TOS/ TOM/ TOL

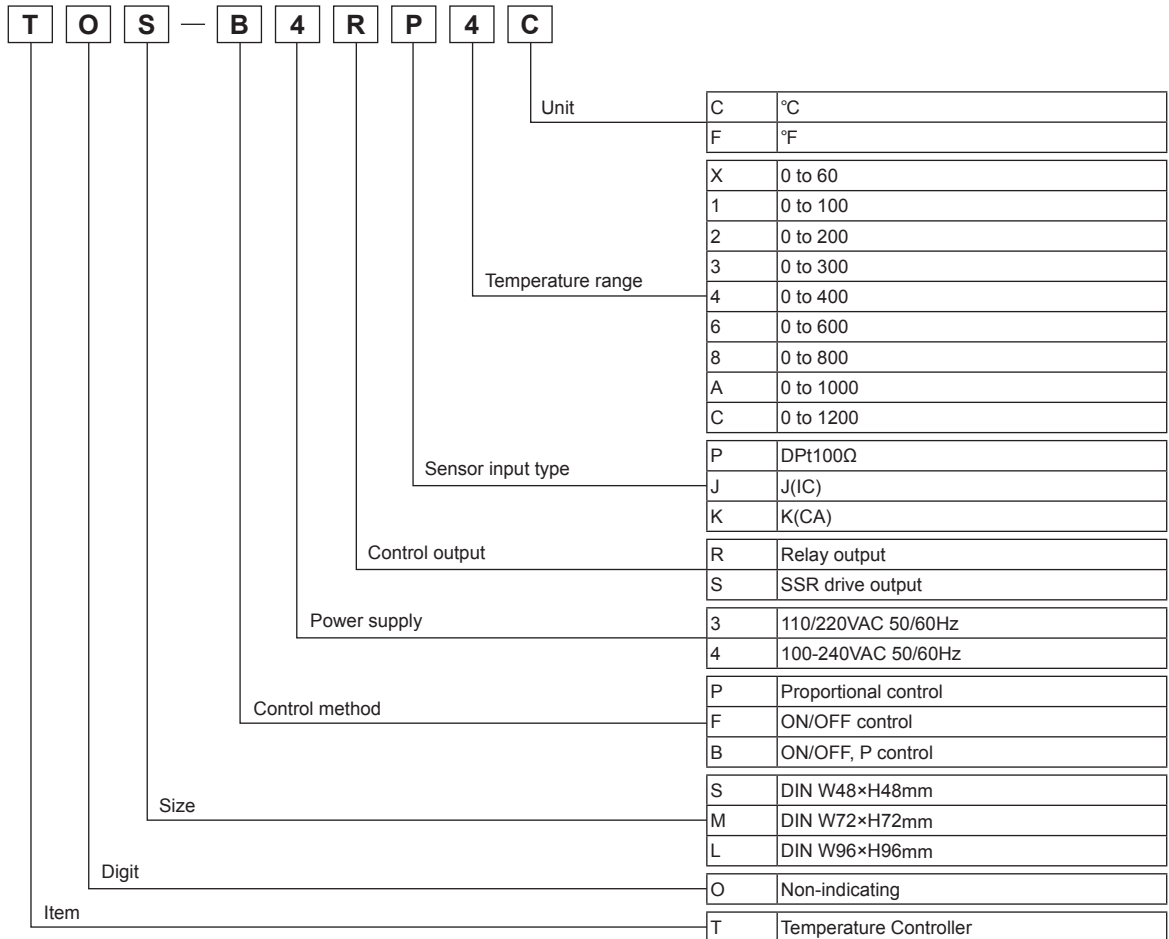## Analog, Non-Display Type Temperature Controller

▣ Features

- Non-indicating type
- Setting temperature by Dial
- Includes burn out function
- Universal power: TOS

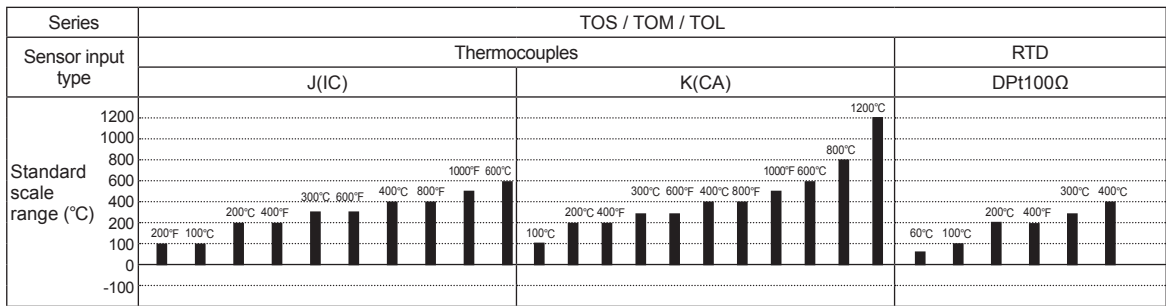⚠ **Please read "Caution for your safety" in operation manual before using.**

c ⦿U US

(TOS Series only)

▣ Ordering Information

T	O	S	–	B	4	R	P	4	C

Unit	C	℃
	F	℉
Temperature range	X	0 to 60
	1	0 to 100
	2	0 to 200
	3	0 to 300
	4	0 to 400
	6	0 to 600
	8	0 to 800
	A	0 to 1000
	C	0 to 1200
Sensor input type	P	DPt100Ω
	J	J(IC)
	K	K(CA)
Control output	R	Relay output
	S	SSR drive output
Power supply	3	110/220VAC 50/60Hz
	4	100-240VAC 50/60Hz
Control method	P	Proportional control
	F	ON/OFF control
	B	ON/OFF, P control
Size	S	DIN W48×H48mm
	M	DIN W72×H72mm
	L	DIN W96×H96mm
Digit	O	Non-indicating
Item	T	Temperature Controller

※Refer to page H-123 about sensor temperature range for selection.

Autonics

Analog, Non-Display Type

■ Temperature Range For Each Sensor

Series	TOS / TOM / TOL		
Sensor input type	Thermocouples		RTD
	J(IC)	K(CA)	DPt100Ω

※Temperature range of each mode is different.

■ Specifications

Series		TOS	TOM	TOL
Power supply		100-240VAC 50/60Hz	110/220VAC 50/60Hz	
Allowable voltage range		90 to 110% of rated voltage		
Power consumption		Max. 2.2VA	Max.3VA	
Display method		LED ON	LED ON/OFF	
Setting type		Dial setting		
Setting accuracy		F.S. ±2%		
Sensor input		Thermocouples: K(CA), J(IC) / RTD: DPt100Ω		
Input line resistance		Thermocouples: Max. 100Ω, RTD: Allowable line resistance max. 5Ω per a wire		
Control method	ON/OFF	Hysteresis: F.S. 0.5% ±0.2% fixed		
	Proportional	Proportional band: F.S. 3% fixed, Period: 20 sec fixed		
Control output		• Relay output: 250VAC 2A 1c • SSR drive output: 12VDC ±3V Load 20mA Max.	• Relay output: 250VAC 3A 1c • SSR drive output: 12VDC ±3V 20mA Max.	
Self-diagnosis		Built-in burn out function (cut off output when sensor is disconnected)		
Insulation resistance		Over 100MΩ (at 500VDC megger)		
Dielectric strength		2,000VAC 50/60Hz for 1 min		
Noise immunity		±1kV the square wave noise (pulse width: 1µs) by the noise simulator		
Vibration	Mechanical	0.75mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 1 hour		
	Malfunction	0.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 min		
Shock	Mechanical	300m/s² (approx. 30G) in each X, Y, Z direction for 3 times		
	Malfunction	100m/s² (approx. 10G) in each X, Y, Z direction for 3 times		
Relay life cycle	Mechanical	Min. 10,000,000 operations		
	Electrical	Min. 100,000 operations (250VAC 3A at resistive load)		
Environ-ment	Ambient temperature	-10 to 50℃, storage: -25 to 65℃		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Approval		$_c$🆄🅻$_{us}$	—	—
Unit weight		Approx. 155g (approx. 104g)[1]	Approx. 419g	Approx. 426g

※F.S. is same with sensor measuring temperature range.
   E.g.) In case of using temperature is from 0 to 800℃, Full scale is "800".
※1. The weight includes packaging. The weight in parenthesis is for unit only.
※Environment resistance is rated at no freezing or condensation.

(A) Photoelectric Sensors
(B) Fiber Optic Sensors
(C) Door/Area Sensors
(D) Proximity Sensors
(E) Pressure Sensors
(F) Rotary Encoders
(G) Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets
(H) Temperature Controllers
(I) SSRs / Power Controllers
(J) Counters
(K) Timers
(L) Panel Meters
(M) Tacho / Speed / Pulse Meters
(N) Display Units
(O) Sensor Controllers
(P) Switching Mode Power Supplies
(Q) Stepper Motors & Drivers & Controllers
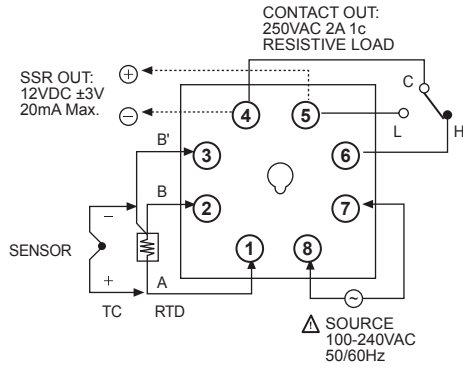(R) Graphic/ Logic Panels
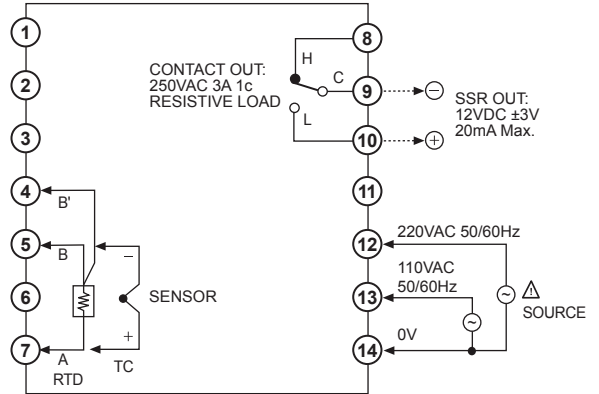(S) Field Network Devices
(T) Software

TOS/ TOM/ TOL

▣ Connections

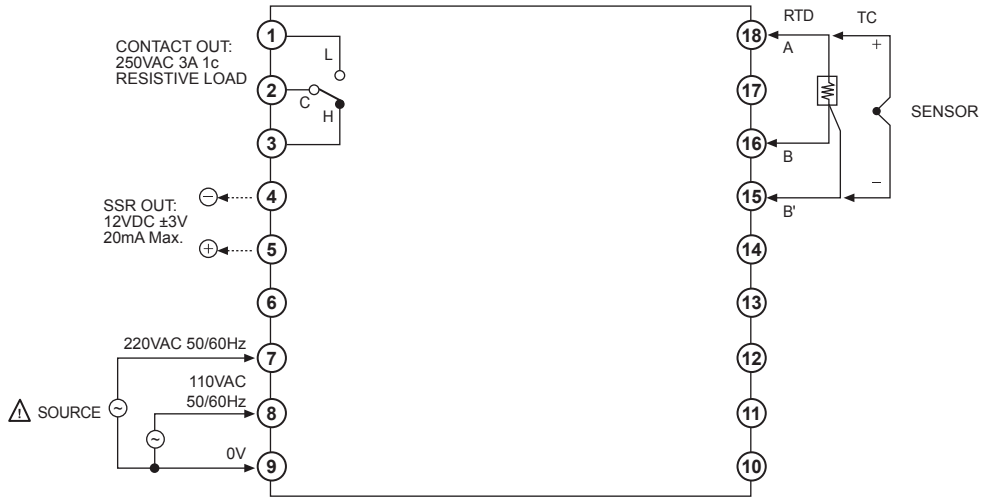※RTD: DPt100Ω (3-wire type)　　※Thermocouple: K(CA), J(IC)

● TOS

CONTACT OUT:
250VAC 2A 1c
RESISTIVE LOAD

SSR OUT:
12VDC ±3V
20mA Max.

SENSOR

TC　RTD

SOURCE
100-240VAC
50/60Hz

● TOM

CONTACT OUT:
250VAC 3A 1c
RESISTIVE LOAD

SSR OUT:
12VDC ±3V
20mA Max.

SENSOR

RTD　TC

220VAC 50/60Hz

110VAC 50/60Hz

0V

SOURCE

● TOL

CONTACT OUT:
250VAC 3A 1c
RESISTIVE LOAD

SSR OUT:
12VDC ±3V
20mA Max.

220VAC 50/60Hz

110VAC 50/60Hz

SOURCE

0V

RTD　TC

SENSOR

▣ Dimensions

(unit: mm)

● TOS

<Bracket>

□ 48

61

13　64　15

45

● Panel cut-out

Min. 55

Min. 62

$45^{+0.6}_{0}$

$45^{+0.6}_{0}$
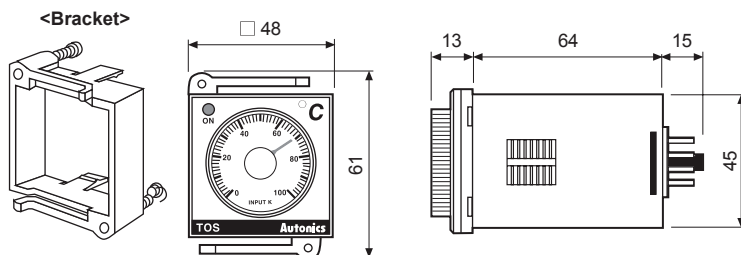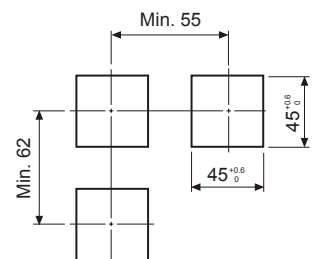
※Socket: PG-08, PS-08(N) (sold separately)

Autonics

Analog, Non-Display Type

▣ Dimensions

(unit: mm)

● TOM

□72

89

20　112

67

●Panel cut-out

Min. 91

Min. 91

$68^{+0.7}_{0}$

$68^{+0.7}_{0}$

● TOL

□96

108

21　100

90

●Panel cut-out

Min. 116

Min. 116

$92^{+0.8}_{0}$

$92^{+0.8}_{0}$
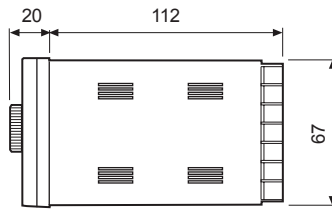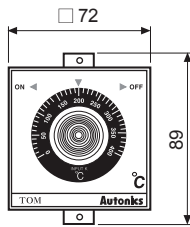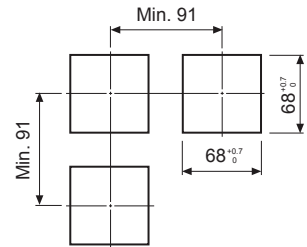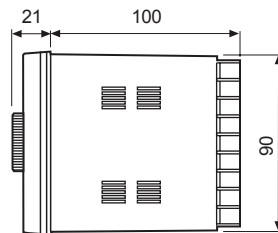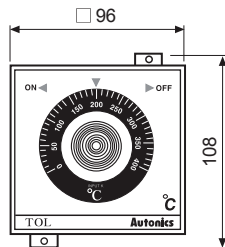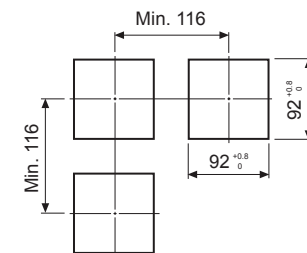
▣ Proper Usage

◎ Application of temperature controller and load connection

● SSR drive output connection

Temperature controller

SSR

SSR drive output terminal

12VDC 20mA Max.

INPUT

LOAD

Load

Load power
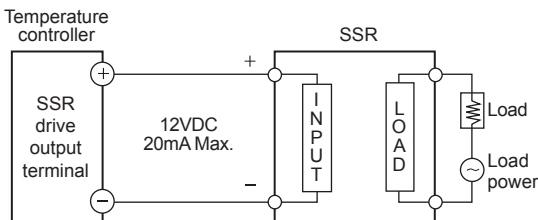
※When using voltage (for driving SSR) in the other purposes, do not over the range of the rated current.

● Relay output connection

Temperature controller

Load

L

C

H

N.O.

COM

N.C

Load power

Relay contact output terminal (250VAC 2A 1c / 250VAC 3A 1c)
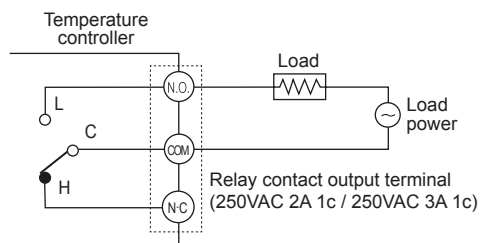
◎ Normal/Reverse operation

Reverse operation executes to output ON when processing value is lower than setting value, and it is used for heating.

Normal operation is executed conversely and used for cooling. (This item runs as a reverse operation.)
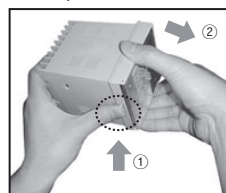
◎ How to select control mode

Factory specification is P control. When using ON/OFF control, transfer the switch of control method from P to F after detaching the case from its body.

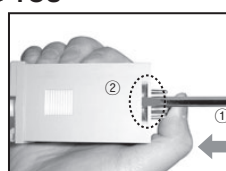Note)Several models require to change control method by jump line or solder.

P　F

P control

P　F

ON/OFF control

◎ Case detachment

● TOM, TOL

Pressing the front guide of Lock toward ① and squeeze and pull toward ②, it is detached.

● TOS

Pressing Pin plug ①, raise it up with a driver as ② and it is detached.

※Refer to page H-172 for caution during use and simple error diagnosis.