CONTROLLER

MA900/901

MULTI-POINT TEMPERATURE DIGITAL CONTROLLER

Actual size

C-Tick Marked Pending

RKC INSTRUMENT INC.

8ch

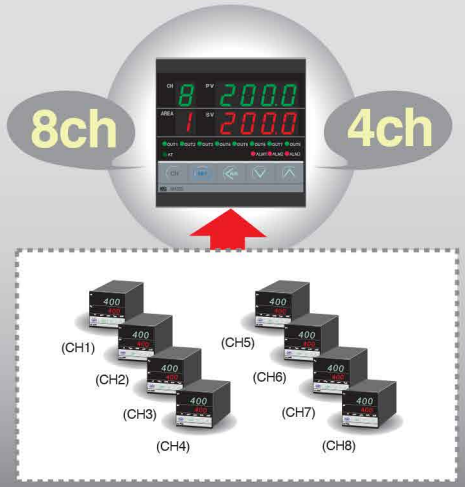
Temperature Control !

With 96(W) x96 (H) x100mm size

Only one unit controls a maximum of 8ch/4ch*

***Available for 8ch and 4ch control types**

A maximum of 8 units of temperature controllers are packed into 96x96x100mm case.
You can reduce your panel cutouts and make your panel board smaller.

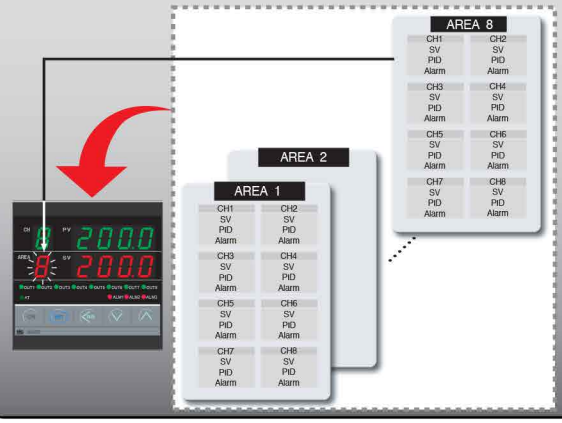


A maximum of 8 kinds of recipe of set values can be set.

"Multi-memory area" function

A maximum of 8 kinds of combinations of temperature set value, PID constant, alarm set value etc for each channel can be registered as "Area" (recipe).
The change of settings caused by the change of a process and product can be simply done only by switching the "area". The switching of the area by optional external contact input is also available.

The available parameters for multi memory area:
SV, Each type of alarms, PID constants, Anti-reset windup, Overlap/dead band, Setting change rate limiter, Channel used/unused

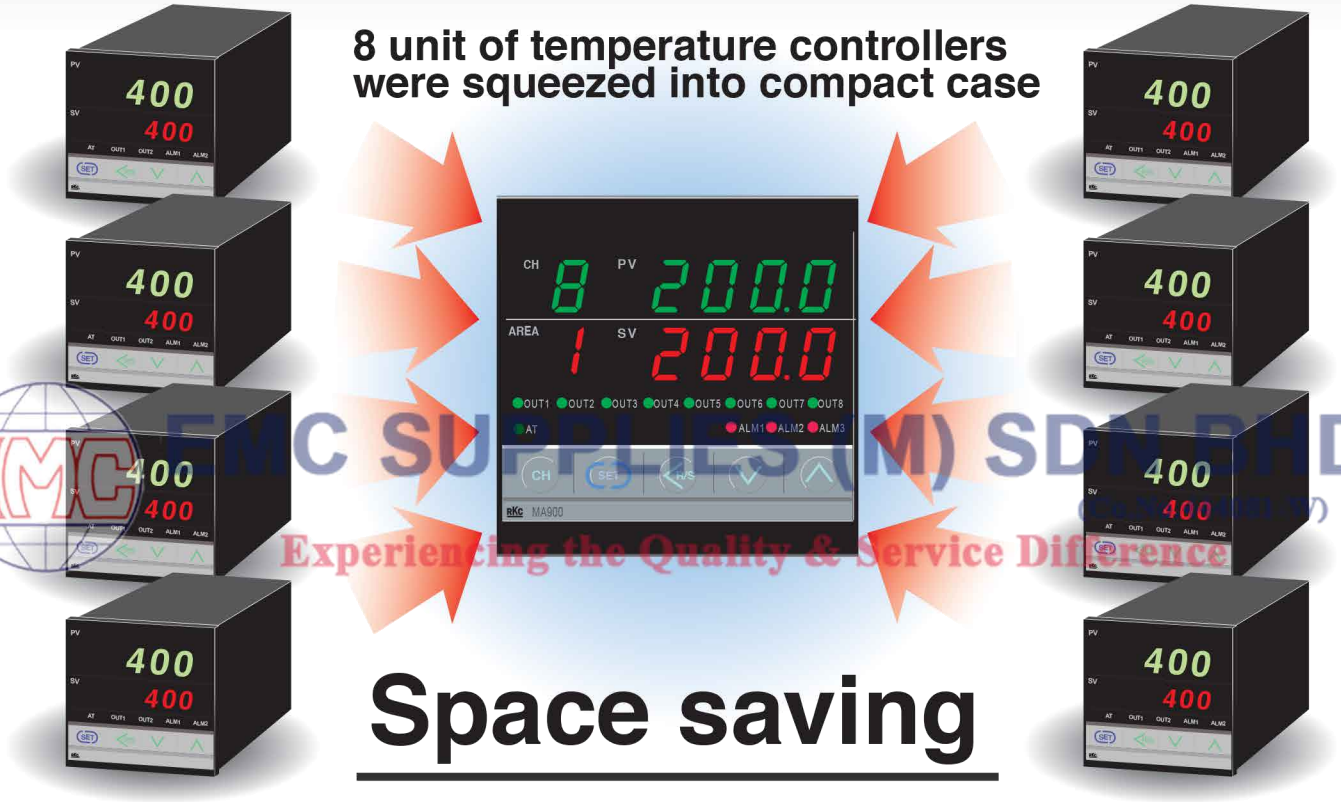


MULTI-POINT DIGITAL TEMPERATURE CONTROLLER

MA900/901

A maximum of 8 units of temperature control functions are packed into 96 mm square case.
One unit of MA900/901 is available for the maximum of 8 channels' temperature control.
The space-saving and cost effective controller is now on the market corresponding to the requirement of those who think the conventional multi-channel temperature controller is too expensive for the temperature control of 3 to 8 channels, or those who are planning to save space for mounting or studying to make a panel board smaller.

8 unit of temperature controllers were squeezed into compact case



Space saving

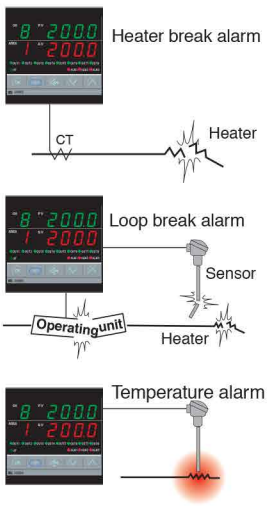
A variety of Optional Functions

Available for each kind of optional functions considering expandability and safety
Flexible for the use in every kind of applications

Digital communications

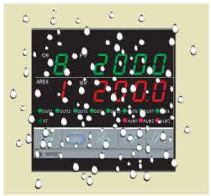
- RKC standard communication
- MODBUS communication (RS-232C/422A/485)

Alarm function



Contact input

Waterproof and dustproof protection (Equivalent to IP65)



Specifications

Input

Number of inputs	4 points (MA900), 8 points (MA901)
Input	a) Thermocouple : K,J,E,T,R,S,B,N (JIS/IEC),U,L(DIN) PLII (NBS),W5Re/W26Re (ASTM) Input impedance : Approx.1MΩ b) RTD : Pt100 (JIS/IEC), JPt100 (JIS) c) DC voltage : 0 to 5V DC, 1 to 5V DC, 0 to 10V DC • RTD or DC voltage input is not isolated.
Sampling time	0.5 sec. (MA900), 1 sec (MA901)
Influence of external resistance	Approx. 0.2μV/Ω (Thermocouple input)
Influence of lead resistance	Approx. 0.01[%/Ω] of reading (RTD input) • Maximum 10Ω per wire
Input break action	a) Thermocouple : Up-scale b) RTD : Up-scale c) DC voltage : Down-scale
Input filter	First order lag digital filter Time constant : 1 to 100 sec. (OFF when 0 is set).
PV bias	- span to +span (Within -1999 to 9999)

Performance

Measuring accuracy	a) Thermocouple : ±(0.3% of reading + 1digit) or ±2℃ (4℉) (Within either range, whichever is larger) • Accuracy is not guaranteed between 0 and 399℃ (0 and 799℉) for type R, S and B. • Accuracy is not guaranteed less than -100.0℃ (-158.0℉) for type K, J, T and U. b) RTD : ±(0.3% of reading + 1digit) or ±0.8℃ (1.6℉) (Within either range, whichever is larger) c) Voltage : ±(0.3% of span + 1digit)
Insulation resistance	More than 20MΩ (500V DC) between measured terminals and ground More than 20MΩ (500V DC) between power terminals and ground
Dielectric voltage	1000V AC for one minute between measured terminals and ground 1500V AC for one minute between power terminals and ground

Control

Control method	a) PID control (with autotuning function) • Available for reverse and direct action. (Specify when ordering.) • ON/OFF, P, PI and PD control are also selectable. ON/OFF action differential gap : 2℃(℉) (Temperature input) 0.2% (Voltage input) b) Heat/Cool PID control (with autotuning function) • Air cooling and water cooling type are available. • Heat/Cool PID control is not available for 8ch type.
Setting range	a) Set value (SV) : Same as input range. b) Heat side proportional band (P) : 0 to span (ON/OFF action when P=0) c) Cool side proportional band (Pc) : 1 to 1000% of heat side proportional band (P) d) Integral time (I) : 1 to 3600 sec. (PD action when I=0) e) Derivative time (D) : 1 to 3600 sec. (PI action when D=0) f) Anti-reset windup (ARW) : 1 to 100% of heat side proportional band (P) (Integral action is OFF when ARW=0) g) Heat side proportional cycle : 1 to 100 sec. (No cycle setting for current output) h) Cool side proportional cycle : 1 to 100 sec. (No cycle setting for current output) i) Deadband/Overlap : - span to +span (Within -1999 to 9999) • Minus setting : Overlap j) Setting change rate limiter : 0 to span/min (OFF when 0 is set)
Operation mode	Available for switching each channel to be normal (control), alarm monitoring (control output OFF, alarm action enabled) and unused.
Output type	a) Relay contact output : 250V AC 3A (resistive load), Form A contact • Electrical life : 300,000 cycles or more (resistive load) b) Voltage pulse output : 0/12V DC (Load resistance : more than 600Ω) c) Current output : 0 to 20mA DC (Load resistance : less than 400Ω) 4 to 20mA DC (Load resistance : less than 400Ω) d) Triac output : Rating : 0.5A (An ambient temperature is less than 40℃) • Measurement terminals and output terminals are not isolate

Temperature alarms

Number of outputs	Up to 3 points (Include loop break alarm and heater break alarm) • Alarm 1 output (Standard), Alarm 2, 3 (Optional) • Independent output for each channel of Alarm 3 is optionally available for 4ch type PID control (OUT 5 to 8) , but not available for Heat/Cool control type.
Output type	Relay contact output : Form A contact Rating : 250V AC 1A (Alarm output 1 to 3) (Resistive load) 250V AC 3A (OUT5 to 8) (Resistive load) • Electrical life : 300,000 cycles or more (Rated load)
Alarm type	Deviation High, Deviation Low, Deviation High-Low, Deviation Band, Process High, Process Low, Set value High, Set value Low, FAIL • Hold action is available except for Deviation Band, Set vale, FAIL • Alarm hold action is effective at the time of power-on, switching from STOP to RUN, set value change and switching of the memory area.
Setting range	a) Deviation alarm : -span to +span Within -1999 (-199.9) to 9999 (999.9) b) Process alarm : Same as set value (SV)
Differential gap	2℃(℉) (Temperature input), 0.2% (Voltage input)

Control loop break alarm : LBA

LBA setting time	OFF, 0.1 to 200.0 min. • LBA deadband : 0 to span (Within 9999 or 999.9 digit) (OFF when 0 is set).
Output	LBA output allocated to alarm 1.

Heater break alarm : HBA (Optional)

CT type	CTL-6-P-N, CTL-12-S56-10L-N (Specify when ordering)
Input range	CTL-6-P-N : 0 to 30A CTL-12-S56-10L-N : 0 to 100A
Display range	0.0 to 100.0A
Display accuracy	±5% of input value or ±2A
Output	HBA output allocated to alarm 2.

Contact input (Optional)

Number of input	5 points
Input rating	Non-voltage contact input a) OPEN : 500kΩ or more b) CLOSE : 10Ω or less
Input type	a) RUN/STOP switching : 1 point (OPEN : STOP CLOSE : RUN) b) Memory area select : Area select : 3 points (BCD input 0 to 7) Data set : 1 point

Communications (Optional)

Communication method	Based on RS-232C/RS-422A/RS-485 (Specify when ordering)
Protocol	a) ANSI X3.28(1976) 2.5 A4 b) MODBUS (Specify when ordering)
Communication method	RS-232C : 3-wire system, Point-to-point connection RS-422A : 4-wire system, Multi-drop connection RS-485 : 2-wire system, Multi-drop connection
Communication speed	2400, 4800, 9600, 19200 BPS (Selectable)
Bit configuration	a) Start bit : 1 b) Data bit : 7 or 8 • For MODBUS 8 bit only c) Parity bit : Without, Odd or Even d) Stop bit : 1 or 2
Maximum connection	RS-232C : 1 unit RS-422A/RS-485 : 31 units

Waterproof/Dustproof (Optional)

Waterproof/Dustproof protection : IP65
• Waterproof/Dustproof protection only effective from the front panel mounted installation.

General Specifications

Supply voltage	a) AC type : 85 to 264V AC (50/60Hz common) [Including supply voltage variation] (Rating 100 to 240V AC) b) 24V AC type : 21.6 to 26.4V AC (50/60Hz common) [Including supply voltage variation] (Rating 24V AC) c) 24V DC type : 21.6 to 26.4V DC [Including supply voltage variation] (Rating 24V DC)
Power consumption	a) AC type : Maximum 14VA at 100V AC Maximum 20VA at 240V AC b) 24V AC type : Maximum 11VA c) 24V DC type : Maximum 330mA
Power failure	A power failure of 30 ms or less will not affect the control action. If power failure of more than 30 ms occurs, controller will restart.
Memory backup	Backed up by non-volatile memory. Number of writing : Approx. 100,000 times Data retaining period : Approx. 10 years
Ambient temperature	0 to 50℃ (32 to 122℉)
Ambient humidity	45 to 85% RH
Weight	Approx. 560g
External dimensions	96 (W) X 96 (H) X 100 (D)mm (1/16 DIN)
Operating environment	Free from corrosive and flammable gas and dust.
Other conditions	Free from external noise, vibration, shock and exposure to direct sunlight.

Compliance with Standards

• CE Mark, UL Recognized, CSA Certified, C-Tick Mark

● Specifications for MA900 series

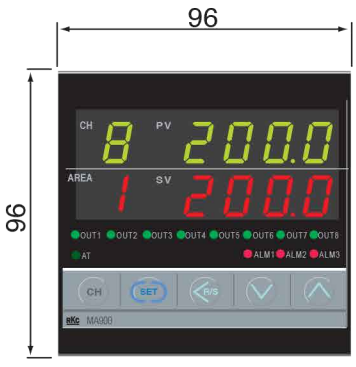
The MA900 series has 2 types, MA900 (4-channel type) and MA901 (8-channel type).
Please select your specifications and functions referring to the following table.
Some functions are limited to be selected or combined according to the specifications

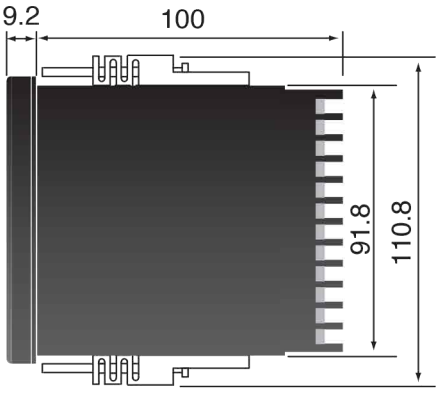
X : Available, △ : Available with conditions, — : Not available

Model	MA900	MA901
Number of channels	4 ch	8 ch
Sampling time	0.5 sec	1 sec
Heat/Cool control	△ (Independent output of Alarm 3 can not be selected.)	—
Independent output of Alarm 3	△ (Not available at heat/cool control.)	—
Heater break alarm	X	△ (External contact input or communication cannot be selected.)
Contact input	X	△ (Heater break alarm is not available.)
Communications	X	△ (Heater break alarm is not available.)

External Dimensions

Unit : mm

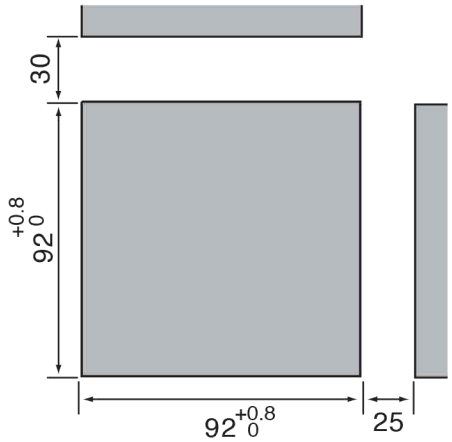


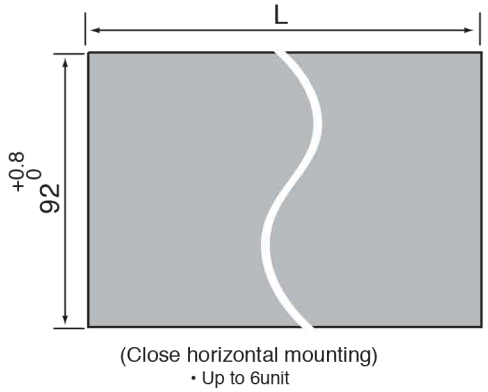


For mounting of the controllers, panel thickness must be between 1 to 10mm. When mounting multiple controllers close together, the panel strength should be checked to ensure proper support..

• Dustproof and waterproof are not effective when controllers are closely mounted.

Panel Cutouts





(Close horizontal mounting)
• Up to 6unit

$L=96Xn-4\ ^{+0.8}_{0}$

n : Number of controllers
(2=<n=<6)

Model and Suffix Code

● MA900 (4ch type)

Specifications	Model and Suffix Code																
	4ch Digital Contorller	MA900 − 4	□	□	□	□	−	□	−	□	*	□	□	□	−	□	/ □ / □
Control method	PID control with AT (reverse action)		F														
	PID control with AT (direct action)		D														
Input and range	See Input and Range Code Table			□	□	□											
OUT1 (Control output)	Relay contact output						M										
	Voltage pulse output						V										
	Current output : 0 to 20mA DC						7										
	Current output : 4 to 20mA DC						8										
	Triac output						T										
OUT2 [1] (Alarm 3 independent output)	No output							N									
	Relay contact output							M									
Power supply voltage	24V AC/DC								3								
	100 to 240V AC								4								
Alarm 1	See Alarm 1 Code Table (Standard)									□							
Alarm 2 [1,2]	No alarm										N						
	Heater break alarm (CTL-6-P-N)										P						
	Heater break alarm (CTL-12-S56-10L-N)										S						
	See Alarm 2 • 3 Code Table										□						
Alarm 3 [1]	No alarm											N					
	See Alarm 2 • 3 Code Table											□					
Contact input	No contact input												N				
	Contact input (RUN/STOP, Area select • Data set)												D				
Communication	No Communication													N			
	RS-232C (RKC standard)													1			
	RS-422A (RKC standard)													4			
	RS-485 (RKC standard)													5			
	RS-485 (MODBUS)													6			
	RS-422A (MODBUS)													7			
	RS-232C (MODBUS)													8			
Waterprrof/Dustproof	Not supplied														N		
	Waterproof/Dustproof														1		
Instrument version	Version symbol																Y

[1] Alarm output is common to all channels. But alarm 3 is available for optional independent output for each channel. When you select optional alarm 3, specify output type (M) for output 2. (Except FAIL alarm)
[2] Heater break output is not available when output 1 (control output) is current output (7, 8).

● MA900 (4ch type, Heat/Cool PID control)

Specifications	Model and Suffix Code																
	4ch Digital controller	MA900 − 4	□	□	□	□	−	□	−	□	*	□	□	□	−	□	/ □ / □
Control method	Heat/Cool PID control with AT (water cooling)		W														
	Heat/Cool PID control with AT (air cooling)		A														
Input and Range	See Input and Range Code Table			□	□	□											
OUT 1 (Heat output)	Relay contact output						M										
	Voltage pulse output						V										
	Current output : 0 to 20mA DC						7										
	Current output : 4 to 20mA DC						8										
	Triac output						T										
OUT 2 [1] (Cool output)	Relay contact output							M									
	Voltage pulse output							V									
	Current output : 0 to 20mA DC							7									
	Current output : 4 to 20mA DC							8									
	Triac output							T									
Power supply voltage	24V AC/DC								3								
	100 to 240V AC								4								
Alarm 1 [2]	See Alarm 1 Code Table (Standard)									□							
Alarm 2 [2]	No alarm										N						
	Heater break alarm (CTL-6-P-N)										P						
	Heater break alarm (CTL-12-S56-10L-N)										S						
	See Alarm 2 • 3 Code Table										□						
Alarm 3 [2]	No alarm											N					
	See Alarm 2 • 3 Code Table											□					
Contact input	No contact input												N				
	Contact input (RUN/STOP, Area select • Data set)												D				
Communication	No communication													N			
	RS-232C (RKC standard)													1			
	RS-422A (RKC standard)													4			
	RS-485 (RKC standard)													5			
	RS-485 (MODBUS)													6			
	RS-422A (MODBUS)													7			
	RS-232C (MODBUS)													8			
Waterproof/Dustproof	Not supplied														N		
	Waterproof/Dustproof														1		
Instrument version	Version symbol																Y

[1] Alarm output is common to all channels.
[2] Heater break output is not available when output 1 (control output) is current output (7, 8).

● MA901 (8ch type)

Specifications	Model and Suffix Code													
	8ch Digital controller	MA900−8	□	□	□	□−□	□	−□	＊□	□	□	−□	□	/ □ / □
Control method	PID control with AT (reverse action)		F											
	PID control with AT (direct action)		D											
Input and Range	See Input and Range Code Table			□	□	□								
OUT 1 (Control output : CH1 to 4)	Relay contact output						M							
	Voltage pulse output						V							
	Current output : 0 to 20mA DC						7							
	Current output : 4 to 20mA DC						8							
	Triac output						T							
OUT 2 (Control output: CH5 to 8)	Relay contact output							M						
	Voltage pulse output							V						
	Current output : 0 to 20mA DC							7						
	Current output : 4 to 20mA DC							8						
	Triac output							T						
Power supply voltage	24V AC/DC								3					
	100 to 240V AC								4					
Alarm 1 [1]	See Alarm 1 Code Table (Standard)									□				
Alarm 2 [1,2,3]	No alarm										N			
	Heater break alarm (CTL-6-P-N)										P			
	Heater break alarm (CTL-12-S56-10L-N)										S			
	See Alarm 2 and 3 Code Table										□			
Alarm 3 [1]	No alarm											N		
	See Alarm 2 and 3 Code Table											□		
Contact input [3]	No contact input												N	
	Contact input (RUN/STOP, Area select・Data set)												D	
Communication [3]	No communication													N
	RS-232C (RKC standard)													1
	RS-422A (RKC standard)													4
	RS-485 (RKC standard)													5
	RS-485 (MODBUS)													6
	RS-422A (MODBUS)													7
	RS-232C (MODBUS)													8
Waterproof/Dustproof	Not supplied													N
	Waterproof/Dustproof													1
Instrument version	Version symbol													Y

[1] Alarm output is common to all channels.
[2] Heater break alarm and communication/contact input cannot be specified on the same hardware.
[3] Heater break output is not available when either of output 1 or 2 is current output.

Input and Range Code Table

Thermocouple input

Input	Code	Range
K (JIS/IEC) [1]	K 01	0 to 200℃
	K 02	0 to 400℃
	K 03	0 to 600℃
	K 04	0 to 800℃
	K 05	0 to 1000℃
	K 06	0 to 1200℃
	K 07	0 to 1372℃
	K 08	-199.9 to +300.0℃
	K 09	0.0 to 400.0℃
	K 10	0.0 to 800.0℃
	K 13	0 to 100℃
	K 14	0 to 300℃
	K 17	0 to 450℃
	K 20	0 to 500℃
	K 29	0.0 to 200.0℃
	K 37	0.0 to 600.0℃
	K 38	-199.9 to +800.0℃
	K A1	0.0 to 800.0℉
	K A2	0 to 1600℉
	K A3	0 to 2502℃
	K A4	0.0 to 800.0℉
	K A9	20 to 70℉
	K B2	-199.9 to +999.9℉
J (JIS/IEC) [1]	J 01	0 to 200℃
	J 02	0 to 400℃
	J 03	0 to 600℃
	J 04	0 to 800℃
	J 05	0 to 1000℃
	J 06	0 to 1200℃
	J 07	-199.9 to +300.0℃
	J 08	0.0 to 400.0℃
	J 09	0.0 to 800.0℃

Input	Code	Range
J (JIS/IEC) [1]	J 10	0 to 450℃
	J 22	0.0 to 200.0℃
	J 23	0.0 to 600.0℃
	J 30	-199.9 to +600.0℃
	J A1	0 to 800℉
	J A2	0 to 1600℉
	J A3	0 to 2192℉
	J A6	0 to 400℉
	J A9	-199.9 to +999.9℉
	J B6	0.0 to 800.0℉
R (JIS/IEC) [2]	R 01	0 to 1600℃
	R 02	0 to 1769℃
	R 04	0 to 1350℃
	R A1	0 to 3200℉
	R A2	0 to 3216℉
S (JIS/IEC) [2]	S 01	0 to 1600℃
	S 02	0 to 1769℃
	S A1	0 to 3200℉
	S A2	0 to 3216℉
B (JIS/IEC) [2]	B 01	400 to 1800℃
	B 02	0 to 1820℃
	B A1	800 to 3200℉
	B A2	0 to 3308℉
E (JIS/IEC)	E 01	0 to 800℃
	E 02	0 to 1000℃
	E A1	0 to 1600℉
	E A2	0 to 1820℉
PLII (NBS)	A 01	0 to 1300℃
	A 02	0 to 1390℃
	A 03	0 to 1200℃
	A A1	0 to 2400℉
	A A2	0 to 2534℉

Input	Code	Range
N (JIS/IEC)	N 01	0 to 1200℃
	N 02	0 to 1300℃
	N 06	0.0 to 800.0℃
	N A1	0 to 2300℉
	N A2	0 to 2372℉
	N A5	0.0 to 999.9℉
T (JIS/IEC) [1]	T 01	-199.9 to +400.0℃
	T 02	-199.9 to +100.0℃
	T 03	-100.0 to +200.0℃
	T 04	0.0 to 350.0℃
	T A1	-199.9 to +752.0℉
	T A2	-100.0 to +200.0℉
	T A3	-100.0 to +400.0℉
	T A4	0.0 to 450.0℉
	T A5	0.0 to 752.0℉
W5Re/W26Re (JIS/IEC)	W 01	0 to 2000℃
	W 02	0 to 2320℃
	W A1	0 to 4000℉
U (DIN) [1]	U 01	-199.9 to +600.0℃
	U 02	-199.9 to +100.0℃
	U 03	0.0 to 400.0℃
	U A1	-199.9 to +999.9℉
	U A2	-100.0 to +200.0℉
	U A3	0.0 to 999.9℉
L (DIN)	L 01	0 to 400℃
	L 02	0 to 800℃
	L A1	0 to 800℉
	L A2	0 to 1600℉

[1] Accuracy is not guaranteed less than -100.0℃ (-158.0℉) for type K, J, T and U.
[2] Accuracy is not guaranteed between 0 and 399℃ (0 and 799℉) for type R, S and B.
[3] DC voltage input can be used for the input of 0 to 20mA (in case of 0 to 5 V) and 4 to 20mA (1 to 5 V) by attaching 250Ω shunt resistor (sold separately) to input terminal. (The model of shunt resistor: KD100-55)

RTD input

Input	Code	Range
Pt100 (JIS/IEC)	D 01	-199.9 to +649.0℃
	D 02	-199.9 to +200.0℃
	D 03	-100.0 to +50.0℃
	D 04	-100.0 to +100.0℃
	D 05	-100.0 to +200.0℃
	D 06	0.0 to 50.0℃
	D 07	0.0 to 100.0℃
	D 08	0.0 to 200.0℃
	D 09	0.0 to 300.0℃
	D 10	0.0 to 500.0℃
	D A1	-199.9 to +999.9℉
	D A2	-199.9 to +400.0℉
	D A3	-199.9 to +200.0℉
	D A4	-100.0 to +100.0℉
	D A5	-100.0 to +300.0℉
	D A6	0.0 to 50.0℉
	D A7	0.0 to 200.0℉
	D A8	0.0 to 400.0℉
	D A9	0.0 to 500.0℉
JPt100 (JIS)	P 01	-199.9 to +649.0℃
	P 02	-199.9 to +200.0℃
	P 03	-100.0 to +50.0℃
	P 04	-100.0 to +100.0℃
	P 05	-100.0 to +200.0℃
	P 06	0.0 to 50.0℃
	P 07	0.0 to 100.0℃
	P 08	0.0 to 200.0℃
	P 09	0.0 to 300.0℃
	P 10	0.0 to 500.0℃

Voltage DC input

Input	Code	Range
0 to 5V	4 01	0.0 to 100.0
0 to 10V	5 01	0.0 to 100.0
1 to 5V	6 01	0.0 to 100.0

Alarm 1 Code Table (Standard)

A	Deviation High	B	Deviation Low	C	Deviation High-Low	D	Deviation Band
E	Deviation High with Hold	F	Deviation Low with hold	G	Deviation High-Low with HOLD	H	Process High
J	Process Low	K	Process High with Hold	L	Process Low with Hold	M	FAIL
R	Loop break alarm[1]	V	Set value High	W	Set value Low		

[1] Loop break alarm is not available with Heat/Cool PID control type.

Alarm 2・3 Code Table (Option)

A	Deviation High	B	Deviation Low	C	Deviation High-Low	D	Deviation Band
E	Deviation High with Hold	F	Deviation Low with Hold	G	Deviation High-Low with Hold	H	Process High
J	Process Low	K	Process High with Hold	L	Process Low with Hold	M	FAIL
V	Set value High	W	Set value Lo				

Rear Terminals

● MA900 (4ch type)

No.	Description	No.	Description	No.	Description	No.	Description	No.	Description
1	L, AC100 - 240V AC24V, DC24V +, N, − — Power supply	49	NO — Alarm 2 output (Option)	37	DI — Contact input (RUN/STOP) (Option)	25	COM, CT1, CT2 — CT input for heater break alarm (Option)	13	A, B, + − — CH1 sensor input (1) Thermocouple (2) RTD (3) Voltage
2		50		38		26		14	
3	NO — Alarm 1 output	51	NO — Alarm 3 output (Option)	39	COM, DI 1, DI 2, DI 4, DI SET — Contact input (Memory area) (Option)	27		15	
4		52		40		28	COM, CT3, CT4	16	A, B, + − — CH2 sensor input (1) Thermocouple (2) RTD (3) Voltage
5	NO (1), + (2), − (3) — Output 1 (OUT1) (1) Relay contact (2) Voltage pulse/Current (3) Triac	53	NO (1), + (2), − (3) — Output 2 (OUT5) (1) Relay contact (2) Voltage pulse/Current (3) Triac	41		29		17	
6		54		42		30		18	
7	NO (1), + (2), − (3) — Output 1 (OUT2) (1) Relay contact (2) Voltage pulse/Current (3) Triac	55	NO (1), + (2), − (3) — Output 2 (OUT6) (1) Relay contact (2) Voltage pulse/Current (3) Triac	43		31		19	A, B, + − — CH3 sensor input (1) Thermocouple (2) RTD (3) Voltage
8		56		44	SG, SG, SG, T(A), T/R(A), SD, T(B), T/R(B), RD, R(A), R(B) — Communications (1) RS-422A (2) RS-485 (3) RS-232C (Option)	32		20	
9	NO (1), + (2), − (3) — Output 1 (OUT3) (1) Relay contact (2) Voltage pulse/Current (3) Triac	57	NO (1), + (2), − (3) — Output 2 (OUT7) (1) Relay contact (2) Voltage pulse/Current (3) Triac	45		33		21	
10		58		46		34		22	A, B, + − — CH4 sensor input (1) Thermocouple (2) RTD (3) Voltage
11	NO (1), + (2), − (3) — Output 1 (OUT4) (1) Relay contact (2) Voltage pulse/Current (3) Triac	59	NO (1), + (2), − (3) — Output 2 (OUT8) (1) Relay contact (2) Voltage pulse/Current (3) Triac	47		35		23	
12		60		48		36		24	

About output 2 (OUT5 to 8)
- It becomes Cool side output for CH1 to CH4 in Heat/Cool control specification.
- It can be used as independent channel output for Alarm 3 in PID control specification. (Specify when ordering)

● MA901 (8ch type)

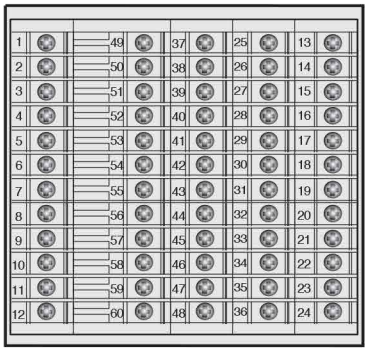
No.	Description	No.	Description	<Heater break alarm type> No.	Description	No.	Description	No.	Description
1	L, AC100 - 240V AC24V, DC24V, N — Power supply	49	NO — Alarm 2 output (Option)	37	COM, CT1, CT2 — CT input for heater break alarm (Option)	25	A, B, + − — CH5 sensor input (1) Thermocouple (2) RTD (3) Voltage	13	A, B, + − — CH1 sensor input (1) Thermocouple (2) RTD (3) Voltage
2		50		38		26		14	
3	NO — Alarm 1 output	51	NO — Alarm 3 output (Option)	39		27		15	
4		52		40	COM, CT3, CT4	28	A, B, + − — CH6 sensor input (1) Thermocouple (2) RTD (3) Voltage	16	A, B, + − — CH2 sensor input (1) Thermocouple (2) RTD (3) Voltage
5	NO (1), + (2), − (3) — Output 1 (OUT1) (1) Relay contact (2) Voltage pulse/Current (3) Triac	53	NO (1), + (2), − (3) — Output 2 (OUT5) (1) Relay contact (2) Voltage pulse/Current (3) Triac	41		29		17	
6		54		42		30		18	
7	NO (1), + (2), − (3) — Output 1 (OUT2) (1) Relay contact (2) Voltage pulse/Current (3) Triac	55	NO (1), + (2), − (3) — Output 2 (OUT6) (1) Relay contact (2) Voltage pulse/Current (3) Triac	43	COM, CT5, CT6	31	A, B, + − — CH7 sensor input (1) Thermocouple (2) RTD (3) Voltage	19	A, B, + − — CH3 sensor input (1) Thermocouple (2) RTD (3) Voltage
8		56		44		32		20	
9	NO (1), + (2), − (3) — Output 1 (OUT3) (1) Relay contact (2) Voltage pulse/Current (3) Triac	57	NO (1), + (2), − (3) — Output 2 (OUT7) (1) Relay contact (2) Voltage pulse/Current (3) Triac	45		33		21	
10		58		46	COM, CT7, CT8	34	A, B, + − — CH8 sensor input (1) Thermocouple (2) RTD (3) Voltage	22	A, B, + − — CH4 sensor input (1) Thermocouple (2) RTD (3) Voltage
11	NO (1), + (2), − (3) — Output 1 (OUT4) (1) Relay contact (2) Voltage pulse/Current (3) Triac	59	NO (1), + (2), − (3) — Output 2 (OUT8) (1) Relay contact (2) Voltage pulse/Current (3) Triac	47		35		23	
12		60		48		36		24	

<Contact input • Communications type>

No.	Description
37	DI — Contact input (RUN/STOP) (Option)
38	
39	COM, DI 1, DI 2, DI 4, DI SET — Contact input (Memory area) (Option)
40	
41	
42	
43	
44	SG, SG, SG, T(A), T/R(A), SD, T(B), T/R(B), RD, R(A), R(B) — Communications (1) RS-422A (2) RS-485 (3) RS-232C (Option)
45	
46	
47	
48	

Heater break alarm and communication/contact input cannot be specified on the same hardware.

<MA900/901>



- Use the solder less terminal appropriate to the screw size.
  Screw size : M3 X 6

Safety Warning

- 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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