OMRON

Digital Temperature Controllers | E5GN

Compact and Intelligent Temperature Controllers

1/32 DIN with Communications Function

- Various temperature inputs: Thermocouple, platinum resistance thermometer, non-contact temperature sensor, and analog inputs.
- Auto-tuning and self-tuning available. Auto-tuning is possible even while self-tuning is being executed.
- Heating or heating/cooling control is available.
- Water-resistant construction (NEMA4X: equivalent to IP66).
- Conforms to UL, CSA, and IEC safety standards as well as CE marking.

48(W) x 24(H) x 100(D) mm

Ordering Information

■ E5GN Standard Models

Size	Power supply voltage	No. of alarm points	Output	Thermocouple model	Platinum resistance thermometer model
1/32 DIN 48(W) x 24(H) x 100(D) mm	100 to 240 VAC	---	Relay	E5GN-RTC	E5GN-RP
			Voltage output (for driving SSR)	E5GN-QTC	E5GN-QP
		1 (see notes 3, 4)	Relay	E5GN-R1TC	E5GN-R1P
			Voltage output (for driving SSR)	E5GN-Q1TC	E5GN-Q1P
	24 VAC/VDC	---	Relay	E5GN-RTC	E5GN-RP
			Voltage output (for driving SSR)	E5GN-QTC	E5GN-QP
		1 (see notes 3, 4)	Relay	E5GN-R1TC	E5GN-R1P
			Voltage output (for driving SSR)	E5GN-Q1TC	E5GN-Q1P

Note: 1. If the heating/cooling function is used, ALM1 will be used for control output and so alarm output will not be available.
2. Control output 2 for heating/cooling control is relay output.
3. Specify the power supply specifications when ordering.

■ E5GN Communication Models

Size	Power supply voltage	Communication function	Output	Thermocouple model	Platinum resistance thermometer model
1/32 DIN 48(W) x 24(H) x 100(D) mm	100 to 240 VAC	RS-485	Relay	E5GN-R03TC-FLK	E5GN-R03P-FLK
			Voltage output (for driving SSR)	E5GN-Q03TC-FLK	E5GN-Q03P-FLK
	24 VAC/VDC		Relay	E5GN-R03TC-FLK	E5GN-R03P-FLK
			Voltage output (for driving SSR)	E5GN-Q03TC-FLK	E5GN-Q03P-FLK

Note: Specify the power supply specifications when ordering.

■ Input Ranges

Platinum Resistance Thermometer Input/Thermocouple Input

	Platinum resistance thermometer input				
Input type	Platinum resistance thermometer				
Name	Pt100			JPt100	
Temperature rangentlp	850 / –200	500.0 / –199.9	100.0 / 0.0	500.0 / –199.9	100.0 / 0.0
Set value	0	1	2	3	4

	Thermocouple input																
Input type	Thermocouple												ES1A Non-contact Temperature Sensor				Analog input
Name	K		J		T	E	L	U	N	R	S	B	K10 to 70°C	K60 to 120°C	K115 to 165°C	K160 to 260°C	0 to 50 mV
Temperature rangentlp	1300 / –200	500.0 / –20.0	850 / –100	400.0 / –20.0	400 / –200	600 / 0	850 / –100	400 / –200	1300 / –200	1700 / 0	1700 / 0	1800 / 100	70 / 0	120 / 0	165 / 0	260 / 0	Usable in the following ranges by scaling: –1999 to 9999 or –199.9 to 999.9
Set value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Applicable standards by input type are as follows:

K, J, T, E, N, R, S, B: JIS C1602-1995
L: Fe-CuNi, DIN 43710-1985
U: Cu-CuNi, DIN 43710-1985
JPt100: JIS C1604-1989, JIS C1606-1989
Pt100: JIS C1604-1997, IEC751

Shaded ranges indicate default settings.

Specifications

■ Ratings

Supply voltage		100 to 240 VAC, 50/60 Hz	24 VAC, 50/60 Hz/24 VDC
Operating voltage range		85% to 110% of rated supply voltage	
Power consumption		7 VA	4 VA/2.5 W
Sensor input		Thermocouple: K, J, T, E, L, U, N, R, S, B Platinum resistance thermometer: Pt100, JPt100 Non-contact temperature sensor: 10 to 70°C, 60 to 120°C, 115 to 165°C, 160 to 260°C Voltage input: 0 to 50 mV	
Control output	**Relay output**	SPST-NO, 250 VAC, 2 A (resistive load), electrical life: 100,000 operations	
	Voltage output	12 VDC (PNP), max. load current: 21 mA, with short-circuit protection circuit	
Alarm output		SPST-NO, 250 VAC, 1 A (resistive load), electrical life: 100,000 operations	
Control method		2-PID or ON/OFF control	
Setting method		Digital setting using front panel keys	
Indication method		7-segment digital display and single-lighting indicator Character height: PV: 7.0 mm; SV: 3.5 mm	
Other functions		According to controller model	
Ambient temperature		–10 to 55°C (with no condensation or icing)	
Ambient humidity		25% to 85%	
Storage temperature		–25 to 65°C (with no condensation or icing)	

■ Characteristics

Indication accuracy	Thermocouple: (±0.5% of indicated value or ±1°C, whichever greater) ±1 digit max. (see note) Platinum resistance thermometer: (±0.5% of indicated value or ±1°C, whichever greater) ±1 digit max. Analog input: ±0.5% FS±1 digit max. CT input: ±5% FS±1 digit max.	
Hysteresis	0.1 to 999.9 EU (in units of 0.1 EU)	
Proportional band (P)	0.1 to 999.9 EU (in units of 0.1 EU)	
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	1 to 99 s (in units of 1 s)	
Manual reset value	0.0% to 100.0% (in units of 0.1%)	
Alarm setting range	-1999 to 9999 (decimal point position depends on input type)	
Sampling period	500 ms	
Insulation resistance	20 MΩ min. (at 500 VDC megger)	
Dielectric strength	2000 VAC, 50 or 60 Hz for 1 min (between different charging terminals)	
Vibration resistance	10 to 55 Hz, 10 m/s^2 for 2 hours each in X, Y and Z directions	
Shock resistance	300 m/s^2, 3 times each in 3 axes, 6 directions (relay: 100 m/s^2)	
Weight	Approx. 90 g	Mounting bracket: approx. 10 g
Protective structure	Front panel: NEMA4X for indoor use (equivalent to IP66), rear case: IP20, terminals: IP00	
Memory protection	EEPROM (non-volatile memory) (number of writes: 100,000)	
EMC	Emission Enclosure: EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A Immunity ESD: EN61000-4-2: 4 kV contact discharge (level 2), 8 kV air discharge (level 3) Immunity RF-interference: ENV50140: 10 V/m (amplitude modulated, 80 MHz to 1 GHz) (level 3), 10 V/m (pulse modulated, 900 MHz) Immunity Conducted Disturbance: ENV50141: 10 V (0.15 to 80 MHz) (level 3) Immunity Burst: EN61000-4-4: 2 kV power-line (level 3), 2 kV I/O signal-line (level 4)	
Approved standards	UL3121-1, CSA22.2 No. 14, E.B.1402C Conforms to EN50081-2, EN50082-2, EN61010-1 (IEC61010-1) Conforms to VDE0106/part 100 (Finger Protection), when the terminal cover is mounted.	

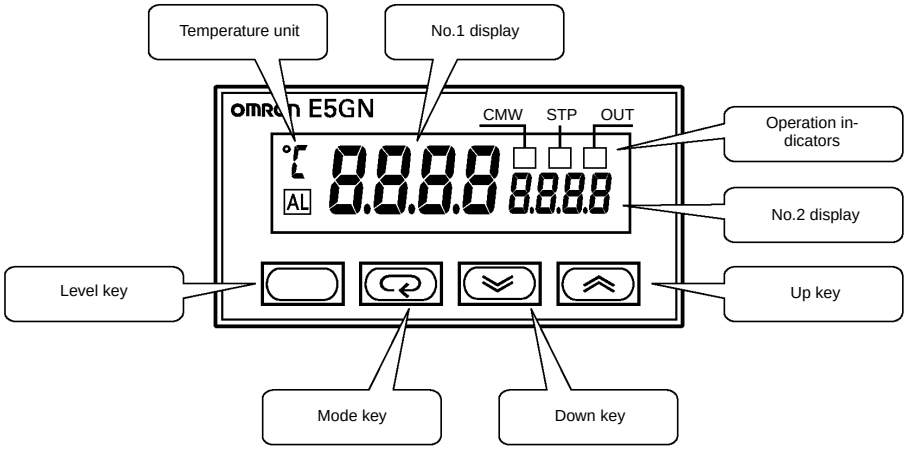
Note: The indication of K thermocouples in the -200 to 1300°C range, and T and N thermocouples at a temperature of -100°C or less, and U and L thermocouples at any temperature is ±2°C±1 digit maximum. The indication of B thermocouples at a temperature of 400°C or less is unrestricted.
The indication of R and S thermocouples at a temperature of 200°C or less is ±3°C±1 digit maximum.

■ Communications Specifications

Transmission path connection	Multiple points
Communications method	RS-485 (two-wire, half duplex)
Synchronization method	Start-stop synchronization
Baud rate	1,200/2,400/4,800/9,600/19,200 bps
Transmission code	ASCII
Data bit length (see note)	7 or 8 bits
Stop bit length (see note)	1 or 2 bits
Error detection	Vertical parity (none, even, odd) Frame check sequence (FCS): with SYSMAC WAY Block check character (BCC): with CompoWay/F
Flow control	Not available
Interface (see note)	RS-485
Retry function	Not available
Communications buffer	40 bytes

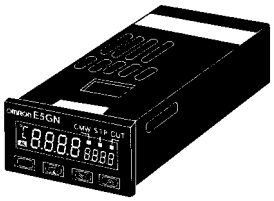
Note: The baud rate, data bit length, stop bit length, or vertical parity can be individually set using the communications setting level.

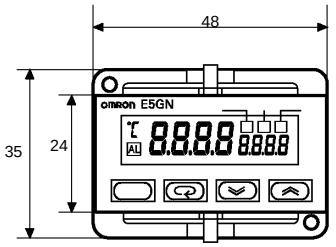
Nomenclature

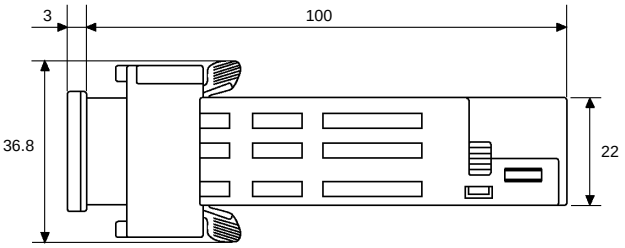


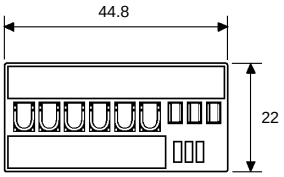
Dimensions

Note: All units are in millimeters unless otherwise indicated.





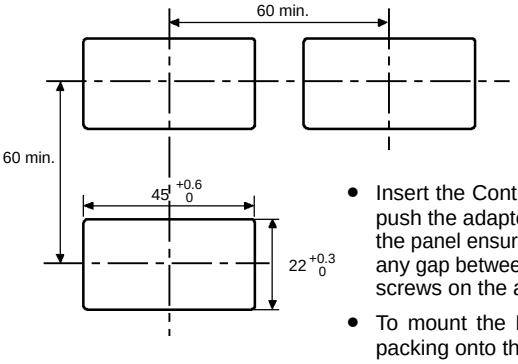




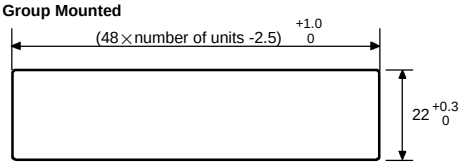
* When carrying out maintenance on the E5GN, only the terminal plate can be drawn out with the terminal leads still attached.

Panel Cutout

Mounted Separately



Group Mounted



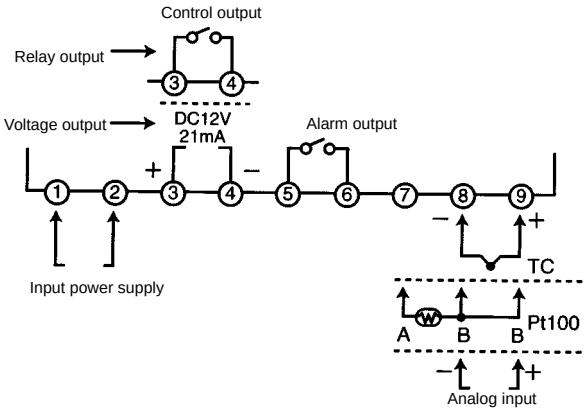
Mounting separately does not allow waterproofing.

- Insert the Controller through the hole in the panel from the front and push the adapter on from the rear. Push the adapter up to the back of the panel ensuring that the controller is pushed all the way in, removing any gap between the Controller, panel, and adapter. Finally, use the two screws on the adapter to secure the unit in place.
- To mount the E5GN so that it is waterproof, insert the waterproof packing onto the E5GN.
- When two or more E5GN Controllers are mounted, make sure that the surrounding temperature does not exceed the allowable operating temperature given in the specifications.

Wiring Terminals

- The voltage output (control output) is not electrically insulated from the internal circuits. When using a grounding thermocouple, do not connect the control output terminals to the ground. If the control output terminals are connected to the ground, errors will occur in the measured temperature values as a result of leakage current.
- Standard insulation is applied to the power supply I/O sections. If reinforced insulation is required, connect the input and output terminals to a device without any exposed current-carrying parts or to a device with standard insulation suitable for the maximum operating voltage of the power supply I/O section.

■ E5GN



Two input power supplies are available:
100 to 240 VAC or 24 VAC/VDC (no polarity).

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.