

DIGITAL TEMPERATURE  
PROGRAMMABLE CONTROLLER

# TTM-P4W



TOHO ELECTRONICS INC.

# DIGITAL TEMPERATURE PROGRAMMABLE CONTROLLER

# TTM-P4W

## ■ Features

### ● Pattern/Step

It is programmable up to "Steps x Patterns=64".  
The maximum number of steps are determined depending on the number of patterns.

Number of Patterns	1	2	3	4	5	6
Max. Number of Steps	64	32	21	16	12	10
Number of Patterns	7	8	9	10	11,12	13,14,15
Max. Number of Steps	9	8	7	6	5	4

### ● Universal Input

Thermocouple(7 types) or R.T.D. (Pt100) is selectable.

### ● Control Type

PID or ON/OFF is selectable.

### ● Standard Equipment

- ① Event Output 1 or Time Signal
- ② Control Output 2, Event Output 2 or Run Signal Output
- ③ DI(Run Singal Input)

### ● Compact Size

It is easy to install and the depth is only 77mm.

### ● Standardization Conformity

Conforms to CE marking

### ● Temperature Unit

Switching between Celsius and Fahrenheit is possible.

### ● Transmission Output

It is possible to transfer PV(Process Value), SV(Set Value) or MV(Manipulated Variable) to external devices.

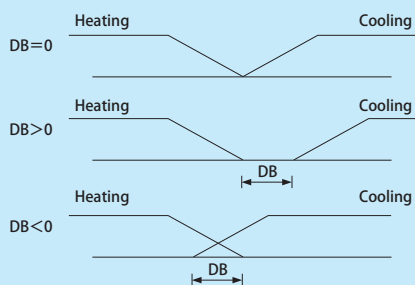
## ■ Easier to see and operate

PV	Indicates measured values and characters
SV	Indication of set value and characters
DI	DI monitor (It appears when DI operates)
RUN	Operation monitor
COM	COM lamp (It blinks during communication)
AL1	Output monitor for alarm1
AL2	Output monitor for alarm2
OUT1	Output monitor for output1
OUT2	Output monitor for output2
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

## ■ Functions

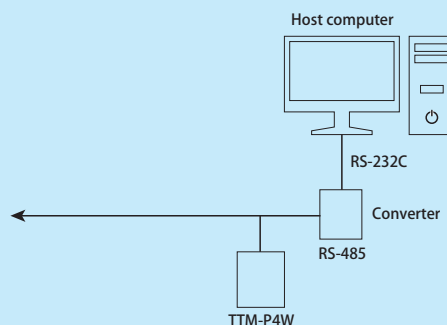
### ● Heating / Cooling

Heating and Cooling control is possible with one unit.  
With the DB (Dead Band) setting, a range can be set between the heating output and the cooling output



### ● Communication function

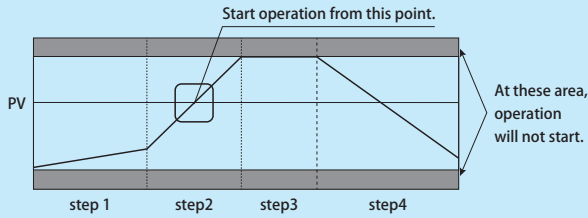
● A connection example with the personal computer  
Centralized supervision with the personal computer is possible with the connection like the chart below.



### ● PV start/SV start

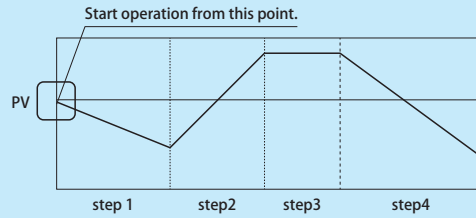
#### \* PV start1

Operation will start from the Ramp step including the PV(Process Value) at the starting time of Program operation.  
In case more than one step is applied, it starts the one with smaller step number.



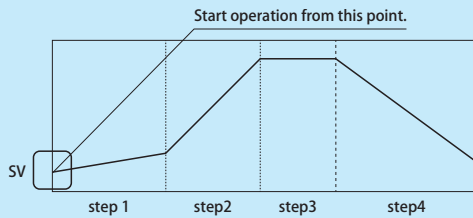
#### \* PV start2

The operation is started with the PV (Process Value) at the start of operation as the start temperature.



#### \* SV start

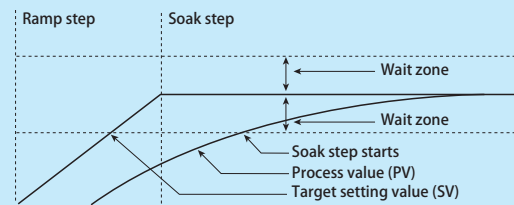
Program operation starts from "the SV start temperature setting"



### ● Wait Action

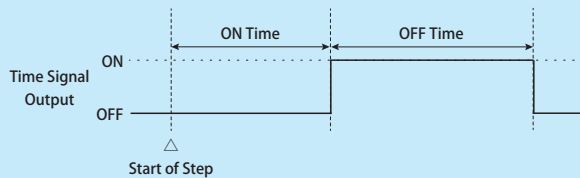
When the process value (PV) does not reach the wait zone (or overshoots beyond the wait zone) after elapse of the measuring time in the process of transition from certain step to the next step, the next step is not started.  
However, transition to the next step occurs after the wait time elapses.

#### Example of operation



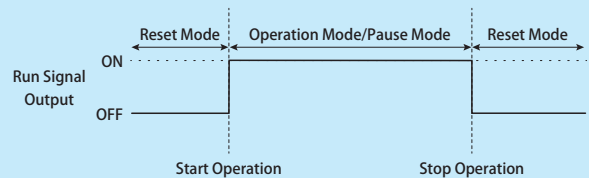
### ● Time Signal Output

It is a function to output at any time at the start of operation or at the transition to the next step.



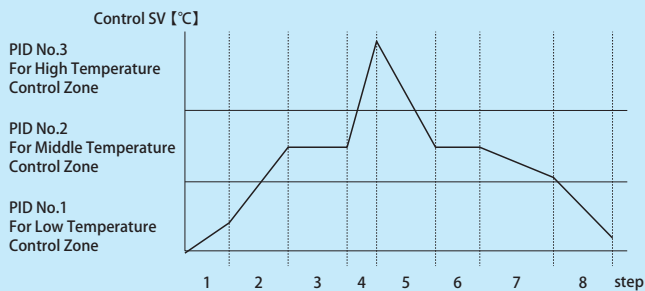
### ● Run Signal Output

It is a function to turn on the output during the operation mode or pause mode. In reset mode, the output is turned off.



### ● 3 Zone PID

It is a function that divides a temperature zone into three temperature zones and switches the PID setting depending on which temperature zone the control SV is at.



## Standard Specifications

Input Type	Thermocouple	K, J, R, T, N, S, B
	RTD	Pt100 [external resistance below 10Ω (per wire. All three wires must have the same resistance)]
Sampling Cycle	250ms	
Settings and Indication Accuracy (Ambient Temperature 23°C ± 10°C)	Thermocouple	K, J, R, T, N, S, B ±(0.3% + 1 digit) of the instruction value or ±2°C, whichever is bigger (Ambient Temperature: 23°C ± 10°C). However, ±3°C between -99°C to 0°C, ±4°C between -210 to -100°C. No stipulation below 400°C in B-thermocouple.
	RTD	Pt100 ±(0.3% + 1 digit) of the instruction value or ±0.9°C, whichever is bigger (Ambient Temperature: 23°C ± 10°C)
Control Type	PID, ON/OFF	
Control Output1 (OUT1)	Relay Contact	250V AC 3A (Resistance load) 1a contact
	SSR Driving Voltage	0 to 12V DC (Load resistance 600Ω or more)
	Current	4 to 20mA DC (Load resistance 600Ω or less)
Event Output1/Time Signal Output	Relay Contact	250V AC 2.4A (Resistance load) 1a contact
Control Output2 /Event Output2/ Run Signal Output (OUT2)	Relay Contact	250V AC 2.4A (Resistance load) 1a contact
	SSR Driving Voltage	0 to 12V DC (Load resistance 600Ω or more)
DI Input	Function	This will be enabled only if external operation is selected. DI (External Input) Selection · · · External Operation: Run/Reset by the signal of DI (External input) Internal Operation: Run/Reset by the front key switch
	Input Method	Non voltage contact point input
	Minimum Input Time	500ms
	When OFF voltage	Max. 6V DC
	When ON current	Max. 6mA
Transmission Output <small>*Available only when 4 to 20mA is selected for control output 1</small>	Function	PV (Process Value) transmission output, SV (Set Value) transmission output, MV (Manipulated Variable) transmission output
Memory Element	EEPROM	
Power Supply	100 to 240V AC(50/60Hz)	
Weight	TTM-P4W: Less than 180g	
Power Consumption	Less than 10VA(264V AC)	
Accessories	Instruction manual & installation attachment	
Operating Condition	0 to 50°C, 20 to 90% RH (Under non-condensation)	
Storage Condition	-25 to 70°C, 5 to 95% RH (Under non-condensation)	
External Standard	6 substances as restricted by the RoHS Directives are not used.	Lead: Below 1,000 ppm Mercury: Below 1,000 ppm Cadmium: Below 100 ppm Hexad Chrome: Below 1,000 ppm Polybrominated Biphenyl (PBB): Below 1,000 ppm Polybrominated Diphenyl Ethers (PBDE): Below 1,000 ppm
	CE marking	

## Option specifications

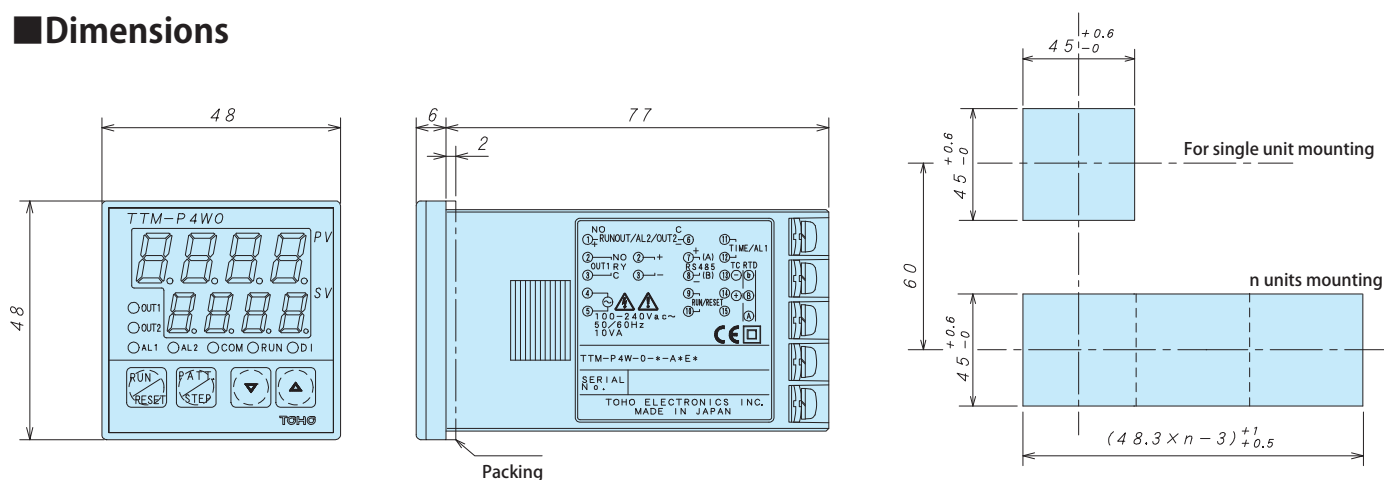
Communication	<p>(1) Communication Standard: RS-485 conformable</p> <p>(2) Communication Method : Protocol: TOHO protocol / MODBUS Multi-drop system (1:31 stations) Direction of Information: Semi-duplex Synchronous method: Asynchronous Transfer code: TOHO protocol ASCII (BCC is excluded) MODBUS RTU / ASCII</p> <p>Interface: Two-wire system Communication speed: 1200 / 2400 / 4800 / 9600 / 19200 BPS Character: Start bit 1 bit fixed Stop bit 1/2 bit Data length - TOHO Protocol 7/8 bit - MODBUS RTU 8 bit - MODBUS ASCII 7 bit</p> <p>Parity None / odd no. / even no. - TOHO Protocol No / Yes</p> <p>BCC check (The error check will be done by CRC for MODBUS RTU, LRC for MODBUS ASCII)</p> <p>Address - TOHO Protocol 1 to 99 - MODBUS RTU and ASCII 1 to 247</p> <p>Response delay time: 0 to 250ms</p> <p>(3) Isolation: Isolated from power circuit and CPU circuit.</p>
---------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Input and Range

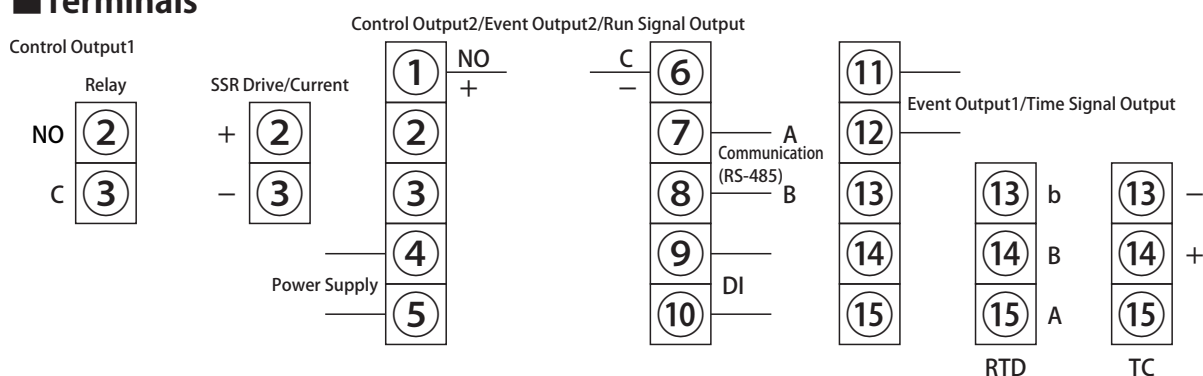
Thermocouple	Measurement/Display Range	Setting Range	Indication resolution
K	-210 to 1382°C	-200 to 1372°C	1°C
J	-210 to 860°C	-200 to 850°C	1°C
R	-10 to 1710°C	0 to 1700°C	1°C
T	-210 to 410°C	-200 to 400°C	1°C
N	-210 to 1310°C	-200 to 1300°C	1°C
S	-10 to 1710°C	0 to 1700°C	1°C
B	-20 to 1802°C	0 to 1800°C	1°C

RTD	Measurement/Display Range	Setting Range	Indication resolution
Pt100	-199.9 to 530.0°C	-199.9 to 500.0°C	0.1°C

## Dimensions



## Terminals



If DI is input with the open collector output, ⑨ is +.


## ■ Ordering Information

TTM-P4W-0--AE

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦


Item	Description	
① Model	P4W	48×48mm
② Input	0	Thermocouple(K, J, R, T, N, S, B) RTD(Pt100) <span style="float: right;">Switchable by key</span>
③ Control Output 1	R	Relay Contact
	P	SSR Drive Voltage
	I	Current 4 to 20mA DC
④ Event Output1/ Time Signal Output	A	Relay Contact
⑤ Control Output2/ Event Output2/ Run Signal Output	B	Relay Contact
	P	SSR Drive Voltage
⑥ External Input	E	DI (Non-voltage contact input)
⑦ Communication		None
	X	RS-485

\*"I" in Control Output1 can be switched to transmission output by parameter setting.



**Warning**

This product is designed to control temperature and other physical volumes of general-purpose industrial facilities.  
(Do not use this product for control that may greatly affect human life.)



**Caution**

- Please read the operation manual carefully for proper and safe usage of the product.
- In case this product causes damage or loss to system or property, take necessary safety measures to prevent accidents before using it.



● Specifications and rated values in this catalog are subject to change without notice  
Note: The color printed in this catalog may be different from actual color.