DIGITAL
TEMPERATURE
CONTROLLER

CN－40

DIN SIZE 48×48mm

■FEATURES

- ●DIN PACKAGE
- ●PID AUTO TUNING
- ●Low cost
- ●4digits LED(PV and SV)
- ●Sensor break protection
- ●100 to 240V AC power supply
- ●Various event functions

■Standard Specification

Input	Thermocouple	K,J,T,E,R,N,S, W5Re/W26Re
	R.T.D	Pt100 DIN JPt100
Setting method	By front (up,down) keys	
Indication	PV	4digits 7segments LED green Letter 10㎜ height
	SV	4digits 7segments LED red Letter 7㎜ height
	OUTPUT/Event monitor	LED red : OUT / LED red : AL
Control output	PID Autotuning	Proportional band 0.1-300.0% Setting span
		Integral time 0-3600seconds
		Derivative time 0-3600seconds
		Cycle time 1-120seconds
	ON/OFF	Control sensitivity 0- Setting span
	Relay contact	250V AC 3A(Load resistance) 1a contact
	SSR drive	0/12V DC upper 600Ω
Sampling time		0.5sec
Setting and Indicating accuracy		Thermocouple : ±(0.5%+1digit) of process value or 4℃,either of bigger numerial value is taken.
		R.T.D : ±(0.5%+1digit) of process value or 1.2℃,either of bigger numerial value is taken.
Memory Element		EEPROM
Voltage source		100V AC to 240V AC(50/60Hz)
Weight		less than 170g
Power Consumption		less than 10VA(240V AC)
Operation Condition		0 to 50℃ 20 to 90%RH(under non-condensation)
Storage Condition		-25 to 70℃ 5 to 95%RH(under non-condensation)
Other functions		Control mode changable, C/F chengable PV adjustable,Lock function by front keys
Event function	Kind of event	21 kinds(Refer to event modes)
	Relay contact	250V AC 3A(Load resistance) 1a contact

■Ordering Information

CN－40□

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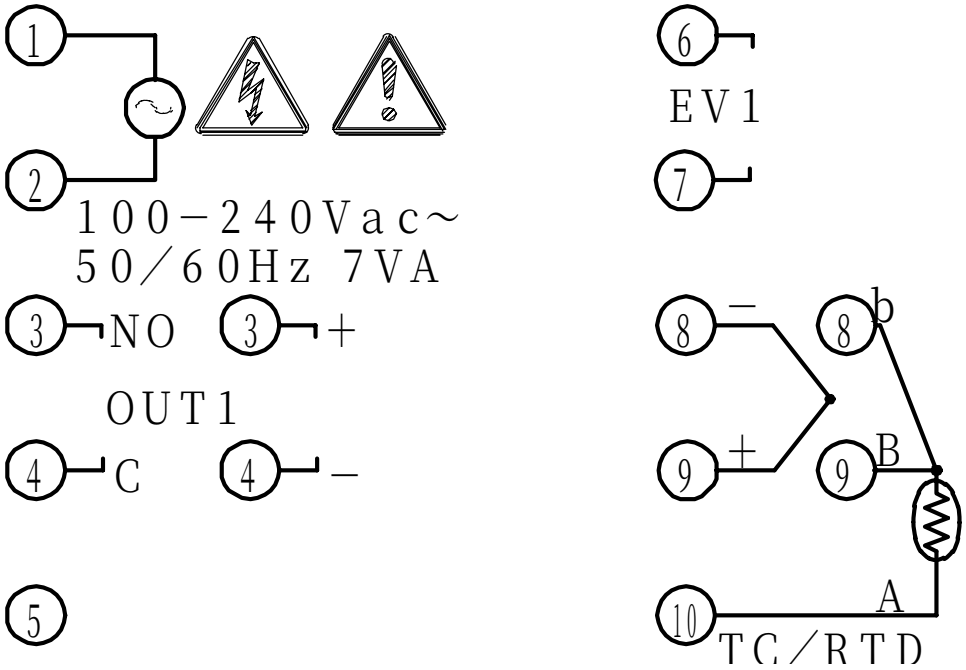
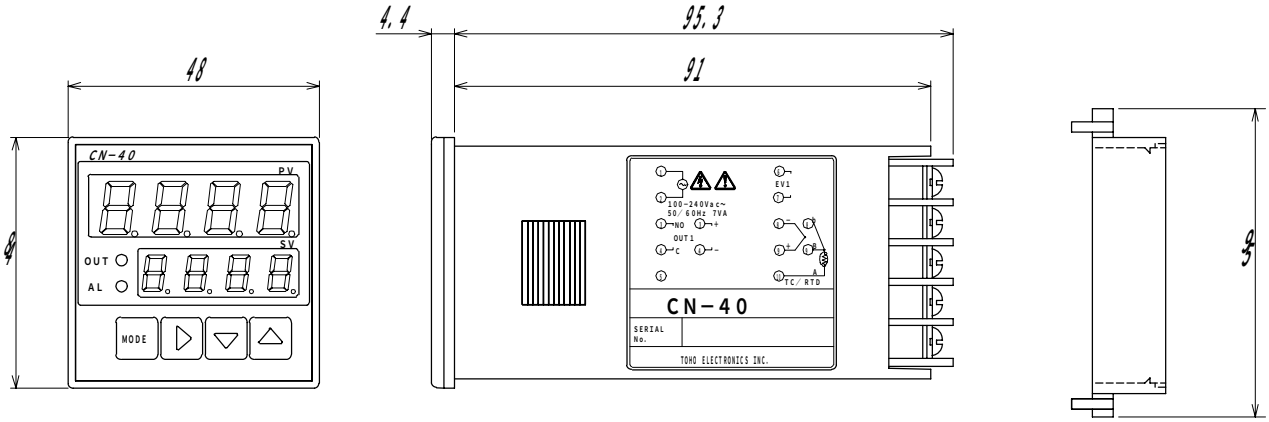
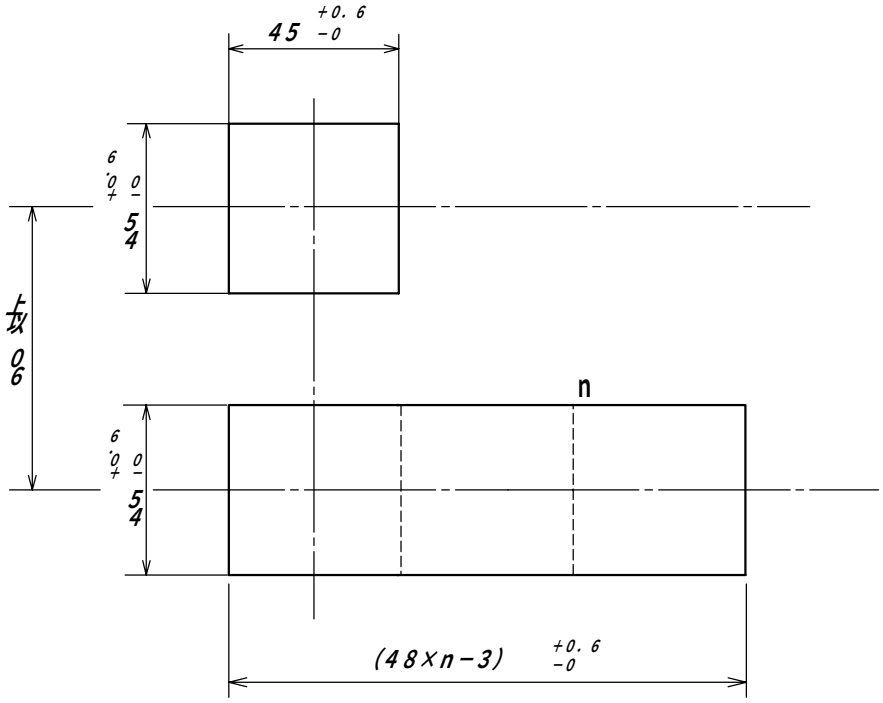
Symbol	Output type
Non	Relay contact output
P	SSR drive voltage output

■Wiring



■Dimensions


4.4
95.3
91
48
CN-40
PV
SV
OUT
AL
MODE
100-240Vac~
50/60Hz 7VA
NO
OUT1
C
EV1
TC/RTD
CN-40
SERIAL No.
TOHO ELECTRONICS INC.


45 +0.6 -0
6.0 +0 -0
54
n
(48×n-3) +0.6 -0

DIGITAL TEMPERATURE CONTROLLER CN-40 USER'S MANUAL

Thank you for purchasing Digital Temperature Controller CN-40.
Please go through carefully this instruction manual and use the unit in proper manner.

1. NOTICE/WARNING BEFORE OPERATION USE

- When having the purchased controller at hand, please be sure that its unit is a correct model (See "Model Configuration #2")
- The following symbol marks are being used in this user's manual for safety operation.

⚠ WARNING Due to mishandling, serious dangers may occur to the operator such as death, electrocution and a skin burn.

⚠ CAUTION Owing to mishandling, it may cause some damage to the unit or the operator getting slight injury.

CAUTION

- For prevention of its malfunction, do not push the front key with sharp points such as pencil or metal needle.

⚠ WARNING

- Make sure the correct wiring connection before turning on electricity. Miss-wiring may cause malfunction of the unit and fire.
- Never modify the unit to prevent damage or incident such as malfunction and fire etc.

- Kindly check the following accessory being contained in that carton box.
- This user's manual: 1copy · Installation attachment
- Please be careful that types of input can not be changed after receipt of the unit at customer's end (Input of thermocouple and RTD can be changed by parameter setting.)
- Please deliver this user's manual to the operator.
- Copy or reprint of this manual, wholly or partially, is not allowed.
- The contents of this manual may change without notice in future.
- Please be aware that we shall not be responsible to all of the defaults resulted by using of the unit.

2. MODEL CONFIGURATION

CN-40□

Symbol	Output type
Non	Relay contact output
P	SSR drive voltage output

3. Parts indication

3.1 LED lamp
a) OUT:control output indication · · · Lights On when output turn On.
b)EV1:event output indication · · · · Lights On when output turn On.

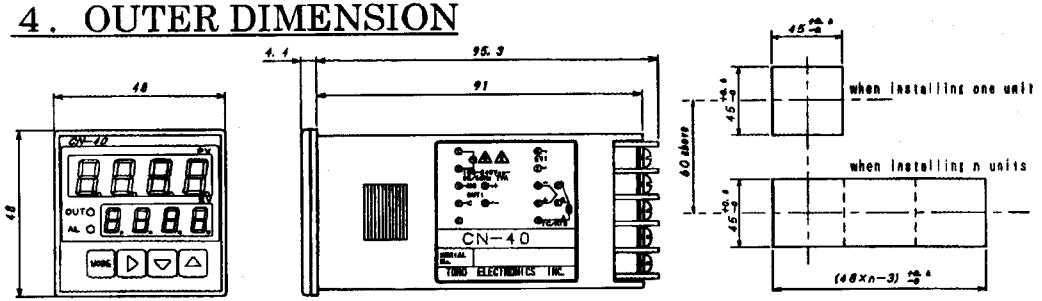
3.2 Operation key
a)Mode key · · · For change of each mode/parameters.
b) ▷ key · · · For action of function setting(sift figures · Auto-tuning start/stop)
c) △ key · · · Up key or changing setting
d) ▽ key · · · Down key or changing setting

3.3 ABOUT LOCATION OF INSTALLATION

Install the unit at the following proper location

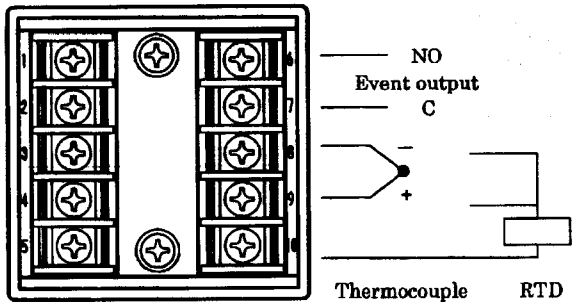
- Less dust and oily smoke.
- Less mechanical vibration and shock.
- Away from splash water.
- Away from the gas of sulfide and corrosion.
- Away from the influence of electromagnetic field.
- Away from the direct sunshine.
- Away from the equipments using high-voltage ignition devices.
- Away from high-voltage wire, welding machine and generator of electric noise.
- Temperature and humidity are within the limit of operation environment.

4. OUTER DIMENSION



5. WIRING

5.1 Termnal arrangement



5.2 NOTICE OF WIRING

⚠ WARNING

- For prevention of electric shock, please do wiring after turning power off.

⚠ CAUTION

- The unit does not make control action for 4 second after turning On. (No output action) Please be careful that when the unit is used as interlock circuit.
- For prevention of miss-wiring, please check with user's manual.

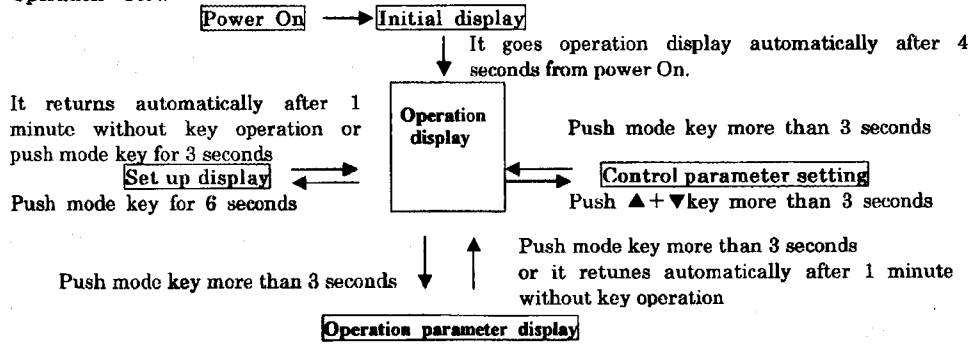
- Use wire material with wire resistance value below 5Ω/ per wire for connecting RTD with the unit.
- Use specified compensation wire or element itself for connecting thermocouple with the unit.
- Use shield wires in operation of near noise generator. Also do not wire the input output lines within same duct or power pip.
- Keep away input output signal wires more than 50 cm from power line or load line.

※ Kind of error

Err 0 : Setting data abnormal.	Err 4 : RAM abnormal.
Err 1 : A/D converter abnormal.	Err 5 : Calibration data abnormal.
Err 2 : Auto-tuning error.	Err 6 : Non-volatile memory abnormal.
Err 3 : ROM abnormal.	Err 7 : cooling contact compensation circuit abnormal.

6 .OPERATION FLOW AND PARAMETER INSTRUCTION

6.1 Operation Flow



6.2 Parameter instruction

a) Operation parameter display

Character	Item	Setting range & instruction	Initial value
	Setting value	SLL~SLH	SLL
A	Event output Setting value	Absolute value : SLL~SLH Deviation value : −(SLH−SLL)~(SLH−SLL) Without await sequence 1) High limit absolute value : SLH 2) Low limit absolute value : SLL 3) High limit deviation : 0 4) Low limit deviation : 0 5) High limit deviation non excitation : 0 6) Low limit deviation non excitation : 0 7) High & Low limit deviation : 0 8) High & Low limit deviation rang : 0 9) High limit absolute value non excitation : SLH 10) Low limit absolute value non excitation : SLL With await sequence 11) High limit absolute value : SLH 12) Low limit absolute value : SLL 13) High limit deviation : 0 14) Low limit deviation : 0 15) High limit deviation non excitation : 0 16) Low limit deviation non excitation : 0 17) High & Low limit deviation : 0 18) High & Low limit deviation rang : 0 19) High limit absolute value non excitation : SLH 20) Low limit absolute value non excitation : SLL	
tYPE	Control type	oFF : TYPE A on : TYPE B (Overshoot protection function)	oFF
At	Auto-tuning	oFF : Auto-tuning action OFF on : Auto-tuning action ON	oFF
P	Proportional band	1~300.0% (SLL-SLH) against	3.0
I	Integral time	0~3600 seconds	0
d	Derivative time	0~3600 seconds	0
Pbb	Manual reset	0.0~100.0%	0.0
t	Proportional cycle	1~120 seconds	20
C	Control sensitivity	0~(SLH−SLL) ℃	Thermocouple : 0 RTD : 0.0
PuS	PV correction	−(SLH−SLL)~(SLH−SLL) ℃ When (SLH-SLL) value is exceeded certain value thermocouple: limit : -1999~9999℃ RTD: limit : -199.9~999.9℃	Thermocouple : 0 RTD : 0.0

b)Set up display

Character	Item	Setting rang & instruction	Initial value
EuF	Event function	0 : Event Non Without await sequence 1 : High limit absolute value　2 : Low limit absolute value 3 : High limit deviation　4 : Low limit deviation 5 : High limit deviation non excitation　6 : Low limit deviation non excitation 7 : High & Low limit deviation　8 : High & Low limit deviation rang 9 : High limit absolute value non excitation 10 : Low limit absolute value non excitation With await sequence 11 : High limit absolute value　12 : Low limit absolute value 13 : High limit deviation　14 : Low limit deviation 15 : High limit deviation non excitation　16 : Low limit deviation non excitation 17 : High & Low limit deviation　18 : High & Low limit deviation rang 19 : High limit absolute value non excitation 20 : Low limit absolute value non excitation	0
EuC	Event sensitivity	0~(SLH−SLL) ℃	Thermocouple : 0 RTD : 0.0
SLH	SV limiter High limit setting	Thermocouple: (SLL+50) ℃~Setting Rang max RTD : (SLL+5.0) ℃~500.0℃	Thermocouple : Maximum value of setting range RTD : 500.0
SLL	SV limiter Low limit setting	Thermocouple: Setting Rang min~(SLH−50) ℃ RTD : -199.9℃~(SLH−5.0) ℃	Thermocouple : Minimum value of setting range RTD : -199.9
MLH	Manipulated value limiter High limit setting	MLL~100.0%	100.0
MLL	Manipulated value limiter Low limit setting	0.0~MLH%	0.0

c) Control parameter display

Character	Item	Setting range & instruction	nitial value
Cnt	Control type	0 : ON/OFF Control　1 : PID Control	1
dir	Control action	0 : Normal action (cooling control)　1 : Reverse action (heating control)	1
InP	Input type	00 : K thermocouple　01 : J thermocouple 02 : T thermocouple　03 : E thermocouple 04 : R thermocouple　05 : N thermocouple 06 : S thermocouple　07 : W5Re/W26Re 10 : Pt100　11 : JPt100	00
CJF	℃/ F switch	C : ℃　F : ˚F	C
FU	FUNC key function	0 : Non　1 : Figure shift of setting value　2 : Auto-tuning start /stop	0
LoC	Key Lock	oFF : Without key lock　on : with key lock	oFF

7 . INDICATION · SETTING RANG & SPECIFICATION

Input type	Indication range	Setting range
K Thermocouple	Thermocouple & R.T.D It is possible to indicate from −5 to 105% of the setting range for all Kind of inputs. But,it must be within −1999(-199.9) ~9999(999.9)of the setting range.	0~1200℃ (0~2200˚F)
J Thermocouple		0~800℃ (0~1450˚F)
T Thermocouple		-200~400℃ (-330~750˚F)
E Thermocouple		0~800℃ (0~1450˚F)
R Thermocouple		0~1700℃ (32~3100˚F)
N Thermocouple		0~1300℃ (32~2350˚F)
S Thermocouple		0~1700℃ (32~3100˚F)
W5Re/W26Re		0~2300℃ (32~4200˚F)
Pt100		-199.9~500.0℃ (-199.9~950.0˚F)
JPt100		-199.9~500.0℃ (-199.9~950.0˚F)

Sensor wire break indication: Over indication 「SEnr」 (PV indication side)　Sampling cycle : 500mS

Input accuracy : Thermocouple : ±(0.5%+1digit) of process value or±4℃(8˚F), either of bigger numerical value is taken.
RTD: ±(0.5%+1digit) pf process value or±1.2℃ (2.4˚F), either of bigger numerical value is taken.

Control output : Relay contact output: Contact form 1a contact　Contact capacity AC250V3A
Minimum load 5V (Same as Event output)

SSR drive voltage output: Output voltage12VDC Output accuracy ±1V(ambient temperature)　Load resistance : 600Ω

Power voltage : AC85~264V 50/60Hz (Power consumption : Below7VA)

Operating condition : 0~50℃(without condensation) Humidity35~85%RH(without condensation)