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NX-series Temperature Control Unit

NX-TC

Optimize Control by Detecting Status Changes Easily Satisfy Both Productivity and Quality

- Provide optimal control for wide range of temperature control.
Furthermore, automatically adapts to changes in the operating environment and measurement object conditions to realize optimum control. (Adaptive control)
- Functions specialized for packaging machines
(Temperature Sensors for Packaging Machines and Automatic Filter Adjustment)
- Function specialized for water-cooled extruders (Watercooling Output Adjustment)



NX-TC2405



NX-TC3405

Features

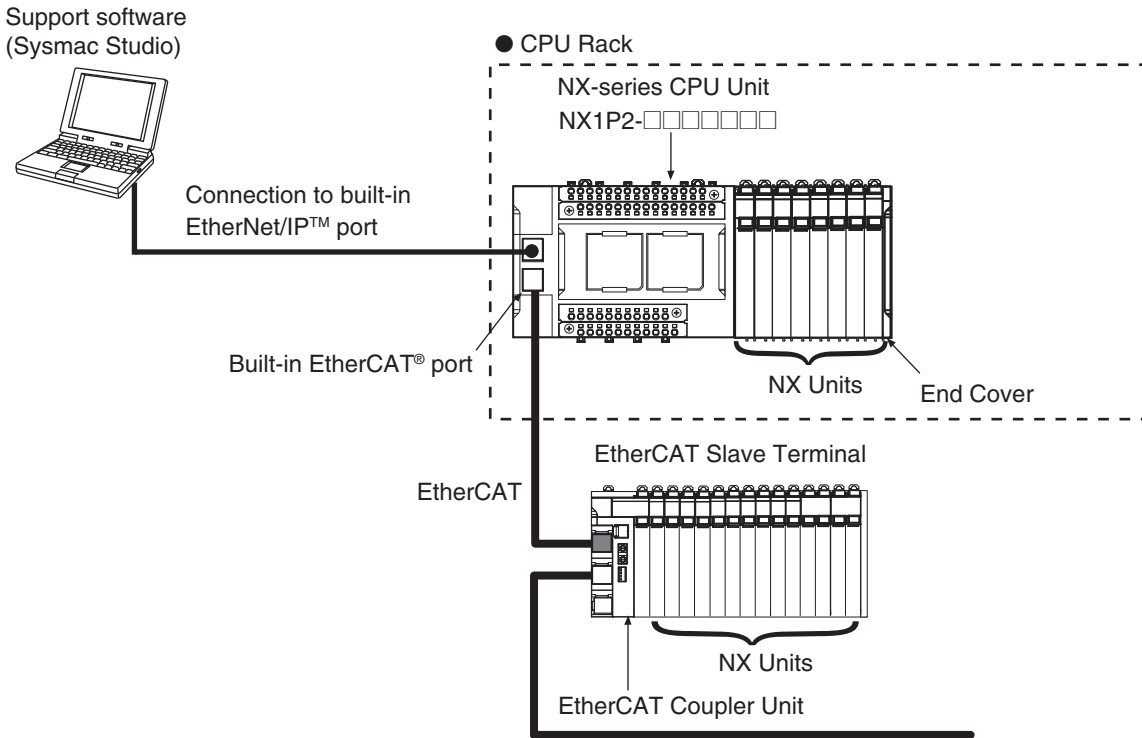
- Build-in 2-or 4-loop (Ch) PID control or ON/OFF control functions not required temperature control programming
- With heater burnout alarm is available
- Multiple inputs for thermocouple and platinum resistance thermometer input models are available
- Detachable front connector with screwless Push-In Plus terminals for easy installation and maintenance
- Monitoring for ambient temperature is available
- Function added to Unit Versions 1.1 and later
 - A Temperature alarm is possible. (Includes an LBA: Loop Burnout Alarm)
 - Parameters are added to I/O data for adjustment of PID constants, etc.
 - Manipulated variable branching enables a manipulated variable with a calculated slope value or offset to be output to another channel.

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System Configurations

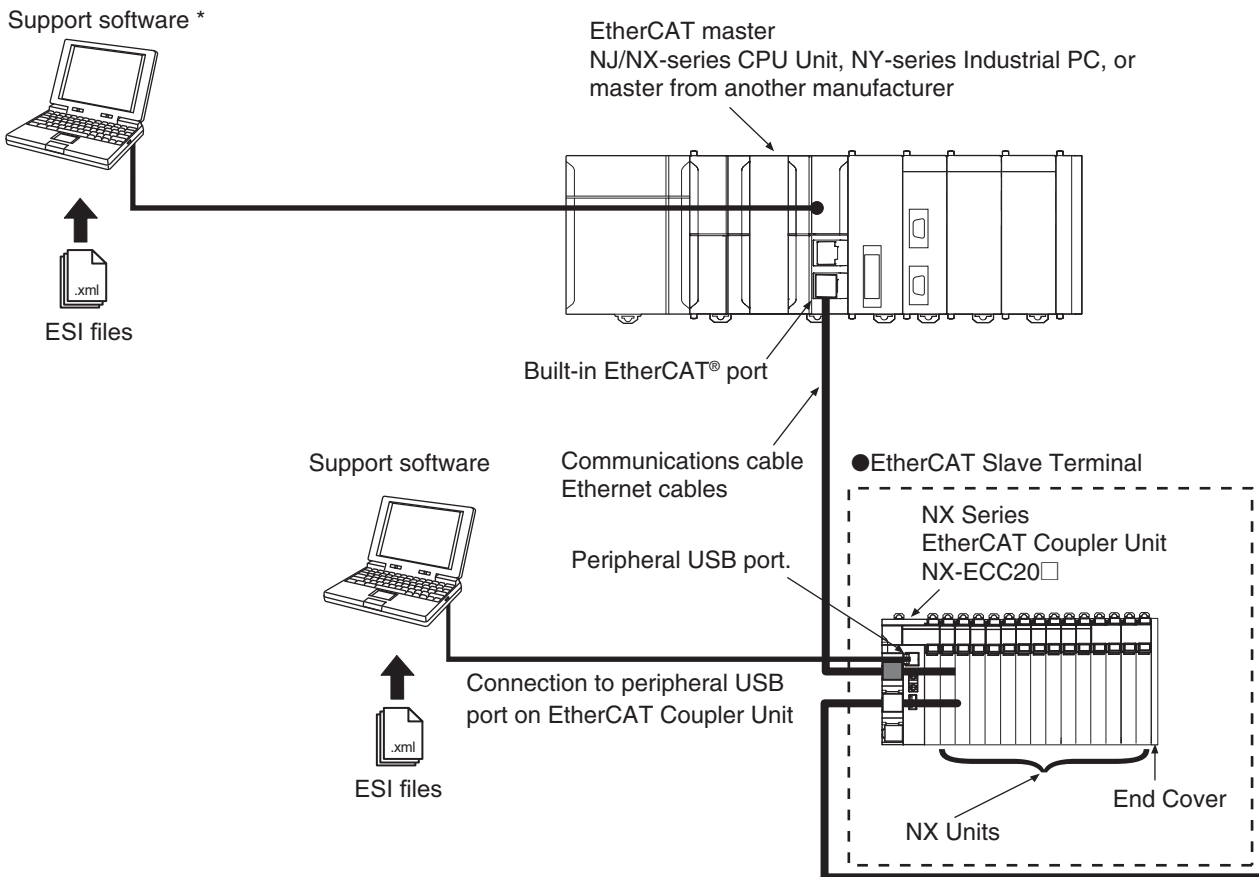
Connected to a CPU Unit

The following figure shows a system configuration when NX Units are connected to an NX-series CPU Unit.



Connected to an EtherCAT Coupler Unit

The following figure shows an example of the system configuration when an EtherCAT Coupler Unit is used as a Communications Coupler Unit.



* The connection method for the Sysmac Studio depends on the model of the CPU Unit or Industrial PC.

Note: To check whether NX Units can be connected to your CPU Unit or Communications Coupler Unit, refer to the user's manual for the CPU Unit or Communications Coupler Unit.

Model Number Structure

NX-TC

(1) (2) (3)

(1) Number of points

No.	Specification
2	2 points
3	4 points

(2) I/O type

No.	Sensor type
4	Multi-input (Thermocouple and Resistance thermometer)

(3) I/O type

No.	Control	Output		Number of CT input points per channel	I/O Refreshing Methods
		Output	Number of output points per channel		
05	Standard control	Voltage output (for driving SSR)	1 point per channel	1 point per channel	Free-Run refreshing
06			1 point per channel	None.	
07	Heating/cooling control		2 points per channel	None.	
08	Standard control	Linear current output	1 point per channel	None.	

NX-TC

Ordering Information

International Standards

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, CE: EU Directives, RCM: Regulatory Compliance Mark, KC: KC Registration, and EAC: EAC Mark.
- Contact your OMRON representative for further details and applicable conditions for these standards.

Temperature Control Units

Unit type	Product name	Specification								Model	Standards
		Number of channels	Input type	Output	Output capacity	CT Input capacity	Control type	Conversion time	I/O refreshing method		
NX Series Temperature Control Unit	Temperature Control Unit 2Ch type	2 Ch	Multi-input (Thermocouple and Resistance thermometer)	Voltage output (for driving SSR)	2 points	2 points	Standard Control	50 m sec	Free-Run refreshing	NX-TC2405	UC1, CE, RCM, KC, EAC
	None				Standard Control	NX-TC2406					
	Voltage output (for driving SSR)			4 points	None	Heating and Cooling Control	NX-TC2407				
	Linear current output			2 points	None	Standard Control	NX-TC2408				
	Temperature Control Unit 4Ch type	4 Ch		Voltage output (for driving SSR)	4 points	4 points	Standard Control			NX-TC3405	
	None				Standard Control	NX-TC3406					
	Voltage output (for driving SSR)			8 points	None	Heating and Cooling Control	NX-TC3407				
	Linear current output			4 points	None	Standard Control	NX-TC3408				

Optional Products

Product name	Specification	Model	Standards
Unit/Terminal Block Coding Pins	Pins for 10 Units (30 terminal block pins and 30 Unit pins)	NX-AUX02	---

Product name	Specification	Model	Standards
Current Transformer (CT)	Hole diameter: 5.8 mm	E54-CT1	---
	Hole diameter: 5.8 mm	E54-CT1L *	---
	Hole diameter: 12.0 mm	E54-CT3	---
	Hole diameter: 12.0 mm	E54-CT3L *	---

* Lead wires are included with these CTs. If UL certification is required, use these CTs.

Accessories

Not included.

General Specifications

Item		Specification
Enclosure		Mounted in a panel
Grounding method		Ground to 100 Ω or less
Operating environment	Ambient operating temperature	0 to 55°C
	Ambient operating humidity	10 to 95% RH (with no condensation or icing)
	Atmosphere	Must be free from corrosive gases.
	Ambient storage temperature	-25 to 70°C (with no condensation or icing)
	Altitude	2,000 m max.
	Pollution degree	Pollution degree 2 or less: Conforms to JIS B 3502 and IEC 61131-2.
	Noise immunity	Conforms to IEC 61000-4-4, 2 kV (power supply line)
	Overvoltage category	Category II: Conforms to JIS B 3502 and IEC 61131-2.
	EMC immunity level	Zone B
	Vibration resistance	Conforms to IEC 60068-2-6. 5 to 8.4 Hz with amplitude of 3.5 mm, 8.4 to 150 Hz, acceleration of 9.8 m/s ² 100 min each in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)
	Shock resistance	Conforms to IEC 60068-2-27. 147 m/s ² , 3 times each in X, Y, and Z directions
	Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)
	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
Applicable standards *		cULus: Listed (UL 61010-2-201), ANSI/ISA 12.12.01, EU: EN 61131-2, RCM, KC: KC Registration, EAC

* Refer to the OMRON website (www.ia.omron.com) or ask your OMRON representative for the most recent applicable standards for each model.

List of Functions


Function name		Description	Applicable units
Free-Run Refreshing		With this I/O refreshing method, the refresh cycle of the NX bus and the I/O refresh cycles of the NX Units are asynchronous.	All models
Selecting Channel To Use		This function disables control processing, error detection, and output for unused channels. The conversion time for its own Unit will not be shortened even if errors are disabled.	All models
Input Functions	Input Type Setting	This function sets the input type of the sensor connected to the temperature input.	All models
	Temperature Unit Setting (°C/°F)	This function sets the temperature units for measured values to °C (Celsius) or °F (Fahrenheit).	All models
	Decimal Point Position Setting	This function sets the number of digits to be displayed after the decimal point for INT type measured values and set point parameters.	All models
	Cold Junction Compensation Enable/Disable Setting	This function enables or disables cold junction compensation using the cold junction sensor that is mounted on the terminal block when a thermocouple input is used.	All models
	Temperature Input Correction	This function corrects measured values. When there are variations in the sensor or when there is a difference in measured value from other measuring instruments. One-point correction and two-point correction methods are provided.	All models
	Input Digital Filter	This function sets the time constant applied to the first-order lag operation filter so that the noise components mixed with the measured value are eliminated.	All models
	Measuring the Ambient Temperature Around Terminals	This function measures the temperature around the terminals of the Temperature Control Unit.	All models
Control Processing	ON/OFF control	This control function uses a preset set point to turn off the control output when the temperature reaches the set point during control.	All models
	PID control	PID control is a combination of proportional (P) control, integral (I) control, and differential (D) control. It is a control function that feeds back the detected value to the set point so that they conform to each other.	All models
	Heating/Cooling Control	This function controls both heating and cooling.	Heating/cooling control type models
	Run or Stop Controls	This function starts and stops temperature control.	All models
	Direct/Reverse Operation	This function specifies direct or reverse operation.	All models
	Manual MV (Manual Manipulated Variable)	This function outputs the specified manipulated variable during PID control.	All models
	MV at Error	This function outputs a fixed manipulated variable when a Sensor Disconnected Error occurs.	All models
	MV Limit	This function adds a limit to the manipulated variable calculated by PID control and outputs it.	All models
	Load Rejection MV	This function performs a preset output operation if the Temperature Control Unit connected to the CPU Unit cannot receive the output setting values from the CPU Unit due to an NX bus error or CPU watchdog timer error. This function performs a preset output operation if the Slave Terminal cannot receive the output setting values due to a communications error between the Temperature Control Unit and the Communications Coupler Unit host or due to an error on the NX bus.	All models
MV Branch	The manipulated variables calculated by the slope or offset are output to the branch-destination channel based on the manipulated variables of the branch-source channel.	Standard control type models	
Load Short-circuit Protection	This function protects output circuits of the Temperature Control Unit when an external device connected to the control output is short-circuited.	Models with voltage output (for driving SSR)	

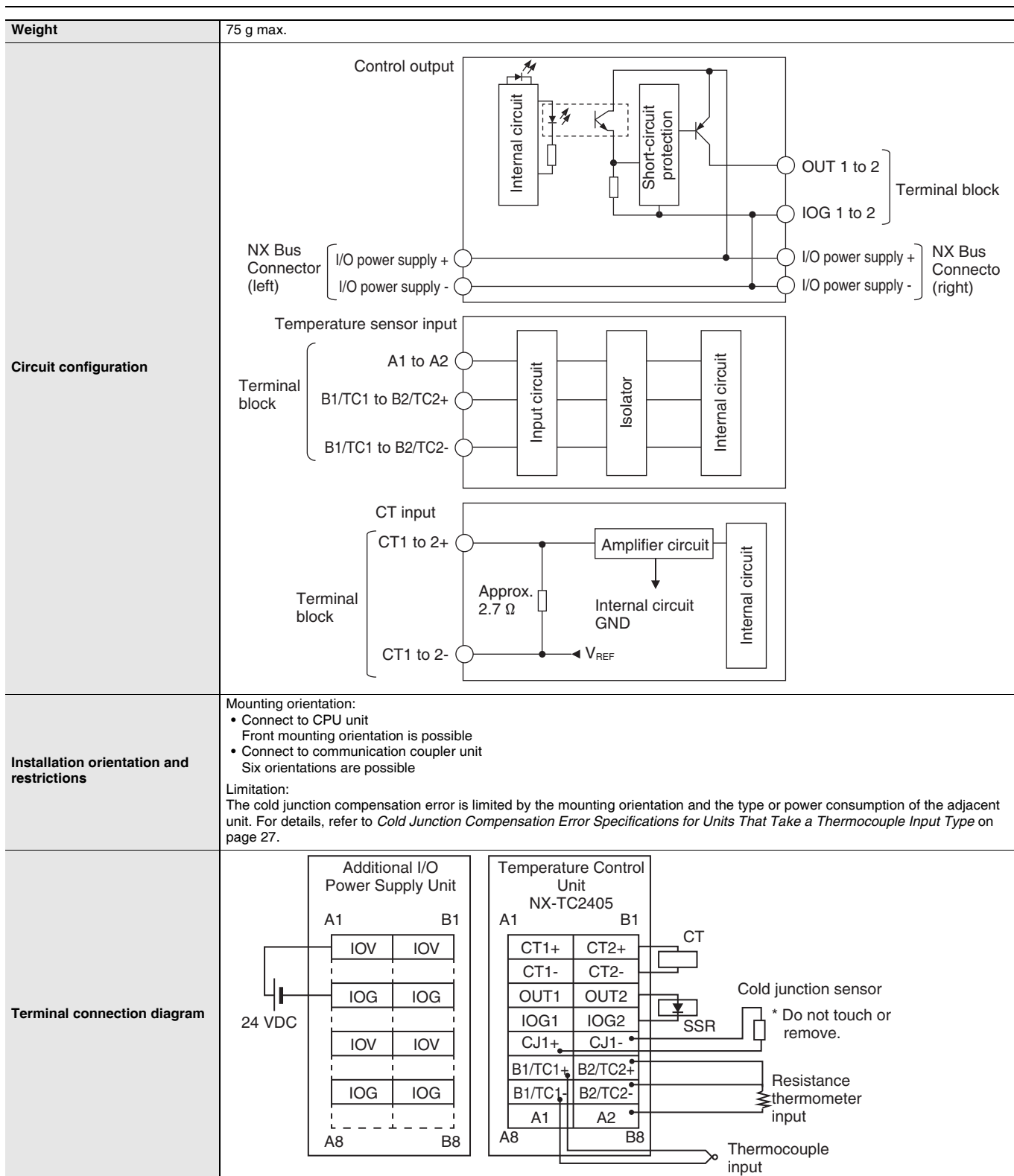
Function name		Description	Applicable units
Tuning	AT (Autotuning)	This is a tuning method that derives the PID constant. This function automatically calculates the PID constant by the limit cycle method according to the characteristics of the control target.	All models
	Automatic Filter Adjustment	This is a tuning method that automatically adjusts the input digital filter. This function is primarily for packing machines. It suppresses periodic temperature variations.	Standard control type models
	Water-cooling Output Adjustment	This is a tuning method that automatically adjusts hunting. This function is primarily for water-cooled extruders. It suppresses temperature variations caused by the cooling water output.	Heating/cooling control type models
	Adaptive Control	This is a tuning method that can maintain high control performance by following system changes. This function maintains control performance even if temperature variation factors such as environmental change and equipment deterioration occur during a long-term equipment operation.	Standard control type models
	Notifying the Update of Tuning Parameters	This function notifies that the Temperature Control Unit has automatically updated the parameters by tuning.	All models
Control Output	Control Period	This function sets the period when the ON/OFF time ratio is changed for voltage output (for driving SSR) in time-proportional operation.	Models with voltage output (for driving SSR)
	Minimum Output ON/OFF Band	This function specifies the minimum ON/OFF bands for the heating side control output or the cooling side control output. This function can be used to prevent deterioration of mechanical relays when mechanical relays are used in the actuators connected to the output terminals.	Models with voltage output (for driving SSR)
	Output Signal Range Setting	This function sets the output signal range of the linear current output. You can specify 4 to 20 mA or 0 to 20 mA.	Models with linear current output
	Limiting Simultaneous Outputs	This function limits the number of outputs that turn ON simultaneously by shifting the control period of each output and restricting the upper limit of the manipulated variable. You can set a delay between outputs, which allows delays in output device operation that can occur when outputs are switched.	Standard control type models with voltage output (for driving SSR)
Error Detection	Sensor Disconnection Detection	This function detects disconnections in temperature sensors. It also detects that the measured value of the temperature sensor is outside the input indication range.	All models
	Heater Burnout Detection	This function detects heater burnouts. A heater burnout is detected if the control output is ON and the heater current is equal to or less than the heater burnout detection current.	Models with CT input
	SSR Failure Detection	This function detects SSR failures. An SSR failure is detected if the control output is OFF and the leakage current is equal to or greater than the SSR failure detection current. An SSR failure is a failure that is caused by an SSR short-circuit.	Models with CT input
	Temperature alarms	Function for detecting a deviation or an error in the measured value as an alarm. Alarm operation corresponding to the use can be performed by selecting "Alarm type".	All models
	LBA (Loop Burnout Alarm)	Function for detecting, as an alarm, the error location in the control loop when there is no change in the measured value while a control deviation equal to or more than the threshold value exists between the set point and the measured value.	All models

NX-TC

Individual Specifications

Temperature Control Unit (2-Channel Type) NX-TC2405

Unit name		Temperature Control Unit (2-Channel Type)	Model	NX-TC2405	
Number of Channels		2 channels	Control type	Standard control	
Number of points per channel		<ul style="list-style-type: none"> Temperature input: 1 point per channel (2 points per unit) CT Input: 1 point per channel (2 points per unit) Control Output: 1 point per channel (2 points per unit) 	External connection terminal	Screwless clamping terminal block (16 terminals)	
I/O refreshing method		Free-Run Refreshing			
Indicators		TS indicator and output indicators 	CT Input section	CT current input range	0 to 0.125 A
				Input resistance	Approx. 2.7 Ω
				Connectable CTs	E54-CT1, E54-CT3, E54-CT1L, and E54-CT3L
				Maximum heater current	50 A AC
				Resolution	0.1 A
				Overall accuracy (25°C)	±5% (full scale) ±1 digit
				Influence of temperature (0 to 55°C)	±2% (full scale) ±1 digit
				Conversion time	50 ms/Unit
Sensor Input section		<ul style="list-style-type: none"> Thermocouple input: K, J, T, E, L, U, N, R, S, B, C/W, PL II Platinum resistance thermometer input: Pt100(three-wire), JPt100 (three-wire) 	Control Output section	Control output type and number of control outputs per channel	Voltage output for driving SSR, 1 point per channel
				Internal I/O common	PNP
				Control Period	0.1, 0.2, 0.5, 1 to 99s
				Manipulated variable	-5 to +105%
				Resolution	---
				Rated Voltage	24 VDC
				Operating Load Voltage Range	15 to 28.8 VDC
				Maximum load current	21 mA/point, 42 mA/Unit
				Maximum Inrush Current	0.3 A/point max., 10 ms max.
				Allowable load resistance	---
				Leakage current	0.1 mA max.
				Residual voltage	1.5 V max.
				Load Short-circuit Protection	Provided
Output range	---				
Overall accuracy (25°C)	---				
Influence of temperature (0 to 55°C)	---				
Dimensions		12 mm (W) ×100 mm (H) ×71 mm (D)	Isolation method	<ul style="list-style-type: none"> Between sensor inputs and internal circuitry: Power = Transformer, Signal = Digital isolator Between inputs: Power = Transformer, Signal = Digital isolator No isolation between internal circuits and CT inputs Between control output and internal circuit: Photocoupler No isolation between control outputs 	
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with a leakage current of 5 mA max.	
I/O power supply method		Supplied from the NX bus.	Current capacity of I/O power supply terminals	IOG: 0.1 A max. per terminal	
NX Unit power consumption		<ul style="list-style-type: none"> Connected to a CPU Unit 1.45 W max. Connected to Communications Coupler Unit 1.10 W max. 	Current consumption from I/O power supply	20 mA max.	



*1. For the setting ranges and indication ranges of the sensors, refer to the *Input types* on page 24.

*2. + 20°C only for the following input type settings:

- 1: JPt100
- 3: JPt100
- 10: T
- 14: U

*3. For details, refer to the *Reference Accuracy and Temperature Coefficient Table* on page 25.

For thermocouple inputs, reference accuracy and cold junction compensation error are guaranteed for a set of a Temperature Control Unit and a terminal block on which a cold junction sensor is mounted.


Be sure to use the terminal block and the Temperature Control Unit with the same calibration control number together.

A calibration control number is displayed both on the terminal block and the Unit.

Make sure to return the terminal block to which a cold junction sensor is mounted and the Unit together.

*4. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.

Temperature Control Unit (2-Channel Type) NX-TC2406

Unit name		Temperature Control Unit (2-Channel Type)	Model	NX-TC2406		
Number of Channels		2 channels	Control type	Standard control		
Number of points per channel		<ul style="list-style-type: none"> Temperature input: 1 point per channel (2 points per unit) CT input: None Control Output: 1 point per channel (2 points per unit) 	External connection terminal	Screwless clamping terminal block (16 terminals)		
I/O refreshing method		Free-Run Refreshing				
Indicators		TS indicator and output indicators				
						
		CT Input section	CT current input range	---		
			Input resistance	---		
			Connectable CTs	---		
			Maximum heater current	---		
			Resolution	---		
			Overall accuracy (25°C)	---		
Influence of temperature (0 to 55°C)	---					
Conversion time	---					
Sensor Input section		Temperature sensor *1				
		<ul style="list-style-type: none"> Thermocouple input: K, J, T, E, L, U, N, R, S, B, C/W, PL II Platinum resistance thermometer input: Pt100 (three-wire), JPt100 (three-wire) 				
		Input conversion range	±20°C of the input range *2			
		Absolute maximum rating	±130 mV			
		Input impedance	20 kΩ min.			
		Resolution	0.1°C max.			
		Reference accuracy	*3			
		Temperature coefficient	*3			
		Cold junction compensation error	±1.2°C *3 *4			
		Input disconnection detection current	Approx. 0.1 μA			
		Input detection current	0.25 mA			
		Effect of conductor resistance	<ul style="list-style-type: none"> Thermocouple input: 0.1°C/Ω (100 Ω or less per conductor) Platinum resistance thermometer input: 0.06°C/Ω (20 Ω or less per conductor) 			
Warm-up period	30 minutes					
Conversion time	50 ms/Unit					
Dimensions		12 mm (W) ×100 mm (H) ×71 mm (D)				
		Isolation method				
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)				
		Dielectric strength				
		510 VAC between isolated circuits for 1 minute with a leakage current of 5 mA max.				
		Current capacity of I/O power supply terminals				
		IOG: 0.1 A max. per terminal				
		I/O power supply method		Supplied from the NX bus.		
				Control output type and number of control outputs per channel		
				Voltage output for driving SSR, 1 point per channel		
				Internal I/O common	PNP	
				Control Period	0.1, 0.2, 0.5, 1 to 99s	
Manipulated variable	-5 to +105%					
Resolution	---					
Rated Voltage	24 VDC					
Operating Load Voltage Range	15 to 28.8 VDC					
Maximum load current	21 mA/point, 42 mA/Unit					
Maximum Inrush Current	0.3 A/point max., 10 ms max.					
Allowable load resistance	---					
Leakage current	0.1 mA max.					
Residual voltage	1.5 V max.					
Load Short-circuit Protection	Provided					
Output range	---					
Overall accuracy (25°C)	---					
Influence of temperature (0 to 55°C)	---					

<p>NX Unit power consumption</p>	<ul style="list-style-type: none"> • Connected to a CPU Unit 1.25 W max. • Connected to Communications Coupler Unit 0.95 W max. 	<p>Current consumption from I/O power supply</p>	<p>20 mA max.</p>
<p>Weight</p>	<p>75 g max.</p>		
<p>Circuit configuration</p>	<p>The diagram illustrates the internal and external circuitry. The top section, labeled 'Control output', shows an internal circuit connected to a terminal block with terminals 'OUT 1 to 2' and 'IOG 1 to 2'. This is powered by an 'NX Bus Connector (left)' providing 'I/O power supply +' and 'I/O power supply -'. The output is connected to an 'NX Bus Connector (right)' which also provides 'I/O power supply +' and 'I/O power supply -'. A 'Short-circuit protection' circuit is shown between the internal circuit and the terminal block. The bottom section, labeled 'Temperature sensor input', shows a terminal block with terminals 'A1 to A2', 'B1/TC1 to B2/TC2+', and 'B1/TC1 to B2/TC2-'. These are connected through an 'Input circuit', an 'Isolator', and an 'Internal circuit'.</p>		
<p>Installation orientation and restrictions</p>	<p>Mounting orientation:</p> <ul style="list-style-type: none"> • Connect to CPU unit • Front mounting orientation is possible • Connect to communication coupler unit • Six orientations are possible <p>Limitation: The cold junction compensation error is limited by the mounting orientation and the type or power consumption of the adjacent unit. For details, refer to <i>Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type</i> on page 27.</p>		
<p>Terminal connection diagram</p>	<p>The diagram shows two terminal blocks: 'Additional I/O Power Supply Unit' and 'Temperature Control Unit NX-TC2406'. The power supply unit has terminals A1, B1, A8, and B8, with IOV and IOG connections. A 24 VDC source is connected to IOV and IOG. The temperature control unit has terminals A1, B1, A8, and B8, with connections for NC, OUT1, OUT2, IOG1, IOG2, CJ1+, CJ1-, B1/TC1+, B2/TC2+, B1/TC1-, B2/TC2-, A1, and A2. A 'Cold junction sensor' is connected to OUT1 and OUT2, with an SSR and a note '* Do not touch or remove.'. A 'Resistance thermometer input' is connected to B1/TC1+ and B2/TC2+. A 'Thermocouple input' is connected to A1 and A2.</p>		

*1. For the setting ranges and indication ranges of the sensors, refer to the *Input types* on page 24.

*2. + 20°C only for the following input type settings:

- 1: JPt100
- 3: JPt100
- 10: T
- 14: U

*3. For details, refer to the *Reference Accuracy and Temperature Coefficient Table* on page 25.

For thermocouple inputs, reference accuracy and cold junction compensation error are guaranteed for a set of a Temperature Control Unit and a terminal block on which a cold junction sensor is mounted.

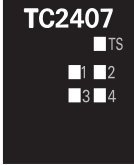
Be sure to use the terminal block and the Temperature Control Unit with the same calibration control number together.

A calibration control number is displayed both on the terminal block and the Unit.

Make sure to return the terminal block to which a cold junction sensor is mounted and the Unit together.

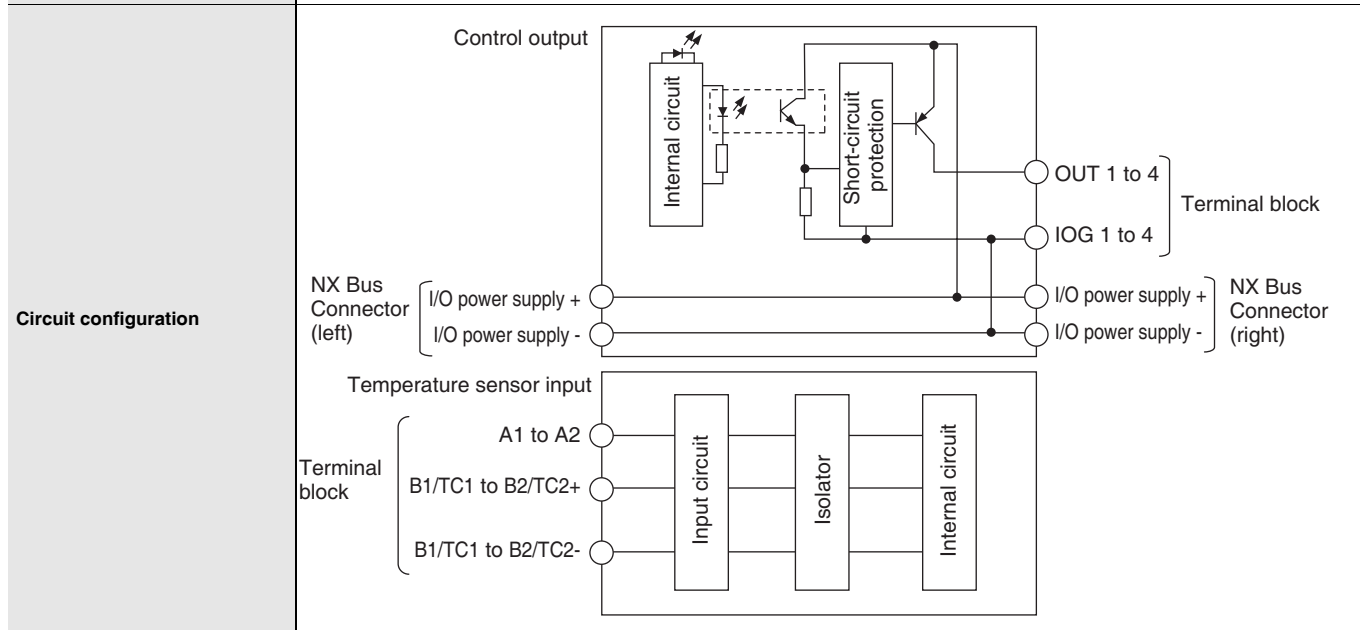
*4. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.

Temperature Control Unit (2-Channel Type) NX-TC2407

Unit name		Temperature Control Unit (2-Channel Type)	Model	NX-TC2407	
Number of Channels		2 channels	Control type	Heating and cooling control	
Number of points per channel		<ul style="list-style-type: none"> Temperature input: 1 point per channel (2 points per unit) CT input: None Control Output: 2 point per channel (4 points per unit) 	External connection terminal	Screwless clamping terminal block (16 terminals)	
I/O refreshing method		Free-Run Refreshing			
Indicators		TS indicator and output indicators 	CT Input section	CT current input range	---
				Input resistance	---
Connectable CTs	---				
Maximum heater current	---				
Resolution	---				
Overall accuracy (25°C)	---				
Influence of temperature (0 to 55°C)	---				
Conversion time	---				
Sensor Input section		Thermocouple input: K, J, T, E, L, U, N, R, S, B, C/W, PL II Platinum resistance thermometer input: Pt100 (three-wire), JPt100 (three-wire)	Control Output section	Control output type and number of control outputs per channel	Voltage output for driving SSR, 2 point per channel
				Internal I/O common	PNP
				Control Period	0.1, 0.2, 0.5, 1 to 99s
				Manipulated variable	<ul style="list-style-type: none"> Heating: 0 to +105% Cooling: 0 to +105%
				Resolution	---
				Rated Voltage	24 VDC
				Operating Load Voltage Range	15 to 28.8 VDC
				Maximum load current	21 mA/point, 84 mA/Unit
				Maximum Inrush Current	0.3 A/point max., 10 ms max.
				Allowable load resistance	---
				Leakage current	0.1 mA max.
				Residual voltage	1.5 V max.
				Load Short-circuit Protection	Provided
				Output range	---
Dimensions		12 mm (W) ×100 mm (H) ×71 mm (D)	Isolation method	<ul style="list-style-type: none"> Between sensor inputs and internal circuitry: Power = Transformer, Signal = Digital isolator Between inputs: Power = Transformer, Signal = Digital isolator Between control output and internal circuit: Photocoupler No isolation between control outputs 	
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with a leakage current of 5 mA max.	
I/O power supply method		Supplied from the NX bus.	Current capacity of I/O power supply terminals	I/O: 0.1 A max. per terminal	

NX Unit power consumption	<ul style="list-style-type: none"> • Connected to a CPU Unit 1.30 W max. • Connected to Communications Coupler Unit 1.00 W max. 	Current consumption from I/O power supply	20 mA max.
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Weight	75 g max.
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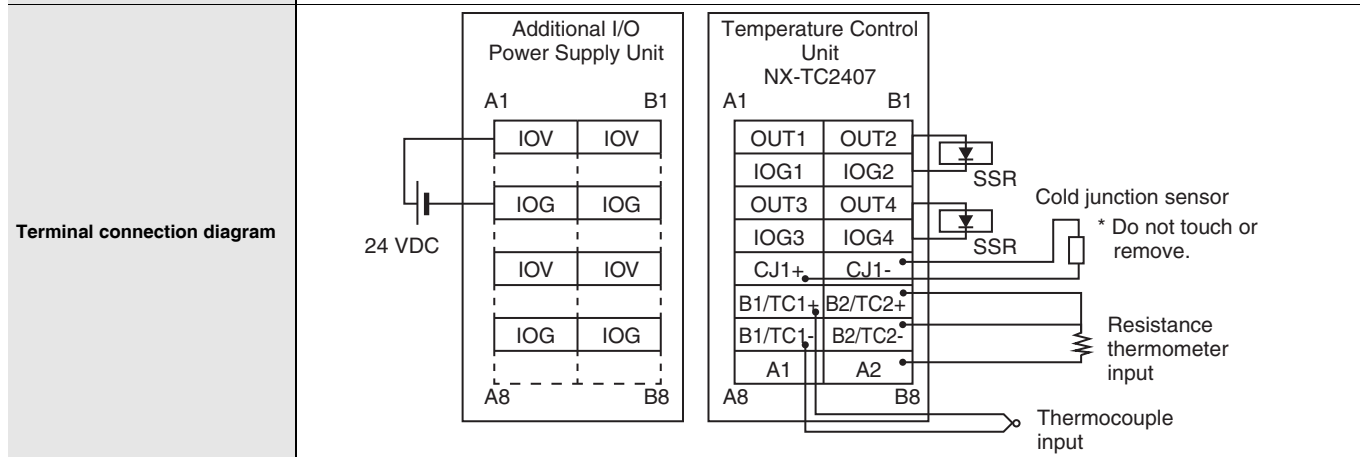


Installation orientation and restrictions

Mounting orientation:


- Connect to CPU unit
- Front mounting orientation is possible
- Connect to communication coupler unit
- Six orientations are possible

Limitation:
The cold junction compensation error is limited by the mounting orientation and the type or power consumption of the adjacent unit. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.



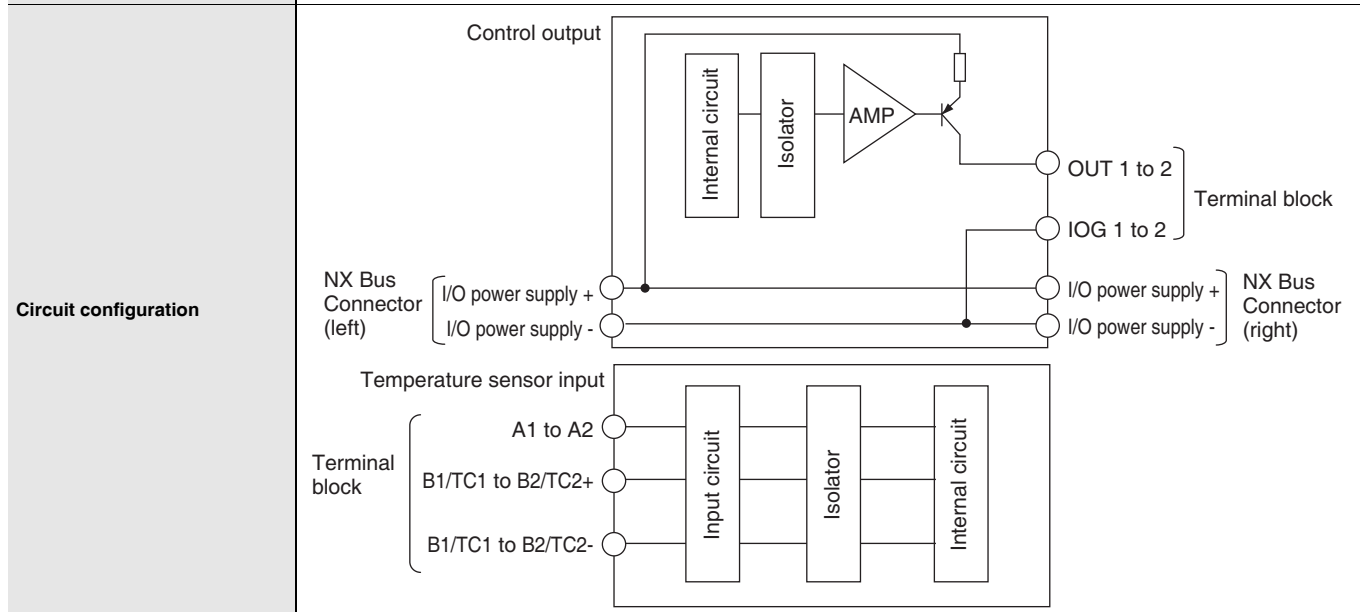
- *1. For the setting ranges and indication ranges of the sensors, refer to the *Input types* on page 24.
- *2. + 20°C only for the following input type settings:
 - 1: JPt100
 - 3: JPt100
 - 10: T
 - 14: U
- *3. For details, refer to the *Reference Accuracy and Temperature Coefficient Table* on page 25. For thermocouple inputs, reference accuracy and cold junction compensation error are guaranteed for a set of a Temperature Control Unit and a terminal block on which a cold junction sensor is mounted. Be sure to use the terminal block and the Temperature Control Unit with the same calibration control number together. A calibration control number is displayed both on the terminal block and the Unit. Make sure to return the terminal block to which a cold junction sensor is mounted and the Unit together.
- *4. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.

Temperature Control Unit (2-Channel Type) NX-TC2408

Unit name		Temperature Control Unit (2-Channel Type)	Model	NX-TC2408	
Number of Channels		2 channels	Control type	Standard control	
Number of points per channel		<ul style="list-style-type: none"> Temperature input: 1 point per channel (2 points per unit) CT input: None Control Output: 1 point per channel (2 points per unit) 	External connection terminal	Screwless clamping terminal block (16 terminals)	
I/O refreshing method		Free-Run Refreshing			
Indicators	TS indicator and output indicators		CT Input section	CT current input range	---
				Input resistance	---
				Connectable CTs	---
				Maximum heater current	---
				Resolution	---
				Overall accuracy (25°C)	---
				Influence of temperature (0 to 55°C)	---
			Conversion time	---	
			Control Output section	Control output type and number of control outputs per channel	Linear current output, one output per channel
				Internal I/O common	---
Control Period				---	
Manipulated variable				-5 to +105%	
Sensor Input section	Temperature sensor *1	<ul style="list-style-type: none"> Thermocouple input: K, J, T, E, L, U, N, R, S, B, C/W, PL II Platinum resistance thermometer input: Pt100(three-wire), JPt100 (three-wire) 	Control Output section	Resolution	1/10,000
	Input conversion range	±20°C of the input range *2		Rated Voltage	24 VDC
	Absolute maximum rating	±130 mV		Operating Load Voltage Range	15 to 28.8 VDC
	Input impedance	20 kΩ min.		Maximum load current	---
	Resolution	0.1°C max.		Maximum Inrush Current	---
	Reference accuracy	*3		Allowable load resistance	350 Ω or less, or greater than 350 Ω but no more than 600 Ω *4
	Temperature coefficient	*3		Leakage current	---
	Cold junction compensation error	±1.2°C *3 *5		Residual voltage	---
	Input disconnection detection current	Approx. 0.1 uA		Load Short-circuit Protection	---
	Input detection current	0.25 mA		Output range	0 to 20 mA, 4 to 20 mA
	Effect of conductor resistance	<ul style="list-style-type: none"> Thermocouple input: 0.1°C/Ω (100 Ω or less per conductor) Platinum resistance thermometer input: 0.06°C/Ω (20 Ω or less per conductor) 		Overall accuracy (25°C)	±0.3% of full scale, but 1% of full scale at 0 to 4 mA of 0 to 20 mA range
	Warm-up period	30 minutes		Influence of temperature (0 to 55°C)	±0.3% (full scale)
Conversion time	50 ms/Unit				
Dimensions	12 mm (W) ×100 mm (H) ×71 mm (D)	Isolation method	<ul style="list-style-type: none"> Between sensor inputs and internal circuitry: Power = Transformer, Signal = Digital isolator Between inputs: Power = Transformer, Signal = Digital isolator Between control output and internal circuit: Photocoupler No isolation between control outputs 		
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with a leakage current of 5 mA max.		
I/O power supply method	Supplied from the NX bus.	Current capacity of I/O power supply terminals	I/O: 0.1 A max. per terminal		

NX Unit power consumption	<ul style="list-style-type: none"> • Connected to a CPU Unit 1.25 W max. • Connected to Communications Coupler Unit 0.95 W max. 	Current consumption from I/O power supply	20 mA max.
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Weight	75 g max.
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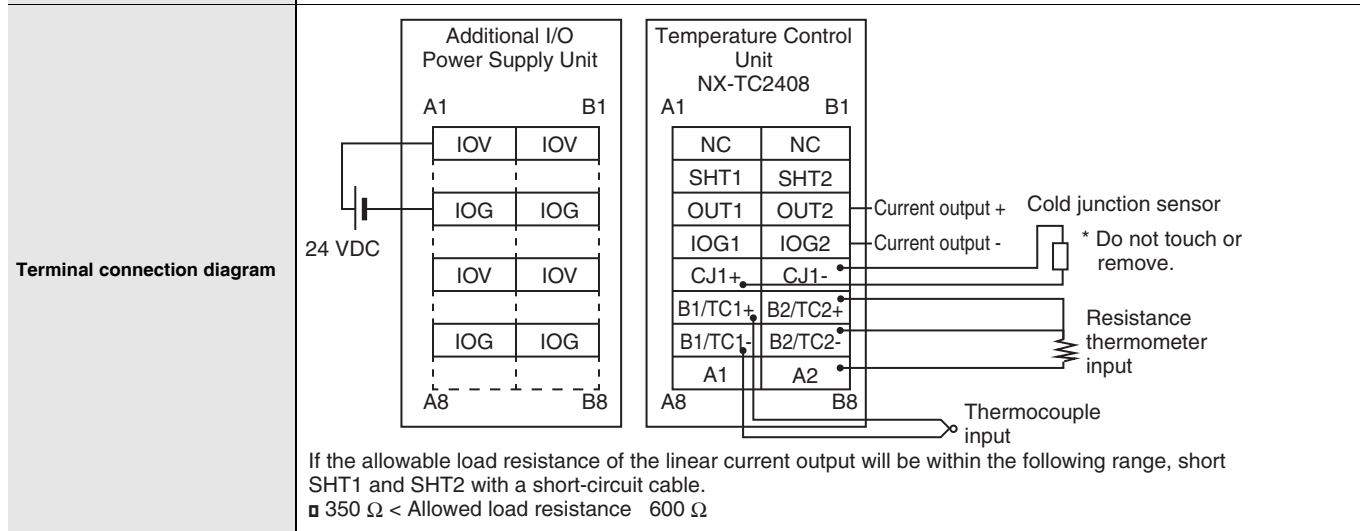


Installation orientation and restrictions

Mounting orientation:

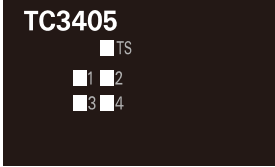
- Connect to CPU unit
- Front mounting orientation is possible
- Connect to communication coupler unit
- Six orientations are possible

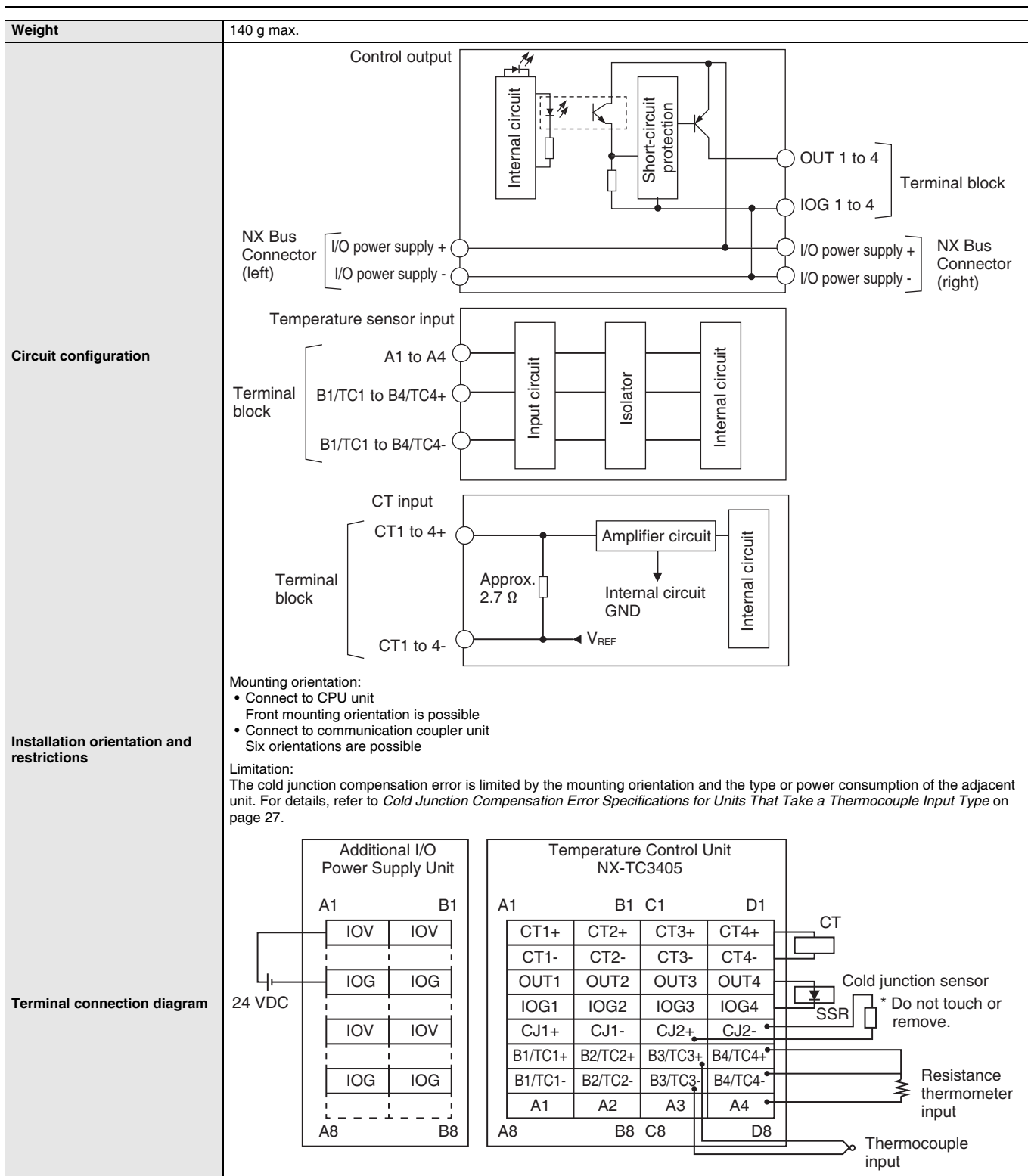
Limitation:
The cold junction compensation error is limited by the mounting orientation and the type or power consumption of the adjacent unit. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.



- *1. For the setting ranges and indication ranges of the sensors, refer to the *Input types* on page 24.
- *2. + 20°C only for the following input type settings:
 - 1: JPt100
 - 3: JPt100
 - 10: T
 - 14: U
- *3. For details, refer to the *Reference Accuracy and Temperature Coefficient Table* on page 25.
 For thermocouple inputs, reference accuracy and cold junction compensation error are guaranteed for a set of a Temperature Control Unit and a terminal block on which a cold junction sensor is mounted.
 Be sure to use the terminal block and the Temperature Control Unit with the same calibration control number together.
 A calibration control number is displayed both on the terminal block and the Unit.
 Make sure to return the terminal block to which a cold junction sensor is mounted and the Unit together.
- *4. To use an allowable load resistance greater than 350 Ω but not exceeding 600 Ω, SHT1 and SHT2 must be shorted with a shorting cable.
 For details, refer to the NX-series Temperature Control Units User's Manual (Cat. No. W523).
- *5. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.

Temperature Control Unit (4-Channel Type) NX-TC3405

Unit name		Temperature Control Unit (4-Channel Type)	Model	NX-TC3405		
Number of Channels		4 channels	Control type	Standard control		
Number of points per channel		<ul style="list-style-type: none"> Temperature input: 1 point per channel (4 points per unit) CT Input: 1 point per channel (4 points per unit) Control Output: 1 point per channel (4 points per unit) 	External connection terminal	Screwless clamping terminal block (16 terminals x 2)		
I/O refreshing method		Free-Run Refreshing				
Indicators	TS indicator and output indicators		CT Input section	CT current input range	0 to 0.125 A	
				Input resistance	Approx. 2.7 Ω	
Connectable CTs				E54-CT1, E54-CT3, E54-CT1L, and E54-CT3L		
Maximum heater current				50 A AC		
Resolution				0.1 A		
Overall accuracy (25°C)				±5% (full scale) ±1 digit		
Influence of temperature (0 to 55°C)				±2% (full scale) ±1 digit		
Conversion time				50 ms/Unit		
Sensor Input section		<ul style="list-style-type: none"> Thermocouple input: K, J, T, E, L, U, N, R, S, B, C/W, PL II Platinum resistance thermometer input: Pt100 (three-wire), JPt100 (three-wire) 		Control Output section	Control output type and number of control outputs per channel	Voltage output for driving SSR, 1 point per channel
					Internal I/O common	PNP
			Control Period		0.1, 0.2, 0.5, 1 to 99s	
			Manipulated variable		-5 to +105%	
			Resolution		---	
			Rated Voltage		24 VDC	
			Operating Load Voltage Range		15 to 28.8 VDC	
			Maximum load current		21 mA/point, 84 mA/Unit	
			Maximum Inrush Current		0.3 A/point max., 10 ms max.	
			Allowable load resistance		---	
Leakage current	0.1 mA max.					
Residual voltage	1.5 V max.					
Load Short-circuit Protection	Provided					
Output range	---					
Effect of conductor resistance	<ul style="list-style-type: none"> Thermocouple input: 0.1°C/Ω (100 Ω or less per conductor) Platinum resistance thermometer input: 0.06°C/Ω (20 Ω or less per conductor) 	Overall accuracy (25°C)	---			
Warm-up period	30 minutes	Influence of temperature (0 to 55°C)	---			
Conversion time	50 ms/Unit					
Dimensions	24 mm (W) × 100 mm (H) × 71 mm (D)	Isolation method	<ul style="list-style-type: none"> Between sensor inputs and internal circuitry: Power = Transformer, Signal = Digital isolator Between inputs: Power = Transformer, Signal = Digital isolator No isolation between internal circuits and CT inputs Between control output and internal circuit: Photocoupler No isolation between control outputs 			
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with a leakage current of 5 mA max.			
I/O power supply method	Supplied from the NX bus.	Current capacity of I/O power supply terminals	IOG: 0.1 A max. per terminal			
NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.80 W max. Connected to Communications Coupler Unit 1.35 W max. 	Current consumption from I/O power supply	20 mA max.			



*1. For the setting ranges and indication ranges of the sensors, refer to the *Input types* on page 24.

*2. + 20°C only for the following input type settings:

- 1: JPt100
- 3: JPt100
- 10: T
- 14: U

*3. For details, refer to the *Reference Accuracy and Temperature Coefficient Table* on page 25.

For thermocouple inputs, reference accuracy and cold junction compensation error are guaranteed for a set of a Temperature Control Unit and a terminal block on which a cold junction sensor is mounted.

Be sure to use the terminal block and the Temperature Control Unit with the same calibration control number together.


A calibration control number is displayed both on the terminal block and the Unit.

In order to distinguish left and right terminal blocks, each terminal block has either a letter "L" (left side) or "R" (right side) appended at the end of a calibration control number.

Make sure to return the terminal block to which a cold junction sensor is mounted and the Unit together.

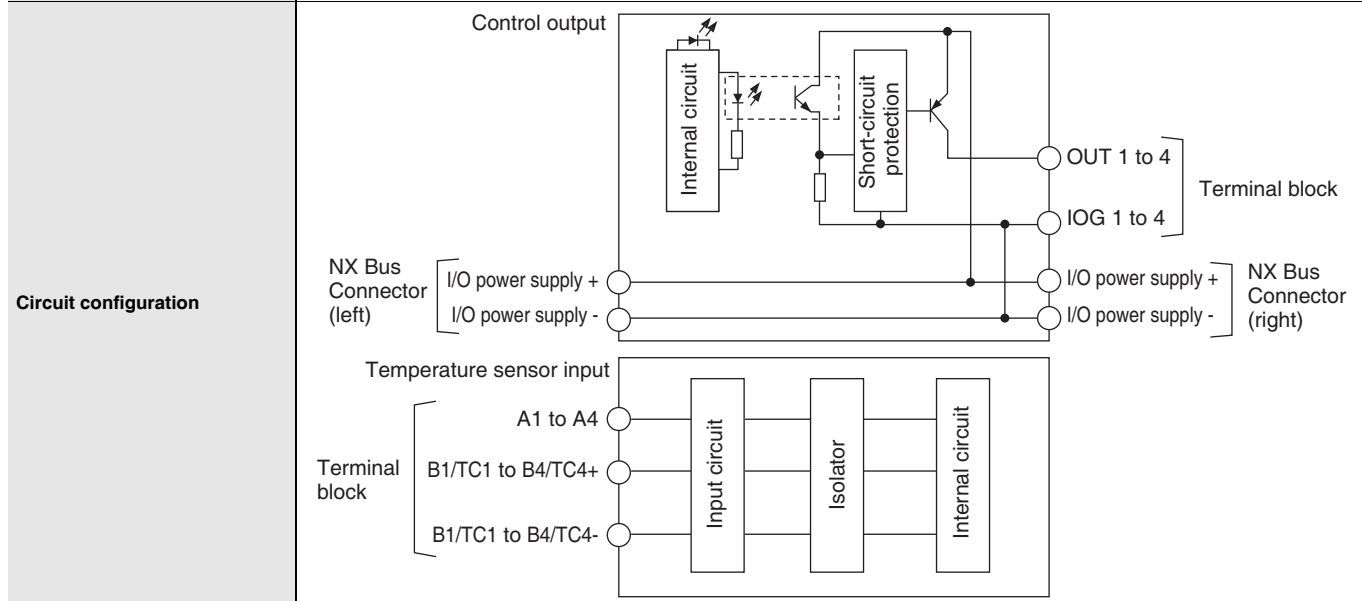
*4. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.

Temperature Control Unit (4-Channel Type) NX-TC3406

Unit name		Temperature Control Unit (4-Channel Type)	Model	NX-TC3406	
Number of Channels		4 channels	Control type	Standard control	
Number of points per channel		<ul style="list-style-type: none"> Temperature input: 1 point per channel (4 points per unit) CT input: None Control Output: 1 point per channel (4 points per unit) 	External connection terminal	Screwless clamping terminal block (16 terminals x 2)	
I/O refreshing method		Free-Run Refreshing			
Indicators		TS indicator and output indicators			
					
		CT Input section	CT current input range	---	
			Input resistance	---	
			Connectable CTs	---	
			Maximum heater current	---	
			Resolution	---	
			Overall accuracy (25°C)	---	
Influence of temperature (0 to 55°C)	---				
Conversion time	---				
Sensor Input section		Temperature sensor *1	Control output type and number of control outputs per channel	Voltage output for driving SSR, 1 point per channel	
			Internal I/O common	PNP	
			Control Period	0.1, 0.2, 0.5, 1 to 99s	
			Manipulated variable	-5 to +105%	
			Resolution	---	
			Rated Voltage	24 VDC	
			Operating Load Voltage Range	15 to 28.8 VDC	
			Maximum load current	21 mA/point, 84 mA/Unit	
			Maximum Inrush Current	0.3 A/point max., 10 ms max.	
			Allowable load resistance	---	
			Leakage current	0.1 mA max.	
			Residual voltage	1.5 V max.	
			Load Short-circuit Protection	Provided	
Output range	---				
Overall accuracy (25°C)	---				
Influence of temperature (0 to 55°C)	---				
Dimensions		24 mm (W) x100 mm (H) x71 mm (D)	Isolation method	<ul style="list-style-type: none"> Between sensor inputs and internal circuitry: Power = Transformer, Signal = Digital isolator Between inputs: Power = Transformer, Signal = Digital isolator Between control output and internal circuit: Photocoupler No isolation between control outputs 	
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with a leakage current of 5 mA max.	
I/O power supply method		Supplied from the NX bus.	Current capacity of I/O power supply terminals	I/O: 0.1 A max. per terminal	

NX Unit power consumption	<ul style="list-style-type: none"> • Connected to a CPU Unit 1.70 W max. • Connected to Communications Coupler Unit 1.25 W max. 	Current consumption from I/O power supply	20 mA max.
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Weight	140 g max.
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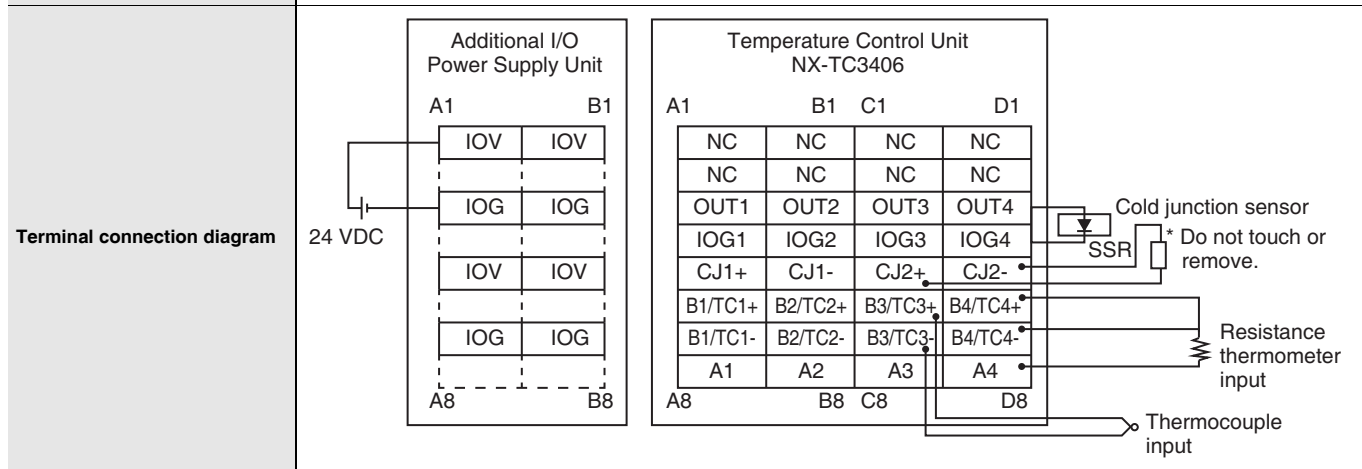


Installation orientation and restrictions

Mounting orientation:

- Connect to CPU unit
- Front mounting orientation is possible
- Connect to communication coupler unit
- Six orientations are possible

Limitation:
The cold junction compensation error is limited by the mounting orientation and the type or power consumption of the adjacent unit. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.



- *1. For the setting ranges and indication ranges of the sensors, refer to the *Input types* on page 24.
- *2. + 20°C only for the following input type settings:
 - 1: JPt100
 - 3: JPt100
 - 10: T
 - 14: U
- *3. For details, refer to the *Reference Accuracy and Temperature Coefficient Table* on page 25.

For thermocouple inputs, reference accuracy and cold junction compensation error are guaranteed for a set of a Temperature Control Unit and a terminal block on which a cold junction sensor is mounted.

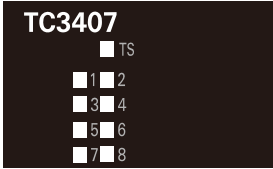
Be sure to use the terminal block and the Temperature Control Unit with the same calibration control number together.

A calibration control number is displayed both on the terminal block and the Unit.

In order to distinguish left and right terminal blocks, each terminal block has either a letter "L" (left side) or "R" (right side) appended at the end of a calibration control number.

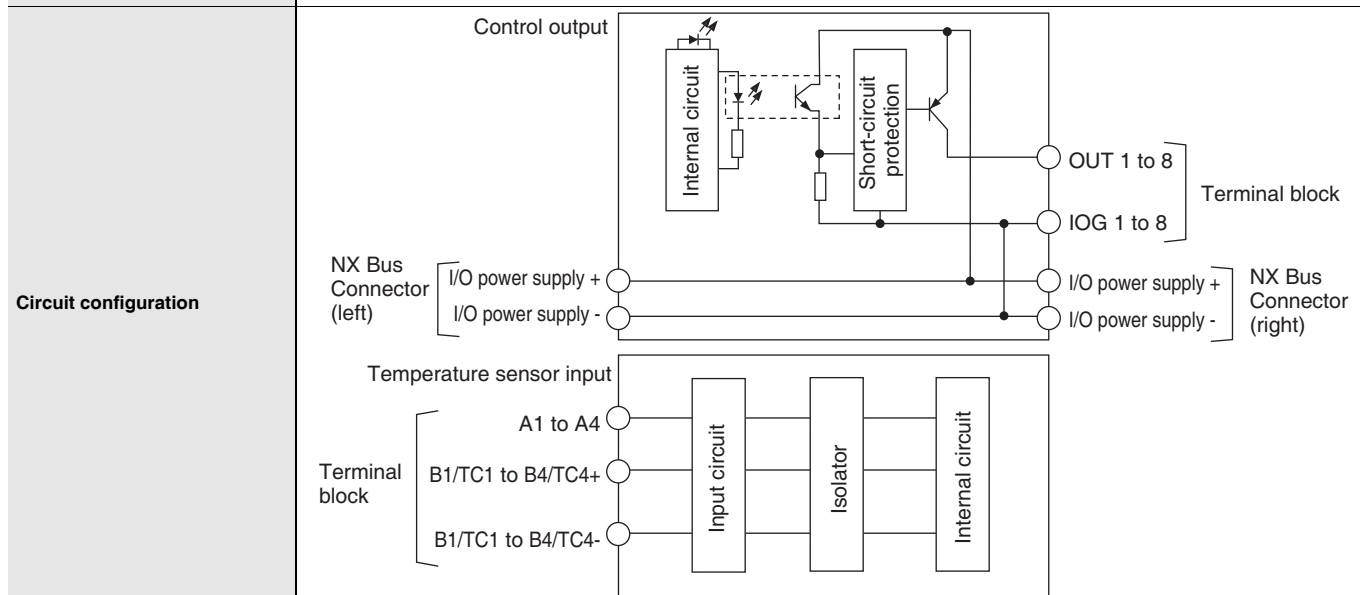
Make sure to return the terminal block to which a cold junction sensor is mounted and the Unit together.
- *4. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.

Temperature Control Unit (4-Channel Type) NX-TC3407

Unit name		Temperature Control Unit (4-Channel Type)	Model	NX-TC3407	
Number of Channels		4 channels	control type	heating and cooling control	
Number of points per channel		<ul style="list-style-type: none"> Temperature input: 1 point per channel (4 points per unit) CT input: None Control Output: 2 point per channel (8 points per unit) 	External connection terminal	Screwless clamping terminal block (16 terminals x 2)	
I/O refreshing method		Free-Run Refreshing			
Indicators		TS indicator and output indicators			
					
		CT Input section	CT current input range	---	
			Input resistance	---	
			Connectable CTs	---	
			Maximum heater current	---	
			Resolution	---	
			Overall accuracy (25°C)	---	
Influence of temperature (0 to 55°C)	---				
Conversion time	---				
Sensor Input section		Control Output section	Control output type and number of control outputs per channel	Voltage output for driving SSR, 2 point per channel	
			Internal I/O common	PNP	
			Control Period	0.1, 0.2, 0.5, 1 to 99s	
			Manipulated variable	<ul style="list-style-type: none"> Heating: 0 to +105% Cooling: 0 to +105% 	
			Resolution	---	
			Rated Voltage	24 VDC	
			Operating Load Voltage Range	15 to 28.8 VDC	
			Maximum load current	21 mA/point, 168 mA/Unit	
			Maximum Inrush Current	0.3 A/point max., 10 ms max.	
			Allowable load resistance	---	
			Leakage current	0.1 mA max.	
			Residual voltage	1.5 V max.	
			Load Short-circuit Protection	Provided	
Output range	---				
Overall accuracy (25°C)	---				
Influence of temperature (0 to 55°C)	---				
Dimensions		24 mm (W) x100 mm (H) x71 mm (D)	Isolation method	<ul style="list-style-type: none"> Between sensor inputs and internal circuitry: Power = Transformer, Signal = Digital isolator Between inputs: Power = Transformer, Signal = Digital isolator Between control output and internal circuit: Photocoupler No isolation between control outputs 	
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with a leakage current of 5 mA max.	
I/O power supply method		Supplied from the NX bus.	Current capacity of I/O power supply terminals	I/O: 0.1 A max. per terminal	

NX Unit power consumption	<ul style="list-style-type: none"> • Connected to a CPU Unit 1.75 W max. • Connected to Communications Coupler Unit 1.30 W max. 	Current consumption from I/O power supply	20 mA max.
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Weight	140 g max.
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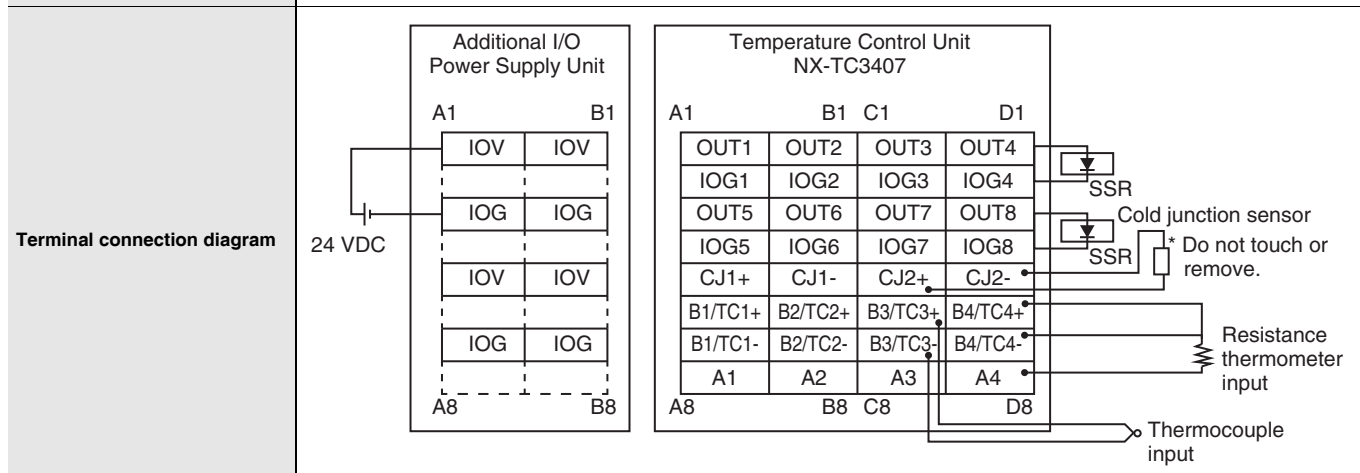


Installation orientation and restrictions

Mounting orientation:

- Connect to CPU unit
- Front mounting orientation is possible
- Connect to communication coupler unit
- Six orientations are possible

Limitation:
The cold junction compensation error is limited by the mounting orientation and the type or power consumption of the adjacent unit. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.



- *1. For the setting ranges and indication ranges of the sensors, refer to the *Input types* on page 24.
- *2. + 20°C only for the following input type settings:
 - 1: JPt100
 - 3: JPt100
 - 10: T
 - 14: U
- *3. For details, refer to the *Reference Accuracy and Temperature Coefficient Table* on page 25.

For thermocouple inputs, reference accuracy and cold junction compensation error are guaranteed for a set of a Temperature Control Unit and a terminal block on which a cold junction sensor is mounted.

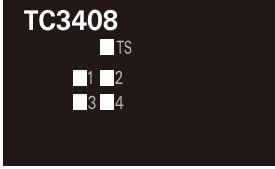
Be sure to use the terminal block and the Temperature Control Unit with the same calibration control number together.

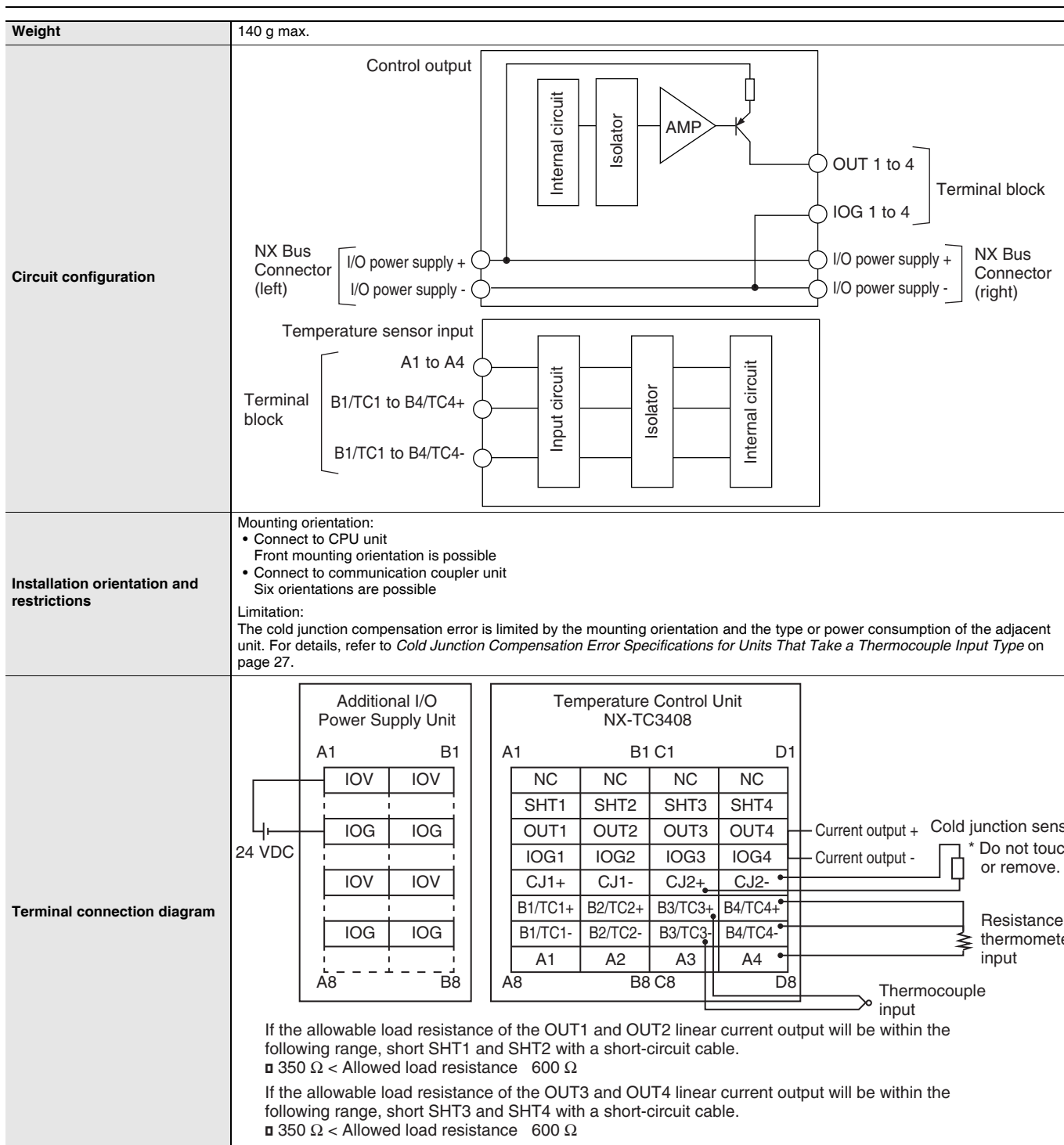
A calibration control number is displayed both on the terminal block and the Unit.

In order to distinguish left and right terminal blocks, each terminal block has either a letter "L" (left side) or "R" (right side) appended at the end of a calibration control number.

Make sure to return the terminal block to which a cold junction sensor is mounted and the Unit together.
- *4. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.

Temperature Control Unit (4-Channel Type) NX-TC3408

Unit name		Temperature Control Unit (4-Channel Type)	Model	NX-TC3408		
Number of Channels		4 channels	Control type	Standard control		
Number of points per channel		<ul style="list-style-type: none"> Temperature input: 1 point per channel (4 points per unit) CT input: None Control Output: 1 point per channel (4 points per unit) 	External connection terminal	Screwless clamping terminal block (16 terminals x 2)		
I/O refreshing method		Free-Run Refreshing				
Indicators		TS indicator and output indicators				
					CT current input range	---
					Input resistance	---
					Connectable CTs	---
					Maximum heater current	---
					Resolution	---
					Overall accuracy (25°C)	---
					Influence of temperature (0 to 55°C)	---
Conversion time	---					
Sensor Input section		<ul style="list-style-type: none"> Thermocouple input: K, J, T, E, L, U, N, R, S, B, C/W, PL II Platinum resistance thermometer input: Pt100 (three-wire), JPt100 (three-wire) 			Control output type and number of control outputs per channel	Linear current output, one output per channel
					Internal I/O common	---
					Control Period	---
					Manipulated variable	-5 to +105%
					Resolution	1/10,000
					Rated Voltage	24 VDC
					Operating Load Voltage Range	15 to 28.8 VDC
					Maximum load current	---
					Maximum Inrush Current	---
					Allowable load resistance	350 Ω or less, or greater than 350 Ω but no more than 600 Ω *4
					Leakage current	---
					Residual voltage	---
Control Output section		Load Short-circuit Protection	---			
		Output range	0 to 20 mA, 4 to 20 mA			
		Overall accuracy (25°C)	±0.3% of full scale, but 1% of full scale at 0 to 4 mA of 0 to 20 mA range			
		Influence of temperature (0 to 55°C)	±0.3% (full scale)			
		Dimensions	24 mm (W) ×100 mm (H) ×71 mm (D)			
		Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)			
		I/O power supply method	Supplied from the NX bus.			
		NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.65 W max. Connected to Communications Coupler Unit 1.25 W max. 			
		Isolation method	<ul style="list-style-type: none"> Between sensor inputs and internal circuitry: Power = Transformer, Signal = Digital isolator Between inputs: Power = Transformer, Signal = Digital isolator Between control output and internal circuit: Photocoupler No isolation between control outputs 			
		Dielectric strength	510 VAC between isolated circuits for 1 minute with a leakage current of 5 mA max.			
Current capacity of I/O power supply terminals	IOG: 0.1 A max. per terminal					
Current consumption from I/O power supply	30 mA max.					



*1. For the setting ranges and indication ranges of the sensors, refer to the *Input types* on page 24.

*2. + 20°C only for the following input type settings:

- 1: JPt100
- 3: JPt100
- 10: T
- 14: U

*3. For details, refer to the *Reference Accuracy and Temperature Coefficient Table* on page 25.

For thermocouple inputs, reference accuracy and cold junction compensation error are guaranteed for a set of a Temperature Control Unit and a terminal block on which a cold junction sensor is mounted.

Be sure to use the terminal block and the Temperature Control Unit with the same calibration control number together.

A calibration control number is displayed both on the terminal block and the Unit.

In order to distinguish left and right terminal blocks, each terminal block has either a letter "L" (left side) or "R" (right side) appended at the end of a calibration control number.

Make sure to return the terminal block to which a cold junction sensor is mounted and the Unit together.

*4. To use an allowable load resistance greater than 350 Ω but not exceeding 600 Ω, either **SHT1** and **SHT2**, or **SHT3** and **SHT4** must be shorted with a shorting cable.

For details, refer to the *NX-series Temperature Control Units User's Manual (Cat. No. W523)*.

*5. For details, refer to *Cold Junction Compensation Error Specifications for Units That Take a Thermocouple Input Type* on page 27.

Input types

The settings are shown in the following table.

Setting name*1	Display of support software	Description	Default	Setting range	Unit	Change application timing
Ch□ input type	Ch□ Input Type	Sets the input type of sensors connected to temperature input.	5: K -200 to 1300°C	*2	No	After unit restart

*1. □ represents the channel number.

*2. The setting range is as follows:

Set values	Input types		Input indication range	Remarks
	Sensor	Input setting range		
0	Pt100	-200 to 850°C/-300 to 1500°F	-220 to 870°C/-340 to 1540°F	Resistance thermometer
1	Pt100	-199.9 to 500.0°C/-199.9 to 900.0°F	-219.9 to 520.0°C/-239.9 to 940.0°F	
2	Pt100	-0.0 to 100.0°C/0.0 to 210.0°F	-20.0 to 120.0°C/-40.0 to 250.0°F	
3	JPt100	-199.9 to 500.0°C/-199.9 to 900.0°F	-219.9 to 520.0°C/-239.9 to 940.0°F	
4	JPt100	-0.0 to 100.0°C/0.0 to 210.0°F	-20.0 to 120.0°C/-40.0 to 250.0°F	
5	K	-200 to 1300°C/-300 to 2300°F	-220 to 1320°C/-340 to 2340°F	
6	K	-20.0 to 500.0°C/0.0 to 900.0°F	-40.0 to 520.0°C/-40.0 to 940.0°F	
7	J	-100 to 850°C/-100.0 to 1500°F	-120 to 870°C/-140 to 1540°F	
8	J	-20.0 to 400.0°C/0.0 to 750.0°F	-40.0 to 420.0°C/-40.0 to 790.0°F	
9	T	-200 to 400°C/-300 to 700°F	-220 to 420°C/-340 to 740°F	
10	T	-199.9 to 400.0°C/-199.9 to 700.0°F	-219.9 to 420.0°C/-239.9 to 740°F	
11	E	-200 to 600°C/-300 to 1100°F	-220 to 620°C/-340 to 1140°F	
12	L	-100 to 850°C/-100 to 1500°F	-120 to 870°C/-140 to 1540°F	
13	U	-200 to 400°C/-300 to 700°F	-220 to 420°C/-340 to 740°F	
14	U	-199.9 to 400.0°C/-199.9 to 700.0°F	-219.9 to 420.0°C/-239.9 to 740°F	
15	N	-200 to 1300°C/-300 to 2300°F	-220 to 1320°C/-340 to 2340°F	
16	R	0 to 1700°C/0 to 3000°F	-20 to 1720°C/-40 to 3040°F	
17	S	0 to 1700°C/0 to 3000°F	-20 to 1720°C/-40 to 3040°F	
18	B	0 to 1800°C/0 to 3200°F	-20 to 1820°C/-40 to 3240°F	
19	C/W	0 to 2300°C/0 to 3200°F	-20 to 2320°C/-40 to 3240°F	
20	PLII	0 to 1300°C/0 to 2300°F	-20 to 1320°C/-40 to 2340°F	

Reference Accuracy and Temperature Coefficient Table

Reference accuracies and temperature coefficients are shown below by input type and measurement temperature.

To convert the temperature unit from Celsius to Fahrenheit, use the following equation.

Fahrenheit temperature (°F) = Celsius temperature (°C) x 1.8 + 32

Set values	Input type		Measurement temperature (°C)	Reference accuracy °C (%) *2	Temperature coefficient °C/°C *3 (ppm/°C *4)
	Sensor	Temperature range (°C) *1			
0	Pt100	-200 to 850	-200 to 300	±1.0 (±0.1%)	±0.1 (±100 ppm/°C)
			300 to 700	±2.0 (±0.2%)	±0.2 (±200 ppm/°C)
			700 to 850	±2.5 (±0.25%)	±0.25 (±250 ppm/°C)
1	Pt100	-199.9 to 500.0	-199.9 to 300.0	±0.8 (±0.12%)	±0.1 (±150 ppm/°C)
			300.0 to 500.0	±0.8 (±0.12%)	±0.2 (±300 ppm/°C)
2	Pt100	0.0 to 100.0	0.0 to 100.0	±0.8 (±0.8%)	±0.1 (±1000 ppm/°C)
3	JPt100	-199.9 to 500.0	-199.9 to 300.0	±0.8 (±0.12%)	±0.1 (±150 ppm/°C)
			300.0 to 500.0	±0.8 (±0.12%)	±0.2 (±300 ppm/°C)
4	JPt100	0.0 to 100.0	0.0 to 100.0	±0.8 (±0.8%)	±0.1 (±1000 ppm/°C)
5	K	-200 to 1300	-200 to -100	±1.5 (±0.1%)	±0.15 (±100 ppm/°C)
			-100 to 400		±0.30 (±200 ppm/°C)
			400 to 1300		±0.38 (±250 ppm/°C)
6	K	-20.0 to 500.0	-20.0 to 400.0	±1.0 (±0.2%)	±0.30 (±600 ppm/°C)
			400.0 to 500.0		±0.38 (±760 ppm/°C)
7	J	-100 to 850	-100 to 400	±1.4 (±0.15%)	±0.14 (±150 ppm/°C)
			400 to 850	±1.2 (±0.13%)	±0.28 (±300 ppm/°C)
8	J	-20.0 to 400.0	-20.0 to 400.0	±1.0 (±0.24%)	±0.14 (±350 ppm/°C)
9	T	-200 to 400	-200 to -100	±1.2 (±0.2%)	±0.30 (±500 ppm/°C)
			-100 to 400		±0.12 (±200 ppm/°C)
10	T	-199.9 to 400.0	-199.9 to -100.0	±1.2 (±0.2%)	±0.30 (±500 ppm/°C)
			-100.0 to 400.0		±0.12 (±200 ppm/°C)
11	E	-200 to 600	-200 to 400	±1.2 (±0.15%)	±0.12 (±150 ppm/°C)
			400 to 600	±2.0 (±0.25%)	±0.24 (±300 ppm/°C)
12	L	-100 to 850	-100 to 300	±1.1 (±0.12%)	±0.11 (±120 ppm/°C)
			300 to 700	±2.2 (±0.24%)	±0.22 (±240 ppm/°C)
			700 to 850		±0.28 (±300 ppm/°C)
13	U	-200 to 400	-200 to 400	±1.2 (±0.2%)	±0.12 (±200 ppm/°C)
14	U	-199.9 to 400.0	-199.9 to 400.0	±1.2 (±0.2%)	±0.12 (±200 ppm/°C)
15	N	-200 to 1300	-200 to 400	±1.5 (±0.1%)	±0.30 (±200 ppm/°C)
			400 to 1000		±0.38 (±250 ppm/°C)
			1000 to 1300		
16	R	0 to 1700	0 to 500	±1.75 (±0.11%)	±0.44 (±260 ppm/°C)
			500 to 1200	±2.5 (±0.15%)	
			1200 to 1700		
17	S	0 to 1700	0 to 1700	±2.5 (±0.15%)	±0.44 (±260 ppm/°C)
18	B	0 to 1800	0 to 400	Reference accuracy cannot be guaranteed	Reference accuracy cannot be guaranteed
			400 to 1200	±3.6 (±0.2%)	±0.45 (±250 ppm/°C)
			1200 to 1800	±5.0 (±0.28%)	±0.54 (±300 ppm/°C)
19	C/W	0 to 2300	0 to 300	±1.15 (±0.05%)	±0.46 (±200 ppm/°C)
			300 to 800	±2.3 (±0.1%)	
			800 to 1500	±3.0 (±0.13%)	
			1500 to 2300		
20	PL II	0 to 1300	0 to 400	±1.3 (±0.1%)	±0.23 (±200 ppm/°C)
			400 to 800	±2.0 (±0.15%)	±0.39 (±300 ppm/°C)
			800 to 1300		±0.65 (±500 ppm/°C)

*1. The decimal point position of the various input types is "no decimal point" or "decimal point 1 digit". When calculating measured value error, round up calculation results in accordance with the decimal point position of the temperature range.