High-performance Multi-point
Control System

SR Mini SYSTEM
SR Mini HG SYSTEM

Supplementary Information
Initialize Settings
[Extended Communications]

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.

SYMBOLS

| WARNING | : This mark indicates precautions that must be taken if there is danger of electric shock, fire, etc., which could result in loss of life or injury. |

| CAUTION | : This mark indicates that if these precautions and operating procedures are not taken, damage to the instrument may result. |

⚠ : This mark indicates that all precautions should be taken for safe usage.

📖 : This mark indicates important information on installation, handling and operating procedures.

📖 : This mark indicates supplemental information on installation, handling and operating procedures.

☞ : This mark indicates where additional information may be located.

⚠ WARNING

● To prevent injury to persons, damage to instrument and equipment, a suitable external protection device shall be required.

● All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.

● This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.

● This instrument is not intended for use in locations subject to flammable or explosive gases.

● Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.

● RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
  - If input/output or signal lines within the building are longer than 30 meters.
  - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.
  The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- To prevent instrument damage as a result of failure, protect the power line and the input/output lines from high currents with a suitable overcurrent protection device with adequate breaking capacity such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- Do not connect modular connectors to telephone line.
- When high alarm with hold action/re-hold action is used for Alarm function, alarm does not turn on while hold action is in operation. Take measures to prevent overheating which may occur if the control device fails.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

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CONTENTS

MEMO

1. TRANSFER TO INITIAL SETTING MODE

This manual describes the Initialize setting changing procedure when this system is changed to Extended communication (Initialize setting mode). Change the setting correctly in accordance with precautions in each item.

⚠️ **WARNING**

The Initial setting data should be set according to the application before setting any parameter related to operation. Once the parameter in the Initial setting data are set correctly, no further changes need to be made to parameter for the same application under normal conditions. If they are changed unnecessarily, it may result in malfunction or failure of the instrument. RKC will not bear any responsibility for malfunction or failure as a result of improper changes in the Initial setting.

CAUTIONS

If you add or delete a function module, or change the arrangement of the modules, or replace a module with a different model, be sure to perform "Module initialization (identifier CL)" (P. 10) before setting the data.

"Module initialization" stores the new module configuration in the □-PCP-A/B module.

If data is set before "Module initialization" is performed, the □-PCP-A/B module will set the previously stored initial data of the old modules in the new modules, which may cause malfunction.

■ Transfer to Initial setting mode

Transfer to Extended communication (Initial setting mode) sets in "1" with identifier IN (Initial setting mode of normally communication).

📖 **The control unit cannot be switched to the Extended communication (Initialize setting mode) state at control start (during control). If it needs to be switched to the above state, first stop the control by "Control RUN/STOP transfer (Identifier: SR)."**

📖 **No control can be started during Extended communication (Initialize setting mode). If the control needs to be re-started, first switch the control unit the normal communication (Set the identifier IN to 0) state.**

[Normally communication]

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Control RUN/STOP transfer [□-PCP-A/B]	**SR**	1	R/W	U	0: Control STOP 1: Control RUN Only when the initial set mode is "0: Normal communication," control can be start.	0
Initial setting mode [□-PCP-A/B]	**IN**	1	R/W	U	0: Normal communication Normal communication is possible. 1: Extended communication (Initialize setting mode) * Normal and initial setting communication are possible.	0

R/W: Read and Write   U: Data for each unit address

* If Extended communication (Initialize setting mode) is selected, the communication data of the Extended communication (Initialize setting mode) can be changed or selected.
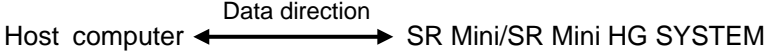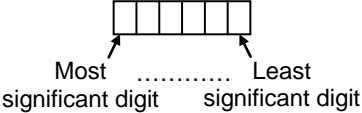
☞ For normally communication, refer to the **SR Mini HG SYSTEM Communication Quick Manual (IMS01V02-E□)** or **SR Mini SYSTEM Communication Instruction Manual (IMSRM04-E□)**.

2. COMMUNICATION IDENTIFIER LIST

2.1 Reference to Communication Identifier List

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Input range number [□-TIO-□, H-CIO-A]	XI	6	R/W	C	□-TIO-A/B/C/D/K/P:　0 to 63 H-TIO-E/F/G/R, H-CIO-A: 　　　　　　　　0 to 120 H-TIO-H/J:　　　　0 to 12 If the input range number is changed, all set values of the corresponding module will be changed (initialized).	Depends on model code

(1) above Name, (2) above Iden-tifier, (3) above Digits, (4) above Attribute, (5) above Structure, (6) above Data range, (7) above Factory set value.

(1) Name:　　Communication data name

★:　Identifier that is only supported in the SR Mini HG SYSTEM.

　　This is not supported in the SR Mini SYSTEM.

[　]:　The module name that data becomes valid is written.

(2) Identifier:　　Communication identifier of RKC communication

(3) Digits:　　The number of communication data digits in RKC communication

(4) Attribute:　　A method of how communication data items are read or written when viewed from the host computer is described.

R/W:　Read and Write data

Data direction

Host computer ← → SR Mini/SR Mini HG SYSTEM

(5) Structure:　　C: Data for each channel　　　L: Data for each event input logic circuit

M: Data for each module　　　U: Data for each unit address

☞ For the data structure, refer to the **2.2 Communication Data Structure (P. 4)**.

(6) Data range:　　Read or write range of communication data

ASCII code data (Example: 6 digits)

Most ………… Least
significant digit　significant digit

(7) Factory set value: Factory set value of communication data

2.2 Communication Data Structure

◼ Data description (Transmission/Receive data structure)

| S T X | ⋮ | ⋮ | .... | ⋮ | E T X | B C C |

Data

Part of the data above is shown below.

● Data for each channel

Data length 6 digits

| | | 0 | 1 | | 1 | 0 | 0 | . | 0 | , | 0 | 2 | | ... | | ... | 2 | 0 | | ... | |

Identifier Channel No. ↑ Space Data ↑ Comma ↑ Space Channel No. Data Channel No. ↑ Space Data

Data length 1 digit

| | | 0 | 1 | | | , | 0 | 2 | | ... | 2 | 0 | | |

Identifier Channel No. ↑ Space Data ↑ Comma Channel No. ↑ Space Data Channel No. ↑ Space Data
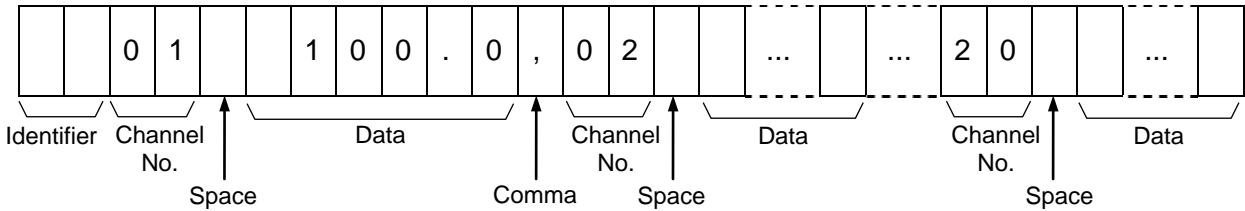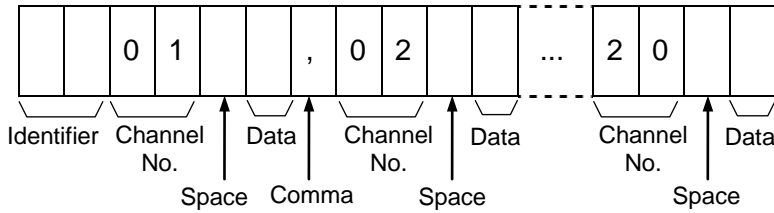
📖 By data structure, channel number becomes as follows:

Data for each module: Module number
Data for each event input logic circuit: Event input logic circuit number

● Data for each unit address (Without channel)

Data length 1 digit   ### Data length 6 digits

Identifier Data   Identifier   Data

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2.3 Extended Communication (Initialize Setting Mode) Communication Data

📖 Note that there are identifiers which indicate that communication is not possible depending on the specification.

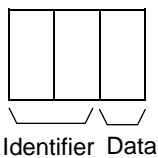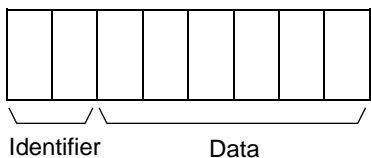| Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Input range number [□-TIO-□, H-CIO-A]	**XI**	6	R/W	C	□-TIO-A/B/C/D/K/P: 0 to 63 H-TIO-E/F/G/R, H-CIO-A: 0 to 120 H-TIO-H/J: 0 to 12 If the input range number is changed, all set values of the corresponding module will be changed (initialized). Refer to ■ **Input range table (P. 30)**.	Depends on model code
Setting limiter high [□-TIO-□, H-CIO-A]	**SH**	6	R/W	C	TC/RTD input: Setting limiter low to Input range (high)	Input range (high)
					Voltage/Current input: Setting limiter low to Display scale high	Display scale high
Setting limiter low [□-TIO-□, H-CIO-A]	**SL**	6	R/W	C	TC/RTD input: Input range (low) to Setting limiter high	Input range (low)
					Voltage/Current input: Display scale low to Setting limiter high	Display scale low
Digital filter [□-TIO-□, H-CIO-A]	**F1**	6	R/W	C	□-TIO-A/B/C/D/K/P: 0 to 100 seconds (0: OFF) H-TIO-E/F/G/H/J/R, H-CIO-A: 0.0 to 100.0 seconds (0.0: OFF)	0 or 0.0
Input error determination point (high) [□-TIO-□, H-CIO-A]	**AV**	6	R/W	C	TC/RTD input: Within input range	Input range (high)
					Voltage/Current input: Within display scale range	Display scale high
Input error determination point (low) [□-TIO-□, H-CIO-A]	**AW**	6	R/W	C	TC/RTD input: Within input range	Input range (low)
					Voltage/Current input: Within display scale range	Display scale low

Continued from the previous page.

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Action at input error (high) [□-TIO-□, H-CIO-A]	**WH**	1	R/W	C	0: Normal control 1: Manipulated output value at input error	0 [a]
Action at input error (low) [□-TIO-□, H-CIO-A]	**WL**	1	R/W	C	0: Normal control 1: Manipulated output value at input error	0
AT bias [□-TIO-□, H-CIO-A]	**GB**	6	R/W	C	Within ± input span range	0 [b]
Setting change rate limiter [□-TIO-□, H-CIO-A]	**HH**	6	R/W	C	0.0 to 100.0 %/minutes of span	0.0
Output limiter high [For Heat/Cool control: Heat-side output limiter (high)] [□-TIO-□, H-CIO-A]	**OH**	6	R/W	C	Heat control, Position proportioning control: Output limiter low to 105.0 % Heat/Cool control: Heat-side output limiter (high): −5.0 % to +105.0 % Heat-side output limiter (low): −5.0 % (fixed) For details, refer to ■ **Output limiter (P. 21)**.	100.0
Output limiter low [For Heat/Cool control: Cool-side output limiter (high)] [□-TIO-□, H-CIO-A]	**OL**	6	R/W	C	Heat control, Position proportioning control: −5.0 % to Output limiter high Heat/Cool control: Cool-side output limiter (high): −5.0 % to +105.0 % Cool-side output limiter (low): −5.0 % (fixed) For details, refer to ■ **Output limiter (P. 21)**.	0.0 [c]
ON/OFF control differential gap (upper) [□-TIO-□, H-CIO-A]	**IV**	6	R/W	C	0.00 to 10.00 % of span	0.02

[a] Heat control (□-TIO-□/H-CIO-A): 0   Heat/Cool control (□-TIO-□/H-CIO-A): 1
   Position proportioning control (H-TIO-K): 0

[b] The position of the decimal point differs depending on the input range.

[c] Heat control (□-TIO-□/H-CIO-A): 0.0   Heat/Cool control (□-TIO-□/H-CIO-A): 100.0
   Position proportioning control (H-TIO-K): 0.0

Continued from the previous page.

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
ON/OFF control differential gap (lower) [□-TIO-□, H-CIO-A]	**IW**	6	R/W	C	0.00 to 10.00 % of span	0.02
Manipulated output value at input error [□-TIO-□, H-CIO-A]	**OE**	6	R/W	C	−5.0 to +105.0 % (Heat control, Position proportioning control) −105.0 to +105.0 % (Heat/Cool control)	0.0
Output change rate limiter (up) [□-TIO-□, H-CIO-A]	**PH**	6	R/W	C	0.0 to 100.0 %/second (0.0: OFF) Setting will be invalid in ON/OFF control. For details, refer to ■ **Output change rate limiter (P. 21)**.	0.0
Output change rate limiter (down) [□-TIO-□, H-CIO-A]	**PL**	6	R/W	C	0.0 to 100.0 %/second (0.0: OFF) Setting will be invalid in ON/OFF control. For details, refer to ■ **Output change rate limiter (P. 21)**.	0.0
Direct/Reverse action selection [□-TIO-□, H-CIO-A]	**XE**	1	R/W	C	0: Direct action 1: Reverse action If the forward operation/reverse operation selection is changed, all set values of the corresponding module will be changed (initialized). Setting will be invalid in Heat/Cool control.	Depends on model code
Hot/Cold start selection [□-TIO-□, H-CIO-A]	**XN**	1	R/W	C	0: Hot start At restarting Operation mode → Same as mode before the power failure Output value → Same as value before the power failure 1: Cold start At restarting Operation mode → Same as mode before the power failure Output value → Output limiter low	1

Continued from the previous page.

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Start determination point [a] [□-TIO-□, H-CIO-A]	**SX**	6	R/W	C	0.0 to 100.0 % of span (Deviation setting from the temperature set value)	3.0
Control RUN/STOP holding [b] [□-PCP-A/B]	**X1**	1	R/W	U	0: Not hold 　Start-up from control stop status 1: Hold 　Start-up from before the stop status	1

[a] On restarting after power failure, if the Temperature measured value (PV) is within the setting range by the start determination points, the hot start will definitely be carried out. If the Temperature measured value (PV) is outside this range, the operation will begin with the start condition with was selected by the Hot/Cold start selection (Identifier: XN).
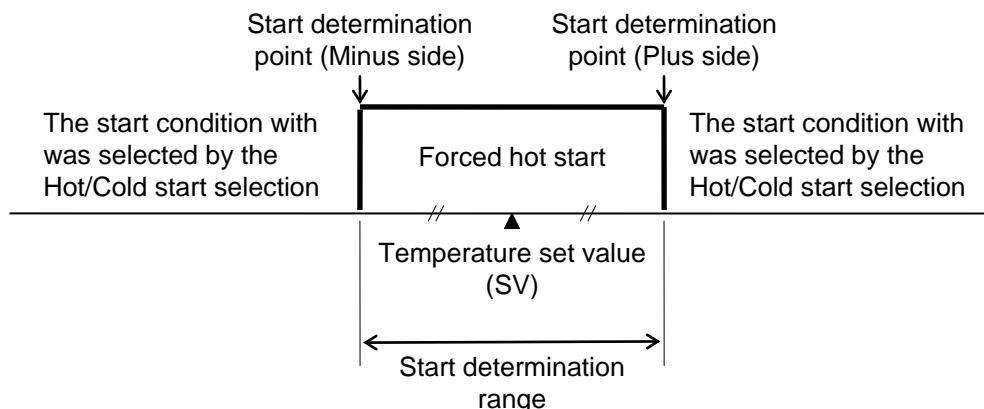
[b] Action after power-ON differs depending on control RUN/STOP holding (Identifier: X1) setting.

Control RUN/STOP holding (Identifier: X1)	Status after power-ON	
	Operation mode transfer (Identifier: EI)	Control RUN/STOP transfer (Identifier: SR)
0: Not hold	Same as mode before the power failure	"0: Control STOP" Stopped until "1: Control RUN" is instructed from the host computer.
1: Hold	Same as mode before the power failure	Same as status before the power failure Control before power failure is maintained even if no host computer is connected.

☞ For the Operation mode transfer (Identifier: EI) and Control RUN/STOP transfer (Identifier: SR), refer to the **SR Mini HG SYSTEM Communication Quick Manual (IMS01V02-E□)** or **SR Mini SYSTEM Communication Instruction Manual (IMSRM04-E□)**.

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Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Temperature rise completion hold function [□-PCP-A/B]	**EK**	1	R/W	U	0: Not hold 1: Hold	1
Interval time setting [□-PCP-A/B]	**ZX**	6	R/W	U	0 to 255 ms	0
Alarm 1 differential gap [□-TIO-□, H-CIO-A]	**HA**	6	R/W	U	0.00 to 10.00 % of span	0.10
Alarm 2 differential gap [□-TIO-□, H-CIO-A]	**HB**	6	R/W	U	0.00 to 10.00 % of span	0.10
Alarm 1 type selection [□-TIO-□, H-CIO-A]	**XA**	1	R/W	U	0: Process high alarm 1: Process low alarm 2: Deviation high alarm 3: Deviation low alarm 4: Deviation high/low alarm 5: Band alarm 6: No alarm function	Depends on model code
Alarm 2 type selection [□-TIO-□, H-CIO-A]	**XB**	1	R/W	U	0: Process high alarm 1: Process low alarm 2: Deviation high alarm 3: Deviation low alarm 4: Deviation high/low alarm 5: Band alarm 6: No alarm function	Depends on model code
Alarm 1 hold action [□-TIO-□, H-CIO-A]	**WA**	1	R/W	U	0: Not provided 1: Provided 2: Re-hold action Re-hold action will be valid in deviation alarm.	Depends on model code
Alarm 2 hold action [□-TIO-□, H-CIO-A]	**WB**	1	R/W	U	0: Not provided 1: Provided 2: Re-hold action Re-hold action will be valid in deviation alarm.	Depends on model code
Alarm 1 interlock [□-TIO-□, H-CIO-A]	**LA**	1	R/W	U	0: Not provided 1: Provided	0
Alarm 2 interlock [□-TIO-□, H-CIO-A]	**LB**	1	R/W	U	0: Not provided 1: Provided	0
Alarm 1 action at input error [□-TIO-□, H-CIO-A]	**OA**	1	R/W	U	0: Normal alarm action 1: Forced alarm ON when temperature measured value exceeds input error determination point.	0

Continued from the previous page.

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Alarm 2 action at input error [□-TIO-□, H-CIO-A]	**OB**	1	R/W	U	0: Normal alarm action 1: Forced alarm ON when temperature measured value exceeds input error determination point.	0
Number of alarm delay times [□-TIO-□, H-CIO-A]	**DF**	6	R/W	U	0 to 255 times Sets the number of sampling period counting times until the alarm is turned ON after temperature measured value enters the alarm region.	0
Module initialization * [□-PCP-A/B]	**CL**	1	R/W	U	0: Normal state (Initialization is not executed) 1: Initialize only the new module (Only modules which are not recognized by the □-PCP-A/B module are initialized) 2: Initialize all module Only 1 or 2 can be used in the selecting and the value will automatically return to 0 after the selection of 1 or 2.	0

 * Initialize method for changing the module composition
   To change module configuration, use the following procedures:
   • When a module is added to the control unit....................................Initialize only the new module
   • When a module is deleted from the control unit ....Initialize only the new module
   • When the module is replaced with a different model.....................Initialize only the new module
   • When a module is inserted (added) between the modules
     in the control unit ....Initialize all modules
   • To change the arrangement of the modules in the control unit......Initialize all modules

   📖   **When "Initialize all modules" is performed, the set values of the setting data of all modules (in the unit) will change (be initialized).**

   📖   **Before performing "Initialize all modules", be sure to make a record of the set values (normal setting data and initial setting data) of all modules. After performing "Initialize all modules", be sure to check the set values (normal setting data and initial setting data) of all modules.**

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Name	Iden- tifier	Digits	Attri- bute	Struc- ture	Data range	Factory set value
PCP module DO type selection [□-PCP-A/B]	**VP**	6	R/W	U	0000 to 9999 [a]	Depends on model code
CT channel setting [□-CT-A]	**ZF**	6	R/W	C	0 to 20 (0: Unused) Allocates the channels for □-TIO-□ module to the input channels of □-CT-A module.	Depends on model code
DO function selection [□-DO-A/B/D]	**LT**	6	R/W	M	00 to 88 [b]	Depends on model code

[a] PCP module DO type selection (□-PCP-A/B module)

0	0	0	0

DO4
DO3
DO2
DO1
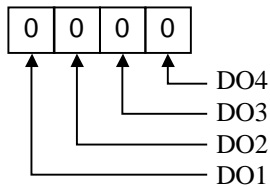
Setting will be valid for only DO1 and DO2 in case of H-PCP-B module.

Data range
 0: Unused
 1: Alarm 1/TI alarm 1
 2: Alarm 2/TI alarm 2
 3: Burnout
 4: Heater break alarm (HBA)
 5: Temperature rise completion
 6: AI alarm 1
 7: AI alarm 2
 8: Control loop break alarm (LBA)
 9: FAIL output

[b] DO function selection (□-DO-A/B module)

□-DO-A/B module

0	0

Block 2 (DO5 to DO8)
Block 1 (DO1 to DO4)
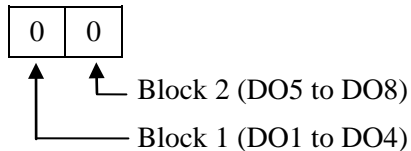
Setting will be valid for only block 1 (DO1 to DO4) in case of □-DO-B module.
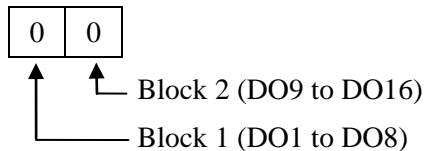
Data range
 0: No alarm function
 1: Alarm 1
 2: Alarm 2
 3: Burnout
 4: Heater break alarm (HBA)
 5: AI alarm 1
 6: AI alarm 2
 7: Control loop break alarm (LBA)
 8: (Not settable)

H-DO-D module

0	0

Block 2 (DO9 to DO16)
Block 1 (DO1 to DO8)

Continued from the previous page.

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
DI function selection [□-DI-A]	**XK**	6	R/W	M	0: Unused 1: Function mode 1 − Memory area transfer (ENABLE terminal is used) After area selection setting, the actual area is changed by detecting the ENABLE edge. − Control RUN/STOP transfer − Alarm interlock release 2: Function mode 2 − Memory area transfer The actual area is changed approximately 2 seconds after area selection setting. − Control RUN/STOP transfer − Alarm interlock release When you select "1: Function mode 1" with the function selection (XK) and use memory area switching, always calculate the setting value with DI 4 (memory area enable) set to used. For details, refer to ■ **Digital input (DI) of H-DI-A module (P. 23)**.	1

Continued from the previous page.

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
DI using selection [□-DI-A]	**H2**	6	R/W	M	0 to 255 * Contact DI selection status is expressed as a bit image in decimal number.	255

* Each DI selection status is assigned as a bit image in binary numbers. However, send data from the SR Mini HG SYSTEM be changed to decimal ASCII code from the bit image in binary numbers.

Bit 7 ········ Bit 0

Bit image: 00000000

Bit 0: DI1   Bit 4: DI5   Bit data
Bit 1: DI2   Bit 5: DI6   0: Used   1: Unused
Bit 2: DI3   Bit 6: DI7
Bit 3: DI4   Bit 7: DI8

Calculation method of setting value

Example: When DI1 to DI4 are used, but DI5 to DI8 are not used.
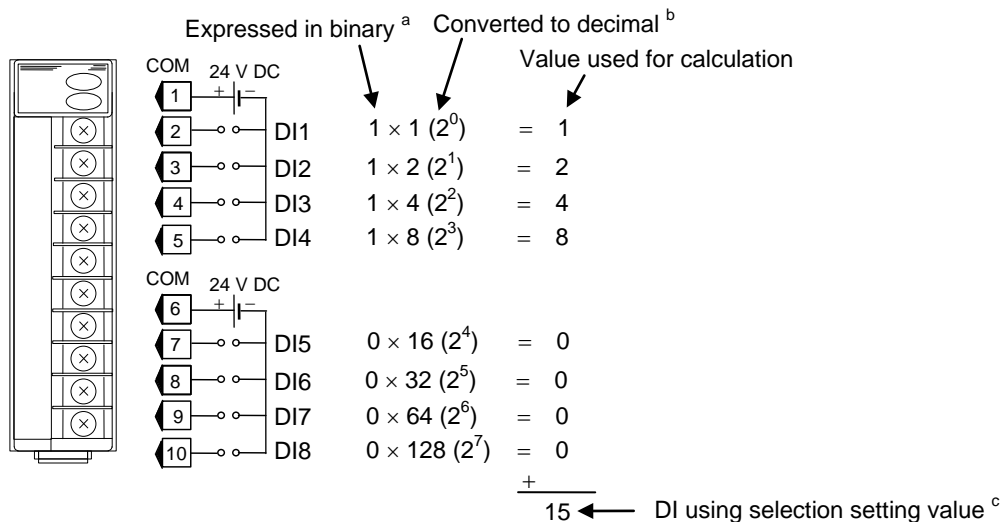
Expressed in binary [a] Converted to decimal [b]

Value used for calculation

DI1	1×1 (2^0)	= 1
DI2	1×2 (2^1)	= 2
DI3	1×4 (2^2)	= 4
DI4	1×8 (2^3)	= 8
DI5	0×16 (2^4)	= 0
DI6	0×32 (2^5)	= 0
DI7	0×64 (2^6)	= 0
DI8	0×128 (2^7)	= 0

15 ◄—— DI using selection setting value [c]

[a] For the binary value, enter either 0 (unused) or 1 (used).
[b] When calculating the setting, express the states for DI1 to DI8 as 1-digit binaries, then convert to decimal.
[c] The setting value is the sum of the calculation values for DI1 to DI8.

Setting example   ×: Used   −: Unused

Setting data	Memory area transfer	Control RUN/STOP transfer	Alarm interlock release
63	×	×	×
255	×	×	×
48	−	×	×
47	×	−	×
32	−	−	×
31	×	×	−
16	−	×	−
15	×	−	−
0	−	−	−

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Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value

AI input range number [H-AI-A/B] ★	**VK**	6	R/W	C	0: 0 to 10 mV DC
					1: −10 to +10 mV DC
					2: 0 to 100 mV DC
					3: −100 to +100 mV DC
					4: 0 to 1 V DC
					5: −1 to +1 V DC
					6: 0 to 5 V DC
					7: 1 to 5 V DC
					8: −5 to +5 V DC
					9: 0 to 10 V DC
					10: −10 to +10 V DC
					11: 0 to 20 mA DC
					12: 4 to 20 mA DC
					Voltage (low) input group:
					  0 to 8
					Voltage (high) input group:
					  9 to 10
					Current input group: 11 to 12
					An input type change may only be made within the input groups.
					If the input range number is changed, all set values of the corresponding module will be changed (initialized).
						Depends on model code

AI display scale high [H-AI-A/B] ★	**JS**	6	R/W	C	Span 10000 or less * (Within −9999 to +10000)	100.0
AI display scale low [H-AI-A/B] ★	**JV**	6	R/W	C	Span 10000 or less * (Within −9999 to +10000)	0.0
AI alarm 1 differential gap [H-AI-A/B] ★	**HC**	6	R/W	U	0.00 to 10.00 % of span	0.10
AI alarm 2 differential gap [H-AI-A/B] ★	**HF**	6	R/W	U	0.00 to 10.00 % of span	0.10
AI alarm 1 type selection [H-AI-A/B] ★	**XC**	1	R/W	U	0: Process high alarm 1: Process low alarm 2 to 6: No alarm function	Depends on model code
AI alarm 2 type selection [H-AI-A/B] ★	**XD**	1	R/W	U		

★ Identifier that is only supported in the SR Mini HG SYSTEM.

 * The position of the decimal point differs depending on AI decimal point position (Identifier: JU) setting.

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Name	Iden- tifier	Digits	Attri- bute	Struc- ture	Data range	Factory set value
AI alarm 1 hold action [H-AI-A/B] ★	**WC**	1	R/W	U	0: Not provided 1: Provided	Depends on model code
AI alarm 2 hold action [H-AI-A/B] ★	**WD**	1	R/W	U		
AI alarm 1 interlock [H-AI-A/B] ★	**LC**	1	R/W	U	0: Not provided 1: Provided	0
AI alarm 2 interlock [H-AI-A/B] ★	**LD**	1	R/W	U		0
Number of AI alarm delay times [H-AI-A/B] ★	**TK**	6	R/W	U	0 to 255 times	0
AI decimal point position [H-AI-A/B] ★	**JU**	1	R/W	C	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places	1
Power supply frequency selection [H-PCP-A/B] ★	**JT**	1	R/W	U	0: 50 Hz 1: 60 Hz	0
AI digital filter [H-AI-A/B] ★	**F2**	6	R/W	C	0.0 to 100.0 seconds (0.0: OFF)	0.0
AI moving average [H-AI-A/B] ★	**VA**	1	R/W	C	0: Not provided 1: Provided	0
Display scale high [H-TIO-H/J, H-CIO-A] ★	**XV**	6	R/W	C	Span 10000 or less [a] (Within −9999 to +10000)	100.0
Display scale low [H-TIO-H/J, H-CIO-A] ★	**XW**	6	R/W	C	Span 10000 or less [a] (Within −9999 to +10000)	0
Decimal point position [H-TIO-H/J, H-CIO-A] ★	**XU**	1	R/W	C	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places	1
AO display scale high [H-AO-A/B] ★	**HV**	6	R/W	C	Span 10000 or less [b] (Within −9999 to +10000)	100.0
AO display scale low [H-AO-A/B] ★	**HW**	6	R/W	C	Span 10000 or less [b] (Within −9999 to +10000)	0.0

★ Identifier that is only supported in the SR Mini HG SYSTEM.

[a] The position of the decimal point differs depending on Decimal point position (Identifier: XU) setting.

[b] The position of the decimal point differs depending on AO decimal point position (Identifier: JR) setting.

Continued from the previous page.

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
AO decimal point position [H-AO-A/B] ★	**JR**	1	R/W	C	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places	1
AO output change rate limiter [H-AO-A/B] ★	**PW**	6	R/W	C	0.0 to 100.0 %/second (0.0: OFF)	0.0
Event DO function selection [H-DO-C] ★	**XF**	6	R/W	C	0 to 30 * (0: Manual)	0
Event DO corresponding channel setting [H-DO-C] ★	**XG**	6	R/W	C	1 to 40 *	1
Event DO mode select setting [H-DO-C] ★	**XH**	6	R/W	C	0 to 40 *	0
Event DO extension alarm differential gap [H-DO-C] ★	**HG**	6	R/W	U	0.00 to 10.00 %	0.10
Event DO extension alarm interlock [H-DO-C] ★	**LE**	1	R/W	U	0: Not provided 1: Provided	0
Number of Event DO extension alarm delay times [H-DO-C] ★	**TI**	6	R/W	U	0 to 255 times	0
Cascade tracking [H-CIO-A] ★	**XL**	1	R/W	M	0: Not provided 　Cascade monitored value 　becomes zero. 1: Provided 　Cascade monitored value 　just before is hold.	0
Cascade data selection [H-CIO-A] ★	**KD**	1	R/W	M	0: Manipulated outpur value 1: Temperature measured value 　(PV) 2: Temperature set value (SV) 3: Set value monitor 4: Temperature deviation	0

★ Identifier that is only supported in the SR Mini HG SYSTEM.

 * Set the function, corresponding channel and mode select of Event DO. Event DO uses it with Event output function.

☞　For the data, refer to the ■ **Event output function (P. 24)**.

Continued from the previous page.

Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Cascade DI function selection [H-CIO-A] ★	H3	1	R/W	M	0: Unused 1: Cascade control ON/OFF only 2: Auto/Manual transfer only 3: DI1 valid (Cascade control ON/OFF), DI2 valid (Auto/Manual transfer)	3
TI input range number [H-TI-A/B/C] ★	XJ	6	R/W	C	0 to 120 If the input range number is changed, all set values of the corresponding module will be changed (initialized). Refer to ■ **Input range table (P. 30)**.	Depends on model code
TI digital filter [H-TI-A/B/C] ★	F3	6	R/W	C	0.0 to 100.0 seconds (0.0: OFF)	0.0
TI alarm 1 differential gap [H-TI-A/B/C] ★	HI	6	R/W	U	0.00 to 10.00 % of span	0.10
TI alarm 2 differential gap [H-TI-A/B/C] ★	HJ	6	R/W	U	0.00 to 10.00 % of span	0.10
TI alarm 1 type selection [H-TI-A/B/C] ★	XP	1	R/W	U	0: Process high alarm 1: Process low alarm 2 to 6: No alarm function	Depends on model code
TI alarm 2 type selection [H-TI-A/B/C] ★	XQ	1	R/W	U		
TI alarm 1 hold action [H-TI-A/B/C] ★	WE	1	R/W	U	0: Not provided 1: Provided	Depends on model code
TI alarm 2 hold action [H-TI-A/B/C] ★	WF	1	R/W	U		
TI alarm 1 interlock [H-TI-A/B/C] ★	LF	1	R/W	U	0: Not provided 1: Provided	0
TI alarm 2 interlock [H-TI-A/B/C] ★	LG	1	R/W	U		
TI alarm 1 action at input error [H-TI-A/B/C] ★	OC	1	R/W	U	0: Normal alarm action 1: Forced alarm ON when temperature measured value exceeds abnormal input trigger input.	0

★ Identifier that is only supported in the SR Mini HG SYSTEM.

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Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
TI alarm 2 action at input error [H-TI-A/B/C] ★	**OD**	1	R/W	U	0: Normal alarm action 1: Forced alarm ON when temperature measured value exceeds abnormal input trigger input.	0
Number of TI alarm delay times [H-TI-A/B/C] ★	**DG**	6	R/W	U	0 to 255 times	0
Event DI type selection 1 [H-DI-B] ★	**R1**	6	R/W	L	0 to 30 * (17 to 30: Not settable)	0
Event DI type selection 2 [H-DI-B] ★	**R2**	6	R/W	L	0 to 30 * (17 to 30: Not settable)	0
Event DI type selection 3 [H-DI-B] ★	**R3**	6	R/W	L	0 to 30 * (17 to 30: Not settable)	0
Event DI type selection 4 [H-DI-B] ★	**R4**	6	R/W	L	0 to 30 * (17 to 30: Not settable)	0
Event DI corresponding channel selection 1 [H-DI-B] ★	**E1**	6	R/W	L	1 to 80 *	1
Event DI corresponding channel selection 2 [H-DI-B] ★	**E2**	6	R/W	L	1 to 80 *	1
Event DI corresponding channel selection 3 [H-DI-B] ★	**E3**	6	R/W	L	1 to 80 *	1
Event DI corresponding channel selection 4 [H-DI-B] ★	**E4**	6	R/W	L	1 to 80 *	1
Event DI reversal selection 1 [H-DI-B] ★	**W1**	1	R/W	L	0: Normal 1: Reversal	0
Event DI reversal selection 2 [H-DI-B] ★	**W2**	1	R/W	L	0: Normal 1: Reversal	0
Event DI reversal selection 3 [H-DI-B] ★	**W3**	1	R/W	L	0: Normal 1: Reversal	0
Event DI reversal selection 4 [H-DI-B] ★	**W4**	1	R/W	L	0: Normal 1: Reversal	0

★ Identifier that is only supported in the SR Mini HG SYSTEM.

 * Set the type and corresponding channel of Event DI. Event DI uses it with Logic input function.

☞ For the data, refer to the ■ **Logic input function (P. 27)**.

Continued from the previous page.

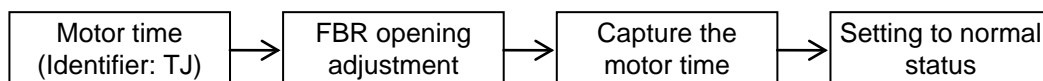| Name	Iden-tifier	Digits	Attri-bute	Struc-ture	Data range	Factory set value
Event DI logic circuit selection [H-DI-B] ★	**LU**	1	R/W	L	0: *AND* (1 active) 1: *NAND* (0 active) 2: *OR* (1 active) 3: *NOR* (0 active)	0
Event DI delay timer setting [H-DI-B] ★	**LW**	6	R/W	L	0 to 255 times	1
Number of HBA trigger points [H-CT-A] ★	**DH**	6	R/W	U	0 to 255 times	5
Positioning adjustment counter [H-TIO-K] ★	**FV**	6	R/W	C	0 to 100 *	0
PCP module DI type selection [H-PCP-B] ★	**VQ**	6	R/W	U	0: OFF (Unused) 1: Type 1 Memory area selection (8 areas selection) 2: Type 2 Combination of control RUN/STOP selection and memory area selection (4 areas selection) 3: Type 3 Combination of control RUN/STOP selection, alarm interlock release and memory area selection (2 areas selection) For details, refer to ■ **Digital input (DI) of H-PCP-B module (P. 22)**.	0

★ Identifier that is only supported in the SR Mini HG SYSTEM.

 * Positioning adjustment counter
   The opening adjustment and the motor time are taken in. When the specified setting counter value is input, the operations begin. (This is only valid when control is stopped.)

📖 **Always adjust the opening first and capture the motor time after the adjustment is complete.**

```
Motor time        →  FBR opening   →  Capture the  →  Setting to normal
(Identifier: TJ)     adjustment       motor time      status
```

☞ For details, refer to the ■ **Positioning adjustment counter (P. 29)**.

☞ For the motor time (Identifier: TJ), refer to the **SR Mini HG SYSTEM Communication Quick Manual (IMS01V02-E□)** or **SR Mini SYSTEM Communication Instruction Manual (IMSRM04-E□)**.
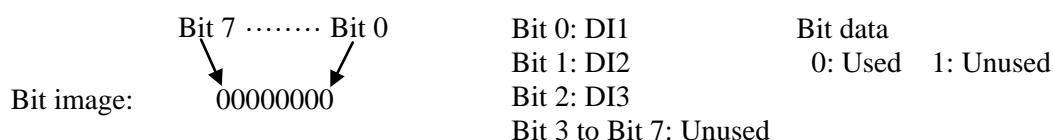
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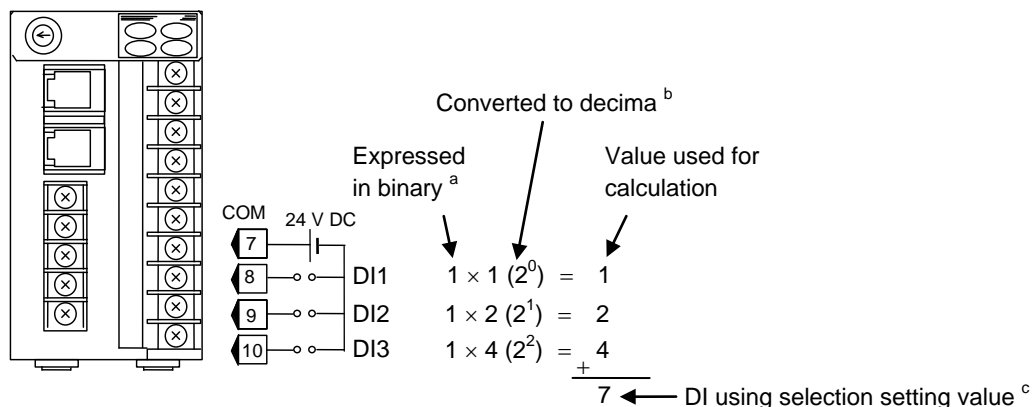| Name	Identifier	Digits	Attribute	Structure	Data range	Factory set value
PCP module DI using selection [H-PCP-B] ★	**H4**	6	R/W	U	0 to 7 [a] Selection status is expressed as a bit image in decimal number.	0
PCP module DO de-energized selection [H-PCP-A, M-PCP-A (Z-190)]	**VS**	6	R/W	U	0000 to 1111 [b]	0

★ Identifier that is only supported in the SR Mini HG SYSTEM.

[a] Each DI selection status is assigned as a bit image in binary numbers. However, send data from the SR Mini HG SYSTEM be changed to decimal ASCII code from the bit image in binary numbers.

Bit 7 ········ Bit 0

Bit image: 00000000

Bit 0: DI1
Bit 1: DI2
Bit 2: DI3
Bit 3 to Bit 7: Unused

Bit data
 0: Used   1: Unused

Calculation method of setting value:

Example: When DI1 to DI3 are used.

Converted to decima [b]

Expressed in binary [a]

Value used for calculation

COM   24 V DC

7		
8	DI1	$1 \times 1 (2^0) = 1$
9	DI2	$1 \times 2 (2^1) = 2$
10	DI3	$1 \times 4 (2^2) = 4$

7 ◄—— DI using selection setting value [c]

[a] For the binary value, enter either 0 (unused) or 1 (used).
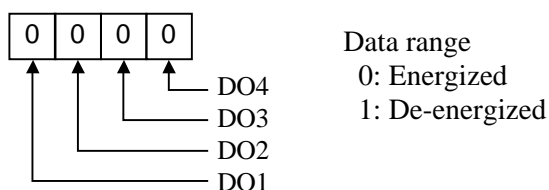
[b] When calculating the setting, express the states for DI1 to DI3 as 1-digit binaries, then convert to decimal.
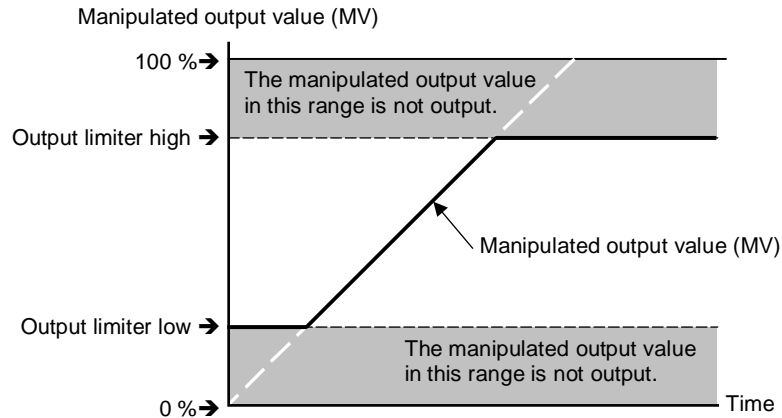
[c] The setting value is the sum of the calculation values for DI1 to DI3.

[b] PCP module DO de-energized selection [H-PCP-A, M-PCP-A (Z-190) module]

0	0	0	0

— DO4
— DO3
— DO2
— DO1

Data range
 0: Energized
 1: De-energized

■ Output limiter

This is the function which restricts the high and low limits of Manipulated output values (MV).

Manipulated output value (MV)

100 %➔ | The manipulated output value in this range is not output.

Output limiter high ➔

Manipulated output value (MV)

Output limiter low ➔

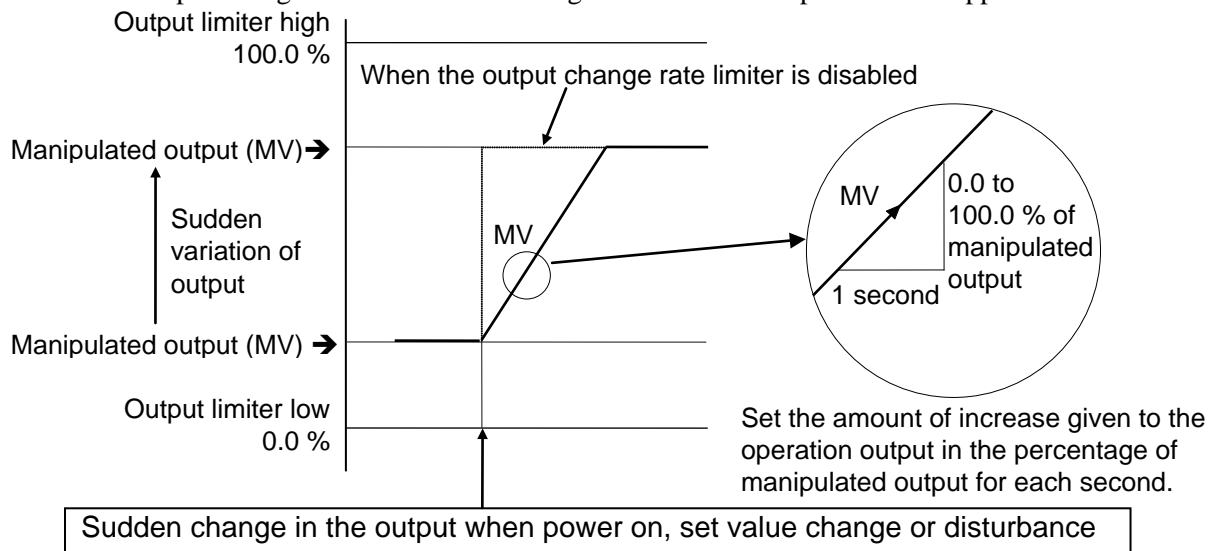The manipulated output value in this range is not output.

0 %➔ ———— Time

■ Output change rate limiter

The output change rate limiter limits the variation of Manipulated output (MV) per second.
This function is suitable for an application in which a sudden MV change is not acceptable.

[The output change rate limiter is effective.]

• The MV reaches 100 % when the power is turned on to the controller and such a sudden output change is not acceptable in the application.
• A sudden output change occurs at the SV change and it is not acceptable in the application.

Output limiter high
100.0 %

When the output change rate limiter is disabled

Manipulated output (MV)➔

Sudden variation of output

MV

MV

0.0 to 100.0 % of manipulated output

1 second

Manipulated output (MV) ➔

Output limiter low
0.0 %

Set the amount of increase given to the operation output in the percentage of manipulated output for each second.

Sudden change in the output when power on, set value change or disturbance

The output changes at specific rates set by output change rate limiter (up) even under the situations where a sudden output change would occur without output change rate limiter function. There is also independent output change rate limiter (down).

📖   If the output change rate is set smaller, it will cause slow control response and affect Derivative action.

📖   When the output change rate limiter is used, you may not be able to obtain appropriate PID constants by autotuning.

📖   The output change rate limiter is particularly effective when a sudden MV change may create uncontrollable situation cause a large current flow. Also, it is very effective current output or voltage output is used as control output.

■ Digital input (DI) of H-PCP-B module

The types below can be selected for the digital input (DI) of the H-PCP-B module.

Type 1: Memory area selection (8 areas selection)

Type 2: Combination of Control RUN/STOP selection and Memory area selection (4 areas selection)

Type 3: Combination of Control RUN/STOP selection, Alarm interlock release and Memory area selection (2 areas selection)

📖 **After the contact is closed, it takes a short time until the action of this device is actually selected. Therefore, pay attention to this delay time if the device is used together with a PLC, etc.**

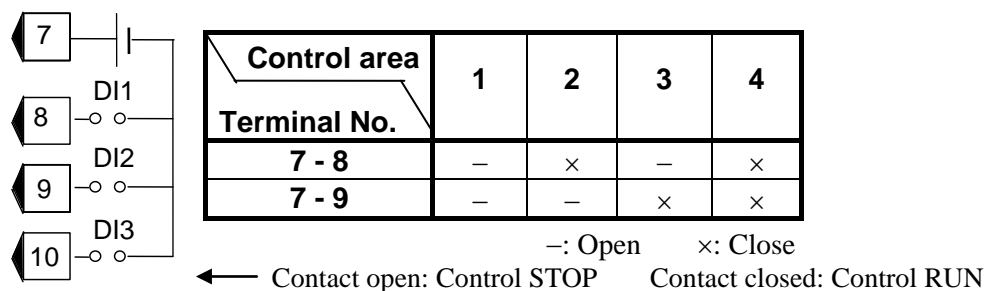📖 External power (24 V DC) supply is required for digital input.

Type 1: Memory area selection

The memory area (control area) can be selected depending on the open or closed state of terminal numbers 7 to 10. Select the memory area by configuring an external contact circuit or using a contact output signal from the PLC, if necessary.

Control area / Terminal No.	1	2	3	4	5	6	7	8
7 - 8	−	×	−	×	−	×	−	×
7 - 9	−	−	×	×	−	−	×	×
7 - 10	−	−	−	−	×	×	×	×

−: Open   ×: Closed
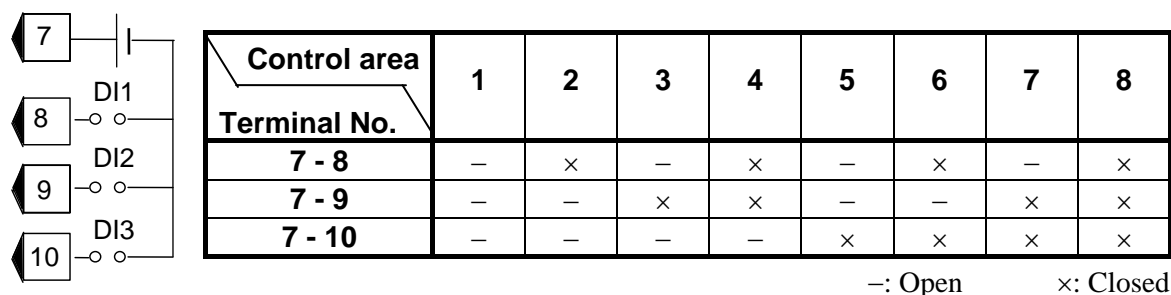
Type 2: Control RUN/STOP selection, Memory area selection

Selection can be performed depending on the open or closed state of terminal numbers 7 to 10.

Control area / Terminal No.	1	2	3	4
7 - 8	−	×	−	×
7 - 9	−	−	×	×

−: Open   ×: Close

← Contact open: Control STOP   Contact closed: Control RUN

Type 3: Control RUN/STOP selection, Alarm interlock release specifying and Memory area selection

Selection or release specifying can be performed depending on the open or closed state of terminal numbers 7 to 10.

← Memory area selection (Contact open: Memory area No.1
Contact closed: Memory area No.2)

← Alarm interlock release (Contact closed: Alarm interlock released)

← Control RUN/STOP selection (Contact open: Control STOP
Contact closed: Control RUN)

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■ Digital input (DI) of H-DI-A module

The types below can be selected for the digital input (DI) of the H-DI-A module.

Function mode 1:
- − Memory area transfer (ENABLE terminal is used)

  After area selection setting, the actual area is changed by detecting the ENABLE edge.
- − Control RUN/STOP transfer
- − Alarm interlock release

Function mode 2:
- − Memory area transfer

  The actual area is changed approximately 2 seconds after area selection setting.
- − Control RUN/STOP transfer
- − Alarm interlock release

> **After the contact is closed, it takes a short time until the action of this device is actually selected. Therefore, pay attention to this delay time if the device is used together with a PLC, etc.**

Memory area selection, Control RUN/STOP selection and Alarm interlock release

Selection or release can be performed depending on the open or closed state of terminal numbers 1 to 8. For memory area selection, configure an external contact circuit or use a contact output signal from the PLC, if necessary.
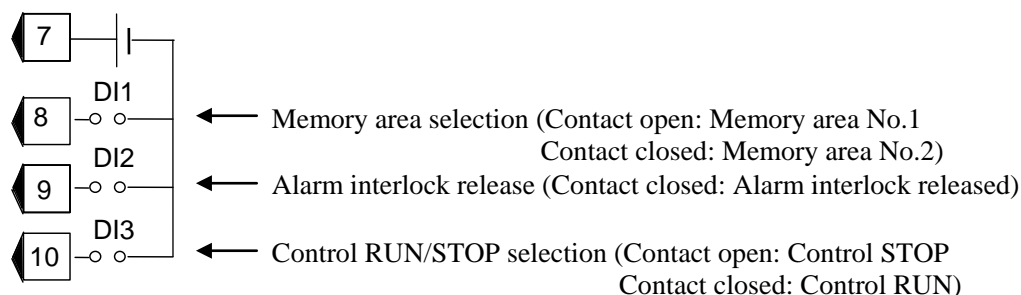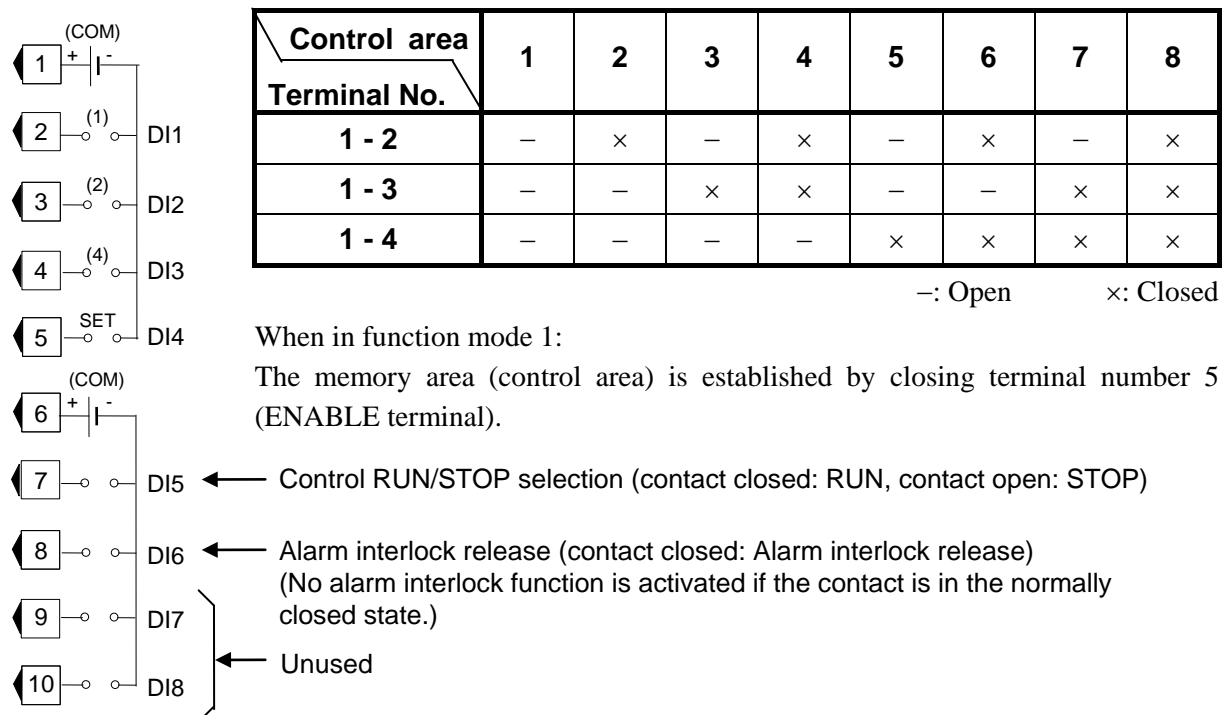

Control area / Terminal No.	1	2	3	4	5	6	7	8
1 - 2	−	×	−	×	−	×	−	×
1 - 3	−	−	×	×	−	−	×	×
1 - 4	−	−	−	−	×	×	×	×

−: Open   ×: Closed

When in function mode 1:

The memory area (control area) is established by closing terminal number 5 (ENABLE terminal).

Control RUN/STOP selection (contact closed: RUN, contact open: STOP)

Alarm interlock release (contact closed: Alarm interlock release)
(No alarm interlock function is activated if the contact is in the normally closed state.)

Unused

> Connect external power (24V DC) to the number 1 and number 6 COM (common) terminals on the DI module so that these terminal sides become positive (+).

■ Event output function (H-DO-C module)

The event output function enables up to 8 points to be output per module of unique alarms different from ordinary temperature and AI alarms (Extension alarm output function), control unit operations (Status output function) and comparison results which are output only under certain conditions (Data comparison output function). The function can be set for each channel of the H-DO-C module.

● Extension alarm output function

An extension alarm is output independently of □-TIO module alarms. As it is independently set, it can be provided as a dedicated alarm output.

Event DO function selection (Identifier: XF)		Event DO corresponding channel setting (Identifier: XG)	Event DO mode select setting (Identifier: XH)
Setting data	Function name		
10	Temperature deviation alarm	1 to 20 CH (□-TIO/H-CIO module)	0: High alarm 1: Low alarm 2: High/Low alarm 3: Band alarm 4: High alarm with hold action 5: Low alarm with hold action 6: High/Low alarm with hold action 7: Band alarm with hold action 8: High alarm with re-hold action 9: Low alarm with re-hold action 10: High/Low alarm with re-hold action
11	Temperature process alarm	1 to 20 CH (□-TIO/H-CIO module)	0: High alarm 1: Low alarm 2: High alarm with hold action 3: Low alarm with hold action
12	Temperature set value alarm	1 to 20 CH (□-TIO/H-CIO module)	0: High alarm 1: Low alarm
13	AI process alarm	1 to 40 CH (H-AI module)	0: High alarm 1: Low alarm 2: High alarm with hold action 3: Low alarm with hold action
20	TI process alarm	1 to 40 CH (H-TI module)	0: High alarm 1: Low alarm 2: High alarm with hold action 3: Low alarm with hold action

📖   This output is different from the ordinary alarm output from the □-DO-A/B type module. Similarly, the ordinary alarm cannot be output from the H-DO-C type module (for event output).

📖   The alarm differential gap and alarm delay timer are commonly set.

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Continued from the previous page.

● **Status output function**

This function is used to output the control unit action status other than the extension alarm output in addition to the ordinary alarm output status (Alarm 1 status, etc.).

Event DO function selection (Identifier: XF)		Event DO corresponding channel setting (Identifier: XG)	Event DO mode select setting (Identifier: XH)
Setting data	Function name		
0	Unused (Manual mode)	—	—
1	Alarm 1	1 to 20 CH (□-TIO/H-CIO module)	—
2	Alarm 2	1 to 20 CH (□-TIO/H-CIO module)	—
3	Burnout	1 to 20 CH (□-TIO/H-CIO module)	—
4	Heater break alarm (HBA)	1 to 20 CH (□-TIO module)	—
5	AI alarm 1	1 to 40 CH (H-AI module)	—
6	AI alarm 2	1 to 40 CH (H-AI module)	—
7	Control loop break alarm (LBA)	1 to 20 CH (□-TIO/H-CIO module)	—
8	PID/AT	1 CH	—
17	TI alarm 1	1 to 40 CH (H-TI module)	—
18	TI alarm 2	1 to 40 CH (H-TI module)	—
19	TI burnout	1 to 40 CH (H-TI module)	—
22	Event DI logic output status	1 to 40 CH (H-DI-B module)	—
9	Not settable	—	—
23 to 30	Not settable	—	—

Continued from the previous page.

● **Data comparison output function**

This function is used to output the result of comparison between the measured value and measured value (or set value and set value) within the same group.

Event DO function selection (Identifier: XF)		Event DO corresponding channel setting (Identifier: XG)	Event DO mode select setting (Identifier: XH)
Setting data	**Function name**	**Data 1**	**Data 2**
14	**Temperature measured value comparison** Comparison between the temperature measured value and temperature measured value	1 to 20 CH (□-TIO/H-CIO module)	1 to 20 CH (□-TIO/H-CIO module)
15	**Temperature set value comparison** Comparison between the temperature set value and temperature set value	1 to 20 CH (□-TIO/H-CIO module)	1 to 20 CH (□-TIO/H-CIO module)
16	**AI measured value comparison** Comparison between the AI measured value and AI measured value	1 to 40 CH (H-AI module)	1 to 40 CH (H-AI module)
21	**TI measured value comparison** Comparison between the TI measured value and TI measured value	1 to 40 CH (H-TI module)	1 to 40 CH (H-TI module)

[Relationship between output and comparison]

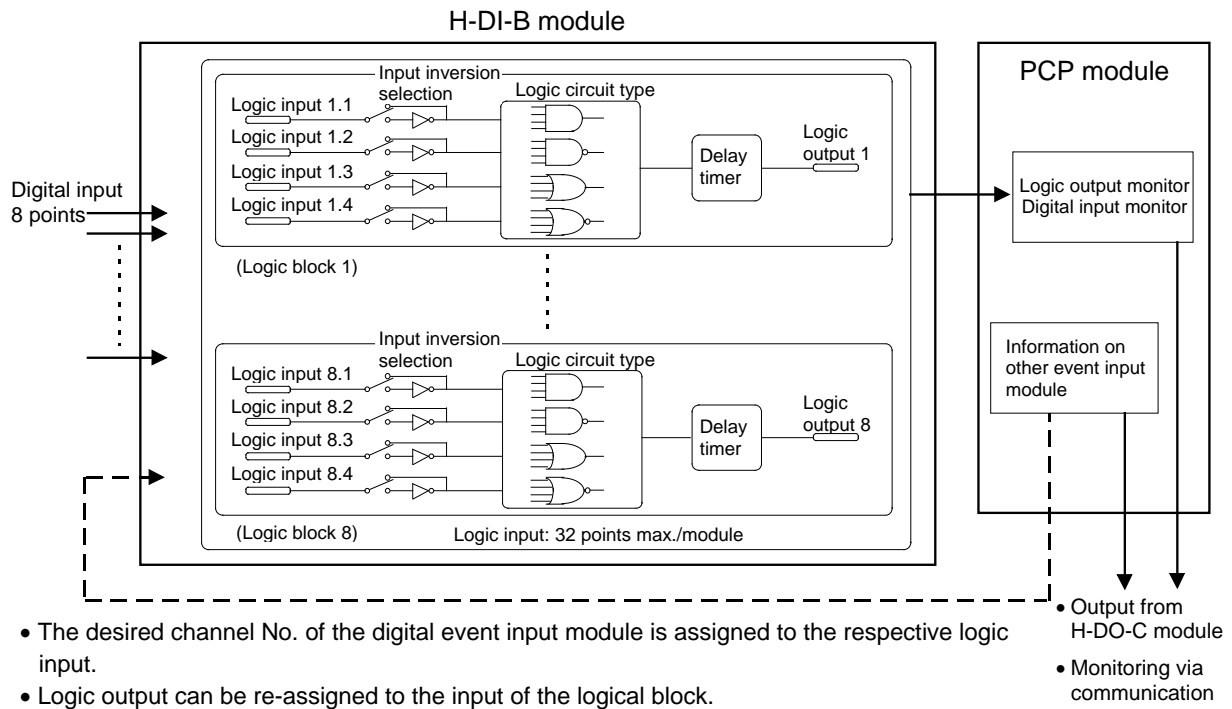Computing equation:
The output turns ON at (Data 2) − (Data 1) ≤ 0

This means :
The output turns ON if (Data 2) is smaller than or equal to (Data 1). {Data 2 ≤ Data 1}

The output turns OFF if (Data 2) is larger than (Data 1).   {Data 2 > Data 1}

■ Logic input function

Each logic is built by four event inputs. Up to 8 logic results (logic outputs) per H-DI-B module can be monitored through communication or can be output from H-DO-C module. In addition, this function can assign the input of the H-DI-B module to any channel number of the H-DO-C module to output the result.

The logic section of event H-DI-B module consists of 4 logic input points, input reversal selection, logic circuit type selection, input delay timer and logic output.

- The desired channel No. of the digital event input module is assigned to the respective logic input.
- Logic output can be re-assigned to the input of the logical block.

Continued from the previous page.

Event DI type selection (Identifier: R1 to R4)		Event DI corresponding channel selection (Identifier: E1 to E4)	Note
Setting data	**Description**		
0	Input always OFF	—	Always ON at "Reversal" selection
1	Event DI input	1 to 80	0: OFF 1: ON
2	Event DI logic output	1 to 80	0: OFF 1: ON
3	Event DO output	1 to 72	0: OFF 1: ON
4	PCP error code	—	0: Not provided 1: Provided
5	Temperature rise completion	—	0: Rise not complete 1: Rise completed
6	PID/AT logical *OR*	—	0: All PID 1: Any one is in AT
7	Alarm 1	1 to18	0: OFF 1: ON
8	Alarm 2	1 to18	0: OFF 1: ON
9	Burnout	1 to18	0: OFF 1: ON
10	Heater break alarm (HBA)	1 to18	0: OFF 1: ON
11	Control loop break alarm (LBA)	1 to18	0: OFF 1: ON
12	AI alarm 1	1 to 36	0: OFF 1: ON
13	AI alarm 2	1 to 36	0: OFF 1: ON
14	TI alarm 1	1 to 36	0: OFF 1: ON
15	TI alarm 2	1 to 36	0: OFF 1: ON
16	TI burnout	1 to 36	0: OFF 1: ON
17 to 30	Not settable	—	—

📖 Each contact status can be monitored by the following identifier.

Digital input (1 to 8) → Event DI contact input monitor (Identifier: L4)

Logic input (1 to 4)/Logic section → Event DI logic input monitor (Identifier: L5)

Logic input (1 to 8) → Event DI logic output monitor (Identifier: Q5)

☞ For identifier L4, L5 and Q5, refer to the **SR Mini HG SYSTEM Communication Quick Manual (IMS01V02-E□)** or **SR Mini SYSTEM Communication Instruction Manual (IMSRM04-E□)**.

■ **Positioning adjustment counter (H-TIO-K module)**

Item	Setting data (Setting counter value)	Description	Status
Opening adjustment	0	Normal status	
	1	Opening adjustment star, open-side output start (Motor time: 110 %)	Automatic
	2	Capture the open-side opening value after 3 seconds stop	
	3	Close-side output start (Motor time: 110 %)	
	4	Capture the close-side opening value after 3 seconds stop	
	5	Above data stored in H-TIO-K module	
	6	Hold status	
Capture the motor time	7	Outputs the close-side until the positioning becomes 0 %. Open-side output start if the positioning is less than 0 %. Stops at an positioning of more than 100 %, and capture the motor time by H-TIO-K module	Automatic
	8	After the motor time has been captured, close-side output comes ON (Motor time: 110 %)	
	9	Hold status	
–	10 to 100	Not settable	

When you input setting counter 1, the opening adjustment starts, operations are carried out automatically up to setting counter 6, then the system goes on hold status. When you input setting counter 7, the motor time capture starts, operations are carried out automatically up to setting counter 9, then the system goes on hold status. After the settings are complete, always set to "0: Normal status."

■ Input range table
Thermocouple input (□-TIO-A/B/C/D/E/G/K/P/R, H-TI-B/C, H-CIO-A)

Input type		Range No.	Input type		Range No.
K	0 to 400 °C	0	T	0.0 to 400.0 °C	53
	0 to 800 °C	1		0 to 400 °C	20
	0 to 1300 °C	2		0 to 200 °C	19
	0.0 to 400.0 °C	46		−200 to +200 °C	21
	0.0 to 800.0 °C	47		0.0 to 200.0 °C [1]	90
	0.0 to 1300.0 °C [1]	80		−200.0 to +200.0 °C [1]	91
	0 to 800 °F	3		0.0 to 700.0 °F	54
	0.0 to 800.0 °F	48		0 to 700 °F	22
	0 to 2400 °F	4		−300 to +400 °F	23
	0.0 to 2400.0 °F [1]	81		−300.0 to +400.0 °F [1]	92
	−200.0 to +300.0 °C [1]	64	N	0 to 1300 °C	24
	−100.0 to +400.0 °C [2]	67		0.0 to 1300.0 °C [1]	93
J	0 to 400 °C	5		0 to 2300 °F	25
	0 to 800 °C	6		0.0 to 2300.0 °F [1]	94
	0 to 1200 °C	7	PL II	0 to 1200 °C	26
	0.0 to 400.0 °C	49		0.0 to 1200.0 °C [1]	95
	0.0 to 800.0 °C	50		0 to 2300 °F	27
	0.0 to 1200.0 °C [1]	82		0.0 to 2300.0 °F [1]	96
	0 to 1600 °F	8	W5Re/ W26Re	0 to 2300 °C	28
	0.0 to 700.0 °F	51		0.0 to 2300.0 °C [1]	97
	0 to 2100 °F	9		0 to 3000 °F	29
	0.0 to 1600.0 °F [1]	83	U	0.0 to 600.0 °C	55
	−200.0 to +300.0 °C [1]	65		0 to 400 °C	30
R	0 to 1700 °C	10		−200 to +200 °C	31
	0.0 to 1700.0 °C [1]	84		0.0 to 400.0 °C [1]	98
	0 to 3000 °F	11		−200.0 to +200.0 °C [1]	99
S	0 to 1700 °C	12		0 to 700 °F	32
	0.0 to 1700.0 °C [1]	85		−300 to +400 °F	33
	0 to 3000 °F	13		0.0 to 700.0 °F [1]	100
B [3]	0 to 1800 °C	14		−300.0 to +400.0 °F [1]	101
	0.0 to 1800.0 °C [1]	86	L	0 to 400 °C	34
	0 to 3000 °F	15		0.0 to 400.0 °C	56
E	0 to 1000 °C	17		0.0 to 900.0 °C	57
	0.0 to 700.0 °C	52		0 to 900 °C	35
	0 to 400 °C	16		0 to 800 °F	36
	0.0 to 400.0 °C [1]	87		0 to 1600 °F	37
	0.0 to 1000.0 °C [1]	88		0.0 to 800.0 °F [1]	102
	0 to 1800 °F	18		0.0 to 1600.0 °F [1]	103
	0.0 to 1800.0 °F [1]	89			

[1] The range can be specified only by H-TIO-E/G/R, H-TI-B or H-CIO-A module (high accuracy type).

[2] The range can be specified only by □-TIO-A/B/C/D [Z-1013 specification] or H-TI-C module [Z-1013 specification].

[3] Accuracy is not guaranteed between 0 to 399 °C (0 to 799 °F) for type B thermocouple input.

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RTD input (□-TIO-A/B/C/D/E/F/G/K/P/R, H-TI-A/B, H-CIO-A)

Input type		Range No.
JPt100	0.0 to 400.0 °C	59
	0 to 400 °C	38
	−200 to +200 °C	39
	−200.0 to +200.0 °C	58
	−50.00 to +150.00 °C [1]	106
	−300 to +900 °F	41
	0 to 800 °F	40
	0.0 to 800.0 °F	60
	−300.0 to +900.0 °F [2]	104
Pt100	0.0 to 400.0 °C	62
	0 to 400 °C	42
	−200 to +200 °C	43
	−200.0 to +200.0 °C	61
	−50.00 to +150.00 °C [1]	107
	−300 to +1200 °F	45
	0 to 800 °F	44
	0.0 to 800.0 °F	63
	−300.0 to +1200.0 °F [2]	105

[1] The range with the resolution of 1/100 can be specified only by H-TIO-E module.
[2] The range can be specified only by H-TIO-F module (high accuracy type).

Voltage input and Current input (H-TIO-H/J, H-CIO-A)

Input type			Range No.	Input group
Voltage input *	0 to 10 mV DC	0.0 to 100.0 %	0	Voltage (low) input group
	−10 to +10 mV DC	0.0 to 100.0 %	1	
	0 to 100 mV DC	0.0 to 100.0 %	2	
	−100 to +100 mV DC	0.0 to 100.0 %	3	
	0 to 1 V DC	0.0 to 100.0 %	4	
	−1 to +1 V DC	0.0 to 100.0 %	5	
	0 to 5 V DC	0.0 to 100.0 %	6	
	1 to 5 V DC	0.0 to 100.0 %	7	
	−5 to +5 V DC	0.0 to 100.0 %	8	
	0 to 10 V DC	0.0 to 100.0 %	9	Voltage (high) input group
	−10 to +10 V DC	0.0 to 100.0 %	10	
Current input *	0 to 20 mA DC	0.0 to 100.0 %	11	Current input group
	4 to 20 mA DC	0.0 to 100.0 %	12	

* Display scale of the voltage and current input can be changed.

📖 **An input type change may only be made within the input groups as shown above.**

MEMO

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