

RT9

Mini recorder

- Temperature record and temperature control
- Zoom function, graphic or characters recording
- Display accuracy 0.3 % of FS, Sampling time 250 ms
- Group PID auto-tuning
- Universal input/output
- Communication function(RS 485/422)



B
Recorder

●● Suffix code

Model	Code	Description
RT9-	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Mini recorder 96(W) × 96(H) mm
Control type	0	Exclusive for recorder
	1	Record and temperature control
Unit selection	0	(°C) Celsius(only)
	1	Etc
Optional	0	None
	1	Alarm output 1 contact (AL1)
	2	Alarm output 2 contact (AL1, AL2)
	3	Communication (RS485)
	4	Communication (RS485) / alarm 1 contact (AL1)
	5	Communication (RS485) / alarm 2 contact (AL1, AL2)

●● Specification

Input

Thermocouple	K, J, E, T, R, B, S, L, N, U, W, PL2
RTD	Pt100 Ω, JPt100 Ω
DC voltage	1 - 5 V DC, 0 - 10 V DC
	-10 - 20 mV, 0 - 100 mV
DC current	4 - 20 mA (attach the external resistance 250 Ω)
Sampling time	250 ms
Input display resolving power	Less than the decimal point of measurement range chart
Input impedance	Thermocouple and DC voltage input(mV) : 1 MΩ min. DC voltage input(V) : approx. 1 MΩ.
Allowable signal resistance	Thermocouple (250 Ω max), DC voltage (2 KΩ max)
Allowable wiring resistance	RTD 10 Ω max. (but resistance among 3 wires must be same)
Allowable rated voltage	Within ±10 V(thermocouple, RTD, DC voltage(mV)). within ± 20 V (V (DC voltage(V))).
Standard contact compensation error	±1.5 °C (15 ~ 35 °C), ±2.0 °C (0 ~ 50 °C)
Input break detection	OFF, UP/DOWN scale selection (thermocouple), UP scale (RTD), detecting current(approx. 50 mA)

Function

Display accuracy	$\pm 0.3\%$ of FS ± 1 Digit. Thermocouple (K, J, E, T, R, B, S, L, U, W, PL2)
Recording accuracy	$\pm 1.0\%$ of FS ± 1 Digit. Thermocouple (N) $\pm 0.3\%$ of FS ± 1 Digit. RTD (Pt100 Ω , JPt100 Ω), DC voltage
Insulation resistance	20 M Ω max (500 V DC) in between of 1st terminal–2nd terminal–earth terminal
Dielectric strength	2,300 V AC 50/60 Hz, 1 minute (1st terminal–2nd terminal–earth terminal) 1,500 V AC 50/60 Hz, 1 minute (2nd terminal–F.G)

* For the detailed indicating accuracy, please refer to the range and input code range.

Record specification

Measurement channel number	1 channel
Response time	Varies depending on the recording speed
Recording type	Thermal line
Letter type	203 dpi (8 dots/mm), 340 dot/Line
Recording paper check	When recording paper runs out, recording operation will be stopped and P-END indicating lamp which located on the front side will be lighted.
Recording paper width	57.5 mm (Approx. 16 m)
Other functions	Set the recording paper speed (24 ~ 900 mm/h), Zoom function
	Recording operation run / stop selectable, Feed recording paper
	Graphic / text recording selectable, parameter data list
	Time setting (set year, month, day, hour, minute and sec)

Main function

PID auto computation

Control by the zone selection

Ramp function

Zoom function

Fuzzy function

Output limit setting function

Set output in emergency

Alarm output (hold function)

Graphic print/text print/list print

Control function and output

Input compensation	-100.0 % ~ 100.0 % of FS
Scaling	0.0 % ~ 100.0 % of FS (SL-L ~ SL-H within the range)
Input filter	OFF, 1 ~ 120 sec
PID group	3 kinds
Control type	Selecting control zone, fuzzy operation and RAMP operation
Control action	Temporal selection of reverse action (heating) / direct action (cooling) (due to the parameter setting)
Auto-tuning 2 type	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 type by the parameter
Hysteresis	0.0 ~ 100.0 % of FS ON/OFF control
PID selection	Zone PID/AUTO 1, 2, 3 selection
Manual reset	Possible to set manual reset when integral time is OFF
Amount of output when input breaks	-5.0 ~ 105.0
Fuzzy function	Selecting function by the parameter
Ramp function	Selecting slope of an output amount regarding the set temperature (set temperature/time (min))
Alarm setting range	0 ~ 100 % of range (absolute alarm). ±100 % (deviation alarm)
Alarm hysteresis	0.0 ~ 100.0 % of range
Alarm type	Please refer to the "alarm type and code" such as high absolute, low absolute and etc

● Output

Control output	Relay	Contact capacity : 1 c, 240 V AC, 3 A. 30 V DC 3 A (Resistive load) Proportional time : 1 ~ 1,000 sec (PID, ON/OFF) Output limitation : 0.0 ~ 100.0 % Hysteresis : 0 ~ 100 % of FS Time resolving power : smaller one of 0.1 % or 10 ms
	SSR	Approximately more than 24 V d.c (Resistive load min 600 Ω) and when disconnected, limits within approx. 30 mA Proportional time : 1 ~ 1,000 sec / Output limitation : 0.0 ~ 100.0 % Time resolving power : smaller one of 0.1 % or 10 ms
	SCR	4 - 20 mA DC (Resistive load min 600 Ω) Accuracy : ±0.5 % of FS (4 - 20 mA), resolving power : approx 3,000 Output limitation : 0.0 ~ 100.0 %
Alarm output	AL1 AL2	1a X 2 contact (AL1, AL2) 240 V AC, 1 A. 30 V DC 1 A (Resistive load)

● Control output parameter selection

Output selection	Control output (OUT)	
	Relay	SSR/SCR
0	Relay (ON/OFF)	-
1	-	SSR
2	-	SCR
3	Relay (PID)	-

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 (dew condensation not allowed)
Storage temperature	-25 ~ 65 °C
Vibration resistance	10 – 55 Hz, peak amplitude 0.75 mm, for 2 hr each in 3 axis direction
Shock resistance	300 m/s ² , 3 times each in 3 axes direction
Weight	530 g

Range and input code

Category	Code	Input	Range (°C)	Accuracy	
Thermocouple	1	K	-200 ~ 1,370 *2	±0.3 % 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	±0.3 % of FS, ±1 Digit	
	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	±0.3 % of FS, ±1 Digit
		12	W	0 ~ 2300	
		13	PL2	0 ~ 1390	
RTD	20	KPt100 Ω	-199.9 ~ 500.0 *3	±0.3 % of FS, ±1 Digit	
	21	Pt100 Ω	-199.9 ~ 640.0 *3		
DC voltage	30	1 – 5 V	1 – 5 V	-1999 ~ 9999 (SL-L ~ SL-H)	
	31	0 – 10 V	0 – 10 V		
	32	-10 – 20 mV	-10 ~ 20 mV		
	33	0 – 100 mV	0 ~ 100 mV		
DC current	30※	4 – 20 mA	※ 250 Ω ±0.1 % external resistance attached at the input terminal		

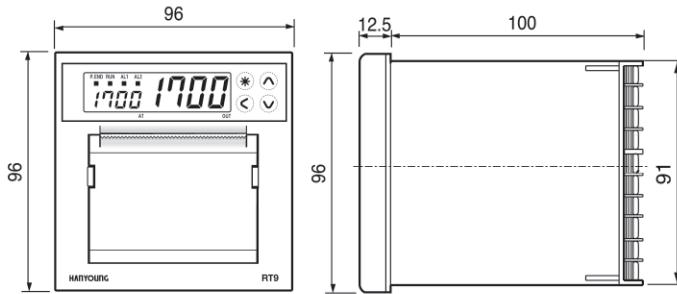
• 1 : 0 ~ 400 °C Range : ±10 % of FS, ±1 Digit

• 2 : 0 °C max : ±1.0 % of FS, ±1 Digit

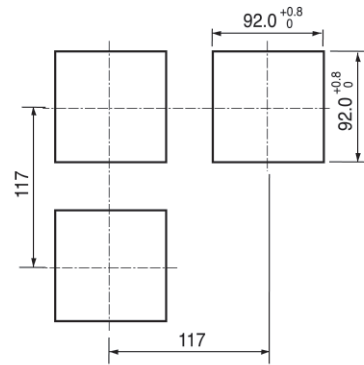
• 3 : -150.0 ~ 150.0 °C max : ±1.0 % of FS, ±1 Digit

Dimension and panel cutout (unit : mm)

Dimension



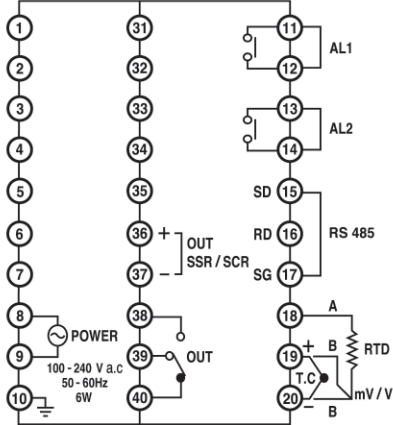
Panel cutout



B

Recorder

Connection diagram



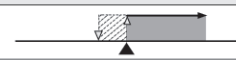
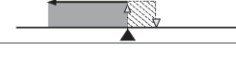


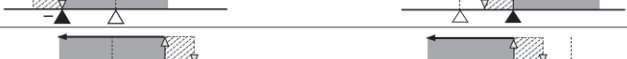
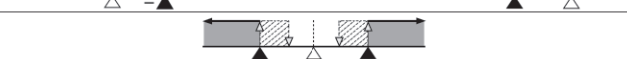
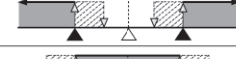
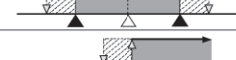
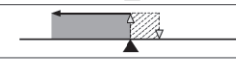











Terminal composition

List	Description
Control output(OUT)	Relay output terminal number (38)–(39)–(40) SSR/4 ~ 20 mA DC output, terminal number (36)–(37)
Power supply voltage	100 – 240 V AC 50 – 60 Hz, terminal number (8)–(9)
Input signal (sensor)	Multi inputs Thermocouple input terminal number (19, +) – (20, –) RTD input terminal number (18, A) – (19, B) – (20, B')
Alarm output (AL1, AL2)	Alarm 1 output terminal number (11) – (12) Alarm 2 output terminal number (13) – (14)
Communication interface	Transmitting terminal number (15) Receiving terminal number (16) Terminal number of the earth (earth for signal) (17)

Alarm type and code

(Cautious) : When selecting a reverse connection, output will be operated as an OFF state only when indicating lamp is ON so users must be careful regarding this fact.

Hysteresis  (Δ : Set value, $-\blacktriangle$: Negative alarm set value, \blacktriangle : Alarm set value)

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

※ Displaying alarm type cannot be used with the models which are only for the recording purpose (RT9-0)