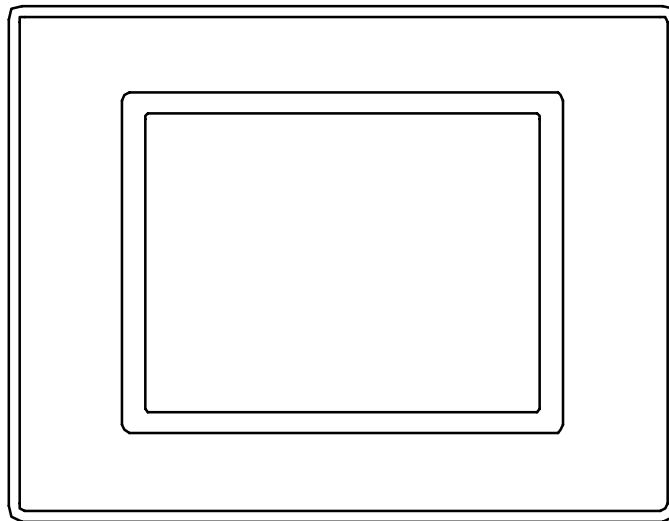


**INSTRUCTION MANUAL
FOR
TOUCH PANEL MONITORING UNIT
CMT-220-K**



PREFACE

Thank you for your purchase of our Touch panel monitoring unit **CMT-220-K**.

This manual contains instructions for the mounting, functions, operations and notes for the operation of **CMT-220-K**.

For model confirmation and unit specifications, please read this instruction manual carefully before starting operation.

To prevent accidents arising from the use of this controller, please ensure the operator using it receives this manual.


Notes

- The contents of this instruction manual are subject to change without notice.
- Care has been taken to assure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform our sales department.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
- Shinko Technos is not liable for any damages or secondary damages incurred as a result of using this manual, including any indirect damages.

SAFETY PRECAUTIONS

(Be sure to read these precautions before using our products.)

The safety precautions are classified into two categories: "Warning" and "Caution".

Depending on circumstances, procedures indicated by  Caution may be linked to serious results so be sure to follow the directions for usage.



Warning

Procedures which may lead to dangerous conditions and cause death or serious injury if not carried out properly.



Caution

Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product if not carried out properly.

1. Installation precautions

(Be sure to read these precautions before using our products.)



Warning

Turn the power supply to the instrument OFF before installation.

Working or touching the terminal with the power switched ON may result in an Electric Shock which could cause severe injury or death.



Caution

Site selection

Mount the unit in a place with:

- (1) A minimum of dust, and an absence of corrosive gases
- (2) No flammable, explosive gases
- (3) No mechanical vibrations or shocks
- (4) No exposure to direct sunlight, an ambient temperature of 0 to 50°C (32 to 122°F) that does not change suddenly
- (5) An ambient non-condensing humidity of 35 to 85%RH
- (6) The units away from large capacity electromagnetic switches or cables through which large current is flowing
- (7) No water, oil or chemicals or where the vapors of these substances can come into direct contact with the unit

When mounting the case to the control panel, tighten the screw with the specified torque.

If excessive force is applied to the screw when tightening, the case may be damaged or bent.

Do not install this instrument near flammable material though the case of this instrument is made of flame resisting resin.

Avoid setting this instrument directly on flammable material.

2. Wiring precautions



Warning

Turn the power supply to the instrument OFF before wiring or checking.
Working or touching the terminal with the power switched ON may result in an Electric Shock which could cause severe injury or death.
The instrument must be grounded before the power supply to the instrument is turned on.



Caution

- Do not put wire chips into the instrument, because they could cause fire, malfunction or trouble.
- For the DC power source wiring, do not confuse the polarity as described in this instruction manual.
- For the CMT-220-K ground terminal, use a wire whose thickness is 2mm² or greater. However, avoid grounding in conjunction with the power line.
- Use the solderless terminal with insulation sleeve that fits to the M3 screw when wiring the CMT-220-K terminals.
- Tighten the terminal screw within the specified torque.
If excessive force is applied to the screw when tightening, the screw or case may be damaged.
- It is advised to provide the protective device against such environmental conditions as may cause damage to the device or contribute to the deterioration of its parts.

3. Running and maintenance precautions



Warning

- Do not touch live terminals. This may cause electric shock or problems in operation.
- Turn off the power before cleaning the module or retightening the screws.
Doing this work while the power is on may result in an electric shock which could cause severe injury or death.

CMT-220-K cannot be applied to the Heating/Cooling, DC voltage and DC current input specifications of the CPT-20A, but can be applied to the other functions of the CPT-20A as well as all functions of the CPT-20A

Revisions

The manual number is noted at the lower right of the back cover.

Print date	Manual number	Revision
May 2001	CMT21E1 2001.05	First edition

CONTENTS

1. Overview

1.1 Overview of CMT-220-K	7
1.2 Units and structure of CMT-220-K	7
1.3 System configuration	8
1.4 Parameter exchange	8

2. Mounting to the control panel

2.1 Site selection	9
2.2 External dimension drawing	9
2.3 Panel cutout	9
2.4 Mounting	10

3. Wiring connection

3.1 Terminal arrangement	11
3.2 Wiring connection example	12

4. Setup

4.1 How to open the System Mode Main Menu display	13
4.2 System Setup	13

5. Operation

5.1 Display configuration	16
5.2 Display operation	
(1) Title display	17
(2) Channel name register display	17
(3) PV, SV and Control output status display	18
(4) All alarm status display	19
(5) MV, Heater current value and PID auto-tuning status display	19
(6) Setting item selection display	20
5.3 Setting display	
(1) Setting value change procedure	21
(2) Alarm action change procedure	22
(3) Control output status selection procedure	22
(4) PID auto-tuning Perform/Cancel selection procedure	23
(5) Heating/Cooling action selection procedure	23
(6) Temperature unit (°C/°F) selection procedure	24
5.4 Explanation of each setting display	25

6. Specifications

6.1 Functional specifications	33
6.2 General specifications	33

7. Troubleshooting 34

1. Overview

1.1 Overview of CMT-220-K

CMT-220-K reads and writes data of up to 10 units (20 points of temperature control) of the 2-channel temperature control unit (CCT-235) via 1 unit of the C series power source host link unit (CPT-200).

1.2 Units and structure of CMT-220-K

(1) Touch panel monitoring unit

CMT-220-K : Touch panel monitoring unit to communicate with the CPT-200

(2) Power source host link unit

CPT-200 : Link unit to supply the power to the CCT-235 and to communicate with the CMT-220-K

(3) 2-channel temperature control unit

CCT-235-2 □ / □ : Independent temperature control unit with 2 channels of which input or output types are the same

(4) Base unit

CBT-210 : Base unit for mounting the CPT-200 and CCT-235
For 1 Base unit, one CPT-200 is required.
A maximum of ten CCT-235 units can be mounted.

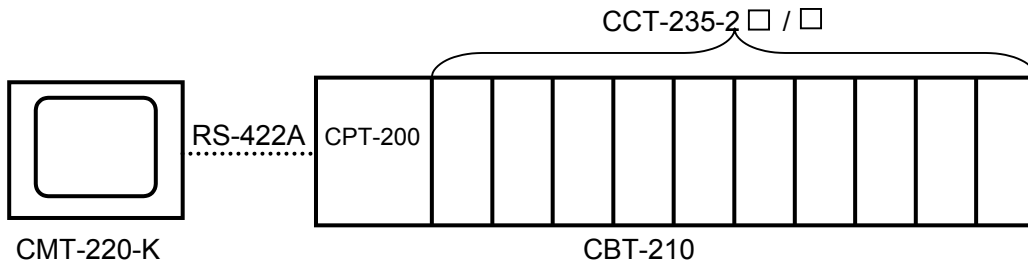
CBT-205 : Base unit for mounting the CPT-200 and CCT-235
For 1 Base unit, one CPT-200 is required.
A maximum of five CCT-235 units can be mounted.

(5) Communication cable

CPM : Designated communication cable to connect the CMT-220-K to the CPT-200

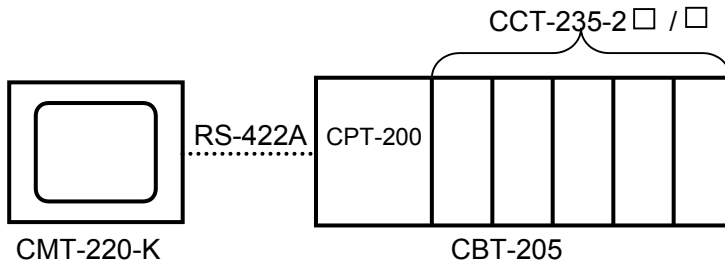
1.3 System configuration

When using CBT-210



[Fig. 1.3-1]

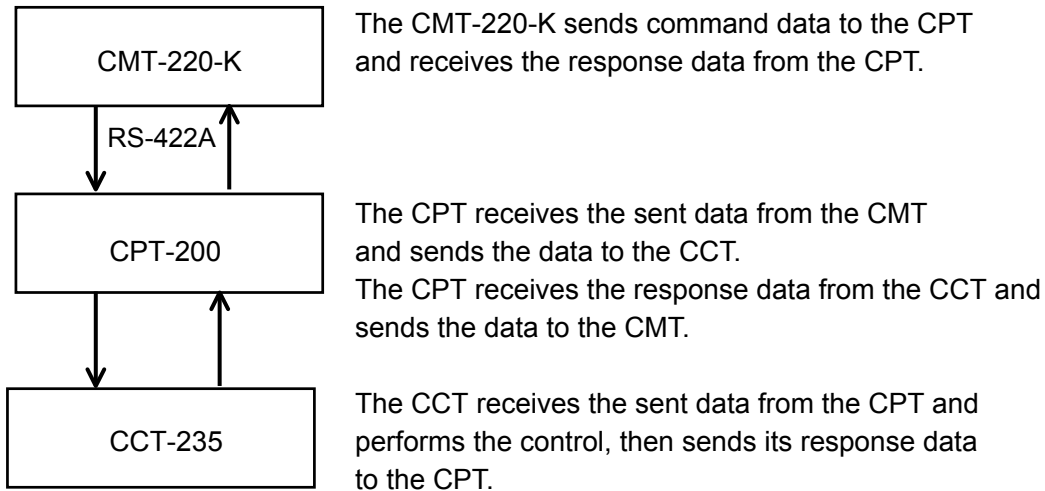
When using CBT-205



[Fig. 1.3-2]

1.4 Parameter exchange

Parameter exchange is shown as follows.



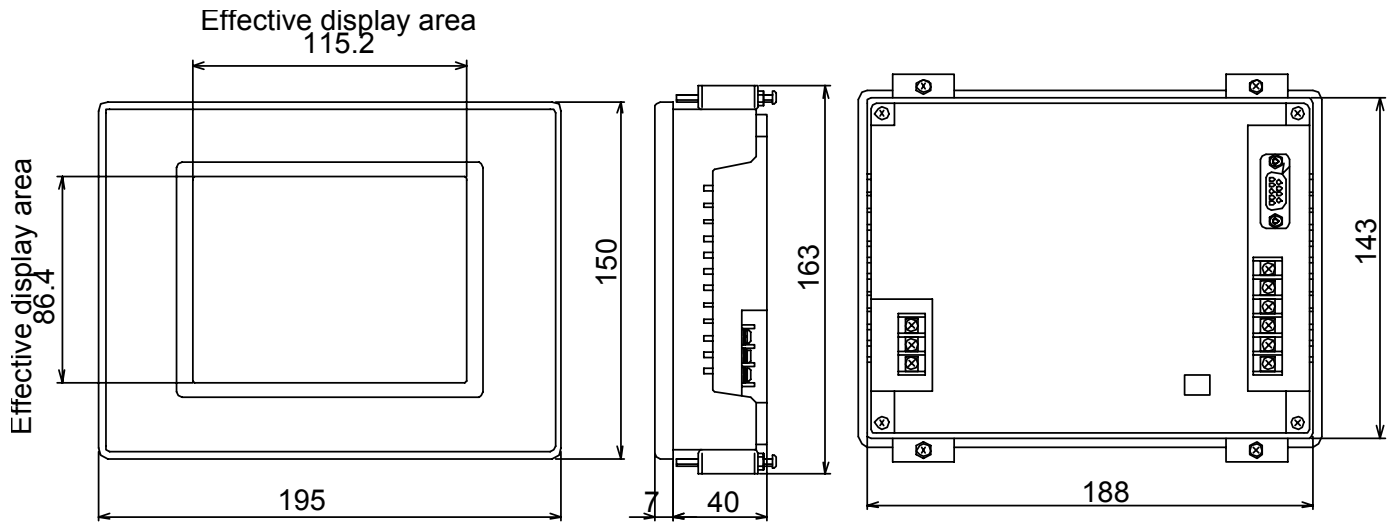
2. Mounting to the control panel

2.1 Site selection

Mount the units in a place with:

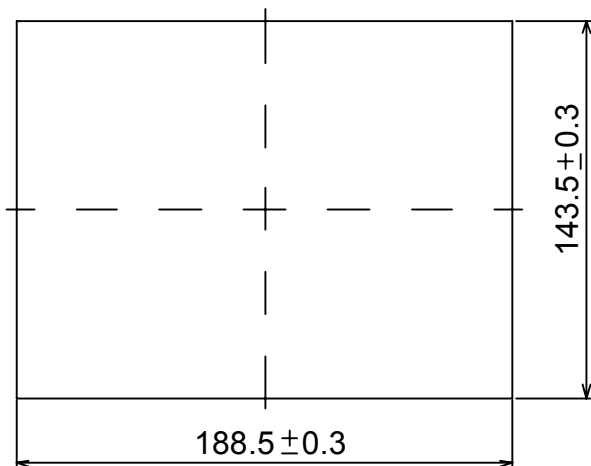
- (1) A minimum of dust, and an absence of corrosive gases
- (2) No flammable, explosive gases
- (3) No mechanical vibrations or shocks
- (4) No exposure to direct sunlight, an ambient temperature of 0 to 50°C (32 to 122°F) that does not change suddenly
- (5) An ambient non-condensing humidity of 35 to 85%RH
- (6) The units away from large capacity electromagnetic switches or cables through which large current is flowing
- (7) No water, oil or chemicals or where the vapors of these substances can come into direct contact with the unit

2.2 External dimension drawing



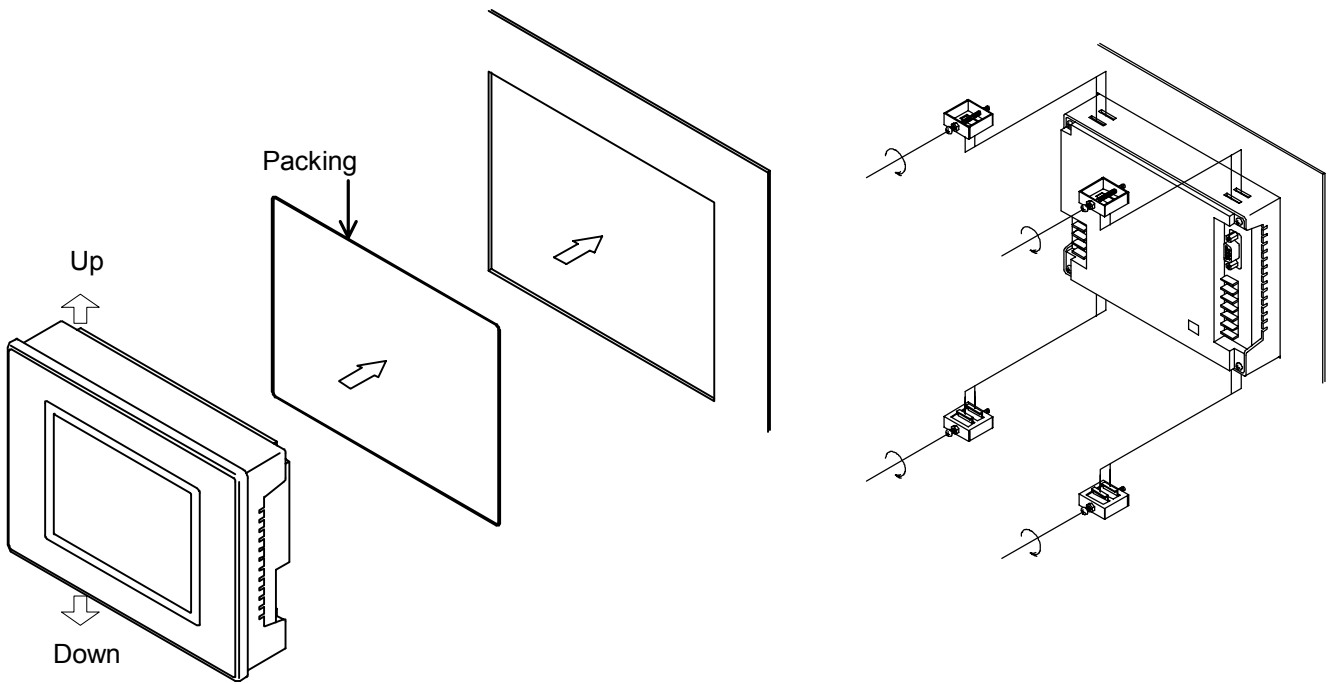
[Fig. 2.2-1]

2.3 Panel cutout



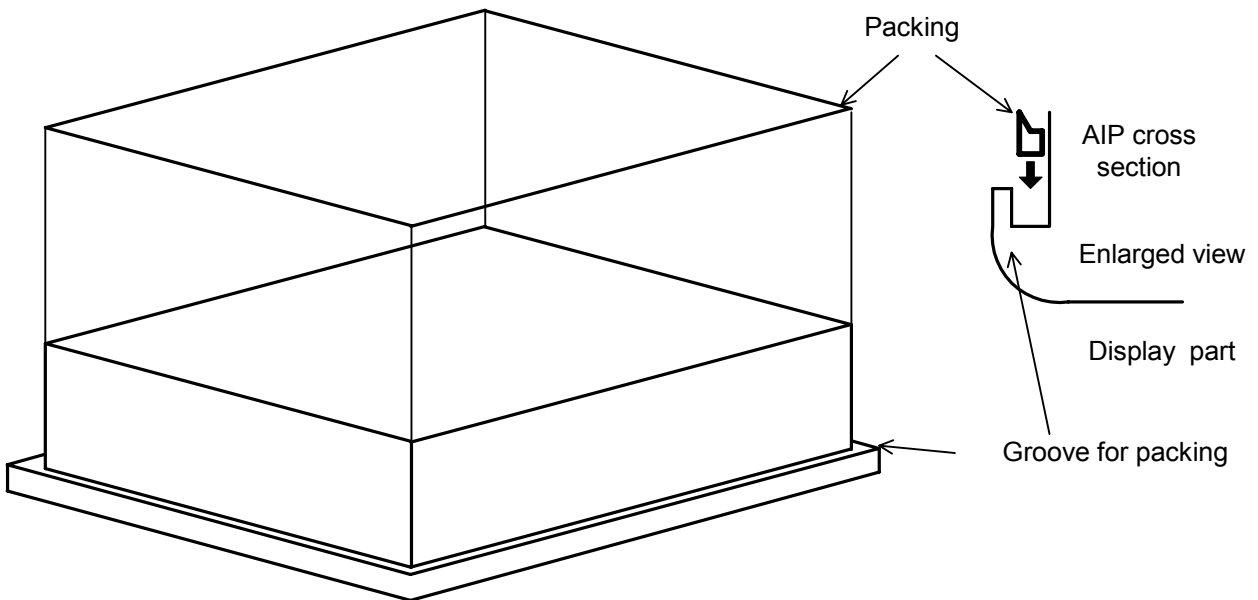
[Fig. 2.3-1]

2.4 Mounting



[Fig. 2.4-1]

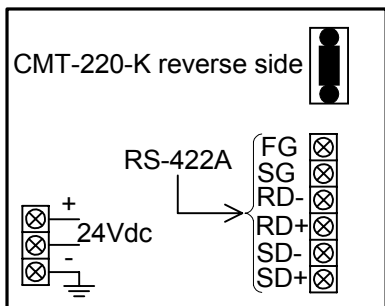
Mounting of packing



[Fig. 2.4-2]

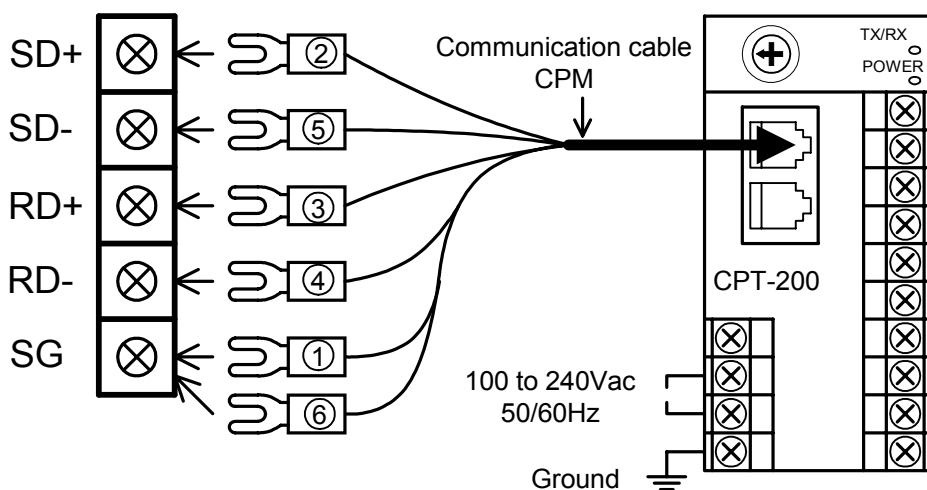
3. Wiring connection

3.1 Terminal arrangement



[Fig. 3.1-1]

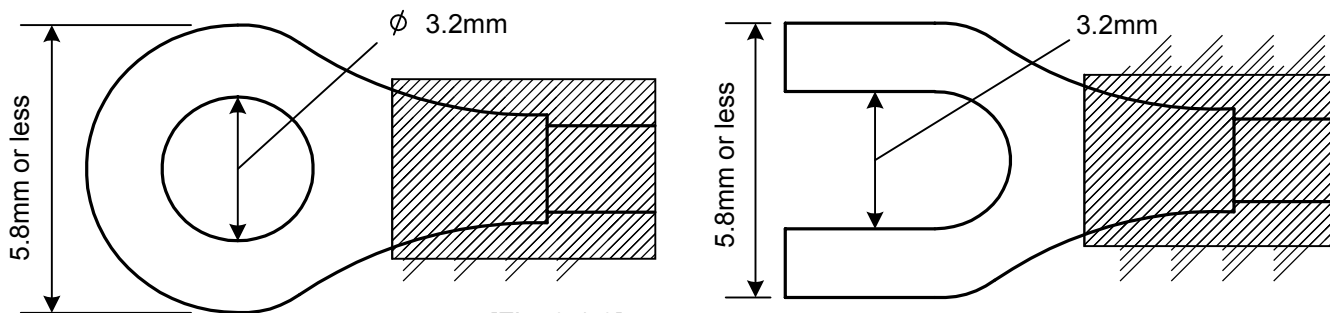
Wiring connection between the CMT-220-K and CPT-200



[Fig. 3.1-2]

Lead wire solderless terminal

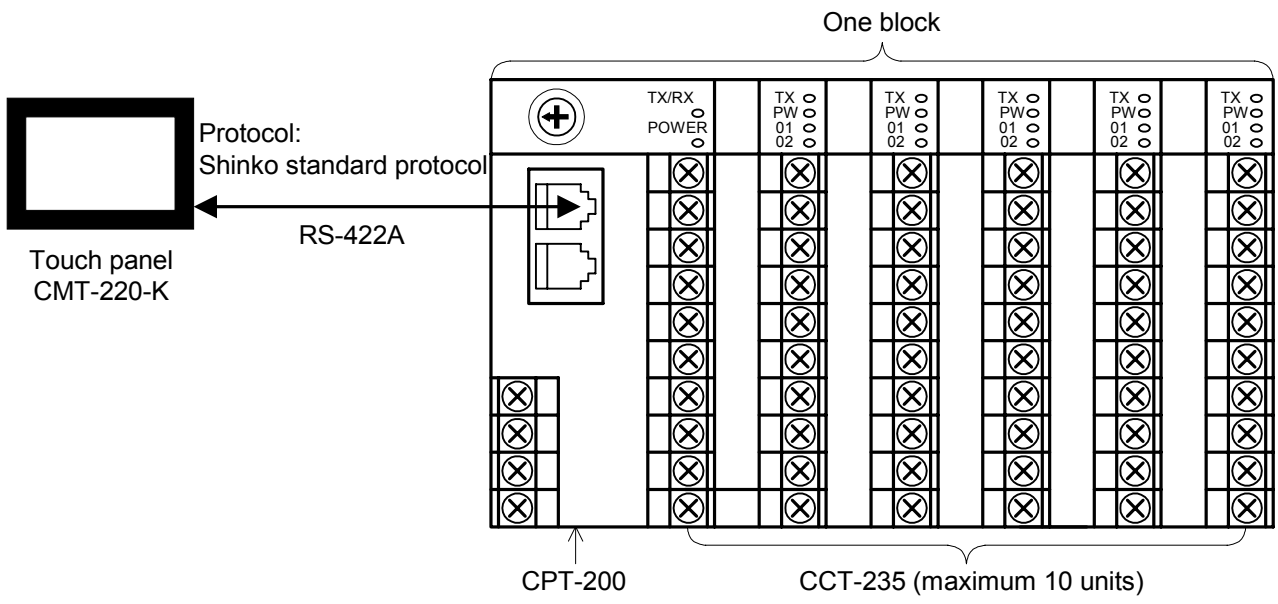
Use a solderless terminal with an insulation sleeve that fits to the M3 screw as shown below.



[Fig. 3.1-3]

Solderless terminal	Manufacturer	Model name	Tightening torque
Y type	Nichifu Terminal Industries CO.,LTD.	1.25Y-3	0.6N·m Max. 1.0N·m
	Japan Solderless Terminal MFG CO.,LTD.	VD1.25-B3A	
Round type	Nichifu Terminal Industries CO.,LTD.	1.25-3	
	Japan Solderless Terminal MFG CO.,LTD.	V1.25-3	

3.2 Wiring connection example



[Fig. 3.2-1]

4. Setup

4.1 How to open the System Mode Main Menu display

Press the upper left and lower right corners of the display simultaneously after turning on the Touch panel monitoring unit CMT-220-K [Fig. 4.1-1].

This brings up the System Mode Main Menu [Fig. 4.1-2] of CMT-220-K.

Note:

From any display, the System Mode Main Menu can be opened by pressing the upper left and lower right corners of the display simultaneously.

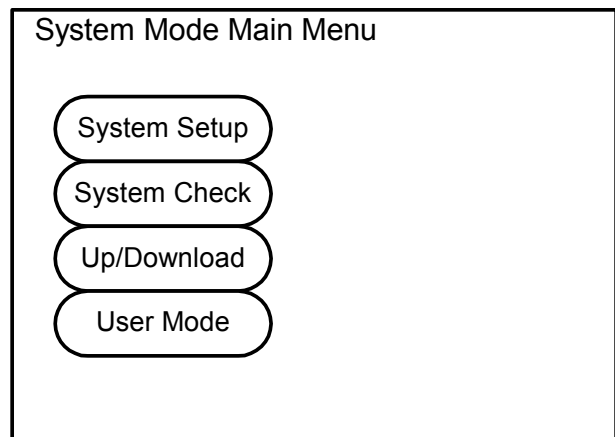


Caution

Press only the “**System Setup**” and “**User Mode**” buttons on the System Mode Main Menu. If this is not done, the unit may not work properly.



[Fig. 4.1-1]



[Fig. 4.1-2]

4.2 System Setup


Pressing the “System Setup” button on the System Mode Main Menu display [Fig. 4.1-2] opens the System Setup display [Fig. 4.2-1].



Caution

- Press only the “**RS485 Setup**” and “**Display Control**” buttons on the “System Setup” display. If this is not done, the unit may not work properly.
- Clock Setup is available on the System Setup display. However, if the power supply to the unit is turned off, the value will return to its initial setting.

RS485 Setup



Caution

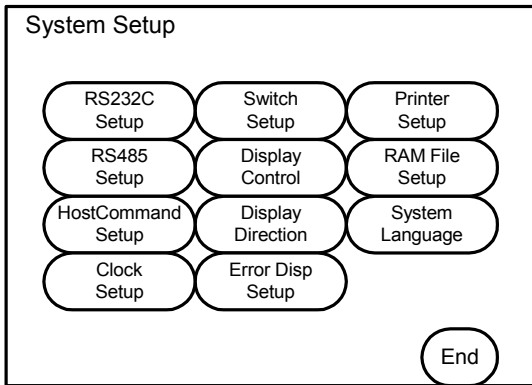
Press only the **Communication Rate** button on the RS485 Setup display.
If this is not done, the unit may not work properly.

Pressing the “RS485 Setup” button on the System Setup opens the “RS485 Setup” display.
See [Fig. 4.2-1] and [Fig. 4.2-2].

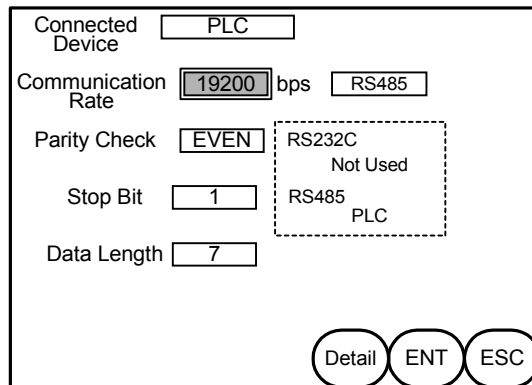
On this display, press the Communication Rate button  .
Communication rate (1200, 2400, 4800, 9600, 19200 or 38400) can be selected by pressing the button.

When completed the Communication Rate setting, press the ENT button to register the rate [Fig. 4.2-2].
Then the display will revert to the System Setup display [Fig. 4.2-1].

To revert to the System Setup display without setting the transfer rate, press the ESC button [Fig. 4.2-2].



[Fig. 4.2-1].



[Fig. 4.2-2].

Display control setup

Pressing the “Display Control” button on the System Setup display [Fig. 4.2-1] opens the Display Control setup display [Fig. 4.2-3].

This display enables Brightness setup and Display off time setup.

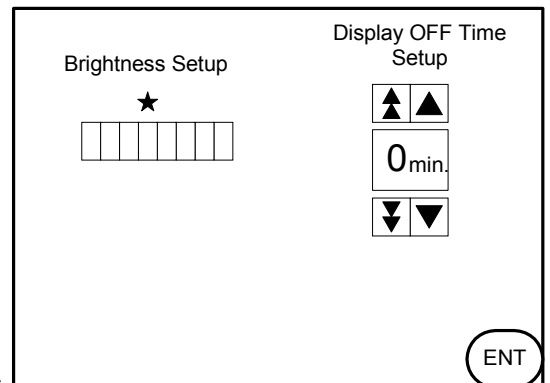
Brightness setup

8 grades of brightness can be selected.
The more the * marking moves to the right, the brighter it gets, and the more to the left, the darker it gets.

Display OFF time setup

This function is to turn the display off when switch input has not been performed for some time.
The time can be set by units of 1 minute up to a maximum of 60 minutes
If it is required to be turned ON all the time, set it to 0 minutes.
After the Display Control setup is finished, press the ENT button to register.

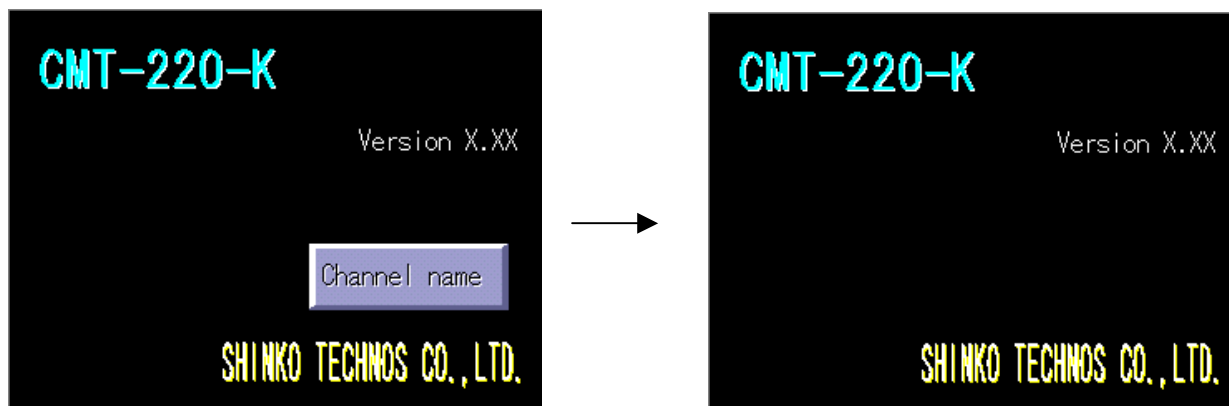
The display will revert to the System Setup display [Fig. 4.2-1].



[Fig. 4.2-3]

System Setup end

When finished “RS485 Setup” and “Display Control” setup, press the END button [Fig. 4.2-1].
The display will revert to the System Mode Main Menu. Then press the User Mode [Fig. 4.1-2].
This brings up the Title display [Fig. 4.2-4], and the control starts.



[Fig. 4.2-4]

5. Operation

5.1 Display configuration

- Title display (P.17)
 - Channel name change display (P.17)
- PV, SV and Control output status display (P.18)
- All alarm status display (P.19)
- MV, Heater current value, PID auto-tuning status display (P.19)
- Setting item selection display (P.20)
 - Main setting value setting (P.25)
 - Alarm 1 setting (P.25)
 - Alarm 2 setting (P.26)
 - Control output ON/OFF status selection (P.26)
 - PID Auto-tuning Perform/Cancel selection (P.26)
 - Proportional band setting (P.27)
 - Integral time setting (P.27)
 - Derivative time setting (P.27)
 - Anti-reset windup setting (P.27)
 - Proportional cycle setting (P.28)
 - Sensor correction setting (P.28)
 - PV filter time constant setting (P.28)
 - PD action manual reset setting (P.28)
 - Heater burnout alarm setting (P.29)
 - Temperature unit (°C/°F) selection (P.29)
 - Control output high limit setting (P.30)
 - Control output low limit setting (P.30)
 - Control output ON/OFF hysteresis setting (P.30)
 - Alarm 1 hysteresis setting (P.30)
 - Alarm 2 hysteresis setting (P.31)
 - Alarm 1 action form selection (P.31)
 - Alarm 2 action form selection (P.31)
 - Loop break alarm time setting (P.32)
 - Loop break alarm span setting (P.32)
 - Heating/Cooling action selection (P.32)

5.2 Display operation

(1) Title display



[Fig. 5.2-1]



[Fig. 5.2-2]

After power supply to the CMT-220-K is turned on, the Title display 1 is indicated for approximately 10 seconds [Fig. 5.2-1], and then Title display 2 [Fig. 5.2-2] and PV, SV and Control output status display [Fig. 5.2-5] are indicated respectively, and the control starts.

(2) Channel name register display



[Fig. 5.2-3]



[Fig. 5.2-4]

Pressing the “Channel name” button on the Title display 1 [Fig. 5.2-1] opens the Channel name register display [Fig. 5.2-3].

Pressing the “Channel” button to be changed opens the Channel name change display [Fig. 5.2-4] and any channel name (4 letters) can be changed.

[Button explanation]

- SPC : Space
- BS : Back space
- CAPS : Alternates from capitals to lower case letters
- MARK : Alternates from the Alphabet input to numeral and symbol input
- SKIP : This button is ineffective.
- ESC : Cancels the setting data and reverts to the former display.
- ENT : Registers the setting data and reverts to the former display.

Press the “Register” button on the Channel name register display [Fig. 5.2-3] after changing the channel name.

Title display 2 [Fig. 5.2-2] and PV, SV and Control output status display [Fig. 5.2-5] are displayed respectively and the control starts.

(3) PV, SV and Control output status display

PV, SV		ALM	MV, CT		setting	
CONT	PV		SV	CONT	PV	SV
ch01	25		100	ch11	25	100
ch02	25		100	ch12	25	100
ch03	25		100	ch13	25	100
ch04	25		100	ch14	25	100
ch05	25		100	ch15	25	100
ch06	25		100	ch16	25	100
ch07	25		100	ch17	25	100
ch08	25		100	ch18	25	100
ch09	25		100	ch19	25	100
ch10	25		100	ch20	25	100

[Fig. 5.2-5]

PV, SV and control output status are included on this display [Fig. 5.2-5].

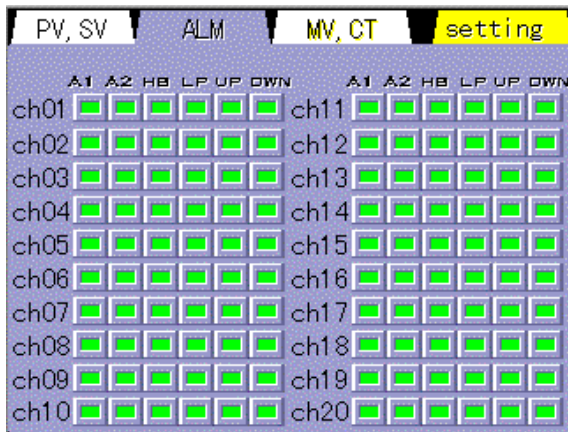
The following shows the contents of the display.

- CONT : When the control output is on, a green indicator lights.
- PV : Indicates process variable.
- SV : Indicates setting value.

The tags of upper side of display are buttons for opening following displays [Fig. 5.2-5].

- ① PV, SV: Opens the PV and SV and Control output status display.
- ② ALM : Opens All alarm status display [Fig. 5.2-6].
- ③ MV, CT: Opens MV, Heater current value and PID auto-tuning status display [Fig. 5.2-7].
- ④ Setting: Opens Setting item selection display [Fig. 5.2-8].

(4) All alarm status display



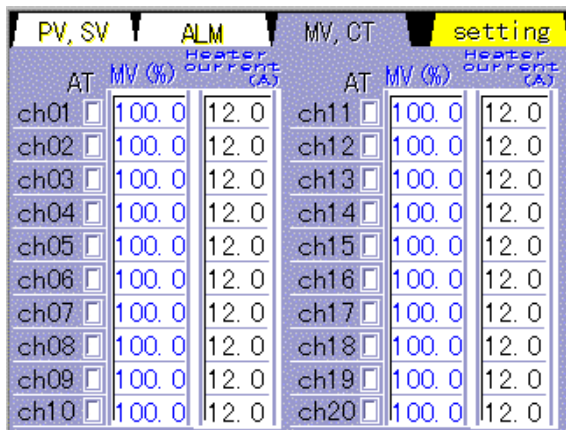
[Fig. 5.2-6]

The status of all alarms is displayed [Fig. 5.2-6].

The contents of the display is as follows.

- A1 : Alarm 1 is indicated by a red light.
- A2 : Alarm 2 is indicated by a red light.
- HB : Heater burnout alarm is indicated by a red light.
- LP : Loop break alarm is indicated by a red light.
- UP : If the sensor input exceeds the rated scale high limit value, it is indicated by a red light.
- DWN: If the sensor input exceeds the rated scale low limit value, it is indicated by a red light.

(5) MV, Heater current value and PID auto-tuning status display



[Fig. 5.2-7]

MV, heater current value and PID auto-tuning status are indicated on the display [Fig. 5.2-7].

Display details are as follows.

- AT : While PID auto-tuning is performing, a yellow light blinks.
- MV : Indicates control output manipulated variable (%).
- Heater current: Indicates heater current (ampere) value.
Available only when the option Heater burnout alarm [code: W] is applied.

(6) Setting item selection display



[Fig. 5.2-8]

Press the following buttons to open each setting display [Fig. 5.2-8].

- Setting value : Main setting value setting display
- Alarm 1 : Alarm 1 setting display
- Alarm 2 : Alarm 2 setting display
- Control ON/OFF: Control output status selection display

If the “Protected” button is pressed, “Not protected” appears.

Pressing the “Not protected” button and one of the other buttons bring up the following setting displays [Fig. 5.2-8].

- Auto-tuning : PID auto-tuning Perform/Cancel selection display
- Proportional band : Proportional band setting display
- Integral time : Integral time setting display
- Derivative time : Derivative time setting display
- Anti-reset windup : Anti-reset windup setting display
- Proportional cycle : Proportional cycle setting display
- Sensor correction : Sensor correction setting display
- PV filter time : PV filter time constant setting display
- Output ON/OFF hysteresis: Control output ON/OFF action hysteresis setting display
- Manual reset : PD action manual reset setting display
- Heater burnout : Heater burnout alarm setting display
- Output high limit : Control output high limit setting display
- Output low limit : Control output low limit setting display
- Alarm 1 hysteresis : Alarm 1 hysteresis setting display
- Alarm 2 hysteresis : Alarm 2 hysteresis setting display
- Alarm 1 action : Alarm 1 action selection display
- Alarm 2 action : Alarm 2 action selection display
- Loop break alarm time : Loop break alarm time setting display
- Loop break alarm span : Loop break alarm span setting display
- Heat/Cool selection : Heating/Cooling action selection display
- °C/°F designation : Temperature unit (°C/°F) selection display

5.3 Setting display

To select a setting item, press the item on the Setting item selection display [Fig. 5.3-1].
(It will take several seconds for some setting items to be displayed.)

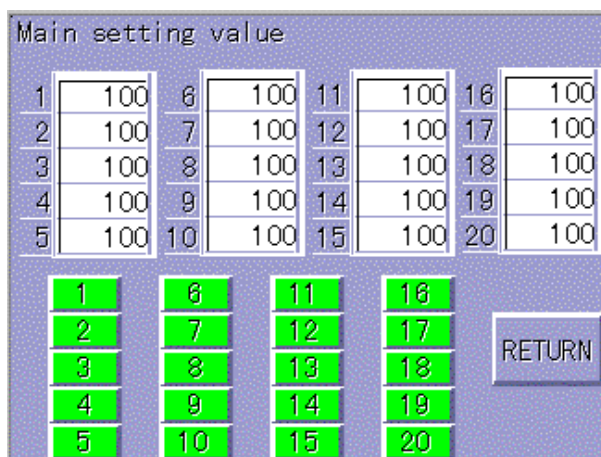


[Fig. 5.3-1]

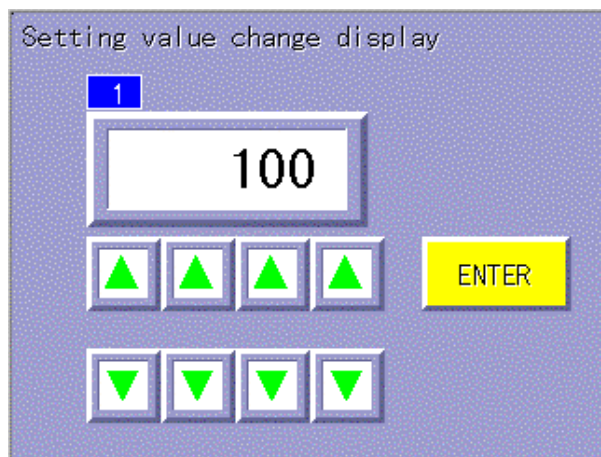
(1) Setting value change procedure

The Main setting value will be used as an example to explain the procedure.
 (Even if the setting item is different, the operation is the same as that of the main setting value setting.)

- ① Press the channel to be changed on the Main setting value display [Fig. 5.3-2].
 The display will be switched to the Setting value change display [Fig. 5.3-3].
- ② Using the ▲ or ▼ key, change the figure of each digit.
 When the change is completed, press the ENTER key [Fig. 5.3-3].
 The setting value will be transferred to the CCT-235, and the display will revert to the Main setting value display [Fig. 5.3-2].
- ③ Repeat procedure①and②until the main setting value settings for all channels are finished.
- ④ If the main setting values for all channels are changed, press the RETURN key.
 The display will revert to the Setting item selection display [Fig. 5.3-1].



[Fig. 5.3-2]



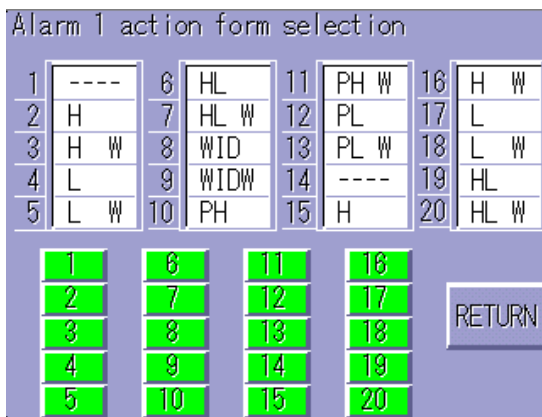
[Fig. 5.3-3]

(2) Alarm action change procedure

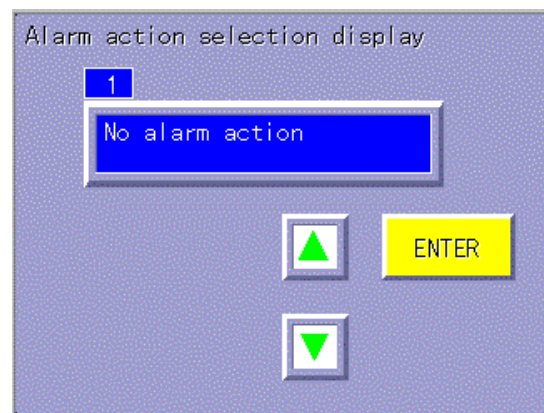
Alarm 1 action selection will be used as an example to explain the procedure.

(For the alarm 2, the operation is the same as that of alarm 1 action selection.)

- ① Press the channel to be changed on the Alarm 1 action form selection display [Fig. 5.3-4].
The display will be changed to the Alarm action selection display [Fig. 5.3-5].
- ② Using the ▲ or ▼ key, select an alarm action form.
After selecting the alarm action form, press the ENTER key [Fig. 5.3-5].
The setting value will be transferred to the CCT-235, and the display will revert to the Alarm 1 action form selection display [Fig. 5.3-4].
- ③ Repeat procedure①and②until alarm action selections for all channels are completed.
- ④ If setting value of all channels are changed, press the RETURN key.
The display will revert to the Setting item selection display [Fig. 5.3-1].



[Fig. 5.3-4]

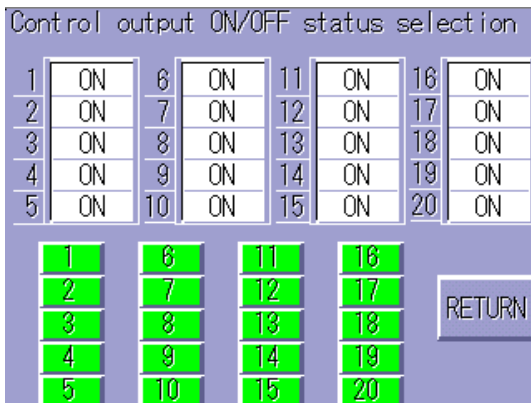


[Fig. 5.3-5]

(3) Control output status selection procedure

When control output status is on, "ON" is indicated in the frame next to the channel number [Fig. 5.3-6].

- ① When turning control output status off, press only the button of the channel to be turned off.
"OFF" will be indicated by turning the control output status off.
- ② To turn the control output status on, just press the button of the channel to be turned on.
"ON" will be indicated by turning the control output status on.
- ③ If all control output status are set, press the RETURN key.
The display will revert to the Setting item selection display [Fig. 5.3-1].

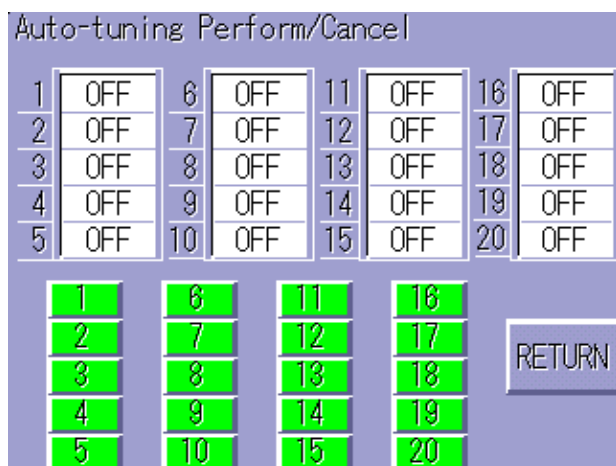


[Fig. 5.3-6]

(4) PID auto-tuning Perform/Cancel selection procedure

When PID auto-tuning is canceled, "OFF" is indicated in the frame next to the channel number [Fig. 5.3-7].

- ① When turning PID auto-tuning status to "ON", press the button of the channel button to be turned on. "ON" is indicated in the frame next to the channel number and PID auto-tuning starts.
- ② When turning PID auto-tuning status to "OFF", press the button of the channel button to be turned off. "OFF" is indicated in the frame next to the channel number and PID auto-tuning is canceled.
- ③ If all PID auto-tunings are set, press the RETURN key. The display will revert to the Setting item selection display [Fig. 5.3-1].

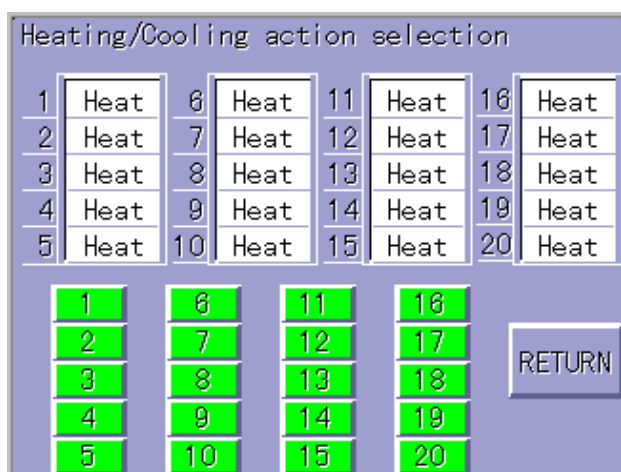


[Fig. 5.3-7]

(5) Heating/Cooling action selection procedure

In the case of the Heating action selection, "Heat" is indicated in the frame next to the channel number [Fig. 5.3-8].

- ① When selecting the Cooling action, press the button of the channel to be set as a cooling action. "Cool" is indicated in the frame next to the channel number and sets the unit to the cooling action.
- ② When selecting Heating action, press the button of the channel to be set as a heating action. "Heat" is indicated in the frame next to the channel number and sets the unit to the heating action.
- ③ If all Heating/Cooling actions are set, press the RETURN key. The display will revert to the Setting item selection display [Fig. 5.3-1].



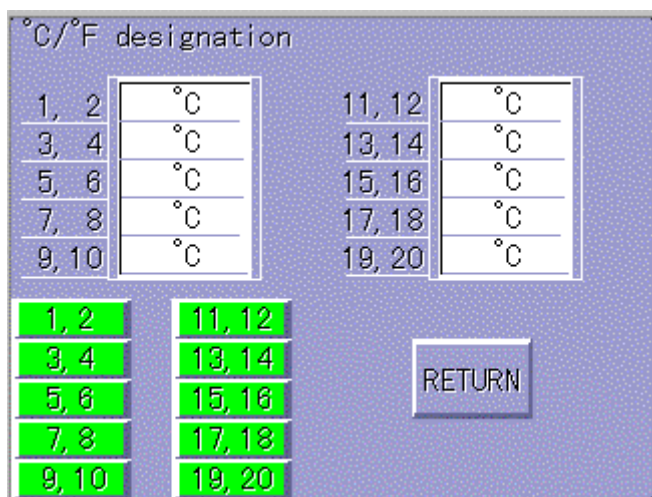
[Fig. 5.3-8]

(6) Temperature unit (°C/°F) selection procedure**Caution**

°C or °F cannot be used in conjunction on a set of two channels since both 2 channels are of the same specifications.

If temperature unit °C is selected, “C” is indicated in the frame next to the channel number [Fig. 5.3-9].

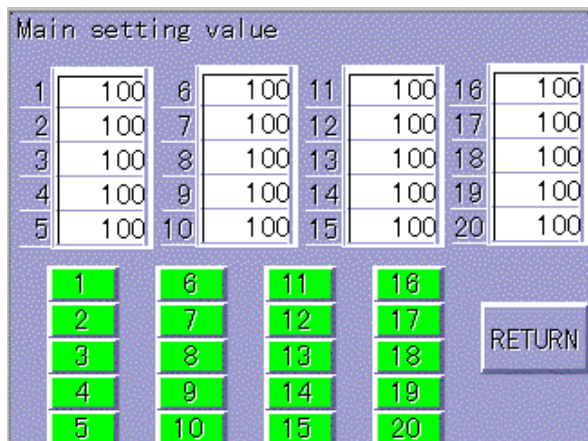
- ① To set the temperature unit to °F, press the button of the channel to be set. “F” is indicated in the frame next to the channel number, which means °F is set.
- ② To set the temperature unit to °C, press the button of the channel to be set. “C” is indicated in the frame next to the channel number, which means °C is set.
- ③ If all temperature units are set, press the RETURN key. The display will revert to the Setting item selection display [Fig. 5.3-1].



[Fig. 5.3-9].

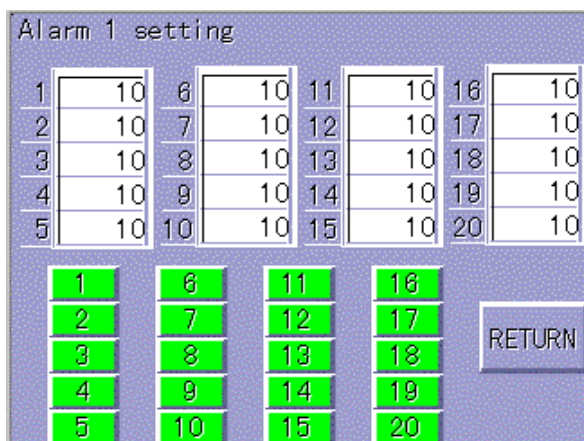
5.4 Explanation of each setting display

• Main setting value setting display



Sets the main setting value for all channels.
 Setting range: Main setting (SV) low limit value to main setting (SV) high limit value

• Alarm 1 setting display



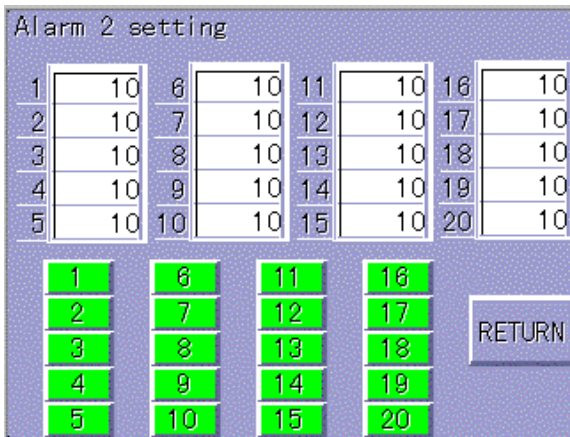
Sets the action point of Alarm 1 output for all channels. However, the setting is not available for the channel that No alarm is selected on the Alarm 1 action form selection display (page 31).
 Setting range: See [Table 5.4-1] below.

[Table 5.4-1]

Alarm action form	Setting range	
	Thermocouple	RTD, TC with a decimal point
High limit alarm *	-200 to 200°C (°F)	-200.0 to 200.0°C (°F)
High limit alarm with standby *	-200 to 200°C (°F)	-200.0 to 200.0°C (°F)
Low limit alarm *	-200 to 200°C (°F)	-200.0 to 200.0°C (°F)
Low limit alarm with standby *	-200 to 200°C (°F)	-200.0 to 200.0°C (°F)
High/Low limits *	0 to 200°C (°F)	0.0 to 200.0°C (°F)
High/Low limits with standby *	0 to 200°C (°F)	0.0 to 200.0°C (°F)
High/Low limit range *	0 to 200°C (°F)	0.0 to 200.0°C (°F)
High/Low limit range with standby *	0 to 200°C (°F)	0.0 to 200.0°C (°F)
Process high alarm	Input range minimum to input range maximum value	
Process high alarm with standby	Input range minimum to input range maximum value	
Process low alarm	Input range minimum to input range maximum value	
Process low alarm with standby	Input range minimum to input range maximum value	

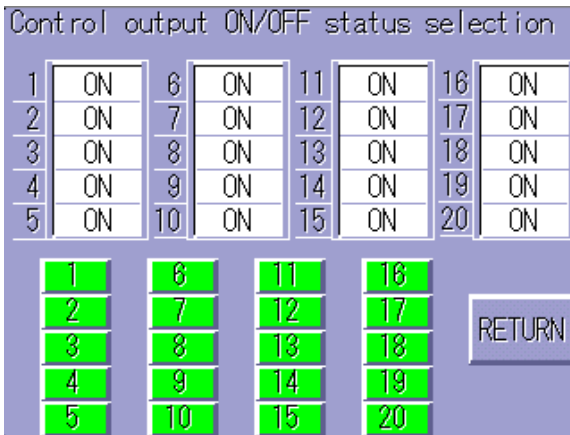
* Setting the value to 0 or 0.0 disables the alarm action.

• Alarm 2 setting display



Sets the action point of Alarm 2 output for all channels. However, the setting is not available for the channel that No alarm is selected on the Alarm 2 action form selection display (page 31).
Setting range: See [Table 5.4-1] (page 25).

• Control output ON/OFF status selection display



Sets the Control output ON or OFF status for all channels.

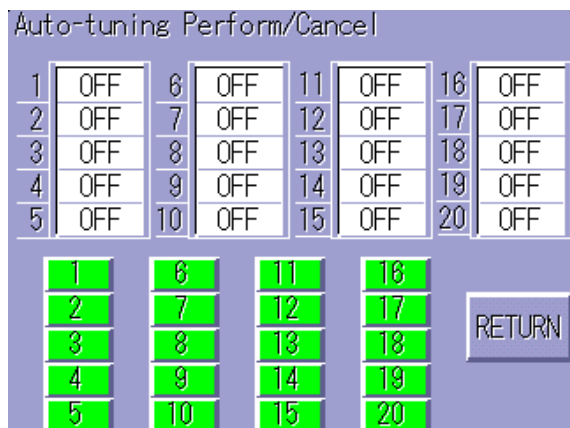
Control output OFF function:

A function to turn the control output OFF even if the power to the instrument is supplied. The function is used when required to halt the control action or when the unit is not being used in multiple units.

! Notice

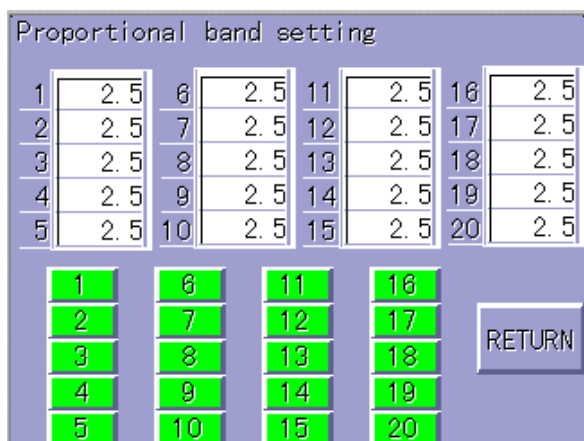
Once the Control output OFF function is enabled, the function cannot be released even if the power to the unit is turned OFF and turned ON again. To cancel the function, go to the Control output ON/OFF status selection display again, and press the button of the channel to be cancelled in order to turn the control output on.

• PID Auto-tuning Perform/Cancel selection display



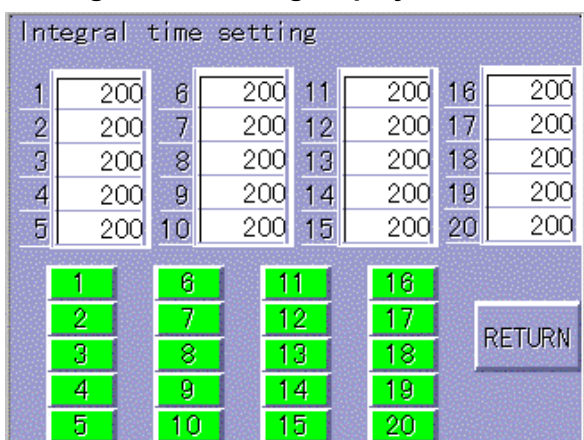
Sets PID Auto-tuning Perform or Cancel for all channels. For the details of PID auto-tuning, refer to the instruction manual for C series. During AT performing, other settings cannot be performed. Do not perform Auto-tuning for the channels whose control is ON/OFF or PD action.

• Proportional band setting display



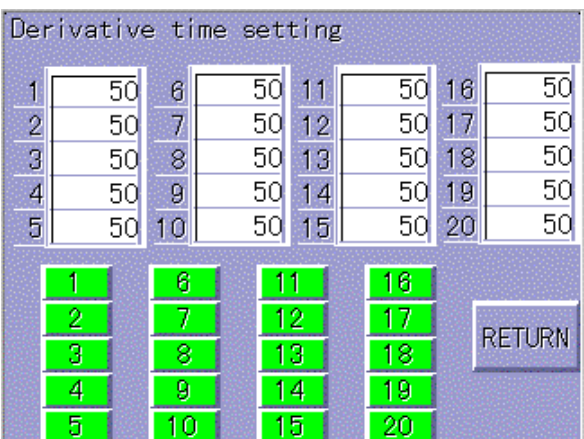
Sets the proportional band for all channels.
 For details of the proportional band, refer to the instruction manual for C series.
 Setting range: 0.0 to 100.0%
 (ON/OFF action when set to 0.0.)

• Integral time setting display



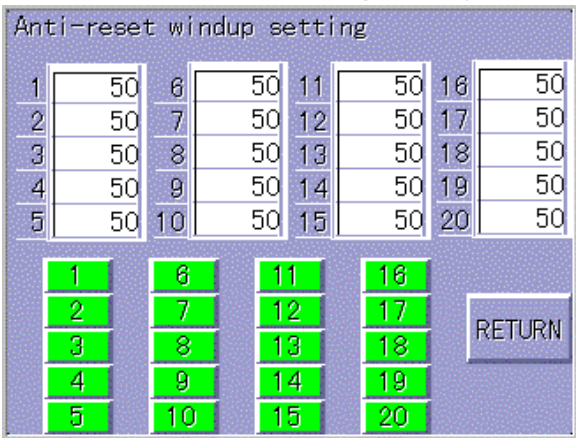
Sets the integral time for all channels.
 For details of the integral time, refer to the instruction manual for C series.
 Setting range: 0 to 3600 seconds
 (Off when set to 0.)

• Derivative time setting display



Sets the derivative time for all channels.
 For details of the derivative time, refer to the instruction manual for C series.
 Setting range: 0 to 3600 seconds
 (Off when set to 0.)

• Anti-reset windup setting display



Sets the anti-reset windup for all channels.
 For details of the anti-reset windup, refer to the instruction manual for C series.
 Setting range: 0 to 100%

• Proportional cycle setting display

Proportional cycle setting

1	3	6	3	11	3	16	3
2	3	7	3	12	3	17	3
3	3	8	3	13	3	18	3
4	3	9	3	14	3	19	3
5	3	10	3	15	3	20	3

1	6	11	16
2	7	12	17
3	8	13	18
4	9	14	19
5	10	15	20

RETURN

Sets the proportional cycle for all channels.
Setting range: 1 to 120 seconds

• Sensor correction setting display

Sensor correction setting

1	0.0	6	0.0	11	0.0	16	0.0
2	0.0	7	0.0	12	0.0	17	0.0
3	0.0	8	0.0	13	0.0	18	0.0
4	0.0	9	0.0	14	0.0	19	0.0
5	0.0	10	0.0	15	0.0	20	0.0

1	6	11	16
2	7	12	17
3	8	13	18
4	9	14	19
5	10	15	20

RETURN

Sets the sensor correction value for all channels.
When a sensor cannot be set at a location where control is desired, the sensor measuring temperature may deviate from the temperature in the controlled location. The control can be set with desired temperature by shifting the input value of sensors.

Setting range: -100.0 to 100.0°C (°F)

• PV filter time constant setting display

PV filter time setting

1	0.0	6	0.0	11	0.0	16	0.0
2	0.0	7	0.0	12	0.0	17	0.0
3	0.0	8	0.0	13	0.0	18	0.0
4	0.0	9	0.0	14	0.0	19	0.0
5	0.0	10	0.0	15	0.0	20	0.0

1	6	11	16
2	7	12	17
3	8	13	18
4	9	14	19
5	10	15	20

RETURN

Sets the PV filter time constant for all channels.
When process variable fluctuates due to such as disturbance, find the setting value at which the value does not fluctuate by setting the value larger by degrees. If the value is set too large, it affects control result due to the delay of response.

Setting range: 0.0 to 10.0 seconds

• PD action manual reset setting display

Manual reset setting

ch		ch		ch		ch	
1	0.0	6	0.0	11	0.0	16	0.0
2	0.0	7	0.0	12	0.0	17	0.0
3	0.0	8	0.0	13	0.0	18	0.0
4	0.0	9	0.0	14	0.0	19	0.0
5	0.0	10	0.0	15	0.0	20	0.0

1	6	11	16
2	7	12	17
3	8	13	18
4	9	14	19
5	10	15	20

RETURN

Sets PD reset (offset correction) for all channels.
The setting is available during PD action only.
Setting range: ±Proportional band converted value
However, the range is -199.9 to 999.9°C (°F).

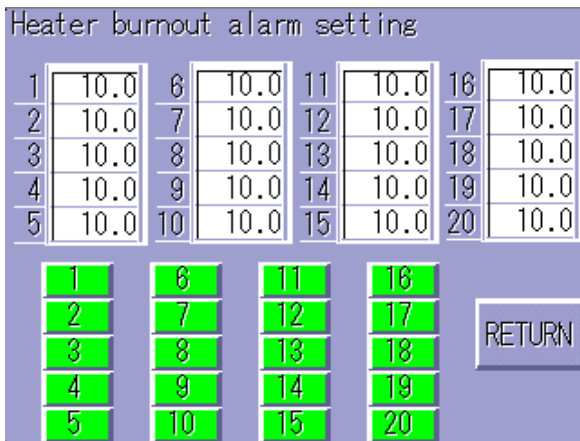
• **How to calculate proportional band converted value**

In the case of thermocouple input (K: -200 to 1370°C), and proportional band is 10%:

$$\text{Proportional band converted value} = \pm[\text{sensor range span (1570)} \times \text{proportional band (0.1)}]$$

Proportional band converted value is 157.0.

• **Heater burnout alarm setting display**



Sets heater current value of Heater burnout alarm for all channels.

Off when set to 0.0

It is recommended that the heater current value (setting value) be set about 80% of the value considering the voltage fluctuation.

The setting is available only when the option [W] is applied to the CCT-235.

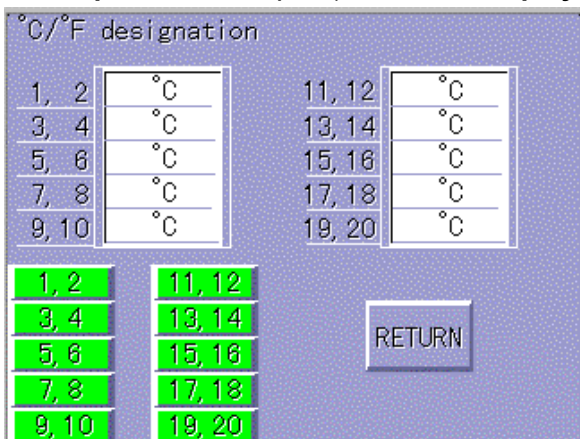
For Heater burnout alarm action drawing, refer to the instruction manual for C series.

Setting range:

Rating 20A: 0.0 to 20.0A

Rating 50A: 0.0 to 50.0A

• **Temperature unit (°C/°F) selection display**

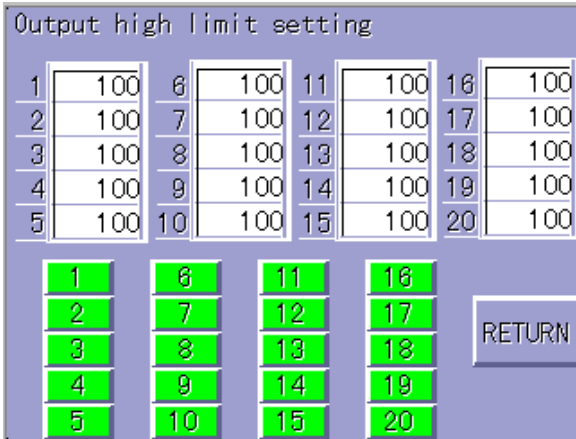


Selects a temperature unit for all channels.

However, 2 channels have to be set at the same temperature unit.

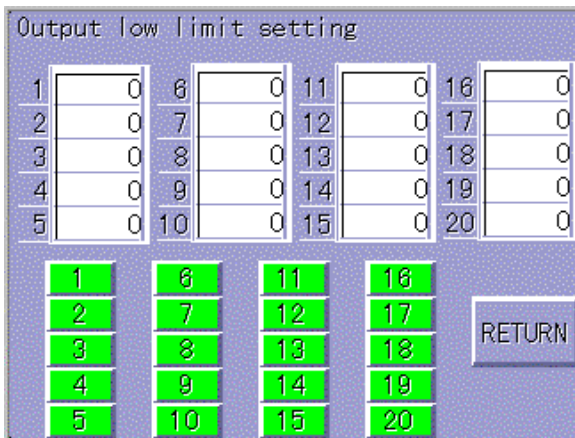
Temperature unit: °C or °F

• **Control output high limit setting display**



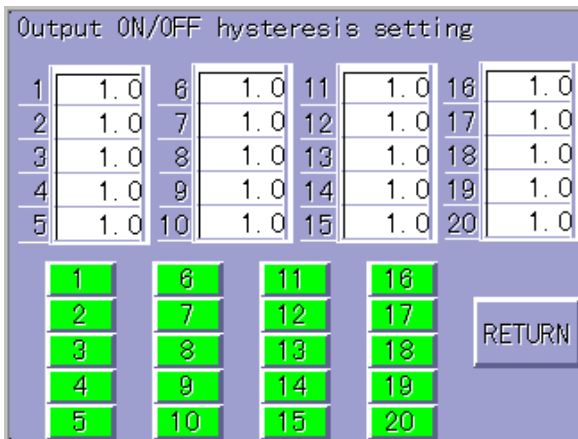
Sets control output high limit value for all channels.
 Setting range: Control output low limit value to 105%
 Setting greater than 100% is effective to the current output type.

• **Control output low limit setting display**



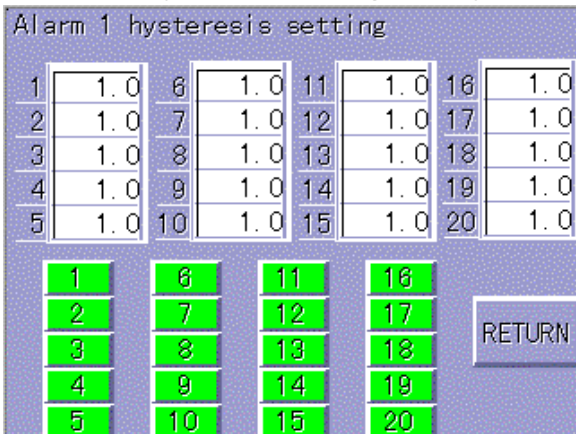
Sets control output low limit value for all channels.
 Setting range: -5% to Control output high limit value
 Setting less than 0% is effective to the current output type.

• **Control output ON/OFF hysteresis setting display**



Sets the control output ON/OFF action hysteresis for all channels.
 Only the channel that have proportional band set to 0.0 in the Proportional band setting display can be set. (P. 27)
 Setting range: 0.1 to 100.0°C (°F)

• **Alarm 1 hysteresis setting display**



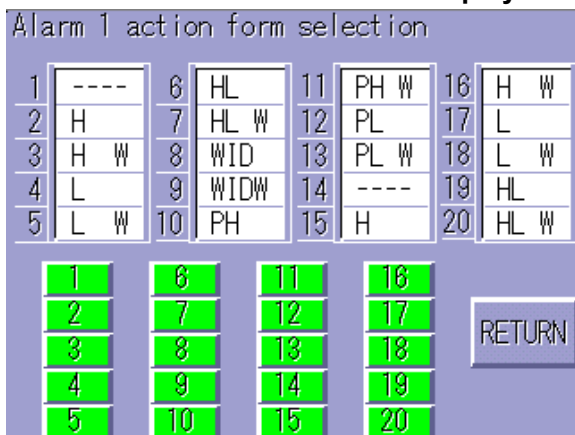
Sets the Alarm 1 hysteresis for all channels.
 This item is not available when No alarm is selected in the Alarm 1 action form selection.
 Setting range: 0.1 to 100.0°C (°F)

• Alarm 2 hysteresis setting display



Sets the Alarm 2 hysteresis for all channels.
 This item is not available when No alarm is selected in the Alarm 2 action form selection.
 Setting range: 0.1 to 100.0°C (°F)

• Alarm 1 action form selection display

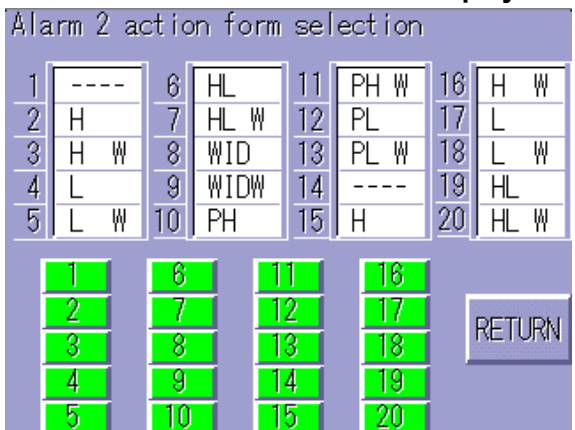


Selects the Alarm 1 action form for all channels.
 Action form: See [Table 5.4-2] below.
 For the alarm action drawings, refer to the instruction manual for C series.

[Table 5.4-2]

Alarm action form	Character
No alarm	----
High limit alarm	H
High limit alarm with standby	H W
Low limit alarm	L
Low limit alarm with standby	L W
High/Low limits alarm	HL
High/Low limits alarm w/standby	HL W
High/Low limit range alarm	WID
High/Low limit range alarm w/standby	WIDW
Process high alarm	PH
Process high alarm with standby	PH W
Process low alarm	PL
Process low alarm with standby	PL W

• Alarm 2 action form selection display



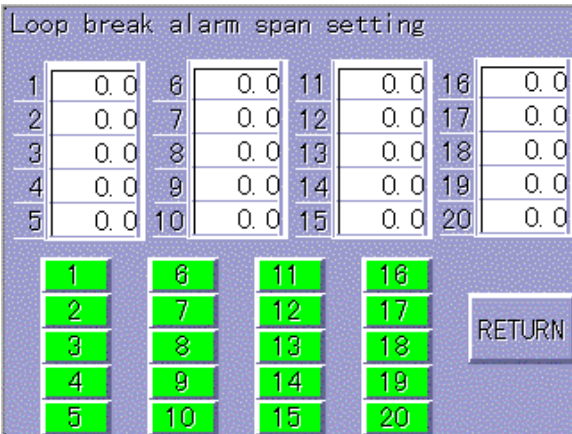
Selects the Alarm 2 action form for all channels.
 Action form: See [Table 5.4-2] above.
 For the alarm action drawings, refer to the instruction manual for C series.

• Loop break alarm time setting display



Sets time to assess the loop break alarm for all channels.
 Setting range: 1 to 200 minutes
 (Setting the value to 0 disables the function.)

• Loop break alarm span setting display



Sets the loop break alarm action span for all channels.
 Setting range: 0.1 to 100.0°C (°F)
 (Setting the value to 0.0 disables the function.)

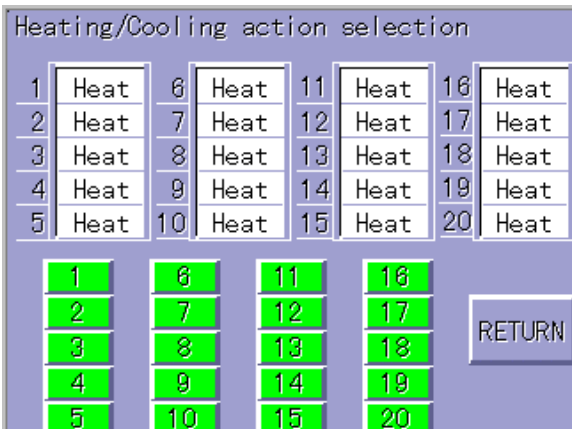
Loop break alarm

The alarm will be activated when the process variable (PV) does not rise as much as the span or greater within the time it takes to assess the loop break alarm after the manipulated variable has reached 100% or the output high limit value.

The alarm will also be activated when the process variable (PV) does not fall as much value as the span or greater within the time it takes to assess loop break alarm after the manipulating value has reached 0% or the output low limit value.

For the cooling control output, read “fall” for “rise” and vice versa.

• Heating/Cooling action selection display



Selects Heating or Cooling action for all channels.
 For details of the Heating/Cooling action drawing, refer to the instruction manual for C series.

6. Specifications

6.1 Functional specifications

Display function

Display device	Colored LCD
Color	16 out of 512 colors
Resolution	320 x 240 dots
Size	5.7 inches
Effective area	115.2 x 86.4mm (W x H)

Input function

Switch system	Transparent conductive touch switch
Switch type	Momentary, Alternate, Auto-repeat

6.2 General specifications

Electricity specification

Rated voltage	20.5 to 28.8Vdc
Power consumption	24VA or less
Dielectric strength	1.0kVdc for 1 minute between power terminal and ground
Insulation resistance	20M Ω or greater at 500Vdc between power terminal and ground

Environment specification

Ambient temperature	0 to 50°C (32 to 122°F)
Ambient humidity	15 to 85%RH (Non-condensing)
Vibration-proof	Based on JIS-C0911 5 to 55Hz, 2G X, Y, Z each direction for 2 hours
Impact-proof	Based on JIS-C0912 10G 12ms or less X, Y, Z each direction

Noise-proof (power source)

1000V_{P.P} (Pulse width 100ns, 1000ns) common mode

Noise-proof (communication)

500V_{P.P} (Pulse width 100ns, 1000ns) capacity coupling

Using atmosphere No corrosive gases present

Structure specification:

Mounting structure	Panel mounting system
Protecting structure	IP65F (for front panel section when using drip-proof packing)
External dimensions	195 x 150 x 47mm (W x H x D)
Weight	Approx. 850g or less

7. Troubleshooting

If any malfunctions occur, check if the power is supplied to the CMT-220-K and C series.
 When the power is supplied to the C series, the green LED of Power (PW) indicator lights up.
 Check the following when C series does not work even if its indicator lights up.



Warning

**Turn the power supply to the instrument OFF before wiring or checking.
 Working or touching the terminal with the power switched on may result in an Electric Shock which could cause severe injury or death.**

Phenomenon: The control output of CMT-220-K cannot be turned on. (The temperature does not rise.)

Presumed cause	Solution
The setting value has not been set yet.	Set the setting value from the CMT-220-K (P. 25)
Control output status has been turned off.	Turn the control output on from the CMT-220-K (P. 26).
Control output high limit value is set to 0%.	Set the control output high limit value properly from the CMT-220-K (P. 30).

Phenomenon: Control output of the CMT-220-K is not turned off. (The temperature rises too much.)

Presumed cause	Solution
Control output low limit value is set to 100%.	Set the control output low limit value properly from the CMT-220-K. (P. 30)

Phenomenon: The temperature indicated on the CMT-220-K is abnormal.

Presumed cause	Solution
Temperature unit setting is mistaken.	Set the unit properly from the CMT-220-K. (P. 29)
Improper sensor correction value is set.	Set the value properly from the CMT-220-K. (P. 28)

Phenomenon: It is unable to set from the CMT-220-K.

Presumed cause	Solution
Auto-tuning is performing.	Cancel the auto-tuning (P. 26).

Phenomenon: It is unable to communicate. (“Serial COM Error” is indicated on the display.)

Presumed cause	Solution
Data transfer rates of CMT-220-K and CPT-200 do not concur.	Set the same transfer rate to both. (P. 13, 14)
Wiring of the communication cable is mistaken.	Wire the cable properly (P. 11).

Phenomenon: Display of the CMT-220-K suddenly disappears

Presumed cause	Solution
“Display OFF Time Setup” of CMT-220-K has been set.	Set the “Display OFF Time” to 0 minutes (P. 13, 14).

If any unexplained malfunctions occur other than the above mentioned, make inquiries at our agency or the shop where you purchased the unit.

******* Inquiry *******

For any inquiry about this unit, please contact the shop where you purchased the unit or our agency
Please let us know the details of malfunction, if any, and the operating conditions.

**SHINKO TECHNOS CO.,LTD.
OVERSEAS DIVISION**

Reg. Office : 2-48, 1-Chome, Ina, Minoo, Osaka, Japan

Mail Address: P.O.Box 17, Minoo, Osaka, Japan

URL : <http://www.shinko-technos.co.jp>

E-mail : overseas@shinko-technos.co.jp

Tel : 81-72-721-2781

Fax: 81-72-724-1760

No.CMT21E1 2001.05