

# Dual-Speed PID Temperature Controllers



## TZ / TZN Series CATALOG

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

The specifications, dimensions, etc are subject to change without notice for product improvement. Some models may be discontinued without notice.

### Features

- Dual-speed PID control
  - High-speed response : minimizes time required to reach SV
  - Low-speed response : minimizes overshoot for sensitive temperature control
- High display accuracy :  $\pm 0.3\%$  of full-scale value
- 2-step auto tuning function
- Various input types (13 total) : includes temperature sensor and analog inputs
- Various sub-output options
  - Various alarm outputs including loop break alarm and sensor break alarm
  - PV transmission output (DC 4-20mA)
  - RS485 Communication output
- Decimal point display function for analog inputs

### Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website .

**TZ / TZN 4 ① - ② 4 ③**

#### ① Size

S: DIN W 48 × H 48 mm (TZN Series)  
 SP: DIN W 48 × H 48 mm (11 pin type, TZ Series)  
 ST: DIN W 48 × H 48 mm (TZ Series)  
 M: DIN W 72 × H 72 mm  
 H: DIN W 48 × H 96 mm  
 W: DIN W 96 × H 48 mm  
 L: DIN W 96 × H 96 mm

#### ③ OUT1 Control output

R: Relay output  
 S: SSR drive output  
 C: Current Output

#### ② Option output

PN	Option output 1	Option output 2
1	Event	-
2	Event	Event
R	Event	PV Transmission
T	Event	Communication
A	Event	Event + PV Transmission
B	Event	Event + Communication

### Product Components

- Product, bracket × 2
- Instruction manual
- [TZ4SP, TZ4ST, TZN4S] Product (+ bracket)
- Unit sticker

### Software

Download the installation file and the manuals from the Autonics website.

#### ■ DAQMaster

DAQMaster is comprehensive device management program. It is available for parameter setting, monitoring.

## Specifications

<b>Series</b>	<b>TZ/TZN Series</b>	
<b>Power supply</b>	100 - 240 VAC ~ 50/60 Hz ± 10%	
<b>Power consumption</b>	≤ 6 VA, TZ4SP, TZ4ST, TZN4S: ≤ 5 VA	
<b>Sampling period</b>	500 ms	
<b>Input specification</b>	Refer to 'Input Type and Using Range'.	
<b>Display accuracy</b>	F.S. ±0.3% or 3°C higher one	
<b>Control output</b>	Relay	250 VAC ~ 3 A, 30 VDC = 3 A 1c
	SSR	12 VDC = ±3 V, ≤ 30 mA
	Current	DC 4-20 mA, load resistance: ≤ 600 Ω
<b>Option output</b>	Event 1/2	250 VAC ~ 1A 1a
	PV Transmission	DC 4 - 20 mA, load resistance: ≤ 600 Ω
	Comm.	RS485
<b>Display type</b>	7 Segment (red, green), LED type	
<b>Control type</b>	ON/OFF, P, PI, PD, PIDF, PIDS control	
<b>Alarm output Hysteresis</b>	1 to 100 (0.1 to 100.0) °C	
<b>Proportional band (P)</b>	0.0 to 100.0%	
<b>Integral time (I)</b>	0 to 3,600 sec	
<b>Derivative time (D)</b>	0 to 3,600 sec	
<b>Control cycle (T)</b>	1 to 120 sec	
<b>LBA setting</b>	1 to 999 sec	
<b>RAMP setting</b>	Ramp Up, Ramp Down: 1 to 99 min	
<b>Relay life cycle</b>	Mechanical	• Control output: ≥ 10,000,000 operations • Option output: ≥ 20,000,000 operations
	Electrical	• Control output: ≥ 100,000 operations (load resistance: 250 VAC ~ 3 A) • Option output: ≥ 500,000 operations (load resistance: 250 VAC ~ 1 A)
<b>Dielectric strength</b>	Between input terminal and power terminal: 2,000 VAC ~ 50/60 Hz for 1 min	
<b>Vibration</b>	0.75 mm amplitude at frequency of 10 to 55Hz (for 1min) in each X, Y, Z direction for 2 hours	
<b>Malfunction vibration</b>	0.5 mm amplitude at frequency of 10 to 55Hz (for 1min) in each X, Y, Z direction for 2 hours	
<b>Insulation resistance</b>	≥ 100 MΩ (500 VDC = megger)	
<b>Noise immunity</b>	± 2 kV square shaped noise by noise simulator (pulse width 1 μs) R-phase, S-phase	
<b>Memory retention</b>	≈ 10 years (non-volatile semiconductor memory type)	
<b>Ambient temperature</b>	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
<b>Ambient humidity</b>	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
<b>Approval</b>	CE, RoHS, ENEC	
<b>Unit weight (packaged)</b>	• TZ4SP: ≈ 144 g (≈ 205 g)	• TZN4S: ≈ 164 g (≈ 226 g)
	• TZ4ST: ≈ 162 g (≈ 218 g)	• TZN4M: ≈ 246 g (≈ 355 g)
	• TZ4M: ≈ 228 g (≈ 360 g)	• TZN4W: ≈ 232 g (≈ 351 g)
	• TZ4W: ≈ 246 g (≈ 365 g)	• TZN4H: ≈ 232 g (≈ 351 g)
	• TZ4H: ≈ 246 g (≈ 365 g)	• TZN4L: ≈ 303 g (≈ 474 g)
	• TZ4L: ≈ 304 g (≈ 474 g)	

## Communication Interface

### RS485

<b>Comm. protocol</b>	BCC
<b>Application standard</b>	EIA RS485 compliance with
<b>Maximum connection</b>	31 units (address: 01 to 99)
<b>Synchronous method</b>	Asynchronous
<b>Comm. method</b>	Two-wire half duplex
<b>Comm. effective range</b>	≤ 1,200 m
<b>Comm. speed</b>	2,400 / 4,800 / 9,600 bps (parameter)
<b>Start bit</b>	1 bit (fixed)
<b>Data bit</b>	8 bit (fixed)
<b>Parity bit</b>	None
<b>Stop bit</b>	1 bit (fixed)
<b>EEPROM life cycle</b>	≈ 1,000,000 operations (Erase / Write)

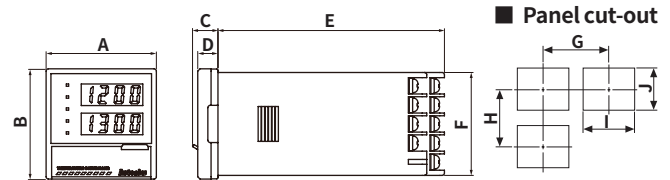
## Input Type and Using Range

The setting range of some parameters is limited when using the decimal point display.

Input type	Decimal point	Display	Using range (°C)	Using range (°F)	
Thermo-couple	K (CA)	1	℄ ℄ RH	-100 to 1300	-148 to 2372
	K (CA)	0.1	℄ ℄ RL	-100.0 to 999.9	-
	J (IC)	1	℄ ℄ LH	0 to 800	32 to 1472
	J (IC)	0.1	℄ ℄ LL	0.0 to 800.0	-
	R (PR)	1	℄ ℄ Pr	0 to 1700	32 to 3092
	E (CR)	1	℄ ℄ r.H	0 to 800	32 to 1472
	E (CR)	0.1	℄ ℄ r.L	0.0 to 800.0	-
	T (CC)	1	℄ ℄ LH	-200 to 400	-328 to 752
	T (CC)	0.1	℄ ℄ LL	-199.9 to 400.0	-
	S (PR)	1	5 ℄ ℄ r	0 to 1700	32 to 3092
	N (NN)	1	℄ ℄ nn	0 to 1300	32 to 2372
	W (TT)	1	℄ ℄ t℄	0 to 2300	32 to 4172
RTD	JPt100Ω	1	℄ ℄ ℄ .H	0 to 500	32 to 932
	JPt100Ω	0.1	℄ ℄ ℄ .L	-199.9 to 199.9	-199.9 to 391.8
	DPT100Ω	1	℄ ℄ ℄ .H	0 to 500	32 to 932
	DPT100Ω	0.1	℄ ℄ ℄ .L	-199.9 to 199.9	-199.9 to 391.8
Analog	Voltage	0 - 10 VDC =	℄ ℄ - ℄	-1999 to 9999 (Display range will vary depending on the decimal point.)	
		1 - 5 VDC =	℄ ℄ - ℄		
	Current	DC 4 - 20 mA	℄ ℄ - ℄		

## Dimensions

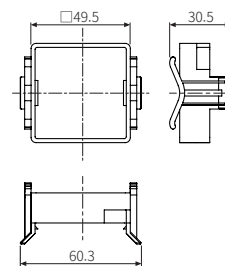
- Unit: mm, For the detailed drawings, follow the Autonics website.
- Below is based on TZ4ST Series.



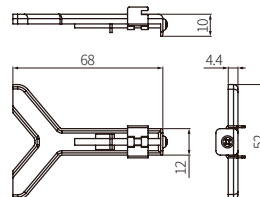
	Body						Panel cut-out			
	A	B	C	D	E	F	G	H	I	J
<b>TZ4SP</b>	48	48	11.1	8.8	97	□44.8	≥ 65	≥ 65	45 <sup>+0.6</sup> <sub>0</sub>	45 <sup>+0.6</sup> <sub>0</sub>
<b>TZ4ST</b>	48	48	11.1	8.8	98.6	□44.8	≥ 65	≥ 65	45 <sup>+0.6</sup> <sub>0</sub>	45 <sup>+0.6</sup> <sub>0</sub>
<b>TZN4S</b>	48	48	10	-	90	□45	≥ 65	≥ 65	45 <sup>+0.6</sup> <sub>0</sub>	45 <sup>+0.6</sup> <sub>0</sub>
<b>TZ4M</b>	72	72	15	13.2	100	□67	≥ 74	≥ 91	68 <sup>+0.7</sup> <sub>0</sub>	68 <sup>+0.7</sup> <sub>0</sub>
<b>TZN4M</b>	72	72	10	-	85	□67	≥ 91	≥ 91	68 <sup>+0.7</sup> <sub>0</sub>	68 <sup>+0.7</sup> <sub>0</sub>
<b>TZ4W</b>	96	48	14.9	13	100	45	≥ 112	≥ 50	92 <sup>+0.8</sup> <sub>0</sub>	45 <sup>+0.6</sup> <sub>0</sub>
<b>TZN4W</b>	96	48	13	-	100	45	≥ 112	≥ 50	92 <sup>+0.8</sup> <sub>0</sub>	45 <sup>+0.6</sup> <sub>0</sub>
<b>TZ4H</b>	48	96	15.3	13	100	90	≥ 50	≥ 102	45 <sup>+0.6</sup> <sub>0</sub>	92 <sup>+0.8</sup> <sub>0</sub>
<b>TZN4H</b>	48	96	13	-	100	90	≥ 50	≥ 102	45 <sup>+0.6</sup> <sub>0</sub>	92 <sup>+0.8</sup> <sub>0</sub>
<b>TZ4L</b>	96	96	14	13	100	□90	≥ 98	≥ 106	92 <sup>+0.8</sup> <sub>0</sub>	92 <sup>+0.8</sup> <sub>0</sub>
<b>TZN4L</b>	96	96	13	-	100	□90	≥ 98	≥ 106	92 <sup>+0.8</sup> <sub>0</sub>	92 <sup>+0.8</sup> <sub>0</sub>

### Bracket

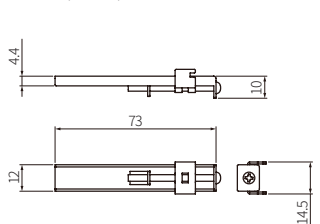
TZ4ST, TZ4SP, TZN4S Series



TZN4M Series

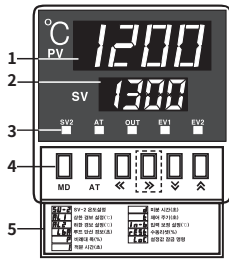


TZ4L, TZN4L, TZ4M, TZ4H, TZN4H, TZ4W, TZN4W Series



## Unit Descriptions

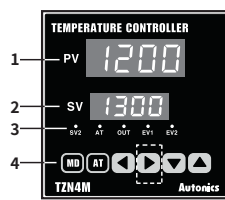
### TZ Series



#### 1. PV Display part (red)

- RUN mode: Displays PV (present value)
- Setting mode: Displays parameter name

### TZN Series



#### 2. SV Display part (green)

- RUN mode: Displays SV (setting value)
- Setting mode: Displays parameter setting value

#### 3. Indicator

Display	Name	Description
SV2	SV2 operation	Turns ON during SV2 operation
AT	Auto tuning	Flash during auto tuning
OUT	Control output operation	Turns ON when the control output is ON. Not operate when control output is current output
EV1	Event 1 output	Turns ON when Event 1/2
EV2	Event 2 output	Output is ON

#### 4. Control key

Display	Name
[MD]	Mode key
[AT]	Auto tuning execution key
[◀], [▶], [▼], [▲]	Setting value control key
[▶] (dotted line)	The key in dotted line (▶) is only for TZ4M, TZN4M, TZ4L, TZN4L Series

#### 5. Key adjustment order chart

## Sold Separately

- 11 pin socket: PG-11, PS-11 (N)
- Communication converter: SCM Series