TOHO

TTM-P9   TTM-P4

DIGITAL TEMPERATURE PROGRAMMABLE CONTROLLER

TTM-P4/P9

Simplest!

Easiest!

Reasonable!

TTM-P9
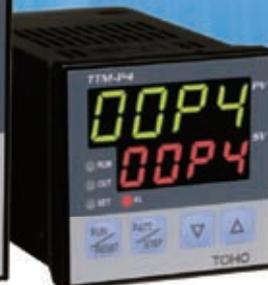
TTM-P4

TOHO ELECTRONICS INC.

DIGITAL TEMPERATURE PROGRAMMABLE CONTROLLER

TTM-P4/P9 Series

■Features

● **Patterns × Steps=64 max.**
It is programmable up to "Patterns x Steps=64".

● **Standard Equipment of Time Signal/Alarm Output, RUN Signal Output and DI(RUN Signal Input)**
It is selectable by parameter either time signal output or alarm output, and RUN signal output and DI(RUN signal input) are equipped as standard.

● **Auto Tuning PID**
The auto tuning PID is performed three temperature ranges, and calculated optimum PID values.

● **Compact Size**
It is easy to install and the depth is only 77mm.

● **Power supply for sensors**
Equips the power source for external supply of 12 VDC, which is usable as power source for sensors and such

● **Standardization Conformity**
CE, UL, cUL approved and RoSH directive

■Front Panel

PV	Indicates measured values and characters
SV	Indication of set value and characters
AL	Output monitor for alarm
SET	Setting monitor
OUT	Output monitor for output1
RUN	Operation monitor
RUN/RESET	Run/Reset/Parameter operation key
PATT./STEP	Pattern/Step/Parameter operation key
△	Increasing the set value/Parameter operation key
▽	Decreasing the set value/Parameter operation key

■Dimensions
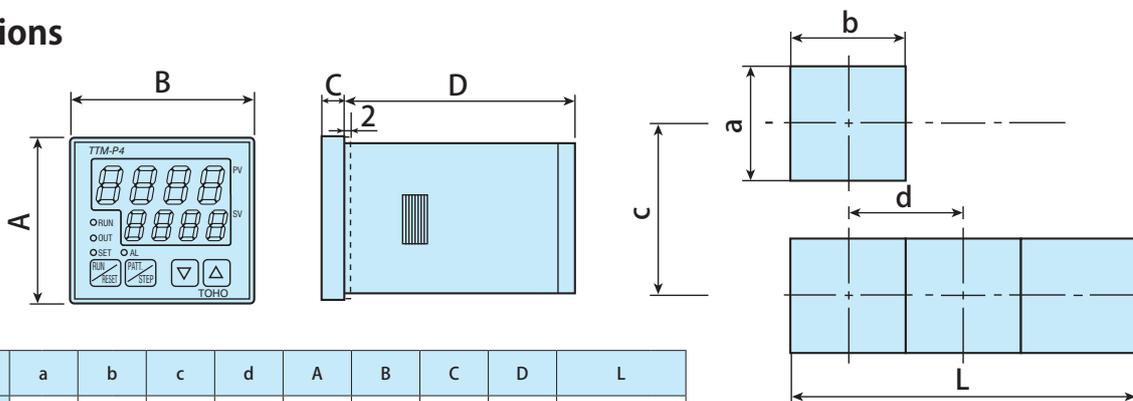
Model	a	b	c	d	A	B	C	D	L
TTM-P4	45 $^{+0.6}_{-0}$	45 $^{+0.6}_{-0}$	60	48	48	48	6	77	(B×N-3) $^{+0.6}_{-0}$
TTM-P9	92 $^{+0.6}_{-0}$	92 $^{+0.6}_{-0}$	120	96	96	96	9	77	(B×N-3) $^{+1}_{-0}$

"L" is for installation of multiple units.
When you use compressed lead wire to install multiple units, please be careful sufficiently not to touch the other lead wires.
Please clean by the well squeezed cloth with neutral detergent.

■Operation Flow

State	Overview
①Reset mode	Reset state mode (this mode will be entered when the power is turned on)
②Operation mode	Mode for executing a programmed run (holding the ▽ key for 3 seconds during operation will enable step feed)
③Pause mode	Mode for pausing a programmed run (in terms of time)
④Pattern number setting mode	Mode for setting the pattern number of the program to be executed. If the product goes out of the operation mode, the product will display the pattern step number being operated. (While the pattern step number is displayed, holding the ▽ key for 3 seconds will enable step feed.)
⑤Programming mode	Mode for setting the program for each pattern
⑥Common parameter setting mode	Mode for setting parameters common to each pattern and step
⑦Alarm temperature setting mode	Mode for setting an alarm temperature
⑧PID setting mode	Mode for changing the setting of the PID constant (only during operation)

■Standard Specifications

Input	Thermocouple	K, J, R (JIS1602 to 1995)	
Indication	PV (Process value)	4 digits, 7 segments Green 10mm height for TTM-P4, 12mm for TTM-P9	
	SV (Setting value)	4 digits, 7 segments Red 8mm height	
	Lamp	RUN, OUT, SET, AL Red LED	
Control Method	PID (Auto-tuning)	Proportional band (P)	0.1 to 200.0% (For temperature setting range)
		Integral time (I)	0 to 3600 sec. (0: OFF)
		Deviation (D)	0 to 3600 sec. (0: OFF)
		Cycle time (T)	1 to 120 sec.
Control Output	Relay Contact	250VAC, 3A (Load resistance) 1a contact	
	SSR Drive Voltage	0 to 12VDC (Load resistance: Max. 600Ω or more)	
Sampling Time		0.5 sec. (Output change period is the same)	
Setting and Indication Accuracy	Thermocouple	±(0.3% + 1 digit) of process value or ±2℃ , either of bigger numerial value is taken. (Ambient temperature: 23℃±10℃)	
Memory Element		EEPROM	
Power Voltage		100VAC to 240VAC (50/60Hz)	
Weight		TTM-P4: less than 180g, TTM-P9: less than 380g	
Power Consumption		Less than 10VA (240VAC)	
Accessories		Instruction manual & installation attachment (TTM-P4) or installation metal instruments (TTM-P9)	
Operating Condition		0 to 50℃ , 20 to 90% RH (Under non-condensation)	
Storage Condition		-25 to 70℃ , 5 to 95% RH (Under non-condensation)	

■Input and Range

Thermocouple	Setting Range	Display Range
K	0 to 1200℃	-40 to 1326℃
J	0 to 800℃	-31 to 850℃
R	0 to 1300℃	-20 to 1755℃

■Event Output Mode

●Event Output

0	None (Time Signal Setting)
1	Deviation high and low limit
2	Deviation high limit
3	Deviation low limit
4	Deviation low and high range
5	Absolute value high and low limit
6	Absolute value high limit
7	Absolute value low limit
8	Absolute high and low range

●Additional Function

0	None
1	Output hold
2	Awaiting sequence
3	Output hold + awaiting sequence

■Ordering Information

TTM－[Model]－0－[Output 1]
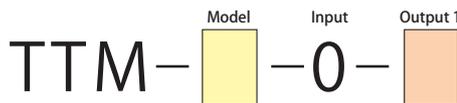
Model	P4	48×48mm
	P9	96×96mm
Output1	R	Relay contact
	P	SSR drive voltage 12VDC

＊Option A, B and E are equipped as standard specifications.
　A: Time signal output/Alarm output　B: RUN signal output　E: DI (Digital input)

■Terminals

●TTM-P4 series
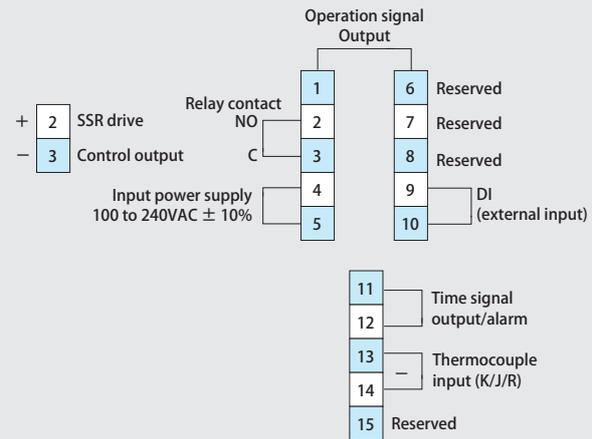
●TTM-P9 series
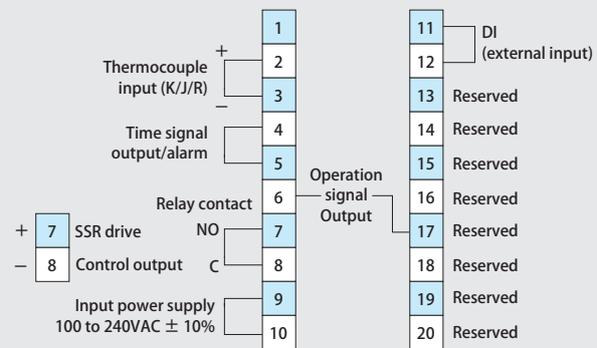

■Functions

●Time Signal Action

Time signal ON/OFF time is the same for each step.
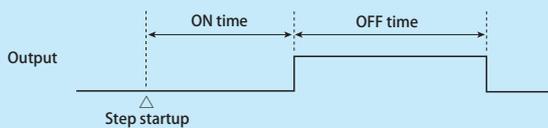
●Wait Action

When the process value (PV) does not reach the wait zone (or overshoots beyond the wait zone) after elapse of the measuring time in the process of transition from certain step to the next step, the next step is not started.
However, transition to the next step occurs after the wait time elapses.

Example of operation
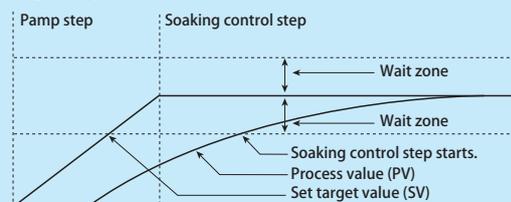
●PV start and SV start

SV start : Operation is started at the specified measured value (SV) toward the set value (SV) of step 1 in the set time of the step.
PV start : Operation is started at the ramp (up or down) step which includes the process value (PV) at the time of start of program operation.
The set value (SV) at the RUN start = the process value (PV).
When two steps are applicable, the step of smaller step number is applied.

●Auto-Tuning

The PID parameters are classified into three groups depending on the set temperature range. Accordingly, the auto-tuning is performed three times to determine the three parameters. It is possible to set each point individually and also to set three points continuously by one operation.
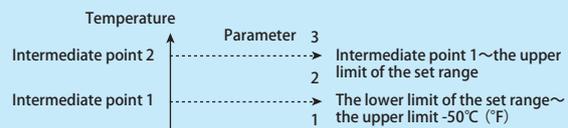
●Specifications are subject to change without notice.
Note: The color printed in this catalog may be different from actual color.

TOHO

TOHO ELECTRONICS INC.