

General Specifications

GS 77J01T06-01E

Model VJT6
Thermocouple Converter
(Isolated Single-output and Isolated Dual-output Types)

JUXTA

General

The VJT6 is a compact, plug-in type thermocouple converter that is connected to an IEC/JIS-standard thermocouple (TC), such as a Type K, T, E, J, R, S, B or N thermocouples to convert temperature signals into isolated DC current or DC voltage signals.

For the degree Fahrenheit, specify the option "/DF".



Model and Suffix Codes

Model	VJT6-0	□	□	-	□	□	□	□	/□
Output									
1: 1 output									
2: 2 outputs									
Power supply									
6: 100-240 V AC/DC (Operating range: 85 to 264 V)									
7: 15-30 V DC (Operating range: 12 to 36 V)									
Input signal									
1: K	5: R								
2: T	6: S								
3: E	7: B								
4: J	8: N								
Z: Custom order									
See customized signal specifications.									
Output-1 signal									
A: 4 to 20 mA DC	1: 0 to 10 mV DC								
B: 2 to 10 mA DC	2: 0 to 100 mV DC								
C: 1 to 5 mA DC	3: 0 to 1 V DC								
D: 0 to 20 mA DC	4: 0 to 10 V DC								
E: 0 to 16 mA DC	5: 0 to 5 V DC								
F: 0 to 10 mA DC	6: 1 to 5 V DC								
G: 0 to 1 mA DC	7: -10 to +10 V DC								
Z: Custom order (DC current/voltage signal)									
See Table 1.									
Output-2 signal									
A: 4 to 20 mA DC	6: 1 to 5 V DC								
N: No output-2									
Z: Custom order (DC current/voltage signal)									
See Table 1.									
Burnout									
U: UP									
D: DOWN									
N: OFF									
Option									
/SN: No socket (with socket if not specified)									
/C0: Coating *									
/FB: Fuse bypass *									
/DF: Fahrenheit unit									

Note 2: "/FB" option: The primary power supply fuse is deleted, short circuit and ship it.

Ordering Information

- Model and Suffix Code: e.g. VJT6-026-1A6U
- Input range (required item): e.g. 0 to 400°C
Note: The specified input range cannot be changed after the delivery.

Input/Output Specifications

Input signal: An IEC/JIS-standard thermocouple (ITS-90, JIS C 1602: '95, IEC 584: '95)

Measuring unit: °C, K, °F (*)

* When specify the option code "/DF".

Measuring range:

Input Type	Measuring range (°C)
JIS C 1602, IEC 60584-1 (ITS-90) Type K	-270 to 1372
JIS C 1602, IEC 60584-1 (ITS-90) Type T	-270 to 400
JIS C 1602, IEC 60584-1 (ITS-90) Type E	-270 to 1000
JIS C 1602, IEC 60584-1 (ITS-90) Type J	-210 to 1200
JIS C 1602, IEC 60584-1 (ITS-90) Type R	-50 to 1768
JIS C 1602, IEC 60584-1 (ITS-90) Type S	-50 to 1768
JIS C 1602, IEC 60584-1 (ITS-90) Type B	0 to 1820
JIS C 1602, IEC 60584-1 (ITS-90) Type N	-270 to 1300

Measuring span: 3 mV or more

Zero elevation: Within 3 times the measuring span or ±25 mV, whichever is smaller

Input resistance: 1 MΩ or more; 10 kΩ or more during power off

Allowable leadwire resistance: 500 Ω maximum; if the converter is combined with a BARD-600, this value is that of a resistance that can be attached externally, aside from the BARD-600 internal resistance.

Allowable input voltage level: Within ±15 V DC

Output signal: DC voltage or DC current signal

Output variable range: -6 to 106 % (Both output 1 and output 2)

* When option code /C0 or /FB is specified, the conformity to the safety and EMC standards is excluded. CE marking is not applicable.

Note 1: "/C0" option: Polyurethane coating. The "/C0" option does not guaranteed the coating effect though it is expected that the corrosion resistance for electric circuit is reinforced. And it is not able to submit coating test data.

Allowable load resistance:

Output-1 Range	Allowable Load Resistance	Output-1 Range	Allowable Load Resistance
4 to 20 mA DC	750 Ω maximum	0 to 10 mV DC	250 kΩ minimum
2 to 10 mA DC	1500 Ω maximum	0 to 100 mV DC	250 kΩ minimum
1 to 5 mA DC	3000 Ω maximum	0 to 1 V DC	2 kΩ minimum
0 to 20 mA DC	750 Ω maximum	0 to 10 V DC	10 kΩ minimum
0 to 16 mA DC	900 Ω maximum	0 to 5 V DC	2 kΩ minimum
0 to 10 mA DC	1500 Ω maximum	1 to 5 V DC	2 kΩ minimum
0 to 1 mA DC	15 kΩ maximum	-10 to +10 V DC	10 kΩ minimum
Output-2 Range	Allowable Load Resistance	Output-2 Range	Allowable Load Resistance
4 to 20 mA DC	350 Ω maximum	1 to 5 V DC	2 kΩ minimum

Output resistance: Current output; 500 kΩ or more

Voltage output other than below: 1 Ω or less

0 to 10 mV DC, 0 to 100 mV DC: 100 Ω or less

Zero adjustment: -5 to +5%

Span adjustment: 95 to 105%

Standard Performance

Accuracy rating: $\pm 0.1\%$ of span; see the following exceptions:

- $\pm 0.1\%$ of span or $\pm 1^\circ\text{C}$, whichever is greater when Type K, T and E $< -200^\circ\text{C}$, $400^\circ\text{C} \leq$ Type B $< 600^\circ\text{C}$, Type E and J $> 750^\circ\text{C}$, or Type N $> 1200^\circ\text{C}$.
- $\pm 0.1\%$ of span or $\pm 2^\circ\text{C}$, whichever is greater when Type N $< -200^\circ\text{C}$.
- Accuracy is not guaranteed when Type B is below -400°C , or for output levels less than 0.5% of the span of a 0 to X mA output range type.
- The accuracy derived from the following expression is applied when the measuring span is below 10 mV in thermoelectromotive force.
 $10/\text{measuring span (mV)} \times \text{accuracy}^*$
 * Any of $\pm 0.1\%$, $\pm 1^\circ\text{C}$ or $\pm 2^\circ\text{C}$.
- When the measurement temperature of type K, E, T, N is -200°C or less, the accuracy is the value obtained by adding the following coefficient (Te) to the above accuracy.

$$\text{Te}(^\circ\text{C}) = -200(^\circ\text{C}) - \text{measurement temperature}(^\circ\text{C}) / X$$
(Type K, T, E: X=10, Type N: X=5)

Accuracy of reference junction compensation:

Type K, T, E, J, B and N thermocouple:

$\pm 1^\circ\text{C}$ ($25^\circ\text{C} \pm 15^\circ\text{C}$)

$\pm 2^\circ\text{C}$ (Terminal temperature other than $25^\circ\text{C} \pm 15^\circ\text{C}$:)

Type R and S thermocouples:

$\pm 2^\circ\text{C}$ ($25^\circ\text{C} \pm 15^\circ\text{C}$)

$\pm 4^\circ\text{C}$ (Terminal temperature other than $25^\circ\text{C} \pm 15^\circ\text{C}$)

Type B: Reference junction compensation is not carried out.

Type K, T, E, N:

Response speed: 150 ms, 63% response (10 to 90%)

Burnout function: One of the three options is selected

- Up, Down or Off; the maximum burnout time is specified as 60 seconds.

Effect of power supply voltage fluctuation: Within the accuracy range of span for power supply voltage fluctuation.

Effect of ambient temperature change: $\pm 0.15\%$ of span for change of 10°C

Effects of leadwire resistance variations: $\pm 15\ \mu\text{V}$ per 100 Ω

Safety and EMC Standards

CE:

EMC directive

EN 61326-1 Class A Table 2 ^{*1} compliance

EN 61326-2-3 compliance

EN 61000-3-2 compliance

EN 61000-3-3 compliance

EN 55011 Class A Group 1 compliance

Low voltage directive:

EN 61010-1, EN 61010-2-030

Overvoltage category II ^{*2}, Pollution degree 2 ^{*3},

Measurement category O (other)

CSA: CAN/CSA C22.2 No. 61010-1

CAN/CSA C22.2 No. 61010-2-030

Overvoltage category II ^{*2}, Pollution degree 2 ^{*3},

Measurement category O (other)

UL: UL 61010-1 (CSA NRTL/C)

UL 61010-2-030 (CSA NRTL/C)

Overvoltage category II ^{*2}, Pollution degree 2 ^{*3},

Measurement category O (other)

RCM: EN 55011 Class A Group 1 compliance

KC: Electromagnetic wave interference prevention standard, electromagnetic wave protection standard compliance

- *1 The instrument continues to operate at a measurement accuracy of within $\pm 20\%$ of the range during testing.
- *2 Overvoltage category II: Describes a number which defines a transient overvoltage condition. Implies the regulation for impulse withstand voltage. "II" applies to electrical equipment which is supplied from the fixed installation like a distribution board.
- *3 Pollution degree 2: Describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to normal indoor atmosphere. Normally, only non-conductive pollution occurs.

However, if optional code /C0 or /FB is specified, the conformity to the safety and EMC standards is excluded.

Environment Standard

EU RoHS directive: EN IEC 63000

(However, when option code /C0 or /FB is specified, CE marking is not applicable because the product does not comply with the Safety and EMC standards.)

Power Supply and Isolation

Power supply rated voltage:

100-240 V AC/DC \approx 50/60 Hz or

15-30 V DC \therefore

Power supply input voltage:

100-240 V AC/DC \approx (-15, +10%) 50/60 Hz

or 15-30 V DC \therefore ($\pm 20\%$)

Power consumption:

2.2 W at 24 V DC ; 2.1 W at 110 V DC;

4.2 VA at 100 V AC; 6.1 VA at 200 V AC

Insulation resistance: 100 MΩ minimum at 500 V DC

between input, output-1, output-2, power

supply and grounding terminals mutually

Withstanding voltage: 2000 V AC for one minute

between input, (output-1 and output-2),

power supply and grounding terminals

mutually;

1000 V AC for one minute between

output-1 and output-2 terminals

■ Environmental Conditions

Temperature: -10 to 55°C (45°C or less for side-by-side close installation*)

- * If the previous model (style S3.xx earlier) is installed together, the ambient temperature is 0 to 40°C.

Humidity: 5 to 90% RH (no condensation)

Ambient Condition: Avoid installation in such environments as corrosive gas like sulfide hydrogen, dust, sea breeze and direct sunlight.

Magnetic field: 400 A/m or less.

Continuous vibration (at 5 to 9 Hz) Half amplitude of 3 mm or less (at 9 to 150 Hz) 4.9 m/s² or less, 1 oct/min for 90 minutes each in the 3-axis directions.

Impact: 98 m/s² or less, 11 msec, 3-axis 3 times each in 6 directions.

Altitude: 2000 m or less.

Installation location: Indoors

Warm-up time: At least 30 minutes after power on.

■ Transport and Storage Conditions

Ambient temperature: -25 to 70°C

Temperature change rate: 20°C per hour or less

Ambient humidity: 5 to 95% RH (no condensation)

■ Mounting and Appearance

Construction: Compact plug-in type

Material: Modified polyphenylene oxide (casing)

Mounting method: Wall, DIN rail or dedicated VJ mounting base (VJCE) mounting

Connection method: M3 screw terminals

External dimensions:

76 (H) x 29.5 (W) x 124.5 (D) mm
(including a socket)

Weight: Main unit: 100 g or less

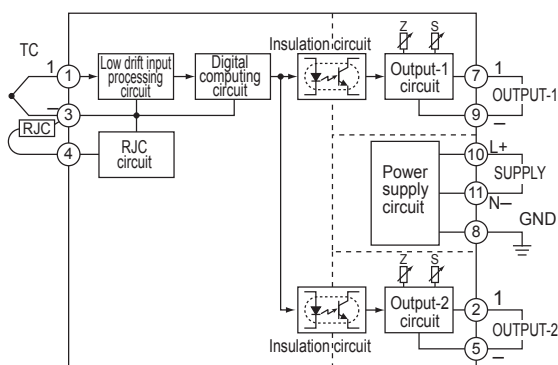
Socket: 50 g or less

■ Accessories

Tag number label: 1 sheet

RJC (reference junction compensation) sensor (Part number: A1167HT): 1 piece (except for Type B)

■ Block Diagram



■ Customized Signal Specifications

● Input custom specification

<Input range>

Special thermocouple with temperature table. The measuring range is between -100 and +100 mV in thermoelectromotive force.

Note: The conformity to the safety standards, EMC standards, and environmental standards is excluded.

● Output custom specification

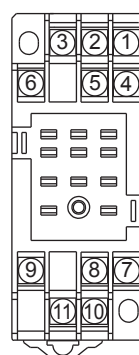
Table 1 Manufacturable Ranges

	Current Signal	Voltage Signal
Output range (DC)	0 to 24 mA	-10 to +10 V
Span (DC)	1 to 24 mA	10 mV to 20 V
Zero elevation	0 to 200%	-100 to +200%

Note: Customized specifications for the output-1 signal within 0 to 20 mA DC or within -10 to +10 V DC comply with safety standards, EMC standards, and environmental standards.

- The above note is limited to the standard specification of output-2.
- Other customized specifications do not conform to these standards.

■ Terminal Assignments



1	Input (+)
2	Output-2 (+)
3	Input (-) [RJC]
4	Input (RJC reverse side)
5	Output-2 (-)
6	Do not use
7	Output-1 (+)
8	GND
9	Output-1 (-)
10	Supply (L+)
11	Supply (N-)

Do not use output-2 for the single-output type.

External Dimensions

