

Thin type thermocouple temperature transducer

MODEL TH-2C, 5C

INSTRUCTION MANUAL



Warning

This marking indicates that the erroneous operation of converter may result in death or serious injury.



Caution

- (1) The application of voltage or current exceeding its maximum allowable value to the input terminals may result in instrument damage.
- (2) The supply of power out of its allowable range may cause fire, electric shock or instrument failure.
- (3) The content of this manual may subject to change without prior notice for product improvement.
- (4) This manual is carefully prepared. However, if any question arises, or any mistake, omission or suggestion is found in the content of this manual, contact your nearest our sales agent.
- (5) Keep this manual available easily anytime.

■ Outline

This is a transducer housed in a thin case which converts a thermocouple input signal into the corresponding DC voltage or current output signal. In addition, the three ports of input, output and power are mutually isolated. The case can be mouted on a DIN rail in one touch.

■ Model NO. configuration

Each code and the standard specifications of this converter are as follows. First check whether or not your desired specifications are correct by comparing them to the following specifications.

Example: TH-5C-K32

TH-□ C-□□□

Output	0: 0 to 5V DC
	1: 1 to 5V DC
	2: 0 to 10V DC
	3: -10 to 10V DC
	A: 4 to 20mA DC
	Y: Other than the above
Input	J0: J 0 to 1000°C
	JY: J Other than the above
	K2: K -50 to 200°C
	K3: K 0 to 200°C
	K4: K -50 to 1200°C
	K5: K 0 to 1200°C
	KY: K Other than the above
	R0: R 0 to 1700°C
	RY: R Other than the above
	T0: T -50 to 350°C
	T1: T 0 to 350°C
	TY: T Other than the above
	S0: S 0 to 1700°C
	SY: S Other than the above
Power	2: 100 to 240V AC
	5: 24V DC

■ Input specification

Thermocouple (JIS C1602-1995)

Code	Sensor	Input	No. Y Limit of specifications
J0	J	0 to 1000°C	-50 to 1000°C Span: 200 to 1050°C
JY		Other than the above	
K2	K	-50 to 200°C	-50 to 1200°C Span: 200 to 1250°C
K3		0 to 200°C	
K4		-50 to 1200°C	
K5		0 to 1200°C	
KY		Other than the above	
R0	R	0 to 1700°C	0 to 1700°C Span: 400 to 1700°C
RY		Other than the above	
T0	T	-50 to 350°C	-50 to 350°C Span: 200 to 400°C
T1		0 to 350°C	
TY		Other than the above	
S0	S	0 to 1700°C	0 to 1700°C Span: 500 to 1700°C
SY		Other than the above	

Allowable input value: -50 to 150% F.S

■ Output specification

Code	Output	Load resistance
0	0 to 5V DC	More than 2kΩ
1	1 to 5V DC	
2	0 to 10V DC	More than 4kΩ Negative output: more than 10kΩ
3	-10 to 10V DC	
A	4 to 20mA DC	Less than 550Ω
Y	Other than the above	

For code No. Y limit of specifications

Voltage output: -10 to 10V DC Span: 1 to 20V

Current output: 0 to 20mA DC Span: 1 to 20mA

■ General specifications

Base accuracy: ± 0.2 F.S (at $25 \pm 2^\circ\text{C}$)

Load resistance variation: $\pm 0.06\%$ F.S

Power supply variation: $\pm 0.06\%$ F.S

Temperature characteristic: $\pm 0.02\%$ F.S/ $^\circ\text{C}$

Accuracy of cold junction compensation: $\pm 1^\circ\text{C}$ (10 to 30°C)

$\pm 2^\circ\text{C}$ (Other than 10 to 30°C)

Response time: 200msec TYP (0 $\rightarrow$ 90%)

Disconnection detection: Upside ($135 \pm 15\%$ F.S)

Front adjustments: $\pm 5\%$ F.S (zero, span)

Insulation resistance: Between the input and output/power supply

More than 100MΩ at 500V DC

Dielectric strength: Between the input and output/power supply

For 1 min. at 1500V AC

Power supply voltage: 100 to 240V AC $\pm 10\%$

24V DC $\pm 10\%$

Consuming current: Less than 20mA (at 100V AC)

Less than 50mA (at 24V DC)

Operating ambient temperature: -5 to 50°C

Operating ambient humidity: Less than 90%RH (No-condensing)

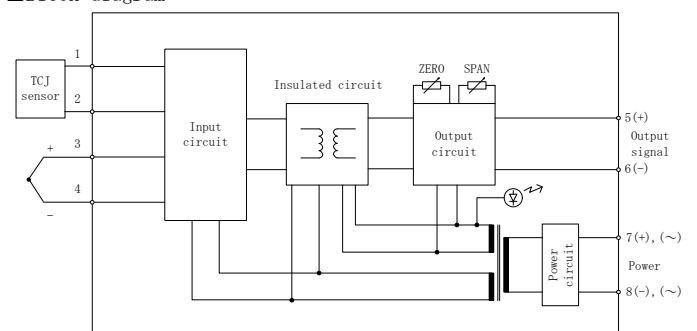
Storage temperature: Within -10 to $+70^\circ\text{C}$

Storage humidity: Less than 60%RH (No-condensing)

Case material: Black PC 94V-2

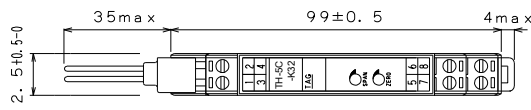
Weight: Approx. 80g

■ Block diagram

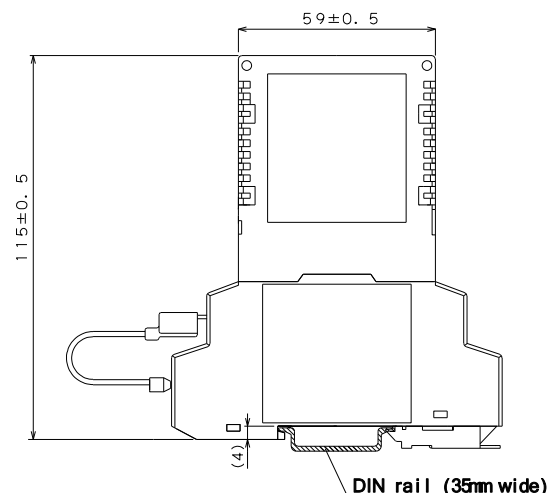


■ Dimensions

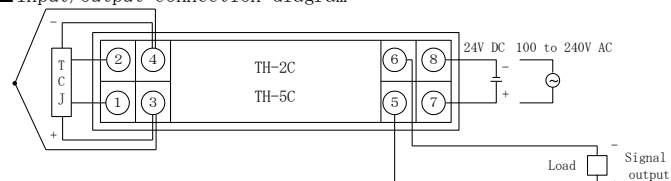
Front view



Side view

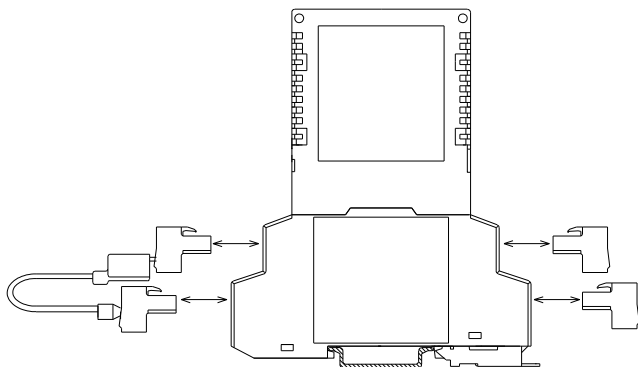


■ Input/output connection diagram

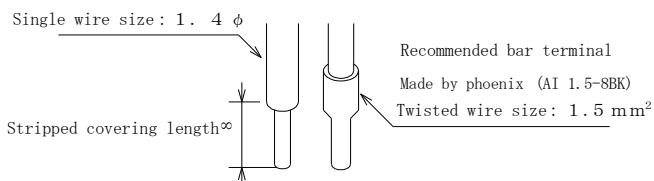


⚠ Note: When conducting wiring, be careful with its polarity.
Note: Please be careful of the kind of power supply.

■ How to disconnect detachable connector type terminal board
This transducer uses a detachable connector type terminal board. Detach each connector in the direction as shown in the following Fig.



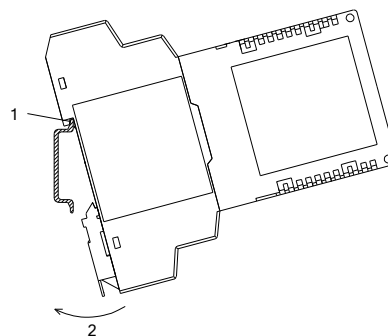
■ Recommended treatment of wires connected to connector type terminal board



■ Mounting or dismantling

Mounting

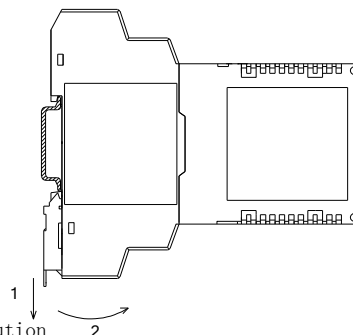
1. Engage the upper side of the transducer with the rail.
2. Push the lower side of the transducer into the rail.



Note: If each transducer is dislocated after being mounted, it is recommended that clamps be used (such as E/NS35N made by Phoenix/Contact, etc.)

Dismounting

1. Push down the slider using a screwdriver.
Pull the transducer toward you, then disengage the lower side of transducer from the rail.
2. Disengage the upper side of the transducer from the rail.



■ Caution

- 1) Store the transducer at a location having a storage temperature of -10 to +70°C and a humidity of less than 60% RH.
- 2) Use the transducer at a location where there are no chemicals or gases harmful to its electrical parts or there is no dust.
- 3) Do not apply any vibration or impact to the transducer.
- 4) In order to lessen the effect of noise, etc., do not bundle the input/output wires with the power supply wires, nor put these wires in the same duct.
- 5) The unit is designed to function as soon as power is supplied, however, a warm up for 30 minutes is required for satisfying complete performance described in the data sheet.

■ Warranty

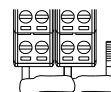
This transducer is warranted for a period of one year from date of delivery. Any defect which occurs in this period and is undoubtedly caused by Watanabe Electric Industry faults will be remedied free of charge. This warranty does not apply to the transducer showing abuse or damage which has been altered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

■ After-sale service

This transducer 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 agent or Watanabe Electric Industry directly giving as much information on problem as possible.

■ Accessorise

Power cable connection clamps: 2pcs.
Use them when two or more transducers are connected.



watanabe
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