

CONTROLLER

HA900 HA400

High-Speed

1 or 2 control loops
Digital Controller



CE   
CE,UL,CSA pending

RKC RKC INSTRUMENT INC.

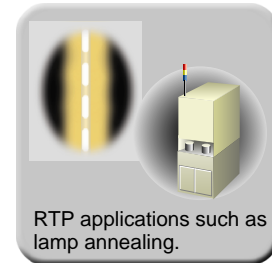
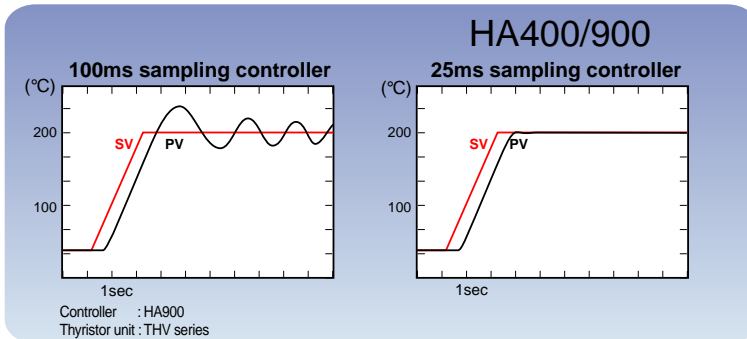
Ultra High Speed Temperature Control

Sampling **0.025** sec

High-Speed Response >>

High-speed feedback control of 40 samples per second

HA Series is a digital controller which provides a high speed sampling cycle time of 25ms (0.025 sec). Supplied with high resolution input and parameters settable in 1/100 sec, the HA Series is ideal for process applications with fast response requirements. These include RTP (Rapid Thermal Process) applications in semiconductor manufacturing, pressure, and flow rate.



• **Autotuning function**

The Autotuning used on HA400/900 is suitable for a control system with a fast response. PID values can also be manually adjusted so that they may be further optimized for the processes.

Just for your information, this Autotuning is performs well for control systems in which temperature rises up to the set point in 30 seconds or faster. If the application is slower (e.g. 5 minutes to reach the set point), HA401/901 are recommended.

Multi-Function >>

High input resolution of 200,000 counts or more (approximately 18 bits), assures stable process control with high speed sampling and good response.

A maximum of two-channel control is available. The control mode is selectable from 1 loop, 2 loops, or cascade mode (available soon). All modes operate at 25msec sampling cycle time.

A multi-memory area function which accepts up to 16 sets of parameters is supplied as standard.

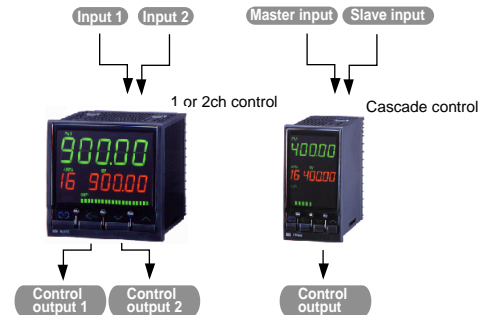
An easy-to-use ramp/soak controller can be set up by setting SV changing rate limiter and soak time.

Other features include a power feed forward function (PFF) that monitors supply voltage variation to compensate for control output, up to two communication ports that are also used for open network (DeviceNet, Profibus, PLC communication, available soon), and output logic function to build simple sequences between devices.

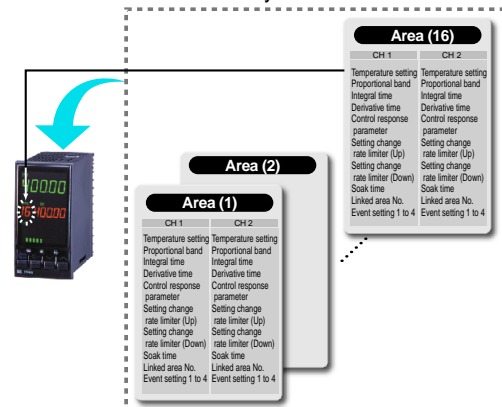
For various processes >>

Continuous voltage and current inputs are available for various process control applications such as pressure, flow rate, levels, in addition to temperature controls.

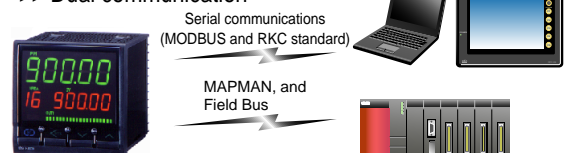
>> Various control modes



>> 16 sets of multi-memory area



>> Dual communication



● Model and Suffix Code

● 1 channel control type

Specifications	Suffix Code	
	(96 X 96mm 1/4 DIN size) HA900	(48 X 96mm 1/8 DIN size) HA400
Input (IN1 : Not input)	See input code table	
Non isolated type remote set value	Not supplied	
Output 1 (Main output)	See Remote input code table	
Output 2 (Main output)	See output code table	
* Not isolated from OUT1.	No output from OUT2	N
Power supply	24V AC/DC	3
Output 3 (Main output)	100 to 240V AC	4
Output 4, 5 (OUT4, 5: Sub output)	No output from OUT3	N
Event input 1 to 5	See output code table	
CT input, Power feed forward (PFF) input, Feedback transformer	No outputs from OUT4 and OUT5	N
	Output 4 : Relay contact output, No output from OUT5	1
	Output 4 and 5 : Relay contact output	2
	Not supplied	N
	Event input : 5 points (DI1 to DI5)	1
	Not supplied	N
	CT input 1 point (CTL-6-P-N)	P
	CT input 1 point (CTL-12-S56-10L-N)	S
	CT input 2 points (CTL-6-P-N)	T
	CT input 2 points (CTL-12-S56-10L-N)	U
	PFF input (With transformer 100 to 120V AC type)	1
	PFF input (With transformer 200 to 240V AC type)	2
	CT 1 point (CTL-6-P-N) + PFF input (With transformer 100 to 120V AC type)	3
	CT 1 point (CTL-6-P-N) + PFF input (With transformer 200 to 240V AC type)	4
	CT 1 point (CTL-12-S56-10L-N) + PFF input (With transformer 100 to 120V AC type)	5
	CT 1 point (CTL-12-S56-10L-N) + PFF input (With transformer 200 to 240V AC type)	6
	Feedback resistance input	F
Communication 1 or Event input 6 to 7	Not supplied	N
	RS-232C (ANSI/RKC standard)	1
	RS-485 (ANSI/RKC standard)	5
	RS-485 (MODBUS)	6
	RS-232C (MODBUS)	8
	Event input : DI6 and DI7 supplied	D
Communication 2	Not supplied	N
	RS-232C (ANSI/RKC standard)	1
	RS-422A (ANSI/RKC standard)	4
	RS-485 (ANSI/RKC standard)	5
	RS-485 (MODBUS)	6
	RS-422A (MODBUS)	7
	RS-232C (MODBUS)	8
	DeviceNet	A
	PROFIBUS	B
Waterproof/Dustproof	Not supplied	N
	Waterproof/Dustproof protection	1
Body color	White	N
	Black	A
Instrument version	Version symbol	Y

● 2 channel control type

Specifications	Suffix Code	
	(96 X 96mm 1/4 DIN size) HA900	(48 X 96mm 1/8 DIN size) HA400
Input 1 (IN1 : Not input)	See input code table	
Input 2 (IN2 : No2 input)	See Remote input code table	
Output 1 (Main output)	See output code table	
Output 2 (Main output)	No output from OUT2	N
* Not isolated from OUT1.	See output code table	
Power supply	24V AC/DC	3
Output 3 (Main output)	100 to 240V AC	4
Output 4, 5 (OUT4, 5: Sub output)	No output from OUT3	N
Event input 1 to 5	See output code table	
	No outputs from OUT4 and OUT5	N
	Output 4 : Relay contact output, No output from OUT5	1
	Output 4 and 5 : Relay contact output	2
	Not supplied	N
	Event input : 5 points (DI1 to DI5)	1
CT input, Power feed forward (PFF) input, Feedback transformer	Not supplied	N
	CT input 1 point (CTL-6-P-N)	P
	CT input 1 point (CTL-12-S56-10L-N)	S
	CT input 2 points (CTL-6-P-N)	T
	CT input 2 points (CTL-12-S56-10L-N)	U
	PFF input (With transformer 100 to 120V AC type)	1
	PFF input (With transformer 200 to 240V AC type)	2
	CT 1 point (CTL-6-P-N) + PFF input (With transformer 100 to 120V AC type)	3
	CT 1 point (CTL-6-P-N) + PFF input (With transformer 200 to 240V AC type)	4
	CT 1 point (CTL-12-S56-10L-N) + PFF input (With transformer 100 to 120V AC type)	5
	CT 1 point (CTL-12-S56-10L-N) + PFF input (With transformer 200 to 240V AC type)	6
	Feedback resistance input	F
Communication 1 or Event input 6 to 7	Not supplied	N
	RS-232C (ANSI/RKC standard)	1
	RS-485 (ANSI/RKC standard)	5
	RS-485 (MODBUS)	6
	RS-232C (MODBUS)	8
	Event input : DI6 and DI7 supplied	D
Communication 2	Not supplied	N
	RS-232C (ANSI/RKC standard)	1
	RS-422A (ANSI/RKC standard)	4
	RS-485 (ANSI/RKC standard)	5
	RS-485 (MODBUS)	6
	RS-422A (MODBUS)	7
	RS-232C (MODBUS)	8
	DeviceNet	A
	PROFIBUS	B
Waterproof/Dustproof	Not supplied	N
	Waterproof/Dustproof protection	1
Body color	White	N
	Black	A
Instrument version	Version symbol	Y

<Remarks>

- Only OUT 1 and OUT 2 can be used for control outputs.
- Event (alarm) outputs, heater break alarm outputs are assignable to OUT3-OUT5.
- Analog output (PV, SV, etc) are assignable to OUT1-OUT3.

<Caution>

- If two isolated analog outputs are required, use OUT1 (or OUT2) and OUT3. OUT1 and OUT2 are not isolated.
- To use as a analog proportioning controller (available soon), two or more outputs must be supplied.
- If heater break alarm is assigned to event function, current transformer (CT is sold separately) are required.

● Input Code Table

Input type	Range	Code	Measuring accuracy	Resolution	
Low voltage group	K	-200 to 1372°C, -328 to 2501°F	K	1°C, 0.1°C 1°F, 0.1°F (Selectable)	
	J	-200 to 1200°C, -328 to 2192°F	J		
	T	-200 to 400°C, -328 to 752°F	T		
	E	-200 to 1000°C, -328 to 1832°F	E		
	PL11	0 to 1390°C, 32 to 2534°F	A		
	N	0 to 1300°C, 32 to 2372°F	N		
	S	-50 to 1768°C, -58 to 3214°F	S		
	R	-50 to 1768°C, -58 to 3214°F	R		
	W5Re/W26Re	0 to 2300°C, 32 to 4172°F	W		
	B	0 to 1800°C, 32 to 3272°F	B		
(Thermocouple, RTD, voltage, current)	Pt100 (3 wire)	-200 to 850°C, -328 to 1562°F	D	1°C, 0.1°C, 0.01°C, 1°F, 0.1°F, 0.01°F, (Selectable)	
	JPt100 (3 wire)	-200 to 600°C, -328 to 1112°F	D		
	Pt100 (4 wire)	-200 to 850°C, -328 to 1562°F	C		
	Pt100 (4 wire)	-200 to 600°C, -328 to 1112°F	C		
	0 to 10mV DC	-20000 to 20000 (Programmable)	3		±(0.1% of Span)
	0 to 100mV DC				
	0 to 1V DC				
	0 to 20mA DC				
	4 to 20mA DC	-20000 to 20000 (Programmable)	6		±(0.1% of Span)
	0 to 5V DC				
0 to 10V DC					
1 to 5V DC					
High voltage group					

* Cold junction temperature compensation error : ±1.0°C(±1.8°F) [at 23°C±2°C(73.4°F±3.6°F)]

Within ±1.5°C(±2.7°F) [Between 0 and 50°C(14 to 122°F)]

**4-wire RTD input type is available only on a single loop type.

● Remote Signal Code Table

(* Not isolated from the No.1 input [IN1])

Input type	Code	
Low voltage group	0 to 10mV DC	G
	0 to 100mV DC	
High voltage group	0 to 1V DC	V
	0 to 5V DC	
Current group	0 to 20mA DC	Y
	4 to 20mA DC	

● Output Code Table

Output Type	Code
Relay contact output	M
Voltage pulse output DC0/12V	V
Continuous voltage output DC 0 to 5V	4
Continuous voltage output DC 0 to 10V	5
Continuous voltage output DC 1 to 5V	6
Current output DC 0 to 20mA	7
Current output DC 4 to 20mA	8
SSR (Triac) output	T



- Before operating this product, read the instruction manual carefully to avoid incorrect operation.
- This product is intended for use with industrial machines, test and measuring equipment. It is not designed for use with medical equipment.
- If it is possible that an accident may occur as a result of the failure of the product or some other abnormality, an appropriate independent protection device must be installed.
- When installing this product, avoid the following:
 - Direct exposure to sunlight.

- An ambient temperature lower than 0°C or higher than 50°C
- Areas subject to high humidity. Ambient humidity should not be lower than 45% or higher than 85%RH
- Direct contact with water.
- Corrosive environments.
- Hazardous areas containing explosive or flammable gases.
- Vibration or shock.
- Areas subject to electrical noise caused by inductive interference, static electricity or magnetic fields.

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