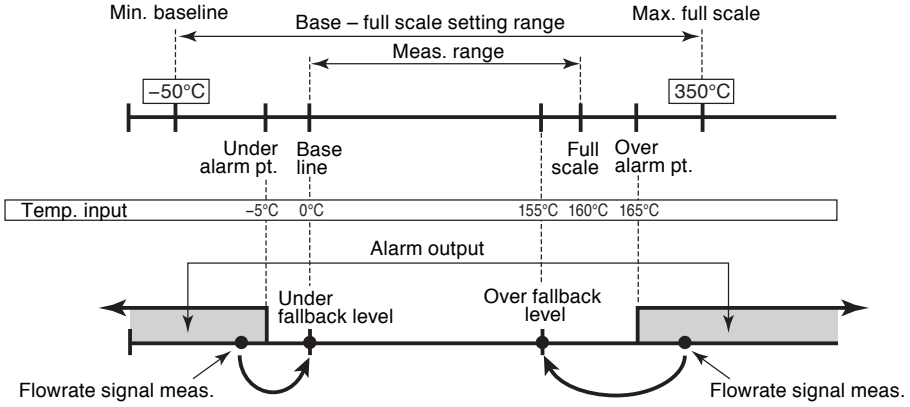
As the factors associated with temperature, the measurement units, constants (with the input type set to NONE in the SYS mode), baseline, full scale value, under alarm point, over alarm point, under fallback level, over fallback level, and smoothing factor are established here.

※ **In setting parameters, set the input type before the user sets these parameters, remembering that definitions vary with the type of input (in the SYS mode).**

(1) Pt 100Ω input

When "Pt100Ω" is your option in the input type (SYS mode), parameter definitions are as follows:
With Pt100Ωinput, the baseline-to-full-scale range is fixed. Set the baseline and full scale setpoint within this range. (Failure to set them within this range will nullify assurance for proper operation.) The baseline and full scale setpoint are referenced when the pulse output scaling is determined. Their settings should be chosen, carefully taking into consideration the nature of calculation as well as the range of standard span.
Temperatures in the RUN mode are indicated relative to the input within the range where the over alarm point and the under alarm point determine its high and low limit, respectively. If an input goes out of this range, the output will automatically be clamped at the over fallback or under fallback value.
Acceptable range of alarm points and fallback levels are determined by the following expressions:

Example Measurement units (UNIT) : ℃
Baseline (BASE SCALE) : 0℃
Full scale (FULL SCALE) : 160℃
Under alarm point (UNDER ALARM POINT) : −5℃
Over alarm point (OVER ALARM POINT) : 165℃
Under fallback level (UNDER FALL BACK) : 5℃
Over fallback level (OVER FALL BACK) : 155℃



Alarm point and fallback setup range is determined as follows:

(i) Low limit $\quad \text{Base scale} - \dfrac{\text{Full scale} - \text{Baseline}}{16} \times 0.5$

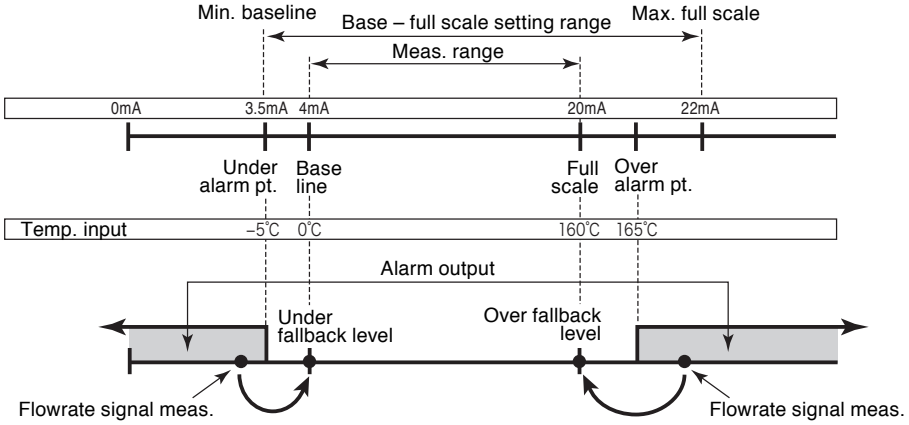
(ii) High limit $\quad \text{Base scae} + \dfrac{\text{Full scale} - \text{Baseline}}{16} \times 2$

(2) 4 to 20mA or 1 to 5V input

When the "4 to 20mA" or "I to 5V" input type is selected (SYS mode), respective parameters are defined as follows:
With 4 to 20mA or 1 to 5V input, the baseline-to-full-scale setting range varies with the given model (calculation). Set the baseline (or base scale) and full scale setpoint within the range acceptable by the specific model used. (Failure to set them within this range will nullify assurance for proper operation.) The baseline and full scale are referenced when the pulse output scaling is determined. Settings should be determined carefully taking into consideration the process of calculation, value of standard span and other contributing factors.

Temperatures in the RUN mode are indicated relative to the input within the range where the over alarm point and the under alarm point determine its high and low limit, respectively. If an input goes out of this range, the output will automatically be clamped at the over fallback or under fallback value.

Example Measurement units (UNIT) : ℃
Baseline (BASE SCALE) : 0℃
Full scale (FULL SCALE) : 160℃
Under alarm point (UNDER ALARM POINT) : −5℃
Over alarm point (OVER ALARM POINT) : 165℃
Under fallback level (UNDER FALL BACK) : 0℃
Over fallback level (OVER FALL BACK) : 160℃

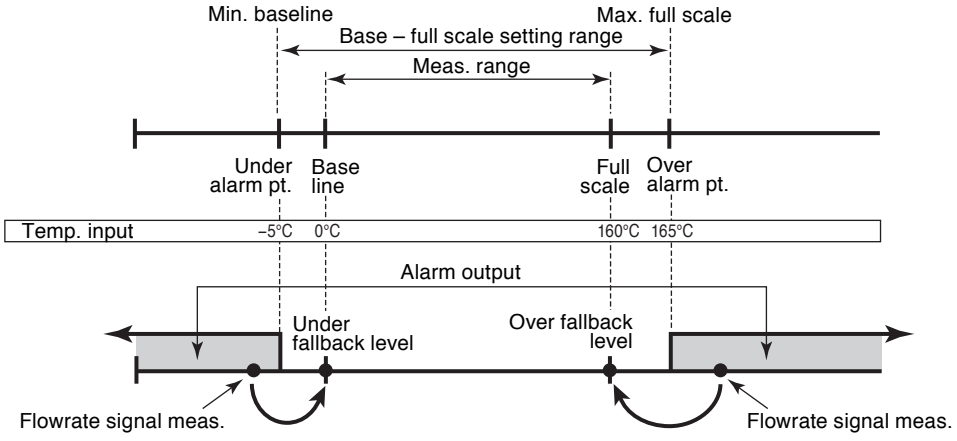


(3) 5mV/℃ and 10mV/℃

When “5mV/℃ and 10mV/℃ ” is your option in the input type (SYS mode), the definitions of each parameter are as follows:

With an 5mV/℃ and 10mV/℃ input, the baseline-to-full-scale setting range is fixed between –50℃ and 150℃ at 10mV/℃ . Set the baseline and full scale setpoint within the range acceptable by the specific model used. The base scale and full scale are referenced when the scaling of pulse output is determined. Settings should be determined carefully taking into consideration the process of computation and the value of standard span. Temperatures in the RUN mode are indicated relative to the input within the range where the over alarm point and the under alarm point determine its upper and lower limit, respectively. If an input goes out of this range, the output will go to an over fallback or under fallback value.

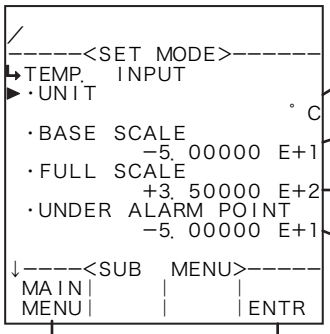
Example Measurement units (UNIT) : ℃
Baseline (BASE SCALE) : 0℃
Full scale (FULL SCALE) : 160℃
Under alarm point (UNDER ALARM POINT) : −5℃
Over alarm point (OVER ALARM POINT) : 165℃
Under fallback level (UNDER FALL BACK) : 0℃
Over fallback level (OVER FALL BACK) : 160℃



(4) Temperature input submenu screen

At the submenu, move the cursor to the desired item (your option) with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired setup screen.

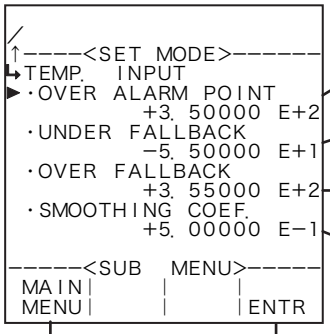
① Pt100Ω, 4 to 20mA, 1 to 5V, or 5mV/℃ and 10mV/℃



① Temperature input unit setup (UNIT) p. 51
③ Temperature input baseline setup (BASE SCALE) p. 52
④ Temperature input full scale setup (FULL SCALE) p. 52
⑤ Temp. input under alarm point setup (UNEDER ALARM POINT) p. 52

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

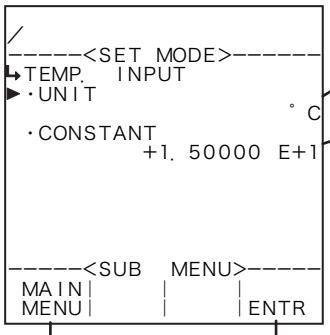


⑥ Temp. input over alarm point setup (OVER ALARM POINT) p. 53
⑦ Temp. input under fallback point setup (UNDER FALLBACK) p. 53
⑧ Temperature input over fallback (over fallback) p. 53
⑨ Temp. input smoothing factor setup (SMOOTHING COEF.) p. 54

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

② Fixed value input.



① Temperature input unit setup (UNIT) p. 51
② Temperature input constant setup (CONSTANT) p. 51

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

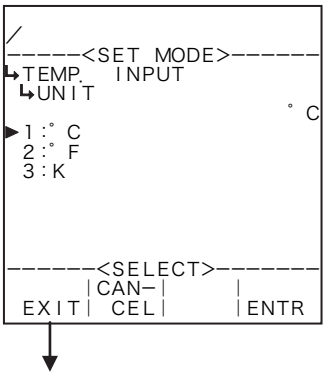
Conditions to show submenu items

Submenu item		
SYS mode input type ※	NONE	Other than NONE
Unit of measurement	Displayed	Displayed
Constant	Displayed	Hidden
Baseline	Hidden	Displayed
Full scale	Hidden	Displayed
Under alarm point	Hidden	Displayed
Over alarm point	Hidden	Displayed
Under fallback level	Hidden	Displayed
Over fallback level	Hidden	Displayed
Smoothing factor	Hidden	Displayed

※ : Conditions for selecting on-screen information

① Temperature input unit setup (UNIT)

Measurement unit of temperature input is chosen here.



To temp. input submenu screen p. 50

←**Unit option select**

For details of unit, see "(2) Measurement unit selection (Select setup screen) (SELECT) on page 46.

Available units in temp. input are "℃," "°F", and "K" and common to all models.

※ **As the measurement unit is changed, current parameters (baseline, full scale setpoint, etc.) are converted automatically to read in the new measurement unit chosen.**

※ **The unit to be set here is that of the temperature displayed in the RUN mode and of the temperature to be set by the temperature input in the SET mode.**

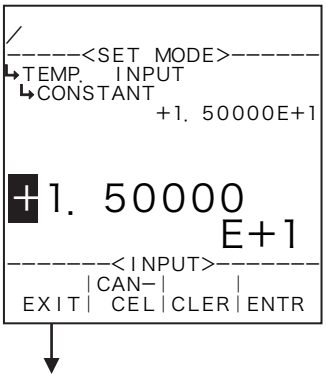
Number of decimal places for each unit

Unit	Number of decimal places
℃	2
°F	2
K	2

② Temperature input constant setup (CONSTANT)

In the SYS mode, when the input type is set to NONE, constants are set.

※ **Constants are fixed values set internally in the equipment contrary to the measurements of external input.**



←**Numerical entry window**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

Numerical value input setup

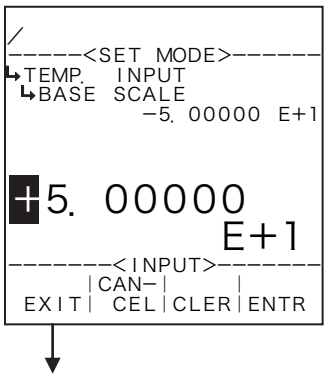
※ **In the SYS mode, this item is not shown unless the temperature input type (① temperature input type setup (TYPE) on page 154) is set to "NONE".**

※ **For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.**

To temp. input submenu screen p. 50

③ Temperature input baseline setup (BASE SCALE)

The baseline with respect to the temperature input is set up here.



To temp. input submenu screen p. 50

←Numerical value input setup

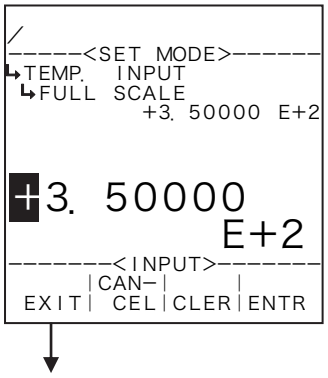
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the temperature input type (① temperature input type setup (TYPE) on page 154) is set to "NONE".

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

④ Temperature input full scale setup (FULL SCALE)

The full scale setpoint with respect to the temperature input is set up here.



To temp. input submenu screen p. 50

←Numerical value input setup

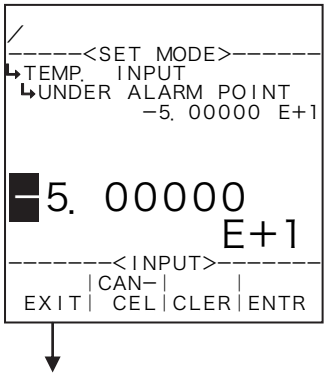
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the temperature input type (① temperature input type setup (TYPE) on page 154) is set to "NONE".

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

⑤ Temperature input under alarm point setup (UNDER ALARM POINT)

The under alarm point with respect to the temperature input is set up here.



To temp. input submenu screen p. 50

←Numerical value input setup

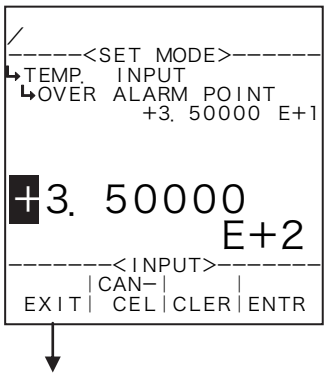
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the temperature input type (① temperature input type setup (TYPE) on page 154) is set to "NONE".

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

⑥ Temperature input over alarm point setup (OVER ALARM POINT)

The over alarm point with respect to the temperature input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

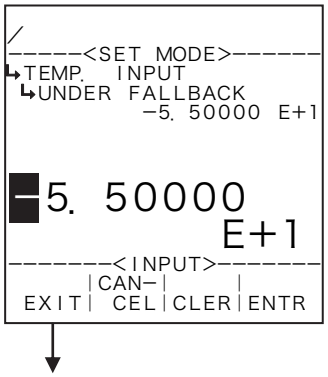
※ In the SYS mode, this item is not shown if the temperature input type (① temperature input type setup (TYPE) on page 154) is set to "NONE".

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

To temp. input submenu screen p. 50

⑦ Temperature input under fallback level setup (UNDER FALLBACK)

The under fallback level with respect to the temperature input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

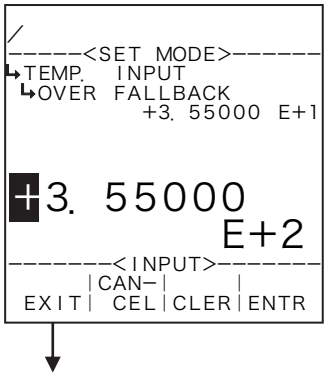
※ In the SYS mode, this item is not shown if the temperature input type (① temperature input type setup (TYPE) on page 154) is set to "NONE".

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

To temp. input submenu screen p. 50

⑧ Temperature input over fallback level setup (OVER FALLBACK)

The over fallback level with respect to the temperature input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the temperature input type (① temperature input type setup (TYPE) on page 154) is set to "NONE".

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

To temp. input submenu screen p. 50

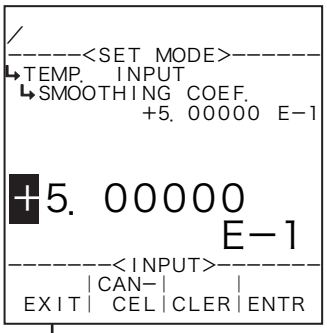
⑨ Temperature input smoothing factor setup (SMOOTHING COEF.)

The smoothing factor with respect to the temperature input is set up here.

※ In the SYS mode, this item is not shown if the temperature input type is set to "NONE".

$$\text{Smoothing factor} \quad K = 1 - \frac{1}{\text{Time constant (s)}}$$

※ Time constant is the time required for the indicated reading to reach 63% of the final level; it reaches 86% after in twice the time duration of time constant and 95% in three times the time duration of time constant.



To temp. input submenu screen p. 50

←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the temperature input type (① temperature input type setup (TYPE) on page 154) is set to "NONE".

※ Do not enter a negative value in the integer part of setting, or it will cause erratic operation.

6.4.2 Pressure Input Setup (PRESS. INPUT)

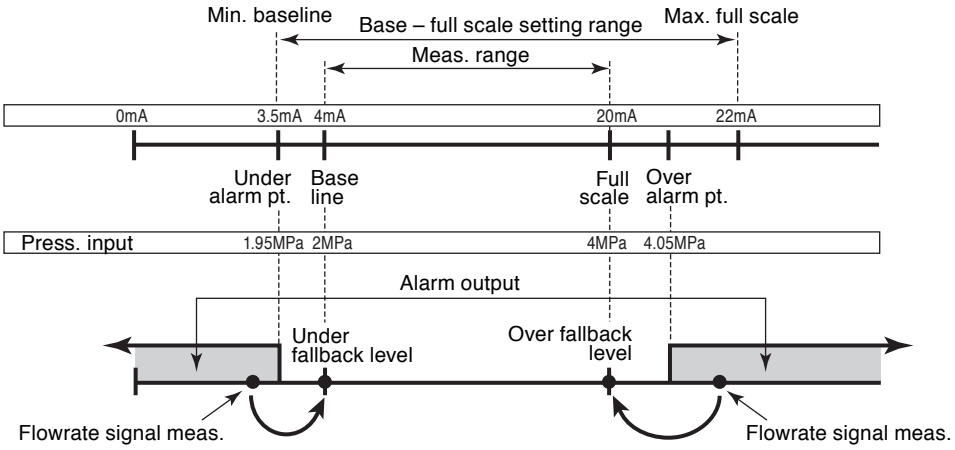
As the factors associated with pressure, the measurement units, constants (with the input type set to NONE in the SYS mode), baseline, full scale value, under alarm point, over alarm point, under fallback level, over fallback level, and smoothing factor are established here.

(1) 4 to 20mA and 1 to 5V input

When the “4 to 20mA” or “1 to 5V” is selected in the input type (SYS mode), respective parameters are as defined as follows:

With 4 to 20mA or 1 to 5V input, the baseline-to-full-scale setting range varies with the given model (calculation). Set the baseline and full scale setpoint within the range acceptable by the specific model used. (Failure to set them within this range will nullify assurance for proper operation.) The base scale and full scale are referenced when the pulse output scaling is determined. Settings should be determined carefully taking into consideration the process of calculation and the value of standard span.
Pressure in the RUN mode are indicated relative to the input within the range where the over alarm point and the under alarm point determine its high and low limit, respectively. If an input goes out of this range, the output will automatically be clamped at the over fallback or under fallback value.

Example Measurement units (UNIT) : MPa
Baseline (BASE SCALE) : 2MPa
Full scale (FULL SCALE) : 4MPa
Under alarm point (UNDER ALARM POINT) : 1.95MPa
Over alarm point (OVER ALARM POINT) : 4.05MPa
Under fallback level (UNDER FALL BACK) : 2MPa
Over fallback level (OVER FALL BACK) : 4MPa



Alarm point and fallback setup range is determined as follows:

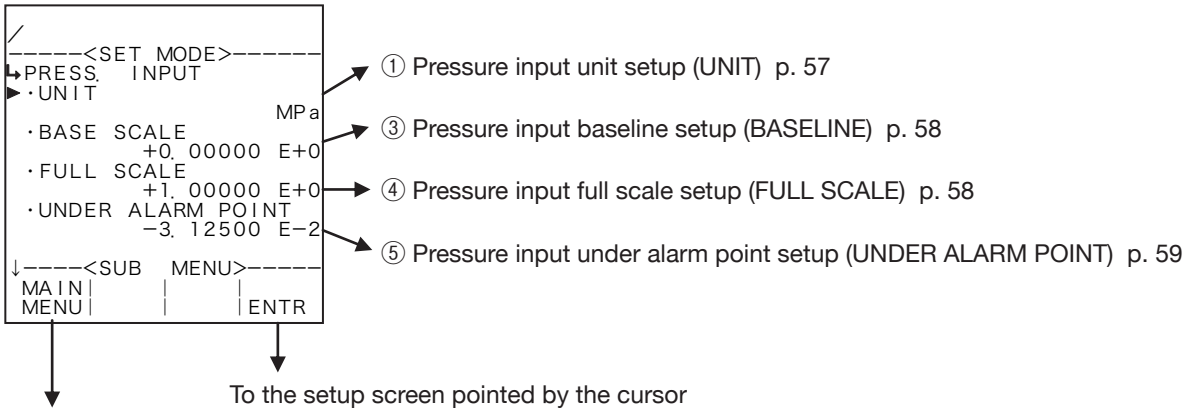
(i) Low limit $\quad \text{Base scale} - \dfrac{\text{Full scale} - \text{Baseline}}{16} \times 0.5$

(ii) High limit $\quad \text{Full scale} + \dfrac{\text{Full scale} - \text{Baseline}}{16} \times 2$

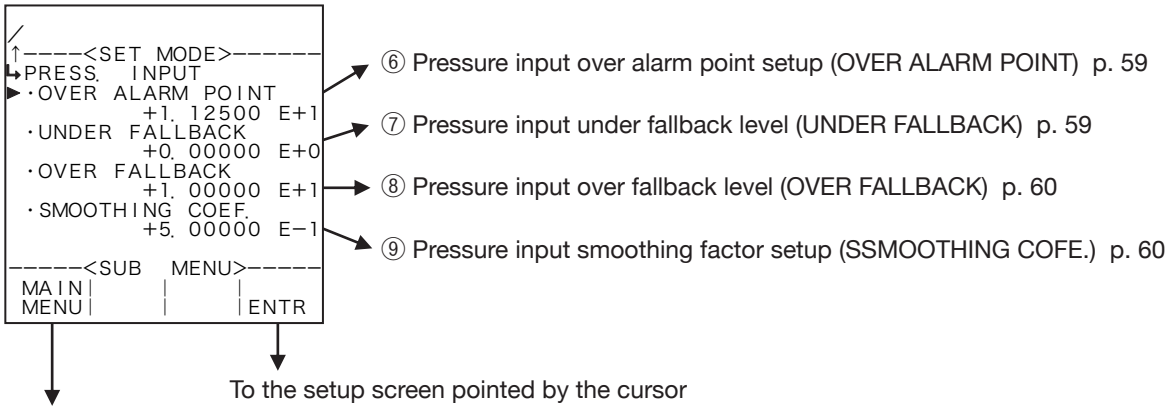
(2) Pressure input submenu screen

At the submenu, move the cursor to the desired item to be set up with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the setup screen of the item desired.

① 4 to 20mA and 1 to 5V input

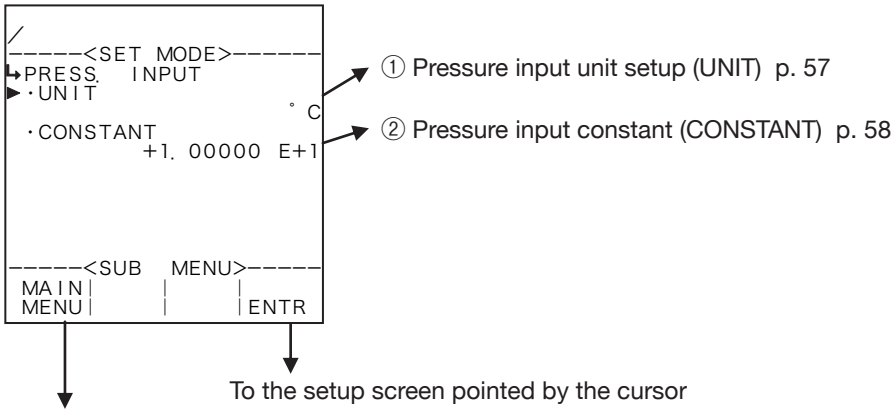


SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

② Constants input



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

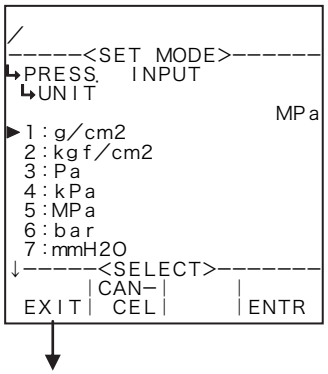
Conditions to show submenu items

Submenu item		
SYS mode input type ※	NONE	Other than NONE
Unit of measurement	Displayed	Displayed
Constant	Displayed	Hidden
Baseline	Hidden	Displayed
Full scale	Hidden	Displayed
Under alarm point	Hidden	Displayed
Over alarm point	Hidden	Displayed
Under fallback level	Hidden	Displayed
Over fallback level	Hidden	Displayed
Smoothing factor	Hidden	Displayed

※：Conditions for selecting on-screen information

① Pressure input unit setup (UNIT)

Measurement unit of pressure input is selected here.



To press. input submenu screen p. 56

←Unit option select

For details of measurement unit selection, see “(2) Measurement unit selection (SELECT)” on page 46.

Available units in pressure input are “g/cm²”, “kgf/cm²”, “Pa”, “kPa”, “MPa”, “bar”, “mmH₂O”, and “psi” and are common to all models.

※ As the measurement unit is changed, the current values (baseline, full scale setpoint, etc.) are converted automatically to read in the new measurement unit chosen.

※ The unit to be set here implies that of the pressure displayed in the RUN mode and of the pressure to be set by the pressure input in the SET mode.

※ Depending on the unit chosen here, the numerical format (number of decimal places) shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.

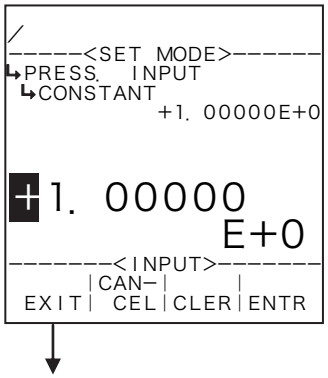
Number of decimal places for each unit

Unit	Number of decimal places
g/cm²	0
kgf/cm²	3
Pa	0
kPa	1
MPa	4
bar	3
mmH₂O	0
psi	2

② Pressure input constant setup (CONSTANT)

In the SYS mode, when the input type is set to NONE, constants are set.

※ Constants are fixed values set internally in the equipment contrary to the measurements of external input.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

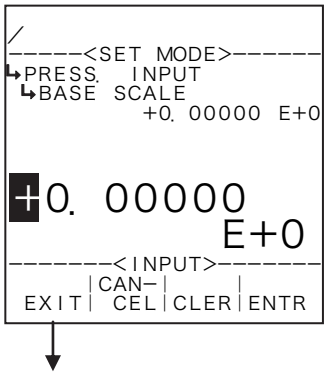
※ In the SYS mode, this item is not shown unless the pressure input type (① Pressure input type setup (TYPE) on page 155) is set to"NONE".

※ For the unit to be set here, the unit set at the pressure input unit setup (① Pressure input unit setup (UNIT) on page 57) is used. Make sure of the unit before you set up.

To press. input submenu screen p. 56

③ Pressure input baseline setup (BASE SCALE)

The baseline value with respect to the pressure input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

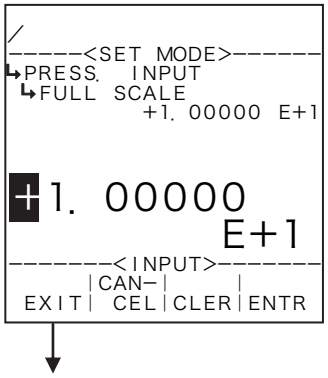
※ In the SYS mode, this item is not shown unless the pressure input type (① Pressure input type setup (TYPE) on page 155) is set to"NONE".

※ For the unit to be set here, the unit set at the pressure input unit setup (① Pressure input unit setup (UNIT) on page 57) is used. Make sure of the unit before you set up.

To press. input submenu screen p. 56

④ Pressure input full scale setup (FULL SCALE)

The full scale value with respect to the pressure input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

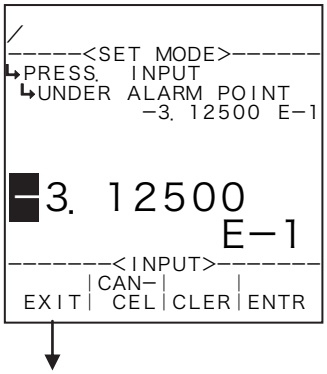
※ In the SYS mode, this item is not shown unless the pressure input type (① Pressure input type setup (TYPE) on page 165) is set to"NONE".

※ For the unit to be set here, the unit set at the pressure input unit setup (① Pressure input unit setup (UNIT) on page 57) is used. Make sure of the unit before you set up.

To press. input submenu screen p. 56

⑤ Pressure input under alarm point setup (UNDER ALARM POINT)

The under alarm point with respect to the pressure input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

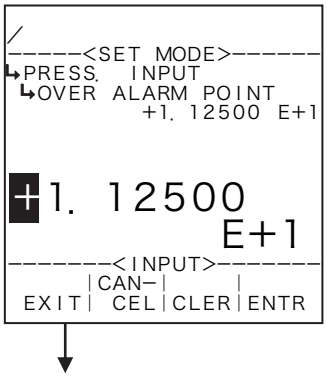
※ In the SYS mode, this item is not shown unless the pressure input type (① Pressure input type setup (TYPE) on page 155) is set to"NONE".

※ For the unit to be set here, the unit set at the pressure input unit setup (① Pressure input unit setup (UNIT) on page 57) is used. Make sure of the unit before you set up.

To press. input submenu screen p. 56

⑥ Pressure input over alarm point setup (OVER ALARM POINT)

The over alarm point with respect to the pressure input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

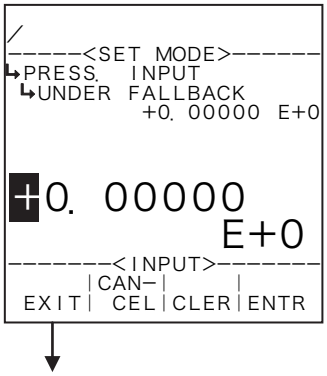
※ In the SYS mode, this item is not shown unless the pressure input type (① Pressure input type setup (TYPE) on page 155) is set to"NONE".

※ For the unit to be set here, the unit set at the pressure input unit setup (① Pressure input unit setup (UNIT) on page 57) is used. Make sure of the unit before you set up.

To press. input submenu screen p. 56

⑦ Pressure input under fallback level setup (UNDER FALLBACK)

The under fallback level with respect to the pressure input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

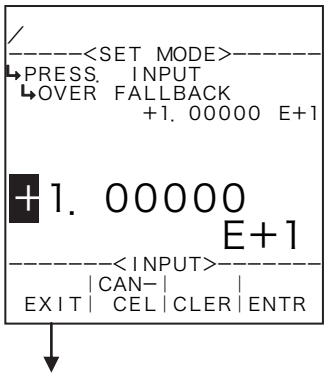
※ In the SYS mode, this item is not shown unless the pressure input type (① Pressure input type setup (TYPE) on page 155) is set to"NONE".

※ For the unit to be set here, the unit set at the pressure input unit setup (① Pressure input unit setup (UNIT) on page 57) is used. Make sure of the unit before you set up.

To press. input submenu screen p. 56

⑧ Pressure input over fallback level setup (OVER FALLBACK)

The over fallback level with respect to the pressure input is set up here.



To press. input submenu screen p. 56

←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown unless the pressure input type (① Pressure input type setup (TYPE) on page 155) is set to "NONE".

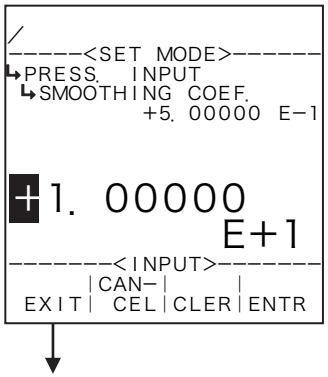
※ For the unit to be set here, the unit set at the pressure input unit setup (① Pressure input unit setup (UNIT) on page 57) is used. Make sure of the unit before you set up.

⑨ Pressure input smoothing factor setup (SMOOTHING COEF.)

The smoothing factor with respect to the pressure input is set up here.

$$\text{Smoothing factor } K = 1 - \frac{1}{\text{Time constant (s)}}$$

※ Time constant is the time required for the indicated reading to reach 63% of the final level; it reaches 86% after in twice the time duration of time constant and 95% in three times the time duration of time constant.



To press. input submenu screen p. 56

←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown unless the pressure input type (① Pressure input type setup (TYPE) on page 155) is set to "NONE".

※ Do not enter a negative value in the integer part of setting, or it will cause erratic operation.

6.4.3 Blend Input Setup (BLEND INPUT)

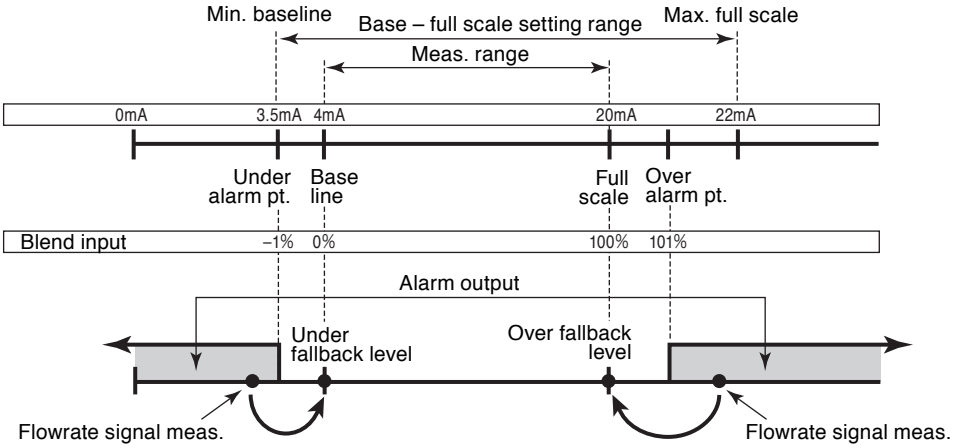
As the factors associated with blend input, the measurement units, constants (with the input type set to NONE in the SYS mode), baseline, full scale value, under alarm point, over alarm point, under fallback level, and over fallback level are established here.

※ **These settings are used only in Model EL4401. They are not shown in other models.**

① 4 to 20mA and 1 to 5V input type

When the “4 to 20mA” or “I to 5V” is your selection in the input type (SYS mode), respective parameters are defined as follows:

Example Measurement units (UNIT) : %
Baseline (BASE SCALE) : 0%
Full scale (FULL SCALE) : 100%
Under alarm point (UNDER ALARM POINT) : −1%
Over alarm point (OVER ALARM POINT) : 101%
Under fallback level (UNDER FALL BACK) : 0%
Over fallback level (OVER FALL BACK) : 100%



With 4 to 20mA or 1 to 5V input, the baseline-to-full-scale setting range varies with the given model (calculation). Set the baseline and full scale setpoint within the range acceptable by the specific model used. (Failure to set them within this range will nullify assurance for proper operation.) The base scale and full scale are referenced when the pulse output scaling is determined. Settings should be determined carefully taking into consideration the process of calculation, the value of standard span and other contributing factors.

Temperatures in the RUN mode are indicated relative to the input within the range where the over alarm point and the under alarm point determine its high and low limit, respectively. If an input goes out of this range, the output will automatically be clamped at the over fallback or under fallback value.

Alarm point and fallback setup range is determined as follows:

（i）Low limit　Base scale $-\dfrac{\text{Full scale} - \text{Baseline}}{16}\times 0.5$

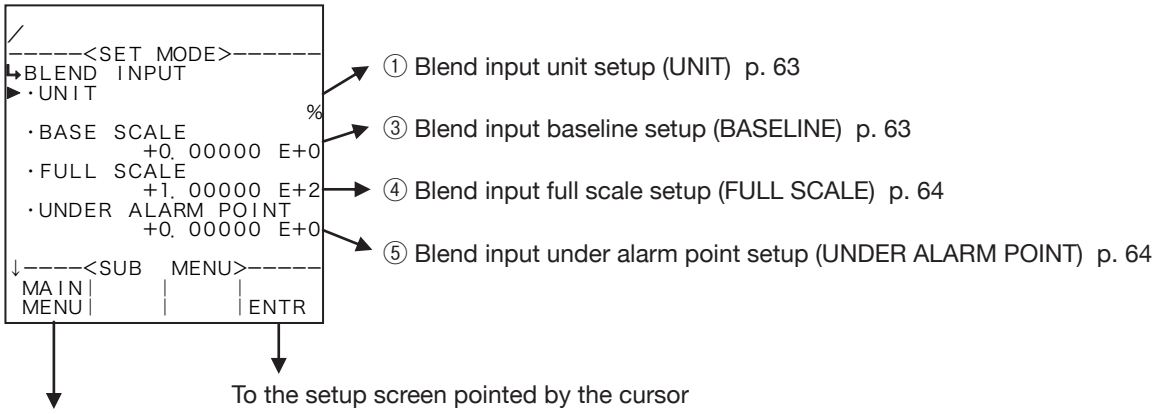
（ii）High limit　Full scale $+\dfrac{\text{Full scale} - \text{Baseline}}{16}\times 2$

(1) Blend input submenu screen

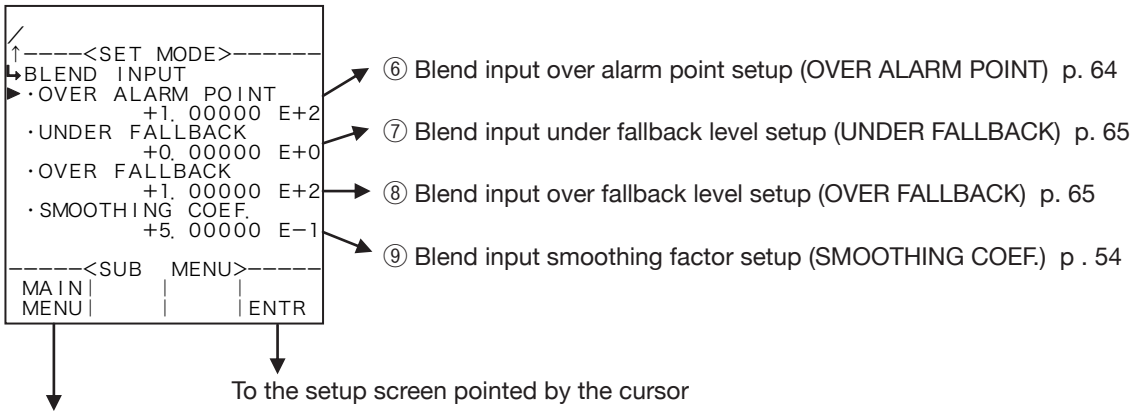
At the submenu, move the cursor to the desired item to be set up with the up and down arrow keys.

At the touch of function key “ENTR”, the screen switches to the setup screen of the item desired.

① 4 to 20mA and 1 to 5V input

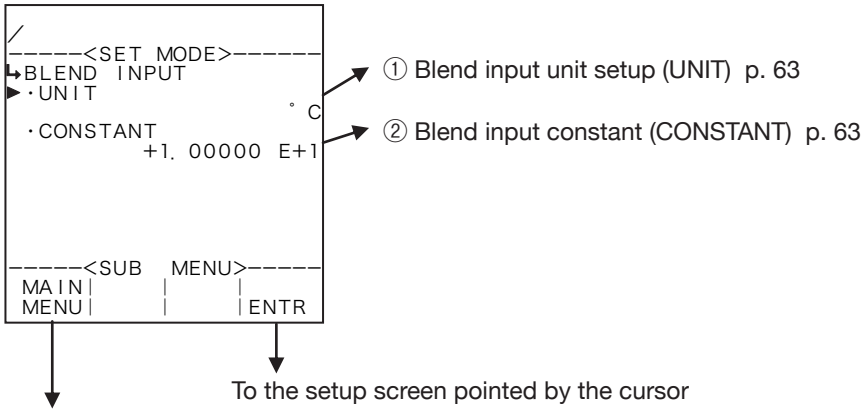


SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

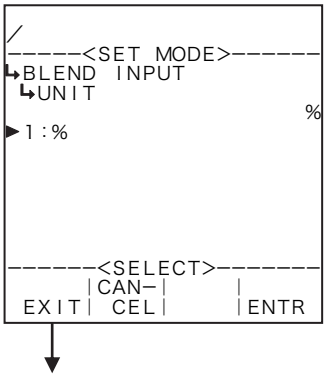
② Constant input



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Blend input unit setup (UNIT)

Measurement unit of blend input is selected here.



←**Unit option select**

For details of measurement unit selection, see "(2) Measurement unit selection (SELECT)" on page 46.

※ **The unit to be set here is the blend unit displayed in the RUN mode and the unit to be set by the blend input in the SET mode.**

Blend input submenu screen p. 62

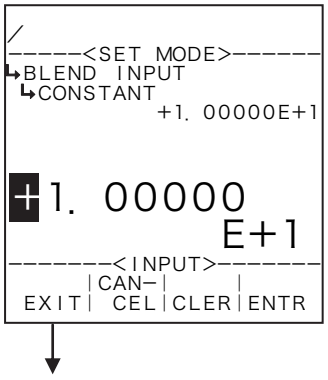
Number of decimal places for each unit

Unit	Number of decimal places
%	2

② Blend input constants (CONSTANT)

In the SYS mode, when the input type is set to NONE, constants are set.

※ **Constants are fixed values set internally in the equipment contrary to the measurements of external input.**



←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

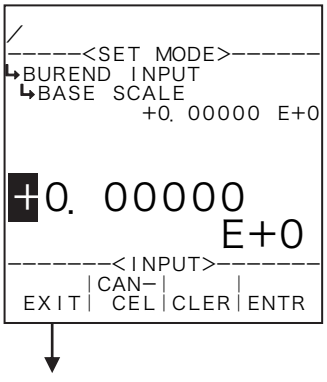
※ **In the SYS mode, this item is not shown unless the blend input type (① Blend input type setup (TYPE) on page 165) is set to "NONE".**

※ **For the unit to be set here, the unit set at the blend input unit setup (① Blend input unit setup (UNIT) on page 63) is used. Make sure of the unit before you set up.**

Blend input submenu screen p. 62

③ Blend input baseline setup (BASE SCALE)

The baseline value with respect to the blend input is set up here.



←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

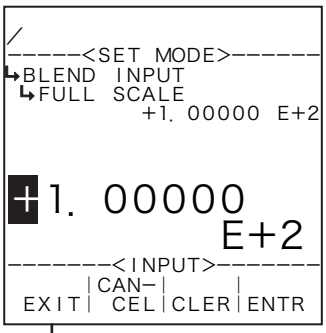
※ **In the SYS mode, this item is not shown if the blend input type (① blend input type setup (TYPE) on page 165) is set to "NONE".**

※ **For the unit to be set here, the unit set at the blend input unit setup (① Blend input unit setup (UNIT) on page 63) is used. Make sure of the unit before you set up.**

Blend input submenu screen p. 62

④ Blend input full scale setup (FULL SCALE)

The full scale value with respect to the blend input is set up here.



Blend input submenu screen p. 62

←Numerical value input setup

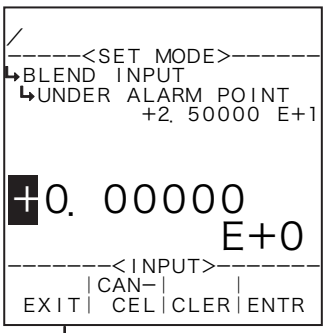
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the blend input type (① Blend input type setup (TYPE) on page 165) is set to "NONE".

※ For the unit to be set here, the unit set at the blend input unit setup (① Blend input unit setup (UNIT) on page 63) is used. Make sure of the unit before you set up.

⑤ Blend input under alarm point setup (UNDER ALARM POINT)

The under alarm point with respect to the blend input is set up here.



Blend input submenu screen p. 62

←Numerical value input setup

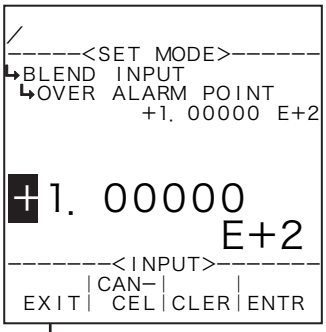
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the blend input type (① Blend input type setup (TYPE) on page 165) is set to "NONE".

※ For the unit to be set here, the unit set at the blend input unit setup (① Blend input unit setup (UNIT) on page 63) is used. Make sure of the unit before you set up.

⑥ Blend input over alarm point setup (OVER ALARM POINT)

The over alarm point with respect to the blend input is set up here.



Blend input submenu screen p. 62

←Numerical value input setup

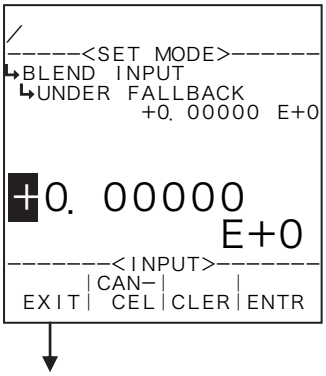
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the blend input type (① Blend input type setup (TYPE) on page 165) is set to "NONE".

※ For the unit to be set here, the unit set at the blend input unit setup (① Blend input unit setup (UNIT) on page 63) is used. Make sure of the unit before you set up.

⑦ Blend input under fallback level setup (UNDER FALLBACK)

The under fallback level with respect to the blend input is set up here.



Blend input submenu screen p. 62

←**Numerical value input setup**

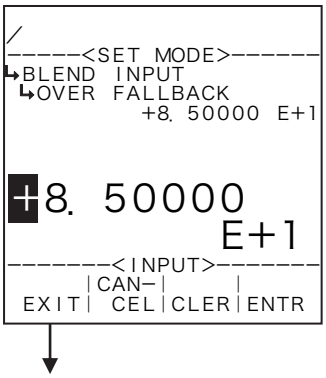
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the blend input type (① Blend input type setup (TYPE) on page 165) is set to "NONE".

※ For the unit to be set here, the unit set at the blend input unit setup (① Blend input unit setup (UNIT) on page 63) is used. Make sure of the unit before you set up.

⑧ Blend input over fallback level setup (OVER FALLBACK)

The over fallback level with respect to the blend input is set up here.



Blend input submenu screen p. 62

←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the blend input type (① Blend input type setup (TYPE) on page 165) is set to "NONE".

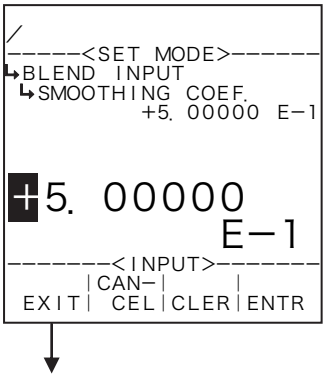
※ For the unit to be set here, the unit set at the blend input unit setup (① Blend input unit setup (UNIT) on page 63) is used. Make sure of the unit before you set up.

⑨ Blend input smoothing factor setup (SMOOTHING COEF.)

The smoothing factor with respect to the blend input is set up here.

$$\text{Smoothing factor} \quad K = 1 - \frac{1}{\text{Time constant (s)}}$$

※ Time constant is the time required for the indicated reading to reach 63% of the final level; it reaches 86% after in twice the time duration of time constant and 95% in three times the time duration of time constant.



Blend input submenu screen p. 62

←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the blend input type (① Blend input type setup (TYPE) on page 165) is set to "NONE".

※ Do not enter a negative value in the integer part of setting, or it will cause erratic operation.

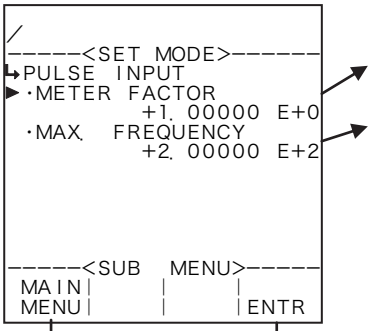
6.4.4 Pulse Input Setup (PULSE INPUT)

As the parameter associated with pulses, the meter factor (the weight of input pulses) and the maximum frequency of input pulses are set up here.

(1) Pulse input submenu item screen

At the submenu, move the cursor to the desired setup item with the up arrow and down arrow keys.

At the touch of function key "ENTR", the screen switches to the item desired for reconfiguration.



① Pulse input meter factor setup (METER FACTOR) p. 66

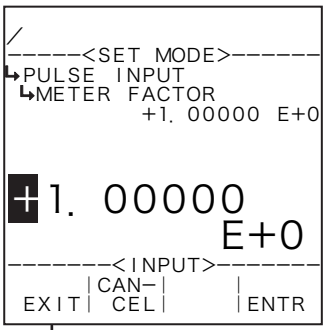
② Pulse input maximum frequency setup (FREQUENCY) p. 66

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Pulse input meter factor setup (METER FACTOR)

The meter factor of pulse input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

On Models EL4301 and EL4311, the unit to be set up here is "kg/p"

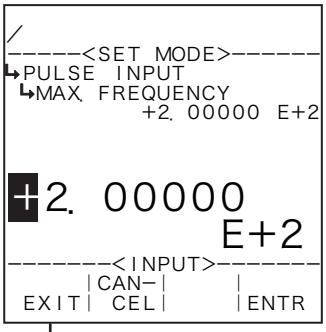
On models other than above, the unit to be set here is "l/p".

※ Do not enter a negative value in the integer part of setting, or it will cause erratic operation.

Pulse input submenu screen p. 66

② Max. pulse frequency input setup (MAX. FREQUENCY)

The maximum frequency of pulse input is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

The unit to be set up here for reconfiguration is "Hz".

※ Do not enter a negative value in the integer part of setting, or it will cause erratic operation.

Pulse input submenu screen p. 66

6.4.5 Instant Flowrate Measurement Setup (FLOW RATE SETTING)

As the parameter values associated with instant flowrate calculation, the type of measurement, low cutoff frequency, totalizing interruption, smoothing factor, maximum frequency setup, number of measurement cycles, interpolation setup, and reference oscillator correction are set up here.

Instant flowrate measurement comes in the following two user selectable approaches:

1. Frequency measurement system
2. Period measurement system

(1) Frequency measurement system

In the frequency measurement system, the frequency is calculated by counting the number of arriving pulses in a predetermined sampling period. In this case, when the input frequency is low, the instability of measurement may result. Application of a smoothing process can alleviate this instability, but it has a drawback in that the speed of response suffers.

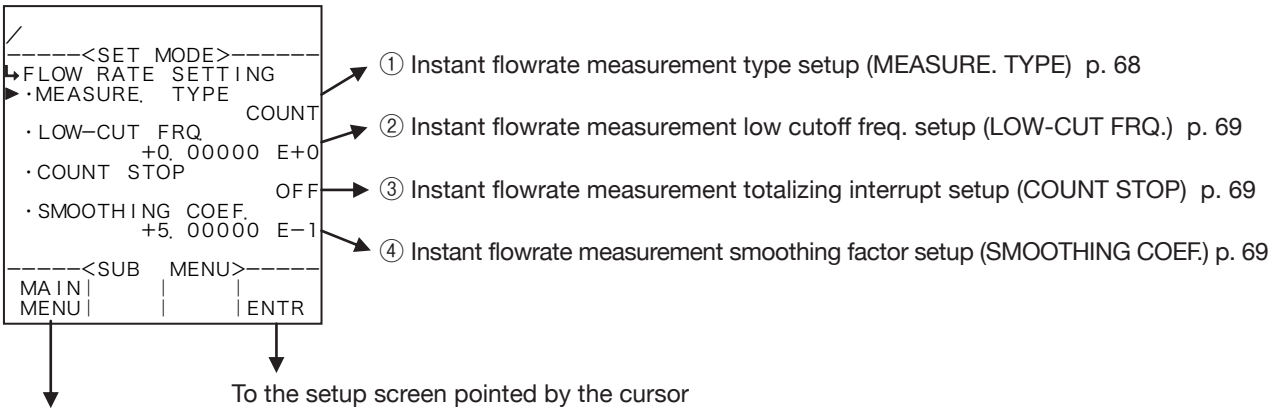
(2) Period measurement system

In the period measurement system, the period is calculated by counting the number of reference clock pulses over the time interval between two successive pulses arriving. However, when the interval between incoming pulses is great, the update time of measurement data may be prolonged.

(3) Instant flowrate measurement submenu screen

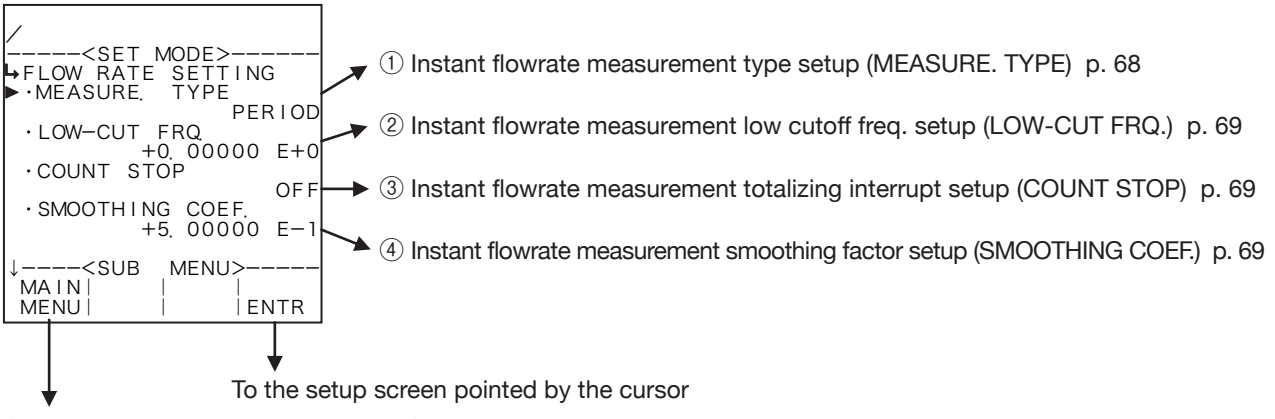
At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the item desired for reconfiguration.

① Frequency measurement system

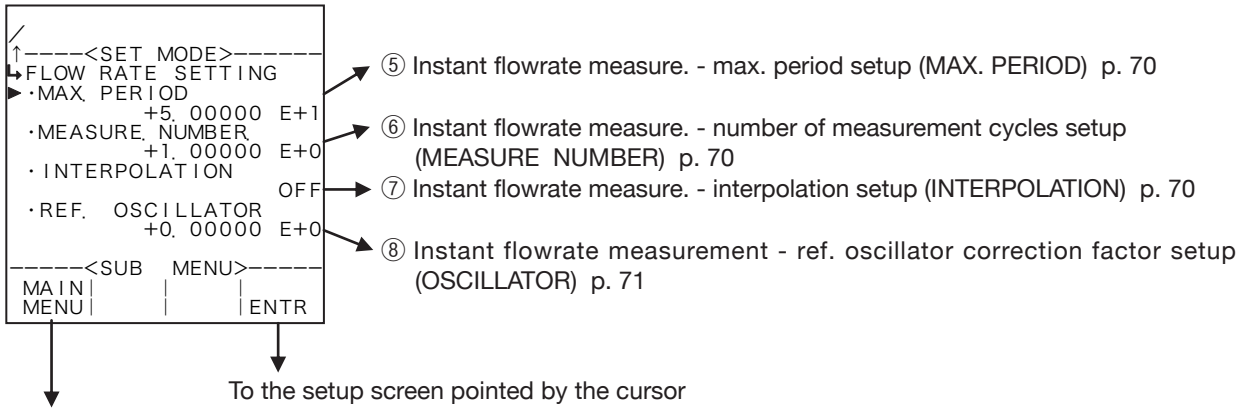


SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

② Period measurement system



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



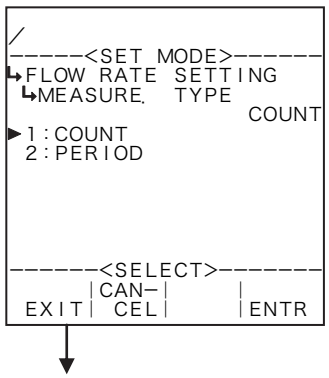
Conditions to show submenu items

Submenu item		
Instant measurement type ※	COUNT	PERIOD
Low cutoff frequency	Displayed	Displayed
Measurement count stop	Displayed	Displayed
Smoothing factor	Displayed	Displayed
Max. period setup	Hidden	Displayed
No. of meas. cycles setup	Hidden	Displayed
Measure. Interpolation setup	Hidden	Displayed
Ref. oscillator corr. factor	Hidden	Displayed

※：Conditions for selecting on-screen information

① Instant flowrate measurement - type setup (MEASURE. TYPE)

The instant flowrate measurement type is set up here.



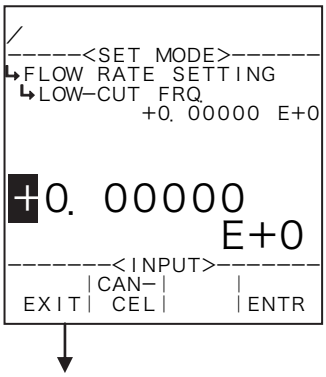
←Measurement type option select

For details of options setup, see “(2) Option select setup screen (SELECT)” on page 46.

Frequency measurement (COUNT) or period measurement (PERIOD) is selected.

② Instant flowrate measurement - low cutoff frequency (LOW-CUT FRQ.)

The count stop in instant flowrate measurement is set up here.



←Numerical value input setup

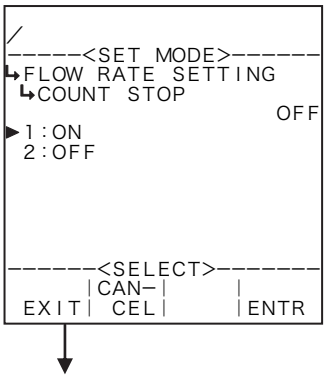
For details of numerical value input setup, see "(1) Numerical value input setup screen (SELECT)" on page 43.

※ The unit to be set up here is "Hz". Make sure of the unit before you set up.

Instant flowrate measurement submenu screen p. 67

③ Instant flowrate measurement - count stop setup (COUNT STOP)

The count stop in instant flowrate measurement is set up here.



←Count stop option selection setup

For details of selecting options setup, see "(2) Option select setup screen (SELECT)" on page 46.
Count interruption (ON) or count uninterrupted (OFF) is selected.
With this setting in the "ON", counting is interrupted whenever the frequency of incoming pulse input falls below the low cutoff frequency.

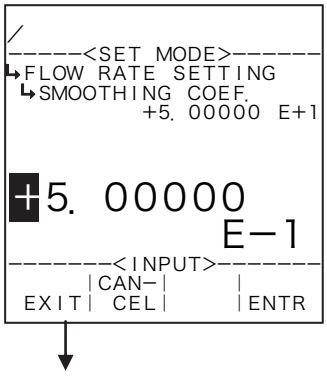
Instant flowrate measurement submenu screen p. 67

④ Instant flowrate measurement - smoothing factor setup (SMOOTHING COEF.)

The smoothing factor is set up here.

$$\text{Smoothing factor} \quad K=1-\frac{1}{\text{Time constant (s)}}$$

※ Time constant is the time required for the indicated reading to reach 63% of the final level; it reaches 86% after in twice the time duration of time constant and 95% in three times the time duration of time constant.



←Numerical value input setup

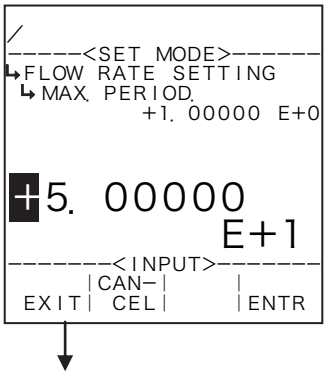
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ Do not enter a negative value in the integer part of setting, or it will cause erratic operation.

Instant flowrate measurement submenu screen p. 67

⑤ Instant flowrate measurement - max. period setup (MAX. PEERIOD)

The maximum period in instant flowrate measurement is set up here. Beyond this time period, obtained frequency measurements are automatically clamped at zero.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the instant flowrate measurement type (① Instant flowrate measurement type setup (TYPE) on page 68) is set to "COUNT".

※ The minimum unit to be set here is "100 ms".

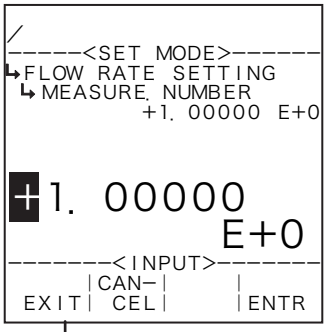
※ A reading "+5. 00000E+1" represents 50×100 ms = 5 seconds.

※ Do not enter a negative value in the integer part of setting, or it will cause erratic operation.

Instant flowrate measurement submenu screen p. 67

⑥ Instant flowrate measurement - number of measurement cycles (MEASURE. NUMBER)

The number of measurement cycles in instant flowrate measurement is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown if the instant flowrate measurement type (① Instant flowrate measurement type setup (TYPE) on page 68) is set to "COUNT".

※ In the computer, this setting is multiplied automatically in the course of frequency calculation.

※ Do not enter a negative value in the integer part of setting, or it will cause erratic operation.

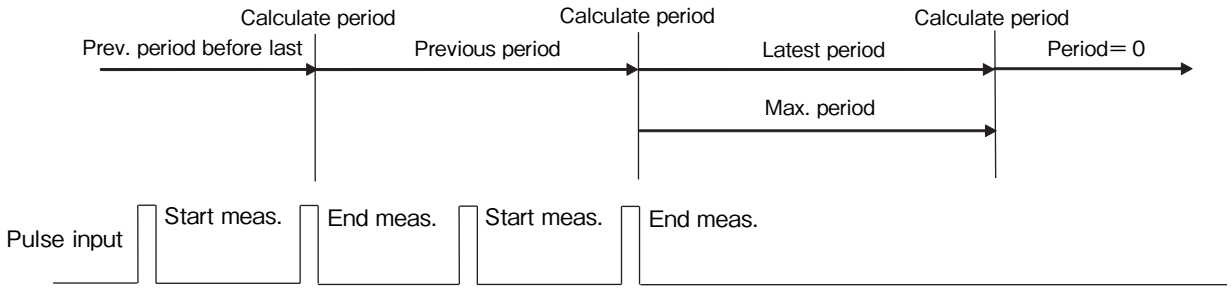
Instant flowrate measurement submenu screen p. 67

⑦ Instant flowrate measurement - interpolation process setup (INTERPOLATION)

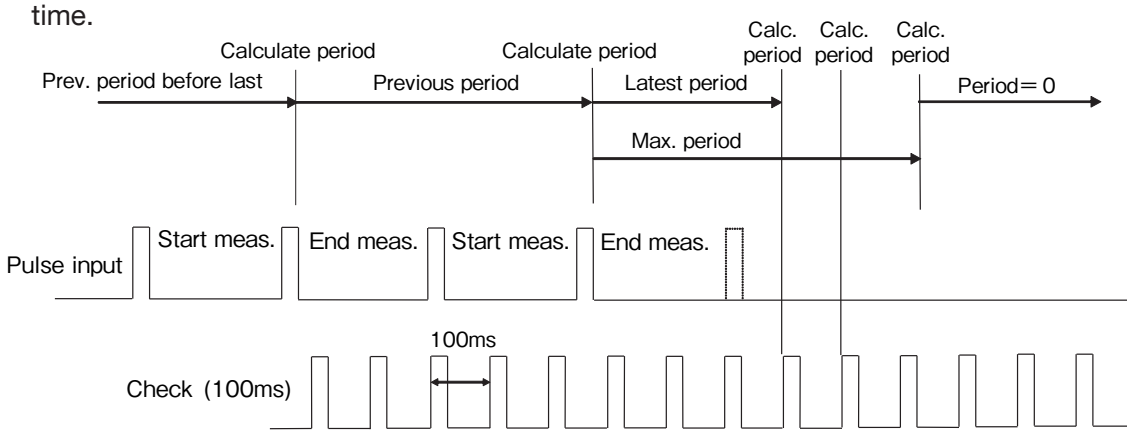
The interpolation process in instant flowrate measurement is set up here.

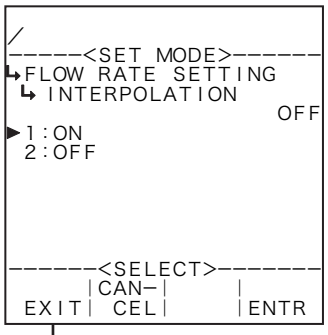
If your option is the period measurement for instant flowrate measurement, you can select whether to implement the interpolation process or not.

In the period measurement, the time duration is calculated by counting the number of reference clock between two successive pulses. But if the current status where pulses arrive regularly changes to another state where pulses no longer arrive at all, the flowrate will remain the same in the previously calculated rate until the maximum period (default timeout duration) is exceeded.



Interpolation – “to read between the lines” - involves a process to run a periodic check for the presence of incoming pulses at intervals of 100 ms; calculate the period based on the elapsed time at the time of check when pulses are missing for a duration beyond the previously measured period of time.





←Interpolation option select

For details of option selection, see “(2) Option select setup screen (SELECT)” on page 46.

※ In the SYS mode, this item is not shown if the instant flowrate measurement type (① Instant flowrate measurement type setup (MEASURE. TYPE) on page 68) is set to “COUNT”.
You select implement interpolation (ON) or without interpolation (OFF).

Instant flowrate measurement submenu screen p. 67

⑧ Instant flowrate measurement - reference oscillator correction factor setup (REF. OSCILLATOR)

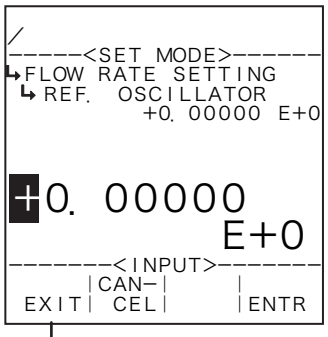
The reference oscillator correction factor in instant flowrate measurement is set up here.

- How internal reference oscillator (5MHz) is corrected -

While the reference clock in instant flowrate measurement is 5MHz, slight errors exist between flow computers.

To reduce measurement errors due to these errors to a minimum, a correction factor in the following formula plays a role of correcting the internal reference oscillator. The correction factor for the reference oscillator is determined by

$$K_C = K_T - 1 = \frac{\text{Reference clock (5MHz)}}{\text{Measured frequency (Hz)}} - 1$$



←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

※ In the SYS mode, this item is not shown if the instant flowrate measurement type (① Instant flowrate measurement type setup (MEASURE. TYPE) on page 68) is set to “COUNT”.

Instant flowrate measurement submenu screen p. 67

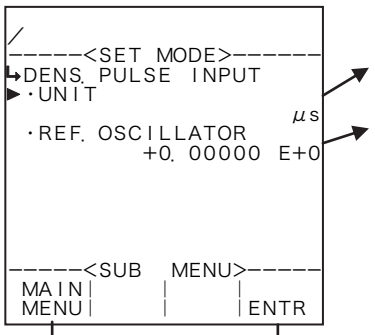
6.4.6 Density Pulse Input (DENS. PULSE INPUT)

As the parameters associated with density pulse input, the measurement unit and correction factor for the reference oscillator are set up here.

※ **These settings are used in Models EL4301, EL4311, and EL4321. They are not used in other models.**

(1) Density pulse input submenu screen

At the submenu, move the cursor to the desired setup item with the up arrow and down arrow keys.
At the touch of function key "ENTR", the screen switches to the item desired for reconfiguration.



① Density pulse input unit setup (UNIT) p. 72

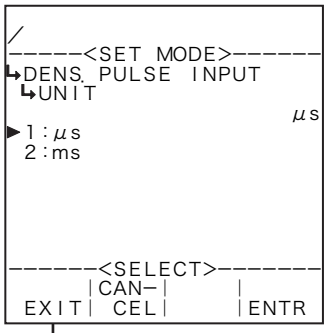
② Density pulse input unit - internal reference oscillator corr. factor (REF. OSCILLATOR) p. 73

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Density pulse input unit setup (UNIT)

The unit in the density period display and that at the density period setup of density input is set up here.



Density pulse input submenu screen p. 72

←Unit option select

For details of selecting options setup, see "(2) Option select setup screen (SELECT)" on page 46.

The units that can be selected are "μs" and "ms," and are common to all models.

※ **As the measurement unit is changed, the values that read in this unit (e.g., density period with water) are converted automatically to read in the new measurement unit chosen.**

※ **The unit to be set here is that of the density period displayed in the RUN mode and of the density period to be set in the density calculation in the SET mode.**

※ **Depending on the unit chosen here, the numerical format (number of decimal places) shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.**

Number of decimal places in respective units

Unit	Number of decimal places
μs	2
ms	5

② Density pulse input – internal reference oscillator correction factor (REF. OSCILLATOR)

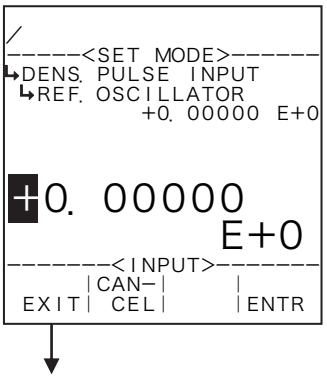
The correction factor of internal reference oscillator used in (the) period measurement of density pulse input is set up here.

- How internal reference oscillator (5MHz) is corrected -

While the reference clock in instant flowrate measurement is 5MHz, slight errors exist between flow computers.

To reduce measurement errors due to these errors to a minimum, a correction factor in the following formula plays a role of correcting the internal reference oscillator. The correction factor for the reference oscillator is determined by

$$K_C = K_T - 1 = \frac{\text{Reference clock (5MHz)}}{\text{Measured frequency (Hz)}} - 1$$



←**Numerical value input setup**

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT) ”on page 43.

Density pulse input submenu screen p. 72

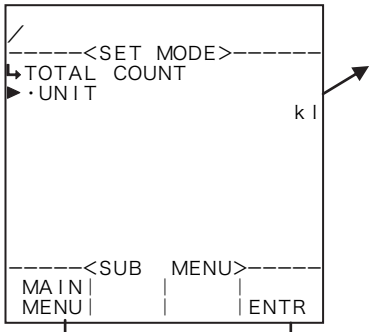
6.4.7 Total Count Setup (TOTAL COUNT)

Total count related items are set up here.

※ **The settings to be made here influence the total counter reading in the RUN mode and the scaling (frequency division) factor of pulse output. Use extra care about the pulse output scale factor when you attempt to alter modify these settings.**

(1) Total count submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of the function key "ENTR", the screen switches to the desired setup screen.



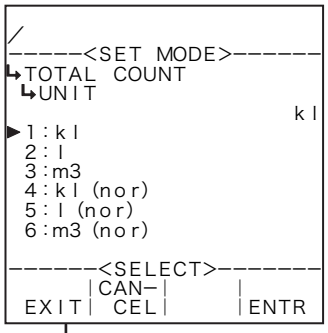
① Total count unit setup (UNIT)

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Total count unit setup (UNIT)

The unit of on-screen total count (RUN mode) is selected here.



←**Unit option select**

For details of selecting options setup, see "(2) Option select setup screen (SELECT)" on page 46.

※ **The unit to be set here is that of total count in the RUN mode and (that) of the total count (reading) to be set at the scaling setup menu.**

Total count submenu screen p. 74

・Available measuring units

Model	Total count reading	Options
EL4101	“TOTAL COUNT1”：Corrected total mass flow	g, kg, t, lb
	“TOTAL COUNT2”：Corrected total calorific flow	cal, kcal, Mcal, J, kJ, MJ
EL4111	“TOTAL COUNT1”：Corrected total mass flow	g, kg, t, lb
	“TOTAL COUNT2”：Corrected total calorific flow	cal, kcal, Mcal, J, kJ, MJ
EL4121	“TOTAL COUNT”：Uncorrected total flow	kl, l, m^3
	“TOTAL COUNT(C)”：Corrected total flow	kl, l, m^3, kl(std), l(std), m^3(std), kl(nor), l(nor), m^3(nor)
EL4131	“TOTAL COUNT”：Uncorrected total flow	kl, l, m^3
	“TOTAL COUNT(C)”：Corrected total flow	kl, l, m^3, kl(C), l(C), m^3(C)
EL4201	“TOTAL COUNT”：Uncorrected total flow	kl, l, m^3
	“TOTAL COUNT(C)”：Corrected total mass flow	g, kg, t, lb
EL4211	“TOTAL COUNT”：Uncorrected total flow	kl, l, m^3
	“TOTAL COUNT(C)”：Corrected total mass flow	g, kg, t, lb
EL4311	“TOTAL COUNT”：Mass total flow	g, kg, t, lb
	“TOTAL COUNT(SOLID)”：Total solids content flow	g, kg, t, l b
EL4401	“TOTAL COUNT”：Uncorrected total flow	kl, l, m^3
	“TOTAL COUNT(C)”：Corrected total flow	kl, l, m^3, kl(std), l(std), m^3(std), kl(nor), l(nor), m^3(nor)
EL4501	“TOTAL COUNT(Q)”：Uncorrected total flow	kl, l, m^3
	“TOTAL COUNT(Qμf)”：Total flow corrected for viscosity	kl, l, m^3, kl(std), l(std), m^3(std), kl(nor), l(nor), m^3(nor)
	“TOTAL COUNT(Qμf ρ)”：Total flow corr. for visc., temp.	kl, l, m^3, kl(std), l(std), m^3(std), kl(nor), l(nor), m^3(nor)

6.4.8 Analog Output Setup (ANALOG OUTPUT)

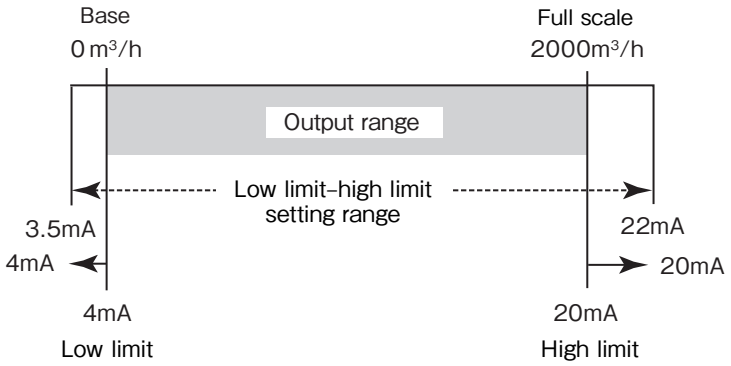
As the parameters associated with analog output, the measuring units, baseline, full scale value, upper high limit of the output, lower low limit of the output, and low cutoff level are set here,

The lower low and upper high level limits determine the current magnitude with respect to the instant flowrate value. These values are set in a range between 3.5mA and 22mA; In most cases, 4mA and 20mA are established.

The baseline and full scale setting ranges depend on the settings for the given model (calculation). Determine them upon consideration of the settings given to the model of the intereset. (Excessively large or small settings will result in failure to perform proper operation.)

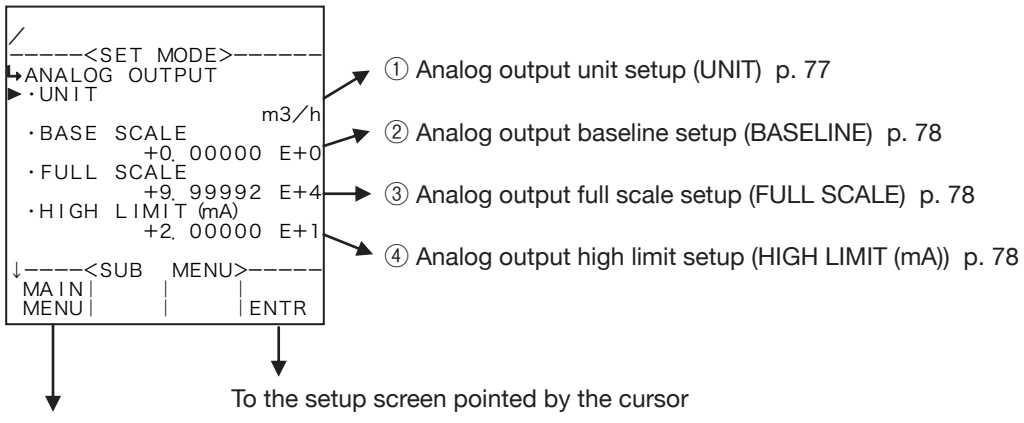
The low cutoff level establishes the minimum flowrate of the meter. If the instant flowrate measured falls short of this level, the analog output will automatically be clamped at the low limit level (typically 4mA). If the operator does not use this feature, set it at the same level as the baseline (0 m^3/h in the example below).

Example Measurement units (UNIT) : m^3/h
Baseline (BASE SCALE) : 0 m^3/h
Full scale (FULL SCALE) : 2000 m^3/h
High limit (HIGH LIMIT (mA)) : 20 mA
Low limit (LOW LIMIT (mA)) : 4 mA

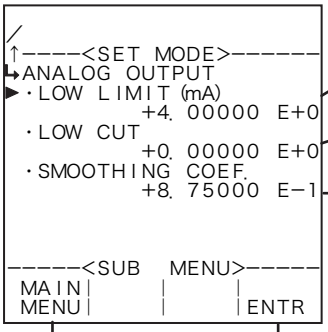


(1) Analog output submenu screen

At the submenu, move the cursor to the desired setup item with the up and downarrow keys.
At the touch of function key “ENTR”, the screen switches to the desired setup screen.



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑤ Analog output low limit setup (LOW LIMIT (mA)) p. 79

⑥ Analog output low cutoff setup (LOW CUT) p. 79 ※1

⑦ Analog output smoothing factor setup (SMOOTHING COEF.) p. 79

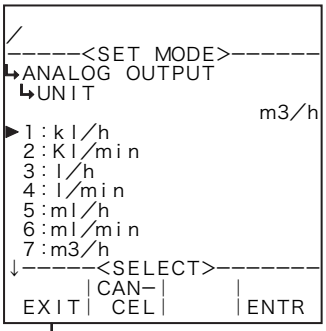
To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

※ Not shown except for Model EL4401

① Analog output unit setup (UNIT)

Analog output measurement unit is selected here.



Analog output submenu screen p. 76

←Numerical value input setup

For details of selecting options setup, see "(2) Option select setup screen (SELECT)" on page 46.

※ On-screen options vary from model to model.

※ As the measurement unit is changed, current parameters (baseline, full scale setpoint, etc.) are converted automatically to read in the new measurement unit chosen.

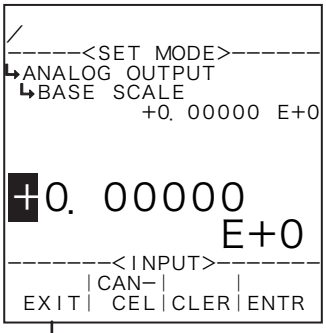
Available measurement units

Model	Available measurement unit options	Analog output options (SYS mode)
EL4101	kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, lb/min	Instant mass flowrate (fixed ※ 1)
EL4111	kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, lb/min	Instant mass flowrate (fixed ※ 1)
EL4121	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min, kl/h(std), kl/min(std), l/h(std), l/min(std), ml/h(std), ml/min(std), m^3/h(std), m^3/min(std), kl/h(nor), kl/min(nor), l/h(nor), l/min(nor), ml/h(nor), ml/min(nor), m^3/h(nor), m^3/min(nor)	Instant flowrate, before and after correction
EL4131	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min, kl/h(C), kl/min(C), l/h(C), l/min(C), ml/h(C), ml/min(C), m^3/h(C), m^3/min(C)	Instant flowrate, before and after correction
EL4201	kl/h、kl/min、l/h、l/min、ml/h、ml/min、m^3/h、m^3/min、kg/h、kg/min、g/h、g/min、t/h、t/min、lb/h、lb/min	Instant flowrate, before and after correction
EL4211	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min, kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, lb/min	Instant flowrate, before and after correction
EL4301	g/ml, g/l, kg/ml, kg/l, %	Corrected density, solids content (% mass)
EL4311	kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, lb/min, % , g/ml, g/l, kg/ml, kg/l	Instant mass flowrate, instant solids content flowrate, solids content (% mass), corrected density
EL4321	g/ml, g/l, kg/ml, kg/l	Corrected instant flowrate (fixed ※ 1)
EL4401	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min, kl/h(std), kl/min(std), l/h(std), l/min(std), ml/h(std), ml/min(std), m^3/h(std), m^3/min(std), kl/h(nor), kl/min(nor), l/h(nor), l/min(nor), ml/h(nor), ml/min(nor), m^3/h(nor), m^3/min(nor)	Corrected Instant flowrate (fixed ※ 1)
EL4501	℃ , °F , K	Temperature (fixed ※ 1)

※ 1 : Because the output is fixed, setup items of analog output are not shown in the SYS mode.

② Analog output baseline setup (BASE SCALE)

The baseline of analog output is set up here.



←Numerical value input setup

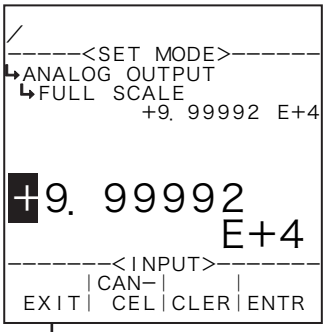
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the analog output unit setup (① Analog output unit setup (UNIT) on page 77) is used. Make sure of the unit before you set up.

Analog output submenu screen p. 76

③ Analog output full scale setup (FULL SCALE)

The full scale of analog output is set up here.



←Numerical value input setup

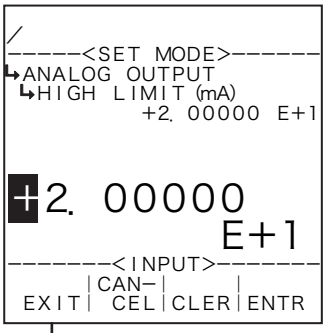
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the analog output unit setup (① Analog output unit setup (UNIT) on page 77) is used. Make sure of the unit before you set up.

Analog output submenu screen p. 76

④ Analog output high limit setup (HIGH LIMIT (mA))

The high limit of analog output is set up here.



←Numerical value input setup

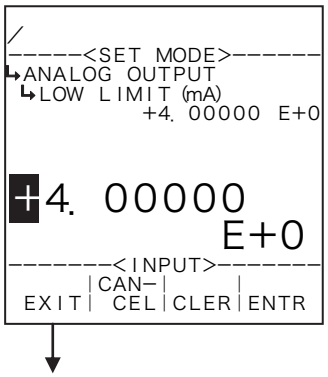
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ The unit to be set up here is mA. Make sure of the unit before you set up.

Analog output submenu screen p. 76

⑤ Analog output low limit setup (LOW LIMIT (mA))

The low limit of analog output is set up here.



Analog output submenu screen p. 76

←**Numerical value input setup**

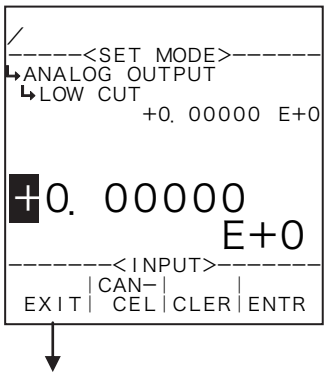
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ **The unit to be set up here is mA. Make sure of the unit before you set up.**

⑥ Analog output low cutoff setup (LOW CUT)

The low cutoff level of analog output is set up here.

※ **This item is shown only in Model EL4401. It is not shown in other models.**



Analog output submenu screen p. 76

←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

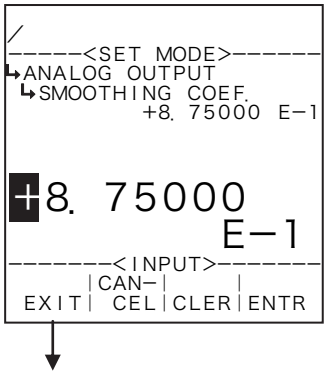
※ **For the unit to be set here, the unit set at the analog output unit setup (① Analog output unit setup (UNIT) on page 77) is used. Make sure of the unit before you set up.**

⑦ Analog output smoothing factor setup (SMOOTHING COEF.)

The smoothing factor of analog output is set up here.

Smoothing facto $K=1-\frac{1}{\text{Time constant (s)}}$

※ **Time constant is the time required for the indicated reading to reach 63% of the final level; it reaches 86% after in twice the time duration of time constant and 95% in three times the time duration of time constant.**



Analog output submenu screen p. 76

←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ **Do not enter a negative value in the integer part of setting, or it will cause erratic operation.**

6.4.9 3α compensation setup (3α COMPENSATE)

As factors associated with 3α compensation, the correction type, coefficients α and β, and reference temperature are set here. If term 2α + β is used in the correction formula, select correction type α ≠ β; if 3α is your choice, select α = β.

＜Calculation formula＞

$K = 1 + (2\alpha + \beta) \times (t - t_0)$

t ：Temperature（℃）

t_0：Reference temperature（℃）

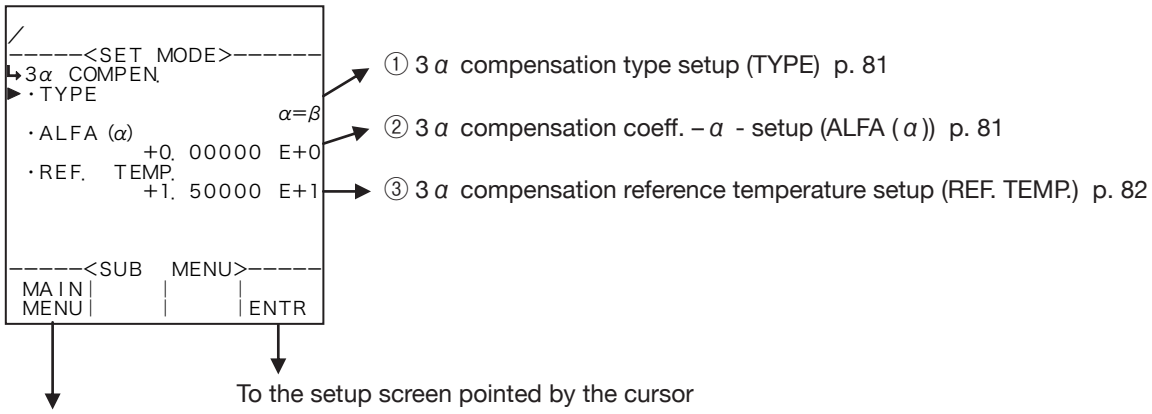
α ：Linear expansion coefficient of the meter body

β ：Linear expansion coefficient of the bluff body

（1）3α compensation submenu screen

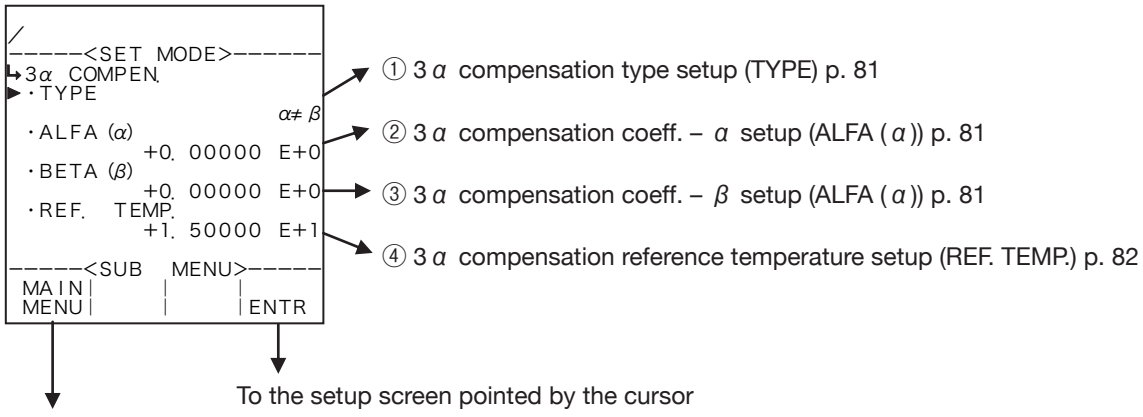
At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired setup screen.

① **Compensation type α = β**



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

② **Compensation type α ≠ β**



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

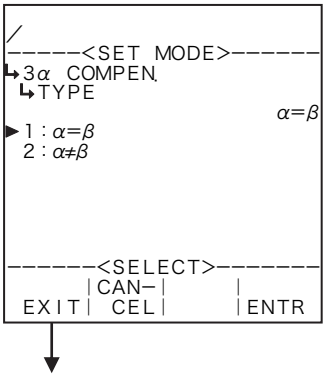
Conditions to show submenu items

Submenu item		
Compensation type ※	α = β	α ≠ β
Coefficient α	Displayed	Displayed
Coefficient β	Hidden	Displayed
Reference temperature	Displayed	Displayed

※：Conditions for selecting on-screen information

① 3α compensation - type setup (TYPE)

The 3α compensation type is set up here. Select either $\alpha = \beta$ or $\alpha \neq \beta$.



←**Correction type option select**

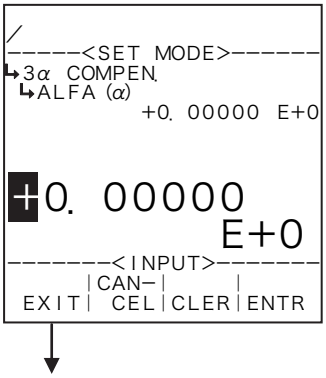
For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

※ **Reminder: Depending on the menu selected, the items on the submenu vary.**

3 α correction submenu screen p. 80

② 3α compensation – coefficient α setup (ALFA (α))

Coefficient α (linear expansion coefficient of the meter body) is set up here.



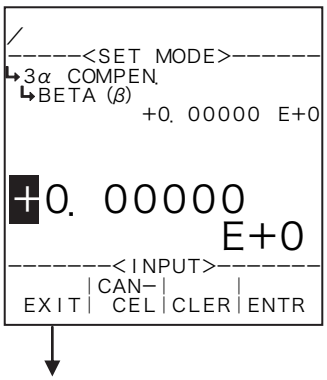
←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

3 α correction submenu screen p. 80

③ 3α compensation – coefficient β setup (BETA (β))

When compensation type $\alpha \neq \beta$ is selected, coefficient β (linear expansion coefficient of the bluff body) is set up here.



←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

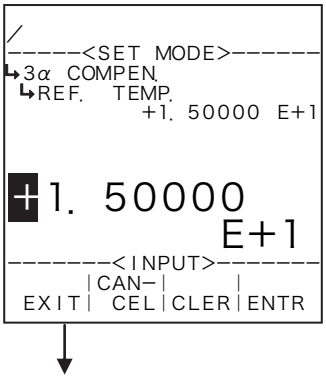
※ **In the SET mode, this item is not shown if the 3α compensation type setup (① 3α compensation type setup (TYPE) on page 81) is set to "$\alpha = \beta$".**

※ **If compensation type $\alpha = \beta$ is your option, value β is the same as value α.**

3 α correction submenu screen p. 80

④ 3α compensation – reference temperature setup (REF. TEMP.)

The reference temperature of 3α compensation is set up here.



3 α correction submenu screen p. 80

←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the measurement unit set in the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

6.4.10 Temperature/Pressure Compensation Setup (T/P COMPEN.)

As parameters associated with temperature and pressure compensation, the reference temperature and pressure are set up here.

＜Calculation formula＞

$$K = \frac{p + 0.101325}{p_0 + 0.101325} \times \frac{t_0 + 273.15}{t + 273.15}$$

where t ：Line temperature（℃）

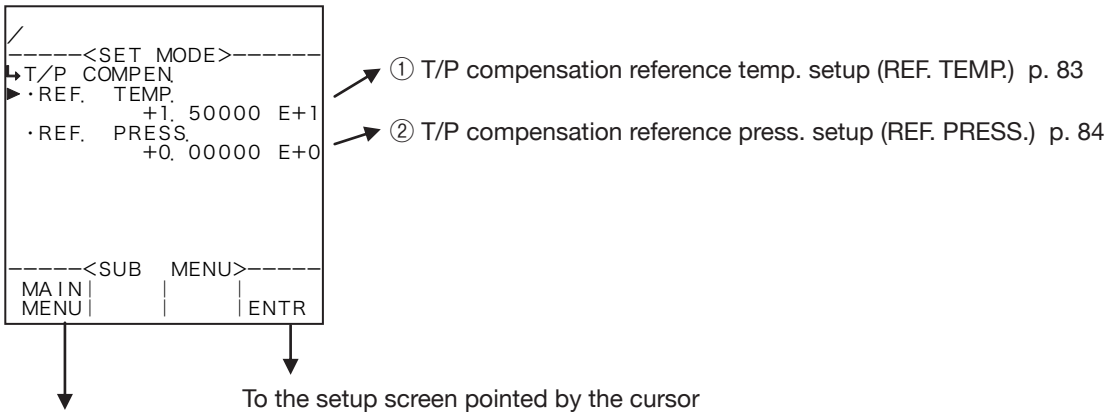
t_0 ：Correction reference temperature（℃）

p ：Line pressure（MPa)

p_0 ：Correction reference pressure（MPa)

(1) T/P compensation submenu screen

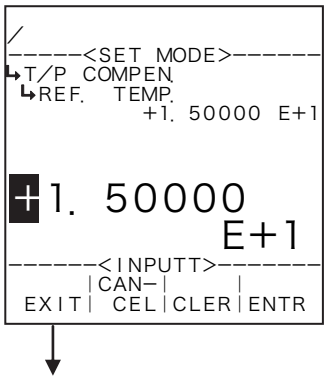
At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired setup screen.



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Temperature/pressure compensation – reference temperature setup (REF. TEMP.)

The reference temperature of T/P compensation is set up here.



T/P correction submenu screen p. 83

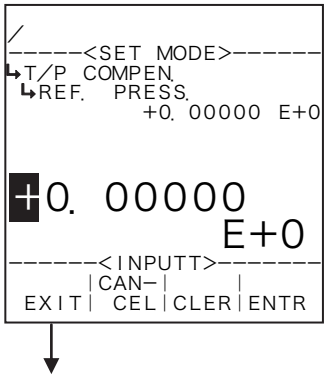
←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

※ For the unit to be set here, the measurement unit set in the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

② Temperature/pressure compensation – reference pressure setup (REF. PRESS.)

The reference pressure of T/P compensation is set up here.



T/P correction submenu screen p. 83

←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ **For the unit to be set here, the measurement unit set in the pressure input unit setup (① Pressure input unit setup (UNIT) on page 57) is used. Make sure of the unit before you set up.**

6.4.11 Meter Factor Correction Setup (METER ERROR)

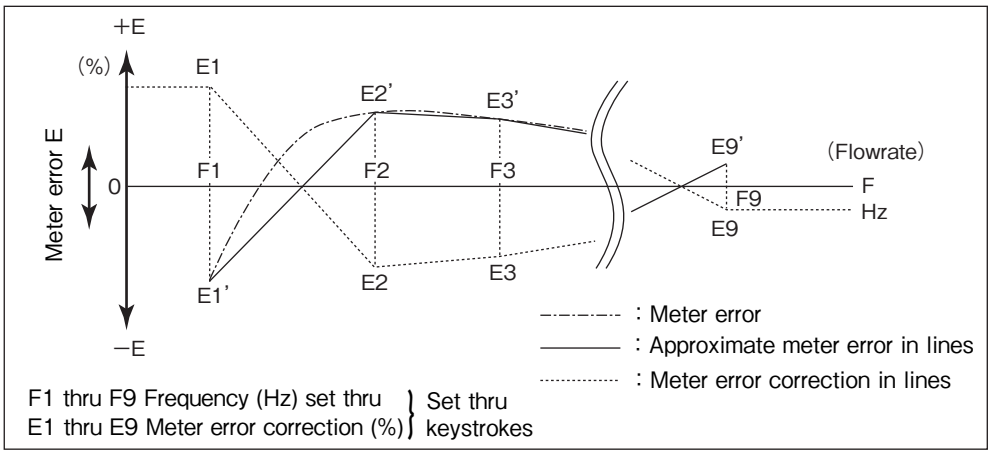
As the parameters associated with the meter error correction factors, the frequencies 1 through 9, constants (the correction type set to “CONSTANT”), and meter errors 1 through 9 (the correction type set to a line graph “POINT TO POINT”) are set here.

① Correction type set to a line graph (POINT TO POINT)

To correct the meter error curve of a given flowmeter, meter error corrections relative to input pulse frequencies are set. First, assume a line graph approximating the given meter error curve as shown below. From frequencies F1 through F9 at which line segments are partitioned and meter errors E1' through E9' at corresponding frequencies, target setpoints are determined.

Since these setpoints represent the meter error corrections desired, they are established as E1 through E9 with a negative sign added to E1' through E9'. Set F1 through F9 to positive integers. If an input pulse frequency falls short of F1, the meter error correction will always go to E1; if it exceeds F9, the correction will always go to E9.

If calibration points are less than 9, select the frequency next to the maximum point and its meter error as follows: Set that frequency at somewhere greater than the maximum frequency in the operating range (eg., 5000Hz); set the meter error to the same value as the maximum point chosen with all subsequent values set to zero.



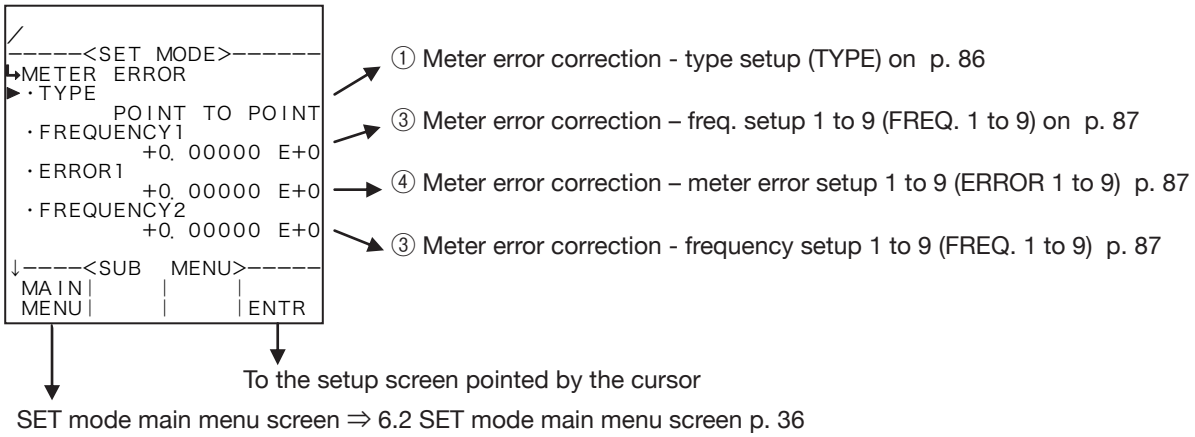
② Correction type set to a constant (CONSTANT)

To correct the meter error curve of a given flowmeter, meter error correction is set. Since the value to be set represents the meter error correction, set it with a negative sign added to the meter error.

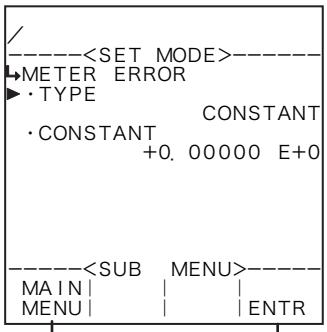
(1) Meter error correction submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired item setup screen.

① Correction type is of a broken line (POINT TO POINT).



② **Correction type set to a constant (CONSTANT)**



① Meter error correction - type setup (TYPE) p. 86

② Meter error correction - constants (CONSTANT) p. 86

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

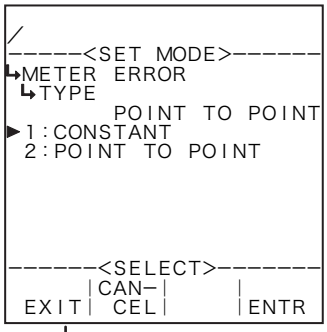
Conditions to show submenu items

Submenu item		
Correction type ※	Constant	Broken line
Constant (s)	Displayed	Hidden
Frequencies 1 to 9	Hidden	Displayed
Meter error 1 to 9	Hidden	Displayed

※ : Conditions for selecting on-screen information

① Meter error correction - type setup (TYPE)

The correction type of meter error correction factors is set up here.



←Correction type select

For details of option setup, see “(2) Option select setup screen (SELECT)”on page 46.

Select either POINT TO POINT or CONSTANT..

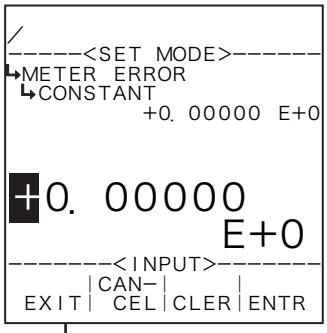
※ **Reminder: Depending on the menu selected, the items at the submenu vary.**

Meter error correction submenu screen p. 85

② Meter error correction -constant (CONSTANT)

With “CONSTANT” chosen for the correction type, constants are set up.

※ **The unit of values to be set up here (at this menu) is “%”. Make sure of the unit before you set up.**



←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

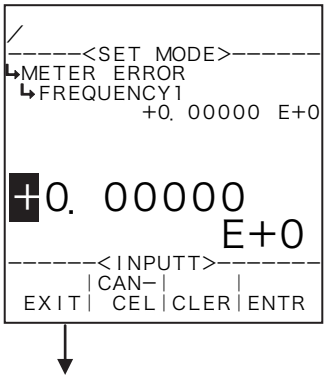
※ **In the SET mode, this item is not shown if the meter error correction - type setup (① Meter error type setup (TYPE) on page 86) is set to“POINT TO POINT”.**

Meter error correction submenu screen p. 85

③ Meter error correction - frequencies 1 thru 9 setup (FREQUENCY 1 thru 9)

When the correction type is set to a line graph “POINT TO POINT”, frequencies are set up here.

※ The measurement unit to be set here is “Hz”. Make sure of the unit before you set up.



←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

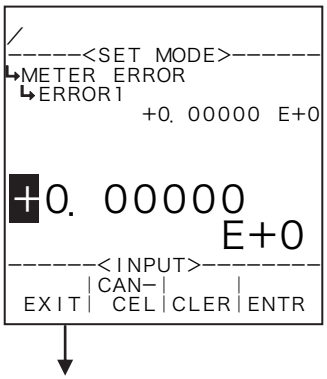
※ In the SET mode, this item is not shown if the meter error correction - type setup (① Meter error type setup (TYPE) on page 86) is set to “CONSTANT”.

Meter error correction submenu screen p. 85

④ Meter error correction - meter error 1 thru 9 setup (ERROR 1 thru 9)

With the correction type “POINT TO POINT” is chosen, meter errors 1 to 9 are set up here.

※ The measurement to be set here is “%”. Make sure of the unit before you set up.



←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

※ In the SET mode, this item is not shown if the meter error correction - type setup (① Meter error type setup (TYPE) on page 86) is set to “CONSTANT”.

Meter error correction submenu screen p. 85

6.4.12 Quadratic Correction Coefficients (QUADRATIC COMPEN)

As the parameters associated with quadratic correction factors, coefficients Pa, Pb, Pc, Ta, Tb, and Tc are set here.

＜Calculation Formula＞

$X = (Pa + Pb \times p + Pc \times p^2) \times (Ta + Tb \times t + Tc \times t^2)$

where p：Line pressure（MPa）

t ：Line temperature（℃）

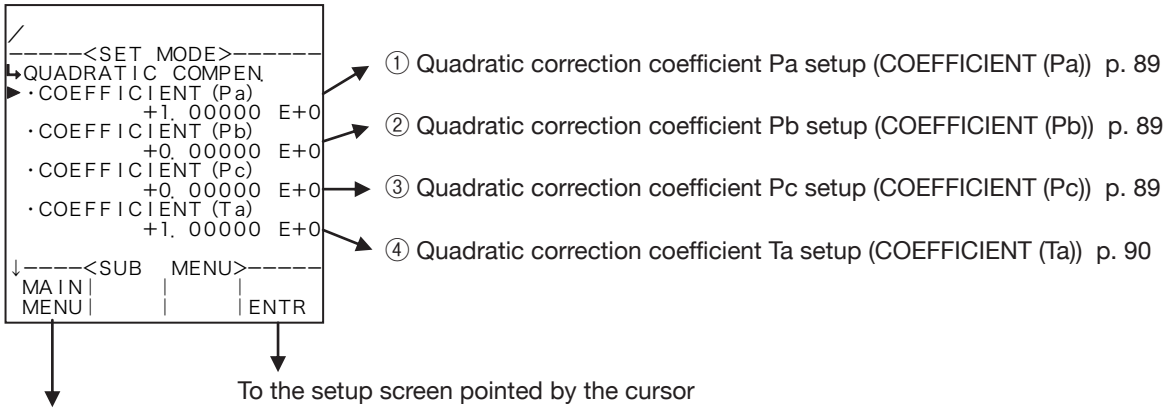
Pa to Pc：Coefficients for pressure

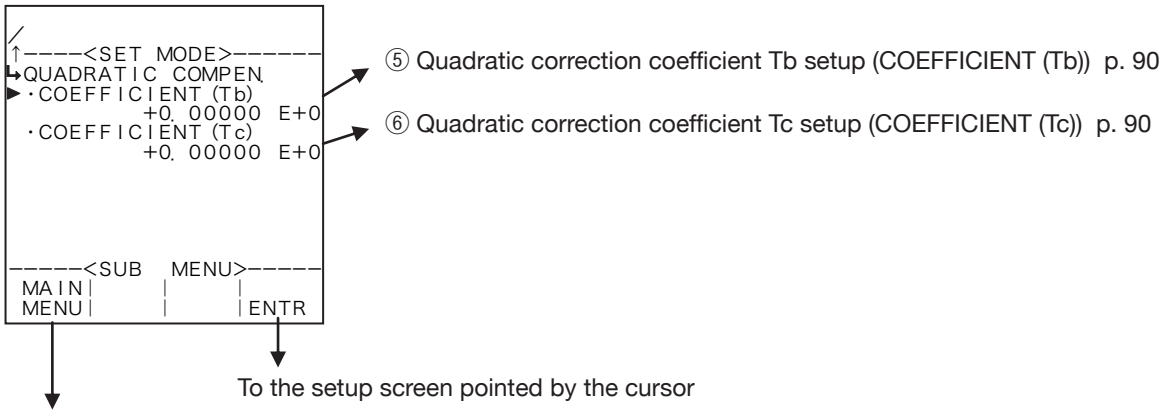
Ta to Tc：Coefficients for temperature

（1）Quadratic correction submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.

At the touch of function key “ENTR”, the screen switches to the desired setup item screen.

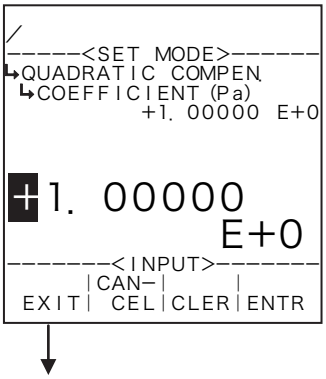




① Quadratic correction - coefficient Pa setup (COEFFICIENT (Pa))

Quadratic correction coefficient Pa is set up here.

※ The pressure unit for this coefficient is “MPa”.



←Numerical value input setup

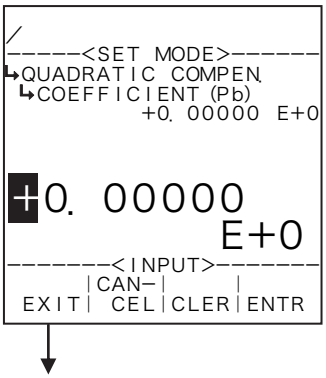
For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Quadratic correction submenu screen p. 88

② Quadratic correction - coefficient Pb setup (COEFFICIENT (Pb))

Quadratic correction coefficient Pb is set up here.

※ The pressure unit for this coefficient is “MPa”.



←Numerical value input setup

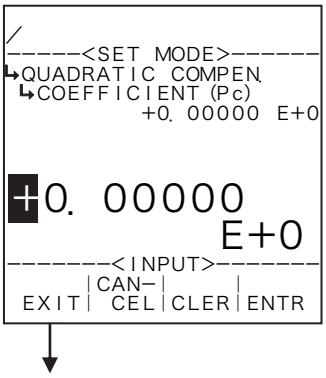
For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Quadratic correction submenu screen p. 88

③ Quadratic correction - coefficient Pc setup (COEFFICIENT (Pc))

Quadratic correction coefficient Pc is set up here.

※ The pressure unit for this coefficient is “MPa”.



←Numerical value input setup

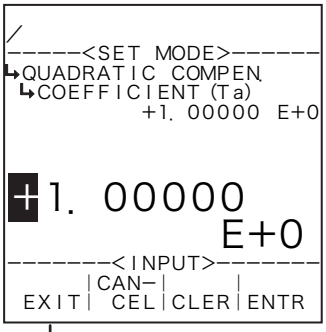
For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Quadratic correction submenu screen p. 88

④ Quadratic correction - coefficient Ta setup (COEFFICIENT (Ta))

Quadratic correction coefficient Ta is set up here.

※ The temperature unit for this coefficient is "°C".



←Numerical value input setup

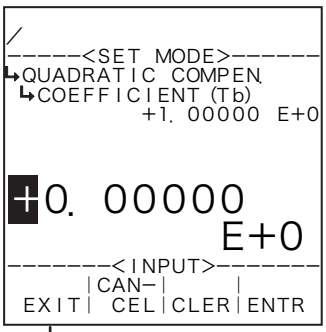
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

Quadratic correction submenu screen p. 88

⑤ Quadratic correction - coefficient Tb setup (COEFFICIENT (Tb))

Quadratic correction coefficient Tb is set up here.

※ The temperature unit for this coefficient is "°C".



←Numerical value input setup

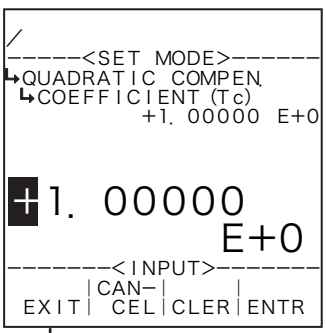
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

Quadratic correction submenu screen p. 88

⑥ Quadratic correction - coefficient Tc setup (COEFFICIENT (Tc))

Quadratic correction coefficient Tc is set up here.

※ The temperature unit for this coefficient is "°C".



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

Quadratic correction submenu screen p. 88

6.4.13 Saturated Steam Density Setup (SPEC. WEIGHT (SAT))

As the parameters associated with the density of saturated steam, their measurement units are set up here.

※ The units to be set here are on-screen units in the RUN mode, and they by no means affect calculation and other settngs.

＜Calculation Formula＞

$K = a + bP + cP^2$

where P ：Abs. Press.（P ＝ P'+0.101325）

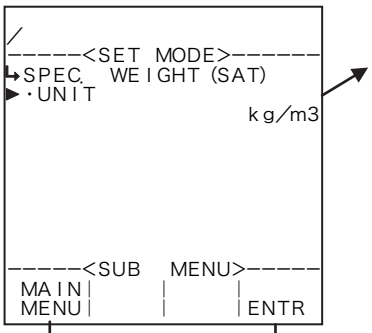
P'：Line pressure（MPa）

a to c ：Coefficients for pressure (constants)

(1) Saturated steam density submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.

At the touch of function key “ENTR”, the screen switches to the desired item setup screen.



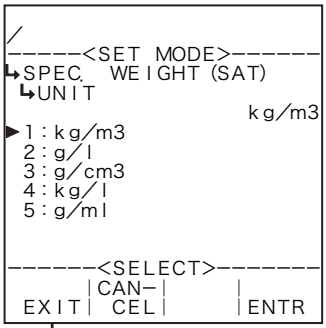
① Saturated steam density unit setup (UNIT) p. 91

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Saturated steam density unit setup (UNIT)

Saturated steam density unit is set up here.



←Unit option select setup

For details of selecting options setup, see “(2) Option select setup screen (SELECT)” on page 46.

The unit you can choose from are “kg/m^3 ”, “g/l”, “g/cm^3 ”, “kg/l”, and or “g/ml”.

※ The unit to be set is that of the density displayed in the RUN mode.

※ Depending on the unit chosen here, the numerical format (number of decimal places) of relative density (specific weight) shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.

Quadratic correction submenu screen p. 88

Number of decimal places for each unit

Unit	Number of decimal places
kg/m^3	4
g/l	6
g/cm^3	4
kg/l	6
g/ml	6

6.4.14 Superheated Steam Density Setup (SPEC. WEIGHT (SUP))

As the parameters associated with the density of superheated steam, their measurement units are set up here.

※ The units to be set here are on-screen units in the RUN mode, and they by no means affect calculation and other settngs.

＜Calculation Formula＞

$$K = \frac{1}{a + bT + cT^2}, \quad a = \alpha_1 + \frac{\beta_1}{P} + \frac{\gamma_1}{P^2}, \quad b = \alpha_2 + \frac{\beta_2}{P} + \frac{\gamma_2}{P^2}, \quad c = \text{Constant}$$

where T ：Temperature（℃）

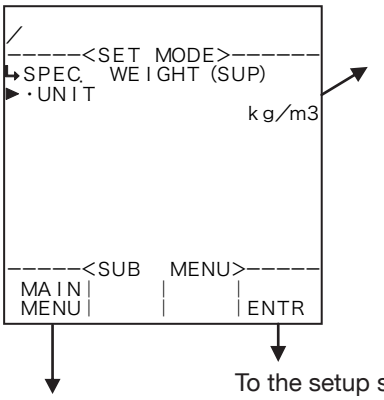
P ：Abs. pressure（P＝P'+0.101325）

P'：Line pressure（MPa）

α, β, γ ：Coefficients for pressure

(1) Superheated steam density submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired item setup screen.



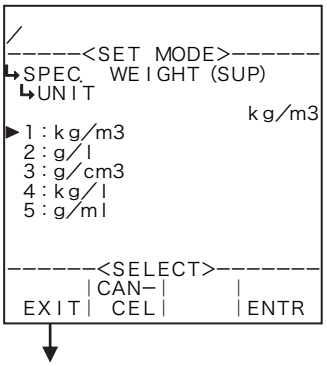
① Superheated steam density unit setup (UNIT) p. 92

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Superheated steam density unit setup (UNIT)

The unit for superheated steam density calculation is set up here.



←Unit option select setup

For details of selecting options setup, see “(2) Option select setup screen (SELECT)” on page 46.

The unit you can choose from are “kg/m³ ”, “g/l”, “g/cm³ ”, “kg/l”, and or “g/ml”.

※ The unit to be set is that of the density displayed in the RUN mode.

※ Depending on the unit chosen here, the numerical format (number of decimal places) of relative density (specific weight) shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.

Superheated steam density submenu screen p. 92

Number of decimal places for each unit

Unit	Number of decimal places
kg/m³	4
g/l	6
g/cm³	4
kg/l	6
g/ml	6

6.4.15 Saturated Steam Specific Enthalpy Setup (SPEC. ENTHALPY (SAT))

As the parameters associated with saturated steam specific enthalpy calulation, their measurement units are set up here.

※ **The units to be set here are on-screen units in the RUN mode, and they by no means affect calculation and other settings.**

＜Calculation Formula＞

$K = a + b \cdot P + c \cdot P^2$

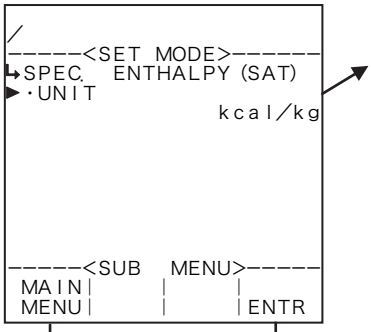
P ：Abs. press.（P＝P'+0.101325）

P'：Line pressure（MPa）

a, b, c：Coefficients for pressure

（1）Saturated steam specific enthalpy submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired item setup screen.



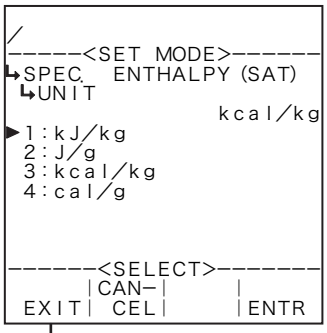
① Saturated steam specific enthalpy unit setup (UNIT) on page 93

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Saturated steam specific enthalpy unit setup (UNIT)

The unit for saturated steam specific enthalpy calculation is selected here.



←Unit option select setup

For details of options setup, see “(2) Option select setup screen (SELECT)” on page 46.

The units you can choose from are “kJ/kg”, “J/g”, “kcal/kg”, and or “cal/g”.

※ **The unit to be set is that of the density displayed in the RUN mode.**

※ **Depending on the unit chosen here, the numerical format (number of decimal places) of relative density (specific weight) shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.**

Saturated steam sp. enthalpy submenu screen p. 93

Number of decimal places for each unit

Unit	Number of decimal places
kJ/kg	2
J/g	2
kcal/kg	3
cal/g	3

6.4.16 Superheated Steam Specific Enthalpy Setup (SPEC. ENTHALPY (SUP))

As the parameters associated with the specific ethalpy of superheated steam, their measurement units are set up here.

※ The units to be set here are on-screen units in the RUN mode, and they by no means affect calculation and other settings.

＜Calculation Formula＞

$K = a + bT$

where a, b : Coefficients for temperature

$a = \alpha_1 + \beta_1 \cdot P + \gamma_1 \cdot P^2$、 $b = \alpha_2 + \beta \cdot P + \gamma_2 \cdot P^2$

T : Temperature (℃)

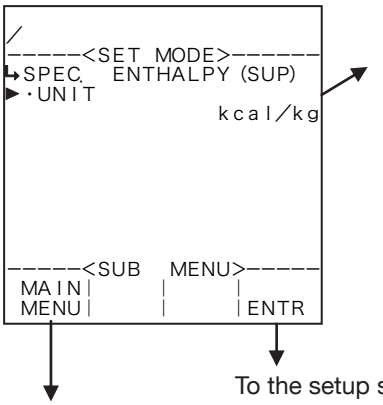
P : Abs. pressure (P = P'+0.101325)

P' : Line pressure (MPa)

α, β, γ : Coefficients for pressure

(1) Superheated steam specific enthalpy submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired item setup screen.



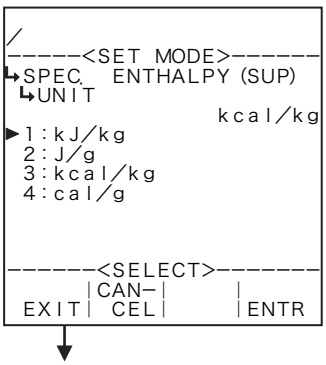
① Superheated steam specific enthalpy unit setup (UNIT) p. 94

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Superheated steam density unit setup (UNIT)

The unit for superheated steam specific enthalpy calculation is set up here.



←Unit option select setup

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

The unit you can choose from are "kJ/kg","J/g","kcal/kg", and or "cal/g".

※ The unit to be set is that of the specific enthalpy displayed in the RUN mode.

※ Depending on the unit chosen here, the numerical format (number of decimal places) of specific enthalpy shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.

Superheated steam specific enthalpy submenu screen

Number of decimal places for each unit

Unit	Number of decimal places
kJ/kg	2
J/g	2
kcal/kg	3
cal/g	3

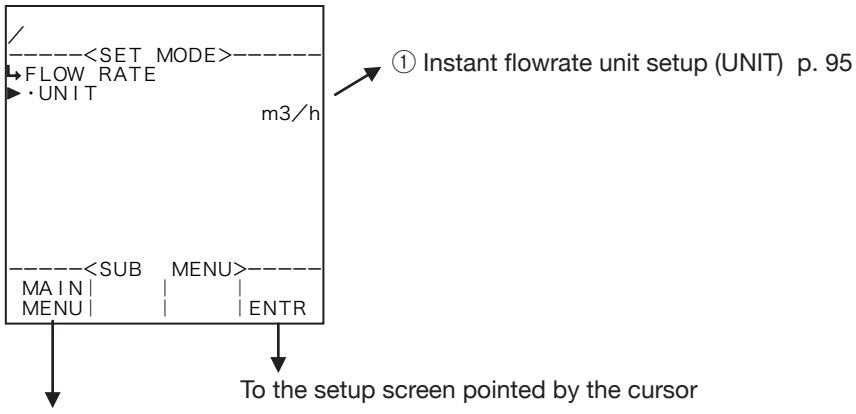
6.4.17 Instant Flowrate Calculation Setup (FLOW RATE)

Parameters associated with instant flowrate computation are set up here.

※ The item to be set at this window applies to the instant flowrate indicated, not to the instant flowrate calculation of analog output. The analog output is configured in the "ANALOG OUTPUT" of the RUN mode.

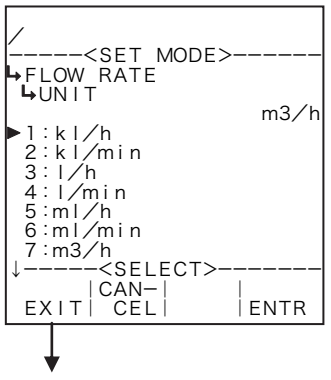
(1) Instant flowrate submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired item setup screen.



① Instant flowrate unit setup (UNIT)

The unit for Instant flowrate calculation is set up here.



←Unit option select setup

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

The unit you can choose from are "kJ/kg","J/g","kcal/kg", and or "cal/g".

※ The unit to be set is that of the Instant flowrate displayed in the RUN mode.

※ Options shown on the screen differ from model to model.

・Available measurement units

Model	Instant flowrate	Unit options available
EL4101	“FLOW RATE”：Corrected instant mass flowrate	kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, lb/min
EL4111	“FLOW RATE”：Corrected instant mass flowrate	kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, lb/min
EL4121	“FLOW RATE”：Uncorrected instant flowrate	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min
	“FLOW RATE (C)”：Corrected instant flowrate	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min, kl/h(nor), kl/min(nor), l/h(nor), l/min(nor), ml/h(nor), ml/min(nor), m^3/h(nor), m^3/min(nor), kl/h(std), kl/min(std), l/h(std), l/min(std), ml/h(std), ml/min(std), m^3/h(std), m^3/min(std)
EL4131	“FLOW RATE”：Uncorrected instant flowrate	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min
	“FLOW RATE (C)”：Corrected instant flowrate	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min, kl/h(C), kl/min(C), l/h(C), l/min(C), ml/h(C), ml/min(C), m^3/h(C), m^3/min(C)
EL4201	“FLOW RATE”：Uncorrected instant flowrate	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min
	“FLOW RATE (C)”：Corrected instant mass flowrate	kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, lb/min
EL4211	“FLOW RATE”：Uncorrected instant flowrate	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min
	“FLOW RATE (C)”：Corrected instant mass flowrate	kg/h, kg/min, g/h, g/min, t/h, t /min, lb/h, lb/min
EL4311	“FLOW RATE”：Instant mass flowrate	kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, lb/min
	“FLOW RATE (SOLID)”：Instant solids content flowrate	kg/h, kg/min, g/h, g/min, t/h, t/min, lb/h, l b/min
EL4401	“FLOW RATE (C)”：Corrected instant flowrate	kl/h, kl/min, l/h, l/min, ml/h, ml/min, m^3/h, m^3/min, kl/h(nor), kl/min(nor), l/h(nor), l/min(nor), ml/h(nor), ml/min(nor), m^3/h(nor), m^3/min(nor), kl/h(std), kl/min(std), l/h(std), l/min(std), ml/h(std), ml/min(std), m^3/h(std), m^3/min(std)

6.4.18 Temperature Compensation Setup (TEMP. COMPEN.)

As the parameters associated with coefficients of temperature compensation, coefficients a, b, and c are set up here.

※ **These settings are used only in Models EL4131 and EL4211. The settings are not shown in other models.**

＜Calculation Formula＞

$$K = \{ a + b \cdot (to - t) + c \cdot (to - t)^2 \}$$

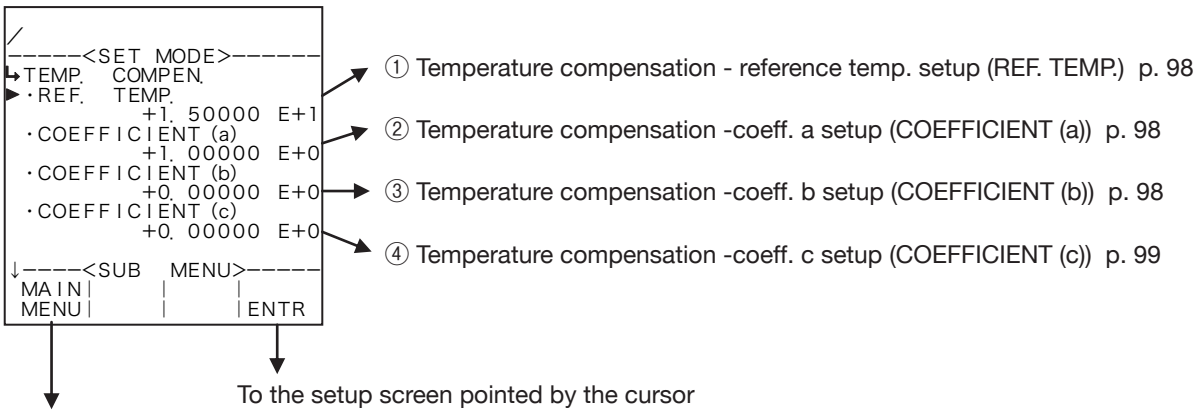
to：Reference temperature（℃）

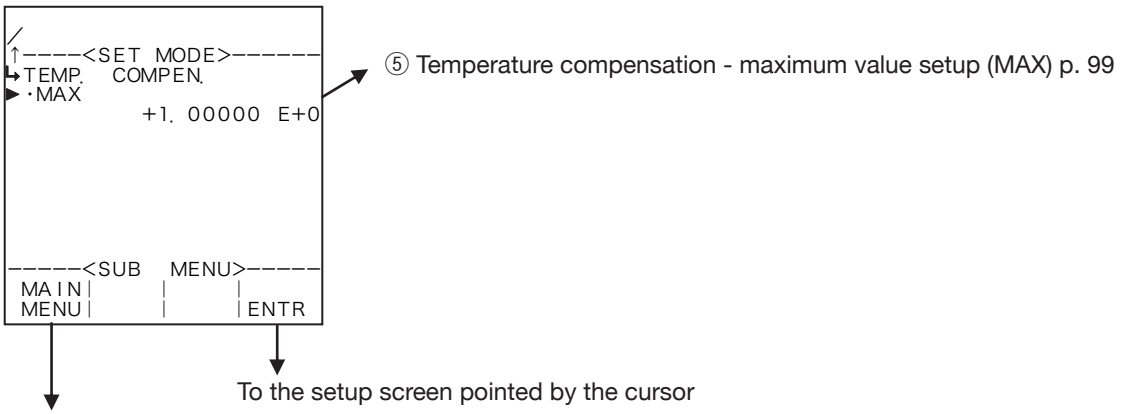
t ：Line temperature（℃）

a , c ：Correction factors

（1） Temperature compensation submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired setup item screen.

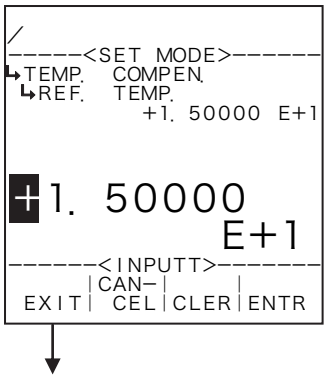




① Temperature compensation - reference temperature setup (REF. TEMP.)

The reference temperature of temperature compensation coefficient is up here.

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

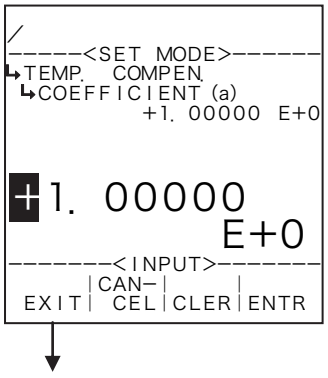
※ In the SYS mode, this item is not shown unless the temperature input type (① Temperature input type setup (TYPE) on page 154) is set to "NONE".

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

Temp. compensate submenu screen p. 97

② Temperature compensation - coefficient a setup (COEFFICIENT (a))

Coefficient a of temperature compensation coefficient is set here.



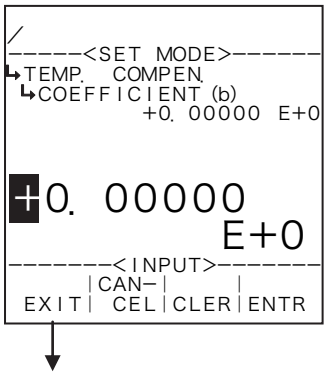
←Numerical value setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

Temp. compensate submenu screen p. 97

③ Temperature compensation - coefficient b setup (COEFFICIENT (b))

Coefficient b of temperature compensation coefficient is set here.



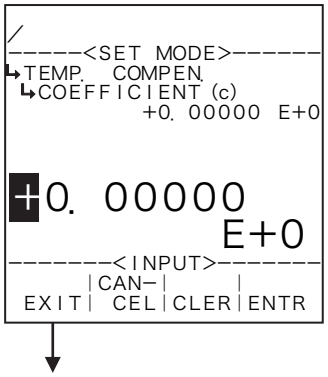
←Numerical value setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

Temp. compensate submenu screen p. 97

④ Temperature compensation - coefficient c setup (COEFFICIENT (c))

Coefficient c of temperature compensation coefficient is set here.



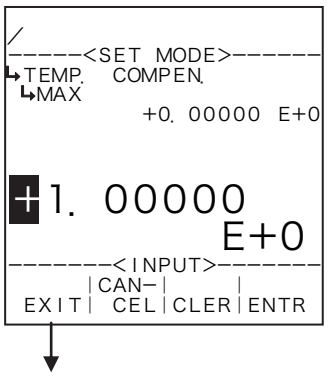
←Numerical value setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Temp. compensate submenu screen p. 97

⑤ Temperature compensation - maximum value setup (MAX)

The maximum value of temperature compensation is set here.



←Numerical value setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Temp. compensate submenu screen p. 97

6.4.19 Density Setup (mass conversion factor) (DENSITY)

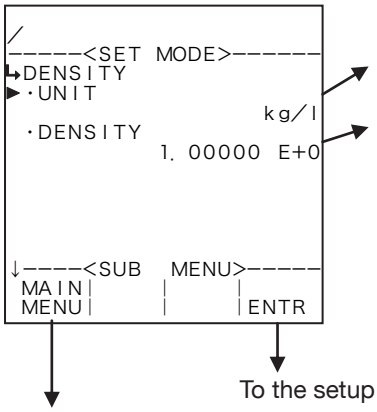
Density and (its) density unit are set up here.

※ **These settings are used only in Models EL4201 and EL4211. The settinge are not shown in other models.**

(1) Density setup submenu screen

At the submenu, move the cursor to the desired setup item with the up arrow and down arrow keys.

At the touch of (the) function key “ENTR”, the screen switches to the desired item setup screen.



① Density unit setup (UNIT) on p. 100

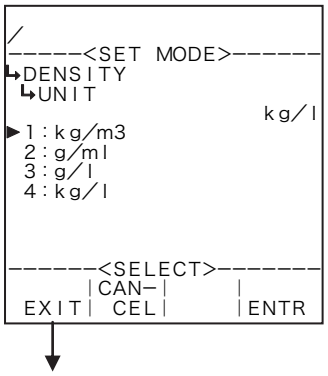
② Density (DENSITY) on p. 101

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Density unit setup (UNIT)

The measuring unit in density setup is selected here.



←Unit option select setup

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

The unit you can choose from are “kg/m^3 ”, “g/ml”, “g/l”, and or “kg/l”.

※ **As the measurement unit is changed, the current value (density) is converted automatically to read in the new measurement unit chosen.**

※ **The unit to be set here is that of the density displayed in the RUN mode and of the density setup in the SET mode.**

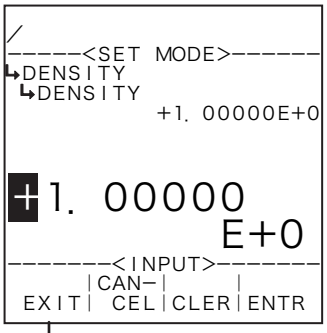
Density setup submenu screen p. 100

Number of decimal places for each unit

EL4201		EL4211	
Unit	No. of decimal places	Unit	No. of decimal places
kg/m^3	4	kg/m^3	1
g/ml	6	g/ml	4
g/l	4	g/l	1
kg/l	6	kg/l	4

② Density (DENSITY)

Density is set up here.



Density setup submenu screen p. 100

←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the density unit setup (① Density unit setup (UNIT) on page 100) is used. Make sure of the unit before you set up.

6.4.20 Density Calculation Setup (DENSITY PARAMETER), EL4301

Along with the parameters associated with density calculation, the alarm points and fallback levels for the corrected density are set up here.

※ **These settings are used only in Model EL4301. They are not shown in other models.**

＜Calculation Formula＞

$$D_x = (D_w - D_a)\left[\frac{T_x^2(1-\alpha t_x) - T_a^2(1-\alpha t_a)}{T_w^2(1-\alpha t_w) - T_a^2(1-\alpha t_a)}\right] + D_a$$

D_x : Uncorrected density　　T_x : Density period

D_w : Density with water　　D_a : Density with air

T_w : Density period with air　　T_a : Density period with air

t_w : Water temp. during calib. with water　　t_x : Line temperature

t_a : Air temperature during calibration

α : Temperature compensation for tube spring constant

$$D_{xC} = D_x + \beta(t_x - t_0)$$

D_{xC} : Corrected density

β : Reference temperature conversion factor of density　　t_0 : Reference temp. for temp. compensation

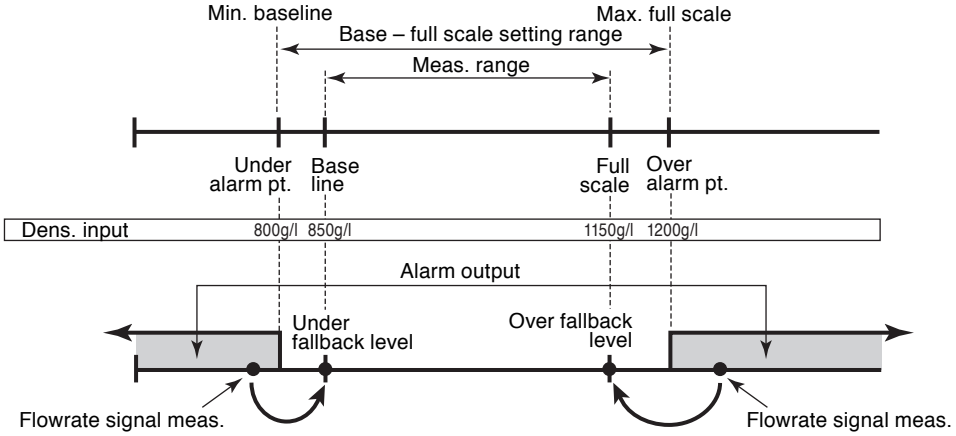
$$\%\,\text{MASS} = \frac{D_4(D_{XC} - D_3)}{D_{XC}(D_4 - D_3)} \times 100\%$$

%MASS : Concentration of solids content proportion in terms of weight

D_3 : Density of carrier fluid　　D_4 : Density of target fluid

Density displayed in the RUN mode is shown in the measuring range where its high limit is at the over alarm point while its low limit is at the under alarm point, corresponding to the input. If the input exceeds or falls short of this range, the over or under alarm point is shown.

Example Measurement units (UNIT) : g/l
Under alarm point (UNDER ALARM POINT) : 800g/l
Over alarm point (OVER ALARM POINT) : 850g/l
Under fallback level (UNDER FALLBACK) : 1150g/l
Over fallback level (OVER FALLBACK) : 1200g/l



Conditions to show submenu items

Submenu item		
Input type in the SYS mode ※	None	Pulse input
Unit	Displayed	Displayed
Constant	Displayed	Hidden
Baseline	Hidden	Displayed
Full scale	Hidden	Displayed
Under alarm point	Hidden	Displayed
Over alarm point	Hidden	Displayed
Under fallback level	Hidden	Displayed
Over fallback level	Hidden	Displayed
Reference temperature setup	Displayed	Displayed
Density with air	Hidden	Displayed
Air temperature during calibration	Hidden	Displayed
Density period with air	Hidden	Displayed
Density with water	Hidden	Displayed
Water temperature during calibration	Hidden	Displayed
Density period with water	Hidden	Displayed
Temp. comp. Coeff. of tube spring const.	Hidden	Displayed
Reference temperature conversion factor of density	Displayed	Displayed
Density of carrier fluid	Displayed	Displayed
Density of target fluid	Displayed	Displayed

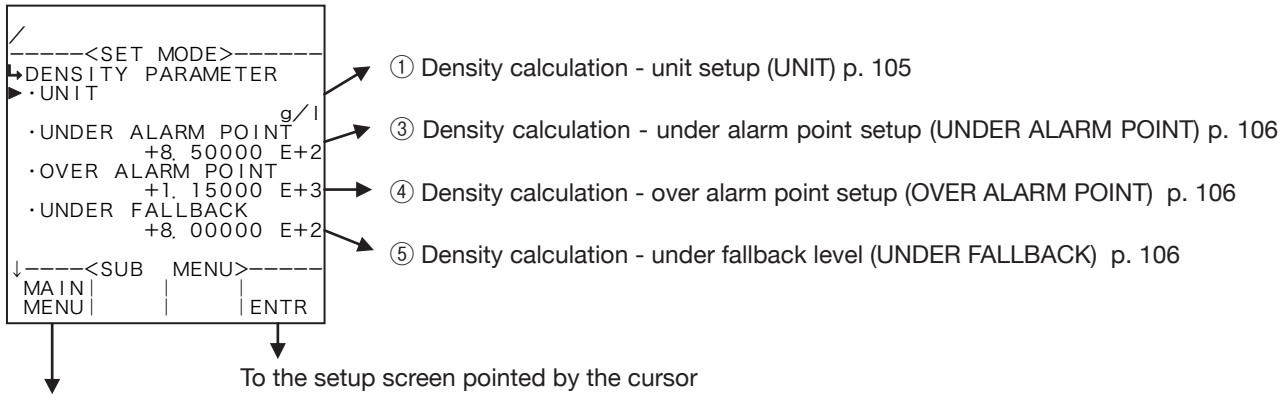
※：Conditions for selecting on-screen information

(1) Density calculation setup submenu screen

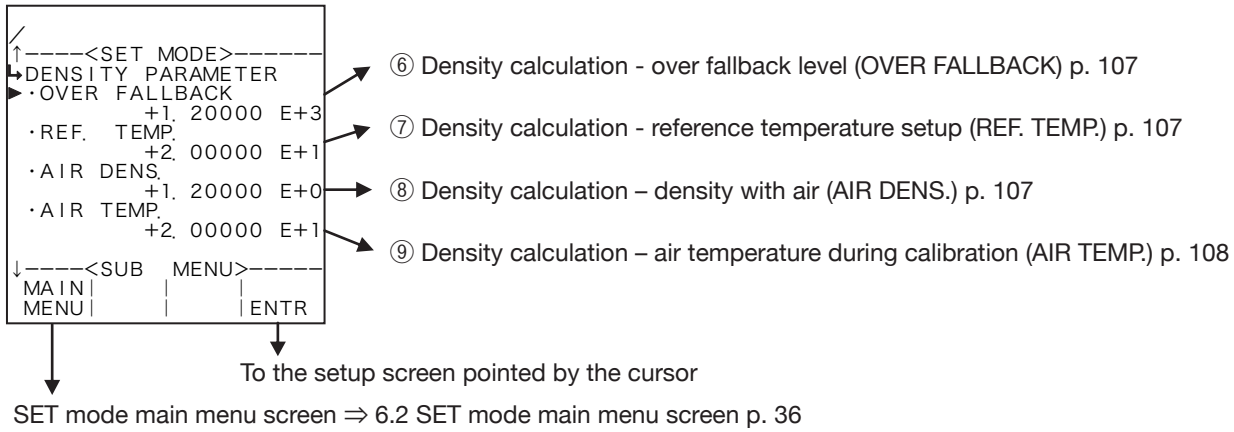
At the submenu, move the cursor to the desired setup item with the up and down arrow keys.

At the touch of function key “ENTR”, the screen switches to the desired item setup screen.

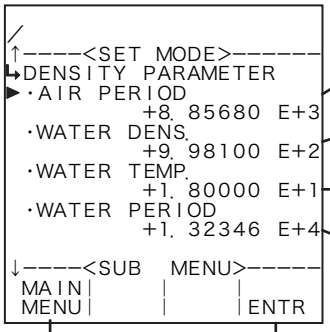
① Density pulse input



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑩ Density calculation - density period with air (AIR PEIOD) p. 108

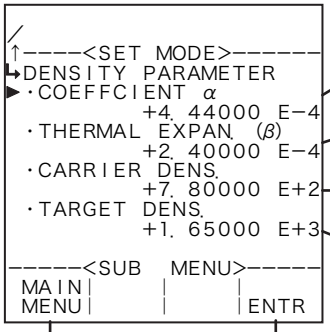
⑪ Density calculation - density with water (WATER DENS.) p. 108

⑫ Density calculation - water temp. during calibration (WATER TEMP.) p. 109

⑬ Density calculation - dens. period with water (WATER PERIOD) p. 109

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑭ Density calculation - temp. compensate. coeff. for tube spring const. (COEFFICIENT α.) p. 109

⑮ Density calculation - reference temperature conversion factor of density (THERMAL EXPAN. (β)) p. 110

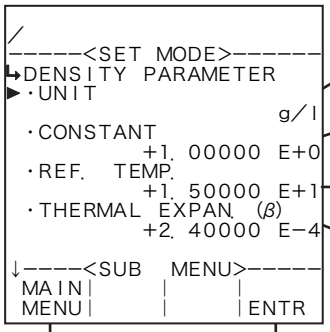
⑯ Density calculation - density of carrier fluid (CARRIER DENS.) p. 110

⑰ Density calculation - density of target fluid (TARGEET DENS.) p. 110

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

②Constants are selected



① Density calculation - unit setup (UNIT) p. 105

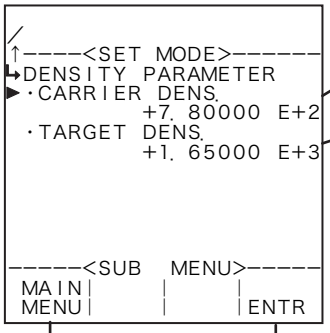
② Density calculation - constants (CONSTNAT) p. 105

⑦ Density calculation - reference temp. setup (REF. TEMP.) p. 107

⑮ Density calculation - reference temperature conversion factor of density (THERMAL EXPAN. (β)) p. 110

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑯ Density calculation - density of carrier fluid (CARRIER DENS.) p. 110

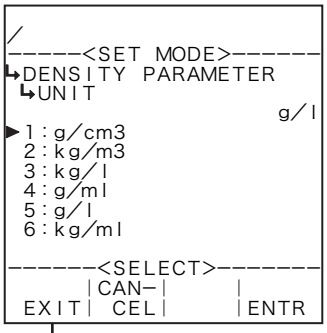
⑰ Density calculation - density of target fluid (TARGET DENS.) p. 110

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Density calculation - unit setup (UNIT)

Density units are chosen here.



←**Unit option select setup**

For details of selecting options setup, see “(2) Option select setup screen (SELECT)” on page 46.

The unit you can choose from are “g/cm³”,“kg/m³”,“kg/l”,“g/ml”,“g/l”, and or “g/ml”.

※ As the measurement unit is changed, the current value (density) is converted automatically to read in the new measurement unit chosen.

※ The unit to be set here is that of the uncorrected and corrected density displayed in the RUN mode and of the density to be set in density calculation in the SET mode.

Density calculation setup submenu screen p. 103

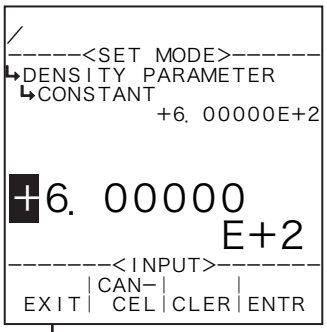
Number of decimal places for each unit

Unit	Number of decimal places
g/cm³	4
kg/m³	1
kg/l	4
g/ml	4
g/l	1
kg/ml	6

② Density calculation - constant (CONSTANT)

In the density input in the SYS mode, when the input type is set to NONE, constants are set.

※ Constants are fixed values set internally in the equipment contrary to the measurements of external input.



←**Numerical value input setup**

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

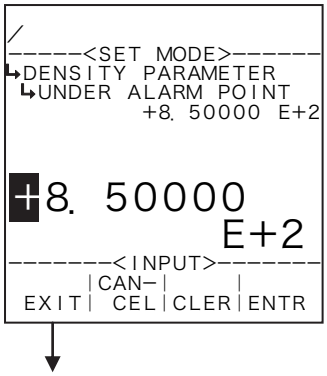
※ In the density input in the SYS mode, this item is not shown unless the input type is set to NONE.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (TYPE) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

③ Density calculation - under alarm point setup (UNDER ALARM POINT)

The under alarm point with respect to the corrected density is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

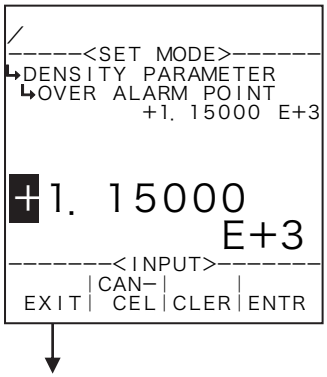
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

④ Density calculation - over alarm point setup (OVER ALARM POINT)

The over alarm point with respect to the corrected density is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

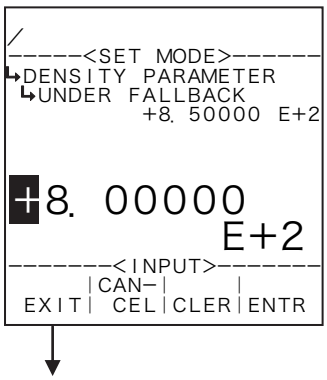
※ IIn SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (TYPE) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑤ Density calculation - under fallback level setup (UNDER FALLBACK)

The under fallback level with respect to the corrected density is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

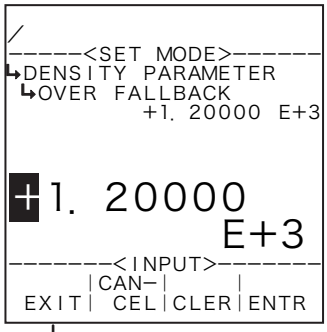
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑥ Density calculation - over fallback level setup (OVER FALLBACK)

The over fallback level with respect to the corrected density is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

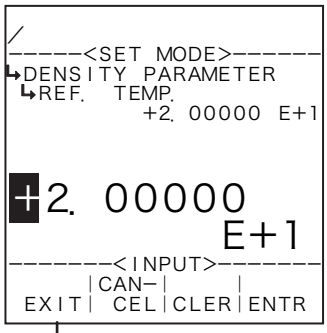
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑦ Density calculation - reference temperature setup (REF. TEMP.)

The reference temperature for temperature compensation is set up here.



←Numerical value input setup

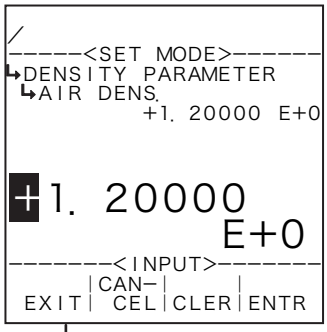
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the temperature unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑧ Density calculation - density with air (AIR DENS.)

The density of air during calibration for density calculation is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

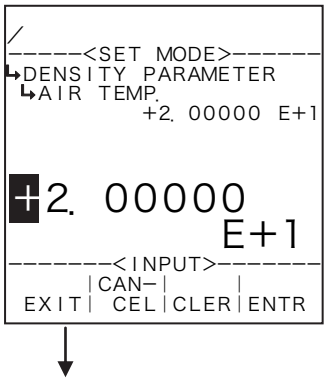
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑨ Density calculation - air temperature during calibration (AIR DENS.)

The density of air during calibration for density calculation is set up here.



←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

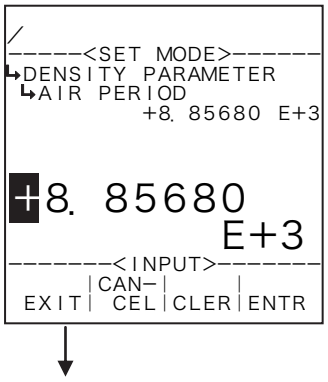
※ IIn SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the temperature unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑩ Density calculation - density period with air (AIR PERIOD)

The density period with air for density calculation is set up here.



←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

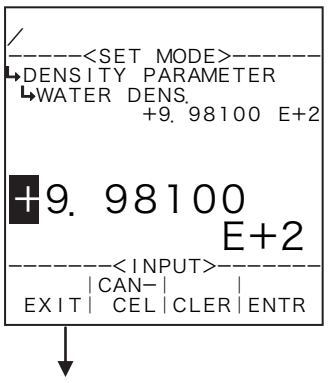
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density pulse unit setup (① Density pulse input unit setup (UNIT) on page 72) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑪ Density calculation - density with water (WATER DENS.)

The density with water for density calculation is set up here.



←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

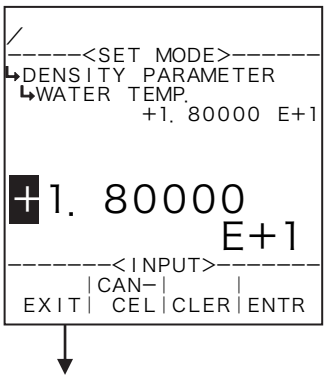
※ IIn SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the unit setup in density calculation unit setup (① Density calculation input unit setup (UNIT) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑫ Density calculation - water temperature during calibration (WATER TEMP.)

The water temperature for density calculation is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

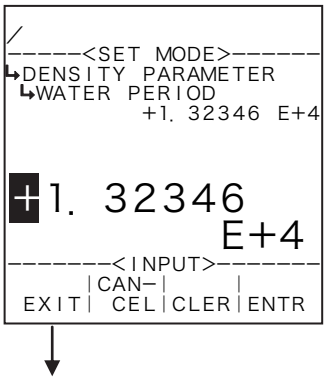
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the temperature unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑬ Density calculation - density period with water (WATER PERIOD)

The density period with water for density calculation is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

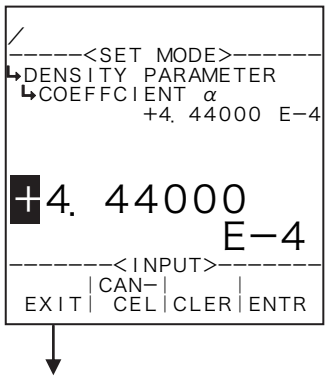
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density pulse unit setup (① Density pulse input unit setup (UNIT) on page 72) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑭ Density calculation - temp. compensation coefficient of tube spring constant (COEFFICIENT (α))

The density of air during calibration for density calculation is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

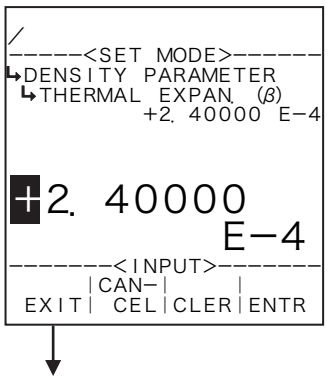
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ The measuring unit to be set here is "%/°C". Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑮ Density calculation - reference temperature conversion factor of density (THERMAL EXPAN. (β))

The reference temperature conversion factor of density for temperature correction is set up here.



←Numerical value input setup

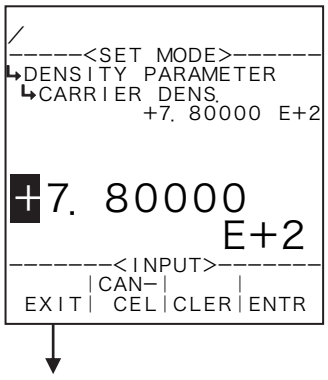
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ The measurement unit to be set here is "g/ml/°C". Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑯ Density calculation - density of carrier fluid (CARRIER DENS.)

The carrier fluid density for calculation of solids content in terms of weight concentration is set up here.



←Numerical value input setup

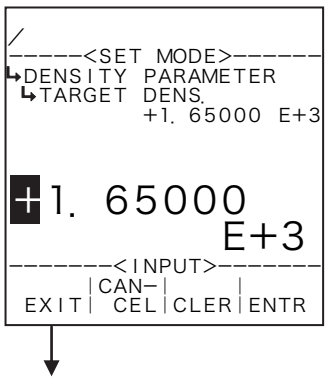
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

⑰ Density calculation - density of target fluid (TARGET DENS.)

The target fluid density for calculation of solids content in terms of weight concentration is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 105) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 103

6.4.21 Density Calculation Setup (DENSITY PARAMETER), EL4311

Along with density calculation associated values, alarm points and fallback levels with respect to the corrected density are set up here.

※ **These settings are used only in Model EL4311. They are not shown in other models.**

＜Calculation Formula＞

$$D_x = (D_w - D_\alpha)\left[\frac{T_x^2(1-\alpha t_x) - T_\alpha^2(1-\alpha t_\alpha)}{T_w^2(1-\alpha t_w) - T_\alpha^2(1-\alpha t_\alpha)}\right] + D_\alpha$$

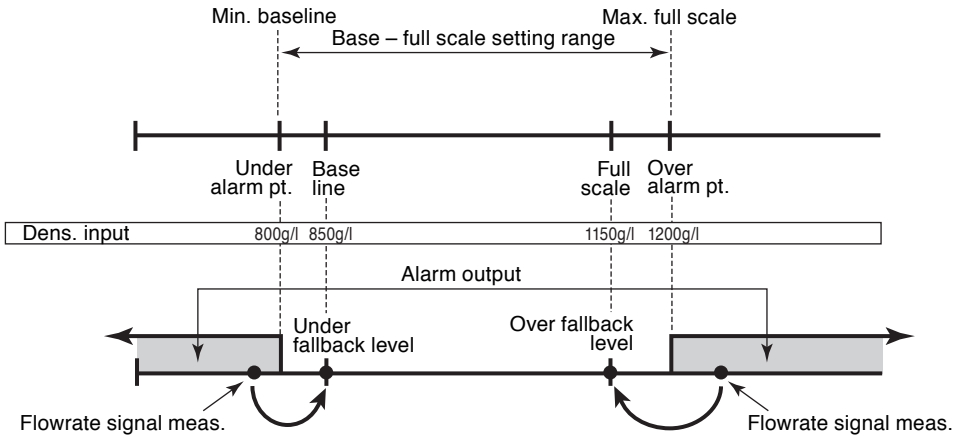
D_x : Uncorrected density
T_x : Density period
D_w : Density with water
D_a : Density with air
T_w : Density period with water
T_a : Density period with air
t_w : Water temperature during calibration
t_x : Line temperature
t_a : Air temperature during calibration
α : Temperature compensation for tube spring constant

$$D_{xc} = D_x + \beta(t_x - t_0)$$

D_{xc} : Corrected density
β : Reference temperature conversion factor of density
t_0 : Ref. temp. for temp. compensation

Corrected density displayed in the RUN mode is shown in the measuring range where its high limit is at the over alarm point while its low limit is at the under alarm point, corresponding to the input. If the input exceeds or falls short of this range, the over or under alarm point is shown.

Example Measurement units (UNIT): g/l
Under alarm point (UNDER ALARM POINT) : 800g/l
Over alarm point (OVER ALARM POINT) : 850g/l
Under fallback level (UNDER FALLBACK) : 1150g/l
Over fallback level (OVER FALLBACK) : 1200g/l



Conditions to show submenu items

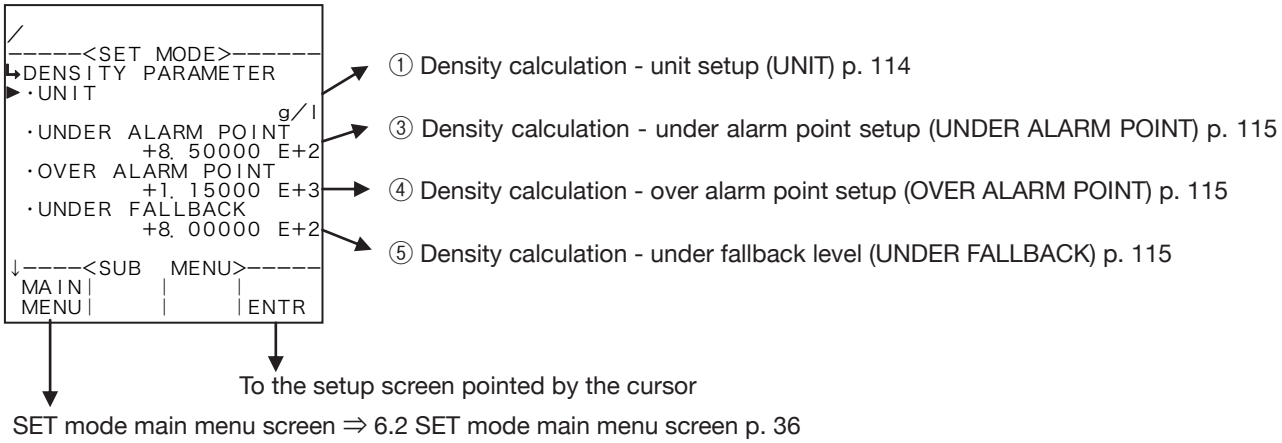
Submenu item		
Input type in the SYS mode ※	None	Pulse input
Unit	Displayed	Displayed
Constant	Displayed	Hidden
Baseline	Hidden	Displayed
Full scale	Hidden	Displayed
Under alarm point	Hidden	Displayed
Over alarm point	Hidden	Displayed
Under fallback level	Hidden	Displayed
Over fallback level	Hidden	Displayed
Reference temperature setup	Displayed	Displayed
Density with air	Hidden	Displayed
Air temperature during calibration	Hidden	Displayed
Density period with air	Hidden	Displayed
Density with water	Hidden	Displayed
Water temperature during calibration	Hidden	Displayed
Density period with water	Hidden	Displayed
Temp. comp. coeff. of tube spring const.	Hidden	Displayed
Reference temp. conversion factor of density	Displayed	Displayed

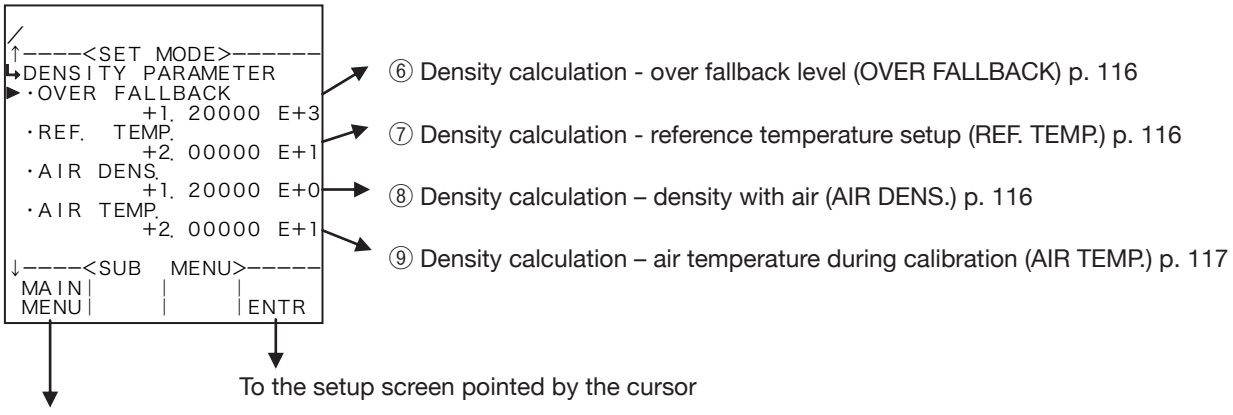
※：Conditions for selecting on-screen information

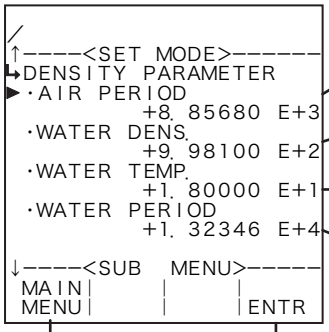
(1) Density calculation setup submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of (the) function key “ENTR”, the screen switches to the desired item setup screen.

① Density pulse input







⑩ Density calculation - density period with air (AIR PEIOD) p. 117

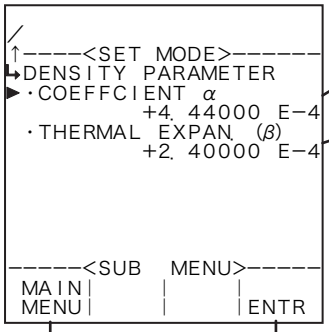
⑪ Density calculation - density with water (WATER DENS.) p. 117

⑫ Density calculation - water temp. during calibration (WATER TEMP.) p. 118

⑬ Density calculation - density period with water (WATER PERIOD) p. 118

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



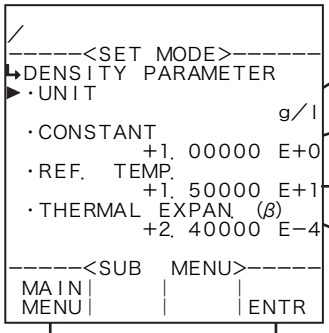
⑭ Density calculation - temp. compensate. coeff. of tube spring const. (AIR TEMP.) p. 118

⑮ Density calculation -reference temperature conversion factor of density (THERMAL EXPAN. (β)) p. 119

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

② Constants are selected



① Density calculation - unit setup (UNIT) p. 114

② Density calculation - constant (CONSTNAT) p. 114

⑦ Density calculation - reference temperature setup (REF. TEMP.) p. 116

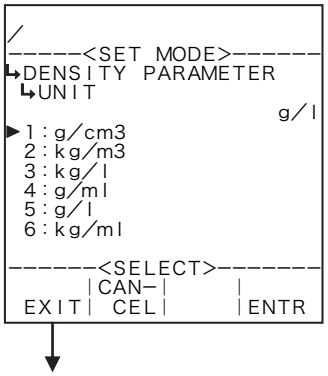
⑮ Density calculation - reference temperature conversion factor of density (THERMAL EXPAN. (β)) on page 119

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Density calculation - unit setup (UNIT)

Density units are chosen here.



←**Unit option select**

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

The unit you can choose from are "g/cm³","kg/m³","kg/l","g/ml","g/l", and "kg/ml".

※ **As the measurement unit is changed, the current value (density) is converted automatically to read in the new measurement unit chosen.**

※ **The unit to be set here is that of the uncorrected and corrected density displayed in the RUN mode and of the density to be set in density calculation in the SET mode.**

Density calculation setup submenu screen p. 112

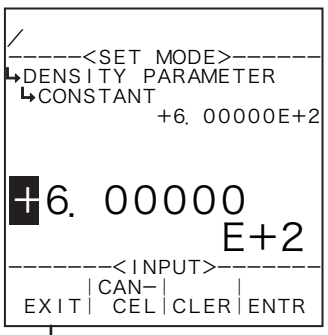
Number of decimal places for each unit

Unit	Number of decimal places
g/cm³	4
kg/m³	1
kg/l	4
g/ml	4
g/l	1
kg/ml	6

② Density calculation - constant (CONSTANT)

In the density input in the SYS mode, when the input type is set to NONE, constants are set.

※ **Constants are fixed values set internally in the equipment contrary to the measurements of external input.**



←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

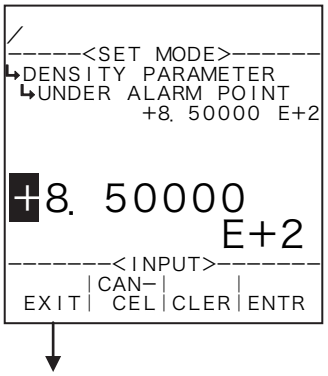
※ **In the density input in the SYS mode (① Density input type setup (TYPE) on page 156), this item is not shown unless the input type is set to NONE.**

※ **For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 114) is used. Make sure of the unit before you set up.**

Density calculation setup submenu screen p. 112

③ Density calculation - under alarm point setup (UNDER ALARM POINT)

The under alarm point with respect to the corrected density is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

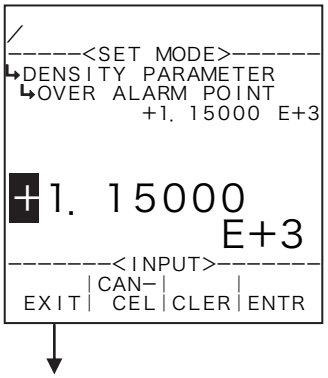
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 114) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 112

④ Density calculation - over alarm point setup (OVER ALARM POINT)

The over alarm point with respect to the corrected density is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

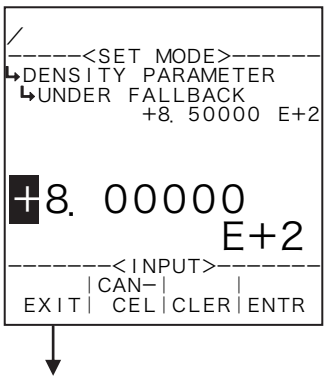
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 114) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 112

⑤ Density calculation - under fallback level setup (UNDER FALLBACK)

The under fallback level with respect to the corrected density is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

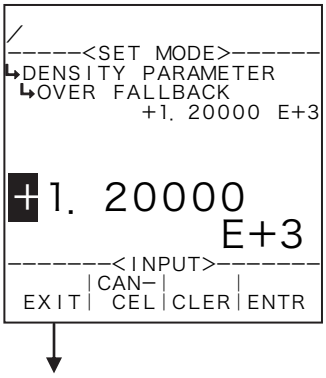
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 114) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 112

⑥ Density calculation - over fallback level setup (OVER FALLBACK)

The over fallback level with respect to the corrected density is set up here.



Density calculation setup submenu screen p. 112

←Numerical value input setup

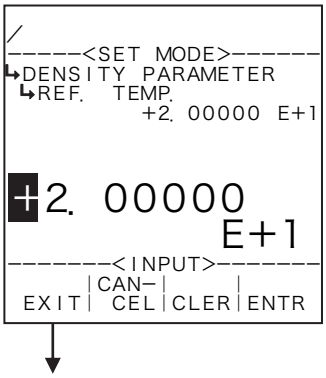
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 114) is used. Make sure of the unit before you set up.

⑦ Density calculation - reference temperature setup (REF. TEMP.)

The reference temperature for temperature compensation is set up here.



Density calculation setup submenu screen p. 112

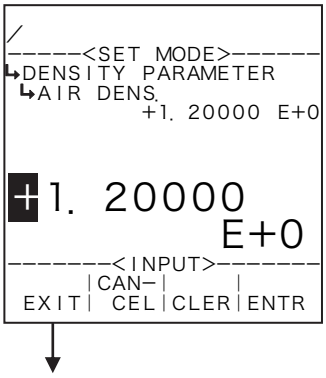
←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the temperature unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

⑧ Density calculation - density with air (AIR DENS.)

The air density during calibration is set up here for density calculation.



Density calculation setup submenu screen p. 112

←Numerical value input setup

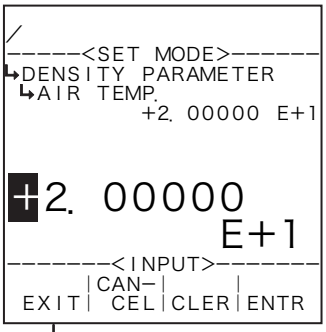
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 114) is used. Make sure of the unit before you set up.

⑨ Density calculation - air temperature during calibration (AIR DENS.)

The air density during calibration is set up here for density calculation.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

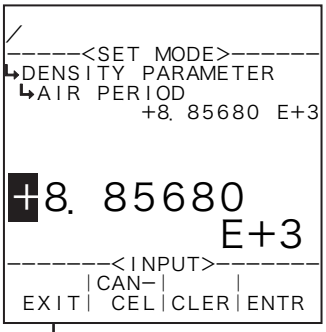
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the temperature unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 112

⑩ Density calculation - density period with air (AIR PERIOD)

The density period with air is set up here for density calculation.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

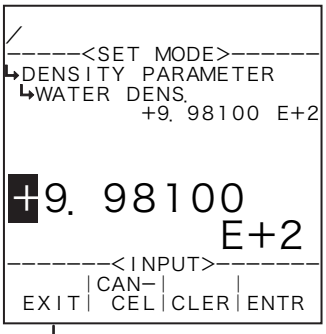
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density pulse unit setup (① Density pulse input unit setup (UNIT) on page 72) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 112

⑪ Density calculation - density with water (WATER DENS.)

The density with water is set up here for density calculation.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

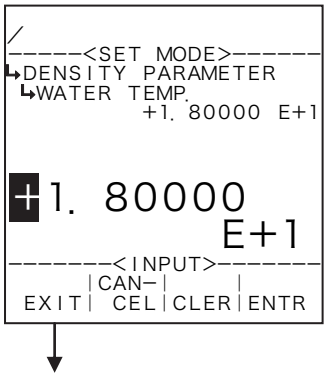
※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the unit setup in density calculation unit setup (① Density calculation input unit setup (UNIT) on page 114) is used. Make sure of the unit before you set up.

Density calculation setup submenu screen p. 112

⑫ Density calculation - water temperature during calibration (WATER TEMP.)

The water temperature is set up here for densicy calculation.



Density calculation setup submenu screen p. 112

←Numerical value input setup

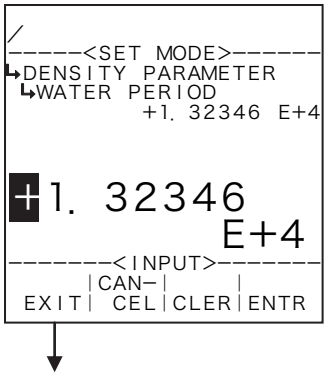
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the temperature unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

⑬ Density calculation - density period with water (WATER PERIOD)

The density period with water is set up here for density calculation.



Density calculation setup submenu screen p. 112

←Numerical value input setup

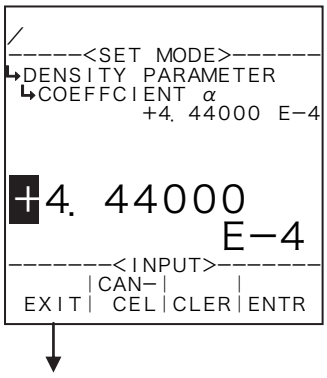
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ For the unit to be set here, the unit set at the density pulse unit setup (① Density pulse input unit setup (UNIT) on page 72) is used. Make sure of the unit before you set up.

⑭ Density calculation - temp. compensation coefficient for tube spring constant (COEFFICIENT (α))

The thermal expansion coefficient of fluid is set up here for temperature compensation.



Density calculation setup submenu screen p. 112

←Numerical value input setup

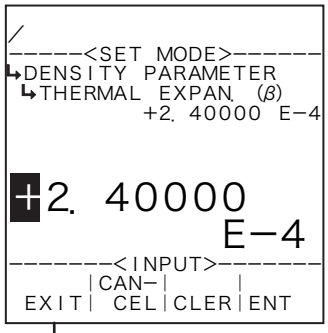
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In SYS mode density input (① Density input type setup (TYPE) on page 156), if NONE is chosen for the input type, this menu will not be shown.

※ The unit of the value parameter to be set here is "%/°C". Make sure of the unit before you set up.

⑮ Density calculation - reference temperature conversion factor of density (THERMAL EXPAN. (β))

The reference temperature conversion factor of density is set up here for temperature compensation.



←**Numerical value input setup**

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ **The measurement unit to be set here is "g/ml/°C". Make sure of the unit before you set up.**

Quadratic correction submenu screen p. 88

6.4.22 Solids Content Flowrate - Calculation Setup (FLOW (SOLID) PARA.)

As parameters associated with flowrate calculation of solids content, coefficients Da, Db, Dc, Ta, Tb, and Tc are set up here.

※ **These settings are used only in Model EL4311. They are not shown in other models.**

＜Calculation Formula＞

$$X_s = (Da + Db \times D_x + Dc \times D_x^2) \times (Ta + Tb \times t_x + Tc \times t_x^2)$$

D_x : Density

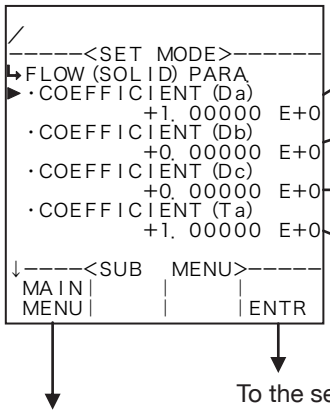
t_x : Temperature

Da to Dc : Coefficients for density

Ta to Tc : Coefficients for temperature

(1) Solids content flowrate calculation submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key "ENTR," the screen switches to the desired item setup screen.



① Solids content flowrate calculation - coefficient Da setup (COEFFICIENT (Da)) p. 121

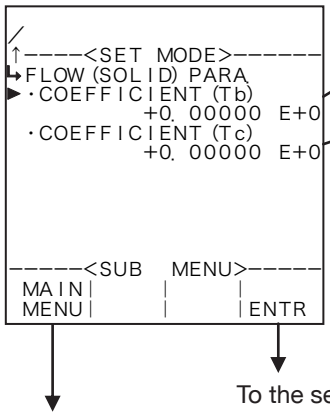
② Solids content flowrate calculation - coefficient Db setup (COEFFICIENT (Db)) p. 121

③ Solids content flowrate calculation - coefficient Dc setup (COEFFICIENT (Dc)) p. 121

④ Solids content flowrate calculation - coefficient Ta setup (COEFFICIENT (Ta)) p. 122

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑤ Solids content flowrate calculation - coefficient Tb setup (COEFFICIENT (Tb)) p. 122

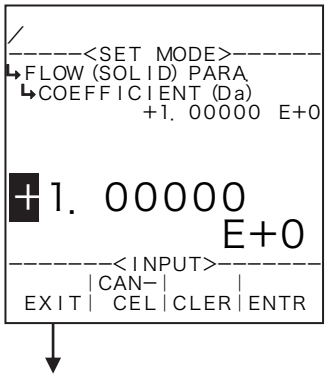
⑥ Solids content flowrate calculation - coefficient Tc setup (COEFFICIENT (Tc)) p. 122

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Solids content flowrate calculation - coefficient Da setup (COEFFICIENT (Da))

Coefficient Da in solids content flowrate calculation is set up here.



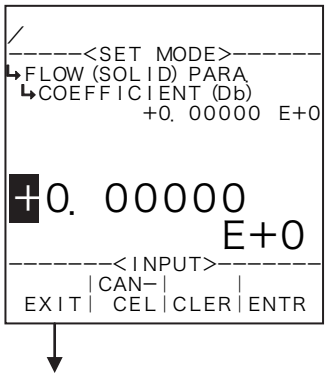
←**Numerical value input setup**

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Solids content calculation submenu screen p. 120

② Solids content flowrate calculation - coefficient Db setup (COEFFICIENT (Db))

Coefficient Db in solids content flowrate calculation is set up here.



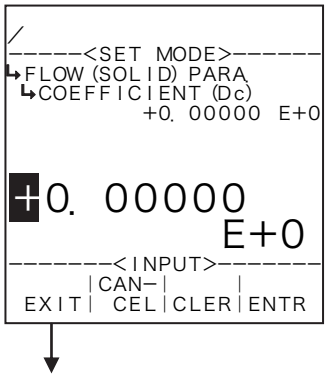
←**Numerical value input setup**

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Solids content calculation submenu screen p. 120

③ Solids content flowrate calculation - coefficient Dc setup (COEFFICIENT (Dc))

Coefficient Dc in solids content flowrate calculation is set up here..



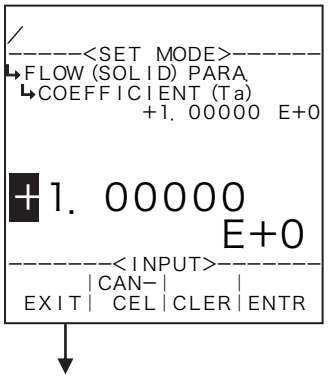
←**Numerical value input setup**

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Solids content calculation submenu screen p. 120

④ Solids content flowrate calculation - coefficient Ta setup (COEFFICIENT (Ta))

Coefficient Ta in solids content flowrate calculation is set up here.



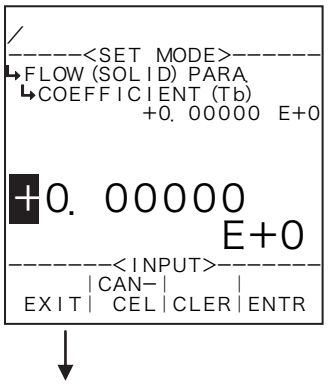
←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Solids content calculation submenu screen p. 120

⑤ Solids content flowrate calculation - coefficient Tb setup (COEFFICIENT (Tb))

Coefficient Tb in solids content flowrate calculation is set up here.



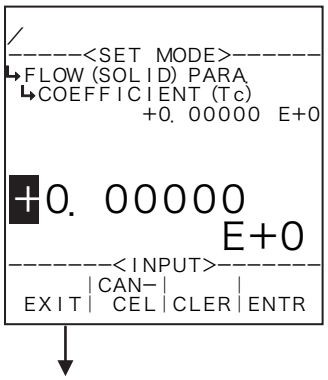
←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Solids content calculation submenu screen p. 120

⑥ Solids content flowrate calculation - coefficient Tc setup (COEFFICIENT (Tc))

Coefficient Tc in solids content flowrate calculation is set up here.



←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Solids content calculation submenu screen p. 120

6.4.23 Density Calculation Setup (DENSITY PARAMETER), EL4321

Along with density calculation associated values, the alarm points and fallback levels with respect to the corrected density are set up here.

※ **These settings are used only in Model EL4321. They are not shown in other models.**

＜Calculation Formula＞

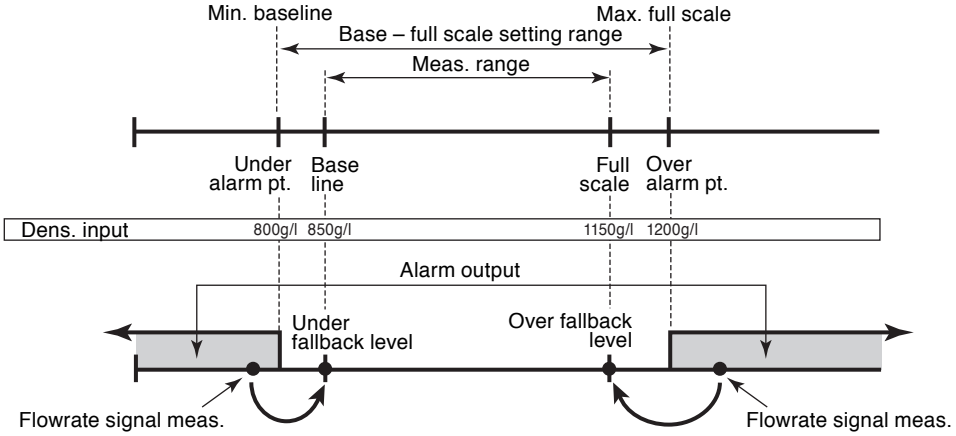
$$d = \frac{2d_0}{T_0'}\left[(T - T_0') + K \frac{(T - T_0')^2}{2T_0'} \right]$$

$$T_0' = T_0 + \alpha \ (t - t_{cal})$$

T ：Period time at measurement
T_0 ：Period time under vacuum（350（μs）±10%）
d_0 ：Constant（70（g/l）±10%）
K ：Constant
t ：Line temperature
t_{cal} ：Temperature during calibration
α ：Temperature coefficient

The density displayed in the RUN mode is shown in the measuring range where its high limit is at the over alarm point while its low limit is at the under alarm point, corresponding to the input. If the input exceeds or falls short of this range, the over or under fallback level is shown.

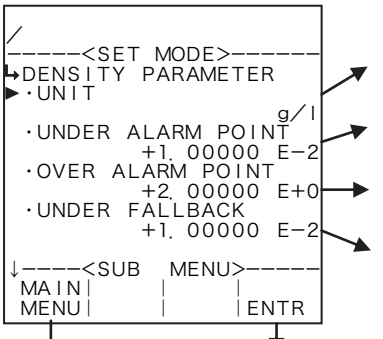
Example Measurement units： g/l
Under alarm point（UNDER ALARM POINT）：800g/l
Over alarm point（OVER ALARM POINT）：850g/l
Under fallback level（UNDER FALLBACK）：1150g/l
Over fallback level（OVER FALLBACK）：1200g/l



(1) Density calculation setup submenu screen

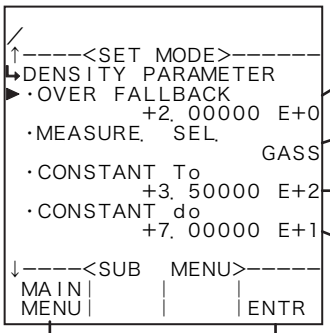
At the submenu, move the cursor to the desired setup item with the up arrow and down arrow keys.
At the touch of (the) function key “ENTR”, the screen switches to the desired item setup screen.

① **Density pulse input option**



① Density calculation - unit setup (UNIT) p. 125
③ Density calculation - under alarm point setup (UNDER ALARM POINT) p. 126
④ Density calculation - over alarm point setup (OVER ALARM POINT) p. 126
⑤ Density calculation - under fallback level (UNDER FALLBACK) p. 127

To the setup screen pointed by the cursor
SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑥ Density calculation - over fallback level (OVER FALLBACK) p. 127

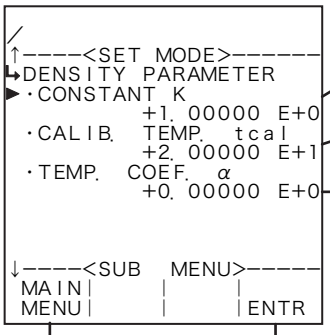
⑦ Density calculation - measure. type selection (MEASURE. SEL.) p. 127

⑧ Density calculation - period time under vacuum (CONSTANT T_0) p.128

⑨ Density calculation - constant d_0 (CONSTANT d_0) p. 128

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑩ Density calculation - constant K (CONSTANT K) p. 128

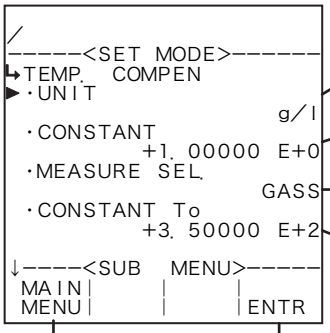
⑪ Density calculation - temperature during calibration t_{cal} (CALIB. TEMP. t_{cal}) p. 129

⑫ Density calculation - temperature coefficientg α (TEMP. COEF. α) p. 129

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

② Constants are selected



① Density calculation - unit setup (UNIT) on page 125

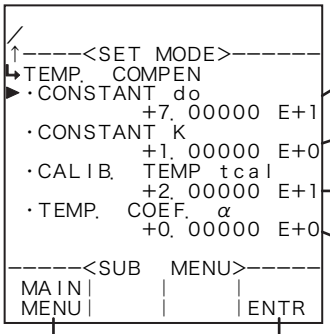
② Density calculation - constants (CONSTNAT) on page 126

⑦ Density calculation - measurement type selection (MEASURE. SEL) p. 127

⑮ Density calculation - period time under vacuum (CONSTANT T0) p. 128

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑨ Density calculation - constant d_0 (CONSTANT d_0) p. 128

⑩ Density calculation - constant K (CONSTANT K) p. 128

⑪ Density calculation - temp. during calibration t_{cal} (CALIB. TEMP. t_{cal}) p. 129

⑫ Density calculation - temperature coeff. α (TEMP. COEF. α) p. 129

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

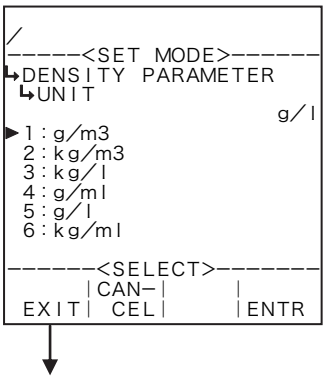
Conditions to show submenu items

Submenu item		
SYS mode input type ※	NONE	PULSE INPUT
Unit of measurement	Displayed	Displayed
Constant	Displayed	Hidden
Under alarm point	Hidden	Displayed
Over alarm point	Hidden	Displayed
Under fallback level	Hidden	Displayed
Over fallback level	Hidden	Displayed
Measurement type select	Displayed	Displayed
Period time under vacuum T_0	Displayed	Displayed
Constant d_0	Displayed	Displayed
Constant K	Displayed	Displayed
Temperature t_{cal} during calibrationl	Displayed	Displayed
Temperature coefficient α	Displayed	Displayed

※：Conditions for selecting on-screen information

① Density calculation - unit setup (UNIT)

Density units are chosen here.



Density calculation submenu screen p. 123

←**Unit option select**

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

The unit you can choose from are “g/cm³”,“kg/m³”,“kg/l”,“g/ml”,“g/l”, and or “kg/ml”.

※ As the measurement unit is changed, the current value (density) is converted automatically to read in the new measurement unit chosen.

※ The unit to be set here is that of the uncorrected and corrected density displayed in the RUN mode and of the density to be set in density calculation in the SET mode.

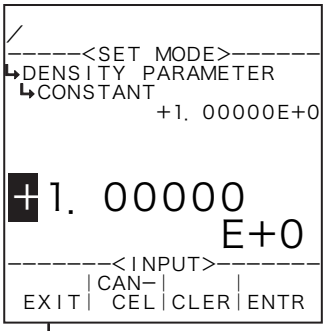
Number of decimal places for each unit

Unit	Number of decimal places
g/cm³	6
kg/m³	4
kg/l	6
g/ml	6
g/l	4
kg/ml	6

② Density calculation - constants (CONSTANT)

In the density input in the SYS mode, when the input type is set to NONE, constants are set.

※ Constants are fixed values set internally in the equipment contrary to the measurements entered through external input.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

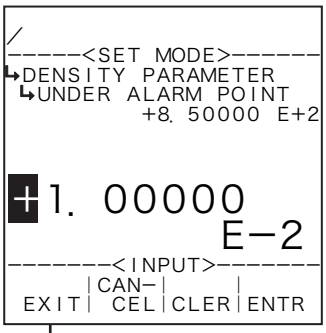
※ In the density input in the SYS mode (① Density input type setup (TYPE) on page 156), this item is not shown unless the input type is set to NONE.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 125) is used. Make sure of the unit before you set up.

Density calculation submenu screen p. 123

③ Density calculation - under alarm point setup (UNDER ALARM POINT)

The under alarm point with respect to the corrected density is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

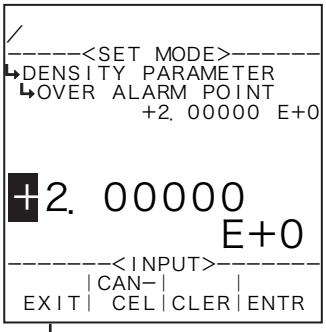
※ In the density input in the SYS mode (① Density input type setup (TYPE) on page 156), this item is not shown unless the input type is set to NONE.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 125) is used. Make sure of the unit before you set up.

Density calculation submenu screen p. 123

④ Density calculation - over alarm point setup (OVER ALARM POINT)

The over alarm point with respect to the corrected density is set established here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

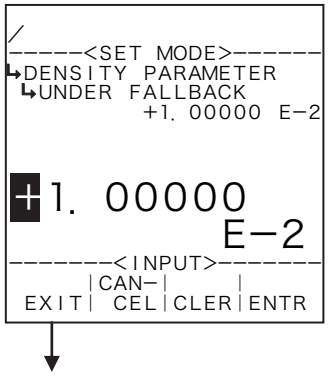
※ In the density input in the SYS mode (① Density input type setup (TYPE) on page 156), this item is not shown unless the input type is set to NONE.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 125) is used. Make sure of the unit before you set up.

Density calculation submenu screen p. 123

⑤ Density calculation - under fallback level setup (UNDER FALLBACK)

The under fallback level with respect to the uncorrected density is set up here.



Density calculation submenu screen p. 123

←Numerical value input setup

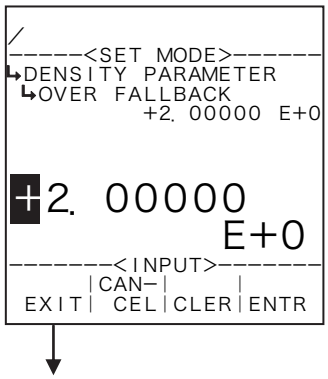
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the density input in the SYS mode (① Density input type setup (TYPE) on page 156), this item is not shown unless the input type is set to NONE.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 125) is used. Make sure of the unit before you set up.

⑥ Density calculation - over fallback level setup (OVER FALLBACK)

The over fallback level with respect to the uncorrected density is set up here.



Density calculation submenu screen p. 123

←Numerical value input setup

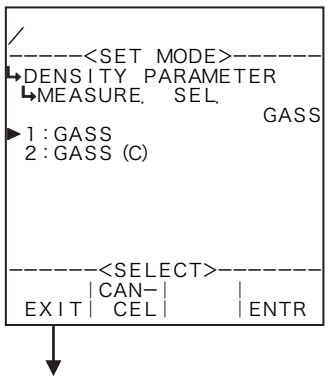
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the density input in the SYS mode (① Density input type setup (TYPE) on page 156), this item is not shown unless the input type is set to NONE.

※ For the unit to be set here, the unit set at the density unit setup in density calculation (① Density calculation unit setup (UNIT) on page 125) is used. Make sure of the unit before you set up.

⑦ Density calculation – measurement type selection (MEASURE. SEL.)

The density measurement type is set up here. When "GASS" is your selection, the computer shows the corrected density, provides an analog output as the uncorrected density and shows its reading.



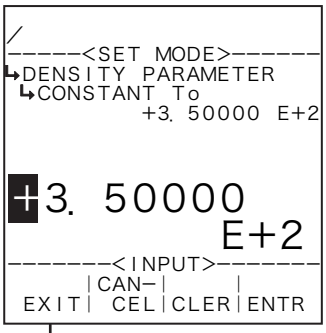
Density calculation submenu screen p. 123

←Measurement type select

Details of measurement type selection, see "(2) Option select setup screen (SELECT)" on paghe 46.

⑧ Density calculation - period time under vacuum (CONSTANT T_o)

The density period under vacuum for density calculation is set up here.



←Numerical value input setup

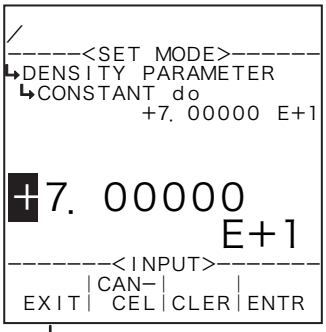
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the density pulse input setup (① Density pulse input unit setup (UNIT) on page 72) is used. Make sure of the unit before you set up.

Density calculation submenu screen p. 123

⑨ Density calculation - constant d_o (CONSTANT d_o)

Constant d_o for density calculation is set up here.



←Numerical value input setup

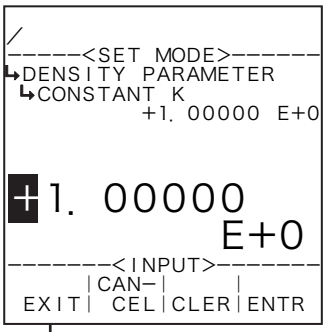
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the density unit setup menu is used. Make sure of the unit before you set up.

Density calculation submenu screen p. 123

⑩ Density calculation - constant K (CONSTANT K)

Constant K for density calculation is set up here.



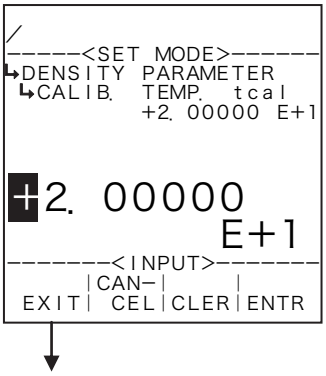
←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

Density calculation submenu screen p. 123

⑪ Density calculation - temperature during calibration t_{cal} (CALIB. TEMP. t_{cal})

The temperature during calibration is set up for density calculation.



←Numerical value input setup

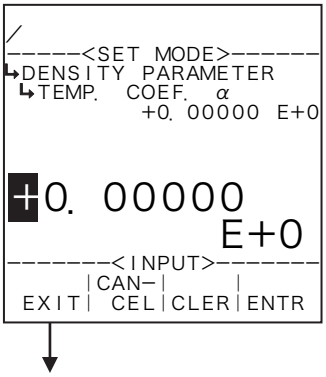
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the temperature input unit setup (① Temperature input unit setup (UNIT) on page 51) is used. Make sure of the unit before you set up.

Density calculation submenu screen p. 123

⑫ Density calculation - temperature coefficient α (TEMP. COEF. α)

The temperature coefficient for temperature calculation is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ The unit to be set here is "μs/°C". Make sure of the unit before you set up.

Density calculation submenu screen p. 123

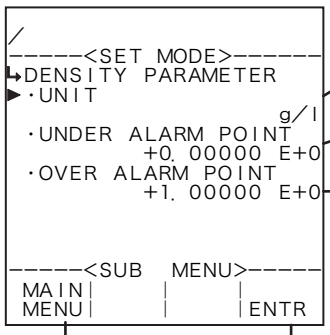
6.4.24 Density Parameter Setup (DENSITY PARAMETER), EL4401

High and low limits of the density to be set in the parameter setup mode (high limit at the over alarm point while low limit at the under alarm point) are set up here. With these parameters, you can limit density settings in the parameter setup mode.

※ **These settings are used only in Model EL4401.**

(1) Density parameter submenu screen

At the submenu, move the cursor to the desired setup item with the up arrow and down arrow keys.
At the touch of (the) function key "ENTR", the screen switches to the desired item setup screen.



① Density parameter - unit setup (UNIT) p. 130

② Density parameter - under alarm point (UNDER ALARM POINT) p. 130

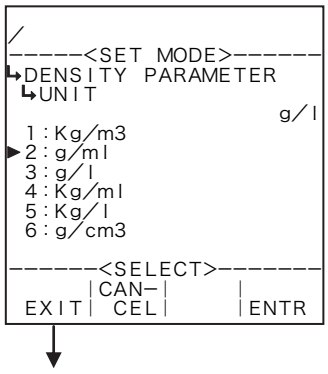
③ Density parameter - over alarm point (OVER ALARM POINT) p. 131

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Density parameter unit setup (UNIT)

Density unit is set established here.



←Unit option select

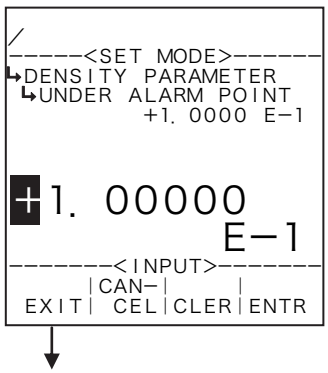
For details of selecting options setup, see "(2) Option select setup screen (SELECT)" on page 46.
The unit you can choose from are "kg/m³","g/ml","g/l","kg/ml","kg/l", and or "g/cm³".

※ **The unit to be set here is the unit to be set at ithe density parameter setup in the SET mode and the density unit to be set in the PARA SET mode. Modifying this unit will change the density unit to be set in the PARA SET mode (① Liquid A (B) density unit setup (UNIT) on page 174) also into the same unit.**

Density parameter submenu screen p. 130

② Density parameter - under alarm point setup (UNDER ALARM POINT)

The under alarm point of density to be set in the parameter setup mode is set up here.



←Numerical value input setup

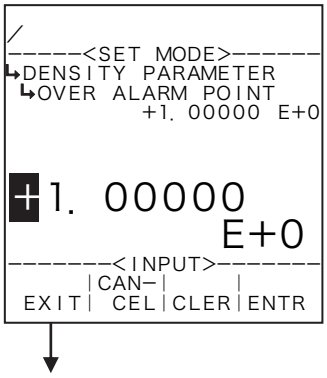
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ **For the unit to be set here, the unit set at the density parameter unit setup (① Density parameter unit setup (UNIT) on page 130) is used. Make sure of the unit before you set up.**

Density parameter submenu screen p. 130

③ Density parameter - over alarm point setup (OVER ALARM POINT)

The over alarm point of density to be set in the parameter setup mode is set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the density parameter unit setup (① Density parameter unit setup (UNIT) on page 130) is used. Make sure of the unit before you set up.

Density parameter submenu screen p. 130

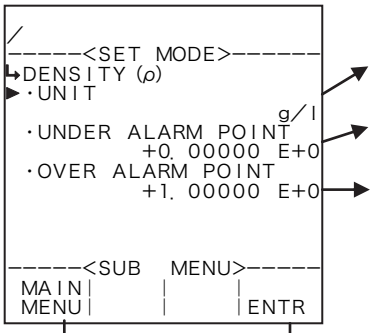
6.4.25 Density (ρ) setup (DENSITY (ρ)), EL4501

High and low limits of the density to be set in the parameter setup mode (KEY card) (high limit at the over alarm point while low limit at the under alarm point) are set up here. With these parameters, you can limit density settings in the parameter setup mode.

※ These settings are used only in Models EL4501 and EL4511.

(1) Density (ρ) parameter submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired item setup screen.



① Density (ρ) - unit setup (UNIT) p. 132

② Density (ρ) - under alarm point (UNDER ALARM POINT) p. 133

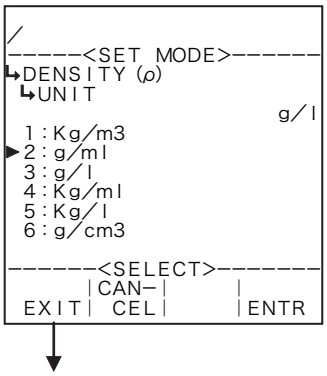
③ Density (ρ) - over alarm point (OVER ALARM POINT) p. 133

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Density (ρ) - unit setup (UNIT)

Density unit is selected here.



Density parameter submenu screen p. 130

←Unit option select

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46. The unit you can choose from are "kg/m³","g/ml","g/l","kg/ml","kg/l", and or "g/cm³".

※ The unit to be set here is the measuring unit set at the density setup and displayed in the RUN mode, that of the density to be set at the density parameter setup (menu, screen) in the SET mode, and the density unit to be set in the PARA SET mode. Modifying this unit will also change the density unit to be set in the PARA SET mode (① Density unit setup (UNIT) on page 180) to read in the same unit.

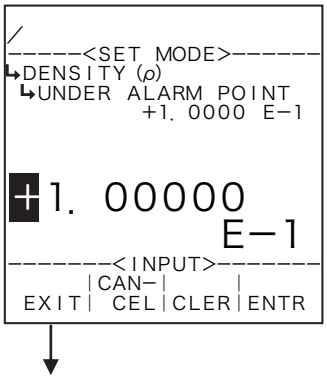
※ Depending on the unit chosen here, the numerical format (number of decimal places) shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.

Number of decimal places for each unit

Unit	Number of decimal places
g/cm³	4
kg/m³	1
kg/l	4
g/ml	4
g/l	1
kg/ml	6

② Density (ρ) - under alarm point setup (UNDER ALARM POINT)

The under alarm point of density to be set in the parameter setup mode is set up here.



Density parameter submenu screen p. 130

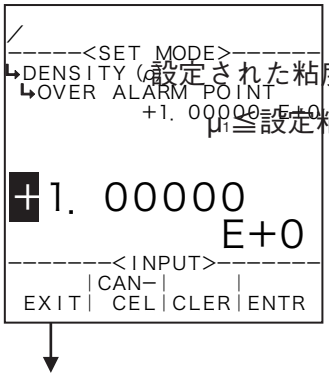
←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the density parameter unit setup (① Density parameter unit setup (UNIT) on page 130) is used. Make sure of the unit before you set up.

③ Density (ρ) - over alarm point setup (OVER ALARM POINT)

The over alarm point of density to be set in the parameter setup mode is set up here.



設定された粘度値から E_{1S} to E_{9S} を求めます。

$\mu_1 \leqq$ 設定粘度 $\mu_S \leqq \mu_2$ の場合

Density parameter submenu screen p. 130

←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the density parameter unit setup (① Density parameter unit setup (UNIT) on page 130) is used. Make sure of the unit before you set up.

6.4.26 Viscosity compensation (μ) setup (VISCOSITY COMP. (μ))

To determine error correction coefficients associated with fluid velocity and viscosity, parameters - measurement units, under alarm point, over alarm point, viscosities 1 to 3, flowrate (frequencies) 1 to 9, and meter errors 11 to 93 are set here.

※ **These settings are used in Models EL4501 and EL4511.**

Viscosity data: 3 points Fluid velocity data: 9 points max. Meter error data: 9×3 points max.

No.	Viscosity / Flowrate (frequencies)(Hz)	μ1	μ 2	μ 3	μ
1	Q 1	E 11	E 12	E 13	E 1S
2	Q 2	E 21	E 22	E 23	E 2S
3	Q 3	E 31	E 32	E 33	E 3S
4	Q 4	E 41	E 42	E 43	E 4S
5	Q 5	E 51	E 52	E 53	E 5S
6	Q 6	E 61	E 62	E 63	E 6S
7	Q 7	E 71	E 72	E 73	E 7S
8	Q 8	E 81	E 82	E 83	E 8S
9	Q 9	E 91	E 92	E 93	E 9S

From the viscosity set, E_{1S} to E_{9S} are determined.

On conditions that $\mu_1 \leqq$ Viscosity set $\mu_S \leqq \mu_2$

$$E_{1S} = E_{11} + (E_{12} - E_{11}) \times \frac{\mu_2 \times (\mu_S - \mu_1)}{\mu_S \times (\mu_2 - \mu_1)}$$

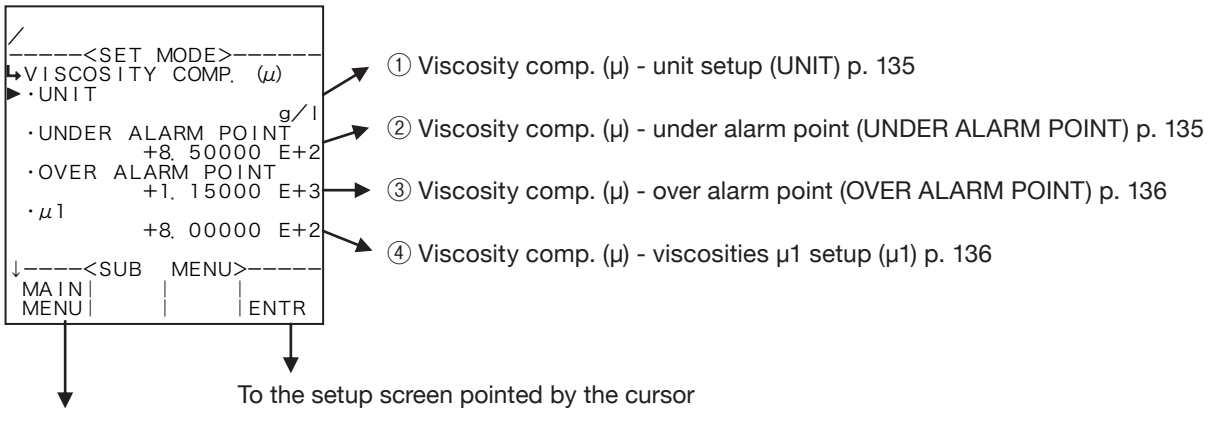
Similarly, proceed to work from E_{2S} to E_{9S}. Also, on conditions $\mu_2 \leqq \mu_S \leqq \mu_3$, determine in the same way.

Next, determine Q_1 to Q_9 from Q_S; find Q_n which is closest to Q_S from E_{1S} to E_{9S}, and Q_{n+1}, E_{nS}, and E_{nS+1}, and calculate the following formula:

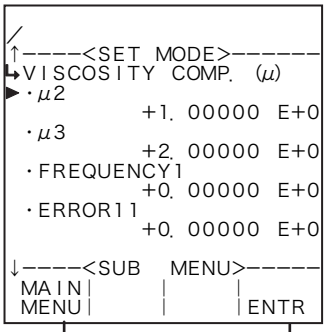
$$E_1 = E_{nS} + (E_{(n+1)S} - E_{nS}) \times \frac{(Q_S - Q_n)}{(Q_{n+1} - Q_n)}$$

(1) Viscosity (μ) submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired item setup screen.



SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36



⑥ Viscosity comp. (μ) - viscosity μ2 setup (μ2) p. 136

⑦ Viscosity comp. (μ) - viscosity μ3 setup (μ3) p. 137

⑧ Viscosity comp. (μ) - freq. setup 1 to 9 (FREQUENCY 1 to 9) p. 137

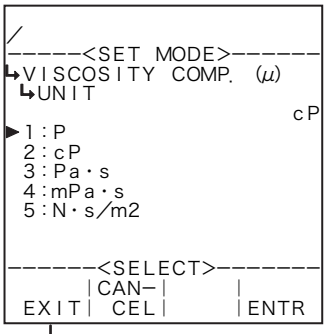
⑨ Viscosity comp. (μ) - meter error setup 11 to 93 (ERROR 11 to 93) p. 137

To the setup screen pointed by the cursor

SET mode main menu screen ⇒ 6.2 SET mode main menu screen p. 36

① Viscosity compensation (μ) - unit setup (UNIT)

Viscosity unit is selected here.



Viscosity compensation (μ) submenu screen p. 134

←Unit option select

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46. The unit you can choose from are.“P”,“cP”,“Pa・s”,“mPa・s”, and or “N・s/m²”.

※ As the measurement unit is changed, current parameters are converted automatically to read in the new measurement unit chosen.

※ The unit to be set here is the measuring unit set at the viscosity setup and displayed in the RUN mode, that of the viscosity to be set at the viscosity setup screen in the SET mode, and the viscosity unit to be set in the PARA SET mode. Modifying this unit will change the viscosity set and displayed in the RUN mode and the viscosity unit to be set in the PARA SET mode (① Vicosity unit setup (UNIT) on page 181) also to read in the same unit modified.

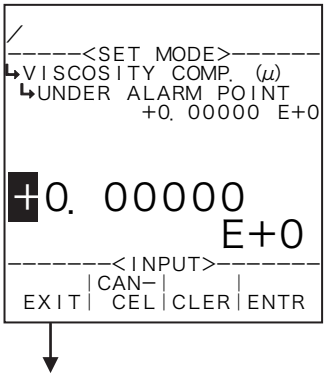
※ Depending on the unit chosen here, the numerical format (number of decimal places) of the set viscosity displayed in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.

Number of decimal places for each unit

Unit	Number of decimal places
P	3
cP	1
Pa·s	4
mPa·s	1
N·s/m²	4

② Viscosity compensation (μ) - under alarm point setup (UNDER ALARM POINT)

The under alarm point of viscosity to be set in the parameter setup mode is set up here.



Viscosity compensation (μ) submenu screen p. 134

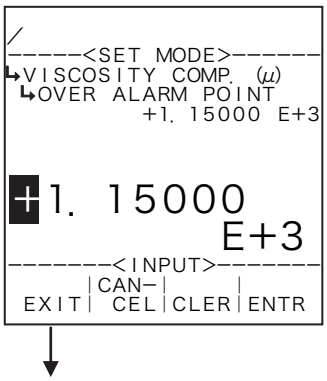
←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

※ For the unit to be set here, the unit set at the unit setup of viscosity compensation (① Viscosity compensation (μ) unit setup (UNIT) on page 135) is used. Make sure of the unit before you set up.

③ Viscosity compensation (μ) - over alarm point setup (OVER ALARM POINT)

The viscosity over alarm point to be set in the parameter setup mode is set up here.



←Numerical value input setup

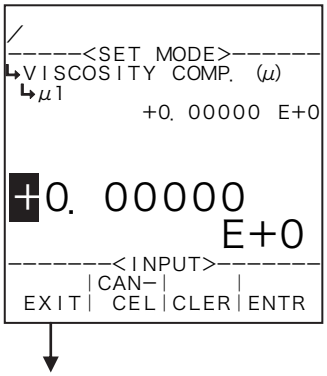
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the unit setup of viscosity compensation (① Viscosity compensation (μ) unit setup (UNIT) on page 135) is used. Make sure of the unit before you set up.

Viscosity compensation (μ) submenu screen p. 134

④ Viscosity compensation (μ) - viscosity μ1 setup (μ1)

Coefficient μ1 in viscosity compensation is set up here.



←Numerical value input setup

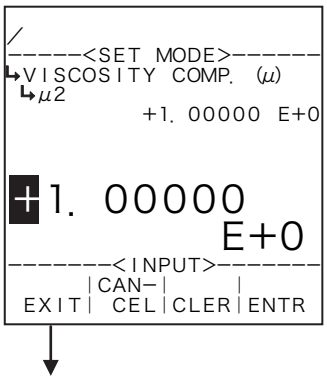
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the unit setup of viscosity compensation (① Viscosity compensation (μ) unit setup (UNIT) on page 135) is used. Make sure of the unit before you set up.

Viscosity compensation (μ) submenu screen p. 134

⑤ Viscosity compensation (μ) - viscosity μ2 setup (μ2)

Coefficient μ2 in viscosity compensation is set up here.



←Numerical value input setup

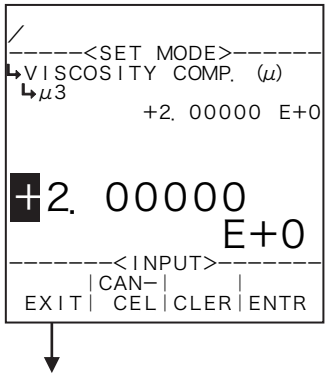
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the unit setup of viscosity compensation (① Viscosity compensation (μ) unit setup (UNIT) on page 135) is used. Make sure of the unit before you set up.

Viscosity compensation (μ) submenu screen p. 134

⑥ Viscosity compensation (μ) - viscosity μ3 setup (μ3)

Coefficient μ3 in viscosity compensation is set up here.



←Numerical value input setup

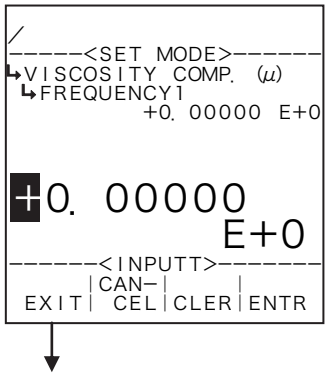
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set here, the unit set at the unit setup of viscosity compensation (① Viscosity compensation (μ) unit setup (UNIT) on page 135) is used. Make sure of the unit before you set up.

Viscosity compensation (μ) submenu screen p. 134

⑦ Viscosity compensation (μ) - frequencies 1 through 9 setup (FREQUENCIES 1 through 9)

Frequencies (setpoints) are set up here.



←Numerical value input setup

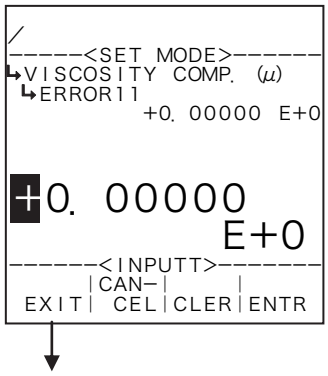
For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ The unit to be set here is "Hz". Make sure of the unit before you set up.

Viscosity compensation (μ) submenu screen p. 134

⑧ Viscosity compensation (μ) - error 11 thru 39 through (ERROR 11 through 39)

Meter errors for the respective fluid viscosity and fluid velocities are set up here.



←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ The unit to be set here is "%". Make sure of the unit before you set up.

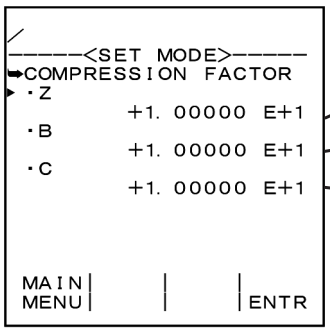
Viscosity compensation (μ) submenu screen p. 134

6.4.27 Compression Deviation Setting (COMPRESSION FACTOR)

Here, factors Z, B and C are set as values related to compression compensation. X is a cubic expression for temperature and pressure.

(1) Compression deviation sub-menu screen

On the sub-menu screen, move the cursor over the item you want to set using the up and down arrow keys. To switch to the setting screen for the item you want to set, press “ENTR” of the function key.



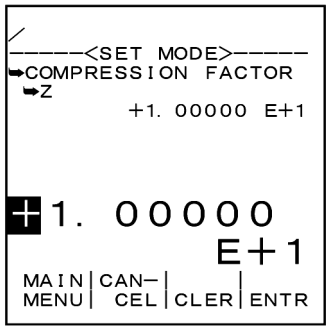
①Setting of compression deviation factor B(COEFFICIENT(Z)) P.138

②Setting of compression deviation factor C(COEFFICIENT(B)) P.138

③Setting of compression deviation factor Z(COEFFICIENT(C)) P.138

① Setting of compression deviation factor Z (COEFFICIENT(Z))

Here, the factor Z for the compression deviation factor is set.

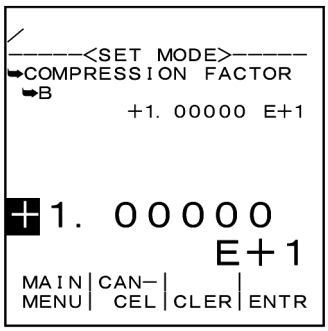


←Numerical input setting

For details of numerical input setting, refer to “(1) Numerical setting screen (INPUT) P43.”

② Setting of compression deviation factor B (COEFFICIENT(B))

Here, the factor B for the compression deviation factor is set.

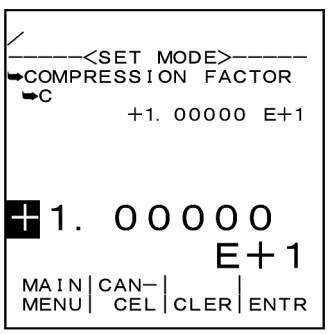


←Numerical input setting

For details of numerical input setting, refer to “(1) Numerical setting screen (INPUT) P43.”

③ Setting of compression deviation factor C (COEFFICIENT(C))

Here, the factor C for the compression deviation factor is set.



←Numerical input setting

For details of numerical input setting, refer to “(1) Numerical setting screen (INPUT) P43.”

6.4.28 Pulse Output Scaling Setup (PULSE OUT DIVIDE)

Upon completion of setting the parameters, the scaling of pulse output must be set, based on the parameters set. The scale factor (frequency division factor) of pulse output determines the pulse unit (10n) of output pulse.

```
/
-----<SET MODE>------
↳PULSE OUT DIVIDE
▶・P. OUT1 10^ (-2)
 ・P. OUT2 10^ (-1)
 ・P. OUT2 10^ (-1)




-----<SUB  MENU>-----
 DATA|CAN-|MAIN|
 WRTE| CEL|MENU|ENTR
```

※ On-screen item options shown on the screen differ from model to model.

※ With EL4301 and EL4321, nothing appears. In this case, press "DATA WRTE" to complete the setup

```
/
-----<SET MODE>------
▶*TEMP.  INPUT
 *PULSE  INPUT
 *TOTAL COUNT1
 *TOTAL COUNT2
 *TOTAL COUNT3
 *ANALOG OUTPUT
 *T/P COMPEN
 *METER ERROR


↓-----<MAIN MENU>-----
 PLSE|     |     |
  SET|     |     |ENTR
```

←Selecting screens

At the SET main menu, pressing function key move the cursor to "PLSE SET" brings up the pulse outut scaling (frequency division) ("PULSE OUT DIVIDE") submenu screen.

Pulse output scaling submenu screen

・About saving of the parameters you have set up

Upon completion of setting all parameters, select an operation from the following options at the pulse output scaling setup menu screen:

① Exiting the SET mode (completing the setup procedure)

Pressing function key"DATA WRITE"validates all the settings (modifications), exits the SET mode, and brings up the mode select menu screen. If the pulse output scale factor selected is out of acceptable range, an asterisk"＊"will appear next to the setting. In this case, you need to change it to an acceptable scale factor in the range.

※ Once this operation has been taken, you cannot restore your previous settings. Careful review of the current settings is therefore necessary before finishing the setup process.

② Completing the SET mode (cancelling the setting)

Pressing function key"CANCEL"aborts all the settings (modifications), exits the SET mode, and brings up the mode select menu screen.

※ This operation cancels all the settings (modifications) and restores your previous settings.

③ Continuing the SET mode (returning to the SET mode main menu)

Pressing function key"MAIN MENU"returns the mode to the SET mode main menu, enabling you to continue the setup (modification) process.

※ On models not provided with pulse input function, switching the screen to the pulse output scaling setup screen will not bring up menu items in the submenu screen. In this case, all you need to do is to select your choice from the available operation options above on the items that have been set.

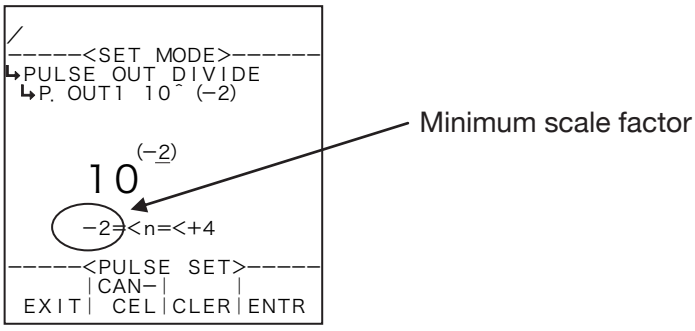
・About the automatic calculation of the minimum pulse output scale factor (weight)

The minimum pulse output scaling (weight) implies the min. value that allows to provide an output pulse, based on such factors as meter factor, correction factors, and unit conversion factor for input pulse. By applying to the pulse output a frequency reduction with a factor larger than this min. value, you can set up the weight (unit) for pulse output.

With a minimum scale factor of (−2), you can set a scale factor ranging from −2 to +4.

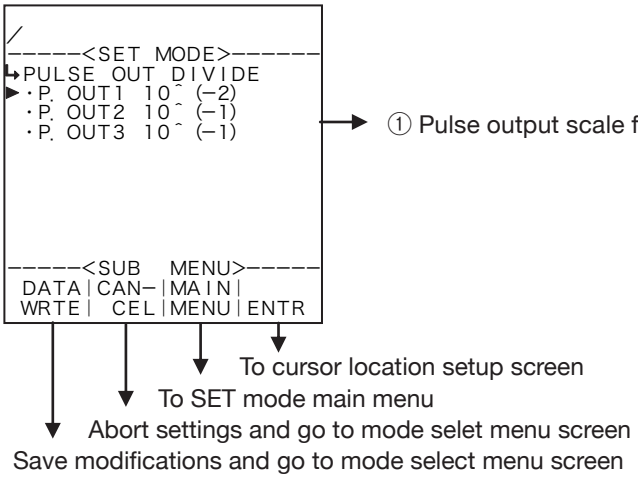
※ **Acceptable scale factors cover a range from min. value to min. value + 6. You cannot complete the setup with any other value.**

With on-screen scale factor set to (−2), the total counter and pulse output reads in the unit $10^{-2} = 0.01$. By setting this value to (+3), the total counter and pulse output reads in the unit $\times 10^{3} = 1000$.



(1) Pulse output scale factor submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired item setup screen.



→ ① Pulse output scale factor setup (P. OUT) p. 139

To cursor location setup screen

To SET mode main menu

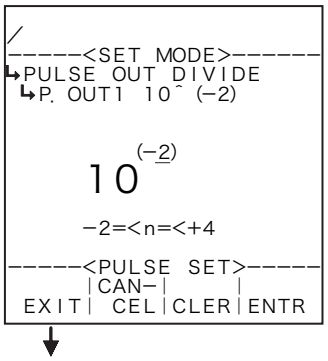
Abort settings and go to mode selet menu screen

Save modifications and go to mode select menu screen

① Pulse output scale factor (P. OUT)

The scaling of pulse output scale factor is set up here.

※ **Any scale factor within the range shown is acceptable. You cannot complete the setting procedure with any value outside this range.**



←Numerical value input setup

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

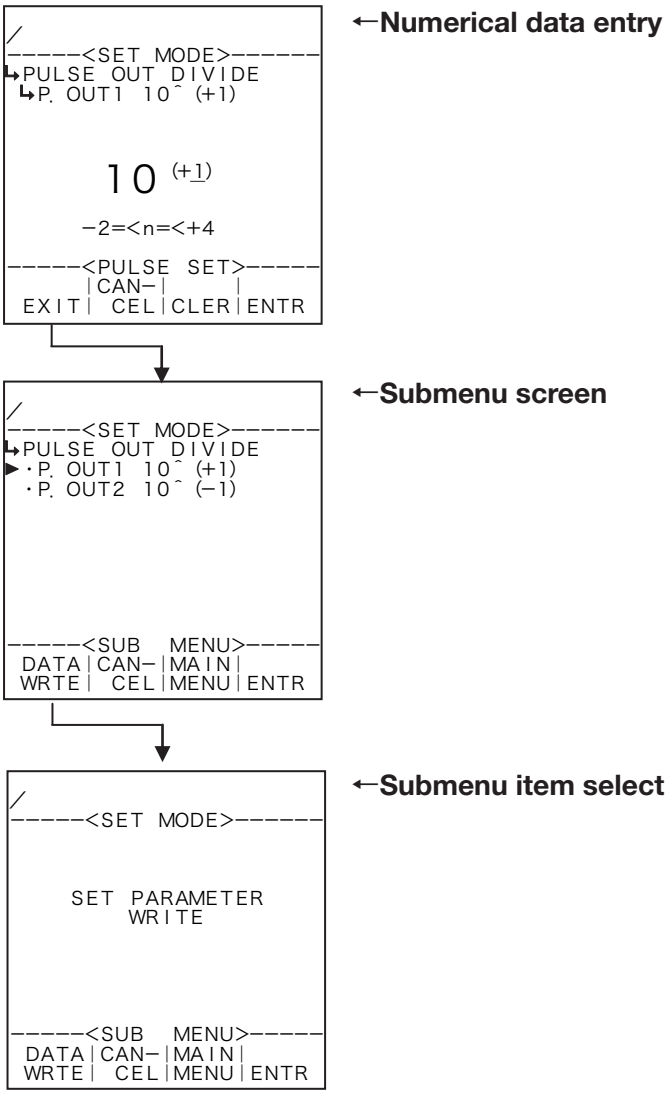
Quadratic correction submenu screen p. 88

(2) Rescaling the scale factor

Using the up and down arrow keys, you can increase or decrease the factor. If the on-screen reading is +0, pressing the up arrow key increases the figure by 1; pressing the down arrow key decreases it by 1, adjustable from −9 to +9.

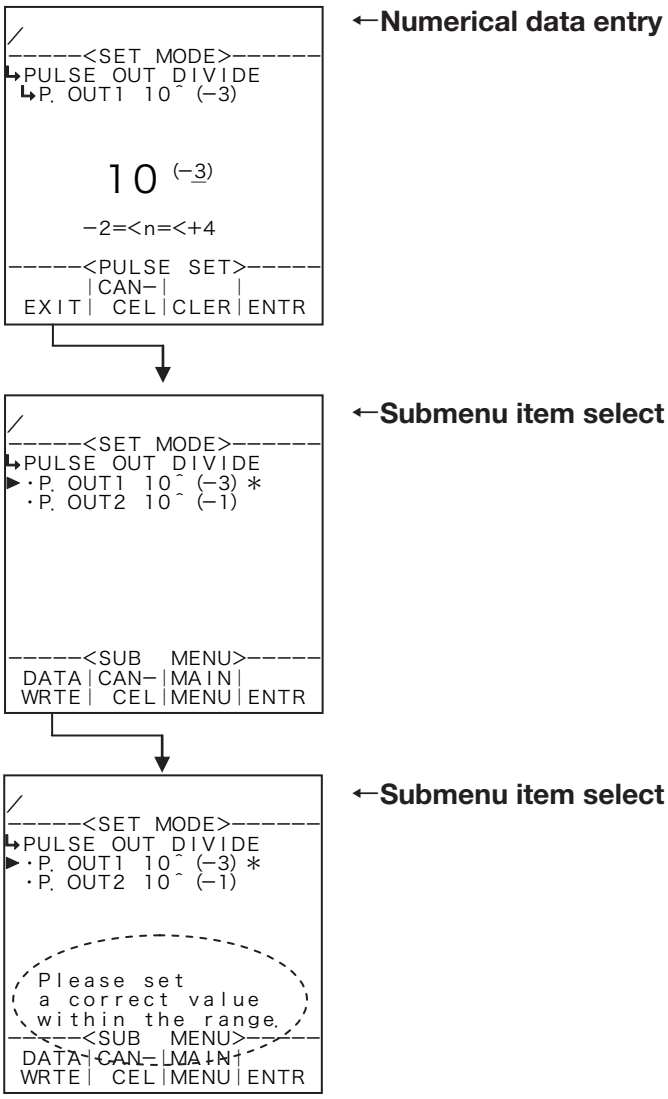
(3) When the scale factor set is within the range

When the scale factor set is within the acceptable range, a “SET PARAMETER WRITE” message appears and the mode select menu screen appears.



(4) When the scale factor is out of range

If the scale factor selected is out of acceptable range, an asterisk"＊"will appear at right of your setting on the submenu screen. "If you press function key "DATA WRTE" to end the setup process while"＊"staying on, you are prompted by the message to set an acceptable factor within the range while the scale factor setup submenu screen staying on."



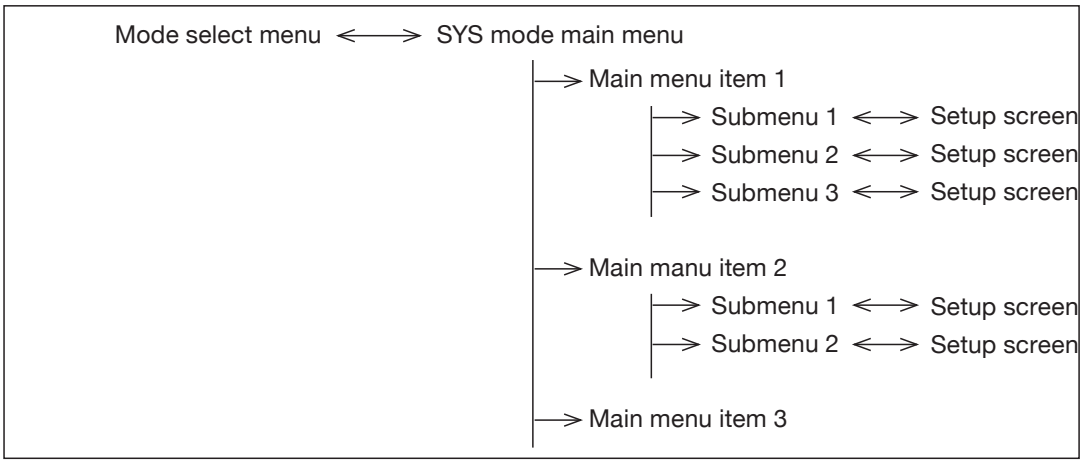
7. SYS MODE

The SYS mode is a mode in which the clock IC, type of temperature input, type of pressure input, reset mode of total counters, and backlight mode required for the implemention of the system in the operating environment are configured. This mode is enabled while the calculation process is interrupted.

7.1 Menu Tree

The SYS mode consists of the following three levels:

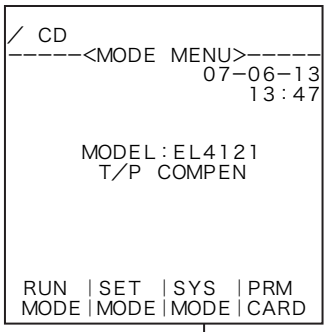
1. Main menu
2. Submenu
3. Setup screen (numerical value setup or option select screen)



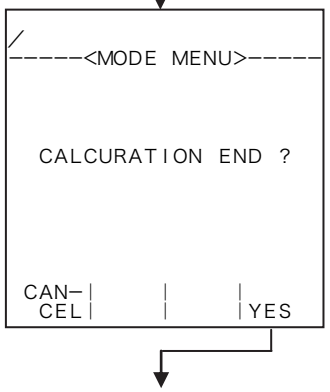
7.1.1 SYS Mode Main Menu Screen

At the mode select menu screen, pressing function key “SYS MODE” brings up a prompter screen asking you whether to interrupt the calculation process or not. At the touch of function key “YES” stops the calculation process and the screen switches to the main menu screen in the SET mode.
At the touch of function key “EXIT”, the mode select menu screen will then reappear.

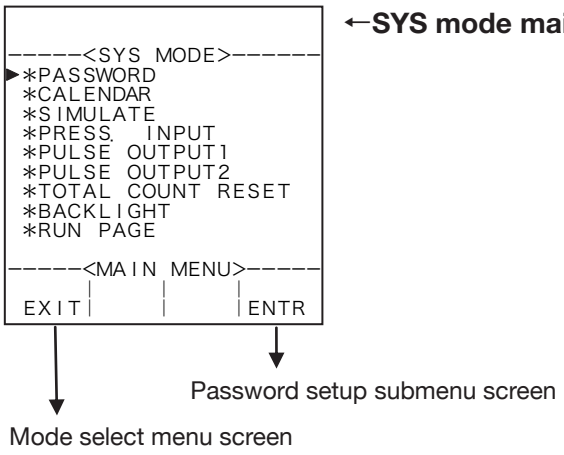
Example



←**Mode select menu screen**



←**Prompter screen asking you whether to interrupt calculation**

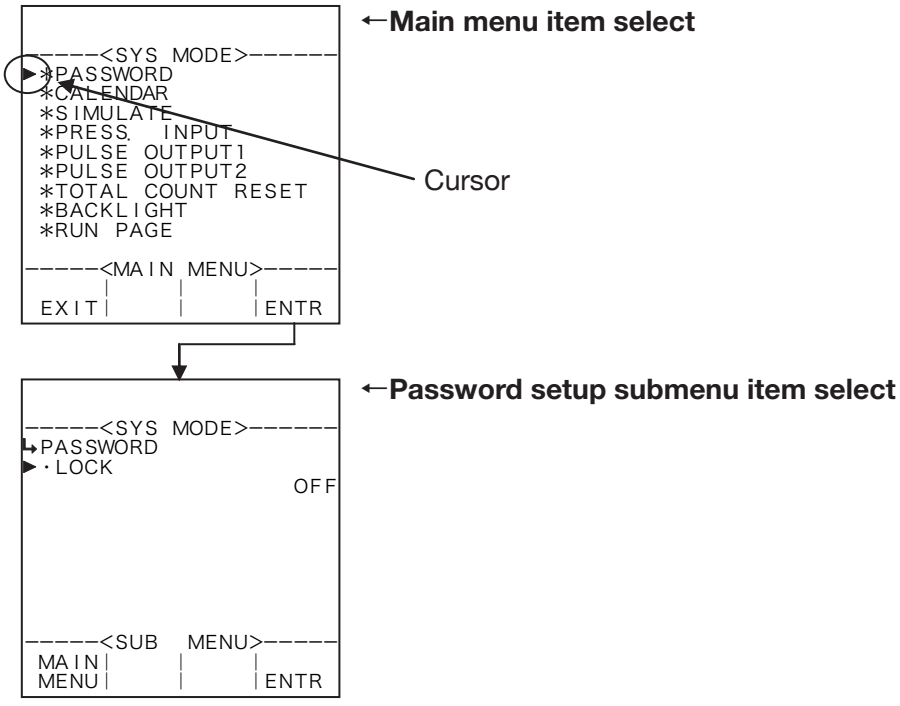


7.2 SYS mode submenu screen

At the submenu screen, pressing function key “ENTR” brings up a submenu screen of the item over which the cursor is placed. At the submenu screen, a more detailed list of menu items and their corresponding settings are shown. You can review details of the current settings or other information on this screen.

To choose an option for modification, move the cursor to the menu item desired with the up and down arrow keys and press function key “ENTR” A configuration then appears corresponding to the item you selected.

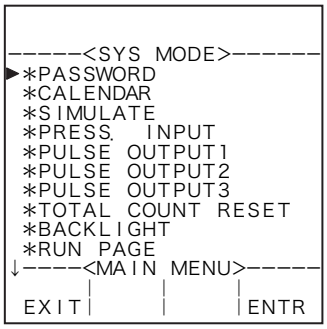
Example: Password setup

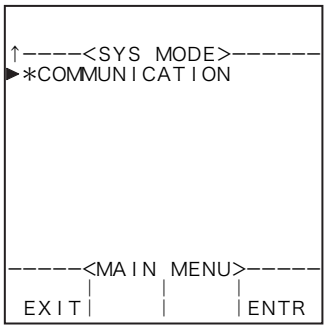


7.3 SYS Mode Menu Tree

System mode menus differ from model to model as shown below.

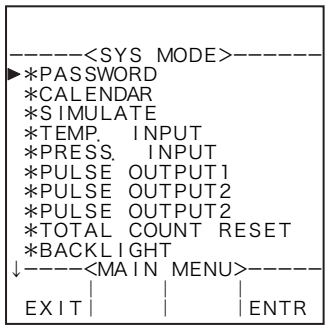
7.3.1 EL4101 Steam Flow Computer (sataurated steam service)

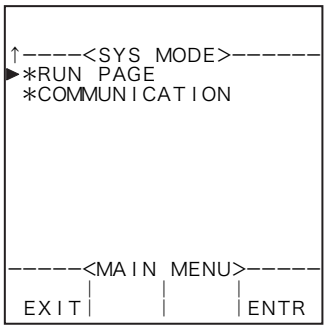




* PASSWPRD (password setup) p. 150
* CALENDAR (calendar setup) p. 152
* SIMULATE (analog output simulate) p. 153
* PRESS. INPUT (pressure input setup) p. 155
* PULSE OUTPUT 1 (pulse output 1 setup) p. 157
* PULSE OUTPUT 2 (pulse output 2 setup) p. 157
* PULSE OUTPUT 3 (pulse output 3 setup) p. 157
* TOTAL COUNT RESET (total counter reset setup) p. 160
* BACKLIGHT (backlight setup) p. 161
* RUN PAGE SAVE (RUN mode page setup save) p. 163
* COMMUNICATION (communication setup)
※ model with com interface p. 166

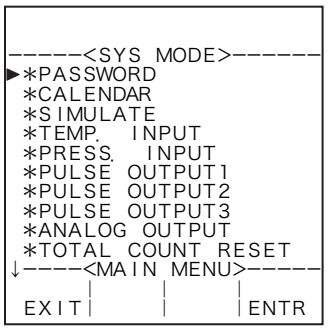
7.3.2 EL4111 Steam Flow Computer (superheated steam service)



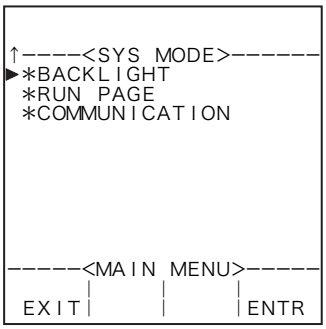


* PASSWPRD (password setup) p. 150
* CALENDAR (calendar setup) p. 152
* SIMULATE (analog output simulate) p. 153
* TEMP. INPUT (temperatuare input setup) p. 154
* PRESS. INPUT (pressure input setup) p. 155
* PULSE OUTPUT 1 (pulse output 1 setup) p. 157
* PULSE OUTPUT 2 (pulse output 2 setup) p. 157
* PULSE OUTPUT 3 (pulse output 3 setup) p. 157
* TOTAL COUNT RESET (total counter reset setup) p. 160
* BACKLIGHT (backlight setup) p. 161
* RUN PAGE SAVE (RUN mode page setup save) p. 163
* COMMUNICATION (communication setup)
※ model with com interface p. 166

7.3.3 EL4121 Temperature/Pressure Compensated Flow Computer (gas service)

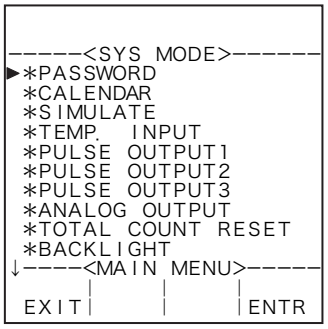


* PASSWPRD (password setup) p. 150
* CALENDAR (calendar setup) p. 152
* SIMULATE (analog output simulate) p. 153
* TEMP. INPUT (temperatuare input setup) p. 154
* PRESS. INPUT (pressure input setup) p. 155
* PULSE OUTPUT 1 (pulse output 1 setup) p. 157
* PULSE OUTPUT 2 (pulse output 2 setup) p. 157
* PULSE OUTPUT 3 (pulse output 3 setup) p. 157
* ANALOG OUTPUT (analog output setup) p. 159
* TOTAL COUNT RESET (total counter reset setup) p. 160

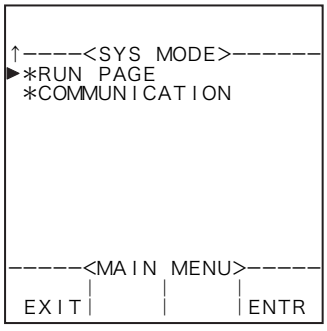


* BACKLIGHT (backlight setup) p. 161
* RUN PAGE SAVE
(RUN mode page setup page shown in RUN mode save) p. 163
* COMMUNICATION (communication setup)
※ model with com interface p. 166

7.3.4 EL4131 Temperature Compensated Flow Computer (liquid service)

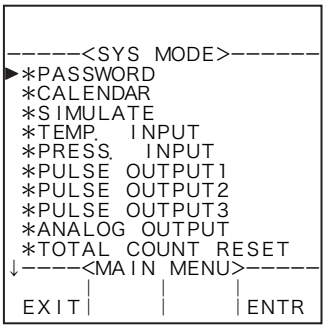


* PASSWPRD (password setup) p. 150
* CALENDAR (calendar setup) p. 152
* SIMULATE (analog output simulate) p. 153
* TEMP. INPUT (temperatuare input setup) p. 154
* PULSE OUTPUT 1 (pulse output 1 setup) p. 157
* PULSE OUTPUT 2 (pulse output 2 setup) p. 157
* PULSE OUTPUT 3 (pulse output 3 setup) p. 157
* ANALOG OUTPUT (analog output setup) p. 159
* TOTAL COUNT RESET (total counter reset setup) p. 160
* BACKLIGHT (backlight setup) p. 161

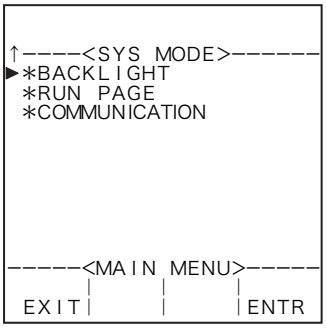


* RUN PAGE SAVE
(RUN mode page setup page shown in RUN mode save) p. 163
* COMMUNICATION (communication setup)
※ model with com interface p. 166

7.3.5 EL4201 Temperature/Pressure Compensated Gas Flow Computer (mass units)

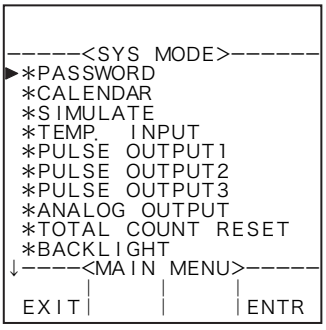


* PASSWPRD (password setup) p. 150
* CALENDAR (calendar setup) p. 152
* SIMULATE (analog output simulate) p. 153
* TEMP. INPUT (temperatuare input setup) p. 154
* PRESS. INPUT (pressure input setup) p. 155
* PULSE OUTPUT 1 (pulse output 1 setup) p. 157
* PULSE OUTPUT 2 (pulse output 2 setup) p. 157
* PULSE OUTPUT 3 (pulse output 3 setup) p. 157
* ANALOG OUTPUT (analog output setup) p. 159
* TOTAL COUNT RESET (total counter reset setup) p. 160

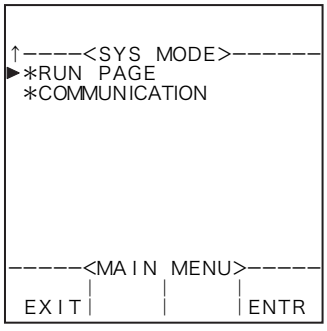


* BACKLIGHT (backlight setup) p. 161
* RUN PAGE SAVE (RUN mode page setup save) p. 163
* COMMUNICATION (communication setup)
  ※ model with com interface p. 166

7.3.6 EL4211 Temperature Compensated Liquid Flow Computer (mass units)

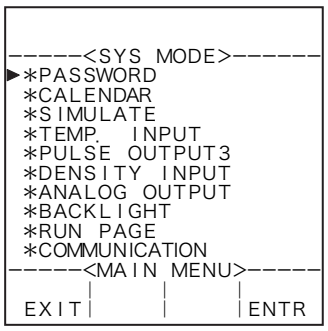


* PASSWPRD (password setup) p. 150
* CALENDAR (calendar setup) p. 152
* SIMULATE (analog output simulate) p. 153
* TEMP. INPUT (temperatuare input setup) p. 154
* PULSE OUTPUT 1 (pulse output 1 setup) p. 157
* PULSE OUTPUT 2 (pulse output 2 setup) p. 157
* PULSE OUTPUT 3 (pulse output 3 setup) p. 157
* ANALOG OUTPUT (analog output setup) p. 159
* TOTAL COUNT RESET (total counter reset setup) p. 160
* BACKLIGHT (backlight setup) p. 161



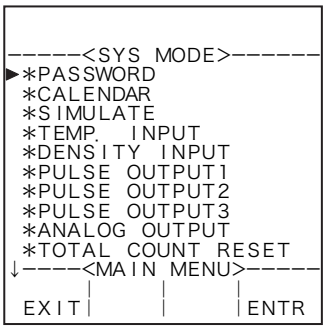
* RUN PAGE SAVE
  (RUN mode page setup page shown in RUN mode save) p. 163
* COMMUNICATION (communication setup)
  ※ model with com interface p. 166

7.3.7 EL4301 Density Computer for Mass Flowmeter

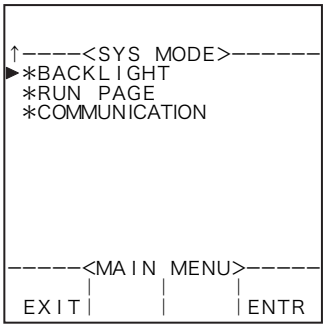


- ＊PASSWORD (password setup) p. 150
- ＊CALENDAR (calendar setup) p. 152
- ＊SIMULATE (analog output simulate) p. 153
- ＊TEMP. INPUT (temperatuare input setup) p. 154
- ＊PULSE OUTPUT 3 (pulse output 3 setup) p. 157
- ＊DENSITY INPUT (density input setup) p. 156
- ＊ANALOG OUTPUT (analog output setup) p. 159
- ＊BACKLIGHT (backlight setup) p. 161
- ＊RUN PAGE SAVE (run mode page setup save) p. 163
- ＊COMMUNICATION (communication setup)
  ※ Model with com interface p. 166

7.3.8 EL4311 Density Computer for Mass Flowmeter (with solids proportion calculation feature)

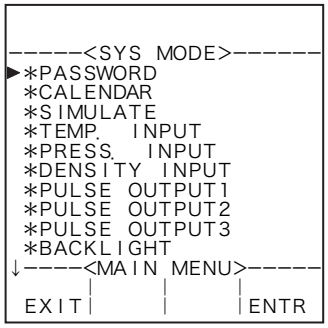


- ＊PASSWORD (password setup) p. 150
- ＊CALENDAR (calendar setup) p. 152
- ＊SIMULATE (analog output simulate) p. 153
- ＊TEMP. INPUT (temperature input setup) p. 154
- ＊PULSE OUTPUT 1 (pulse output 1 setup) p. 157
- ＊PULSE OUTPUT 2 (pulse output 2 setup) p. 157
- ＊PULSE OUTPUT 3 (pulse output 3 setup) p. 157
- ＊DENSITY INPUT (density input setup) p. 156
- ＊ANALOG OUTPUT (analog output setup) p. 159
- ＊TOTAL COUNT RESET (total counter reset setup) p. 160

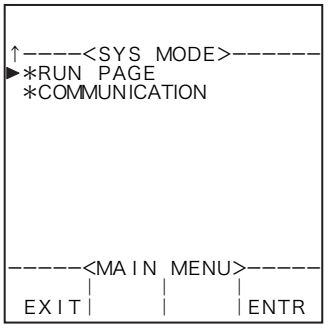


- ＊BACKLIGHT (backlight setup) p. 161
- ＊RUN PAGE SAVE (RUN mode page setup save) p. 163
- ＊COMMUNICATION (communication setup)
  ※ model with com interface p. 166

7.3.9 EL4321 Density Computer for Spool Densitometer (gas service)

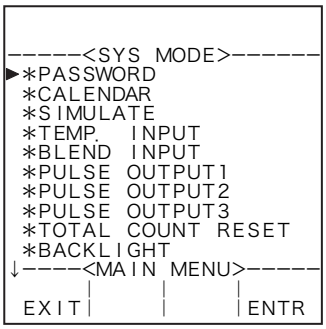


* PASSWPRD (password setup) p. 150
* CALENDAR (calendar setup) p. 152
* SIMULATE (analog output simulate) p. 153
* TEMP. INPUT (temperatuare input setup) p. 154
* PRESS. INPUT (pressure input setup) p. 155
* DENSITY INPUT (density input setup) p. 156
* PULSE OUTPUT 1 (pulse output 1 setup) p. 157
* PULSE OUTPUT 2 (pulse output 2 setup) p. 157
* PULSE OUTPUT 3 (pulse output 3 setup) p. 157
* BACKLIGHT (backlight setup) p. 161

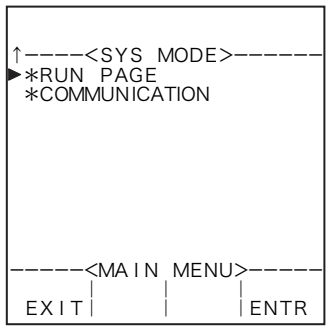


* RUN PAGE SAVE (RUN mode page setup save) p. 163
* COMMUNICATION (communication setup)
※ model with com interface p. 166

7.3.10 EL4401 Blend Oil Temperature Compensated Flow Computer

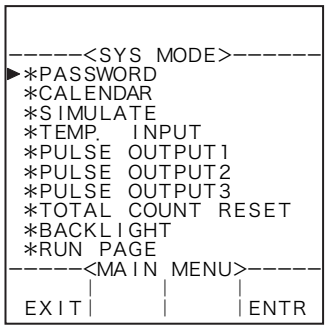


* PASSWPRD (password setup) p. 150
* CALENDAR (calendar setup) p. 152
* SIMULATE (analog output simulate) p. 153
* TEMP. INPUT (temperatuare input setup) p. 154
* BLEND INPUT (blend input setup) p. 165
* PULSE OUTPUT 1 (pulse output 1 setup) p. 157
* PULSE OUTPUT 2 (pulse output 2 setup) p. 157
* PULSE OUTPUT 3 (pulse output 3 setup) p. 157
* TOTAL COUNT RESET (total counter reset setup) p. 160
* BACKLIGHT (backlight setup) p. 161

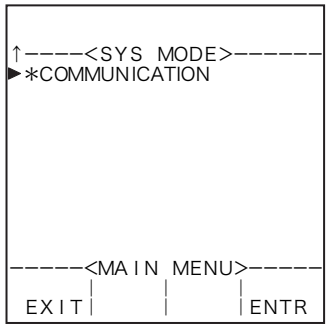


* RUN PAGE SAVE (RUN mode page setup save) p. 163
* COMMUNICATION (communication setup)
※ model with com interface p. 166

7.3.11 EL4501 Multipoint Temperature Compensated Flow Computer (liquid service)



- ＊PASSWPRD (password setup) p. 150
- ＊CALENDAR (calendar setup) p. 152
- ＊SIMULATE (analog output simulate) p. 153
- ＊TEMP. INPUT (temperatuare input setup) p. 154
- ＊PULSE OUTPUT 1 (pulse output 1 setup) p. 157
- ＊PULSE OUTPUT 2 (pulse output 2 setup) p. 157
- ＊PULSE OUTPUT 3 (pulse output 3 setup) p. 157
- ＊TOTAL COUNT RESET (total counter reset setup) p. 160
- ＊BACKLIGHT (backlight setup) p. 161
- ＊RUN PAGE SAVE (RUN mode page setup save) p. 163



- ＊COMMUNICATION (communication setup) p. 166

7.4 Setup Items

7.4.1 Password Setup (PASSWORD)

This page describes the procedure to enable or disable the password function, along with the procedure to create your login password.
By turning ON (enable) the password setting, you can inhibit unauthorized access with a prompter message asking for entering user's password each time the mode select is accessed (in the SET, SYS, and EXTD (extended) modes).

- ※ **To minimize the risk of configuration modifications by inadvertent operation, use the password to the fullest extent possible.**
- ※ **In most cases, the password function and password numerals are factory set to "ON" and "1111", respectively.**
  If the user himself wants to change the mode and modify settings, read this manual thoroughly before working with them.

Conditions to show submenu items

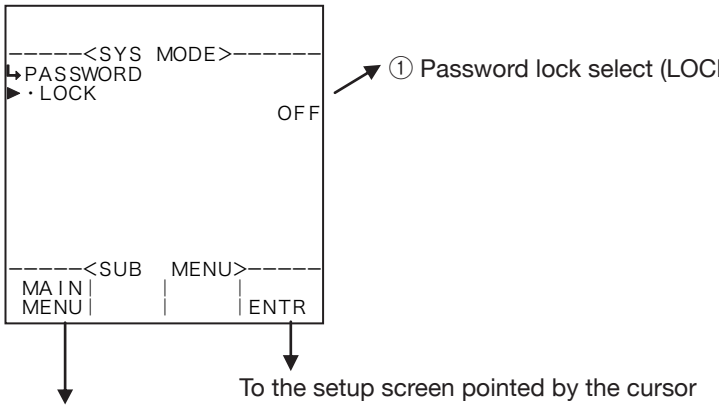
Submenu item		
Password lock setting ※	ON	OFF
Password numerical setting	Displayed	Hiden

※：Conditions for selecting on-screen information

(1) Password setup submenu screen

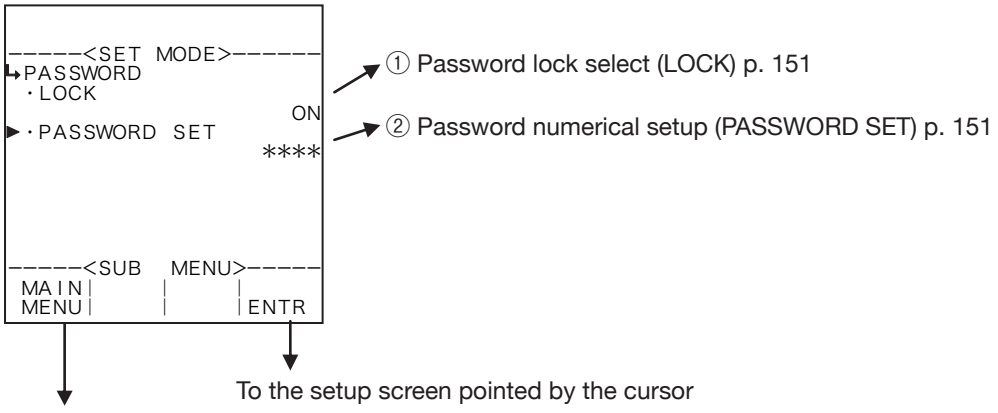
At the submenu, move the cursor to the desired item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired setup screen.

① **Password setup submenu screen**



7.1.1 SYS mode main menu screen p. 142

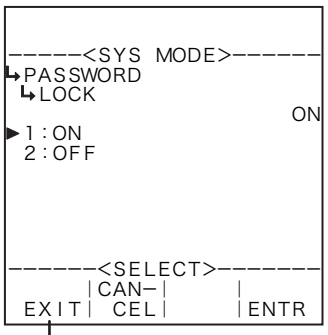
② **The password setup is ON.**



7.1.1 SYS mode main menu screen p. 142

① Password lock selection (LOCK)

To enable the password function or disable it is selected at this screen.



←Lock option select

For details of option setup. See "(2) Option select setup screen (SELECT)" on page 46.

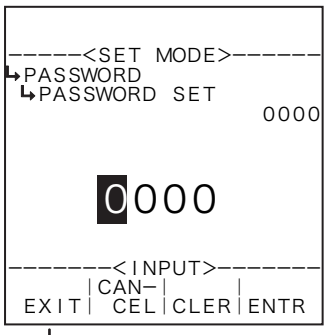
※ To minimize the risk of configuration modifications by inadvertent operation, use the password to the fullest extent possible.

※ Depending on your option selected, different items will be shown on the submenu.

Password setup submenu screen p. 150

② Password numerical value setup (PASSWORD SET)

Password's numerical value is set up here. Acceptable password is a four-digit number using digits 0 to 9.



←Numerical entry of password

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ In the SYS mode, this item is not shown unless the password lock select (① Password lock option setup (LOCK) on page 151) is set to "OFF".

※ If you leave this setup procedure undone with password lock setup "ON", the setting will remain at "1111".

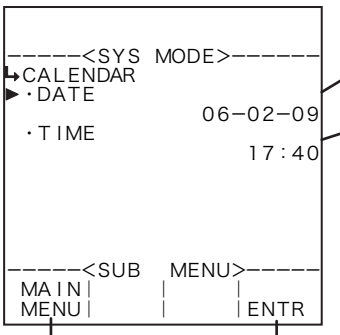
Password setup submenu screen p. 150

7.4.2 Calendar Setup (CALENDAR)

Date and time of the clock IC are set up here.

(1) Calendar setup submenu screen

At the submenu, move the cursor to the desired item with the up and down arrow keys.
At the touch of (the) function key “ENTR”, the screen switches to the desired setup screen.



① Date setup (DATE) on page 152

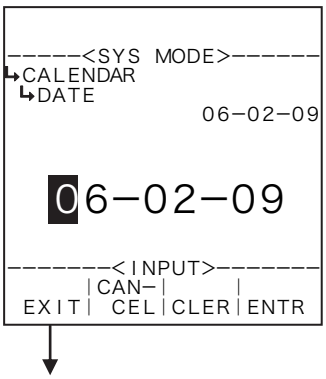
② Time setup (TIME) on page 15

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Date setup (DATE) Date of the clock 1C is set here.

Date of the clock IC is set up here.



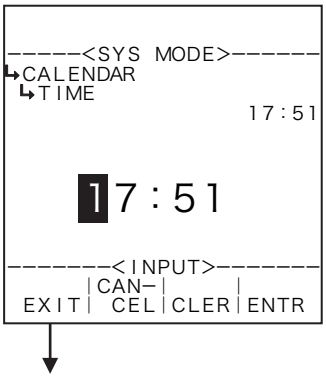
←**Numerical entry of password**

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

Calendar setup submenu screen p. 152

② Time setup (TIME)

Time of the clock IC is set up here.



←**Numerical entry of password**

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

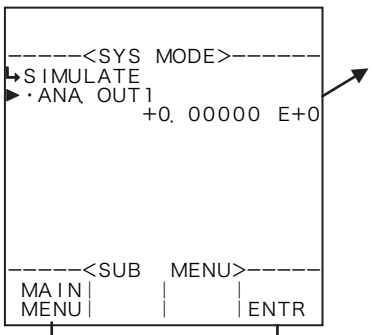
Calendar setup submenu screen p. 152

7.4.3 Simulated Analog Output (SIMULATE)

A simulated analog output is set up here.

(1) Simulated analog output submenu screen

At the submenu, move the cursor to the desired item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired setup screen.



① Analog output (ANA. OUT) p. 153

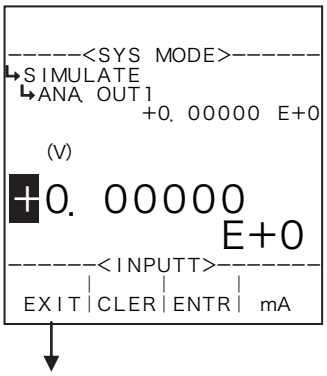
To the setup screen pointed by the cursor

77.1.1 SYS mode main menu screen p. 142

① Analog output 1 (ANA. OUT 1)

A simulated analog output level is set up here.

※ **The acceptable settings range from 3.5 to 22mA. If your setting exceeds this range, an inaccurate or erratic output may result.**



Simulated analog output submenu screen p. 153

←Numerical value setup

Pressing function key labeled "mA" while it appears enables you to set up values of current magnitude (mA). Pressing function key "V" while it appears enables you set up values of voltage magnitude (V). (The screen at left shows the voltage setup screen.)

Move the cursor to the desired figure place in the numerical value edit field (4x size characters) with the left and right arrow keys; increase or decrease the value with the left and right arrow keys until the desired setting is obtained.

At the touch of function key "ENTR," the current setting indicated is replaced by the new setting desired for the output.

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

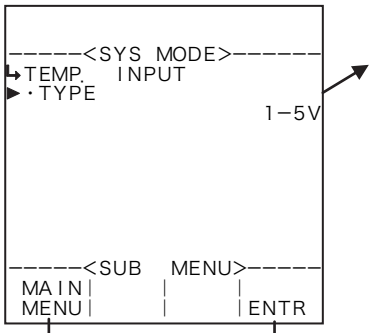
By so doing, analog output is provided in proportion to the setting.

7.4.4 Temperature Input Setup (TEMP. INPUT)

The type of input for the temperature input is set up here.

(1) Temperature input submenu screen

At the submenu, move the cursor to the desire setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired setup screen.



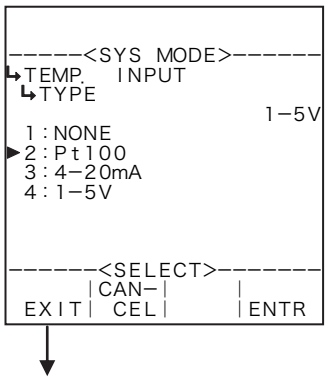
① Temperature input type setup (TYPE) on page 154

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Temperature input type setup (TYPE)

The type of input for the temperature input is set up here.



Temperature input submenu screen p. 155

←Input type option

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

※ In cases where the user has changed the input type to NONE (constant) or to other type, do not fail to set up the constant at the temperatuare input setup in the SET mode (② Temperataure input constant setup (CONSTANT) on page 51), and set up the pulse output scaling (Section 6.4.27 Pulse output scaling setup (PULSE OUT DIVIDE) on page 138). Unless they are so configured, the computer possibly may not perform properly.

※ On Models EL4301 and EL4311, switching among options - 4 to 20mA, 1 to 5mA, 5mV/°C, and 10mV/°C - is done by hardware. You cannot alter setting at this menu.

・Available items for setup

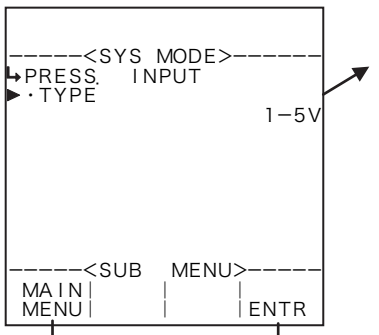
Model	Options
EL4111	"NONE","Pt100Ω","4-20mA","1-5V"
EL4121	"NONE","Pt100Ω","4-20mA","1-5V"
EL4131	"NONE","Pt100Ω","4-20mA","1-5V"
EL4201	"NONE","Pt100Ω","4-20mA","1-5V"
EL4211	"NONE","Pt100Ω","4-20mA","1-5V"
EL4301	"NONE","Pt100Ω","4-20mA","1-5V","5mV/℃ ","10mV/℃ "
EL4311	"NONE","Pt100Ω","4-20mA","1-5V","5mV/℃ ","10mV/℃ "
EL4321	"NONE","Pt100Ω","4-20mA","1-5V"
EL4401	"NONE","Pt100Ω","4-20mA","1-5V"
EL4501	"NONE","Pt100Ω","4-20mA","1-5V"

7.4.5 Pressure Input Setup (PRESS. INPUT)

The type of input for the pressure input is set up here.

(1) Pressure input submenu screen

At the submenu, move the cursor to the desire setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired setup screen.



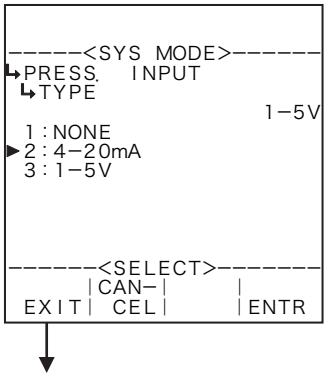
① Pressure input type setup (TYPE) on page 155

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Pressure input type setup (TYPE)

The type of input for the pressure input is set up here.



←**Input type option setup**

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

※ In cases where the user has changed the input type to NONE (constant) or to other type, do not fail to set up the constant at the pressuare input setup in the SET mode (② Pressure input constant setup (CONSTANT) on page 58), and set up the pulse output scaling (Section 6.4.27 Pulse output scaling setup (PULSE OUT DIVIDE) on page 138). Unless they are so configured, the computer possibly may not perform properly.

Pressure input submenu screen p. 156

・Available items for setup

Model	Options
EL4101	"NONE", "4 to 20mA", "1 to 5V"
EL4111	"NONE", "4 to 20mA", "1 to 5V"
EL4121	"NONE", "4 to 20mA", "1 to 5V"
EL4201	"NONE", "4 to 20mA", "1 to 5V"
EL4321	"NONE", "4 to 20mA", "1 to 5V"

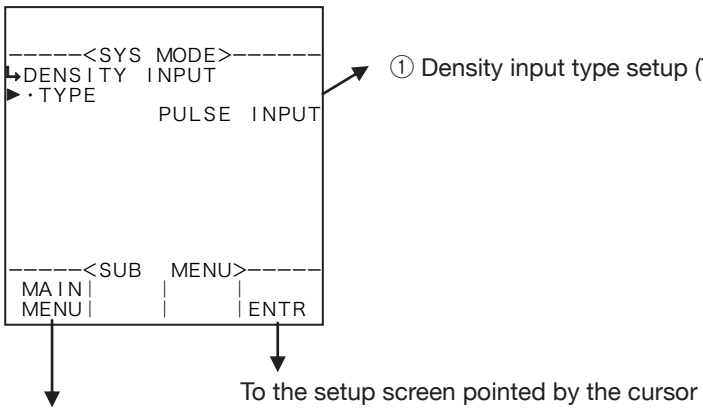
※ This item is not shown in models other than above.

7.4.6 Density Input Setup (DENSITY INPUT)

The type of input for the density input is set up here.

(1) Density input submenu screen

At the submenu, move the cursor to the desire setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired setup screen.



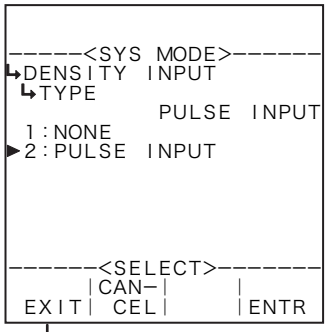
① Density input type setup (TYPE) on page 156

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Density input type setup (TYPE)

The type of input for the density input is set up here.



←**Input type option setup**

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

※ In cases where the user has changed the input type to NONE (constant) or to other type, do not fail to set up the constant (※1) at the density input setup in the SET mode, and set up the pulse output scaling (Section 6.4.27 Pulse output scaling setup (PULSE OUT DIVIDE) on page 138). Unless they are so configured, the computer possibly may not perform properly.

Densitye input submenu screen p. 156

※ 1

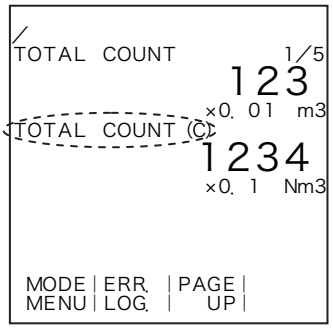
On EL4301, ② Density calculation costant (CONSTANT) p. 105
On EL4311, ② Density calculation costant (CONSTANT) p. 114
On EL4321, ② Density calculation costant (CONSTANT) p. 126

7.4.7 Pulse Output Setup (PULSE OUTPUT)

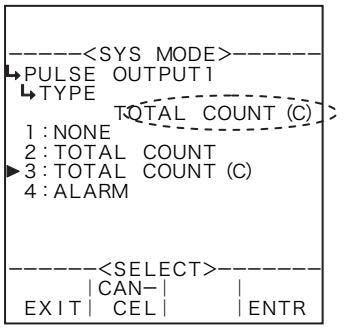
The type of output for the pulse output is set up here.

Example: On the RUN mode screen, if the "TOTAL COUNT" represents the uncorrected count while the "TOTAL COUNT (C)" represents the corrected count, then setting up the "TOTAL COUNT (C)" at "TYPE" of the "PULSE OUTPUT 1" config menu results in providing the corrected total pulse output.

RUN mode screen

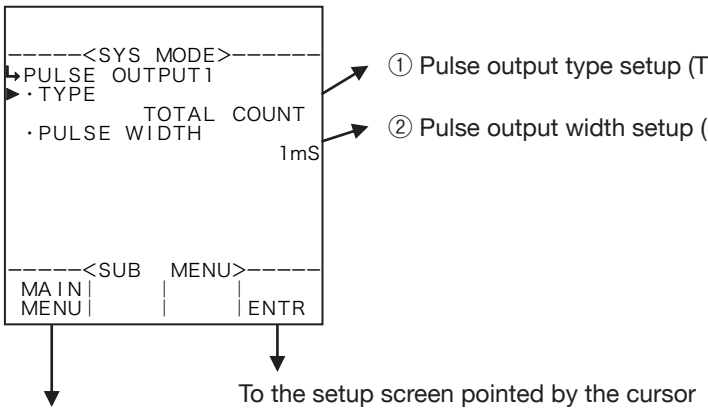


SYS mode pulse output setup



(1) Pulse output submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the pulse output submenu screen.



① Pulse output type setup (TYPE) on page 157

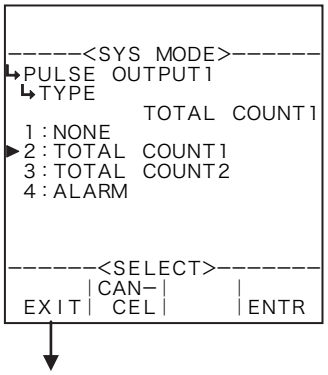
② Pulse output width setup (PULSE WIDTH) on page 158

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Pulse output type setup (TYPE)

The type of output for the pulse output is set up here.



←Input type option setup

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

Pulse output submenu screen p. 157

・Avaiable options

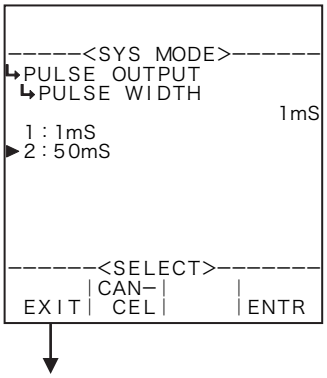
Model	Output	Options
EL4101	PULSE OUTPUT1 to 3	“NONE”, “TOTAL COUNT 1” (corrected mass total) “TOTAL COUNT 2” (corrected thermal total), “ALARM” (alarm output)
EL4111		“NONE”, “TOTAL COUNT 1” (corrected mass total) “TOTAL COUNT 2” (corrected thermal total), “ALARM” (alarm output)
EL4121		“NONE”, “TOTAL COUNT” (uncorrected total) “TOTAL COUNT (C)” (corrected total), “ALARM” (alarm output)
EL4131		“NONE”, “TOTAL COUNT” (uncorrected total) “TOTAL COUNT (C)” (corrected total), “ALARM” (alarm output)
EL4201		“NONE”, “TOTAL COUNT 1” (uncorrected total) “TOTAL COUNT 2” (corrected mass total), “ALARM” (alarm output)
EL4211		“NONE”, “TOTAL COUNT 1” (uncorrected total) “TOTAL COUNT 2” (corrected mass total), “ALARM” (alarm output)
EL4301	PULSE OUTPUT3	“NONE”, “ALARM” (alarm output)
EL4311	PULSE OUTPUT1 to 3	“NONE”, “TOTAL COUNT 1” (corrected mass total) “TOTAL COUNT 2” (corrected mass solids content total), “ALARM” (alarm output)
EL4321		“NONE”, “ALARM” (alarm output)
EL4401		“NONE”, “TOTAL COUNT 1” (corrected total) “TOTAL COUNT 2” (corrected mass total), “ALARM” (alarm output)
EL4501		“NONE”, “ALARM” (alarm output), “TOTAL COUNT 1” (uncorrected total), “TOTAL COUNT 2” (viscosity corrected total), “TOTAL COUNT 3” (visc./temp. corrected total)

※ “ALARM” (alarm output) is a status output to be produced when at least one error occurred.

※ This item is not shown in models other than above.

② Pulse output width setup (PULSE WIDTH)

The pulse width of output is set up here.



Pulse output submenu screen p. 157

←Output type option select

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

※ At pulse output 3, this item is not shown. The pulse output width of pulse output 3 is set up with a jumper.

※ If 50ms is selected for pulse output width, great care should be taken in the proper selection of output pulse frequency. With 50ms selected, proper output will not be produced above 20Hz in the pulse output frequency. So, in an application where the output pulse frequency exceeds 20Hz, select a greater scaling factor for the pulse output to have a larger unit of the output pulse, or select a width of 1ms. (With a 50ms width selected, as a rule of thumb, the maximum frequency of pulse output is 10Hz.)

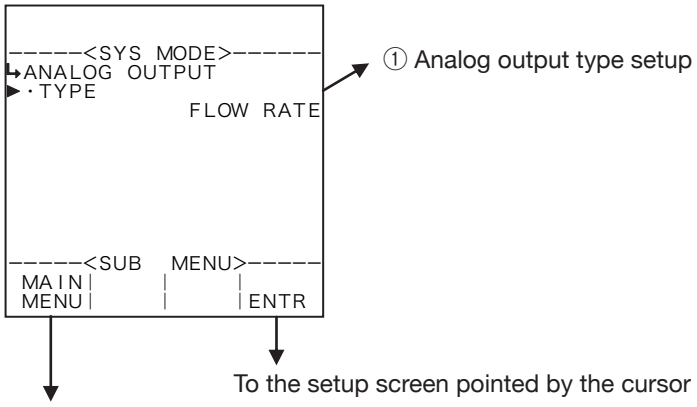
7.4.8 Analog Output Setup (ANALOG OUTPUT)

The type of output for the analog output is set up here.

Example: On the RUN mode screen, if “FLOW RATE” represents the uncorrected instant flowrate while “FLOW RATE (C)” represents the corrected instant flowrate, then setting up “FLOW RATE (C)” at “TYPE” of “ANALOG OUTPUT” setup menu results in providing an analog output corresponding to the instant flowrate.

(1) Analog output submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the pulse output submenu screen.



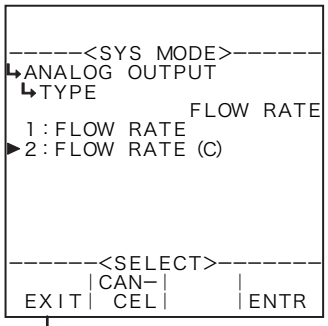
① Analog output type setup (TYPE) on page 159

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Analog output type setup (TYPE)

The type of output for the analog output is set up here.



←Output type option select

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

※ In case the user has changed the output type to the other type, do not fail to set up the analog output in the SET mode (Section 6.4.8 Analog output setup (ANALOG OUTPUT) on page 76), and set up the pulse output scaling (Section 6.4.27 Pulse output scaling setup (PULSE OUT DIVIDE) on page 138). Unless they are so configured, the computer possibly may not perform properly.

Analog output submenu screen p. 159

・Available optional items

Model	Options
EL4121	“FLOW RATE” uncorrected instant flowrate, “FLOW RATE (C)” corrected instant flowrate
EL4131	“FLOW RATE” uncorrected instant flowrate, “FLOW RATE (C)” corrected instant flowrate
EL4201	“FLOW RATE” uncorrected instant flowrate, “FLOW RATE (C)” corrected instant mass flowrate
EL4211	“FLOW RATE” uncorrected instant flowrate, “FLOW RATE (C)” corrected instant mass flowrate
EL4301	“DENSITY” corrected density, “%MASS” % solids content
EL4311	“FLOW RATE” instant mass flowrate, “FLOW RATE (SOLID)” instant solids content flowrate, “SOLID RATIO” solids content (%mass), “DENSITY” corrected density

※ These optional items are not shown in the following models due to fixed analog output parameters.

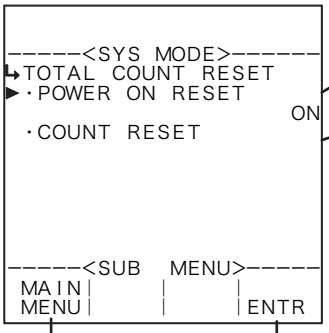
EL4101	Corrected instant mass flowrate
EL4111	Corrected instant mass flowrate
EL4321	Corrected density
EL4401	Corrected instant flowrate
EL4501	Temperature

7.4.9 Total Count Reset Setup (TOTAL COUNT RESET)

Whether to enable power-on reset for total counter reading or not is set up here.

(1) Total count reset submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of (function key “ENTR”, the screen switches to the desired setup screen.



① Total count reset - power on reset select (POWER ON RESET) p. 160

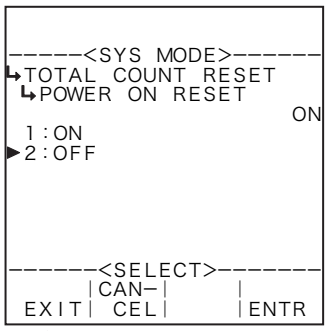
② Total count reset (COUNT RESET) p. 160

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Total count reset - power on reset select (POWER ON RESET)

Whether to enable power-on reset for total counter reading or not is set up here.



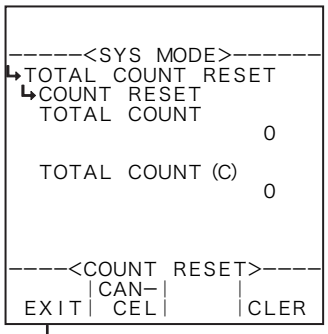
←**Reset option select**

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

Total count reset submenu screen p. 160

② Total count reset (COUNT RESET)

Total count can be reset at this menu screen.



←**Total count reset select**

Pressing function key “CLER” resets total count readings to “ 0.”
Close the screen at the touch of function key “EXIT.”

※ **By pressing function key “CANCEL”, you can cancel the reset that has just been made (restoring your previous setting) and terminate this procedure.**

Total count reset submenu screen p. 160

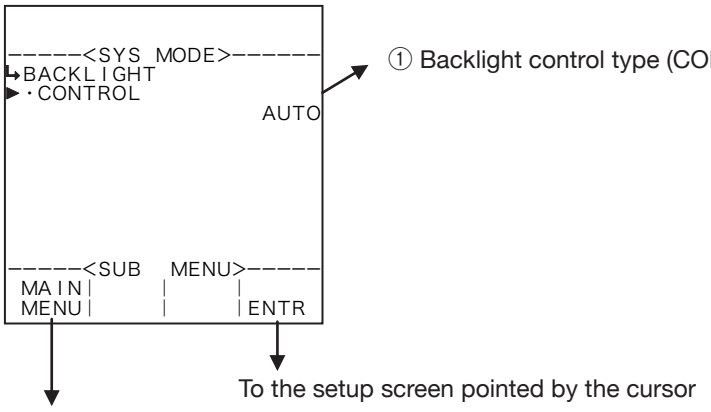
7.4.10 Backlight Setup (BACK LIGHT)

This section describes the procedures to control the display backlight and set up the backlight ON/OFF options. If the control type (CONTROL) is set to AUTO, the backlight will automatically go out about five minutes after the last keystroke. It will come on again with any subsequent keystroke.

(1) Backlight setup submenu screen

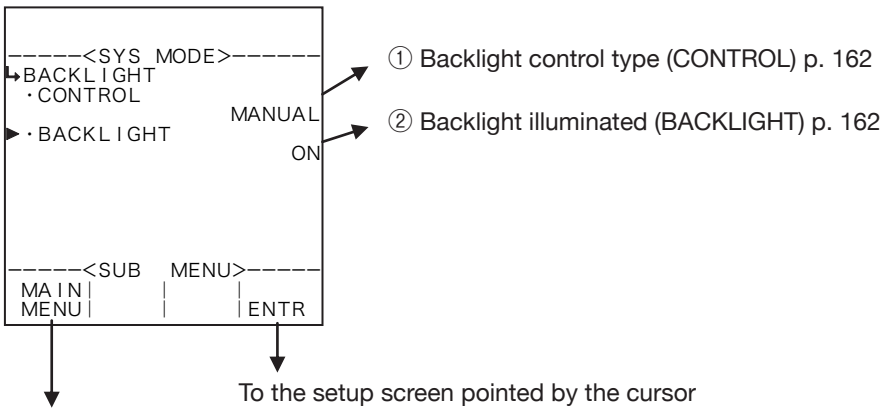
At the submenu, move the cursor to the desire setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired setup screen.

① When control type (CONTROL) is set to AUTO



7.1.1 SYS mode main menu screen p. 142

② When control type (CONTROL) is set to MANUAL



7.1.1 SYS mode main menu screen p. 142

Conditions to show submenu items

Submenu item		
Backlight control type ※	AUTO	MANUAL
Backligh illumination	Hidden	Displayed

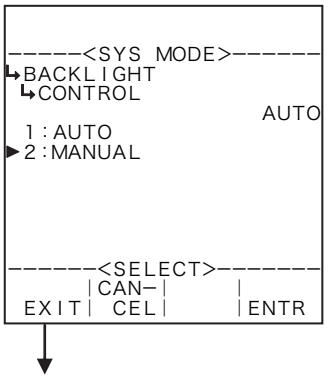
※：Conditions for selecting on-screen information

① Backlight control type (CONTROL)

The type of control is set up here. Select either “AUTO” or “MANUAL”. If your selection is AUTO, the backlight will automatically go out about five minutes after the last keystroke. It will come on again with any subsequent keystroke.

With “MANUAL”, select either illumination steady on or steady off.

※ **Reminder - ”MANUAL” combined with steady illumination will result in considerably reduced backlight life expectancy. Select “AUTO” mode in normal use.**



←**Control type option select**

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

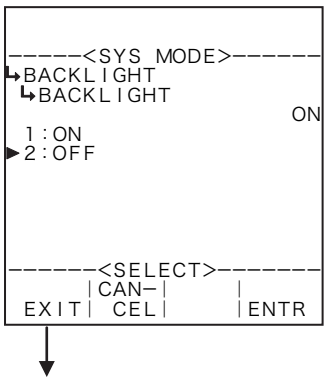
At the submenu, move the cursor to the desired setup item with the up and down arrow keys.

At the touch of function key “ENTR,” the screen switches to the desired setup screen.

Backlight setup submenu screen p. 161

② Backlight illumination (BACKLIGHT)

With “MANUAL” set in the control type, select either illumination steady on or steady off.



←**Backlight illumination setup**

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

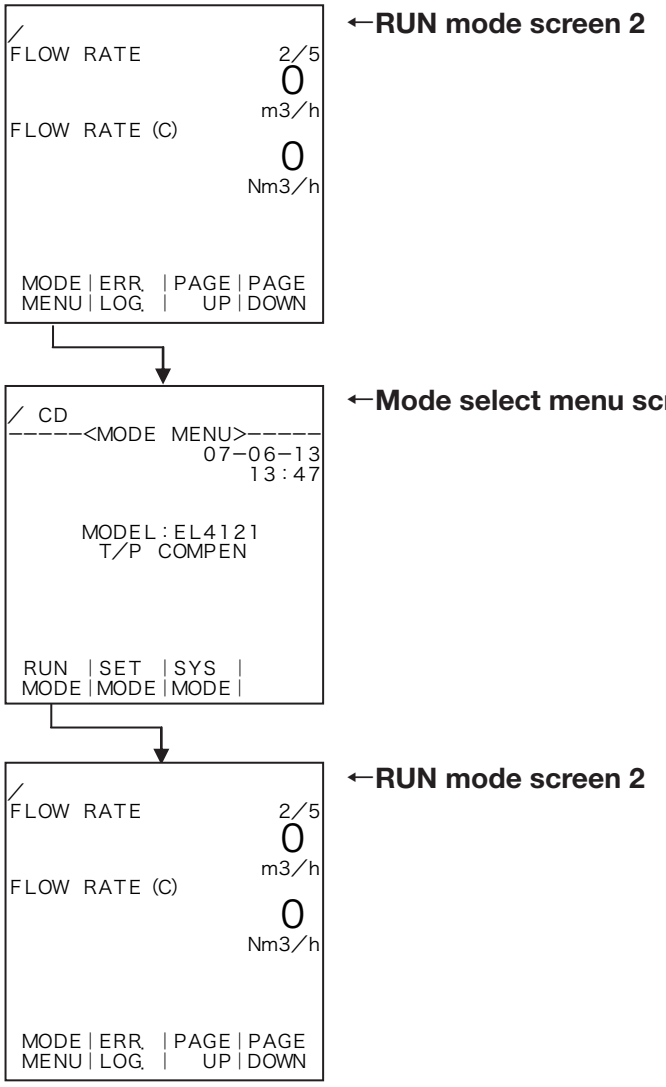
Backlight setup submenu screen p. 161

7.4.11 RUN Mode Page Save Setup (RUN PAGE)

This section describes the procedure whether how to save the number of page when the RUN mode is shown.

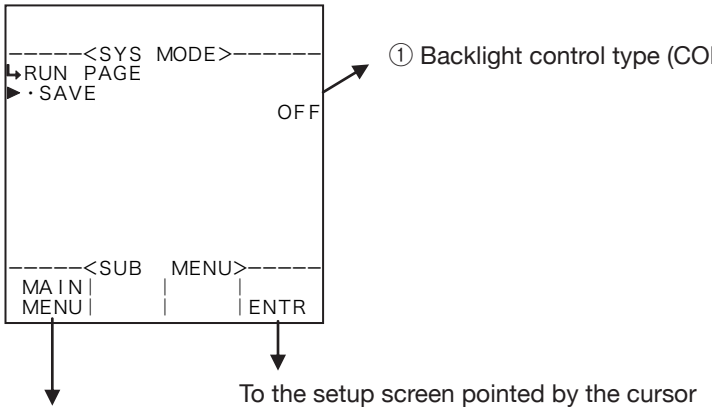
With the page save setup “ON” (save) selected, the last viewed page appears at first whenever you switch to view the RUN mode from other mode, e.g., the mode select menu screen. With OFF (don't save) selected, the first page appears when you switch to view the RUN mode from other mode, e.g., the mode select menu screen.

When “ON” (save) is selected



(1) RUN mode page save submenu screen

At the submenu, move the cursor to the desired setup item with the up arrow and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired setup screen.

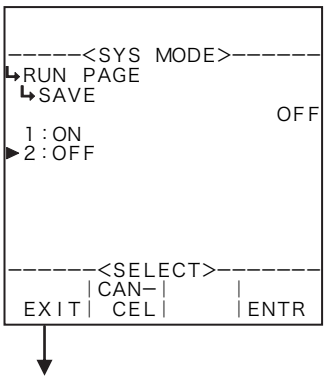


① Backlight control type (CONTROL) p. 162

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① RUN mode page save setup (SAVE)



←**Save option select setup**

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

Backlight setup submenu screen p. 161

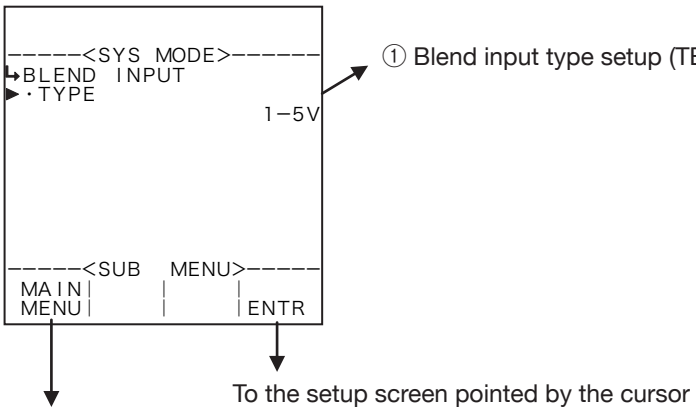
7.4.12 Blend Input Setup (BLEND INPUT)

Input type of the blend input is set up here.

※ **This setting is used only in EL4401. This item is not shown in other models.**

(1) Blend input submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired setup screen.



① Blend input type setup (TEYPE) p. 165

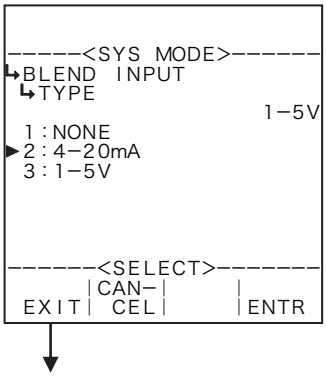
To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Blend input type setup (TYPE)

Input type of the blend input is set up here.

※ **If you have changed the input type to NONE (constant) or to other type, do not fail to make sure of the blend input setting in the SET mode and set up the pulse output scaling. Unless it is so configured, the computer possibly may not perform properly.**



←Input type option select setup

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

Blend input submenu screen p. 165

7.4.13 Communication Setup (COMMUNICATION)

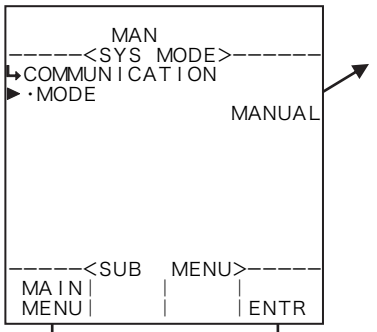
Communication functions are set up here.

※ **This item is not shown in models not provided with communication capabilities.**

(1) Communication setup submenu screen

At the submenu, move the cursor to the desired setup item with the up arrow and down arrow keys. At the touch of function key “ENTR”, the screen switches to the desired setup screen.

① When communication mode is in “MANUAL”

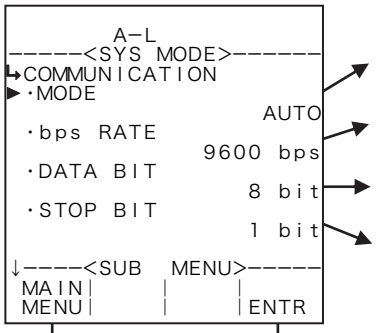


① Communication mode setup (MODE) on page 167

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

② When communication mode is in “AUTO”



① Communication mode setup (MODE) p. 167

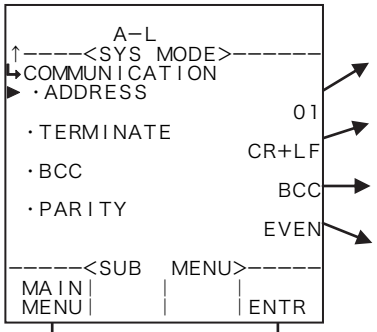
② Communication baud rate setup (bps RATE) p. 167

③ Communication data bit length setup (DATA BIT) p. 168

④ Communication stop bit length setup (STOP BIT) p. 168

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142



⑤ Communication home address setup (ADDRESS) p. 168

⑥ Communication terminator setup (TERMINATE) p. 168

⑦ Communication BCC setup (BCC) p. 169

⑧ Communication parity bit setup (PARITY) p. 169

To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

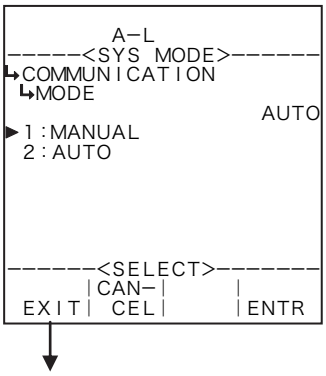
Conditions to show submenu items

Submenu item		
Communication mode ※	MANUAL	AUTO
Communication baud rate	Hidden	Displayed
Communication data bit length	Hidden	Displayed
Communication stop bit length	Hidden	Displayed
Communication home address	Hidden	Displayed
Communication terminator	Hidden	Displayed
Communication BBC	Hidden	Displayed
Communication parity bit	Hidden	Displayed

※ : Conditions for selecting displayed information

① Communication mode setup (MODE)

Communication mode is set up here.



←**Mode option select setup**

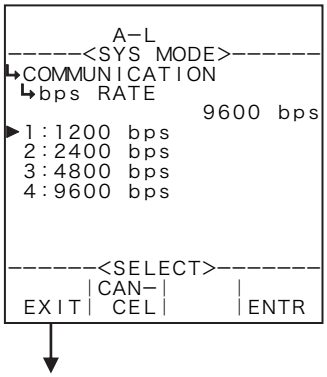
For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

Communication setup submenu screen p. 166

② Communication baud rate setup (bps RATE)

Communication baud rate is set up here.

※ If communication difficulties occur because of communication-lines related problems, lower the baud rate.



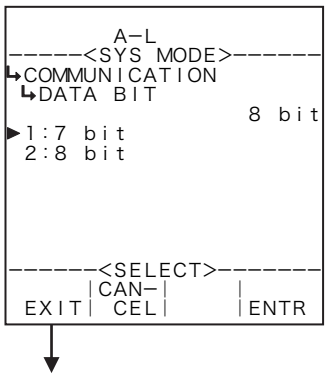
←**Communication baud rate option select**

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

Communication setup submenu screen p. 166

③ Communication data bit length setup (DATA BIT)

Communication data bit length is set up here.



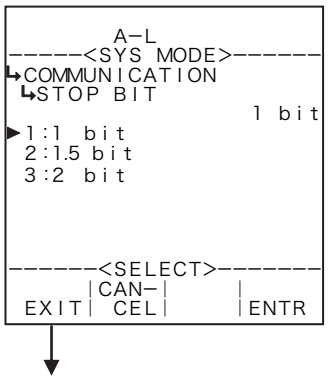
←**Communication data bit length option select**

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

Communication setup submenu screen p. 166

④ Communication stop bit length setup (STOP BIT)

Communication stop bit length is set up here.



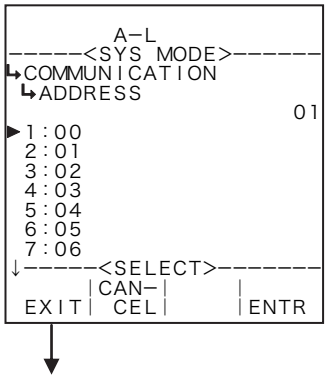
←**Data stop bit length option select**

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

Communication setup submenu screen p. 166

⑤ Communication home address setup (ADDRESS)

Home address of communication is set up here. "00" to "0F" can be chosen for home address.



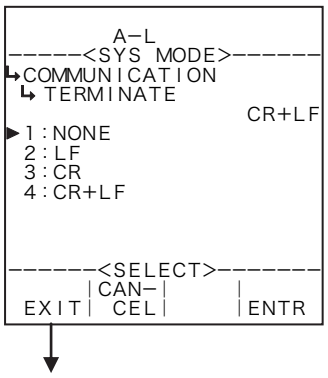
←**Data bit length option select (setup)**

For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

Communication setup submenu screen p. 166

⑥ Communication terminator setup (TERMINATE)

Communication terminator is set up here.



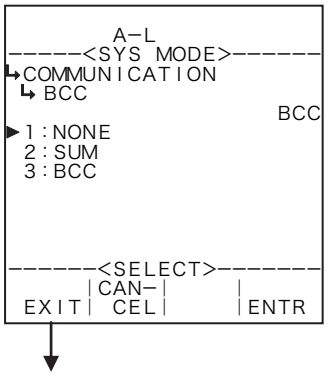
←Data bit length option select

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

Communication setup submenu screen p. 166

⑦ Communication BCC setup (BCC)

Communication BCC is set up here.



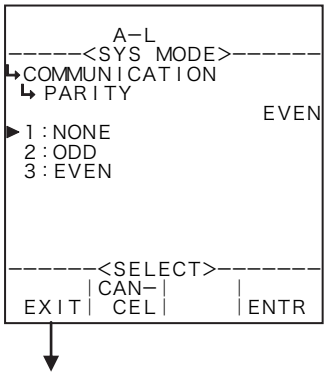
←Data bit length option select (setup)

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

Communication setup submenu screen p. 166

⑧ Communication parity bit setup (PARITY)

Communication parity bit is set up here.



←Data bit length option select (setup)

For details of option setup, see “(2) Option select setup screen (SELECT)” on page 46.

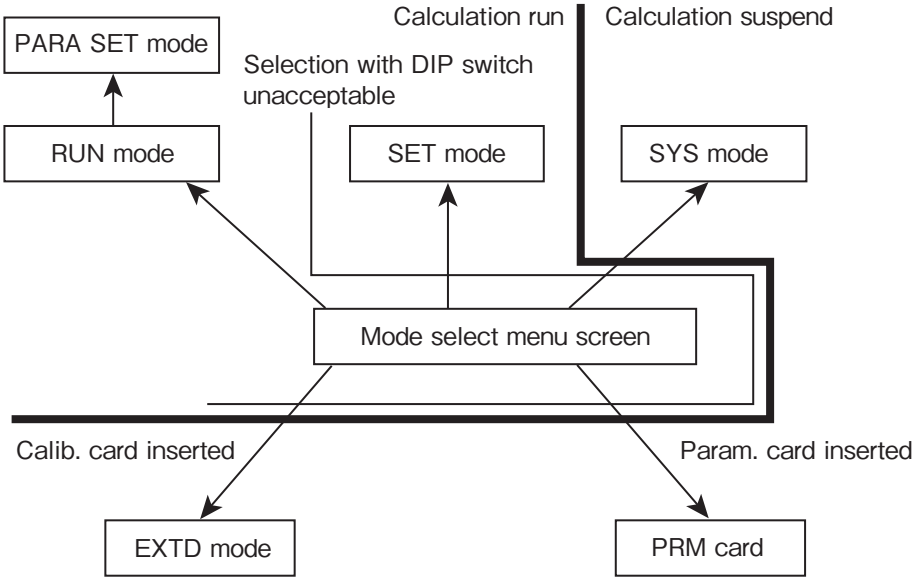
Communication setup submenu screen p. 166

8. About EL4401

8.1 Mode Select Menu Tree

Shown below is the menu tree for individual modes and mode select menu screen.

※ **This setting is used only on EL4401. It is not shown in other models.**



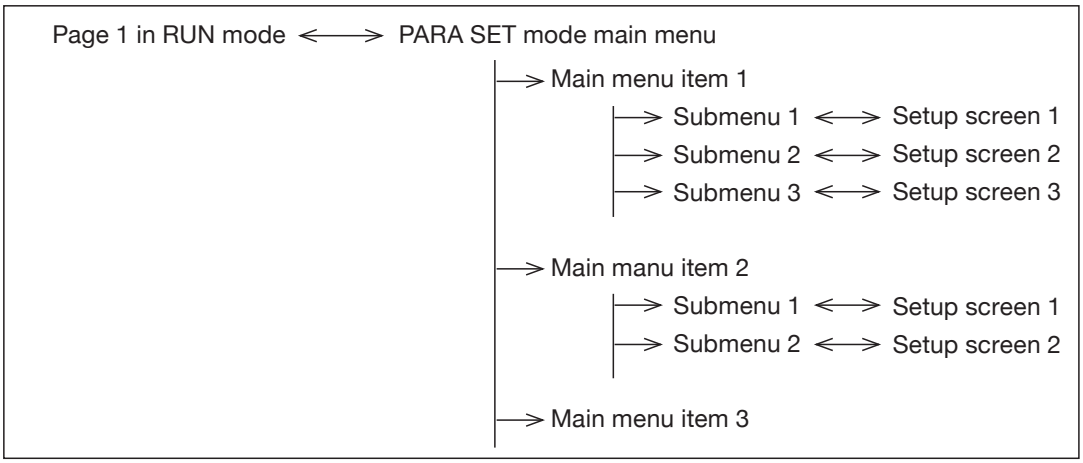
8.1.1 PARA SET Mode Screen

In the PARA SET mode, liquid kind and density are set up. This mode is implemented while executing calculations.

8.2 PARA SET Mode Menu Tree

The PARA SET mode consists of the following three levels:

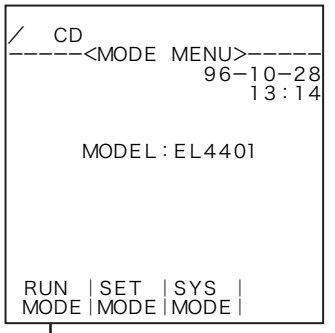
1. Main menu
2. Submenu
3. Setup screen (numerical data setup or option select screen)



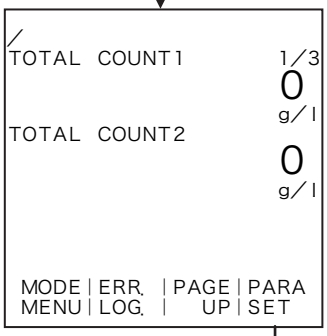
8.2.1 PARA SET Mode Main Menu Screen

At the mode select menu screen, press function key “RUN MODE” to show the RUN mode. Then, press “PARA SET” on page 1 of RUN mode screen.

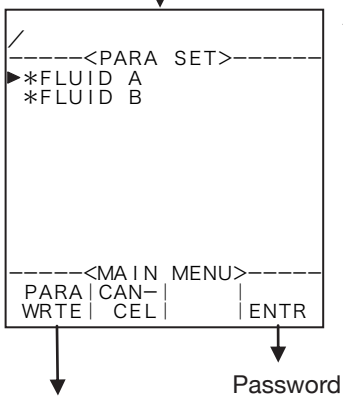
Example



←**Mode select menu screen**



←**Page1 of RUN mode (screen)**



←**PARA SET mode - main menu screen**

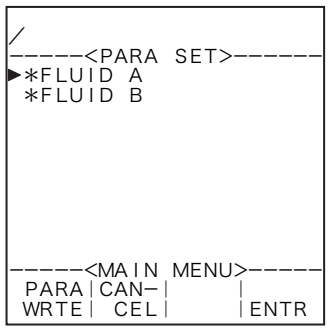
Pressing function key “PARA WRITE” at this point allows the setting to be written and the screen returns to the mode select menu screen.

Password setup submenu screen

Mode select main menu screen

8.2.2 PARA SET Mode Main Menu Setup Items List

PARA SET mode screen consists of the following:



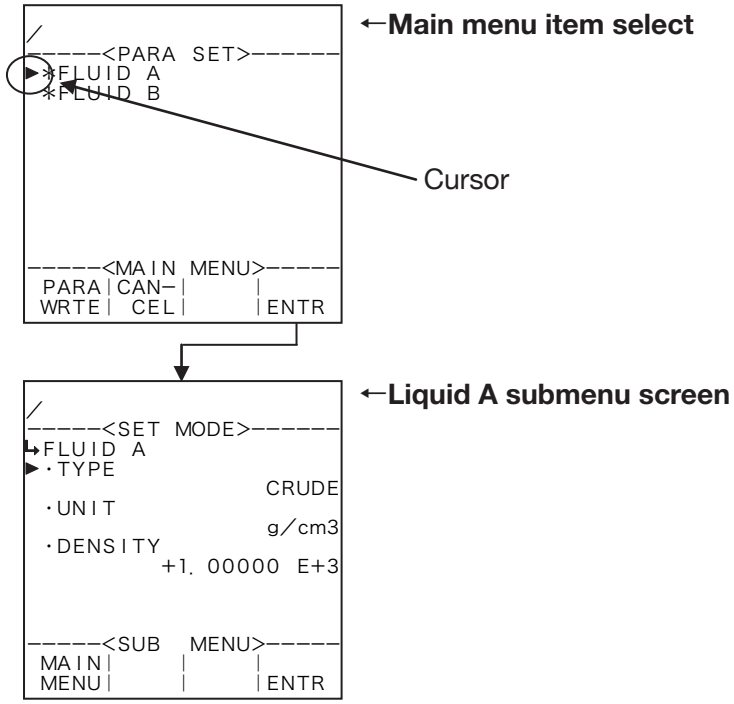
FLUID A (liquid A)
FLUID B (liquid B)

8.2.3 PARA SET Mode Submenu Screen

Pressing function key “ENTR” at the main menu screen brings up the submenu screen of the menu item at the cursor location. The submenu screen shows more detailed items about the specific item selected and its setup information. You can review setup information on this screen.

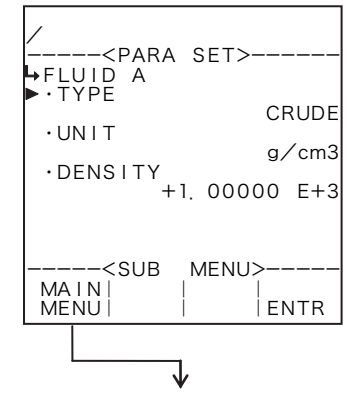
To select the item subject to modification, move the cursor over the item of interest with the up and down arrow keys and press function key “ENTR”. The screen now switches to the setup screen corresponding to respective iitems.

Example: Liquid A – liquid kind setup



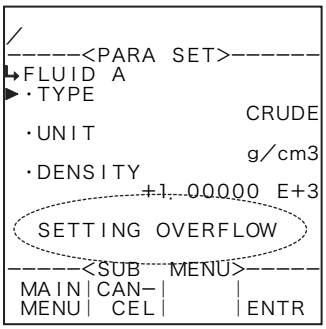
(1) Range check at density setup

Run a range check before setting up the density at the PARA SET mode screen. If found out of range, a prompter message appears; you cannot close the parameter setup screen unless the setting entered falls within the acceptable range. If such is the case, by setting an acceptable value or pressing CANCEL, you can close the screen without changes, leaving your previous setting unchanged.



←Liquid A - submenu screen

Upon completion of numerical or measuring unit setup, a range check is done while returning to the main menu.



←Liqui A – submenu screen

If found out of range, an error message appears. The information the message conveys are:

"SETTING OVERFLOW": Density exceeds the high limit of range.

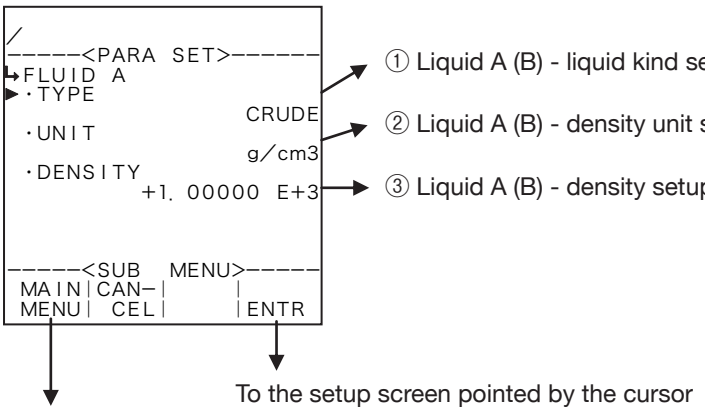
"SETTING UNDERFLOW": Density falls below the low limit of range.

8.3 Submenu Setup Items

8.3.1 Liquid A (B) Setup (FLUID A (B))

(1) Liquid A (B) setup submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key "ENTR", the screen switches to the desired setup screen.

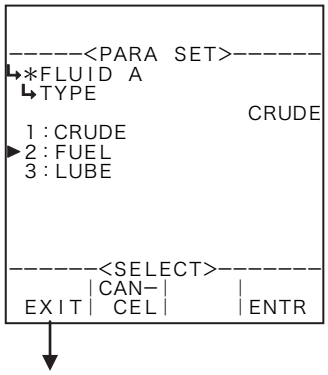


To the setup screen pointed by the cursor

7.1.1 SYS mode main menu screen p. 142

① Liquid A (B) - liquid kind setup (TYPE)

Liquid kind is set up here.



←Liquid kind option select

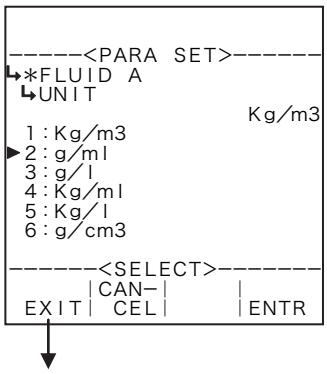
For details of option selection, see "(2) Option select setup screen (SELECT)" on page 46.

Avaialble liquid kinds are "CRUDE OIL," "FUEL," and "LUBE."

Liquid A (B) setup submenu screen p. 173

② Liquid A (B) - density unit setup (UNIT)

Density unit is set up here.



←**Unit option select**

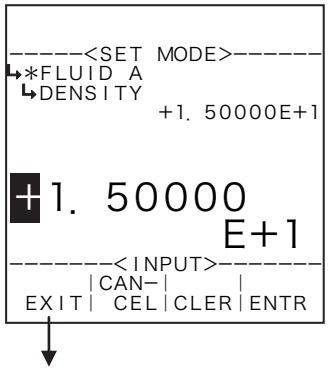
For details of option selection, see “(2) Option select setup screen (SELECT)” on page 46.

Avaialble liquid kinds are “kg/m³”, “g/ml”, “g/l”, “kg/ml”, “kg/l” and “g/cm³ ”.

Liquid A (B) setup submenu screen p. 173

③ Liquid A (B) - density setup (DENSITY)

Density is set up here.



←**Numerical value input setup**

For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

※ For the unit to be set up here, the unit set up at the density parameter unit setup (② Liquid A (B) density unit setup (UNIT) on page 174) is used. Make sure of the unit before you set up.

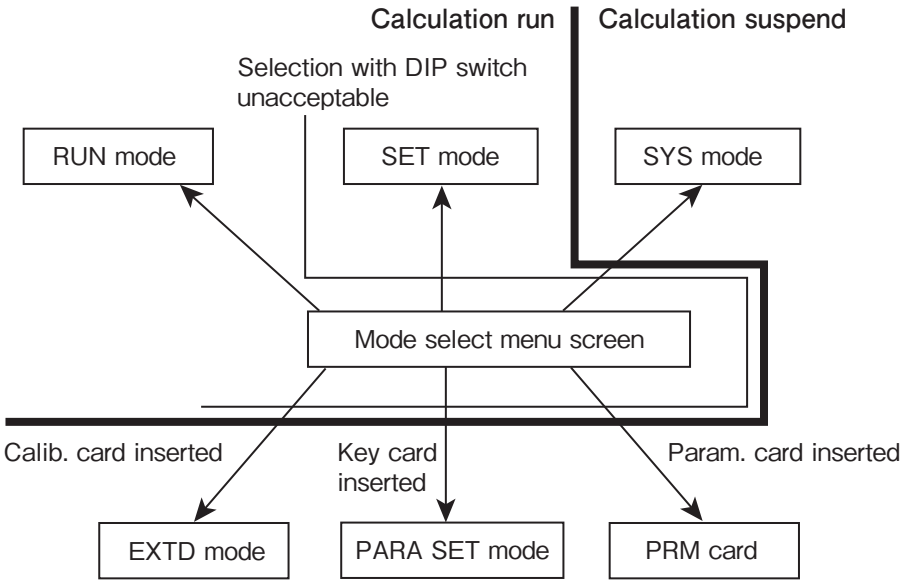
Liquid A (B) setup submenu screen p. 173

9. About EL4501

9.1 Mode Select Menu Tree

Shown below is the menu tree for individual modes and mode select menu screen.

※ **This setting is used only in Models EL4501 and EL4511. This item is not shown in other models.**



9.1.1 PARA SET Mode (KEY Card)

Only when the “KEY card” for Model EL4501/EL4511 is inserted in place, a message “PARA SET” (parameter setup mode) appears at the right end of mode select menu function keys.
In this mode, you can set up density, viscosity, and liquid kind.

⚠ **CAUTION: This mode is implemented while the calculation process is suspended. Make sure if suspension of calculation will not present any problem before you proceed to work on the setup procedure.**

Key card not in place

```
/
------<MODE MENU>------
                06-10-28
                   13:14


     MODEL:EL4501
   MULTI TEMP. COMP



 RUN  |SET  |SYS  |
MODE|MODE|MODE|
```

Key card in place

```
/  CD
------<MODE MENU>------
                06-10-28
                   13:14


     MODEL:EL4501
   MULTI TEMP. COMP



 RUN  |SET  |SYS  |PARA
MODE|MODE|MODE|  SET
```

(1) About key verification

In Models EL4501/EL4511, a 7-digit lock number is registered in the computer and in the key card. For the respective computer, only the card which agrees with its registered lock number can be used.

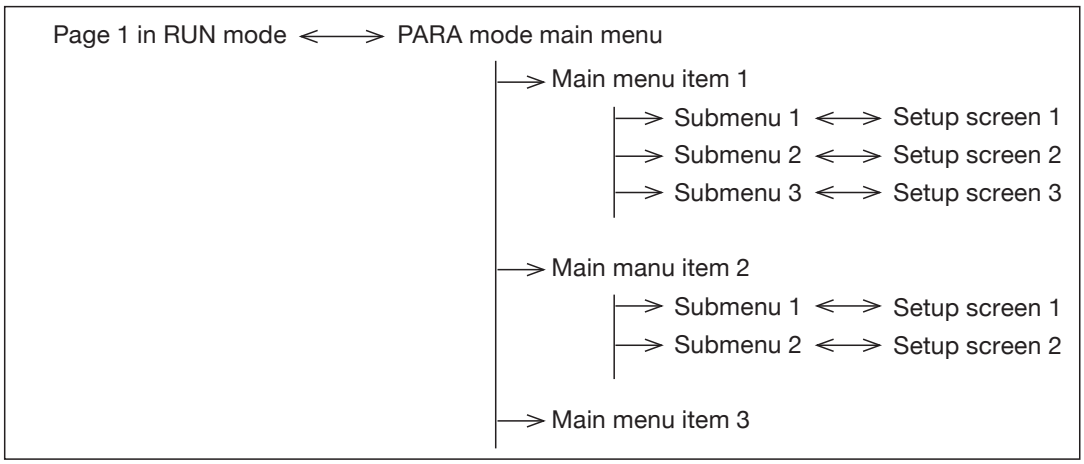
※ **Unless otherwise specified, a factory-set default number “0000000” is set in all key number entry fields.**

9.2 PARA SET Mode Menu Tree

Inserting the KEY card in place (into the reader) and loading the card information brings up the PARA SET mode main menu screen.

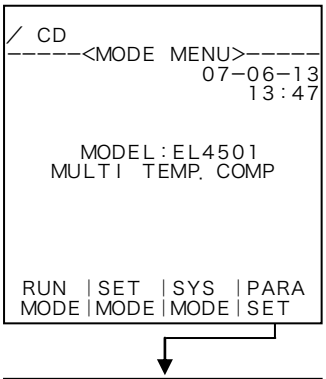
The SYS mode consists of the following three levels:

1. Main menu
2. Submenu
3. Setup screen (numerical data setup or option select screen)



9.2.1 PARA SET Mode Main Menu Screen

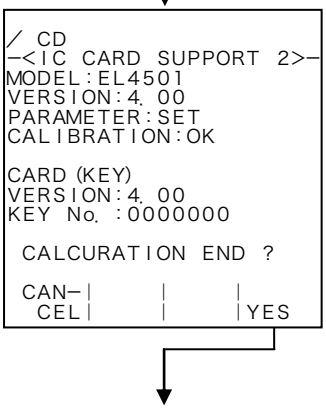
In response to KEY card insertion into the reader, a label “PARA SET” appears in the function key field. At the touch of this function key “PARA SET”, the screen changes to the IC card support 2 screen.



←Mode select menu screen.

In response to KEY card insertion, label “PARA SET” appears in the function key field as shown.

At the touch of function key “PARA SET”, the screen changes to the IC card support 2 screen.



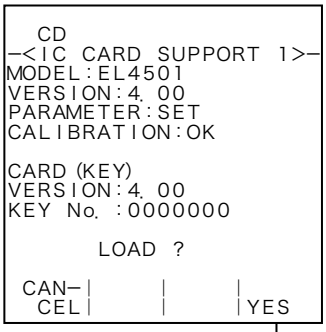
←IC card support 2 screen

With the KEY card, implementation remains impossible unless calculation is suspended, a prompter message reminds you whether or not to suspend calculation.

Pressing function key “YES” suspends calculation and switches the screen to the IC card support 1 screen.

Pressing function key “CANCEL” causes the screen to return to the mode select menu screen.

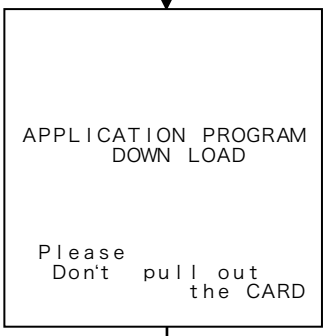
⚠CAUTION: A switch to the IC card support screen 1 suspends update calculation.



←IC card support 1 screen

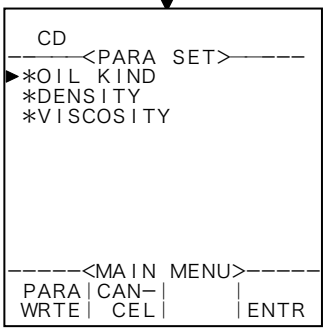
Pressing function key “YES” causes the KEY card information to be loaded. Pressing function key “CANCEL” causes the screen to return to the IC card support 2 screen.

⚠CAUTION: PARA SET mode is implemented while calculation is suspended.
Make sure that suspension of calculation will not present any problem before you set up in this mode.



←Download sceen

⚠CAUTION: Do not attempt to remove the card during the downloading process.



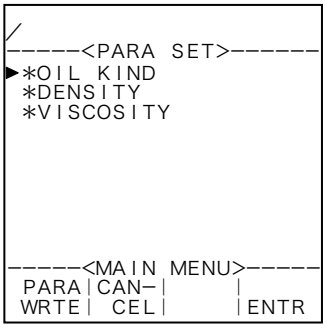
←PARA SET mode (KEY card) main menu screen

In response to pressing function key “PARA WRTE”, the computer writes the setting and returns the screen to the mode select menu screen.
Pressing function key “CANCEL” aborts the setting, leaving your previous setting unchanged, and returns the screen to the mode select menu screen.

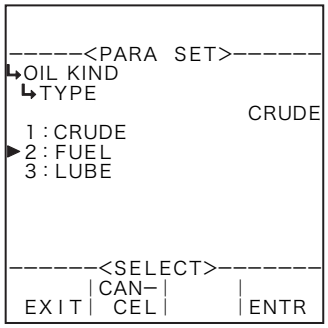
9.2.2 PARA SET Mode Submenu Screen

Pressing function key “ENTR” at the main menu screen brings up the submenu screen of the menu item at the cursor location. The submenu screen shows more detailed items about the item selected and their setup information. You can review setup information on this screen.
To select the item subject to modification, move the cursor over the item of interest with the up and down arrow keys and press function key “ENTR”. The screen now switches to the setup screen for respective imems.

Example: Oil kind setup



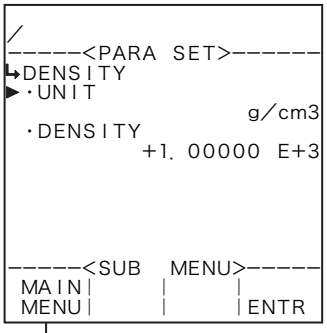
←Main menu item select



←**Oil kind submenu screen**

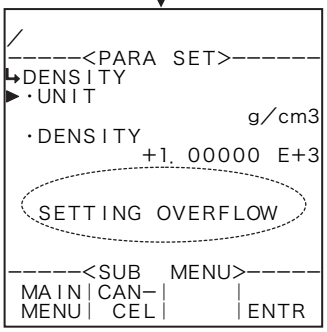
(1) Range check at density and viscosity setup

Run a range check before setting up the density and viscosity at the PARA SET mode screen. If found out of range, a prompter message appears; you cannot close the parameter setup screen unless the setting entered falls within the acceptable range. If such is the case, by setting an acceptable value or pressing CANCEL, you can close the screen without changes, leaving your previous setting unchanged. Density and viscosity setting ranges are set up in the SET mode.



←**Density setup submenu screen**

Upon completion of numerical or measuring unit setup, a range check is done while returning to the main menu.



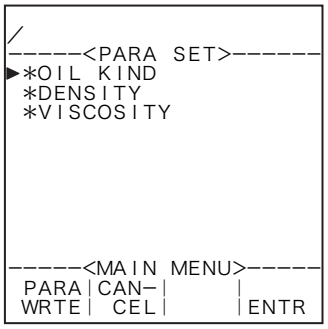
←**Density setup submenu screen**

If found out of range, an error message appears. The information the message conveys are:

Viscosity set exceeds the high limit of range. : “SETTING OVERFLOW”
Viscosity set falls below the low limit of range. : “SETTING UNDERFLOW”
Density set exceeds the high limit of range. : “SETTING OVERFLOW”
Density set falls below the low limit of range. : “SETTING UNDERFLOW”

9.2.3 PARA SET Mode Screens

The PARA SET mode screen consists of the following optional items.



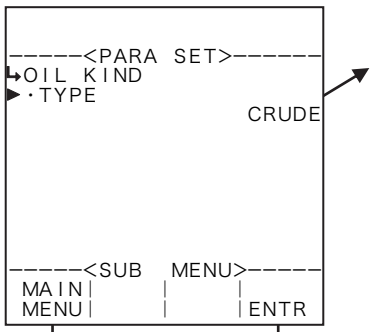
OIL KIND (oil kind setup)
DENSITY (density setup)
VISCOSITY (viscosity setup)

9.3 Submenu Setup Items

9.3.1 Liquid Kind Setup (OIL KIND)

(1) Liquid kind setup submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired setup screen.



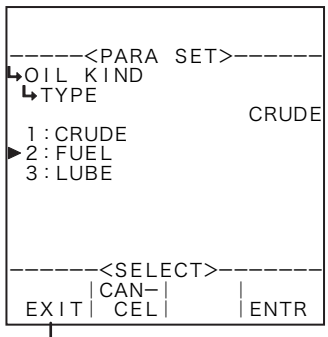
① Liquid kind setup (TYPE) on page 179

To the setup screen pointed by the cursor

9.2.1 PARA SET mode main menu screen p. 176

① Liquid kind setup (TYPE)

Liquid kind is selected here.



←Liquid kind option select

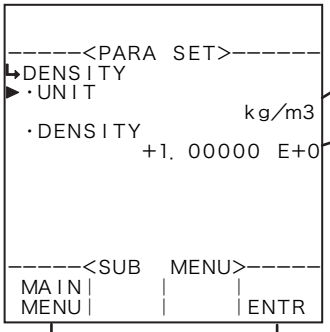
For details of option selection, see “(2) Option select setup screen (SELECT)” on page 46.
Avaialble liquid kinds are “CRUDE OIL”, “FUEL”, and “LUBE”.

Liquid kind setup submenu screen p. 179

9.3.2 Density Setup (DENSITY)

(1) Density setup submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of function key “ENTR”, the screen switches to the desired setup screen.



① Density unit setup (UNIT) p. 180

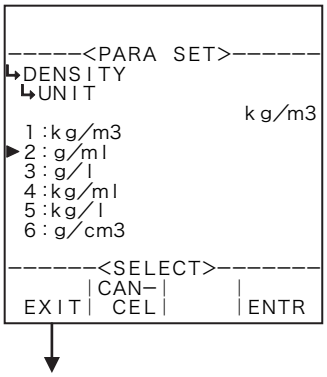
② Density setup (UNIT) p. 180

To the setup screen pointed by the cursor

9.2.1 PARA SET mode main menu screen p. 176

① Density unit setup (UNIT)

Density unit is selected here.



Density setup submenu screen p. 180

←Unit option select

For details of option selection, see “(2) Option select setup screen (SELECT)” on page 46.

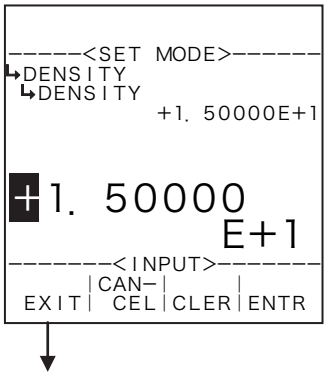
Avaialble liquid kinds are “kg/m³”, “g/ml”, “g/l”, “kg/ml”, “kg/l” and “g/cm³”.

※ The unit to be set here is the unit of the density set and displayed in the RUN mode, that of the density to be set at the density parameter setup in the SET mode, and that of the density to be set in the PARA SET mode. Modifying this unit results in modifying both the unit of the density set and displayed in the RUN mode and that of the density to be set in the SET mode (① Density parameter unit setup (UNIT) on page 130) to read in the same unit.

※ Depending on the unit chosen here, the numerical format (number of decimal places) shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.

② Density setup (DENSITY)

Density is setup here.



Density setup submenu screen p. 180

←Numerical value input setup

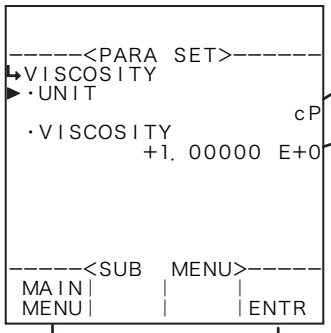
For details of numerical value input setup, see “(1) Numerical value setup screen (INPUT)” on page 43.

※ For the unit to be set up here, the unit set up at the density unit setup (① Density unit setup (UNIT) on page 180) is used. Make sure of the unit before you set up.

9.3.3 Viscosity Setup (VISCOSITY)

(1) Viscosity setup submenu screen

At the submenu, move the cursor to the desired setup item with the up and down arrow keys.
At the touch of (the) function key "ENTR", the screen switches to the desired setup screen.



① Viscosity unit setup (VISCOSITY) p. 181

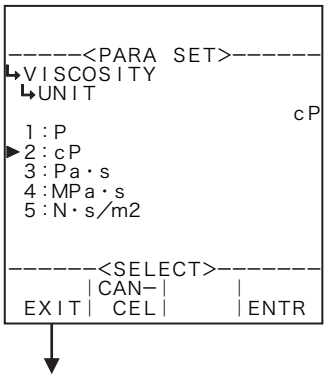
② Viscosity setup (VISCOSITY) p. 181

To the setup screen pointed by the cursor

9.2.1 PARA SET mode main menu screen p. 176

① Viscosity unit setup (UNIT)

The unit you can choose from are "P", "cP", "Pa・s", "MPa・s", and or "N・s/m²".



Viscosity setup submenu screen p. 181

←Unit option select

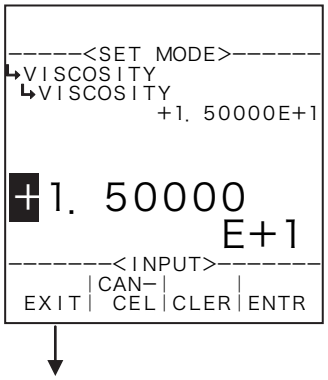
For details of option setup, see "(2) Option select setup screen (SELECT)" on page 46.

※ The unit to be set here is the unit of the viscosity set and displayed in the RUN mode, that of the viscosity to be set at the viscosity parameter setup in the SET mode, and that of the viscosity to be set in the PARA SET mode. Modifying this unit results in modifying both the unit of the viscosity set and displayed in the RUN mode, and that of the viscosity to be set in the SET mode (① Viscosity parameter (μ) unit setup (UNIT) on page 135) to read in the same unit.

※ Depending on the unit chosen here, the numerical format (number of decimal places) of viscosity set and shown in the RUN mode varies. When you modify it, carefully take into account the count capacity and the number of decimal places to be shown.

② Viscosity setup (VISCOSITY)

Viscosity is set up here.



Viscosity setup submenu screen p. 181

←Numerical value input setup

For details of numerical value input setup, see "(1) Numerical value setup screen (INPUT)" on page 43.

※ For the unit to be set up here, the unit set up at the viscosity unit setup (① Viscosity unit setup (UNIT) on page 181) is used. Make sure of the unit before you set up.

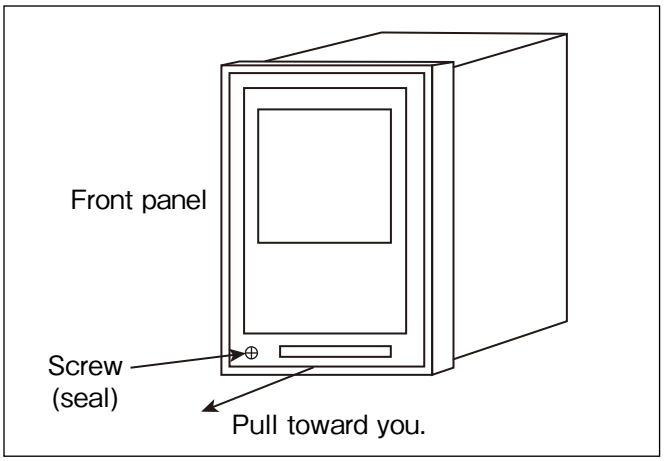
10. DIP SWITCH CONFIGURATION

In addition to setting up parameters through keystrokes, this computer has internal switches (DIP switches) for setting up parameters.
DIP switch settings include the following:

(1) Inactivate the password.
(2) Close the initial check window.
(3) Inhibit switching from one mode to another.

How to open up the front panel
The front panel can be separated by the following procedure:

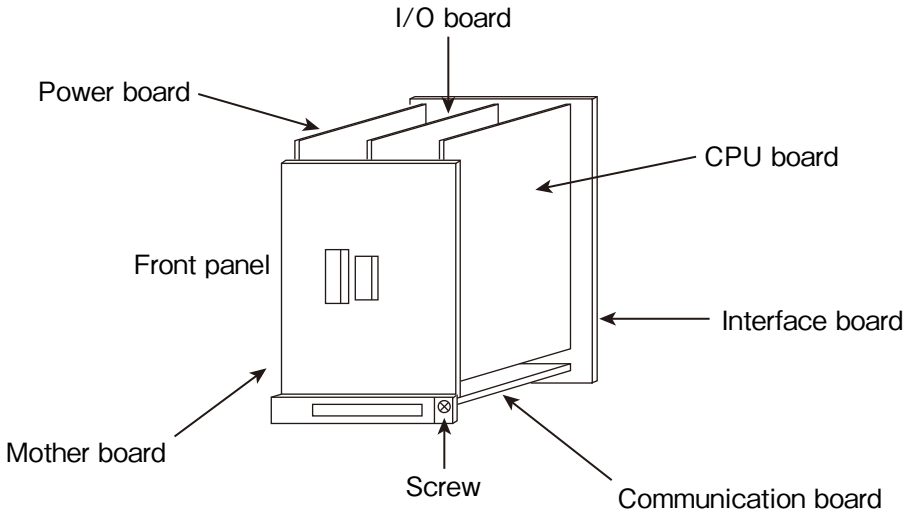
1. Loosen screws (seals) at bottom left of the front panel.
2. Holding the bottom end of front panel, pull it toward you to separate.



⚠ **CAUTION: 1. Power must be OFF before you start working with the front panel. Problems do arise if you, with power ON, attempt to gain access to the rear of the front panel.**
2. Do not disconnect the cables connected to the front panel.

10.1 Location of Internal Boards

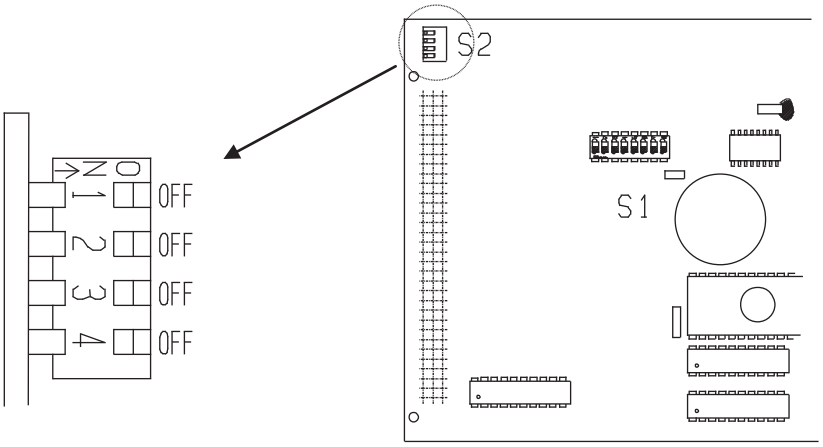
The sketch below illustrates the location of internal modularized boards.



10.2 DIP Switches Idensitifaction

Shown below are the location of DIP switches and their functions.

● CPU board S1



No.	Position	Description
1	OFF	Unused (always OFF) ※ 1
2	OFF	Communication feature ON: Enabled / OFF: Disabled
3	OFF	Mode select protect ON: Protected / OFF: Undone
4	OFF	Unused (always OFF) ※ 1

※ 1 ：Do not attempt to change this setting.

11. OVERALL MENU TREE STRUCTURES

Listed below are the SET and SYS mode menu items of respective models organized in a tree structure.

11.1 EL4101 Steam Flow Computer (saturated steam service)

SYS mode

- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 65
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input setup (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX. FREQUENCY (max. frequency set)
- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate stup (FLOW RATE SETTING) p.67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)
  - ・COUNT STOP (totalizing stop set)
  - ・SMOOTHING COEF. (smoothing coef. set)
  - ・MAX.PERIOD (max. period set)
  - ・MEASURE.NUMBER (number of meas. cycles set)
  - ・INTERPOLATION (interpolation set)
  - ・REF. OSCILLATOR (ref. oscillator correction set)
- ＊TOTAL COUNT1 (total count 1 set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT2 (total count 2 set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT(unit set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊METER ERROR (meter error correction set) ⇒Meter error correction setup (METER ERROR) p. 85
  - ・TYPE (correction t type set)
  - ・CONSTANT (constants)
  - ・FREQUENCY (flowmeter calibration flow velocity (frequency 1))
  - ・ERROR 1 (meter error 1)
  - ・FREQUENCY 2 (flowmeter calibration flow velocity (frequency 2))
  - ・ERROR 2 (meter error 2)
  - ・FREQENCY 3 (flowmeter calibration flow velocity (frequency 3))
  - ・ERROR 3 (meter error 3)
  - ・FREQUENCY 4 (flowmeter calibration flow velocity (frequency 4))
  - ・ERROR 4 (meter error 4)
  - ・FREQENCY 5 (flowmeter calibration flow velocity (frequency 5))
  - ・ERROR 5 (meter error 5)
  - ・FREQUENCY 6 (flowmeter calibration flow velocity (frequency 6))
  - ・ERROR 6 (meter error 6)
  - ・FREQENCY 7 (flowmeter calibration flow velocity (frequency 7))
  - ・ERROR 7 (meter error 7)
  - ・FREQUENCY 8 (flowmeter calibration flow velocity (frequency 8))
  - ・ERROR 8 (meter error 8)
  - ・FREQENCY 9 (flowmeter calibration flow velocity (frequency 9))
  - ・ERROR 9 (meter error 9)
- ＊SPEC. WEIGHT (SAT) (relataive dens. (sp. wt.) set) ⇒Sat. steam dens. setup (SPEC. WEIGHT (SAT) p. 91
  - ・UNIT (unit set)
- ＊SPEC. ENTHALPY (SAT) (sp. enth. set) ⇒Sat. steam sp. enthalpy setup (SPEC. ENTHALPY (SAT) p. 93
  - ・UNIT (unit set)
- ＊FLOW RATE (instant flowrate set) ⇒Instant flowrate setup (FLOW RATE) p. 95
  - ・UNIT (unit set)

SYS mode

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set))
- ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 155
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊TOTAL COUNT RESET (total count reset set) ⇒Total count reset setup (TOTAL COUNT RESET) p. 160
  - ・POWER ON RESET (power on reset)
  - ・COUNT RESET (total count reset)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate)
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

11.2 EL4111 Steam Flow Computer (superheated steam service)

SYS mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 55
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input setup (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX FREQUENCY (max. frequency set)

- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate stup (FLOW RATE SETTING) p. 67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)
  - ・COUNT STOP (totalizing stop set)
  - ・SMOOTHING COEF. (smoothing coef. set)
  - ・MAX. PERIOD (max. period set)
  - ・MEASURE.NUMBER (number of meas. cycles set)
  - ・INTERPOLATION (interpolation set)
  - ・REF. OSCILLATOR (ref. oscillator correction set)
- ＊TOTAL COUNT 1 (total count 1 set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT 2 (total count 2 set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊3α COMPEN. (3α compensate set) ⇒3α compenstate setup (3α COMPEN.) p. 80
  - ・TYPE (type set)
  - ・ALFA (α) (α set)
  - ・BETA (β) (β set)
  - ・REF. TEMP. (ref. temp. set)
- ＊METER ERROR (meter error correction set) ⇒Meter error correction setup (METER ERROR) p. 85
  - ・TYPE (correction t type set)
  - ・CONSTANT (constants)
  - ・FREQUENCY (flowmeter calibration flow velocity (frequency 1))
  - ・ERROR 1 (meter error 1)
  - ・FREQUENCY 2 (flowmeter calibration flow velocity (frequency 2))
  - ・ERROR 2 (meter error 2)
  - ・FREQENCY 3 (flowmeter calibration flow velocity (frequency 3))
  - ・ERROR 3 (meter error 3)
  - ・FREQUENCY 4 (flowmeter calibration flow velocity (frequency 4))
  - ・ERROR 4 (meter error 4)
  - ・FREQENCY 5 (flowmeter calibration flow velocity (frequency 5))
  - ・ERROR 5 (meter error 5)
  - ・FREQUENCY 6 (flowmeter calibration flow velocity (frequency 6))
  - ・ERROR 6 (meter error 6)
  - ・FREQENCY 7 (flowmeter calibration flow velocity (frequency 7))
  - ・ERROR 7 (meter error 7)
  - ・FREQUENCY 8 (flowmeter calibration flow velocity (frequency 8))
  - ・ERROR 8 (meter error 8)
  - ・FREQENCY 9 (flowmeter calibration flow velocity (frequency 9))
  - ・ERROR 9 (meter error 9)
- ＊SP. WT. (SAT) (relataive dens. (sp. wt.) set) ⇒Sat. steam dens. setup (SPEC. WEIGHT (SAT) p. 91
  - ・UNIT (unit set)
- ＊SP. ENTHALPY (SAT) (sp. enth. set) ⇒Sat. steam sp. enthalpy setup (SPEC. ENTHALPY (SAT) p. 93
  - ・UNIT (unit set)
- ＊FLOW RATE (instant flowrate set) ⇒Instant flowrate setup (FLOW RATE) p. 95
  - ・UNIT (unit set)

SYS mode

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set)
- ＊SIMUATE (analog output simulate) Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
  - ・TYPE (input type set)
- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 155
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)

- ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊TOTAL COUNT RESET (total count reset set) ⇒Total count reset setup (TOTAL COUNT RESET) p. 160
  - ・POWER ON RESET (power on reset)
  - ・COUNT RESET (total count reset)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate)
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

11.3 EL4121 Temperature/Pressure Compensated Flow Computer (gas service)

SYS mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 55
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input setup (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX FREQUENCY (max. frequency set)
- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate stup (FLOW RATE SETTING) p.67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)
  - ・COUNT STOP (totalizing stop set)
  - ・SMOOTHING COEF. (smoothing coef. set)
  - ・MAX. PERIOD (max. period set)
  - ・MEASURE.NUMBER (number of meas. cycles set)
  - ・INTERPOLATION (interpolation set)
  - ・REF. OSCILLATOR (ref. oscillator correction set)
- ＊TOTAL COUNT 1 (total count 1 set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT 2 (total count 2 set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing set)

- ＊3α COMPEN. (3α compensate set) ⇒3α compenstate setup (3α COMPEN.) p. 80
  - ・TYPE (type set)
  - ・ALFA (α) (α set)
  - ・BETA (β) (β set)
  - ・REF. TEMP. „(ref. temp. set)
- ＊T/P COMPEN. (temp./press. compensation set) ⇒T/P compensation setup (T/P COMPEN.) p. 83
  - ・REF. TEMP. (ref. temperature set)
  - ・REF. PRESS. (ref. pressure set)
- ＊METER ERROR (meter error correction set) ⇒Meter error correction setup (METER ERROR) p. 85
  - ・TYPE (correction type set)
  - ・CONSTANT (constants)
  - ・FREQUENCY (flowmeter calibration flow velocity (frequency 1))
  - ・ERROR (meter error 1)
  - ・FREQUENCY 2 (flowmeter calibration flow velocity (frequency 2))
  - ・ERROR 2 (meter error 2)
  - ・FREQENCY 3 (flowmeter calibration flow velocity (frequency 3))
  - ・ERROR 3 (meer error 3)
  - ・FREQUENCY 4 (flowmeter calibration flow velocity (frequency 4))
  - ・ERROR 4 (meter error 4)
  - ・FREQENCY 5 (flowmeter calibration flow velocity (frequency 5))
  - ・ERROR 5 (meter error 5)
  - ・FREQUENCY 6 (flowmeter calibration flow velocity (frequency 6))
  - ・ERROR 6 (meter error 6)
  - ・FREQENCY 7 (flowmeter calibration flow velocity (frequency 7))
  - ・ERROR 7 (meter error 7)
  - ・FREQUENCY 8 (flowmeter calibration flow velocity (frequency 8))
  - ・ERROR 8 (meter error 8)
  - ・FREQENCY 9 (flowmeter calibration flow velocity (frequency 9))
  - ・ERROR 9 (meter error 9)
- ＊QUADRATIC COMPEN. (quad. comp. set) ⇒Quadratic compen. setup (QUADRATIC COMPEN.) p. 88
  - ・COEFFICIENT (Pa) (coefficient Pa set)
  - ・COEFFICIENT (Pb) (coefficient Pb set)
  - ・COEFFICIENT (Pc) (coefficient Pc set)
  - ・COEFFICIENT (Ta) (coefficient Ta set)
  - ・COEFFICIENT (Tb) (coefficient Tb set)
  - ・COEFFICIENT (Tc) (coefficient Tc set)

※ **When the additional code is DA2, the item for setting the quadratic compensation factor disappears and COMPRESSION FACTOR (compression deviation setting), P.138, is added.**

- ＊FLOW RATE (instant flowrate calculation set) ⇒Instant flowrate setup (FLOW RATE) p. 95
  - ・UNIT (unit set)
- ＊FLOW RATE (C) (instant flowrate (corrected) set) ⇒Instant flowrate setup (FLOW RATE) p. 95
  - ・UNIT (unit set)

SYS mode

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set)
- ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
  - ・TYPE (input type set)
- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 155
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)

- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 159
  - ・TYPE (output type set)
- ＊TOTAL COUNT RESET (total count reset set) ⇒Tot count reset setup (TOTAL COUNT RESET) p. 160
  - ・POWER ON RESET (power on reset)
  - ・COUNT RESET (total count reset)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate)
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

11.4 EL4131 Temperature Compensated Flow Computer (liquid service)

SET mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input setup (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX FREQUENCY (max. frequency set)
- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate stup (FLOW RATE SETTING) p.67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)
  - ・COUNT STOP (totalizing stop set)
  - ・SMOOTHING COEF. (smoothing coef. set)
  - ・MAX. PERIOD (max. period set)
  - ・MEASURE.NUMBER (number of meas. cycles set)
  - ・INTERPOLATION (interpolation set)
  - ・REF. OSCILLATOR (ref. oscillator correction set)
- ＊TOTAL COUNT (total count set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT (C) (total count (corrected)) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・(UNIT (unit set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊METER ERROR (meter error correction set) ⇒Meter error correction setup (METER ERROR) p. 85
  - ・TYPE (correction t type set)
  - ・CONSTANT (constants)
  - ・FREQUENCY (flowmeter calibration flow velocity (frezuency 1))
  - ・ERROR (meter error 1)
  - ・FREQUENCY 2 (flowmeter calibration flow velocity (frequency 2))
  - ・ERROR 2 (meter error 2)
  - ・FREQENCY 3 (flowmeter calibration flow velocity (frequency 3))
  - ・ERROR 3 (meter error 3)
  - ・FREQUENCY 4 (flowmeter calibration flow velocity (frequency 4))
  - ・ERROR 4 (meter error 4)
  - ・FREQENCY 5 (flowmeter calibration flow velocity (frequency 5))
  - ・ERROR 5 (meter error 5)

- ・FREQUENCY 6 (flowmeter calibration flow velocity (frequency 6))
- ・ERROR 6 (meter error 6)
- ・FREQENCY 7 (flowmeter calibration flow velocity (frequency 7))
- ・ERROR 7 (meter error 7)
- ・FREQUENCY 8 (flowmeter calibration flow velocity (frequency 8))
- ・ERROR 8 (meter error 8)
- ・FREQENCY 9 (flowmeter calibration flow velocity (frequency 9))
- ・ERROR 9 (meter error 9)

→ ＊FLOW RATE (instant flowrate calculation set) ⇒Instant flowrate setup (FLOW RATE) p. 95
- ・UNIT (unit set)

→ ＊FLOW RATE (C) (instant flowrate (corrected) set) ⇒Instant flowrate setup (FLOW RATE) p. 95
- ・UNIT (unit set)

→ ＊TEMP. COMPEN. (temp. compensate set) ⇒Temp. compen. setup (TEMP. COMPEN.) p. 97
- ・REF. TEMP. (ref. temperature set)
- ・COEFFICIENT (a) (coefficient a set)
- ・COEFFICIENT (b) (coefficient b set)
- ・COEFFICIENT (c) (coefficient c set)
- ・MAX. (maximum set)

→ ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
- ・Bps RATE (communication baud rate set)
- DATA BIT (data bit length set)
- STOP BIT (stop bit length set)
- ADDRESS (home address set)
- TERMINATE (terminator set)
- BCC (BCC set)
- PARITY (parity bit set)

SYS mode

→ ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
- ・LOCK (password lock option set)
- ・PASSWORD SET (password numeric set)

→ ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
- ・DATE (date set)
- ・TIME (time set)

→ ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
- ・ANA. OUT 1 (analog output 1)

→ ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
- ・TYPE (input type set)

→ ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
- ・TYPE (output type set)
- ・PULSE WIDTH (pulse output width set)

→ ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
- ・TYPE (output type set)
- ・PULSE WIDTH (pulse output width set)

→ ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
- ・TYPE (output type set)

→ ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 159
- ・TYPE (output type set)

→ ＊TOTAL COUNT RESET (total count reset set) ⇒Tot count reset setup (TOTAL COUNT RESET) p. 160
- ・POWER ON RESET (power on reset)
- ・COUNT RESET (total count reset)

→ ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
- ・CONTROL (control type)
- ・BACKLIGHT (backlight illuminate)

→ ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
- ・SAVE (save set)

→ ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
- ・Bps RATE (communication baud rate set)
- ・DATA BIT (data bit length set)
- ・STOP BIT (stop bit length set)
- ・ADDRESS (home address set)
- ・TERMINATE (terminator set)
- ・BCC (BCC set)
- ・PARITY (parity bit set)

11.5 EL4201 Temperature/Pressure Compensated Gas Flow Computer (mass units)

SET mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 55
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input setup (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX FREQUENCY (max. frequency set)
- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate stup (FLOW RATE SETTING) p.67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)
  - ・COUNT STOP (totalizing stop set)
  - ・SMOOTHING COEF. (smoothing coef. set)
  - ・MAX. PERIOD (max. period set)
  - ・MEASURE.NUMBER (number of meas. cycles set)
  - ・INTERPOLATION (interpolation set)
  - ・REF. OSCILLATOR (ref. oscillator correction set)
- ＊TOTAL COUNT (total count set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT (C) (total count (C) set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊3α COMPEN. (3α compensate set) ⇒3α compenstate setup (3α COMPEN.) p. 80
  - ・TYPE (type set)
  - ・ALFA (α) (α set)
  - ・BETA (β) (β set)
  - ・REF. TEMP. (ref. temp. set)
- ＊T/P COMPEN. (temp./press. compensation set) ⇒T/P compensation setup (T/P COMPEN.) p. 83
  - ・REF. TEMP. (ref. temperature set)
  - ・REF. PRESS. (ref. pressure set)
- ＊METER ERROR (meter error correction set) ⇒Meter error correction setup (METER ERROR) p. 85
  - ・TYPE (correction type set)
  - ・CONSTANT (constants)
  - ・FREQUENCY (flowmeter calibration flow velocity (frequency 1))
  - ・ERROR (meter error 1)
  - ・FREQUENCY 2 (flowmeter calibration flow velocity (frequency 2))
  - ・ERROR 2 (meter error 2)
  - ・FREQENCY 3 (flowmeter calibration flow velocity (frequency 3))
  - ・ERROR 3 (meer error 3)
  - ・FREQUENCY 4 (flowmeter calibration flow velocity (frequency 4))
  - ・ERROR 4 (meter error 4)
  - ・FREQENCY 5 (flowmeter calibration flow velocity (frequency 5))
  - ・ERROR 5 (meter error 5)

- ・FREQENCY 6 (flowmeter calibration flow velocity (frequency 6))
- ・ERROR 6 (meter error 6)
- ・FREQENCY 7 (flowmeter calibration flow velocity (frequency 7))
- ・ERROR 7 (meter error 7)
- ・FREQUENCY 8 (flowmeter calibration flow velocity (frequency 8))
- ・ERROR 8 (meter error 8)
- ・FREQENCY 9 (flowmeter calibration flow velocity (frequency 9))
- ・ERROR 9 (meter error 9)

→ ＊QUADRATIC COMPEN. (quad. comp. set) ⇒Quadratic compen. setup (QUADRATIC COMPEN.) p. 88

- ・COEFFICIENT (Pa) (coefficient Pa set)
- ・COEFFICIENT (Pb) (coefficient Pb set)
- ・COEFFICIENT (Pc) (coefficient Pc set)
- ・COEFFICIENT (Ta) (coefficient Ta set)
- ・COEFFICIENT (Tb) (coefficient Tb set)
- ・COEFFICIENT (Tc) (coefficient Tc set)

※ When the additional code is DA2, the item for setting the quadratic compensation factor disappears and COMPRESSION FACTOR (compression deviation setting), P.138, is added.

→ ＊FLOW RATE (instant flowrate calculation set) ⇒Instant flowrate setup (FLOW RATE) p. 95

- ・UNIT (unit set)

→ ＊FLOW RATE (C) (instant flowrate (corrected) set) ⇒Instant flowrate setup (FLOW RATE) p. 95

- ・UNIT (unit set)

→ ＊DENSITY (density set) ⇒Density setup (mass convertion factor) (DENSITY) p. 95

- ・UNIT (unit set)
- ・DENSITY (density)

SYS mode

→ ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150

- ・LOCK (password lock option set)
- ・PASSWORD SET (password numeric set)

→ ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152

- ・DATE (date set)
- ・TIME (time set)

→ ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153

- ・ANA. OUT 1 (analog output 1)

→ ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154

- ・TYPE (input type set)

→ ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 155

- ・TYPE (input type set)

→ ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157

- ・TYPE (output type set)
- ・PULSE WIDTH (pulse output width set)

→ ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157

- ・TYPE (output type set)
- ・PULSE WIDTH (pulse output width set)

→ ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157

- ・TYPE (output type set)

→ ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 159

- ・TYPE (output type set)

→ ＊TOTAL COUNT RESET (total count reset set) ⇒Total count reset setup (TOTAL COUNT RESET) p. 160

- ・POWER ON RESET (power on reset)
- ・COUNT RESET (total count reset)

→ ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161

- ・CONTROL (control type)
- ・BACKLIGHT (backlight illuminate)

→ ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163

- ・SAVE (save set)

→ ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166

- ・Bps RATE (communication baud rate set)
- ・DATA BIT (data bit length set)
- ・STOP BIT (stop bit length set)
- ・ADDRESS (home address set)
- ・TERMINATE (terminator set)
- ・BCC (BCC set)
- ・PARITY (parity bit set)

11.6 EL4211 Temperature Compensated Liquid Flow Computer (mass units)

SET mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input setup (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX FREQUENCY (max. frequency set)
- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate stup (FLOW RATE SETTING) p.67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)
  - ・COUNT STOP (totalizing stop set)
  - ・SMOOTHING COEF. (smoothing coef. set)
  - ・MAX. PERIOD (max. period set)
  - ・MEASURE.NUMBER (number of meas. cycles set)
  - ・INTERPOLATION (interpolation set)
  - ・REF. OSCILLATOR (ref. oscillator correction set)
- ＊TOTAL COUNT (C) (total count (corrected)) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT (C) (total count (corrected)) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊METER ERROR (meter error correction set) ⇒Meter error correction setup (METER ERROR) p. 85
  - ・TYPE (correction t type set)
  - ・CONSTANT (constants)
  - ・FREQUENCY (flowmeter calibration flow velocity (frequency 1))
  - ・ERROR (meter error 1)
  - ・FREQUENCY 2 (flowmeter calibration flow velocity (frequency 2))
  - ・ERROR 2 (meter error 2)
  - ・FREQENCY 3 (flowmeter calibration flow velocity (frequency 3))
  - ・ERROR 3 (meter error 3)
  - ・FREQUENCY 4 (flowmeter calibration flow velocity (frequency 4))
  - ・ERROR 4 (meter error 4)
  - ・FREQENCY 5 (flowmeter calibration flow velocity (frequency 5))
  - ・ERROR 5 (meter error 5)
  - ・FREQUENCY 6 (flowmeter calibration flow velocity (frequency 6))
  - ・ERROR 6 (meter error 6)
  - ・FREQENCY 7 (flowmeter calibration flow velocity (frequency 7))
  - ・ERROR 7 (meter error 7)
  - ・FREQUENCY 8 (flowmeter calibration flow velocity (frequency 8))
  - ・ERROR 8 (meter error 8)
  - ・FREQENCY 9 (flowmeter calibration flow velocity (frequency 9))
  - ・ERROR 9 (meter error 9)
- ＊FLOW RATE (instant flowrate calculation set) ⇒Instant flowrate setup (FLOW RATE) p. 95
  - ・UNIT (unit set)
- ＊FLOW RATE (C) (instant flowrate (C) set) ⇒Instant flowrate setup (FLOW RATE) p. 95
  - ・UNIT (unit set)
- ＊TEMP. COMPEN. (temp. compensate set) ⇒Temp. compen. setup (TEMP. COMPEN.) p. 97
  - ・REF. TEMP. (ref. temperature set)
  - ・COEFFICIENT (a) (coefficient a set)
  - ・COEFFICIENT (b) (coefficient b set)
  - ・COEFFICIENT (c) (coefficient c set)
  - ・MAX. (maximum set)
- ＊DENSITY (density set) ⇒Density setup (mass conversion factor) (DENSITY) p. 100
  - ・UNIT (unit set)
  - ・DENSITY (density)

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set)
- ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 159
  - ・TYPE (output type set)
- ＊TOTAL COUNT RESET (total count reset set) ⇒Total count reset setup (TOTAL COUNT RESET) p. 160
  - ・POWER ON RESET (power on reset)
  - ・COUNT RESET (total count reset)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate)
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

11.7 EL4301 Density Computer for Mass Flowmeter

SET mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHJING COEF. (smoothing set)
- ＊DENS. PULSE INPUT (density pulse input set) ⇒Density pulse input (DENS. PULSE INPUT) p. 72
  - ・UNIT (unit set)
  - ・REF. OSCILLATOR (correction factor of internal ref. oscillator)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊DENSITY PARAMETER (dens. param set) ⇒Dens. calculation setup (DENSITY PARAM), EL4301 p. 102
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・UNDER ALARM POINT (under alarm point set)

- ・OVER ALARM POINT (over alarm point set)
- ・UNDER FALLBACK (under fallback level set)
- ・OVER FALLBACK (over fallback level set)
- ・REF. TEMP. (ref. temperature set)
- ・AIR DENS. (density with air)
- ・AIR TEMP. (air temperature during calibration)
- ・AIR PERIOD (density period with air)
- ・WATER DENS. (density with water)
- ・WATER TEMP. (water temperature during calibration)
- ・WATER PERIOD (density period with water)
- ・COEFFICIENT α (temp. compensation for tube spring constant)
- ・THERMAL EXPAN. (β) (reference temperature conversion factor of density)
- ・CARRIER DENS. (carrier fluid density)
- ・TARGET DENS. (target fluid density)

SYS mode

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set)
- ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
  - ・TYPE (input type set)
- ＊DENSITY INPUT (density input set) ⇒Density input setup (DENSITY INPUT) p. 156
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 159
  - ・TYPE (output type set)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate)
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

11.8 EL4311 Density Computer for Mass Flowmeter (with solids proportion calculation feature)

SET mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing factor set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input setup (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX FREQUENCY (max. frequency set)
- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate setup (FLOW RATE SETTING) p.67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)

- ・COUNT STOP (totalizing stop set)
- ・SMOOTHING COEF. (smoothing coef. set)
- ・MAX. PERIOD (max. period set)
- ・MEASURE.NUMBER (number of meas. cycles set)
- ・INTERPOLATION (interpolation set)
- ・REF. OSCILLATOR (ref. oscillator correction set)

→ ＊DENS. PULSE INPUT (density pulse input set) ⇒Density pulse input (DENS. PULSE INPUT) p. 72

- ・UNIT (unit set)
- ・REF. OSCILLATOR (correction factor of internal ref. oscillator)

→ ＊TOTAL COUNT (total count set) ⇒Total count setup (TOTAL COUNT) p. 74

- ・UNIT (unit set)

→ ＊TOTAL COUNT (SOLID) (total count (solids content) set) ⇒Total count setup (TOTAL COUNT) p. 74

- ・UNIT (unit set)

→ ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76

- ・UNIT (unit set)
- ・BASE SCALE (baseline set)
- ・FULL SCALE (full scale set)
- ・HIGH LIMIT (mA) (output high limit set)
- ・LOW LIMIT (mA) (output low limit set)
- ・SMOOTHING COEF. (smoothing set)

→ ＊METER ERROR (meter error correction set) ⇒Meter error correction setup (METER ERROR) p. 85

- ・TYPE (correction type set)
- ・CONSTANT (constants)
- ・FREQUENCY (flowmeter calibration flow velocity (frequency 1))
- ・ERROR (meter error 1)
- ・FREQUENCY 2 (flowmeter calibration flow velocity (frequency 2))
- ・ERROR 2 (meter error 2)
- ・FREQENCY 3 (flowmeter calibration flow velocity (frequency 3))
- ・ERROR 3 (meter error 3)
- ・FREQUENCY 4 (flowmeter calibration flow velocity (frequency 4))
- ・ERROR 4 (meter error 4)
- ・FREQENCY 5 (flowmeter calibration flow velocity (frequency 5))
- ・ERROR 5 (meter error 5)
- ・FREQUENCY 6 (flowmeter calibration flow velocity (frequency 6))
- ・ERROR 6 (meter error 6)
- ・FREQENCY 7 (flowmeter calibration flow velocity (frequency 7))
- ・ERROR 7 (meter error 7)
- ・FREQUENCY 8 (flowmeter calibration flow velocity (frequency 8))
- ・ERROR 8 (meter error 8)
- ・FREQENCY 9 (flowmeter calibration flow velocity (frequency 9))
- ・ERROR 9 (meter error 9)

→ ＊FLOW SOLID PARA. (solids content flow set) ⇒Solids content flow setup (FLOW (SOLID) PARA.) p. 120

- ・COEFFICIENT (Da) (coefficient Da set)
- ・COEFFICIENT (Db) (coefficient Db set)
- ・COEFFICIENT (Dc) (coefficient Dc set)
- ・COEFFICIENT (Ta) (coefficient Ta set)
- ・COEFFICIENT (Tb) (coefficient Tb set)
- ・COEFFICIENT (Tc) (coefficient Tc set)

→ ＊FLOW RATE (instant flowrate calculation set) ⇒Instant flowrate setup (FLOW RATE) p. 95

- ・UNIT (unit set)

→ ＊FLOW RATE (SOLID) (instant flowrate (solids content) set) ⇒Instant flowrate setup (FLOW RATE) p. 95

- ・UNIT (unit set)

→ ＊DENSITY PARAMETER (dens. param set) ⇒Dens. calculation setup (DENSITY PARAM), EL4301 p. 102

- ・UNIT (unit set)
- ・CONSTANT (constant)
- ・UNDER ALARM POINT (under alarm point set)
- ・OVER ALARM POINT (over alarm point set)
- ・UNDER FALLBACK (under fallback level set)
- ・OVER FALLBACK (over fallback level set)
- ・REF. TEMP. (ref. temperature set)
- ・AIR DENS. (density with air)
- ・AIR TEMP. (air temperature during calibration)
- ・AIR PERIOD (density period with air)
- ・WATER DENS. (density with water)
- ・WATER TEMP. (water temperature during calibration)
- ・WATER PERIOD (density period with water)
- ・COEFFICIENT α (temp. compensation for tube spring constant)
- ・THERMAL EXPAN. (β) (reference temperature conversion factor of density)

SYS mode

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set)
- ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
  - ・TYPE (input type set)
- ＊DENSITY INPUT (density input set) ⇒Density input setup (DENSITY INPUT) p. 156
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 159
  - ・TYPE (output type set)
- ＊TOTAL COUNT RESET (total count reset set) ⇒Total count reset setup (TOTAL COUNT RESET) p. 160
  - ・POWER ON RESET (power on reset)
  - ・COUNT RESET (total count reset)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate)
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

11.9 EL4321 Density Computer for Spool Densitometer (gas service)

SET mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHJING COEF. (smoothing factor set)
- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 55
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHJING COEF. (smoothing set)
- ＊DENS. PULSE INPUT (density pulse input set) ⇒Density pulse input (DENS. PULSE INPUT) p. 72
  - ・UNIT (unit set)
  - ・REF. OSCILLATOR (correction factor of internal ref. oscillator)

- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊T/P COMPEN. (temp./press. compensation set) ⇒T/P compensation setup (T/P COMPEN.) p. 83
  - ・REF. TEMP. (ref. temperature set)
  - ・REF. PRESS. (ref. pressure set)
- ＊QUADRATIC COMPEN. (quad. comp. set) ⇒Quadratic compen. setup (QUADRATIC COMPEN.) p. 88
  - ・COEFFICIENT (Pa) (coefficient Pa set)
  - ・COEFFICIENT (Pb) (coefficient Pb set)
  - ・COEFFICIENT (Pc) (coefficient Pc set)
  - ・COEFFICIENT (Ta) (coefficient Ta set)
  - ・COEFFICIENT (Tb) (coefficient Tb set)
  - ・COEFFICIENT (Tc) (coefficient Tc set)

※ **When the additional code is DA2, the item for setting the quadratic compensation factor disappears and COMPRESSION FACTOR (compression deviation setting), P.138, is added.**

- ＊DENSITY PARAMETER (dens. param set) ⇒Dens. calculation setup (DENSITY PARAM), EL4321 p. 123
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・MEASURE. SEL. (measurement type select)
  - ・CONSTANT To (period time under vacuum)
  - ・CONSTANT do (constant do)
  - ・CONSTANT K (constant K)
  - ・CALIB. TEMP. tcal (temperature tcal during calibration)
  - ・TEMP. COEF. α (temperature coef. α)

SYS mode

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set)
- ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
  - ・TYPE (input type set)
- ＊PRESS. INPUT (pressure input set) ⇒Pressure input setup (PRESS. INPUT) p. 155
  - ・TYPE (input type set)
- ＊DENSITY INPUT (density input set) ⇒Density input setup (DENSITY INPUT) p. 156
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate))
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

11.10 EL4401 Blend Oil Temperature Compensated Flow Computer

SET mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing set)
- ＊BLEND INPUT (blend input set) ⇒Blend input setup (BLEND INPUT) p. 61
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHING COEF. (smoothing factor set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX. FREQUENCY (max. frequency set)
- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate setup (FLOW RATE SETTING) p.67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)
  - ・COUNT STOP (totalizing stop set)
  - ・SMOOTHING COEF. (smoothing coef. set)
  - ・MAX. PERIOD (max. period set)
  - ・MEASURE.NUMBER (number of meas. cycles set)
  - ・INTERPOLATION (interpolation set)
  - ・REF. OSCILLATOR (ref. oscillator correction set)
- ＊TOTAL COUNT (total count set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT (C) (total count (corrected)) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊FLOW RATE (C) (instant flowrate (corrected) set) ⇒Instant flowrate setup (FLOW RATE) p. 95
  - ・UNIT (unit set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・LOW-CUT (low cutoff set)
  - ・SMOOTHING COEF. (smoothing factor set)
- ＊3α COMPEN. (3α compensate set) ⇒3α compensate setup (3α COMPEN.) p. 80
  - ・TYPE (type set)
  - ・ALFA (α) (α set)
  - ・BETA (β) (β set)
  - ・REF. TEMP. (ref. temp. set)
- ＊DENSITY PARAMETER (dens. param set) ⇒Dens. param. setup (DENSITY PARAM) p. 130
  - ・UNIT (unit set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
- ＊METER ERROR (meter error correction set) ⇒Meter error correction setup (METER ERROR) p. 85
  - ・TYPE (correction t type set)
  - ・CONSTANT (constants)
  - ・FREQUENCY 1 (flowmeter calibration flow velocity (frequency 1))
  - ・ERROR 1 (meter error 1)
  - ・FREQUENCY 2 (flowmeter calibration flow velocity (frequency 2))
  - ・ERROR 2 (meter error 2)

- ・FREQENCY 3 (flowmeter calibration flow velocity (frequency 3))
- ・ERROR 3 (meter error 3)
- ・FREQUENCY 4 (flowmeter calibration flow velocity (frequency 4))
- ・ERROR 4 (meter error 4)
- ・FREQENCY 5 (flowmeter calibration flow velocity (frequency 5))
- ・ERROR 5 (meter error 5)
- ・FREQUENCY 6 (flowmeter calibration flow velocity (frequency 6))
- ・ERROR 6 (meter error 6)
- ・FREQENCY 7 (flowmeter calibration flow velocity (frequency 7))
- ・ERROR 7 (meter error 7)
- ・FREQUENCY 8 (flowmeter calibration flow velocity (frequency 8))
- ・ERROR 8 (meter error 8)
- ・FREQENCY 9 (flowmeter calibration flow velocity (frequency 9))
- ・ERROR 9 (meter error 9)

SYS mode

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set)
- ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
  - ・TYPE (input type set)
- ＊BLEND INPUT (blend input set) ⇒Blend input setup (BLEMD INPUT) p. 165
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 2 (pulse output 2 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 159
  - ・TYPE (output type set)
- ＊TOTAL COUNT RESET (total count reset set) ⇒Total count reset setup (TOTAL COUNT RESET) p. 160
  - ・POWER ON RESET (power on reset)
  - ・COUNT RESET (total count reset)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate)
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

PARA SET mode

- ＊FLUID A (liquid kind A) ⇒Liquid A (B) setup (FLUID A (B)) p. 173
  - ・TYPE (type set)
  - ・UNIT (unit set)
  - ・DENSITY (density set)
- ＊FLUID B (liquid kind B) ⇒Liquid A (B) setup (FLUID A (B)) p. 173
  - ・TYPE (type set)
  - ・UNIT (unit set)
  - ・DENSITY (density set)

11.11 EL4501 Multipoint Temperature Compensated Flow Computer (liquid service)

SET mode

- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 48
  - ・UNIT (unit set)
  - ・CONSTANT (constant)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・UNDER FALLBACK (under fallback level set)
  - ・OVER FALLBACK (over fallback level set)
  - ・SMOOTHJING COEF. (smoothing factor set)
- ＊PULSE INPUT (pulse input set) ⇒Pulse input (PULSE INPUT) p. 66
  - ・METER FACTOR (meter factor set)
  - ・MAX. FREQUENCY (max. frequency set)
- ＊FLOW RATE SETTING (instant flowrate set) ⇒Instant flowrate stup (FLOW RATE SETTING) p.67
  - ・MEASURE. TYPE (measurement type set)
  - ・LOW-CUT FRQ. (low cutoff frequency set)
  - ・COUNT STOP (totalizing stop set)
  - ・SMOOTHING COEF. (smoothing factor set)
  - ・MAX. PERIOD (max. period set)
  - ・MEASURE.NUMBER (number of meas. cycles set)
  - ・INTERPOLATION (interpolation set)
  - ・REF. OSCILLATOR (ref. oscillator correction set)
- ＊TOTAL COUNT (Q) (total count (Q) set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT (Q μ f) (total count (Q μ f)) set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊TOTAL COUNT (Q μ f ρ (total count (Q μ f ρ)) set) ⇒Total count setup (TOTAL COUNT) p. 74
  - ・UNIT (unit set)
- ＊ANALOG OUTPUT (analog output set) ⇒Analog output setup (ANALOG OUTPUT) p. 76
  - ・UNIT (unit set)
  - ・BASE SCALE (baseline set)
  - ・FULL SCALE (full scale set)
  - ・HIGH LIMIT (mA) (output high limit set)
  - ・LOW LIMIT (mA) (output low limit set)
  - ・SMOOTHING COEF. (smoothing factor set)
- ＊3 α COMPEN. (3 α compensate set) ⇒3 α compenstate setup (3 α COMPEN.) p. 80
  - ・TYPE (type set)
  - ・ALFA (α) (α set)
  - ・BETA (β) (β set)
  - ・REF. TEMP. (ref. temp. set)
- ＊DENSITY PARAMETER (dens. param set) ⇒Dens. param. setup (DENSITY PARAM), EL4301 p. 130
  - ・UNIT (unit set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
- ＊VISCOSITY COMPEN. (viscosity correction factor set) ⇒Viscosity corrrection (μ) setup (VISCOSITY COMP. (μ)) p. 134
  - ・UNIT (unit set)
  - ・UNDER ALARM POINT (under alarm point set)
  - ・OVER ALARM POINT (over alarm point set)
  - ・ μ 1 (viscosity corrected for meter error μ 1)
  - ・ μ 2 (viscosity corrected for meter error μ 2)
  - ・ μ 3 (viscosity corrected for meter error μ 3)
  - ・FREQUENCY 1 (flow velocity at meter calibration (frequency 1))
  - ・METER ERROR 11 (meter error)
  - ・METER ERROR 12 (meter error)
  - ・METER ERROR 13 (meter error)
  - ・FREQUENCY 2 (flow velocity at meter calibration (frequency 2))
  - ・METER ERROR 21 (meter error)
  - ・METER ERROR 22 (meter error)
  - ・METER ERROR 23 (meter error)
  - ・FREQUENCY 3 (flow velocity at meter calibration (frequency 3))
  - ・METER ERROR 31 (meter error)
  - ・METER ERROR 32 (meter error)
  - ・METER ERROR 33 (meter error)
  - ・FREQUENCY 4 (flow velocity at meter calibration (frequency 4))
  - ・METER ERROR 41 (meter error)
  - ・METER ERROR 42 (meter error)
  - ・METER ERROR 43 (meter error)

- ・FREQUENCY 5 (flow velocity at meter calibration (frequency 5))
- ・METER ERROR 51 (meter error)
- ・METER ERROR 52 (meter error)
- ・METER ERROR 53 (meter error)
- ・FREQUENCY 6 (flow velocity at meter calibration (frequency 6))
- ・METER ERROR 61 (meter error)
- ・METER ERROR 62 (meter error)
- ・METER ERROR 63 (meter error)
- ・FREQUENCY 7 (flow velocity at meter calibration (frequency 7))
- ・METER ERROR 71 (meter error)
- ・METER ERROR 72 (meter error)
- ・METER ERROR 73 (meter error)
- ・FREQUENCY 8 (flow velocity at meter calibration (frequency 8))
- ・METER ERROR 81 (meter error)
- ・METER ERROR 82 (meter error)
- ・METER ERROR 83 (meter error)
- ・FREQUENCY 9 (flow velocity at meter calibration (frequency 9))
- ・METER ERROR 91 (meter error)
- ・METER ERROR 92 (meter error)
- ・METER ERROR 93 (meter error)

SYS mode

- ＊PASSWORD (password set) ⇒Password setup (PASSWORD) p. 150
  - ・LOCK (password lock option set)
  - ・PASSWORD SET (password numeric set)
- ＊CALENDAR (calendar set) ⇒Calendar setup (CALENDAR) p. 152
  - ・DATE (date set)
  - ・TIME (time set)
- ＊SIMUATE (analog output simulate) ⇒Analog output simulate (SIMSULATE) p. 153
  - ・ANA. OUT 1 (analog output 1)
- ＊TEMP. INPUT (temperature input set) ⇒Temperature input setup (TEMP. INPUT) p. 154
  - ・TYPE (input type set)
- ＊PULSE OUTPUT 1 (pulse output 1 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 2 (pulse output 2 set ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
  - ・PULSE WIDTH (pulse output width set)
- ＊PULSE OUTPUT 3 (pulse output 3 set) ⇒Pulse output setup (PULSE OUTPUT) p. 157
  - ・TYPE (output type set)
- ＊TOTAL COUNT RESET (total count reset set) ⇒Tot count reset setup (TOTAL COUNT RESET) p. 160
  - ・POWER ON RESET (power on reset)
  - ・COUNT RESET (total count reset)
- ＊BACKLIGHT (backlight set) ⇒Backlight setup (BACKLIGHT) p. 161
  - ・CONTROL (control type)
  - ・BACKLIGHT (backlight illuminate)
- ＊RUN PAGE (RUN mode page set) ⇒RUN mode page save setup (RUN PAGE) p. 163
  - ・SAVE (save set)
- ＊COMMUNICATION (com set) ※com. Provided model ⇒Com setup (COMMUNICATION) p. 166
  - ・Bps RATE (communication baud rate set)
  - ・DATA BIT (data bit length set)
  - ・STOP BIT (stop bit length set)
  - ・ADDRESS (home address set)
  - ・TERMINATE (terminator set)
  - ・BCC (BCC set)
  - ・PARITY (parity bit set)

PARA SET mode

- ＊OIL KIND (liquid kind set) ⇒Liquid kind setup (OIL KIND) p. 179
  - ・TYPE (type set)
- ＊DENSITY (density set) ⇒Density setup (DENSITY) p. 180
  - ・UNIT (unit set)
  - ・DENSITY (density set)
- ＊VISCOSITY (viscosity set) ⇒Viscosity setup (VISCOSITY) p. 181
  - ・UNIT (unit set)
  - ・VISCOSITY (viscosity set)

2022.05 Revised△
2008.10 Released
E-880TM-5-E (1)

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