TERMINAL TYPE

TEMPERATURE TRANSDUCER MODEL TW-1C

INSTRUCTION MANUAL



This marking indicates that the err oneous operation of this transducer may result in death or serious injury.

Precautions

- (1) If voltage or current exceeding the allowable maximum voltage or current is applied to the input terminals, the transducer may be damaged.
- (2) Apply power within the applicable range of the transducer. Otherwise fire, electric shock or transducer damage may result.
- $\left(3\right) The contents of this instruction manual are subject to change$ without prior notice.
- (4) This instruction manual is carefully prepared.
- However, if any mistake or omission is found, contact your nearest Watanabe Electric Industry sales agent or Watanabe Electric Industry directly.
- (5) Make this manual available easily anytime.

■Outline

Model TW-1C is a highly accurate temperature transducer.

It inputs a thermocouple (Type R, K, E, J, T, S or B) or an RTD (Pt100 Ω)signal to convert the signal to the corresponding isolated voltage or current signal as its output. A wire break detection circuit and a cold junction compensation circuit are built in it. In addition, the three ports of input, output and power supply are mutually isolated. Its case can be engaged with DIN rails in one touch.

As its input/output terminal/board, an M3.5 screw terminal board is used.

■Specification check

Each code No. and the standard specifications of this transducer is as follows. First check whether or not your desired specifications are correct by comparing them to the following specifications.

Example:	TW-1C-KA-1-N	0	to	1000°
Erampie.	IW IC NA I N	0	ιυ	1000 C



As input specifications, separately specify the zero and span temperatures (in steps of 1° C)

If not specified, temperature ranges are only as specified above. Also, be careful that your present input specification cannot be modified on your side.

■Input specifications

Sensor	Code	Input temperature($^{\circ}\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	Minimum span(°C)
R	R	0 to 1700	400
К	K	-50 to 1200	100
Е	Е	-50 to 900	100
J	J	-50 to 1000	100
Т	Т	-50 to 350	100
S	S	0 to 1700	500
В	В	200 to 1700	1000
$Pt100\Omega$	Р	-150 to 800	100

Thermocouple input specification

Accuracy of cold junction compensation: $\pm 1^{\circ}$ (at 10 to 30°C) *For thermocouples other than B type thermocouple

Burnout detection current: 300nA(TYP)

RTD input specification

Allowable lead wire resistance: Less than $10\,\Omega$

Current following through RTD: 1mA

■Output specifications

Code	Output signal	Output load resistance	Output at burnout	
0	0 to 5V DC			
1	1 to 5V DC	more than $2 \mathrm{K} \Omega$	Approx. 120%F. S	
2	0 to 10V DC	More than $4\mathrm{k}\Omega$		
3	-10 to +10V DC			
А	4 to 20mA DC	Less than 550 Ω		

■Power supply specifications

Code	Power supply voltage
1	100 to 240V AC $\pm 10\%$ (50/60Hz)
4	24V DC ±10%

■General specifications

Accuracy Power supply voltage variation	:	±0.15% F.S (at 25°C±2°C) ±0.1% F.S
Temperature characteristic	:	±0.02%F.S/°C
Response time	:	Less than 2sec (0 to 90%)
Insulation resistance	:	Input/Output/Power supply more than $100M\Omega$ (500V DC)
Dielectric strength	:	Input/Output/Power supply 1500V AC/1min
Consuming current	:	DC SPEC: Less than 110mA AC SPEC: Less than 50mA
Operating ambient temperature	:	-5 to 50℃
Operating ambient humidity	:	Less than 90%RH (No dew-condensing)
Storage temperature	:	-10 to 70℃
Storage humidity	:	Less than 60%RH (No dew-condensing)
Case material	÷	Black PBT 94-VU
weight	÷	Approx. 140g

■Block diagram







With terminal cover



■Input/output connection diagram

TC

RTD



▲ Note :Pay attention to the connection polarity.

■About solder less terminal to connect with the screw type terminal block

Screw size: M3.5×7L

Recommendation solder less terminal: Ring tongue(R type)M3.5

Spade tongue (A type) M3.5

Applicable AWG #26 to 22

Quality of material: Screw lron, nickel plated Connection board Yellow copper, tin plated

■How to remove the terminal cover

Disengage the hooks and then lift the cover.



■Mounting/dismounting



1. Engage the upper side of the transducer with the rail. 2. Push the lower side of the transducer into the rail.

dismounting



1. Push down the slider using a screwdriver.

Pull up the lower side of the transducer.

2. Disengage the upper side of the transducer from the rail.

Note: If the transducer is dislocated after its mounting, it is recommended that a clamp be used.

In addition, if two or more transducers are mounted side by side, do not contact them but keep enough space Between them.

Cautions

a)Store the converter at a storage temperature of -10°C to +70°C and a humidity of less than 60% RH.

- b)Use the converter at a location where there are no chemicals or gases harmful to electrical parts and components, nor dust.
- c)Do not apply any shock or vibration to the converter.
- d) In order to reduce the effect of noise on the converter, do not bundle the input/output wires with the power supply wires,

■ Warranty

This converter is warranted for a period of one year from date of delivery. Any defect which occurs in this period and is undoubtedly caused by Watanabe Electric Industry faults will be remedied free of charge. This warranty does not apply to the converter showing abuse or damage which has been altered or repaired by others except as authorized by Watanabe Electric Industry.

■After-sale service

This converter is delivered after being manufactured, tested and inspected, under strict quality control.

However, if any problem does occur, contact your nearest Watanabe Electric Industry sales again or Watanabe Electric industry directly giving as much information on problem as possible.

Accessories

Terminal cover $\times 2$

*TCJ sensor $\times 1$ (Only for thermocouple input specification) *Connect the TCJ sensor to No.1 and No.2 terminals. In addition, be careful that as this transducer is adjusted

together with the devices packed in the same box, the spacified performance may not be displayed if used with any

devices other than the above.

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