

A

Temperature
Controller

UX100

Multi input/output digital temperature controller

- PID auto tuning.
- Group PID 3 types.
- Scaling and input compensation function.
- Heating/cooling control
- Communication(RS485)



Suffix code

model	code	Description
UX100 -	☐ ☐	Multi input/output temperature controller, 48(W) X 24(H) mm
Control type	0	Universal type
	1	Heating/cooling control (but heating side cannot use relay)
Options	0	None
	1	Communication function (RS 485)

INDUSTRIAL AUTOMATION

Specification

Input

Thermocouple	K, J, E, T, R, B, S, L, N, U, W, PL2
RTD input	Pt 100 Ω , KPt 100 Ω (Old)
DC rated voltage	1 – 5 V DC, –10 – 20 mV, 0 – 100 mV, 4 – 20 mA (attach 250 Ω external resistance)
Input sampling time	250 ms
Input display resolution	Usually less than the decimal points of "measurement range chart"
Input impedance	Thermocouple and DC rated voltage (mV) : min 1 M Ω , DC voltage input (V) : approx 1 M Ω
Allowable signal source resistance	Thermocouple (max 250 Ω), DC voltage (Max 2 k Ω)
Allowable wiring resistance	RTD (max 10 Ω , however resistance among 3 wires should be same)
Allowable input voltage	Within ± 10 V (thermocouple, RTD, DC voltage (mV)), within ± 20 V (DC voltage (V))
Scaling	0.0 % ~ 100.0 % of FS (SL–L ~ SL–H within)
Input compensation	–100.0 % ~ 100.0 % of FS
Cold junction compensation error	± 1.5 $^{\circ}\text{C}$ (15 ~ 35 $^{\circ}\text{C}$), ± 2.0 $^{\circ}\text{C}$ (0 ~ 50 $^{\circ}\text{C}$)
Input signal break detection	OFF, UP/DOWN Scale selection (thermocouple), UP Scale (RTD)

Performance

Display accuracy	±0.5 % of FS ±1 Digit. thermocouple (K, J, E, T, L, U, W, PL2) ±1.0 % of FS ±1 Digit. thermocouple (N) ±0.2 % of FS ±1 Digit. RTD(KPt100 Ω, Pt100 Ω), DV voltage
External Power supply	24 V DC, 20 mA max (cannot be used when using Retransmission output)
Insulation resistance	Min 20 MΩ (500 V DC) Between 1st terminal–2nd terminal–earth terminal
Dielectric strength	2,300 V AC, 50 / 60 Hz, for 1 min (between 1st terminal–2nd terminal–earth terminal) 1,500 V AC, 50 / 60 Hz, for 1 min (between 2nd terminal–F,G)

Control function and output

Control type	PID auto tuning
Control action	a) temporal selection of reverse action (heating) and direct action (cooling) (due to the selection of parameter) b) heating/cooling synchronous control
Range setting	Please refer to the range and input code
Auto tuning 2 types	Target value/low target value auto tuning selection
Proportional band	0.1 ~ 999.9 % (heating/cooling type : 0.0 ~ 999.9 %)
Integral time	OFF, 1 ~ 6,000 sec
Differential time	OFF, 1 ~ 6,000 sec
A.R.W(Anti Reset Wind-up)	Auto, 50.0 ~ 200.0 % (Proportional band)
ON/OFF control	Select the output types by parameter
PID selection	Group PID selection
Proportional cycle	1 ~ 1000 sec
Manual reset	Possible to set as manual reset when integral time is OFF
Amount of output with input break	-5.0 ~ 105.0(regular type), 0.0 ~ 105.0 %(heating/cooling type)
Regular type hysteresis	0.0 ~ 100.0 % of FS. but, ON/OFF control
Heating/cooling type hysteresis	0.0 ~ 100.0 % of FS. but, ON/OFF control
Heating/cooling dead zone setting	-100.0 ~ 50.0 % (proportional band)
Fuzzy function	Function selected by parameter
Ramp function	Select the amount of output slope regarding the set temperature (setup temperature/time (min))
Retransmission output type	Present value/set value/amount of output/external Power supply (24 V DC, 20 mA max) selection
Retransmission output scaling	By the limitation of set range or scaling setting
Alarm setting range	0~100% of range (absolute alarm), ±100 % (deviation alarm)
Alarm hysteresis	0.0 ~ 100.0 % of range
Alarm type	Select by the parameter selection refer to "alarm type of code"

A

Temperature
Controller

● Output

Control output	Relay	Contact composition : 1 a Contact capacity : 240 V AC 1 A, 30 V DC 1 A (resistive load) Time resolving power : smaller one between 0.1 % and 10 ms
	SSR	Approx. more than 24 V DC (min 600 Ω resistive load), with disconnection, limit within approx 30 mA Time resolving power : smaller one between 0.1 % and 10 ms
	SCR	4 – 20 mA DC (resistive load less than 600 Ω) Accuracy : ± 0.5 % of FS (range 4 – 20 mA DC) Resolving power : approx. 3,000
Alarm output	Relay	Contact composition : 1 a. ※ 6–7 terminal Contact capacity : 240 V AC, 1 A, 30 V DC 1 A (resistive load) Output point : different depends on spec of the models (refer to the connection diagram)
Retransmission output	RET	4 – 20 mA DC (resistive load less than 600 Ω), ※ 4–5 terminal Accuracy : ± 0.5 % of FS (range 4 – 20 mA DC) Resolving power : approx. 3,000

● Control output composition

	Output selection	Control output (OUT1)	
		Using terminal ⑥–⑦	Using terminal ④–⑤
Regular type	0	ON/OFF control output	Retransmission output (RET)
	1	Alarm output	SSR
	2	Alarm output	SCR (4 – 20 mA DC)
	3	Relay control output	Retransmission output(RET)
Heating/ Cooling type	Output selection	Heating side (OUT1)	Cooling side (OUT2)
		Using terminal ④–⑤	Using terminal ⑥–⑦
	4	SSR	Relay
	5	SCR (4 – 20 mA DC)	Relay

General specification

Power supply voltage	100 – 240 V AC, 50 – 60 Hz
Voltage fluctuation	± 10 % of Power supply voltage
Power consumption	10 VA max.
Ambient temperature	0 ~ 50 °C
Ambient humidity	35 ~ 85 % RH (without dew condensation)
Storage temperature	-25 ~ 65 °C
Vibration resistance	10 – 55 Hz, peak amplitude 0.75 mm for 2 hrs each in 3 axis direction
Shock resistance	300 $\frac{m}{s^2}$, 3 times each in 3 axes direction
Weight	94 g

Range and input code

Classification	Code	Input	Range	Accuracy
Thermocouple (TC)	1	K	-200 ~ 1,370 *2	±0.5 % of FS ±1 digit
	2	K	-199.9 ~ 999.9 *2	
	3	J	-199.9 ~ 999.9 *2	
	4	E	-199.9 ~ 999.9 *2	
	5	T	-199.9 ~ 400.0 *2	
	6	R	0 ~ 1700 *2	
	7	B	0 ~ 1800 *1	
	8	S	0 ~ 1700	
	9	L	-199.9 ~ 900.0 *2	
	10	N	-200 ~ 1300	±1.0 % of FS ±1 digit
	11	U	-199.9 ~ 400.0 *2	±0.5 % of FS ±1 digit
	12	W	0 ~ 2300	
	13	PL2	0 ~ 1390	
RTD	20	KPt100 Ω	-199.9 ~ 500.0 *3	±0.5 % of FS ±1 digit
	21	Pt100 Ω	-199.9 ~ 640.0 *3	
DC voltage	30	1 - 5 V	1 - 5 V	
	32	-10 - 20 mV	-10 - 20 mV	±0.5 % of FS ±1 digit
	33	0 - 100 mV	0 - 100 mV	
DC current	30	4 - 20 mA		

*1 : range 0 ~ 400 °C : ±10 % of FS ±1 Digit

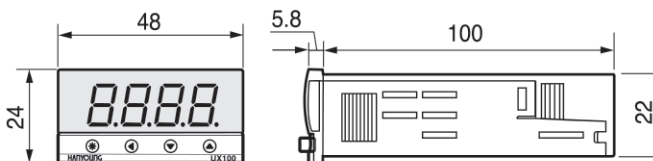
*2 : less than 0 °C : ±1.0 % of FS ±1 Digit

*3 : less than -150.0 ~ 150.0 °C : ±1.0 % of FS ±1 Digit

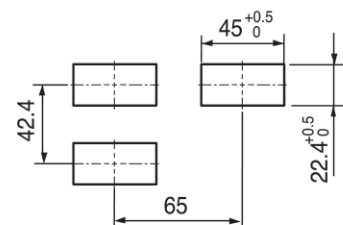
※ When using 4 - 20mA DC current input, please select input code #30 and attach 250 ohm 0.1% resistance at the both terminal of input terminal

Dimension and panel cutout (unit : mm)

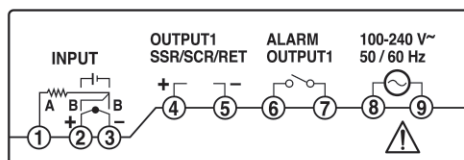
Dimension



Panel cutout



Connection diagram



※ RS485/422 communication(cable length: 300mm)



A

Temperature
Controller

Alarm type and code

(Cautious): Display lamp will be ON when output becomes OFF in inverted type.

Hysteresis



(Δ : Set value, $-\Delta$: minus alarm set value, Δ : alarm set value)

Code number	Alarm type	Operation diagram
1	high absolute (proper)	
2	low absolute (proper)	
3	high deviation (proper)	
4	low deviation (proper)	
5	high deviation (Inverted)	
6	low deviation (Inverted)	
7	high/low deviation	
8	within high/low deviation	
9	high absolute (Inverted)	
10	low absolute (Inverted)	
11	high absolute (proper, Hold function)	
12	low absolute (proper, Hold function)	
13	high deviation (proper, Hold function)	
14	low deviation (proper, Hold function)	
15	high deviation (Inverted, hold function)	
16	low deviation (Inverted, hold function)	
17	high/low deviation (hold function)	
18	within high/low deviation (Hold function)	
19	high absolute (Inverted, hold function)	
20	low absolute (Inverted, hold function)	