

Temperature and Process Control Instrumentation

Omron Smart Solutions

NEW! E5CN-T/E5CN-L

Compact 1/16 DIN size temperature and process controllers feature easy-to-read 11-segment LCD displays; PV can display 3 colors to reflect status.



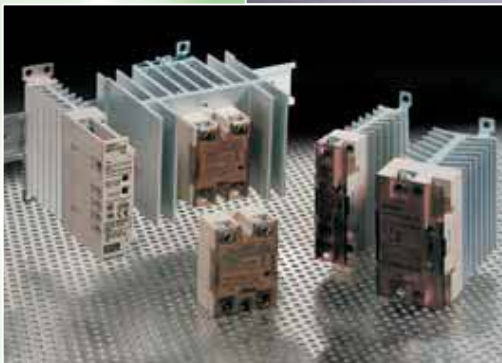
NEW! E5CN-FR

Compact 1/16 DIN size Factory Mutual temperature limit switch prevents runaway heating and cooling control.



E5ZN

Control up to 32 zones with slim 22.5 mm wide modular dual-loop temperature controllers. Fast RS-485 serial communications connects directly to an Omron HMI, PLC or PC for a complete control panel installation.



SSRs

Compact DIN-track mounting solid state relays (SSRs) with built-in heat sinks support frequently cycling loads. Choose single-phase or three-phase models.

TEMPERATURE AND PROCESS CONTROLLERS



E5CN-T/E5CN-U

E5CN-L

E5CN-FR

E5CS-X

Dimensions mm (in)

E5CN-T: 48 H x 48 W x 78 D
(1.89 x 1.89 x 3.07)
E5CN-U: 48 H x 48 W x 84.6 D
(1.89 x 1.89 x 3.33)

48 H x 48 W x 78 D
(1.89 x 1.89 x 3.07)

48 H x 48 W x 97 D
(1.89 x 1.89 x 3.82)

48 H x 48 W x 100 D
(1.89 x 1.89 x 3.94)

Features

- For general purpose applications
- Fast, 250 ms sampling
- PV display with settable three-color switching
- Setting protection indicator
- Connect to thermocouple, infrared, or platinum RTD
- Three-phase heater burnout detection and SSR fault detection available
- Voltage outputs for both heating and cooling control
- Long-life relay output gives 10x conventional relay life
- Plug-in (E5CN-U) models fit standard 11-pin round sockets

- Analog input process controllers for pressure, flow rate, level, humidity, and weight control
- Transfer output allows easy connection to recorder or PLC analog I/O module
- Setting protection indicator
- Long-life relay output gives 10x conventional relay life

- Factory Mutual temperature limit switch prevents runaway heating or cooling control
- Annunciator output for warning lights or buzzers
- Reset limit remotely using event input
- Trace error status
- Two-color switching display

- Tamper-proof setting
- Field-selectable auto-tuning PID or ON/OFF control
- 8-function alarm
- Input shift function

Product type

1/16 DIN temperature controllers

1/16 DIN process controllers

1/16 DIN size Factory Mutual temperature limit switch

1/16 DIN Temperature Controller

Inputs

Thermocouple: K, J, T, E, L, U, N, R, S, or B
Platinum resistance thermometer: Pt100 or JPt100
Infrared sensor: similar to Type K thermocouple

Current: 4 to 20 mA or 0 to 20 mA
Voltage: 1 to 5 V, 0 to 5 V, 0 to 10 V

Thermocouple: K, J, T, E, L, U, N, R, S, or B
Platinum resistance thermometer: Pt100 or JPt100
Infrared sensor: similar to Type K thermocouple

Thermocouple models: Types K (6 ranges), J (5 ranges), Platinum RTD (9 ranges), Thermistor (10 ranges)

Control modes

Auto-tuning 2 PID control or ON/OFF control

Auto-tuning 2 PID or ON/OFF control

Factory Mutual limit output relay

Auto-tuning PID or ON/OFF

Indication accuracy

Thermocouple and Platinum resistance thermometer: ($\pm 0.5\%$ of indicated value or $\pm 1^\circ\text{C}$, whichever is greater) ± 1 digit max. Current transformer: $\pm 5\%$ FS ± 1 digit max.

Analog input: $\pm 0.5\%$ FS ± 1 digit max.

Thermocouple and Platinum resistance thermometer: ($\pm 0.5\%$ of indicated value or $\pm 1^\circ\text{C}$, whichever is greater) ± 1 digit max.

$\pm 0.5\%$ of full scale

Setting accuracy

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Optional functions

Event inputs
Serial communications
Two voltage outputs
Heater burnout detection
SSR failure detection

Event inputs
Serial communications

Event inputs (two)
Serial communications

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Supply voltage

100 to 240 VAC, 50/60 Hz, 24 VAC/VDC

100 to 240 VAC, 50/60 Hz, 24 VAC/VDC

100 to 240 VAC, 50/60 Hz

100 to 240 VAC, 50/60 Hz

Control outputs

Relay output: SPDT-NO, 3 A, 250 VAC
SPDT, 3 A, 250 VAC (E5CN-U)
Voltage output: 12 VDC; PNP;
Max. load current: 21 mA with short circuit protection
Current output: 4-20 mA DC load, 600 ohm max.; 2,700 resolution

Relay output: SPDT-NO, 3 A, 250 VAC
SPDT, 3 A, 250 VAC
Voltage output: 12 VDC; PNP;
Max. load current: 21 mA with short circuit protection
Current output: 4-20 mA DC load, 600 ohm max.; 2,700 resolution

FM Limit: SPST-NO, 3 A, 250 VAC
Alarm: SPST-NO, 1 A, 250 VAC

Relay models (E5CS-R□□X): SPDT, 3 A, 250 VAC; Voltage models (E5CS-Q□□X): 12 VDC, 20 mA with short-circuit protection

PC software

CX-DNC Thermo

CX-DNC Thermo

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Approvals

UL, CSA, CE

UL, CSA, CE

cULus, CE, FM3545/3810

UL, CSA

TEMPERATURE AND PROCESS CONTROLLERS				
				
	E5CK	E5AK and E5EK	E5GN	E5C2
Dimensions mm (in)	48 H x 48 W x 100 D (1.89 x 1.89 x 3.94)	(E5AK) 96 H x 96 W x 100 D (3.78 x 3.78 x 3.94); (E5EK) 96 H x 48 W x 112 D (3.78 x 1.89 x 4.41)	24 H x 48 W x 100 D (0.94 x 1.89 x 3.94)	48 H x 48 W x 86.7 D (1.89 x 1.89 x 3.41)
Features	<ul style="list-style-type: none"> Heat/cool or standard operation Front panel programming Ramp to set point Field replaceable outputs and option boards Water-resistant front panel meets NEMA 4X ratings Heat only or heat/cool 	<ul style="list-style-type: none"> Field replaceable outputs and option boards Six levels of security Heater burnout function Loop break alarm Water-resistant front panel meets NEMA 4X ratings Heat only or heat/cool 	<ul style="list-style-type: none"> For general purpose applications Dual display 22 different input types Auto- and self-tuning functions 	<ul style="list-style-type: none"> Plug and Play temperature controller ON/OFF or PD models Dual scaling analog setting dial (°C or °F) Fits standard 8-pin sockets
Product type	1/16 DIN Process Controller	1/4 DIN (E5AK) and 1/8 DIN (E5EK) Temperature and Process Controllers	1/32 DIN Temperature Controller	1/16 DIN Plug-in Temperature Controller
Inputs	Thermocouples: Types K1, K2, B, L1, L2, J1, J2, T/U, N, E, R/S, W, PI II; RTD: JPt100, Pt100	Thermocouples: Types K1, K2, B, L1, L2, J1, J2, T/U, N, E, R/S, W, PI II; RTD JPt100, Pt100	Thermocouples: Types K1, K2, B, L, J1, J2, T/U, N, E, R/S, ES1A non-contact, type K (four ranges); RTD: JPt100, Pt100	Thermocouples: Types K, J, Platinum RTD, Thermistor
Control modes	Fuzzy adaptive PID, PID, ON/OFF	Fuzzy adaptive PID, PID, ON/OFF	Auto-tuning PID or ON/OFF	ON/OFF or PD, separate models
Indication accuracy	±0.3% of set value	±0.3% of set value	Thermocouple and platinum resistance thermometer: (±5% of indication value or ±1°C, whichever is greater) ±1 digit max. Analog input: ±5%FS ±1 digit max. CT input: ±0.5%FS ±1 digit max.	–
Setting accuracy	–	–	–	±2% of full scale
Optional functions	Communications output: RS-232C, RS-422 or RS-485; Transfer output: 4 to 20 mA; Event input	Communications output: RS-232C, RS422, RS485, BCD; Transfer output: 4 to 20 mA; Event input	Communications output: RS-485	–
Supply voltage	100 to 240 VAC, 50/60 Hz, 24 VAC/DC	100 to 240 VAC, 50/60 Hz, 24 VAC/DC	100 to 240 VAC, 50/60 Hz; 24 VDC	110/120 or 220/240 VAC, 50/60 Hz
Control outputs	Relay/Relay: Pulse voltage/relay (NPN, PNP); Pulse voltage/ voltage (NPN/PNP); Linear current/relay (0 to 20, 4 to 20 mA); Linear Voltage/relay (0 to 10 VDC)	Relay: SPDT, 5 A, 250 VAC; SSR: SPST-NO, 1 A, 75 to 250 VAC; Voltage; 12 VDC, NPN, 40 mA, 24 VDC, NPN, 20 mA, 24 VDC, PNP, 20 mA; Linear current/relay (0 to 20, 4 to 20 mA); Linear voltage/relay (0 to 5, 0 to 10 VDC)	Relay output: SPDT-NO, 2 A, 250 VAC; Voltage output: 12 VDC (PNP); Max. load current: 21 mA with short circuit protection	Relay output: SPDT, 3 A, 250 VAC; Voltage output: 5 VDC, 10 mA
PC software	ThermoTools	ThermoTools	ThermoTools	–
Approvals	UL, CSA, CE	UL, CSA, CE	UL, CSA, CE	UL, CSA, SEV

TEMPERATURE AND PROCESS CONTROLLERS



	E5EN	E5AN	E5ZN	E5AR and E5ER
Dimensions mm (in)	48 W X 96 H X 78 D (1.89 X 3.77 X 3.07)	96 H X 96 W X 96 D (3.77 X 3.77 X 3.77)	Controller: 72.8 H x 22.5 W (2.87 x 0.89) With socket: 130 H x 22.5 W x 112 D (5.12 x 0.89 x 4.41)	E5AR: 96 H X 96 W X 96 D (3.77 X 3.77 X 3.77); E5ER: 48 W X 96 H X 78 D (1.89 X 3.77 X 3.07)
Features	<ul style="list-style-type: none"> • For general purpose applications • Dual digital display • NEMA 4X water-resistant construction • Heating or heating/cooling control 	<ul style="list-style-type: none"> • For general purpose applications • Dual digital display • NEMA 4X water-resistant construction • Heating or heating/cooling control 	<ul style="list-style-type: none"> • For applications that need multi-loop controlling • Can be programmed via communications (RS-485) or E5ZN-SDL display unit • Can combine 16 units for 32 temperature loops • Socket mountable 	<ul style="list-style-type: none"> • Up to 6 event inputs • Up to 2 transfer outputs • RS-485 serial communications • Control up to 4 loops with a single unit
Product type	1/8 DIN size	1/4 DIN size	DIN Process Controller	DeviceNet Compatible Digital Controller
Inputs	Platinum resistance thermometer input: Pt100, JPt100. Thermocouple models: Type K1, K2, J1, T, E, L, U, N, R, S, B; ES1A Non-contact temperature sensor; Analog input: 10 to 50mV.	Platinum resistance thermometer input: Pt100, JPt100. Thermocouple models: Type K1, K2, J1, T, E, L, U, N, R, S, B; ES1A Non-contact temperature sensor; Analog input: 10 to 50mV.	Thermocouples: Types K, J, T, E, L, U, N, R, S, B; Infrared temperature sensor: 10 to 70°C, 60 to 120°C, 115 to 165°C, 160 to 260°C (ES1A series); Voltage input: 0 to 50 mV Platinum resistance thermometer: Pt100, JPt100	Thermocouple: K, J, T, E, L, U, N, R, S, B, W; Platinum resistance thermometer: Pt100; Current input: 4 to 20 mA DC, 0 to 20 mA DC (including remote SP input); Voltage input: 1 to 5 VDC, 0 to 5 VDC, 0 to 10 VDC (including remote SP input); (Input impedance: 150 K for current input, approx. 1 MK for voltage input)
Control modes	Auto-tuning PID control or ON/OFF control	Auto-tuning PID control or ON/OFF control	2-PID or ON/OFF control	2-PID or ON/OFF control
Indication accuracy	Thermocouple and Platinum resistance thermometer: (±0.5% of indicated value or ±1°C, whichever is greater) ±1 digit max. Analog input: ±0.5% FS+1 digit max. CT input: ±5% FS ±1 digit max.	Thermocouple and Platinum resistance thermometer: (±0.5% of indicated value or ±1°C, whichever is greater) ±1 digit max. Analog input: ±0.5% FS+1 digit max. CT input: ±5% FS ±1 digit max.	Thermocouple and platinum resistance thermometer: (±5% of indication value or ±1°C, whichever is greater) ±1 digit max. Analog input: ±5%FS ±1 digit max. CT input: ±0.5%FS ±1 digit max.	Thermocouple input with cold junction compensation: (±0.1% of PV or ±1°C, whichever is greater) ±1 digit max.; Thermocouple input without cold junction compensation: (±0.1% FS or ±1°C, whichever is smaller) ±1 digit; Analog input: ±0.1% FS ±1 digit max.; Platinum resistance thermometer input: (±0.1% of PV or ±0.5°C, whichever is greater) ±1 digit max.; Position-proportional potentiometer input: ±5% FS ±1 digit max.
Optional functions	Communications: RS-232C, RS-485; Multiple set-point event input board; Current transformer.	Communications: RS-232C, RS-485; Multiple set-point event input board; Current transformer.	Heater burn out detection, Multi-SP and run/stop switching using event input communications; Serial communications; RS-485	Communications: RS-485, DeviceNet; 4 event inputs board position proportional control
Supply voltage	100 to 240 VAC, 50/60 Hz; 24 VAC/VDC	100 to 240 VAC, 50/60 Hz; 24 VAC/VDC	24 VDC	100 to 240-VAC models: 50 A max.; 24 VAC/VDC models: 30 A max.DeviceNet power supply: 24 VDC
Control outputs	Relay: SPST-NO, 250 VAC, 3 amps max. (resistive load); Voltage output: 12 VDC (PNP), max. load current: 40 mA Current output: 4 to 20 mA DC	Relay: SPST-NO, 250 VAC, 3 amps max. (resistive load); Voltage output: 12 VDC (PNP), max. load current: 40 mA Current output: 4 to 20 mA DC	Voltage output: 12 VSDC ±15% (PNP); Max. load current: 21 mA, with short-circuit protection circuit; Transistor output: Max. operating voltage: 30 VDC; Max. load current: 100 mA; Residual voltage: 1.5V max.; Leakage current 0.4 mA max.	Voltage (pulse)output: 12 VDC, 40 mA max. with short-circuit protection circuit; Current output: 0 to 20 mA DC, 4 to 20 mA DC; load: 500 K max. (including transfer output) (Resolution: Approx. 54,000 for 0 to 20 mA DC; Approx. 43,000 for 4 to 20 mA DC);Relay output: Position-proportional control type (open, closed) N.O., 250 VAC, 1 A (including inrush current)
PC software	ThermoTools	ThermoTools	CX-DNC Thermo	ThermoTools
Approvals	UL, CSA, CE	UL, CSA, CE	UL, CSA, CE	cRUus, CE

INDUSTRIAL SOLID STATE RELAYS



G3NA

G3PA

G3PB

Dimensions mm (in)	27 H x 58 L x 43 W (1.06 x 2.28 x 1.69)	Consult Omron for specific model dimensions	Consult Omron for specific model dimensions
Switching current range	5 A to 90 A	10 A to 50 A	15 A to 45 A
Features	<ul style="list-style-type: none"> • Ideal for industrial controls • Hockey puck design • Operation indicator standard 	<ul style="list-style-type: none"> • Single-phase • Replaceable power element cartridges • Integrated heat sink • LED indicator and finger protection cover standard features 	<ul style="list-style-type: none"> • Available in single-phase or three-phase • Integrated heat sink • LED indicator and finger protection cover standard features • DIN rail or panel mountable • Available in 240 VAC or 480 VAC outputs
Operating input	4-32 VDC; 75-264 VAC	4 to 30 VDC / 19.2 to 26.4 VAC	9.6 to 30 VDC
Dielectric strength	2,500 VAC	4,000 VAC; 50/60 Hz for 1 min.	2,500 VAC; 50/60 Hz for 1 min.
Zero crossing	Yes	Yes	Yes
Isolation	Phototriac, Photocoupler	Phototriac	Phototriac
Snubber circuit	Yes	Yes	Yes
Life expectancy (MTTF)	100,000 hours	100,000 hours	100,000 hours
Mounting	Panel	DIN rail and panel	DIN rail and panel
Termination	Screw	Screw	Screw
Heat sink	Optional: Y92B -N50, -N100, -N150, -P250, -P250NF	Integrated heat sink	Integrated heat sink
Approvals	UL, CSA, TUV	CE, UL, CSA, VDE	CE, UL, CSA, VDE