

# Systempak (Digital/File Type) Thermocouple Conversion Module Model J-STC 90/95

## Introduction

The Thermocouple Conversion (J-STC) Module accepts an electromotive force of thermocouple input, and converts it into a 1 to 5V DC or 4 to 20 mA DC signal.

The Thermocouple Conversion Module provides a linearization function as a standard function to obtain a linear output proportional to the measured temperature, as well as a filter function to convert input and output signals in response to the application.

The J-STC is available for one-output (J-STC90) or two-output (J-STC95) model. Kind of thermocouple, range, filter function changes, and such other setting changes are easily done with the dedicated Loader Software, which operates on a general-purpose PC.

Complete isolation is employed between the power, input, and output circuits. In the two-output model, isolation is employed also between the two output circuits.

## Specification

- Input signal:  
Thermocouples Types R, S, B, K, E, J, T, N (IEC 584-1 1995 / JIS C 1602-1995)  
WRe5-26 (ASTM-E988-96 (2002))

T/C type	Measuring range
R	-50 to 1760°C
S	-50 to 1760°C
B	0 to 1820°C
K	-200 to 1370°C
E	-200 to 1000°C
J	-210 to 1200°C
T	-200 to 400°C
N	-270 to 1300°C
WRe5-26	0 to 2700°C

- Measuring range: (Refer to the table above)
- Span:  
Specifiable to a desired span within the measuring range.  
Contact us for ranges less than -200°C. (Because thermocouple electromotive force changes are extremely small.)
- Burnout protection: Upscale/Downscale (Specify when ordering.)
- Burnout response:  
30 sec or less (Moving average available, first-order lag filtering: 0.1 sec)
- Output signal:  
No. 1 output; 1 to 5V DC or 4 to 20 mA DC  
No. 2 output; 1 to 5V DC (Between No. 1 and No. 2 outputs is isolated.)  
Edge connector output; 1 to 5V DC (No. 1 output must be 1 to 5V DC when connecting the signal with the A-MC I/O cable.)
- Output impedance:  
Voltage output; 250 Ω or less, Current output; 250 kΩ or more
- Output range: -20 to +120%FS
- Allowable load resistance: 0 to 600 Ω (Current output: Up to +110%)
- Output update interval: 5 msec  
(Output hardware filter: 0 to 90% response, 50 msec)
- Input/output response: 160 msec at minimum, 0 to 90% response (Moving average and first-order lag filtering are not provided.)
- Accuracy:

Input span	No. 1 and No. 2 output
10 mV or more	±0.15%FS
10 mV or less	Input accuracy shown in separate table + CJC accuracy



- Cold junction compensation accuracy;  
±0.5°C at 23°C (Other than R, WRe)  
±1.0°C at 23°C (R, WRe)
- Insulation resistance:  
500V DC, 100 MΩ min (Mutual between input - output - GND - power terminal)
- Withstand voltage:  
1000V AC, 1 min (Mutual between input - output - GND - power terminal)
- Power supply: 24V DC<sup>+10</sup><sub>-15</sub> %
- Current consumption: 130 mA or less (at 24V DC)
- Ambient temperature:  
Normal operating condition; 5 to 45°C  
Operation limit; 0 to 50°C
- Ambient humidity: 0 to 90%RH (No condensation allowed)
- Mounting: File
- Front mask color: Black
- Weight: 250 g
- Operating influence:  
Cold junction compensation accuracy; ±0.5°C/10°C 5 to 45°C  
Supply voltage effect; ±0.1%FS/24V DC<sup>+10</sup><sub>-15</sub> %  
Temperature effect; Input accuracy shown in separate table/10°C
- Loader settings:  
Module ID; 16 one-byte characters, 8 two-byte kanji characters  
Input type; Specify thermocouple type.  
Unit of temperature; °C, F  
Input range; Lo and Hi setting values  
Linearization table; 101 points  
Input filtering; Disabled/Enabled (moving average)  
Zero-span adjustment; Adjustable between -20 and +120%  
First-order lag filtering; Without/With (0 to 20.0 sec, 63% response time)

Note: Burnout protection (Upscale/Downscale) is specified by hardware.  
Please specify it when ordering.  
Default setting is "Upscale" unless specified otherwise.

## Table Input Accuracy

Thermocouple	Full-scale set temperature	Input accuracy % to span
K	250°C or more	$\pm 0.15\% \times \text{Measurement full-scale set temperature } [^{\circ}\text{C}] / \text{Set span range } [^{\circ}\text{C}]$
	Less than 250°C	$\pm 0.15\% \times 250^{\circ}\text{C} / \text{Set span range } [^{\circ}\text{C}]$
J	200°C or more	$\pm 0.15\% \times \text{Measurement full-scale set temperature } [^{\circ}\text{C}] / \text{Set span range } [^{\circ}\text{C}]$
	Less than 200°C	$\pm 0.15\% \times 200^{\circ}\text{C} / \text{Set span range } [^{\circ}\text{C}]$
T	250°C or more	$\pm 0.15\% \times \text{Measurement full-scale set temperature } [^{\circ}\text{C}] / \text{Set span range } [^{\circ}\text{C}]$
	Less than 250°C	$\pm 0.15\% \times 250^{\circ}\text{C} / \text{Set span range } [^{\circ}\text{C}]$
E	200°C or more	$\pm 0.15\% \times \text{Measurement full-scale set temperature } [^{\circ}\text{C}] / \text{Set span range } [^{\circ}\text{C}]$
	Less than 200°C	$\pm 0.15\% \times 200^{\circ}\text{C} / \text{Set span range } [^{\circ}\text{C}]$
R	1000°C or more	$\pm 0.15\% \times \text{Measurement full-scale set temperature } [^{\circ}\text{C}] / \text{Set span range } [^{\circ}\text{C}]$ (Measurement value less than 500°C is not applied with the accuracy specification.)
	Less than 1000°C	$\pm 0.15\% \times 1000^{\circ}\text{C} / \text{Set span range } [^{\circ}\text{C}]$ (Measurement value less than 500°C is not applied with the accuracy specification.)
WRe5-26		$\pm 0.15\% \times \text{Measurement full-scale set temperature } [^{\circ}\text{C}] / \text{Set span range } [^{\circ}\text{C}]$ (Measurement value less than 700°C is not applied with the accuracy specification.)

## CJC accuracy

	CJC base accuracy	Additional accuracy
Other than R, WRe	$\pm 0.5^{\circ}\text{C}$ (at 23°C)	CJC temperature effect $\pm 0.5^{\circ}\text{C} / 10^{\circ}\text{C}$ 5 to 45°C
R, WRe	$\pm 1.0^{\circ}\text{C}$ (at 23°C)	CJC temperature effect $\pm 0.5^{\circ}\text{C} / 10^{\circ}\text{C}$ 5 to 45°C

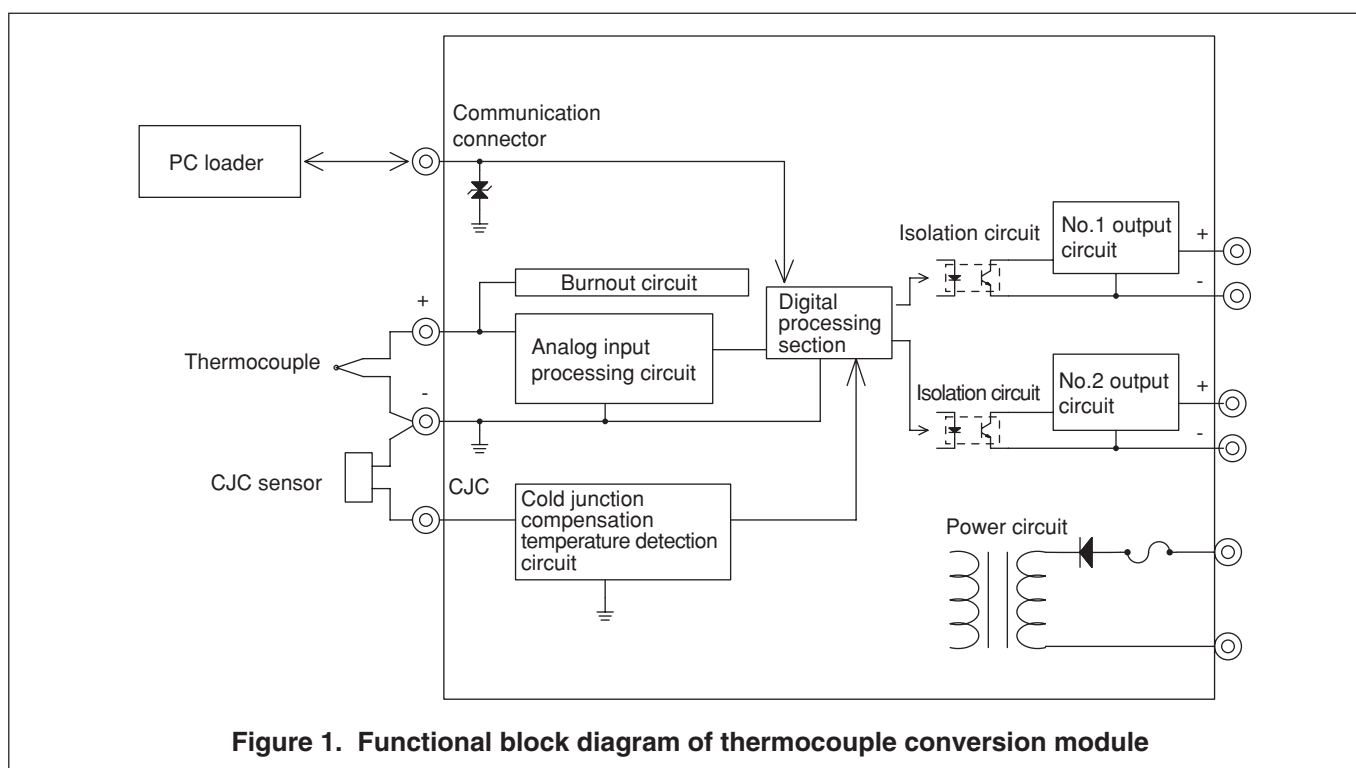


Figure 1. Functional block diagram of thermocouple conversion module

## Model Number Table

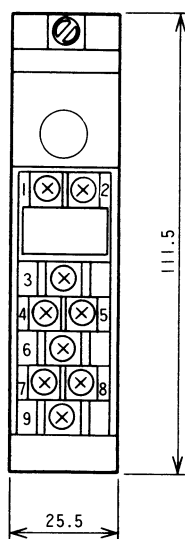
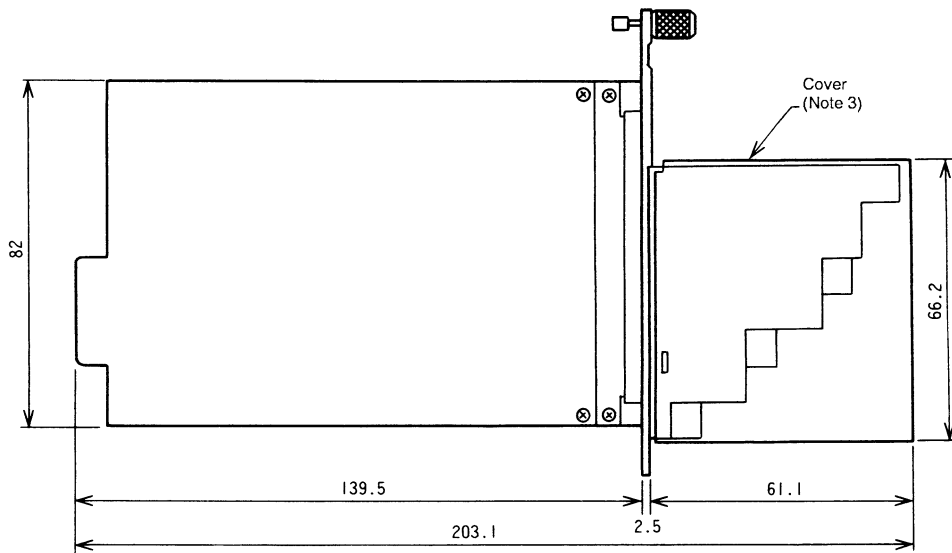
One-output model

Basic model number	Selections		Additions	Description
	I	II		
J-STC90				Thermocouple Conversion Module (1-output)
	X			No varnish coated
	C			Varnish coated
	-T			Input signal: Thermocouple (Type T)
	-J			Input signal: Thermocouple (Type J)
	-K			Input signal: Thermocouple (Type K)
	-E			Input signal: Thermocouple (Type E)
	-R			Input signal: Thermocouple (Type R)
	-S			Input signal: Thermocouple (Type S)
	-B			Input signal: Thermocouple (Type B)
	-N			Input signal: Thermocouple (Type N)
		1		Output signal: 1 to 5V DC
		2		Output signal: 4 to 20 mA DC
			-0	Without test report
			-1	With test report

Two-output model

Basic model number	Selections		Additions	Description
	I	II	I	
J-STC95				Thermocouple Conversion Module (2-output)
	X			No varnish coated
	C			Varnish coated
		-T		Input signal: Thermocouple (Type T)
		-J		Input signal: Thermocouple (Type J)
		-K		Input signal: Thermocouple (Type K)
		-E		Input signal: Thermocouple (Type E)
		-R		Input signal: Thermocouple (Type R)
		-S		Input signal: Thermocouple (Type S)
		-B		Input signal: Thermocouple (Type B)
		-N		Input signal: Thermocouple (Type N)
			1	No. 1 output signal: 1 to 5V DC, No. 2 output signal: 1 to 5V DC
			2	No. 1 output signal: 4 to 20 mA DC, No. 2 output signal: 1 to 5V DC
			-0	Without test report
		-1	With test report	

Example: J-STC95X-J1-1



No.	Description
1 (Note 2)	_____
2 (Note 2)	T/C input (-)
3	T/C input (+)
4	No.1 output (+)
5	No.1 output (-)
6	No.2 output (+) (Note 1)
7	No.2 output (-) (Note 1)
8	_____
9	GND

- Notes: 1) For two-output model  
 2) Used for cold junction resistor.  
 3) Operate the Module with a cover.  
 4) Terminal screws: M3.5  
 5) Use the pressured terminals with insulation sheath.

Figure 2. Dimensions and wiring diagram

Note: Thermocouple Types S, B and N will become available for sale at timings that differ from those of other types. When ordering, please check with our sales representative.

When ordering, please specify:

- 1) Tag number
- 2) Input range\* [Default setting differs depending on thermocouple type.]
- 3) Burnout (Upscale, Downscale) [Set to Upscale by default]

The following are also set by default:

- a) Input filtering: Moving average available
- b) First-order lag filtering: Available, 0.1 sec

\* Use the quick list below when specifying the range. Ranges other than those below are also accepted.

Code No.	Input range
01	0 to 50°C
02	0 to 100°C
03	0 to 150°C
04	0 to 200°C
05	0 to 300°C
06	0 to 400°C
07	0 to 500°C
08	0 to 800°C
09	0 to 1000°C
10	0 to 1200°C

Please read the "Terms and Conditions" from the following URL before ordering or use:

<http://www.azbil.com/products/bi/order.html>

*Specifications are subject to change without notice.*



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