MC9 series

Multi Channel Temperature Controller operation manual

Thank you very much for purchasing Hanyoung Nux products.
Please use the product according to the intended use after reading the operation manual to see if it is the product you want. Also, be sure to keep this manual.

HANYOUNG NUX

Warranty policy

The standard warranty period for new products is 1 year(12 months), Hanyoungnux will repair free of charge only in the case of a failure that occurs under normal use as specified in this operation manual.

Except as stipulated in our warranty terms, we do not accept any warranty or responsibility for this product.

In using the product, due to unforeseen defects or natural disasters,
In the event of damage to a third party, the Company shall not be held responsible for any damage or indirect damage, etc. in any case.

Repairs due to failure that occur after the warranty period of the product has expired will be handled at actual cost (paid) in accordance with the standards set by HANYOUNGNUX.

In the following cases, even failures occurring within the warranty repair period will be handled at actual cost.

- Failure due to user error
- Failure due to natural disaster
- Failure due to movement after product installation
- Failure due to arbitrarily replacement (change or damage)
- Failure due to power problem such as unstable power supply
- If warranty service is required due to failures, etc., please contact the place of purchase or HANYOUNGNUX sales department
- Intended use of the equipment:

This device is used in various industrial environments to receive input from a temperature sensor, detect the difference between the set temperature and the actual temperature, and adjust it to reach the target temperature.

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Safety Precautions

BEFORE using this device, read this manual and save for future reference.
Signal words are used in this manual and apply to hazards or unsafe practices which could result in injury or property damage See the information below for definitions of the signal words.

⚠ **Danger**	Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ **Warning**	Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ **Caution**	Caution indicates a potentially hazardous situation which, if not avoided, may result in property damage or minor injury or both.
	Equipment protected throughout by DOUBLE INSULATION of REINFORCED INDULATION
	Rated voltage refers to AC contact voltage.
	Rated voltage indicates DC contact voltage.
	The CE mark is a mark used by EU member states to ensure the safety of products manufactured and distributed within the European market. Products related to consumer health, safety, and the environment sold in the EU are required to bear the CE mark.
	It means that the product complies with the safety requirements for electrical and electronic products in the Republic of Korea, and it is issued by a Korean certification body approved by the Korean Standards Association.
	A mark regarding the separation, discharge, recovery and recycling of waste electrical and electronic products.
	Check the electrical safety manual.
	Indicates the correct upward direction of the cargo. A cargo sign that has a top/bottom and cannot be flipped over.
	Cargo that should not be exposed to rain.
	Handle with caution (fragile product).

⚠ Danger

- This product operates at 100 – 240 V a.c., 50/60 Hz without any additional operation.
  If you use a power source other than the rated power, there is a risk of electric shock and fire.
- Do not touch with wet hands.
- Do not earth the unit to a gas pipe, lightning conductor or telephone etc. There is a risk of explosion and fire.

⚠ Warning

- If there is a risk of a serious accident due to a malfunction or abnormality of this device, install an appropriate external protection circuit.
- For the protection and safety of this device and the system used in connection with this device, please follow the safety precautions in this manual.
- In case of use or handling not in accordance with the instructions of the user manual, or any safety and loss caused by negligence etc. HANYOUNGNUX is not responsible.
- For the protection and safety of this device and the system used in connection with this device, the separate protection or safety circuit must be install it outside.
- Do not disassemble, repair, or modify arbitrarily. It may result in electric shock, fire or failure.
- Do not subject product to severe physical shock. It may result in damage on the device or failure.
- When wiring, turn off the power to all instruments before wiring.
- When using, follow basic precautions to reduce the risk of fire, electric shock and injury.
- For installation and use, follow only as specified in the operate manual.
- There is a risk of electric shock while energized, so do not touch the terminals.

⚠ Caution

- Before turning on the power, do a third-class grounding. (ground resistance less than 100 Ω)
- Do not supply power until the connection between devices of this product is completed.
- Do not block the heat sink on this product. It may cause malfunction.
- Install a switch on the power line to disconnect this device from the main power.
- Connect a fuse of about 250 V a.c., 500 mA to the power line.
- Use it in places with elevation below 2000 m.
- Do not wipe this unit with organic solvents such as alcohol or benzene. (Wipe with a neutral detergent.)
- Use in a place free from wather, oil, chemicals, steam, dust, salt, iron, etc. (Pollution Level 1 or 2)
- Do not use outdoors
- Overvoltage category II (OVC II)

Installation

Installation location and precautions

▪ Installation place

Danger As there is a risk of electric shock, use this product while it is installed on the panel.

- Do not install in the following places.
  - Where a person may unknowingly come into contact with the terminal.
  - Where directly exposed to mechanical vibrations or shocks.
  - Where exposed to corrosive or combustible gases.
  - Where is a lot of temperature change.
  - Where is too hot or too cold.
  - Where directly exposed to sunlight.
  - Where highly affected by electormagnetic waves.
  - Where is with flammable itmes around in case of fire.
  - Where is with a lot of dust, salt or moisture.
- Install the product so that the ventilation holes are not blocked (Min. 3 cm away from the other structures)

▪ Warranty

- The standard warranty period for new products is 1 year(12 months), Hanyoungnux will repair free of charge only in the case of a failure that occurs under normal use as specified in this operation manual.
- Except as stipulated in our warranty terms, we do not accept any warranty or responsibility for this product.
- In using the product, due to unforeseen defects or natural disasters, In the event of damage to a third party, the Company shall not be held responsible for any damage or indirect damage, etc. in any case.

▪ About product warranty terms

- The user's manual describes the product's functions in detail, and does not guarantee anything other than those described in the user's manual.
- The warranty period of the product is one year from the date of purchase, and only in the case of a failure that occurs under normal use as specified in the user manual, it will be repaired free of charge.
- Repairs due to malfunctions that occur after the warranty period of the product has expired are handled at actual cost (paid) in accordance with the standards set by our company.
- In the following cases, even failures occurring within the warranty repair period will be handled at actual cost.
  - Failure due to user error
  - Failure due to natural disaster
  - Failure due to movement after product installation
  - Failure due to product change or damage
  - Failure due to power failure such as power instability
- If service (A/S) is required due to malfunction, etc., please contact the place of purchase or our company.

Model configuration

4 Channels

Model	Code					Description
MC9-4	□	□	□	□	□	4Channel Digital Thermostat size : 96 (W) X 96 (H) ㎜
Control type	D					Cooling control (direct action)
	R					Heating control (reverse action)
Input type		□				Refre to "code" of input code chart
Output 1 ~ 4			M			Relay contact output
			S			SSR operation output
			4			Current output (4 - 20 ㎃ d.c.)
Ooptional				N		None
				3		AL2, AL3 + RS485/422 + contact input
Power supply voltage					2	100 - 240 V a.c. 50/60 Hz

8Channels

Model	Code						Description
MC9-8	□	□	□	□	□	□	8Channel Digital Thermostat size : 96 (W) X 96 (H) X 100 (D) ㎜
Control type	D						Cooling control (direct action)
	R						Heating control (reverse action))
Input type		□					Refre to "code" of input code chart
Output 1 ~ 4			M				Relay contact output
			S				SSR operation output
			4				Current output (4 - 20 ㎃ d.c.)
Output 5 ~ 8				N			None (when selected, input channels 5 ~ 8 are for indication)
				M			Relay contact output
				S			SSR operation output
				4			Current output (4 - 20 ㎃ d.c.)
Ooptional					N		None (Alarm output AL1, 2, 3 installed as standard)
					3		RS485/422 + contact input
Power supply voltage						2	100 - 240 V a.c. 50/60 Hz

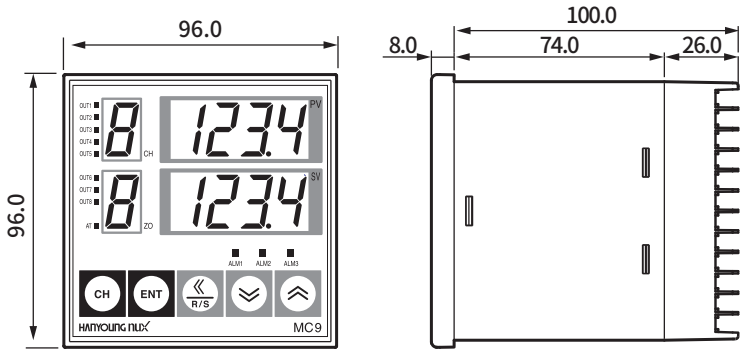
Input type & Range code

Category	Code	Input Type	Input Range (°C)	Accuracy
Thermocouple	K0	K	-200 ~ 1,370	± (0.3 % of F.S ± 1 Digit) or ± 2 °C whichever is greater
	K1	K	-199.9 ~ 999.9	
	J0	J	-200 ~ 1200	
	J1	J	-199.9 ~ 999.9	
	E0	E	-200 ~ 900	
	E1	E	-199.9 ~ 900.0	
	T0	T	-199.9 ~ 400.0	
	R0	R	0 ~ 1700	
	R1	R	0.0 ~ 999.9	
	B0	B	100 ~ 1800	
	B1	B	100.0 ~ 999.9	
	S0	S	0 ~ 1700	
	S1	S	0.0 ~ 999.9	
	L0	L	-199.9 ~ 900.0	
	N0	N	-200 ~ 1300	
	N1	N	-199.9 ~ 999.9	
	U0	U	-199.9 ~ 400.0	
	W0	W	0 ~ 2300	
	A0	PL2	0 ~ 1390	
RTD	P0	Kpt100 Ω	-199.9 ~ 500.0	± (0.3 % of F.S ± 1 Digit) or ± 0.8 °C whichever is greater
	D0	Pt100 Ω	-199.9 ~ 600.0	
Direct current	V0	0 - 5 V	-199.9 ~ 999.9	± (0.3 % of F.S ± 1 Digit)
	V1	1 - 5 V	-199.9 ~ 999.9	
	V2	0 - 10 V	-199.9 ~ 999.9	

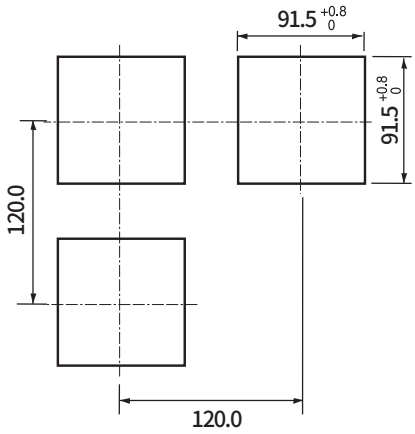
Dimentions & Panel cutout

[Unit:mm]

External dimensions

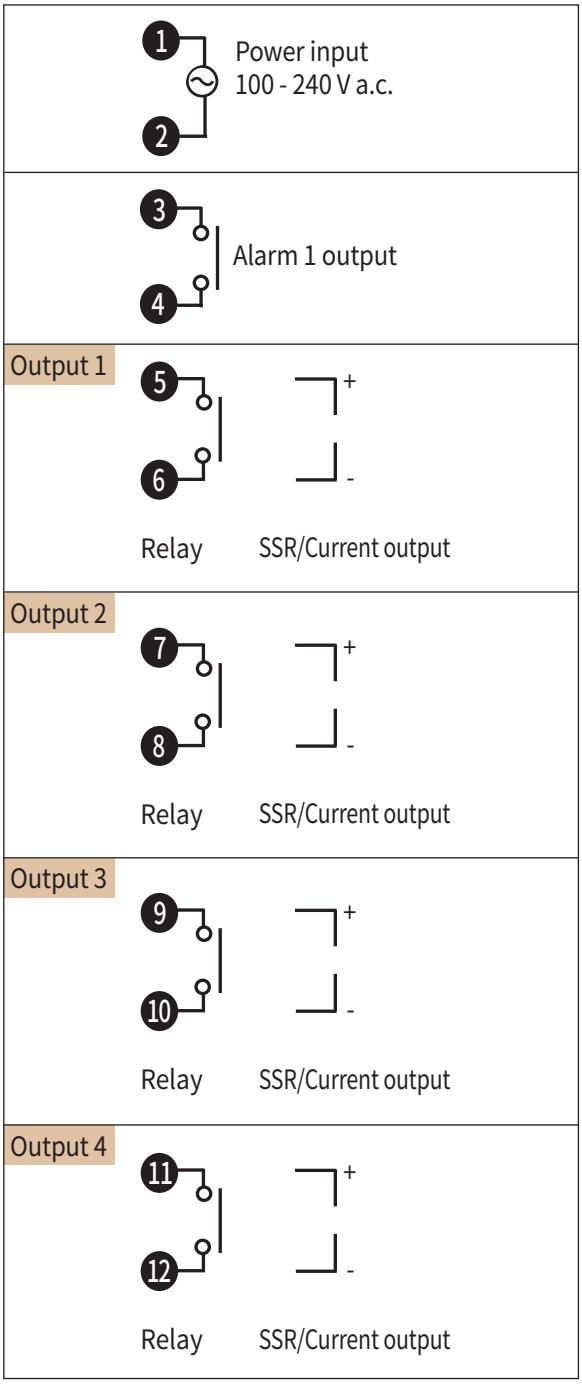


Panel cutout

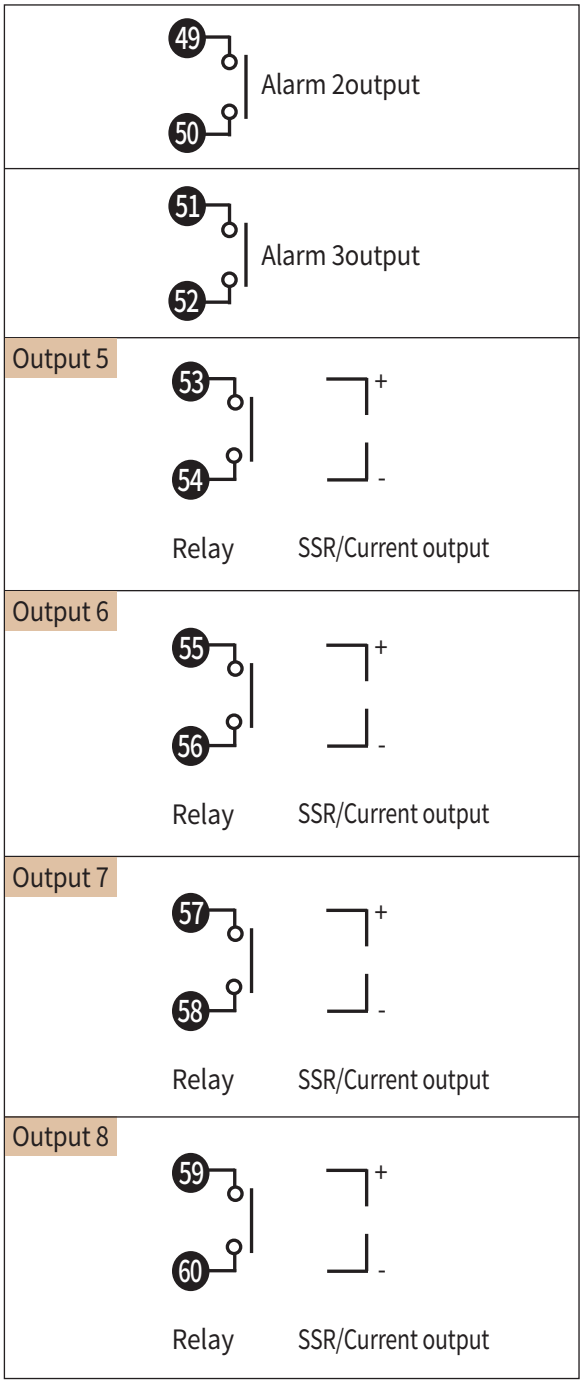


Connection diagrams

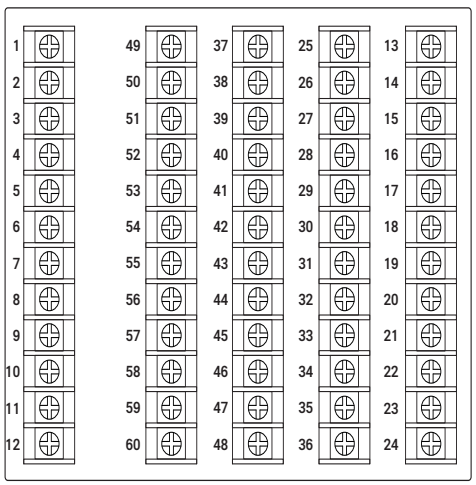
Output 1 ~ 4



Output 5 ~ 8

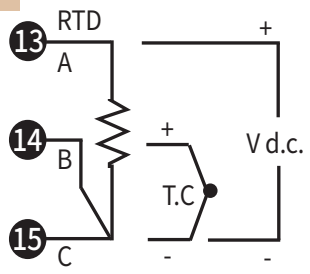


Terminal Arrangement

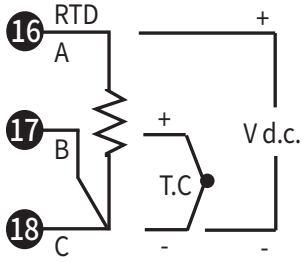


Input (1) 1 ~ 4 Channels

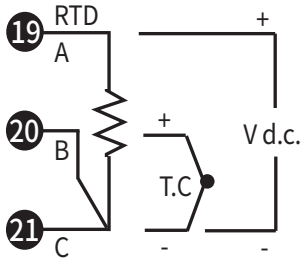
Channels 1



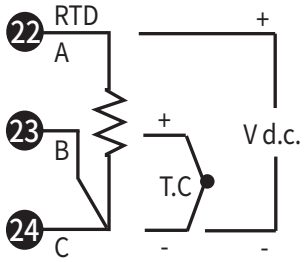
Channels 2



Channels 3

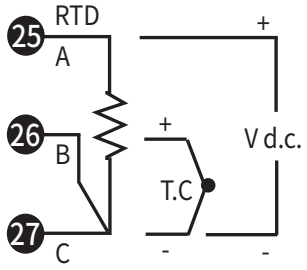


Channels 4

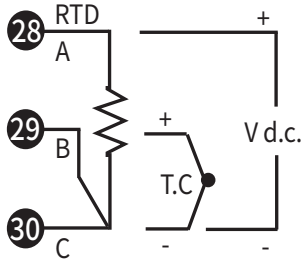


Input (2) 5 ~ 8 Channels

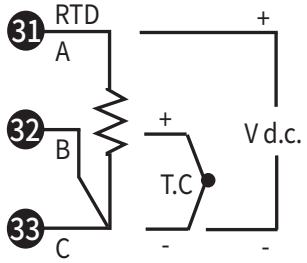
Channels 5



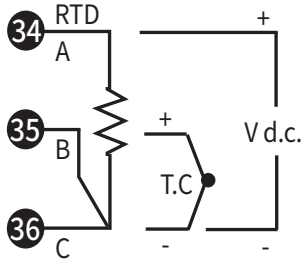
Channels 6



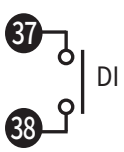
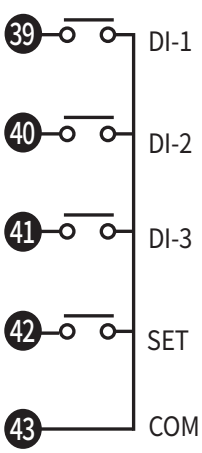
Channels 7



Channels 8



Option 1

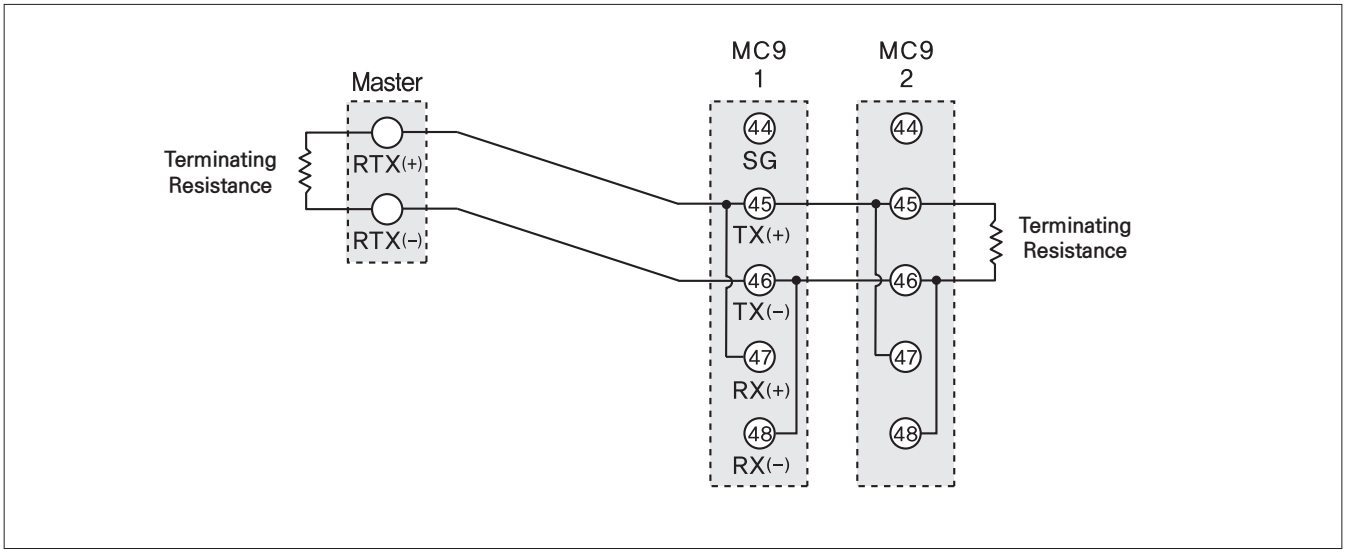
Contact input (Run/Stop)	Contact input (Memory Zone)	Communication
		

Communication connection example

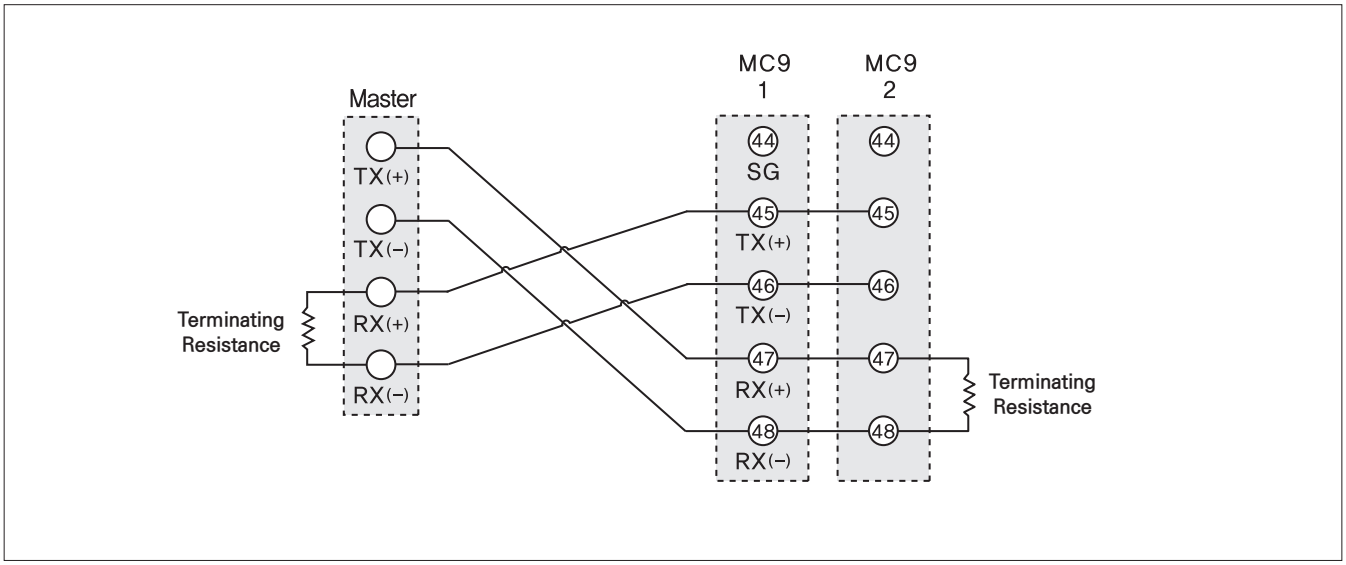
RS422 / RS485

Up to 32 units can be connected.
Be sure to connect a terminating resistor (100 Ω ~ 200 Ω 1/4 W) at both ends of the communication path.

2-wire

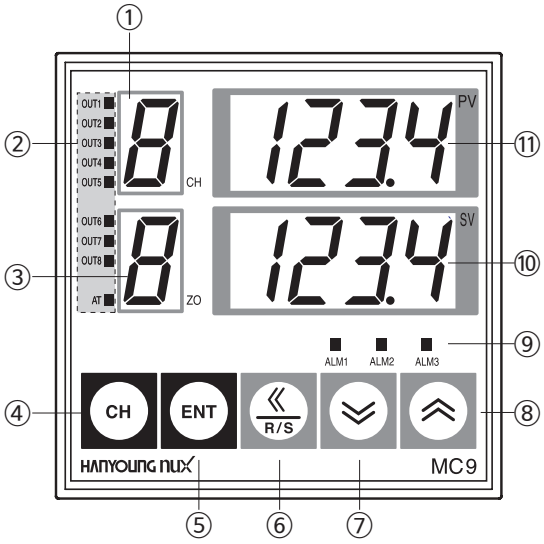


4-wire



How to set

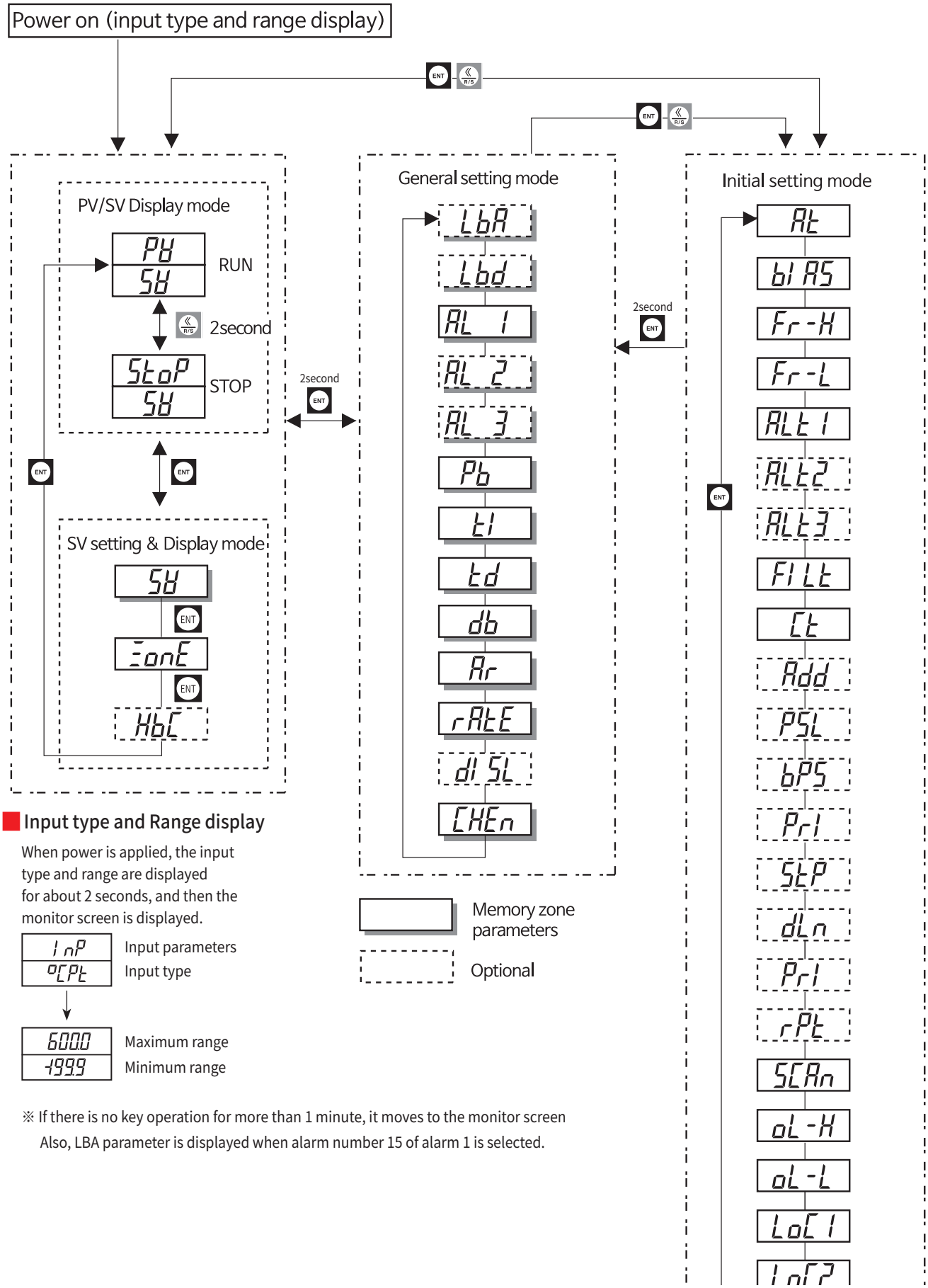
Name & Function



① : Channel number display
② : Control output and Auto-tuning display
③ : Memory zone indication
④ : Channel change (CH)
⑤ : Enter (ENT)
⑥ : Shif
⑦ : Decrease the setpoint
⑧ : Increase setpoint
⑨ : Alarm output display
⑩ : Set value (S.V) display
⑪ : Measured value (P.V) display

No	Name	Accuracy
①	Channel number Display	Display measurement channel or corresponding channel of setting parameter
②	Control output LED	Control output (1~8) operation indication and corresponding channel auto-tuning (AT) indication
③	Memory Zone Display	Displays the currently controlled zone number or the zone number of the parameter being set
④	CH	During individual scan, press the “CH” for 1 second to switch to automatic scan When “CH” is pressed during individual scan, the channel to be scanned is changed
⑤	ENT	Save the changed parameter or move to the next parameter
⑥	R/S	Move the number of digits of the set value Press for 1 second to start (RUN) or end (RESET) the control
⑦	﹀	Decrease in setpoint
⑧	﹀	Increase of set value
⑨	Alarm output LED	Alarm output operation indication LED (Alarm-1 ~ Alarm-3)
⑩	Set value Display	Set value (SV) display Parameter setting value display
⑪	Measured value Display	Measured value (PV) display Parameter display (7 SEG LED)

Parameter diagram



Input type and Range display

When power is applied, the input type and range are displayed for about 2 seconds, and then the monitor screen is displayed.

InP	Input parameters
oCPt	Input type
6000	Maximum range
-999	Minimum range

※ If there is no key operation for more than 1 minute, it moves to the monitor screen
Also, LBA parameter is displayed when alarm number 15 of alarm 1 is selected.

Parameter setting range & Initial setting value

PV/SV Display mode & SV setting & Display mode

Signal	Name	Range	Initial Value	Unit	Memory zone	Channel
SV	Temperature setpoint	Within range	0 %	EU	O	O
ZonE	Memory zone	1 ~ 8	1	Absolute value	O	X

General setting mode

Signal	Name	Range	Initial Value	Unit	Memory zone	Channel
LbA	Loop break alarm	OFF. 0.1 ~ 200.0 minute	8.0	Minute	O	O
Lbd	Loop break alarm hysteresis	EUS (0 ~ 100 %)	EUS 0 %	EUS	O	O
AL 1	Alarm 1 setpoint	5.3 Alarm action reference	-	-	O	O
AL2	Alarm 2 setpoint		-	-	O	O
AL3	Alarm 3 setpoint		-	-	O	O
Pb	Proportionality	EU (0 ~ 100 %)	30.0 °C, 3.0 %	EU	O	O
t I	Integral time (I)	0 ~ 3600	240	Second	O	O
td	Integral time (D)	0 ~ 3600	60	Second	O	O
Ar	Overintegration limit (A.R..W)	0 ~ 100	0.0(Auto)	%	O	O
rAtE	Limiting the rate of change	0 ~ 100 %	OFF	EUS	O	O
dI SL	Choose the point of contact	0 / 1	O	-	X	X
CHEn	Channel use non-use	OFF, MONI, CONT	CONT	ABS	O	O

Initial setting mode

Signal	Name	Range	Initial Value	Unit	Memory zone	Channel
AT	Auto tuning (A.T)	OFF, ON	OFF	ABS	O	O
bIAS	Temperature compensation	0.0 ~ 100 %	0.0	EUS	X	O
Fr-H	Upper limit range	FR-L ~ upper limit range	Input range upper limit	EU	X	X
Fr-L	lower limit range	upper limit range ~ FR-H	Input range lower limit	EU	X	X
ALt1	Alarm-1 type	0 ~ 16	0	-	X	X
ALt2	Alarm-2 type	0 ~ 16	0	-	X	X
ALt3	Alarm-3 type	0 ~ 16	0	-	X	X
FILt	Filter	OFF, 1 ~ 100	OFF	Second	X	O
Ct	Proportional cycle	1 ~ 100	20/2	Second	X	O
Add	Address	1 ~ 99	1	ABS	X	X
PSL	Protocol selection	0 ~ 1	0	-	X	X
bPS	Communication speed	0 ~ 3	3	ABS	X	X
Pri	Parity bit	0 ~ 2	0	ABS	X	X
StP	Stop bit	1.2	1	ABS	X	X
dLn	Data length	7.8	8	ABS	X	X
rPt	Response time	0 ~ 10	O	ABS	X	X
SCAn	Scan time	1 ~ 10	2	Second	X	X
LoC1	Lock 1	LOC 1 reference	0000	ABS	X	X
LoC2	Lock 2	LOC 2 reference	0000	ABS	X	X

EU (Engineering Unit) & EUS

EU (Engineering Unit) refers to the industrial unit, and The range is indicated with the percentage range to indicate the measurement range, and EUS is the span for the range indicated with the percentage range to indicate the measurement range.

Ex) EU, EUS setting range when the range is “-200 °C ~ 1370 °C”

Display items	Setting range (°C)	Note
EU 0 ~ 100 %	-200 ~ 1370	Percentage range display for range
EU -100 ~ 100 %	-1770 ~ 1370	
EUS 0 ~ 100 %	0 ~ 1570	Show percentage range for span
EUS -100 ~ 100 %	-1570 ~ 1570	

Range & Span

The Range is the range of the minimum and maximum values of the input variable or output variable, and is displayed as “minimum value to maximum value”.

The Span is the difference between the maximum and minimum values of a range.

That is, when the range is “-200 ~ 1,370”, The span would be 1,370 - (-200) = 1,570

Range	Span
-200 ~ 1,370	1,570
0 ~ 1,370	1,370
50 ~ 1,350	1,300
4 ~ 20 mA	16 mA

Measured value / Set value display mode

In the measured value (PV) / set value (SV) display mode, it is a screen to check the measured value (PV) and set value (SV) corresponding to the channel number displayed on the channel (CH) window.

Change channel

Manual channel change	CH Each time the key is pressed, the channel changes, and the measured value (PV) and set value (SV) of the memory zone for each channel are displayed. Scan time in initial setting mode (Scan time)
Auto channel change	CH If the key is pressed for more than 1 second, the channel number is changed automatically. In this case, the change time is the initial It is determined according to the setting mode scan time setting value

※ The set value (SV) displays the set value that changes according to the rate of change when the set rate limit (Rate) operates.

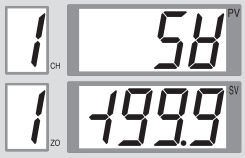
RUN / STOP

The R/S key is pressed more than 2 seconds in PV/SV mode, it can switch between RUN(operating)/STOP(stop) and measured value displays STOP when operation is stopped, and displays error message code when an error occurs.

Temperature setpoint (SV) setting and display mode

Select the memory zone to set and control the temperature set value (SV).
When power is applied, it becomes “PV/SV display mode”
At this time, set the set value with the ENT key while moving to setting and display item SV (set value) → ZONE R/S, ∨, ∧ by pressing the key.

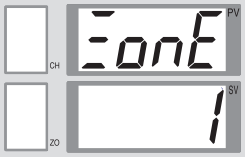
Temperature setpoint setting (SV)



- Initial value: EU 0 % (minimum value of range)
- Setting range: within the input range.
- Set the temperature set value (SV).

You can set up to 8 temperature setpoints from 1 to 8 channels.
Can set set the temperature setpoint to the same value from channel 1 to channel 8 at the same time.

Memory Zone Selection (ZONE)



- Initial value : 1
- Setting range : 1~8 Memory Zone
- Select the memory zone to be controlled.

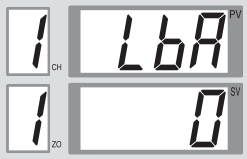
Up to 8 memory zones (storage areas) can store the settings for each channel.
Since the setting values of 8 channels can be saved, in case of 8 channels,
8 channels × 8 memory zones = 64 set values (SV) can be saved.

General setting mode

Press the ENT key for 2 seconds on the display screen to enter the "General setting mode"
In this setting mode, it is a parameter setting mode in which the user frequently changes the setting value, and it can be saved in up to 8 “memory zones”
When setting, can be registered and changed the setting value by using the ENT, ≪, ≫ key.

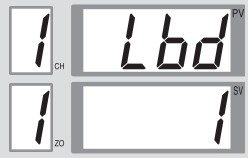
Description of each parameter

Control loop break alarm (LBA)



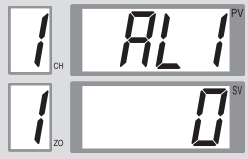
- Initial value : 8 minute
- Initial range : 0.1 ~ 200.0 minute
- Description : LBA monitors the change amount of the measured value (PV) and sets the time to detect any abnormal control loop
- Displayed only when LBA is set in alarm 1
- When auto-tuning (AT) is executed, twice the integral time (T1) is automatically set (However, it does not work if LBA is set to OFF)

Control loop disconnection alarm deadband (LBD)



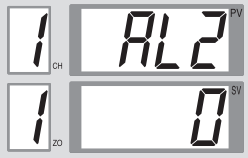
- Initial value : 0 °C, 0.0 °C, Voltage input : 0.0 %
- Initial range : 0 ~ 100 (second)
- Description : Set the range not to check for LBA error occurrence
  Displayed only when LBA is set in alarm 1
  If the LBA setting value is set to “0”, it does not work

Alarm-1 setpoint (AL 1)



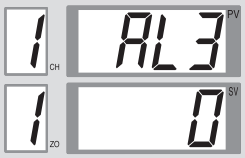
- Initial value : Maximum value of range (Refer to input type and range code table)
- Setting range : Range (refer to the input type and range code table)
- Description : Please set the set value of alarm 1.
  It does not appear if there is no alarm option or the alarm type is FAIL or LBA.

Alarm-2 setpoint (AL 2)



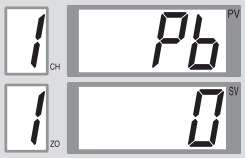
- Initial value : Maximum value of range (refer to input type and range code table)
- Setting range : Range efer to input type and range code table)
- Description : · Please set the set value of alarm 2.
  It does not appear if there is no alarm option or the alarm type is FAIL.

Alarm-3 setpoint (AL 3)



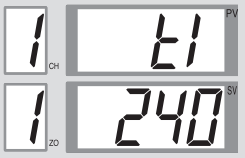
•Initial value : Maximum value of range (refer to input type and range code table)
•Setting range : Range (refer to input type and range code table)
•Description : Please set the set value of alarm 3
It does not appear if there is no alarm option or the alarm type is FAIL

Proportional band (PB)



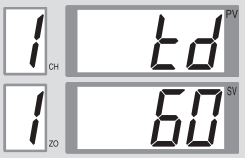
•Initial value : 30 °C, 30.0 °C,Voltage input : 3.0 %
•Setting range : 0(0.0) ~ Range maximun
•Description : Set the proportional band (PB) for P control, PI control, PD control, and PID control.
It is automatically set when automatic calculation (AT) is executed.

Integral time (TI)



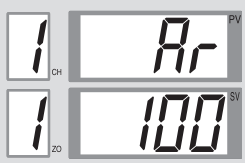
•Initial value : 60 second
•Setting range : 1 ~ 3600 second
•Description : Set the integral operation time
It is set automatically when automatic calculation (AT) is executed

Derivative time (TD)



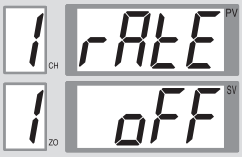
•Initial value : 60second
•Setting range : 1 ~ 3,600second
•Description : Set the differential operation time.
When automatic calculation (AT) is executed, it is set automatically.

Overintegration limit (AR)



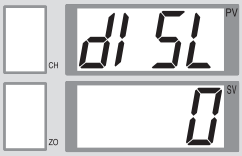
•Initial value : 0 (Auto)
•Setting range : 0 (Auto) ~ 100 %
•Description : To prevent overshoot due to over-integration effect, set the effective operating range of integral operation.
Set Ar = 0, it works automatically.

Set value change rate limit (RATE)



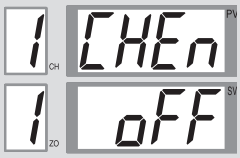
- Initial value : OFF
- Setting range : 0(0.0) ~ Range maximun / minute
- Description : Set the target value (SV) change per minute.
  If set to OFF, it does not work.
  If the target value (SV) is changed during operation (RUN),
  the slope setting (RATE) is activated.
  If AT is executed while slope setting (RATE) is running, RATE is immediately
  stopped and automatic calculation is executed with the newly set set value.

Select whether to use contact input (DISL)



- Initial value : 0
- Setting range : 0, 1
- Description : Select whether to use the DI function.
  0 : DI Not used / 1 : DI Used

Select whether to use a channel or not (CHEN)

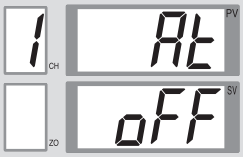


- Initial value : CONT
- Setting range : OFF, CONT, MONI
- Description : Select whether or not to use each channel for each memory area
  OFF : Specifies an unused channel
  (When set to OFF, the channel is not displayed)
  CONT : It becomes a general control state
  MONI : Display only PV value, no control operation

Initial setting mode

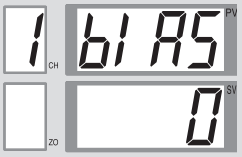
In display mode or general setting mode, press ENT and R/S keys at the same time to enter "initial setting mode".
In this setting mode, the user sets the system when building the system.
When setting, The ENT , , key can be used to register and change the setting value. (4.2.3Refer to initial setting mode)

Auto tuning (AT)



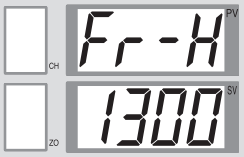
- Initial value : OFF
- Setting range : OFF, ON
- Set whether to execute auto-tuning.
  - Auto-tuning execution : After turning on the AT parameter, press the ENT key.
  - Cancel Auto Tuning : Turn off the AT parameter and press the ENT key.
    Auto-tuning is automatically canceled when the temperature set value (SV) is changed, when a burn-out or ADC error occurs, or when the operation is stopped.

Measurement value correction (BIAS)



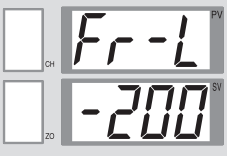
- Initial value : 0 °C, 0.0 °C, Voltage input 0.0 %
- Setting range : EUS (0 ~ 100 %)
- Description : As the sensor compensation function, when the measured value differs from the standard value, it is compensated for by the deviation to match.

Upper range limit (FR-H)



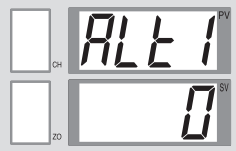
- Initial value : Upper limit of input range
- Setting range : FR-L ~ Upper limit of input range
- Description : Set the upper limit of the user input range.
  If the input value is higher than this value, an OVR or bout will occur.

Lower range limit (FR-L)



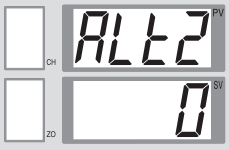
- Initial value : lower limit of input range
- Setting range : lower limit of input range ~ FR-H
- Description : Set the lower limit of the input range.
  If the input value is lower than this value, -OVR or bout is raised.

Alarm-1 type (ALT 1)



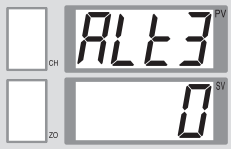
- Initial value : 0
- Setting range : 0 ~ 16
- Description : Set the type of alarm 1.
  Please refer to 5-3 Alarm Action.

Alarm-2 type (ALT 2)



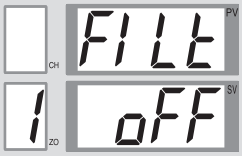
- Initial value : 0
- Setting range : 0 ~ 16
- Description : Set the type of alarm 2.
  Please refer to 5-3 Alarm Action.

Alarm-3 type (ALT 3)



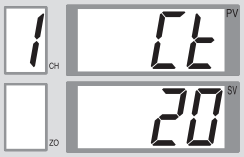
- Initial value : 0
- Setting range : 0 ~ 16
- Description : Set the type of alarm 3.
  Please refer to 5-3 Alarm Action.

Input filter (FILT)



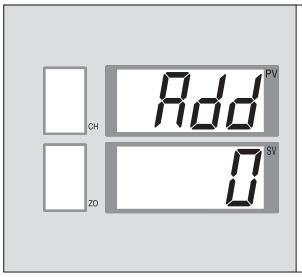
- Initial value : OFF
- Setting range : 1 ~ 120 seconds
- Description : Set the time of the 1st delay filter to remove any noise
  from the measured input value.

Proportional period (CT)



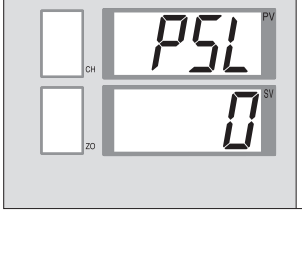
- Initial value : RELAY : 20seconds, SSR : 2seconds
- Setting range : 1 ~ 1000 seconds
- Description : · Set the control output cycle.
  · It does not apply when the output type is current.

Communication address (ADD)



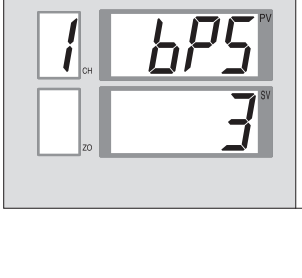
- Initial value : 1
- Setting range : 1 ~ 99
- Description : Select the communication function option and the parameters will be displayed. For RS422/485 communication, the address of the device is stored. For details, refer to the communication manual.

Select communication protocol (PSL)



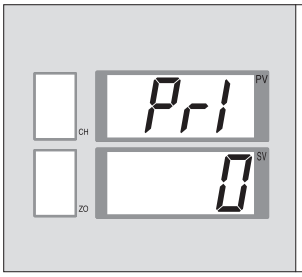
- Initial value : 0
- Setting range : 0 ~ 1
- Description : · Set the communication protocol type.
  0 : No pc link sum
  1 : Yes pc link sum

Communication speed selection (BPS)



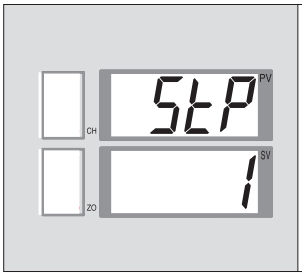
- Initial value : 3
- Setting range : 0 ~ 3
- Description : 1) Set the communication speed.
  2) Select the communication option and the parameters will be displayed.
  0 : 1200bps 1 : 2400bps
  2 : 4800bps 3 : 9600bps

Parity bit (PRI)



- Initial value : 0
- Setting range : 0 ~ 2
- Description : · Set communication parity.
  · Select the communication option and the parameters will be displayed.
  0 : NONE 1 : EVEN
  2 : ODD

Stop beat (STP)

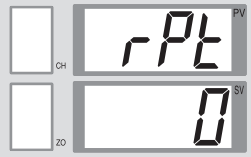


- Initial value: 1
- Setting range : 1 ~ 2
- Description : · Set the communication stop bit.
  · Select the communication option and the parameters will be displayed. 1 : 1 BIT 2 : 2 BIT

Data length (DLN)

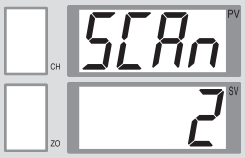
- Initial value : 7
- Setting range : 7 ~ 8
- Contents : · Set the communication data length.
  · Select the communication option and the parameters will be displayed.
  7 : 7 BIT 8 : 8 BIT

Response time (RPT)



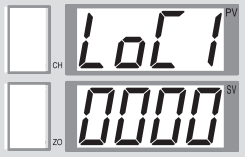
- Initial value : 0
- Setting range : 0 ~ 10
- Contents : · Set the communication response time.
  · Select the communication option and the parameters will be displayed.
  · Response time = processing time + RPT × 20 msT

Scan time (SCAN)



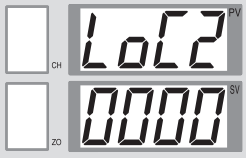
- Initial value : 2 seconds
- Setting range : 1 ~ 100 seconds
- Contents : Set the time from the currently displayed channel to the next channel.

Lock level(LOC 1)



- Initial value : 0000
- Description : · A device that restricts parameter setting changes by key operation.
  · DIGIT 1 : All parameters except SV and alarm 1, 2, 3 are prohibited.
  0 : unlock 1 : lock
  · DIGIT 2: Setting of alarms 1, 2 and 3 is prohibited.
  0 : unlock 1 : lock
  · DIGIT 3 : Prohibits setting of SV set value.
  0 : unlock 1 : lock
  · DIGIT 4 : Disabled (fixed to "0")

Lock level (LOC 2)



- Initial value : 0000
- Description : · It is a device that limits the prohibition of operation/stop change and the prohibition of change of zone area.
  · DIGIT 1 : RUN/STOP change is prohibited.
  · DIGIT 2 : Zone changes are prohibited.
  · DIGIT 3 : Not used (fixed at "0")
  · DIGIT 4 : Not used (fixed at "0")
  0 : unlock 1 : lock

Setting sequence

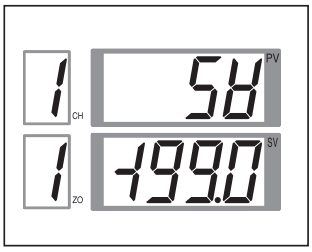
Settings by channel

An example of changing the temperature set value (SV) is as follows.
The same setting method applies to other parameters not described here.

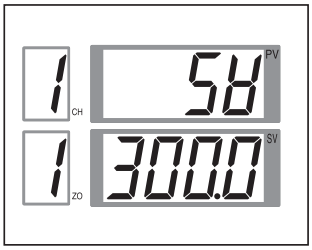
How to change the temperature set value (SV)

“Follow the procedure below to change the “Channel 1” setting of “Memory Zone 1” from -199.9 °C to 300.0 °C.

1. The ENT key is pressed once in PV/SV display mode,
   the SV(set value) setting mode is displayed as shown on the right.

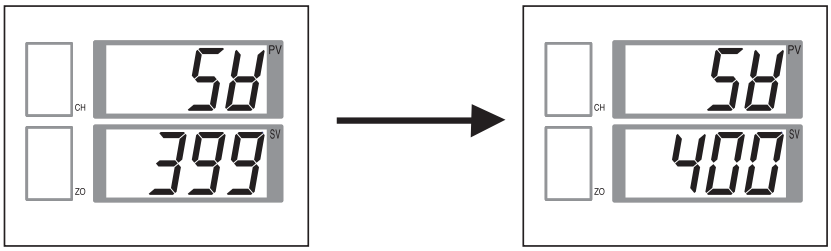


2. Press the R/S key once and the first digit "9" of SV will flash.
   Press the R/S key to move the digit, use the ∧ / ∨ key
   to set 300.0, and then press the ENT key to set.



When setting value (SV) increases (when changing from 399 to 400)

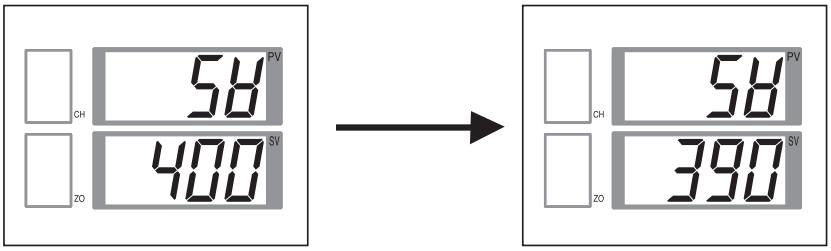
- As shown in figure [A], press the R/S key once and the number 9 on the device will blink.
- Press the ∧ key once to change to "0".
- In the SV display window, it is changed to 400 as shown in the figure below.



[Figure A] [Figure B]

When setting value (SV) increases (when changing from 400 to 390)

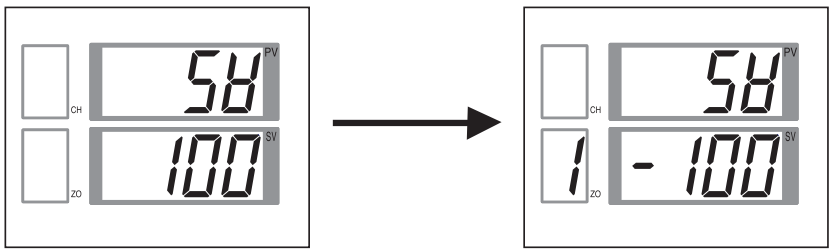
- As shown in the picture below, press the R/S key twice to flash the ten digit number.
- Press the ▼ key once to change the 10th "0" to a "9".
- In the SV display window, it is changed to 390 as shown in the figure below.



[Figure A] [Figure B]

When setting negative set value (SV) (when changing from 100 to -100)

- Press the R/S key three times as shown below and the 100 digit number will flash.
- Press the ▼ key twice to change to "-".
- In the SV display window, it is changed to -100 as shown in the figure below.

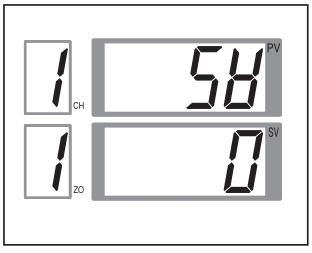


[Figure A] [Figure B]

When changing the set value (SV) of another control zone without changing the current control zone

The zone currently being controlled is Zone 1, and the desired zone is to change the set value (SV) from 200 to 100 in channel 2 of the second zone.

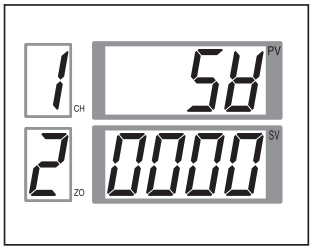
1. If the ENT key is pressed once on the PV/SV screen, the screen on as the left is displayed.



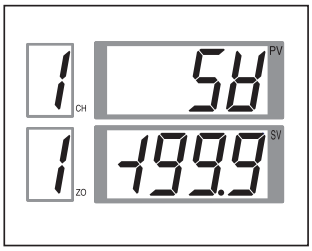
2. Each time press the R/S key to change from one 1 to zone 2, the digits of the SV (setpoint) appear sequentially as shown below, and "1" flashes when the cursor is on the number "1".

At this time, if the ▲ key is pressed once, “1” is changed to “2”, and if the ENT key is pressed again, the blinking operation of the “2” number stops.

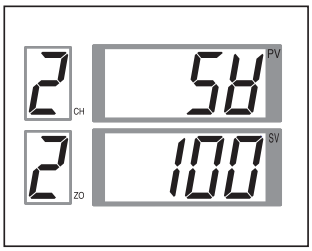
1 ← 0 ← 0 ← 0 ← 0 ←



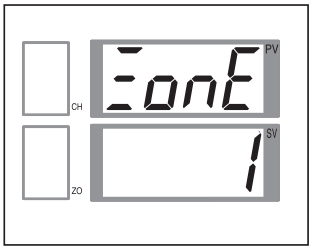
3. Press the CH key once to change the channel number from “1” to “2”. This will change the channel number from "1" to "2".



4. To change the set value (SV) of channel number “2” from 200 to 100, Press the R/S key 3 times to start blinking at 100 digits. At this time, if the the ▼ key is pressed, 200 changes to 100 the blinking operation is performed. the other way, if the ENT key is pressed, the blinking operation is stopped and registration is performed.



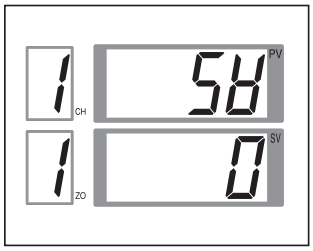
5. To change the zone number, press the ▲ key on the left screen to change the zone value.



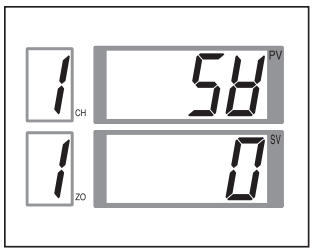
When setting all set values (SV) at once

When to set the channel setting value (SV) of 1-8 corresponding to Zone “1” from 0 °C to 200 °C all at once

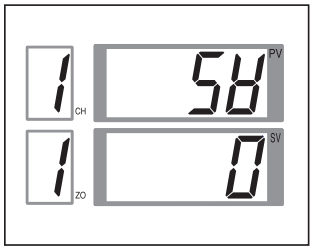
1. • If the ENT key is pressed in the PV/SV display state, the screen on as the left is displayed
   • press CH key. "A" is displayed after the number on the CH display, and "- - - -" is displayed on the set value (SV) display.



2. • The letter "A" here stands for batch setup.
   • Each time the CH key is pressed, the channel number changes as follows.
   1-2-3-4-5-6-7-8-A



3. • Press the R/S key to move the cursor to the 100th position, press the key twice to set it to 200, press the ENT key to register the SV value of all channels as 200 at the same time.
   • The parameters are replaced by the following parameters.



caution

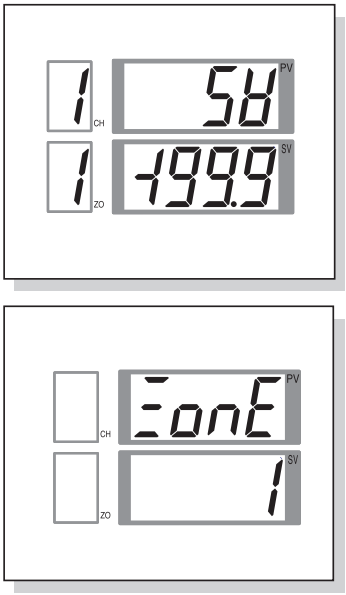
When this process is completed, the set value (SV) of unused channels is also set in batches.

Operation

This chapter describes the machine's operation, operation/stop switching, and memory area.
When the power voltage is applied after the wiring is completed, the operation starts after about 3 seconds.
(However, the operation stops according to the initial value setting. Press the R/S key to start RUN.)

Set value (SV) change

To change the setting value of “Channel 1 (CH1)” of memory zone “1” from -199.9°C to 300.0°C, set as follows.



1) When the ENT key is pressed once in PV/SV display mode,
SV (set value) setting mode is displayed as shown in the figure on the left.
2) Press the R/S key once and the first digit "9" of SV will flash.
3) Each time you press the R/S key, the number moves and flashes.
4) After setting the number using the ▼ and ▲ keys, press the ENT key to register.
5) In the SV setting mode, press the ENT key again to display
the memory area setting mode.

That is, whenever the ENT key is pressed in the temperature measurement mode ① Temperature measurement mode ⇒ ②Temperature set value (SV) setting mode ⇒ ③ It moves in order of memory zone (ZONE).
At this time, use the R/S, ▼, and ▲ Key to change the setting value.

Operation (RUN) / STOP (STOP) Selection

RUN/STOP can be selected by operating the front key except
for external contact input (option) or communication (option).

External contact input (number 37 - 38)	Front key status	Operation state	PV window display
OFF (STOP STATE)	Front key = RUN	STOP	dStP
	Front key = STOP	STOP	StoP
ON (RUN STATE)	Front key = RUN	RUN	Current temperature display
	Front key = STOP	STOP	PStP

Operation/Stop selection by external contact input (D.I) (option)

First, select “1 (Use D.I)” for the function mode “D.I selection” parameter, and then press the front R/S key in the operation screen (display current temperature).

Press to turn on the external contact input (No. 37-38) when “ dSTP ” is displayed on the PV display window to display the current temperature on the PV display window. This state is the RUN state.

Also, when the external contact input is turned OFF, “ STOP” is displayed on the PV display window and the operation is stopped.In other words, whenever the front R/S key is pressed when the external contact input is ON and in the running state, the run/stop state is repeated.

Run/Stop selection by front key operation

First, select “0 (DI not used)” in the function mode “DI selection” parameter and press the front R/S key on the operation screen (display current temperature) to display “ USTP ” (stop) and current temperature (RUN).
Is displayed on the PV display and the operation/stop status is repeated.

Changing the control memory zone

To change the memory area, there is a method by operating the front key in addition to the method by external contact input (option) and communication (option). The method by external contact input and the method by front key operation are as follows.
For the method of selection by communication (optional), refer to the communication manual.

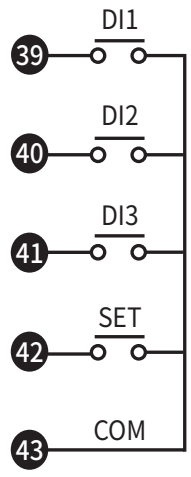
Changing memory area by front key operation

To change “memory area 1” to “memory area 2”

1) When the ENT key is pressed in the PV/SV display mode, the SV (set value) change mode is displayed.
2) Press the ENT key to display the ZONE (memory zone) change mode.
3) Press the ▲ key to set "2", press the ENT key to save the new value.

Memory area change by external contact input (option)

Select the memory zone according to ON/OFF of external contact input terminals 39 ~ 43.
The memory zone number is selected by the external contact input terminals 39 to 42,
and the memory zone number is stored when the contact numbers 42 and 43 (D.I SET) change from OFF to ON.



Terminal number	Memory area number							
	1	2	3	4	5	6	7	8
39 - 43 (COM)	OFF	ON	OFF	ON	OFF	ON	OFF	ON
40 - 43 (COM)	OFF	OFF	ON	ON	OFF	OFF	ON	ON
41 - 43 (COM)	OFF	OFF	OFF	OFF	ON	ON	ON	ON

Auto tuning (Autotuning)

The auto-tuning function automatically calculates and calculates
the optimal PID value and LBA setting time, and sets the values to each parameter.

Auto tuning execution

Auto-tuning is executed when all of the following conditions are satisfied.
1) Set all parameters except PID(PB,TI,TD) and LBA.
2) In setup mode, lock level 1 (LOCK1) and lock level (LOCK2) are set to “0000”.
3) RUN/STOP mode is set to RUN mode.
4) Set the setting mode “AT” parameter to “ON”.
(When auto-tuning is finished, it is automatically set to “OFF”.)

Cancel auto-tuning

Autotune (AT) is canceled when any of the following conditions occur.
1) When auto-tuning parameter is set to “OFF” during auto-tuning
2) If the input sensor is disconnected and burnout or ADC error occurs
3) In case the power is turned off during auto-tuning
4) When switching to STOP mode
When auto-tuning is completed, the PID(PB, TI, TD), ARW(AR), and LBA parameters are changed to new values.
Also, if auto-tuning is canceled while auto-tuning is in progress,
control operation is performed with the parameter set value before auto-tuning.

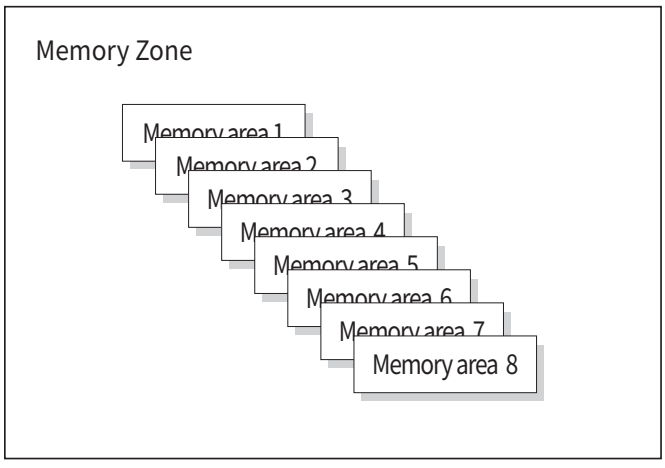
Details of the function

External contact input (D.I) function (option)

1) This device can be operated (RUN) or stopped (STOP) by an external contact input signal.
2) It can be controlled by selecting the memory area number with an external contact input signal.
※ When using external contact input, function mode "DISL" must be selected as No. 1 (using DI).

Memory zone function

This function saves parameters such as temperature set value (SV) of channels 1 to 8 in 8 memory zones.
In other words, data of 8 channels is stored in one memory zone, and temperature control is possible under different setting conditions only by selecting
the memory zone number as needed.
The parameters that can be saved in the memory area are set value (SV), control loop break alarm (LBA), alarm 1, alarm 2, alarm 3, proportional band, integral time, derivative time, overintegration limit,
SV slope setting, channel use. /Not used.



Input correction function (Bias)

The measured value is corrected by adding the value set in the input correction (Bias) parameter to the value input by the sensor.

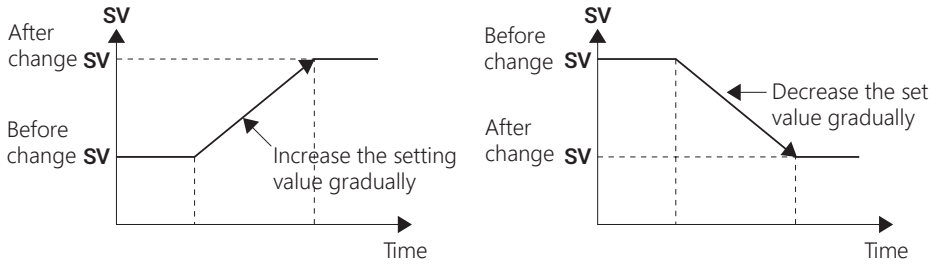
Digital filter function (Filter)

In order to reduce the fluctuation of the measured value (PV) due to noise, the influence of input noise can be suppressed by appropriately setting the time constant of the filter according to the noise level. However, if the time constant is too large, the response of the input signal is delayed.

Set value (SV) change rate setting function (Rate)

When the set value is changed, the set value / minute, that is, the amount of change of the set value per minute is set to prevent thermal shock and improve control stability.
If the function mode “RATE” parameter is set to “OFF”, the slope setting function does not work.
If auto-tuning (AT) is executed while the slope setting is running, the slope setting function is stopped and auto-tuning is performed with the newly set setting value.

Alarm action



Scan time setting function (Scan)

This function displays the measured values and set values of all channels in the memory zone at scan time intervals. For example, if the scan interval time is set to 2 seconds, the measured value and set value of each channel are displayed at an interval of 2 seconds.

All channels batch setting function

This is used to set the same value from 1 to 8 channels in the designated memory zone.

1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → A

“A” is displayed on the CH display window and “----” is displayed on the SV window. At this time, set the setting value by using the R/S key, ∧ key, and ∨ key and press the ENT key to set the same value from channel 1 to channel 8.

Alarm function

• Alarm output is commonly applied to all channels. That is,
if any one of 4 channels or 8 channels satisfies the alarm output conditions, the alarm output operates.

• Hysteresis for alarm output is set to 2 ℃ (2 %).

• The standby operation alarm operates on standby in the following cases.

- When you first start operation
- When changing the target value
- When the target value is changed by changing the memory zone

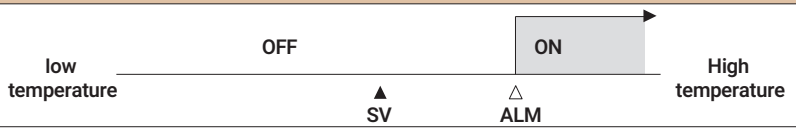
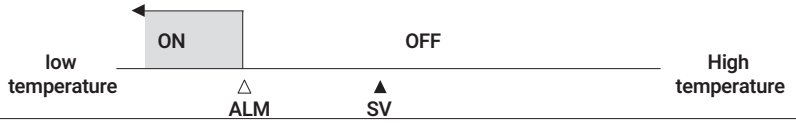
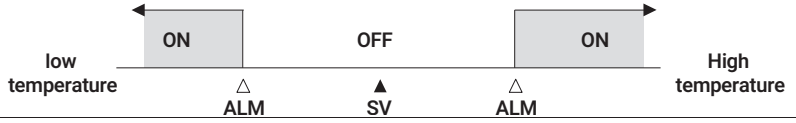
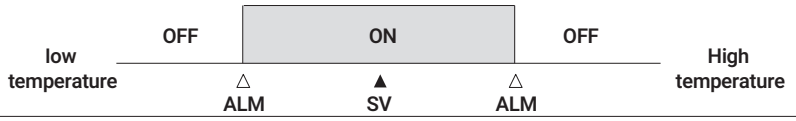
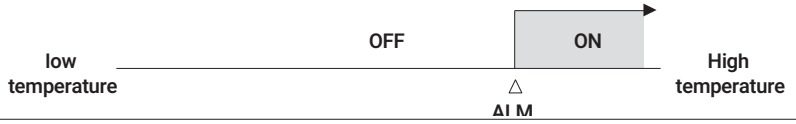
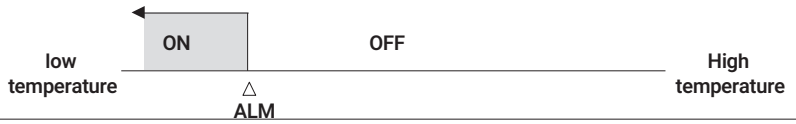
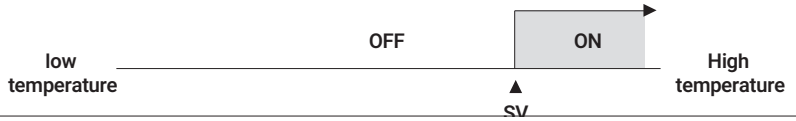
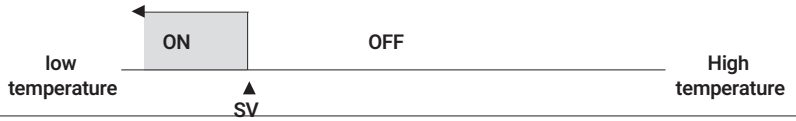
• Setting range and initial setting value for each alarm type

Setting number	Alarm type		Setting range	Initial value
0	No alarm		-	-
1	Deviation setting	High limit alarm	SPAN (EUS)의 ±100 %	Maximum
2		Low limit alarm		
3		High/low limit alarm	SPAN (EUS)의 0~100 %	
4		In range alarm		Minimum
5	Deviation setting (Standby operation)	High limit alarm	SPAN (EUS)의 ±100 %	Maximum
6		Low limit alarm		
7		High/low limit alarm	SPAN (EUS)의 0~100 %	
8		In range alarm		Minimum
9	Absolute setting	High limit alarm	Same as input range (EU 0 ~ 100 %)	Maximum
10		Low limit alarm		Minimum
11	Absolute setting (Standby operation)	High limit alarm		Maximum
12		Low limit alarm		Minimum
13	SV High limit alarm			Maximum
14	SV Low limit alarm			Minimum
15	LBA alarm		-	-
16	FAIL alarm		-	-

※ Setting number 15 (LBA alarm) operates only in 'ALt 1'.

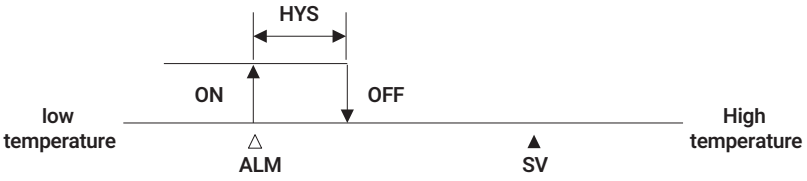
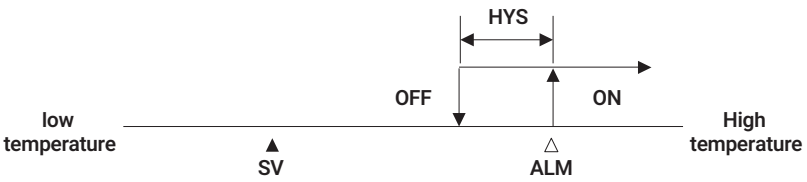
※ The setting range can be set within the range of -1999 to 9999.

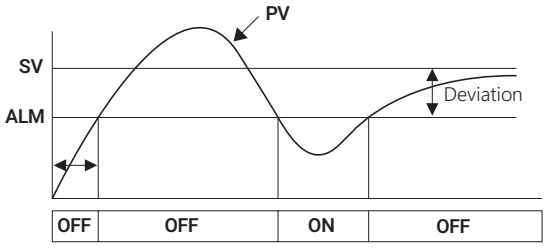
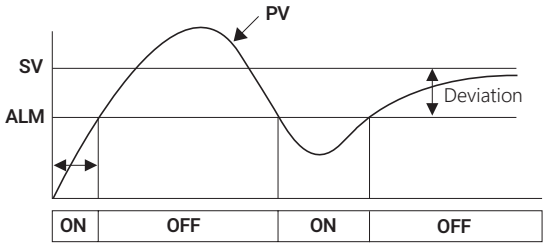
• Example of alarm operation (▲: Control error setting value, △: Alarm temperature setpoint)

Alarm type		Alarm operation
Deviation setting	High limit alarm	
	Low limit alarm	
	High/low limit alarm	
	In range alarm	
Absolute setting	High limit alarm	
	Low limit alarm	
SV High limit alarm		
SV Low limit alarm		

• Alarm output hysteresis

The alarm output hysteresis is fixed at 2 °C.

Alarm type	Alarm operation
Low limit alarm	
High limit alarm	

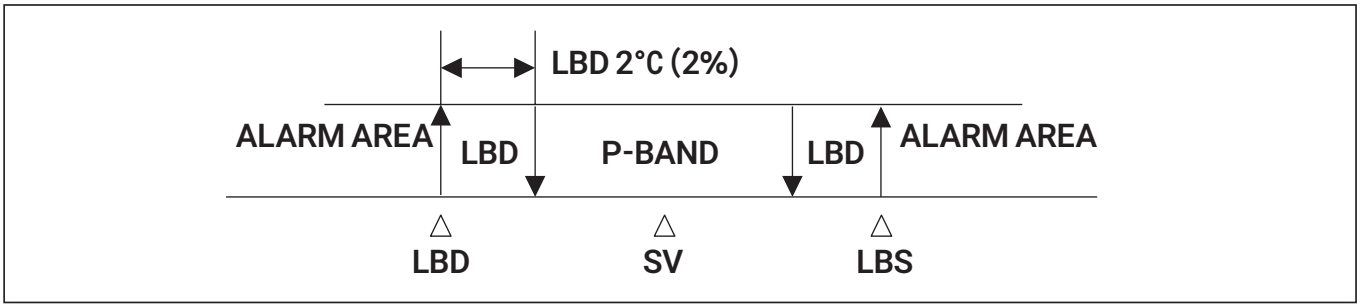
Alarm type	Alarm operation
There is a standby operation	
There is no standby operation.	

Control loop break alarm (LBA)

If the measured value (PV) is within the proportional band (PB),
the LBA operation is not performed and LBA operation starts after it is out of the proportional band.

• Loop break alarm (LBA) operation
- When the output is “0” % and the control output operation is a direct operation
  It operates when the measured value does not rise more than 2 °C (2 °F, 2 %) within the time set in LBA.
- When the output is “0” % and the control output operation is the reverse operation
  It operates when the measured value does not fall more than 2 °C (2 °F, 2 %) within the time set in LBA.
- When the output is “100” % and the control output operation is a direct operation
  It operates when the measured value does not fall more than 2 °C (2 °F, 2 %) within the time set in LBA.
- When output is “100” % and control output operation is reverse operation
  It operates when the measured value does not rise more than 2 °C (2 °F, 2 %) within the time set in LBA.

• Hysteresis of loop break alarm (LBD)
- LBD sets the hysteresis of the loop break alarm output in the parameter.
- Even if an alarm occurs due to LBA operation, if the measured value is within the LBD,
  the alarm operation does not occur.



ERROR DISPLAYS (TROUBLESHOOTING)

Display	Meaning	PV window display	Action & status of control
oVr -oVr	When the measured value (PV) exceeds the input range	OVR : Display current PV value alternately up to EU (105 %) -OVR : Display current PV value alternately up to EU (-5 %)	Countermeasure : Check PV value Output state: Normal operation PV status: Normal operation
rJC	In case of R.J.C error	Displays PV value that does not include RJC value	Countermeasure : POWER OFF → ON Output status: Normal operation PV status : Normal operation
EEP	In case of EEPROM error	Display current PV value	Countermeasure : POWER OFF → ON Output status : Normal operation PV status : Normal operation
bOUt	Input sensor error or measured value (PV) exceeds EU (-5 to 105 %)	BOUT display	Countermeasure : Input sensor inspection, PV value inspectionOutput status : Forward (100%) Reverse (0%) PV status : Forward (0%) or less Reverse (100%) or more
AdC	More than A.D converter	ADC	Countermeasure : POWER OFF → ON. If the error continues to appear, contact the nearest agency or head office A/S. Output status : Forward (100%) Reverse (0%) PV status : Forward (0 %) or less Reverse (100 %)

Specification

Input specifications

Title	Description
Temperature input (multi input)	Thermocouple (T.C) : K, J, R, S, B, E, N, T, W, PL2, U, L RTD (R.T.D) : Pt100 Ω, KPt100 Ω Direct current voltage (DCV) : 0 ~ 5 V, 1 ~ 5 V, 0 ~ 10 V,4 ~ 20 ㎃ (250 Ω with external resistor)
The degree of display level	Thermocouple : ±(0.3 % of F.S ±1Digit) or ±2 °C, whichever is greater RTD : (±0.3 % of F.S ±1Digit) or ±0.8 °C, whichever is greater DC voltage : ±0.3 % of F.S ±1Digit
Sampling cycle	1 second
Input display resolution	Basically, below the decimal point of the "measurement range index"
Input impedance	1 ㏁ or more. (Input thermocouple and DC voltage)
Effect of allowable input resistance	about 0.2 μV/Ω
Acceptable input wire resistance	Temperature resistance (10 Ω or less. However, the resistance between the three lines will be the sam)
Acceptable input voltage	Within 2–5 V (thermal band, thermoelectric resistor), within -5–12 V (d. c. voltage)
Scaling	0.0 % ~ 100.0 % of F.S
Input correction	±100 % of F.S
Reference point compensation error	±1.5 °C (Between 0 and 50°C)
Input open circuit detection	UP SCALE (reverse acting), DOWN SCALE (reverse acrion)
Insulation resistance	20 ㏁ or morte (500 V d.c.), Measurement terminal-Power terminal
Voltage resistance	2,300 V a.c. 50/60 ㎐, For a minute. Measurement terminal-Power terminal.

Output specification

Title		Description
Control output	Relay output	Contact capacities: 1a, 240 V a.c., 3A. (resistance load) Proportional cycle: 1 to 1,000 seconds Time resolution: 0.1 % or 10 ms, whichever is smaller
	S.S.R (voltage pulse)	Voltage pulse : More than or equal to about 12 ~ 15 V d.c. (Load resistance of 600 or more) Proportional cycle: 1 to 1,000 seconds Time resolution: 0.1% or 10%, whichever is smaller
	S.C.R (Current.)	Current. : 4-20 ㎃ d.c., 0 ~ 20 ㎃ (Load resistance less than 600Less than) Degree : ±1.0 % of F.S (4-20 ㎃ range)
Alarm output (Relay)	Temperature alarm (AL1,2,3)	1a, 240 V a.c., 1 A. (Resistance load) Output score: Up to 3 points (depending on the selection specification)
	Short-loop warning (L.B.A)	1a 1point, 240 V a.c., 1 A. (Resistance load) Proportional period : 1 ~ 1,000 seconds

General specification

Title	Description
Power supply voltage	100 - 240 V a.c., 50 / 60 Hz
Voltage fluctuation rate	Power supply voltage ±10 %
Power consumption	21 VA
Ambient temperature	0 - 50 °C
Ambient humidity	35 - 85 % RH (Without condensation)
Storage temperature	-25 ~ 65 °C
Vibration resistance	10 - 55 Hz, One-sided width 0.75 ㎜, Three axes, in each direction, 2h
Shock resistance	300 ㎨, Three axes, in each direction. Three times each
Weight (g)	700 g

Communication specification

Title	Description
Applied specification	EIA-RS485, RS422A
Maximum number of connections	31 or 255 units
Communication method	2-wire half-duplex, or 4-wire half-duplex
Synchronous Way	Asynchronous
Communication order	No order
Communication distance	1.2 ㎞ max
Communication speed	1200/2400/4800/9600 bps (Change by parameter setting)
Start bit	1 Bit
Date bit	7 or 8 Bit
Parity bit	None, Even number, Odd number
Stom bit	1 or 2 Bit
Protocol	PC Link SUM none. (0), PC Link SUM Have (1)
Response delay time	Receipt processing time + (response time X 10)

Frequently Asked Questions(FAQ)

NO.	Questions & Answers
1	Q : "KSTP" is displayed on the temperature display window, the device does not work.
	A : When this KEY is pressed for 3 seconds, the stop status is released and the operation state is performed. Press R/S KEY for 3 seconds again to stop the control.
2	Q : Want to control the temperature for only some channels, is it possible to RUN/STOP for each channel?
	A : RUN/STOP is basically all-channel RUN/STOP.The parameter "CHEN" allows RUN/STOP for each channel. If the RUN/STOP is set to the RUN state and the value of the "CHEN" parameter of each channel is set to OFF or monitor, the control of the corresponding channel is stopped. If you want to turn on the corresponding channel, you can set the value of this parameter to "control". If the value of this parameter is set to mono, it is not controlled, but the current temperature is displayed, and if it is set to off, the channel is not displayed on the driving screen.
3	Q : Is it possible to change the temperature of each channel automatically?
	A : Pressing the ch key on the front for about 3 seconds automatically changes the channel display.
4	Q : Can't I use a temperature sensor as a thermoelectric type k→J?
	A : This control instrument is determined at the time of shipment in a single input method, and the customer cannot change it.
5	Q : I want to use the output together with relay or ssr depending on the channel. Is it possible?
	A : This control instrument can be used separately up to two types of 1-4 channels and 5-8 channels. However, each channel cannot be used differently. One type of output is possible by grouping into four channels.
6	Q : Do you want to do ON/OFF control instead of P.I.D control?
	A : When the integer P value of the PB of the parameter is set to "0", the channel performs an ON/OFF operation.
7	Q : Warning output can be set by individual channels?
	A : Up to three alarms are supported, and each alarm has one alarm type. An alarm is generated when the alarm condition is out of one or more of the entire channels.
8	Q : It shows "rjc" on the screen, so it does not do anything.
	A : There is an abnormality in the temperature compensation part, so please send the product to a nearby agency or headquarters department A/S.
9	Q : When controlling ON/OFF, I want to adjust the width of the hysteresis. Is there a way?
	A : In MC9, the hysteresis is set to be fixed, so the width cannot be arbitrarily changed.
10	Q : The temperature of some CHs among 8 CHs is deviated, and is it possible to correct each of the temperatures of the generated channels?
	A : Press ENT+<KEY on the monitor screen to enter the setup mode. Press the ENT key to correct it in BIAS.
11	Q : After remembering the set temperature in advance, if necessary, how much is it possible to call and use it?
	A : MC9 can remember up to eight settings for each channel and use them. 8CH×8 = 64 set values can be stored.

12	Q : I want to set the setting value to the same value for 8 channels at the same time, how to do?
	A : To set the same value for eight channels, The parameter is set to A then input, will be set to the same value for eight channels.
13	Q : Is it possible to auto-tune at 8 channels once?
	A : If you press ENT+<< KEY in functional mode, can enter the set-up mode, then the AT parameter appears, press CH KEY sequentionally, it will become 1->2->3->...A, when "A" comes out, change the OFF of the SV display to ON then press ENT KEY, all channels are auto-tuned at once.
14	Q : In which case is auto-tuning canceled?
	A : Auto-tuning is automatically canceled when the AT parameter is OFF, the target value (SV) is changed and Burn-Out or ADC error occurs.
15	Q : Is it possible to auto-tune only certain channel?
	A : In order to execute auto-turn on specific channel, press CH key in AT parameter to select a desired channel number and change the OFF to ON.
16	Q : Due to the surrounding influence of temperature, the movement of the last digit is severe, how do I take action?
	A : On the monitor screen, press ENT+ << KEY to enter the setup mode, and press ENT KEY to enter it in the parameter of FILT, the movement appears dull.
17	Q : How many PID values operate in channel 8?
	A : The PID value constant exists in each channel, 8 PID values exist when using 8 channels, and since there are 8 SV storage per channel, 64 PID integers exist.
18	Q : What is ZONE MEMORY?
	A : Zone Memory is a memory area that stores the setting values of 1-8 channels from zone 1 to zone 8.
19	Q : There are 3 alarms, how do they operate?
	A : If desired alarm values are set in alarms 1, 2, and 3, the operation is performed when a temperature corresponding to the alarm is detected during operation.
20	Q : I want to change the setting value(SV) of another control zone without changing the currently controlled zone.
	A : When you want to change from zone 1 to zone 2, press ENT KEY once on the initial screen to enter SV mode. Here, in order to change the zone from 1 to 2, the digital value of SV changes every time << KEY is pressed, and when the cursor's position is in the zone, press UP KEY to change it to 1→2, the zone changes from zone 1 to zone 2. Here, when CHKEY is pressed to change the channel number from 1 to 2, the channel is sequentially changed. Here, the desired temperature may be set using UP and DOWN KEY. - Refer to Manual 29 page.

MC9

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