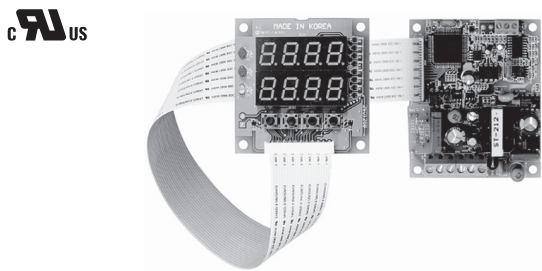


Autonics

BOARD TYPE TEMPERATURE CONTROLLER
TB42 SERIES

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

- *Please keep these instructions and review them before using this unit.
- *Please observe the cautions that follow;
- Warning** Serious injury may result if instructions are not followed.
- Caution** Product may be damaged, or injury may result if instructions are not followed.
- *The following is an explanation of the symbols used in the operation manual.
- caution**:Injury or danger may occur under special conditions.

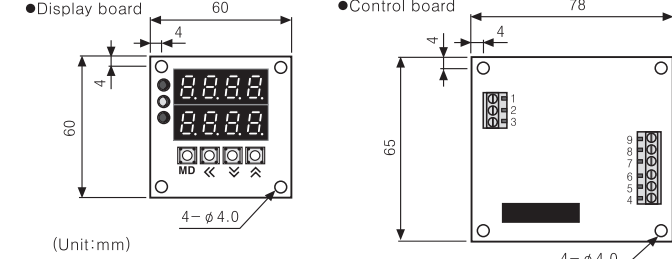
Warning

- In case of using this unit with machineries(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it requires installing fail-safe device, or contact us for information on type required.
- This unit must be mounted on panel.
- Do not repair or checkup when power on.
- Do not disassemble and modify this unit.

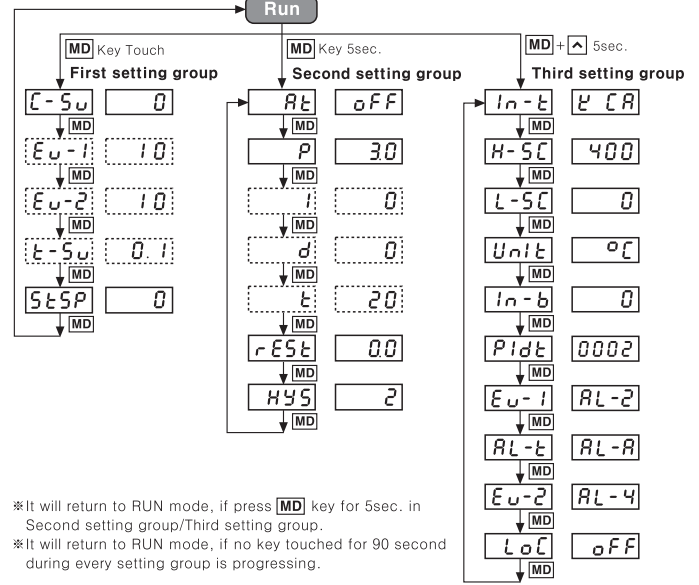
Caution

- This unit shall not be used outdoors.
- Please observe specification rating.
- Do not use the load beyond rated switching capacity of Relay contact.
- In cleaning the unit, do not use water or an oil-based detergent.
- Do not use this unit at place where flammable or explosive gas, humidity, direct ray of the sun, radiant heat vibration, impact etc.
- Do not inflow dust or wire dregs into inside of this unit.
- Please wire properly after checking the polarity of terminals when connect thermocouples.

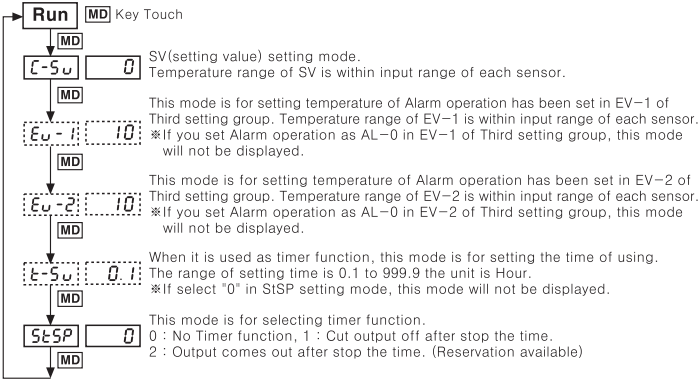
Dimensions



Parameter



Flow chart for first setting group

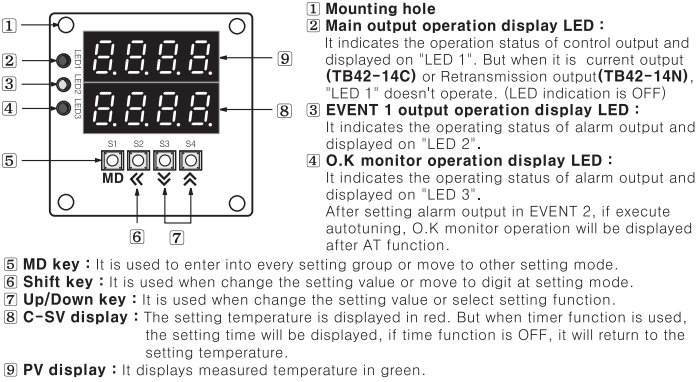


- *Once enter into setting mode, the decimal point can be displayed, which is displayed by range of using temperature sensor but it doesn't influence on the function.
- *The value in every setting mode is factory specification.
- *Entering parameter is not available in transmission output type.
- *Example of setting temperature(C-SV) : Example of setting 100℃.
- *The above specifications are subject to change and some models may be discontinued without notice.

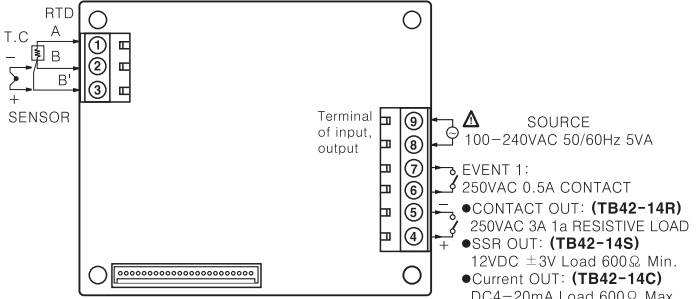
Specifications

Model	TB42
Power supply	100~240VAC 50/60Hz(90 to 110% of rated voltage)
Power consumption	Approx. max. 5VA
Input sensor	• Thermocouple : K(CA), J(IC) (Tolerance of outer resistance is max. 100Ω) • RTD : Pt100Ω 3 wires(Allowable line resistance is max. 5Ω per a wire)
Control method	• ON/OFF control(Hysteresis is adjustable) • P, PI, PD, PIDF, PID
Control output	• Relay contact output:250VAC 3A 1a • SSR output:12VDC ±3V Load 600Ω min. • Current output:4~20mADC, Load 600Ω max.
Retransmission output	4~20mADC, Load 600Ω max. for PV
Sub output	• EVENT 1 output : Relay contact output(250VAC 0.5A 1a) • EVENT 2 output : OK monitor operation display by LED
Setting method	Setting by front push buttons
Display accuracy	±0.3% rdg based on F•S or 3℃ Max.
Adjustment sensitivity	Adjustable 1 to 100℃(0.1 to 100.0℃) at ON / OFF control
Proportional band(P)	0.0 ~ 100.0%
Integral time(I)	0 ~ 3600sec
Derivative time(D)	0 ~ 3600sec
Control cycle(T)	1 ~ 120sec
Sampling time	0.5sec. fixed
Relay life cycle	Main output Mechanical:Min.10,000,000 times Electrical:Min.100,000 times(250VAC 3A resistive load) Sub output Mechanical:Min.20,000,000 times Electrical:Min.200,000 times(250VAC 0.5A resistive load)
Memory retention	10 years
Ambient temperature	-10 ~ 50℃
Storage temperature	-20 ~ 60℃
Ambient humidity	35 ~ 85%RH

Front panel identification



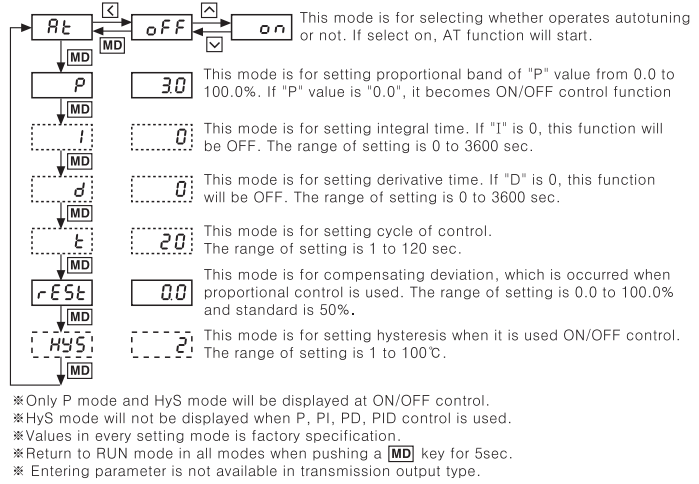
Connections



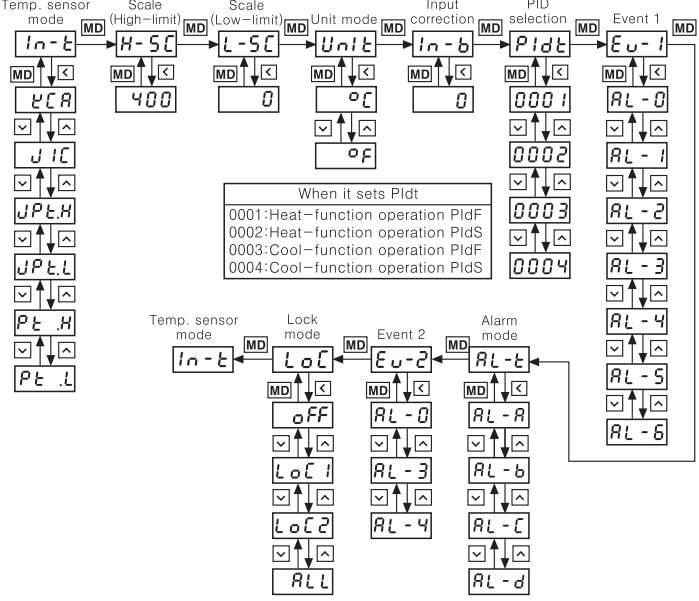
Alarm output

Mode	Operation	Function
AL-A	General Alarm	No optional alarm output.
AL-b	Alarm Latch	When alarm output turns on once, the output will keep ON continuously.
AL-C	Standby Alarm	It doesn't output at first operation. (When it reaches to first object value)
AL-d	Alarm Latch & Standby Alarm	It operates Alarm Latch & Standby Alarm at the same time.

Flow chart for second setting group



Flow chart for third setting group



In-t	4CA	Select one input sensor among 6 kinds.
H-SC	400	Setting High-limit of temperature. Setting range is within input range of each sensor.
L-SC	0	Setting Low-limit of temperature. Setting range is within input range of each sensor.
Unit	0C	Setting the unit of temperature and select between ℃ or ℉.
In-b	0	It is compensating the allowance occurred in input sensor. The range of setting is -50 to 50℃(Decimal type : -50.0 to 50.0℃).
PIdt	2	Select PID control type among 4 kinds.
Ev-1	AL-1	Select Alarm output function of EVENT1 among 7 kinds.
AL-t	AL-A	Select Alarm output option function among 4 kinds.
Ev-2	AL-4	Select Alarm output function of EVENT2 among 3 kinds.
LoC	oFF	Set whether it is locked or not of setting value among 4 kinds.

- *It will return to RUN Mode by pressing MD + Key for 5second in each setting Mode
- *When SV is flickered by pressing key, it is able to set the value by pressing key then press MD key and move to other Mode by pressing MD key again.
- *If no key touched for 90sec. in each setting mode, it will return to RUN Mode.

Operation chart for alarm output

AL-0	No alarm output.
AL-1	■Deviation High-limit alarm If deviation between PV and SV is occurring higher than deviation temperature setting value, the output will be ON. The deviation temperature is set in EV-1 of first setting group.
AL-2	■Deviation Low-limit alarm If deviation between PV and SV is occurring lower than deviation temperature setting value, the output will be ON. The deviation temperature is set in EV-1 of first setting group.
AL-3	■Deviation High/Low-limit alarm If deviation between PV and SV is higher or lower than deviation temperature setting value, the output will be ON. The deviation temperature is set in EV-1 or EV-2 of first setting group.
AL-4	■Deviation High/Low-limit reverse alarm If deviation between PV and SV is higher or lower than deviation temperature setting value, the output will be OFF. The deviation temperature is set in EV-1 or EV-2 of first setting group.
AL-5	■The absolute value High-limit alarm If PV is equal or higher than alarm temperature setting value, the output will be ON. The deviation temperature is set in EV-1 of first setting group.
AL-6	■The absolute value Low-limit alarm If PV is equal or lower than alarm temperature setting value, the output will be ON. The alarm temperature is set in EV-1 of first setting group.

Functions

- EVENT function
- Autotuning function
- Dual PID control function

- Retransmission output(PV)
- Error indication
- Manual reset(rEST)
- Lock function
- Timer function(t-Sv)

- Input sensor specification and temperature range
- Factory default
- Caution for using

Input sensor	Display	Selectable temperature range ℃	Selectable temperature range ℉
K(CA)	4CA	-100 ~ 1300 ℃	-148 ~ 2372 ℉
J(IC)	4IC	0 ~ 800 ℃	32 ~ 1472 ℉
JPH	4Pth	0 ~ 500 ℃	32 ~ 932 ℉
JPL	4Ptl	-199.9 ~ 199.9 ℃	-199.9 ~ 392.0 ℉
DPH	4Pth	0 ~ 500 ℃	32 ~ 932 ℉
DPL	4Ptl	-199.9 ~ 199.9 ℃	-199.9 ~ 392.0 ℉

Factory default

First setting group	Second setting group	Third setting group
C-SV 0	AL oFF	In-t 4CA
Ev-1 10	P 30	H-SC 400
Ev-2 10	I 0	L-SC 0
StSP 0	d 0	Unit 0C
	t 20	In-b 0
	rEST 00	PIdt 2
		Ev-1 AL-1
		AL-t AL-A
		Ev-2 AL-4
		LoC oFF

Caution for using

- Installation environment
- Pollution Degree 2.
- Altitude Max. 2000m.
- Installation Category II.
- Please use separated line from high voltage line or power line in order to avoid inductive noise.
- Please install power switch or circuit-breaker in order to cut power supply off.
- The switch or circuit-breaker should be installed near by users.
- Do not use this product as Volt-meter or Ampere-meter, this is a temperature controller.
- Be sure to use compensating wire when extends wire from controller to thermocouple, otherwise the temperature deviation will be occurred at the part where wires are connected to each other.
- In case of using RTD sensor, 3wire type must be used.
- If you need to extend the line, 3wires must be used with the same thickness as the line.
- It might cause the deviation of temperature if the resistance of line is different.
- In case of making power line and input signal line close, line filter for noise protection should be installed at power line and input signal line should be shielded.
- Keep away from the high frequency instruments. (High frequency welding machine & sewing machine, big capacitive SCR controller)

It may cause malfunction if above instructions are not followed.

Main products

- Photoelectric sensors
- Temperature controllers
- Fiber optic sensors
- Temperature/Humidity transducers
- Door sensors
- SSR/Power controllers
- Door side sensors
- Counters
- Area sensors
- Timers
- Proximity sensors
- Panel meters
- Pressure sensors
- Tachometer/Pulse(Rate)meters
- Rotary encoders
- Display units
- Connector/Sockets
- SSR controllers
- Switching mode power supplies
- Control switches/Lamps/Buzzers
- IO Terminal Blocks & Cables
- Stepper motors/drivers/motion controllers
- Graphic/Logic panels
- Field network devices
- Laser marking system(Fiber, CO₂, Nd:YAG)
- Laser welding/soldering system

Autonics Corporation
http://www.autonics.com

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