SR Mini SYSTEM

Operation Panel

OPL-A

Instruction Manual

RKC RKC INSTRUMENT INC.

IMSRM11-E4

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.

SYMBOLS

WARNING : This mark indicates precautions that must be taken if there is danger of electric shock, fire, etc., which could result in loss of life or injury.

CAUTION : This mark indicates that if these precautions and operating procedures are not taken, damage to the instrument may result.

NOTE : This mark indicates supplemental information on installation, handling and operating procedures.

⚠ : This mark indicates that all precautions should be taken for safe usage.

* : This mark is used to add extra notes, precautions or supplementary explanations to table and figures.

⚠ WARNING

- To prevent injury to persons, damage to instrument and equipment, a suitable external protection device shall be required.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
  - If input/output or signal lines within the building are longer than 30 meters.
  - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.
  The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- To prevent instrument damage as a result of failure, protect the power line and the input/output lines from high currents with a suitable overcurrent protection device with adequate breaking capacity such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- Do not connect modular connectors to telephone line.
- When high alarm with hold action/re-hold action is used for Alarm function, alarm does not turn on while hold action is in operation. Take measures to prevent overheating which may occur if the control device fails.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

CONTENTS

1 OUTLINE

1.1 Handling procedure

Proceed with the work according to the following procedures.

① Confirmation of the accessories

Refer to Chapter 1: "1.2 Confirmation of the products."

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② Confirmation of the model code

Refer to Chapter 1: "1.3 Model code."

↓

③ Mounting and wiring

Refer to Chapter 2: "MOUNTING AND WIRING."

↓

④ Preparations before operation

Refer to Chapter 3: "OPERATIONS."

↓

⑤ Turn ON the power

Refer to Chapter 3: "OPERATIONS."

↓

⑥ Settings concerning the communications

Refer to Chapter 3: "OPERATIONS."

↓

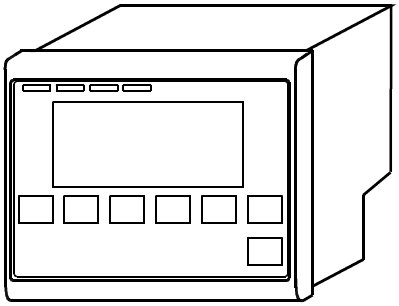
⑦ Operations

Refer to Chapter 3:"OPERATIONS," and Chapter 4:
"OPERATING PROCEDURE."

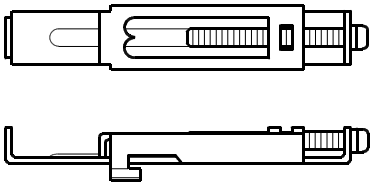
* When carrying out the above procedure, be sure to follow each of the caution items.

1.2 Confirmation of the products

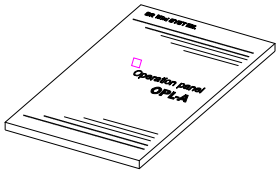
When first opening the packing box, confirm that the following products are all included. In the worst case, if any of the packaged products are missing or damaged, or if there are missing pages or erratic pagination in the manual, etc., please contact your nearest RKC sales office or agent from which you bought the instrument.



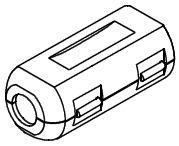
SR Mini SYSTEM
Operation panel [OPL-A]
(1 unit)



Operation panel mounting brackets
(4 brackets)



Operation panel instruction manual
[IMSRM11-E4]
(1 copy)



Ferrite core (2 pieces)

Attached to the CE/UL/cUL (or CSA) approved instrument.

Option

● Host communications connector
DSUB 9−pin (female): 1 piece
(Attached to the instrument with the host communication function.)

● Modular cable (sold separately)
For connecting SR Mini control unit
W−BF−02−3000 (Cable length: 3 meter)

1.3 Model code

Confirm whether the delivered product is the model that was ordered by referring to the following model code list.
In the worst situation, if the delivered product differs from the required specification, please contact your nearest RKC sales office or agent from which you bought the instrument.

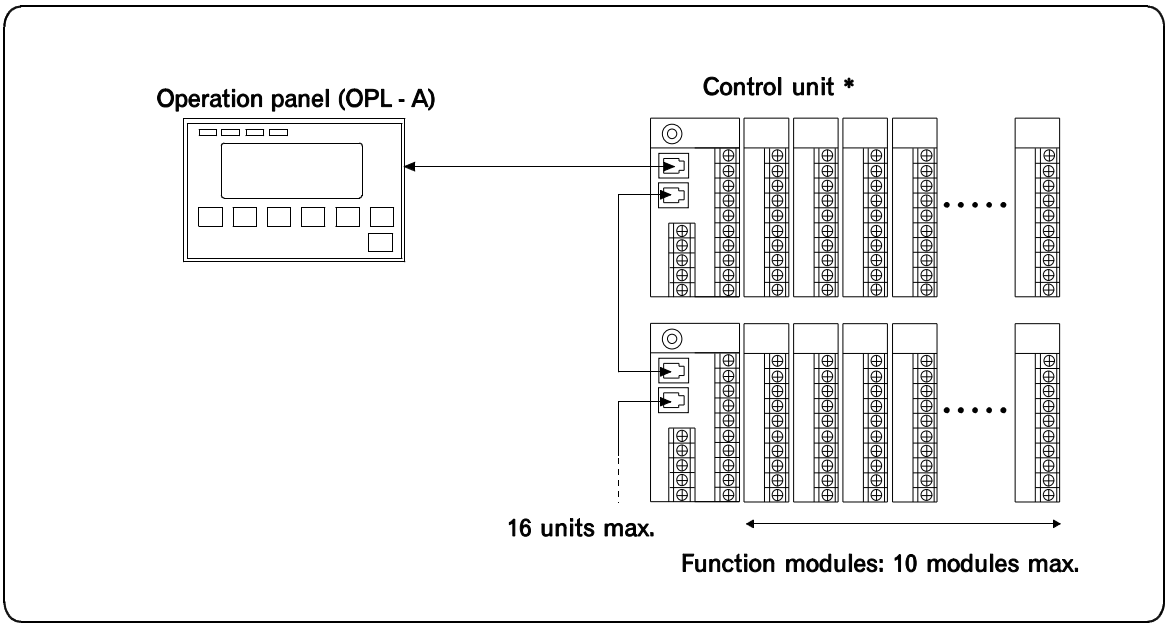
OPL−A ✻ □
①

① Communication interface
N: No function
1: RS−232C
4: RS−422A
5: RS−485

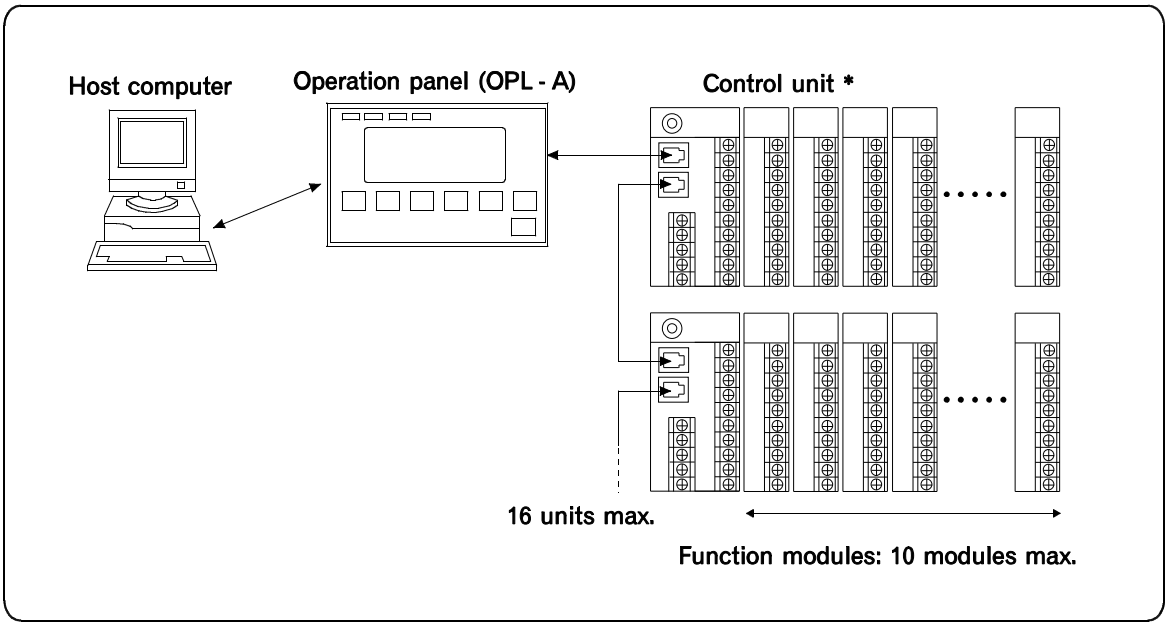
* The operation panel is provided with one relay contact (SUB output) as standard.
* The communication protocol for the control unit should conform to RS−422A.

1.4 System configuration

■ Operation panel & Control unit



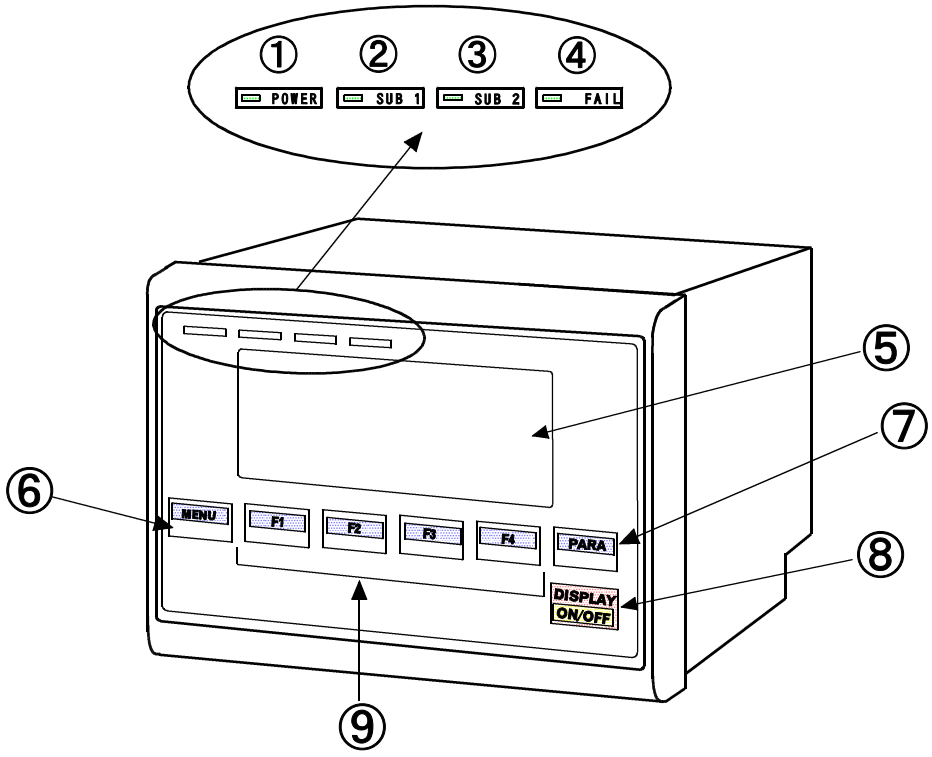
■ Host computer, Operation panel & Control unit



* Usable modules: M−PCP−A, M−TIO−(A, B, C, D or P type), M−CT−A, M−DI−A, M−DO−A and M−DO−B.

1.5 Name of parts

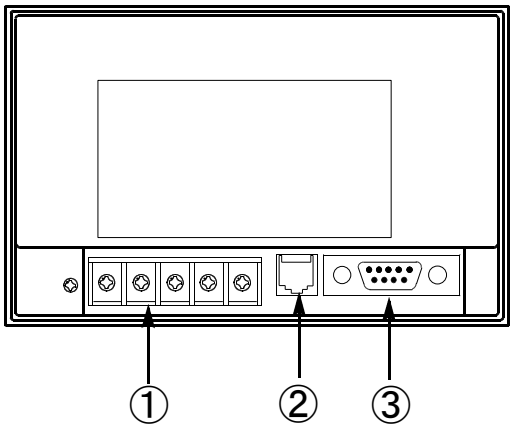
■ Front



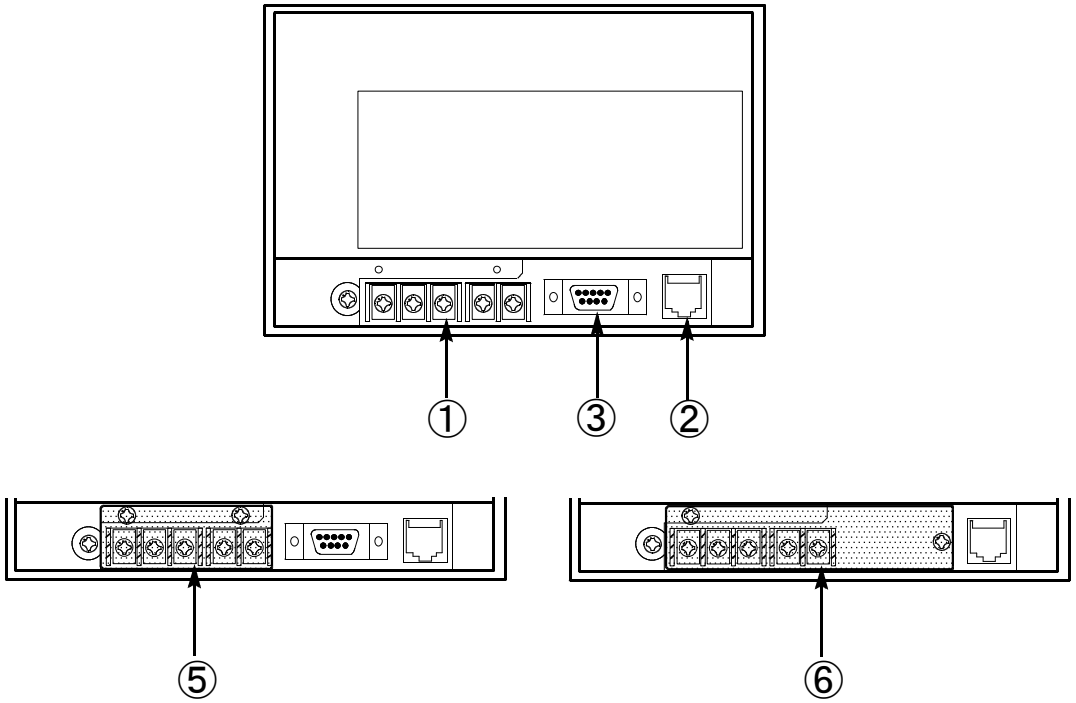
Name	Description
① Power indicator lamp	Light when power to the operation panel is turned on. (Green LED)
②③ SUB indicator lamps	Lights during SUB output. (Red LED)
④ Failure output indicator lamp	Light when there is an abnormality in the operation panel. (Red LED)
⑤ Display	Displaying and setting unit for all data.
⑥ MENU switch	Return to displayed screen before.
⑦ PARA switch	Change to setting item switch.
⑧ Display screen ON/OFF switch	Switch that changes between displaying or not displaying the display screen.
⑨ Function switch	Selection of functions displayed on screen and set switches.

■ Rear

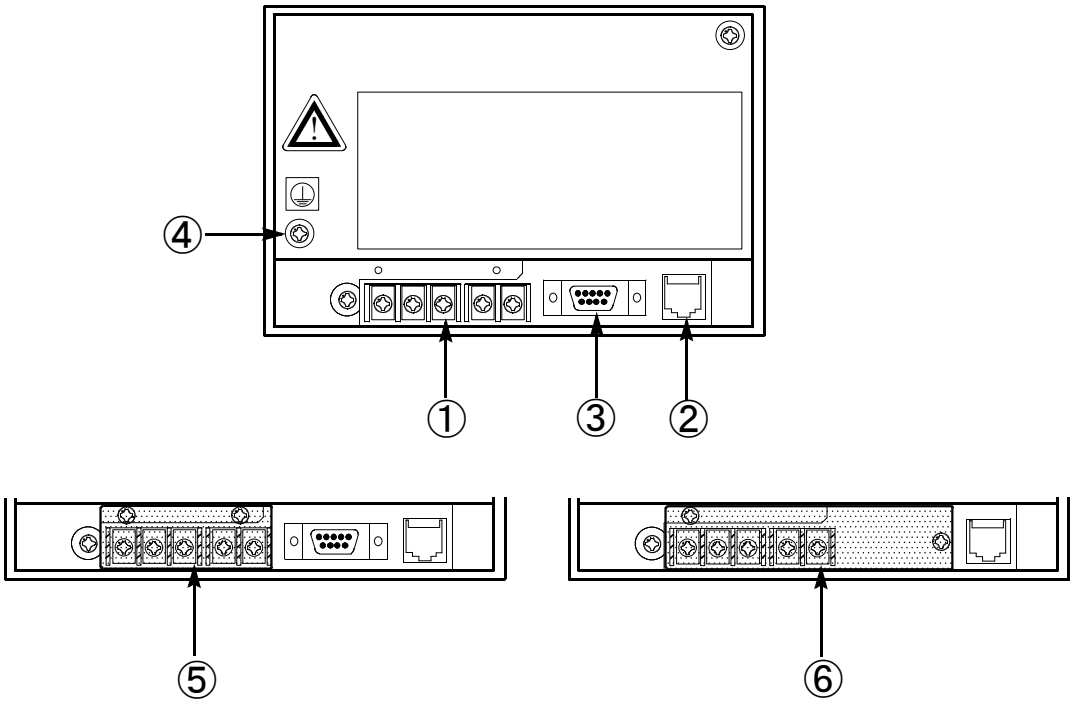
[100 to 240 V AC]



[24 V DC]



[CE/UL/cUL (or CSA) approved instrument (100 to 240 V AC or 24 V DC)]



Name	Description
① Tterminals	Terminals for the power supply, SUB output and grounding. （Refer to "2.4 Wiring" about terminals.）
② Modular jack	Communication connection with the control units.
③ D-SUB connecter for Host computer communications (9 pins)	For communications with the host computer. One of the RS−232C, RS−422A or RS−485 connectors can be specified. ［Option］
④ Protective earth terminal	Terminal for the Protective earth.
⑤ Terminal cover	This is for the type with host communication function.
⑥ Terminal cover	This is for the type without host communication function.

MOUNTING AND WIRING

2

2.1 Cautions for mounting

⚠ WARNING

To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.

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(1) Mounting environment

■ This instrument is intended to be used under the following environmental conditions. (IEC61010-1)
[OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]

■ Use this instrument within the following environment conditions:

- Allowable ambient temperature: 0 to 40 °C
- Allowable ambient humidity: 45 to 85 % RH
- Installation environment conditions: Indoor use
  Altitude up to 2000m.

■ Avoid the following when selecting the mounting location.

- Rapid changes in ambient temperature which may cause condensation.
- Corrosive or inflammable gases.
- Direct vibration or shock to the mainframe.
- Water, oil, chemicals, vapor or steam splashes. *
- Excessive dust, salt or iron particles. *
- Excessive induction noise, static electricity, magnetic fields or noise.
- Direct air flow from an air conditioner.
- Should be used indoors where the system is not exposed to direct sunlight.
- Heat to be accumulated due to radiation heat.

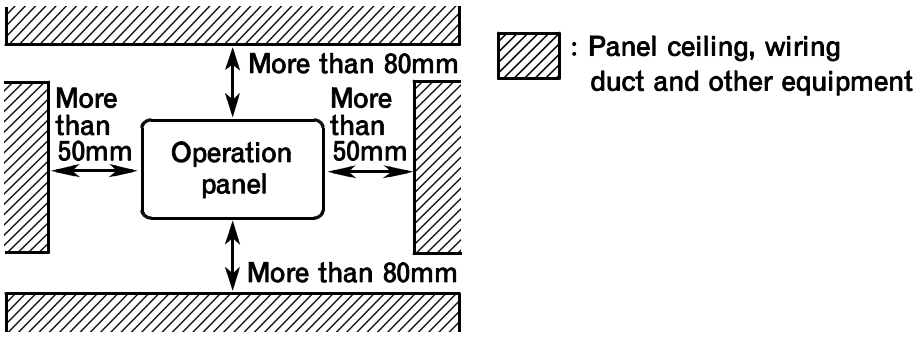
* The front operation panel has a dustproof, waterproof construction equivalent to IP55 when the instrument is mounted on the panel, allowing it to be used safely even in harsh environments.

■ In case this instrument is connected to a supply by means of a permanent connection, a switch or circuit-breaker shall be included in the installation. This shall be in close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.

(2) Mounting cautions

When mounting the instrument within the panel, take into account the following.

- Allow enough ventilation space to radiate heat from around the instrument. Allow a minimum of 50 mm on the left and right and 80 mm on the top and bottom.

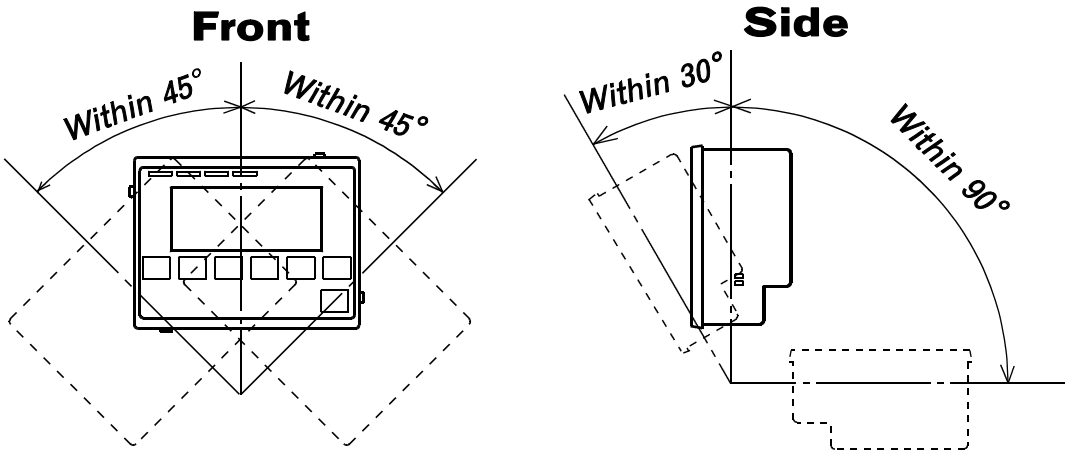


- Do not mount the instrument directly above equipment which generates much heat (heaters, transformers, semiconductor drive units, large resistors etc.).
- If the ambient temperature exceeds 40 °C, cool the panel inside using forced fans or coolers. However, do not directly expose the instrument to cooled air.
- In order to improve the noise rejection characteristics and safety, mount the instrument as far away from high−voltage equipment, power lines or rotating machinery as possible.

High−voltage equipment:	Do not install it in the same panel as the instrument.
Power line:	Mount the instrument more than 200 mm away from power lines.
Rotating machinery:	Mount the instrument as far away from rotating machinery as possible.

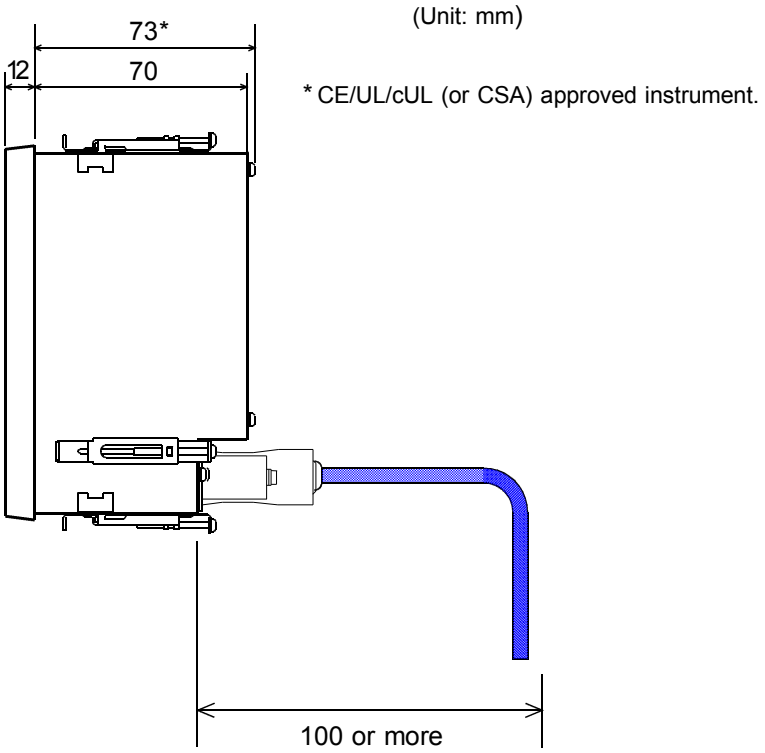
(3) Mounting angle

Mount the operation panel within 30° in the forward direction, 90° in the backward direction, or 45° in the right or left direction to prevent malfunction.



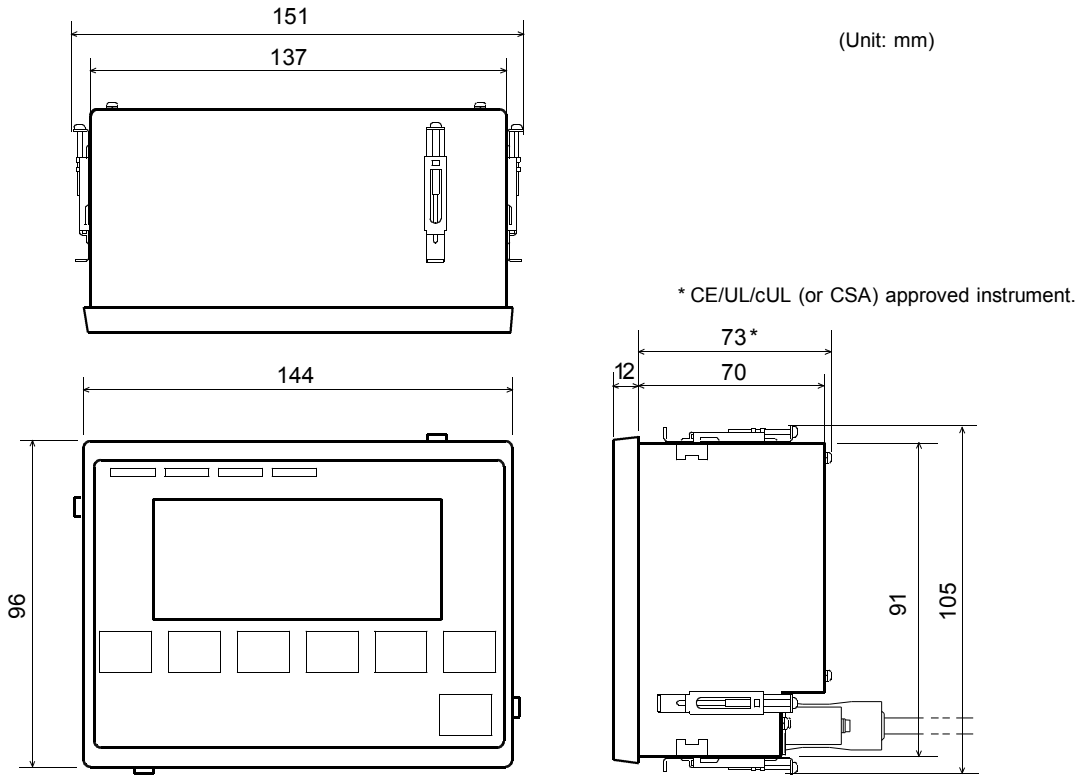
(4) Mounting depth

The operation panels are connected to the host computer via cables with connectors.
Therefore, when the operation panel is mounted on a panel, keep an interval of more than 100 mm including the length of the above cable from the rear of the operation panel to avoid a sharp bend of the cable.
Leave enough space as much as possible by taking into account operability and safety.

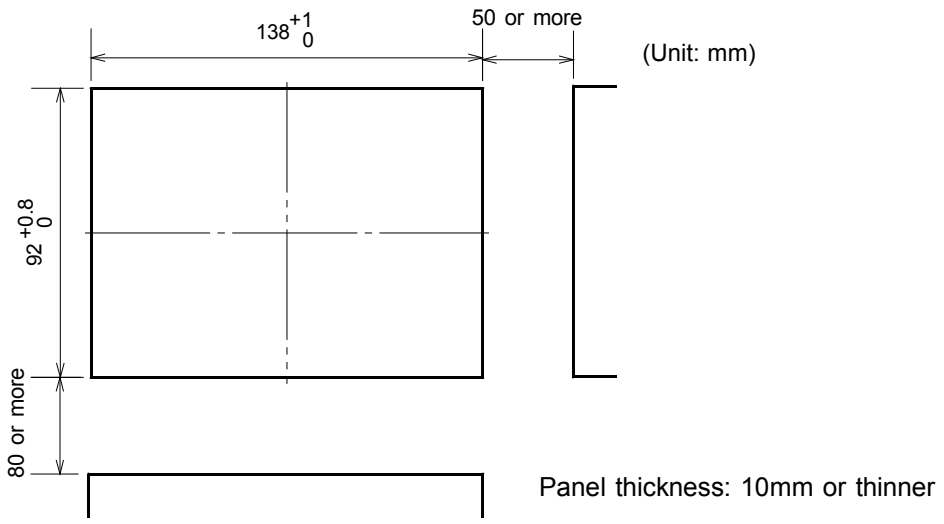


2.2 Mounting

(1) External dimensions diagram & Panel cutout dimension diagram



External dimension diagram



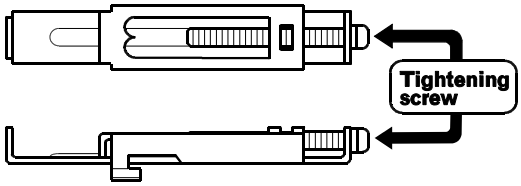
Panel cutout dimension diagram

(2) Mounting method

CAUTION

The maximun thickness of panel (applicable range of mounting brackets) to be mounted with the instrument is 1 to 10 mm. In order to improve safety, waterproof and dustproof effects, mount the instrument is as thick a panel as possible.

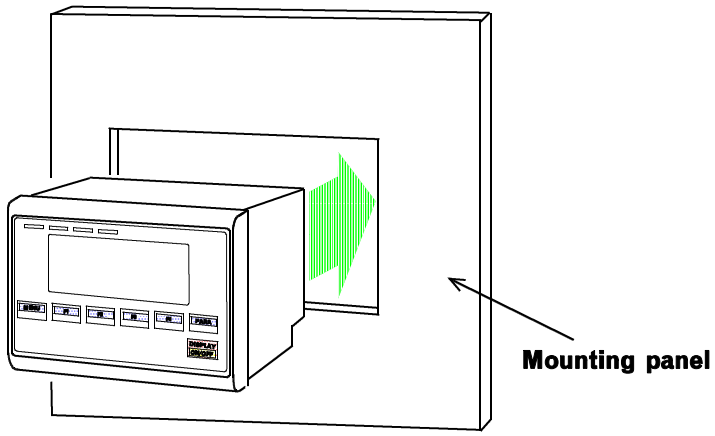
① Prepare 4 mounting brackets supplied with the operation panel.



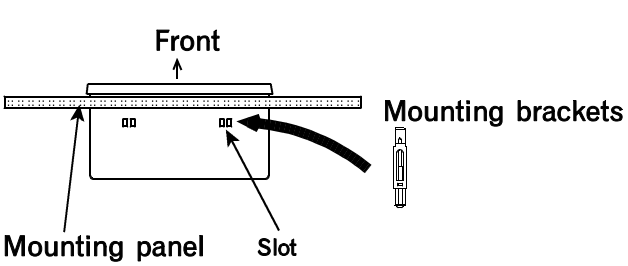
Mounting brackets …… 4 brackets
(Attached to the operation panel)

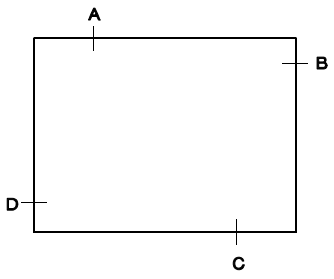
② Make a panel cutout through the panel by referring to the panel cutout dimensions.

③ Insert the operation panel main unit into the front face of the mounting panel.



④ The mounting brackets should be attached in 2 places on each of the top and bottom surfaces, and also in 2 places on both side surfaces (Total of 4 locations).



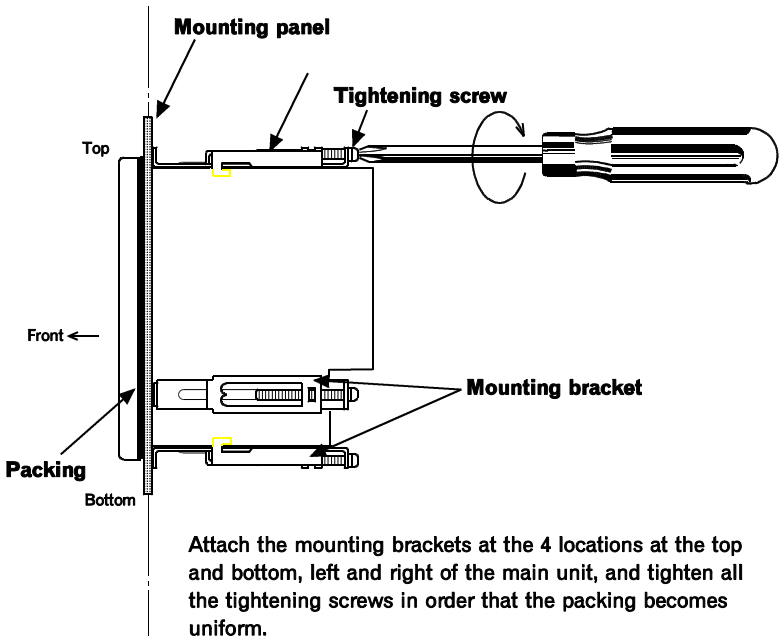


Positions of the mounting brackets

⑤ Tighten each bracket setscrew using a Phillips screwdriver to secure the operation panel.

CAUTION

Tighten the bracket setscrew so that the thickness of the dustproof packing is uniform, otherwise the operation panel may not be fully dustproof and waterproof.



Tightening torque (Recommended value) : 0.3 N·m (3 kgf·cm)

2.3 Cautions for wiring

WARNING

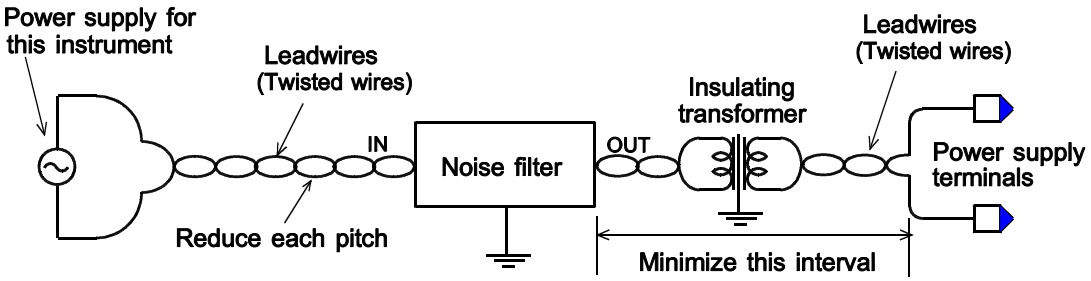
To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

(1) Measures for noise

Noise may adversely affect electronic equipment, causing equipment malfunction and many problems such as lost profit due to decrease in productivity, time loss, etc.
Therefore the source of noise must be eliminated wherever possible.

<Measures for suppressing power supply noise>

If a noise source is near the instrument and could affect the instrument, use a noise filter.
(Select the noise filter after checking the power supply voltage of the instrument*)
Noise suppression is more effective if an insulating transformer is also used.
* Sufficient effect may not be obtained depending on the filter used. Therefore, select the suitable filter by referring to the filter frequency characteristics.



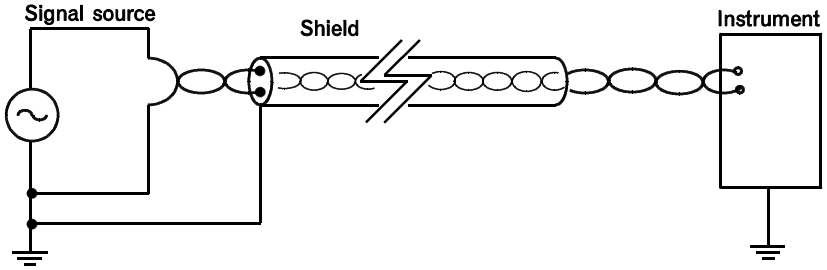
CAUTIONS

- If the instrument is likely to be affected by noise, twist the power supply leadwires used for connections to reduce the noise.
  The shorter the twists, the more effective the noise suppression. In addition, always ground the noise filter and insulating transformer.
- Always install the noise filter on the grounded panel. Also minimize the wiring distance between the noise filter output side and instrument power supply terminals to ensure the effectiveness of the noise filter.
- Do not connect fuses or switches on the wiring of the noise filter output side, since these may reduce the effectiveness of the noise filter.

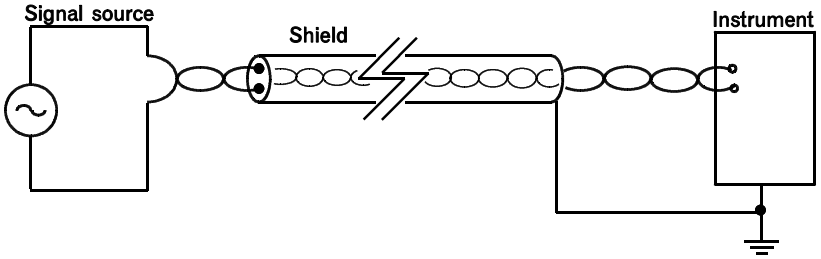
<Measures for noise in input/output signal wires>

- Use independent ducts for the input/output wires and power circuits inside and outside the panel.
- If input/output wires have to be placed in the same duct as the power circuits, use shielded wires. Also ground the shield to reject any noise generated by the floating capacitance between the cores and shield or by a grounding potential.

[Example : When signal source is grounded] Connect the signal source to the grounding side.



[Example : When signal source is not grounded] Ground the signal source on the instrument side.



(2) Power supply line wiring

- Use power supply as specified in power supply rated voltage range.

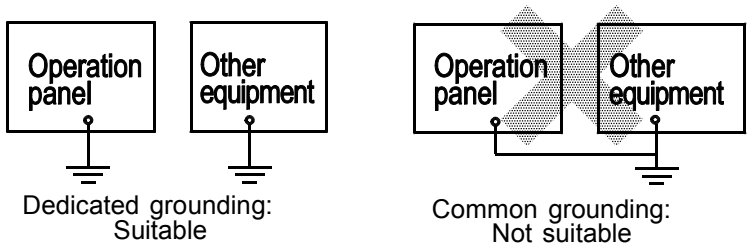
  90 to 264 V AC [Including power supply voltage variations] , 50/60 Hz
  (Rating : 100 to 240 V AC)

  21.6 to 26.4 V DC [Including power supply voltage variations]
  (Rating : 24 V DC)

- Power supply wiring must be twisted and have a low voltage drop.
- For eliminating noise contained in the power supply use an insulating transformer. It is recommended to reject the noise before supplying the power to the unit.
- Provide separate power supply for this instrument independent of other input/output circuits, motors, equipment and operating circuits.

(3) Grounding-wire wiring

- Do not ground the instrument together with other equipment.
  The full grounding effect may not be produced depending on the grounding method.

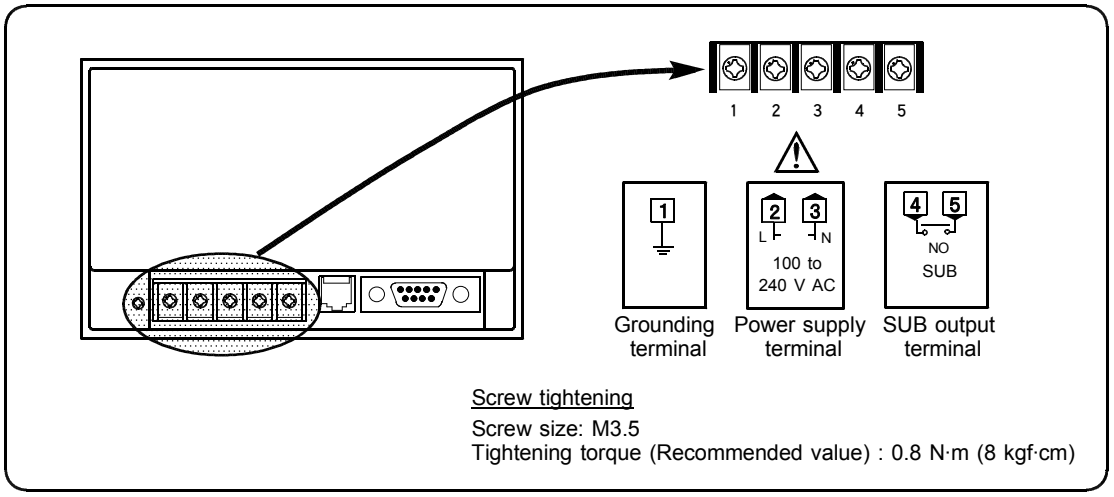


- Do not use the same grounding wire as that for high− voltage equipment such as motors, etc.
- Do not ground grounding wires so that they form a grounding loop. Ground each wire at one point.
- Use grounding wires with a cross section area of 2.0 mm^2 or more.

2.4 Wiring

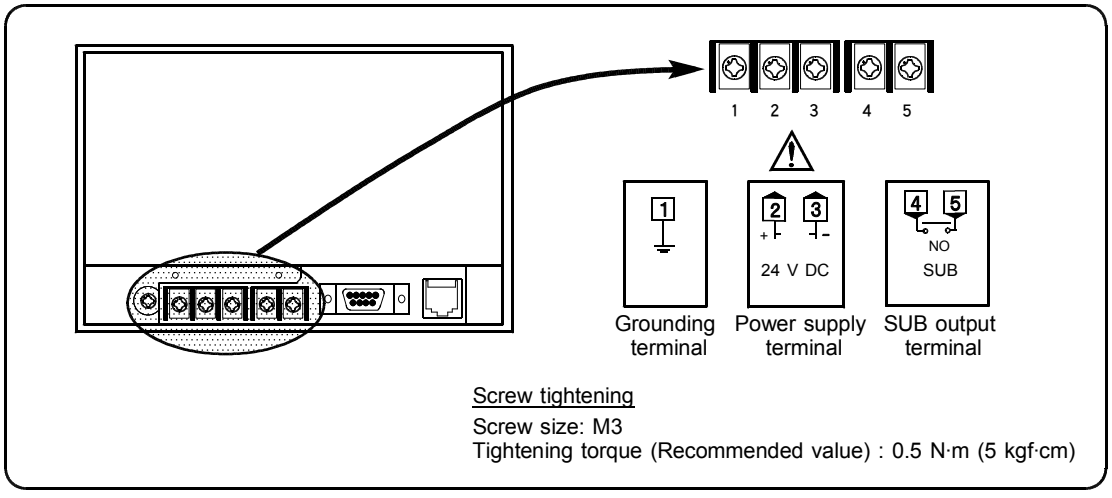
(1) Terminal configuration

100 to 240V AC



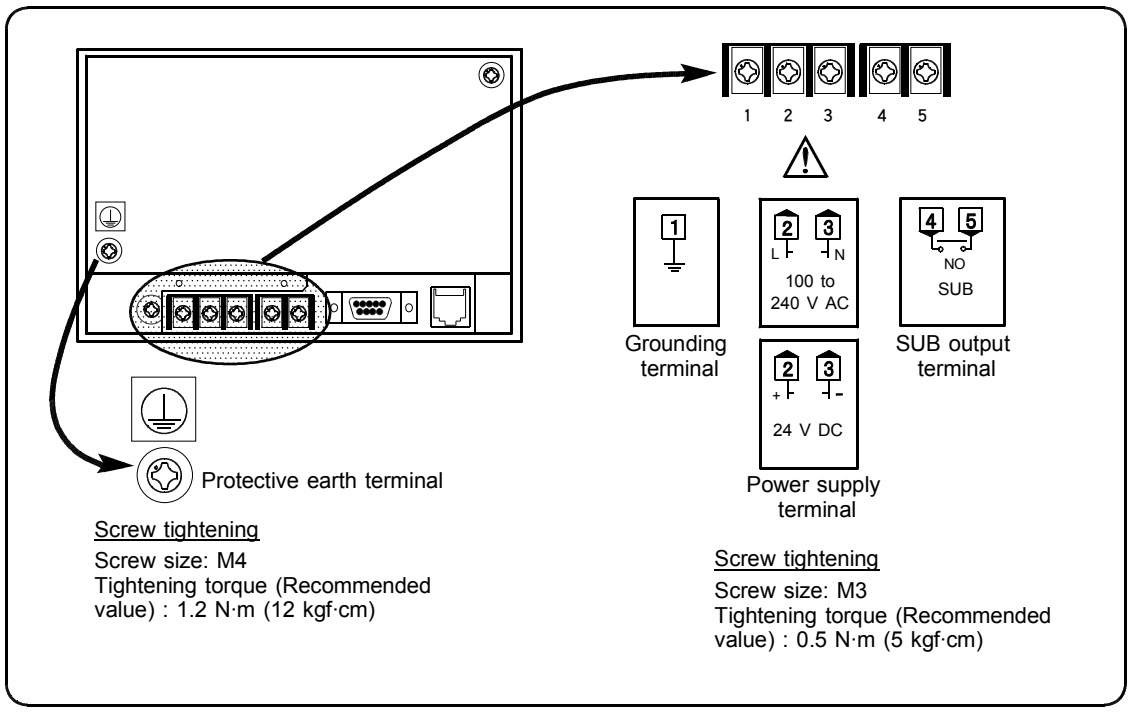
Screw tightening
Screw size: M3.5
Tightening torque (Recommended value) : 0.8 N·m (8 kgf·cm)

DC24V



Screw tightening
Screw size: M3
Tightening torque (Recommended value) : 0.5 N·m (5 kgf·cm)

CE/UL/cUL (or CSA) approved instrument (100 to 240 V AC and 24 V DC)



- Use power supply as specified in power supply rated voltage range.

  90 to 264 V AC [Including power supply voltage variations], 50/60 Hz
  (Rating : 100 to 240 V AC)

  21.6 to 26.4 V DC [Including power supply voltage variations]
  (Rating : 24 V DC)

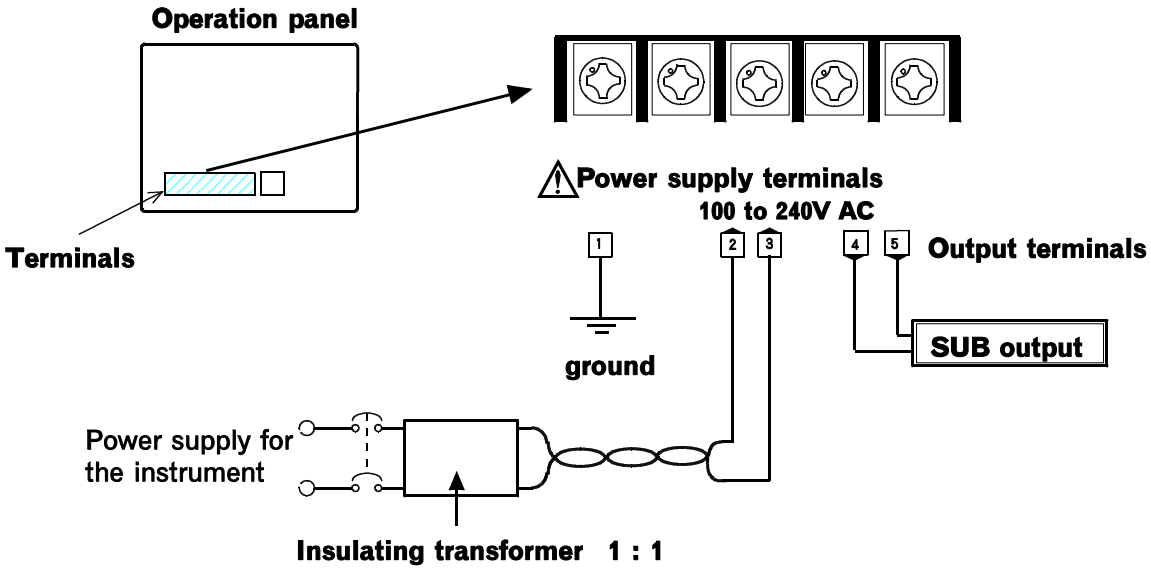
- The SUB output enables the contact signals corresponding to an alarm and temperature rise completion generated on the control unit side to be output even on the operation panel side.
  For details on SUB output selection, see the supplementary manual for OPL initialize "SUB output selection."

  (Relay contact output (Closed when an error occurs.)
  Contact capacity : 250V AC, 1A or less (Resistive load) 1 "a" contact*
  * Energized or de−energized [Z-140C] can be selected.)

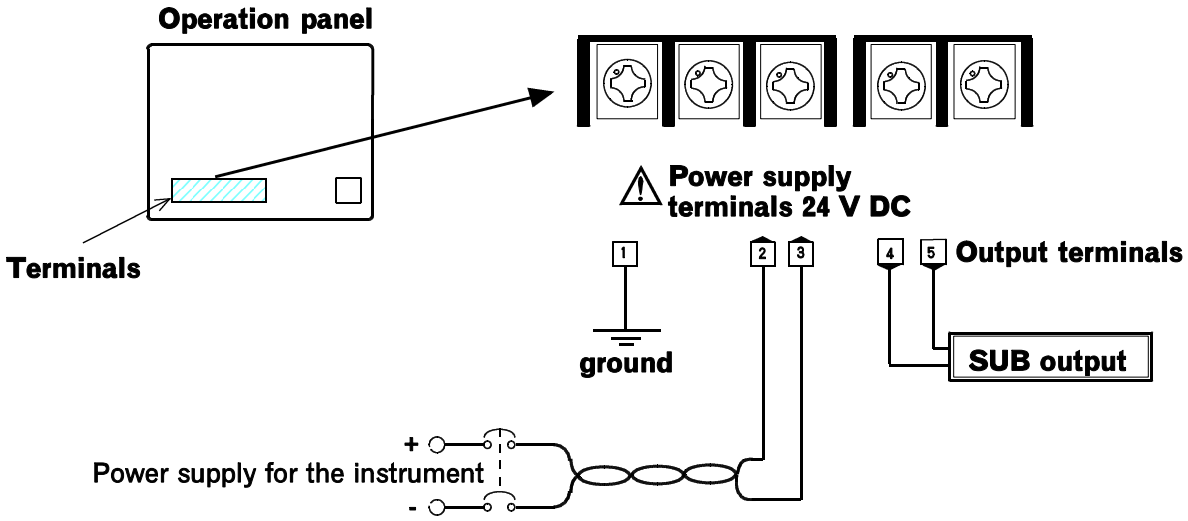
- Protective earth terminal shall conform to the standard of the country where this instrument is installed [CE/UL/cUL (or CSA) approved instrument].
- For an instrument with 24 V power supply input, supply power from “SELV” circuit defined as IEC 60950-1.
- A suitable power supply should be considered in the end-use equipment. The power supply must be in compliance with a limited-energy circuits (maximum available current of 8 A).

(2) Wiring example

- 100 to 240 V AC



- 24 V DC



2.5 Connection

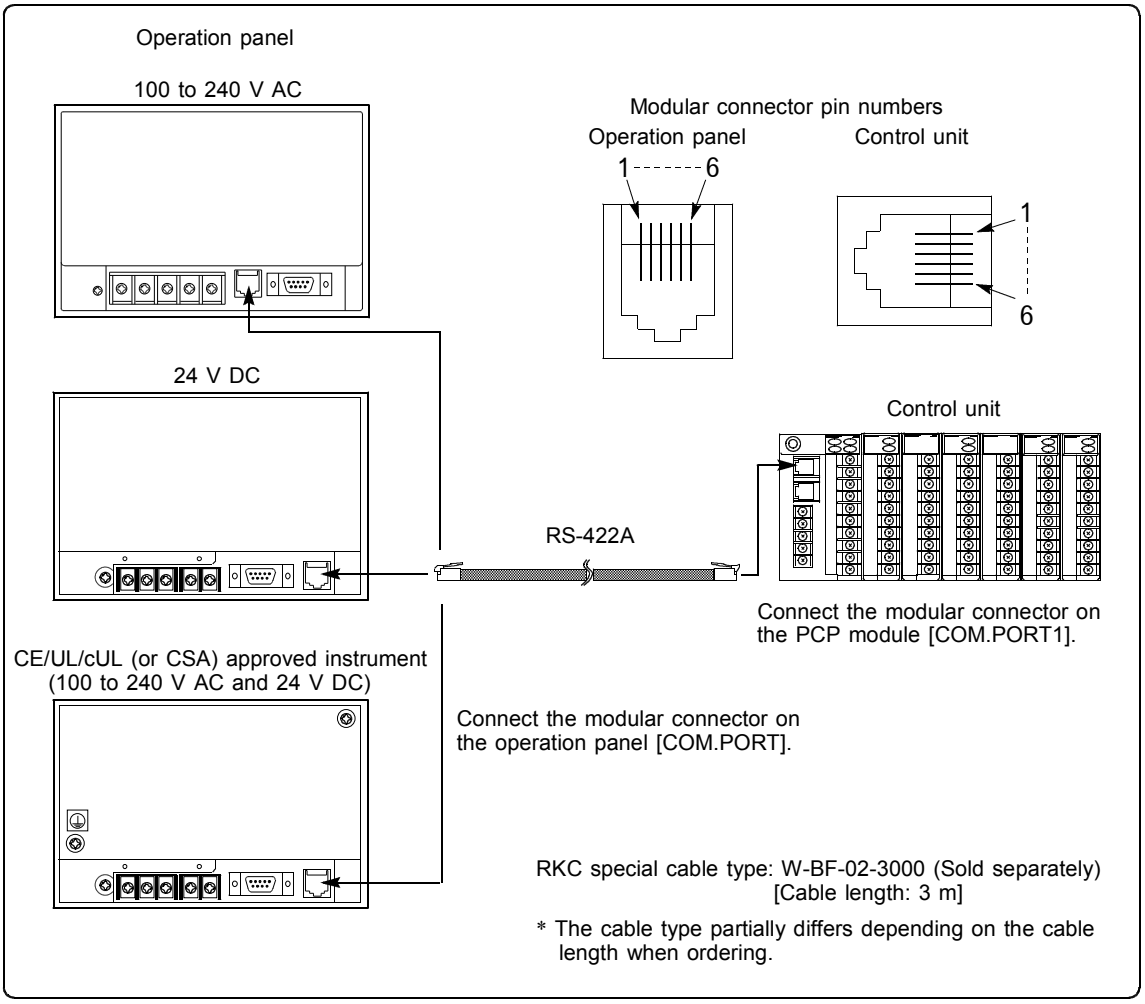
WARNING

To prevent electric shock or instrument failure, turn off the power before connecting or disconnecting the instrument and peripheral equipment.

CAUTIONS

- Connect the connector in the correct position and direction. In the connector is inserted incorrectly and forcibly into the socket, its pins may be bent to cause instrument failure.
- Connect or disconnect the connector in the direction parallel to the socket surface as much as possible. Otherwise, its pins may be bent to cause instrument failure.
- Disconnect the connector by holding the connector. If the connector is disconnected by pulling the cable, the instrument may become faulty.
- For preventing the instrument from the malfunction, do not touch the contact surface of the connector with bare or oily hands.
- For preventing the instrument from the malfunction, firmly connect the connector, then firmly fix the connector with set screws.
- For preventing the cable from damage, do not forcibly bent it.
- If the instrument is easily affected by noise, use the ferrite core in the both ends of the cable (nearest the connector).

2.5.1 Connection with the control unit



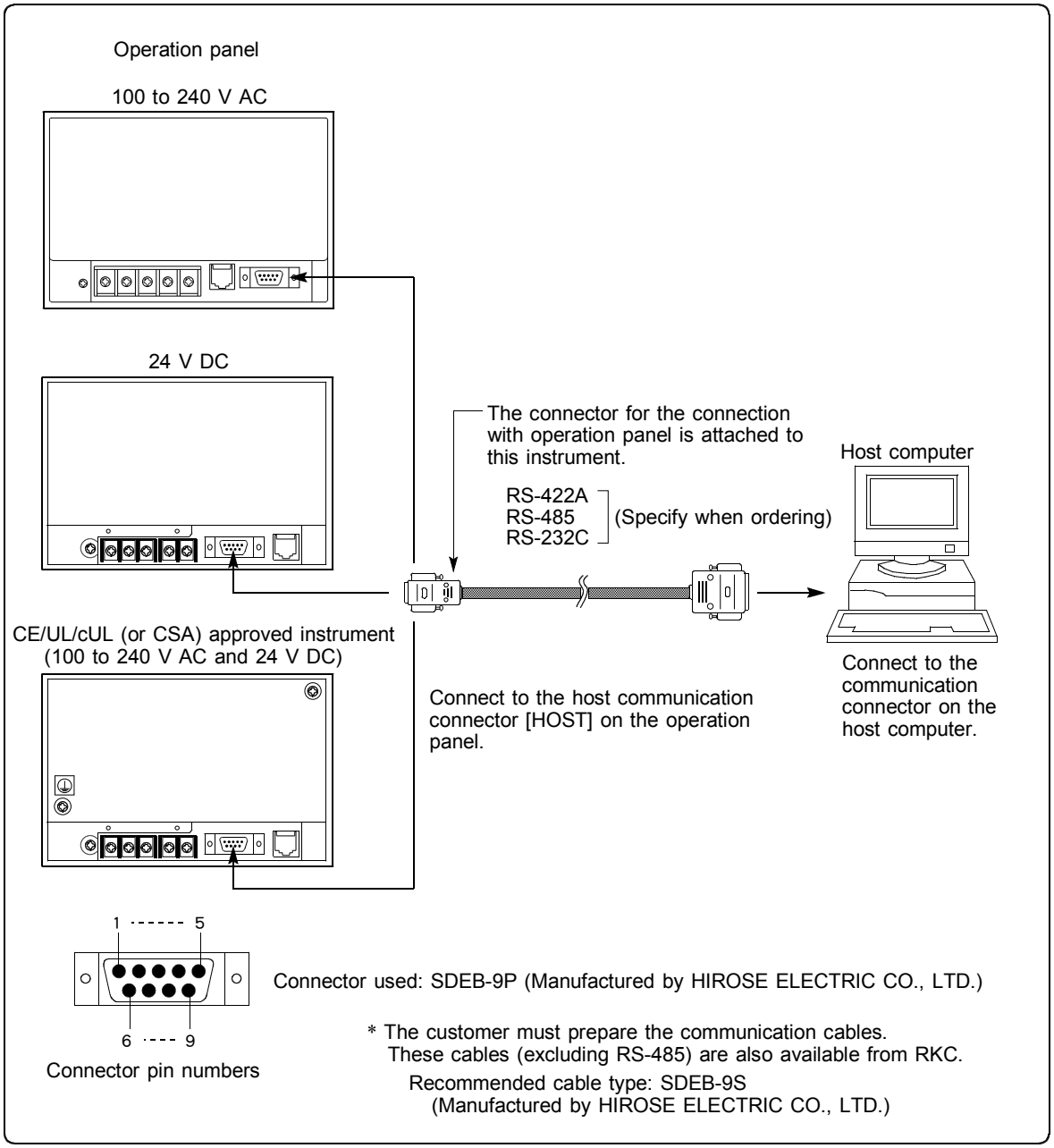
NOTE

For the CE/UL/cUL (or CSA) approved instrument, install the ferrite cores attached to the operation panel to both ends of the cable.

● Pin No. and signal details

Pin No.	Signal Name	Description
1	R(A)	RS-422A Receive data
2	R(B)	RS-422A Receive data
3	SG	Signal ground
4	T(B)	RS-422A Send data
5	T(A)	RS-422A Send data
6	FG	Frame ground

2.5.2 Connector with the host computer (Option)

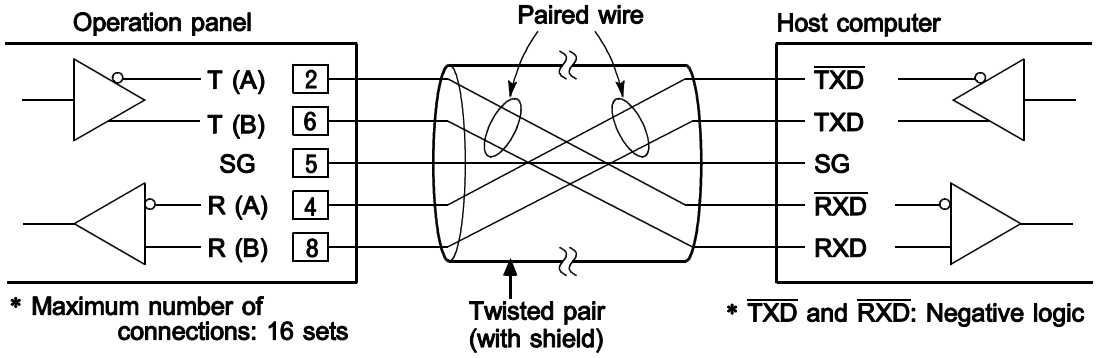


RS-422A

● Pin No. and signal details

Pin No.	Signal name	Description	Signal direction Operation panel Host computer
2	T(A)	Send data	→
6	T(B)	Send data	→
5	SG	Signal ground	—
4	R(A)	Receive data	←
8	R(B)	Receive data	←

● Contents of communication cable wiring

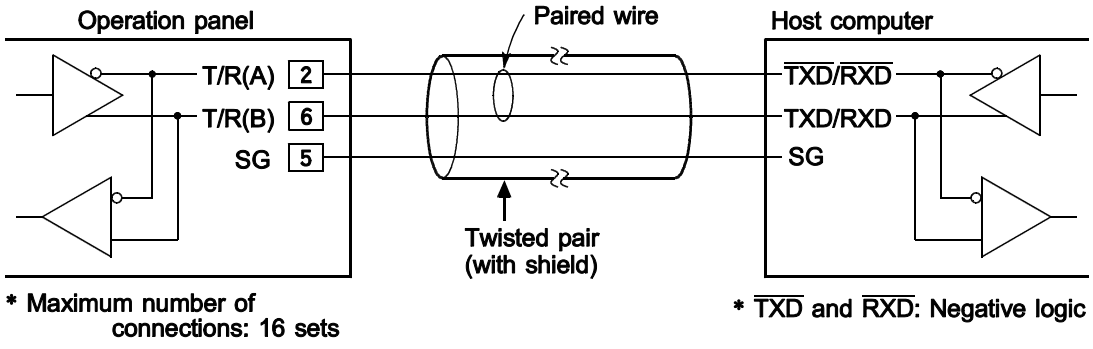


RS-485

● Pin No. and signal details

Pin No.	Signal name	Description	Signal direction Operation panel Host computer
2	T/R (A)	Send and receive data	↔
6	T/R (B)	Send and receive data	↔
8	SG	Signal ground	—

● Contents of communication cable wiring

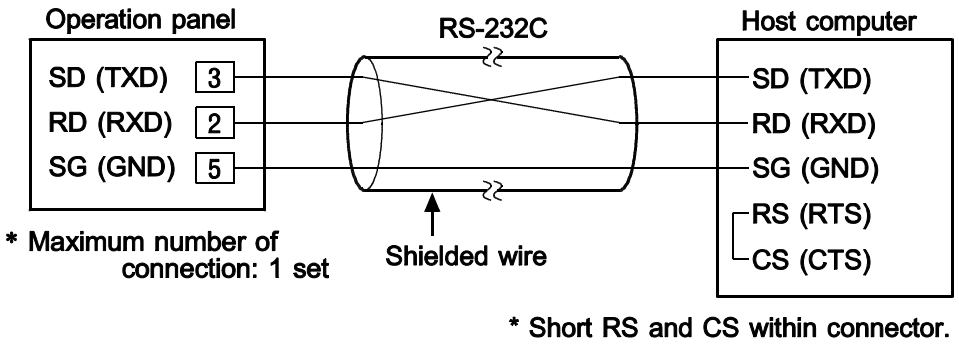


RS-232C

● Pin No. and signal details

Pin No.	Signal name	Description	Signal direction Operation panel Host computer
3	SD (TXD)	Send data	→
2	RD (RXD)	Receive data	←
5	SG (GND)	Signal ground	—

● Contents of communication cable wiring



OPERATIONS

3

3.1 Preparations before operation

Before carrying out the operation, re−check each of the items that have been explained so far according to the procedure given below in order to allow the operation to be carried out in safety.

1. **Confirm that the settings are the environment of Chapter 2, Section 2.1.**

   Refer to Chapter 2 : "2.1 Cautions for mounting" (P. 2-2).

2. **Confirm that the power supply voltage is appropriate to the instrument specifications.**

   Use 100 to 240 V AC or 24V DC.

3. **Confirm that there is no abnormality in the wiring components.**

   Refer to Chapter 2 : "MOUNTING AND WIRING" (P. 2-1).

4. **Confirm that the control unit initialize settings have been set properly.**

   Refer to the separate Installation Manual (IMSRM01-E□), or else see Chapter 3 : "3.2 Initialize settings prior to operation" (P. 3-3).

5. **Turn on the power and begin the operation.**

   Refer to Chapter 3 : "3.3 When power−on for the first time" (P. 3-5), or else see Chapter 4 : "OPERATING PROCEDURE" (P. 4-1).

When an error is suspected, refer to Chapter 5 : "MEASURES TAKEN WHEN AN ERROR OCCURRENCE" (P. 5-1) in this manual.

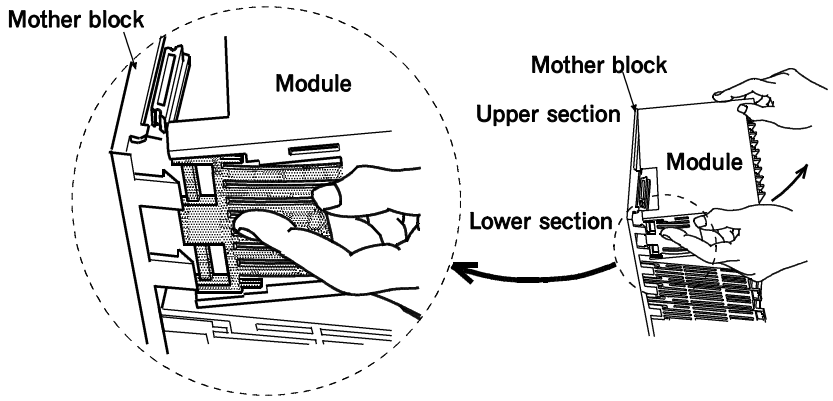
3.2 Initialize settings prior to operation

Always make the same communication settings on the control unit and operation panel.
If the control unit and operation panel are purchased as a set, they are set to the same settings.

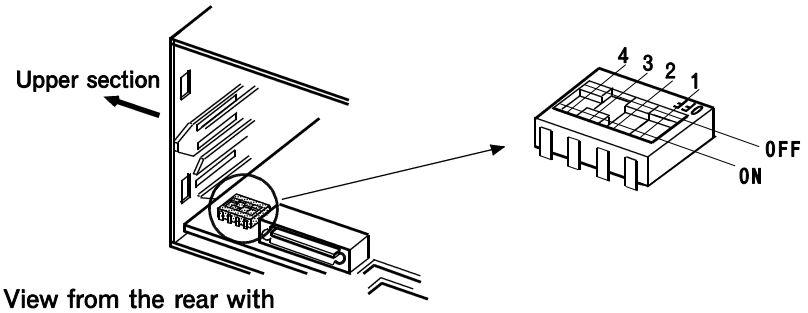
(1) Settings for communications with control unit

<Setting procedure>

① If the section marked with ▭ (removal lever) is lifted centering around the upper module engagement while pressing the above section, the module is separated from the mother block.



② Set the desired data configuration and communication speed by the dip switches located in the PCP module. (factory set value: 8−bit non−parity, 9600 bps)



1	2	Data configuration
OFF	OFF	8-bit non-parity
OFF	ON	7-bit even parity
ON	OFF	7-bit odd parity
ON	ON	(Do not set this one)

3	4	Communication speeds
OFF	OFF	2400 bps
OFF	ON	4800 bps
ON	OFF	9600 bps
ON	ON	19200 bps*

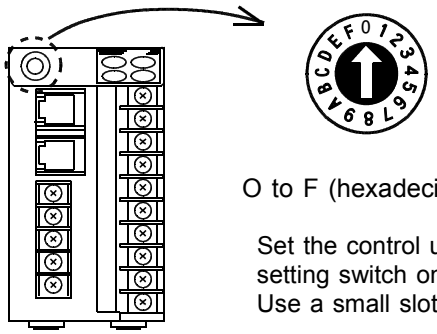
* As this speed does not correspond to OPL, do not set this speed.

③ After the above settings are finished, firmly engage the PCP module with the engagement at the top of the mother block, then with the lower section of the mother block centering around the upper engagement until a click sound is produced by following the reverse order of disassembly.

(2) Unit address setting

CAUTION

Set the unit address such that it is different to the other addresses on the same line. Otherwise, problems or malfunction may result.



PCP module

O to F (hexadecimal) : Addresses 0 to 15

Set the control unit address number by the unit address setting switch on the PCP module.
Use a small slotted screwdriver to make the settings.

NOTE

This operation panel can correspond up to 16 control units.（Unit address setting : 0 to F）

(3) Settings for communications with host computer

These settings are made on the screen of the operation panel.
For details on the settings see the supplementary manual for OPL initialize "Host communication initialize settings."

3.3 When power-on for the first time

(1) Cheking before power-on

Prior to power−on, check that :

- Ensure before power-on that the operating location corresponds to the caution items outlined in Chapter 2 : MOUNTING AND WIRING, and check that there are no abnormalities in the wiring or connections.
- There are no incorrect wiring and connections.

(2) Confirmation at power-on

When the power is turned on, simultaneously start the control unit and operation panel, or start the operation panel after the power to the control unit is turned on.

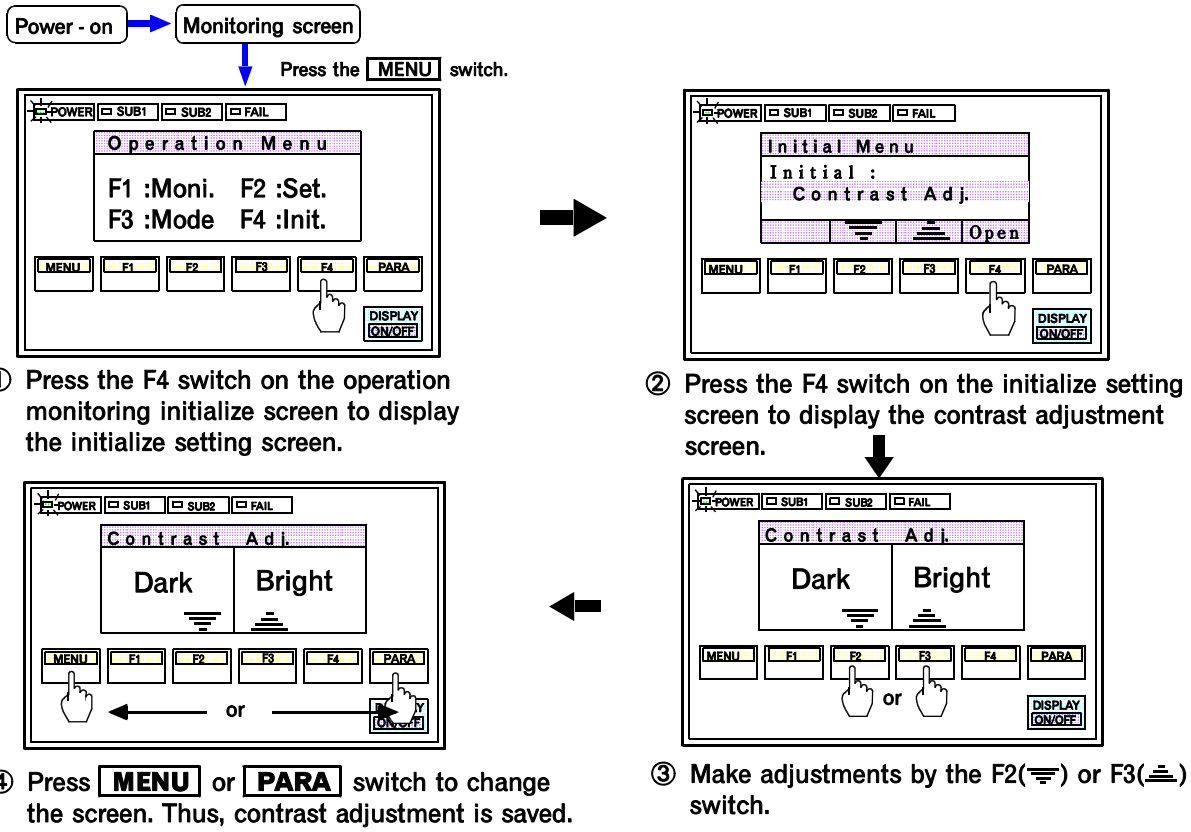
(3) Confirmation after power-on

- After changing the control unit module configuration, confirm that the control unit has been initialezed.
  (See the supplementary manual for "Controller initialize.")
- When the control unit are used under multidrop connection, confirm that the control units existing after power-on are set to "Unused."
  (See the supplementary manual for "OPL initialize.")

(4) Contrast adjustment

In addition to the special characteristics of the LCD, the screen display may be difficult to see according to the position that the operation panel screen is viewed from and the surrounding brightness.
In this situation, an adjustment of the display contrast should be carried out to adjust the screen to the brightness that allows the easiest confirmation of the display.

<Adjustment procedure>



① Press the F4 switch on the operation monitoring initialize screen to display the initialize setting screen.

② Press the F4 switch on the initialize setting screen to display the contrast adjustment screen.

③ Make adjustments by the F2(▽) or F3(△) switch.

④ Press **MENU** or **PARA** switch to change the screen. Thus, contrast adjustment is saved.

*The contrast adjustment settings will remain memorized even when the power is turned off.

OPERATING PROCEDURE

4

4.1 Prior to starting screen operation

Observe the following when operating the screen.

- Do not strike or scratch the surface of the panel (display unit) with a sharp object such as a ball−point pen or screwdriver. Since this may scratch or damage the panel.
- Avoid indelibly staining the panel (display unit), or the display may become unclear or be damaged.
- In order to prevent scratches and damage, do not press the keys with anything other than fingers.
- Press the keys lightly to avoid damaging them.
- Do not spray insecticide or clean the operation panel with a volatile organic solvent (thinner or benzene), chemicals or chemical dustcloth to avoid damaging or discoloring the panel.

  If the operation panel is dirty, clean it using a clean cloth dampened with neutral detergent and then completely wrung out.

(Cleaning with a volatile organic solvent will become a cause of switch breakdowns and screen clouding, etc.)

4.2 Screen configuration

Screen configuration

① Operation monitoring screen

Displays the various measured values (PV, operation output values, alarm conditions, etc.)

→ Refer to "4.4.2 Operation monitoring screen" (P. 4-6).

② Setting screen

Carries out setting of the various set values of the control unit (SV, alarm set values, PID constants, etc.)

→ Refer to "4.4.3 Setting screen" (P. 4-13).

③ Operation mode screen

Carries out switching of the operation conditions such as executing the autotuning or control Run / Stop, etc.

→ Refer to "4.4.4 Operation mode screen" (P. 4-24).

④ Initialize settings screen

Carries out changing of the initialize set values of the control unit and operation panel (Communication settings, screen scanning setting, Unit/CH name setting, screen contrast adjustment, etc.)

→ Refer to "4.4.5 Initialize settings screen" (P. 4-39).

⑤ Alarm message screen

On the occurrence of an alarm, the message is automatically displayed.

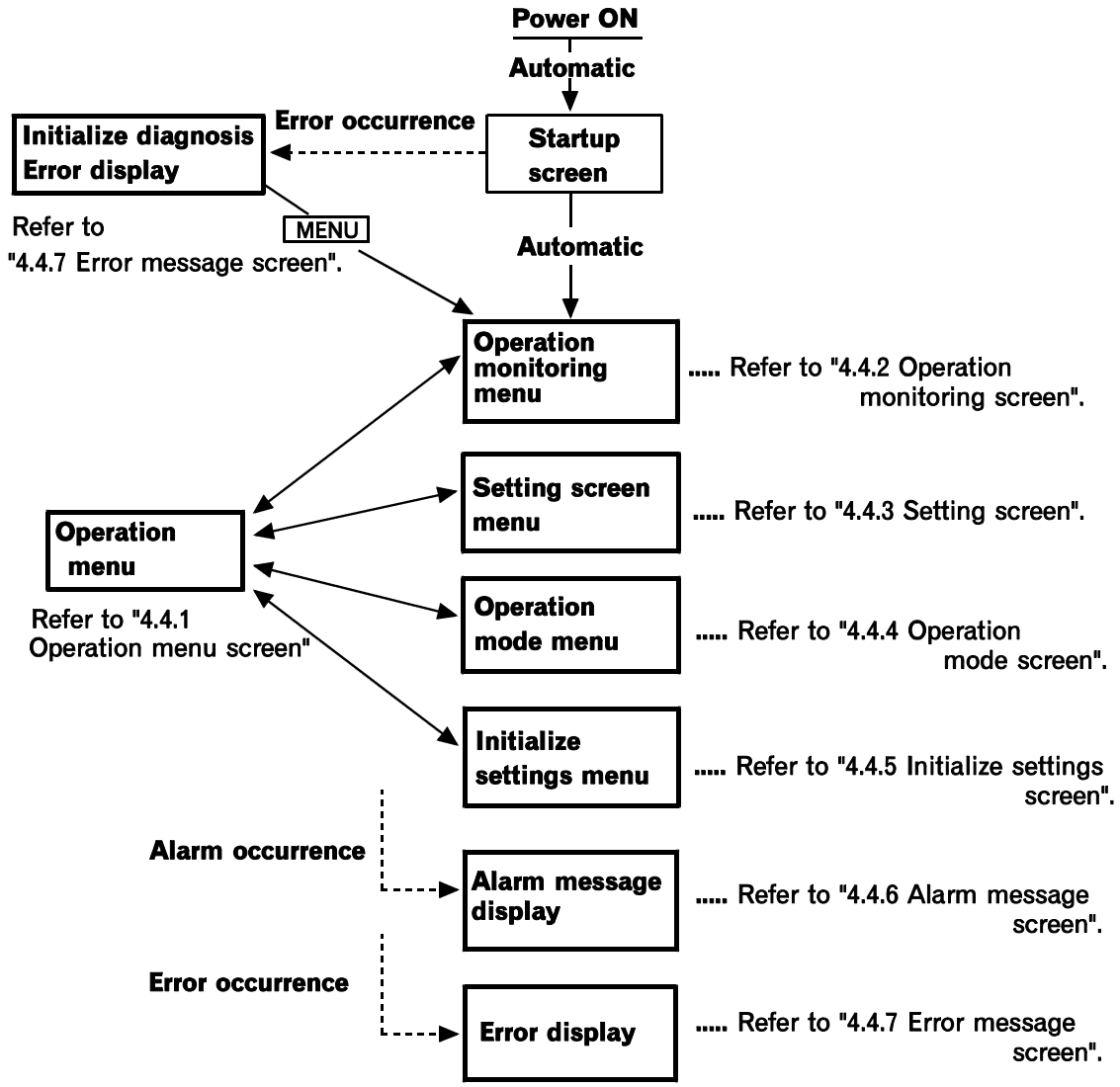
→ Refer to "4.4.6 Alarm message screen" (P. 4-56).

⑥ Error message screen

On the occurrence of an error, the message with the contents of the error is automatically displayed.

→ Refer to "4.4.7 Error message screen" (P. 4-58).

4.3 Screen flow diagram

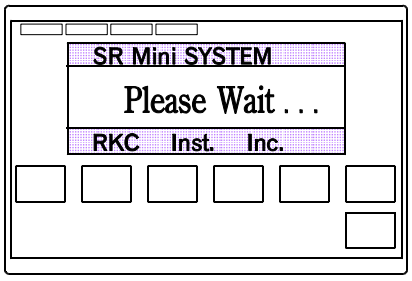


NOTES

- The startup screen is displayed only when the power is turned on.
- Screens releating to non−existent module functions are not displayed.

* Startup screen

While the startup screen is being displayed, the control unit configuration and hardware errors are checked on the operation panel. If there is any error, the error message screen is displayed.



Startup screen

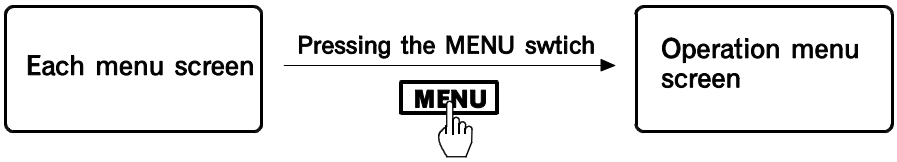
4.4 Explanation of each screen

4.4.1 Operation menu screen

The operation menu screen allows the selection of each of the "Operation monitoring," "Setting," "Operation mode" and "Initialize setting" screens.

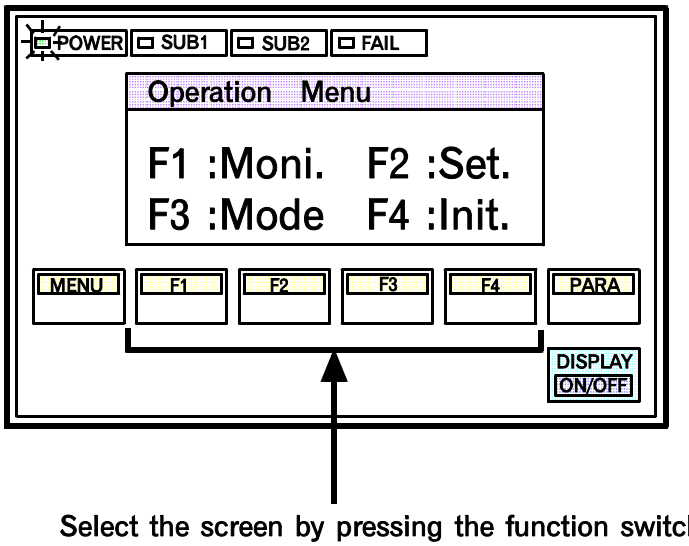
■ Method of calling up the operation menu screen.

Press the MENU switch to select the Operation menu screen from each screen.



■ Method of calling up each screen

Select the desired screen from among the 4 screen items appearing on the Operation menu screen by pressing the relevant function switch.



Select the screen by pressing the function switch.

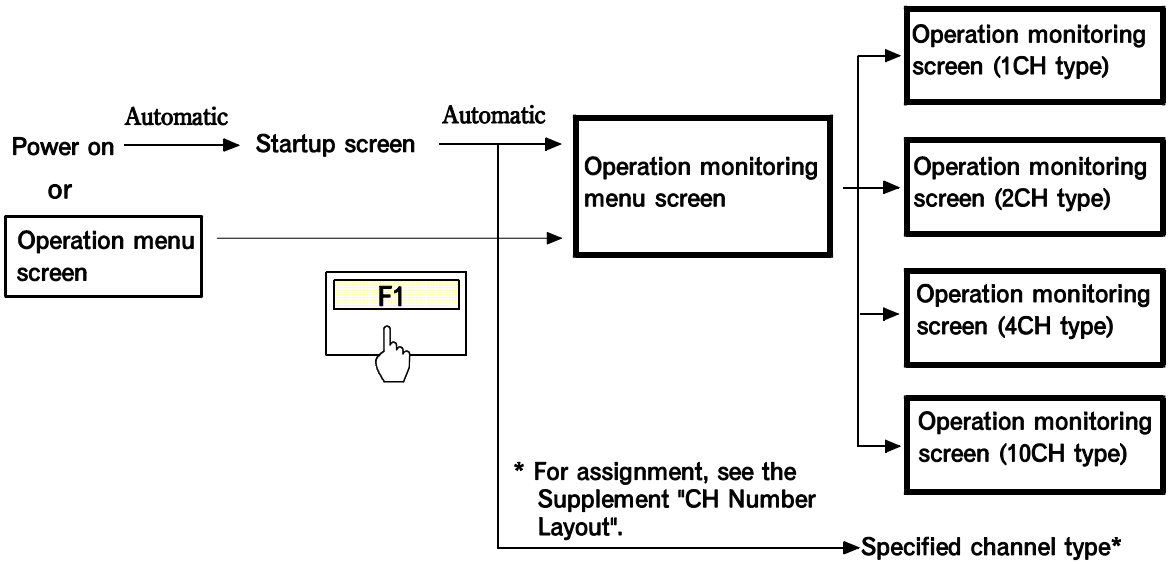
F1 switch: Pressing this switch selects the "Operation monitoring menu" screen.
F2 switch: Pressing this switch selects the "Setting menu" screen.
F3 switch: Pressing this switch selects the "Operation mode menu" screen.
F4 switch: Pressing this switch selects the "Initialize menu" screen.

* For the contents and operation methods of the each screen, see description of 4.4.2 and afterwards.

4.4.2 Operation monitoring screen

The Operation monitoring screen monitors (Confirms by displaying) the set values, measured values, control output values, alarm output conditions, etc. in units of 1, 2, 4 or 10 channels.

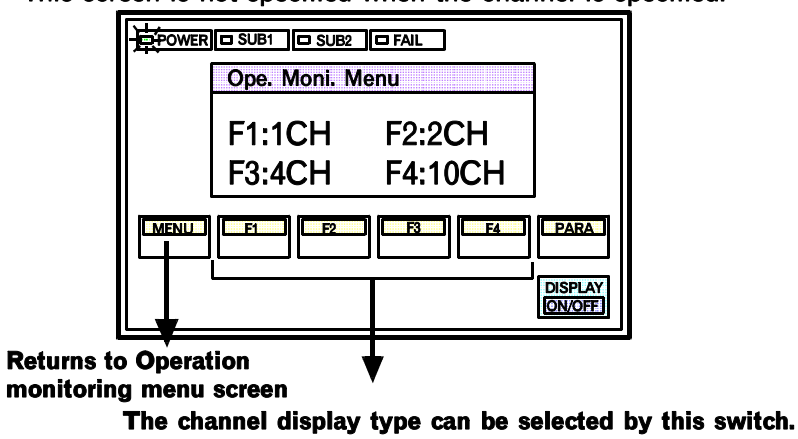
■ Calling procedure



■ Display details

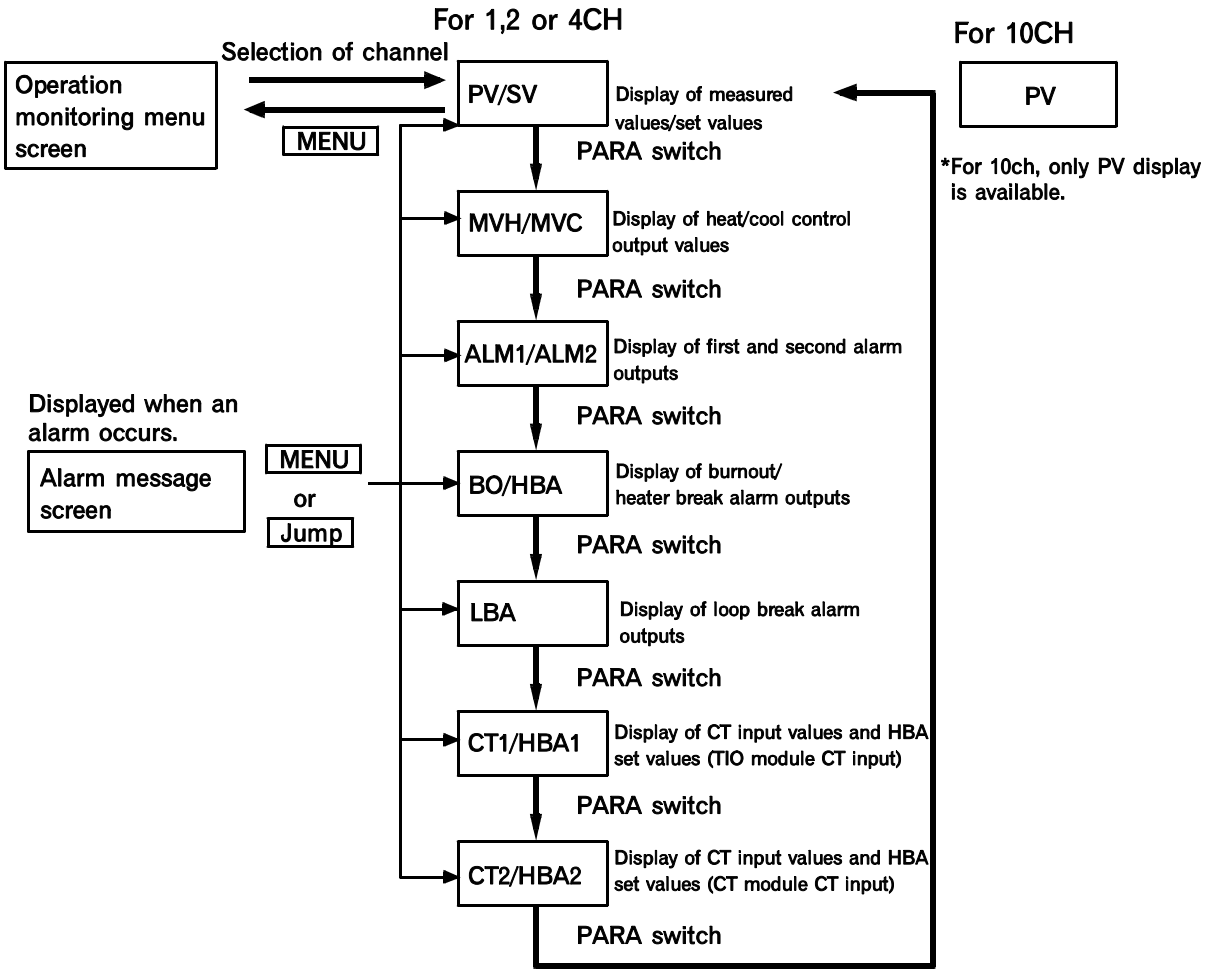
Operation monitoring menu screen

* This screen is not specified when the channel is specified.



- Selecting a necessary screen by pressing the function switch on Operation monitoring menu screen.
- After changing to each of the screens, the pressing of the **MENU** switch at the bottom of the screen returns the screen again to the Operation monitoring menu screen.

[Monitoring screen configuration]

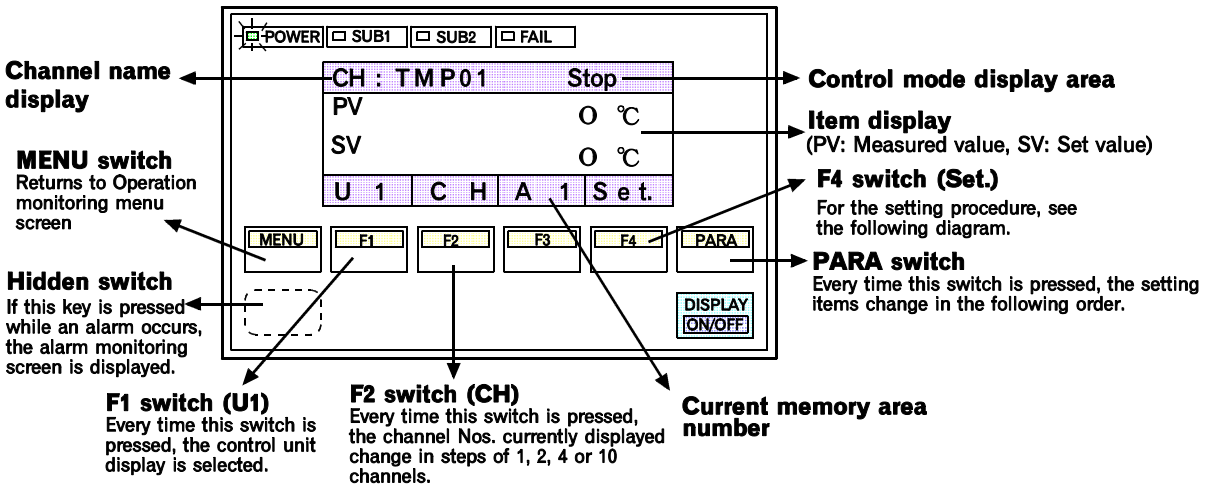


* If an alarm occurs while 1, 2 or 4CH is being monitored, open the screen to display the current alarm by pressing the hidden switch once.

The screen display for each variable can be selected by OPL initialize "Disp. Lock Level." For the setting procedure, see the Supplementary manual "OPL initialize."

Operation monitoring screen

1 - channel display type



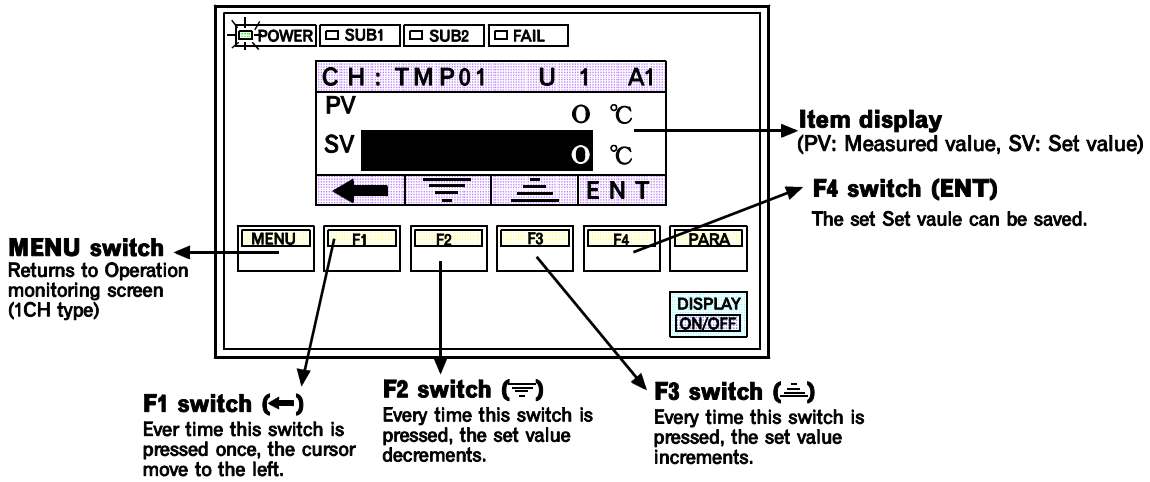
<Status display unit>

Each status is displayed only the operation monitoring 1CH display type. For display details, see the table at the right.

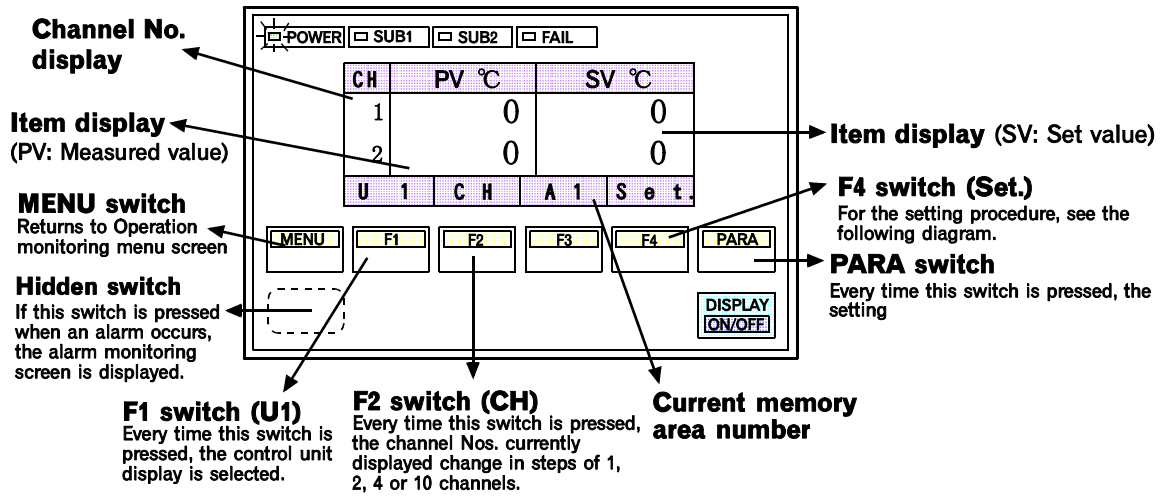
Display	Display contents	Display condition
BO	Burnout	Displayed when an alarm occurs in any in - use channels of all units.
HBA	Heater break alarm	
ALM1	First alarm	
ALM2	Second alarm	
LBA	Loop break alarm	
T.R.C.	Completion of temperature rise	Displayed when all units have completed their temperature rise.
Comp.	Computer mode	Displayed in computer mode.
Stop	Control Run/Stop	Displayed when any unit stops during monitoring.
AT	Autotuning	Displayed when any channel is being autotuned during monitoring.

Higher ↑ Displayed priority order ↓ Lower

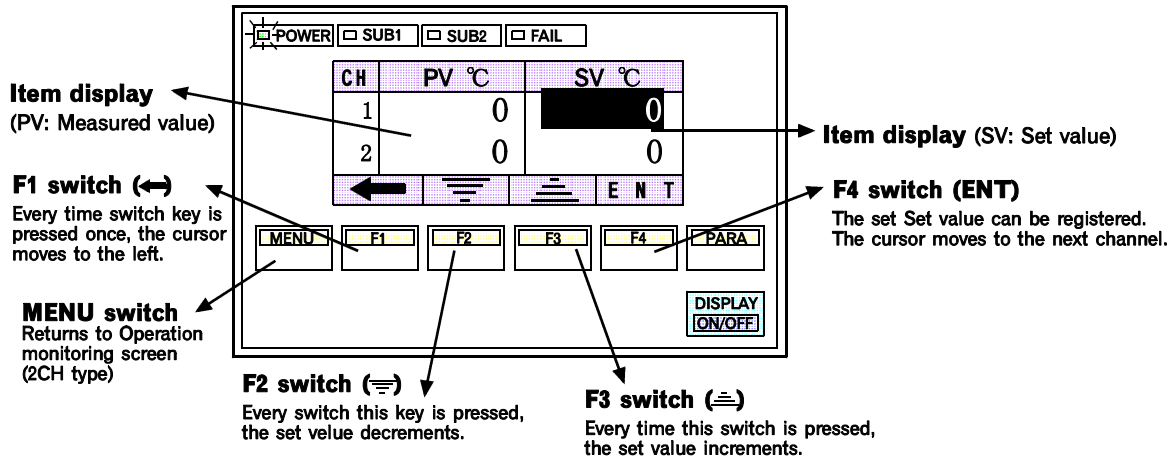
SV changing procedure



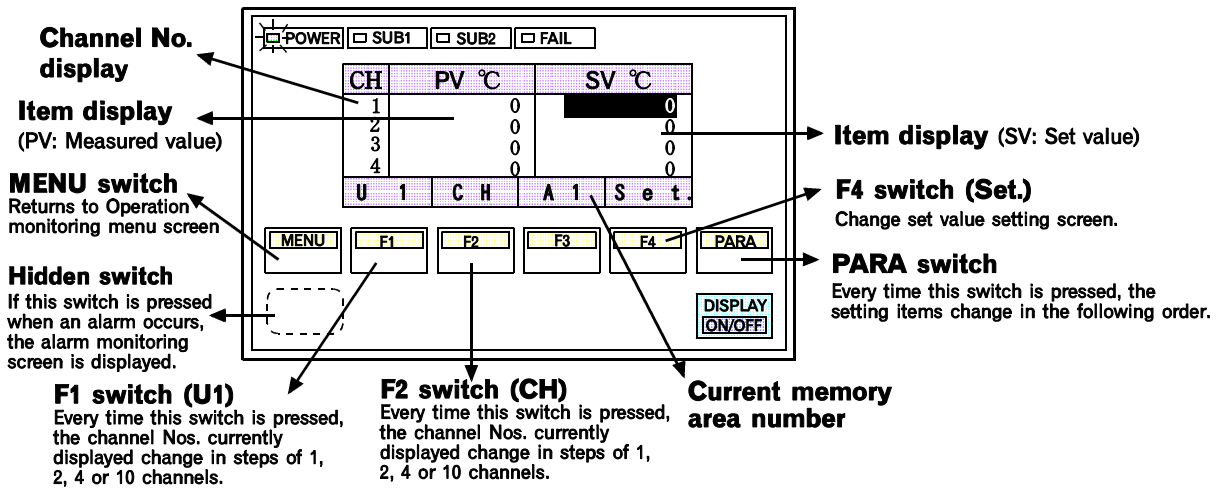
2 - channel display type



SV changing procedure

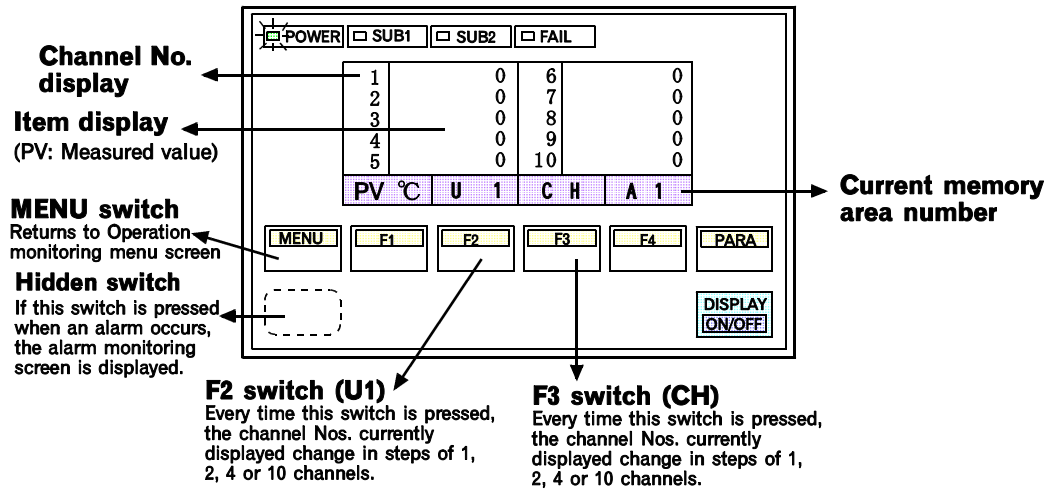


4 - channel display type



* For the 4 - channel SV changisng procedure, see the 2 - channel SV changing procedure.

10 - channel display type

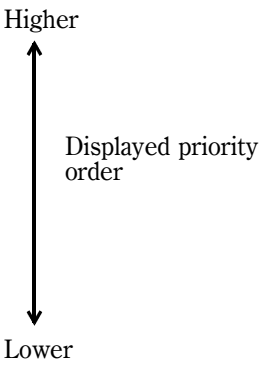


* For 10 - channel, only PV display is available.

NOTES

- Only set values can be set on the operation monitoring screen.
- If the number of control units used is 1, the control unit No. select switch is invalid.
- If there is no channel to be selected, the channel No. select switch becomes invalid.
- Channels which are not in use are displayed as "－－－－－－." (Except the display of channel Nos.)
- The operation monitoring screen is scanned only on the CH display screen selected from the operation monitoring menu screen. (A screen whose CH display differs is not scanned.)
- When the power is turned on again, the screen set by OPL initialize "CH Number Layout screen" is displayed. For this setting, see the Supplement, "OPL initialize."
- Even if there are two or more display resolutions (1 °C/°F and 0.1 °C/°F), the relevant data items are displayed on the operation monitoring screen.
  However, data items in temperature engineering units of °C/°F cannot be displayed on the above screen. In the operation panel, the temperature engineering unit is determined by the first TIO module in No.1 control unit.
- The message is displayed only on the operation monitoring screen. One of the following messages is displayed after the temperature rise is completed or when an alarm occurs.
  Pressing the F4 switch (Jump) when an alarm occurs changes the monitoring display to the alarm monitoring screen. Thus, the unit No. and channel No. where the alarm occurs can be confirmed.

No.	Item	Message
1	Burnout	BO is "ON"
2	Heater break alarm	HBA is "ON"
3	Alarm 1 (First alarm)	ALM 1 is "ON"
4	Alarm 2 (Second alarm)	ALM 2 is "ON"
5	Loop break alarm	LBA is "ON"
6	Completion of temperature rise	Temp. rise comp.



* The message of the burnout, heater break alarm, first alarm, second alarm or loop break alarm is displayed if the relevant alarm occurs in any of the using channels. If more than one type of alarm occurs simultaneously, the message corresponding to the above item with higher priority is displayed. For example, if the burnout and first alarms occur simultaneously, the burnout alarm message is displayed.

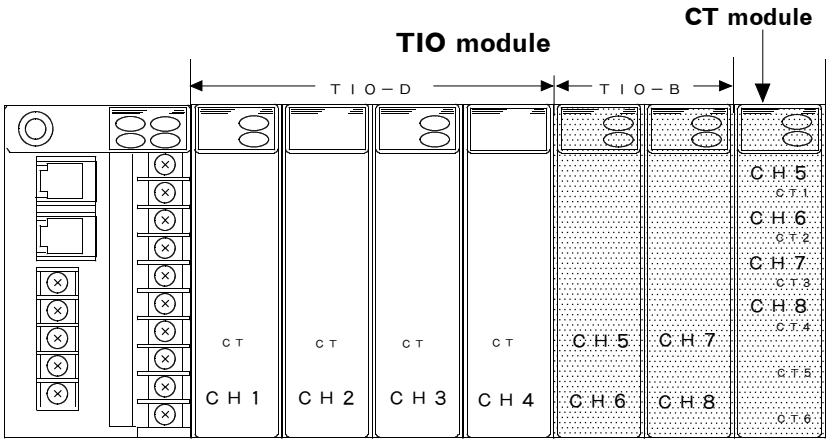
* The temperature rise completion message is displayed after the temperature rise is completed in all units.

* The details of alarm messages and alarm message screen display/no－display can be changed. For details on these changes, see "4.4.5 Initialize screen" (P. 4-39).

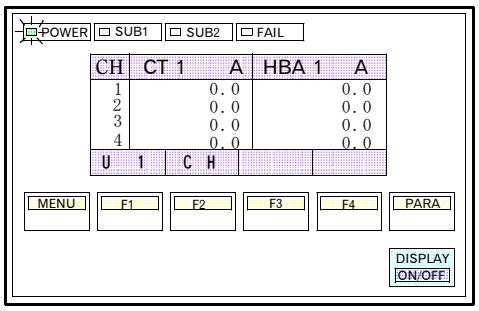
* CT1 and CT2, HBA1 and HBA2 screens

CT1 and HBA1 will show the input values of each of the TIO module CT inputs, and the HBA set values.
CT2 and HBA2 will show the input values of each of the CT module CT inputs, and the HBA set values.

(Example) For 4 channel display.

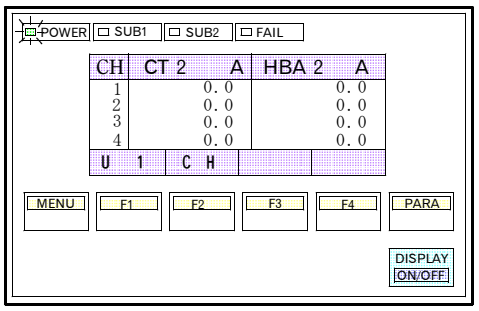


(CT1, HBA1 display)



*** The displayed channel numbers will be the channel numbers of the TIO module.**

(CT2, HBA2 display)



*** The displayed channel numbers will be the channel numbers of the CT module.**

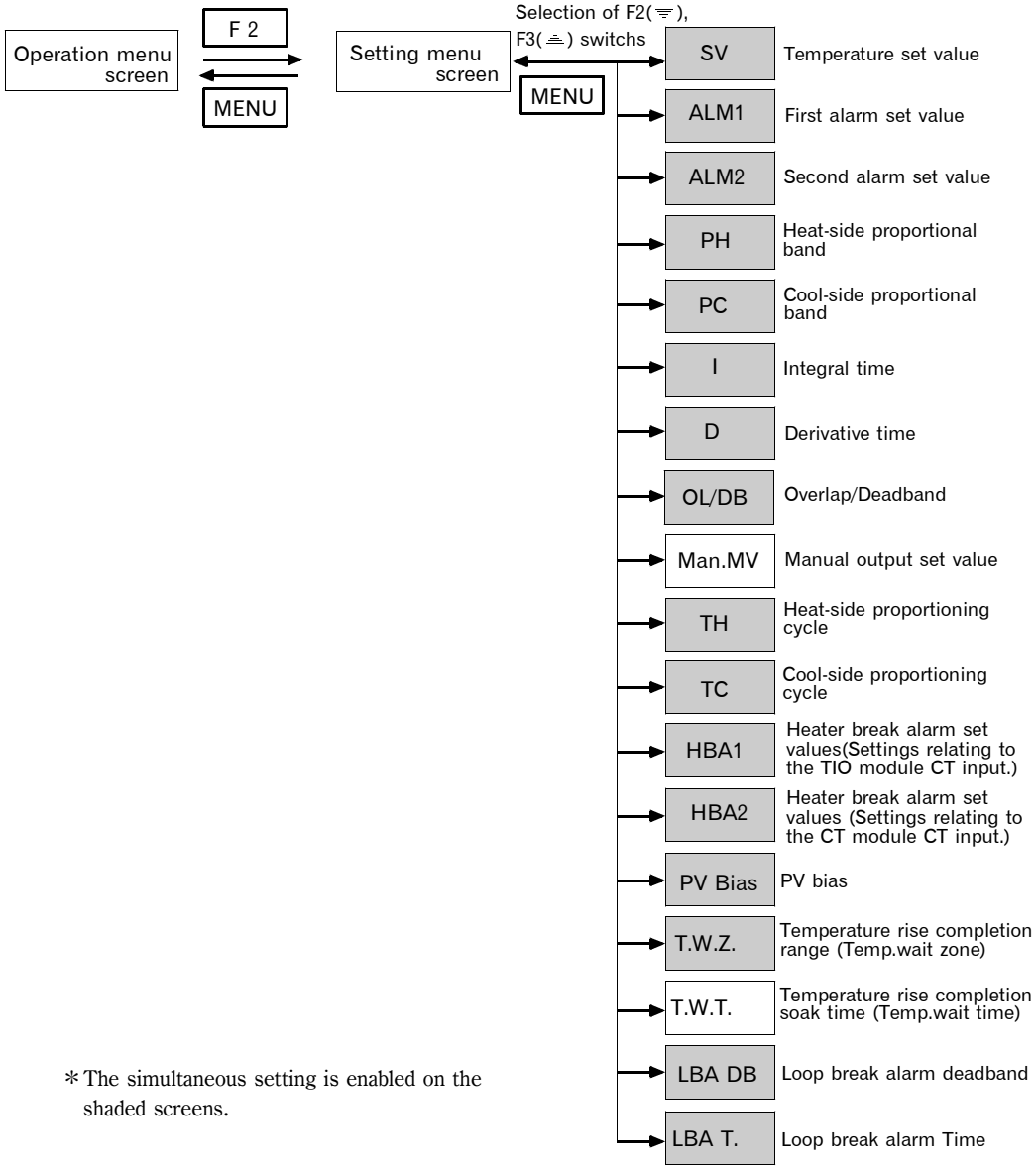
In addition each CT module channel No. corresponds to the related TIO module channel No.

- If there is no CT nor HBA in the connected module, the "CT1/HBA1" or "CT2/HBA2" screen is not displayed.

4.4.3 Setting screen

The setting screen is used to set the temperature set value, alarm set value and control related parameters. To call each setting screen, press the F2 switch on the operation menu screen to display the setting menu screen. The setting screen can be called up by pressing the relevant key on the setting menu screeen.
The screen display for each variable can be selected by OPL initialize "Disp. Lock Level." For the setting procedure, see the Supplementary manual "OPL initialize."

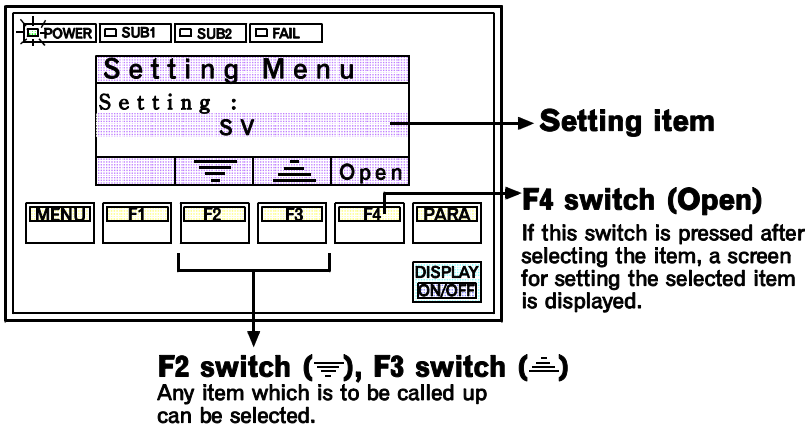
■ Calling procedure



* Every time the PARA switch is pressed once, each item changes.

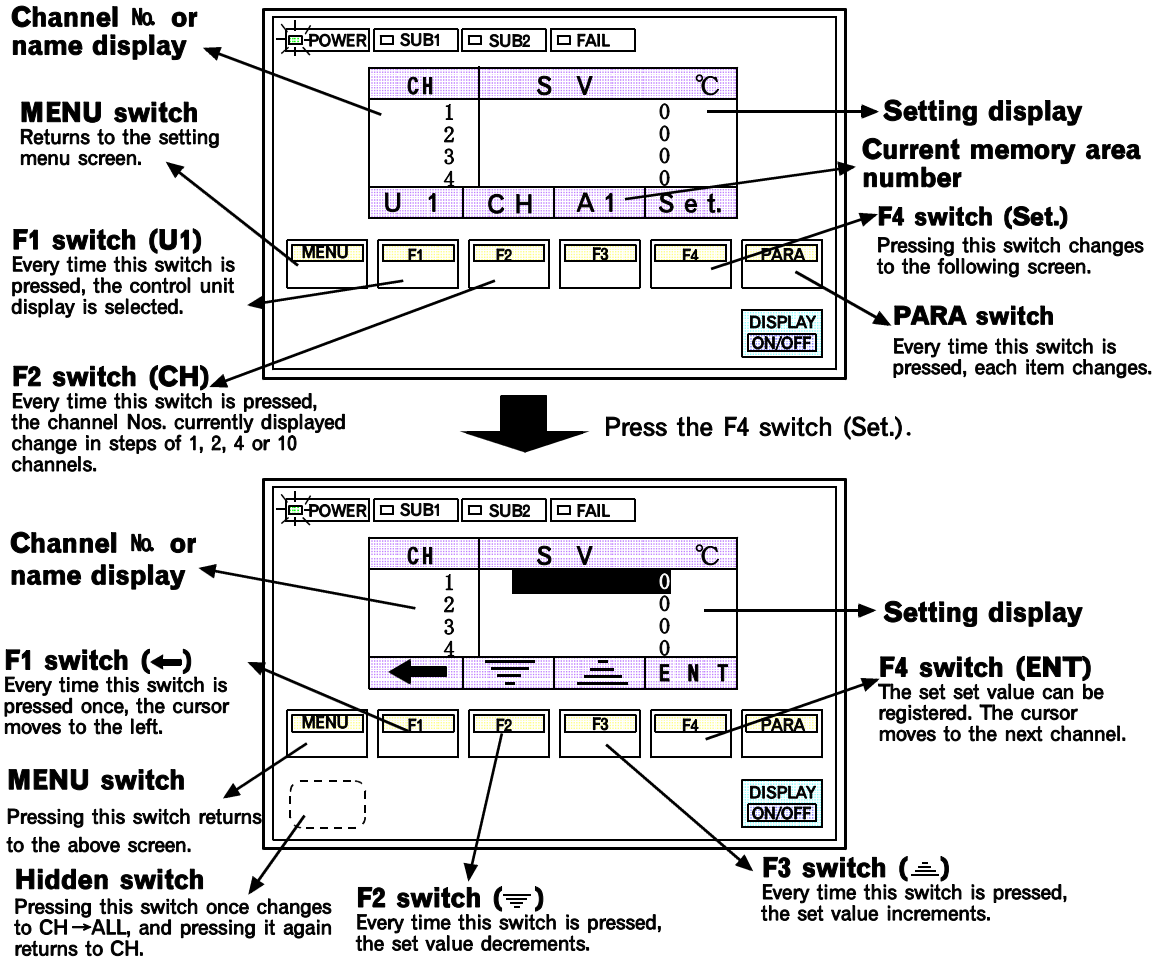
■ Display details

Setting menu screen



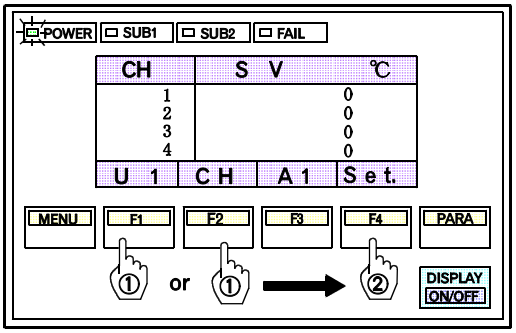
Each setting screen

Each setting screen is shown below.

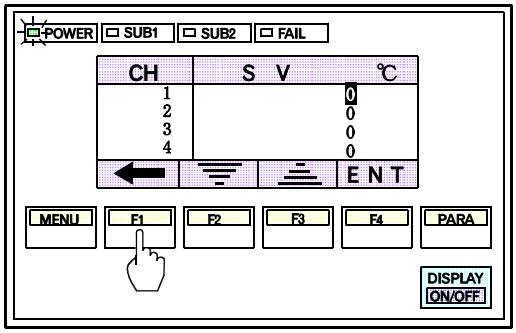


■ Setting procedure

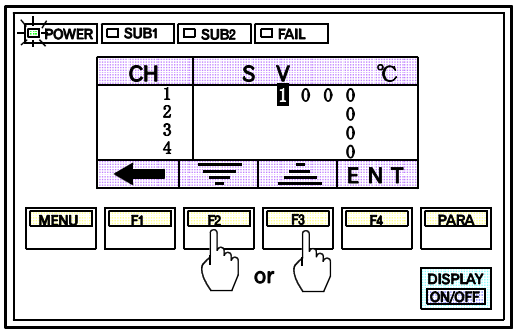
Method of changing the settings



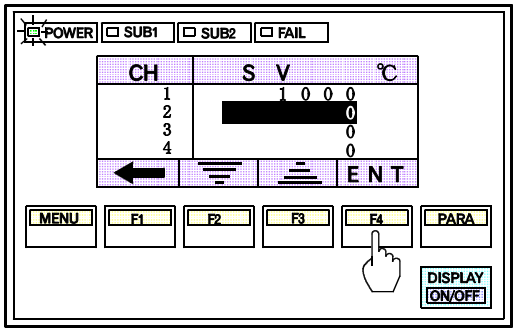
1. Call up any item whose setting is to be changed, select the desired unit by pressing the F1 switch(U1) and the desired channel by pressing the F2 switch(CH), then press the F4 switch(Set.).



2. First press the F1 switch(⬅) once to move the cursor to the 1st digit.



3. Next, move the cursor to digit to which the desired set value is to be set by pressing the F1 switch(⬅), then set the value by pressing the F2(▽) or F3(△) switch.



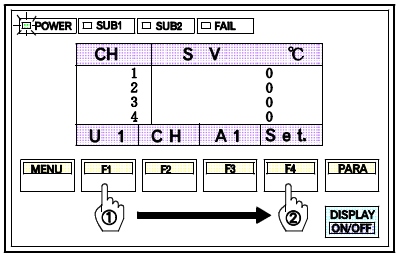
4. Press the F4 switch(ENT) after entering the set value to save it.
   Set value save completed→The cursor moves to the next channel automati - cally.
   Set value save rejected→The set value returns to the value before the save. (The cursor position remains unchanged.)

NOTES

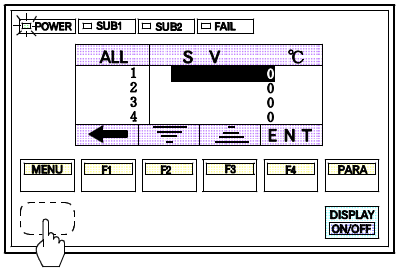
- Use set values conforming to the control unit specification.
- For the control unit with ON/OFF control action, manual output set value is invalid.
- When " Computer mode " is selected in computer/local selection, switches other than screen selection related switches cannot be operated on the setting screen.
- If an invalid numeric value is entered and then registered, it automatically returns to the previous numeric value and is inversely displayed.
  (Example: When trying to input a set value of 800 °C in the control unit with a range of 0 to 400 °C.)
- If the number of control units used is 1, the control unit No. select switch is invalid.
- If there is no channel to be selected, the channel No. select switch becomes invalid.

Simultaneous setting procedure (For each unit)

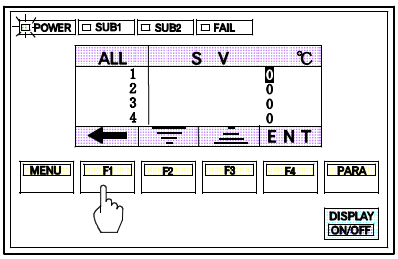
All of the same items on the selected control unit can be set to the same numeric value.



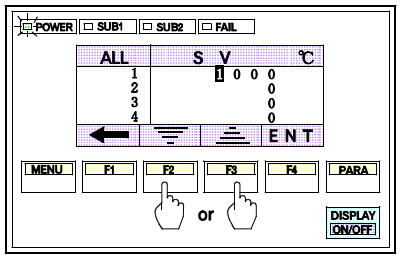
1. Call up the item whose setting need to be changed : select the units to be simultaneously set by pressing the F1 switch (U1) : then press the F4 switch (Set.) .



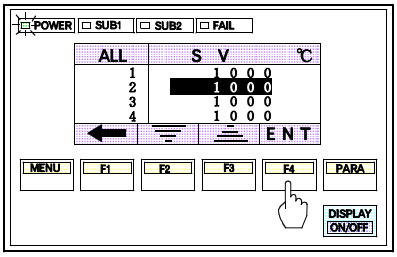
2. Pressing the hidden switch once changes the CH display at the top left to ALL.



3. In the same way as the normal setting procedure, press the F1 switch(⬅) once to move the cursor to the 1st digit.



4. Next, move the cursor to the digit to which the desired set value is to be set by pressing the F1 switch(⬅), then set the set value by pressing the F2(⩒) or F3(⩓) switch. (The example in the figure at the left is when the set value is set to 1000℃.)



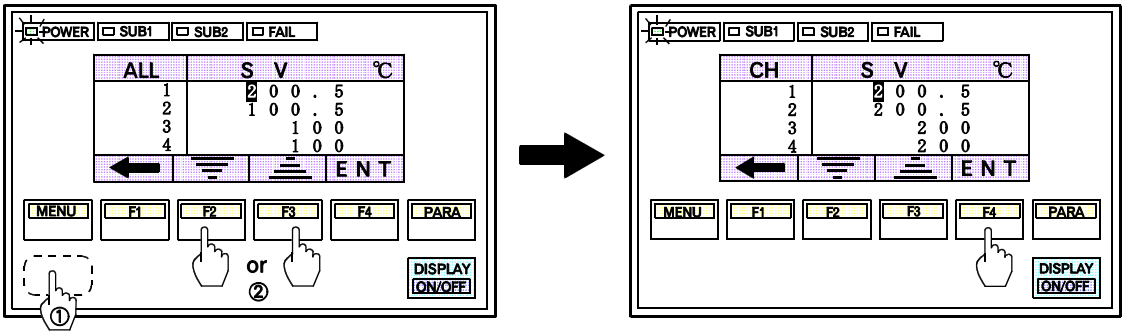
5. Press the F4 switch(ENT) after entering the set value to save it. As a result, the set values of all the channels in the unit selected in Step 1 become the same value.

Set value save completed→The cursor moves to the next channel automatically.
Set value save rejected→The set value returns to the value before the save. (The cursor position remains unchanged.)

NOTES

- Use set values conforming to the control unit specification.
- For the control unit with ON/OFF control action, manual output set value is invalid. Auto/Manual operation mode transfer is also invalid.
- When " Computer mode " is selected in computer/local selection, switches other than screen selection related switches cannot be operated on the setting screen.
- If an invalid numeric value is entered and then registered, it automatically returns to the previous numeric value and is inversely displayed.
  (Example: When trying to input a set value of 800 °C in the control unit with a range of 0 to 400 °C.)
- If the number of control units used is 1, the control unit No. select switch is invalid.
- If there is no channel to be selected, the channel No. select switch becomes invalid.
- The following setting items cannot be simultaneously set.
  - Manual output value
  - Temperture rise completion soak time (Temp. wait time)
- The simultaeous setting function is activated for each unit.
- To suspend simultaneous setting, press the hidden switch to change the display " form ALL to CH ."
- When set values with a decimal point are mixed with those without a decimal point, note that the result of simultaneous setting may become as shown in the following figure.

Example : Set values are set to 200.5℃.

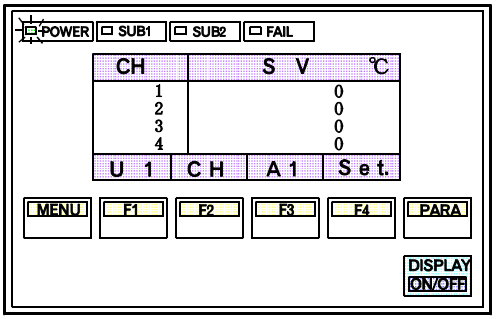


First change CH to ALL by pressing the hidden switch, then set the set value by pressing the F2(▽) or F3(△) switch.

If the set value is saved by pressing the F4 switch(ENT), for the set value without a decimal point, the figures after the decimal point is omitted.

■ Each setting screens

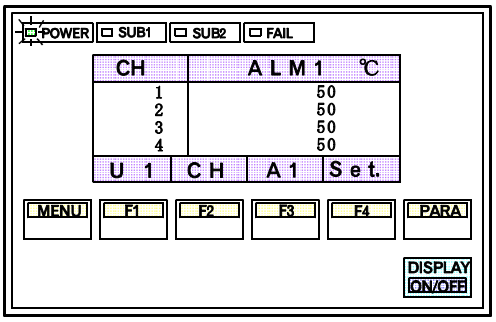
Set value setting screen



Setting range : Within input range

Setting prior to factory shipment : 0

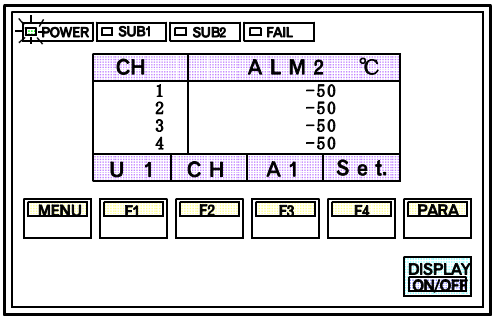
First alarm setting screen



Setting range : Within input range or span range

Setting prior to factory shipment :
Depends on specifications

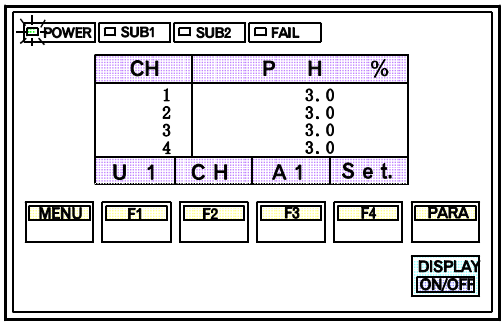
Second alarm setting screen



Setting range : Within input range or span range

Setting prior to factory shipment :
Depends on specifications

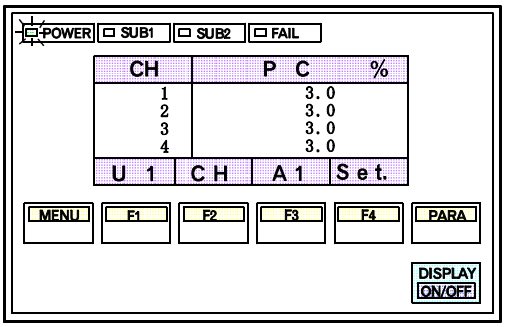
Heating Prop.Band setting screen



Setting range : 0.1 to 1000.0% of span

Setting prior to factory shipment : 3.0

Cooling Prop.Band setting screen

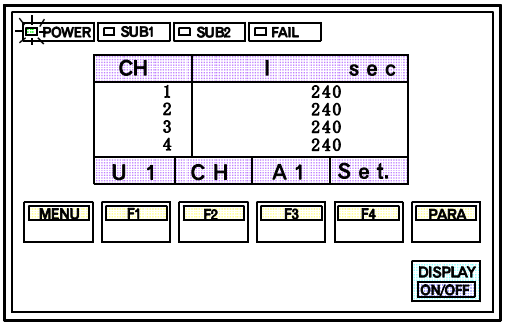


Setting range : 0.1 to 1000.0% of span

Setting prior to factory shipment : 3.0

*Setting will be invalid in ON/OFF action or heating action.

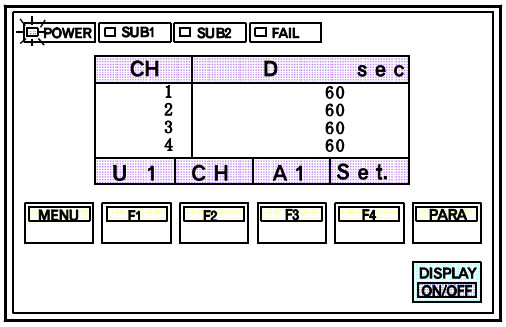
Integral time setting screen



Setting range : 1 to 3600 second

Setting prior to factory shipment : 240

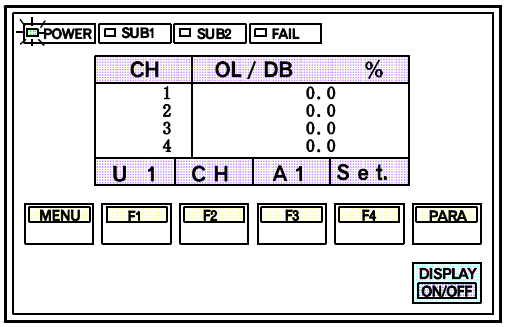
Derivative time setting screen



Setting range : 0 to 3600 second

Setting prior to factory shipment : 60

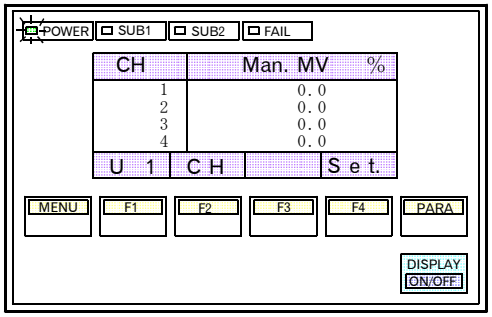
Overlap/Deadband setting screen



Setting range : −10.0 to +10.0% of span

Setting prior to factory shipment : 0.0

Manual output setting screen

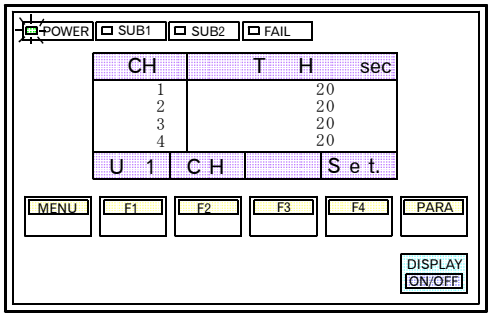


Setting range : −5.0 to +105.0 %

Setting prior to factory shipment : 0.0

*No simultaneous setting is available.

Heat-side prportioning cycle setting screen

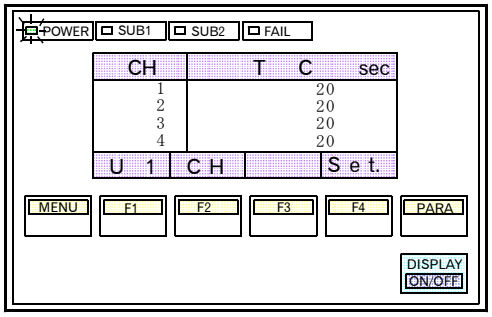


Setting range : 1 to 100 second

Setting prior to factory shipment :
Relay contact output 20
Voltage pulse output 2
Open collector output 2
Triac output 2
Continuous voltage/current output 0

*Setting will be invalid in ON/OFF action.

Cool−side prportioning cycle setting screen

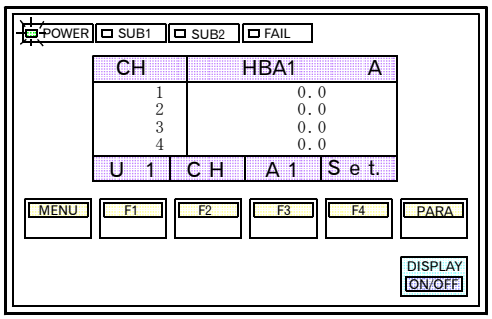


Setting range : 1 to 100 second

Setting prior to factory shipment :
Relay contact output 20
Voltage pulse output 2
Open collector output 2
Triac output 2
Continuous voltage/current output 0

*Setting will be invalid in ON/OFF action or heating action.

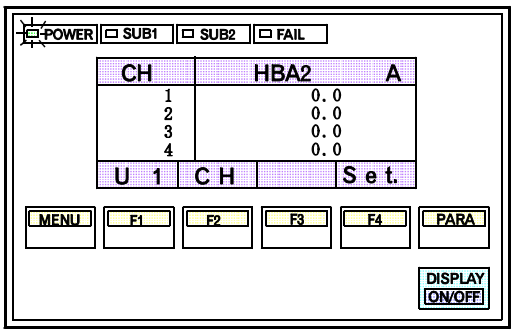
Heater Break Alarm 1 setting screen



Setting range : 0.0 to 100.0 A or 0.0 to 30.0 A
(Settings relating to the TIO module CT input.)

Setting prior to factory shipment : 0.0

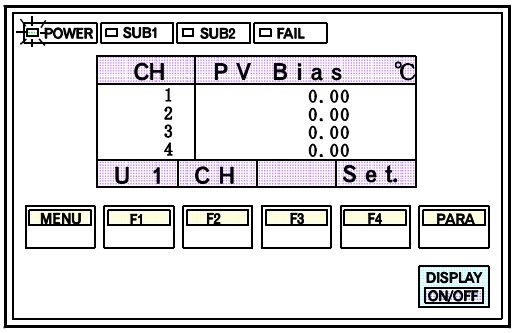
Heater Break Alarm 2 setting screen



Setting range : 0.0 to 100.0 A or 0.0 to 30.0 A
(Settings relating to the CT module CT input.)

Setting prior to factory shipment : 0.0

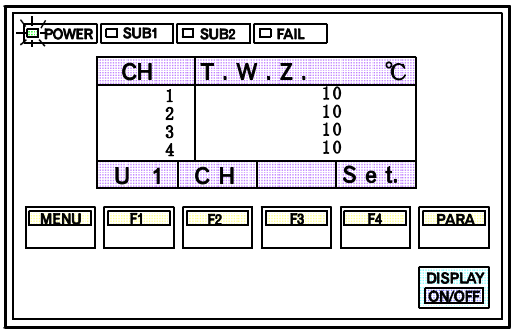
PV bias setting screen



Setting range : −5.00 to +5.00% of span

Setting prior to factory shipment : 0.00

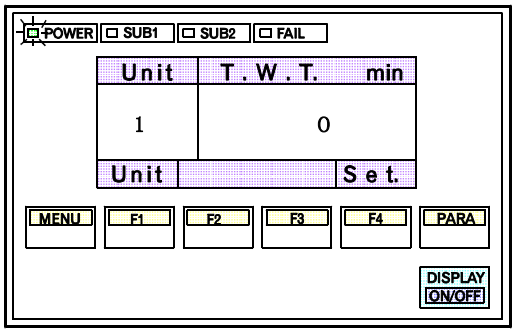
Temperature rise completion range setting screen



Setting range : 1 to 10℃(1 to 20.0˚F)

Setting prior to factory shipment : 10℃(20.0˚F)

Temperature rise completion soak time setting screen

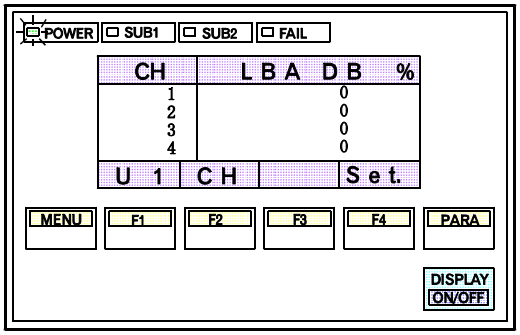


Setting range : 0 to 360 minute

Setting prior to factory shipment : 0

* No simultaneous setting is available.

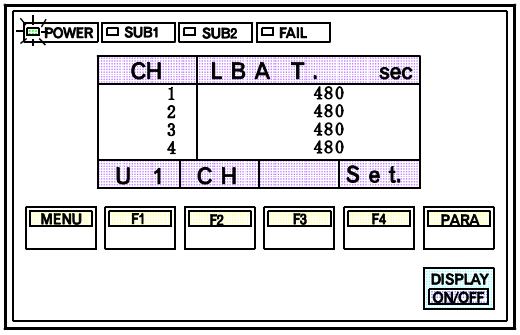
LBA Deadband setting screen



Setting range : Input span

Setting prior to factory shipment : 0

LBA Time setting screen



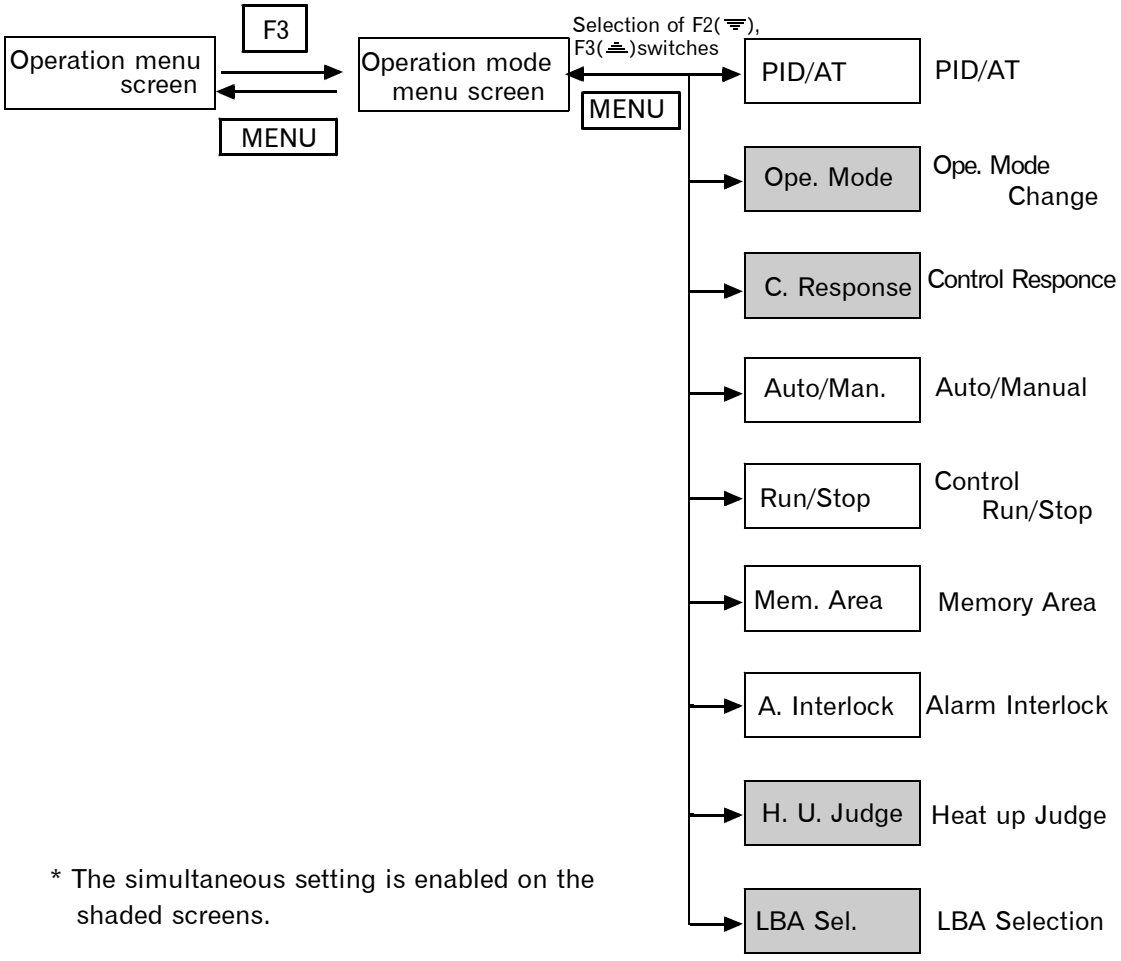
Setting range : 1 to 7200 second

Setting prior to factory shipment : 480

4.4.4 Operation mode screen

The Operation mode screen is used to select or specify the operation mode (condition). The screen display for each variable can be selected by OPL initialize "Disp. Lock Level." For the setting procedure, see the Supplementary manual "OPL initialize."

■ Calling procedure

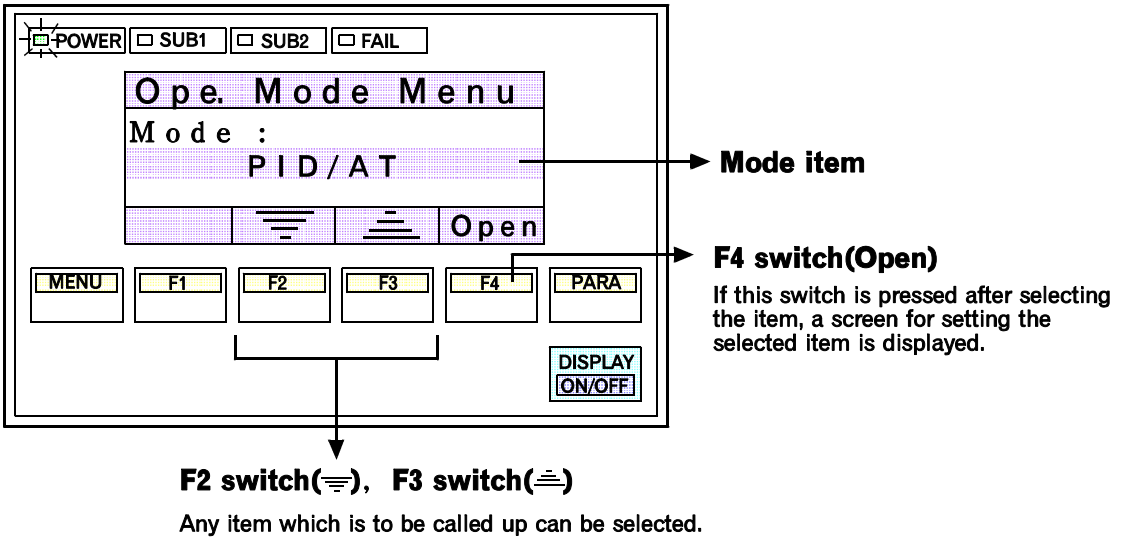


* The simultaneous setting is enabled on the shaded screens.

* Every time the PARA switch is pressed once, each item changes.

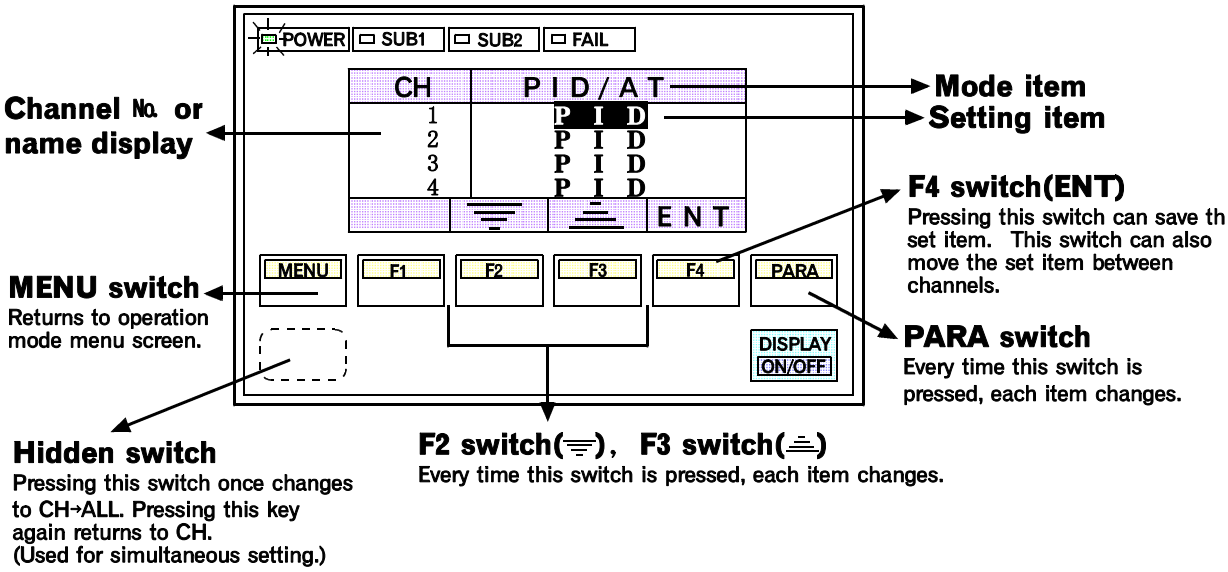
■ Display details

Operation mode menu screen



Each operation mode screen

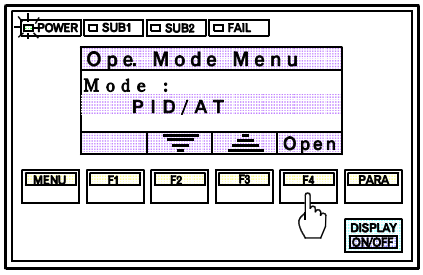
Each operation mode screen is shown below.



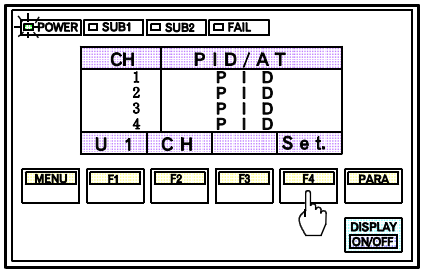
* For detail on the unit and channel setting procedures, see "4.4.3 Setting screen" (P. 4-13).

■ Setting procedure

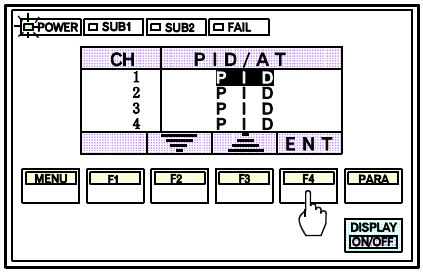
Method of changing the mode (Example: PID/AT screen)



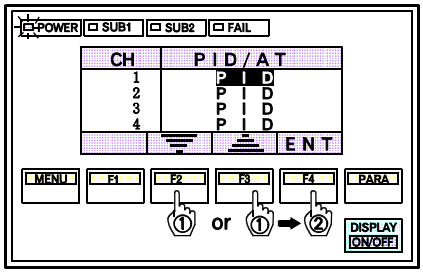
1. Select any time which is to be set, then press the F4 switch (Open).
   A screen to set the selected item is displayed.



2. Select the desired unit by pressing the F1 switch(U1), also select the desired channel by pressing the F2 switch(CH), then press the F4 switch(Set.) to display the setting change screen.



3. Press the F4 switch(ENT) to move the cursor to the channel line to be changed. Every time the F4 switch(ENT) is pressed once, the cursor moves.



4. Change the data by pressing the F2(▽) or F3(△) switch, then save it by pressing the F4(ENT) switch.
   After it is saved, press the MENU switch to return to the setting screen.

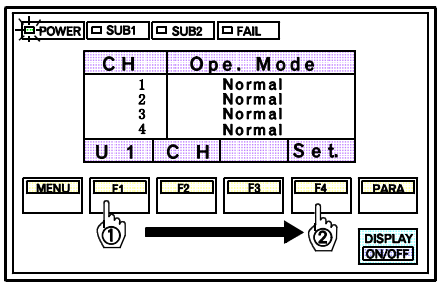
   * When "PID" is changed to "AT".
     After the autotuning(AT) function is activated, the mode display of each channel returns to "PID" automatically.

NOTES

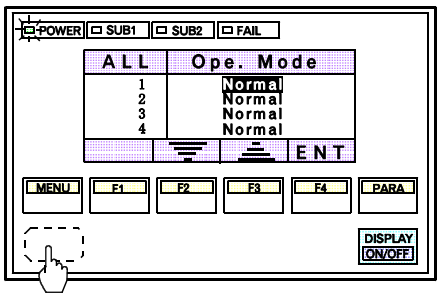
- For the control unit with ON/OFF control action, manual output set value is invalid. Auto/Manual operation mode transfer is also invalid.
- When " Computer mode " is selected in computer/local selection, switches other than screen selection related switches cannot be operated on the setting screen.
- If the number of control units used is 1, the control unit No. select switch is invalid.
- If there is no channel to be selected, the channel No. select switch becomes invalid.

Simultaneous setting procedures

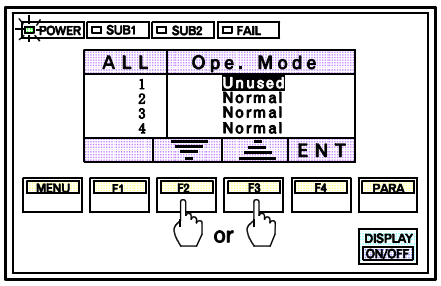
● **In Control Run/Stop mode**



1. Select any unit which is to be simultaneously set by pressing the F1 switch(U1), then press the F4 switch(Set.).



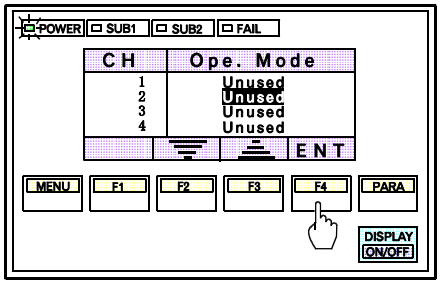
2. Pressing the hidden switch once changes the CH display at the top left to ALL.



3. Select the mode in which simultaneous setting is to be made by pressing the F2(▽) or F3(△) switch, then press the F4 switch(ENT). The selected mode is saved. As a result, all the channels of the selected unit are set to the mode thus set.

Save completed→The cursor moves to the next channel automatically.

Save suspended→The current display returns to the mode display before saving the mode.
(The cursor position remains unchanged.)



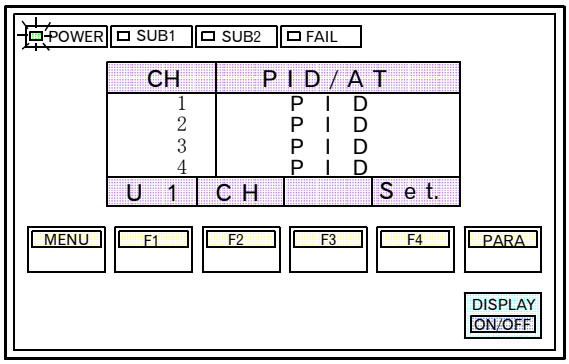
NOTES

- For the control unit with ON/OFF control action, manual output set value is invalid. Auto/Manual operation mode transfer is also invalid.
- When " Computer mode " is selected in computer/local selection, switches other than screen selection related switches cannot be operated on the setting screen.
- If the number of control units used is 1, the control unit No. select switch is invalid.
- If there is no channel to be selected, the channel No. select switch becomes invalid.
- The following setting items cannot be simultaneously set.
  - PID/AT transfer
  - Auto/Manual transfer
  - Alarm interlock release
  - Control Run/Stop
  - Memory area transfer
- To suspend simultaneous setting, press the hidden switch to change "ALL" to "CH."

■ Each operation mode screen

PID/AT screen

This screen is used in executing AT (Autotuning) from PID (PID control) or in stopping AT and changing to PID.



Setting : PID control
Autotuning (AT)

Setting prior to factory shipment : PID control

* If the autotunig function is activated "AT" is displayed in the status display section of the operation monitoring screen (1CH display).

<The conditions of autotuning >

Autotuning (AT) is the function which automatically measures, calculates and sets the optimum PID constants according to the set temperature. Following are the conditions necessary to carry out autotuning and the conditions which will cause the autotuning to stop.

Conditions necessary for autotuning:

The autotuning should be executed after satisfying all of the following conditions:

(1) Operation mode conditions:
- Auto/Manual : Auto mode
- PID/AT : PID mode
- Control Run/Stop : Control Run mode

(2) The input value should not be abnormal. (According to the input error trigger point)

(3) The output limiter high limit should be more than 0.1% and the output limiter low limit should be less than 99.9%. (By controller initialize setting)

(4) When operation mode is set to "Normal."

When the autotuning is finished, the mode display of each channel will automatically return to show "PID."

Conditions which will cause the autotuning to stop:

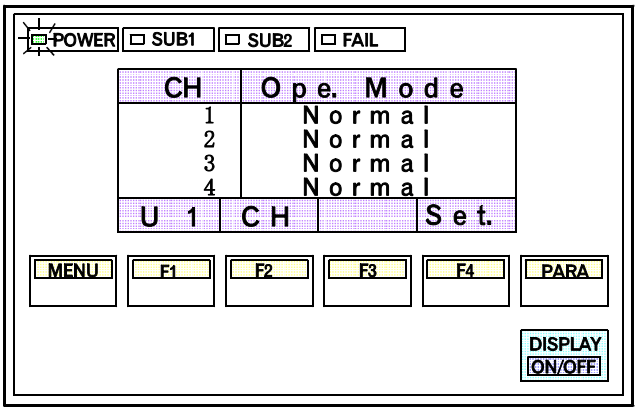
- When the set value (SV) is changed.
- When the memory area is changed.
- When the PV bias value is changed.
- When the AT bias value is changed.
- When transfer to Manual mode using the auto/manual transfer.
- When the input value becomes an underscale or overscale display.
- When the power is cut off.
- When a FAIL occurrs in the module whose channel is under the autotuning.
  Otherwise, when a FAIL occurrs in the PCP module.
- When transfer to the PID mode by the PID/AT transfer.
- When operation mode is set to "Normal."
- When the Control Run/Stop function is changed to the "Control Stop" function.
- When the digital filter is changed. (By controller initialize setting)
- When the output limiter high limit or low limit is changed. (By controller initialize setting)

CAUTION

When the above-mentioned conditions to stop the autotuning occurrs, the auto tuning is immediately stopped and change to the PID (PID control) mode. The PID constants return to the values at the start of the autotuning.

Operation mode change screen

This screen is used to select the operation conditions for each channel.



Setting : Unused
Moni.
Alarm
Normal

Setting prior to factory shipment :
Normal

① **Unused**

If set to "Unused," no control, monitoring or alarm monitoring is performed.
Use this mode when conducting module replacement or device maintenance or inspection.

② **Monitoring (Moni.)**

If set to "Monitoring," only the monitoring action is performed (measured value (PV) capture).
No control or alarm monitoring is performed.
Use this mode when stopping equipment operation temporarily.

③ **Alarm**

If set to "Alarm," monitoring or alarm monitoring is performed. No control is performed.
Use this mode when stopping equipment operation temporarily.

④ **Normal**

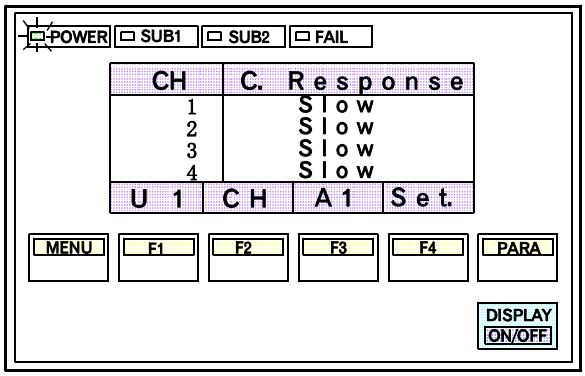
Control, monitoring and alarm monitoring are performed.

NOTE

Even if the temperature rise completion function (Heat up judge) is set to the "unused," it continues to be effective. If the temperature rise completion function is also to be set invalid, change the setting of the temperature rise completion trigger function to "No."

Control response designation parameter screen

This screen is used to specify the response to a temperature setting change in PID control.



Setting : Slow, Medium, Fast

Setting prior to factory shipment : Slow

* The heat/cool type is set to "Fast" prior to shipment.

<Control response designation parameter>

This is the function of enabling the setting of response to set value (SV) change in select any one of 3 steps (Slow, Medium, Fast) in PID control. In order to achieve faster controlled object response to set value (SV) change, select Fast.
However, slight overshoot is unavoidable when selecting Fast. Depending on the controlled object, specify Slow if overshoot should be avoided.

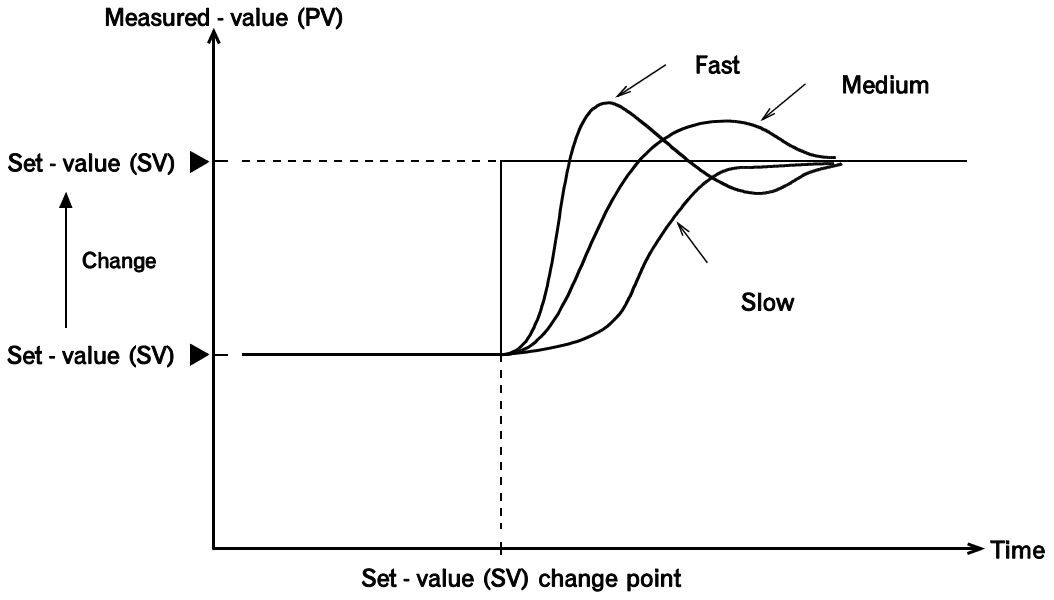
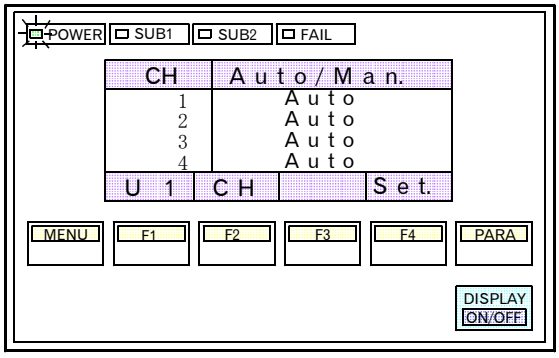


Fig. Example of control response designation parameter at set value (SV) change

Auto/Manual screen

This screen is used to change the control to Auto mode (Automatic operation) or to Manual mode (Manual operation).



Setting : Auto mode, Manual mode

Setting prior to factory shipment : Auto mode

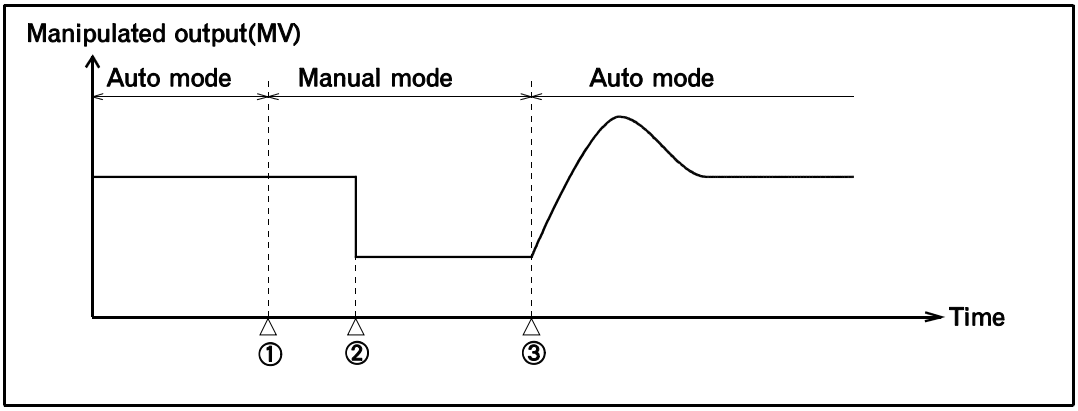
Auto : Mode for automatically outputting the manipulated output (MV) computed to the set value (SV)

Manual : Mode for manually setting the manipulated output (MV)

*The output settings during manual control should be set using the manual output items in the setting screen.

NOTES

- Set the manipulated output (MV) in manual mode on the setting screen.
- When the control unit is in the ON/OFF control specification, manual mode becomes invalid. The manual output setting on the setting screen also becomes invalid.
- The balanceless, bumpless function prevents the control output from overload caused by a rapid manipulated output (MV) change during auto/manual transfer.



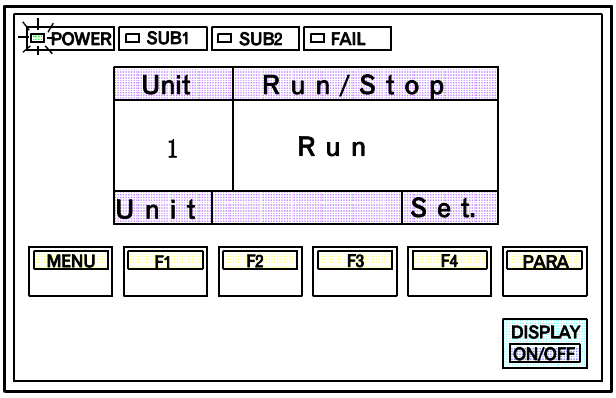
① Transfer from auto mode to manual mode. However, the manipulated output during transfer to manual mode follows the manipulated output in auto mode.

② Manipulated output change (manual mode function)

③ Transfer from manual mode to auto mode. The manipulated output when transferred to auto mode corresponds to the output computed to the set value.

Control Run/Stop screen

This screen is used to change the Control Run/Stop for each of the units.



Setting : Run (control run)
Stop (control stop)

Setting prior to factory shipment : Run

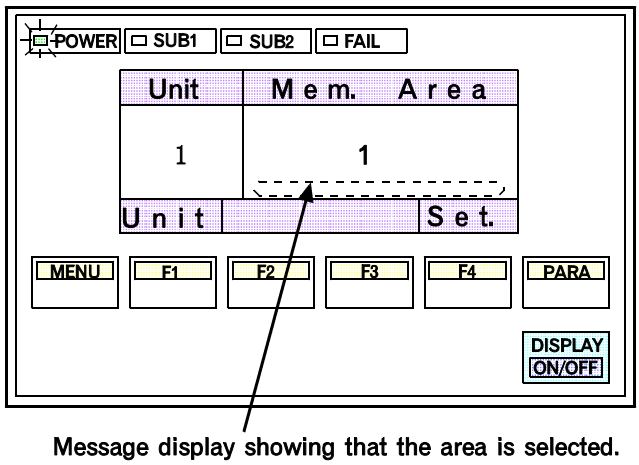
*The item on this screen is unit of the control unit.

NOTE

If control is turned to " Stop," both control and alarm outputs are turned off.

Memory area screen

This screen is used to set the memory area used for control for each control unit.



Setting : 1 to 8

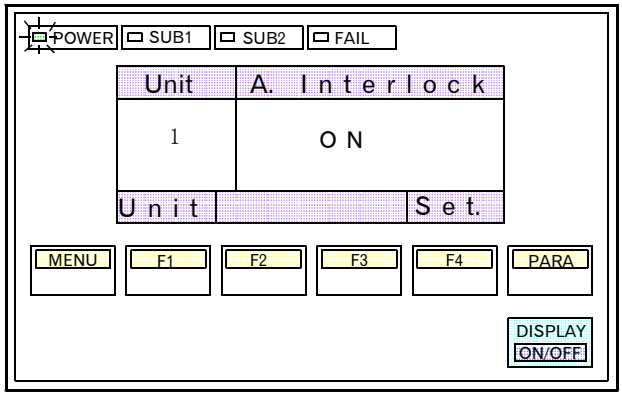
Setting prior to factory shipment : 1

NOTES

- In order to select the desired memory area No., it is necessary to store data corresponding to up to 8 memories, with the following data relating to temperature control set to one memory in abvance.
  - Temperature set value
  - Heat−side proportional band
  - Cool−side proportional band
  - Integral time
  - Derivative time
  - Deadband/Overlap
  - Control response parameters
  - First alarm set value
  - Second alarm set value
- During a memory area change, the operation panel reads all of the data stored in the changed area from the control unit.
  During this period, all switch operations are invalid and the message " **Please wait.** " appears on the screen.

Alarm interlock screen

This screen is used to release the alarm interlock for each control unit.



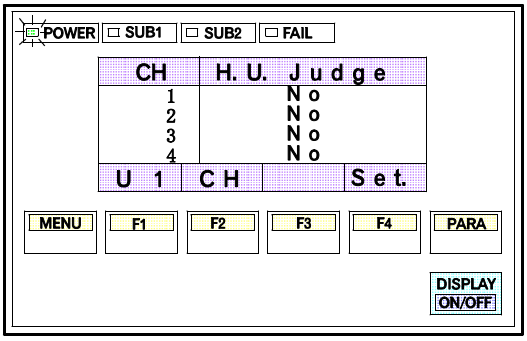
Setting : OFF (Alarm inerlock release)

NOTES

- If the alarm interlock is released, the display is also automatically turned to " Normal (ON)."
- The alarm interlock function is used to hold the alarm state even if the measured value (PV) is out of the alarm area having entered it once.

Temperature rise completion trigger screen

This screen is used to select whether the temperature rise completion trigger signal is issued when the measured value enters the temperature rise completion triggering range.
The temperature rise completion trigger signal is issued for each channel.

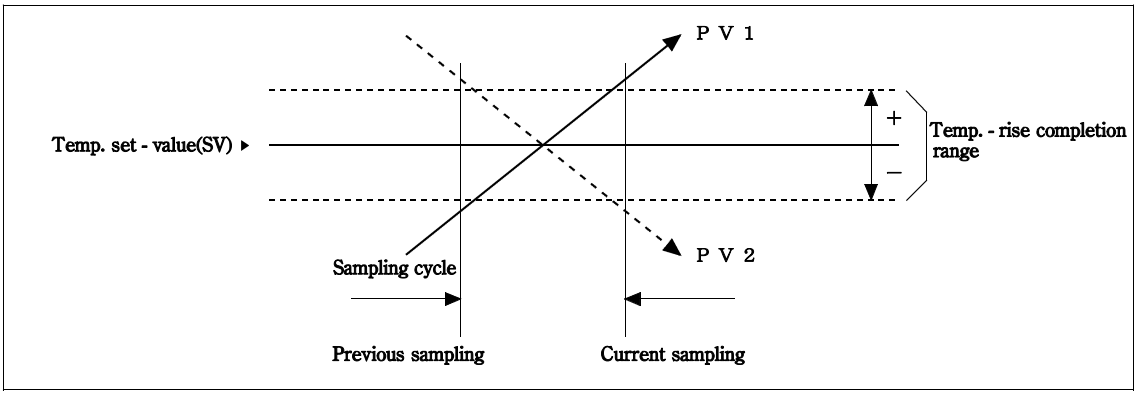


Setting : Yes (Temp. rise completion trigger signal issued.)
No (Temp. rise completion trigger signal not issued.)

Setting prior to factory shipment : No

<Temperature rise completion function>

The temperature rise is completed if the temperature measured value (PV) is within the temperature rise completion range during temperature input sampling. In addition, due to the narrow setting of the temperature rise completion range, even when the temperature measured value (PV) has passed the temperature rise completion range in the sampling cycle (from the previous time to this time), the used channel is assumed to be in the temperature rise completion state.
However, only the channel subject to temperature rise completion triggering is in the temperature rise completion state.

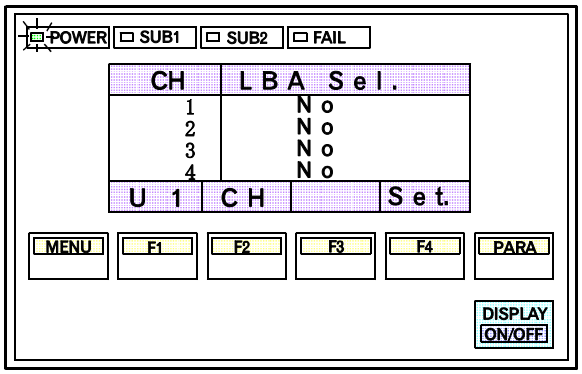


NOTE

The temperature rise completion function becomes valid even when "Unused" is selected in each channe on the operation mode change screen.
If it is necessary to disable the operation mode and also to disable the temperature rise completion trigger function, change the above temperature rise completion trigger selection to "No."

Loop break alarm selection screen

This screen is used to select whether the loop break alarm function is used. The loop break alarm function is selected for each channel.



Setting : Yes (Loop break alarm function provided.)
No (Loop break alarm function not provided.)

Setting prior to factory shipment : No

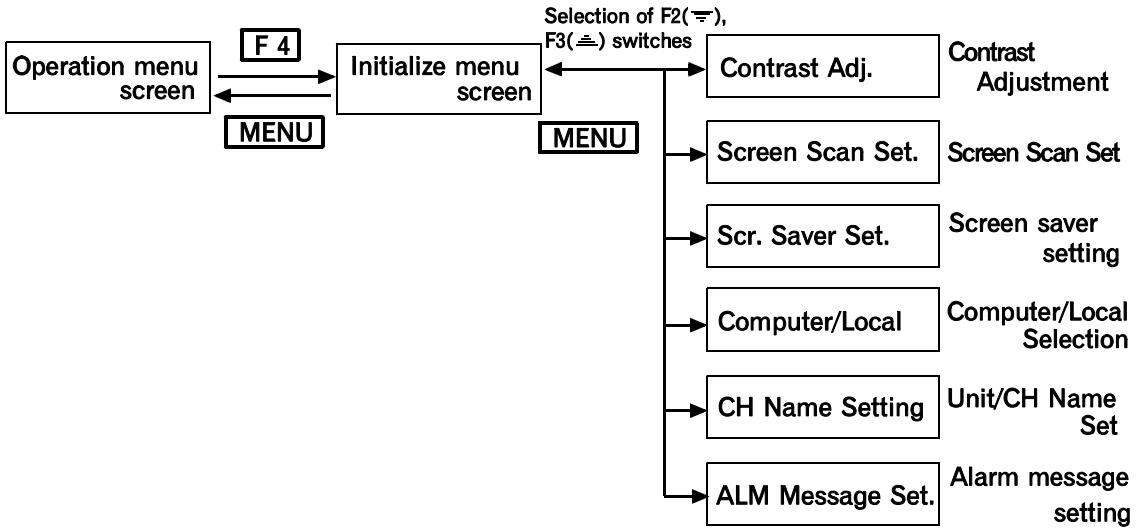
NOTES

- When the selected control unit consists of modules without the loop break alarm function, this setting screen is not displayed.
- Only when operation mode selection is turned to " Normal," the loop break alarm function is activated.
- No loop break alarm function is activated during autotuning.
- The LBA function is used to detect errors in the control loop but cannot pinpoint the location of the error. Therefore check the control loop accordingly.

4.4.5 Initialize settings screen

The initialize settings screen is used to set the time, scan the operation monitoring screens, and also display or set both data which is not frequently set such as data on the operation panel and commands.

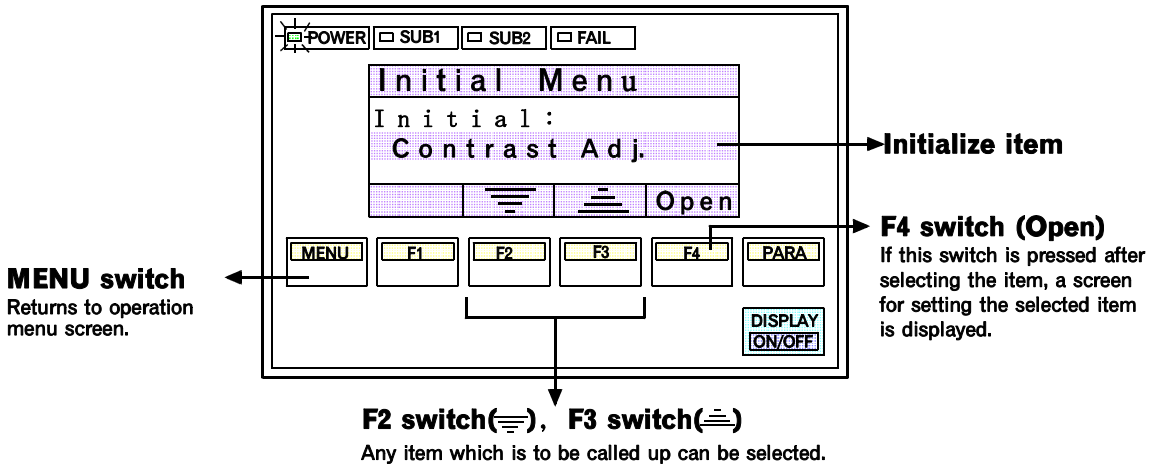
■ Calling procedure



* Every time the PARA switch is pressed once, each item changes.

■ Initialize menu screen

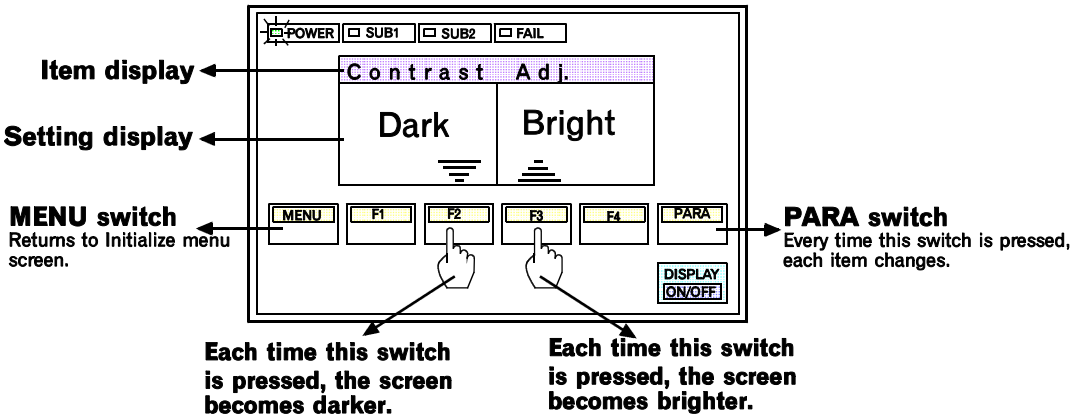
This screen allows changing to each of the initialize setting screens.



■ Contrast Adujustment screen

This screen is used to adjust the contrast of the operation panel display.

<Display details>

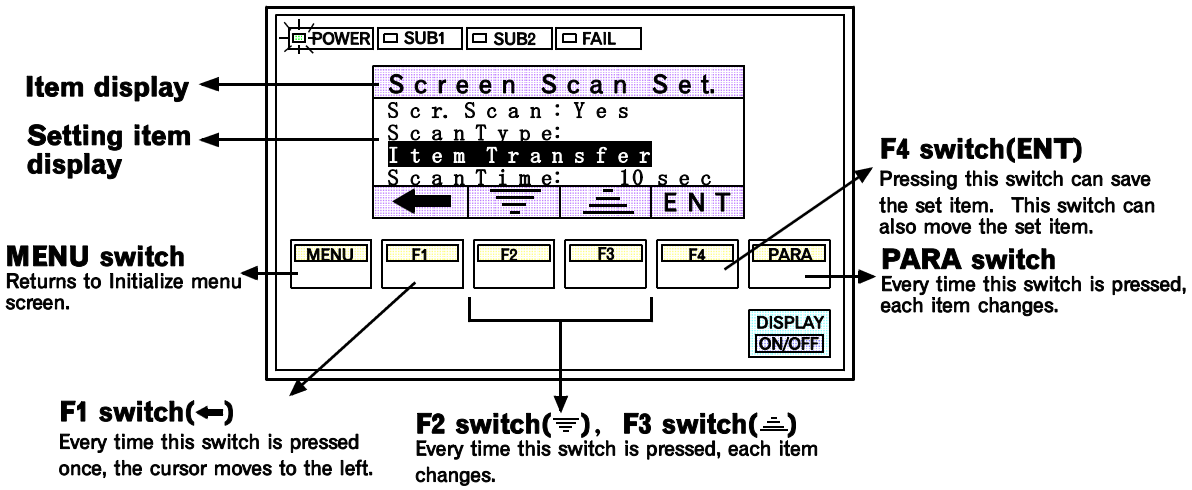


* The LCD (Liquid Crystal Display) may be difficult to see depending on the position from which the screen is viewed. In this case, adjust contrast of the screen to improve display clarity.
* The adjusted contrast is registered by pressing the MENU or PARA switch.
* The adjusted contrast is stored if once set even when the power is turned off.

■ Screen scan setting screen

This screen is used to for the setting of the items concerning the scanning of each screen during operation monitoring is carried out.

<Display details>



Scr.Scan: Setting the ON/OFF of the display screen scanning

No: Screen scanning invalid

Yes: Screen scanning valid

ScanType: Setting the type of screen scanning

Item transfer : Scans the items in the operation monitoring screen

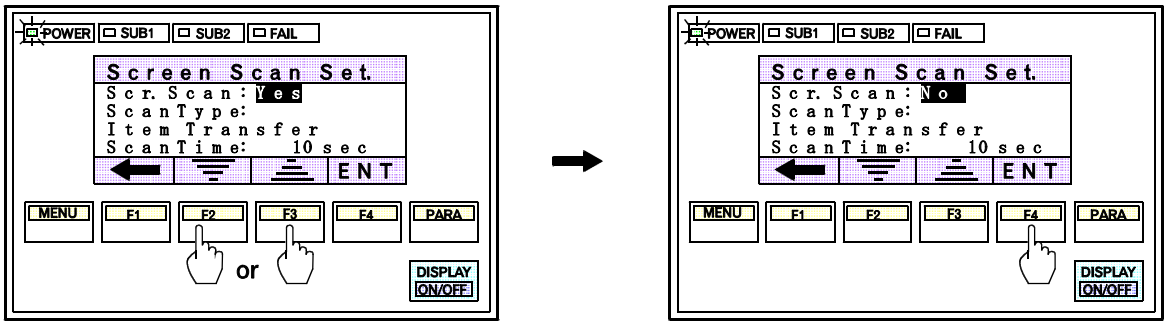
Unit transfer : In using several control units joined together, the displayed item can be scanned for each unit separately.

ScanTime: Screen scanning time

1 to 9999 seconds

<Setting procedure>

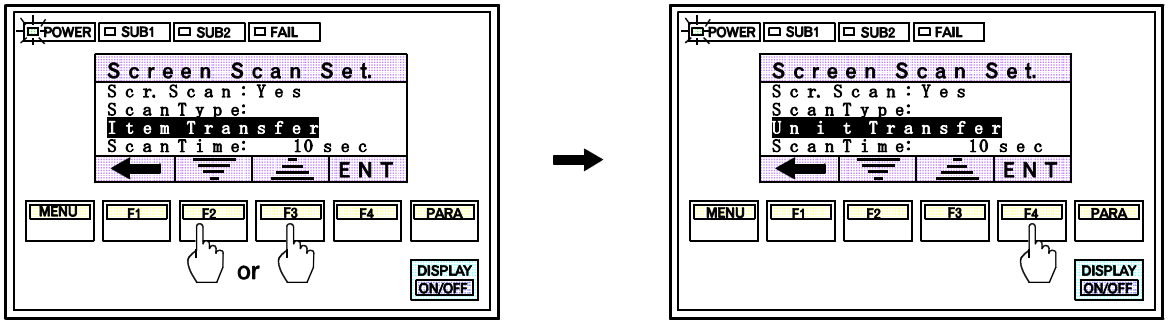
1. Setting the ON/OFF of the display screen scanning



1. Press the F2(▽) or F3(△) switch to change the set item.

2. Press the F4 switch(ENT) to save the changed set item. After the item is saved, the cursor move to the next set item automatically.

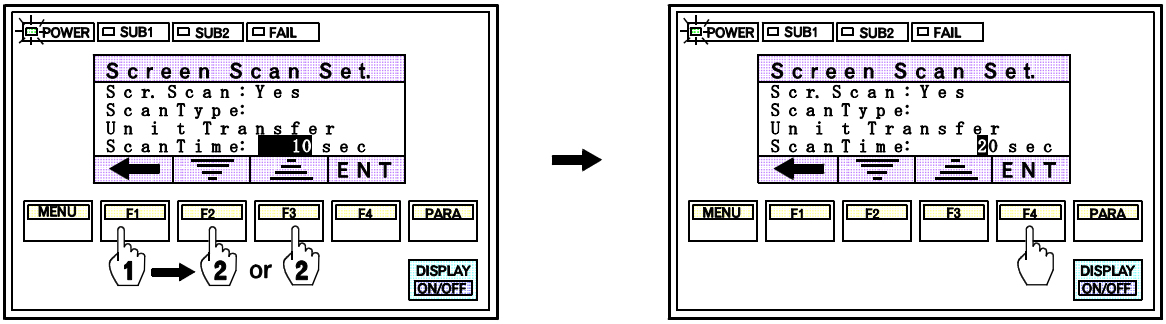
2. Setting the type of screen scanning



1. Press the F2(▽) or F3(△) switch to change the set item.

2. Press the F4 switch(ENT) to save the changed set item. After the item is saved, the cursor move to the next set item automatically.

3. Screen scanning time



1. Press the F1 switch(←) to move the cursor to the digit to which the desired time to be set. Then, press the F2(▽) or F3 switch(△) to set the desired time.

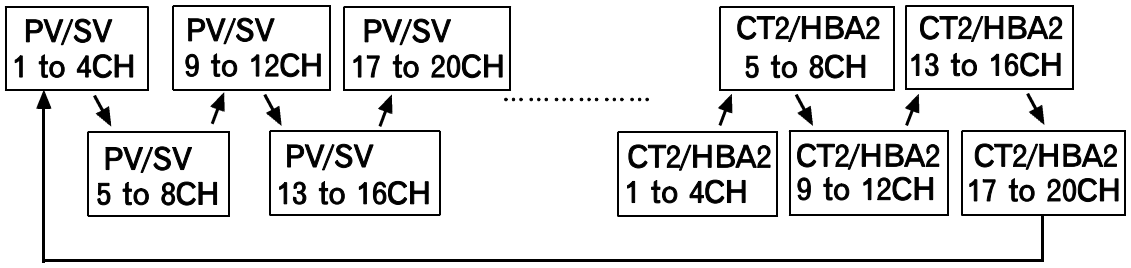
2. Press the F4 switch(ENT) to save the set time. After the time is set, the cursor moves to the first set item automatically.

<Scanning screen flow diagram>

● When item changing is selected (Unit designation)

For the displayed control units

(Example : 4 channel display type)



* If more than one control unit is connected, when the **F1** switch is pressed during screen scanning, each item corresponding to the selected control unit is scanned.

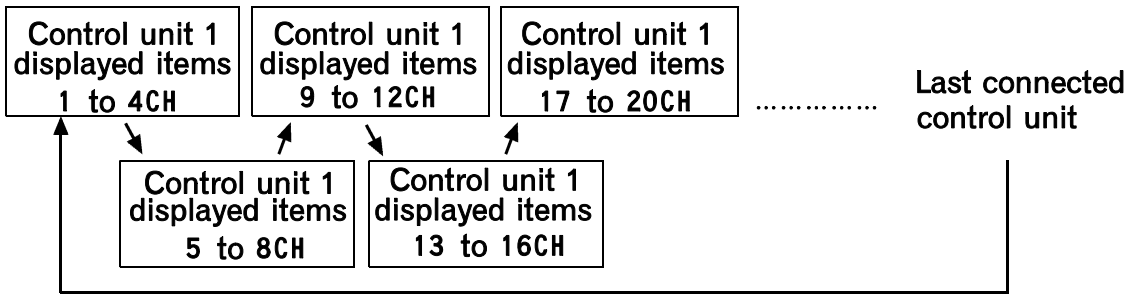
* If there is no relevant module, that screen item is skipped.

* If there is no CT nor HBA in the connected module, the "CT1/HBA1" or "CT2/HBA2" screen is not displayed.

● When unit changing is selected (Item designation)

For the displayed items

(Example : 4 channel display type)



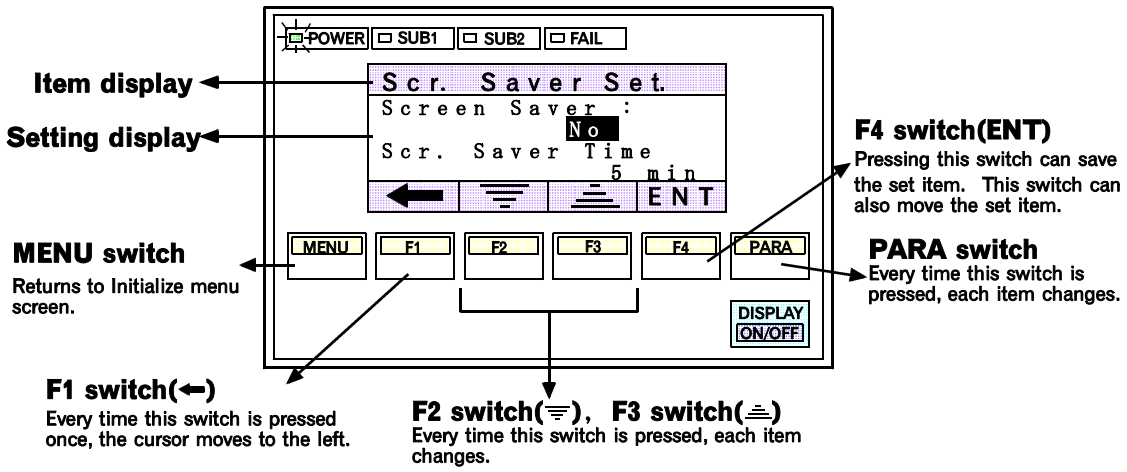
* If the **PARA** switch is pressed during screen scanning, when the select item that is scanned in each control unit.

* If there is no relevant module, that screen item is skipped.

■ Screen saver setting screen

This screen is used to set the function of turning off the display automatically when no key operations are performed for a fixed time.

＜Display details＞



Screen Saver: Setting the presence or absence of screen saver

No: Screen saver invalid

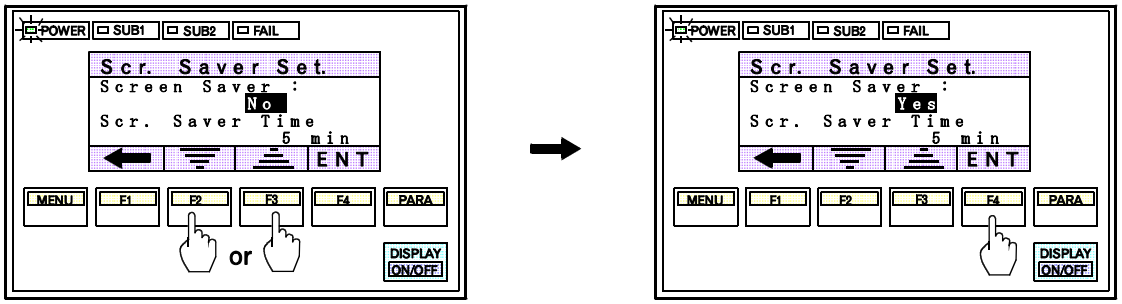
Yes: Screen saver valid

Screen saver time

1 to 99 minute (Setting prior to factory shipment : 5 minutes)

＜Setting procedure＞

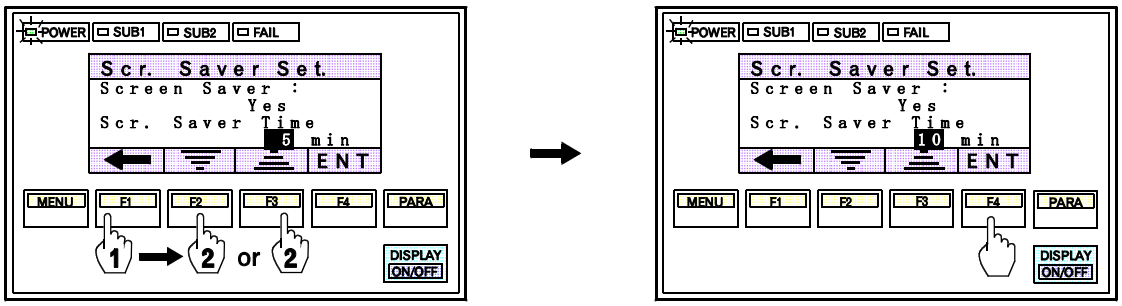
1. Setting the presence or absence of screen saver



1. Press the F2(▽) or F3(△) switch to change the set item.

2. Press the F4 switch(ENT) to save the changed set item. After the item is saved, the cursor move to the next set item automatically.

2. Screen saver time



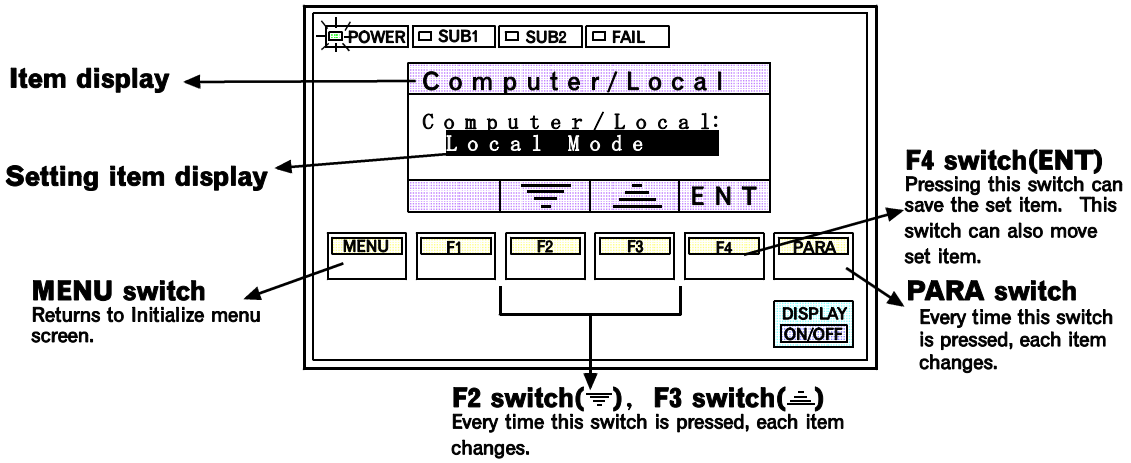
1. Press the F1 switch(←) to move the cursor to the digit to which the desired time is to be set. Then, press the F2(▽) or F3 switch(△) to set the desired time.

2. Press the F4 switch(ENT) to save the set time. After the time is set, the cursor moves to the first set item automatically.

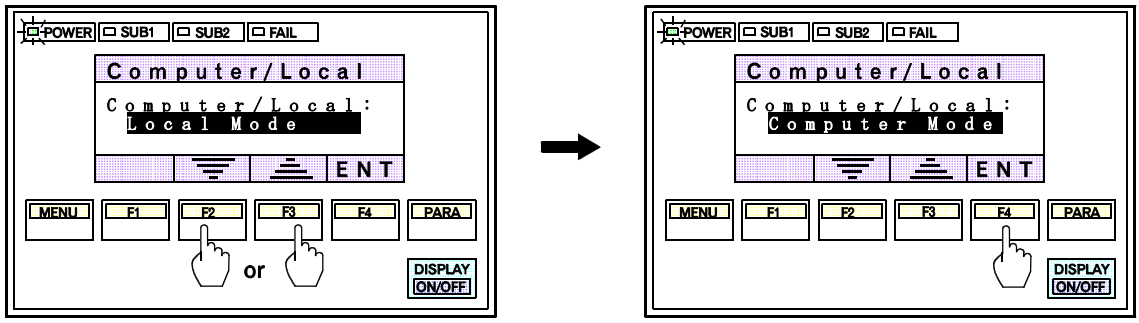
■ Computer/Local screen

This screen is used to select whether the settings shall be carried out by a host computer (Computer mode) or by the operation panel (Local mode).

<Display details>



<Setting procedure>



1. Press the F2(▽) or F3(△) switch to change the set item.

2. Press the F4 switch(ENT) to save the change set item.

NOTE

In the Computer mode, the host computer has priority and none of the operation panel keys concerning the settings are effective. (Except for the setting of Computer/Local.)

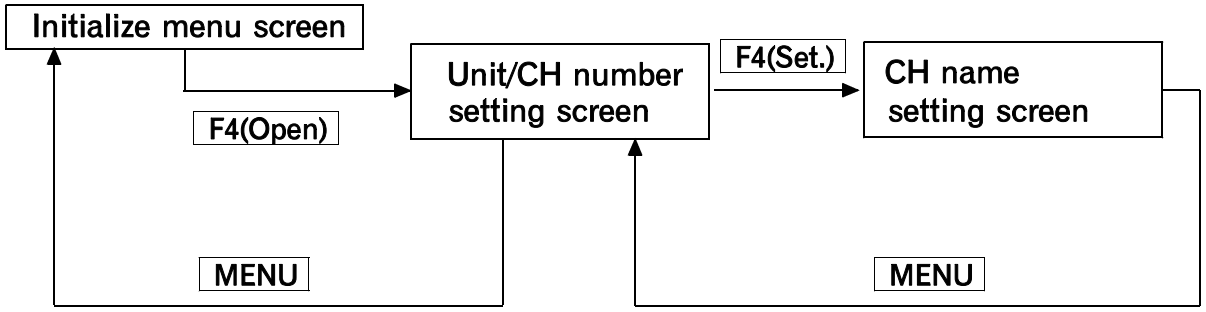
■ Unit/CH (Channel) name setting screen

This screen is used to set the names of control unit and channel shown on the Operation monitoring screen, Setting screen and Operation mode screen.

CAUTION

The number of characters that can be set as the channel name is 5 characters.

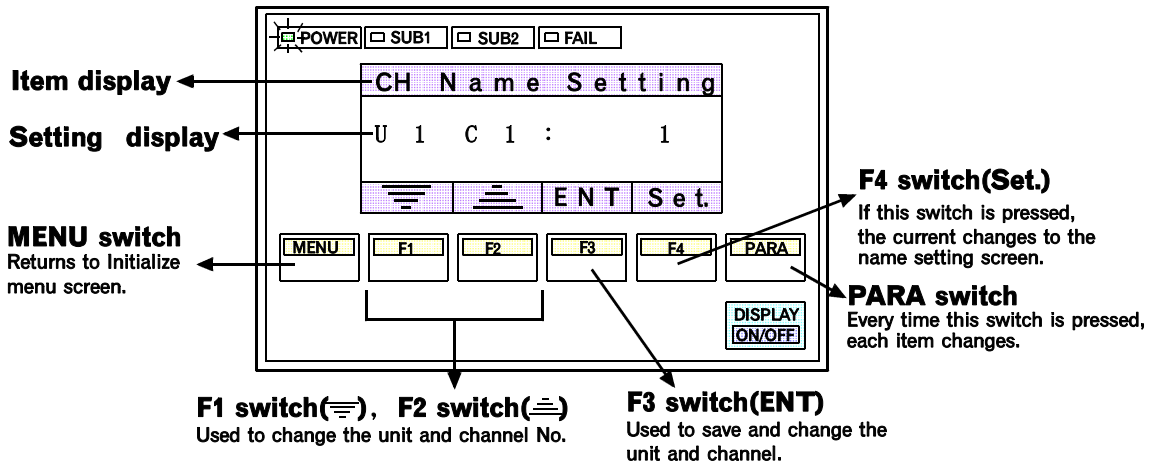
<Flow diagram of the unit/channel name setting screen>



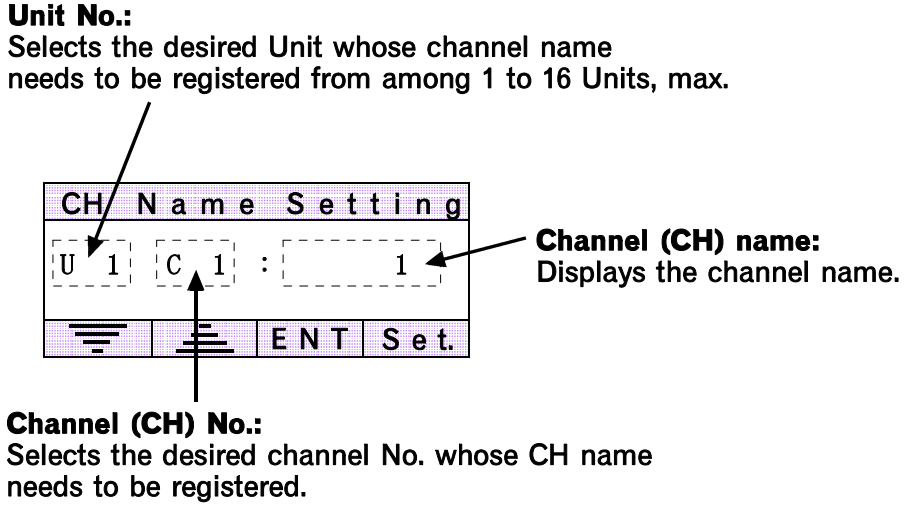
<Display details>

Unit/CH number setting screen

This screen is used to specify the control unit and the channel to be set or changed the name.
It is also used to check what names are set.



Details of Unit/channel No. setting screen



Unit No.:

Each Unit No. corresponds to the unit address set in the PCP module. For example, Unit No.U1 displayed on the screen corresponds to control unit with unit address No.00.

Select the desired Unit No. by referring to the following table.

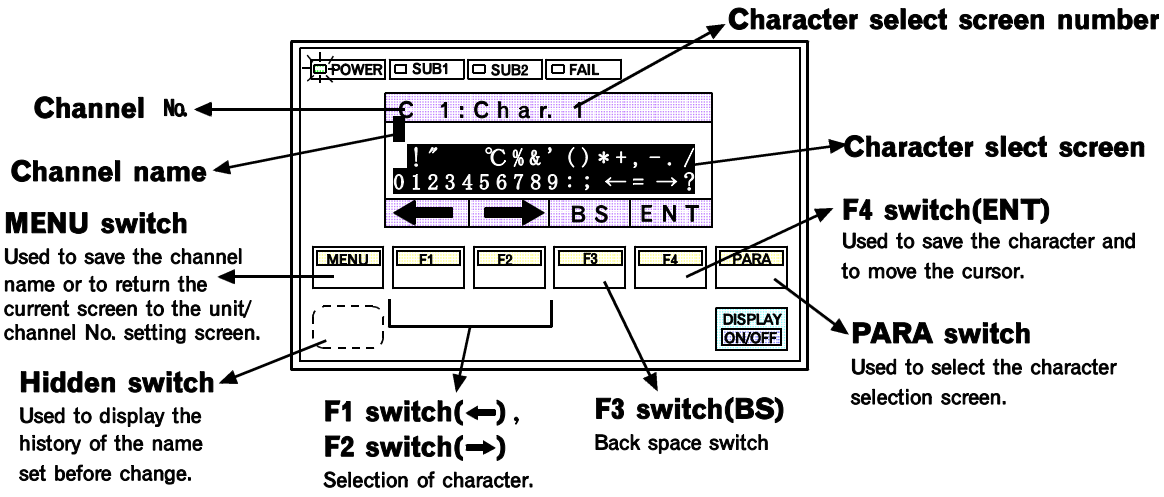
Display	Unit No.	Unit address	Unit address setting switch
U 1	Unit No. 1	Unit address 00	0
U 2	Unit No. 2	Unit address 01	1
U 3	Unit No. 3	Unit address 02	2
U 4	Unit No. 4	Unit address 03	3
U 5	Unit No. 5	Unit address 04	4
U 6	Unit No. 6	Unit address 05	5
U 7	Unit No. 7	Unit address 06	6
U 8	Unit No. 8	Unit address 07	7
U 9	Unit No. 9	Unit address 08	8
U 1 0	Unit No. 10	Unit address 09	9
U 1 1	Unit No. 11	Unit address 10	A
U 1 2	Unit No. 12	Unit address 11	B
U 1 3	Unit No. 13	Unit address 12	C
U 1 4	Unit No. 14	Unit address 13	D
U 1 5	Unit No. 15	Unit address 14	E
U 1 6	Unit No. 16	Unit address 15	F

NOTE

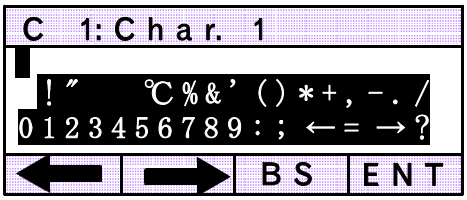
Numerals (1, 2, ...) are set in the channel name column prior to factory shipment.

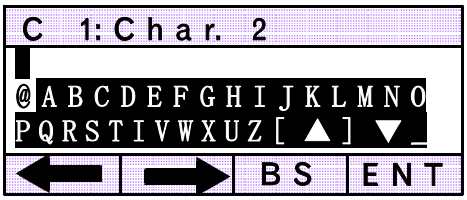
CH name setting screen

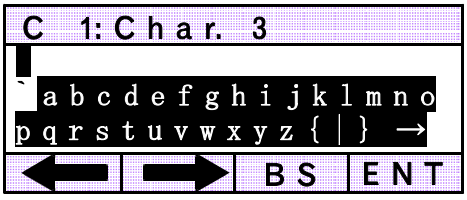
This screen is used to set or change the names of the channel.

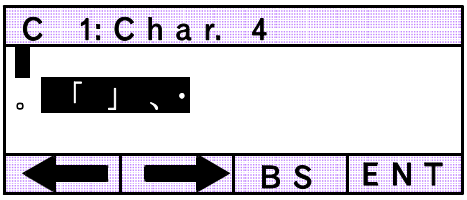


Character select screen:





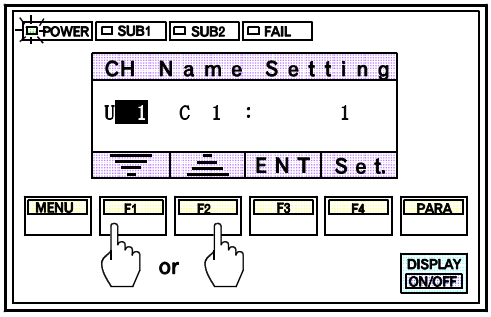




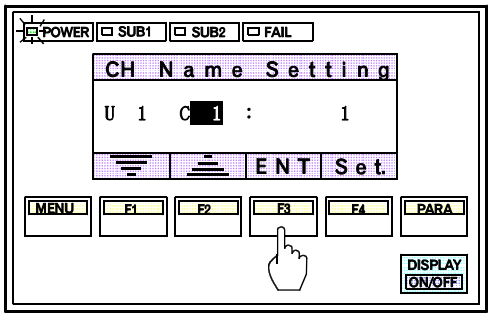
<Setting procedure>

To the set "T" character in setting the name of unit 1 as "Tmp02."

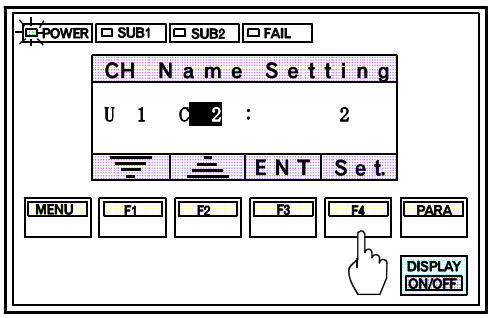
<Unit/CH number setting screen>



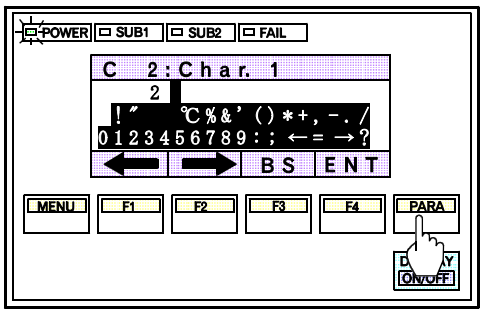
1. Press the F1( ) or F2 switch( ) to select the unit No. whose channel No. is to be changed.



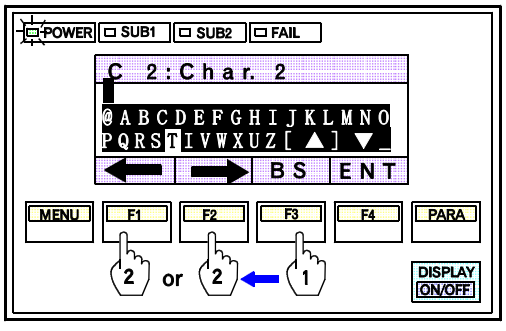
2. Press the F3 switch(ENT) to save the unit No. After the unit No. is saved, the cursor moves to the channel No. Set and save the channel No. in the same way as Step 1.



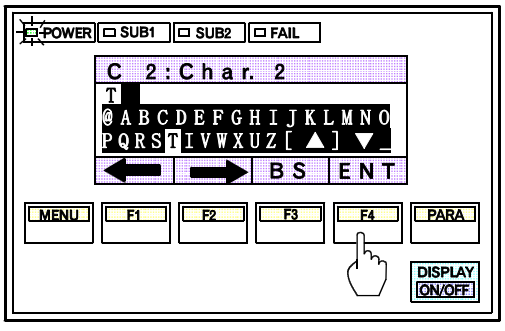
3. After the unit and channel Nos. are set, press the F4 switch(Set.) to display the channel name setting screen. If the above procedure is performed incorrectly, repeat again from Step 1.



4. Select the character selection screen to be set by pressing the PARA switch.



5. Press the F3 switch(BS) to move the cursor, then select the character by pressing the F1 or F2 switch.



6. After the character is selected, press the F4 switch (ENT) to save the character. If a wrong character is selected by mistake, press the F3 switch(BS) to delete it.
Thereafter, select and save the desired character one by one in turn.

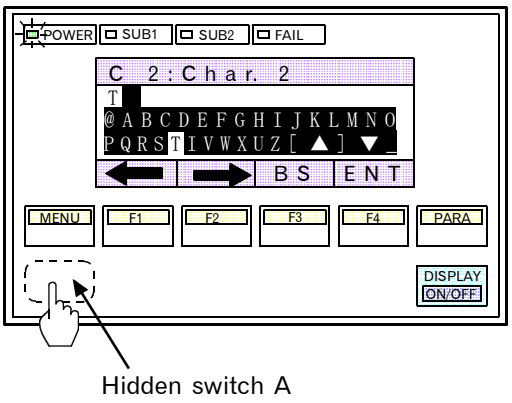
<For the history（Hidden switch A）>

When the settings of similar names continue, this switch is used to input the previously input name directly and used for the setting.

CAUTION

When the channel name is registered for the first time or the power for operation panel is turned on again, the channel name is not stored as a past record. Therefore, if the Record Switch (hidden switch A) is pressed in this state, the displayed channel name is erased.

Channel 2 name setting screen



After setting channel 1 as "**Tmp01**," if channel 2 is to be set as "**Tmp02**," press the hidden switch A on the channel 2 name setting screen.
The previously set "**Tmp01**" characters can be directly input into the name area.
Then press the **F3** switch(BS) to delete just the character "**1**," and input and set the character "**2**."

When the settings are entered wrongly or when the entered values are to be changed:

F3 switch (BS) : Each time this switch is press, the last character of the name will be deleted one by one.

NOTES

- When entering names, the use of "－－－－" etc. for unused channel names is convenient to make the screen display clearer.
- The channel name whose history is stored is cleared when the power supply is turned off.

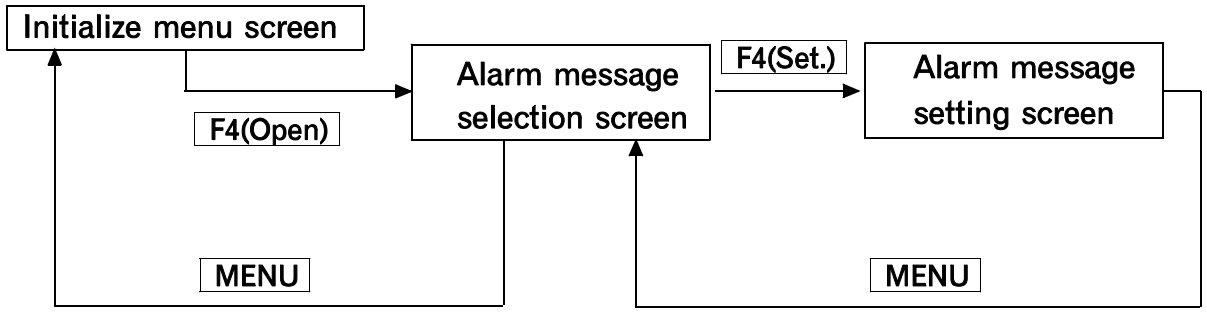
■ Alarm message setting screen

This screen is used to set alarm messages to inform the operator of alarms occuring during monitoring.

CAUTION

The number of characters that can be set as the alarm message is 16 characters.

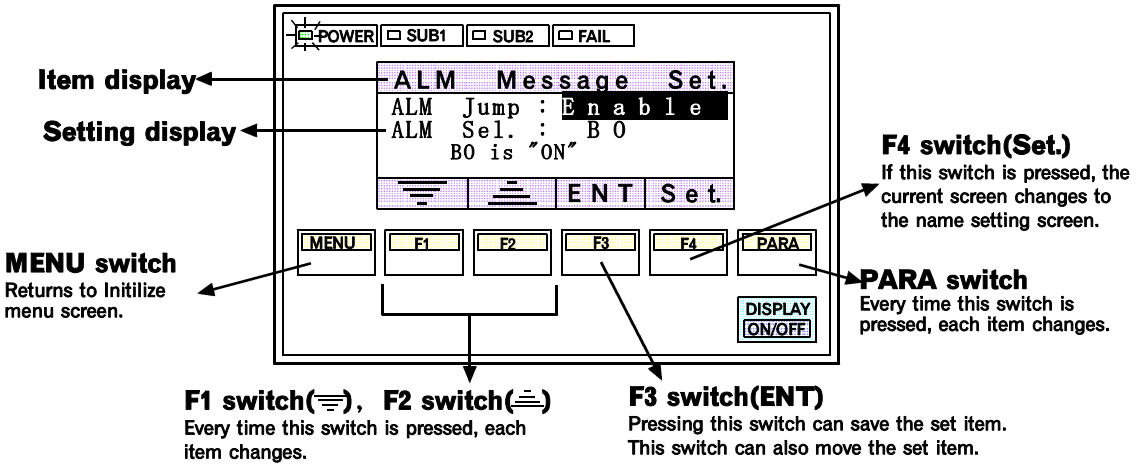
< Flow diagram of the alarm message setting screen >



＜Display details＞

Alarm message selection screen

On this screen, alarm message screen display/no−display can be selected while an alarm occurs.
The message alarm to be changed can also be selected.



ALM Jump: Alarm message screen display/no−display selection

Enable: Alarm message screen display while an alarm occurs.

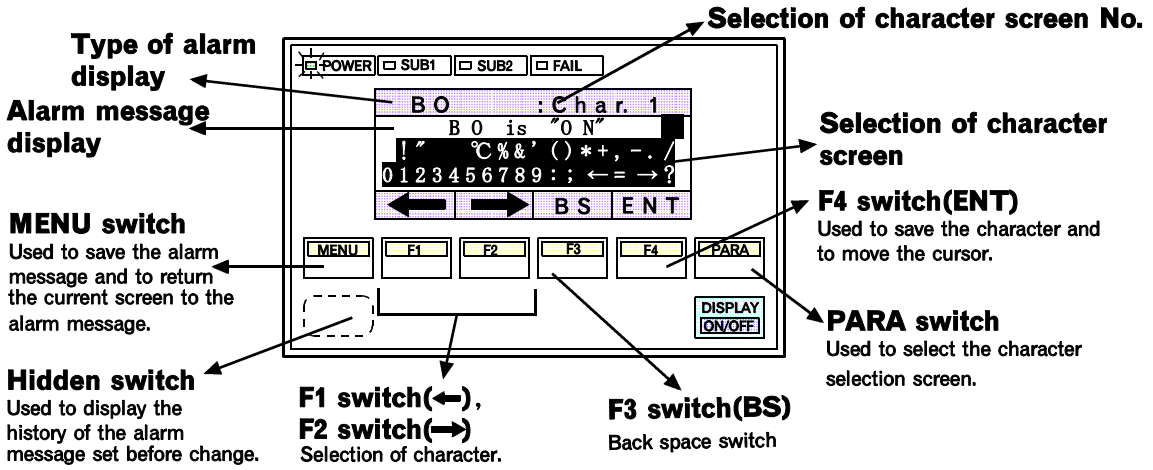
Disable: Alarm message screen no−display while an alarm occurs.

ALM Sel.: Alarm type selection

BO: Burnout alarm
HBA: Heater break alarm
ALM1: First alarm
ALM2: Second alarm
LBA: Loop break alarm
T.R.C: Temperature rise complete

Alarm meassage setting screen

This screen is used to set and change the alarm message.



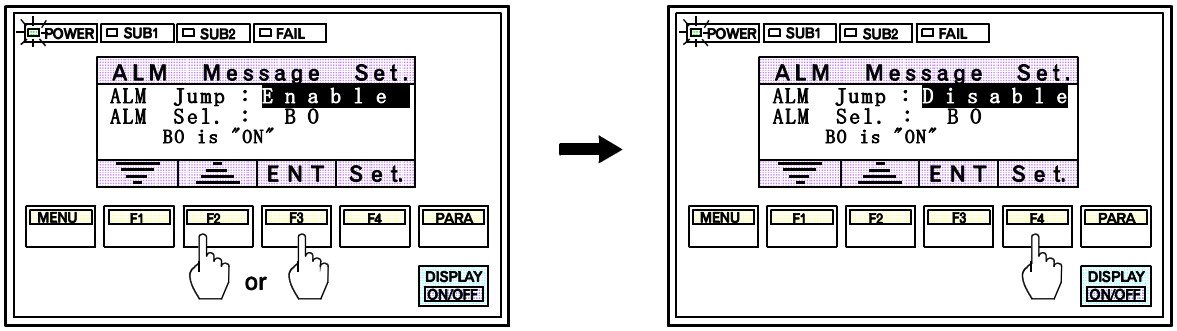
List of alarm display message (Default values)

Type of alarm	Details of display	Details of alarm message
BO	BO is "ON"	Burnout alarm occurs
HBA	HBA is "ON"	Heater break alarm occurs
ALM1	ALM1 is "ON"	First alarm occurs
ALM2	ALM2 is "ON"	Second alarm occurs
LBA	LBA is "ON"	Loop break alarm occurs
T.R.C.	Temp. rise comp.	Temperture rise complete message

* The types of character selection screen are the same as those of the CH name setting screen (P. 4-49).

<Setting procedure>

1. Alarm message screen display/no–display selection

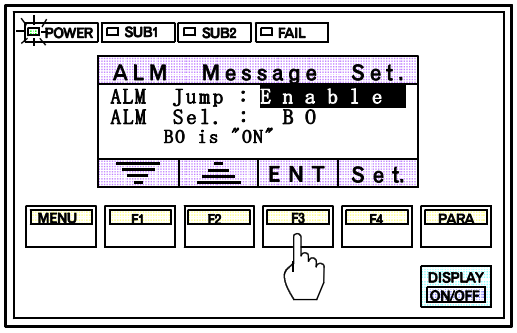


1. Press the F2(▽) or F3(△) switch to change the set item.

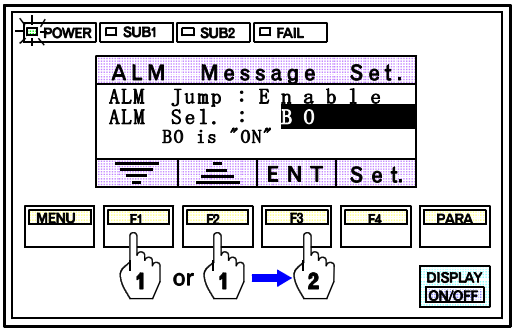
2. Press the F4 switch(ENT) to save the change set item. After the item is saved, the cursor move to the next set item automatically.

2. Alarm message setting

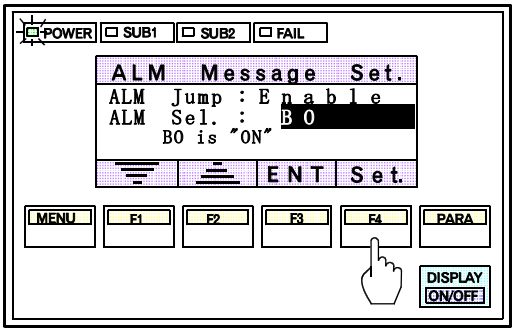
When characters "BO is ON" of burnout (BO) are set to "BO 1".



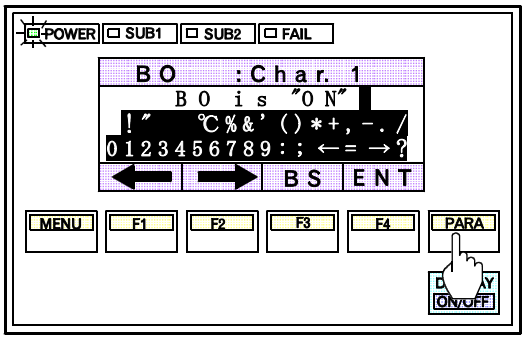
1. Press the F3 switch(ENT) to move the item. The cursor moves to the type of alarm.



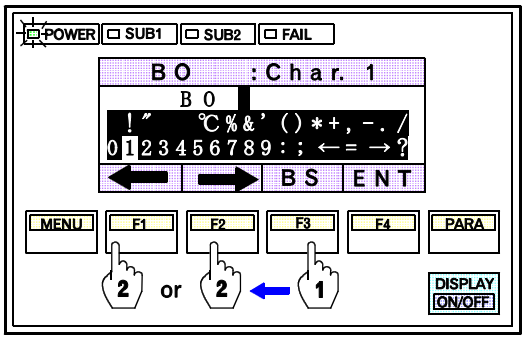
2. Press the F1(▽) or F2 switch(△) to select the alarm message. Then, press the F3 switch(ENT).



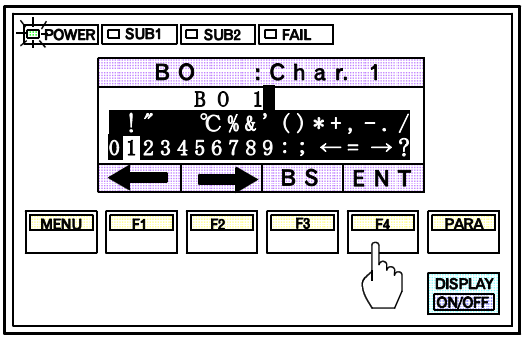
3. After the alarm is selected, press the F4 switch (Set.) to display the alarm message setting screen.



4. Select the character selection screen to be set by pressing the PARA switch.



5. Press the F3 switch(BS) to move the cursor, then select the character by pressing the F1 or F2 switch.



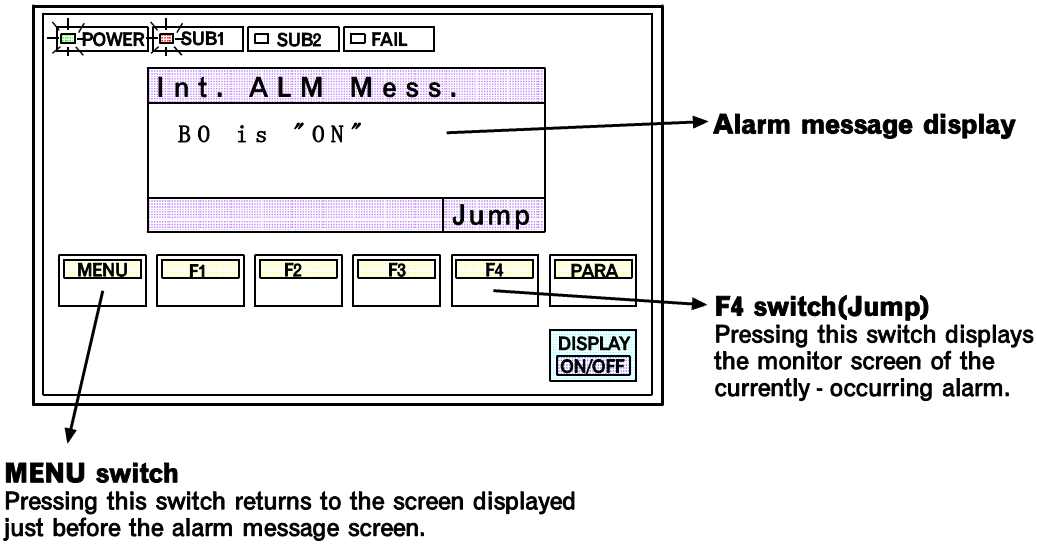
6. After the character is selected, press the F4 switch(ENT) to save the character. If a wrong character is selected by mistake, press the F3 switch(BS) to delete it. Thereafter, select and save the desired character one by one in turn.

* When the settings of similar alarm message continue, this switch is used to input the previously input alarm message directly and used for the setting.
For details on the history (hidden switch), see "For the history (Hidden switch)" (P. 4-51).

4.4.6 Alarm message screen

This screen is automatically displayed when an alarm occurs in any used channel during monitoring on the operation monitor screen.

<Display details>



Displayed messages

No.	Item	Message
1	Burnout	BO is "ON"
2	Heater break alarm	HBA is "ON"
3	Alarm 1 (First alarm)	ALM 1 is "ON"
4	Alarm 2 (Second alarm)	ALM 2 is "ON"
5	Loop break alarm	LBA is "ON"
6	Temperture rise complete	Temp. rise comp.

Higher

Displayed priority orders

Lower

*If two or more types of alarms occur simultaneously, the alarm message of higher priority is displayed. For example, if the burnout and 1st alarms occur simultaneously, the burnout alarm message is displayed.

*Alarm messages or alarm message screen display/non−display can be changed. For details, see "■ Alarm message setting screen" (P. 4-52).

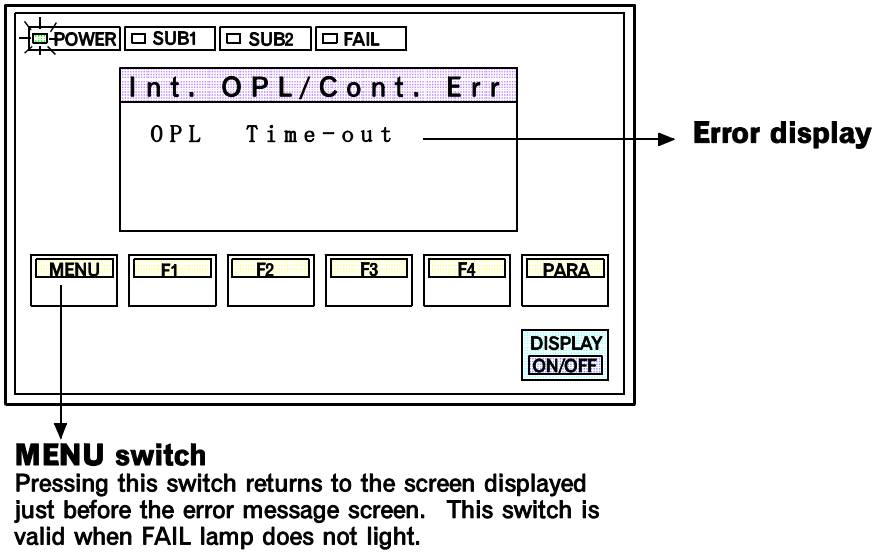
NOTES

- Pressing the F4 switch (Jump) changes to the monitor screen of the currently−occurring alarm. Therefore, control unit and the channel No. where the alarm is occurring can be checked.
  When the burnout or heater break alarm occurs
  BO/HBA of the operation monitoring screen is displayed.
  When the 1st or 2nd alarm occurs
  ALM1/ALM2 of the operation monitoring screen is displayed.
  *If the operation monitoring screen when an alarm occurs is of the 10−channel display type, the alarm screen of the 1−channel display type is displayed. For the 1, 2 or 4−channel display type, the alarm screen of the same display type is shown.
- Upon recovery from the alarm state, the present screen is automatically returned to the screen displayed before the alarm occurred.

4.4.7 Error message screen

This screen is automatically displayed on the occurrence of an error in the control unit, operation panel main unit or communications.

<Display details>



NOTES

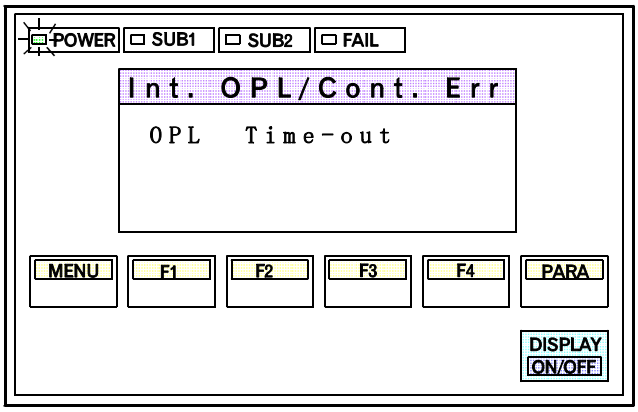
- For the control unit in which an error occurs, the unit No. which becomes error is also displayed.
- Using the **MENU** switch, the previous screen just before the error can be displayed.
  (If the error will occurr when the power was turned on, the screen will return to the Operation monitoring screen.)
  However, when the FAIL lamp on the operation panel is lit, the resetting can not be called out.
- When the error state is eliminated, the current screen automatically returns to the screen displayed before the error was produced.
- For details on error message, see "5.1 Error messages" (P. 5-2).

IN CASE OF TROUBLE

5

5.1 Error messages

If a system error occurs during operation or when the power is turned on, the error message screen will be displayed, and at the same time it will be possible to have confirmation of the contents of the error (Inversed display part).



*** "MENU" switch is valid when FAIL lamp does not light.**

(1) Concerning the operation panel

① Parity error …… During communication, the data has been wrongly written
(OPL Parity)
② Framing error …… During communication, the data has been wrongly written
(OPL Framing)
③ Over Run …… Problem with the taking in of the received data
(OPL Over Run)
④ Time-out …… No response from the controller
(OPL Time-out)
⑤ EEPROM write error …… Incorrect writing into EEPROM.
(EEPROM Write)
⑥ OPL RAM read/write error… Problem with the system RAM.
(OPL RAM R/W)
⑦ Communication error …… Imperfect communication cable connection
(SCI Error)

- If errors ① to ④ have occurred, there will be a possibility that too much noise or surge might be applied to the connecting cable with control unit. Investigate the wiring condition of the connecting cable and whether there is a noise generating source nearby, then turn on the power again.
- If errors ⑤ or ⑥ have occurred, request for the replacement or the repair of the operation panel. (Refer to "5.3 Replacement precautions" on page 5-10.)
- If error ⑦ has occurred, there will be a possibility of the problem with the power supply, there may be the breakage of the connecting cable with control unit, or the detachment of the connector. Confirm the power supply to the control unit and the condition of the connecting cable.

* If the above−mentioned processing does not improve the problem, please contact RKC's sales representative, our closest sales office, or the agent who has supplied the equipment.

(2) Concerning the control unit

① Back up data error …… The control data has been destroyed or written wrongly
(Back Up Data U☐☐)
② RAM read/write error …… Problem with the system RAM
(RAM R/W U☐☐)
③ System composition error …… The system composition has been changed
(Sys. Config. U☐☐)
④ Internal communications error … Abnormality in the internal communications
(Internal U☐☐)
⑤ A/D converter error …… Problem with the A/D converter
(A/D Convert. U☐☐)
⑥ Adjustment data error …… The adjustment data has been written wrongly
(Adjust Data U☐☐)

* Unit No. is displayed in ☐☐.

● If error ①, ② or ⑤ occurs :

Cause : The RAM, ROM or A/D converter is faulty.
Action : Request us to repair it or replace the defective control unit.
(The module whose FAIL lamp is lit).

● If error ③ occurs :

Cause : The present module configuration differs from the initialize module configuration, for example, when replacing a module having a different module No.
Action : Initialize the module(according to controller initialize setting) or return the module configuration to the original configuration.

● If error ④ occurs :

Cause : The module was removed while the power was on. The module is faulty.
Action : Install the removed module as before. Request us to repair it or replace the defective control unit (The module whose FAIL lamp is lit).

● If error ⑤ or ⑥ occurs :

Cause : The excessive noise, surge or strong impact might be added to the control unit.
Action : Request us to repair it or replace the defective control unit.
(The module whose FAIL lamp is lit).

* If the above−mentioned processing does not improve the problem, please contact RKC's sales representative, our closest sales office, or the agent who has supplied the equipment.
* When replacing the instrument, refer to "5.3 Replacement precautions" (P. 5-10).

5.2 Troubleshooting

This section lists some basic causes and solutions to be taken when any problem would arise in this instrument. If you cannot solve a problem, please contact RKC sales office or the agent, on confirming the type name and specifications of the product.

If the instrument is necessary to be replaced, observe the following warning.

⚠ WARNING

- To prevent electric shock or instrument failure, always turn off the system power before replacing the instrument.
- To prevent electric shock or instrument failure, always turn off the power before mounting or removing the module and operation panel.
- To prevent electric shock or instrument failure, do not turn on the power untill all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.
- To prevent electric shock or instrument failure, do not touch the inside of the module or connector pins.
- All wiring must be performed by authorized personnel with electrical experience in this type of work.

CAUTION

When replacing the module with a new one, always use the module with the same Model No. In addition, when replacing the module with a new one of the different module type, contact RKC sales office or the agent directly as it becomes necessary to initialize the module, etc.

NOTE

If it becomes necessary to replace the insturment, always turn off the opwer, then remove the instrument. For details on replacing the instrument, carefully read "5.3 Replacement precautions" (P. 5-12) or the separate "Hardware Instruction Manual" (IMSRM02-E□)

(1) Relating to the operation panel

Problem	Probable cause	Solution
The power supply (power) lamp does not light	The power is not being supplied.	Check the external breaker, etc.
	The proper power supply voltage is not being supplied.	Confirm the supplied power supply.
	Poor contacts at the power supply terminals.	Tighten the terminals.
	Problem in the power supply unit.	Replace the operation panel.
The screen display is abnormal	A noise generating source is close by.	Move the equipment away from the noise generating source.
	The proper power supply voltage is not being supplied.	Confirm the power supply specification.
The screens are not displayed	The display ON/OFF switch is set to OFF.	Press the display ON/OFF switch is turned ON.
	The display is turned off by the screen saver.	Press the display ON/OFF switch is turned ON.
	Problem with the LCD back light.	Replace the operation panel.
None of the controllers operate	System setting has not been carried out.	Perform "Module initialize."
·The specified channel does not operate ·The specified control output does not operate ·The specified alarm does not operate ·The specified measured value is not displayed	The operation mode changing specifying has not been correctly set.	Change each item to the operation mode.
	Problem with the controller module.	Replace the module.
	System setting has not been carried out.	Perform "Module initialize."
The press switches on the screen do not operate	The screen is set to Computer mode.	Set to Local mode.
	Problem with the press switches.	Replace the operation panel.
Error messages are displayed	Refer to Section "5.1 Error messages" (P. 5-2).	

(2) Relating to the control unit

① Relating to the PCP module

Problem	Probable cause	Solution
The operation (RUN) lamp does not light	The power is not being supplied.	Check the external breaker, etc.
	The proper power supply voltage is not being supplied.	Confirm the power supply specifications.
	Poor contacts at the power supply terminals.	Tighten the terminals.
	Problem in the power supply unit.	Replace the PCP module.
The operation (RUN) lamp remains lit continuously	The module has become detached.	Restore to the proper mounting condition.
	The configuration of the modules has been changed without carrying out system setting.	Perform "Module initialize."
		Return the configuration to the original specification.
The data sending and receiving (TX, RX) lamps do not light	The power supply of the operation panel or host computer is not ON.	Confirm the power supplies.
	The operation panel connecting cable is detached.	Inspect and replace the cable.
	Problem with the CPU.	Replace the PCP module.
The DO is not output	Problem with the output allocations.	Confirm the allocation settings.
	Problem with the output circuit.	Replace the PCP module.
The failure (FAIL) is output	Problem with CPU of the PCP module or power supply unit.	Replace the PCP module.
The failure (FAIL) is output (The FAIL lamp does not light) The operation (RUN) lamp remains lit	The configuration of the modules has been changed without carrying out system setting.	Perform "Module initialize."
		Return the configuration to the original specification.
	The module has become detached.	Restore to the proper mounting condition.

② Relating to the DI module

Problem	Probable cause	Solution
The operation (RUN) lamp does not flash	Problem with the power supply line.	Replace the motherblock.
	Problem with the power supply.	Replace the PCP module.
	Breakdown in the CPU.	Replace the module.
The operation (RUN) lamp remains lit continuously	A module with a different system specification has been inserted.	Replace with the module that matches the specifications.
	The maximum number of modules that can be connected has been exceeded.	Remove the number of modules in excess.
The failure (FAIL) lamp lights	Breakdown of the CPU.	Replace the module.
None of the input values change	The module is in the not used mode.	Set to the used mode.
	Breakdown in the CPU.	Replace the PCP module.
	Problem with the bus line.	Replace the mother block.
The specified input value does not change	Wire breakage in the sensor.	Replace the sensor.
	Problem with the tightening of the terminals.	Tighten the terminals.
	The module is in the not used mode.	Set to the used mode.
	Breakdown in the input circuit or CPU.	Replace the module.
There is an error on and after the specified module	Problem with the motherblock at the head of the abnormal modules.	Replace the motherblock.
	The module connection has been detached.	Confirm the connections.

③ Relating to the TIO module

Problem	Probable cause	Solution
The operation (RUN) lamp does not flash	Problem with the power supply line.	Replace the motherblock.
	Problem with the power supply unit.	Replace the PCP module.
	Breakdown in the CPU.	Replace the module.
The operation (RUN) lamp remains lit continuously	A module with a different system specification has been inserted.	Replace with a module that matches the specifications.
	The maximum number of modules that can be connected has been exceeded.	Remove the number of modules in excess.
The failure (FAIL) lamp lights	Breakdown of the CPU.	Replace the module.
The specified outputs are not output	Input wire breakage.	Replace the sensor.
	Problem with the external operation equipment.	Inspect the external operation equipment.
	Mistake in wiring or wiring breakage in the output.	Inspect and replace the wiring.
	Terminal screw looseness.	Tighten the terminal screws.
	Breakdown in the output circuit or CPU	Replace the module.
	Problem with the bus line.	Replace the motherblock.
None of the outputs operate	The unit is in the operation stop mode.	Set to the operation start mode.
	The unit is in the not used mode.	Set to the used mode.
	The load power supply is not being supplied.	Supply the power supply.
	The load power supply voltage is outside the rated values.	Change the voltage so that it is within the rated values.
	Breakdown in the main CPU.	Replace the PCP module.
	Problem in the bus line.	Replace the motherblock.
The specified output relay does not become OFF	Welding of the output relay contact point.	Replace the module.
	Problem with the resetting of the external operation equipment caused by the leak current from the surge killer, etc.	Review the surge killer and review the external operation equipment.
	Breakdown in the output circuit or CPU.	Replace the TIO module.
None of the output relays become OFF	Breakdown in the main CPU.	Replace the PCP module.
·The outputs cause chattering	Problem with the tightening of the terminals.	Tighten the terminals.
·ON/OFF key occurs in an extremely short time period	The control time period is too short.	Change the setting of the time period.
	Miss operation caused by too much noise.	Investigate the installation of a noise filter.
None of the input values change	The module is in the not used mode.	Set to the used mode.
	Breakdown in the main CPU.	Replace the PCP module.
	Problem with the bus line.	Replace the motherblock.
The specified input value does not change	Wire breakage in the sensor.	Replace the sensor.
	Problem with the tightening of the terminals.	Tighten the terminals.
	The unit is in the unused mode.	Set to the used mode.
	Breakdown in the input circuit or CPU.	Replace the module.
There is an error in a module following after the specified module	Problem with the mother block at the head of the abnormal modules.	Replace the motherblock.
	The module connection has been detached.	Confirm the connections.

Continued on the next page.

Continued from the previous page

Problem	Probable cause	Solution
The control is unstable	The PID constant values are inappropriate.	Execute auto tuning or change the settings of the PID constants.
	Problem with the tightening of the terminals.	Tighten the terminals.
	Problem with the operation of the external operation equipment.	Replace the external operation equipment.
	Breakdown in the output circuit or CPU.	Replace the TIO module.

④ Relating to the DO module

Problem	Probable cause	Solution
The operation (RUN) lamp does not flash	Problem with the power supply line	Replace the mother block.
	Problem with the power supply.	Replace the module.
	Breakdown in the CPU.	Replace the module.
The failure (FAIL) lamp lights	The maximum number of modules that can be connected has been exceeded.	Remove the number of modules in excess.
	Breakdown of the CPU.	Replace the module.
The specified outputs do not operate (The RUN lamp flashes)	Problem with the external operation equipment.	Inspect the external operation equipment.
	Mistake in wiring or wiring breakage in the output unit.	Inspect and replace the wiring.
	Terminal screw looseness	Tighten the terminal screws.
	Breakdown in the output circuit or CPU.	Replace the module.
	Problem with the bus line.	Replace the mother block.
None of the outputs operate	The load power supply is not supplied.	Supply the power supply.
	The load power supply voltage is outside the rated values.	Change the voltage so that it is within the rated values.
	Breakdown in the main CPU.	Replace the PCP module.
	Problem in the bus line	Replace the mother block.
The specified output relay does not become OFF	Welding of the output relay contact.	Replace the module.
	Problem with the resetting of the external operation equipment caused by the leak current from the surge killer, etc.	Review the surge killer and review the external operation equipment.
	Breakdown in the output circuit or CPU.	Replace the module.
None of the output relays become OFF	Breakdown in the main CPU.	Replace the PCP module.
The outputs cause chattering	Problem with the tightening of the terminals.	Tighten the terminals.
ON/OFF switching occurs in an extremely short time period	The control time period is too short.	Change the setting of the time period.
	Miss operation caused by too much noise.	Investigate the installation of a noise filter.
There is an error on and after the specified module	Problem with the mother block at the head of the abnormal modules.	Replace the mother block.
	The module connection has been detached.	Confirm the connections.

⑤ Relating to the CT module

Problem	Probable cause	Solution
The operation (RUN) lamp does not flash	Problem with the power supply line.	Replace the mother block.
	Problem with the power supply.	Replace the module.
	Breakdown in the CPU.	Replace the module.
The failure (FAIL) lamp lights	A module with a different system specification has been inserted.	Replace with a module that matches the specifications.
	The maximum number of modules that can be connected has been exceeded.	Remove the number of modules in excess.
	Breakdown of the CPU.	Replace the module.
Error the current taking in values	A CT sensor with a different specification from the module specification has been used.	Replace the CT sensor.
	Heater break.	Inspect the heater.
	Looseness of terminals, or mistaken wiring between channels.	Tighten the terminals, or confirm the wiring.
	Breakdown of the input circuit or CPU.	Replace the module.
There is an error on and after the specified module	Problem with the motherblock at the head of the abnormal modules.	Replace the motherblock.
	The module connection has been detached.	Confirm the connections.

5.3 Replacement precautions

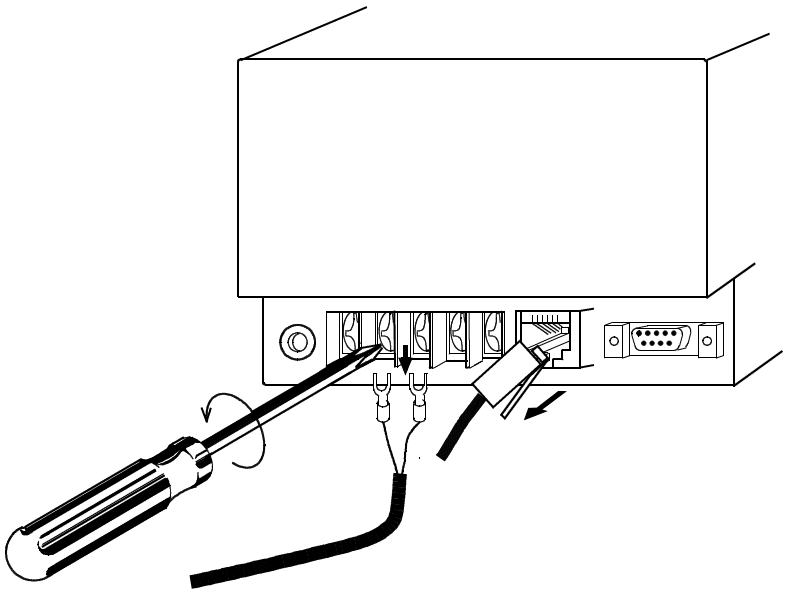
⚠ WARNING

- To prevent electric shock or instrument failure, always turn off the system power before replacing the instrument.
- To prevent electric shock or instrument failure, always turn off the power before mounting or removing the operation panel.
- To prevent electric shock or instrument failure, do not turn on the power untill all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

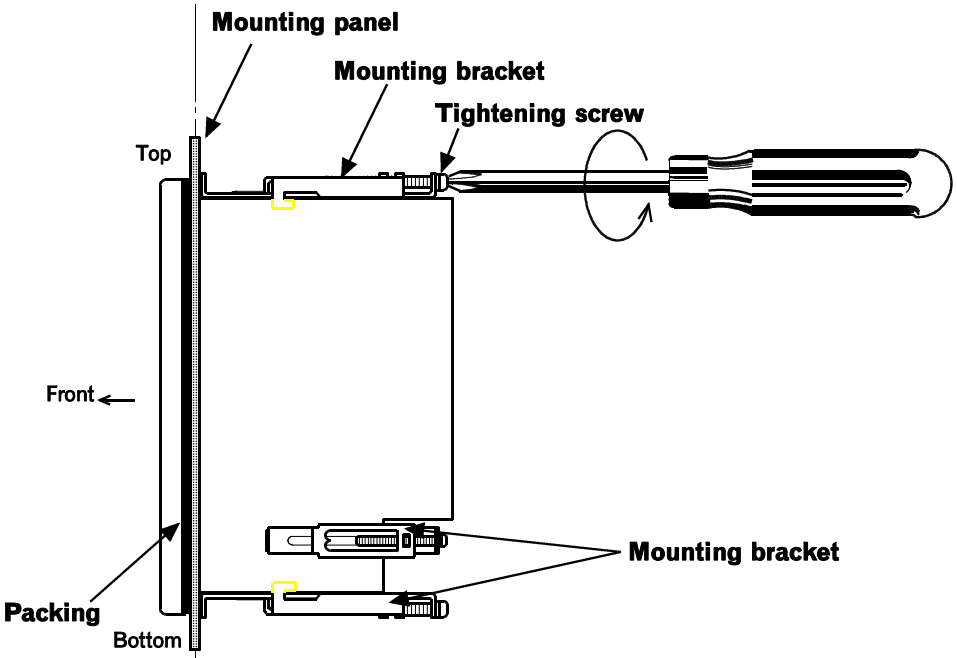
Replacement procedure

① Turn off the power for the Operation Panel.

② Remove the wires connected to the rear terminal board and the connector.

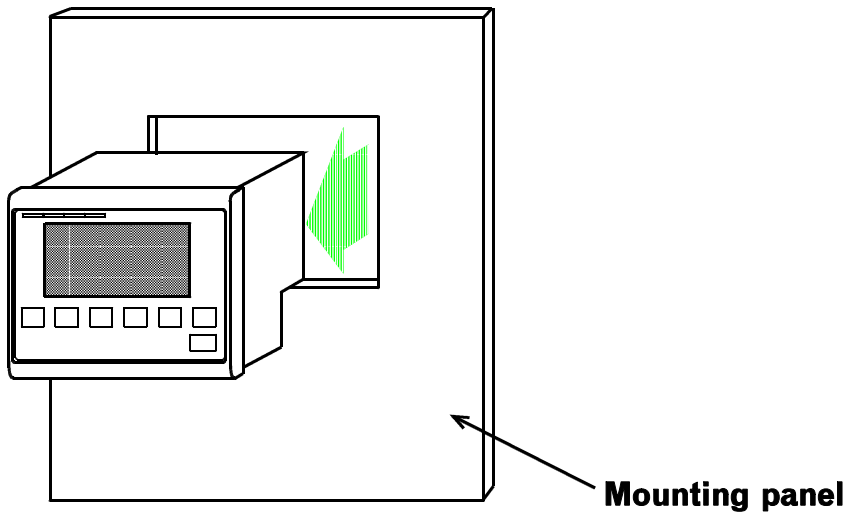


③ Removing the mounting brackets.



Loosen the tightening screws of the mounting brackets in the 2 places at the top and bottom of the main unit rear side (Total 4 places), and remove the mounting brackets. At this time, support the main unit to stop it falling out from the front face of the mounting panel.

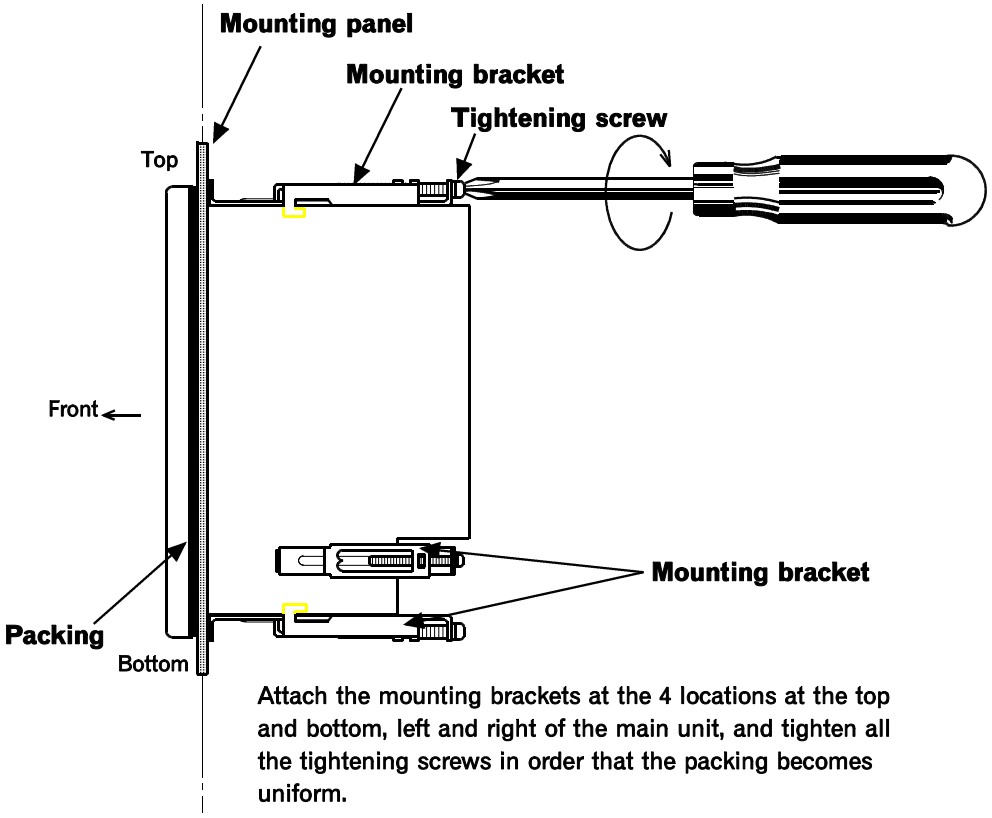
④ Remove the operation panel from the mounting panel.



⑤ Mount the normal operation panel.
For mounting, follow the reverse order of dismounting.

CAUTION

Tighten the bracket setscrew so that the thickness of the dustproof packing is uniform, otherwise the operation panel may not be fully dustproof and waterproof.



Attach the mounting brackets at the 4 locations at the top and bottom, left and right of the main unit, and tighten all the tightening screws in order that the packing becomes uniform.

Tightening torque (Recommended value) : 0.3 N·m (3 kgf·cm)

⑥ Conduct the wiring and connection.

⑦ Turn on the power for the Operation Panel.

⑧ Replacement completion

* For details of mounting and wiring, see "2 .MOUNTING AND WIRING" (P. 2-1).

SPECIFICATIONS

6

6.1 Display specifications

Item	Details
Display	Screen type: STN dot−matrix LCD (transmissivity type)
	Number of dots: 128 (W) × 48 (H) dots
	Screen area: 90 (W) × 36 (H) mm
	Color: Blue type
	Backlight: Cool fluorescent tube (CFL)
	Contrast: Adjustment with switches on front panel
	Number of screened characters : 16 characters × 3 lines (8 × 16 dots characters) 16 characters × 6 lines (5 × 7 dots characters)
	Character types: Alphanumeric, symbols
	Character size: Half−size characters (8 × 16 dots) Full−size characters (16 × 16 dots) Characters (5 × 7 dots)
	Graphic screen: Screen frame
	Display details: Displays the measured value and set value of control unit, and various switches.
LED indicators	POWER: Green LED (Lights when power goes on.)
	SUB1, SUB2: Red LED (Indicates sub output)
	FAIL: Red LED (Lights when the operation panel malfunctions.)

6.2 Function specifications

Item	Details
Screen scanning function	Applicable screens: Automatically scans the operating monitoring screens
	Setting method: Set on initialize screen
	Setting item: ① Scan time: 1 to 9999 second ② Selection of presence or absence of scan function ③ Scan type: Unit/item transfer select
Screen saver function	Applicable screens: All screens
	Setting method: Set on initialize screen
	Setting item: ① Screen saver time: 1 to 99 minute ② Selection of presence or absence of screen saver
Data protection at power failure	Data protection: Buckup by EEPROM
	Number of re−writing times:10,000 times Data storage period : Approx. 10 years *However, the above life differs depending on the product storage period, and storage and operating environments.
Control unit error monitoring function	Check items: Communication stop is monitored.
	Error display: An error message is displayed on LCD display unit.
Digital output function (SUB output)	① Number of output points: 1 ② Output type: Relay contact output ③ Rating: 250 V AC, 1 A or less (Resistive load) 1'a'contact (Energized or de−enerigized [Z−140C] can be selected.) Electrical life:300,000 times or more (Rated load) ④ Output details: Selectable from among ALM1, ALM2, Burnout, HBA, Temperature rise completion, LBA, communication error and Unused.
Name setting function	① Alarm message setting Number of setting characters : 16 half−size characters ② Channel name setting Number of setting characters : 5 half−size characters
Self−diagnostic function	Check item: ① RAM check ② Watchdog timer
	Error display: FAIL lamp lighting or error message screen display

6.3 Control unit communication specifications

Item	Details
Communication interface	Based on RS−422A, EIA standard
Communication protocol	Based on ANSI X3.28-1976 subcategories 2.5 and B1 Polling/selection type
Communication method	4−wire system, multidrop connection (RS−422A)
Synchronous method	Start/stop synchronous type
Communication speed	2400bps, 4800bps, 9600bps
Data format	Start bit: 1 Data bit: 7 or 8 Parity bit: Unused or Used (Odd number or Even number) *For 8 data bits : None Stop bit: 1
Data type	ASCII code
Maximum number of connection	16 units (When multidrop connection) *Maximum No. of modules per control unit : 10 modules

6.4 Host communication specifications

Item	Details
Communication interface	Based on RS−232C, EIA standard Based on RS−422A, EIA standard Based on RS−485, EIA standard *Can be specified when ordering.
Communication protocol	Based on ANSI X3.28-1976 subcategories 2.5 and B1 Polling/selection type
Communication method	Point−to−point connection (RS−232C) 4−wire system, multidrop connection (RS−422A) 2−wire system, multidrop connection (RS−485)
Synchronous method	Start/stop synchronous type
Communication speed	2400bps, 4800bps, 9600bps
Data format	Start bit: 1 Data bit: 7 or 8 Parity bit: Unused or Used (Odd number or Even number) Stop bit: 1 or 2
Data type	ASCII code
Maximum number of connection	RS−232C: 1 set RS−422A: 16 sets RS−485: 16 sets

6.5 Power supply specifications

● 100 to 240V AC type

Item	Details
Power supply voltage	90 to 264 V AC (50/60 Hz) Including power supply voltage variation. (Rated:100 to 240 V AC)
Power consumption	14.0 VA max. (For 90 to 264 V AC) [CE/UL/cUL (or CSA) approved instrument] 18.0 VA max. (For 240 V AC) 11.0 VA max. (For 100 V AC)

● 24V DC type

Item	Details
Power supply voltage	21.6 to 26.4 V DC (Ripple:10% P−P or less) (Rated: 24 V DC)
Power consumption	6 W max. (0.3 A or less)

6.6 Others

Item	Details
Performance	Insulation resistance Between power and grounding terminals : 20 MΩ or more at 500 V DC
	Dielectric resistance Between power and grounding terminals : 1500 V AC for 1 minute
	Dustproof and waterproof: IP55 (However, applied only to the front panel of the operation panel mounted on the panel)
Working environment conditions	Allowable ambient temperature: 0 to 40 °C
	Allowable ambient humidity: 45 to 85 % RH (No condensation)
	Ambient operating atmosphere: No corrosive gases, no large amounts of dust or particulates.
Construction	Method of attachment: Panel attachment
	Weight: Approx. 700 g
	External dimension: 144 (W) × 96 (H) × 70 (D) mm [CE/UL/cUL (or CSA) approved instrument] 144 (W) × 96 (H) × 73 (D) mm

Supplementary Manual

OPL initialize
Controller initialize

This manual describes initialize settings (controller and OPL initialize) in the dedicated operation panel for the SR Mini SYSTEM.
Usually, these settings do not need to be changed during normal operation; unnecessary changes could cause malfunction and trouble.
Therefore, do not change the settings unless required.

CAUTION

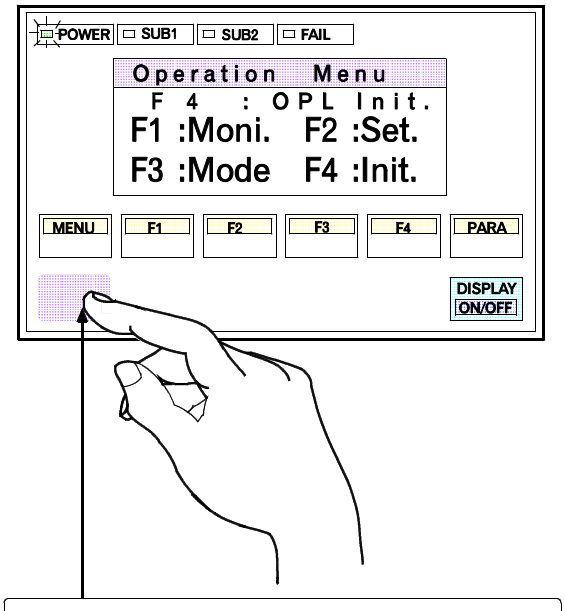
When the OPL initialize or controller initialize setting is changed, turn the power off once, then turn the power on again. The re-set item become valid when the power is turned on.

CONTENTS

(Releasing OPL/controller initialize calling– up key protect)

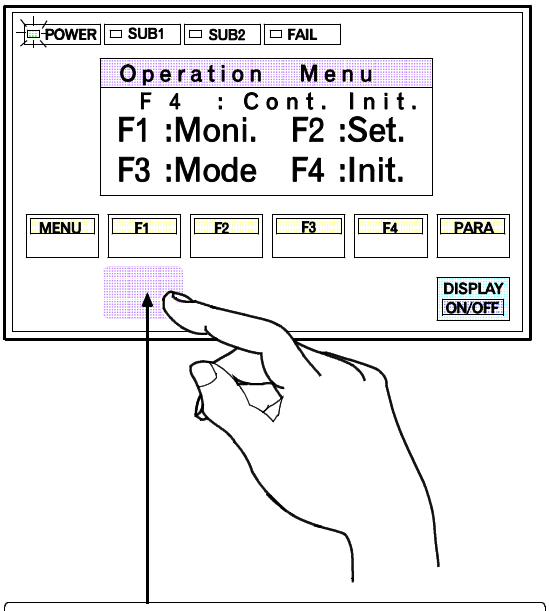
The F4 swtches (Init.) for changing the display to the OPL initialize and controller initialize screens are protected, so you can not switch to these screens without removing the protection.

For the OPL initialize



If this section on the operation menu screen is pressed 8 times or more successively, a "F4: OPL Init." message appears at the top of the operation menu screen.
Pressing the F4 key displays the OPL initialize menu screen.

For the controller initialize



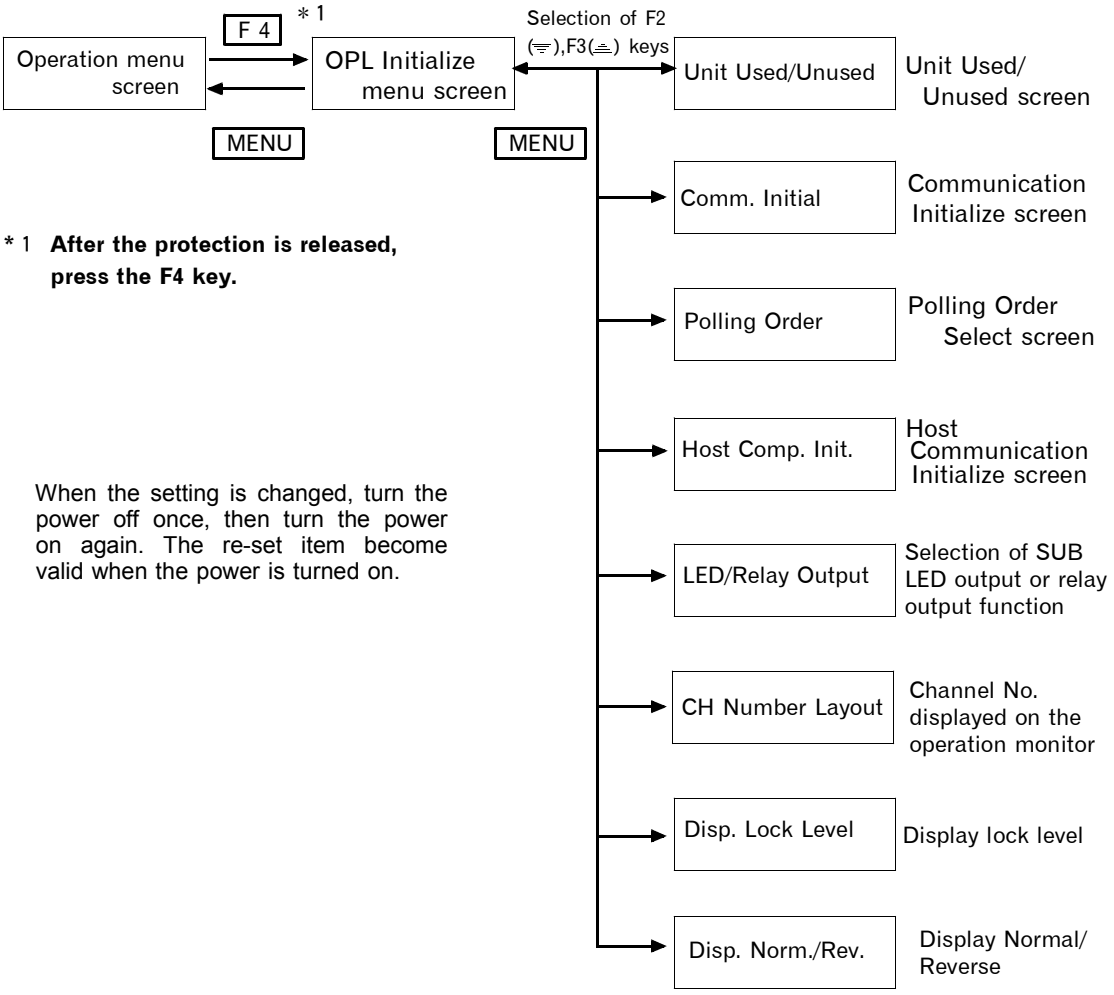
If this section on the operation menu screen is pressed 8 times or more successively, a "F4: Cont. init." message appears at the top of the operation menu screen.
Pressing the F4 key displays the controller initialize opening screen.

- Release the F4 swtch protection for changing the display to the OPL initialize and controller initialize screens on the operation menu screen.
- The protection is released when the "F4: OPL Init." or "F4: Cont. init." message is displayed, and pressing the F4 key displays the initialize menu screen.
- After the "F4: OPL Init." or "F4: Cont. init." message is displayed, if any key other than the above key is pressed, protect release is cancelled. In this case, call up the operation menu screen again to perform the protect release operation.

1. OPL initialize

This is used for various settings related to the OPL (operation panel) itself.

1.1 Calling procedure



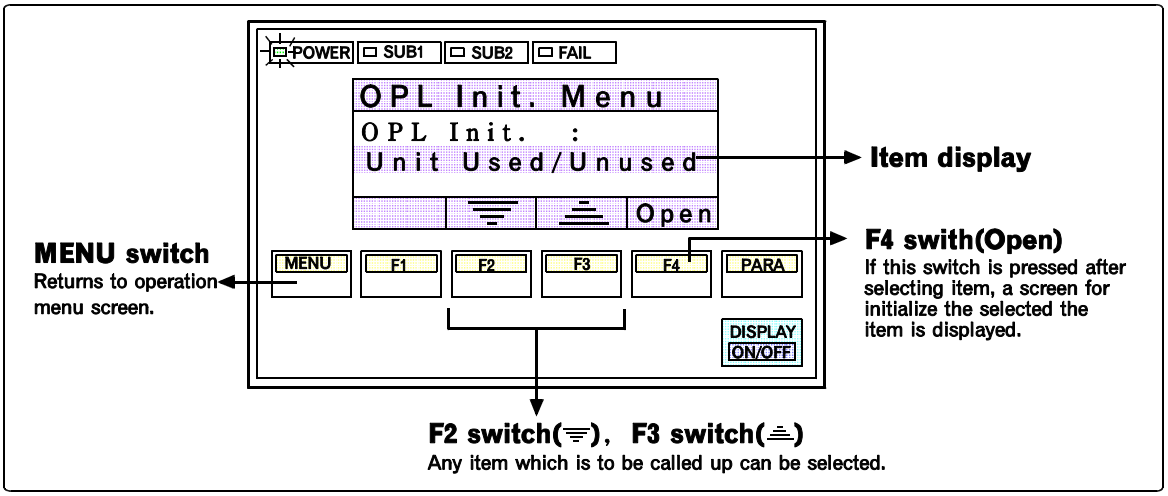
* 1 **After the protection is released, press the F4 key.**

When the setting is changed, turn the power off once, then turn the power on again. The re-set item become valid when the power is turned on.

The PARA key cannot be used to move between each item. Therefore, in order to set one of the other items, press the MENU key to return to the OPL initialize menu screen, then select the relevant item.

1.2 OPL initialize menu screen

Every time the F2 or F3 switch is pressed, the initialize menu screen is displayed.
Select the desired initialize menu, then display the initialize screen by pressing the F4 switch.

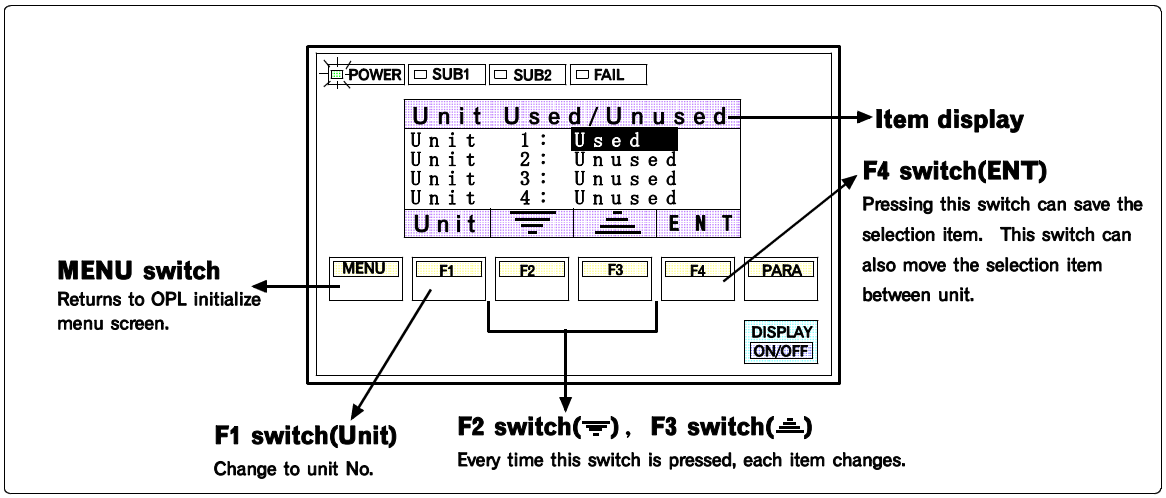


1.3 Unit used/unused

This screen is used to select "Used/Unused" of the control unit when the control unit is multidrop connected.

CAUTIONS

- If the connected control unit is turned to "Unused," data on that control unit is not displayed on the screen.
- Prior to factory shipment, only Unit 1 is set to "Used." The others are set to "Unused."



* The setting becomes valid when the power supply is turned on again.

<Unit used/unused>

Unit 1 selection : Used / Unused
Unit 2 to 16 selection : Used / Unused

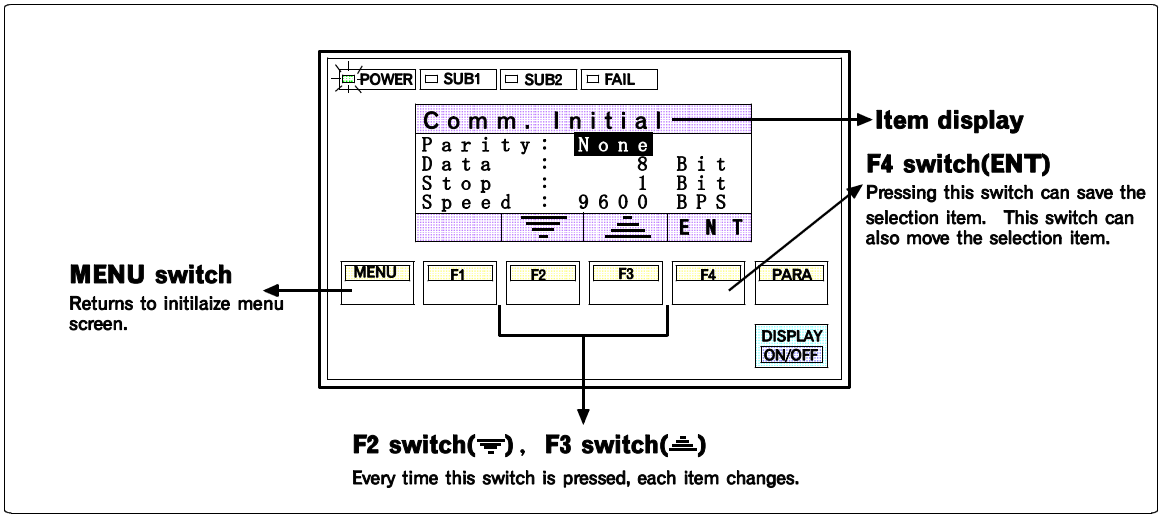
: Setting prior to factory shipment

1.4 Communication initialize settings

This screen is used to perform settings related to communications between the operation panel and the control unit. The bit format and communication speed are set.

CAUTION

As the values on this screen are fixed, do not change them.



* The setting becomes valid when the power supply is turned on again.

< 1. Bit Format >

Parity bit selection : None / Even / Odd
Data bit selection : 8 / 7 (When "8" is selected: No parity bit)
Stop bit : 1 / 2

: Setting prior to factory shipment

< 2. Speed >

Communication speed selection :
2400 / 4800 / 9600 (bps)

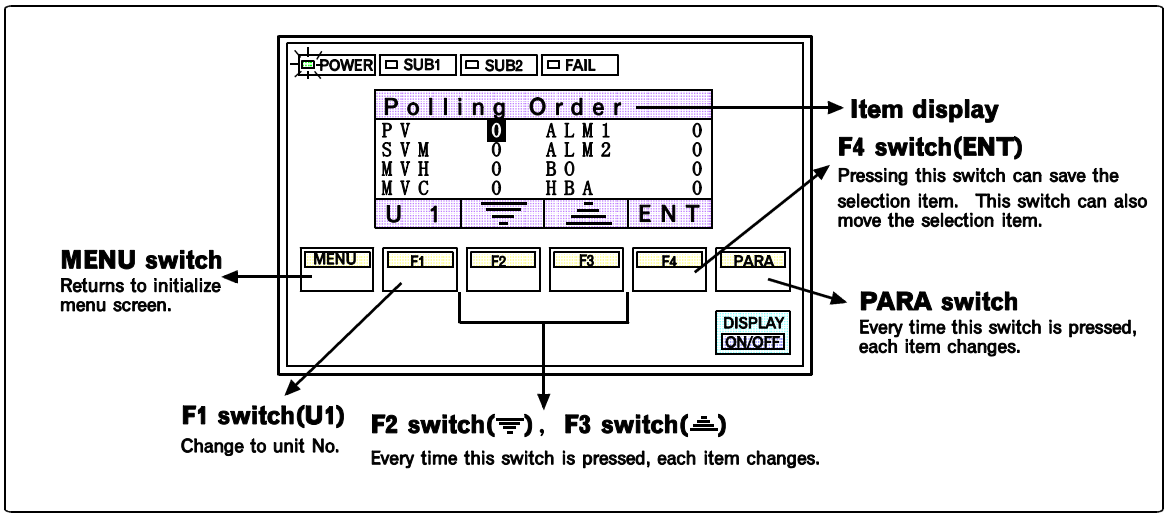
: Setting prior to factory shipment

NOTES

- When the communication speed needs to be changed, always change it to the same value with the control unit.
  Both the operation panel and control unit are set to "9600bps" prior to factory shipment .
- This setting is the communication setting with the control unit to be used.
  The communication setting with a host computer is set on the "1.6 Host communication initialize settings" (P. A-10) screen.

1.5 Polling Order select

This screen is used to call up (polling) data from the control unit for monitoring and set the priority order of each data type for each control unit.



* This setting does not affect the order of control sampling.

* The setting becomes valid when the power supply is turned on again.

<1. Deteals of polling order item >

	First screen	Second screen
Item detial	PV	LBA
	SVM	CT1
	MVH	CT2
	MVC	TRC
	ALM1	Err.
	ALM2	MVM
	BO	
	HBA	

<2. Polling order>

0 : Polling is performed every time.

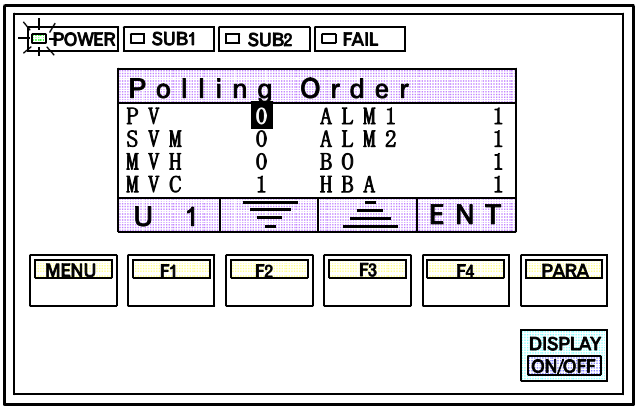
1 : After polling with prority 0 is finished, polling with priority 1 is performed.

2 : No polling is performed.

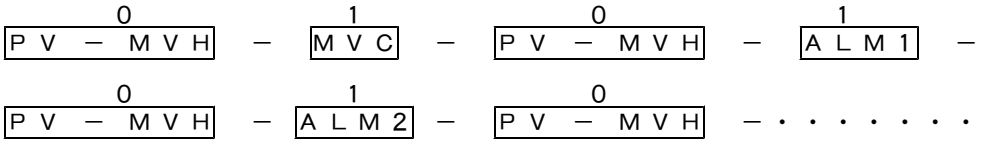
: Setting prior to factory shipment

* The order of polling priority may be set to "2" automatically depending on the specification.

Setting example:



For example if the setting is as shown above, the order of data capture by the operation panel becomes as follows.



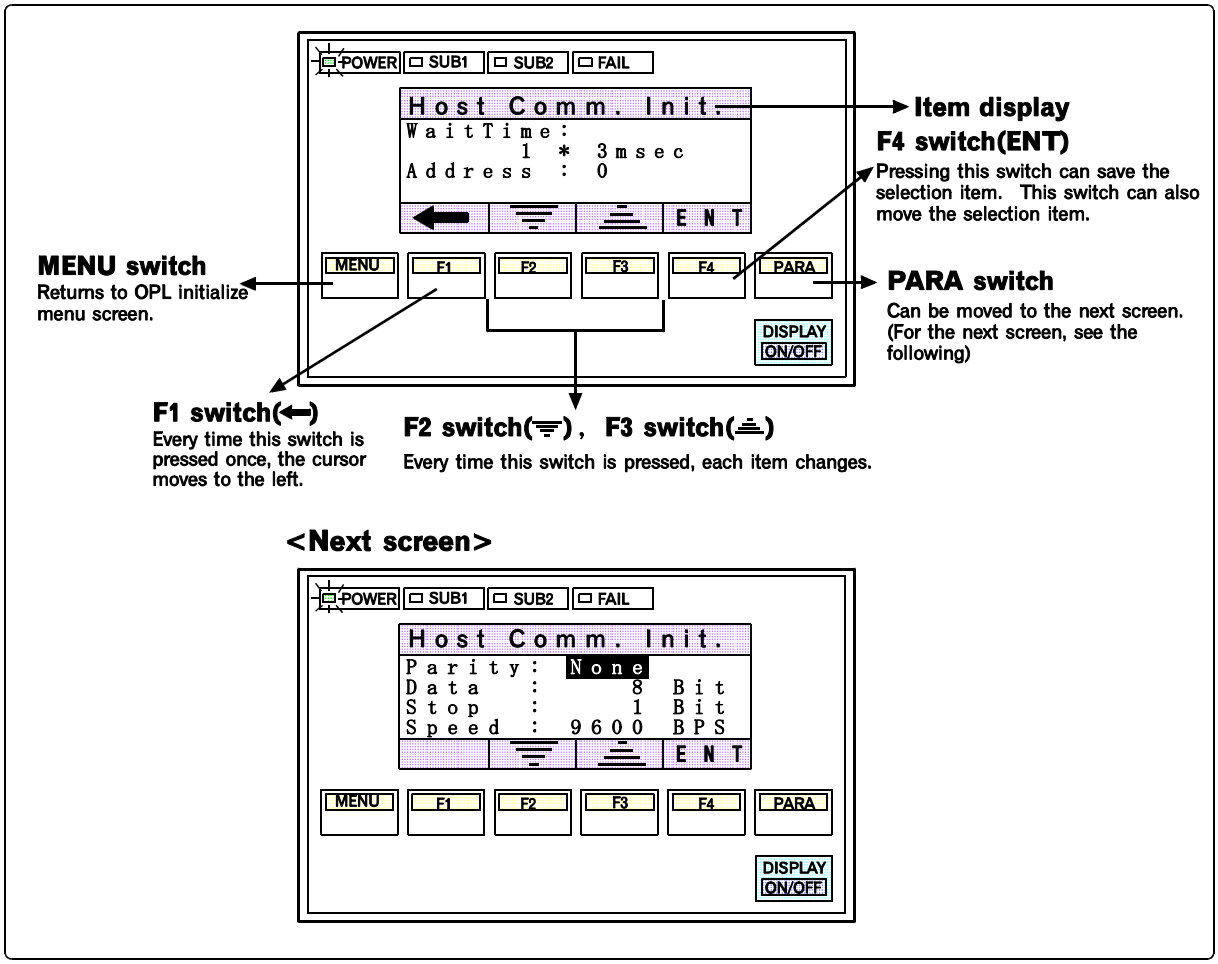
This means that the data on PV (measured value) and heating output which are set to zero is captured first and are updated on the display earlier than the other data.
In this manner,use this setting when the monitoring of the samll changes on the specific data is necessary.
(All values are set to "0" when shipped from factory.)

NOTE

If the function which does not exist in the system is set to "2" (No polling), the updating period of the display can be done faster. The display shows "----" for the item set to "2."

1.6 Host communication initialize settings

This screen is used to set the communication format when the operation panel is controlled by the host computer. The device address of the operation panel itself, bit format and communication speed are set.



* The setting becomes valid when the power supply is turned on again.

< 1. Sending selection time >

The sending selection time is set.

Sending selection time factor : 0 to 100

: Setting prior to factory shipment

< 2. Address >

The device address of the operation panel is selected and set.

Address selection : 0 to 15 (Address No. : 0 to 15)

: Setting prior to factory shipment

< 3. Bit Format >

The communication bit format of the operation panel is selected and set.

Parity bit selection : None / Even / Odd
Data bit selection : 8 / 7 (When "8" is selected: No parity bit)
Stop bit : 1 / 2

: Setting prior to factory shipment

< 4. Speed >

Communication speed with the host computer is selected and set.

Communication speed selection :
2400 / 4800 / 9600 (bps)

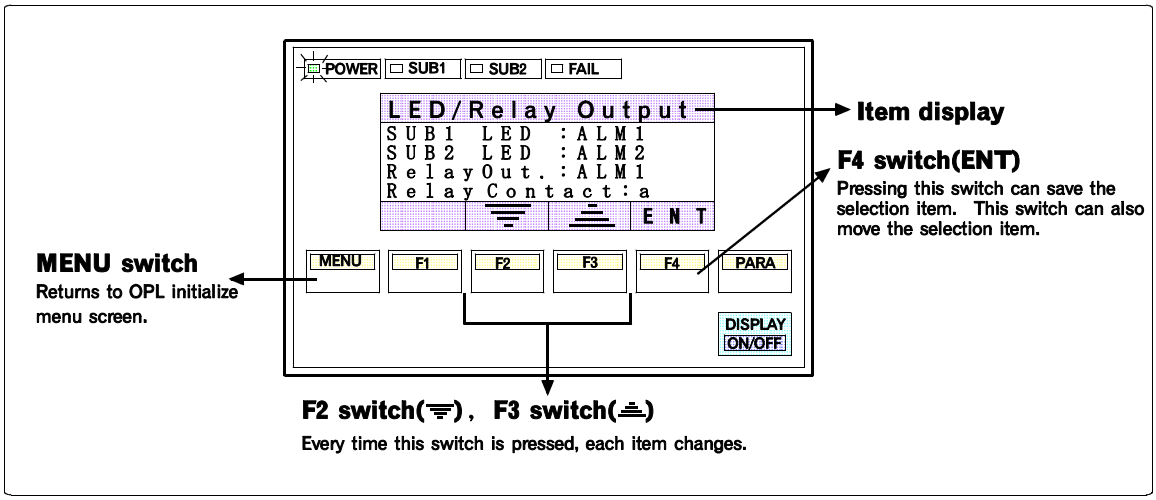
: Setting prior to factory shipment

NOTES

- Set host communications in the same way as external host computer settings.
- This setting is the communication setting with the host computer to be used.
  The communication setting with the control unit is done on the screen "1.4 Communication initialize settings" (P. A-7).

1.7 SUB output LED/relay function selection

This screen is used to assign output types so that even the SUB output signal on the operation panel side can be output when the control unit outputs an alarm or after a temperature rise is completed.



<1. SUB 1 LED>

Selection: ALM1 / ALM2 / Burnout / HBA / T. R. C. / LBA / SCI err / Unused

: Setting prior to factory shipment

<2. SUB 2 LED>

Selection: ALM1 / ALM2 / Burnout / HBA / T. R. C. / LBA / SCI err / Unused

: Setting prior to factory shipment

<3. Relay output>

Selection: ALM1 / ALM2 / Burnout / HBA / T. R. C. / LBA / SCI err / Unused

: Setting prior to factory shipment

<4. Relay contact>

Choice : 'a' (Energized) / 'b' (De−energized)

: Setting prior to factory shipment

Energized / De - energized	At power - OFF	At power - ON	
		Non - alarm state	Alarm state
Energized alarm **Setting : 'a'**			
De - energized alarm **(Z - 140C)** **Setting : 'b'**			

NOTE

When relay contact 'a' is selected in any of the following cases, the SUB output contact is closed.
When relay contact 'b' is selected, the SUB output contact opens.

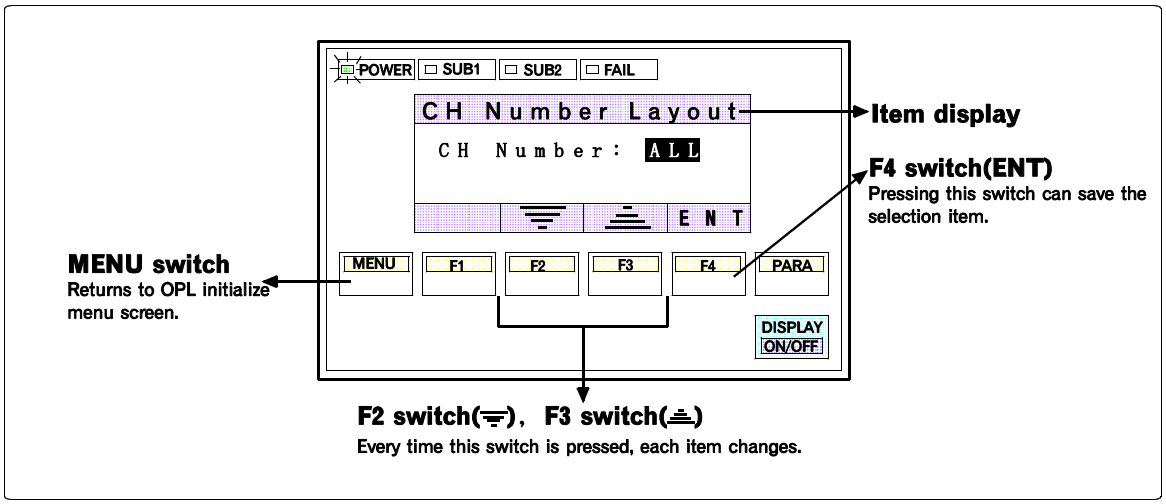
① When any of ALM1, ALM2, HBA, BO, and LBA alarms occurs

② The temperature rise of all control units has completed.

③ When any of OPL parity (parity error), OPL Framing (framing error), OPL Over Run (overrun error) and OPL Time−out (no response) occurs

1.8 Channel No. displayed on the operation monitor

This function is used to set the number of display channels on the moniter screen.



<Display of channel No.>

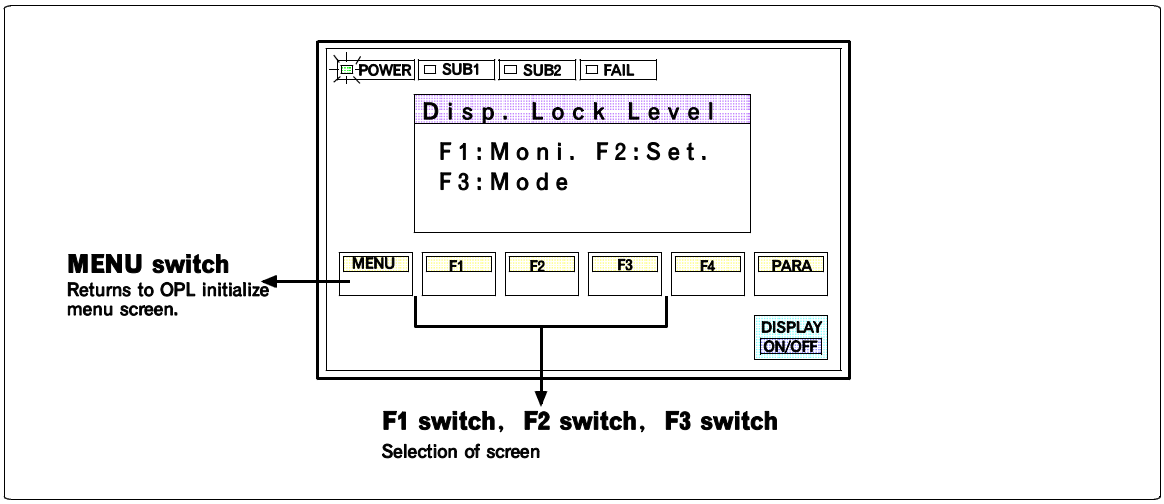
ALL : The 1, 2, 4 or 10 CH screen can be selected by the menu.
1 : Only the 1 CH screen is valid.
2 : Only the 2 CH screen is valid.
4 : Only the 4 CH screen is valid.
10 : Only the 10 CH screen is valid.

: Setting prior to factory shipment

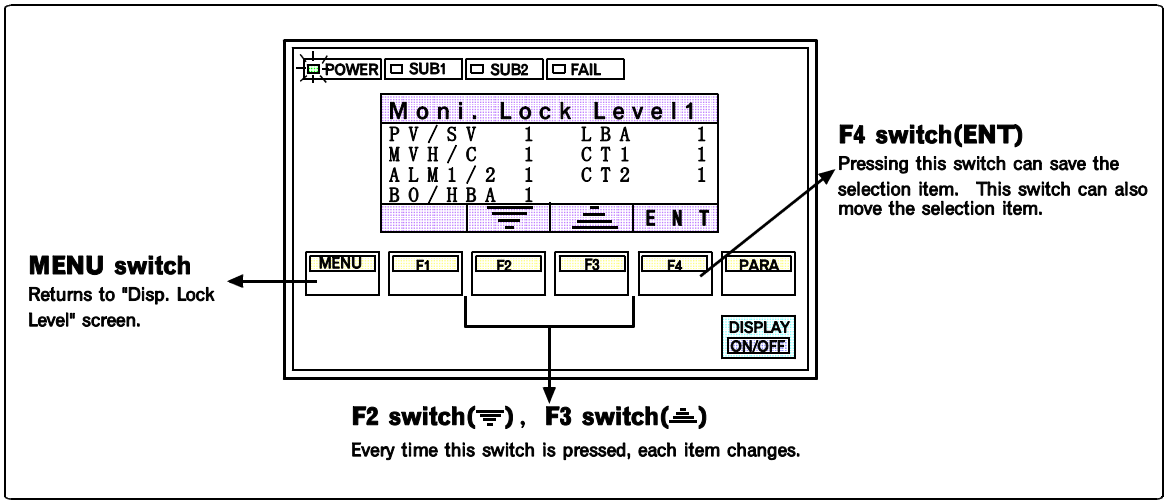
* If the number of display channels other than "ALL" is selected, no operation menu screen is displayed.

1.9 Display lock level

This function is used to select display/no−display of the screen regardless of whether the module (SR Mini) is connected.



Setting operation monitor screen

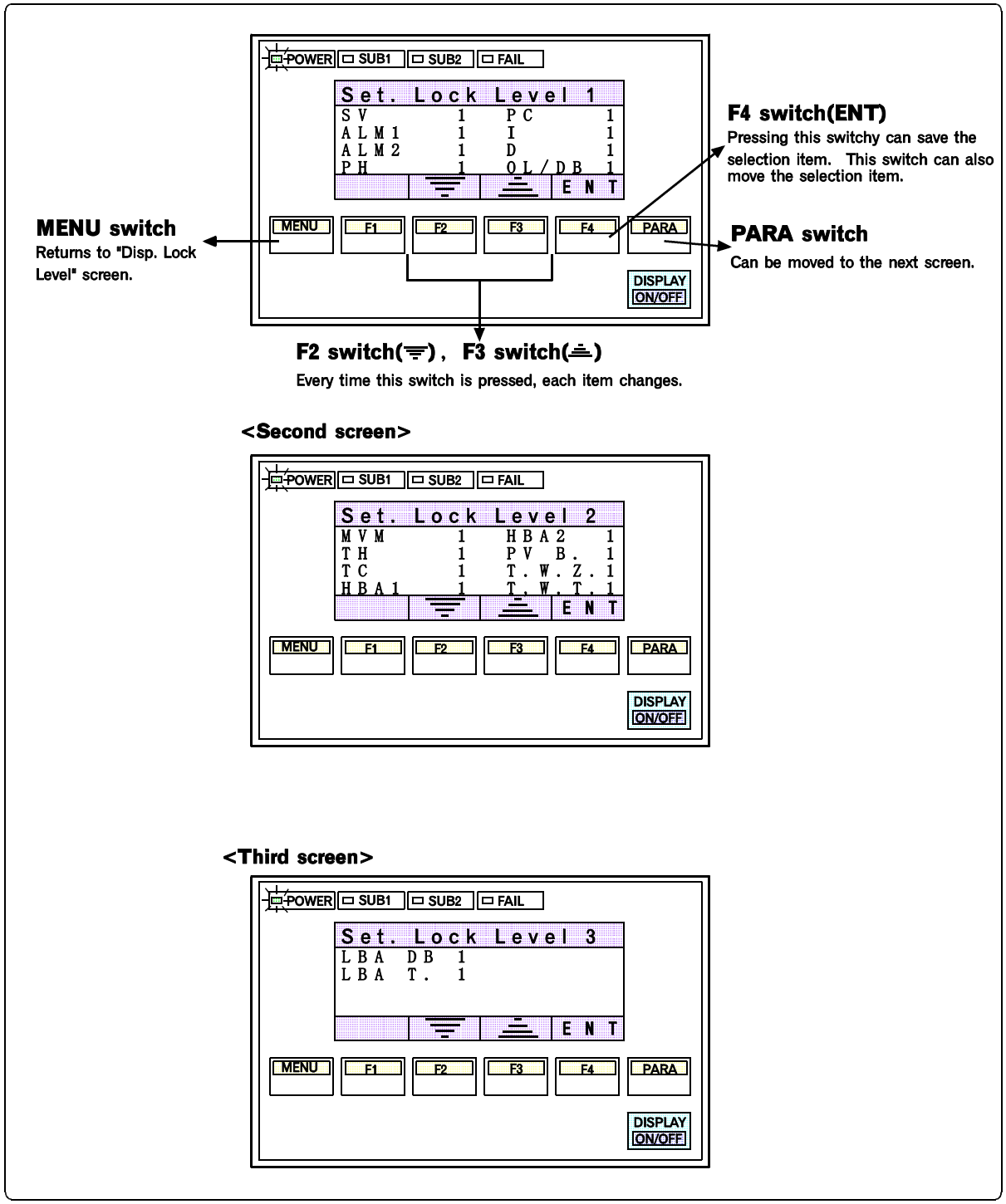


< Presence or absence of screen display>

1 : Display valid
0 : Display invalid

: Setting prior to factory shipment

Setting display lock level



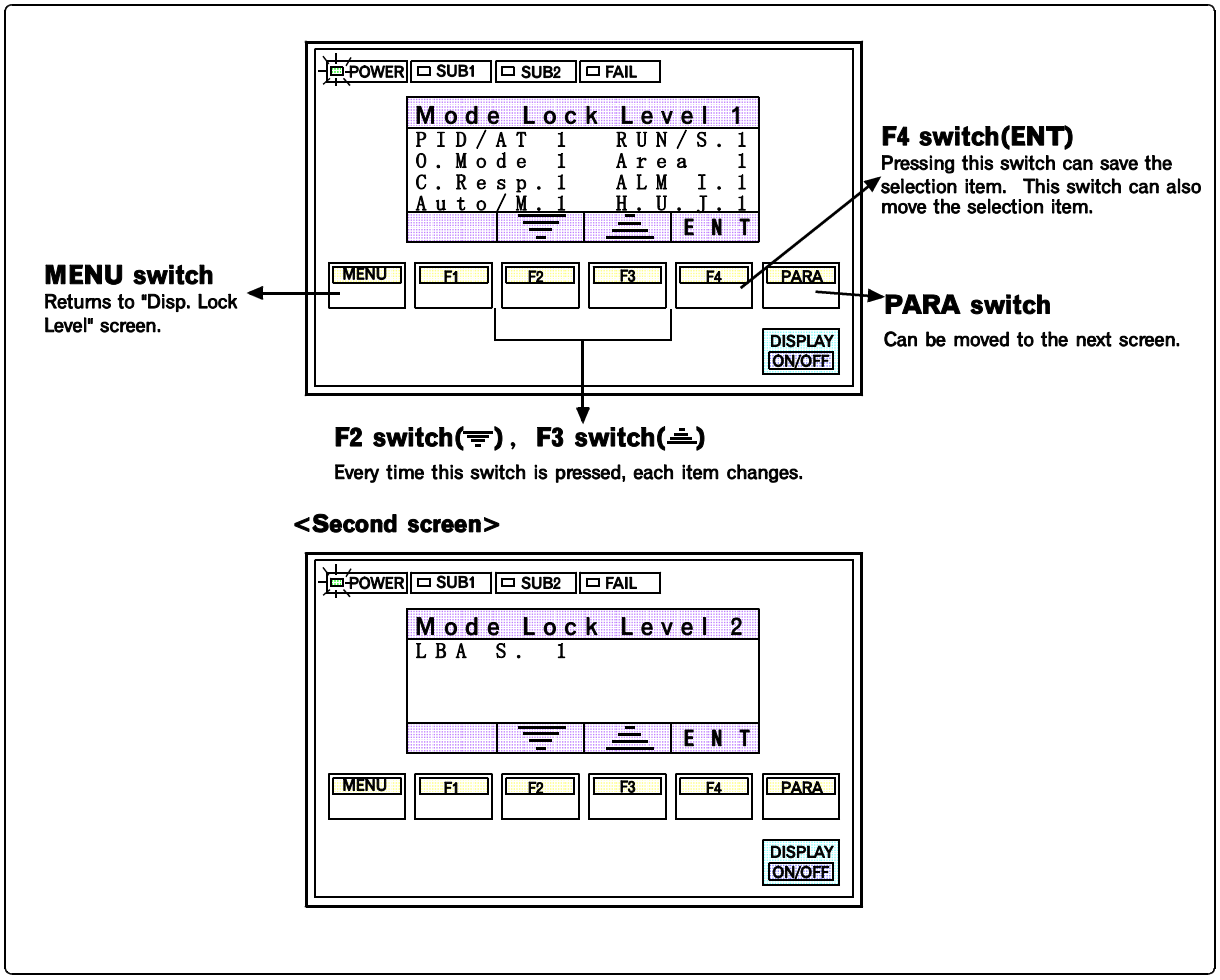
< Presence or absence of screen display>

1 : Display valid

0 : Display invalid

: Setting prior to factory shipment

Setting mode lock level



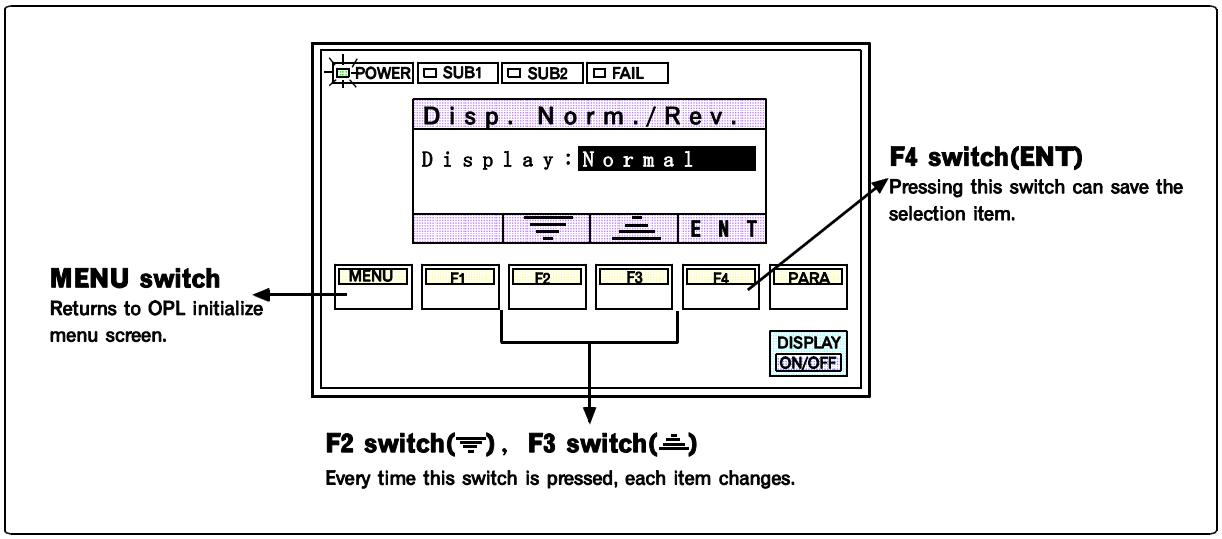
< Presence or absence of screen display>

1 : Display valid
0 : Display invalid

: Setting prior to factory shipment

1.10 Reverse/normal of the screen display

This screen is used to set reverse/normal of the screen display.



<Display of screen>

Normal : Normal display

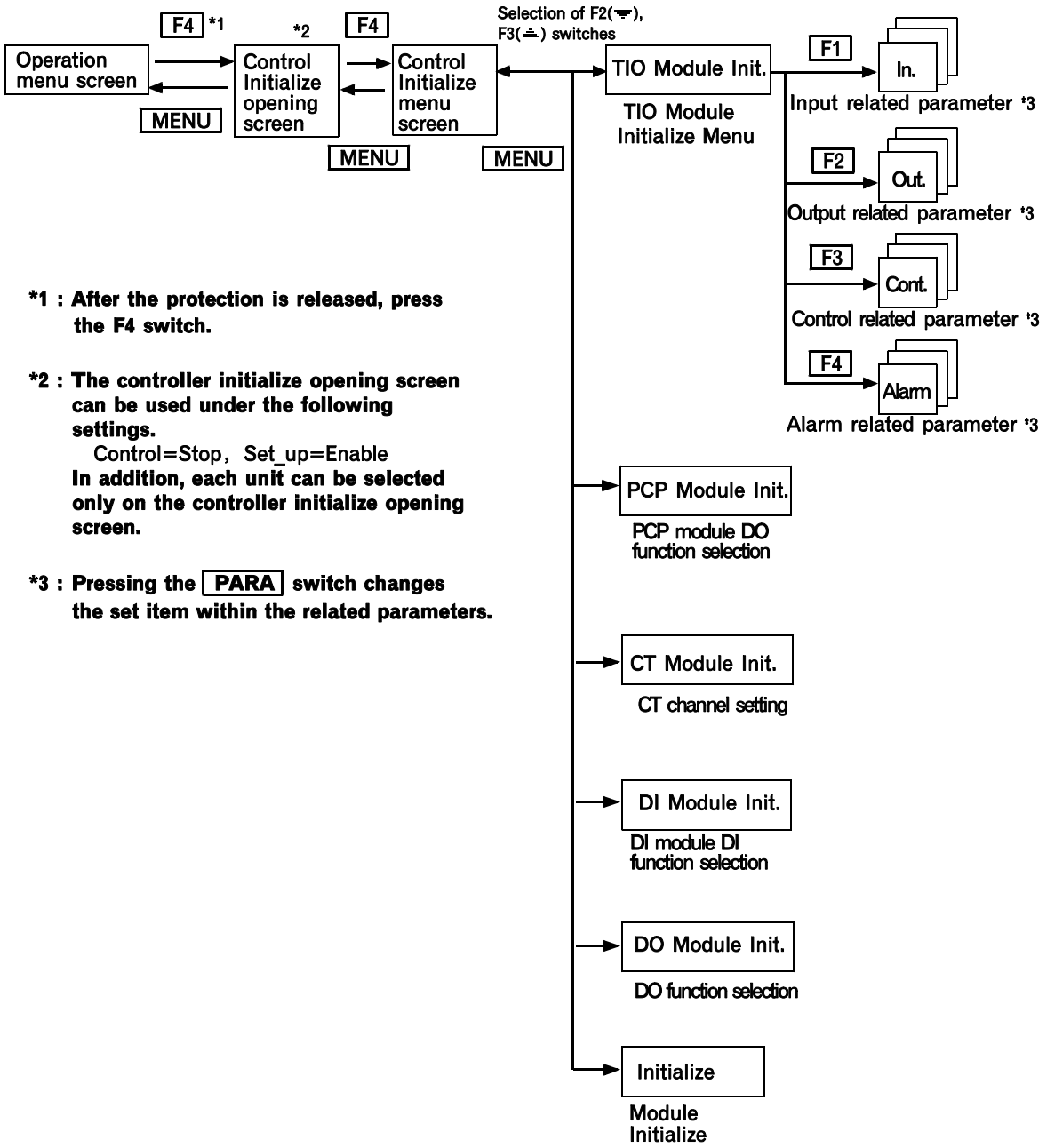
Reverse : Reverse display

: Setting prior to factory shipment

2. Controller initialize

This screen is used to perform various settings to the control unit itself.

2.1 Calling procedure



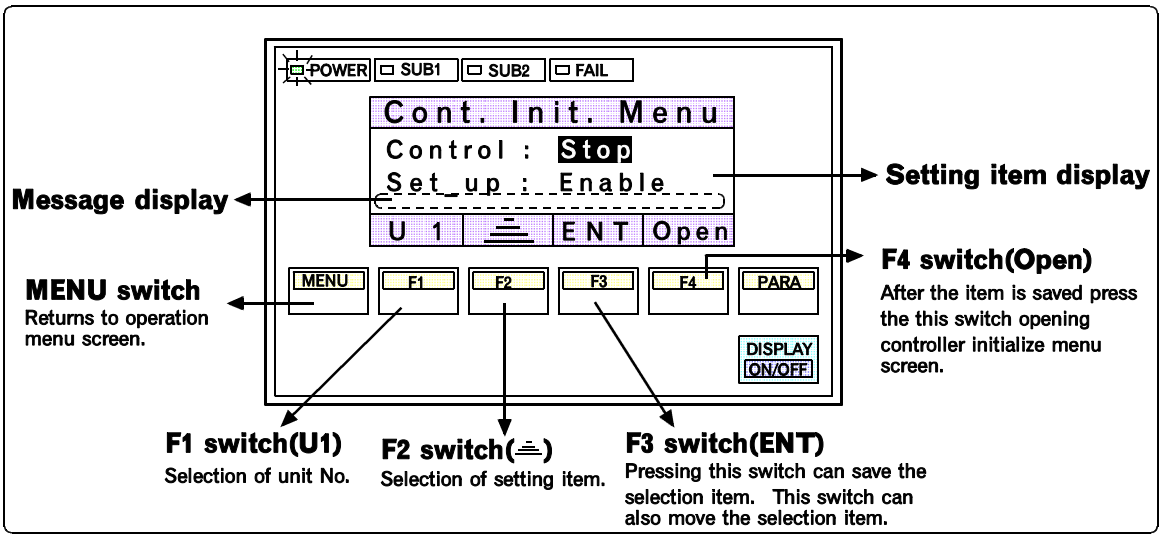
***1 : After the protection is released, press the F4 switch.**

***2 : The controller initialize opening screen can be used under the following settings.**
Control=Stop, Set_up=Enable
In addition, each unit can be selected only on the controller initialize opening screen.

***3 : Pressing the PARA switch changes the set item within the related parameters.**

2.2 Controller initialize opening screen

After the protection is released on the operation menu screen, pressing the F4 switch displays the controller initialize opening screen.



● Setting condition display

The conditions to enter the initialize settings are set.

The switch used to enter the initialize settings becomes valid when **Set_up=Enable** and **Control=Stop**.

For this setting, reverse–display the desired setting display section, select the section by pressing the F2 switch, then save the values by pressing the F3 switch.

Control selection : Run / Stop
Set_up selection : Disable / Enable

: Settings prior to factory shipment

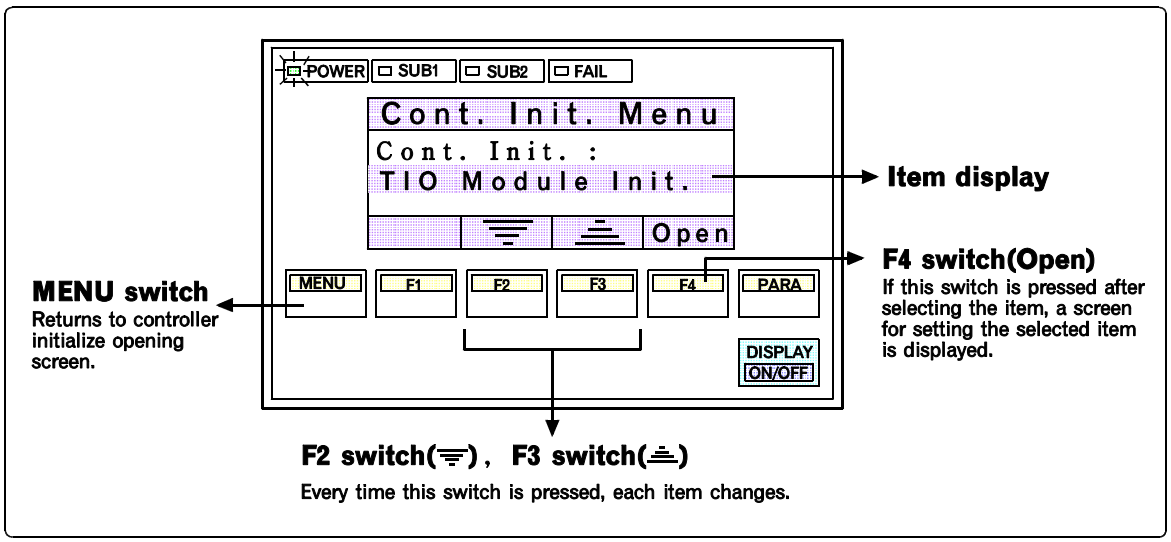
* The **MENU** switch becomes valid when "**Set_up=Disable**."

* As no unit can be changed within the controller initialize setting, always set the unit on this screen, then enter the controller initialize setting.

* If the controller initialize setting is changed, turn on the power supply again.

2.3 Controller initialize menu screen

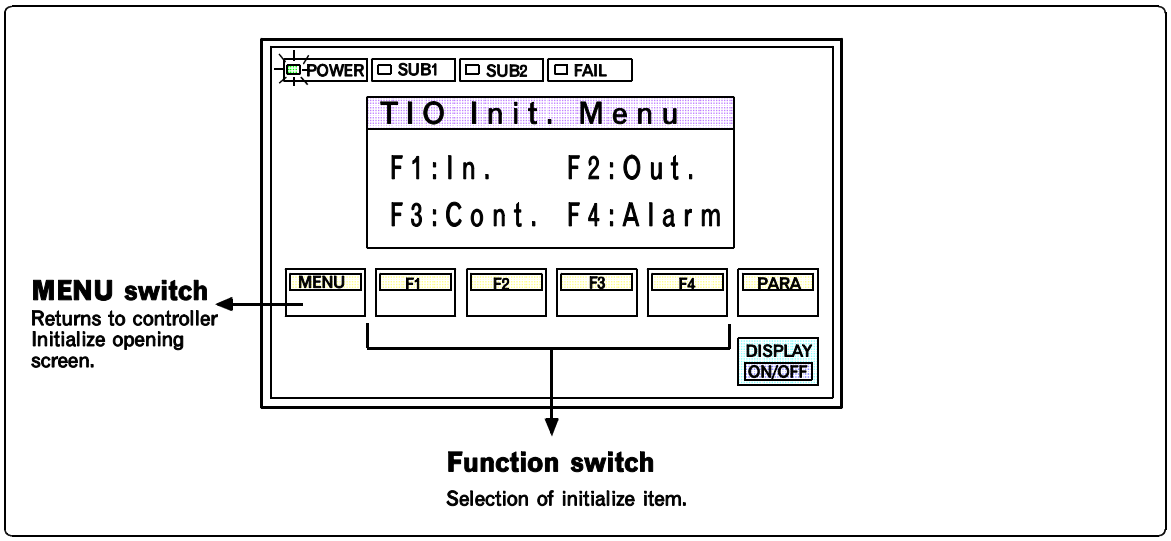
After the setting on the controller initialize opening screen is finished, pressing the F4 switch displays the following screen.



2.4 TIO module initialize settings

TIO module initialize menu screen

If "TIO Module Init." is selected on the controller initialize menu screen, the following TIO module initialize menu screen is displayed.

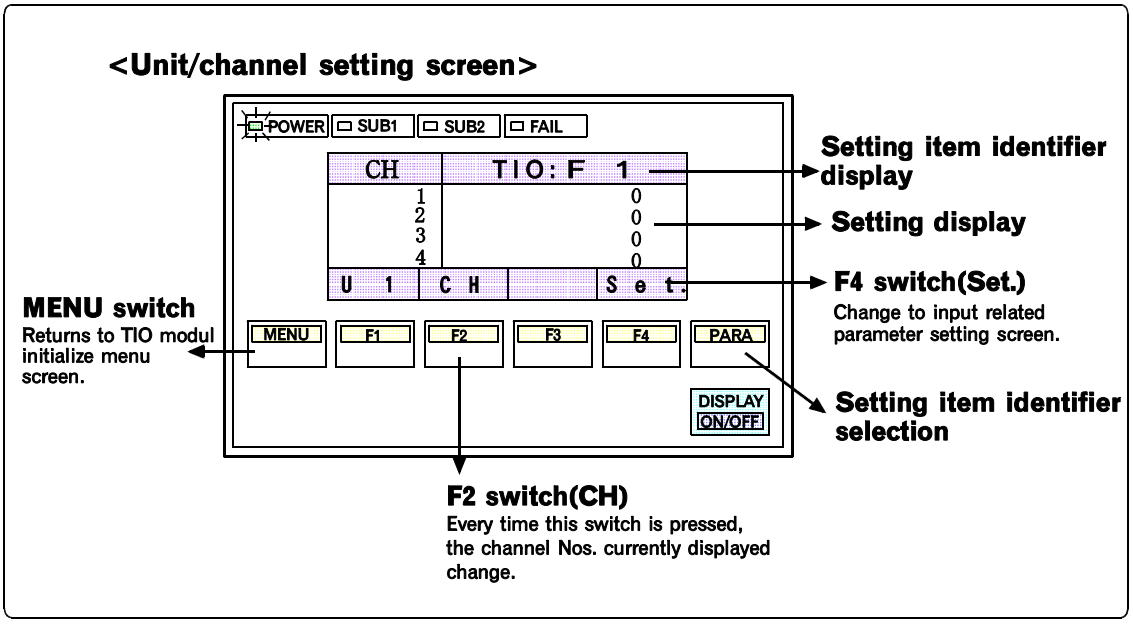


TIO module initialize settings are divided into 4 groups of input, output, control and alarm.
Touching the related parameter switch to be initialized changes to the related parameter setting screen.

* For details on each related parameter setting screen, see pages on and after page A-23.

Related parameter setting screen

The related parameter setting screen is shown below.



For each parameter setting, follow the procedure in Chapter 4, "4.4.3 Setting screen" (P. 4-13).

* Unit No. cannot be selected on the above setting screen. Select it on the controller initialize opening screen.

Each related parameter setting item

■ Input related parameter

*ID:Identifier

No.	Name	ID *	Range or Item description	Factory set value
1	Digital filter	**F1**	0 to 100 seconds	0

■ Output related parameter

No.	Name	ID *	Range or Item description	Factory set value
1	Output change rate limit (High limit)	**PH**	0.0 to 100.0 %/second	0.0
2	Output change rate limit (Low limit)	**PL**	0.0 to 100.0 %/second	0.0
3	Output limit (High limit)	**OH**	−5.0 to +105.0 %	100.0
4	Output limit (Low limit)	**OL**	−5.0 to +105.0 %	*1
5	Manipulated output value at input error	**OE**	−5.0 to +105.0 % (Heat/cool type : −105.0 to +105.0 %)	0.0

*1 Heat type : 0.0, Heat/cool type : 100.0

■ Control related parameter

No.	Name	ID *	Range or Item description	Factory set value
1	AT bias	**GB**	Within ± the input span range	0
2	Setting change rate limit	**HH**	0.0 to 100.0 % of span/minute	0.0
3	ON/OFF action differential gap (Upper)	**IV**	0.00 to 10.00 % of span	0.02
4	ON/OFF action differential gap (Lower)	**IW**	0.00 to 10.00 % of span	0.02

■ Alarm related parameter

No.	Name	ID *	Range or Item description	Factory set value
1	Number of alarm delay times	**DF**	0 to 255 times	0
2	First alarm differential gap	**HA**	0.00 to 10.00 % of span	0.10
3	Second alarm differential gap	**HB**	0.00 to 10.00 % of span	0.10

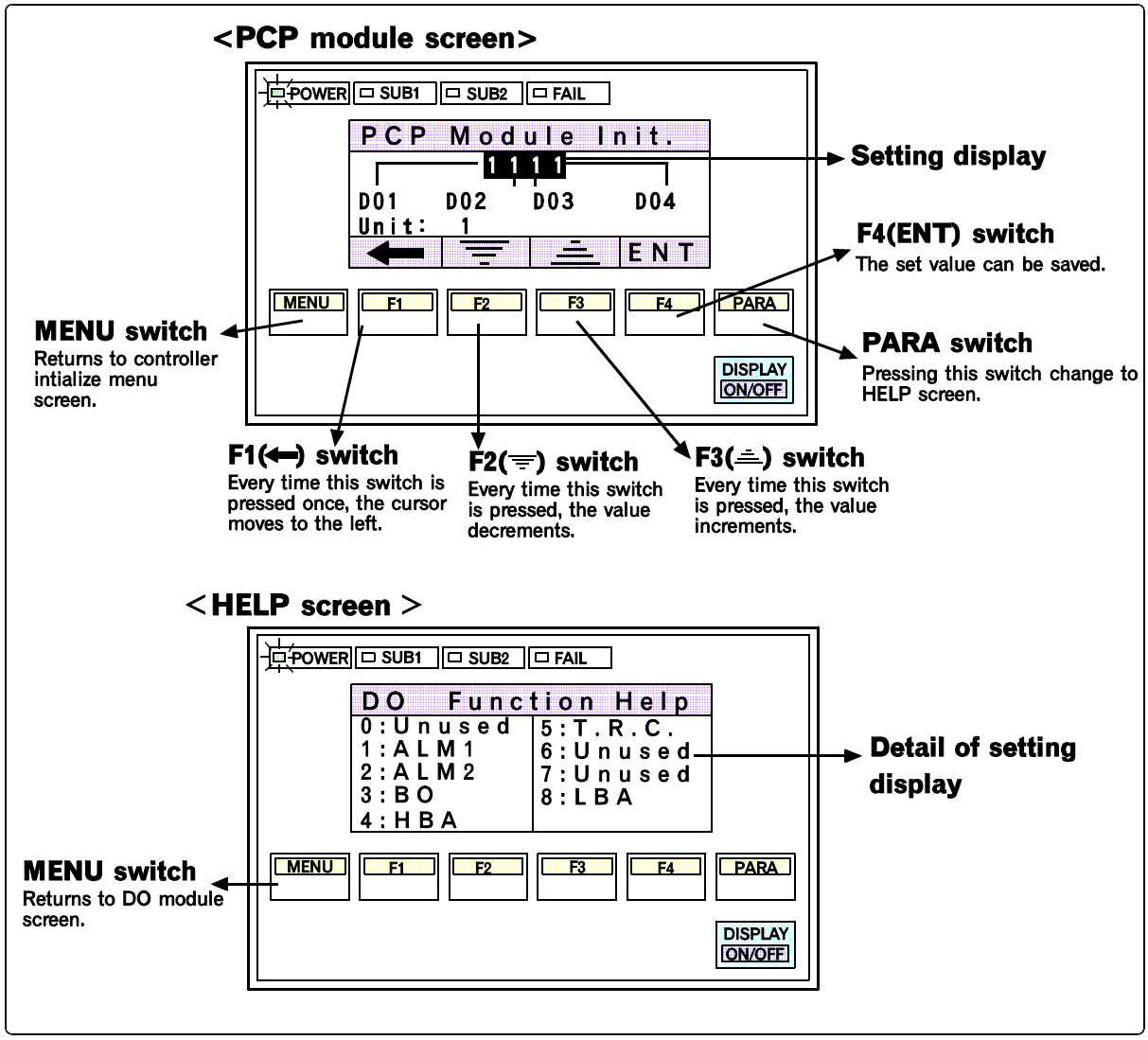
2.5 PCP module DO function selection

This screen is used to assign functions to PCP module DOs (OUT 1 to 4) .

CAUTION

If the module configuration is changed (module location is changed or module is added or removed), always initialize the module first, then re-set the assignment .

→ See 2.9 Module initialize setting (P. A-31).



For each parameter setting, follow the procedure in Chapter 4, "4.4.3 Setting screen" (P. 4-13).

* Unit No. cannot be selected on the above setting screen. Select it on the controller initial opening screen.

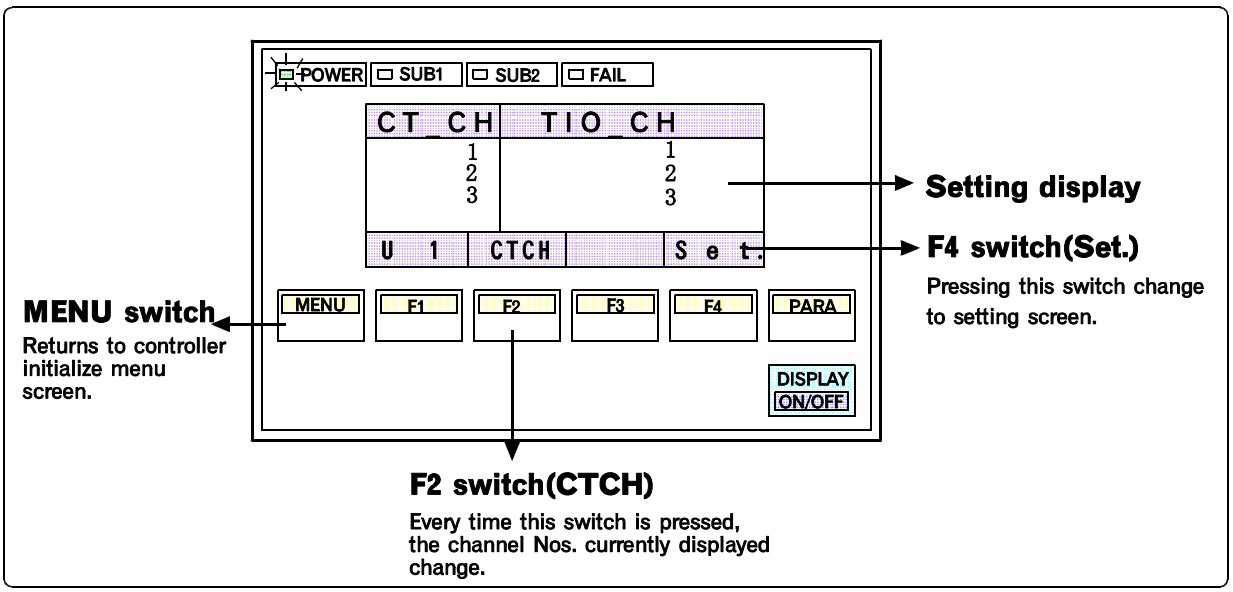
* For details on the PCP module DO terminal output status, see the relevant Hardware Instruction Manual (IMSRM02-E□).

2.6 CT channel setting

This screen is used to assign the TIO module channel used for the CT module input channel.

CAUTIONS

- If the module configuration is changed (module location is changed or module is added or removed), always initialize the module first, then re-set the assignment.
  → See 2.9 Module initialize setting (P. A-31).
- When modules need to be added, do not exceed the maximum number of modules that can be connected.
  → See the Hardware Instruction Manual (IMSRM02-E□) or the Installation Manual (IMSRM01-E□).



<Channel No. range for each module>

TIO module channel : 1 to 20
CT module channel : 1 to 60 * TIO module channel setting can be duplicated.

For each parameter setting, follow the procedure in Chapter 4, "4.4.3 Setting screen" (P. 4-13).

* Unit No. cannot be selected on the above setting screen. Select it on the controller initialize opening screen.

* For details on the CT module terminal output status , see the relevant Hardware Instruction Manual (IMSRM02-E□).

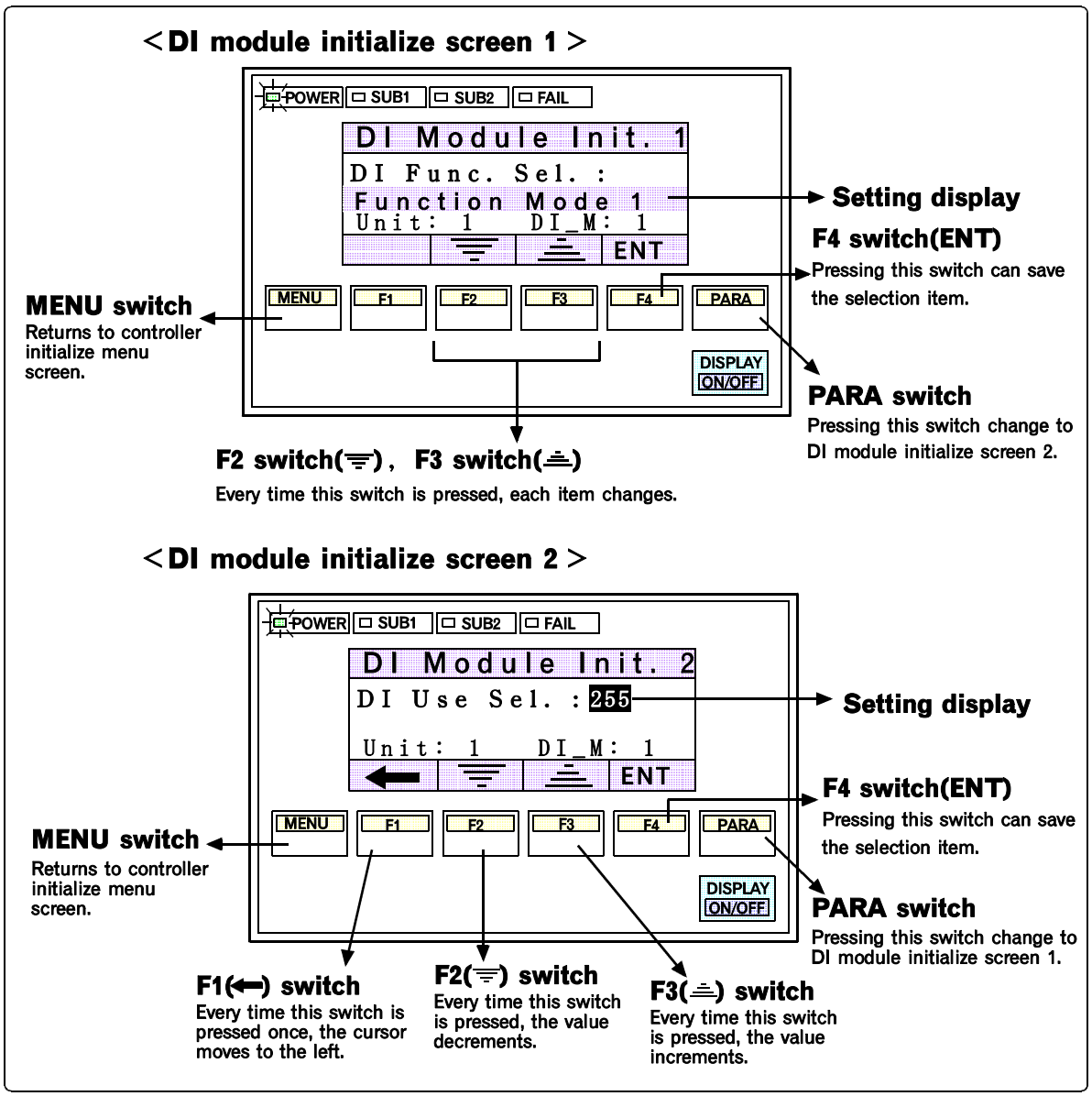
2.7 DI function selection of DI module

This screen is used to select whether to use the DI function of the DI module.

CAUTION

If the module configuration is changed (module location is changed or module is added or removed), always initialize the module first, then re-set the assignment.

→ See 2.9 Module initialize setting (P. A-31).



For each parameter setting, follow the procedure in Chapter 4, "4.4.3 Setting screen" (P. 4-13).

* This function is selected and set for one DI module per unit.

* Unit No. cannot be selected on the above setting screen. Select it on the controller initialize menu screen.

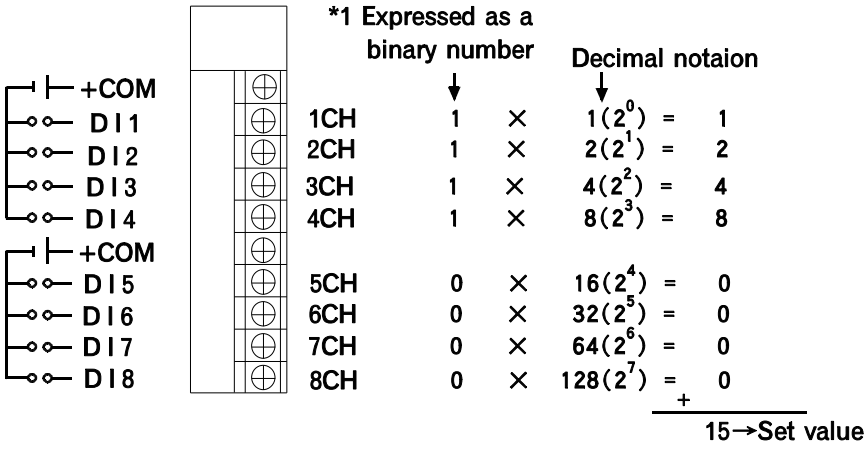
* For details on the DI module terminal status , see the relevant Hardware Instruction Manual (IMSRM02-E□).

<DI setting procedure>

Set the use/no−use of each channel for the DI module according to the following calculation.

● **Set value calculation procedure**

Example) For the following channel settings
1 to 4CH : Used
5 to 8CH : Unused



*1 The binary number is as follows.
Used : 1/Unused : 0

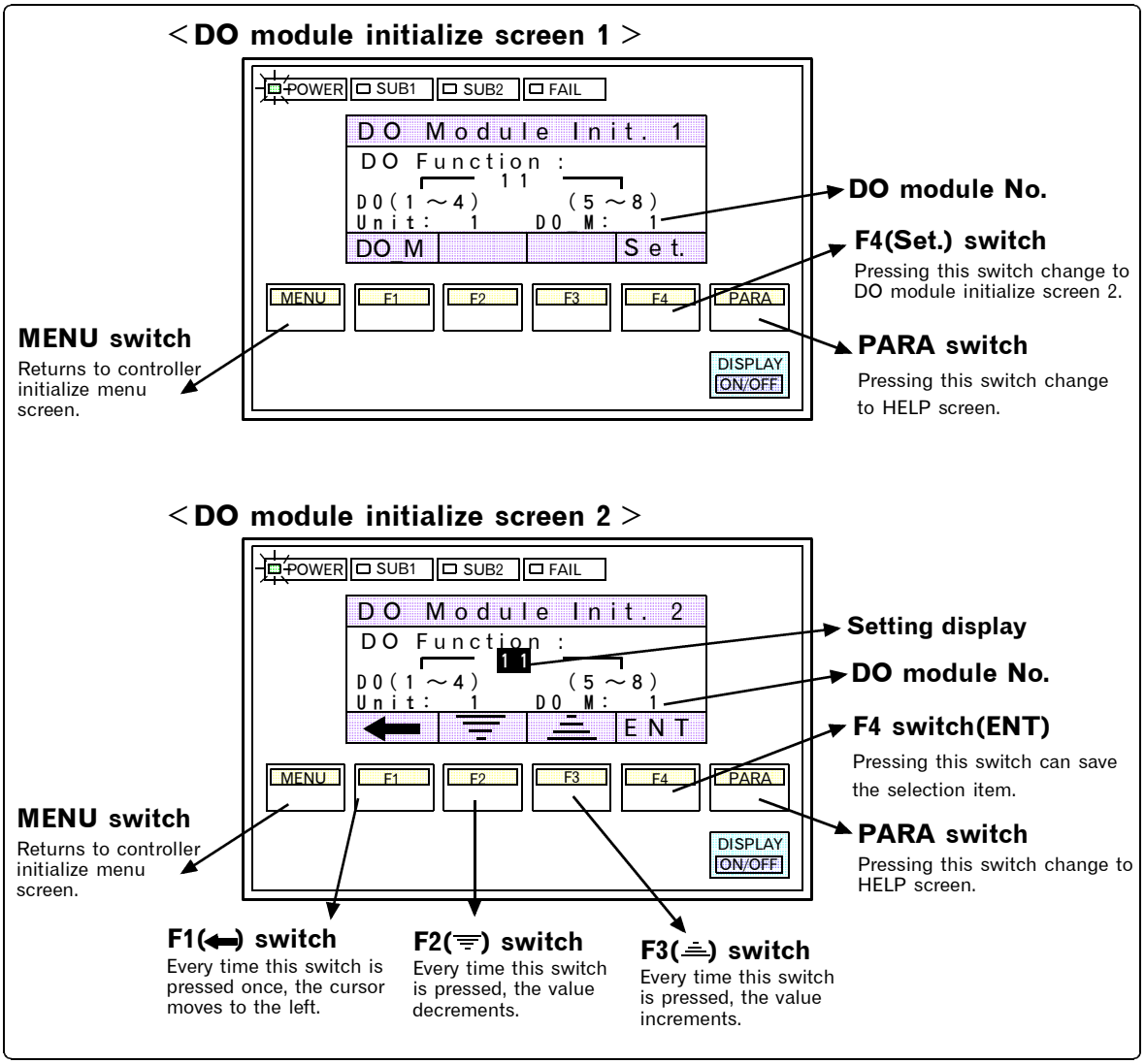
* When calulating the set value, first set 8CH to one digit as a binary number, then change to the relevant decimal digit.

2.8 DO function selection of DO module

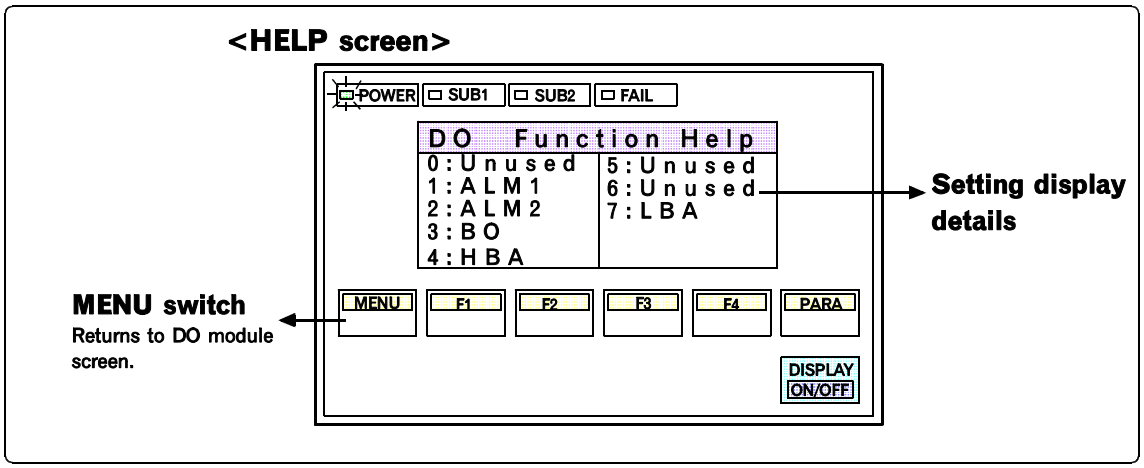
This screen is used to assign the alarm type to be output to the DO module output terminals (for each block).

CAUTIONS

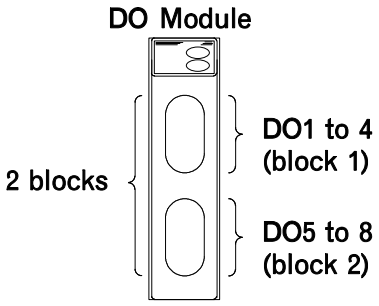
- If the module configuration is changed (module location is changed or module is added or removed), always initialize the module first, then re-set the assignment.
  → See 2.9 Module initialize setting (P. A-31).
- When modules need to be added, do not exceed the maximum number of modules that can be connected.
  → See the Hardware Instruction Manual (IMSRM02-E□) or the Installation Manual (IMSRM01-E□) .



For each parameter setting, follow the procedure in Chapter 4, "4.4.3 Setting screen" (P. 4-13).



* The DO module has 8 output points and consists of 2 blocks, each of which has 4 output points with one common point. The function is selected in steps of one unit and is set for each block. In addition, up to 9 DO modules per unit can be set.

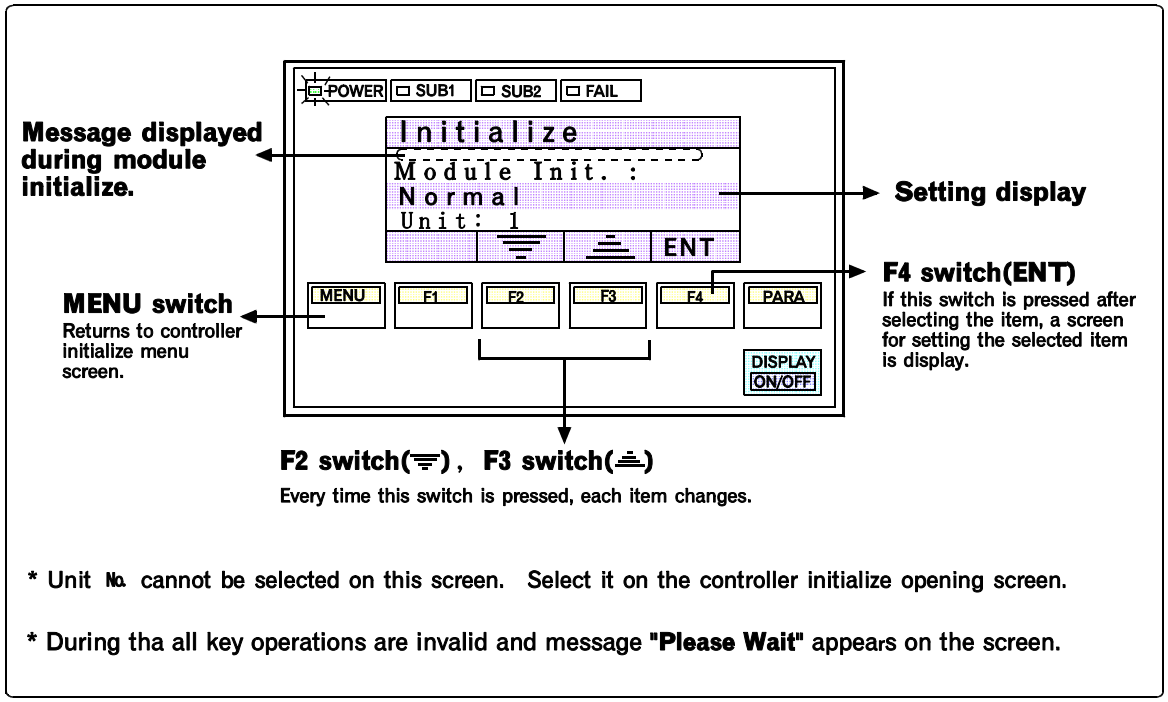


* Unit No. cannot be selected on the above setting screen. Select it on the controller initialize menu screen.

* For details on the DO module terminal output status, see the relevant Hardware Instruction Manual (IMSRM02-E□).

2.9 Module initialize setting

This screen is used to store the new system in the PCP module when the module configuration of the control unit is changed.
It can be selected that only the new module is initialized (system set) or all the modules are initialized.



<Setting during module configuration change>

For this setting, follow the procedure in Chapter 4, "4.4.3 Setting screen" (P. 4-13).
Conduct this setting for each unit.

CAUTION

If "All Modules " is executed, data within all modules (units) are set to the default values. Therefore, perform this operation only after checking all the data.

Details of default: The set values or items expect the contents determinated by the modeling and the contents of the DO allocation of PCP module, the DO allocation of DO module and the channel allocation of CT module.

Details of setting

· **When a module is added to control unit**

Initialize Add on module only. (Setting display : Add on Modules)

· **When a module is removed from control unit**

Initialize Add on module only. (Setting display : Add on Modules)

· **When a module is inserted (added) between existing modules**

Initialize All modules. (Setting display : All Modules)

· **When the configuration of modules is changed in control unit**

Initialize All modules. (Setting display : All Modules)

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RKC INSTRUMENT INC.

HEADQUARTERS: 16-6, KUGAHARA 5-CHOME, OHTA-KU TOKYO 146-8515 JAPAN
PHONE: 03-3751-9799 (+81 3 3751 9799)
FAX: 03-3751-8585 (+81 3 3751 8585)
E-mail: info@rkcinst.co.jp
Website: http://www.rkcinst.com/

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