

Universal Process Controller

GTC Series User Manual

Thank you very much for selecting GINICE temperature controller.

For your safety, please read the following before using.



Universal Input

Universal Power

Heating/Cooling

Sensor Power

Alarm

Output Limit

Timer

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CAUTION FOR YOUR SAFETY

- Please keep these instructions and review before using this controller.
- This instruction manual uses WARNING and CAUTION as signal words for safety.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury and at other times will result in death or serious injury. I may also be used to alert against unsafe practice.

WARNING indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.

1. In case of using this unit with machineries (warehouse, medical equipments, vehicle, train, airplane, nuclear power or safety device etc.), it requires installing fail-safe device.
 - **It may result in serious damage, fire or human injury.**
2. Use a rated voltage to prevent damage or trouble.
 - **It may result in fire.**
3. Check the number of terminal when connect each line and signal input.
 - **It may cause fire or trouble.**

4. Do not turn on the power until the wiring completed.
 - **It may cause electric shock.**
5. Do not repair, wiring or checkup when electric power on.
 - **It may cause electric shock.**
6. Installation the controller where there is no dust, corrosive or explosive gas, direct ray of the sun, mechanical vibration or shock present.
 - **It may cause fire or explosive.**
7. This controller must be mounted on panel.
 - **It may cause electric shock.**
8. Do not repair beyond of authorized technician.
 - **It may cause trouble.**

CAUTION indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury and at other times will result in death or serious injury. I may also be used to alert against unsafe practice.

Installation Guidelines

1. Ensure the surrounding ambient operating temperature is between 0~50°C (32~122°F)
 - **It may cause fire or wrong operation.**
2. Altitude over 0~2000m use.
3. Ensure the power supply for the controller does not fluctuate greatly. Main supply voltage fluctuations not exceed $\pm 10\%$ of the normal voltage.
 - **It may cause fire.**
4. Install the controller where there is no dust, corrosive or explosive gas present.
 - **It may cause fire.**

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5. Install the controller where there is no risk of mechanical vibration or shock.
 - **It might shorten the life cycle of the product or give an electric shock.**
6. This controller shall not be used outdoors.
 - **It might shorten the life cycle of the product or give an electric shock.**
7. When control signal wire connection, #20AWG (0.5mm²) should be used and screw blot on terminal block with 0.74N.m strength.
 - **It may result in malfunction or error.**
8. Keep the controller away from high current and voltage circuits. The controller and connection wires (esp. compensation conductors and RTD lead wires) should be kept approximately 30cm(12") away from high current or voltage circuits to limit the possible affect of noise.
 - **It may cause display fluctuation or error.**
9. Do not use a place where temperature fluctuates or icing occurs.
 - **It may cause fire, explosive or error.**
10. In cleaning the controller, do not use water or an oil-based detergent.
 - **It might cause an electric shock or fire that will result in damage to the product.**
11. Do not inflow dust or dregs into inside of this controller.
 - **It may cause fire or trouble.**
12. Check the number of terminal when connect signal input line.
 - **It may cause fire or trouble.**
13. Installation category II
14. Pollution degree 2

1. Feature

[1-1] General

The **GTC** digital indicating controller is designed to accept almost kind of process control. It is a new universal controller that handles all the common process control application with simplicity, easy setting and low price.

[1-2] Feature

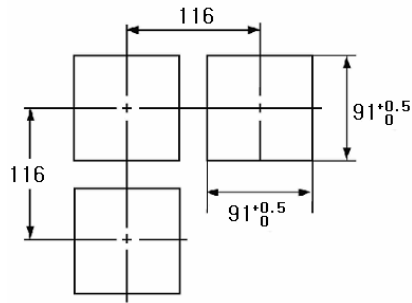
- ▷ Universal Input
- ▷ Timer (99 hour 59 minute)
- ▷ Universal Power (100~240V ac, 50/60Hz)
- ▷ Heating. Cooling Control Mode
- ▷ Delay Timer for Heater Protection
- ▷ 2 Point Alarm Contact
- ▷ Control Output Limit
- ▷ Transmitter DC Power Supply 15V 30mA

2. Installation

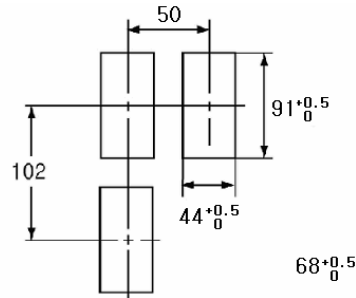
a. Make a 91X91mm (or each size according to panel cut size) panel cutout. When installing more than two controllers parallel to each other, keep distance between the panel cuts to allow room for the bezel of the controller (refer to drawing).

b. Insert the controller into the panel cut.

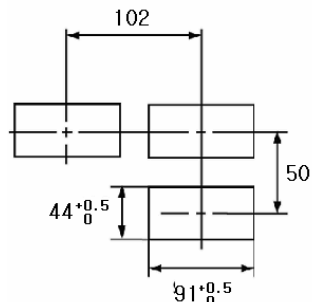
c. Insert a mounting clip into both sides of the controller and tighten the screws. (around 14.7N.m)



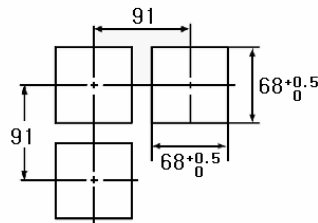
(GTC99)



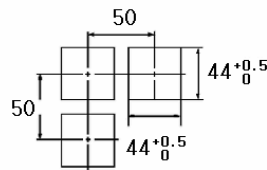
(GTD49)



(GTC94)



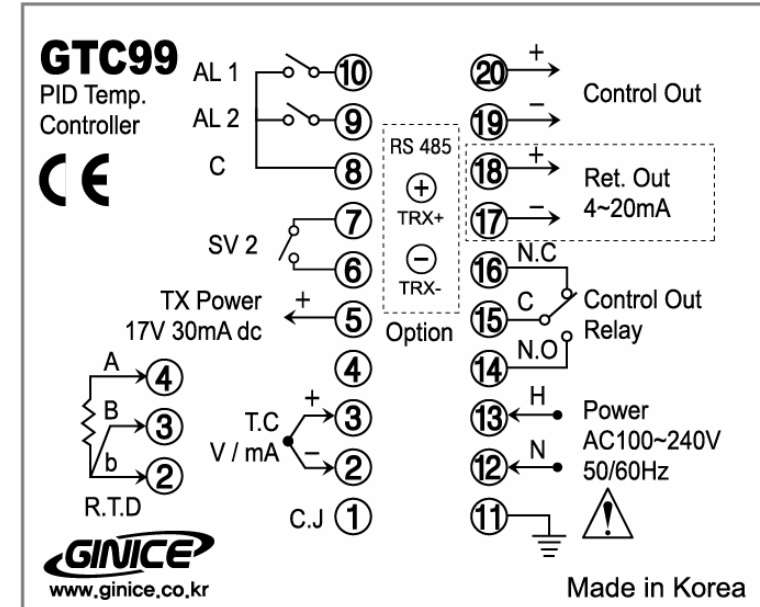
(GTC77)



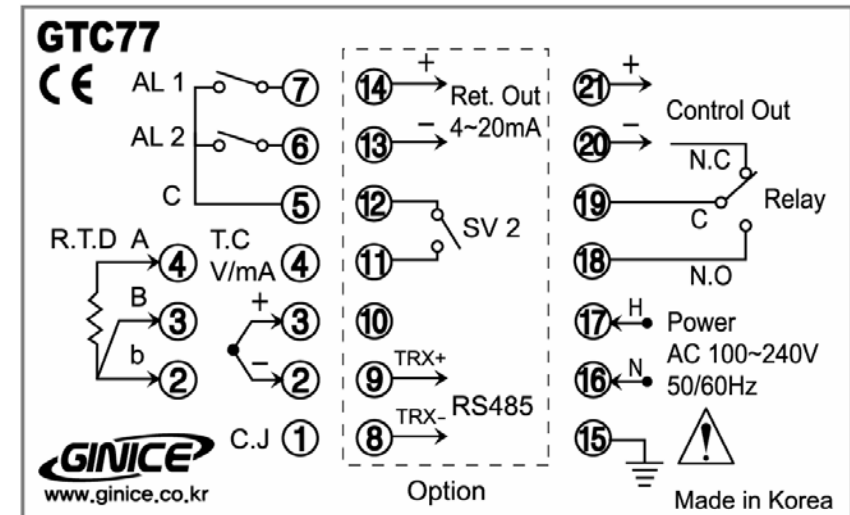
(GTC44)

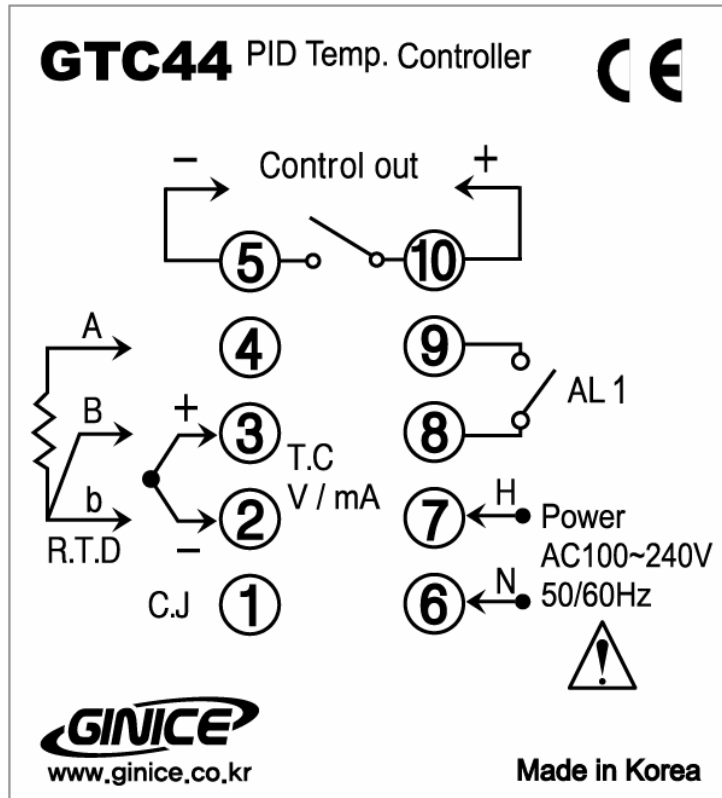
GTC series panel cut size

3. Wiring Diagram



(GTC-99, GTC-49, GTC-94)





[3-1] Power Connection

Prior to applying power, ensure the supply voltage is connected to the correct terminals as marked on the electrical connection diagram. Connect the power supply voltage to power terminals. If controlling a heater, prevent input surge voltage by making sure the power supply voltage and the heater magnetic switch drive voltage are isolated.

Note: Connect the power supply ground to terminal 11(15). If this connection is not made, the controller could be affected by noises, causing malfunction.

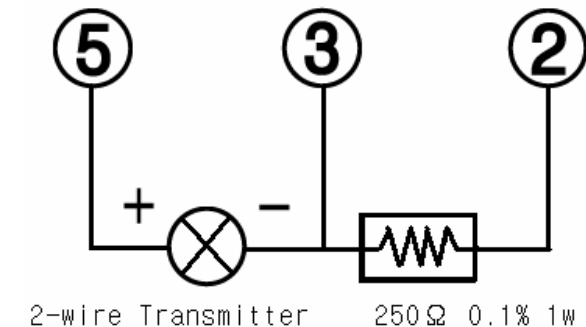
[3-2] Input Signal Connection

a. Thermocouple Input: Connect the positive lead of the thermocouple sensor to terminal 3 and the negative lead of the thermocouple to terminal 2.

b. RTD Input: Connect lead A of the RTD sensor to terminal (A), and the other two leads to terminal (B) and terminal (b).

Note: The maximum allowable resistance of the lead wire connected to the RTD is 15Ω . Each lead wire should be the same thickness.

c. DC Voltage Input: Connect the input signal positive lead to terminal + and the negative input signal lead to terminal -.



GTC 99 / 49 / 94

※ GTC 77 and GTC 44 have no DC power supply (DC17V).

※ For an input of 4~20mA install a 250Ω 1/4W 0.1% resistor between terminals + and - as shown above.

※ Do not short between power supply terminal and signal input terminal.

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[3-3] Control Output Connections

a. Relay Output

Relay output rated load is 250V ac 3A.

In case of using inductive load, connect a surge absorber or varistor for safety operating.

b. 4~20mA

Maximum driving impedance is 600Ω.

c. SSR Output

Maximum driving current is 20mA.(20Vdc)

d. 0 – 10Vdc

Maximum driving current is 20mA

[3-4] Alarm Output Connections

Supplied 2-point alarm of normal open type. Alarm relay output rated load is 250V ac 1A.

Note: In case of selecting timer off mode at AL-1, cannot use PV alarm.

Note: GTC 44 has alarm-1

[3-5] Ground

Connect the power supply ground terminal. If this connection is not made, the controller could be affected by noise, causing malfunction.

[3-6] Fuse

If controller does not operating when power on, check internal fuse.

Note: Fuse rating-1A 250V, 20mm glass tube fuse.

Note: GTC 44 use not internal fuse. Use external fuse or safety breakers.

4. Configurations

[4-1] Front Description

SV DISPLAY

Displays set value and Parameters set.

PV DISPLAY

Displays processing value

OPERATION KEYS

Data increase or decrease, parameter selection, auto-tuning and data enter

INDICATOR LAMP

Indicates alarms



	Key	Operation
1		1. parameters description 2. timer On-Off
2		Selection of parameter
3		Decrement and increment of parameter data
5		Start or end of auto-tuning

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[4-2] Changing Parameters

- (1) Pressing the MODE key when the process value is displayed allows various parameter groups to be seen in the process value display.
- (2) The indicated parameters can be changed by using the increase and decrease keys. Holding down these keys for more than 1.5 seconds will change the value rapidly.
- (3) After changing the value of a parameter, the right decimal point blinks, indicating the parameter has not been accepted. By pressing Enter this value is accepted and entered into EEPROM(nonvolatile memory). When the value is accepted the decimal point disappears.
- (4) Once finished changing parameter values, pressing for more than 2 seconds returns the controller to normal operation and the process value will be displayed. Waiting approximately 80 seconds without pressing the key will return the meter to normal operation as well.

Note: Parameter groups other than group 1 have a major affect on the operation of the controller. If possible, no changes in these parameter groups should be made during controller operation. All changes should be made by experienced personnel.

[4-3] Parameter Groups

The parameters are divided into six groups. This includes group 1, the tuning parameter group, which is used frequently and the extension group.

Note: Group 1(Tuning parameter group) is accessible without any restrictions, but other parameter group is accessible only by entering a pass number. This number is entered at the end of group 1.

[4-4] Parameter Group 1 (Tuning parameter group)

These are frequently used parameters for tuning the controller.

This parameter group is accessible by connecting power to the controller and does not require a pass number. This parameter group controls every tuning parameter including target set value, PID coefficient, hysteresis, alarm set value, and auto-tuning start. This group is also used to get to the extension parameter group.

Symbol	Setting Data	Operation
----	Control Out Capacity	Displays control output capacity.
P	Proportional Band	0.5~999.8%
I	Integral Time	0~9998sec. If set to 0, "P" control only.
D	Derivative Time	0~2500sec. If set to 0, "PI" control only.
HYS	On/Off Hysteresys	Set ON/OFF control dead band.
CP	Control Period	1~60sec.
AL-1	Alarm 1 Set	Alarm 1
AL-2	Alarm 2 Set	Alarm 2
At	Auto-Tuning Start	If set to "StAt", auto-tuning will start.
PASS	Password	Enter to access other parameter group. Parameter is '5'.
Conf.	Select Para. Group	Use to select parameter group to be displayed.

Note: If the correct password is not entered other parameter groups will not be displayed.

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[5] Parameter Group 2 (Input/Output group)

These define an input/output or high/low limit.

Symbol	Setting Data	Operation
<i>CONF.</i>	Parameter Group	Select other parameter group
<i>INPt</i>	Input Selection	Select input sensor signal type. (See table "Input Sensor")
<i>OUTPt</i>	Output Selection	Select control output type.
<i>Unit</i>	Indicating Unit	Select Celcius or Fahrenheit.
<i>dP</i>	Decimal Point	Use only voltage input signal.
<i>SC-H</i>	Display High-Limit	Use only voltage input signal.
<i>SC-L</i>	Display Low-Limit	Use only voltage input signal.
<i>nr</i>	Manual Reset	When using proportional control use to set manual reset value.
<i>FILT</i>	Input Filter	Select input filter time 0~60sec.
<i>INS</i>	Insert	Input offset adjustment.(-100 ~ 100)

<Input Sensor>

Symbol	Sensor	Set Range	
		°C	°F
<i>K-tc</i>	K Thermocouple	-70~1370°C	-94~2498°F
<i>J-tc</i>	J Thermocouple	-70~950°C	-94~1742°F
<i>E-tc</i>	E Thermocouple	-70~750°C	-94~1382°F
<i>N-tc</i>	N Thermocouple	-100~1300°C	-148~2372°F
<i>C-tc</i>	C Thermocouple	0~2300°C	32~4172°F
<i>T-tc</i>	T Thermocouple	-130~400°C	-202~752°F
<i>R-tc</i>	R Thermocouple	0~1760°C	32~3200°F
<i>S-tc</i>	S Thermocouple	0~1760°C	32~3200°F
<i>B-tc</i>	B Thermocouple	0~1800°C	32~3200°F
<i>JPt</i>	Jis Pt 100Ω	-200~600°C	-328~1112°F
<i>dPt</i>	Din Pt 100Ω	-200~600°C	-328~1112°F
<i>1-5</i>	1~5 V dc (4~20mA)	By set limit high and low parameters.	

※ In case of set to **JPt1** or **dPt1**, can be setting and display with decimal point.

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[6] Parameter Group 3 (Alarm and retransmission output parameter group)

These define alarms and a retransmission output.

Symbol	Setting Data	Operation
<i>CONF.</i>	Parameter Group	Select other parameter groups.
<i>ALS.1</i>	Alarm 1 Action	Select type of alarm that alarm 1 will be.
<i>HYS.1</i>	Alarm 1 Hysteresys	Set alarm 1 dead band
<i>ALS.2</i>	Alarm 2 Action	Select type of alarm that alarm 2 will be. Same as AL1 except LBA and P.END.
<i>HYS.2</i>	Alarm 2 Hysteresys	Set alarm 2 dead band
<i>LbA</i>	Loop Break Alarm	0~9998sec.
<i>Ret</i>	Retransmission Out	Select type of Ret-Out. PV, SV or MV.
<i>t-H</i>	Ret-Out High Limit	Set Ret-out high limit.
<i>t-L</i>	Ret-Out Low Limit	Set Ret-out low limit.
<i>d-tñ</i>	Ramp Control Output	0~30min. 1~5V (4~20mA) control out only.

[7] Parameter Group 4 (Control parameter group)

These assign a control operation.

Symbol	Setting Data	Operation
<i>CONF.</i>	Parameter Group	Select other parameter groups.
<i>SP-2</i>	2 nd set point	Set 2 nd target set point value.
<i>di</i>	Select Digital Input	SP2 or Auto/Manual or program control Hold can be selected.
<i>At-S</i>	Auto-Tuning	OFF/ON
<i>FUZY</i>	Fuzzy Logic	OFF/ON
<i>b.OUT</i>	Burn Out	Set output % in case of burn-out.
<i>CACt</i>	Control Action	Select output control action.
<i>ñH-H</i>	Control Out High Limit	Set high control out limit.
<i>ñH-L</i>	Control Out Low Limit	Set low control out limit. In case of under 99.0%, AT disable.
<i>CGAP</i>	Heat/Cool Dead Band	Set heat/cool out dead band. (Unit=%)
<i>CGAn</i>	Cooling Gain	Set cooling output gain. (0.1~10.0%)
<i>CtYP</i>	Cooling Output Type	Select cooling output type.
<i>C-CY</i>	Control Period	If cooling output is relay, set control period. (1~60sec.)

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[8] Parameter Group 5 (Setting value program control group)

These affect the set value program control.

Symbol	Setting Data	Operation
Conf. rSEn Endn HAt PSt SOnO SOrG. SOnOd SH 1 tñ 1 SH 2 tñ 2 SH A tñ A	Parameter Group	Select other parameter groups.
	Enable Program Control	YES: Enable program control NO: Disable program control
	Pattern End Mode	Select Hold, Reset, Repeat or End.
	Wait Time	Set wait time
	Restart Mode.	Restart mode setting after power failure.
	Number of Segment.	Set segment quantity.
	Start Value	Set first segment value.
	Start Mode	SV: first seg. Start by "SORG". PV: first seg. Start by processing value.
	Set Point 1	Segment 1 set value
	Time 1	Segment 1 time
	Set Point 2	Segment 1 set value
	Time 2	Segment 2 time
	Set Point 10	Segment 10 set value
	Time 10	Segment 10 time

※Time description: XX.YY (XX: Hour, YY: Minute)

※If program control hold is required press the **MANUAL** Key.

※If hold cancellation is required press the **ENTER** key for approximately 2 sec.

[9] Parameter Group 6

These affect RS-485 communication options.

Symbol	Setting Data	Operation
Add5	Communication Address	(0~31) Set of communication address for RS485
SPEd	Communication Speed	Set speed 2400, 4800 or 9600 BPS.
8888	Reply Delay Time	1: 4~54 msec. 2: 54~104 msec. 3: 104~154 msec.



※ See RS485 manual for additional information.

5. Operation

[1] Operation Procedure

(1) Automatic operation

Upon connecting power the controller is in a state of automatic operation and the process value is indicated on the upper display (process value display) and the set value is indicated on the lower display (the set value / parameter display).

The set value can be changed by using ,  and **ENTER** key. Operation of the controller depends on the initial settings and alarm assignments. The controller will indicate a control output, an alarm state and an operation.



The controller can be tuned for the process being monitored by changing parameter group 1 (tuning parameter group) as outlined in chapter 4.

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(2) Automatic and Manual operation

Changing between automatic/manual operation is performed by using the **MANUAL** key on the front or by using the digital input. The MAN indicator is on during manual operation and off during automatic operation.

When parameter **dl** is set to auto/manual operation is accomplished by using the digital input only. Using the front key to change to manual operation is disabled.

When set to manual operation, the control output is indicated on the display by / symbol. The control output can be changed by using ,  and **ENTER** key.



Control output indication during manual operation.

Note: In the following cases, manual operation is disabled or restricted.

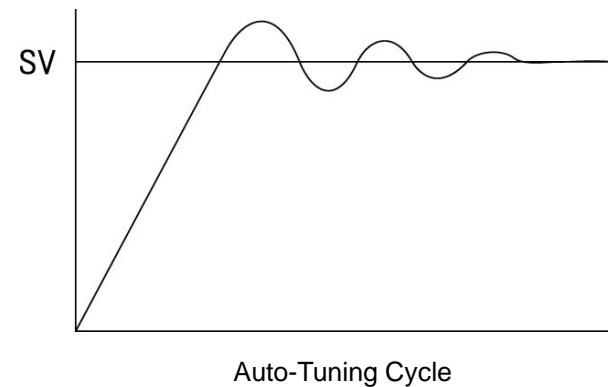
1. When the ON/OFF control operation is selected manual operation is disabled.
2. When the process/heating function is operating manual operation is disabled.
3. When heating/refrigerating function is operating, more than 50% of the output is heating output and less than 50% is refrigeration output. (See heating/refrigeration operation in chapter 6)

[2] Auto-Tuning

Auto-tuning, using PID, automatically tunes the controller for the process being monitored so it will operate optimally. This saves time over tuning the controller manually.

(1) Auto-tuning procedure

- a. Find the A.T parameter from parameter group 4 and enable auto-tuning by entering **YES**.
- b. Find the tuning start parameter from parameter group 1 and enter **StAt**. This will start the auto-tuning process.
- c. When auto-tuning begins the controller is in ON-OFF control operation and the manual operation indicator (AT indicator) will be blink. (Figure 5)
- d. To cancel autotuning press the AT key. The AT indicator will turn off and autotuning will stop.
- e. When auto-tuning is stops the controller calculates the optimum PID constant and applies it to the control function, the loop break alarm time LbA is set to twice yhe integral time.



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(2) Auto-tuning considerations

- Auto-tuning does not affect the output when the controller is in ON-OFF control mode.
- Auto-tuning does not affect the output when the controller is in heating-cooling control mode.
- Auto-tuning function does not operate when the high limit of the control output is set below 99.9% or the low limit is above 0.1 %.

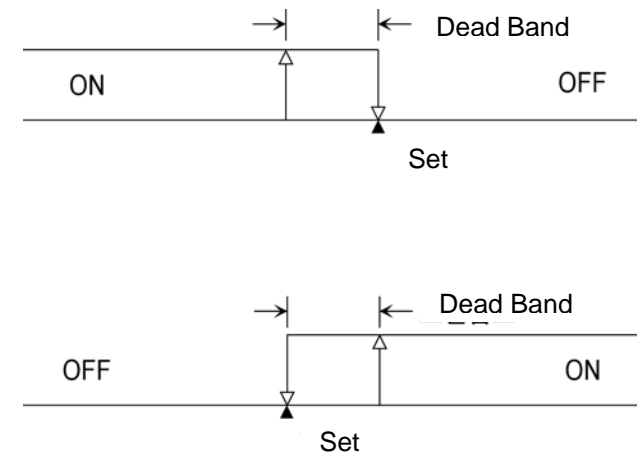
[3] ON-OFF Control

When the control operation is set to ON-OFF mode the controller performs the ON-OFF control operation and "hysteresis" can be adjusted.

(1) Programming procedure

- Find the control operation parameter (parameter symbol : **CAct**) from parameter group 4.
- Enter "**d.o.n.F**" for positive (cooling operation) of the ON-OFF control.
- Enter "**On.OF**" for negative (heating operation) operation of the ON-OFF control.
- Find the hysteresis parameter (parameter symbol : HYS) from the tuning parameter group and set the hysteresis as required.

(2) Negative and Positive operation ON-OFF control












[4] Alarm operation

The alarms can be used as an output for two types of information. Alarm function based on the process value is disabled automatically when alarm 2 is used as a refrigeration output in the heating/refrigeration control.

(1) Alarm operation programming procedure

- a. Find the alarm operation parameter (parameter symbol : ALS1, ALS2) from parameter group 3 and assign alarm operation.
- b. Find the hysteresis parameter (parameter symbol HYS1, HYS2) from parameter group 3 and set the hysteresis.
- c. Set the alarm activation point with the alarm parameter (parameter symbol : AL-1,AL-2) from parameter group 1.

<Assignment symbol and alarm operation>

Symbol	Setting Data	Operation
----	Alarm Off	
---[High alarm	
---E	Standby high alarm	
]---	Low alarm	
3---	Standby low alarm	
---11	Deviation high alarm	
11---	Deviation low alarm	
-+-	Deviation alarm	
LbA	Loop break alarm	
PEnd	Program control pattern end output	Alarm 1 application

Note: The deviation alarm is 0 when the alarm set value is below 0.

Note: The deviation alarm hysteresis is 1/2 of the alarm set value when it is below 1/2 of the alarm set value.

[6] Heating/refrigeration control

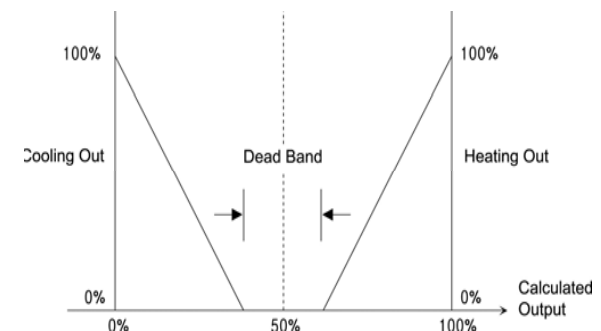
The heating/refrigeration control output is 50% of the control output obtained by PID calculation.

- Heating output=(calculated output – 50% - hysteresys/2) X 2
- Refrigeration output=(50% - calculated output – hysteresys/2) X 2 X refrigeration gain

(1) Programming procedure

Find the control operation parameter from parameter group 4 and enter heating/refrigeration operation. Set the heating/refrigeration hysteresys. The heating/refrigeration output is set to OFF while within the hysteresys dead band.

Set refrigeration gain. Refrigeration gain is used for controlling refrigeration speed. Enter the type of refrigeration output. Choose from relay and current. Set the refrigeration control output period when the refrigeration output is assigned as a relay.



heating/refrigeration operation output characteristic

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(2) Heating/refrigeration output

- a. Heating output is enabled through the control output in parameter group 2.
- b. Auto-tuning is disabled during the heating/refrigeration control operation. Manual tuning is still possible.
- c. The second alarm output is disabled automatically when the refrigeration output is assigned as a relay, and the transmission output is disabled automatically when the refrigeration output is assigned as a 4~20mA current output. Use these outputs as the refrigeration output.
- d. Any output value set during manual operation is divided by the heating/refrigeration output and contains 50% center hysteresis.
- e. Except in special cases set the control output to 50%.

[7] Ramp output heating

Some heaters can be damaged if power is not supplied gradually. In this case the heater should be protected by using the ramp control function.

(1) Programming procedure

- a. Find the ramp control output parameter (parameter symbol : **d-tm**) from parameter group 3 and set the required ramp control output time in minutes. The control output increases slowly after the power is on and resets to the original control output after the time set for the ramp control parameter **d-tm** has been reached.

If set to "0" stop ramp output.

- b. The control output indicator blinks during the ramp control output function.

※ Control output indication
during ramp control output



(2) Ramp control output

- a. Ramp control output is a 4-20 mA current control output.
- b. Ramp control output is disabled during ON/OFF control operation.
- c. Auto-tuning is disabled when ramp control output is enabled.
- d. Manual operation is disabled when ramp control output is enabled.

[8] Loop break alarm

If the control output lasts longer than the time set for operation, the controller treats this as a control loop error and an alarm is activated.

(1) Programming procedure

- a. Find the first alarm operation parameter in parameter group 3. Assign the control loop break alarm.
- b. Find the alarm time set parameter and set the alarm time. Usually twice the integral is used. Alarm function stops when set to "0". (Information output does not occur.)
- c. When auto-tuning is enabled, twice the time of the integral time is automatically set as the alarm time based on the PID constant calculation procedure.

(2) Cause for alarm generation

- a. Power interruption
- b. Heating element problem
- c. Exterior relay or magnetic switch malfunction

Note: When the control output high limit set value is below 99.9%, the control loop break alarm does not function.

Note: When manual control output is set to a time that is more than 100%, the control loop break alarm occurs.

[9] Using the second set value

The first set value which is the controller set value can be changed to the second set value by using the exterior contact. (dl)

(1) Programming procedure

Find the contact point input selection parameter from parameter group 4 and assign this as the second set value.

Find

(2) Second set value operation

When the contact input is set to automatic/manual operation changing the second set value is impossible.

Adjustability of the second target set value is automatically restricted according to the input sensor and scale setting being used.

6. Set value program control (Ramp-Sock Control)

This describes the procedure necessary to use the set value program located in parameter group 5. This will setup the set value program operation which is 10 segments in length.

The parameters relate to the set value program operation control and the parameters set each segment value and time.

This procedure sets the parameters related to operation control and enables the set value program operation, which determines the control operation after the end of the program operation, and assigns the operation procedure after a power failure.

This is accomplished by setting the wait value that the process value reaches when the last segment ends each segment starts.

[1] Set value program procedure

- (1) Set related parameter suitable for the process.
- (2) Enable the set value program operation. (Parameter symbol: **rSEn**)
- (3) The operation begins by pressing the **ENTER** key for 2 seconds.
When the operation begins, the operation indicator blinks.
- (4) To cancel during operation, press the **ENTER** key for two seconds. This resets to the initial fixed set value operation state. (Reset)

[2] The end of the operation

- (1) When operation end mode is set to hold mode it is enabled on the last set value of the program operation.
 - a. The operation indicator turns ON.
 - b. The relay of the first alarm output indicator turns ON when the first alarm output is assigned to pattern end indication output.
 - c. When the **ENTER** key is pressed for two seconds while the controller is in the hold state, the hold state is cancelled and the controller resets to the initial fixed set value operation state. (Reset)
- (2) When operation end mode is set to repeat mode.
 - a. The set value program operation will restart from the initial segment.
 - b. The first alarm output relay turns ON for 3 seconds and resets when the first alarm output is assigned to pattern end indication output.

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[3] Temporary hold of the set value during operation (hold)

- (1) Press the **MANUAL** key when set value hold is required during operation.
- (2) Auto-tuning is possible only during a set value hold state.
- (3) Automatic/manual operation selection is possible only during a set value hold state.
- (4) To cancel the hold functions press the **ENTER** key for 2 seconds during a hold state. The hold function ends automatically during auto-tuning.

[4] Process value "WAIT" function

When each segment begins, if the difference between the process value and the set value is larger than wait value, the change in set value stops and the set value is changed so it will be within the wait value. If the wait function is not necessary set the wait set value to 0.

[5] Repeat after a power failure

- (1) Reset to the initial fixed set value operation state and operate when repeat mode is set to reset.
- (2) Restart from the initial segment (segment 1) when repeat mode is set to restart.

7. Specification

[1] Input

(1) Accuracy

T.C Input: $\pm 0.3\%$ of F.S + 1 digit or 3°C

(R,S,B,C exclusion under 450°C)

RTD Input: $\pm 0.2\%$ of F.S 1 digit

DC Volt (Current 4~20mA) Input: $\pm 0.2\%$ of F.S

(2) Input

T.C : K,J,E,N,C,T,R,S,B

RTD : Pt100 ohm, JPt100 ohm

Volt : 1~5Vdc (4~20mA)

(Universal Input)

Digital input: 1 point dry contact. Operating impedance $100\ \Omega$ max.

[2] Output

(1) Control Output

Relay Contact (250V 2A, R load)

4~20mA (max. $600\ \Omega$)

SSR (20Vdc, 21mA)

(Universal Output)

(2) Retransmission Output: programmable scale

$600\ \Omega$ max.

Accuracy: $\pm 0.2\%$

(3) Alarm output

2-point 250Vac. 1A (R load)

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[3] Control Mode

- (1) PID, PI, PD, P, ON-OFF
Each direct/reverse mode. Heating/Cooling mode
- (2) Auto-Manual Control
- (3) Program Control: 1 Pattern 10 Segment
- (4) 2nd Set Value: by digital input
- (5) ARW: Auto operating
- (6) Control Output Period: 1~60 sec. (*Contact. SSR control only)
- (7) Manual Reset: 0~100% (*P. PD control only)

[4] Option and Others

- (1) Scan Time: 0.16 sec.
- (2) Power
AC 100~240V, 50/60Hz, 0.1A max.
- (3) Communication
RS 485, 2-wire type. MODBUS® protocol: optional
- (4) Operating Environment
Temperature 0~50℃ Humidity 35~85%RH
- (5) Demension
GTC 99: 96 X 96 X 100(mm)
GTC 49: 48 X 96 X 100(mm)
GTC 94: 96 X 48 X 100(mm)
GTC 77: 72 X 72 X 100(mm)

*Caution should be used when installing this device. Misuse or incorrect installation may result in serious injury or damage to the controller.

*This manual is subject to change without notice.