

E5GN Temperature controller



EN Instruction Manual

Thank you for purchasing the OMRON E5GN temperature controller. Read this manual carefully before using the controller and always keep it close at hand while the controller is in use.

OMRON CORPORATION

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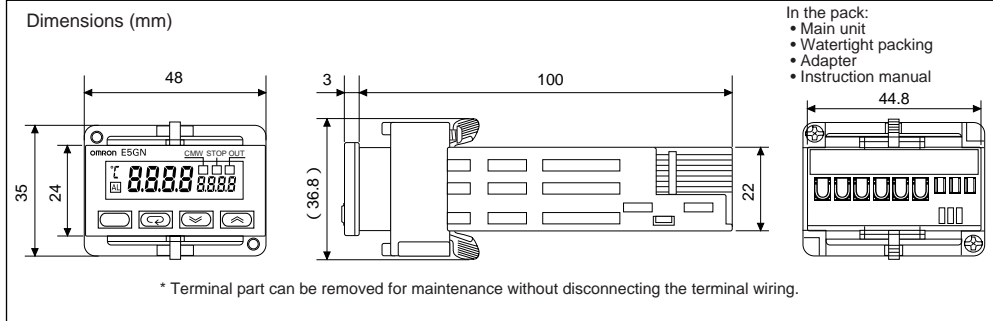
For detailed operating instructions, please refer to the E5GN User's Manual.

Safety Precautions

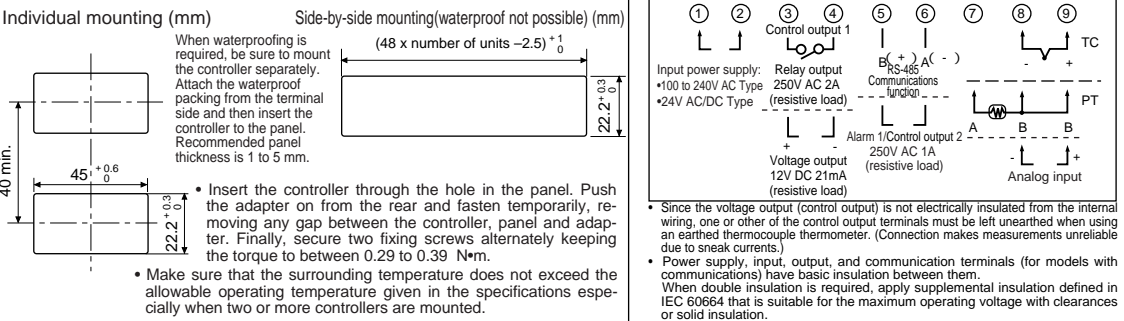
- Key to Warning Symbols**
- CAUTION** (Triangle with exclamation mark): Indicates a potentially hazardous situation which, if not avoided, is likely to result in minor or moderate injury or property damage. Read this manual carefully before using the product.

Wiring

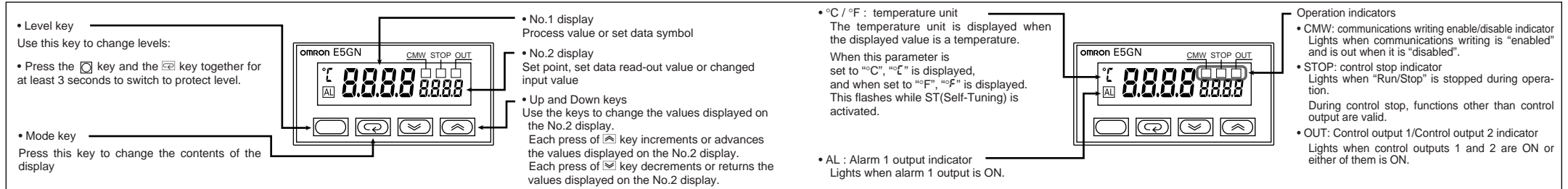
Dimensions



Installation



Names of parts on front panel



Operation menu

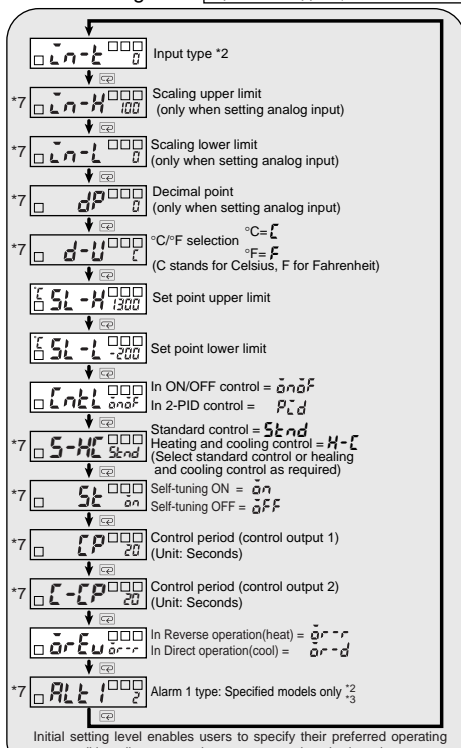
Input type

Input type	Input	Setting	Setting range
Platinum resistance thermometer	Pt100	0	-200 to 850 (°C) / -300 to 1500 (°F)
		1	-199.9 to 500.0 (°C) / -199.9 to 900.0 (°F)
	JPt100	2	0.0 to 100.0 (°C) / 0.0 to 210.0 (°F)
		3	-199.9 to 500.0 (°C) / -199.9 to 900.0 (°F)
Thermocouple	K	0	-200 to 1300 (°C) / -300 to 2300 (°F)
		1	-20.0 to 500.0 (°C) / 0.0 to 900.0 (°F)
		2	0.0 to 100.0 (°C) / 0.0 to 210.0 (°F)
	J	2	-100 to 850 (°C) / -100 to 1500 (°F)
		3	-20.0 to 400.0 (°C) / 0.0 to 750.0 (°F)
	T	4	-200 to 400 (°C) / -300 to 700 (°F)
		17	-199.9 to 400.0 (°C) / -199.9 to 700.0 (°F)
	E	5	0 to 600 (°C) / 0 to 1100 (°F)
		6	-100 to 850 (°C) / -100 to 1500 (°F)
		U	-200 to 400 (°C) / -300 to 700 (°F)
	N	8	-200 to 1300 (°C) / -300 to 2300 (°F)
		9	0 to 1700 (°C) / 0 to 3000 (°F)
	R	9	0 to 1700 (°C) / 0 to 3000 (°F)
		S	10
	B	11	100 to 1800 (°C) / 300 to 3200 (°F)
12		0 to 90 (°C) / 0 to 190 (°F)	
Infrared	10-70	0 to 90 (°C) / 0 to 190 (°F)	
	13	0 to 120 (°C) / 0 to 240 (°F)	
Thermosensor ES1B	115-165	0 to 165 (°C) / 0 to 320 (°F)	
	140-260	0 to 260 (°C) / 0 to 500 (°F)	
Analog input	0 to 50mV	16	Use the following ranges for scaling: -1999 to 9999, -199.9 to 999.9

Alarms

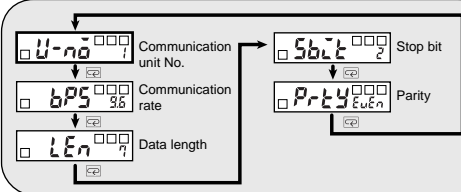
Setting	Alarm type	Alarm output function
		Positive alarm value (X) Negative alarm value (X)
0	No alarm function	Output off
1	Deviation upper/lower limit	Vary with "L", "H" values
		Vary with "L", "H" values
2	Deviation upper limit	Vary with "L", "H" values
		Vary with "L", "H" values
3	Deviation lower limit	Vary with "L", "H" values
		Vary with "L", "H" values
4	Deviation upper/lower range	Vary with "L", "H" values
		Vary with "L", "H" values
5	Deviation upper/lower limit standby sequence ON	Vary with "L", "H" values
		Vary with "L", "H" values
6	Deviation upper limit standby sequence ON	Vary with "L", "H" values
		Vary with "L", "H" values
7	Deviation lower limit standby sequence ON	Vary with "L", "H" values
		Vary with "L", "H" values
8	Absolute value upper limit	
9	Absolute value lower limit	
10	Absolute value upper limit standby sequence ON	
11	Absolute value lower limit standby sequence ON	

Initial setting level

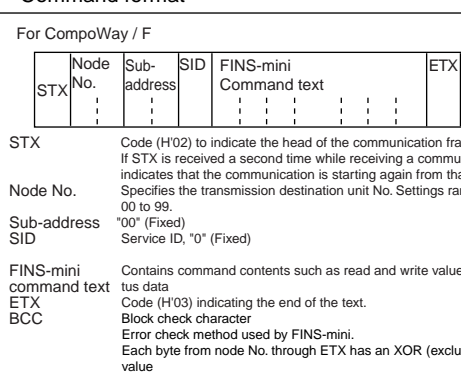


*2: Refer to the adjoining tables for details of input types and alarm types.

Communication setting level



Command format



Adjustment level

Setting	Adjustment level
7: AT execute = $\bar{0}n$ AT cancel = $\bar{0}FF$	Derivative time (Unit: secs)
7: $\bar{0}r-r$ Communication write *4	Cooling coefficient
7: $\bar{0}r-c$ Temperature input shift (Unit: °C or °F)	Dead band
7: $\bar{0}r-u$ Input shift upper limit (When Infrared Thermosensor ES1A selected)	Manual reset value (Unit: %)
7: $\bar{0}r-l$ Input shift lower limit (When Infrared Thermosensor ES1A selected)	Hysteresis (Control output 1)
7: $\bar{0}r-p$ Proportional band	Hysteresis (Control output 2)
7: $\bar{0}r-t$ Integral time (Unit: secs)	

Restricts which settings can be displayed or changed, and restricts change by key operation.

Operation / Adjustment protection

The following table shows the relationship between settings and protect limits related to Operation level and Adjustment level.

Level	Set value	
Operation level	Process value	
Adjustment level	Others	
0	0	0
1	1	1
2	2	2
3	3	3

Default setting: 0

- Can be displayed and changed
- Can be displayed
- Can not be displayed and change to other levels not possible

Initial setting/Communications protection

This protect level restricts movement to the initial setting level, communications setting level and advanced function setting level.

Set value	Initial setting level	Communications setting level	Advanced function setting level
0			
1			
2	x	x	x

Default setting: 1

- Change to other levels possible
- Change to other levels not possible

Setting change protection

Setting changes by key operation are restricted.

OFF " $\bar{0}FF$ ": Setting can be changed by key operation

ON " $\bar{0}n$ ": Setting cannot be changed by key operation (Protect level settings can all be changed.)

Termination code (For CompoWay / F)

Termination code	Name	Description
00	Normal termination	
0F	Command error	Unexecutable command received
10	Parity error	Parity mismatch
11	Framing error	No stop bit detected
12	Overrun	Receive buffer overflowed
13	BCC error	BCC mismatch
14	Format error	Incorrect data length
16	Sub-address error	Incorrect sub-address
18	Frame length error	When the receive frame exceeds the specified byte count

Controller attribute read-out

Use this function to check the controller's format and communication buffer size.

Command

STX	Node No.	Sub-address	SID	MRC	SRC	ETX/BCC
		0:0	0	0:5	0:3	

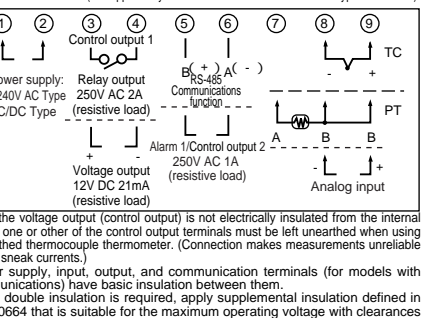
Response

STX	Node No.	Sub-address	Termination code	MRC	SRC	Response code	Format	Buffer size	ETX/BCC
				0:5	0:3			4	1 1

Specifications

- Power supply voltage:** 100-240V AC type, 24V AC/DC type
- Operating frequency:** 50-60Hz
- Operating voltage range:** 85 to 110% of the rated voltage
- Power consumption:** Approx. 7VA (AC100-240V), Approx. 4VA (AC24V), Approx. 2.5W (DC24V)
- Indication accuracy:** Thermocouple, platinum resistance thermometer: (±0.5% of indication value or ±1°C, which is greater) ±1 digit max. Analog input: ±0.5% FS ±1 digit max.
- Control output 1:** Relay output (SPST-NO, 250VAC 2A (resistive load)), Voltage output 12VDC 21mA
- Control output 2:** SPST-NO, 250VAC, 1A (resistive load), electrical life: 100,000 operations
- Alarm output (control output 2):** -10 to 55°C (Avoid freezing or condensation)
- Ambient humidity:** RH 25 to 85% (Avoid freezing or condensation)
- Storage temperature:** -25 to 65°C (Avoid freezing or condensation)
- Altitude:** Max. 2,000m
- Recommended fuse:** T2A, 250V AC, time-lag, low-breaking capacity
- Weight:** Approx. 90g (main unit only)
- Installation environment:** Setup category II, pollution degree 2 (as per IEC61010-1)

Connections



AT (auto-tuning)

AT in Adjustment level

Designate " $\bar{0}n$ ": AT execute" to execute AT and " $\bar{0}FF$ ": AT cancel" to cancel AT.

Also when AT execution ends, the display automatically returns to " $\bar{0}FF$ ".

Error display (trouble shooting)

When an error has occurred, the No.1 display alternately indicates error codes together with the current display item.

No.1 display	Meaning	Action	Status at error
			Control output Alarm
5Err (S. Err)	Input error *6	Check the wiring of inputs, disconnections, shorts and input type.	OFF
	A/D converter error *6	After the correction of input error, turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF
E !!! (E111)	Memory error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF

If the input value exceeds the display limit (-1999~-199.9) to 9999(999.9), though it is within the control range, [Err] will be displayed under -1999~-199.9 and [Err] above 9999(999.9). Under these conditions, control output and alarm output will operate normally. Refer to "E5GN User's Manual" for details of control range.

Other functions

In addition to the aforementioned, there are alarm hysteresis, automatic return of display mode and others in the advanced setting level.

Refer to "E5GN User's Manual" for details.

For communications details, please refer to "E5AN/ENC/N/GN communications User's Manual".

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