

# SPECIFICATIONS

## Ratings

Supply voltage	100 to 240V AC, 50/60 Hz	24 VAC/DC, 50/60 Hz
Operating Voltage Range	85% to 110% of rated supply voltage	
Power Consumption	16VA	12 VA, 8 W
Sensor Input	Thermocouple: K, J, T, E, L, U, N, R, S, B, W, PLII *1, *2 *1, *2 Platinum resistance thermometer: JPt100, Pt100 Voltage input: 4 to 20 mA, 0 to 20 mA (input impedance 150Ω) Current input: 1 to 5 V, 0 to 5 V, 0 to 10 V (input impedance 1MΩ)	
Sub-Input	CT input: E54-CT1, E54-CT3 Potentiometer: 100Ω to 2.5 kΩ	
Control Output	According to output unit (see “Output Unit Ratings and Characteristics” (page A-4))	
Auxiliary Output	SPST-NO, 3 A at 250 VAC (resistive load)	
Control Method	Advanced PID or ON/OFF control	
Setting Method	Digital setting using front panel keys.	
Indication Method	7-segment digital display, bar graph and LEDs	
Other Functions	According to option unit (see “Option Unit Ratings and Characteristics” (page A-4))	
Ambient Temperature	-10°C to 55°C (without condensation and icing)/3-year warranty period: -10 to 50°C	
Ambient Humidity	35% to 85% (relative humidity)	
Storage Temperature	-25°C to 65°C (without condensation and icing)	

\*1 Thermocouple W is W/Re5-26.

\*2 For the setting ranges and indication ranges for each of inputs, see below.

## Characteristics

Indication Accuracy	Thermometer: ( $\pm 0.3\%$ of indication value or $\pm 1^{\circ}\text{C}$ , whichever greater) $\pm 1$ digit max. (*1) Platinum resistance thermometer: ( $\pm 0.2\%$ of indication value or $\pm 0.8^{\circ}\text{C}$ whichever greater) $\pm 1$ digit max. Analog input: $\pm 0.2\%F \pm 1$ digit max. CT input: $5\pm\%FS \pm 1$ digit max. Potentiometer: $\pm 5\%FS \pm 1$ digit max.	
Hysteresis	0.01 to 99.99%FS (in units of 0.1%FS)	
Proportional Band (P)	0.1 to 999.9%FS (in units of 0.1%FS)	
Integral Time (I)	0 to 3999s (in units of 1 second)	(*2)
Derivative Time (D)	0 to 3999s (in units of 1 second)	
Control Period	1 to 99s (in units of 1 second)	
Manual Reset Value	0.0 to 100.0% (in units of 0.1%)	
Alarm Setting Range	-1999 to 9999 (decimal point position dependent on input type)	
Sampling Period	Temperature input: 250 ms, Analog input: 100 ms, Sub-input: 1s	
Program Method	Set time or rate of rise programming	
Program Size	8 patterns, Max. 16 steps/pattern	
Program Time Accuracy	$\pm 0.2\% \pm 500$ ms of set value (even-numbered steps in the "rate of rise programming" setting are set to the time unit of ramp rate)	
Insulation Resistance	20 M $\Omega$ min. (at 500 VDC)	
Dielectric Strength	2000 VAC, 50/60 Hz for 1 min. (between electrically live terminals of different polarities)	
Vibration Resistance	Malfunction	10 to 55 Hz, 10m/s <sup>2</sup> {approx. 1G} for 10 min. each in X, Y, and Z directions
	Destruction	10 to 55 Hz, 10m/s <sup>2</sup> {approx. 2G} for 2 hrs. each in X, Y, and Z directions
Shock Resistance	Malfunction	200 m/s <sup>2</sup> min. {approx. 20G}, 3 times each in 6 directions (100 m/s <sup>2</sup> {approx. 10G} applied to the relay)
	Destruction	300 m/s <sup>2</sup> min. {approx. 30G}, 3 times each in 6 directions
Weight	Approx. 450 g, mounting bracket: approx. 65 g	
Enclosure Ratings	Front panel: NEMA4 for indoor use (equivalent to IP66) Rear case: IP20 Terminals: IP00	
Memory Protection	Non-volatile memory (number of writes: 100,000)	

\*1 The indication accuracy of the K1, T and N thermocouples at a temperature of  $-100^{\circ}\text{C}$  or less is  $\pm 2^{\circ}\text{C} \pm 1$  digit maximum. The indication accuracy of the U, L1 and L2 thermocouples at any temperature is  $\pm 2^{\circ}\text{C} \pm 1$  digit maximum. The indication accuracy of the B thermocouple at a temperature of  $400^{\circ}\text{C}$  or less is unrestricted. The indication accuracy of the R and S thermocouples at a temperature of  $200^{\circ}\text{C}$  or less is  $\pm 3^{\circ}\text{C} \pm 1$  digit maximum. The indication accuracy of the W thermocouple  $\pm 1$  digit max. of whichever is the greater of  $\pm 0.3\%$  or  $\pm 3^{\circ}\text{C}$  of the indicated value. The indication accuracy of the PLII thermocouple is  $\pm 1$  digit max. of whichever is the greater of  $\pm 0.3\%$  or  $\pm 2^{\circ}\text{C}$  of the indicated value.

\*2 On a position-proportional type controllers, 1 to 3999.

\*3 Changes to parameters and switched remote/local settings are written.

## Heater Burnout Alarm

Max. heater current	Single-phase 50 A VAC	
Heater current value indication accuracy	$\pm 5\%FS \pm 1$ digit max.	
Heater burnout alarm setting range	0.1 to 49.9 A (in units of 0.1 A)	(*1)
Min. detection ON time	190 ms	(*2)

\*1 0.0 A: The heater burnout alarm turns OFF. 50.0 A: The heater burnout alarm turns ON.

\*2 No heater burnout detection or heater current value measurement is possible if the control output is ON for less than 190 ms.

## Sensor Input Setting Ranges and Indication Ranges

Input	Setting Range	Indication Range
JPt100	-199.9 to 650.0 (C°) / -199.9 to 999.9 (F°)	-199.9 to 735.0 (C°) / -199.9 to 999.9 (F°)
Pt100	-199.9 to 650.0 (C°) / -199.9 to 999.9 (F°)	-199.9 to 735.0 (C°) / -199.9 to 999.9 (F°)
K1	-200 to 1300 (C°) / -300 to 2300 (F°)	-350 to 1450 (C°) / -560 to 2560 (F°)
K2	-0.0 to 500.0 (C°) / -0.0 to 900.0 (F°)	-50.0 to 550.0 (C°) / -90.0 to 990.0 (F°)
J1	-100 to 850 (C°) / -100 to 1500 (F°)	-195 to 945 (C°) / -260 to 1660 (F°)
J2	-0.0 to 400.0 (C°) / -0.0 to 750.0 (F°)	-40.0 to 440.0 (C°) / -75.0 to 825.0 (F°)
T	-199.9 to 400.0 (C°) / -199.9 to 700.0 (F°)	-199.9 to 460.0 (C°) / -199.9 to 790.0 (F°)
E	0 to 600 (C°) / -0 to 1100 (F°)	-60 to 660.0 (C°) / -110 to 1210 (F°)
L1	-100 to 850 (C°) / -100 to 1500 (F°)	-195 to 945 (C°) / -260 to 1660 (F°)
L2	0.0 to 400.0 (C°) / 0.0 to 750.0 (F°)	-40.0 to 440.0 (C°) / -75.0 to 825.0 (F°)
U	-199.9 to 400.0 (C°) / -199.9 to 700.0 (F°)	-199.9 to 650.0 (C°) / -199.9 to 999.9 (F°)
N	-200.0 to 1300 (C°) / -300 to 2300 (F°)	-199.9 to 460.0 (C°) / -199.9 to 790.0 (F°)
R	0 to 1700 (C°) / 0 to 3000 (F°)	-350 to 1450 (C°) / -560 to 2560 (F°)
S	0 to 1700 (C°) / 0 to 3000 (F°)	-170 to 1870 (C°) / -300 to 3300 (F°)
B	100 to 1800 (C°) / 300 to 3200 (F°)	-170 to 1870 (C°) / -300 to 3300 (F°)
W	0 to 2300 (C°) / 0 to 4100 (F°)	-70 to 1970 (C°) / 10 to 3490 (F°)
PL	0 to 1300 (C°) / 0 to 2300 (F°)	-230 to 2530 (C°) / -410 to 4510 (F°)
4 to 20mA 0 to 20mA 1 to 5V 0 to 5V 0 to 10V	One of following ranges depending on results of scaling -1999 to 9999 -199.9 to 999.9 -19.99 to 99.99 -1.999 to 9.999	-10 to 110% of setting range. Note, however, that max. value is -1999 to 9999.

## Output Unit Ratings and Characteristics

Ratings and characteristics conform to the output unit mounted on the controller. For details on the ratings of the output unit, see Section 2-2 Installation

The relay output unit is already mounted on the E5AK-TPRR[ ].  
(When the output unit is replaced, use the E53-R.)

## Option Unit Ratings and Characteristics

Event inputs	Contact input	ON: 1kΩ max., OFF: 100kΩ min.
	No-contact input	ON: residual voltage 1.5 V max., OFF: leakage current 0.1 mA max.

Communications	Interface	:RS-232C, RS-422 or RS-485
	Transmission method	:Half-duplex
	Synchronization method	:Start-stop synchronization (asynchronous method)
	Baud rate	:1.2/2.4/4.8/9.6/19.2 kbps
Transfer output	DC 4 to 20 mA, Permissible load impedance: 600Ω max., Resolution: Approx. 2600	