Ordering Information

Temperature Controllers

Size	Power supply voltage	Input type	Alarm output	Control output	Model
E5CB 48 × 48 mm	100 to 240 VAC	Thermocouple	1	Relay output	**E5CB-R1TC**
		Platinum resistance thermometer			**E5CB-R1P**
		Thermocouple		Voltage output (for driving SSR)	**E5CB-Q1TC**
		Platinum resistance thermometer			**E5CB-Q1P**
	24 VAC/VDC	Thermocouple		Relay output	**E5CB-R1TCD**
		Platinum resistance thermometer			**E5CB-R1PD**
		Thermocouple		Voltage output (for driving SSR)	**E5CB-Q1TCD**
		Platinum resistance thermometer			**E5CB-Q1PD**

Accessories (Order Separately)

Terminal Cover

Model	E53-COV19

Front Cover

Type	Model
Hard Front Cover	**Y92A-48B**
Soft Front Cover	**Y92A-48D**

USB-Serial Conversion Cable

Model	E58-CIFQ2

Mounting Adapter (Included)

Model	Y92F-49

Adapter

Model	Y92F-45

Note: 1. Use this Adapter when the Front Panel has already been prepared for the E5B□.
2. Only black is available.

Waterproof Packing (Included)

Model	Y92S-P6

Unit Seal

Model	Y92S-L2

Specifications

Ratings

Power supply voltage		100 to 240 VAC 50/60 Hz, 24 VAC 50/60 Hz, or 24 VDC
Operating voltage range		85% to 110% of rated supply voltage
Power consumption		Approx. 3.5 VA (100 to 240 VAC) Approx. 3.5 VA (24 VAC) Approx. 2.5 W (24 VDC)
Sensor input		Models with thermocouple inputs Thermocouple: K, J, T, R, or S (JIS C 1602-1995, IEC60584-1) Models with platinum resistance thermometer inputs Platinum resistance thermometer: Pt100 (JIS C 1604-1997, IEC60751)
Control output	**Relay output**	SPST-NO, 250 VAC, 3 A (resistive load), electrical life: 100,000 operations, minimum applicable load: 5 V, 10 mA
	Voltage output (for driving SSR)	Output voltage: 12 VDC +25%/−15% (PNP), max. load current: 21 mA, with short-circuit protection circuit
Alarm output	**Relay output**	SPST-NO, 250 VAC, 1 A (resistive load), electrical life: 100,000 operations, minimum load: 5 V, 10 mA
Control method		ON/OFF control or 2-PID control (with auto-tuning)
Setting method		Digital setting using front panel keys
Indication method		7-segment digital display and individual indicators Character height: 16.2 mm (PV)
Other functions		Temperature input shift, run/stop, protection functions, etc.
Ambient operating temperature		−10 to 55°C (with no condensation or icing)/With a three-year guarantee: −10 to 50°C
Ambient operating humidity		25% to 85%
Storage temperature		−25 to 65°C (with no condensation or icing)

Input Ranges

Models with Thermocouple Inputs

Model (temperature input)	Set value	Input type	Range	
			°C	°F
TC input	0	K	–200 to 1,300	–300 to 2,300
	1		–20.0 to 500.0	0.0 to 900.0
	2	J	–100 to 850	–100 to 1500
	3		–20.0 to 400.0	0.0 to 750.0
	4	T	–200 to 400	–300 to 700
	5		–199.9 to 400.0	–199.9 to 700.0
	6	R	0 to 1,700	0 to 3,000
	7	S	0 to 1,700	0 to 3,000

Default setting: 0
Applicable standards (K, J, T, R, S): JIS C1602-1995 and IEC 60584-1

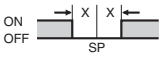
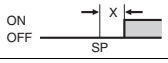
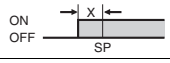
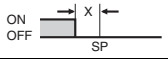
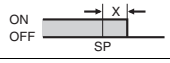
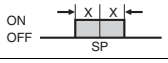
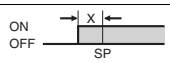
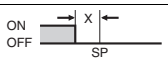
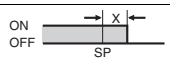
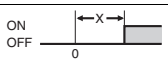
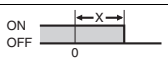
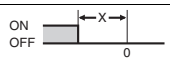
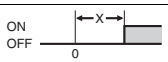
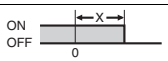
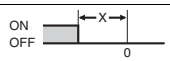
Platinum Resistance Thermometer Input

Model (temperature input)	Set value	Input type	Range	
			°C	°F
Pt input	8	Pt100	–200 to 850	–300 to 1500
	9		–199.9 to 500.0	–199.9 to 900.0

Default setting: 8
Applicable standards (Pt100): JIS C1604-1997 and IEC 60751

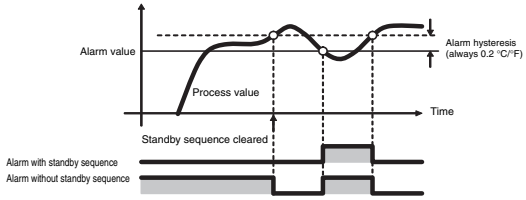
Alarm Types

Select alarm types out of the 11 alarm types listed in the following table.

Setting	Alarm type	Positive alarm value (X)	Negative alarm value (X)	Deviation alarm/absolute value alarm
0	No alarm	Output OFF		
1	Upper/lower limit		Always ON	Deviation alarm
2	Upper limit			Deviation alarm
3	Lower limit			Deviation alarm
4	Upper/lower range		Always OFF	Deviation alarm
5 (See note 2.)	Upper/lower limit standby sequence ON		Always OFF	Deviation alarm
6 (See note 2.)	Upper limit standby sequence ON			Deviation alarm
7 (See note 2.)	Lower limit standby sequence ON			Deviation alarm
8	Absolute value upper limit			Absolute value alarm
9	Absolute value lower limit			Absolute value alarm
10 (See note 2.)	Absolute value upper limit standby sequence ON			Absolute value alarm
11 (See note 2.)	Absolute value lower limit standby sequence ON			Absolute value alarm
12	Do not set.			

Note: 1. The default is 2.
2. Alarms with a Standby Sequence
The alarm is blocked until the first safe-state is reached. Unwanted alarm during start-up are prevented.

Example: Deviation Lower Limit Standby Sequence ON
The standby sequence is cleared when the alarm OFF condition has been met.



The standby sequence is started again when any of the following conditions is met.

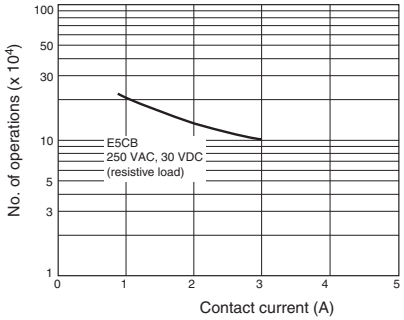
- Operation is started (power is turned ON or operation is switched from stop to run).
- The alarm value is changed.
- The temperature input offset is changed.
- The set point is changed.

Characteristics

Indication accuracy		Thermocouple: (See note 1.) (±0.5% of indicated value or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer: (±0.5% of indicated value or ±1°C, whichever is greater) ±1 digit max.
Influence of temperature (See note 2.)		R and S thermocouple inputs: (±1% of PV or ±10°C, whichever is greater) ±1 digit max. K, J, and T thermocouple inputs: (±1% of PV or ±4°C, whichever is greater) ±1 digit max. Platinum resistance thermometer inputs: (±1% of PV or ±2°C, whichever is greater) ±1 digit max.
Influence of voltage (See note 2.)		
Hysteresis		0.1 to 999.9 (in units of 0.1) °C/°F
Proportional band (P)		0.1 to 999.9 (in units of 0.1) °C/°F
Integral time (I)		0 to 3999 s (in units of 1 s)
Derivative time (D)		0 to 3999 s (in units of 1 s)
Control period		0.5, 1 to 99 s (in units of 1 s)
Alarm setting range		−1999 to 9999 (decimal point position depends on input type)
Input sampling period		250 ms
Affect of signal source resistance		Thermocouple: 0.1°C/Ω max. (100 Ω max.) (See note 3.) Platinum resistance thermometer: 0.6°C/Ω max. (10 Ω max.)
Insulation resistance		20 MΩ min. (at 500 VDC)
Dielectric strength		2,300 VAC, 50 or 60 Hz for 1 min (between terminals with different charge)
Vibration resistance	**Malfunction**	10 to 55 Hz, 20 m/s² for 10 min each in X, Y, and Z directions
	Destruction	10 to 55 Hz, 20 m/s² for 2 hrs each in X, Y, and Z directions
Shock resistance	**Malfunction**	200 m/s², 3 times each in X, Y, and Z directions
	Destruction	300 m/s², 3 times each in X, Y, and Z directions
Weight		Controller: Approx. 100 g, Mounting Bracket: Approx. 10 g
Degree of protection		Front panel: IP66 Rear case: IP20, Terminals: IP00
Memory protection		Non-volatile memory (number of writes: 100,000 times)
Conformed standards	**Certified standards**	UL 61010-1, CSA C22.2 No. 1010-1
	Applicable standards	EN61326, EN61010-1, IEC61010-1 VDE0106, Part 100 (Finger protection), when the terminal cover is mounted.
EMC		EMI EN61326 Emission Enclosure: EN55011 Group1 Class A Emission AC Mains: EN55011 Group1 Class A EMS EN61326 Immunity ESD: EN61000-4-2 Immunity RF-interference: EN61000-4-3 Immunity Burst: EN61000-4-4 Conduction Disturbance Immunity EN61000-4-6 Immunity Surge: EN61000-4-5 Immunity Voltage Dip/Interrupting: EN61000-4-11

Note: 1. The indication accuracy of K and T thermocouples at a temperature of −100°C max. is ±2°C ±1 digit maximum. The indication accuracy of the R and S thermocouples at a temperature of 200°C max. is ±3°C ±1 digit max.
2. Conditions: Ambient temperature: −10 to 23 to 55°C, Voltage range: −15% to ±10% of rated voltage
3. R, and S sensors: 0.2°C/Ω max. (100 Ω max.)

Electrical Life Expectancy Curve for Relays (Reference Values)



USB-Serial Conversion Cable Specifications

Applicable OS	Windows 2000, XP, Vista, or 7
Applicable software	Thermo Mini
Applicable models	E5CB Series
USB interface standard	USB specification 1.1
DTE speed	38,400 bps
Connector Specifications	Computer: USB (Type A plug) Temperature Controller: Special serial connector
Power supply	Bus power (supplied from the USB host controller)
Power supply voltage	5 VDC
Current consumption	450 mA max.
Output voltage	4.7±0.2 VDC (Supplied from USB-Serial Conversion Cable to the Temperature Controller.)
Output current	250 mA max. (Supplied from USB-Serial Conversion Cable to the Temperature Controller.)
Ambient temperature	0 to 55°C (with no condensation or icing)
Ambient humidity	10% to 80%
Storage temperature	−20 to 60°C (with no condensation or icing)
Storage humidity	10% to 80%
Altitude	2,000 m max.
Weight	Approx. 120 g

Note: 1. A high-power port is used for the USB port.
2. A driver must be installed on the computer. Refer to the ***Instruction Manual*** included with the Cable for the installation procedure.

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