Temperature Controller

GZ400/GZ900

Instruction Manual
[Host Communication]

RKC INSTRUMENT INC.

IMR03D07-E2

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 explanation purpose.
- 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.

Safety Precautions

■ Pictorial Symbols (safety symbols)

Various pictorial symbols are used in this manual to ensure safe use of the product, to protect you and other people from harm, and to prevent damage to property. The symbols are described below.
Be sure you thoroughly understand the meaning of the symbols before reading this manual.

⚠ 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.

⚠ WARNING

- To prevent injury to persons, damage to the instrument and the 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 the instrument and the equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to the instrument and the 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 may 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 plant.)
- 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 to operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- All wiring must be in accordance with local codes and regulations.
- 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 a fuse, circuit breaker, etc.
- A malfunction in this product may occasionally make control operations impossible or prevent alarm outputs, resulting in a possible hazard. Take appropriate measures in the end use to prevent hazards in the event of malfunction.
- 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 dissipation.
- 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 may occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to the instrument display, do not rub with an abrasive material or push the front panel with a hard object.

For Proper Disposal

When disposing of each part used for this instrument, always follows the procedure for disposing of industrial wastes stipulated by the respective local community.

Symbols

■ Pictorial Symbols (safety symbols)

NOTE : 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.

■ Character Symbols

11-segment character

0	1	2	3	4	5	6	7	8	9	Minus	Period
											

A	B (b)	C	c	D (d)	E	F	G	H	I	J	K
											

L	M	N	n	O (o)	P	Q	R	S	T	t	U
											

u	V	W	X	Y	Z	Degree	／	Prime	✱ (Asterisk)	→
										

7-segment character

0	1	2	3	4	5	6	7	8	9	Minus	Period

A	B (b)	C	c	D (d)	E	F	G	H	I	J	K

L	M	N (n)	O (o)	P	Q	R	S	T	t	U	u

V	W	X	Y	Z	Degree	／	Prime	✱ (Asterisk)

■ Abbreviation symbols

These abbreviations are used in this manual:

Abbreviation symbols	Name	Abbreviation symbols	Name
PV	Measured value	TC (input)	Thermocouple (input)
SV	Set value	RTD (input)	Resistance temperature detector (input)
MV	Manipulated output value	V (input)	Voltage (input)
AT	Autotuning	I (input)	Current (input)
ST	Startup tuning	HBA (1, 2)	Heater break alarm (1, 2)
OUT (1 to 3)	Output (1 to 3)	CT (1, 2)	Current transformer (1, 2)
DI (1 to 6)	Digital input (1 to 6)	LBA	Control loop break alarm
DO (1 to 4)	Digital output (1 to 4)	LBD	LBA deadband

Document Configuration

There are seven manuals pertaining to this product. Please be sure to read all manuals specific to your application requirements.

The following manuals can be downloaded from the official RKC website:
https://www.rkcinst.co.jp/english/download-center/

Manual	Manual Number	Remarks
GZ400/GZ900 Installation Manual	IMR03D01-E☐	This manual is enclosed with instrument. This manual explains the mounting and wiring.
GZ400/GZ900 Quick Operation Manual	IMR03D02-E☐	This manual is enclosed with instrument. This manual explains the basic key operation, mode menu, and data setting.
GZ400/GZ900 Parameter List	IMR03D03-E☐	This manual is enclosed with instrument. This list is a compilation of the parameter data of each mode.
GZ400/GZ900 Instruction Manual [Part 1: Hardware]	IMR03D04-E☐	This manual describes installation, wiring, troubleshooting and product specification.
GZ400/GZ900 Instruction Manual [Part 2: Parameters/Functions]	IMR03D05-E☐	Parameters: This manual describes how to switch the operation modes and parameters, the range of parameters, and initialization/automatic conversion associated with the change of settings. Functions: This manual describes how to set up and each function.
GZ400/GZ900 Instruction Manual [Host Communication]	**IMR03D07-E2**	This manual you are reading now. This manual explains RKC communication protocol (ANSI X3.28-1976) and Modbus relating to communication parameters setting.
GZ400/GZ900 Instruction Manual [PLC Communication]	IMR03D08-E☐	This manual describes how to set up the instrument for communication with a programmable controller (PLC).

Read this manual carefully before operating the instrument. Please place the manual in a convenient location for easy reference.

About This Manual

This manual consists of 8 chapters and an appendix. If you are looking for topics concerning the host communication, you may be able to find one in the following table.

	What do you want to do?	See the following section for more details
☐	I want to know the features of the host communication	1 OUTLINE
☐	I want to know how to connect to the host computer	2. WIRING
☐	I want to know how to connect to the loader communication device	2. WIRING
☐	I want to know how to set up the communication parameters	3. PARAMETER SETTING
☐	I want to know the content of RKC communication protocol	4. RKC COMMUNICATION PROTOCOL
☐	I want to know the content of Modbus protocol	5. MODBUS PROTOCOL
☐	I want to know how to use Modbus data mapping	5. MODBUS PROTOCOL
☐	I want to know how to use Memory area data	5. MODBUS PROTOCOL
☐	I want to check the data map structure	6. COMMUNICATION DATA LIST
☐	I want to know how to read the table	6. COMMUNICATION DATA LIST
☐	I want to check RKC communication/Modbus (double word) [identifier, data register address, data attribute, data range and factory set values]	6. COMMUNICATION DATA LIST
☐	I want to check Modbus data register address (single word)	6. COMMUNICATION DATA LIST
☐	I want to check the communication data register address equivalent to the FB series	6. COMMUNICATION DATA LIST
☐	I want to check the identifier and the communication data register address equivalent to the HA series	6. COMMUNICATION DATA LIST
☐	I want to know how to cope with errors	7. TROUBLESHOOTING
☐	I want to know the specification of the host communication	8. SPECIFICATIONS
☐	I want to see the table of ASCII/JIS 7-bit code	A. APPENDIX

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1 OUTLINE

This chapter describes the host communication of GZ400/900.

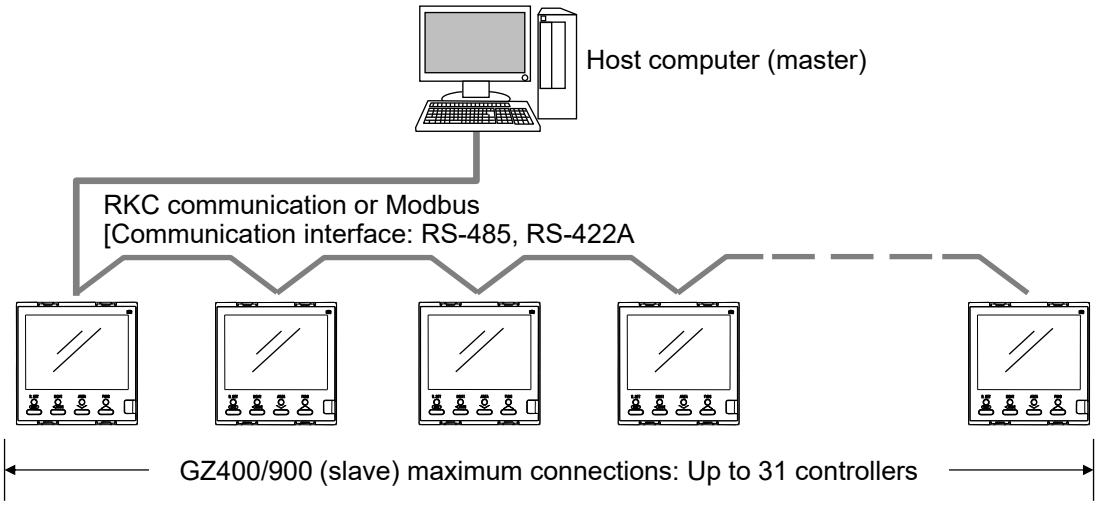
The communication function makes it possible to monitor and set the data of the Temperature Controller GZ400/900 from a host computer. The GZ400/900 interfaces with the host computer via Modbus or RKC communication (ANSI X3.28-1976 subcategories 2.5 and A4) protocols. Communication function is available only when optional communication function has been specified at the time of ordering.
In addition, the controller GZ400/900 is equipped standard with a loader communication connector. Therefore, loader communication is possible. For reference purposes, the Modbus protocol identifies the host computer as master, the controller as slave.

■ Host communication (RKC communication, Modbus) [Optional]

Communication interface: RS-485
RS-422A

● Multi-drop connection (Communication interface: RS-485)

One host computer (master) can communicate with up to 31 GZ400/900s.



● Communication data type

There are such data as shown below for the communication with the computer.
Communication data type can be selected at Input data type (*I Ndr*).

☞ For the Input data type, refer to **3.2 Selection of Communication Data Type (P. 3-5)**.

● RKC communication

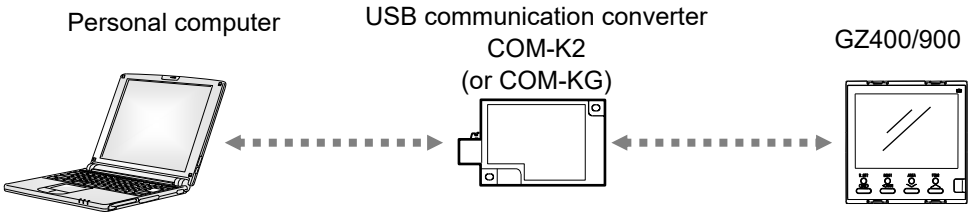
- 7 digits data,Communication data of GZ400/900
- 6 digits data,Communication data of GZ400/900
- 7 digits data,Communication data equivalent to our HA series (RKC communication identifiers are compatible)
  The RKC communication identifiers for the HA series can be used to handle the communication data of the GZ400/900 corresponding to the HA series.
  If there is no relevant communication data on the GZ400/900, dummy data is used.

● **Modbus**

- Double word, Communication data of GZ400/900
- Single word, Communication data of GZ400/900
- Single word, Communication data equivalent to our FB series (Modbus register addresses are compatible)
  The Modbus register addresses for the FB series can be used to handle the communication data of the GZ400/900 corresponding to the FB series.
  If there is no relevant communication data on the GZ400/900, the data is handled as undefined data.
- Double word, Communication data equivalent to our HA series (Modbus register addresses are compatible)
  The Modbus register addresses for the HA series can be used to handle the communication data of the GZ400/900 corresponding to the HA series.
  If there is no relevant communication data on the GZ400/900, the data is handled as dummy data.

■ Loader communication

Loader communication allows GZ400/900 data to be set from a personal computer.
By saving the data that was set using our Communication Tool PROTEM2 to a computer, the data can be transferred to other GZ400/900s, allowing setup to be accomplished much more quickly than when the data is set in each GZ400/900 using the front panel keys.
RKC USB communication converter COM-K2 or COM-KG (sold separately) is required for the loader communication.



Maximum connections: 1 controller

NOTE

The Loader port is only for parameter setup. Not used for data logging during operation.

Loader communication can be used on a GZ400/900 even when the Communication function (optional) is not installed.

The loader communication corresponds to the RKC communication protocol "Based on ANSI X3.28-1976 subcategories 2.5 and A4."

■ PLC communication

The PLC communication function makes it possible to monitor and set the data of the Temperature Controller GZ400/900 from a programmable controller (PLC).
The GZ400/900 can be connected to the programmable controller (PLC) without using any program.

This manual describes the host communication (RKC communication and Modbus).
For the PLC communication, refer to **GZ400/GZ900 Instruction Manual [PLC Communication] (IMR03D08-E□)**.

■ Communication Tool PROTEM2

PROTEM2 is an integrated configuration support software to manage parameter setting and measured values of our controllers (including GZ400/900).

The PROTEM2 can be downloaded from the official RKC website.
Check our website for more details and operating environment of the PROTEM2.

PROTEM2 requires Microsoft.NET Framework 4.5 or later to be installed on the computer.

PROTEM2 can be used with RKC communication protocol and Modbus protocol.
PROTEM2 can also be used for loader communication and a host communication.

2 WIRING

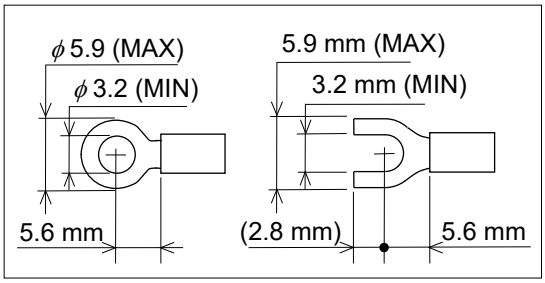
This chapter describes how to connect to the host computer.

⚠ WARNING

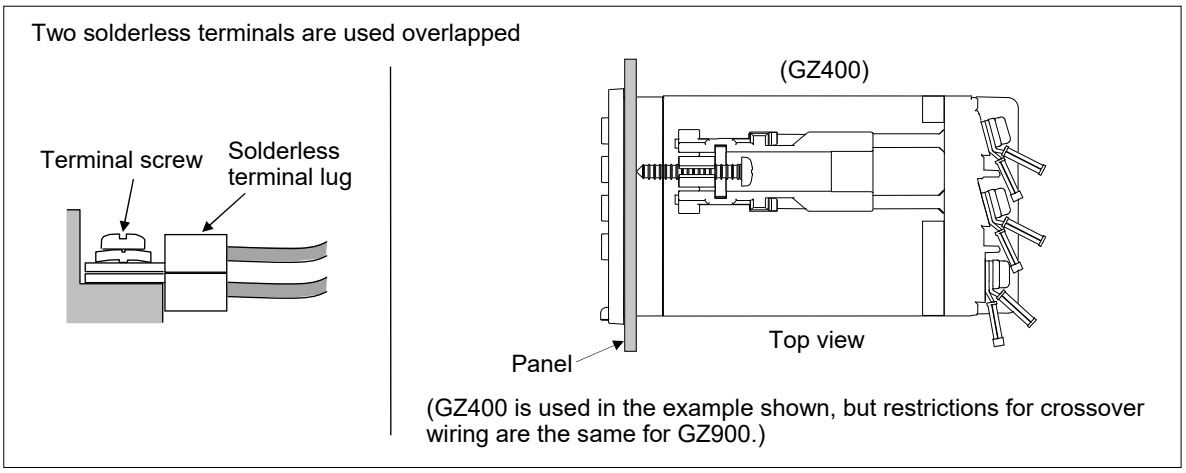
To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

2.1 Wiring Cautions

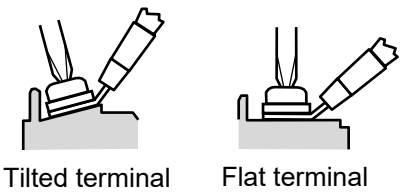
- To avoid noise induction, keep communication wire away from instrument power line, load lines and power lines of other electric equipment.
- Use the solderless terminal appropriate to the screw size.
  Screw size: M3×7 (with 5.8×5.8 square washer)
  Recommended tightening torque:
  0.4 N・m [4 kgf・cm]
  Applicable wire: Solid/twisted wire of 0.25 to 1.65 mm^2
  Specified dimension:
  Refer to Fig. at the right
  Specified solderless terminal:
  Manufactured by J.S.T MFG CO., LTD.
  Circular terminal with isolation V1.25-MS3



- Make sure that during field wiring parts of conductors cannot come into contact with adjacent conductive parts.
- If solderless terminal lugs other than the recommended dimensions are used, terminal screws may not be tightened. In that case, bend each solderless terminal lug before wiring. If the terminal screw is forcibly tightened, it may be damaged.
- Up to two solderless terminal lugs can be connected to one terminal screw. **The requirements of reinforced insulation can be still complied with in this condition.** When actually doing this, place one solderless terminal lug over the other as illustrated below.



- When tightening a screw of the instrument, make sure to fit the screwdriver properly into the screw head mounted tilted or flat as shown in the right figure. Tightening the screw with excessive torque may damage the screw thread.

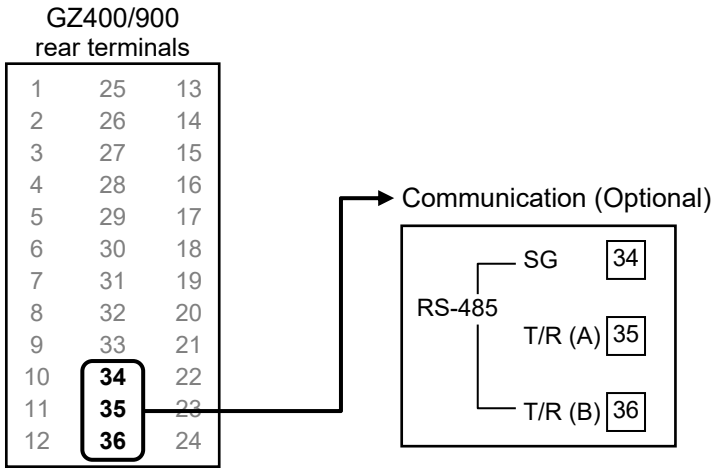


2.2 Wiring for Host Communication

Host communication is used for a connection to a host computer via RS-485 or RS-422A.

2.2.1 Connection to the RS-485 port of GZ400/GZ900

■ Communication terminal number and signal details

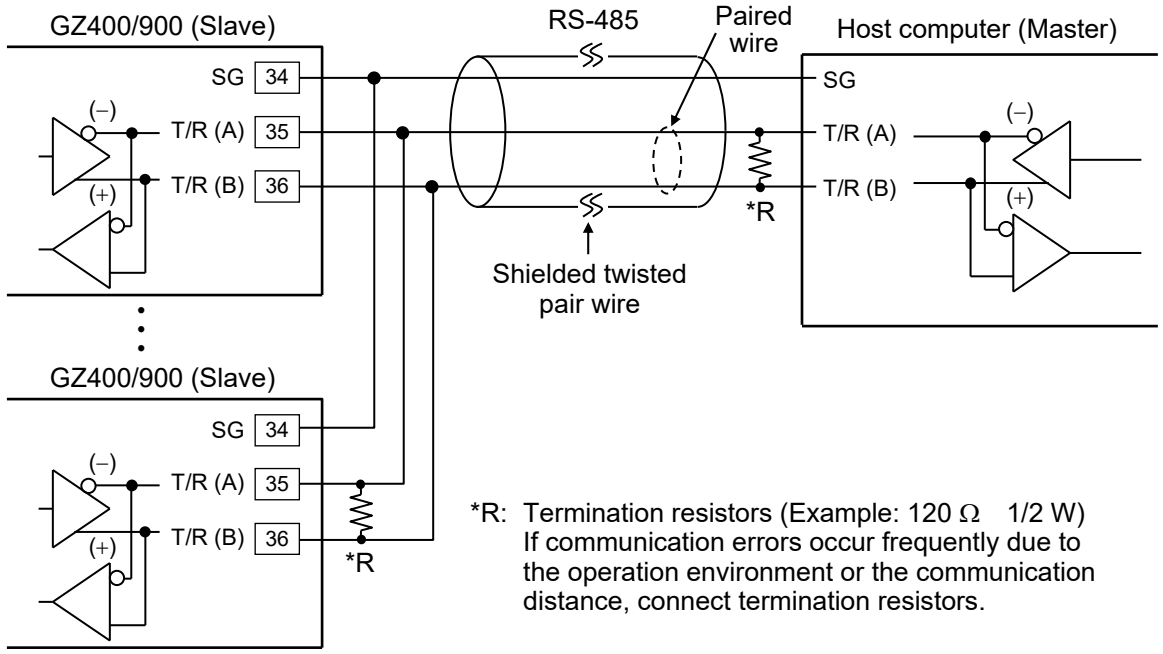


RS-485

GZ400/900 terminal No.	Symbol	Signal name
34	SG	Signal ground
35	T/R (A)	Send data/Receive data
36	T/R (B)	Send data/Receive data

■ Connection to the RS-485 port of the host computer (master)

● Wiring example



*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

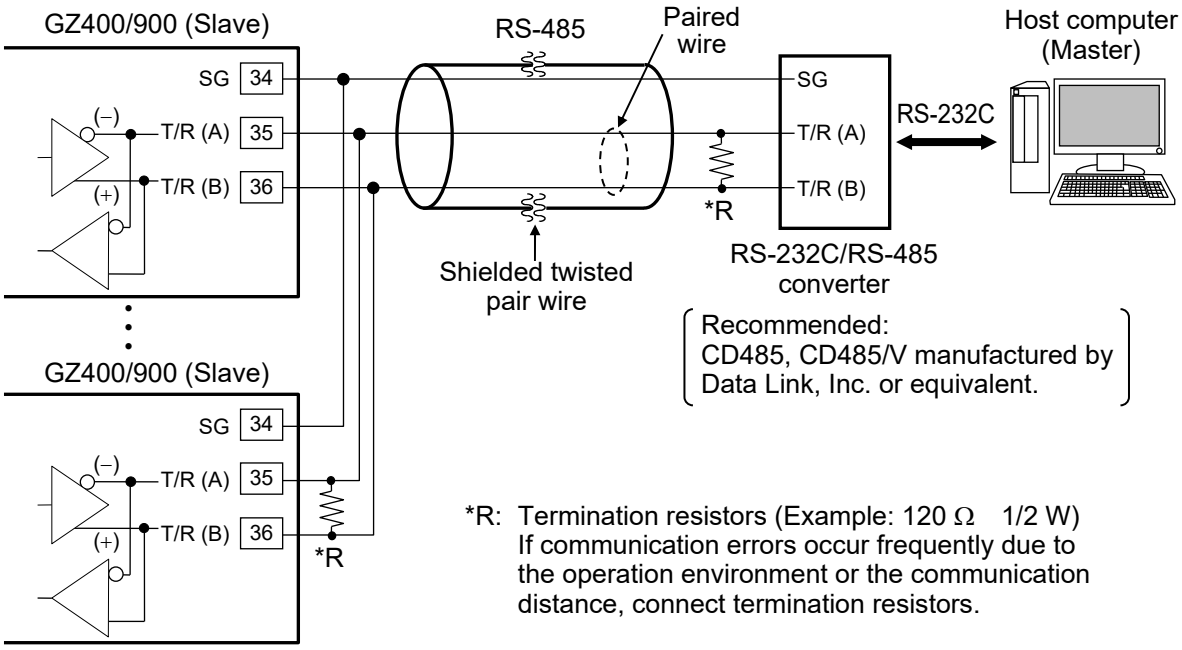
Maximum connections: Up to 31 GZ400/900s

The communication cable and termination resistor(s) must be provided by the customer.

■ Connection to the RS-232C port of the host computer (master)

Use a RS-232C/RS-485 converter with an automatic send/receive transfer function.

● Wiring example



*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

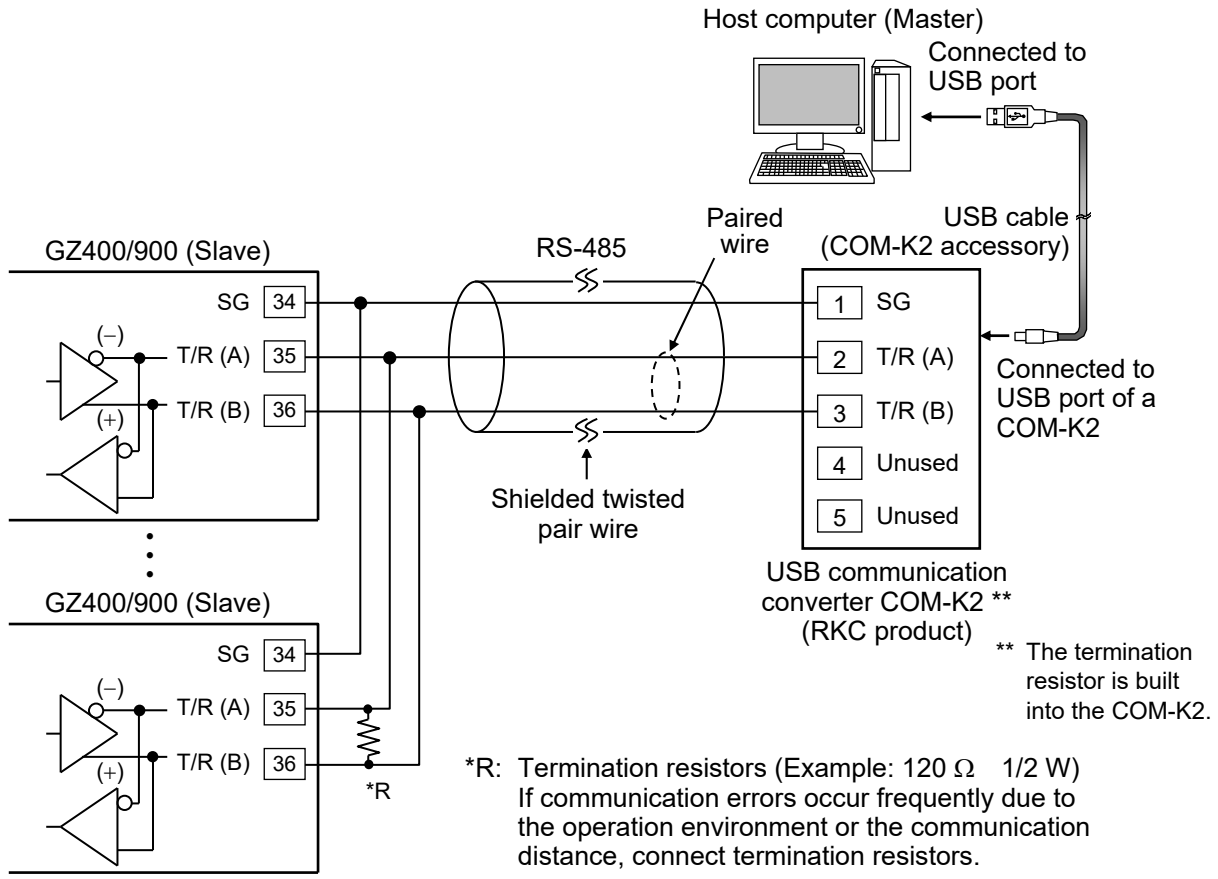
Maximum connections: Up to 31 GZ400/900s

The communication cable and termination resistor(s) must be provided by the customer.

■ Connection to the USB of the host computer (master)

Connect the USB communication converter between the host computer and the GZ400/900.

● Wiring example



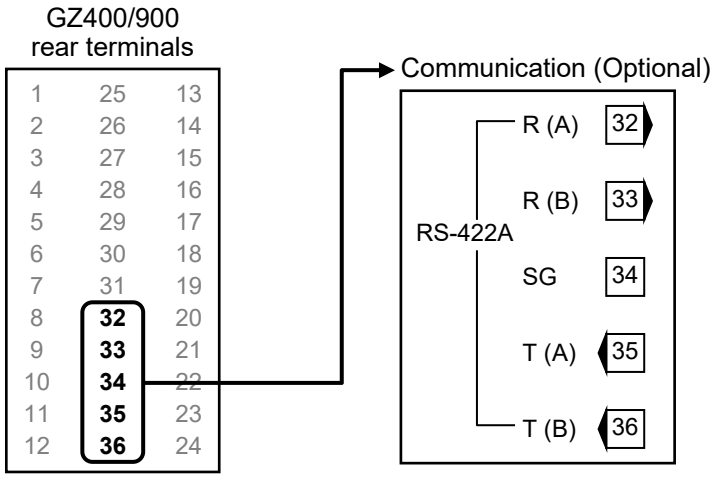
Maximum connections: Up to 31 GZ400/900s

The communication cable and termination resistor(s) must be provided by the customer.

Recommended USB communication converter: **COM-K2** or **COM-KG (RKC product)**
For the COM-K2, refer to the **COM-K2 Instruction Manual**.
For the COM-KG, refer to the **COM-KG Instruction Manual**.

2.2.2 Connection to the RS-422A port of GZ400/GZ900

■ Communication terminal number and signal details

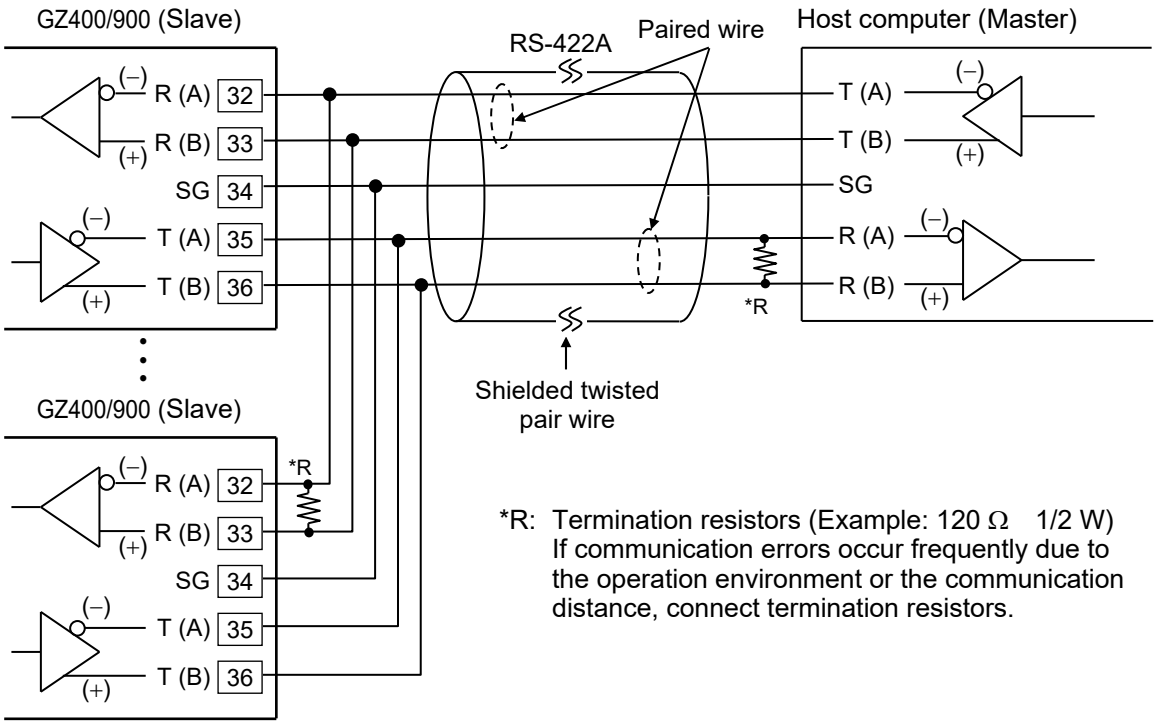


RS-422A

GZ400/900 terminal No.	Symbol	Signal name
32	R (A)	Receive data
33	R (B)	Receive data
34	SG	Signal ground
35	T (A)	Send data
36	T (B)	Send data

■ Connection to the RS-422A port of the host computer (master)

● Wiring example



*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

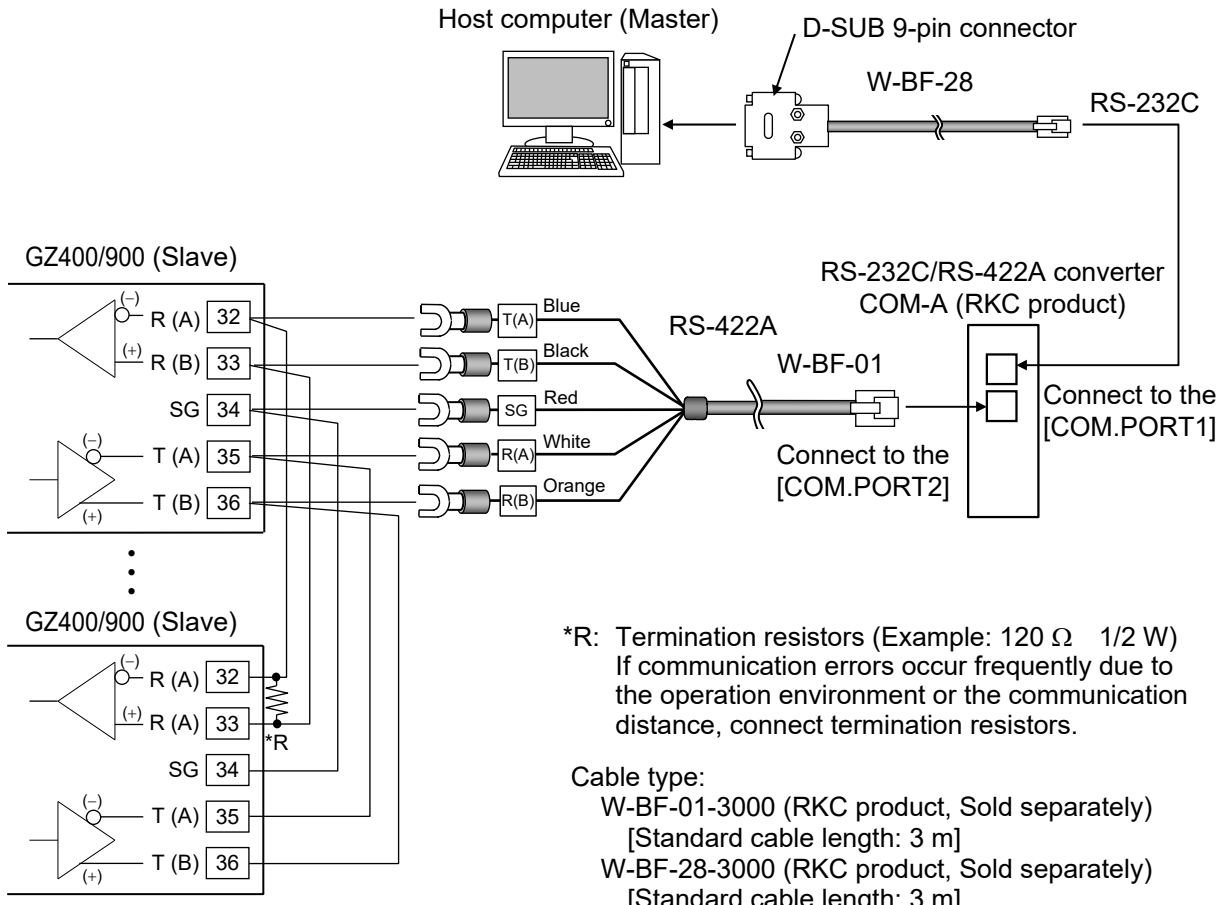
Maximum connections: Up to 31 GZ400/900s

The cable and termination resistor(s) must be provided by the customer.

■ Connection to the RS-232C port of the host computer (master)

A RS-232C/RS-422A converter is required.

● Wiring example



*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

Cable type:
W-BF-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]
W-BF-28-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]

The cable and termination resistor(s) must be provided by the customer.

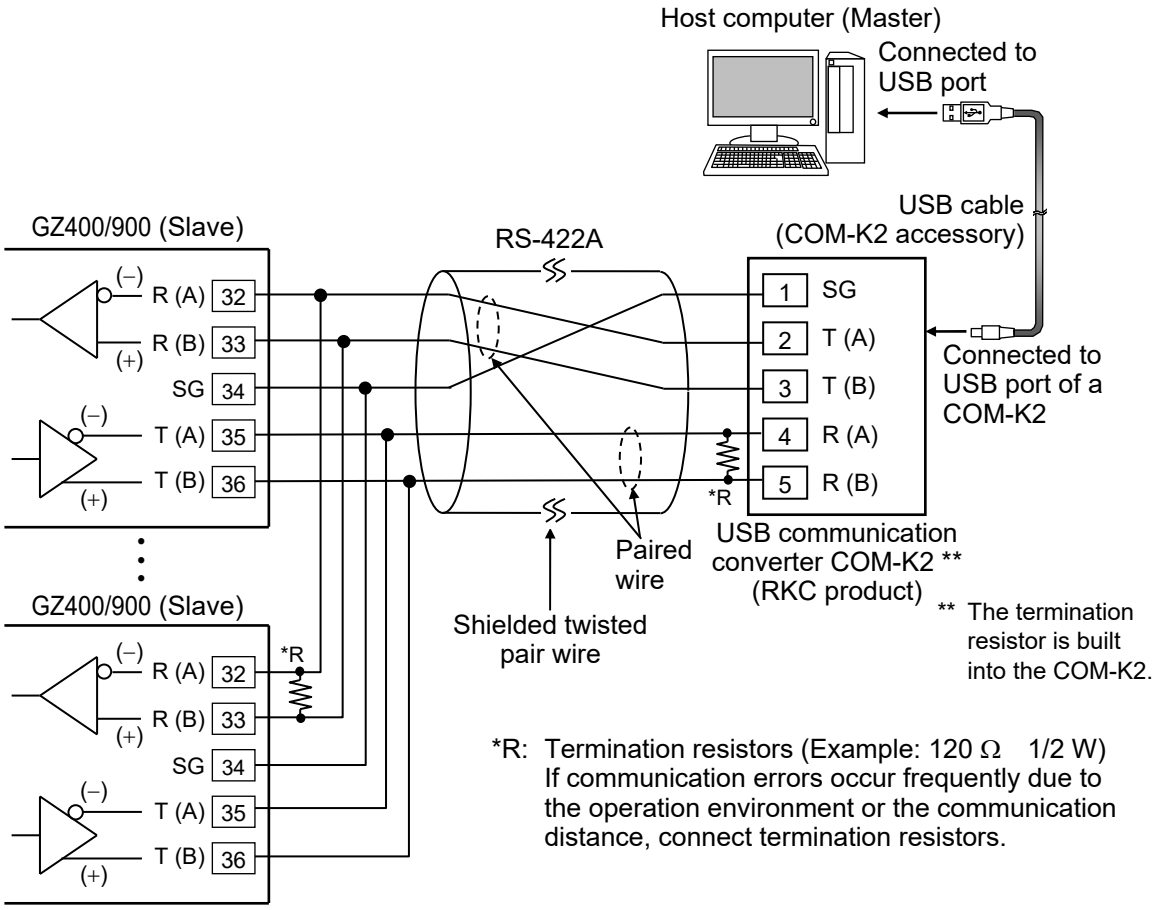
W-BF-01 or W-BF-28 communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

Recommended RS-232C/RS-422A converter: **COM-A** (RKC product)
For the COM-A, refer to the **COM-A/COM-B Instruction Manual**.

■ Connection to the USB of the host computer (master)

Connect the USB communication converter between the host computer and the GZ400/900.

● Wiring example



Maximum connections: Up to 31 GZ400/900s

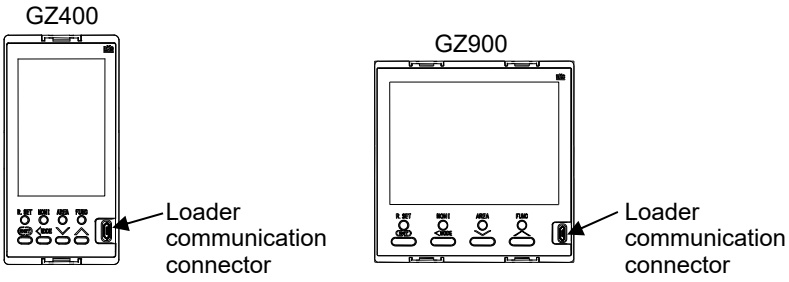
The communication cable and termination resistor(s) must be provided by the customer.

Recommended USB communication converter: **COM-K2** or **COM-KG (RKC product)**
For the COM-K2, refer to the **COM-K2 Instruction Manual**.
For the COM-KG, refer to the **COM-KG Instruction Manual**.

2.3 Connections for Loader Communication

■ Position of loader communication connector

The loader communication connector can be found on the front of the instrument. In the following picture the connector cover is open.

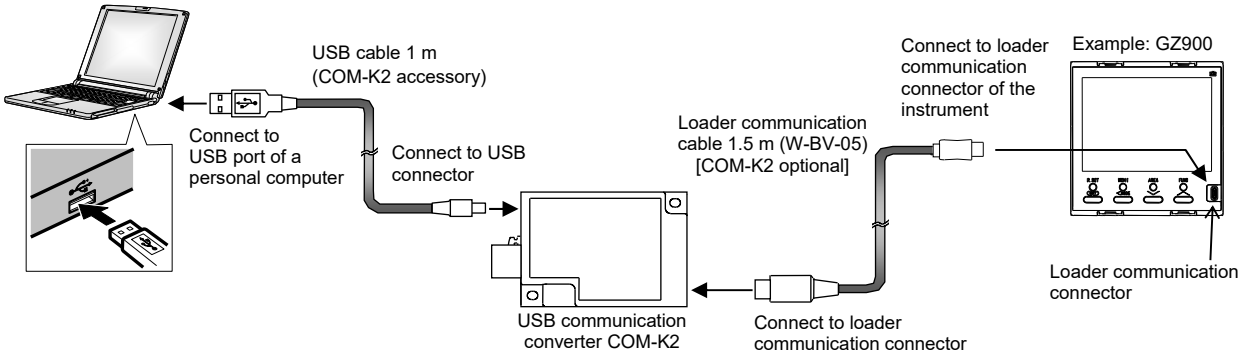


■ Wiring method

Connect the GZ400/900, COM-K2 (or COM-KG), and personal computer using a USB cable and a loader communication cable. Make sure the connectors are oriented correctly when connecting.

NOTE

The Loader port is only for parameter setup. Not used for data logging during operation.



Connection example of loader communication

- Communication Tool
  PROTEM2
  Software operation environment:
  Consult the manual that you downloaded
- Communication settings on the computer
  (The following values are all fixed)
  Communication speed: 38400 bps
  Start bit: 1
  Data bit: 8
  Parity bit: None
  Stop bit: 1
- Communication port of host computer
  USB port: Based on USB Ver. 2.0

- The device address of the loader communication is fixed at "0." The setting of the device address is disregarded.
- The loader communication corresponds to the RKC communication protocol "Based on ANSI X3.28-1976 subcategories 2.5 and A4."
- Loader communication can be used on a GZ400/900 even when the Communication function (optional) is not installed.

Recommended USB communication converter:
COM-K2 or **COM-KG (RKC product)**
For the COM-K2, refer to the **COM-K2 Instruction Manual**.
For the COM-KG, refer to the **COM-KG Instruction Manual**.

When using the loader communication, USB driver for COM-K2 must be installed on the personal computer. The USB driver can be downloaded the official RKC website. Installation of the USB driver is not necessary when the COM-KG is used on Windows 10.

When the instrument is powered off, power can be supplied to the instrument from COM-K2 (or COM-KG). This function is exclusive for parameter setting, and the instrument functions as follows.

- Control is stopped (Output is off, relay remains open).
- Host communication is stopped.
- The PV/SV monitor shows "LoAd" for the Measured value (PV) display and "----" for the Set value (SV) display. The LCD backlight is partially turned off.

While the instrument is powered by COM-K2 (or COM-KG), if power is applied to the instrument, the instrument will be reset and starts for normal operation.

When the instrument is normally powered, the host communication can be used simultaneously.

3 PARAMETER SETTING

This chapter describes how to set up parameters necessary for the host communication.

3.1 Setting of Communication Parameter

3.1.1 Description of each parameter

To establish communication between host computer (master) and GZ400/900 (slave), it is necessary to set the following parameters. The communication related parameters can be found in the Function block No. 60: communication (SCI) of Engineering mode.
The communication status can be monitored at "Communication response monitor."

■ Function block No. 60: Communication (SCI)

No.	Symbol	Name	Data range	Description	Factory set value
—	Fn60	Function block No. 60	This is the first parameter symbol of Function block No. 60.		—
282	CMPS	Communication protocol	0: RKC communication 1: Modbus (Order of data transfer: high-order word to low-order word) 2: Modbus (Order of data a transfer: low-order word to high-order word) 3: PLC communication (MITSUBISHI MELSEC series special protocol QnA-compatible 3C frame [format 4]) **Do not set for the host communication.**	Select the communication protocol type.	When the communication protocol is specified at the time of order, the specified communication protocol will be the factory set value. With communication, communication protocol not specified: 0
283	Add	Device address	RKC communication: 0 to 99 Modbus: 1 to 99 PLC communication: 0 to 30	Do not use the same device address for more than one GZ400/900 in multi-drop connection. Each GZ400/900 must have a unique address in multi-drop connection.	RKC communication: 0 Modbus: 1 PLC communication: 0
284	bPS	Communication speed	0: 2400 bps 1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: 57600 bps 6: 115200 bps	Set the same communication speed for both the GZ400/900 (slave) and the host computer (master).	3
285	bIT	Data bit configuration	0 to 11 Refer to **Data bit configuration table (P. 3-3)**	Set the same data bit configuration for both the GZ400/900 (slave) and the host computer (master).	0
286	INT	Interval time	0 to 250 ms	The Interval time is the waiting time between the receipt of the message from the host computer and the transmission of the reply message from GZ400/900. Adjust the interval time when the switchover between send and receive is not appropriate.	10
287	CMRM	Communication response monitor	Refer to ● **Communication response monitor (P. 3-3)**	Displays the communication state.	—

Data bit configuration table

Set value	Data bit	Parity bit	Stop bit
0	8	None	1
1	8	None	2
2	8	Even	1
3	8	Even	2
4	8	Odd	1
5	8	Odd	2

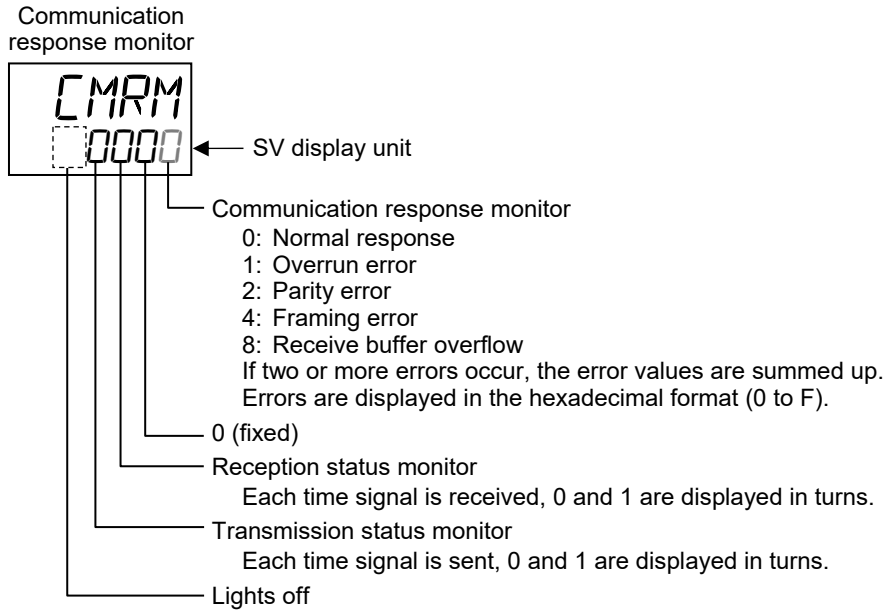
Set value	Data bit	Parity bit	Stop bit
6	7	None	1
7	7	None	2
8	7	Even	1
9	7	Even	2
10	7	Odd	1
11	7	Odd	2

: Not settable for Modbus

Interval time:
The interval time for the GZ400/900 should be set to provide a time for host computer to finish sending all data including stop bit and to switch the line to receive status for the host. If the interval time between the two is too short, the GZ400/900 may send data before the host computer is ready to receive it. In this case, communication transmission cannot be conducted correctly.

The communication protocol, device address (slave address), communication speed, data bit configuration, and interval time can also be set by loader communication using PROTEM2. It can also be set by host communication.

● Communication response monitor



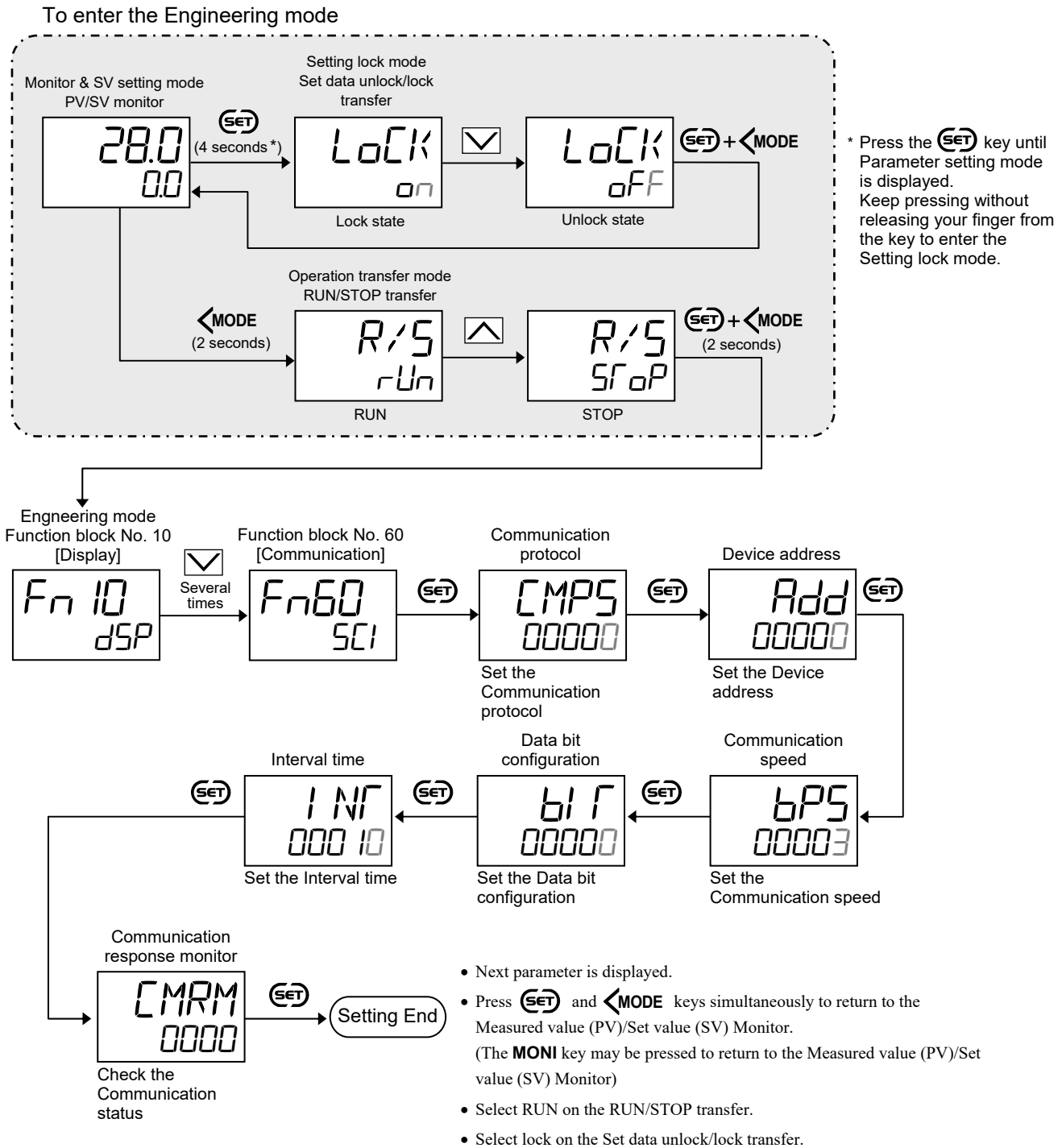
3.1.2 Setting procedure

The communication related parameters can be found in the Function block No. 60: Communication (SCI) of Engineering mode.

Set value change and registration

- The flashing digit indicates which digit can be set. Press MODE key to go to a different digit.
- To store a new value for the parameter, always press the SET key. The display changes to the next parameter and the new value will be stored. The modified data will not be stored only by operating the ∧ and ∨ keys.
- In case no operation is performed within 60 seconds after the change of the setting, the mode will return to Monitor and SV setting mode. The modified data will not be registered in this case.

■ Setting procedure



3.2 Selection of Communication Data Type

3.2.1 Communication data type

There are such data as shown below for the communication with the computer. Communication data type can be selected at Input data type (*I NdT*).

☞ For the Input data type, refer to the **3.2.2 Description of each parameter (P. 3-6)**.

■ RKC communication

Communication data type	Set value of Input data type
• 7 digits data, Communication data of GZ400/900	**0**
• 6 digits data, Communication data of GZ400/900	**1**
• 7 digits data, Communication data equivalent to our HA series (RKC communication identifiers are compatible) The RKC communication identifiers for the HA series can be used to handle the communication data of the GZ400/900 corresponding to the HA series. If there is no relevant communication data on the GZ400/900, dummy data is used.	**2**

☞ For the data map of RKC communication, **6.3.1 GZ400/GZ900 communication data [RKC communication identifier/Modbus double word] (P. 6-12)**.

■ Modbus

Communication data type	Set value of Input data type
• Double word, Communication data of GZ400/900 ☞ For details, refer to the **6.3.1 GZ400/GZ900 communication data [RKC communication identifier/Modbus double word] (P. 6-12)**.	**0**
• Single word, Communication data of GZ400/900 ☞ For details, refer to the **6.4.1 GZ400/GZ900 communication data [Modbus single word] (P. 6-142)**.	**1**
• Single word, Communication data equivalent to our FB series (Modbus register addresses are compatible) The Modbus register addresses for the FB series can be used to handle the communication data of the GZ400/900 corresponding to the FB series. If there is no relevant communication data on the GZ400/900, the data is handled as undefined data. ☞ For details, refer to the **6.4.4 FB series equivalent communication data [Modbus single word] (P. 6-169)**.	**1**
• Double word, Communication data equivalent to our HA series (Modbus register addresses are compatible) The Modbus register addresses for the HA series can be used to handle the communication data of the GZ400/900 corresponding to the HA series. If there is no relevant communication data on the GZ400/900, the data is handled as dummy data. ☞ For details, refer to the **6.3.4 HA series equivalent communication data [RKC communication identifier/Modbus single word] (P. 6-103)**.	**2**

3.2.2 Description of each parameter

Communication data type can be selected at Input data type (I Ndr). The Input data type can be found in the Function block No. 21: Input 1 (I. InP) of Engineering mode.

■ Function block No. 21: Input 1 (I. InP)

No.	Symbol	Name	Data range	Description	Factory set value
—	Fn2 1	Function block No. 21	This is the first parameter symbol of Function block No. 21		—
⋮	⋮	⋮	⋮	⋮	⋮
165	I Ndr	Input data type	0: Number of measured value digits: 5 Number of RKC communication data digits: 7 Modbus data: Double word PLC communication data: Double word (System data: Single word) 1: Number of measured value digits: 4 Number of RKC communication data digits: 6 Modbus data: Single word * PLC communication data: Single word 2: HA series equivalent (Communication identifiers of RKC communication and register address of Modbus switch to the HA series equivalent data.) Number of measured value digits: 5 Number of RKC communication data digits: 7 Modbus: Double word PLC communication: Double word (System data: Single word) * Including our FB series equivalent data When changing the Input data type from 0 (or 2) to 1 and when the present Input range has 5 digits (example: Input range high: 1372.0), you need to configure the Input range to have 4 digits beforehand. The display of the time unit depends on the Input data type. In case of Input data type 0 or 2 hour/minute/second, hour/minute, minute/second, second In case of Input data type 1 hour/minute, minute/second, second	Select the input data type.	Depends on the input range code specified at the time of order.

The communication data type can be checked at Input data type of the host communication.

Input data type

RKC communication identifier:	SE	(Refer to P. 6-50)
Modbus Double word:	01A4H, 01A5H	(Refer to P. 6-50)
Modbus Single word:	20D2H	(Refer to P. 6-148)

3.2.3 Setting procedure

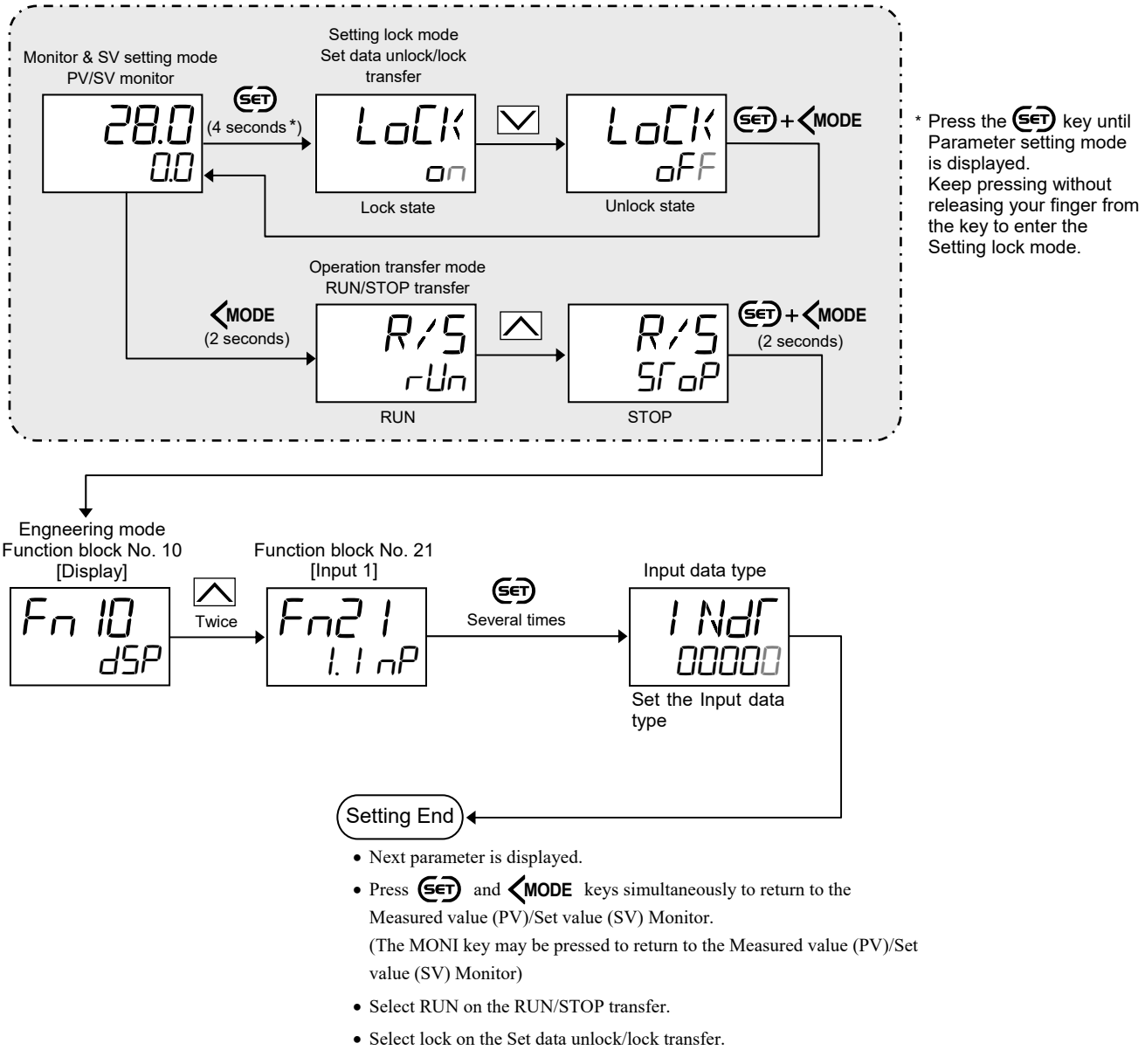
The Input data type can be found in the Function block No. 21: Input 1 (I. InP) of Engineering mode.

Set value change and registration

- The flashing digit indicates which digit can be set. Press MODE key to go to a different digit.
- To store a new value for the parameter, always press the SET key. The display changes to the next parameter and the new value will be stored. The modified data will not be stored only by operating the ∧ and ∨ keys.
- In case no operation is performed within 60 seconds after the change of the setting, the mode will return to Monitor and SV setting mode. The modified data will not be registered in this case.

■ Setting procedure

To enter the Engineering mode



- Next parameter is displayed.
- Press SET and MODE keys simultaneously to return to the Measured value (PV)/Set value (SV) Monitor. (The MONI key may be pressed to return to the Measured value (PV)/Set value (SV) Monitor)
- Select RUN on the RUN/STOP transfer.
- Select lock on the Set data unlock/lock transfer.

3.3 Communication Requirements

■ Processing times during data send/receive

When the host computer is using either the polling or selecting procedure for communication, the following processing times are required for GZ400/900 to send data:
– Response wait time after GZ400/900 sends BCC in polling procedure
– Response wait time after GZ400/900 sends ACK or NAK in selecting procedure

Response send time is time when interval time is set at 0 ms.

RKC communication (Polling procedure) processing times

Procedure details	Time
Response send time after GZ400/900 receives ENQ	4.48 ms max.
Response send time after GZ400/900 receives ACK	4.64 ms max.
Response send time after GZ400/900 receives NAK	4.64 ms max.
Response send time after GZ400/900 sends BCC	304 μs max.

RKC communication (Selecting procedure) processing times

Procedure details	Time
Response send time after GZ400/900 receives BCC	280 ms max.
Response wait time after GZ400/900 sends ACK	276 μs max.
Response wait time after GZ400/900 sends NAK	276 μs max.

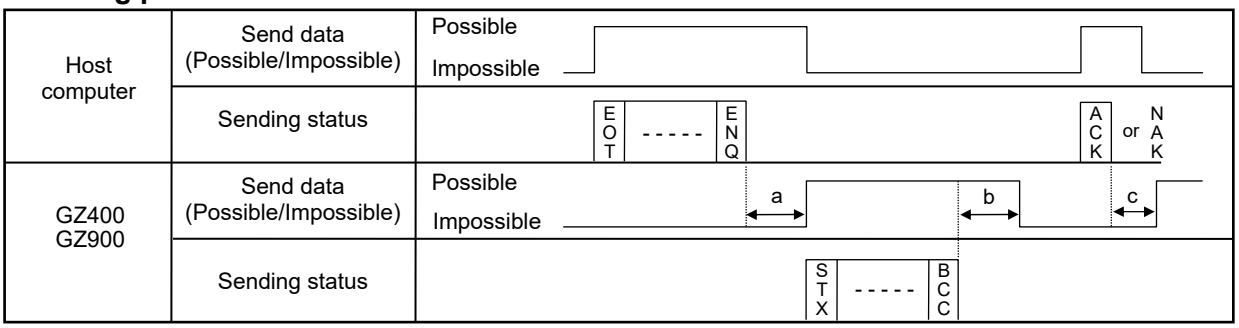
Modbus processing times

Procedure details	Time
Read holding registers [03H] Response send time after the slave receives the query message	14.8 ms max.
Preset single register [06H] Response send time after the slave receives the query message	160 ms max.
Diagnostics (loopback test) [08H] Response send time after the slave receives the query message	14.8 ms max.
Preset multiple registers (Write multiple registers) [10H] Response send time after the slave receives the query message	312 ms max.

■ RS-485 (2-wire system) send/receive timing (RKC communication)

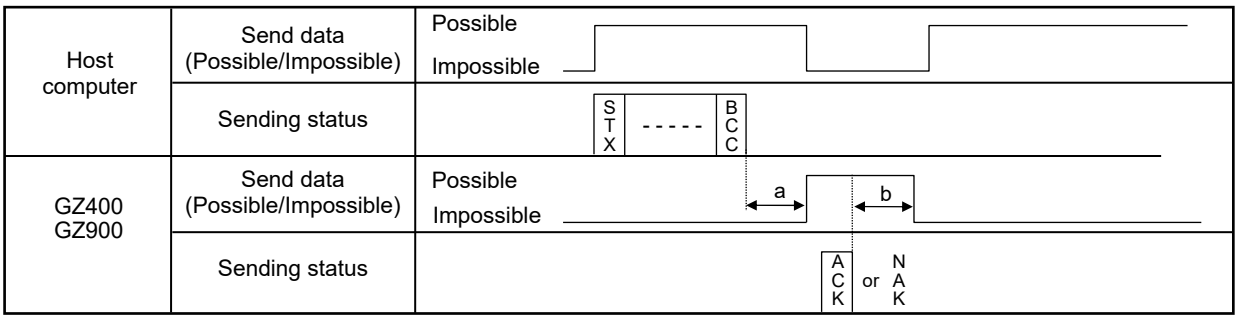
RS-485 communication is conducted through two wires, therefore, the transmission and reception of data requires precise timing.

● Polling procedure



a: Response send time after the GZ400/900 receives [ENQ] + Interval time
b: Response send time after the GZ400/900 sends BCC
c: Response send time after the GZ400/900 receives [ACK] + Interval time or
Response send time after the GZ400/900 receives [NAK] + Interval time

● Selecting procedure



a: Response send time after the GZ400/900 receives BCC + Interval time
b: Response wait time after the GZ400/900 sends ACK or Response wait time after the GZ400/900 sends NAK

To switch the host computer from transmission to reception, send data must be on line.

The following processing times are required for the GZ400/900 to process data:
– In polling procedure, Response wait time after the GZ400/900 sends BCC
– In selecting procedure, Response wait time after the GZ400/900 sends ACK or NAK

■ Fail-safe

A transmission error may occur if the transmission line is disconnected, shorted or set to the high-impedance state. In order to prevent the above error, it is recommended that the fail-safe function be provided on the receiver side of the host computer. The fail-safe function can prevent a framing error from its occurrence by making the receiver output stable to the MARK (1) when the transmission line is in the high-impedance state.

MEMO

RKC COMMUNICATION PROTOCOL

4

This chapter describes the RKC communication protocol.

The RKC communication uses the Polling/Selecting method to establish a data link. The basic procedure follows ANSI X3.28-1976 subcategories 2.5 and A4 basic mode data transmission control procedure (Fast selecting is the selecting method used in this controller).
In this chapter GZ400/900 are called controllers.

- The Polling/Selecting procedures are a centralized control method where the host computer controls the entire process. The host computer initiates all communication so the controller responds according to queries and commands from the host.
- The code used in communication is 7-bit ASCII code including transmission control characters.
  The transmission control characters are EOT (04H), ENQ (05H), ACK (06H), NAK (15H), STX (02H) and ETX (03H). The figures in the parentheses indicate the corresponding hexadecimal number.

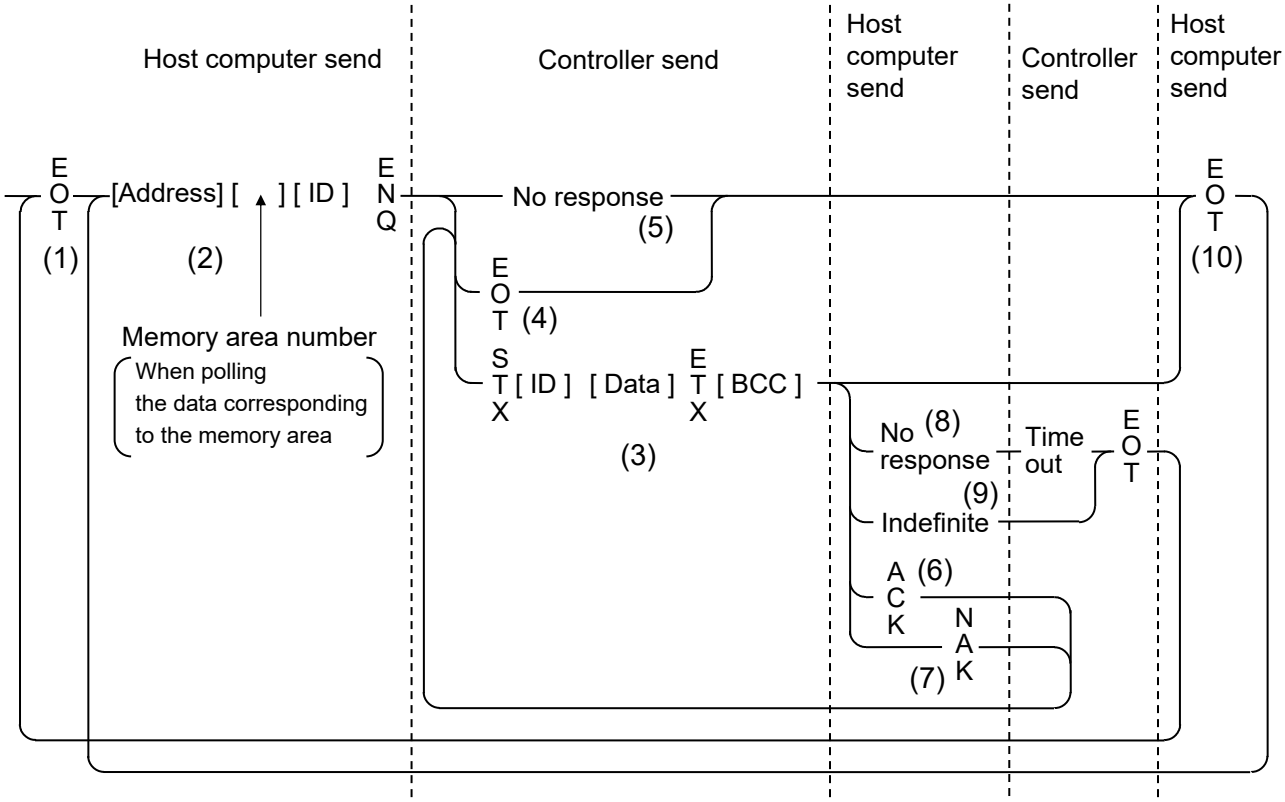
Data send/receive state (communication data monitoring and setting) of RKC communication can be checked by using the following software:

Communication Tool "PROTEM2"

The software can be downloaded from the official RKC website.

4.1 Polling

Polling is the action where the host computer requests one of the connected controllers to transmit data. An example of the polling procedure is shown below:



ID: Identifier

4.1.1 Polling procedures

(1) Data link initialization

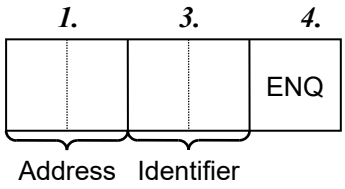
Host computer sends EOT to the controllers to initiate data link before polling sequence.

(2) Data sent from host computer - Polling sequence

The host computer sends the polling sequence in the following two types of formats:
- Format in which no Memory area number is specified, and
- Format in which the Memory area number is specified.

■ When no Memory area number is specified

To be sent in this format for any identifier not corresponding to the memory area.

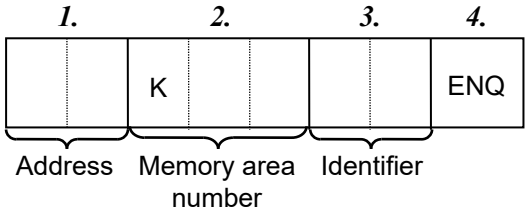


Example:

0	1	M	1	ENQ

■ When the Memory area number is specified

To be sent in this format for any identifier corresponding to the memory area.



Example:

0	1	K	1	0	S	1	ENQ

1. Address (2 digits)
The device address specifies the controller to be polled and each controller must have its own unique device address.
This data is a device address of the controller to be selected and must be the same as the device address set value in item **3. PARAMETER SETTING (P. 3-1)**.

📖 The polling address which transmitted a message once becomes effective so long as data link is not initialized by transmit and receive of EOT.

2. Memory area number (3 digits)
This is the identifier to specify the Memory area number. It is expressed by K1 to K16 to each Memory area number (from 1 to 16). If the Memory area number is assigned with K0, this represents that Control area is specified.

📖 The memory area now used for control is called Control area.

📖 If the Memory area number is not specified when polling the identifier corresponding to the memory area, this represents that the Control area is specified.

📖 If any identifier not corresponding to the memory area is assigned with a Memory area number, this Memory area number is ignored.

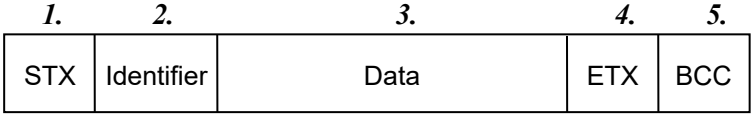
3. Identifier (2 digits)
The identifier specifies the type of data that is requested from the controller. Always attach the ENQ code to the end of the identifier.

☞ For details, refer to **6.3 RKC Communication/Modbus (Double Word) Data (P. 6-12)**.

4. ENQ
The ENQ is the transmission control character that indicates the end of the polling sequence.
The ENQ must be attached to the end of the identifier.
The host computer then must wait for a response from the controller.

(3) Data sent from the controller

If the polling sequence is received correctly, the controller sends data in the following format:



1. STX
STX is the transmission control character which indicates the start of the text transmission (identifier and data).

2. Identifier (2 digits)
The identifier indicates the type of data (measured value, status and set value) sent to the host computer.

☞ For details, refer to **6.3 RKC Communication/Modbus (Double Word) Data (P. 6-12)**.

3. Data (7 or 6 digits)
Data which is indicated by an identifier of the controller. It is expressed in decimal ASCII code including a minus sign (–) and a decimal point. Data is not zero-suppressed.

The following items have the data length (in digits) as follows.
- Instrument serial number monitor (Identifier RX): 10 digits
- Model code monitor (Identifier ID): 32 digits

Memory area soak time monitor and Area soak time become the following data:
- When data range is 0 hour 00 minute 00 second to 9 hours 59 minutes 59 seconds:
  Data range is 0:00:00 to 9:59:59, punctuation of time unit is expressed in colon ": (3AH)."
- When data range is 0 hour 00 minute to 99 hours 59 minutes:
  Data range is 0:00 to 99:59, punctuation of time unit is expressed in colon ": (3AH)."
- When data range is 0 minute 00 second to 199 minutes 59 seconds:
  Data range is 0:00 to 199:59, punctuation of time unit is expressed in colon ": (3AH)."
- When data range is 0.00 second to 59.99 seconds:
  Data range is 0:00 to 59:00, punctuation of time unit is expressed in colon ": (3AH)."

☞ The data length in RKC communication (7 or 6 digits) can be set at Input data type (*InDT*).
For the Input data type, refer to **3.2 Selection of Communication Data Type (P. 3-5)**.

4. ETX
ETX is a transmission control character used to indicate the end of text transmission.

5. BCC

BCC (Block Check Character) detects error by using horizontal parity (even number).

Calculation method of BCC: *Exclusive OR* all data and characters from STX through ETX, not including STX.

Example:

STX	M	1	0	0	1	0	0	.	0	ETX	BCC
	4DH	31H	30H	30H	31H	30H	30H	2EH	30H	03H	← Hexadecimal numbers

BCC＝4DH ⊕ 31H ⊕ 30H ⊕ 30H ⊕ 31H ⊕ 30H ⊕ 30H ⊕ 2EH ⊕ 30H ⊕ 03H＝50H

(⊕: *Exclusive OR*)

Value of BCC becomes 50H.

(4) EOT sent from the controller (Ending data transmission from the controller)

In the following cases, the controller sends EOT to terminate the data link:

- When the specified identifier is invalid
- When there is an error in the data type
- When data is not sent from the host computer even if the data link is initialized
- When all the data has been sent

(5) No response from the controller

The controller will not respond if the polling address is not received correctly. It may be necessary for the host computer to take corrective action such as a time-out.

(6) ACK (Acknowledgment)

An acknowledgment ACK is sent by the host computer when data received is correct. When the controller receives ACK from the host computer, the controller will send any remaining data of the next identifier without additional action from the host computer.

☞ For the identifier, refer to **6.3 RKC Communication/Modbus (Double Word) Data (P. 6-12)**.

When the host computer determines to terminate the data link, EOT is sent from the host computer.

(7) NAK (Negative acknowledge)

If the host computer does not receive correct data from the controller, it sends a negative acknowledgment NAK to the controller. The controller will re-send the same data when NAK is received. This cycle will go on continuously until either recovery is achieved or the data link is corrected at the host computer.

(8) No response from host computer

When the host computer does not respond within approximately three seconds after the controller sends data, the controller sends EOT to terminate the data link. (Time out: 3 seconds)

(9) Indefinite response from host computer

The controller sends EOT to terminate the data link when the host computer response is indefinite.

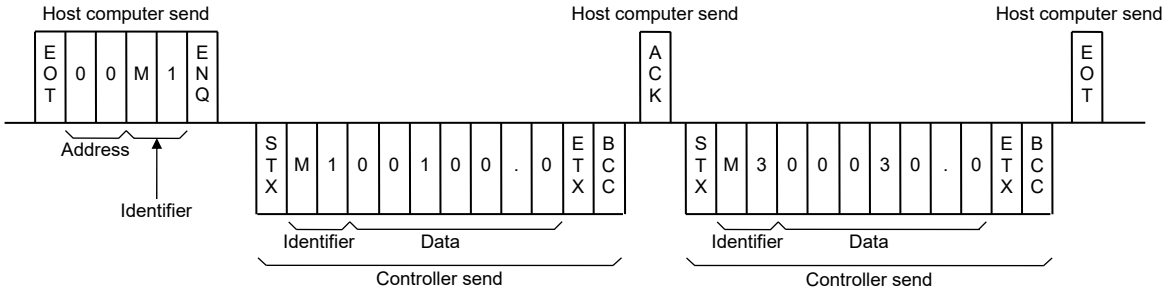
(10) EOT (Data link termination)

The host computer sends EOT message when it is necessary to suspend communication with the controller or to terminate the data link due to lack of response from the controller.

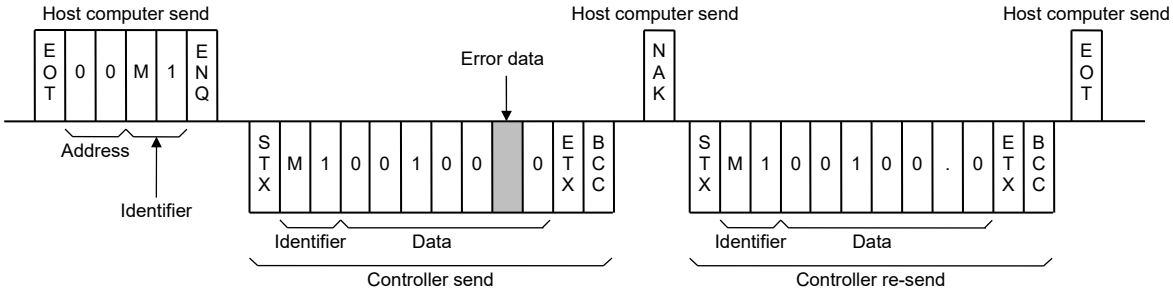
4.1.2 Polling procedure example

(1) When the monitored items are polled [Example: Input 1_Measured value (PV) M1]

■ **Normal transmission**

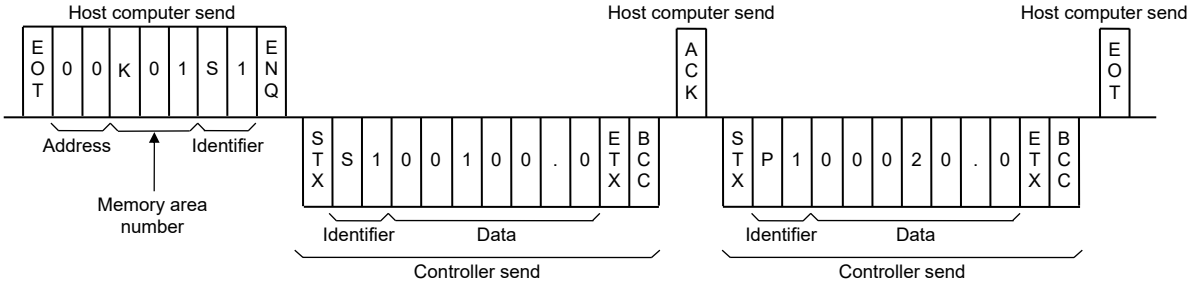


■ **Error transmission**

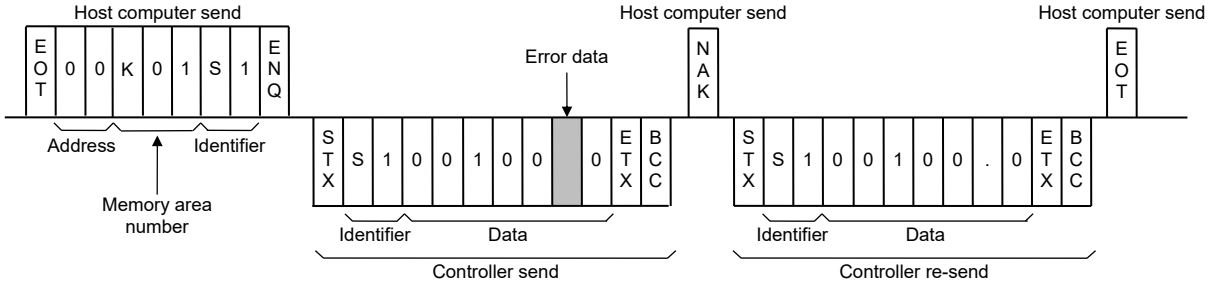


(2) When the items corresponding to the memory area are polled [Example: Input 1_Set value (SV) S1]

■ **Normal transmission**

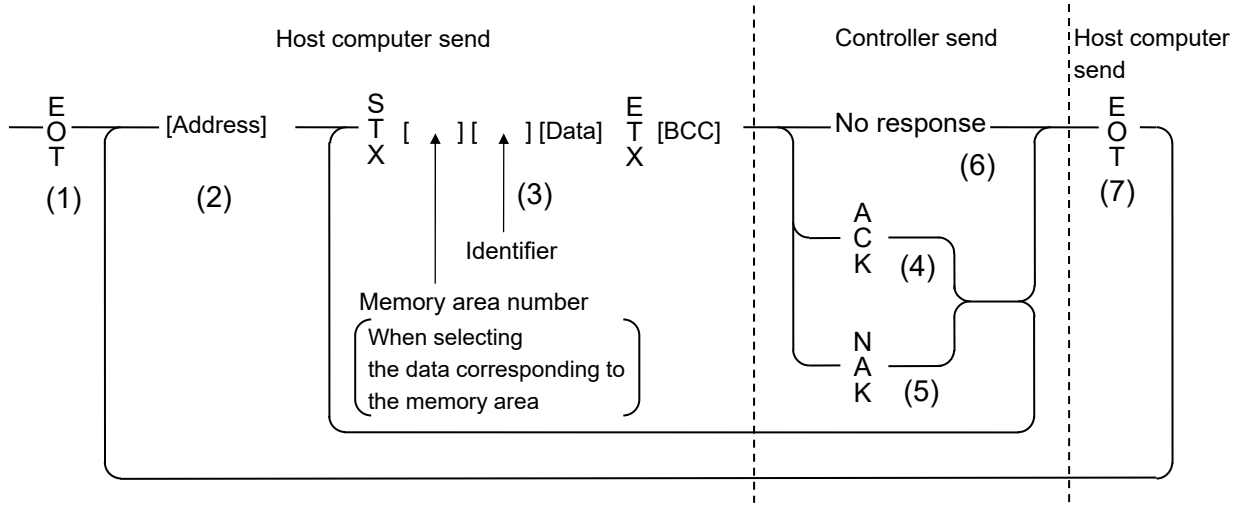


■ **Error transmission**



4.2 Selecting

Selecting is the action where the host computer requests one of the connected controllers to receive data. An example of the selecting procedure is shown below:



4.2.1 Selecting procedures

(1) Data link initialization

Host computer sends EOT to the controllers to initiate data link before selecting sequence.

(2) Sending selecting address from the host computer

Host computer sends selecting address for the selecting sequence.

■ **Address (2 digits)**

This data is a device address of the controller to be selected and must be the same as the device address set value in item **3. PARAMETER SETTING (P. 3-1)**.

As long as the data link is not initialized by sending or receiving EOT, the selecting address once sent becomes valid.

(3) Data sent from the host computer

The host computer sends data for the selecting sequence with the following format:

■ When no memory area number is specified

	2.	*3.*		
STX	Identifier	Data	ETX	BCC

■ When the memory area number is specified

	1.	*2.*	*3.*		
STX	Memory area number	Identifier	Data	ETX	BCC

☞ For the STX, ETX and BCC, refer to **4.1 Polling (P. 4-2)**.

1. Memory area number (3 digits)
This is the identifier to specify the Memory area number. It is expressed by K1 to K16 to each Memory area number (from 1 to 16). If the Memory area number is assigned with K0 this represents that Control area is specified.

📖 The memory area now used for control is called Control area.

📖 If the Memory area number is not specified when selecting the identifier corresponding to the memory area, selecting is made to the memory area.

📖 If any identifier not corresponding to the memory area is assigned with a Memory area number, this Memory area number is ignored.

2. Identifier (2 digits)
The identifier specifies the type of data that is requested from the controller, such as set value.

☞ For details, refer to **6.3 RKC Communication/Modbus (Double Word) Data (P. 6-12)**.

3. Data
Data which is indicated by an identifier of the controller is expressed in decimal ASCII code including a minus sign (–) and a decimal point. The channel number can be zero-suppressed.
The number of digits varies depending on the type of identifier. (7 or 6 digits)

📖 Memory area soak time monitor and Area soak time become the following data:

- When data range is 0 hour 00 minute 00 second to 9 hours 59 minutes 59 seconds:
  Data range is 0:00:00 to 9:59:59, punctuation of time unit is expressed in colon ": (3AH)."
- When data range is 0 hour 00 minute to 99 hours 59 minutes:
  Data range is 0:00 to 99:59, punctuation of time unit is expressed in colon ": (3AH)."
- When data range is 0 minute 00 second to 199 minutes 59 seconds:
  Data range is 0:00 to 199:59, punctuation of time unit is expressed in colon ": (3AH)."
- When data range is 0.00 second to 59.99 seconds:
  Data range is 0:00 to 59:00, punctuation of time unit is expressed in colon ": (3AH)."

In addition to above, when minute and second data are set in more than 60, become as the following:

Example: 1:65 (1 hour 65 minutes) → 2:05 (2 hours 05 minutes)
0:65 (0 minute 65 seconds) → 1:05 (1 minute 05 seconds)

☞ The data length in RKC communication (7 or 6 digits) can be set at Input data type (*InDT*).
For the Input data type, refer to **3.2 Selection of Communication Data Type (P. 3-5)**.

● **About numerical data**

Receivable data

The controller can receive zero-suppressed data and whole number data (data without decimal fraction).

<Example> For example, even if the data −1.5 is sent by the host as −001.5, −01.5, −1.5, −1.50, −1.500, the controller receives the data as −1.5.

- When the host computer sends data containing a decimal point to the item without a decimal point, the controller receives a message with the value that is cut off below the decimal point.

<Example> When setting range is 0 to 200, the controller will receive as follows:

Send data	0.5	100.5
Receive data	0	100

- The controller receives a value truncated to a specified number of decimal places. The digits smaller than that will be cut off.

<Example> When setting range is −10.00 to +10.00, the controller will receives as follows:

Send data	−.5	−.058	.05	−0
Receive data	−0.50	−0.05	0.05	0.00

Unreceivable data

The controller sends NAK when received a following data.

+	Plus sign and data with a plus sign
−	Only minus sign (without a number)
.	Only decimal point (period)
−.	Only minus sign and a decimal point

(4) ACK (Acknowledgment)

An acknowledgment ACK is sent by the controller when data received is correct. When the host computer receives ACK from the controller, the host computer will send any remaining data. If there is no more data to be sent to the controller, the host computer sends EOT to terminate the data link.

(5) NAK (Negative acknowledge)

If the controller does not receive correct data from the host computer, it sends a negative acknowledgment NAK to the host computer. Corrections, such as re-send, must be made at the host computer. The controller will send NAK in the following cases:

- When an error occurs on communication the line (parity, framing error, etc.)
- When a BCC check error occurs
- When the specified identifier is invalid
- When receive data exceeds the setting range
- When receive data is the identifier of RO (read only)

(6) No response from controller

The controller does not respond when it cannot receive the selecting address, STX, ETX or BCC.

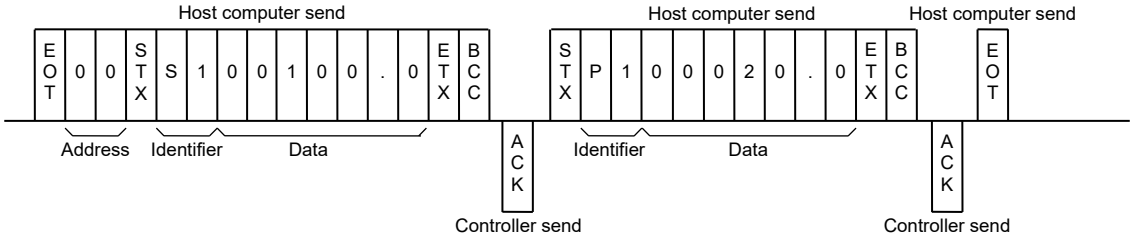
(7) EOT (Data link termination)

The host computer sends EOT when there is no more data to be sent from the host computer or there is no response from the controller.

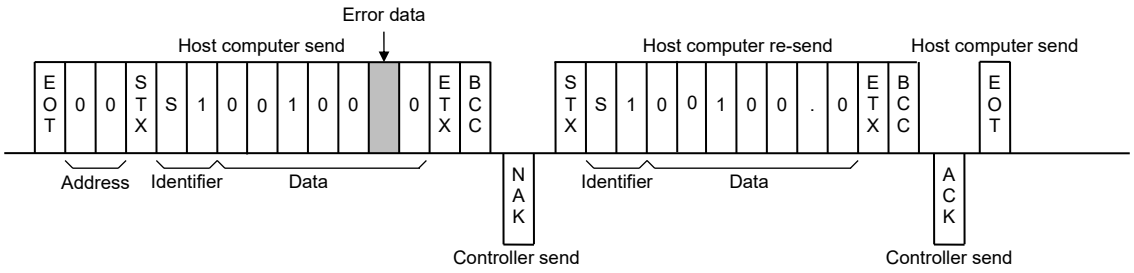
4.2.2 Selecting procedure example

(1) When the items corresponding to the Control area are selected [Example: Input 1_Set value (SV) S1]

■ **Normal transmission**

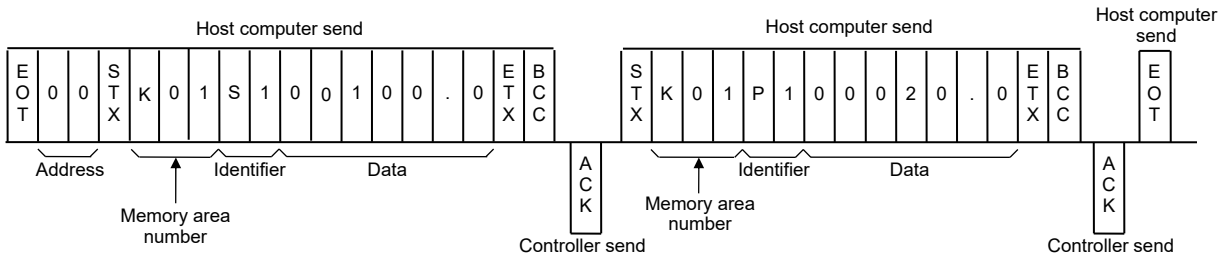


■ **Error transmission**

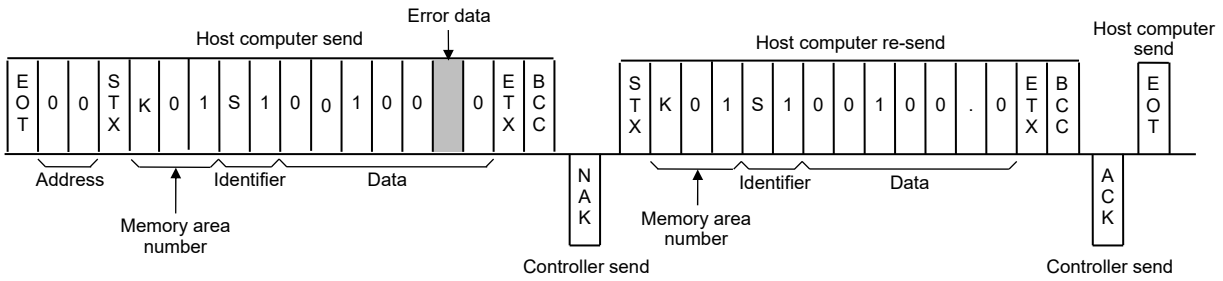


(2) When the items corresponding to the memory area are selected [Example: Input 1_Set value (SV) S1]

■ **Normal transmission**



■ **Error transmission**



MODBUS PROTOCOL

5

This chapter describes the Modbus protocol.

In this chapter a host computer is called Master and GZ400/900 is called Slave.

The master controls communication between master and slave. A typical message consists of a request (query message) sent from the master followed by an answer (response message) from the slave. When master begins data transmission, a set of data is sent to the slave in a fixed sequence. When it is received, the slave decodes it, takes the necessary action, and returns data to the master.

Data send/receive state (communication data setting) of Modbus can be checked by using the following software:

Communication Tool "PROTEM2"

The software can be downloaded from the official RKC website.

5.1 Message Format

The message consists of four parts: slave address, function code, data, and error check code which are always transmitted in the same sequence.

Slave address
Function code
Data
Error check (CRC-16)

Message format

■ Slave address

The slave address is a number from 1 to 99 manually set at the front key panel of the GZ400/900.

Master does not communicate with the slave when the address is set to "0."

For details, refer to **3. PARAMETER SETTING (P. 3-1)**.

Although all connected slave units receive the query message sent from the master, only the slave with the slave address coinciding with the query message will accept the message.

■ Function code

The function codes are the instructions set at the master and sent to the slave describing the action to be executed. The function codes are included when the slave responds to the master.

For details, refer to **5.2 Function Code (P. 5-3)**.

■ Data

The data to execute the function specified by the function code is sent to the slave and corresponding data returned to the master from the slave.

For details, refer to **5.6 Register Read and Write (P. 5-8)** and **6. COMMUNICATION DATA LIST (P. 6-1)**.

■ Error check

An error checking code (CRC-16: Cyclic Redundancy Check) is used to detect an error in the signal transmission.

For details, refer to **5.5 Calculating CRC-16 (P. 5-5)**.

5.2 Function Code

Function code contents

Function code (Hexadecimal)	Function	Contents
03H	Read holding registers	Measured (PV) value monitor, Event state monitor, etc.
06H	Preset single register	Set value (SV), Event set value, PID constants, PV bias, etc. (Write single data)
08H	Diagnostics (loopback test)	loopback test
10H	Preset multiple registers (Write multiple registers)	Set value (SV), Event set value, PID constants, PV bias, etc. (Write multiple consecutive data)

Message length of each function (Unit: byte)

Function code (Hexadecimal)	Function	Query message		Response message	
		Min	Max	Min	Max
03H	Read holding registers	8	8	5	255
06H	Preset single register	8	8	5	8
08H	Diagnostics (loopback test)	8	8	5	8
10H	Preset multiple registers (Write multiple registers)	11	255	5	8

5.3 Communication Mode

Signal transmission between the master and slaves is conducted in Remote Terminal Unit (RTU) mode.

Items	Contents
Data bit length	8-bit (Binary)
Start mark of message	Unused
End mark of message	Unused
Message length	Refer to **5.2 Function Code**
Data time interval	Less than 24-bit time *
Error check	CRC-16 (Cyclic Redundancy Check)

* When sending a command message from the master, set intervals of data configuring one message to time shorter than the 24-bit time. If time intervals become time longer than the 24-bit time the relevant slave assumes that message sending from the master is terminated and there is no response.

5.4 Slave Responses

(1) Normal response

- In the response message of the Read Holding Registers, the slave returns the read out data and the number of data items with the same slave address and function code as the query message.
- In the response message of the Preset Single Register, the slave returns the same message as the query message.
- In the response message of the Diagnostics (Loopback test), the slave returns the same message as the query message.
- In the response message of the Preset Multiple Registers (Write Multiple Registers), the slave returns the slave address, the function code, starting number, and number of holding registers in the multi-query message.

(2) Defective message response

- If the query message from the master is defective, except for transmission error, the slave returns the error response message without any action.

Slave address
Function code
Error code
Error check (CRC-16)

Error response message

- If the self-diagnostic function of the slave detects an error, the slave will return an error response message to all query messages.
- The function code of each error response message is obtained by adding 80H to the function code of the query message.

Error code	Contents
1	Function code error (An unsupported function code was specified)
2	• When the mismatched address is specified. • Address other than 0000H to 00AFH is specified as the starting number.
3	• The maximum number (Read from a read holding resister or write to Preset multiple resisters [Write multiple registers]) has been exceeded. • The setting of the number of data (the number of requested byte) is not set to a double of the requested number of data at the time of “Preset multiple registers (Write multiple registers)”
4	Self-diagnostic error response

- Order of determination of error
  Error code 1 > Error code 3 > Error code 2 > Error code 4

(3) No response

The slave ignores the query message and does not respond when:

- The slave address in the query message does not coincide with any slave address settings.
- The CRC code of the master does not coincide with that of the slave.
- Transmission error such as overrun, framing, parity etc., is found in the query message.
- Data time interval in the query message from the master exceeds 24-bit time.

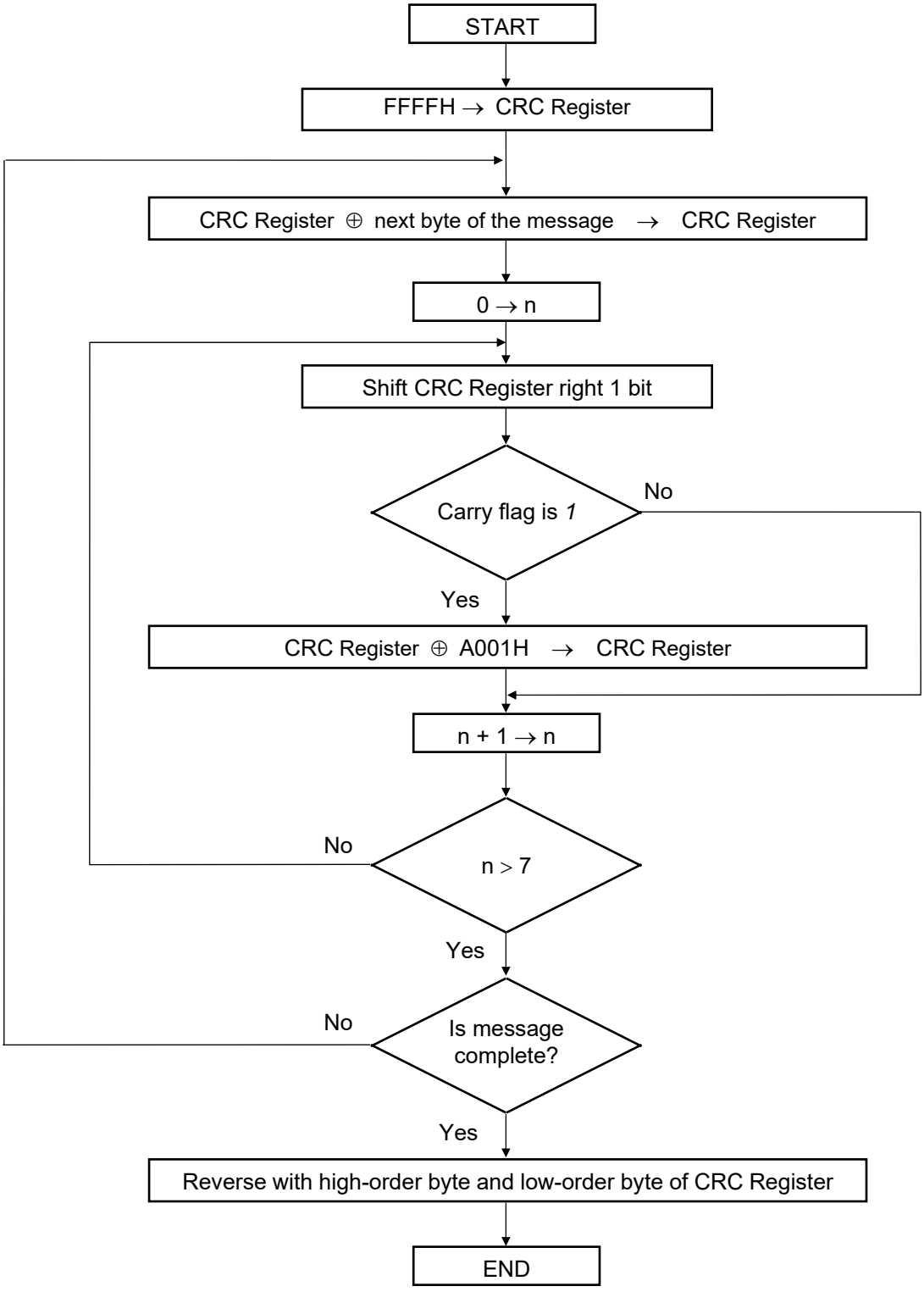
5.5 Calculating CRC-16

The Cyclic Redundancy Check (CRC) is a 2 byte (16-bit) error check code. After constructing the data message, not including start, stop, or parity bit, the master calculates a CRC code and appends this to the end of the message. The slave will calculate a CRC code from the received message, and compare it with the CRC code from the master. If they do not coincide, a communication error has occurred and the slave does not respond.

The CRC code is formed in the following sequence:

1. Load FFFFH to a 16-bit CRC register.
2. *Exclusive OR* (⊕) the first byte (8 bits) of the message with the CRC register. Return the result to the CRC register.
3. Shift the CRC register 1 bit to the right.
4. If the carry flag is 1, *exclusive OR* the CRC register with A001 hexadecimal and return the result to the CRC register. If the carry flag is 0, repeat step ***3***.
5. Repeat step ***3*** and ***4*** until there have been 8 shifts.
6. *Exclusive OR* the next byte (8 bits) of the message with the CRC register.
7. Repeat step ***3*** through ***6*** for all bytes of the message (except the CRC).
8. The CRC register contains the 2 byte CRC error code. When they are appended to the message, the low-order byte is appended first, followed by the high-order byte.

■ The flow chart of CRC-16



The ⊕ symbol indicates an *exclusive OR* operation. The symbol for the number of data bits is *n*.

■ Example of a CRC calculation in the 'C' language

This routine assumes that the data types 'uint16' and 'uint8' exist. These are unsigned 16-bit integer (usually an 'unsigned short int' for most compiler types) and unsigned 8-bit integer (unsigned char). 'z_p' is a pointer to a Modbus message, and 'z_messaage_length' is its length, excluding the CRC. Note that the Modbus message will probably contain NULL characters and so normal C string handling techniques will not work.

uint16 calculate_crc（byte *z_p, unit16 z_message_length）

```
/* CRC runs cyclic Redundancy Check Algorithm on input z_p      */
/* Returns value of 16 bit CRC after completion and             */
/* always adds 2 crc bytes to message                           */
/* returns 0 if incoming message has correct CRC                */

{
    uint16 CRC= 0xffff;
    uint16 next;
    uint16 carry;
    uint16 n;
    uint8 crch, crcl;

    while (z_messaage_length--) {
        next = (uint16) *z_p;
        CRC ^= next;
        for (n = 0; n < 8; n++) {
            carry = CRC & 1;
            CRC >>= 1;
            if (carry) {
              CRC ^= 0xA001;
            }
        }
        z_p++;
    }
    crch = CRC / 256;
    crcl = CRC % 256
    z_p [z_messaage_length++] = crcl;
    z_p [z_messaage_length] = crch;
    return CRC;
}
```

5.6 Register Read and Write

■ Read holding registers [03H]

The query message specifies the starting register address and quantity of registers to be read.
The contents of the holding registers are entered in the response message as data, divided into two parts: the high-order 8-bit and the low-order 8-bit, arranged in the order of the register numbers.

Example: The contents of the four holding registers from 0000H to 0003H are the read out from slave address 2.

● Double word

Query message

Slave address		02H	
Function code		03H	
Starting number	High	00H	First holding register address
	Low	00H	
Quantity	High	00H	The setting must be between 1 (0001H) and 62 (003EH).
	Low	04H	
CRC-16	High	44H	
	Low	3AH	

Normal response message

Slave address		02H	
Function code		03H	
Number of data		08H	→ Number of holding registers × 2
First holding register contents	High	00H	
(Low-order word of the first data)	Low	62H	
Next holding register contents	High	00H	
(High-order word of the first data)	Low	00H	
Next holding register contents	High	00H	
(Low-order word of the next data)	Low	14H	
Next holding register contents	High	00H	
(High-order word of the next data)	Low	00H	
CRC-16	High	99H	
	Low	51H	

Error response message

Slave address		02H
80H + Function code (+ denotes a logical add)		83H
Error code		03H
CRC-16	High	F1H
	Low	31H

● Single word

Query message

Slave address		02H	
Function code		03H	
Starting number	High	00H	First holding register address
	Low	00H	
Quantity	High	00H	The setting must be between 1(0001H) and 125 (007DH).
	Low	04H	
CRC-16	High	44H	
	Low	3AH	

Normal response message

Slave address		02H	
Function code		03H	
Number of data		08H	→ Number of holding registers × 2
First holding register contents (First data)	High	00H	
	Low	62H	
Next holding register contents (Next data)	High	00H	
	Low	14H	
Next holding register contents (Next data)	High	00H	
	Low	00H	
Next holding register contents (Next data)	High	00H	
	Low	00H	
CRC-16	High	E9H	
	Low	56H	

Error response message

Slave address		02H
80H + Function code (+ denotes a logical add)		83H
Error code		03H
CRC-16	High	F1H
	Low	31H

■ Preset single register [06H]

The query message specifies data to be written into the designated holding register. The write data is arranged in the query message with high-order 8-bit first and low-order 8-bit next.
Only R/W holding registers can be specified.

Example: Data is written into the holding register 0072H of slave address 1.

Query message

Slave address		01H
Function code		06H
Holding register number	High	00H
	Low	72H
Write data	High	00H
	Low	01H
CRC-16	High	E8H
	Low	11H

} Any data within the range

Normal response message

Slave address		01H
Function code		06H
Holding register number	High	00H
	Low	72H
Write data	High	00H
	Low	01H
CRC-16	High	E8H
	Low	11H

} Contents will be the same as query message data.

Error response message

Slave address		01H
80H + Function code (+ denotes a logical add)		86H
Error code		02H
CRC-16	High	C3H
	Low	A1H

In the case of double word, writing to high-order word register only is not possible.
The attempt ends with a normal message, but the write will not be done.

■ Diagnostics (Loopback test) [08H]

The master's query message will be returned as the response message from the slave.
This function checks the communication system between the master and slave (the GZ400/900).

Example: Loopback test for slave address 1

Query message

Slave address		01H	
Function code		08H	
Test code	High	00H	Test code must be set to "00."
	Low	00H	
Data	High	1FH	Any pertinent data
	Low	34H	
CRC-16	High	E9H	
	Low	ECH	

Normal response message

Slave address		01H	Contents will be the same as query message data.
Function code		08H	
Test code	High	00H	
	Low	00H	
Data	High	1FH	
	Low	34H	
CRC-16	High	E9H	
	Low	ECH	

Error response message

Slave address		01H
80H + Function code (+ denotes a logical add)		88H
Error code		03H
CRC-16	High	06H
	Low	01H

■ Preset multiple registers (Write multiple registers) [10H]

The query message specifies the starting register address and quantity of registers to be written. The write data is arranged in the query message with high-order 8-bit first and low-order 8-bit next. Only R/W holding registers can be specified.

Example: Data is written into the two holding registers from 0070H to 0071H of slave address 1.

Query message

Slave address		01H	
Function code		10H	
Starting number	High	00H	First holding register address
	Low	70H	
Quantity	High	00H	Set a register address within the following range. Double word: 1 to 61 (0001H to 003DH) Single word: 1 to 123 (0001H to 007BH)
	Low	02H	
Number of data		04H	→ Number of holding registers × 2
Data to first register	High	00H	Any pertinent data
	Low	01H	
Data to next register	High	00H	
	Low	00H	
CRC-16	High	A5H	
	Low	4BH	

Normal response message

Slave address		01H
Function code		10H
Starting number	High	00H
	Low	70H
Quantity	High	00H
	Low	02H
CRC-16	High	40H
	Low	13H

Error response message

Slave address		01H
80H + Function code (+ denotes a logical add)		90H
Error code		02H
CRC-16	High	CDH
	Low	C1H

5.7 Caution for Handling Communication Data

- The numeric range of data used in Modbus protocol is 0000H to FFFFH. Only the set value within the setting range is effective.

  FFFFH represents –1.

- The Modbus protocol processes the data with a decimal point as the data without a decimal point during the communication.

  Example 1: When Input 1_Manipulated output value monitor [heat-side] is 5.0 %, 5.0 is processed as 50,
  50 = 0032H.

Input 1_Manipulated output value monitor [heat-side]	High	00H
	Low	32H

  Example 2: When Input 1_Set value (SV) is –20.0 °C, –20.0 is processed as –200,
  –200 = 0000H – 00C8H = FF38H.

Input 1_Set value (SV)	High	FFH
	Low	38H

- In our communication a variable is handled as a double word or a single word.

  Switchover between the single word and the double word can be done at Input data type.
  For the Input data type, refer to **3.2 Selection of Communication Data Type (P. 3-5)**.

  [Double word]
  - The variable is handled as 4 bytes data.
  - One variable use two register addresses (Address of high-order word, Address of low-order word).
  - To Read/Write two-word data is implemented from the low-order word to the high-order word or from the high-order word to the low-order word.

    The data transfer sequence is selectable at “Communication protocol” in the Engineering mode.
    For the Communication protocol, refer to **3.1 Setting of Communication Parameter (P. 3-2)**.
  - There is the following constraint in writing data in order to treat the variable as 4 bytes data.
    - It is not possible to write only of high-order word. The communication response becomes normal response, but do not writing.
    - A writing only of low-order word does sign extend and does it.
      Example 1: When did a writing only of “0020H” in low-order word.
      The controller interprets high-order word as “0000H.”
      Example 2: When did a writing only of “FFFFH (–1)” in low-order word.
      The controller interprets high-order word as “FFFFH.”

  [Single word]
  - A variable is handled as a two-byte data.
  - Each variable occupies one register address.

- In this communication, the variables that memory area includes handle different address with for control area and for setting area.

- If data range error occurs during data writing (Write Action), it is not processed as an error. Normal data is written in data register but data with error is not written; therefore, it is recommended to confirm data of changed items after the data setting.
- Commands should be sent at time intervals of 24 bits after the master receives the response message.
- Definitions of registers
  ① Undefined register
  Reserved register for extension within the data map range defined in Specification.
  ② Illegal register
  Register outside of the data map range defined in Specification.
  ③ Unused register
  Register that can be used/unused depending on the selected function and that is set to unused.
- Register handling
  (1) Reading register

Register types contained in communication data	Action at the time of reading
① Undefined register	Return 0000h only for undefined register.
② Illegal register	Error code 2* is returned if illegal register is included.
③ Unused register	Return 0000h only for unused register.
④ Registers except the above	Register can be read.

(2) Preset single register

Register types contained in communication data	Action at the time of writing
① Undefined register	Destroy write data.
② Illegal register	Return error code 2* and destroy write data.
③ Unused register	Destroy write data.
④ Write-protected register (Read-only register)	
⑤ Write a value outside the setting range	
⑥ High word register of double word data	
⑦ Registers except the above	Capable of writing into register.

(3) Preset multiple registers (Write multiple registers)

Register types contained in communication data	Action at the time of writing
① Undefined register	Destroy write data of undefined register.
② Illegal register	Error code 2* is returned if illegal register is included, and all the written data will be destroyed.
③ Unused register	Destroy write data of unused registers.
④ Write-protected register (Read-only register)	Destroy write data to write-protected register.
⑤ Write a value outside the setting range	Destroy write data outside the setting range.
⑥ Register last written into is a high word register.	Destroy data of the last written register.
⑦ Registers except the above	Capable of writing into register.

* When an error with higher error code determination is active, priority is given to it.

5.8 How to Use Modbus Data Mapping

Data mapping function is a function that enables the data that needs to be constantly monitored to be mapped into the specified address area.
Up to 32 communication data can be assigned to the register address in the following table used to actually read the data from/write the data to.
Communication data allocation can be performed in "Register address specifying the mapping data."

(HEX: Hexadecimal number DEC: Decimal number)

	Double word	Single word
Register address specifying the mapping data	HEX: 1000H to 103FH DEC: 4096 to 4159	HEX: 1000H to 101FH DEC: 4096 to 4127
Register address actually read from/write to	HEX: 1500H to 153FH DEC: 5376 to 5439	HEX: 1500H to 151FH DEC: 5376 to 5407
Register address of the mappable data	Refer to **6.3.1 GZ400/GZ900 communication data [RKC communication identifier/Modbus double word] (P. 6-12)** and **6.3.4 HA series equivalent communication data [RKC communication identifier/ Modbus single word] (P. 6-103)**.	Refer to **6.4.1 GZ400/GZ900 communication data [Modbus single word] (P. 6-142)** and **6.4.4 FB series equivalent communication data [Modbus single word] (P. 6-169)**.

☞ For the data mapping address list, refer to the **6.3.3 Data mapping address [Modbus double word] (P. 6-98)**, **6.4.3 Data mapping address [Modbus single word] (P. 6-165)**.

Example 1: When the data is read in double-word

Data to be mapped: Input 1_Measured value (PV), Input 1_Manipulated output value monitor [heat-side], Event 1 state monitor, Event 2 state monitor

Communication protocol:
1 (Modbus [Order of data transfer: high-order word to low-order word])

1. Write 0000H to the low-order word of Register address setting 1 to 4 (see table of "Register address for data designation"). Write register address of the data to be mapped (either low-order word or high-order word) to the high-order word.

Data to be mapped

Name	Register address			
	HEX		DEC	
	Low-order	High-order	Low-order	High-order
Input 1_Measured value (PV)	0000	0001	0	1
Input 1_Manipulated output value monitor [heat-side]	000E	000F	14	15
Event 1 state monitor	001C	001D	28	29
Event 2 state monitor	001E	001F	30	31

Write 0000H to the low-order word of Register address for data designation, or
Write register address of the data to be mapped (either low-order word or high-order word) to the high-order word.*
* There is no difference whichever data is written.

Register address for data designation

Name	Register address				Setting data
	HEX		DEC		
	Low-order	High-order	Low-order	High-order	
Register address setting 1 [Read/write address: Low-order word 1500H, high-order word 1501H]	1000	1001	4096	4097	Low-order word: 0000H High-order word: 0000H or 0001H
Register address setting 2 [Read/write address: Low-order word 1502H, high-order word 1503H]	1002	1003	4098	4099	Low-order word: 0000H High-order word: 000EH or 000FH
Register address setting 3 [Read/write address: Low-order word 1504H, high-order word 1505H]	1004	1005	4100	4101	Low-order word: 0000H High-order word: 001CH or 001DH
Register address setting 4 [Read/write address: Low-order word 1506H, high-order word 1507H]	1006	1007	4102	4103	Low-order word: 0000H High-order word: 001EH or 001FH

The table below shows the assignment of read/write register addresses 1500H to 1507H by the above mapping.

Register address				Name
HEX		DEC		
Low-order	High-order	Low-order	High-order	
1500	1501	5376	5377	Input 1_Measured value (PV)
1502	1503	5378	5379	Input 1_Manipulated output value monitor [heat-side]
1504	1505	5380	5381	Event 1 state monitor
1506	1507	5382	5383	Event 2 state monitor

2. Reads out the mapping data by following order message.

Slave address		02H	
Function code		03H	
Starting number	High	15H	First holding register address (1500H)
	Low	00H	
Quantity	High	00H	Number of data (4)
	Low	04H	
CRC-16	High	40H	
	Low	36H	

Example 2: When the data is read in a single word of data mapped.

Data to be mapped: Input 1_Measured value (PV), Input 1_Manipulated output value monitor [heat-side], Event 1 state monitor, Event 2 state monitor

1. Write register addresses of mapping data to register address setting from 1 to 4 (Register address for data designation).

Data to be mapped

Name	Register address	
	HEX	DEC
Input 1_Measured value (PV)	2000	8192
Input 1_Manipulated output value monitor [heat-side]	2007	8199
Event 1 state monitor	200E	8206
Event 2 state monitor	200F	8207

Write register address to be mapped to the register address for the designation of data

Register address for data designation

Name	Register address		Setting data
	HEX	DEC	
Register address setting 1 [Read/write address: 1500H]	1000	4096	**2000**
Register address setting 2 [Read/write address: 1501H]	1001	4097	**2007**
Register address setting 3 [Read/write address: 1502H]	1002	4098	**200E**
Register address setting 4 [Read/write address: 1503H]	1003	4099	**200F**

The table below shows the assignment of read/write register addresses 1500H to 1503H by the above mapping.

Register address		Name
HEX	DEC	
1500	5376	Input 1_Measured value (PV)
1501	5377	Input 1_Manipulated output value monitor [heat-side]
1502	5378	Event 1 state monitor
1503	5379	Event 2 state monitor

2. Reads out the mapping data by following order message.

Slave address		02H	
Function code		03H	
Starting number	High	15H	First holding register address (1500H)
	Low	00H	
Quantity	High	00H	Number of data (4)
	Low	04H	
CRC-16	High	40H	
	Low	36H	

5.9 How to Use Memory Area Data

Memory area function can store up to 16 individual sets of SVs and parameters. One of the areas is used for control, and the currently selected area is Control area.
Memory area data can be used to check and change settings that belong to memory areas other than the Control area.

5.9.1 Read and write of memory area data

There are two types of methods for reading from and writing to the Memory area.

- **Direct designation method (Double word, Single word)**

  The direct designation method uses register address (0500H to 0E1FH for double word or 2500H to 298FH for single word) to read data from or write data to the Memory area.

- **Area designation method (Double word, Single word)**

  If any Memory area number to perform data read and write is specified by the Setting memory area number, data corresponding to the specified Memory area number is called up to the register addresses of memory area. This register address is used to read data from and write data to the Memory area.
  The area designation method is mainly designed for the use of the data equivalent to our HA series [1] or FB series [2].

  [1] The data equivalent to our HA series refers to the communication data of our HA series compatible with the GZ400/900.

  [2] The data equivalent to our FB series refers to the communication data of our FB series compatible with the GZ400/900.

■ Direct designation method (Double word, Single word)

The direct designation method uses register address (0500H to 0E1FH for double word or 2500H to 298FH for single word) to read data from or write data to the Memory area.

(HEX: Hexadecimal number DEC: Decimal number)

Memory area number	Register address of Memory area					
	Double word				Single word	
	HEX		DEC		HEX	DEC
	Low-order	High-order	Low-order	High-order		
Memory area 1	0500 ⋮ 0590	0501 ⋮ 0591	1280 ⋮ 1424	1281 ⋮ 1425	2500 ⋮ 2548	9472 ⋮ 9544
Memory area 2	0592 ⋮ 0622	0593 ⋮ 0623	1426 ⋮ 1570	1427 ⋮ 1571	2549 ⋮ 2591	9545 ⋮ 9617
Memory area 3	0624 ⋮ 06B4	0625 ⋮ 06B5	1572 ⋮ 1716	1573 ⋮ 1717	2592 ⋮ 25DA	9618 ⋮ 9690
Memory area 4	06B6 ⋮ 0746	06B7 ⋮ 0747	1718 ⋮ 1862	1719 ⋮ 1863	25DB ⋮ 2623	9691 ⋮ 9763
Memory area 5	0748 ⋮ 07D8	0749 ⋮ 07D9	1864 ⋮ 2008	1865 ⋮ 2009	2624 ⋮ 266C	9764 ⋮ 9836

Memory area number	Register address of Memory area					
	Double word				Single word	
	HEX		DEC		HEX	DEC
	Low-order	High-order	Low-order	High-order		
Memory area 6	07DA ⋮ 086A	07DB ⋮ 086B	2010 ⋮ 2154	2011 ⋮ 2155	266D ⋮ 26B5	9837 ⋮ 9909
Memory area 7	086C ⋮ 08FC	086D ⋮ 08FD	2156 ⋮ 2300	2157 ⋮ 2301	26B6 ⋮ 26FE	9910 ⋮ 9982
Memory area 8	08FE ⋮ 098E	08FF ⋮ 098F	2302 ⋮ 2446	2303 ⋮ 2447	26FF ⋮ 2747	9983 ⋮ 10055
Memory area 9	0990 ⋮ 0A20	0991 ⋮ 0A21	2448 ⋮ 2592	2449 ⋮ 2593	2748 ⋮ 2790	10056 ⋮ 10128
Memory area 10	0A22 ⋮ 0AB2	0A23 ⋮ 0AB3	2594 ⋮ 2738	2595 ⋮ 2739	2791 ⋮ 27D9	10129 ⋮ 10201
Memory area 11	0AB4 ⋮ 0B44	0AB5 ⋮ 0B45	2740 ⋮ 2884	2741 ⋮ 2885	27DA ⋮ 2822	10202 ⋮ 10274
Memory area 12	0B46 ⋮ 0BD6	0B47 ⋮ 0BD7	2886 ⋮ 3030	2887 ⋮ 3031	2823 ⋮ 286B	10275 ⋮ 10347
Memory area 13	0BD8 ⋮ 0C68	0BD9 ⋮ 0C69	3032 ⋮ 3176	3033 ⋮ 3177	286C ⋮ 28B4	10348 ⋮ 10420
Memory area 14	0C6A ⋮ 0CFA	0C6B ⋮ 0CFB	3178 ⋮ 3322	3179 ⋮ 3323	28B5 ⋮ 28FD	10421 ⋮ 10493
Memory area 15	0CFC ⋮ 0D8C	0CFD ⋮ 0D8D	3324 ⋮ 3468	3325 ⋮ 3469	28FE ⋮ 2946	10494 ⋮ 10566
Memory area 16	0D8E ⋮ 0E1E	0D8F ⋮ 0E1F	3470 ⋮ 3614	3471 ⋮ 3615	2947 ⋮ 298F	10567 ⋮ 10639

☞ For the memory area data list, refer to the **6.3.2 Memory area data (Direct designation method) [Modbus double word] (P. 6-80), 6.4.2 Memory area data (Direct designation method) [Modbus single word] (P. 6-152)**.

☞ The memory area data is used in three groups for the Level PID. For details of Level PID, refer to the **GZ400/GZ900 Instruction Manual [Part 2: Parameters/Functions] (IMR03D05-E□)**.

■ Area designation method (Double word, Single word)

If any Memory area number to perform data read and write is specified by the Setting memory area number, data corresponding to the specified Memory area number is called up to the register addresses of memory area. This register address is used to read data from and write data to the Memory area.
The area designation method is mainly designed for the use of the data equivalent to our HA series [1] or FB series [2].

[1] The data equivalent to our HA series refers to the communication data of our HA series compatible with the GZ400/900.

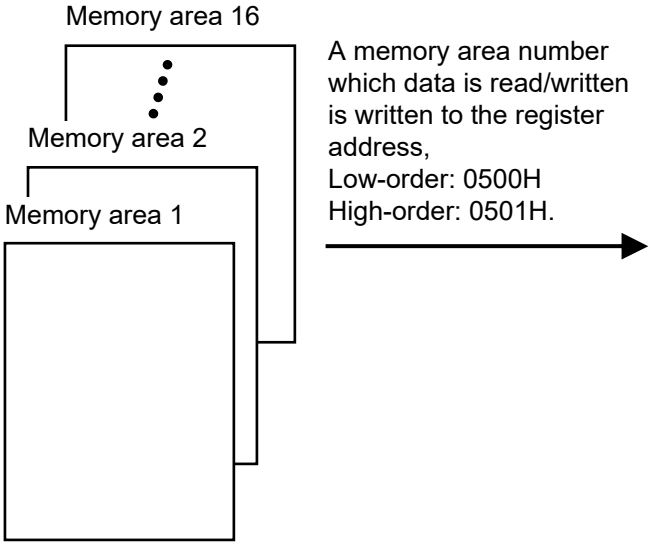
[2] The data equivalent to our FB series refers to the communication data of our FB series compatible with the GZ400/900.

(HEX: Hexadecimal number DEC: Decimal number)

Setting memory area number (Register address designating the memory area.)	The data equivalent to our HA series Double word HEX: 0500H, 0501H DEC: 1280, 1281 The data equivalent to our FB series Single word HEX: 0500H DEC: 1280
Register address of memory area data (Register address for data read and data write.)	The data equivalent to our HA series Double word HEX: 0502H to 0535H DEC: 1282 to 1333 The data equivalent to our FB series Single word HEX: 0501H to 055EH DEC: 1281 to 1374

☞ For the memory area data list, refer to the **6.3.5 HA series equivalent memory area data (Area designation method) [Modbus double word] (P. 6-137)** and **6.4.5 Memory area data equivalent to the FB series (Area designation method) [Modbus single word] (P. 6-180)**.

● Double word



Data corresponding to a specified Memory area number is called up to the register addresses from 0502H to 0535H.

Name	HEX	
	Low-order	Hogh-order
Event 1 set value (EV1) Event 1 set value (EV1) [high]	0502H	0503H
Event 2 set value (EV2) Event 2 set value (EV2) [high]	0504H	0505H
Event 3 set value (EV3) Event 3 set value (EV3) [high]	0506H	0507H
Input 1_Control loop break alarm (LBA) time	0508H	0509H
Input 1_LBA deadband (LBD)	050AH	050BH
Event 4 set value (EV4) Event 4 set value (EV4) [high]	050CH	050DH
Input 2_Control loop break alarm (LBA) time	050EH	050FH
Input 2_LBA deadband (LBD)	0510H	0511H
Input 1_Set value (SV)	0512H	0513H
Input 1_Proportional band [heat-side]	0514H	0515H
⋮	⋮	⋮
Link area number	0534H	0535H

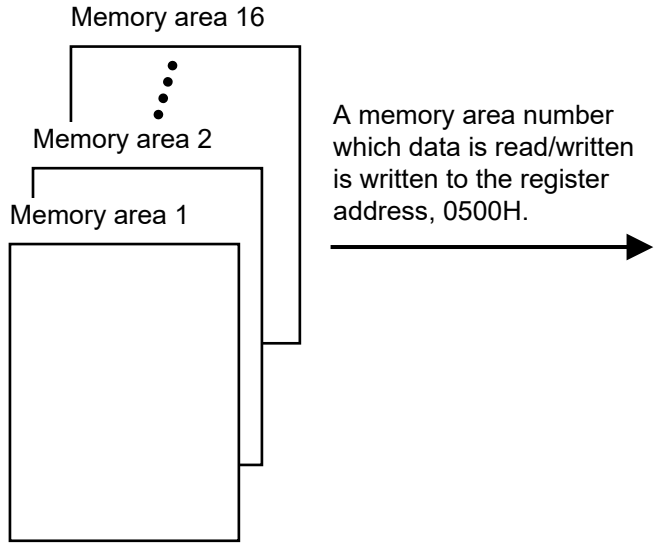
Example 1: When data on the Event 1 set value (EV1) in Memory area 2 is read

1. The Memory area number, "2" is written to the Setting memory area number (Low-order word: 0500H, High-order word: 0501H). Data in Memory area 2 is called up to the register addresses from 0502H to 0535H.
2. Data on Event 1 set values (EV1) (Low-order word: 0500H, High-order word: 0501H) is read.

Example 2: When the Input 1_Set value (SV) in Memory area 3 is changed to 200

1. The Memory area number, "3" is written to the Setting memory area number (Low-order word: 0500H, High-order word: 0501H). Data in Memory area 3 is called up to the register addresses from 0502H to 0535H.
2. "200" is written to the Set value (SV) (Low-order word: 0512H, High-order word: 0513H).

- **Single word**



Data corresponding to a specified Memory area number is called up to the register addresses from 0501H to 055EH.

Name	HEX
Event 1 set value (EV1) Event 1 set value (EV1) [high]	0501H
Event 2 set value (EV2) Event 2 set value (EV2) [high]	0502H
Event 3 set value (EV3) Event 3 set value (EV3) [high]	0503H
Event 4 set value (EV4) Event 4 set value (EV4) [high]	0504H
Input 1_Control loop break alarm (LBA) time	0505H
Input 1_LBA deadband (LBD)	0506H
Input 1_Set value (SV)	0507H
Input 1_Proportional band [heat-side]	0508H
Input 1_Integral time [heat-side]	0509H
Input 1_Derivative time [heat-side]	050AH
Input 1_Integral time [heat-side]	050BH
Input 1_Proportional band [cool-side]	050CH
Input 1_Integral time [cool-side]	050DH
⋮	⋮
Input 2_Knee point correction value 5	055EH

Example 1: When data on the Event 1 set value (EV1) in Memory area 2 is read

1. The Memory area number, "2" is written to the Setting memory area number (0500H). Data in Memory area 2 is called up to the register addresses from 0501H to 055EH.
2. Data on Event 1 set values (EV1) (0501H) is read.

Example 2: When the Input 1_Set value (SV) in Memory area 3 is changed to 200

1. The Memory area number, "3" is written to the Setting memory area number (0500H). Data in Memory area 3 is called up to the register addresses from 0501H to 055EH.
2. "200" is written to the Set value (SV) (0507H).

5.9.2 Control area transfer

Any memory area used for control is specified by the Memory area transfer. The area now used for control is called Control area.

(HEX: Hexadecimal number DEC: Decimal number)

	Double word	Single word
Memory area transfer	• GZ400/900 communication data HEX: Low-order word: 0064H High-order word: 0065H DEC: Low-order word: 100 High-order word: 101 • HA series equivalent communication data * HEX: Low-order word: 003CH High-order word: 003DH DEC: Low-order word: 60 High-order word: 61	• GZ400/900 communication data HEX: 2032H DEC: 8242 • FB series equivalent communication data ** HEX: 0024H DEC: 0036
Control area (Area now used for control)	• GZ400/900 communication data HEX: 007EH to 010FH DEC: 126 to 271 • HA series equivalent communication data * HEX: 003EH to 0071H, 02A2H, 02A3H, 02A4H, 02A5H, 02BCH, 02BDH, 02BEH, 02BFH DEC: 62 to 113, 674, 675, 676, 677, 700, 701, 702, 703	• GZ400/900 communication data HEX: 203FH to 2087H DEC: 8255 to 8327 • FB series equivalent communication data ** HEX: 0026H to 0039H, 00A5H, 00A6H, 00A9H, 00AAH DEC: 0038 to 0057, 0165, 0166, 0169, 0170

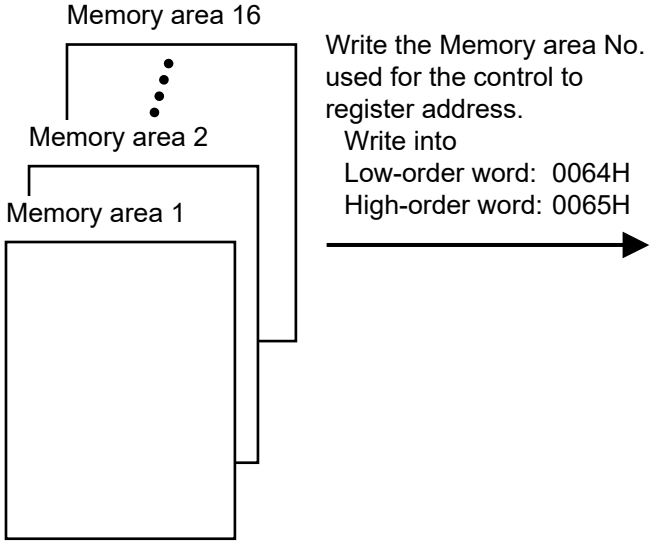
* The data equivalent to our HA series refers to the communication data of our HA series compatible with the GZ400/900.

** The data equivalent to our FB series refers to the communication data of our FB series compatible with the GZ400/900.

☞ For the control area data list, refer to the **6.3.1 GZ400/GZ900 communication data [RKC communication identifier/Modbus double word] (P. 6-12)**, **6.3.4 HA series equivalent communication data [RKC communication identifier/ Modbus double word] (P. 6-103), 6.4.1 GZ400/GZ900 communication data [Modbus single word] (P. 6-142)** and **6.4.4 FB series equivalent communication data [Modbus single word] (P. 6-169)**.

🕮 The Memory area number (Control area) can be changed at either RUN or STOP.

● GZ400/900 communication data (Double word)



Data corresponding to a specified Memory area number is called up to the register addresses from 007EH to 010FH

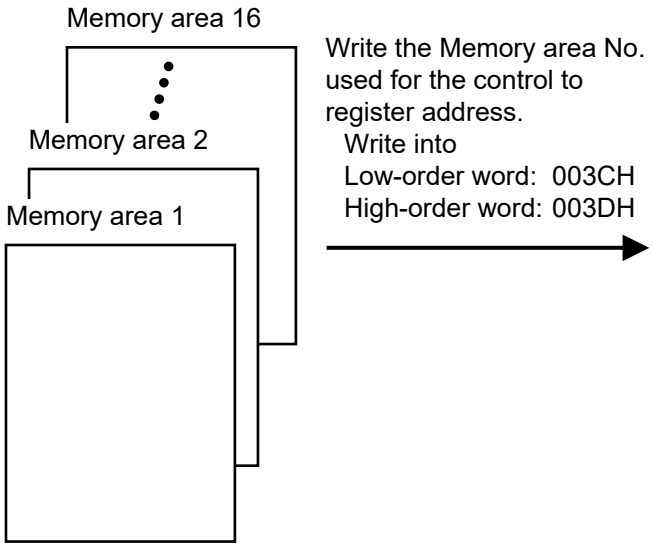
Name	HEX	
	Low-order	High-order
Input 1_Set value (SV)	007E	007F
Input 2_Set value (SV)	0080	0081
Set value (SV) of differential temperature input	0082	0083
Event 1 set value (EV1)	0084	0085
Event 1 set value (EV1') [low]	0086	0087
Event 2 set value (EV2)	0088	0089
Event 2 set value (EV2') [low]	008A	008B
Event 3 set value (EV3)	008C	008D
Event 3 set value (EV3') [low]	008E	008F
⋮	⋮	⋮
Input 2_Knee point correction value 5	010E	010F

Example: When performing control by calling up data in Memory area 3 (Double word)

1. The Memory area number, "3" is written to the Memory area transfer (Low-order word: 0064H High-order word: 0065H).
Data in Memory area 3 is called up to the register addresses from 007EH to 010FH.

2. Control is performed by using data in the register addresses from 007EH to 010FH.

- **HA series equivalent communication data (Double word)**



Data corresponding to a specified Memory area number is called up to the register addresses from 003EH to 0071H, 02A2H, 02A3H, 02A4H, 02A5H, 02BCH, 02BDH, 02BEH, 02BFH

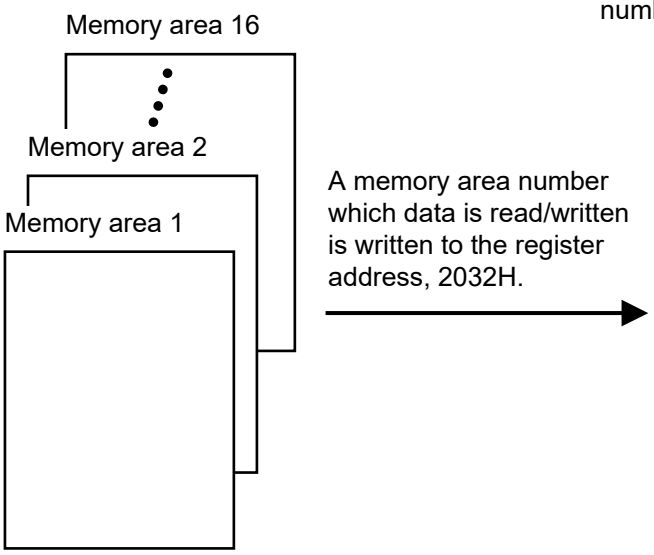
Name	HEX	
	Low-order	High-order
Event 1 set value (EV1)	003E	003F
Event 2 set value (EV2)	0040	0041
Event 3 set value (EV3)	0042	0043
Input 1_Control loop break alarm (LBA) time	0044	0045
Input 1_LBA deadband (LBD)	0046	0047
Event 4 set value (EV4)	0048	0049
Input 2_Control loop break alarm (LBA) time	004A	004B
Input 2_LBA deadband (LBD)	004C	004D
Input 1_Set value (SV)	004E	004F
⋮	⋮	⋮
Input 2_Setting limiter high	02BC	02BD
Input 2_Setting limiter low	02BE	02BF

Example: When performing control by calling up data in Memory area 3 (Double word)

1. The Memory area number, "3" is written to the Memory area transfer (Low-order word: 003CH High-order word: 003DH).
Data in Memory area 3 is called up to the register addresses from 003EH to 0071H, 02A2H, 02A3H, 02A4H, 02A5H, 02BCH, 02BDH, 02BEH, and 02BFH.

2. Control is performed by using data in the register addresses from 003EH to 0071H, 02A2H, 02A3H, 02A4H, 02A5H, 02BCH, 02BDH, 02BEH, and 02BFH.

● **GZ400/900 communication data (Single word)**



Data corresponding to a specified Memory area number is called up to the register addresses from 203FH to 2087H.

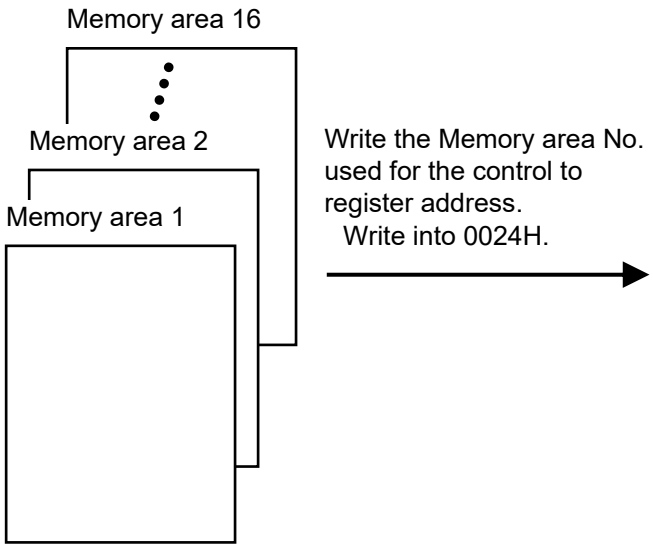
Name	HEX
Input 1_Set value (SV)	203FH
Input 2_Set value (SV)	2040H
Set value (SV) of differential temperature input	2041H
Event 1 set value (EV1)	2042H
Event 1 set value (EV1') [low]	2043H
Event 2 set value (EV2)	2044H
Event 2 set value (EV2') [low]	2045H
Event 3 set value (EV3)	2046H
Event 3 set value (EV3') [low]	2047H
Event 4 set value (EV4)	2048H
Event 4 set value (EV4') [low]	2049H
⋮	⋮
Input 2_Knee point correction value 5	2087H

Example: When performing control by calling up data in Memory area 3 (Single word)

1. The Memory area number, "3" is written to the Memory area transfer (2032H).
Data in Memory area 3 is called up to the register addresses from 203FH to 2087H.

2. Control is performed by using data in the register addresses from 203FH to 2087H.

- **FB series equivalent communication data (Single word)**



Data corresponding to a specified Memory area number is called up to the register addresses from 203FH to 2087H, 0026H to 0039H, 00A5H, 00A6H, 00A9H and 00AAH.

GZ400/900 communication data

Name	HEX
Input 1_Set value (SV)	203FH
Input 2_Set value (SV)	2040H
Set value (SV) of differential temperature input	2041H
Event 1 set value (EV1)	2042H
Event 1 set value (EV1') [low]	2043H
Event 2 set value (EV2)	2044H
Event 2 set value (EV2') [low]	2045H
⋮	⋮
Input 2_Knee point correction value 5	2087H

FB series equivalent communication data

Name	HEX
Event 1 set value (EV1) Event 1 set value (EV1) [high]	0026H
Event 2 set value (EV2) Event 2 set value (EV2) [high]	0027H
Event 3 set value (EV3) Event 3 set value (EV3) [high]	0028H
Event 4 set value (EV4) Event 4 set value (EV4) [high]	0029H
Input 1_Control loop break alarm (LBA) time	002AH
Input 1_LBA deadband (LBD)	002BH
Input 1_Set value (SV)	002CH
Input 1_Proportional band [heat-side]	002DH
Input 1_Integral time [heat-side]	002EH
Input 1_Derivative time [heat-side]	002FH
Input 1_Integral time [heat-side]	0030H
Input 1_Proportional band [cool-side]	0031H
Input 1_Integral time [cool-side]	0032H
Input 1_Derivative time [cool-side]	0033H
Input 1_Overlap/Deadband	0034H
Input 1_Manual reset	0035H
Input 1_Setting change rate limiter (up)	0036H
Input 1_Setting change rate limiter (down)	0037H
Area soak time	0038H
Link area number	0039H
Input 1_Output limiter high [heat-side]	00A5H
Input 1_Output limiter low [heat-side]	00A6H
Input 1_Output limiter high [cool-side]	00A9H
Input 1_Output limiter low [cool-side]	00AAH

The FB series equivalent communication data [retrieved to the control area of Modbus single word] may be overlapped with the communication data of the GZ400/900 retrieved to the control area of [Modbus single word], but not all of the data in the Memory area will be retrieved into the Control area of FB series equivalent communication data [Modbus single word]. To use all o the data in the Memory area for control, use the control area (203FH to 2087H) of GZ400/900 communication data [Modbus single word].

Example: When performing control by calling up data in Memory area 3 (Single word)

1. The Memory area number, "3" is written to the Memory area transfer (0024H).
The data in Memory area 3 will be retrieved into register addresses 0026H to 0039H, 00A5H, 00A6H, 00A9H, 00AAH, and 0041H to 0073H.

2. Control will be conducted using the data in register addresses 0026H to 0039H, 00A5H, 00A6H, 00A9H, 00AAH and 0041H to 0073H.

If the Memory area transfer (0024H) and the Setting memory area number (0500H) are set to the same Memory area number, the respective data can be synchronized.

- Values in the Control areas (0026H to 0039H, 00A5H, 00A6H, 00A9H, 00AAH and 0041H to 0073H) become the same as those in the memory areas (0501H to 055EH).
- If data in the control area is changed, data in the memory area is also changed.
- If data in the memory area is changed, data in the control area is also changed.

COMMUNICATION DATA LIST

6

This chapter describes communication data.

6.1 Data Map Structure

This chapter contains two types of data maps.

- **RKC Communication/Modbus (Double Word) data map**
- **Modbus (Single word) data map**
- **HA series equivalent communication data map**

The data length in RKC communication (7 or 6 digits), the communication data type in Modbus (single word/double word) or HA series equivalent communication data can be set at Input data type (*INdT*).

☞ For the Input data type, refer to the **3.2 Selection of Communication Data Type (P. 3-5)**.

6.1.1 Structure of RKC Communication/Modbus (Double Word) data map

This part describes identifiers in RKC communication and register addresses in Modbus data (double word). The structure of RKC communication/Modbus (double word) is as follows.

■ RKC communication

Monitor items	⇦ The separator position of the continuous [ACK] polling.
Setting items	⇦ The separator position of the continuous [ACK] polling.
For compatibility of identifiers with other models (dummy data)	

■ Modbus (Double word)

HEX: Hexadecimal number DEC: Decimal number

Register address				Contents
HEX		DEC		
Low-order	High-order	Low-order	High-order	
0000 ⋮ 016E	0001 ⋮ 016F	0 ⋮ 366	1 ⋮ 367	Data of GZ400/900 (Normal setting data) Refer to **6.3.1 GZ400/GZ900 Communication data [RKC communication identifier/Modbus double word] (P. 6-12)**.
0170 ⋮ 02F6	0171 ⋮ 02F7	368 ⋮ 758	369 ⋮ 759	Data of GZ400/900 (Data in the Engineering mode) Refer to **6.3.1 GZ/400/GZ900 Communication data [RKC communication identifier/Modbus double word] (P. 6-12)**.
02F8 ⋮ 04FE	02F9 ⋮ 04FF	760 ⋮ 1278	761 ⋮ 1279	Illegal registers
0500 ⋮ 0E1E	0501 ⋮ 0E1F	1280 ⋮ 3614	1281 ⋮ 3615	Memory area data of GZ400/900 Refer to **6.3.2 Memory area data (Direct designation method) [Modbus double word] (P. 6-80)**.
0E20 ⋮ 0FFE	0E21 ⋮ 0FFF	3616 ⋮ 4094	3617 ⋮ 4095	Illegal registers
1000 ⋮ 103E	1001 ⋮ 103F	4096 ⋮ 4158	4097 ⋮ 4159	Mapping setting of GZ400/900 (32) Refer to ■ **Register address for data designation** of **6.3.3 Data mapping address [Modbus double word] (P. 6-98)**.
1040 ⋮ 14FE	1041 ⋮ 14FF	4160 ⋮ 5374	4161 ⋮ 5375	Illegal registers
1500 ⋮ 153E	1501 ⋮ 153F	5376 ⋮ 5438	5377 ⋮ 5439	Mapping data of GZ400/900 (32) Refer to ■ **Register address for data read/write** of **6.3.3 Data mapping address [Modbus double word] (P. 6-101)**.
1540 ⋮ 7FFE	1541 ⋮ 7FFF	5440 ⋮ 32766	5441 ⋮ 32767	Illegal registers

☞ For illegal registers, refer to **5.7 Caution for Handling Communication Data (P. 5-13)**.

☞ For the Data mapping, refer to the **5.8 How to Use Modbus Data Mapping (P. 5-15)**.

☞ For the Memory area, refer to the **5.9 How to Use Memory Area Data (P. 5-18)**.

6.1.2 Structure of Modbus (Single Word) data map

This part describes register addresses of Modbus data (single word). The structure of the data map of Modbus (single word) is as follows.

HEX: Hexadecimal number DEC: Decimal number

Register address		Contents
HEX	DEC	
0000 ⋮ 00E0	0 ⋮ 224	Communication data equivalent to our FB series* (address compatible) Refer to **6.4.4 FB series equivalent communication data [Modbus single word] (P. 6-169)**.
00E1 ⋮ 04FF	225 ⋮ 1279	Illegal registers
0500 ⋮ 055E	1280 ⋮ 1374	Memory area data equivalent to our FB series* (address compatible) Refer to **6.4.5 Memory area data equivalent to the FB series (Area designation method) [Modbus single word] (P. 6-180)**.
055F ⋮ 0FFF	1375 ⋮ 4095	Illegal registers
1000 ⋮ 101F	4096 ⋮ 4127	Mapping setting of GZ400/900 (32) Up to 16 for FB series equivalent Refer to ■ **Register address for data designation** of **6.4.3 Data mapping address [Modbus single word] (P. 6-165)**.
1020 ⋮ 14FF	4128 ⋮ 5375	Illegal registers
1500 ⋮ 151F	5376 ⋮ 5407	Mapping data of GZ400/900 (32) Up to 16 for FB series equivalent Refer to ■ **Register address for data read**/write of **6.4.3 Data mapping address [Modbus single word] (P. 6-167)**.
1520 ⋮ 1FFF	5408 ⋮ 8191	Illegal registers
2000 ⋮ 20B7	8192 ⋮ 8375	Data of GZ400/900 (Normal setting data items) Refer to **6.4.1 GZ400/GZ900** communication **data [Modbus single word] (P. 6-142)**.
20B8 ⋮ 217B	8376 ⋮ 8571	Data of GZ400/900 (Data in the Engineering mode) Refer to **6.4.1 GZ400/GZ900** communication **data [Modbus single word] (P. 6-142)**.
217C ⋮ 24FF	8572 ⋮ 9471	Illegal registers
2500 ⋮ 298F	9472 ⋮ 10639	Memory area data of GZ400/900 Refer to **6.4.2 Memory area data (**Direct **designation method) [Modbus single word] (P. 6-152)**.
2990 ⋮ 7FFF	10640 ⋮ 32767	Illegal registers

* The communication identifiers of GZ400/900 equivalent to our FB series can be used.
If there is no relevant communication data on the GZ400/900, the data is handled as undefined register.

☞ For illegal registers, refer to **5.7 Caution for Handling Communication Data (P. 5-13)**.

☞ For the Data mapping, refer to the **5.8 How to Use Modbus Data Mapping (P. 5-15)**.

☞ For the Memory area, refer to the **5.9 How to Use Memory Area Data (P. 5-18)**.

6.1.3 Structure of HA series equivalent communication data map

This part describes identifiers of the HA series equivalent RKC communication data and register address of MODBUS data (double word). The data map structure of RKC communication/Modbus (double word) is as follows.

■ RKC communication

Monitor items	
Setting items	⇦ The separator position of the continuous [ACK] polling.
For compatibility of identifiers with other models (dummy data)	⇦ The separator position of the continuous [ACK] polling.

■ Modbus (Double word)

HEX: Hexadecimal number DEC: Decimal number

Register address				Contents
HEX		DEC		
Low-order	High-order	Low-order	High-order	
0000 ⋮ 009A	0001 ⋮ 009B	0 ⋮ 154	1 ⋮ 155	Communication data equivalent to our HA series* (address compatible) Refer to **6.3.4 HA series equivalent communication data [RKC communication identifier/Modbus double word] (P. 6-103)**.
009C ⋮ 01FE	009D ⋮ 01FF	156 ⋮ 510	157 ⋮ 511	Illegal registers
0200 ⋮ 02FA	0201 ⋮ 02FB	512 ⋮ 762	513 ⋮ 763	Communication data equivalent to our HA series* (address compatible) Refer to **6.3.4 HA series equivalent communication data [RKC communication identifier/Modbus double word] (P. 6-103)**.
02FC ⋮ 04FE	02FD ⋮ 04FF	764 ⋮ 1278	765 ⋮ 1279	Illegal registers
0500 ⋮ 0534	0501 ⋮ 0535	1280 ⋮ 1332	1281 ⋮ 1333	Memory area data equivalent to our HA series* (address compatible) Refer to **6.3.5 HA series equivalent memory area data (Area designation method) [Modbus double word] (P. 6-137)**.
0536 ⋮ 05FE	0537 ⋮ 05FF	1334 ⋮ 1534	1335 ⋮ 1535	Illegal registers
0600 ⋮ 0878	0601 ⋮ 0879	1536 ⋮ 2168	1537 ⋮ 2169	Unused registers
087A ⋮ 0FFE	087B ⋮ 0FFF	2170 ⋮ 4094	2171 ⋮ 4095	Illegal registers
1000 ⋮ 103E	1001 ⋮ 103F	4096 ⋮ 4158	4097 ⋮ 4159	Mapping data of GZ400/900 (32) Refer to ■ **Register address for data designation** of **6.3.3 Data mapping address [Modbus double word] (P. 6-98)**.
1040 ⋮ 14FE	1041 ⋮ 14FF	4160 ⋮ 5374	4161 ⋮ 5375	Illegal registers
1500 ⋮ 153E	1501 ⋮ 153F	5376 ⋮ 5438	5377 ⋮ 5439	Mapping data of GZ400/900 (32) Refer to ■ **Register address for data read/write** of **6.3.3 Data mapping address [Modbus double word] (P. 6-101)**.
1540 ⋮ 7FFE	1541 ⋮ 7FFF	5440 ⋮ 32766	5441 ⋮ 32767	Illegal registers

* The communication identifiers of GZ400/900 equivalent to our HA series can be used.
If there is no relevant communication data on the GZ400/900, the data is handled as dummy data.

☞ For illegal registers and unused registers, refer to **5.7 Caution for Handling Communication Data (P. 5-13)**.

☞ For the Data mapping, refer to the **5.8 How to Use Modbus Data Mapping (P. 5-15)**.

☞ For the Memory area, refer to the **5.9 How to Use Memory Area Data (P. 5-18)**.

6.2 How to Read the Table

■ Data map of RKC communication identifiers/Modbus double word

This part describes how to read the data map of **6.3.1 GZ400/GZ900 Communication data [RKC communication identifier/Modbus double word] (P. 6-12)**.

(1) (2) (3) (4) (5) (6) (7) (8)

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
1	Input 1_Measured value (PV)	**M1**	7 or 6	0000	0001	0	1	RO	Input 1_Input range low – (Input 1_5 % of input span or more) to Input 1_Input range high + (Input 1_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—
2	Input 1_Set value (SV) monitor	**MS**	7 or 6	0002	0003	2	3	RO	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	—

(1) No.: Communication data number

(2) Name: Communication data name

☞ For undefined registers and illegal registers, refer to **5.7 Caution for Handling Communication Data (P. 5-13)**.

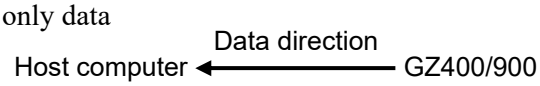
(3) Identifier: Identifier for RKC communication

(4) Digits: Number of digits for RKC communication

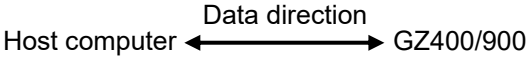
(5) Register address: Register address for Modbus communication
(HEX: Hexadecimal number DEC: Decimal number)

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

RO: Read only data

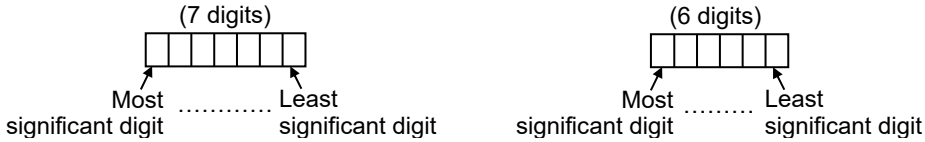


R/W: Read and Write data



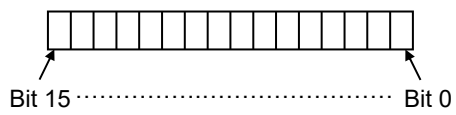
(7) Data range: Read or write range of communication data

- **ASCII code data (RKC communication)**



☞ The data length in RKC communication (7 or 6 digits) can be set at **Input data type** (*I NdT*) (P. 3-6).

- **16-bit data (Modbus)**



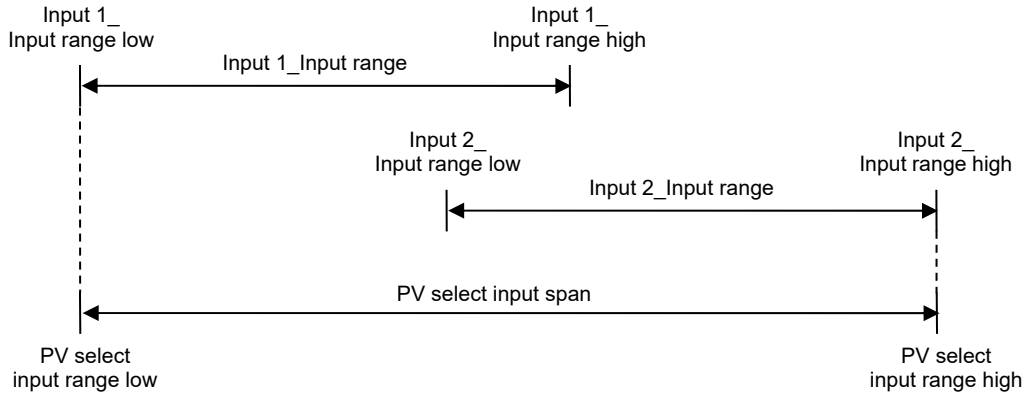
(8) Factory set value: Factory set value of communication data

In the data range and the factory set value some unfamiliar expressions are used. These are used for Control with PV select and can be rephrased as follows:
PV select input span as Input span
PV select input range high as Input range high
PV select input range low as Input range low

The setting range is as follows.

- PV select input range high: Input range high of Input 1 and Input 2, whichever is larger
- PV select input range low: Input range low of Input 1 and Input 2, whichever is smaller
- PV select input span: PV select input range low up to PV select input range high

[Example] When there is a relation as follows between the Input range of Input 1 and Input 2.



The communication data include "Normal setting data," "Data in the Engineering mode," "Data of identifiers compatible with other models (dummy data)."

Normal setting data:	No. 1 to 187
Data in the Engineering mode:	No. 188 to 383
Data of identifiers compatible with other models (dummy data):	No. 384 to 389

The attribute of the data in the Engineering mode is RO (read only) during RUN (control).

⚠ WARNING

Communication data in the Engineering mode should be set according to the application before setting any parameter related to operation. Once the communication data in the Engineering mode are set correctly, no further changes need to be made to parameters 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 Engineering mode.

NOTE

Communication data in Engineering mode are settable only when the controller is in STOP mode. However, only checking can be made even in the RUN state.

■ Data map of Modbus single word

This part describes how to read the data map of **6.4.1 GZ400/GZ900 communication data [Modbus single word] (P. 6-142)**.

(1) (2) (3) (4)

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
1	Input 1_Measured value (PV)	2000	8192	1
2	Input 1_Set value (SV) monitor	2001	8193	2

(1) No.: Communication data number

(2) Name: Communication data name

(3) Register address: Register address for Modbus communication
(HEX: Hexadecimal number DEC: Decimal number)

(4) 6.3.1 Reference No.: Refer to **6.3.1 GZ400/GZ900 Communication data [RKC communication identifier/Modbus double word] (P. 6-12)** for communication data numbers.

Find the same number in the data map **6.3.1 GZ400/GZ900 Communication data [RKC communication identifier/Modbus double word]**, and use the attribute, the data range and the factory set value obtained there.

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
1	Input 1_Measured value (PV)	**M1**	7 or 6	0000	0001	0	1	RO	Input 1_Input range low – (Input 1_5 % of input span or more) to Input 1_Input range high + (Input 1_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—
2	Input 1_Set value (SV) monitor	**MS**	7 or 6	0002	0003	2	3	RO	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	—

The communication data include “Normal setting data,” “Data in the Engineering mode,” “Data of identifiers compatible with other models (dummy data).”

Normal setting data: No. 1 to 184

Data in the Engineering mode: No. 185 to 380

The attribute of the data in the Engineering mode is RO (read only) during RUN (control).

⚠ WARNING

Communication data in the Engineering mode should be set according to the application before setting any parameter related to operation. Once the communication data in the Engineering mode are set correctly, no further changes need to be made to parameters 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 Engineering mode.

NOTE

Communication data in Engineering mode are settable only when the controller is in STOP mode. However, only checking can be made even in the RUN state.

■ Data map of HA series equivalent communication

This part describes how to read the data map of **6.3.4 HA series equivalent communication data [RKC communication identifier/Modbus double word] (P. 6-103)**.

(1) (2) (3) (4) (5) (6) (7) (8)

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
1	Input 1_Measured value (PV) [Input 1_measured value (PV1) monitor]	**M1**	7	0000	0001	0	1	RO	Input 1_Input range low − (Input 1_5 % of input span or more) to Input 1_Input range high + (Input 1_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—
2	Input 2_Measured value (PV) [Input 2_measured value (PV2) monitor]	**M0**	7	0002	0003	2	3	RO	Input 2_Input range low − (Input 2_5 % of input span or more) to Input 2_Input range high + (Input 2_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—

(1) No.: Communication data number

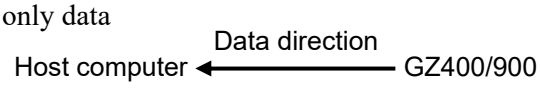
(2) Name: Communication data name
[ ]: Name of HA series communication data

(3) Identifier: Identifier for RKC communication

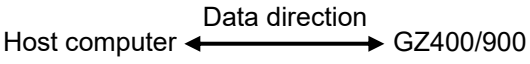
(4) Digits: Number of digits for RKC communication

(5) Register address: Register address for Modbus communication
(HEX: Hexadecimal numberDEC: Decimal number)

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

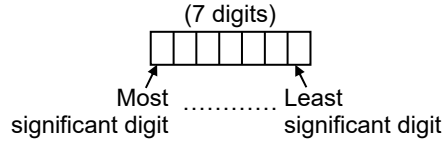


R/W: Read and Write data

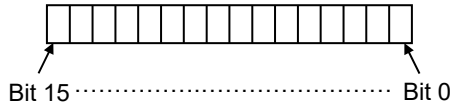


(7) Data range: Read or write range of communication data

- **ASCII code data (RKC communication)**



- **16-bit data (Modbus)**



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

The communication data include “Normal setting data” and “Data in the Engineering mode.”
Normal setting data: No. 1 to 71, 153, 154, 160, 161, 166, 167, 173, 174, 200, 202
Data in the Engineering mode: No. 72 to 152, 155 to 159, 162 to 165, 168 to 172, 175 to 199, 201, 203, 204

The attribute of the data in the Engineering mode is RO (read only) during RUN (control).

⚠ WARNING

Communication data in the Engineering mode should be set according to the application before setting any parameter related to operation. Once the communication data in the Engineering mode are set correctly, no further changes need to be made to parameters 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 Engineering mode.

NOTE
Communication data in Engineering mode are settable only when the controller is in STOP mode. However, only checking can be made even in the RUN state.

■ Data map of FB series equivalent communication

This part describes how to read the data map of **6.4.4 FB series equivalent communication data [Modbus single word] (P. 6-169)**.

(1) (2) (3) (4)

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
1	Measured value (PV)	Input 1_Measured value (PV)	0000	0	1
2	Current transformer 1 (CT1) input value monitor	Current transformer 1 (CT1) input value monitor	0001	1	11

(1) No.: Communication data number

(2) Name: Communication data name
Data equivalent to our FB series:
The communication data of our FB series compatible with the data of GZ400/900.
Relevant data of GZ400/900:
The data of GZ400/900 equivalent to the communication data of our FB series.

(3) Register address: Register address for Modbus communication
(HEX: Hexadecimal number DEC: Decimal number)

(4) 6.3.1 Reference No.: Refer to **6.3.1 GZ400/GZ900 Communication data [RKC communication identifier/Modbus double word] (P. 6-12)** for communication data numbers.

Find the same number in the data map **6.3.1 GZ400/GZ900 Communication data [RKC communication identifier/Modbus double word]**, and use the attribute, the data range and the factory set value obtained there.

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
1	Input 1_Measured value (PV)	**M1**	7 or 6	0000	0001	0	1	RO	Input 1_Input range low – (Input 1_5 % of input span or more) to Input 1_Input range high + (Input 1_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—
2	Input 1_Set value (SV) monitor	**MS**	7 or 6	0002	0003	2	3	RO	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	—

6.3 RKC Communication/Modbus (Double Word) Data

6.3.1 GZ400/GZ900 Communication data [RKC communication identifier/Modbus double word]

The following table shows communication identifiers of RKC communication and double word register address of Modbus.

In case of Input data type "0," Modbus double word.

Switchover between the single word and the double word can be done at Input data type.
For the Input data type, refer to the **3.2 Selection of Communication Data Type (P. 3-5)**.

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
1	Input 1_Measured value (PV)	**M1**	7 or 6	0000	0001	0	1	RO	Input 1_Input range low – (Input 1_5 % of input span or more) to Input 1_Input range high + (Input 1_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—
2	Input 1_Set value (SV) monitor	**MS**	7 or 6	0002	0003	2	3	RO	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	—
3	Input 2_Measured value (PV)	**M0**	7 or 6	0004	0005	4	5	RO	Input 2_Input range low – (Input 2_5 % of input span or more) to Input 2_Input range high + (Input 2_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—
4	Input 2_Set value (SV) monitor	**MT**	7 or 6	0006	0007	6	7	RO	Input 2_Setting limiter low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	—
5	PV select Measured value (PV)	**L3**	7 or 6	0008	0009	8	9	RO	When controlling with Input 1: Input 1_Input range low – (Input 1_5 % of input span or more) to Input 1_Input range high + (Input 1_5 % of input span or more) When controlling with Input 2: Input 2_Input range low – (Input 2_5 % of input span or more) to Input 2_Input range high + (Input 2_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
6	Measured value (PV) of differential temperature input	**L2**	7	000A	000B	10	11	RO	In case of Input data type 0 or 2 −19999 to +99999 [Varies with the setting of the Decimal point position.]	—
			6	—	—	—	—	RO	In case of Input data type 1 −1999 to +9999 [Varies with the setting of the Decimal point position.]	—
7	Set value (SV) monitor of differential temperature input	**LE**	7 or 6	000C	000D	12	13	RO	− (Input 1_Input span) to + (Input 1_Input span) [Varies with the setting of the Decimal point position.]	—
8	Input 1_Manipulated output value monitor [heat-side]	**O1**	7 or 6	000E	000F	14	15	RO	−5.0 to +105.0 %	—
9	Input 1_Manipulated output value monitor [cool-side]	**O2**	7 or 6	0010	0011	16	17	RO	−5.0 to +105.0 %	—
10	Input 2_Manipulated output value monitor	**O0**	7 or 6	0012	0013	18	19	RO	−5.0 to +105.0 %	—
11	Current transformer 1 (CT1) input value monitor	**M3**	7 or 6	0014	0015	20	21	RO	0.0 to 100.0 A	—
12	Current transformer 2 (CT2) input value monitor	**M4**	7 or 6	0016	0017	22	23	RO	0.0 to 100.0 A	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
13	Memory area soak time monitor	**TR**	7	0018	0019	24	25	RO	In case of Input data type 0 or 2 • RKC communication 0 hours 00 minutes 00 seconds to 9 hours 59 minutes 59 seconds * 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus 0 to 35999 seconds 0 to 11999 seconds 0 to 5999 minutes 0 to 5999 seconds (10 ms) (Calculation is performed every 50 ms.) [Data range of Memory area soak time monitor can be selected on the Soak time unit.]	—
			6	—	—	—	—	RO	In case of Input data type 1 • RKC communication 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds 0 to 5999 seconds (10 ms) (Calculation is performed every 50 ms.) [Data range of Memory area soak time monitor can be selected on the Soak time unit.]	—
14	Remote setting input value monitor	**S2**	7 or 6	001A	001B	26	27	RO	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
15	Event 1 state monitor	**AA**	7 or 6	001C	001D	28	29	RO	0: OFF 1: ON	—
16	Event 2 state monitor	**AB**	7 or 6	001E	001F	30	31	RO	0: OFF 1: ON	—
17	Event 3 state monitor	**AG**	7 or 6	0020	0021	32	33	RO	0: OFF 1: ON	—
18	Event 4 state monitor	**AH**	7 or 6	0022	0023	34	35	RO	0: OFF 1: ON	—
19	Heater break alarm 1 (HBA1) state monitor	**AC**	7 or 6	0024	0025	36	37	RO	0: OFF 1: ON	—
20	Heater break alarm 2 (HBA2) state monitor	**AD**	7 or 6	0026	0027	38	39	RO	0: OFF 1: ON	—
21	Control loop break alarm 1 (LBA1) state monitor	**AE**	7 or 6	0028	0029	40	41	RO	0: OFF 1: ON	—
22	Control loop break alarm 2 (LBA2) state monitor	**AF**	7 or 6	002A	002B	42	43	RO	0: OFF 1: ON	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
23	Comprehensive event state	**AJ**	7 or 6	002C	002D	44	45	RO	0 to 4095 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm 1 (LBA1) +128: Control loop break alarm 2 (LBA2) +256: Input 1_Input error high +512: Input 1_Input error low +1024: Input 2_Input error high +2048: Input 2_Input error low When multiple items are applicable, they are summed up.	—
24	Input 1_Burnout state monitor	**B1**	7 or 6	002E	002F	46	47	RO	0: OFF 1: ON	—
25	Input 2_Burnout state monitor	**B0**	7 or 6	0030	0031	48	49	RO	0: OFF 1: ON	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
26	DI state monitor	**L1**	7 or 6	0032	0033	50	51	RO	RKC communication The DI state is assigned as a bit image in binary numbers. Bit 0: DI1 Bit 1: DI2 Bit 2: DI3 Bit 3: DI4 Bit 4: DI5 Bit 5: DI6 Bit 6 to Bit 7: Unused Data 0: Open 1: Closed	—
									Modbus 0 to 63 0: Open +1: DI1 Closed +2: DI2 Closed +4: DI3 Closed +8: DI4 Closed +16: DI5 Closed +32: DI6 Closed When multiple items are applicable, they are summed up.	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
27	OUT state monitor	**Q1**	7 or 6	0034	0035	52	53	RO	RKC communication The OUT state is assigned as a bit image in binary numbers. Bit 0: OUT1 Bit 1: OUT2 Bit 2: OUT3 Bit 3 to Bit 7: Unused Data 0: OFF 1: ON	—
									Modbus 0 to 7 0: OFF +1: OUT1 ON +2: OUT2 ON +4: OUT3 ON When multiple items are applicable, they are summed up.	—
28	DO state monitor	**Q2**	7 or 6	0036	0037	54	55	RO	RKC communication The DO state is assigned as a bit image in binary numbers. Bit 0: DO1 Bit 1: DO2 Bit 2: DO3 Bit 3 DO4 Bit 4 to Bit 7: Unused Data 0: OFF 1: ON	—
									Modbus 0 to 15 0: OFF +1: DO1 ON +2: DO2 ON +4: DO3 ON +8: DO4 ON When multiple items are applicable, they are summed up.	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
29	Overall operation status	**L0**	7 or 6	0038	0039	56	57	RO	0 to 511 0: OFF +1: STOP state +2: Input 1_Manual mode state +4: Input 2_Manual mode state +8: Remote mode state (Differential temperature control state, Input 2 state of Control with PV select) +16: Input 1_Autotuning (AT) state +32: Input 2_Autotuning (AT) state +64: Set value of Input 1 is now changing +128: Set value of Input 2 is now changing +256: Communication monitoring result When multiple items are applicable, they are summed up.	—
30	Input 1_PID memory	**PC**	7 or 6	003A	003B	58	59	RO	Switching by Memory area number: 1 to 16 Switching by Set value (SV): 1 to 8 Switching by Measured value (PV): 1 to 8 [Which PID memory can be used depends on the setting of the Input 1_Level PID action selection.]	—
31	Input 2_PID memory	**PD**	7 or 6	003C	003D	60	61	RO	Switching by Memory area number: 1 to 16 Switching by Set value (SV): 1 to 8 Switching by Measured value (PV): 1 to 8 [Which PID memory can be used depends on the setting of the Input 2_Level PID action selection.]	—
32	Input 1_Peak hold monitor	**HQ**	7 or 6	003E	003F	62	63	RO	Input 1_Input range low – (Input 1_5 % of input span) to Input 1_Input range high + (Input 1_5 % of input span) [Varies with the setting of the Decimal point position.]	—
33	Input 1_Bottom hold monitor	**FQ**	7 or 6	0040	0041	64	65	RO	Input 1_Input range low – (Input 1_5 % of input span) to Input 1_Input range high + (Input 1_5 % of input span) [Varies with the setting of the Decimal point position.]	—
34	Input 2_Peak hold monitor	**HR**	7 or 6	0042	0043	66	67	RO	Input 2_Input range low – (Input 2_5 % of input span) to Input 2_Input range high + (Input 2_5 % of input span) [Varies with the setting of the Decimal point position.]	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
35	Input 2_Bottom hold monitor	**FR**	7 or 6	0044	0045	68	69	RO	Input 2_Input range low – (Input 2_5 % of input span) to Input 2_Input range high + (Input 2_5 % of input span) [Varies with the setting of the Decimal point position.]	—
36	Input 1_AT remaining time monitor	**AN**	7 or 6	0046	0047	70	71	RO	RKC communication 0 hours 00 minutes to 48 hours 00 minutes	—
									Modbus 0 to 2880 minutes	—
37	Input 2_AT remaining time monitor	**AO**	7 or 6	0048	0049	72	73	RO	RKC communication 0 hours 00 minutes to 48 hours 00 minutes	—
									Modbus 0 to 2880 minutes	—
38	Input 1_AT/ST status monitor	**AP**	7 or 6	004A	004B	74	75	RO	–4 to +2 0: AT/ST complete +1: AT running now +2: ST running now –1: Aborted. Setting changed. –2: Aborted. Abnormal input. –3: Aborted. Timeout. –4: Aborted. Abnormal calculated values.	—
39	Input 2_AT/ST status monitor	**AQ**	7 or 6	004C	004D	76	77	RO	–4 to +2 0: AT/ST complete +1: AT running now +2: ST running now –1: Aborted. Setting changed. –2: Aborted. Abnormal input. –3: Aborted. Timeout. –4: Aborted. Abnormal calculated values.	—
40	Error code	**ER**	7 or 6	004E	004F	78	79	RO	0 to 71 0: Normal +1: Adjustment data error +2: Data back-up error +4: A/D conversion error (Temperature compensation error included) +64: Display units error When multiple items are applicable, they are summed up.	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
41	Integrated operating time	**UT**	7 or 6	0050	0051	80	81	RO	0 to 65535 hours	—
42	Peak hold monitor of ambient temperature	**HP**	7 or 6	0052	0053	82	83	RO	−120 to +120 °C	—
43	ROM version	**VR**	7 or 6	—	—	—	—	RO	Version of ROM built in the instrument	—
44	Model code monitor	**ID**	32	—	—	—	—	RO	Model code	—
45	Instrument number monitor	**RX**	10	—	—	—	—	RO	Instrument serial number	—
46	Retransmission output 1 decimal point position	—	—	0054	0055	84	85	RO	0: No decimal place 1: One decimal place 2: Two decimal place 3: Three decimal place 4: Four decimal place When the type of retransmission output is as follows: Varies with the setting of the Input 1_Decimal point position. No retransmission output Input 1_Measured value (PV) Input 1_Local SV Remote setting input value Input 1_SV monitor value Input 1_Deviation Measured value (PV) of differential temperature input When the type of retransmission output is as follows: Varies with the setting of the Input 2_Decimal point position. Input 2_Measured value (PV) Input 2_Local SV Input 2_SV monitor value Input 2_Deviation When the type of retransmission output is as follows: 1 (One decimal place) Input 1_Manipulated output value [heat-side] Input 1_Manipulated output value [cool-side] Input 2_Manipulated output value Current transformer 1 (CT1) input value Current transformer 2 (CT2) input value	—
47	Retransmission output 2 decimal point position	—	—	0056	0057	86	87	RO		—
48	Retransmission output 3 decimal point position	—	—	0058	0059	88	89	RO		—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
49	Event 1 decimal point position	—	—	005A	005B	90	91	RO	0: No decimal place 3: Three decimal places 1: One decimal place 4: Four decimal places 2: Two decimal places	—
50	Event 2 decimal point position	—	—	005C	005D	92	93	RO	When the event type is No event, Deviation, Process, or SV: For Input 1, differential temperature input: Varies with the setting of the Input 1_Decimal point position. For Input 2: Varies with the setting of the Input 2_Decimal point position.	—
51	Event 3 decimal point position	—	—	005E	005F	94	95	RO		—
52	Event 4 decimal point position	—	—	0060	0061	96	97	RO	When the Event type is Manipulated output value: 1 (One decimal place)	—
53	Interlock release	**IL**	7 or 6	0062	0063	98	99	R/W	0: Interlock release 1: Interlock state "1: Interlock state" is for monitoring the interlocked state. Do not write "1."	0
54	Memory area transfer	**ZA**	7 or 6	0064	0065	100	101	R/W	1 to 16 When the DI1 function selection is set to "Memory area transfer (Without area set signal)" and when "External mode" is selected with the Control area Local/External transfer, the data is RO (Read only).	1
55	Input 1_Hold reset	**CQ**	7 or 6	0066	0067	102	103	R/W	0: Hold 1: Reset Returns to Hold state automatically after reset.	0
56	Input 2_Hold reset	**CR**	7 or 6	0068	0069	104	105	R/W	0: Hold 1: Reset Returns to Hold state automatically after reset.	0
57	Bottom suppression start signal	**S8**	7 or 6	006A	006B	106	107	R/W	0 to 3 0: No forced ON +1: Input 1_Bottom suppression action Forced ON +2: Input 2_Bottom suppression action_Forced ON	0
58	RUN/STOP transfer	**SR**	7 or 6	006C	006D	108	109	R/W	0: RUN (Control start) 1: STOP (Control stop)	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
59	Input 1_Autotuning (AT)	**G1**	7 or 6	006E	006F	110	111	R/W	0: PID control 1: Start Autotuning When the Autotuning (AT) is finished, the control will automatically return to “0.”	0
60	Input 2_Autotuning (AT)	**G0**	7 or 6	0070	0071	112	113	R/W	0: PID control 1: Start Autotuning When the Autotuning (AT) is finished, the control will automatically return to “0.”	0
61	Input 1_Startup tuning (ST)	**ST**	7 or 6	0072	0073	114	115	R/W	0: ST unused 1: Execute once * 2: Execute always * When the ST is finished, the control will automatically return to “0.”	0
62	Input 2_Startup tuning (ST)	**SZ**	7 or 6	0074	0075	116	117	R/W	0: ST unused 1: Execute once * 2: Execute always * When the ST is finished, the control will automatically return to “0.”	0
63	Input 1_Auto/Manual transfer	**J1**	7 or 6	0076	0077	118	119	R/W	0: Auto mode 1: Manual mode	0
64	Input 2_Auto/Manual transfer	**J0**	7 or 6	0078	0079	120	121	R/W	0: Auto mode 1: Manual mode	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
65	Remote/Local transfer	**C1**	7 or 6	007A	007B	122	123	R/W	When Select function for input 2 is: “Remote setting input” 0: Local mode 1: Remote mode	0
									When Select function for input 2 is: “Control with PV select” 0: Input 1 1: Input 2 When “Switching by level” is selected at “Selection of PV select trigger,” the parameter becomes RO (Read only).	0
									When Select function for input 2 is: “2-loop control/Differential temperature control” 0: 2-loop control 1: Differential temperature control	0
66	Control area Local/External transfer	**E1**	7 or 6	007C	007D	124	125	R/W	0: Local mode 1: External mode	0
67	Input 1_Set value (SV) ★	**S1**	7 or 6	007E	007F	126	127	R/W	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	0
68	Input 2_Set value (SV) ★	**S0**	7 or 6	0080	0081	128	129	R/W	Input 2_Setting limiter low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	0
69	Set value (SV) of differential temperature input ★	**S3**	7 or 6	0082	0083	130	131	R/W	– (Input 1_Input span) to + (Input 1_Input span) [Varies with the setting of the Decimal point position.]	0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
70	Event 1 set value (EV1) When Event 1 type is either high or low limit with individual setting Event 1 set value (EV1) [high] ★	**A1**	7 or 6	0084	0085	132	133	R/W	• Deviation When assigned to Input 1 or Differential temperature input – (Input 1_Input span) to + (Input 1_Input span) When assigned to Input 2 – (Input 2_Input span) to + (Input 2_Input span) When Control with PV select is selected at Select function for input 2 – (PV select input span) to + (PV select input span) [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 10 V/I inputs: 5 % of input span
									• Input value or Set value When assigned to Input 1 Input 1_Input range low to Input 1_Input range high When assigned to Input 2 Input 2_Input range low to Input 2_Input range high When assigned to Differential temperature input – (Input 1_Input span) to + (Input 1_Input span) When Control with PV select is selected at Select function for input 2 PV select input range low to PV select input range high [Varies with the setting of the Decimal point position.]	
									• Manipulated output value –5.0 to +105.0 %	50.0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address HEX Low-order	Register address HEX High-order	Register address DEC Low-order	Register address DEC High-order	Attribute	Data range	Factory set value
71	Event 1 set value (EV1') [low] ★	**BT**	7 or 6	0086	0087	134	135	R/W	• Deviation When assigned to Input_1 or Differential temperature input – (Input 1_Input span) to + (Input 1_Input span) When assigned to Input 2 – (Input 2_Input span) to + (Input 2_Input span) When Control with PV select is selected at Select function for Input 2 – (PV select input span) to + (PV select input span) [Varies with the setting of the Decimal point position.]	TC/RTD inputs: −10 V/I inputs: −5 % of input span
									• Input value or Set value When assigned to Input 1 Input 1_Input range low to Input 1_Input range high When assigned to Input 2 Input 2_Input range low to Input 2_Input range high When assigned to Differential temperature input – (Input 1_Input span) to + (Input 1_Input span) When Control with PV select is selected at Select function for Input 2 PV select input range low to PV select input range high [Varies with the setting of the Decimal point position.]	
72	Event 2 set value (EV2) When Event 2 type is either high or low limit with individual setting Event 2 set value (EV2) [high] ★	**A2**	7 or 6	0088	0089	136	137	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
73	Event 2 set value (EV2') [low] ★	**BU**	7 or 6	008A	008B	138	139	R/W	Same as Event 1 set value (EV1') [low]	
74	Event 3 set value (EV3) When Event 3 type is either high or low limit with individual setting Event 3 set value (EV3) [high] ★	**A7**	7 or 6	008C	008D	140	141	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
75	Event 3 set value (EV3') [low] ★	**BV**	7 or 6	008E	008F	142	143	R/W	Same as Event 1 set value (EV1') [low]	
76	Event 4 set value (EV4) When Event 4 type is either high or low limit with individual setting Event 4 set value (EV4) [high] ★	**A8**	7 or 6	0090	0091	144	145	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
77	Event 4 set value (EV4') [low] ★	**BW**	7 or 6	0092	0093	146	147	R/W	Same as Event 1 set value (EV1') [low]	
78	Input 1_Proportional band [heat-side] ★	**P1**	7 or 6	0094	0095	148	149	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 1000.0 % of Input 1_Input span (When Control with PV select: 0.0 to 1000.0 % of PV select input span) 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0
79	Input 1_Integral time [heat-side] ★	**I1**	7 or 6	0096	0097	150	151	R/W	PID control or Heat/Cool PID control 0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240.00
80	Input 1_Derivative time [heat-side] ★	**D1**	7 or 6	0098	0099	152	153	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60.00

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
81	Input 1_Control response parameter ★	**CA**	7 or 6	009A	009B	154	155	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	PID control: 0 Heat/Cool PID control: 2
82	Input 1_Proactive intensity ★	**ZP**	7 or 6	009C	009D	156	157	R/W	0 to 4 0: No function	2
83	Input 1_Manual reset ★	**MR**	7 or 6	009E	009F	158	159	R/W	−100.0 to +100.0 %	0.0
84	Input 1_FF amount ★	**F3**	7 or 6	00A0	00A1	160	161	R/W	−100.0 to +100.0 %	0.0
85	Input 1_Output limiter high [heat-side] ★	**OH**	7 or 6	00A2	00A3	162	163	R/W	Input 1_Output limiter low [heat-side] to 105.0 %	105.0
86	Input 1_Output limiter low [heat-side] ★	**OX**	7 or 6	00A4	00A5	164	165	R/W	−5.0 % to Input 1_Output limiter high [heat-side]	−5.0
87	Input 1_Control loop break alarm (LBA) time ★	**A5**	7 or 6	00A6	00A7	166	167	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0
88	Input 1_LBA deadband (LBD) ★	**V3**	7 or 6	00A8	00A9	168	169	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.]	0
89	Input 2_Proportional band ★	**P0**	7 or 6	00AA	00AB	170	171	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 1000.0 % of Input 2_Input span 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
90	Input 2_Integral time ★	**I0**	7 or 6	00AC	00AD	172	173	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00,0.000): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240.00
91	Input 2_Derivative time ★	**D3**	7 or 6	00AE	00AF	174	175	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60.00
92	Input 2_Control response parameter ★	**C8**	7 or 6	00B0	00B1	176	177	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	0
93	Input 2_Proactive intensity ★	**ZQ**	7 or 6	00B2	00B3	178	179	R/W	0 to 4 0: No function	2
94	Input 2_Manual reset ★	**MQ**	7 or 6	00B4	00B5	180	181	R/W	−100.0 to +100.0 %	0.0
95	Input 2_FF amount ★	**F4**	7 or 6	00B6	00B7	182	183	R/W	−100.0 to +100.0 %	0.0
96	Input 2_Output limiter high ★	**OO**	7 or 6	00B8	00B9	184	185	R/W	Input 2_Output limiter low to 105.0 %	105.0
97	Input 2_Output limiter low ★	**OS**	7 or 6	00BA	00BB	186	187	R/W	−5.0 % to Input 2_Output limiter high	−5.0
98	Input 2_Control loop break alarm (LBA) time ★	**A9**	7 or 6	00BC	00BD	188	189	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
99	Input 2_LBA deadband (LBD) ★	**V4**	7 or 6	00BE	00BF	190	191	R/W	0 to Input 2_Input span [Varies with the setting of the Decimal point position.]	0
100	Input 1_Proportional band [cool-side] ★	**P2**	7 or 6	00C0	00C1	192	193	R/W	TC/RTD inputs 1 (0.1, 0.01) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 1 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.1 to 1000.0 % of Input 1_Input span (When Control with PV select: 0.1 to 1000.0 % of PV select input span)	TC/RTD inputs: 30 V/I inputs: 3.0
101	Input 1_Integral time [cool-side] ★	**I2**	7 or 6	00C2	00C3	194	195	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240.00
102	Input 1_Derivative time [cool-side] ★	**D2**	7 or 6	00C4	00C5	196	197	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60.00
103	Input 1_Overlap/Deadband ★	**V1**	7 or 6	00C6	00C7	198	199	R/W	TC/RTD inputs – (Input 1_Input span) to + (Input 1_Input span) (When Control with PV select: – (PV select input span) to + (PV select input span)) (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs –100.0 to +100.0 % of Input 1_Input span (When Control with PV select: –100.0 to +100.0 % of PV select input span) Minus (–) setting results in Overlap. However, the overlapping range is within the proportional range.	TC/RTD inputs: 0 V/I inputs: 0.0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
104	Input 1_Output limiter high [cool-side] ★	**OL**	7 or 6	00C8	00C9	200	201	R/W	Heat/Cool PID control Input 1_Output limiter low [cool-side] to 105.0 %	105.0
	Input 1_Output limiter low [heat-side] ★								PID control −5.0 % to Input 1_Output limiter high [heat-side] Same data as RKC communication identifier OX	−5.0
105	Input 1_Output limiter low [cool-side] ★	**OY**	7 or 6	00CA	00CB	202	203	R/W	−5.0 % to Input 1_Output limiter high [cool-side]	−5.0
106	Select Trigger type for Memory area transfer ★	**EY**	7 or 6	00CC	00CD	204	205	R/W	0 to 63 0: No assignment +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Digital input 1 (DI1) Close edge +32: Digital input 1 (DI1) Open edge To select two or more functions, sum each value.	0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address HEX Low-order	Register address HEX High-order	Register address DEC Low-order	Register address DEC High-order	Attribute	Data range	Factory set value
107	Area soak time ★	**TM**	7	00CE	00CF	206	207	R/W	In case of Input data type 0 or 2 • RKC communication 0 hours 00 minutes 00 seconds to 9 hours 59 minutes 59 seconds 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus 0 to 35999 seconds 0 to 11999 seconds 0 to 5999 minutes 0 to 5999 (10 ms) (Calculation is performed every 50 ms.) [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0.00 seconds) Modbus: 0
			6	—	—	—	—	R/W	In case of Input data type 1 • RKC communication 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds 0 to 5999 (10 ms) (Calculation is performed every 50 ms.) [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0.00 seconds) Modbus: 0
108	Link area number ★	**LP**	7 or 6	00D0	00D1	208	209	R/W	0 to 16 0: No function	0
109	Input 1_Setting change rate limiter (up) ★	**HH**	7 or 6	00D2	00D3	210	211	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: No function [Varies with the setting of the Decimal point position.]	0
110	Input 1_Setting change rate limiter (down) ★	**HL**	7 or 6	00D4	00D5	212	213	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: No function [Varies with the setting of the Decimal point position.]	0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
111	Input 1_Auto/Manual transfer selection (Area) ★	**J2**	7 or 6	00D6	00D7	214	215	R/W	0: No transfer 1: Auto mode (bumpless) 2: Auto mode (bump) 3: Manual mode (bumpless) 4: Manual mode (bump)	0
112	Input 1_Manipulated output value (Area) ★	**O8**	7 or 6	00D8	00D9	216	217	R/W	PID control −5.0 to +105.0 % Heat/Cool PID control −105.0 to +105.0 %	PID control: −5.0 Heat/Cool PID control: 0.0
113	Input 2_Setting change rate limiter (up) ★	**HX**	7 or 6	00DA	00DB	218	219	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0
114	Input 2_Setting change rate limiter (down) ★	**HY**	7 or 6	00DC	00DD	220	221	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0
115	Input 2_Auto/Manual transfer selection (Area) ★	**J3**	7 or 6	00DE	00DF	222	223	R/W	0: No transfer 1: Auto mode (bumpless) 2: Auto mode (bump) 3: Manual mode (bumpless) 4: Manual mode (bump)	0
116	Input 2_Manipulated output value (Area) ★	**O9**	7 or 6	00E0	00E1	224	225	R/W	−5.0 to +105.0 %	−5.0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
117	Remote/Local transfer selection (Area) ★	**C2**	7 or 6	00E2	00E3	226	227	R/W	When Select function for input 2 is: “Remote setting input” 0: No transfer 1: Local mode 2: Remote mode When Select function for input 2 is: “Control with PV select” 0: No transfer 1: Input 1 2: Input 2 When Select function for input 2 is: “2-loop control/Differential temperature control” 0: No transfer 1: 2-loop control 2: Differential temperature control	0
118	Input 1_Number of knee point ★	**YJ**	7 or 6	00E4	00E5	228	229	R/W	0 to 5 0: Input knee point correction function is disabled	5
119	Input 1_Knee point input value 1 ★	**JA**	7 or 6	00E6	00E7	230	231	R/W	Input 1_Input range low to Input 1_Input range high [Varies with the setting of the Decimal point position.]	Input 1_Input range high
120	Input 1_Knee point input value 2 ★	**JB**	7 or 6	00E8	00E9	232	233	R/W	Same as Input 1_Knee point input value 1	
121	Input 1_Knee point input value 3 ★	**JC**	7 or 6	00EA	00EB	234	235	R/W	Same as Input 1_Knee point input value 1	
122	Input 1_Knee point input value 4 ★	**JD**	7 or 6	00EC	00ED	236	237	R/W	Same as Input 1_Knee point input value 1	
123	Input 1_Knee point input value 5 ★	**JE**	7 or 6	00EE	00EF	238	239	R/W	Same as Input 1_Knee point input value 1	

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
124	Input 1_Knee point correction value 1 ★	**UA**	7 or 6	00F0	00F1	240	241	R/W	Deviation setting: – (Input 1_Knee point correction limit value) to + (Input 1_Knee point correction limit value) Direct setting: Input 1_Input range low to Input 1_Input range high [Varies with the setting of the Decimal point position.]	Deviation setting: 0 Direct setting: Input 1_Input range high
125	Input 1_Knee point correction value 2 ★	**UB**	7 or 6	00F2	00F3	242	243	R/W	Same as Input 1_Knee point correction value 1	
126	Input 1_Knee point correction value 3 ★	**UC**	7 or 6	00F4	00F5	244	245	R/W	Same as Input 1_Knee point correction value 1	
127	Input 1_Knee point correction value 4 ★	**UD**	7 or 6	00F6	00F7	246	247	R/W	Same as Input 1_Knee point correction value 1	
128	Input 1_Knee point correction value 5 ★	**UE**	7 or 6	00F8	00F9	248	249	R/W	Same as Input 1_Knee point correction value 1	
129	Input 2_Number of knee point ★	**YK**	7 or 6	00FA	00FB	250	251	R/W	0 to 5 0: Input knee point correction function is disabled	5
130	Input 2_Knee point input value 1 ★	**JK**	7 or 6	00FC	00FD	252	253	R/W	Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.]	Input 2_Input range high
131	Input 2_Knee point input value 2 ★	**JL**	7 or 6	00FE	00FF	254	255	R/W	Same as Input 2_Knee point input value 1	
132	Input 2_Knee point input value 3 ★	**JM**	7 or 6	0100	0101	256	257	R/W	Same as Input 2_Knee point input value 1	

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
133	Input 2_Knee point input value 4 ★	**JN**	7 or 6	0102	0103	258	259	R/W	Same as Input 2_Knee point input value 1	
134	Input 2_Knee point input value 5 ★	**JO**	7 or 6	0104	0105	260	261	R/W	Same as Input 2_Knee point input value 1	
135	Input 21_Knee point correction value 1 ★	**UK**	7 or 6	0106	0107	262	263	R/W	Deviation setting: – (Input 2_Knee point correction limit value) to + (Input 2_Knee point correction limit value) Direct setting: Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.]	Deviation setting: 0 Direct setting: Input 2_Input range high
136	Input 2_Knee point correction value 2 ★	**UL**	7 or 6	0108	0109	264	265	R/W	Same as Input 2_Knee point correction value 1	
137	Input 2_Knee point correction value 3 ★	**UM**	7 or 6	010A	010B	266	267	R/W	Same as Input 2_Knee point correction value 1	
138	Input 2_Knee point correction value 4 ★	**UN**	7 or 6	010C	010D	268	269	R/W	Same as Input 2_Knee point correction value 1	
139	Input 2_Knee point correction value 5 ★	**UO**	7 or 6	010E	010F	270	271	R/W	Same as Input 2_Knee point correction value 1	
140	Display update cycle	**HE**	7 or 6	0110	0111	272	273	R/W	1: 50 ms 6: 300 ms 2: 100 ms 7: 350 ms 3: 150 ms 8: 400 ms 4: 200 ms 9: 450 ms 5: 250 ms 10: 500 ms	1
141	Input 1_PV bias	**PB**	7 or 6	0112	0113	274	275	R/W	– (Input 1_Input span) to + (Input 1_Input span) (When Control with PV select: – (PV select input span) to + (PV select input span)) [Varies with the setting of the Decimal point position.]	0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
142	Input 1_PV digital filter	**F1**	7 or 6	0114	0115	276	277	R/W	0.00 to 10.00 seconds 0.00: Filter OFF	0.00
143	Input 1_PV ratio	**PR**	7 or 6	0116	0117	278	279	R/W	0.500 to 1.500	1.000
144	Input 1_PV low input cut-off	**DP**	7 or 6	0118	0119	280	281	R/W	0.00 to 25.00 % of Input 1_Input span (When Control with PV select: 0.00 to 25.00 % of PV select input span)	0.00
145	Input 2_PV bias (RS bias)	**RB**	7 or 6	011A	011B	282	283	R/W	– (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.] RS bias is selected by selecting “Remote setting input” at Select function for input 2.	0
146	Input 2_PV digital filter (RS digital filter)	**F2**	7 or 6	011C	011D	284	285	R/W	0.00 to 10.00 seconds 0.00: Filter OFF RS digital filter is selected by selecting “Remote setting input” at Select function for input 2.	0.00
147	Input 2_PV ratio (RS ratio)	**RR**	7 or 6	011E	011F	286	287	R/W	Input 2_PV ratio 0.500 to 1.500 RS ratio 0.001 to 9.999 RS ratio is selected by selecting “Remote setting input” at Select function for input 2.	1.000
148	Input 2_PV low input cut-off	**DS**	7 or 6	0120	0121	288	289	R/W	0.00 to 25.00 % of Input 2_Input span	0.00

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
149	OUT1 proportional cycle time	**T0**	7 or 6	0122	0123	290	291	R/W	0.1 to 100.0 seconds	Relay contact output: 20.0 Voltage pulse output, Transistor output: Note1
150	OUT2 proportional cycle time	**T1**	7 or 6	0124	0125	292	293	R/W	0.1 to 100.0 seconds	Relay contact output: 20.0 Voltage pulse output, Transistor output: Note2
151	OUT3 proportional cycle time	**T2**	7 or 6	0126	0127	294	295	R/W	0.1 to 100.0 seconds	Voltage pulse output: Note3
152	OUT1 minimum ON/OFF time of proportional cycle	**OP**	7 or 6	0128	0129	296	297	R/W	0 to 1000 ms	0
153	OUT2 minimum ON/OFF time of proportional cycle	**OQ**	7 or 6	012A	012B	298	299	R/W	0 to 1000 ms	0
154	OUT3 minimum ON/OFF time of proportional cycle	**OR**	7 or 6	012C	012D	300	301	R/W	0 to 1000 ms	0

Note1: In case OUT1 function selection is “Input 1_Control output [cool-side]” and Input 1_Control action is “Brilliant II Heat/Cool PID control [air cooling] or [water cooling]”: 20.0
Other cases: 2.0

Note2: In case OUT2 function selection is “Input 1_Control output [cool-side]” and Input 1_Control action is “Brilliant II Heat/Cool PID control [air cooling] or [water cooling]”: 20.0
Other cases: 2.0

Note3: In case OUT3 function selection is “Input 1_Control output [cool-side]” and Input 1_Control action is “Brilliant II Heat/Cool PID control [air cooling] or [water cooling]”: 20.0
Other cases: 2.0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
155	Heater break alarm 1 (HBA1) set value	**A3**	7 or 6	012E	012F	302	303	R/W	0.0 to 100.0 A 0.0: HBA function OFF	0.0
156	Number of heater break alarm 1 (HBA1) delay times	**TH**	7 or 6	0130	0131	304	305	R/W	0 to 255 times	5
157	Heater break alarm 2 (HBA2) set value	**A4**	7 or 6	0132	0133	306	307	R/W	0.0 to 100.0 A 0.0: HBA function OFF	0.0
158	Number of heater break alarm 2 (HBA2) delay times	**TI**	7 or 6	0134	0135	308	309	R/W	0 to 255 times	5
159	Input 1_Manual manipulated output value	**ON**	7 or 6	0136	0137	310	311	R/W	PID control Input 1_Output limiter low [heat-side] to Input 1_Output limiter high [heat-side] Heat/Cool PID control * –(Input 1_Output limiter high [cool-side]) to +(Input 1_Output limiter high [heat-side])	PID control: –5.0 Heat/Cool PID control: 0.0

* In case of Heat/Cool PID control, the data range has such exceptional conditions as shown below.

(1) Input 1_Output limiter high [cool-side] is ≤ 0.0 %
- Input 1_Output limiter low [heat-side] is ≤ 0.0 %: 0.0 % to +(Input 1_Output limiter high [heat-side])
- Input 1_Output limiter low [heat-side] is > 0.0 %: Input 1_Output limiter low [heat-side] to Input 1_Output limiter high [heat-side]

(2) Input 1_Output limiter high [heat-side] is ≤ 0.0 %
- Input 1_Output limiter low [cool-side] is ≤ 0.0 %: –(Input 1_Output limiter high [cool-side]) to 0.0 %
- Input 1_Output limiter low [cool-side] is > 0.0 %: –(Input 1_Output limiter high [cool-side]) to –(Input 1_Output limiter low [cool-side])

(3) Fixed at 0.0% in the following cases: Input 1_Output limiter high [cool-side] ≤ 0.0 %, and Input 1_Output limiter high [heat-side] ≤ 0.0 %

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
160	Input 1_Level PID setting 1 *	**Q4**	7 or 6	0138	0139	312	313	R/W	Input 1_Input range low to Input 1_Input range high (When Control with PV select: PV select input range low to PV select input range high) [Varies with the setting of the Decimal point position.]	Input 1_ Input range high (When Control with PV select: PV select input range high)
161	Input 1_Level PID setting 2 *	**Q5**	7 or 6	013A	013B	314	315	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_ Level PID setting 1
162	Input 1_Level PID setting 3 *	**Q6**	7 or 6	013C	013D	316	317	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1
163	Input 1_Level PID setting 4 *	**Q7**	7 or 6	013E	013F	318	319	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1
164	Input 1_Level PID setting 5 *	**Q8**	7 or 6	0140	0141	320	321	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1
165	Input 1_Level PID setting 6 *	**Q9**	7 or 6	0142	0143	322	323	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1
166	Input 1_Level PID setting 7 *	**QA**	7 or 6	0144	0145	324	325	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1

* Level PID settings 1 to 7 of Input 1 always maintain the following relation.
(Input 1_Level PID setting 1) ≤ (Input 1_Level PID setting 2) ≤ (Input 1_Level PID setting 3) ≤ (Input 1_Level PID setting 4) ≤ (Input 1_Level PID setting 5) ≤ (Input 1_Level PID setting 6) ≤ (Input 1_Level PID setting 7)

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
167	Input 1_ON/OFF action differential gap	**MH**	7 or 6	0146	0147	326	327	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 100.0 % of Input 1_Input span (When Control with PV select: 0.0 to 100.0 % of PV select input span)	TC/RTD inputs: 2 V/I inputs: 0.2
168	Input 1_ON/OFF action differential gap (upper)	**IV**	7 or 6	0148	0149	328	329	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 100.0 % of Input 1_Input span (When Control with PV select: 0.0 to 100.0 % of PV select input span)	TC/RTD inputs: 1 V/I inputs: 0.1
169	Input 1_ON/OFF action differential gap (lower)	**IW**	7 or 6	014A	014B	330	331	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 100.0 % of Input 1_Input span (When Control with PV select: 0.0 to 100.0 % of PV select input span)	TC/RTD inputs: 1 V/I inputs: 0.1
170	Input 2_Manual manipulated output value	**OM**	7 or 6	014C	014D	332	333	R/W	Input 2_ Output limiter low to Input 2_Output limiter high	−5.0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
171	Input 2_Level PID setting 1 *	**QB**	7 or 6	014E	014F	334	335	R/W	Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.]	Input 2_Input range high
172	Input 2_Level PID setting 2 *	**QC**	7 or 6	0150	0151	336	337	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
173	Input 2_Level PID setting 3 *	**QD**	7 or 6	0152	0153	338	339	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
174	Input 2_Level PID setting 4 *	**QE**	7 or 6	0154	0155	340	341	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
175	Input 2_Level PID setting 5 *	**QF**	7 or 6	0156	0157	342	343	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
176	Input 2_Level PID setting 6 *	**QG**	7 or 6	0158	0159	344	345	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
177	Input 2_Level PID setting 7 *	**QH**	7 or 6	015A	015B	346	347	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1

* Level PID settings 1 to 7 of Input 2 always maintain the following relation.
(Input 2_Level PID setting 1) ≤ (Input 2_Level PID setting 2) ≤ (Input 2_Level PID setting 3) ≤ (Input 2_Level PID setting 4) ≤ (Input 2_Level PID setting 5) ≤ (Input 2_Level PID setting 6) ≤ (Input 2_Level PID setting 7)

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
178	Input 2_ON/OFF action differential gap	**MG**	7 or 6	015C	015D	348	349	R/W	TC/RTD inputs: 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 100.0 % of Input 2_Input span	TC/RTD inputs: 2 V/I inputs: 0.2
179	Input 2_ON/OFF action differential gap (upper)	**IX**	7 or 6	015E	015F	350	351	R/W	TC/RTD inputs: 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 100.0 % of Input 2_Input span	TC/RTD inputs: 1 V/I inputs: 0.1
180	Input 2_ON/OFF action differential gap (lower)	**IY**	7 or 6	0160	0161	352	353	R/W	TC/RTD inputs: 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 100.0 % of Input 2_Input span	TC/RTD inputs: 1 V/I inputs: 0.1
181	Input 1_AT bias	**GB**	7 or 6	0162	0163	354	355	R/W	– (Input 1_Input span) to + (Input 1_Input span) {When Control with PV select: – (PV select input span) to + (PV select input span)} [Varies with the setting of the Decimal point position.]	0
182	Input 2_AT bias	**GA**	7 or 6	0164	0165	356	357	R/W	– (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.]	0
183	FF amount learning	**G7**	7 or 6	0166	0167	358	359	R/W	0 to 3 0: No learning +1: Learn Input 1 +2: Learn Input 2 To select two or more functions, sum each value.	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
184	Input 1_Determination point of external disturbance	**G8**	7 or 6	0168	0169	360	361	R/W	– (Input 1_Input span) to + (Input 1_Input span) (When Control with PV select: – (PV select input span) to + (PV select input span)) [Varies with the setting of the Decimal point position.]	–1
185	Input 2_Determination point of external disturbance	**G9**	7 or 6	016A	016B	362	363	R/W	– (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.]	–1
186	PV select transfer level	**L8**	7 or 6	016C	016D	364	365	R/W	Input 1_Input range low to Input 1_Input range high [Varies with the setting of the Decimal point position.]	Input 1_ Input range high
187	PV select transfer time	**L9**	7 or 6	016E	016F	366	367	R/W	0.0 to 100.0 seconds	0.0

Items 188 to 383 are data in the Engineering mode.

⚠ WARNING

Communication data the Engineering mode should be set according to the application before setting any parameter related to operation. Once the communication data in the Engineering mode are set correctly, no further changes need to be made to parameters 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 Engineering mode.

NOTE

Parameters in Engineering mode are settable only when the controller is in STOP mode. However, only checking can be made even in the RUN state.

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
188	STOP display selection	**DX**	7 or 6	0170	0171	368	369	R/W	0: Stop on PV display 1: Stop on SV display 2: Stop on MV display	1
189	ALM lamp lighting condition	**LY**	7 or 6	0172	0173	370	371	R/W	0 to 4095 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm 1 (LBA1) +128: Control loop break alarm 2 (LBA2) +256: Input 1_Input error high +512: Input 1_Input error low +1024: Input 2_Input error high +2048: Input 2_Input error low To select two or more functions, sum each value.	255

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
190	PV flashing display at input error	**DU**	7 or 6	0174	0175	372	373	R/W	0: Flashing display 1: Non-flashing display	0
191	Show/Hide Input 1_SV	**H8**	7 or 6	0176	0177	374	375	R/W	0: Hide Input 1_SV 1: Show Input 1_SV	1
192	Show/Hide Input 2_SV	**HN**	7 or 6	0178	0179	376	377	R/W	0: Hide Input 2_SV 1: Show Input 2_SV	1
193	Show/Hide Input 1_MV	**H9**	7 or 6	017A	017B	378	379	R/W	0: Hide 1: Show Input 1_Manipulated output value (MV) 2: Show Memory area soak time 3: Show Current transformer 1 (CT1) input value 4: Show Current transformer 2 (CT2) input value	1
194	Show/Hide Input 2_MV	**HO**	7 or 6	017C	017D	380	381	R/W	0: Hide 1: Show Input 2_Manipulated output value (MV) 2: Show Memory area soak time 3: Show Current transformer 1 (CT1) input value 4: Show Current transformer 2 (CT2) input value	1
195	Select hide items in Monitor mode	**LN**	7 or 6	017E	017F	382	383	R/W	0 to 31 0: Show all +1: Remote setting input value monitor +2: Manipulated output value (MV) monitor +4: Current transformer (CT) input value monitor +8: Comprehensive event state +16: Memory area soak time To select two or more functions, sum each value.	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
196	Select hide items in Operation transfer mode	**LM**	7 or 6	0180	0181	384	385	R/W	0 to 63 0: Show all +1: RUN/STOP transfer +2: Autotuning (AT) +4: Startup tuning (ST) +8: Auto/Manual transfer +16: Remote/Local transfer (PV select transfer, 2-loop control/Differential temperature control) +32: Control area Local/External transfer To select two or more functions, sum each value.	0
197	Data registration	**KN**	7 or 6	0182	0183	386	387	R/W	0: SET key method Used to register the Set value (SV) using the SET key. 1: Direct registration Used to register the Set value (SV) without pressing the SET key.	0
198	FUNC key assignment	**FK**	7 or 6	0184	0185	388	389	R/W	0: Unused 1: RUN/STOP transfer 2: Autotuning (AT) (Common to Input 1 and 2) 3: Input 1_Autotuning (AT) 4: Input 2_Autotuning (AT) 5: Auto/Manual transfer (Common to Input 1 and 2) 6: Input 1_Auto/Manual transfer 7: Input 2_Auto/Manual transfer 8: Remote/Local transfer (PV select transfer, 2-loop control/Differential temperature control) 9: Control area Local/External transfer 10: Interlock release 11: Hold reset (Common to Input 1 and 2) 12: Input 1_Hold reset 13: Input 2_Hold reset 14: Set data Unlock/Lock transfer 15: Area jump	1

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
199	FUNC key operation selection	**FL**	7 or 6	0186	0187	390	391	R/W	0: Press once The function set at "FUNC key assignment" is activated upon a press of the FUNC key. 1: Press and hold The function set at "FUNC key assignment" is activated by holding the FUNC key pressed.	0
200	Input 1_Input type	**XI**	7 or 6	0188	0189	392	393	R/W	0: TC input K 1: TC input J 2: TC input R 3: TC input S 4: TC input B 5: TC input E 6: TC input N 7: TC input T 8: TC input W5Re/W26Re 9: TC input PLII 10: TC input U 11: TC input L 12: TC input PR40-20 13: RTD input Pt100 14: RTD input JPt100 15: Current input 0 to 20 mA DC 16: Current input 4 to 20 mA DC 17: Voltage input 0 to 10 V DC 18: Voltage input 0 to 5 V DC 19: Voltage input 1 to 5 V DC 20: Voltage input 0 to 1 V DC 21: Voltage input −10 to +10 V DC 22: Voltage input −5 to +5 V DC 23: Voltage input 0 to 100 mV DC 24: Voltage input 0 to 10 mV DC	Same as the input type of the input range code specified at the time of order.
201	Input 1_Display unit	**PU**	7 or 6	018A	018B	394	395	R/W	0: °C 1: °F	Same as the display unit of the input range code specified at the time of order.
202	Input 1_Decimal point position	**XU**	7 or 6	018C	018D	396	397	R/W	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places 4: Four decimal places TC input: W5Re/W26Re, PR40-20: 0 (fixed) Thermocouples other than those shown above: 0 or 1 RTD input: 0 to 2 Voltage (V)/Current (I) inputs: In case of Input data type 0 or 2: 0 to 4 In case of Input data type 1: 0 to 3 When Control with PV select: Decimal point position setting of Input 1 and Input 2 is compared and the smaller will be used.	Same as the decimal point position of the input range code specified at the time of order. For V/I inputs: 1

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
203	Input 1_Input range high	**XV**	7 or 6	018E	018F	398	399	R/W	(Input 1_Input range low + 1 digit) to Input 1_Maximum value of input range [Varies with the setting of the Decimal point position.]	High limit value of the input range code specified at the time of order. For V/I inputs: 100.0
204	Input 1_Input range low	**XW**	7 or 6	0190	0191	400	401	R/W	Input 1_Minimum value of input range to (Input 1_Input range high − 1 digit) [Varies with the setting of the Decimal point position.]	Low limit value of the input range code specified at the time of order. For V/I inputs: 0.0
205	Input 1_Input error determination point (high)	**AV**	7 or 6	0192	0193	402	403	R/W	Input 1_Input error determination point (low) to Input 1_Input range high + (Input 1_5 % of input span) [Varies with the setting of the Decimal point position.]	Input 1_ Input range high + (Input 1_5 % of input span)
206	Input 1_Input error determination point (low)	**AW**	7 or 6	0194	0195	404	405	R/W	Input 1_Input range low − (Input 1_5 % of input span) * to Input 1_Input error determination point (high) [Varies with the setting of the Decimal point position.] * When Input type of Input 1 is RTD, low limit value is about 2 Ohms. (Pt100: −245.5 °C [−409.8 °F], JPt100: −237.6 °C [−395.7 °F])	Input 1_ Input range low − (Input 1_5 % of input span)
207	Input 1_Temperature compensation calculation	**R0**	7 or 6	0196	0197	406	407	R/W	0: No temperature compensation calculation 1: With temperature compensation calculation	1
208	Input 1_Burnout direction	**BS**	7 or 6	0198	0199	408	409	R/W	0: Upscale 1: Downscale	0
209	Input 1_Selection of knee point function	**YM**	7 or 6	019A	019B	410	411	R/W	0: Disable input knee point correction function 1: Enable input knee point correction function	0
210	Input 1_Selection of correction value setting	**YH**	7 or 6	019C	019D	412	413	R/W	0: Deviation setting (set as a deviation from the knee point input value) 1: Direct setting (value after the correction can directly be set)	0
211	Input 1_Knee point correction limit value	**YL**	7 or 6	019E	019F	414	415	R/W	0 to Input 1_Input span [Varies with the setting of the Decimal point position.]	10

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
212	Input 1_Square root extraction	**XH**	7 or 6	01A0	01A1	416	417	R/W	0: Unused 1: Used	0
213	Input 1_Inverting input	**IB**	7 or 6	01A2	01A3	418	419	R/W	0: Unused 1: Used	0
214	Input data type	**SE**	7 or 6	01A4	01A5	420	421	R/W	0: Number of measured value digits: 5 Number of RKC communication data digits: 7 Modbus data: Double word 1: Number of measured value digits: 4 Number of RKC communication data digits: 6 Modbus data: Single word * 2: HA series equivalent (Communication identifiers of RKC communication and register address of Modbus switch to the HA series equivalent data.) Number of measured value digits: 5 Number of RKC communication digits: 7 Modbus: Double word PLC communication: Double word (System data: Single word) * Including our FB series equivalent data When changing the Input data type from 0 (or 2) to 1 and when the present Input range has 5 digits (example: Input range high: 1372.0), you need to configure the Input range to have 4 digits beforehand. The display of the time unit depends on the Input data type. In case of Input data type 0 or 2 hour/minute/second, hour/minute, minute/second, second In case of Input data type 1 hour/minute, minute/second, second The time unit is selectable at Soak time unit (RKC communication: RU, Modbus: 02C0H to 02C1H)	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
215	Power supply frequency	**JT**	7 or 6	01A6	01A7	422	423	R/W	0: 50 Hz 1: 60 Hz	0
216	Input 2_Input type	**XR**	7 or 6	01A8	01A9	424	425	R/W	0: TC input K 1: TC input J 2: TC input R 3: TC input S 4: TC input B 5: TC input E 6: TC input N 7: TC input T 8: TC input W5Re/W26Re 9: TC input PLII 10: TC input U 11: TC input L 12: TC input PR40-20 13: RTD input Pt100 14: RTD input JPt100 15: Current input 0 to 20 mA DC 16: Current input 4 to 20 mA DC 17: Voltage input 0 to 10 V DC 18: Voltage input 0 to 5 V DC 19: Voltage input 1 to 5 V DC 20: Voltage input 0 to 1 V DC 21: Voltage input −10 to +10 V DC 22: Voltage input −5 to +5 V DC 23: Voltage input 0 to 100 mV DC 24: Voltage input 0 to 10 mV DC ・When Measured Input 2 is selected: 0 to 24 ・When Remote setting input is selected: 15 to 24	Same as Input 1_Input type When Remote setting input is specified at the time of order, but the input type is not specified: 17
217	Input 2_Display unit	**PT**	7 or 6	01AA	01AB	426	427	R/W	0: °C 1: °F	Same as Input 1_Display unit
218	Input 2_Decimal point position	**XZ**	7 or 6	01AC	01AD	428	429	R/W	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places 4: Four decimal places TC input: W5Re/W26Re, PR40-20: 0 (fixed) Thermocouples other than those shown above: 0 or 1 RTD input: 0 to 2 Voltage (V)/Current (I) inputs: In case of Input data type 0 or 2: 0 to 4 In case of Input data type 1: 0 to 3	Same as Input 1_Decimal point position

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
219	Input 2_Input range high	**XX**	7 or 6	01AE	01AF	430	431	R/W	TC/RTD inputs and Voltage (V)/Current (I) Inputs (For other than Remote setting input): (Input 2_Input range low + 1 digit) to Input 2_Maximum value of input range Voltage (V)/Current (I) Inputs (For Remote setting input): (Input 2_Input range low + 1 digit) to Input 1_Maximum value of input range [Varies with the setting of the Decimal point position.]	Same as Input 1_Input range high
220	Input 2_Input range low	**XY**	7 or 6	01B0	01B1	432	433	R/W	TC/RTD inputs and Voltage (V)/Current (I) Inputs (For other than Remote setting input): Input 2_Minimum value of input range to (Input 2_Input range high − 1 digit) Voltage (V)/Current (I) Inputs (For Remote setting input): Input 1_Minimum value of input range to (Input 2_Input range high − 1 digit) [Varies with the setting of the Decimal point position.]	Same as Input 1_Input range low
221	Input 2_Input error determination point (high)	**AX**	7 or 6	01B2	01B3	434	435	R/W	Input 2_Input error determination point (low) to Input 2_Input range high + (Input 2_5 % of input span) [Varies with the setting of the Decimal point position.]	Input 2_Input range high + (Input 2_ 5 % of input span)
222	Input 2_Input error determination point (low)	**AY**	7 or 6	01B4	01B5	436	437	R/W	Input 2_Input range low − (Input 2_5 % of input span) * to Input 2_Input error determination point (high) [Varies with the setting of the Decimal point position.] * When Input type of Input 2 is RTD, low limit value is about 2 Ohms. (Pt100: −245.5 °C [−409.8 °F] , JPt100: −237.6 °C [−395.7 °F])	Input 2_ Input range low − (Input 2_ 5 % of input span)
223	Input 2_Temperature compensation calculation	**R1**	7 or 6	01B6	01B7	438	439	R/W	0: No temperature compensation calculation 1: With temperature compensation calculation	1
224	Input 2_Burnout direction	**BR**	7 or 6	01B8	01B9	440	441	R/W	0: Upscale 1: Downscale	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
225	Input 2_Selection of knee point function	**YN**	7 or 6	01BA	01BB	442	443	R/W	0: Disable input knee point correction function 1: Enable input knee point correction function	0
226	Input 2_Selection of correction value setting	**YI**	7 or 6	01BC	01BD	444	445	R/W	0: Deviation setting (set as a deviation from the knee point input value) 1: Direct setting (value after the correction can directly be set)	0
227	Input 2_Knee point correction limit value	**YG**	7 or 6	01BE	01BF	446	447	R/W	0 to Input 2_Input span [Varies with the setting of the Decimal point position.]	10
228	Input 2_Square root extraction	**XG**	7 or 6	01C0	01C1	448	449	R/W	0: Unused 1: Used	0
229	Input 2_Inverting input	**IC**	7 or 6	01C2	01C3	450	451	R/W	0: Unused 1: Used	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
230	DI1 function selection	**H2**	7 or 6	01C4	01C5	452	453	R/W	0: No function 1: RUN/STOP transfer 2: Auto/Manual transfer (Common to Input 1 and 2) 3: Input 1_Auto/Manual transfer 4: Input 2_Auto/Manual transfer 5: Remote/Local transfer (PV select transfer, 2-loop control/Differential temperature control) 6: Interlock release 7: Hold reset (Common to Input 1 and 2) 8: Input 1_Hold reset 9: Input 2_Hold reset 10: Autotuning (AT) (Common to Input 1 and 2) 11: Input 1_Autotuning (AT) 12: Input 2_Autotuning (AT) 13: Set data unlock/lock transfer 14: Direct/Reverse action transfer 15: Memory area transfer (2 points, Without area set signal) 16: Memory area transfer (8 points, Without area set signal) 17: Memory area transfer (8 points, With area set signal) 18: Memory area transfer (16 points, Without area set signal) 19: Memory area transfer (16 points, With area set signal) 20: Area jump	Based on Model code
231	DI2 function selection	**H3**	7 or 6	01C6	01C7	454	455	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
232	DI3 function selection	**H4**	7 or 6	01C8	01C9	456	457	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
233	DI4 function selection	**H5**	7 or 6	01CA	01CB	458	459	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
234	DI5 function selection	**H6**	7 or 6	01CC	01CD	460	461	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
235	DI6 function selection	**H7**	7 or 6	01CE	01CF	462	463	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
236	DI logic invert	**D0**	7 or 6	01D0	01D1	464	465	R/W	0 to 31 0: No logic invert +1: RUN/STOP transfer +2: Auto/Manual transfer +4: Remote/Local transfer (PV select transfer, 2-loop control/Differential temperature control) +8: Set data unlock/lock transfer +16: Direct/Reverse action transfer To select two or more functions, sum each value.	0
237	Area switching time (Without area set signal)	**LJ**	7 or 6	01D2	01D3	466	467	R/W	1 to 5 seconds	2
238	OUT1 function selection	**E0**	7 or 6	01D4	01D5	468	469	R/W	0: No assignment 1: Input 1_Control output [heat-side] 2: Input 1_Control output [cool-side] 3: Input 2_Control output 4: Retransmission output 5: Logic calculation output (Event, HBA, LBA, Input error) 6: RUN state output 7: Input 1_Manual mode state output 8: Input 2_Manual mode state output 9: Remote mode state output (Output of differential temperature control state, Input 2 state output of Control with PV select) 10: Input 1_Autotuning (AT) state output 11: Input 2_Autotuning (AT) state output 12: Output while Set value of Input 1 is changing 13: Output while Set value of Input 2 is changing 14: Output of the communication monitoring result 15: FAIL output	Based on Model code

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
239	OUT2 function selection	**E2**	7 or 6	01D6	01D7	470	471	R/W	Same as OUT1 function selection	Based on Model code
240	OUT3 function selection	**E3**	7 or 6	01D8	01D9	472	473	R/W	Same as OUT1 function selection	4
241	OUT1 logic calculation selection	**W0**	7 or 6	01DA	01DB	474	475	R/W	0 to 4095 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm 1 (LBA1) +128: Control loop break alarm 2 (LBA2) +256: Input 1_Input error high +512: Input 1_Input error low +1024: Input 2_Input error high +2048: Input 2_Input error low To select two or more functions, sum each value.	0
242	OUT2 logic calculation selection	**W2**	7 or 6	01DC	01DD	476	477	R/W	Same as OUT1 logic calculation selection	Based on Model code
243	OUT3 logic calculation selection	**W3**	7 or 6	01DE	01DF	478	479	R/W	Same as OUT1 logic calculation selection	4

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
244	Energized/De-energized selection	**NA**	7 or 6	01E0	01E1	480	481	R/W	0 to 127 0: All outputs are energized +1: OUT1 de-energized +2: OUT2 de-energized +4: OUT3 de-energized +8: DO1 de-energized +16: DO2 de-energized +32: DO3 de-energized +64: DO4 de-energized To select two or more functions, sum each value.	0
245	Interlock selection	**LF**	7 or 6	01E2	01E3	482	483	R/W	0 to 4095 0: Unused +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm 1 (LBA1) +128: Control loop break alarm 2 (LBA2) +256: Input 1_Input error high +512: Input 1_Input error low +1024: Input 2_Input error high +2048: Input 2_Input error low To select two or more functions, sum each value.	0
246	Output action at control stop	**SS**	7 or 6	01E4	01E5	484	485	R/W	0 to 7 0: OFF +1: Logic calculation output: Action continues +2: Retransmission output: Action continues +4: Instrument status output: Action continues To select two or more functions, sum each value.	0
247	Universal output type selection (OUT3)	**XO**	7 or 6	01E6	01E7	486	487	R/W	0: Voltage pulse output 1: Current output (4 to 20 mA DC) 2: Current output (0 to 20 mA DC)	1

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
248	Retransmission output 1 type	**LA**	7 or 6	01E8	01E9	488	489	R/W	0: No retransmission output 1: Input 1_Measured value (PV) 2: Input 1_Local SV 3: Input 1_SV monitor value 4: Input 1_Deviation 5: Input 1_Manipulated output value [heat-side] 6: Input 1_Manipulated output value [cool-side] 7: Input 2_Measured value (PV) 8: Input 2_Local SV 9: Input 2_SV monitor value 10: Input 2_Deviation 11: Input 2_Manipulated output value 12: Remote setting input value 13: Current transformer 1 (CT1) input value 14: Current transformer 2 (CT2) input value 15: Measured value (PV) of differential temperature input	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
249	Retransmission output 1 scale high	**HV**	7 or 6	01EA	01EB	490	491	R/W	No retransmission output, Input 1_Measured value (PV), Input 1_Local SV, Input 1_SV monitor value, and Remote setting input value Input 1_Input range low to Input 1_Input range high (When Control with PV select: PV select input range low to PV select input range high) [Varies with the setting of the Decimal point position.] Input 1_Deviation − (Input 1_Input span) to + (Input 1_Input span) [Varies with the setting of the Decimal point position.] Input 2_Measured value (PV), Input 2_Local SV, and Input 2_SV monitor value Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.] Input 2_Deviation − (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.] Manipulated output value −5.0 to +105.0 % Current transformer (CT) input value 0.0 to 100.0 % Measured value (PV) of differential temperature input − (Input 1_Input span) to + (Input 1_Input span) [Varies with the setting of the Decimal point position.]	No retransmission output, Input 1_Measured value (PV), Input 1_Local SV, Input 1_SV monitor value, and Remote setting input value: Input 1_Input range high (Control with PV select: PV select input range high) Input 1_Deviation: +(Input 1_Input span) Input 2_Measured value (PV), Input 2_Local SV, and Input 2_SV monitor value: Input 2_Input range high Input 2_Deviation: +(Input 2_Input span) Manipulated output value, and Current transformer (CT) input value: 100.0 Measured value (PV) of differential temperature input: 100

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
250	Retransmission output 1 scale low	**HW**	7 or 6	01EC	01ED	492	493	R/W	No retransmission output, Input 1_Measured value (PV), Input 1_Local SV, Input 1_SV monitor value, and Remote setting input value Input 1_Input range low to Input 1_Input range high (When Control with PV select: PV select input range low to PV select input range high) [Varies with the setting of the Decimal point position.] Input 1_Deviation − (Input 1_Input span) to + (Input 1_Input span) [Varies with the setting of the Decimal point position.] Input 2_Measured value (PV), Input 2_Local SV, and Input 2_SV monitor value Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.] Input 2_Deviation − (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.] Manipulated output value −5.0 to +105.0 % Current transformer (CT) input value 0.0 to 100.0 % Measured value (PV) of differential temperature input − (Input 1_Input span) to + (Input 1_Input span) [Varies with the setting of the Decimal point position.]	No retransmission output, Input 1_Measured value (PV), Input 1_Local SV, Input 1_SV monitor value, and Remote setting input value: Input 1_Input range low (Control with PV select: PV select input range low) Input 1_Deviation: − (Input 1_Input span) Input 2_Measured value (PV), Input 2_Local SV, and Input 2_SV monitor value: Input 2_Input range low Input 2_Deviation: − (Input 2_Input span) Manipulated output value, and Current transformer (CT) input value: 0.0 Measured value (PV) of differential temperature input: −100
251	Retransmission output 2 type	**LB**	7 or 6	01EE	01EF	494	495	R/W	Same as Retransmission output 1 type	0
252	Retransmission output 2 scale high	**CV**	7 or 6	01F0	01F1	496	497	R/W	Same as Retransmission output 1 scale high	
253	Retransmission output 2 scale low	**CW**	7 or 6	01F2	01F3	498	499	R/W	Same as Retransmission output 1 scale low	

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
254	Retransmission output 3 type	**LC**	7 or 6	01F4	01F5	500	501	R/W	Same as Retransmission output 1 type	1
255	Retransmission output 3 scale high	**EV**	7 or 6	01F6	01F7	502	503	R/W	Same as Retransmission output 1 scale high	
256	Retransmission output 3 scale low	**EW**	7 or 6	01F8	01F9	504	505	R/W	Same as Retransmission output 1 scale low	
257	DO1 function selection	**E4**	7 or 6	01FA	01FB	506	507	R/W	0: No assignment 1: Logic calculation output (Event, HBA, LBA, Input error) 2: RUN state output 3: Input 1_Manual mode state output 4: Input 2_Manual mode state output 5: Remote mode state output (Output of differential temperature control state, Input 2 state output of Control with PV select) 6: Input 1_Autotuning (AT) state output 7: Input 2_Autotuning (AT) state output 8: Output while Set value of Input 1 is changing 9: Output while Set value of Input 2 is changing 10: Output of the communication monitoring result 11: FAIL output	Based on Model code
258	DO2 function selection	**E5**	7 or 6	01FC	01FD	508	509	R/W	Same as DO1 function selection	Based on Model code
259	DO3 function selection	**E6**	7 or 6	01FE	01FF	510	511	R/W	Same as DO1 function selection	Based on Model code
260	DO4 function selection	**E7**	7 or 6	0200	0201	512	513	R/W	Same as DO1 function selection	Based on Model code

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
261	DO1 logic calculation selection	**W4**	7 or 6	0202	0203	514	515	R/W	0 to 4095 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm 1 (LBA1) +128: Control loop break alarm 2 (LBA2) +256: Input 1_Input error high +512: Input 1_Input error low +1024: Input 2_Input error high +2048: Input 2_Input error low To select two or more functions, sum each value.	Based on Model code
262	DO2 logic calculation selection	**W5**	7 or 6	0204	0205	516	517	R/W	Same as DO1 logic calculation selection	Based on Model code
263	DO3 logic calculation selection	**W6**	7 or 6	0206	0207	518	519	R/W	Same as DO1 logic calculation selection	Based on Model code
264	DO4 logic calculation selection	**W7**	7 or 6	0208	0209	520	521	R/W	Same as DO1 logic calculation selection	Based on Model code
265	Event 1 assignment	**FA**	7 or 6	020A	020B	522	523	R/W	1: Input 1 2: Input 2 3: Differential temperature input	1

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
266	Event 1 type	**XA**	7 or 6	020C	020D	524	525	R/W	0: None 1: Deviation high (Using SV monitor value) [a] 2: Deviation low (Using SV monitor value) [a] 3: Deviation high/low (Using SV monitor value) [a] 4: Band (Using SV monitor value) [a] 5: Deviation high/low (Using SV monitor value) [High/Low individual setting] [a] 6: Band (Using SV monitor value) [High/Low individual setting] [a] 7: SV high (Using SV monitor value) 8: SV low (Using SV monitor value) 9: Process high [b] 10: Process low [b] 11: Deviation high (Using local SV) [a] 12: Deviation low (Using local SV) [a] 13: Deviation high/low (Using local SV) [a] 14: Band (Using local SV) [a] 15: Deviation high/low (Using local SV) [High/Low individual setting] [a] 16: Band (Using local SV) [High/Low individual setting] [a] 17: SV high (Using local SV) 18: SV low (Using local SV) 19: MV high [heat-side] [b] 20: MV low [heat-side] [b] 21: MV high [cool-side] [b] 22: MV low [cool-side] [b] 23: Process high/low [High/Low individual setting] [b] 24: Process band [High/Low individual setting] [b] [a] Event hold and re-hold action is available. [b] Event hold action is available.	If the Event type is specified by the initial setting code when ordering, that Event type will be the factory set value. If the Event type is not specified: 1
267	Event 1 hold action	**WA**	7 or 6	020E	020F	526	527	R/W	0: Hold action OFF 1: Hold action ON 2: Re-hold action ON Setting hold or re-hold action on the event that is not available with hold and re-hold actions will just be ignored.	If the Event type is specified by the initial setting code when ordering, the factory set value of Event hold action differs depending on the Event type. If the Event type is not specified: 0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
268	Event 1 differential gap	**HA**	7 or 6	0210	0211	528	529	R/W	Deviation, Process and SV: • If event assignment is either Input 1 or Differential temperature. 0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) • If event assignment is Input 2 0 to Input 2_Input span [Varies with the setting of the Decimal point position.] MV: 0.0 to 110.0 %	Deviation, Process and SV: TC/RTD inputs: 2 V/I inputs: 0.2 % of input span MV: 0.2
269	Event 1 timer	**TD**	7 or 6	0212	0213	530	531	R/W	0.0 to 600.0 seconds	0.0
270	Event 2 assignment	**FB**	7 or 6	0214	0215	532	533	R/W	Same as Event 1 assignment	
271	Event 2 type	**XB**	7 or 6	0216	0217	534	535	R/W	Same as Event 1 type	
272	Event 2 hold action	**WB**	7 or 6	0218	0219	536	537	R/W	Same as Event 1 hold action	
273	Event 2 differential gap	**HB**	7 or 6	021A	021B	538	539	R/W	Same as Event 1 differential gap	
274	Event 2 timer	**TG**	7 or 6	021C	021D	540	541	R/W	Same as Event 1 timer	
275	Event 3 assignment	**FC**	7 or 6	021E	021F	542	543	R/W	Same as Event 1 assignment	
276	Event 3 type	**XC**	7 or 6	0220	0221	544	545	R/W	Same as Event 1 type	

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
277	Event 3 hold action	**WC**	7 or 6	0222	0223	546	547	R/W	Same as Event 1 hold action	
278	Event 3 differential gap	**HC**	7 or 6	0224	0225	548	549	R/W	Same as Event 1 differential gap	
279	Event 3 timer	**TE**	7 or 6	0226	0227	550	551	R/W	Same as Event 1 timer	
280	Event 4 assignment	**FD**	7 or 6	0228	0229	552	553	R/W	Same as Event 1 assignment	
281	Event 4 type	**XD**	7 or 6	022A	022B	554	555	R/W	Same as Event 1 type	
282	Event 4 hold action	**WD**	7 or 6	022C	022D	556	557	R/W	Same as Event 1 hold action	
283	Event 4 differential gap	**HD**	7 or 6	022E	022F	558	559	R/W	Same as Event 1 differential gap	
284	Event 4 timer	**TF**	7 or 6	0230	0231	560	561	R/W	Same as Event 1 timer	
285	CT1 assignment	**ZF**	7 or 6	0232	0233	562	563	R/W	0: None 1: OUT1 2: OUT2 3: OUT3	1
286	CT1 type	**YE**	7 or 6	0234	0235	564	565	R/W	0: CTL-6-P-N 1: CTL-12-S56-10L-N 2: CTL-6-P-Z	Based on Model code

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
287	CT1 ratio	**XS**	7 or 6	0236	0237	566	567	R/W	0 to 9999 When the CT type is changed, the following value will be automatically set. CTL-6-P-N: 800 CTL-12-S56-10L-N: 1000 CTL-6-P-Z: 800	If CTL-6-P-N or CTL-6-P-Z is specified for the Current transformer (CT) type: 800 If CTL-12-S56-10L-N is specified for the Current transformer (CT) type: 1000
288	CT1 low input cut-off	**M5**	7 or 6	0238	0239	568	569	R/W	0.0 to 1.0 A	0.0
289	CT2 assignment	**ZG**	7 or 6	023A	023B	570	571	R/W	0: None 1: OUT1 2: OUT2 3: OUT3	Based on Model code
290	CT2 type	**YF**	7 or 6	023C	023D	572	573	R/W	0: CTL-6-P-N 1: CTL-12-S56-10L-N 2: CTL-6-P-Z	Based on Model code
291	CT2 ratio	**XT**	7 or 6	023E	023F	574	575	R/W	0 to 9999 When the CT type is changed, the following value will be automatically set. CTL-6-P-N: 800 CTL-12-S56-10L-N: 1000 CTL-6-P-Z: 800	If CTL-6-P-N or CTL-6-P-Z is specified for the Current transformer (CT) type: 800 If CTL-12-S56-10L-N is specified for the Current transformer (CT) type: 1000
292	CT2 low input cut-off	**M7**	7 or 6	0240	0241	576	577	R/W	0.0 to 1.0 A	0.0
293	Hot/Cold start	**XN**	7 or 6	0242	0243	578	579	R/W	0: Hot/Cold start 1 1: Hot/Cold start 2 2: Cold start 3: STOP start	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
294	Manual manipulated output value selection	**OT**	7 or 6	0244	0245	580	581	R/W	0: The last manipulated output value (Balanceless-bumpless function) 1: Manual manipulated output value	0
295	SV tracking	**XL**	7 or 6	0246	0247	582	583	R/W	0 to 3 0: No SV tracking function +1: SV tracking at transferring Remote/Local * * Including 2-loop control/Differential temperature control transfer +2: SV tracking at transferring Auto/Manual To select two or more functions, sum each value.	1
296	Integral/Derivative time decimal point position	**PK**	7 or 6	0248	0249	584	585	R/W	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places	2
297	ST start condition	**SU**	7 or 6	024A	024B	586	587	R/W	0: Activate the Startup tuning (ST) function when the power is turned on; when transferred from STOP to RUN; or when the Set value (SV) is changed. 1: Activate the Startup tuning (ST) function when the power is turned on; or when transferred from STOP to RUN. 2: Activate the Startup tuning (ST) function when the Set value (SV) is changed.	0
298	Input 1_Control action	**XE**	7 or 6	024C	024D	588	589	R/W	0: Brilliant II PID control (direct action) 1: Brilliant II PID control (reverse action) 2: Brilliant II Heat/Cool PID control [water cooling] 3: Brilliant II Heat/Cool PID control [air cooling] 4: Brilliant II Heat/Cool PID control [Cooling linear type]	Control action specified at the time of order.
299	Input 1_Output change rate limiter (up) [heat-side]	**PH**	7 or 6	024E	024F	590	591	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
300	Input 1_Output change rate limiter (down) [heat-side]	**PL**	7 or 6	0250	0251	592	593	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
301	Input 1_Action (high) input error	**WH**	7 or 6	0252	0253	594	595	R/W	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual mode) The operation mode is switched to the Manual mode and the Manipulated output at Input error of Input 1 is output. 2: Manipulated output value at input error (Auto mode) The operation mode remains in the Auto mode and the Manipulated output at Input error of Input 1 is output. When the error is recovered, the operation mode is switched to the PID control.	2
302	Input 1_Action (low) input error	**WL**	7 or 6	0254	0255	596	597	R/W	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual mode) The operation mode is switched to the Manual mode and the Manipulated output at Input error of Input 1 is output. 2: Manipulated output value at input error (Auto mode) The operation mode remains in the Auto mode and the Manipulated output at Input error of Input 1 is output. When the error is recovered, the operation mode is switched to the PID control.	2
303	Input 1_Manipulated output value at input error	**OE**	7 or 6	0256	0257	598	599	R/W	PID control −5.0 to +105.0 % Heat/Cool PID control −105.0 to +105.0 %	PID control: −5.0 Heat/Cool PID control: 0.0
304	Input 1_ Manipulated output value at STOP [heat-side]	**OF**	7 or 6	0258	0259	600	601	R/W	−5.0 to +105.0 %	−5.0
305	Input 1_Start determination point	**SX**	7 or 6	025A	025B	602	603	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: Operation starts from any start state selected by Hot/Cold start [Varies with the setting of the Decimal point position.]	3 % of Input 1_input span (When Control with PV select: 3 % of PV select input span)
306	Input 1_Level PID action selection	**PP**	7 or 6	025C	025D	604	605	R/W	0: Switching by Memory area number 1: Switching by Set value (SV) (Level PID action) 2: Switching by Measured value (PV) (Level PID action)	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
307	Input 1_Level PID differential gap	**L5**	7 or 6	025E	025F	606	607	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 2 V/I inputs: 0.2% of Input 1_input span (When Control with PV select: 0.2 % of PV select input span)
308	Input 2_Control action	**XF**	7 or 6	0260	0261	608	609	R/W	0: Brilliant II PID control (direct action) 1: Brilliant II PID control (reverse action)	Same as Input 1_ Control action
309	Input 2_Output change rate limiter (up)	**PX**	7 or 6	0262	0263	610	611	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: No function	0.0
310	Input 2_Output change rate limiter (down)	**PY**	7 or 6	0264	0265	612	613	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: No function	0.0
311	Input 2_Action (high) input error	**WX**	7 or 6	0266	0267	614	615	R/W	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual mode) The operation mode is switched to the Manual mode and the Manipulated output at Input error of Input 2 is output. 2: Manipulated output value at input error (Auto mode) The operation mode remains in the Auto mode and the Manipulated output at Input error of Input 2 is output. When the error is recovered, the operation mode is switched to the PID control.	2
312	Input 2_Action (low) input error	**WY**	7 or 6	0268	0269	616	617	R/W	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual mode) The operation mode is switched to the Manual mode and the Manipulated output at Input error of Input 2 is output. 2: Manipulated output value at input error (Auto mode) The operation mode remains in the Auto mode and the Manipulated output at Input error of Input 2 is output. When the error is recovered, the operation mode is switched to the PID control.	2
313	Input 2_Manipulated output value at input error	**PE**	7 or 6	026A	026B	618	619	R/W	−5.0 to +105.0 %	−5.0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
314	Input 2_ Manipulated output value at STOP	**OJ**	7 or 6	026C	026D	620	621	R/W	−5.0 to +105.0 %	−5.0
315	Input 2_Start determination point	**SW**	7 or 6	026E	026F	622	623	R/W	0 to Input 2_Input span 0: Operation starts from any start state selected by Hot/Cold start [Varies with the setting of the Decimal point position.]	3 % of Input 2_input span
316	Input 2_Level PID action selection	**PO**	7 or 6	0270	0271	624	625	R/W	0: Switching by Memory area number 1: Switching by Set value (SV) (Level PID action) 2: Switching by Measured value (PV) (Level PID action)	0
317	Input 2_Level PID differential gap	**L6**	7 or 6	0272	0273	626	627	R/W	0 to Input 2_Input span [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 2 V/I inputs: 0.2% of Input 2_input span
318	Input 1_Output change rate limiter (up) [cool-side]	**PM**	7 or 6	0274	0275	628	629	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
319	Input 1_Output change rate limiter (down) [cool-side]	**PN**	7 or 6	0276	0277	630	631	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
320	Input 1_ Manipulated output value at STOP [cool-side]	**OG**	7 or 6	0278	0279	632	633	R/W	−5.0 to +105.0 %	−5.0
321	Undershoot suppression factor	**KB**	7 or 6	027A	027B	634	635	R/W	0.000 to 1.000	Water cooling: 0.100 Air cooling: 0.250 Cooling linear: 1.000
322	Overlap/Deadband reference point	**UY**	7 or 6	027C	027D	636	637	R/W	0.0 to 1.0	0.0
323	Bottom suppression function	**G6**	7 or 6	027E	027F	638	639	R/W	0: No function 1: FF amount is added by level 2: FF amount is forcibly added	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
324	Select function for input 2	**KL**	7 or 6	0280	0281	640	641	R/W	0: No function 1: Remote setting input 2: 2-loop control/Differential temperature control * 3: Control with PV select 6: Input circuit error alarm * This parameter cannot be specified if the instrument is a Heat/Cool PID type. • When Measured input 2 is selected at the time of order: 0 to 3, 6 • When the Remote settting input is selected: 0 to 1	Based on Model code
325	Selection of PV select trigger	**L7**	7 or 6	0282	0283	642	643	R/W	0: Switching by level 1: Switching by signal (Key, DI and Communication)	0
326	Input circuit error alarm set value	**L4**	7 or 6	0284	0285	644	645	R/W	0 to Input 1_Input span 0: No function [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 10 V/I inputs: 5 % of Input 1_Input span
327	Communication protocol	**IS**	7 or 6	0286	0287	646	647	R/W	0: RKC communication 1: Modbus (Order of data transfer: high-order word to low-order word) 2: Modbus (Order of data transfer: low-order word to high-order word) 3: PLC communication (MITSUBISHI MELSEC series special protocol QnA compatible 3C frame [Format 4])	When the communication protocol is specified at the time of order, the specified communication protocol will be the factory set value. With communication, communication protocol not specified: 0
328	Device address	**IP**	7 or 6	0288	0289	648	649	R/W	RKC communication: 0 to 99 Modbus: 1 to 99 PLC communication: 0 to 30	RKC communication: 0 Modbus: 1 PLC communication: 0
329	Communication speed	**IR**	7 or 6	028A	028B	650	651	R/W	0: 2400 bps 1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: 57600 bps 6: 115200 bps	3

<table>
<tr><th rowspan="3">No.</th><th rowspan="3">Name</th><th rowspan="3">Identifier</th><th rowspan="3">Digits</th><th colspan="4">Register address</th><th rowspan="3">Attribute</th><th rowspan="3">Data range</th><th rowspan="3">Factory set value</th></tr>
<tr><th colspan="2">HEX</th><th colspan="2">DEC</th></tr>
<tr><th>Low-order</th><th>High-order</th><th>Low-order</th><th>High-order</th></tr>
<tr><td>330</td><td>Data bit configuration</td><td>IQ</td><td>7 or 6</td><td>028C</td><td>028D</td><td>652</td><td>653</td><td>R/W</td><td>Data bit configuration table
<table><tr><th>Set value</th><th>Data bit</th><th>Parity bit</th><th>Stop bit</th></tr><tr><td>0</td><td>8</td><td>None</td><td>1</td></tr><tr><td>1</td><td>8</td><td>None</td><td>2</td></tr><tr><td>2</td><td>8</td><td>Even</td><td>1</td></tr><tr><td>3</td><td>8</td><td>Even</td><td>2</td></tr><tr><td>4</td><td>8</td><td>Odd</td><td>1</td></tr><tr><td>5</td><td>8</td><td>Odd</td><td>2</td></tr><tr><td>6</td><td>7</td><td>None</td><td>1</td></tr><tr><td>7</td><td>7</td><td>None</td><td>2</td></tr><tr><td>8</td><td>7</td><td>Even</td><td>1</td></tr><tr><td>9</td><td>7</td><td>Even</td><td>2</td></tr><tr><td>10</td><td>7</td><td>Odd</td><td>1</td></tr><tr><td>11</td><td>7</td><td>Odd</td><td>2</td></tr></table>RKC communication: 0 to 11
Modbus: 0 to 5</td><td>0</td></tr>
<tr><td>331</td><td>Interval time</td><td>IT</td><td>7 or 6</td><td>028E</td><td>028F</td><td>654</td><td>655</td><td>R/W</td><td>0 to 250 ms</td><td>10</td></tr>
<tr><td>332</td><td>Register type</td><td>QZ</td><td>7 or 6</td><td>0290</td><td>0291</td><td>656</td><td>657</td><td>R/W</td><td>MITSUBISHI PLC
0: D register (data register)
1: R register (file register)
2: W register (link register)
3: ZR register
(Method of specifying consecutive numbers when 32767 of R register is exceeded.)</td><td>0</td></tr>
<tr><td>333</td><td>Register start number
(High-order 4-bit)</td><td>QS</td><td>7 or 6</td><td>0292</td><td>0293</td><td>658</td><td>659</td><td>R/W</td><td>0 to 15</td><td>0</td></tr>
<tr><td>334</td><td>Register start number
(Low-order 16-bit)</td><td>QX</td><td>7 or 6</td><td>0294</td><td>0295</td><td>660</td><td>661</td><td>R/W</td><td>0 to 65535</td><td>1000</td></tr>
<tr><td>335</td><td>Monitor item register bias</td><td>R3</td><td>7 or 6</td><td>0296</td><td>0297</td><td>662</td><td>663</td><td>R/W</td><td>12 to 65535</td><td>12</td></tr>
</table>

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
336	Setting item register bias	**R4**	7 or 6	0298	0299	664	665	R/W	0 to 65535	0
337	Instrument link recognition time	**QT**	7 or 6	029A	029B	666	667	R/W	0 to 255 seconds	5
338	PLC response waiting time	**VT**	7 or 6	029C	029D	668	669	R/W	0 to 3000 ms	255
339	PLC communication start time	**R5**	7 or 6	029E	029F	670	671	R/W	1 to 255 seconds	5
340	Slave register bias	**R8**	7 or 6	02A0	02A1	672	673	R/W	0 to 65535	80
341	Number of recognizable devices	**QU**	7 or 6	02A2	02A3	674	675	R/W	0 to 30	8
342	Station number	**QV**	7 or 6	02A4	02A5	676	677	R/W	0 to 31	0
343	PC number	**QW**	7 or 6	02A6	02A7	678	679	R/W	0 to 255	255
344	Monitor item selection 1	**R6**	7 or 6	02A8	02A9	680	681	R/W	0 to 65535	3459
345	Monitor item selection 2	**R7**	7 or 6	02AA	02AB	682	683	R/W	0 to 65535	16512
346	Monitor item selection 3	**R9**	7 or 6	02AC	02AD	684	685	R/W	0 to 65535	1024

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
347	Setting item selection 1	**RE**	7 or 6	02AE	02AF	686	687	R/W	0 to 65535	16480
348	Setting item selection 2	**RF**	7 or 6	02B0	02B1	688	689	R/W	0 to 65535	7850
349	Setting item selection 3	**RG**	7 or 6	02B2	02B3	690	691	R/W	0 to 65535	32768
350	Setting item selection 4	**RH**	7 or 6	02B4	02B5	692	693	R/W	0 to 65535	771
351	Setting item selection 5	**RI**	7 or 6	02B6	02B7	694	695	R/W	0 to 65535	0
352	Setting item selection 6	**RJ**	7 or 6	02B8	02B9	696	697	R/W	0 to 65535	5
353	Setting item selection 7	**RK**	7 or 6	02BA	02BB	698	699	R/W	0 to 65535	0
354	Setting item selection 8	**RL**	7 or 6	02BC	02BD	700	701	R/W	0 to 65535	0
355	Setting change rate limiter unit time	**HU**	7 or 6	02BE	02BF	702	703	R/W	0.1 to 360.0 seconds	0.1

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
356	Soak time unit	**RU**	7	02C0	02C1	704	705	R/W	In case of Input data type 0 or 2 0: 0 hours 00 minutes to 99 hours 59 minutes 1: 0 minutes 00 seconds to 199 minutes 59 seconds 2: 0 hours 00 minutes 00 seconds to 9 hours 59 minutes 59 seconds 3: 0.00 seconds to 59.99 seconds	3
			6	—	—	—	—	R/W	In case of Input data type 1 0: 0 hours 00 minutes to 99 hours 59 minutes 1: 0 minutes 00 seconds to 199 minutes 59 seconds 3: 0.00 seconds to 59.99 seconds	3
357	Input 1_Setting limiter high	**SH**	7 or 6	02C2	02C3	706	707	R/W	Input 1_Setting limiter low to Input 1_Input range high (When Control with PV select Input 1_Setting limiter low to PV select input range high) [Varies with the setting of the Decimal point position.]	Input 1_ Input range high (When Control with PV select: PV select input range high)
358	Input 1_Setting limiter low	**SL**	7 or 6	02C4	02C5	708	709	R/W	Input 1_Setting limiter low to Input 1_Input range high (When Control with PV select PV select input range low to Input 1_Setting limiter high) [Varies with the setting of the Decimal point position.]	Input 1_ Input range low (When Control with PV select: PV select input range low)
359	Input 2_Setting limiter high	**U0**	7 or 6	02C6	02C7	710	711	R/W	Input 2_Setting limiter low to Input 2_Input range high [Varies with the setting of the Decimal point position.]	Input 2_ Input range high
360	Input 2_Setting limiter low	**U1**	7 or 6	02C8	02C9	712	713	R/W	Input 2_Input range low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	Input 2_ Input range low
361	Initialization	**DC**	7 or 6	02CA	02CB	714	715	R/W	1225: Start initialization Other values: Set values are maintained After the initialization, this instrument is restarted. This setting will automatically go back to zero.	0
362	Set data unlock/lock transfer	**LU**	7 or 6	02CC	02CD	716	717	R/W	0: Unlock state 1: Lock state	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
363	Set lock level	**LK**	7 or 6	02CE	02CF	718	719	R/W	RKC communication The Set lock level is assigned as a bit image in binary numbers. Bit 0: SV setting mode * + Parameter select mode Bit 1: Operation transfer mode Bit 2: Parameter setting mode Bit 3 Setup setting mode Bit 4 Engineering mode Bit 5 to Bit 7: Unused Data 0: Unlock 1: Lock * The data of Set value (SV) and Interlock release can be locked.	00000
									Modbus 0 to 31 0: Unlock + 1: SV setting mode * + Parameter select mode + 2: Operation transfer mode + 4: Parameter setting mode + 8: Setup setting mode +16: Engineering mode * The data of Set value (SV) and Interlock release can be locked.	0
364	Area lock	**LL**	7 or 6	02D0	02D1	720	721	R/W	0: Memory area is adjustable when the setting data is locked. 1: Memory area is not adjustable when the setting data is locked. (Memory area transfer mode is not displayed)	0
365	Select Blind function	**BQ**	7 or 6	02D2	02D3	722	723	R/W	0: Blind function: OFF 1: Blind function: ON	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
366	Fix parameter setting	**LO**	7 or 6	02D4	02D5	724	725	R/W	RKC communication The Fix parameter setting is assigned as a bit image in binary numbers. Bit 0: Autotuning (AT) Fixed to PID control Bit 1: Auto/Manual transfer Fixed to Auto mode Bit 2: Remote/Local transfer Fixed to Local mode Bit 3: Control response parameter Fixed to Slow Bit 4: Hot/Cold start Fixed to Hot start 2 Bit 5 to Bit 7: Unused Data 0: Adjustable 1: Fixed	00000
									Modbus 0 to 31 0: None + 1: Autotuning (AT) Fixed to PID control + 2: Auto/Manual transfer Fixed to Auto mode + 4: Remote/Local transfer Fixed to Local mode + 8: Control response parameter Fixed to Slow +16: Hot/Cold start Fixed to Hot start 2	0
367	Parameter select direct registration	**LD**	7 or 6	02D6	02D7	726	727	R/W	0: Direct registration: OFF 1: Direct registration: ON	0
368	Parameter select setting 1	**BA**	7 or 6	02D8	02D9	728	729	R/W	0 to 313 (Screen No.) 0: No registration	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
369	Parameter select setting 2	**BB**	7 or 6	02DA	02DB	730	731	R/W	0 to 313 (Screen No.) 0: No registration	0
370	Parameter select setting 3	**BC**	7 or 6	02DC	02DD	732	733	R/W	0 to 313 (Screen No.) 0: No registration	0
371	Parameter select setting 4	**BD**	7 or 6	02DE	02DF	734	735	R/W	0 to 313 (Screen No.) 0: No registration	0
372	Parameter select setting 5	**BE**	7 or 6	02E0	02E1	736	737	R/W	0 to 313 (Screen No.) 0: No registration	0
373	Parameter select setting 6	**BF**	7 or 6	02E2	02E3	738	739	R/W	0 to 313 (Screen No.) 0: No registration	0
374	Parameter select setting 7	**BG**	7 or 6	02E4	02E5	740	741	R/W	0 to 313 (Screen No.) 0: No registration	0
375	Parameter select setting 8	**BH**	7 or 6	02E6	02E7	742	743	R/W	0 to 313 (Screen No.) 0: No registration	0
376	Parameter select setting 9	**BI**	7 or 6	02E8	02E9	744	745	R/W	0 to 313 (Screen No.) 0: No registration	0
377	Parameter select setting 10	**BJ**	7 or 6	02EA	02EB	746	747	R/W	0 to 313 (Screen No.) 0: No registration	0
378	Parameter select setting 11	**BK**	7 or 6	02EC	02ED	748	749	R/W	0 to 313 (Screen No.) 0: No registration	0
379	Parameter select setting 12	**BL**	7 or 6	02EE	02EF	750	751	R/W	0 to 313 (Screen No.) 0: No registration	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
380	Parameter select setting 13	**BM**	7 or 6	02F0	02F1	752	753	R/W	0 to 313 (Screen No.) 0: No registration	0
381	Parameter select setting 14	**BN**	7 or 6	02F2	02F3	754	755	R/W	0 to 313 (Screen No.) 0: No registration	0
382	Parameter select setting 15	**BO**	7 or 6	02F4	02F5	756	757	R/W	0 to 313 (Screen No.) 0: No registration	0
383	Parameter select setting 16	**BP**	7 or 6	02F6	02F7	758	759	R/W	0 to 313 (Screen No.) 0: No registration	0
384	Dummy data (REX-F400/700/900: For Bar-graph display selection)	**DA**	7 or 6	—	—	—	—	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
385	Dummy data (REX-F400/700/900: For Second alarm energized/de-energized selection)	**NB**	7 or 6	—	—	—	—	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
386	Dummy data (REX-F400/700/900: For Local mode/computer mode identification)	**RA**	7 or 6	—	—	—	—	RO	The read data is “0.”	0
387	Dummy data (REX-F400/700/900: For Operation execution (RUN)/STOP transfer)	**DH**	7 or 6	—	—	—	—	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
388	Dummy data (REX-F400/700/900: For First alarm action selection at input abnormality)	**OA**	7 or 6	—	—	—	—	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
389	Dummy data (REX-F400/700/900: For Second alarm action selection at input abnormality)	**OB**	7 or 6	—	—	—	—	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0

6.3.2 Memory area data (Direct designation method) [Modbus double word]

Register addresses 0500H to 0E1FH are used to check and change set values belonging to the Memory area.

☞ For Memory area, refer to the **5.9 How to Use Memory Area Data (P. 5-18)**.

■ Memory area 1 data

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
1	Input 1_Set value (SV)	0500	0501	1280	1281	R/W	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	0
2	Input 2_Set value (SV)	0502	0503	1282	1283	R/W	Input 2_Setting limiter low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	0
3	Set value (SV) of differential temperature input	0504	0505	1284	1285	R/W	− (Input 1_Input span) to + (Input 1_Input span) [Varies with the setting of the Decimal point position.]	0
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	0506	0507	1286	1287	R/W	• Deviation When assigned to Input 1 or Differential temperature input − (Input 1_Input span) to + (Input 1_Input span) When assigned to Input 2 − (Input 2_Input span) to + (Input 2_Input span) When Control with PV select is selected at Select function for input 2 − (PV select input span) to + (PV select input span) [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 10 V/I inputs: 5 % of input span
							• Input value or Set value When assigned to Input 1 Input 1_Input range low to Input 1_Input range high When assigned to Input 2 Input 2_Input range low to Input 2_Input range high When assigned to Differential temperature input − (Input 1_Input span) to + (Input 1_Input span) When Control with PV select is selected at Select function for input 2 PV select input range low to PV select input range high [Varies with the setting of the Decimal point position.]	
							• Manipulated output value −5.0 to +105.0 %	50.0

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
5	Event 1 set value (EV1') [low]	0508	0509	1288	1289	R/W	• Deviation When assigned to Input_1 or Differential temperature input − (Input 1_Input span) to + (Input 1_Input span) When assigned to Input 2 − (Input 2_Input span) to + (Input 2_Input span) When Control with PV select is selected at Select function for Input 2 − (PV select input span) to + (PV select input span) [Varies with the setting of the Decimal point position.]	TC/RTD inputs: −10 V/I inputs: −5 % of input span
							• Input value or Set value When assigned to Input 1 Input 1_Input range low to Input 1_Input range high When assigned to Input 2 Input 2_Input range low to Input 2_Input range high When assigned to Differential temperature input − (Input 1_Input span) to + (Input 1_Input span) When Control with PV select is selected at Select function for Input 2 PV select input range low to PV select input range high [Varies with the setting of the Decimal point position.]	
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	050A	050B	1290	1291	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
7	Event 2 set value (EV2') [low]	050C	050D	1292	1293	R/W	Same as Event 1 set value (EV1') [low]	
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	050E	050F	1294	1295	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
9	Event 3 set value (EV3') [low]	0510	0511	1296	1297	R/W	Same as Event 1 set value (EV1') [low]	
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	0512	0513	1298	1299	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
11	Event 4 set value (EV4') [low]	0514	0515	1300	1301	R/W	Same as Event 1 set value (EV1') [low]	

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
12	Input 1_Proportional band [heat-side]	0516	0517	1302	1303	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 1000.0 % of Input 1_Input span (When Control with PV select: 0.0 to 1000.0 % of PV select input span) 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0
13	Input 1_Integral time [heat-side]	0518	0519	1304	1305	R/W	PID control or Heat/Cool PID control 0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/ Derivative time decimal point position.]	240.00
14	Input 1_Derivative time [heat-side]	051A	051B	1306	1307	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/ Derivative time decimal point position.]	60.00
15	Input 1_Control response parameter	051C	051D	1308	1309	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	PID control: 0 Heat/Cool PID control: 2
16	Input 1_Proactive intensity	051E	051F	1310	1311	R/W	0 to 4 0: No function	2
17	Input 1_Manual reset	0520	0521	1312	1313	R/W	−100.0 to +100.0 %	0.0
18	Input 1_FF amount	0522	0523	1314	1315	R/W	−100.0 to +100.0 %	0.0
19	Input 1_Output limiter high [heat-side]	0524	0525	1316	1317	R/W	Input 1_Output limiter low [heat-side] to 105.0 %	105.0
20	Input 1_Output limiter low [heat-side]	0526	0527	1318	1319	R/W	−5.0 % to Input 1_Output limiter high [heat-side]	−5.0
21	Input 1_Control loop break alarm (LBA) time	0528	0529	1320	1321	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0
22	Input 1_LBA deadband (LBD)	052A	052B	1322	1323	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.]	0
23	Input 2_Proportional band	052C	052D	1324	1325	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 1000.0 % of Input 2_Input span 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
24	Input 2_Integral time	052E	052F	1326	1327	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/ Derivative time decimal point position.]	240.00
25	Input 2_Derivative time	0530	0531	1328	1329	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/ Derivative time decimal point position.]	60.00
26	Input 2_Control response parameter	0532	0533	1330	1331	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	0
27	Input 2_Proactive intensity	0534	0535	1332	1333	R/W	0 to 4 0: No function	2
28	Input 2_Manual reset	0536	0537	1334	1335	R/W	−100.0 to +100.0 %	0.0
29	Input 2_FF amount	0538	0539	1336	1337	R/W	−100.0 to +100.0 %	0.0
30	Input 2_Output limiter high	053A	053B	1338	1339	R/W	Input 2_Output limiter low to 105.0 %	105.0
31	Input 2_Output limiter low	053C	053D	1340	1341	R/W	−5.0 % to Input 2_Output limiter high	−5.0
32	Input 2_Control loop break alarm (LBA) time	053E	053F	1342	1343	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0
33	Input 2_LBA deadband (LBD)	0540	0541	1344	1345	R/W	0 to Input 2_Input span [Varies with the setting of the Decimal point position.]	0
34	Input 1_Proportional band [cool-side]	0542	0543	1346	1347	R/W	TC/RTD inputs 1 (0.1, 0.01) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 1 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.1 to 1000.0 % of Input 1_Input span (When Control with PV select: 0.1 to 1000.0 % of PV select input span)	TC/RTD inputs: 30 V/I inputs: 3.0
35	Input 1_Integral time [cool-side]	0544	0545	1348	1349	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/ Derivative time decimal point position.]	240.00
36	Input 1_Derivative time [cool-side]	0546	0547	1350	1351	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/ Derivative time decimal point position.]	60.00

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
37	Input 1_ Overlap/Deadband	0548	0549	1352	1353	R/W	TC/RTD inputs − (Input 1_Input span) to + (Input 1_Input span) (When Control with PV select: − (PV select input span) to + (PV select input span)) (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs −100.0 to +100.0 % of Input 1_Input span (When Control with PV select: −100.0 to +100.0 % of PV select input span) Minus (−) setting results in Overlap. However, the overlapping range is within the proportional range.	TC/RTD inputs: 0 V/I inputs: 0.0
38	Input 1_Output limiter high [cool-side]	054A	054B	1354	1355	R/W	Heat/Cool PID control Input 1_Output limiter low [cool-side] to 105.0 %	105.0
	Input 1_Output limiter low [heat-side]						PID control −5.0 % to Input 1_Output limiter high [heat-side] Same data as RKC communication identifier OX	−5.0
39	Input 1_Output limiter low [cool-side]	054C	054D	1356	1357	R/W	−5.0 % to Input 1_Output limiter high [cool-side]	−5.0
40	Select Trigger type for Memory area transfer	054E	054F	1358	1359	R/W	0 to 63 0: No assignment +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Digital input 1 (DI1) Close edge +32: Digital input 1 (DI1) Open edge To select two or more functions, sum each value.	0

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
41	Area soak time	0550	0051	1360	1361	R/W	In case of Input data type 0 or 2 • RKC communication 0 hours 00 minutes 00 seconds to 9 hours 59 minutes 59 seconds 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus 0 to 35999 seconds 0 to 11999 seconds 0 to 5999 minutes 0 to 5999 seconds (10 ms) (Calculation is performed every 50 ms.) [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0.00 seconds) Modbus: 0
							In case of Input data type 1 • RKC communication 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds 0 to 5999 seconds (10 ms) (Calculation is performed every 50 ms.) [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0.00 seconds) Modbus: 0
42	Link area number	0552	0553	1362	1363	R/W	0 to 16 0: No function	0
43	Input 1_Setting change rate limiter (up)	0554	0555	1364	1365	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: No function [Varies with the setting of the Decimal point position.]	0
44	Input 1_Setting change rate limiter (down)	0556	0557	1366	1367	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: No function [Varies with the setting of the Decimal point position.]	0
45	Input 1_Auto/Manual transfer selection (Area)	0558	0559	1368	1369	R/W	0: No transfer 1: Auto mode (bumpless) 2: Auto mode (bump) 3: Manual mode (bumpless) 4: Manual mode (bump)	0
46	Input 1_Manipulated output value (Area)	055A	055B	1370	1371	R/W	PID control −5.0 to +105.0 % Heat/Cool PID control −105.0 to +105.0 %	PID control: −5.0 Heat/Cool PID control: 0.0
47	Input 2_Setting change rate limiter (up)	055C	055D	1372	1373	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
48	Input 2_Setting change rate limiter (down)	055E	055F	1374	1375	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0
49	Input 2_Auto/Manual transfer selection (Area)	0560	0561	1376	1377	R/W	0: No transfer 1: Auto mode (bumpless) 2: Auto mode (bump) 3: Manual mode (bumpless) 4: Manual mode (bump)	0
50	Input 2_Manipulated output value (Area)	0562	0563	1378	1379	R/W	−5.0 to +105.0 %	−5.0
51	Remote/Local transfer selection (Area)	0564	0565	1380	1381	R/W	When Select function for input 2 is: "Remote setting input" 0: No transfer 1: Local mode 2: Remote mode	0
							When Select function for input 2 is: "Control with PV select" 0: No transfer 1: Input 1 2: Input 2	
							When Select function for input 2 is: "2-loop control/Differential temperature control" 0: No transfer 1: 2-loop control 2: Differential temperature control	
52	Input 1_Number of knee point	0566	0567	1382	1383	R/W	0 to 5 0: Input knee point correction function is disabled	5
53	Input 1_Knee point input value 1	0568	0569	1384	1385	R/W	Input 1_Input range low to Input 1_Input range high [Varies with the setting of the Decimal point position.]	Input 1_Input range high
54	Input 1_Knee point input value 2	056A	056B	1386	1387	R/W	Same as Input 1_Knee point input value 1	
55	Input 1_Knee point input value 3	056C	056D	1388	1389	R/W	Same as Input 1_Knee point input value 1	
56	Input 1_Knee point input value 4	056E	056F	1390	1391	R/W	Same as Input 1_Knee point input value 1	
57	Input 1_Knee point input value 5	0570	0571	1392	1393	R/W	Same as Input 1_Knee point input value 1	
58	Input 1_Knee point correction value 1	0572	0573	1394	1395	R/W	Deviation setting: − (Input 1_Knee point correction limit value) to + (Input 1_Knee point correction limit value) Direct setting: Input 1_Input range low to Input 1_Input range high [Varies with the setting of the Decimal point position.]	Deviation setting: 0 Direct setting: Input 1_Input range high
59	Input 1_Knee point correction value 2	0574	0575	1396	1397	R/W	Same as Input 1_Knee point correction value 1	

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
60	Input 1_Knee point correction value 3	0576	0577	1398	1399	R/W	Same as Input 1_Knee point correction value 1	
61	Input 1_Knee point correction value 4	0578	0579	1400	1401	R/W	Same as Input 1_Knee point correction value 1	
62	Input 1_Knee point correction value 5	057A	057B	1402	1403	R/W	Same as Input 1_Knee point correction value 1	
63	Input 2_Number of knee point	057C	057D	1404	1405	R/W	0 to 5 0: Input knee point correction function is disabled	5
64	Input 2_Knee point input value 1	057E	057F	1406	1407	R/W	Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.]	Input 2_Input range high
65	Input 2_Knee point input value 2	0580	0581	1408	1409	R/W	Same as Input 2_Knee point input value 1	
66	Input 2_Knee point input value 3	0582	0583	1410	1411	R/W	Same as Input 2_Knee point input value 1	
67	Input 2_Knee point input value 4	0584	0585	1412	1413	R/W	Same as Input 2_Knee point input value 1	
68	Input 2_Knee point input value 5	0586	0587	1414	1415	R/W	Same as Input 2_Knee point input value 1	
69	Input 2_Knee point correction value 1	0588	0589	1416	1417	R/W	Deviation setting: – (Input 2_Knee point correction limit value) to + (Input 2_Knee point correction limit value) Direct setting: Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.]	Deviation setting: 0 Direct setting: Input 2_Input range high
70	Input 2_Knee point correction value 2	058A	058B	1418	1419	R/W	Same as Input 2_Knee point correction value 1	
71	Input 2_Knee point correction value 3	058C	058D	1420	1421	R/W	Same as Input 2_Knee point correction value 1	
72	Input 2_Knee point correction value 4	058E	058F	1422	1423	R/W	Same as Input 2_Knee point correction value 1	
73	Input 2_Knee point correction value 5	0590	0591	1424	1425	R/W	Same as Input 2_Knee point correction value 1	

■ Memory area 2 to 16 data

For details of attribute, data range and factory set values, refer to the same line No. in ■ **Memory area 1 data (P. 6-80)**.

Memory area 2 to 4 data

Low: Low-order High: High-order

No.	Name	Memory area 2 data				Memory area 3 data				Memory area 4 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	Input 1_Set value (SV)	0592	0593	1426	1427	0624	0625	1572	1573	06B6	06B7	1718	1719
2	Input 2_Set value (SV)	0594	0595	1428	1429	0626	0627	1574	1575	06B8	06B9	1720	1721
3	Set value (SV) of differential temperature input	0596	0597	1430	1431	0628	0629	1576	1577	06BA	06BB	1722	1723
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	0598	0599	1432	1433	062A	062B	1578	1579	06BC	06BD	1724	1725
5	Event 1 set value (EV1') [low]	059A	059B	1434	1435	062C	062D	1580	1581	06BE	06BF	1726	1727
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	059C	059D	1436	1437	062E	062F	1582	1583	06C0	06C1	1728	1729
7	Event 2 set value (EV2') [low]	059E	059F	1438	1439	0630	0631	1584	1585	06C2	06C3	1730	1731
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	05A0	05A1	1440	1441	0632	0633	1586	1587	06C4	06C5	1732	1733
9	Event 3 set value (EV3') [low]	05A2	05A3	1442	1443	0634	0635	1588	1589	06C6	06C7	1734	1735
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	05A4	05A5	1444	1445	0636	0637	1590	1591	06C8	06C9	1736	1737
11	Event 4 set value (EV4') [low]	05A6	05A7	1446	1447	0638	0639	1592	1593	06CA	06CB	1738	1739
12	Input 1_Proportional band [heat-side]	05A8	05A9	1448	1449	063A	063B	1594	1595	06CC	06CD	1740	1741
13	Input 1_Integral time [heat-side]	05AA	05AB	1450	1451	063C	063D	1596	1597	06CE	06CF	1742	1743
14	Input 1_Derivative time [heat-side]	05AC	05AD	1452	1453	063E	063F	1598	1599	06D0	06D1	1744	1745
15	Input 1_Control response parameter	05AE	05AF	1454	1455	0640	0641	1600	1601	06D2	06D3	1746	1747
16	Input 1_Proactive intensity	05B0	05B1	1456	1457	0642	0643	1602	1603	06D4	06D5	1748	1749
17	Input 1_Manual reset	05B2	05B3	1458	1459	0644	0645	1604	1605	06D6	06D7	1750	1751
18	Input 1_FF amount	05B4	05B5	1460	1461	0646	0647	1606	1607	06D8	06D9	1752	1753
19	Input 1_Output limiter high [heat-side]	05B6	05B7	1462	1463	0648	0649	1608	1609	06DA	06DB	1754	1755
20	Input 1_Output limiter low [heat-side]	05B8	05B9	1464	1465	064A	064B	1610	1611	06DC	06DD	1756	1757
21	Input 1_Control loop break alarm (LBA) time	05BA	05BB	1466	1467	064C	064D	1612	1613	06DE	06DF	1758	1759
22	Input 1_LBA deadband (LBD)	05BC	05BD	1468	1469	064E	064F	1614	1615	06E0	06E1	1760	1761
23	Input 2_Proportional band	05BE	05BF	1470	1471	0650	0651	1616	1617	06E2	06E3	1762	1763
24	Input 2_Integral time	05C0	05C1	1472	1473	0652	0653	1618	1619	06E4	06E5	1764	1765
25	Input 2_Derivative time	05C2	05C3	1474	1475	0654	0655	1620	1621	06E6	06E7	1766	1767
26	Input 2_Control response parameter	05C4	05C5	1476	1477	0656	0657	1622	1623	06E8	06E9	1768	1769
27	Input 2_Proactive intensity	05C6	05C7	1478	1479	0658	0659	1624	1625	06EA	06EB	1770	1771
28	Input 2_Manual reset	05C8	05C9	1480	1481	065A	065B	1626	1627	06EC	06ED	1772	1773
29	Input 2_FF amount	05CA	05CB	1482	1483	065C	065D	1628	1629	06EE	06EF	1774	1775
30	Input 2_Output limiter high	05CC	05CD	1484	1485	065E	065F	1630	1631	06F0	06F1	1776	1777
31	Input 2_Output limiter low	05CE	05CF	1486	1487	0660	0661	1632	1633	06F2	06F3	1778	1779
32	Input 2_Control loop break alarm (LBA) time	05D0	05D1	1488	1489	0662	0663	1634	1635	06F4	06F5	1780	1781
33	Input 2_LBA deadband (LBD)	05D2	05D3	1490	1491	0664	0665	1636	1637	06F6	06F7	1782	1783
34	Input 1_Proportional band [cool-side]	05D4	05D5	1492	1493	0666	0667	1638	1639	06F8	06F9	1784	1785
35	Input 1_Integral time [cool-side]	05D6	05D7	1494	1495	0668	0669	1640	1641	06FA	06FB	1786	1787
36	Input 1_Derivative time [cool-side]	05D8	05D9	1496	1497	066A	066B	1642	1643	06FC	06FD	1788	1789
37	Input 1_Overlap/Deadband	05DA	05DB	1498	1499	066C	066D	1644	1645	06FE	06FF	1790	1791
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	05DC	05DD	1500	1501	066E	066F	1646	1647	0700	0701	1792	1793
39	Input 1_Output limiter low [cool-side]	05DE	05DF	1502	1503	0670	0671	1648	1649	0702	0703	1794	1795
40	Select Trigger type for Memory area transfer	05E0	05E1	1504	1505	0672	0673	1650	1651	0704	0705	1796	1797
41	Area soak time	05E2	05E3	1506	1507	0674	0675	1652	1653	0706	0707	1798	1799
42	Link area number	05E4	05E5	1508	1509	0676	0677	1654	1655	0708	0709	1800	1801
43	Input 1_Setting change rate limiter (up)	05E6	05E7	1510	1511	0678	0679	1656	1657	070A	070B	1802	1803
44	Input 1_Setting change rate limiter (down)	05E8	05E9	1512	1513	067A	067B	1658	1659	070C	070D	1804	1805
45	Input 1_Auto/Manual transfer selection (Area)	05EA	05EB	1514	1515	067C	067D	1660	1661	070E	070F	1806	1807
46	Input 1_Manipulated output value (Area)	05EC	05ED	1516	1517	067E	067F	1662	1663	0710	0711	1808	1809
47	Input 2_Setting change rate limiter (up)	05EE	05EF	1518	1519	0680	0681	1664	1665	0712	0713	1810	1811
48	Input 2_Setting change rate limiter (down)	05F0	05F1	1520	1521	0682	0683	1666	1667	0714	0715	1812	1813

Memory area 2 to 4 data

Low: Low-order High: High-order

No.	Name	Memory area 2 data				Memory area 3 data				Memory area 4 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
49	Input 2_Auto/Manual transfer selection (Area)	05F2	05F3	1522	1523	0684	0685	1668	1669	0716	0717	1814	1815
50	Input 2_Manipulated output value (Area)	05F4	05F5	1524	1525	0686	0687	1670	1671	0718	0719	1816	1817
51	Remote/Local transfer selection (Area)	05F6	05F7	1526	1527	0688	0689	1672	1673	071A	071B	1818	1819
52	Input 1_Number of knee point	05F8	05F9	1528	1529	068A	068B	1674	1675	071C	071D	1820	1821
53	Input 1_Knee point input value 1	05FA	05FB	1530	1531	068C	068D	1676	1677	071E	071F	1822	1823
54	Input 1_Knee point input value 2	05FC	05FD	1532	1533	068E	068F	1678	1679	0720	0721	1824	1825
55	Input 1_Knee point input value 3	05FE	05FF	1534	1535	0690	0691	1680	1681	0722	0723	1826	1827
56	Input 1_Knee point input value 4	0600	0601	1536	1537	0692	0693	1682	1683	0724	0725	1828	1829
57	Input 1_Knee point input value 5	0602	0603	1538	1539	0694	0695	1684	1685	0726	0727	1830	1831
58	Input 1_Knee point correction value 1	0604	0605	1540	1541	0696	0697	1686	1687	0728	0729	1832	1833
59	Input 1_Knee point correction value 2	0606	0607	1542	1543	0698	0699	1688	1689	072A	072B	1834	1835
60	Input 1_Knee point correction value 3	0608	0609	1544	1545	069A	069B	1690	1691	072C	072D	1836	1837
61	Input 1_Knee point correction value 4	060A	060B	1546	1547	069C	069D	1692	1693	072E	072F	1838	1839
62	Input 1_Knee point correction value 5	060C	060D	1548	1549	069E	069F	1694	1695	0730	0731	1840	1841
63	Input 2_Number of knee point	060E	060F	1550	1551	06A0	06A1	1696	1697	0732	0733	1842	1843
64	Input 2_Knee point input value 1	0610	0611	1552	1553	06A2	06A3	1698	1699	0734	0735	1844	1845
65	Input 2_Knee point input value 2	0612	0613	1554	1555	06A4	06A5	1700	1701	0736	0737	1846	1847
66	Input 2_Knee point input value 3	0614	0615	1556	1557	06A6	06A7	1702	1703	0738	0739	1848	1849
67	Input 2_Knee point input value 4	0616	0617	1558	1559	06A8	06A9	1704	1705	073A	073B	1850	1851
68	Input 2_Knee point input value 5	0618	0619	1560	1561	06AA	06AB	1706	1707	073C	073D	1852	1853
69	Input 2_Knee point correction value 1	061A	061B	1562	1563	06AC	06AD	1708	1709	073E	073F	1854	1855
70	Input 2_Knee point correction value 2	061C	061D	1564	1565	06AE	06AF	1710	1711	0740	0741	1856	1857
71	Input 2_Knee point correction value 3	061E	061F	1566	1567	06B0	06B1	1712	1713	0742	0743	1858	1859
72	Input 2_Knee point correction value 4	0620	0621	1568	1569	06B2	06B3	1714	1715	0744	0745	1860	1861
73	Input 2_Knee point correction value 5	0622	0623	1570	1571	06B4	06B5	1716	1717	0746	0747	1862	1863

Memory area 5 to 7 data

Low: Low-order High: High-order

No.	Name	Memory area 5 data				Memory area 6 data				Memory area 7 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	Input 1_Set value (SV)	0748	0749	1864	1865	07DA	07DB	2010	2011	086C	086D	2156	2157
2	Input 2_Set value (SV)	074A	074B	1866	1867	07DC	07DD	2012	2013	086E	086F	2158	2159
3	Set value (SV) of differential temperature input	074C	074D	1868	1869	07DE	07DF	2014	2015	0870	0871	2160	2161
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	074E	074F	1870	1871	07E0	07E1	2016	2017	0872	0873	2162	2163
5	Event 1 set value (EV1') [low]	0750	0751	1872	1873	07E2	07E3	2018	2019	0874	0875	2164	2165
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	0752	0753	1874	1875	07E4	07E5	2020	2021	0876	0877	2166	2167
7	Event 2 set value (EV2') [low]	0754	0755	1876	1877	07E6	07E7	2022	2023	0878	0879	2168	2169
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	0756	0757	1878	1879	07E8	07E9	2024	2025	087A	087B	2170	2171
9	Event 3 set value (EV3') [low]	0758	0759	1880	1881	07EA	07EB	2026	2027	087C	087D	2172	2173
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	075A	075B	1882	1883	07EC	07ED	2028	2029	087E	087F	2174	2175
11	Event 4 set value (EV4') [low]	075C	075D	1884	1885	07EE	07EF	2030	2031	0880	0881	2176	2177
12	Input 1_Proportional band [heat-side]	075E	075F	1886	1887	07F0	07F1	2032	2033	0882	0883	2178	2179
13	Input 1_Integral time [heat-side]	0760	0761	1888	1889	07F2	07F3	2034	2035	0884	0885	2180	2181
14	Input 1_Derivative time [heat-side]	0762	0763	1890	1891	07F4	07F5	2036	2037	0886	0887	2182	2183
15	Input 1_Control response parameter	0764	0765	1892	1893	07F6	07F7	2038	2039	0888	0889	2184	2185
16	Input 1_Proactive intensity	0766	0767	1894	1895	07F8	07F9	2040	2041	088A	088B	2186	2187
17	Input 1_Manual reset	0768	0769	1896	1897	07FA	07FB	2042	2043	088C	088D	2188	2189
18	Input 1_FF amount	076A	076B	1898	1899	07FC	07FD	2044	2045	088E	088F	2190	2191
19	Input 1_Output limiter high [heat-side]	076C	076D	1900	1901	07FE	07FF	2046	2047	0890	0891	2192	2193
20	Input 1_Output limiter low [heat-side]	076E	076F	1902	1903	0800	0801	2048	2049	0892	0893	2194	2195
21	Input 1_Control loop break alarm (LBA) time	0770	0771	1904	1905	0802	0803	2050	2051	0894	0895	2196	2197
22	Input 1_LBA deadband (LBD)	0772	0773	1906	1907	0804	0805	2052	2053	0896	0897	2198	2199
23	Input 2_Proportional band	0774	0775	1908	1909	0806	0807	2054	2055	0898	0899	2200	2201
24	Input 2_Integral time	0776	0777	1910	1911	0808	0809	2056	2057	089A	089B	2202	2203
25	Input 2_Derivative time	0778	0779	1912	1913	080A	080B	2058	2059	089C	089D	2204	2205
26	Input 2_Control response parameter	077A	077B	1914	1915	080C	080D	2060	2061	089E	089F	2206	2207
27	Input 2_Proactive intensity	077C	077D	1916	1917	080E	080F	2062	2063	08A0	08A1	2208	2209
28	Input 2_Manual reset	077E	077F	1918	1919	0810	0811	2064	2065	08A2	08A3	2210	2211
29	Input 2_FF amount	0780	0781	1920	1921	0812	0813	2066	2067	08A4	08A5	2212	2213
30	Input 2_Output limiter high	0782	0783	1922	1923	0814	0815	2068	2069	08A6	08A7	2214	2215
31	Input 2_Output limiter low	0784	0785	1924	1925	0816	0817	2070	2071	08A8	08A9	2216	2217
32	Input 2_Control loop break alarm (LBA) time	0786	0787	1926	1927	0818	0819	2072	2073	08AA	08AB	2218	2219
33	Input 2_LBA deadband (LBD)	0788	0789	1928	1929	081A	081B	2074	2075	08AC	08AD	2220	2221
34	Input 1_Proportional band [cool-side]	078A	078B	1930	1931	081C	081D	2076	2077	08AE	08AF	2222	2223
35	Input 1_Integral time [cool-side]	078C	078D	1932	1933	081E	081F	2078	2079	08B0	08B1	2224	2225
36	Input 1_Derivative time [cool-side]	078E	078F	1934	1935	0820	0821	2080	2081	08B2	08B3	2226	2227
37	Input 1_Overlap/Deadband	0790	0791	1936	1937	0822	0823	2082	2083	08B4	08B5	2228	2229
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	0792	0793	1938	1939	0824	0825	2084	2085	08B6	08B7	2230	2231
39	Input 1_Output limiter low [cool-side]	0794	0795	1940	1941	0826	0827	2086	2087	08B8	08B9	2232	2233
40	Select Trigger type for Memory area transfer	0796	0797	1942	1943	0828	0829	2088	2089	08BA	08BB	2234	2235
41	Area soak time	0798	0799	1944	1945	082A	082B	2090	2091	08BC	08BD	2236	2237
42	Link area number	079A	079B	1946	1947	082C	082D	2092	2093	08BE	08BF	2238	2239
43	Input 1_Setting change rate limiter (up)	079C	079D	1948	1949	082E	082F	2094	2095	08C0	08C1	2240	2241
44	Input 1_Setting change rate limiter (down)	079E	079F	1950	1951	0830	0831	2096	2097	08C2	08C3	2242	2243
45	Input 1_Auto/Manual transfer selection (Area)	07A0	07A1	1952	1953	0832	0833	2098	2099	08C4	08C5	2244	2245
46	Input 1_Manipulated output value (Area)	07A2	07A3	1954	1955	0834	0835	2100	2101	08C6	08C7	2246	2247
47	Input 2_Setting change rate limiter (up)	07A4	07A5	1956	1957	0836	0837	2102	2103	08C8	08C9	2248	2249
48	Input 2_Setting change rate limiter (down)	07A6	07A7	1958	1959	0838	0839	2104	2105	08CA	08CB	2250	2251

Memory area 5 to 7 data

Low: Low-order High: High-order

No.	Name	Memory area 5 data				Memory area 6 data				Memory area 7 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
49	Input 2_Auto/Manual transfer selection (Area)	07A8	07A9	1960	1961	083A	083B	2106	2107	08CC	08CD	2252	2253
50	Input 2_Manipulated output value (Area)	07AA	07AB	1962	1963	083C	083D	2108	2109	08CE	08CF	2254	2255
51	Remote/Local transfer selection (Area)	07AC	07AD	1964	1965	083E	083F	2110	2111	08D0	08D1	2256	2257
52	Input 1_Number of knee point	07AE	07AF	1966	1967	0840	0841	2112	2113	08D2	08D3	2258	2259
53	Input 1_Knee point input value 1	07B0	07B1	1968	1969	0842	0843	2114	2115	08D4	08D5	2260	2261
54	Input 1_Knee point input value 2	07B2	07B3	1970	1971	0844	0845	2116	2117	08D6	08D7	2262	2263
55	Input 1_Knee point input value 3	07B4	07B5	1972	1973	0846	0847	2118	2119	08D8	08D9	2264	2265
56	Input 1_Knee point input value 4	07B6	07B7	1974	1975	0848	0849	2120	2121	08DA	08DB	2266	2267
57	Input 1_Knee point input value 5	07B8	07B9	1976	1977	084A	084B	2122	2123	08DC	08DD	2268	2269
58	Input 1_Knee point correction value 1	07BA	07BB	1978	1979	084C	084D	2124	2125	08DE	08DF	2270	2271
59	Input 1_Knee point correction value 2	07BC	07BD	1980	1981	084E	084F	2126	2127	08E0	08E1	2272	2273
60	Input 1_Knee point correction value 3	07BE	07BF	1982	1983	0850	0851	2128	2129	08E2	08E3	2274	2275
61	Input 1_Knee point correction value 4	07C0	07C1	1984	1985	0852	0853	2130	2131	08E4	08E5	2276	2277
62	Input 1_Knee point correction value 5	07C2	07C3	1986	1987	0854	0855	2132	2133	08E6	08E7	2278	2279
63	Input 2_Number of knee point	07C4	07C5	1988	1989	0856	0857	2134	2135	08E8	08E9	2280	2281
64	Input 2_Knee point input value 1	07C6	07C7	1990	1991	0858	0859	2136	2137	08EA	08EB	2282	2283
65	Input 2_Knee point input value 2	07C8	07C9	1992	1993	085A	085B	2138	2139	08EC	08ED	2284	2285
66	Input 2_Knee point input value 3	07CA	07CB	1994	1995	085C	085D	2140	2141	08EE	08EF	2286	2287
67	Input 2_Knee point input value 4	07CC	07CD	1996	1997	085E	085F	2142	2143	08F0	08F1	2288	2289
68	Input 2_Knee point input value 5	07CE	07CF	1998	1999	0860	0861	2144	2145	08F2	08F3	2290	2291
69	Input 2_Knee point correction value 1	07D0	07D1	2000	2001	0862	0863	2146	2147	08F4	08F5	2292	2293
70	Input 2_Knee point correction value 2	07D2	07D3	2002	2003	0864	0865	2148	2149	08F6	08F7	2294	2295
71	Input 2_Knee point correction value 3	07D4	07D5	2004	2005	0866	0867	2150	2151	08F8	08F9	2296	2297
72	Input 2_Knee point correction value 4	07D6	07D7	2006	2007	0868	0869	2152	2153	08FA	08FB	2298	2299
73	Input 2_Knee point correction value 5	07D8	07D9	2008	2009	086A	086B	2154	2155	08FC	08FD	2300	2301

Memory area 8 to 10 data

Low: Low-order High: High-order

No.	Name	Memory area 8 data				Memory area 9 data				Memory area 10 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	Input 1_Set value (SV)	08FE	08FF	2302	2303	0990	0991	2448	2449	0A22	0A23	2594	2595
2	Input 2_Set value (SV)	0900	0901	2304	2305	0992	0993	2450	2451	0A24	0A25	2596	2597
3	Set value (SV) of differential temperature input	0902	0903	2306	2307	0994	0995	2452	2453	0A26	0A27	2598	2599
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	0904	0905	2308	2309	0996	0997	2454	2455	0A28	0A29	2600	2601
5	Event 1 set value (EV1') [low]	0906	0907	2310	2311	0998	0999	2456	2457	0A2A	0A2B	2602	2603
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	0908	0909	2312	2313	099A	099B	2458	2459	0A2C	0A2D	2604	2605
7	Event 2 set value (EV2') [low]	090A	090B	2314	2315	099C	099D	2460	2461	0A2E	0A2F	2606	2607
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	090C	090D	2316	2317	099E	099F	2462	2463	0A30	0A31	2608	2609
9	Event 3 set value (EV3') [low]	090E	090F	2318	2319	09A0	09A1	2464	2465	0A32	0A33	2610	2611
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	0910	0911	2320	2321	09A2	09A3	2466	2467	0A34	0A35	2612	2613
11	Event 4 set value (EV4') [low]	0912	0913	2322	2323	09A4	09A5	2468	2469	0A36	0A37	2614	2615
12	Input 1_Proportional band [heat-side]	0914	0915	2324	2325	09A6	09A7	2470	2471	0A38	0A39	2616	2617
13	Input 1_Integral time [heat-side]	0916	0917	2326	2327	09A8	09A9	2472	2473	0A3A	0A3B	2618	2619
14	Input 1_Derivative time [heat-side]	0918	0919	2328	2329	09AA	09AB	2474	2475	0A3C	0A3D	2620	2621
15	Input 1_Control response parameter	091A	091B	2330	2331	09AC	09AD	2476	2477	0A3E	0A3F	2622	2623
16	Input 1_Proactive intensity	091C	091D	2332	2333	09AE	09AF	2478	2479	0A40	0A41	2624	2625
17	Input 1_Manual reset	091E	091F	2334	2335	09B0	09B1	2480	2481	0A42	0A43	2626	2627
18	Input 1_FF amount	0920	0921	2336	2337	09B2	09B3	2482	2483	0A44	0A45	2628	2629
19	Input 1_Output limiter high [heat-side]	0922	0923	2338	2339	09B4	09B5	2484	2485	0A46	0A47	2630	2631
20	Input 1_Output limiter low [heat-side]	0924	0925	2340	2341	09B6	09B7	2486	2487	0A48	0A49	2632	2633
21	Input 1_Control loop break alarm (LBA) time	0926	0927	2342	2343	09B8	09B9	2488	2489	0A4A	0A4B	2634	2635
22	Input 1_LBA deadband (LBD)	0928	0929	2344	2345	09BA	09BB	2490	2491	0A4C	0A4D	2636	2637
23	Input 2_Proportional band	092A	092B	2346	2347	09BC	09BD	2492	2493	0A4E	0A4F	2638	2639
24	Input 2_Integral time	092C	092D	2348	2349	09BE	09BF	2494	2495	0A50	0A51	2640	2641
25	Input 2_Derivative time	092E	092F	2350	2351	09C0	09C1	2496	2497	0A52	0A53	2642	2643
26	Input 2_Control response parameter	0930	0931	2352	2353	09C2	09C3	2498	2499	0A54	0A55	2644	2645
27	Input 2_Proactive intensity	0932	0933	2354	2355	09C4	09C5	2500	2501	0A56	0A57	2646	2647
28	Input 2_Manual reset	0934	0935	2356	2357	09C6	09C7	2502	2503	0A58	0A59	2648	2649
29	Input 2_FF amount	0936	0937	2358	2359	09C8	09C9	2504	2505	0A5A	0A5B	2650	2651
30	Input 2_Output limiter high	0938	0939	2360	2361	09CA	09CB	2506	2507	0A5C	0A5D	2652	2653
31	Input 2_Output limiter low	093A	093B	2362	2363	09CC	09CD	2508	2509	0A5E	0A5F	2654	2655
32	Input 2_Control loop break alarm (LBA) time	093C	093D	2364	2365	09CE	09CF	2510	2511	0A60	0A61	2656	2657
33	Input 2_LBA deadband (LBD)	093E	093F	2366	2367	09D0	09D1	2512	2513	0A62	0A63	2658	2659
34	Input 1_Proportional band [cool-side]	0940	0941	2368	2369	09D2	09D3	2514	2515	0A64	0A65	2660	2661
35	Input 1_Integral time [cool-side]	0942	0943	2370	2371	09D4	09D5	2516	2517	0A66	0A67	2662	2663
36	Input 1_Derivative time [cool-side]	0944	0945	2372	2373	09D6	09D7	2518	2519	0A68	0A69	2664	2665
37	Input 1_Overlap/Deadband	0946	0947	2374	2375	09D8	09D9	2520	2521	0A6A	0A6B	2666	2667
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	0948	0949	2376	2377	09DA	09DB	2522	2523	0A6C	0A6D	2668	2669
39	Input 1_Output limiter low [cool-side]	094A	094B	2378	2379	09DC	09DD	2524	2525	0A6E	0A6F	2670	2671
40	Select Trigger type for Memory area transfer	094C	094D	2380	2381	09DE	09DF	2526	2527	0A70	0A71	2672	2673
41	Area soak time	094E	094F	2382	2383	09E0	09E1	2528	2529	0A72	0A73	2674	2675
42	Link area number	0950	0951	2384	2385	09E2	09E3	2530	2531	0A74	0A75	2676	2677
43	Input 1_Setting change rate limiter (up)	0952	0953	2386	2387	09E4	09E5	2532	2533	0A76	0A77	2678	2679
44	Input 1_Setting change rate limiter (down)	0954	0955	2388	2389	09E6	09E7	2534	2535	0A78	0A79	2680	2681
45	Input 1_Auto/Manual transfer selection (Area)	0956	0957	2390	2391	09E8	09E9	2536	2537	0A7A	0A7B	2682	2683
46	Input 1_Manipulated output value (Area)	0958	0959	2392	2393	09EA	09EB	2538	2539	0A7C	0A7D	2684	2685
47	Input 2_Setting change rate limiter (up)	095A	095B	2394	2395	09EC	09ED	2540	2541	0A7E	0A7F	2686	2687
48	Input 2_Setting change rate limiter (down)	095C	095D	2396	2397	09EE	09EF	2542	2543	0A80	0A81	2688	2689

Memory area 8 to 10 data

Low: Low-order High: High-order

No.	Name	Memory area 8 data				Memory area 9 data				Memory area 10 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
49	Input 2_Auto/Manual transfer selection (Area)	095E	095F	2398	2399	09F0	09F1	2544	2545	0A82	0A83	2690	2691
50	Input 2_Manipulated output value (Area)	0960	0961	2400	2401	09F2	09F3	2546	2547	0A84	0A85	2692	2693
51	Remote/Local transfer selection (Area)	0962	0963	2402	2403	09F4	09F5	2548	2549	0A86	0A87	2694	2695
52	Input 1_Number of knee point	0964	0965	2404	2405	09F6	09F7	2550	2551	0A88	0A89	2696	2697
53	Input 1_Knee point input value 1	0966	0967	2406	2407	09F8	09F9	2552	2553	0A8A	0A8B	2698	2699
54	Input 1_Knee point input value 2	0968	0969	2408	2409	09FA	09FB	2554	2555	0A8C	0A8D	2700	2701
55	Input 1_Knee point input value 3	096A	096B	2410	2411	09FC	09FD	2556	2557	0A8E	0A8F	2702	2703
56	Input 1_Knee point input value 4	096C	096D	2412	2413	09FE	09FF	2558	2559	0A90	0A91	2704	2705
57	Input 1_Knee point input value 5	096E	096F	2414	2415	0A00	0A01	2560	2561	0A92	0A93	2706	2707
58	Input 1_Knee point correction value 1	0970	0971	2416	2417	0A02	0A03	2562	2563	0A94	0A95	2708	2709
59	Input 1_Knee point correction value 2	0972	0973	2418	2419	0A04	0A05	2564	2565	0A96	0A97	2710	2711
60	Input 1_Knee point correction value 3	0974	0975	2420	2421	0A06	0A07	2566	2567	0A98	0A99	2712	2713
61	Input 1_Knee point correction value 4	0976	0977	2422	2423	0A08	0A09	2568	2569	0A9A	0A9B	2714	2715
62	Input 1_Knee point correction value 5	0978	0979	2424	2425	0A0A	0A0B	2570	2571	0A9C	0A9D	2716	2717
63	Input 2_Number of knee point	097A	097B	2426	2427	0A0C	0A0D	2572	2573	0A9E	0A9F	2718	2719
64	Input 2_Knee point input value 1	097C	097D	2428	2429	0A0E	0A0F	2574	2575	0AA0	0AA1	2720	2721
65	Input 2_Knee point input value 2	097E	097F	2430	2431	0A10	0A11	2576	2577	0AA2	0AA3	2722	2723
66	Input 2_Knee point input value 3	0980	0981	2432	2433	0A12	0A13	2578	2579	0AA4	0AA5	2724	2725
67	Input 2_Knee point input value 4	0982	0983	2434	2435	0A14	0A15	2580	2581	0AA6	0AA7	2726	2727
68	Input 2_Knee point input value 5	0984	0985	2436	2437	0A16	0A17	2582	2583	0AA8	0AA9	2728	2729
69	Input 2_Knee point correction value 1	0986	0987	2438	2439	0A18	0A19	2584	2585	0AAA	0AAB	2730	2731
70	Input 2_Knee point correction value 2	0988	0989	2440	2441	0A1A	0A1B	2586	2587	0AAC	0AAD	2732	2733
71	Input 2_Knee point correction value 3	098A	098B	2442	2443	0A1C	0A1D	2588	2589	0AAE	0AAF	2734	2735
72	Input 2_Knee point correction value 4	098C	098D	2444	2445	0A1E	0A1F	2590	2591	0AB0	0AB1	2736	2737
73	Input 2_Knee point correction value 5	098E	098F	2446	2447	0A20	0A21	2592	2593	0AB2	0AB3	2738	2739

Memory area 11 to 13 data

Low: Low-order High: High-order

No.	Name	Memory area 11 data				Memory area 12 data				Memory area 13 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	Input 1_Set value (SV)	0AB4	0AB5	2740	2741	0B46	0B47	2886	2887	0BD8	0BD9	3032	3033
2	Input 2_Set value (SV)	0AB6	0AB7	2742	2743	0B48	0B49	2888	2889	0BDA	0BDB	3034	3035
3	Set value (SV) of differential temperature input	0AB8	0AB9	2744	2745	0B4A	0B4B	2890	2891	0BDC	0BDD	3036	3037
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	0ABA	0ABB	2746	2747	0B4C	0B4D	2892	2893	0BDE	0BDF	3038	3039
5	Event 1 set value (EV1') [low]	0ABC	0ABD	2748	2749	0B4E	0B4F	2894	2895	0BE0	0BE1	3040	3041
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	0ABE	0ABF	2750	2751	0B50	0B51	2896	2897	0BE2	0BE3	3042	3043
7	Event 2 set value (EV2') [low]	0AC0	0AC1	2752	2753	0B52	0B53	2898	2899	0BE4	0BE5	3044	3045
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	0AC2	0AC3	2754	2755	0B54	0B55	2900	2901	0BE6	0BE7	3046	3047
9	Event 3 set value (EV3') [low]	0AC4	0AC5	2756	2757	0B56	0B57	2902	2903	0BE8	0BE9	3048	3049
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	0AC6	0AC7	2758	2759	0B58	0B59	2904	2905	0BEA	0BEB	3050	3051
11	Event 4 set value (EV4') [low]	0AC8	0AC9	2760	2761	0B5A	0B5B	2906	2907	0BEC	0BED	3052	3053
12	Input 1_Proportional band [heat-side]	0ACA	0ACB	2762	2763	0B5C	0B5D	2908	2909	0BEE	0BEF	3054	3055
13	Input 1_Integral time [heat-side]	0ACC	0ACD	2764	2765	0B5E	0B5F	2910	2911	0BF0	0BF1	3056	3057
14	Input 1_Derivative time [heat-side]	0ACE	0ACF	2766	2767	0B60	0B61	2912	2913	0BF2	0BF3	3058	3059
15	Input 1_Control response parameter	0AD0	0AD1	2768	2769	0B62	0B63	2914	2915	0BF4	0BF5	3060	3061
16	Input 1_Proactive intensity	0AD2	0AD3	2770	2771	0B64	0B65	2916	2917	0BF6	0BF7	3062	3063
17	Input 1_Manual reset	0AD4	0AD5	2772	2773	0B66	0B67	2918	2919	0BF8	0BF9	3064	3065
18	Input 1_FF amount	0AD6	0AD7	2774	2775	0B68	0B69	2920	2921	0BFA	0BFB	3066	3067
19	Input 1_Output limiter high [heat-side]	0AD8	0AD9	2776	2777	0B6A	0B6B	2922	2923	0BFC	0BFD	3068	3069
20	Input 1_Output limiter low [heat-side]	0ADA	0ADB	2778	2779	0B6C	0B6D	2924	2925	0BFE	0BFF	3070	3071
21	Input 1_Control loop break alarm (LBA) time	0ADC	0ADD	2780	2781	0B6E	0B6F	2926	2927	0C00	0C01	3072	3073
22	Input 1_LBA deadband (LBD)	0ADE	0ADF	2782	2783	0B70	0B71	2928	2929	0C02	0C03	3074	3075
23	Input 2_Proportional band	0AE0	0AE1	2784	2785	0B72	0B73	2930	2931	0C04	0C05	3076	3077
24	Input 2_Integral time	0AE2	0AE3	2786	2787	0B74	0B75	2932	2933	0C06	0C07	3078	3079
25	Input 2_Derivative time	0AE4	0AE5	2788	2789	0B76	0B77	2934	2935	0C08	0C09	3080	3081
26	Input 2_Control response parameter	0AE6	0AE7	2790	2791	0B78	0B79	2936	2937	0C0A	0C0B	3082	3083
27	Input 2_Proactive intensity	0AE8	0AE9	2792	2793	0B7A	0B7B	2938	2939	0C0C	0C0D	3084	3085
28	Input 2_Manual reset	0AEA	0AEB	2794	2795	0B7C	0B7D	2940	2941	0C0E	0C0F	3086	3087
29	Input 2_FF amount	0AEC	0AED	2796	2797	0B7E	0B7F	2942	2943	0C10	0C11	3088	3089
30	Input 2_Output limiter high	0AEE	0AEF	2798	2799	0B80	0B81	2944	2945	0C12	0C13	3090	3091
31	Input 2_Output limiter low	0AF0	0AF1	2800	2801	0B82	0B83	2946	2947	0C14	0C15	3092	3093
32	Input 2_Control loop break alarm (LBA) time	0AF2	0AF3	2802	2803	0B84	0B85	2948	2949	0C16	0C17	3094	3095
33	Input 2_LBA deadband (LBD)	0AF4	0AF5	2804	2805	0B86	0B87	2950	2951	0C18	0C19	3096	3097
34	Input 1_Proportional band [cool-side]	0AF6	0AF7	2806	2807	0B88	0B89	2952	2953	0C1A	0C1B	3098	3099
35	Input 1_Integral time [cool-side]	0AF8	0AF9	2808	2809	0B8A	0B8B	2954	2955	0C1C	0C1D	3100	3101
36	Input 1_Derivative time [cool-side]	0AFA	0AFB	2810	2811	0B8C	0B8D	2956	2957	0C1E	0C1F	3102	3103
37	Input 1_Overlap/Deadband	0AFC	0AFD	2812	2813	0B8E	0B8F	2958	2959	0C20	0C21	3104	3105
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	0AFE	0AFF	2814	2815	0B90	0B91	2960	2961	0C22	0C23	3106	3107
39	Input 1_Output limiter low [cool-side]	0B00	0B01	2816	2817	0B92	0B93	2962	2963	0C24	0C25	3108	3109
40	Select Trigger type for Memory area transfer	0B02	0B03	2818	2819	0B94	0B95	2964	2965	0C26	0C27	3110	3111
41	Area soak time	0B04	0B05	2820	2821	0B96	0B97	2966	2967	0C28	0C29	3112	3113
42	Link area number	0B06	0B07	2822	2823	0B98	0B99	2968	2969	0C2A	0C2B	3114	3115
43	Input 1_Setting change rate limiter (up)	0B08	0B09	2824	2825	0B9A	0B9B	2970	2971	0C2C	0C2D	3116	3117
44	Input 1_Setting change rate limiter (down)	0B0A	0B0B	2826	2827	0B9C	0B9D	2972	2973	0C2E	0C2F	3118	3119
45	Input 1_Auto/Manual transfer selection (Area)	0B0C	0B0D	2828	2829	0B9E	0B9F	2974	2975	0C30	0C31	3120	3121
46	Input 1_Manipulated output value (Area)	0B0E	0B0F	2830	2831	0BA0	0BA1	2976	2977	0C32	0C33	3122	3123
47	Input 2_Setting change rate limiter (up)	0B10	0B11	2832	2833	0BA2	0BA3	2978	2979	0C34	0C35	3124	3125
48	Input 2_Setting change rate limiter (down)	0B12	0B13	2834	2835	0BA4	0BA5	2980	2981	0C36	0C37	3126	3127

Memory area 11 to 13 data

Low: Low-order High: High-order

No.	Name	Memory area 11 data				Memory area 12 data				Memory area 13 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
49	Input 2_Auto/Manual transfer selection (Area)	0B14	0B15	2836	2837	0BA6	0BA7	2982	2983	0C38	0C39	3128	3129
50	Input 2_Manipulated output value (Area)	0B16	0B17	2838	2839	0BA8	0BA9	2984	2985	0C3A	0C3B	3130	3131
51	Remote/Local transfer selection (Area)	0B18	0B19	2840	2841	0BAA	0BAB	2986	2987	0C3C	0C3D	3132	3133
52	Input 1_Number of knee point	0B1A	0B1B	2842	2843	0BAC	0BAD	2988	2989	0C3E	0C3F	3134	3135
53	Input 1_Knee point input value 1	0B1C	0B1D	2844	2845	0BAE	0BAF	2990	2991	0C40	0C41	3136	3137
54	Input 1_Knee point input value 2	0B1E	0B1F	2846	2847	0BB0	0BB1	2992	2993	0C42	0C43	3138	3139
55	Input 1_Knee point input value 3	0B20	0B21	2848	2849	0BB2	0BB3	2994	2995	0C44	0C45	3140	3141
56	Input 1_Knee point input value 4	0B22	0B23	2850	2851	0BB4	0BB5	2996	2997	0C46	0C47	3142	3143
57	Input 1_Knee point input value 5	0B24	0B25	2852	2853	0BB6	0BB7	2998	2999	0C48	0C49	3144	3145
58	Input 1_Knee point correction value 1	0B26	0B27	2854	2855	0BB8	0BB9	3000	3001	0C4A	0C4B	3146	3147
59	Input 1_Knee point correction value 2	0B28	0B29	2856	2857	0BBA	0BBB	3002	3003	0C4C	0C4D	3148	3149
60	Input 1_Knee point correction value 3	0B2A	0B2B	2858	2859	0BBC	0BBD	3004	3005	0C4E	0C4F	3150	3151
61	Input 1_Knee point correction value 4	0B2C	0B2D	2860	2861	0BBE	0BBF	3006	3007	0C50	0C51	3152	3153
62	Input 1_Knee point correction value 5	0B2E	0B2F	2862	2863	0BC0	0BC1	3008	3009	0C52	0C53	3154	3155
63	Input 2_Number of knee point	0B30	0B31	2864	2865	0BC2	0BC3	3010	3011	0C54	0C55	3156	3157
64	Input 2_Knee point input value 1	0B32	0B33	2866	2867	0BC4	0BC5	3012	3013	0C56	0C57	3158	3159
65	Input 2_Knee point input value 2	0B34	0B35	2868	2869	0BC6	0BC7	3014	3015	0C58	0C59	3160	3161
66	Input 2_Knee point input value 3	0B36	0B37	2870	2871	0BC8	0BC9	3016	3017	0C5A	0C5B	3162	3163
67	Input 2_Knee point input value 4	0B38	0B39	2872	2873	0BCA	0BCB	3018	3019	0C5C	0C5D	3164	3165
68	Input 2_Knee point input value 5	0B3A	0B3B	2874	2875	0BCC	0BCD	3020	3021	0C5E	0C5F	3166	3167
69	Input 2_Knee point correction value 1	0B3C	0B3D	2876	2877	0BCE	0BCF	3022	3023	0C60	0C61	3168	3169
70	Input 2_Knee point correction value 2	0B3E	0B3F	2878	2879	0BD0	0BD1	3024	3025	0C62	0C63	3170	3171
71	Input 2_Knee point correction value 3	0B40	0B41	2880	2881	0BD2	0BD3	3026	3027	0C64	0C65	3172	3173
72	Input 2_Knee point correction value 4	0B42	0B43	2882	2883	0BD4	0BD5	3028	3029	0C66	0C67	3174	3175
73	Input 2_Knee point correction value 5	0B44	0B45	2884	2885	0BD6	0BD7	3030	3031	0C68	0C69	3176	3177

Memory area 14 to 16 data

Low: Low-order High: High-order

No.	Name	Memory area 14 data				Memory area 15 data				Memory area 16 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	Input 1_Set value (SV)	0C6A	0C6B	3178	3179	0CFC	0CFD	3324	3325	0D8E	0D8F	3470	3471
2	Input 2_Set value (SV)	0C6C	0C6D	3180	3181	0CFE	0CFF	3326	3327	0D90	0D91	3472	3473
3	Set value (SV) of differential temperature input	0C6E	0C6F	3182	3183	0D00	0D01	3328	3329	0D92	0D93	3474	3475
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	0C70	0C71	3184	3185	0D02	0D03	3330	3331	0D94	0D95	3476	3477
5	Event 1 set value (EV1') [low]	0C72	0C73	3186	3187	0D04	0D05	3332	3333	0D96	0D97	3478	3479
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	0C74	0C75	3188	3189	0D06	0D07	3334	3335	0D98	0D99	3480	3481
7	Event 2 set value (EV2') [low]	0C76	0C77	3190	3191	0D08	0D09	3336	3337	0D9A	0D9B	3482	3483
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	0C78	0C79	3192	3193	0D0A	0D0B	3338	3339	0D9C	0D9D	3484	3485
9	Event 3 set value (EV3') [low]	0C7A	0C7B	3194	3195	0D0C	0D0D	3340	3341	0D9E	0D9F	3486	3487
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	0C7C	0C7D	3196	3197	0D0E	0D0F	3342	3343	0DA0	0DA1	3488	3489
11	Event 4 set value (EV4') [low]	0C7E	0C7F	3198	3199	0D10	0D11	3344	3345	0DA2	0DA3	3490	3491
12	Input 1_Proportional band [heat-side]	0C80	0C81	3200	3201	0D12	0D13	3346	3347	0DA4	0DA5	3492	3493
13	Input 1_Integral time [heat-side]	0C82	0C83	3202	3203	0D14	0D15	3348	3349	0DA6	0DA7	3494	3495
14	Input 1_Derivative time [heat-side]	0C84	0C85	3204	3205	0D16	0D17	3350	3351	0DA8	0DA9	3496	3497
15	Input 1_Control response parameter	0C86	0C87	3206	3207	0D18	0D19	3352	3353	0DAA	0DAB	3498	3499
16	Input 1_Proactive intensity	0C88	0C89	3208	3209	0D1A	0D1B	3354	3355	0DAC	0DAD	3500	3501
17	Input 1_Manual reset	0C8A	0C8B	3210	3211	0D1C	0D1D	3356	3357	0DAE	0DAF	3502	3503
18	Input 1_FF amount	0C8C	0C8D	3212	3213	0D1E	0D1F	3358	3359	0DB0	0DB1	3504	3505
19	Input 1_Output limiter high [heat-side]	0C8E	0C8F	3214	3215	0D20	0D21	3360	3361	0DB2	0DB3	3506	3507
20	Input 1_Output limiter low [heat-side]	0C90	0C91	3216	3217	0D22	0D23	3362	3363	0DB4	0DB5	3508	3509
21	Input 1_Control loop break alarm (LBA) time	0C92	0C93	3218	3219	0D24	0D25	3364	3365	0DB6	0DB7	3510	3511
22	Input 1_LBA deadband (LBD)	0C94	0C95	3220	3221	0D26	0D27	3366	3367	0DB8	0DB9	3512	3513
23	Input 2_Proportional band	0C96	0C97	3222	3223	0D28	0D29	3368	3369	0DBA	0DBB	3514	3515
24	Input 2_Integral time	0C98	0C99	3224	3225	0D2A	0D2B	3370	3371	0DBC	0DBD	3516	3517
25	Input 2_Derivative time	0C9A	0C9B	3226	3227	0D2C	0D2D	3372	3373	0DBE	0DBF	3518	3519
26	Input 2_Control response parameter	0C9C	0C9D	3228	3229	0D2E	0D2F	3374	3375	0DC0	0DC1	3520	3521
27	Input 2_Proactive intensity	0C9E	0C9F	3230	3231	0D30	0D31	3376	3377	0DC2	0DC3	3522	3523
28	Input 2_Manual reset	0CA0	0CA1	3232	3233	0D32	0D33	3378	3379	0DC4	0DC5	3524	3525
29	Input 2_FF amount	0CA2	0CA3	3234	3235	0D34	0D35	3380	3381	0DC6	0DC7	3526	3527
30	Input 2_Output limiter high	0CA4	0CA5	3236	3237	0D36	0D37	3382	3383	0DC8	0DC9	3528	3529
31	Input 2_Output limiter low	0CA6	0CA7	3238	3239	0D38	0D39	3384	3385	0DCA	0DCB	3530	3531
32	Input 2_Control loop break alarm (LBA) time	0CA8	0CA9	3240	3241	0D3A	0D3B	3386	3387	0DCC	0DCD	3532	3533
33	Input 2_LBA deadband (LBD)	0CAA	0CAB	3242	3243	0D3C	0D3D	3388	3389	0DCE	0DCF	3534	3535
34	Input 1_Proportional band [cool-side]	0CAC	0CAD	3244	3245	0D3E	0D3F	3390	3391	0DD0	0DD1	3536	3537
35	Input 1_Integral time [cool-side]	0CAE	0CAF	3246	3247	0D40	0D41	3392	3393	0DD2	0DD3	3538	3539
36	Input 1_Derivative time [cool-side]	0CB0	0CB1	3248	3249	0D42	0D43	3394	3395	0DD4	0DD5	3540	3541
37	Input 1_Overlap/Deadband	0CB2	0CB3	3250	3251	0D44	0D45	3396	3397	0DD6	0DD7	3542	3543
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	0CB4	0CB5	3252	3253	0D46	0D47	3398	3399	0DD8	0DD9	3544	3545
39	Input 1_Output limiter low [cool-side]	0CB6	0CB7	3254	3255	0D48	0D49	3400	3401	0DDA	0DDB	3546	3547
40	Select Trigger type for Memory area transfer	0CB8	0CB9	3256	3257	0D4A	0D4B	3402	3403	0DDC	0DDD	3548	3549
41	Area soak time	0CBA	0CBB	3258	3259	0D4C	0D4D	3404	3405	0DDE	0DDF	3550	3551
42	Link area number	0CBC	0CBD	3260	3261	0D4E	0D4F	3406	3407	0DE0	0DE1	3552	3553
43	Input 1_Setting change rate limiter (up)	0CBE	0CBF	3262	3263	0D50	0D51	3408	3409	0DE2	0DE3	3554	3555
44	Input 1_Setting change rate limiter (down)	0CC0	0CC1	3264	3265	0D52	0D53	3410	3411	0DE4	0DE5	3556	3557
45	Input 1_Auto/Manual transfer selection (Area)	0CC2	0CC3	3266	3267	0D54	0D55	3412	3413	0DE6	0DE7	3558	3559
46	Input 1_Manipulated output value (Area)	0CC4	0CC5	3268	3269	0D56	0D57	3414	3415	0DE8	0DE9	3560	3561
47	Input 2_Setting change rate limiter (up)	0CC6	0CC7	3270	3271	0D58	0D59	3416	3417	0DEA	0DEB	3562	3563
48	Input 2_Setting change rate limiter (down)	0CC8	0CC9	3272	3273	0D5A	0D5B	3418	3419	0DEC	0DED	3564	3565

Memory area 14 to 16 data

Low: Low-order High: High-order

No.	Name	Memory area 14 data				Memory area 15 data				Memory area 16 data			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
49	Input 2_Auto/Manual transfer selection (Area)	0CCA	0CCB	3274	3275	0D5C	0D5D	3420	3421	0DEE	0DEF	3566	3567
50	Input 2_Manipulated output value (Area)	0CCC	0CCD	3276	3277	0D5E	0D5F	3422	3423	0DF0	0DF1	3568	3569
51	Remote/Local transfer selection (Area)	0CCE	0CCF	3278	3279	0D60	0D61	3424	3425	0DF2	0DF3	3570	3571
52	Input 1_Number of knee point	0CD0	0CD1	3280	3281	0D62	0D63	3426	3427	0DF4	0DF5	3572	3573
53	Input 1_Knee point input value 1	0CD2	0CD3	3282	3283	0D64	0D65	3428	3429	0DF6	0DF7	3574	3575
54	Input 1_Knee point input value 2	0CD4	0CD5	3284	3285	0D66	0D67	3430	3431	0DF8	0DF9	3576	3577
55	Input 1_Knee point input value 3	0CD6	0CD7	3286	3287	0D68	0D69	3432	3433	0DFA	0DFB	3578	3579
56	Input 1_Knee point input value 4	0CD8	0CD9	3288	3289	0D6A	0D6B	3434	3435	0DFC	0DFD	3580	3581
57	Input 1_Knee point input value 5	0CDA	0CDB	3290	3291	0D6C	0D6D	3436	3437	0DFE	0DFF	3582	3583
58	Input 1_Knee point correction value 1	0CDC	0CDD	3292	3293	0D6E	0D6F	3438	3439	0E00	0E01	3584	3585
59	Input 1_Knee point correction value 2	0CDE	0CDF	3294	3295	0D70	0D71	3440	3441	0E02	0E03	3586	3587
60	Input 1_Knee point correction value 3	0CE0	0CE1	3296	3297	0D72	0D73	3442	3443	0E04	0E05	3588	3589
61	Input 1_Knee point correction value 4	0CE2	0CE3	3298	3299	0D74	0D75	3444	3445	0E06	0E07	3590	3591
62	Input 1_Knee point correction value 5	0CE4	0CE5	3300	3301	0D76	0D77	3446	3447	0E08	0E09	3592	3593
63	Input 2_Number of knee point	0CE6	0CE7	3302	3303	0D78	0D79	3448	3449	0E0A	0E0B	3594	3595
64	Input 2_Knee point input value 1	0CE8	0CE9	3304	3305	0D7A	0D7B	3450	3451	0E0C	0E0D	3596	3597
65	Input 2_Knee point input value 2	0CEA	0CEB	3306	3307	0D7C	0D7D	3452	3453	0E0E	0E0F	3598	3599
66	Input 2_Knee point input value 3	0CEC	0CED	3308	3309	0D7E	0D7F	3454	3455	0E10	0E11	3600	3601
67	Input 2_Knee point input value 4	0CEE	0CEF	3310	3311	0D80	0D81	3456	3457	0E12	0E13	3602	3603
68	Input 2_Knee point input value 5	0CF0	0CF1	3312	3313	0D82	0D83	3458	3459	0E14	0E15	3604	3605
69	Input 2_Knee point correction value 1	0CF2	0CF3	3314	3315	0D84	0D85	3460	3461	0E16	0E17	3606	3607
70	Input 2_Knee point correction value 2	0CF4	0CF5	3316	3317	0D86	0D87	3462	3463	0E18	0E19	3608	3609
71	Input 2_Knee point correction value 3	0CF6	0CF7	3318	3319	0D88	0D89	3464	3465	0E1A	0E1B	3610	3611
72	Input 2_Knee point correction value 4	0CF8	0CF9	3320	3321	0D8A	0D8B	3466	3467	0E1C	0E1D	3612	3613
73	Input 2_Knee point correction value 5	0CFA	0CFB	3322	3323	0D8C	0D8D	3468	3469	0E1E	0E1F	3614	3615

6.3.3 Data mapping address [Modbus double word]

Necessary data can be read/written at one time by assigning any desired data (max. 32) continuously.

☞ For the Data mapping, refer to the **5.8 How to Use Modbus Data Mapping (P. 5-15)**.

■ Register address for data designation

No.	Name	Registeraddress				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
1	Register address setting 1 [Read/write address: Low-order word 1500H, high-order word 1501H]	1000	1001	4096	4097	R/W	Set the register address of data to be assigned to 1500H to 153FH Decimal number: −1 to 20479 (−1: Without mapping) Hexadecimal numeral: FFFFH to 4FFFH (FFFFH: Without mapping) The register addresses for data designation (1000H to 103FH) and read/write (1500H to 153FH) will be invalid (without mapping), even if set.	−1
2	Register address setting 2 [Read/write address: Low-order word 1502H, high-order word 1503H]	1002	1003	4098	4099	R/W		−1
3	Register address setting 3 [Read/write address: Low-order word 1504H, high-order word 1505H]	1004	1005	4100	4101	R/W		−1
4	Register address setting 4 [Read/write address: Low-order word 1506H, high-order word 1507H]	1006	1007	4102	4103	R/W		−1
5	Register address setting 5 [Read/write address: Low-order word 1508H, high-order word 1509H]	1008	1009	4104	4105	R/W		−1
6	Register address setting 6 [Read/write address: Low-order word 150AH, high-order word 150BH]	100A	100B	4106	4107	R/W		−1
7	Register address setting 7 [Read/write address: Low-order word 150CH, high-order word 150DH]	100C	100D	4108	4109	R/W		−1
8	Register address setting 8 [Read/write address: Low-order word 150EH, high-order word 150FH]	100E	100F	4110	4111	R/W		−1
9	Register address setting 9 [Read/write address: Low-order word 1510H, high-order word 1511H]	1010	1011	4112	4113	R/W		−1
10	Register address setting 10 [Read/write address: Low-order word 1512H, high-order word 1513H]	1012	1013	4114	4115	R/W		−1
11	Register address setting 11 [Read/write address: Low-order word 1514H, high-order word 1515H]	1014	1015	4116	4117	R/W		−1
12	Register address setting 12 [Read/write address: Low-order word 1516H, high-order word 1517H]	1016	1017	4118	4119	R/W		−1

No.	Name	Registeraddress				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
13	Register address setting 13 [Read/write address: Low-order word 1518H, high-order word 1519H]	1018	1019	4120	4121	R/W	Set the register address of data to be assigned to 1500H to 153FH Decimal number: −1 to 20479 (−1: Without mapping) Hexadecimal numeral: FFFFH to 4FFFH (FFFFH: Without mapping) The register addresses for data designation (1000H to 103FH) and read/write (1500H to 153FH) will be invalid (without mapping), even if set.	−1
14	Register address setting 14 [Read/write address: Low-order word 151AH, high-order word 151BH]	101A	101B	4122	4123	R/W		−1
15	Register address setting 15 [Read/write address: Low-order word 151CH, high-order word 151DH]	101C	101D	4124	4125	R/W		−1
16	Register address setting 16 [Read/write address: Low-order word 151EH, high-order word 151FH]	101E	101F	4126	4127	R/W		−1
17	Register address setting 17 [Read/write address: Low-order word 1520H, high-order word 1521H]	1020	1021	4128	4129	R/W		−1
18	Register address setting 18 [Read/write address: Low-order word 1522H, high-order word 1523H]	1022	1023	4130	4131	R/W		−1
19	Register address setting 19 [Read/write address: Low-order word 1524H, high-order word 1525H]	1024	1025	4132	4133	R/W		−1
20	Register address setting 20 [Read/write address: Low-order word 1526H, high-order word 1527H]	1026	1027	4134	4135	R/W		−1
21	Register address setting 21 [Read/write address: Low-order word 1528H, high-order word 1529H]	1028	1029	4136	4137	R/W		−1
22	Register address setting 22 [Read/write address: Low-order word 152AH, high-order word 152BH]	102A	102B	4138	4139	R/W		−1
23	Register address setting 23 [Read/write address: Low-order word 152CH, high-order word 152DH]	102C	102D	4140	4141	R/W		−1
24	Register address setting 24 [Read/write address: Low-order word 152EH, high-order word 152FH]	102E	102F	4142	4143	R/W		−1
25	Register address setting 25 [Read/write address: Low-order word 1530H, high-order word 1531H]	1030	1031	4144	4145	R/W		−1
26	Register address setting 26 [Read/write address: Low-order word 1532H, high-order word 1533H]	1032	1033	4146	4147	R/W		−1
27	Register address setting 27 [Read/write address: Low-order word 1534H, high-order word 1535H]	1034	1035	4148	4149	R/W		−1

No.	Name	Registeraddress				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
28	Register address setting 28 [Read/write address: Low-order word 1536H, high-order word 1537H]	1036	1037	4150	4151	R/W	Set the register address of data to be assigned to 1500H to 153FH Decimal number: −1 to 20479 (−1: Without mapping) Hexadecimal numeral: FFFFH to 4FFFH (FFFFH: Without mapping) The register addresses for data designation (1000H to 103FH) and read/write (1500H to 153FH) will be invalid (without mapping), even if set.	−1
29	Register address setting 29 [Read/write address: Low-order word 1538H, high-order word 1539H]	1038	1039	4152	4153	R/W		−1
30	Register address setting 30 [Read/write address: Low-order word 153AH, high-order word 153BH]	103A	103B	4154	4155	R/W		−1
31	Register address setting 31 [Read/write address: Low-order word 153CH, high-order word 153DH]	103C	103D	4156	4157	R/W		−1
32	Register address setting 32 [Read/write address: Low-order word 153EH, high-order word 153FH]	103E	103F	4158	4159	R/W		−1

■ Register address for data read/write

No.	Name	Registeraddress				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
1	Data specified Register address setting 1 (Low-order word 1000H, high-order word 1001H)	1500	1501	5376	5377			
2	Data specified Register address setting 2 (Low-order word 1002H, high-order word 1003H)	1502	1503	5378	5379			
3	Data specified Register address setting 3 (Low-order word 1004H, high-order word 1005H)	1504	1505	5380	5381			
4	Data specified Register address setting 4 (Low-order word 1006H, high-order word 1007H)	1506	1507	5382	5383			
5	Data specified Register address setting 5 (Low-order word 1008H, high-order word 1009H)	1508	1509	5384	5385			
6	Data specified Register address setting 6 (Low-order word 100AH, high-order word 100BH)	150A	150B	5386	5387			
7	Data specified Register address setting 7 (Low-order word 100CH, high-order word 100DH)	150C	150D	5388	5389			
8	Data specified Register address setting 8 (Low-order word 100EH, high-order word 100FH)	150E	150F	5390	5391			
9	Data specified Register address setting 9 (Low-order word 1010H, high-order word 1011H)	1510	1511	5392	5393		Based on the data specified at 1000H to 103FH.	
10	Data specified Register address setting 10 (Low-order word 1012H, high-order word 1013H)	1512	1513	5394	5395			
11	Data specified Register address setting 11 (Low-order word 1014H, high-order word 1015H)	1514	1515	5396	5397			
12	Data specified Register address setting 12 (Low-order word 1016H, high-order word 1017H)	1516	1517	5398	5399			
13	Data specified Register address setting 13 (Low-order word 1018H, high-order word 1019H)	1518	1519	5400	5401			
14	Data specified Register address setting 14 (Low-order word 101AH, high-order word 101BH)	151A	151B	5402	5403			
15	Data specified Register address setting 15 (Low-order word 101CH, high-order word 101DH)	151C	151D	5404	5405			
16	Data specified Register address setting 16 (Low-order word 101EH, high-order word 101FH)	151E	151F	5406	5407			

No.	Name	Registeraddress				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
17	Data specified Register address setting 17 (Low-order word 1020H, high-order word 1021H)	1520	1521	5408	5409			
18	Data specified Register address setting 18 (Low-order word 1022H, high-order word 1023H)	1522	1523	5410	5411			
19	Data specified Register address setting 19 (Low-order word 1024H, high-order word 1025H)	1524	1525	5412	5413			
20	Data specified Register address setting 20 (Low-order word 1026H, high-order word 1027H)	1526	1527	5414	5415			
21	Data specified Register address setting 21 (Low-order word 1028H, high-order word 1029H)	1528	1529	5416	5417			
22	Data specified Register address setting 22 (Low-order word 102AH, high-order word 102BH)	152A	152B	5418	5419			
23	Data specified Register address setting 23 (Low-order word 102CH, high-order word 102DH)	152C	152D	5420	5421			
24	Data specified Register address setting 24 (Low-order word 102EH, high-order word 102FH)	152E	152F	5422	5423			
25	Data specified Register address setting 25 (Low-order word 1030H, high-order word 1031H)	1530	1531	5424	5425		Based on the data specified at 1000H to 103FH.	
26	Data specified Register address setting 26 (Low-order word 1032H, high-order word 1033H)	1532	1533	5426	5427			
27	Data specified Register address setting 27 (Low-order word 1034H, high-order word 1035H)	1534	1535	5428	5429			
28	Data specified Register address setting 28 (Low-order word 1036H, high-order word 1037H)	1536	1537	5430	5431			
29	Data specified Register address setting 29 (Low-order word 1038H, high-order word 1039H)	1538	1539	5432	5433			
30	Data specified Register address setting 30 (Low-order word 103AH, high-order word 103BH)	153A	153B	5434	5435			
31	Data specified Register address setting 31 (Low-order word 103CH, high-order word 103DH)	153C	153D	5436	5437			
32	Data specified Register address setting 32 (Low-order word 103EH, high-order word 103FH)	153E	153F	5438	5439			

6.3.4 HA series equivalent communication data [RKC communication identifier/Modbus double word]

Below is a table of the HA series equivalent RKC communication identifiers and register address of Modbus.

The "HA series equivalent communication data" means the data of our HA series controllers compatible with the data of GZ400/900.

The data is HA series equivalent when the Input data type is set to "2."

For the Input data type, refer to the **3.2 Selection of Communication Data Type (P. 3-5)**.

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
1	Input 1_Measured value (PV) [Input 1_measured value (PV1) monitor]	**M1**	7	0000	0001	0	1	RO	Input 1_Input range low – (Input 1_5 % of input span or more) to Input 1_Input range high + (Input 1_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—
2	Input 2_Measured value (PV) [Input 2_measured value (PV2) monitor]	**M0**	7	0002	0003	2	3	RO	Input 2_Input range low – (Input 2_5 % of input span or more) to Input 2_Input range high + (Input 2_5 % of input span or more) [Varies with the setting of the Decimal point position.]	—
3	Dummy data (Feedback resistance input value monitor)	**M2**	7	0004	0005	4	5	R/W	The read data is "0." When data is written, a normal response message will be returned to the all of the values, but "0" will be written.	0
4	Current transformer 1 (CT1) input value monitor [Current transformer input value 1 (CT1) monitor]	**M3**	7	0006	0007	6	7	RO	0.0 to 100.0 A In case of Input data type "2," it is "Second current transformer input value (CT2)" of our REX-D equivalent parameter.	—
5	Current transformer 2 (CT2) input value monitor [Current transformer input value 2 (CT2) monitor]	**M4**	7	0008	0009	8	9	RO	0.0 to 100.0 A	—
6	Input 1_Set value (SV) monitor [Input 1_set value (SV1) monitor]	**MS**	7	000A	000B	10	11	RO	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	—
7	Input 2_Set value (SV) monitor [Input 2_set value (SV2) monitor]	**MT**	7	000C	000D	12	13	RO	Input 2_Setting limiter low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
8	Remote setting input value monitor [Remote input value monitor]	**S2**	7	000E	000F	14	15	RO	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	—
9	Dummy data (Cascade monitor)	**KH**	7	0010	0011	16	17	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
10	Input 1_Burnout state monitor [Input 1_burnout state]	**B1**	7	0012	0013	18	19	RO	0: OFF 1: ON	—
11	Input 2_Burnout state monitor [Input 2_burnout state]	**B0**	7	0014	0015	20	21	RO	0: OFF 1: ON	—
12	Dummy data (Feedback resistance input burnout state)	**B2**	7	0016	0017	22	23	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
13	Event 1 state monitor [Event 1 state]	**AA**	7	0018	0019	24	25	RO	0: OFF 1: ON	—
14	Event 2 state monitor [Event 2 state]	**AB**	7	001A	001B	26	27	RO	0: OFF 1: ON	—
15	Event 3 state monitor [Event 3 state]	**AC**	7	001C	001D	28	29	RO	0: OFF 1: ON	—
16	Event 4 state monitor [Event 4 state]	**AD**	7	001E	001F	30	31	RO	0: OFF 1: ON	—
17	Heater break alarm 1 (HBA1) state monitor [Heater break alarm 1 (HBA1) state]	**AE**	7	0020	0021	32	33	RO	0: OFF 1: ON	—
18	Heater break alarm 2 (HBA2) state monitor [Heater break alarm 2 (HBA2) state]	**AF**	7	0022	0023	34	35	RO	0: OFF 1: ON	—
19	Input 1_Manipulated output value monitor [heat-side] [Input 1_manipulated output value (MV1) monitor]	**O1**	7	0024	0025	36	37	RO	−5.0 to +105.0 %	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
20	Input 2_Manipulated output value monitor [Input 2_manipulated output value (MV2) monitor]	**O0**	7	0026	0027	38	39	RO	−5.0 to +105.0 %	—
21	Error code	**ER**	7	0028	0029	40	41	RO	0 to 71 0: Normal +1: Adjustment data error +2: Data back-up error +4: A/D conversion error (Temperature compensation error included) +64: Display units error When multiple items are applicable, they are summed up.	—
22	DI state monitor [Event input (DI) state]	**L1**	7	002A	002B	42	43	RO	RKC communication The DI state is assigned as a bit image in binary numbers. Bit 0: DI1 Bit 1: DI2 Bit 2: DI3 Bit 3: DI4 Bit 4: DI5 Bit 5: DI6 Bit 6 to Bit 7: Unused Data 0: Open 1: Closed	
									Modbus 0 to 63 0: Open +1: DI1 Closed +2: DI2 Closed +4: DI3 Closed +8: DI4 Closed +16: DI5 Closed +32: DI6 Closed When multiple items are applicable, they are summed up.	

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
23	Overall operation status [Operation mode state]	**L0**	7	002C	002D	44	45	RO	0 to 511 0: OFF +1: STOP state +2: Input 1_Manual mode state +4: Input 2_Manual mode state +8: Remote mode state (Differential temperature control state, Input 2 state of Control with PV select) +16: Input 1_Autotuning (AT) state +32: Input 2_Autotuning (AT) state +64: Set value of Input 1 is now changing +128: Set value of Input 2 is now changing +256: Communication monitoring result When multiple items are applicable, they are summed up.	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
24	Memory area soak time monitor	**TR**	7	002E	002F	46	47	RO	In case of Input data type 0 or 2 • RKC communication 0 hours 00 minutes 00 seconds to 9 hours 59 minutes 59 seconds 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus 0 to 35999 seconds 0 to 5999 minutes 0 to 11999 seconds 0 to 5999 (10 ms) (Calculation is performed every 50 ms.) [Data range of Memory area soak time monitor can be selected on the Soak time unit.]	—
									In case of Input data type 1 • RKC communication 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds 0 to 5999 (10 ms) (Calculation is performed every 50 ms.) [Data range of Memory area soak time monitor can be selected on the Soak time unit.]	—
25	Input 1_Autotuning (AT) [Input 1_PID/AT transfer]	**G1**	7	0030	0031	48	49	R/W	0: PID control 1: Start Autotuning When the Autotuning (AT) is finished, the control will automatically return to “0.”	0
26	Input 2_Autotuning (AT) [Input 2_PID/AT transfer]	**G0**	7	0032	0033	50	51	R/W	0: PID control 1: Start Autotuning When the Autotuning (AT) is finished, the control will automatically return to “0.”	0
27	Input 1_Auto/Manual transfer	**J1**	7	0034	0035	52	53	R/W	0: Auto mode 1: Manual mode	0
28	Input 2_Auto/Manual transfer	**J0**	7	0036	0037	54	55	R/W	0: Auto mode 1: Manual mode	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
29	Remote/Local transfer	**C1**	7	0038	0039	56	57	R/W	When Select function for input 2 is: “Remote setting input” 0: Local mode 1: Remote mode	0
									When Select function for input 2 is: “Control with PV select” 0: Input 1 1: Input 2 When “Switching by level” is selected at “Selection of PV select trigger,” the parameter becomes RO (Read only).	0
									When Select function for input 2 is: “2-loop control/Differential temperature control” 0: 2-loop control 1: Differential temperature control	0
30	RUN/STOP transfer	**SR**	7	003A	003B	58	59	R/W	0: RUN (Control start) 1: STOP (Control stop)	0
31	Memory area transfer [Memory area selection]	**ZA**	7	003C	003D	60	61	R/W	1 to 16 When the DI1 function selection is set to “Memory area transfer (Without area set signal)” and when “External mode” is selected with the Control area Local/External transfer, the data is RO (Read only).	1

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
32	Event 1 set value (EV1) [Event 1 set value] When Event 1 type is either high or low limit with individual setting: Event 1 set value (EV1) [high] ★	**A1**	7	003E	003F	62	63	R/W	• Deviation When assigned to Input 1 or Differential temperature input − (Input 1_Input span) to + (Input 1_Input span) When assigned to Input 2 − (Input 2_Input span) to + (Input 2_Input span) When Control with PV select is selected at Select function for input 2 − (PV select input span) to + (PV select input span) [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 10 V/I inputs: 5 % of input span
									• Input value or Set value When assigned to Input 1 Input 1_Input range low to Input 1_Input range high When assigned to Input 2 Input 2_Input range low to Input 2_Input range high When assigned to Differential temperature input − (Input 1_Input span) to + (Input 1_Input span) When Control with PV select is selected at Select function for input 2 PV select input range low to PV select input range high [Varies with the setting of the Decimal point position.]	
									• Manipulated output value −5.0 to +105.0 %	50.0
33	Event 2 set value (EV2) [Event 2 set value] When Event 2 type is either high or low limit with individual setting: Event 2 set value (EV2) [high] ★	**A2**	7	0040	0041	64	65	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
34	Event 3 set value (EV3) [Event 3 set value] When Event 3 type is either high or low limit with individual setting: Event 3 set value (EV3) [high] ★	**A3**	7	0042	0043	66	67	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
35	Input 1_Control loop break alarm (LBA) time [Control loop break alarm 1 (LBA1) time] ★	**A5**	7	0044	0045	68	69	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0
36	Input 1_LBA deadband (LBD) [LBA1 deadband] ★	**N1**	7	0046	0047	70	71	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.]	0
37	Event 4 set value (EV4) [Event 4 set value] When Event 4 type is either high or low limit with individual setting: Event 4 set value (EV4) [high] ★	**A4**	7	0048	0049	72	73	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
38	Input 2_Control loop break alarm (LBA) time [Control loop break alarm 2 (LBA2) time] ★	**A6**	7	004A	004B	74	75	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
39	Input 2_LBA deadband (LBD) [LBA2 deadband] ★	**N2**	7	004C	004D	76	77	R/W	0 to Input 2_Input span [Varies with the setting of the Decimal point position.]	0
40	Input 1_Set value (SV) [Input 1_set value (SV1)] ★	**S1**	7	004E	004F	78	79	R/W	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	0
41	Input 1_Proportional band [heat-side] [Input 1_proportional band] ★	**P1**	7	0050	0051	80	81	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 1000.0 % of Input 1_Input span (When Control with PV select: 0.0 to 1000.0 % of PV select input span) 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0
42	Input 1_Integral time [heat-side] [Input 1_integral time] ★	**I1**	7	0052	0053	82	83	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240.00
43	Input 1_Derivative time [heat-side] [Input 1_derivative time] ★	**D1**	7	0054	0055	84	85	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60.00
44	Input 1_Control response parameter ★	**CA**	7	0056	0057	86	87	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	PID control: 0 Heat/Cool PID control: 2
45	Undefined registers	—	—	0058	0059	88	89	—	—	—
46	Input 2_Set value (SV) [Input 2_set value (SV2)] ★	**S0**	7	005A	005B	90	91	R/W	Input 2_Setting limiter low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
47	Input 2_Proportional band ★	**P0**	7	005C	005D	92	93	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 1000.0 % of Input 2_Input span 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0
48	Input 2_Integral time ★	**I0**	7	005E	005F	94	95	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240.00
49	Input 2_Derivative time ★	**D0**	7	0060	0061	96	97	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60.00
50	Input 2_Control response parameter ★	**C9**	7	0062	0063	98	99	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	0
51	Undefined registers	**—**	—	0064	0065	100	101	—	—	—
52	Input 1_Setting change rate limiter (up) ★	**HH**	7	0066	0067	102	103	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: No function [Varies with the setting of the Decimal point position.]	0
53	Input 1_Setting change rate limiter (down) ★	**HL**	7	0068	0069	104	105	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: No function [Varies with the setting of the Decimal point position.]	0
54	Input 2_Setting change rate limiter (up) ★	**HX**	7	006A	006B	106	107	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
55	Input 2_Setting change rate limiter (down) ★	**HY**	7	006C	006D	108	109	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0
56	Area soak time ★	**TM**	7	006E	006F	110	111	R/W	In case of Input data type 0 or 2 • RKC communication 0 hours 00 minutes 00 seconds to 9 hours 59 minutes 59 seconds 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus 0 to 35999 seconds 0 to 5999 minutes 0 to 11999 seconds 0 to 5999 (10 ms) (Calculation is performed every 50 ms.) [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0.00 seconds) Modbus: 0
									In case of Input data type 1 • RKC communication 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds 0 to 5999 (10 ms) (Calculation is performed every 50 ms.) [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0.00 seconds) Modbus: 0
57	Link area number ★	**LP**	7	0070	0071	112	113	R/W	0 to 16 0: No function	0
58	Heater break alarm 1 (HBA1) set value	**A7**	7	0072	0073	114	115	R/W	0.0 to 100.0 A 0.0: HBA function OFF	0.0
59	Heater break alarm 2 (HBA2) set value	**A8**	7	0074	0075	116	117	R/W	0.0 to 100.0 A 0.0: HBA function OFF	0.0
60	Input 1_PV bias	**PB**	7	0076	0077	118	119	R/W	– (Input 1_Input span) to + (Input 1_Input span) (When Control with PV select: – (PV select input span) to + (PV select input span)) [Varies with the setting of the Decimal point position.]	0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
61	Input 1_PV digital filter	**F1**	7	0078	0079	120	121	R/W	0.00 to 10.00 seconds 0.00: Filter OFF	0.00
62	Input 1_PV ratio	**PR**	7	007A	007B	122	123	R/W	0.500 to 1.500	1.000
63	Input 1_PV low input cut-off	**DP**	7	007C	007D	124	125	R/W	0.00 to 25.00 % of Input 1_Input span (When Control with PV select: 0.00 to 25.00 % of PV select input span)	0.00
64	OUT1 proportional cycle time [Input 1_proportional cycle time]	**T0**	7	007E	007F	126	127	R/W	0.1 to 100.0 seconds	Relay contact output: 20.0 Voltage pulse output, Transistor output: Note1
65	Input 1_Manual manipulated output value [Input 1_manual output value]	**ON**	7	0080	0081	128	129	R/W	PID control Input 1_Output limiter low [heat-side] to Input 1_Output limiter high [heat-side] Heat/Cool PID control * −(Input 1_Output limiter high [cool-side]) to +(Input 1_Output limiter high [heat-side])	PID control: −5.0 Heat/Cool PID control: 0.0
66	Input 2_PV bias (RS bias)	**PA**	7	0082	0083	130	131	R/W	−(Input 2_Input span) to +(Input 2_Input span) [Varies with the setting of the Decimal point position.] RS bias is selected by selecting “Remote setting input” at Select function for input 2.	0
67	Input 2_PV digital filter (RS digital filter)	**F0**	7	0084	0085	132	133	R/W	0.00 to 10.00 seconds 0.00: Filter OFF RS digital filter is selected by selecting “Remote setting input” at Select function for input 2.	0.00

Note1: In case OUT1 function selection is “Input 1_Control output [cool-side]” AND Inpu1_Control action is “Heat/Cool PID control [air cooling] or [water cooling]”: 20.0, Other casees: 2.0

* In case of Heat/Cool PID control, the data range has such exceptional conditions as shown below.

(1) Input 1_Output limiter high [cool-side] is ≤ 0.0 %
- Input 1_Output limiter low [heat-side] is ≤ 0.0 %: 0.0 % to +(Input 1_Output limiter high [heat-side])
- Input 1_Output limiter low [heat-side] is > 0.0 %: Input 1_Output limiter low [heat-side] to Input 1_Output limiter high [heat-side]

(2) Input 1_Output limiter high [heat-side] ≤ 0.0 %
- Input 1_Output limiter low [cool-side] is ≤ 0.0 %: −(Input 1_Output limiter high [cool-side]) to 0.0 %
- Input 1_Output limiter low [cool-side] is > 0.0 %: −(Input 1_Output limiter high [cool-side]) to −(Input 1_Output limiter low [cool-side])

(3) Fixed at 0.0% in the following cases: Input 1_Output limiter high [cool-side] ≤ 0.0 %, AND Input 1_Output limiter high [heat-side] ≤ 0.0 %

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
68	Input 2_PV ratio (RS ratio)	**PQ**	7	0086	0087	134	135	R/W	Input 2_PV ratio: 0.500 to 1.500 RS ratio: 0.001 to 9.999 RS ratio is selected by selecting “Remote setting input” at Select function for input 2.	1.000
69	Input 2_PV low input cut-off	**DO**	7	0088	0089	136	137	R/W	0.00 to 25.00 % of Input 2_Input span	0.00
70	OUT2 proportional cycle time [Input 2_proportional cycle time]	**T2**	7	008A	008B	138	139	R/W	0.1 to 100.0 seconds	Relay contact output: 20.0 Voltage pulse output, Transistor output: Note1
71	Input 2_Manual manipulated output value [Input 2_manual output value]	**OM**	7	008C	008D	140	141	R/W	Input 2_ Output limiter low to Input 2_Output limiter high	−5.0
72	Set lock level	**LK**	7	008E	008F	142	143	R/W	RKC communication The Set lock level is assigned as a bit image in binary numbers. Bit 0: SV setting mode * + Parameter select mode Bit 1: Operation transfer mode Bit 2: Parameter setting mode Bit 3 Setup setting mode Bit 4 Engineering mode Bit 5 to Bit 7: Unused Data 0: Unlock 1: Lock * The data of Set value (SV) and Interlock release can be locked.	00000
									Modbus 0 to 31 0: Unlock + 1: SV setting mode * + Parameter select mode + 2: Operation transfer mode + 4: Parameter setting mode + 8: Setup setting mode +16: Engineering mode * The data of Set value (SV) and Interlock release can be locked.	0

Note1: In case OUT2 function selection is “Input 1_Control output [cool-side]” AND Inpu1_Control action is “Heat/Cool PID control [air cooling] or [water cooling]”: 20.0, Other casees: 2.0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
73	Dummy data (EEPROM storage state)	**EM**	7	0090	0091	144	145	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
74	Dummy data (EEPROM storage mode)	**EB**	7	0092	0093	146	147	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
75	Dummy data (Heater break determination point 1)	**NE**	7	0094	0095	148	149	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
76	Dummy data (Heater melting determination point 1)	**NF**	7	0096	0097	150	151	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
77	Dummy data (Heater break determination point 2)	**NH**	7	0098	0099	152	153	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
78	Dummy data (Heater melting determination point 2)	**NI**	7	009A	009B	154	155	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
—	Illegal registers	—	—	009C ⋮ 01FE	009D ⋮ 01FF	156 ⋮ 510	157 ⋮ 511	—	—	—
79	STOP display selection	**DX**	7	0200	0201	512	513	R/W	0: Stop on PV display 1: Stop on SV display 2: Stop on MV display	1
80	Dummy data (Bar-graph display selection)	**DA**	7	0202	0203	514	515	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
81	Dummy data (Bar graph resolution setting)	**DE**	7	0204	0205	516	517	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
82	Undefined registers	—	—	0206	0207	518	519	—	—	—
83	Dummy data (Auto/Manual transfer key operation selection (A/M))	**DK**	7	0208	0209	520	521	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
84	Dummy data (Remote/Local transfer key operation selection (R/L))	**DL**	7	020A	020B	522	523	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
85	Dummy data (RUN/STOP transfer key operation selection (R/S))	**DM**	7	020C	020D	524	525	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
86	Input 1_Input type [Input 1_input type selection]	**XI**	7	020E	020F	526	527	R/W	0: TC input K 1: TC input J 2: TC input R 3: TC input S 4: TC input B 5: TC input E 6: TC input N 7: TC input T 8: TC input W5Re/W26Re 9: TC input PLII 10: TC input U 11: TC input L 12: TC input PR40-20 13: RTD input Pt100 14: RTD input JPt100 15: Current input 0 to 20 mA DC 16: Current input 4 to 20 mA DC 17: Voltage input 0 to 10 V DC 18: Voltage input 0 to 5 V DC 19: Voltage input 1 to 5 V DC 20: Voltage input 0 to 1 V DC 21: Voltage input −10 to +10 V DC 22: Voltage input −5 to +5 V DC 23: Voltage input 0 to 100 mV DC 24: Voltage input 0 to 10 mV DC	Same as the input type of the input range code specified at the time of order.
87	Input 1_Display unit [Input 1_display unit selection]	**PU**	7	0210	0211	528	529	R/W	0: °C 1: °F	Same as the display unit of the input range code specified at the time of order.

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
88	Input 1_Decimal point position [Input 1_decimal point position]	**XU**	7	0212	0213	530	531	R/W	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places 4: Four decimal places TC input: W5Re/W26Re, PR40-20: 0 (fixed) Thermocouples other than those shown above: 0 or 1 RTD input: 0 to 2 Voltage (V)/Current (I) inputs: In case of Input data type 0 or 2: 0 to 4 In case of Input data type 1: 0 to 3 (When Control with PV select: Decimal point position setting of Input 1 and Input 2 is compared and the smaller will be used.)	Same as the decimal point position of the input range code specified at the time of order. For V/I inputs: 1
89	Input 1_Input range high [Input 1_input scale high]	**XV**	7	0214	0215	532	533	R/W	(Input 1_Input range low + 1 digit) to Input 1_Maximum value of input range [Varies with the setting of the Decimal point position.]	High limit value of the input range code specified at the time of order. For V/I inputs: 100.0
90	Input 1_Input range low [Input 1_input scale low]	**XW**	7	0216	0217	534	535	R/W	Input 1_Minimum value of input range to (Input 1_Input range high − 1 digit) [Varies with the setting of the Decimal point position.]	Low limit value of the input range code specified at the time of order. For V/I inputs: 0.0
91	Input 1_Input error determination point (high)	**AV**	7	0218	0219	536	537	R/W	Input 1_Input error determination point (low) to Input 1_Input range high + (Input 1_5 % of input span) [Varies with the setting of the Decimal point position.]	Input 1_ Input range high + (Input 1_5 % of input span)
92	Input 1_Input error determination point (low)	**AW**	7	021A	021B	538	539	R/W	Input 1_Input range low − (Input 1_5 % of input span) * to Input 1_Input error determination point (high) [Varies with the setting of the Decimal point position.] * When Input type of Input 1 is RTD, low limit value is about 2 Ohms. (Pt100: −245.5 °C [−409.8 °F], JPt100: −237.6 °C [−395.7 °F])	Input 1_ Input range low − (Input 1_5 % of input span)

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
93	Input 1_Burnout direction	**BS**	7	021C	021D	540	541	R/W	0: Upscale 1: Downscale	0
94	Input 1_Square root extraction [Input 1_square root extraction selection]	**XH**	7	021E	021F	542	543	R/W	0: Unused 1: Used	0
95	Power supply frequency [Power supply frequency selection]	**JT**	7	0220	0221	544	545	R/W		0
96	Input 2_Input type [Input 2_input type selection]	**XJ**	7	0222	0223	546	547	R/W	0: TC input K 1: TC input J 2: TC input R 3: TC input S 4: TC input B 5: TC input E 6: TC input N 7: TC input T 8: TC input W5Re/W26Re 9: TC input PLII 10: TC input U 11: TC input L 12: TC input PR40-20 13: RTD input Pt100 14: RTD input JPt100 15: Current input 0 to 20 mA DC 16: Current input 4 to 20 mA DC 17: Voltage input 0 to 10 V DC 18: Voltage input 0 to 5 V DC 19: Voltage input 1 to 5 V DC 20: Voltage input 0 to 1 V DC 21: Voltage input −10 to +10 V DC 22: Voltage input −5 to +5 V DC 23: Voltage input 0 to 100 mV DC 24: Voltage input 0 to 10 mV DC ・ When Measured Input 2 is selected:0 to 24 ・ When Remote setting input is selected:15 to 24	Same as Input 1_Input type When Remote setting input is specified at the time of order, but the input type is not specified: 17
97	Input 2_Display unit [Input 2_display unit selection]	**PT**	7	0224	0225	548	549	R/W	0: °C 1: °F	Same as Input 1_Display unit
98	Input 2_Decimal point position	**XT**	7	0226	0227	550	551	R/W	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places 4: Four decimal places TC input: W5Re/W26Re, PR40-20: 0 (fixed) Thermocouples other than those shown above: 0 or 1 RTD input: 0 to 2 Voltage (V)/Current (I) inputs: In case of Input data type 0 or 2: 0 to 4 In case of Input data type 1: 0 to 3	Same as Input 1_Decimal point position

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
99	Input 2_Input range high [Input 2_input scale high]	**XX**	7	0228	0229	552	553	R/W	TC/RTD inputs and Voltage (V)/Current (I) Inputs (For other than Remote setting input): (Input 2_Input range low + 1 digit) to Input 2_Maximum value of input range Voltage (V)/Current (I) Inputs (For Remote setting input): (Input 2_Input range low + 1 digit) to Input 1_Maximum value of input range [Varies with the setting of the Decimal point position.]	Same as Input 1_Input range high
100	Input 2_Input range low [Input 2_input scale low]	**XY**	7	022A	022B	554	555	R/W	TC/RTD inputs and Voltage (V)/Current (I) Inputs (For other than Remote setting input): Input 2_Minimum value of input range to (Input 2_Input range high − 1 digit) Voltage (V)/Current (I) Inputs (For Remote setting input): Input 1_Minimum value of input range to (Input 2_Input range high − 1 digit) [Varies with the setting of the Decimal point position.]	Same as Input 1_Input range low
101	Input 2_Input error determination point (high)	**AX**	7	022C	022D	556	557	R/W	Input 2_Input error determination point (low) to Input 2_Input range high + (Input 2_5 % of input span) [Varies with the setting of the Decimal point position.]	Input 2_Input range high + (Input 2_ 5 % of input span)
102	Input 2_Input error determination point (low)	**AY**	7	022E	022F	558	559	R/W	Input 2_Input range low − (Input 2_5 % of input span) * to Input 2_Input error determination point (high) [Varies with the setting of the Decimal point position.] * When Input type of Input 2 is RTD, low limit value is about 2 Ohms. (Pt100: −245.5 °C [−409.8 °F] , JPt100: −237.6 °C [−395.7 °F])	Input 2_ Input range low − (Input 2_ 5 % of input span)
103	Input 2_Burnout direction	**BR**	7	0230	0231	560	561	R/W	0: Upscale 1: Downscale	0
104	Input 2_Square root extraction [Input 2_square root extraction selection]	**XG**	7	0232	0233	562	563	R/W	0: Unused 1: Used	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
105	DI1 function selection [Event input logic selection]	**H2**	7	0234	0235	564	565	R/W	0: No function 1: RUN/STOP transfer 2: Auto/Manual transfer (Common to Input 1 and 2) 3: Input 1_Auto/Manual transfer 4: Input 2_Auto/Manual transfer 5: Remote/Local transfer (PV select transfer, 2-loop control/Differential temperature control) 6: Interlock release 7: Hold reset (Common to Input 1 and 2) 8: Input 1_Hold reset 9: Input 2_Hold reset 10: Autotuning (AT) (Common to Input 1 and 2) 11: Input 1_Autotuning (AT) 12: Input 2_Autotuning (AT) 13: Set data unlock/lock transfer 14: Direct/Reverse action transfer 15: Memory area transfer (2 points, Without area set signal) 16: Memory area transfer (8 points, Without area set signal) 17: Memory area transfer (8 points, With area set signal) 18: Memory area transfer (16 points, Without area set signal) 19: Memory area transfer (16 points, With area set signal) 20: Area jump	Based on Model code

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
106	OUT1 function selection [Output logic selection]	**E0**	7	0236	0237	566	567	R/W	0: No assignment 1: Input 1_Control output [heat-side] 2: Input 1_Control output [cool-side] 3: Input 2_Control output 4: Retransmission output 5: Logic calculation output (Event, HBA, LBA, Input error) 6: RUN state output 7: Input 1_Manual mode state output 8: Input 2_Manual mode state output 9: Remote mode state output (Output of differential temperature control state, Input 2 state output of Control with PV select) 10: Input 1_Autotuning (AT) state output 11: Input 2_Autotuning (AT) state output 12: Output while Set value of Input 1 is changing 13: Output while Set value of Input 2 is changing 14: Output of the communication monitoring result 15: FAIL output	Based on Model code
107	Event 1 timer [Output 1 timer setting]	**TD**	7	0238	0239	568	569	R/W	0.0 to 600.0 seconds	0.0
108	Event 2 timer [Output 2 timer setting]	**TG**	7	023A	023B	570	571	R/W	Same as Event 1 timer	
109	Event 3 timer [Output 3 timer setting]	**TH**	7	023C	023D	572	573	R/W	Same as Event 1 timer	
110	Event 4 timer [Output 4 timer setting]	**TI**	7	023E	023F	574	575	R/W	Same as Event 1 timer	
111	Dummy data (Event 5 timer) [Output 5 timer setting]	**TJ**	7	0240	0241	576	577	RW	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
112	Retransmission output 1 type [Transmission output 1_type selection]	**LA**	7	0242	0243	578	579	R/W	0: No retransmission output 1: Input 1_Measured value (PV) 2: Input 1_Local SV 3: Input 1_SV monitor value 4: Input 1_Deviation 5: Input 1_Manipulated output value [heat-side] 6: Input 1_Manipulated output value [cool-side] 7: Input 2_Measured value (PV) 8: Input 2_Local SV 9: Input 2_SV monitor value 10: Input 2_Deviation 11: Input 2_Manipulated output value 12: Remote setting input value 13: Current transformer 1 (CT1) input value 14: Current transformer 2 (CT2) input value 15: Measured value (PV) of differential temperature input	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
113	Retransmission output 1 scale high [Transmission output 1_scale high]	**HV**	7	0244	0245	580	581	R/W	No retransmission output, Input 1_Measured value (PV), Input 1_Local SV, Input 1_SV monitor value, and Remote setting input value Input 1_Input range low to Input 1_Input range high (When Control with PV select: PV select input range low to PV select input range high) [Varies with the setting of the Decimal point position.] Input 1_Deviation –(Input 1_Input span) to +(Input 1_Input span) [Varies with the setting of the Decimal point position.] Input 2_Measured value (PV), Input 2_Local SV, and Input 2_SV monitor value Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.] Input 2_Deviation –(Input 2_Input span) to +(Input 2_Input span) [Varies with the setting of the Decimal point position.] Manipulated output value –5.0 to +105.0 % Current transformer (CT) input value 0.0 to 100.0 % Measured value (PV) of differential temperature input –(Input 1_Input span) to +(Input 1_Input span) [Varies with the setting of the Decimal point position.]	No retransmission output, Input 1_Measured value (PV), Input 1_Local SV, Input 1_SV monitor value, and Remote setting input value: Input 1_Input range high (Control with PV select: PV select input range high) Input 1_Deviation: +(Input 1_Input span) Input 2_Measured value (PV), Input 2_Local SV, and Input 2_SV monitor value: Input 2_Input range high Input 2_Deviation: +(Input 2_Input span) Manipulated output value, and Current transformer (CT) input value: 100.0 Measured value (PV) of differential temperature input: 100

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
114	Retransmission output 1 scale low [Transmission output 1_scale low]	**HW**	7	0246	0247	582	583	R/W	No retransmission output, Input 1_Measured value (PV), Input 1_Local SV, Input 1_SV monitor value, and Remote setting input value Input 1_Input range low to Input 1_Input range high (When Control with PV select: PV select input range low to PV select input range high) [Varies with the setting of the Decimal point position.] Input 1_Deviation –(Input 1_Input span) to +(Input 1_Input span) [Varies with the setting of the Decimal point position.] Input 2_Measured value (PV), Input 2_Local SV, and Input 2_SV monitor value Input 2_Input range low to Input 2_Input range high [Varies with the setting of the Decimal point position.] Input 2_Deviation –(Input 2_Input span) to +(Input 2_Input span) [Varies with the setting of the Decimal point position.] Manipulated output value –5.0 to +105.0 % Current transformer (CT) input value 0.0 to 100.0 % Measured value (PV) of differential temperature input –(Input 1_Input span) to +(Input 1_Input span) [Varies with the setting of the Decimal point position.]	No retransmission output, Input 1_Measured value (PV), Input 1_Local SV, Input 1_SV monitor value, and Remote setting input value: Input 1_Input range low (Control with PV select: PV select input range low) Input 1_Deviation: – (Input 1_Input span) Input 2_Measured value (PV), Input 2_Local SV, and Input 2_SV monitor value: Input 2_Input range low Input 2_Deviation: – (Input 2_Input span) Manipulated output value, and Current transformer (CT) input value: 0.0 Measured value (PV) of differential temperature input: –100
115	Retransmission output 2 type [Transmission output 2_type selection]	**LB**	7	0248	0249	584	585	R/W	Same as Retransmission output 1 type	0

No.	Name	Identifier	Digits	Register address HEX Low-order	Register address HEX High-order	Register address DEC Low-order	Register address DEC High-order	Attribute	Data range	Factory set value
116	Retransmission output 2 scale high [Transmission output 2_scale high]	**CV**	7	024A	024B	586	587	R/W	Same as Retransmission output 1 scale high	
117	Retransmission output 2 scale low [Transmission output 2_scale low]	**CW**	7	024C	024D	588	589	R/W	Same as Retransmission output 1 scale low	
118	Retransmission output 3 type [Transmission output 3_type selection]	**LC**	7	024E	024F	590	591	R/W	Same as Retransmission output 1 type	1
119	Retransmission output 3 scale high [Transmission output 3_scale high]	**EV**	7	0250	0251	592	593	R/W	Same as Retransmission output 1 scale high	
120	Retransmission output 3 scale low [Transmission output 3_scale low]	**EW**	7	0252	0253	594	595	R/W	Same as Retransmission output 1 scale low	
121	Event 1 type [Event 1 type selection]	**XA**	7	0254	0255	596	597	R/W	0: None 1: Deviation high (Using SV monitor value) [a] 2: Deviation low (Using SV monitor value) [a] 3: Deviation high/low (Using SV monitor value) [a] 4: Band (Using SV monitor value) [a] 5: Deviation high/low (Using SV monitor value) [High/Low individual setting] [a] 6: Band (Using SV monitor value) [High/Low individual setting] [a] 7: SV high (Using SV monitor value) 8: SV low (Using SV monitor value) 9: Process high [b] 10: Process low [b] 11: Deviation high (Using local SV) [a] 12: Deviation low (Using local SV) [a] 13: Deviation high/low (Using local SV) [a] 14: Band (Using local SV) [a] 15: Deviation high/low (Using local SV) [High/Low individual setting] [a] 16: Band (Using local SV) [High/Low individual setting] [a] 17: SV high (Using local SV) 18: SV low (Using local SV) 19: MV high [heat-side] [b] 20: MV low [heat-side] [b] 21: MV high [cool-side] [b] 22: MV low [cool-side] [b] 23: Process high/low [High/Low individual setting] [b] 24: Process band [High/Low individual setting] [b] [a] Event hold and re-hold action is available. [b] Event hold action is available.	If the Event type is specified by the initial setting code when ordering, that Event type will be the factory set value. If the Event type is not specified: 1

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
122	Event 1 hold action	**WA**	7	0256	0257	598	599	R/W	0: Hold action OFF 1: Hold action ON 2: Re-hold action ON Setting hold or re-hold action on the event that is not available with hold and re-hold actions will just be ignored.	If the Event type is specified by the initial setting code when ordering, the factory set value of Event hold action differs depending on the Event type. If the Event type is not specified: 0
123	Event 1 differential gap	**HA**	7	0258	0259	600	601	R/W	Deviation, Process and SV: • If event assignment is either Input 1 or Differential temperature. 0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) • If event assignment is Input 2 0 to Input 2_Input span [Varies with the setting of the Decimal point position.] MV: 0.0 to 110.0 %	Deviation, Process and SV: TC/RTD inputs: 2 V/I inputs: 0.2 % of input span MV: 0.2
124	Dummy data (Event 1 action at input error)	**OA**	7	025A	025B	602	603	R/W	The read data is "0." When data is written, a normal response message will be returned to the all of the values, but "0" will be written.	0
125	Event 1 assignment	**FA**	7	025C	025D	604	605	R/W	1: Input 1 2: Input 2 3: Differential temperature input	1
126	Event 2 type [Event 2 type selection]	**XB**	7	025E	025F	606	607	R/W	Same as Event 1 type	
127	Event 2 hold action	**WB**	7	0260	0261	608	609	R/W	Same as Event 1 hold action	
128	Event 2 differential gap	**HB**	7	0262	0263	610	611	R/W	Same as Event 1 differential gap	
129	Dummy data (Event 2 action at input error)	**OB**	7	0264	0265	612	613	R/W	The read data is "0." When data is written, a normal response message will be returned to the all of the values, but "0" will be written.	0
130	Event 2 assignment	**FB**	7	0266	0267	614	615	R/W	Same as Event 1 assignment	

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
131	Event 3 type [Event 3 type selection]	**XC**	7	0268	0269	616	617	R/W	Same as Event 1 type	
132	Event 3 hold action	**WC**	7	026A	026B	618	619	R/W	Same as Event 1 hold action	
133	Event 3 differential gap	**HC**	7	026C	026D	620	621	R/W	Same as Event 1 differential gap	
134	Dummy data (Event 3 action at input error)	**OC**	7	026E	026F	622	623	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
135	Event 3 assignment	**FC**	7	0270	0271	624	625	R/W	Same as Event 1 assignment	
136	Event 4 type [Event 4 type selection]	**XD**	7	0272	0273	626	627	R/W	Same as Event 1 type	
137	Event 4 hold action	**WD**	7	0274	0275	628	629	R/W	Same as Event 1 hold action	
138	Event 4 differential gap	**HD**	7	0276	0277	630	631	R/W	Same as Event 1 differential gap	
139	Dummy data (Event 4 action at input error)	**OD**	7	0278	0279	632	633	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
140	Event 4 assignment	**FD**	7	027A	027B	634	635	R/W	Same as Event 1 assignment	
141	CT1 ratio	**XR**	7	027C	027D	636	637	R/W	0 to 9999 When the CT type is changed, the following value will be automatically set. CTL-6-P-N: 800 CTL-12-S56-10L-N: 1000 CTL-6-P-Z: 800	If CTL-6-P-N or CTL-6-P-Z is specified for the Current transformer (CT) type: 800 If CTL-12-S56-10L-N is specified for the Current transformer (CT) type: 1000
142	CT1 assignment	**ZF**	7	027E	027F	638	639	R/W	0: None 1: OUT1 2: OUT2 3: OUT3	1
143	CT2 ratio	**XS**	7	0280	0281	640	641	R/W	0 to 9999 When the CT type is changed, the following value will be automatically set. CTL-6-P-N: 800 CTL-12-S56-10L-N: 1000 CTL-6-P-Z: 800	If CTL-6-P-N or CTL-6-P-Z is specified for the Current transformer (CT) type: 800 If CTL-12-S56-10L-N is specified for the Current transformer (CT) type: 1000

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
144	CT2 assignment	**ZG**	7	0282	0283	642	643	R/W	0: None 1: OUT1 2: OUT2 3: OUT3	Based on Model code
145	Hot/Cold start [Hot/Cold start selection]	**XN**	7	0284	0285	644	645	R/W	0: Hot/Cold start 1 1: Hot/Cold start 2 2: Cold start 3: STOP start	0
146	Dummy data (Input 2_use selection)	**KM**	7	0286	0287	646	647	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
147	Dummy data (Cascade ratio)	**RR**	7	0288	0289	648	649	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
148	Dummy data (Cascade bias)	**RB**	7	028A	028B	650	651	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
149	SV tracking	**XL**	7	028C	028D	652	653	R/W	0 to 3 0: No SV tracking function +1: SV tracking at transferring Remote/Local * * Including 2-loop control/Differential temperature control transfer +2: SV tracking at transferring Auto/Manual To select two or more functions, sum each value.	1
150	Input 1_Control action [Input 1_control action type selection]	**XE**	7	028E	028F	654	655	R/W	0: Brilliant II PID control (direct action) 1: Brilliant II PID control (reverse action) 2: Brilliant II Heat/Cool PID control [water cooling] 3: Brilliant II Heat/Cool PID control [air cooling] 4: Brilliant II Heat/Cool PID control [Cooling linear type]	Control action specified at the time of order.
151	Integral/Derivative time decimal point position [Input 1_integral/derivative time decimal point position selection]	**PK**	7	0290	0291	656	657	R/W	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places	2
152	Dummy data (Input 1_derivative gain)	**DG**	7	0292	0293	658	659	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
153	Input 1_ON/OFF action differential gap (upper)	**IV**	7	0294	0295	660	661	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 100.0 % of Input 1_Input span (When Control with PV select: 0.0 to 100.0 % of PV select input span)	TC/RTD inputs: 1 V/I inputs: 0.1
154	Input 1_ON/OFF action differential gap (lower)	**IW**	7	0296	0297	662	663	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 100.0 % of Input 1_Input span (When Control with PV select: 0.0 to 100.0 % of PV select input span)	TC/RTD inputs: 1 V/I inputs: 0.1
155	Input 1_Action (high) input error [Input 1_action at input error (high)]	**WH**	7	0298	0299	664	665	R/W	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual mode) The operation mode is switched to the Manual mode and the Manipulated output at Input error of Input 1 is output. 2: Manipulated output value at input error (Auto mode) The operation mode remains in the Auto mode and the Manipulated output at Input error of Input 1 is output. When the error is recovered, the operation mode is switched to the PID control.	2
156	Input 1_Action (low) input error [Input 1_action at input error (low)]	**WL**	7	029A	029B	666	667	R/W	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual mode) The operation mode is switched to the Manual mode and the Manipulated output at Input error of Input 1 is output. 2: Manipulated output value at input error (Auto mode) The operation mode remains in the Auto mode and the Manipulated output at Input error of Input 1 is output. When the error is recovered, the operation mode is switched to the PID control.	2

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
157	Input 1_Manipulated output value at input error [Input 1_manipulated output value at input error]	**OE**	7	029C	029D	668	669	R/W	PID control −5.0 to +105.0 % Heat/Cool PID control −105.0 to +105.0 %	PID control: −5.0 Heat/Cool PID control: 0.0
158	Input 1_Output change rate limiter (up) [heat-side] [Input 1_output change rate limiter (up)]	**PH**	7	029E	029F	670	671	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
159	Input 1_Output change rate limiter (down) [heat-side] [Input 1_output change rate limiter (down)]	**PL**	7	02A0	02A1	672	673	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
160	Input 1_Output limiter high [heat-side] [Input 1_output limiter (high)] ★	**OH**	7	02A2	02A3	674	675	R/W	Input 1_Output limiter low [heat-side] to 105.0 %	105.0
161	Input 1_Output limiter high [cool-side] [Input 1_output limiter (low)] ★	**OL**	7	02A4	02A5	676	677	R/W	Heat/Cool PID control Input 1_Output limiter low [cool-side] to 105.0 %	105.0
	Input 1_Output limiter low [heat-side] [Input 1_output limiter (low)] ★								PID control −5.0 % to Input 1_Output limiter high [heat-side] Same data as RKC communication identifier OX	−5.0
162	Dummy data (Input 1_power feed forward selection)	**PF**	7	02A6	02A7	678	679	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
163	Input 2_Control action [Input 2_control action type selection]	**XF**	7	02A8	02A9	680	681	R/W	0: Brilliant II PID control (direct action) 1: Brilliant II PID control (reverse action)	Same as Input 1_ Control action
164	Dummy data (Input 2_integral/derivative time decimal point position selection)	**PJ**	7	02AA	02AB	682	683	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
165	Dummy data (Input 2_derivative gain)	**DJ**	7	02AC	02AD	684	685	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
166	Input 2_ON/OFF action differential gap (upper)	**IX**	7	02AE	02AF	686	687	R/W	TC/RTD inputs: 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 100.0 % of Input 2_Input span	TC/RTD inputs: 1 V/I inputs: 0.1
167	Input 2_ON/OFF action differential gap (lower)	**IY**	7	02B0	02B1	688	689	R/W	TC/RTD inputs: 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 100.0 % of Input 2_Input span	TC/RTD inputs: 1 V/I inputs: 0.1
168	Input 2_Action (high) input error [Input 2_action at input error (high)]	**WX**	7	02B2	02B3	690	691	R/W	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual mode) The operation mode is switched to the Manual mode and the Manipulated output at Input error of Input 2 is output. 2: Manipulated output value at input error (Auto mode) The operation mode remains in the Auto mode and the Manipulated output at Input error of Input 2 is output. When the error is recovered, the operation mode is switched to the PID control.	2
169	Input 2_Action (low) input error [Input 2_action at input error (low)]	**WY**	7	02B4	02B5	692	693	R/W	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual mode) The operation mode is switched to the Manual mode and the Manipulated output at Input error of Input 2 is output. 2: Manipulated output value at input error (Auto mode) The operation mode remains in the Auto mode and the Manipulated output at Input error of Input 2 is output. When the error is recovered, the operation mode is switched to the PID control.	2
170	Input 2_Manipulated output value at input error [Input 2_manipulated output value at input error]	**OF**	7	02B6	02B7	694	695	R/W	−5.0 to +105.0 %	−5.0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
171	Input 2_Output change rate limiter (up)	**PX**	7	02B8	02B9	696	697	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: No function	0.0
172	Input 2_Output change rate limiter (down)	**PY**	7	02BA	02BB	698	699	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: No function	0.0
173	Input 2_Output limiter high ★	**OX**	7	02BC	02BD	700	701	R/W	Input 2_Output limiter low to 105.0 %	105.0
174	Input 2_Output limiter low ★	**OY**	7	02BE	02BF	702	703	R/W	−5.0 % to Input 2_Output limiter high	−5.0
175	Dummy data ([Input 2_power feed forward selection)	**PG**	7	02C0	02C1	704	705	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
176	Input 1_AT bias	**GB**	7	02C2	02C3	706	707	R/W	−(Input 1_Input span) to +(Input 1_Input span) (When Control with PV select: −(PV select input span) to +(PV select input span)) [Varies with the setting of the Decimal point position.]	0
177	Input 1_AT cycle	**G3**	7	02C4	02C5	708	709	R/W	0: 1.5 cycles 1: 2.0 cycles 2: 2.5 cycles 3: 3.0 cycles Use to select the number of ON/OFF cycles used to calculate PID values during autotuning.	1
178	Dummy data (Input 1_AT differential gap time)	**GH**	7	02C6	02C7	710	711	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
179	Input 2_AT bias	**GA**	7	02C8	02C9	712	713	R/W	− (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.]	0
180	Input 2_AT cycle	**G2**	7	02CA	02CB	714	715	R/W	0: 1.5 cycles 1: 2.0 cycles 2: 2.5 cycles 3: 3.0 cycles Use to select the number of ON/OFF cycles used to calculate PID values during autotuning.	1

★ Parameters which can be used in multi-memory area function

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
181	Dummy data (Input 2_AT differential gap time)	**GG**	7	02CC	02CD	716	717	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
182	Dummy data (Open/Close output neutral zone)	**V2**	7	02CE	02CF	718	719	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
183	Dummy data (Open/Close output differential gap)	**VH**	7	02D0	02D1	720	721	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
184	Dummy data (Action at feedback resistance (FBR) input error)	**SY**	7	02D2	02D3	722	723	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
185	Dummy data (Feedback adjustment)	**FV**	7	02D4	02D5	724	725	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
186	Setting change rate limiter unit time [Setting change rate limiter unit time]	**HU**	7	02D6	02D7	726	727	R/W	0.1 to 360.0 seconds	0.1
187	Soak time unit [Soak time unit selection]	**RU**	7	02D8	02D9	728	729	R/W	In case of Input data type 0 or 2 0: 0 hours 00 minutes to 99 hours 59 minutes 1: 0 minutes 00 seconds to 199 minutes 59 seconds 2: 0 hours 00 minutes 00 seconds to 9 hours 59 minutes 59 seconds 3: 0.00 seconds to 59.99 seconds	3
									In case of Input data type 1 0: 0 hours 00 minutes to 99 hours 59 minutes 1: 0 minutes 00 seconds to 199 minutes 59 seconds 3: 0.00 seconds to 59.99 seconds	3
188	Input 1_Setting limiter high	**SH**	7	02DA	02DB	730	731	R/W	Input 1_Setting limiter low to Input 1_Input range high (When Control with PV select Input 1_Setting limiter low to PV select input range high) [Varies with the setting of the Decimal point position.]	Input 1_ Input range high (When Control with PV select: PV select input range high)

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
189	Input 1_Setting limiter low	**SL**	7	02DC	02DD	732	733	R/W	Input 1_Setting limiter low to Input 1_Input range high (When Control with PV select PV select input range low to Input 1_Setting limiter high) [Varies with the setting of the Decimal point position.]	Input 1_ Input range low (When Control with PV select: PV select input range low)
190	Input 2_Setting limiter high	**ST**	7	02DE	02DF	734	735	R/W	Input 2_Setting limiter low to Input 2_Input range high [Varies with the setting of the Decimal point position.]	Input 2_ Input range high
191	Input 2_Setting limiter low	**SU**	7	02E0	02E1	736	737	R/W	Input 2_Input range low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	Input 2_ Input range low
192	ROM version [ROM version display]	**VR**	7	02E2	02E3	738	739	RO	Version of ROM built in the instrument	—
193	Integrated operating time [Integrated operating time display]	**UT**	7	02E4	02E5	740	741	RO	0 to 65535 hours	—
194	Peak hold monitor of ambient temperature [Holding peak value ambient temperature display]	**Hp**	7	02E6	02E7	742	743	RO	−120 to +120 °C	—
195	Dummy data (Power feed transformer input value display)	**HM**	7	02E8	02E9	744	745	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
196	Dummy data (Feedback resistance (FBR) input assignment)	**VG**	7	02EA	02EB	746	747	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
197	Dummy data (Input 1_power feed forward gain)	**PZ**	7	02EC	02ED	748	749	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
198	Dummy data (Input 2_power feed forward gain)	**PW**	7	02EE	02EF	750	751	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
199	Dummy data (Heater break alarm 1 (HBA1) type selection])	**ND**	7	02F0	02F1	752	753	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
200	Number of heater break alarm 1 (HBA1) delay times	**DH**	7	02F2	02F3	754	755	R/W	0 to 255 times	5
201	Dummy data (Heater break alarm 2 (HBA2) type selection)	**NG**	7	02F4	02F5	756	757	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0
202	Number of heater break alarm 2 (HBA2) delay times	**DF**	7	02F6	02F7	758	759	R/W	0 to 255 times	5
203	ALM lamp lighting condition [Alarm lamp lighting condition setting 1]	**LY**	7	02F8	02F9	760	761	R/W	0 to 4095 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm 1 (LBA1) +128: Control loop break alarm 2 (LBA2) +256: Input 1_Input error high +512: Input 1_Input error low +1024: Input 2_Input error high +2048: Input 2_Input error low To select two or more functions, sum each value.	255
204	Dummy data (Alarm lamp lighting condition setting 2)	**LZ**	7	02FA	02FB	762	763	R/W	The read data is “0.” When data is written, a normal response message will be returned to the all of the values, but “0” will be written.	0

6.3.5 Memory area data equivalent to the HA series (Area designation method) [Modbus double word]

Register addresses 0500H to 0534H are used to check and change set values belonging to the Memory area.

☞ For Memory area, refer to the **5.9 How to Use Memory Area Data (P. 5-18)**.

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
1	Memory area transfer	0500	0501	1280	1281	R/W	1 to 16 When the DI1 function selection is set to "Memory area transfer (Without area set signal)" and when "External mode" is selected with the Control area Local/External transfer, the data is RO (Read only).	1
2	Event 1 set value (EV1) [Event 1 set value] When Event 1 type is either high or low limit with individual setting Event 1 set value (EV1) [high]	0502	0503	1282	1283	R/W	• Deviation When assigned to Input 1 or Differential temperature input −(Input 1_Input span) to +(Input 1_Input span) When assigned to Input 2 −(Input 2_Input span) to +(Input 2_Input span) When Control with PV select is selected at Select function for input 2 −(PV select input span) to +(PV select input span) [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 10 V/I inputs: 5 % of input span
							• Input value or Set value When assigned to Input 1 Input 1_Input range low to Input 1_Input range high When assigned to Input 2 Input 2_Input range low to Input 2_Input range high When assigned to Differential temperature input −(Input 1_Input span) to +(Input 1_Input span) When Control with PV select is selected at Select function for input 2 PV select input range low to PV select input range high [Varies with the setting of the Decimal point position.]	
							• Manipulated output value −5.0 to +105.0 %	50.0

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
3	Event 2 set value (EV2) [Event 2 set value] When Event 2 type is either high or low limit with individual setting Event 2 set value (EV2) [high]	0504	0505	1284	1285	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
4	Event 3 set value (EV3) [Event 3 set value] When Event 3 type is either high or low limit with individual setting Event 3 set value (EV3) [high]	0506	0507	1286	1287	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
5	Input 1_Control loop break alarm (LBA) time [Control loop break alarm 1 (LBA1) time]	0508	0509	1288	1289	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0
6	Input 1_LBA deadband (LBD) [LBA1 deadband]	050A	050B	1290	1291	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.]	0
7	Event 4 set value (EV4) Event 4 set value (EV4) [high] When Event 4 type is either high or low limit with individual setting Event 4 set value (EV4) [high]	050C	050D	1292	1293	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
8	Input 2_Control loop break alarm (LBA) time [Control loop break alarm 2 (LBA2) time]	050E	050F	1294	1295	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0
9	Input 2_LBA deadband (LBD) [LBA2 deadband]	0510	0511	1296	1297	R/W	0 to Input 2_Input span [Varies with the setting of the Decimal point position.]	0
10	Input 1_Set value (SV)	0512	0513	1298	1299	R/W	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	0

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
11	Input 1_Proportional band [heat-side] [Input 1_proportional band]	0514	0515	1300	1301	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 1_Input span (Unit: °C [°F]) (When Control with PV select: 0 to PV select input span) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 1000.0 % of Input 1_Input span (When Control with PV select: 0.0 to 1000.0 % of PV select input span) 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0
12	Input 1_Integral time [heat-side] [Input 1_integral time]	0516	0517	1302	1303	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240.00
13	Input 1_Derivative time [heat-side] [Input 1_derivative time]	0518	0519	1304	1305	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60.00
14	Input 1_Control response parameter [Input 1_control response parameter]	051A	051B	1306	1307	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	PID control: 0 Heat/Cool PID control: 2
15	Undefined registers	051C	051D	1308	1309	—	—	—
16	Input 2_Set value (SV) [Input 2_set value (SV2)]	051E	051F	1310	1311	R/W	Input 2_Setting limiter low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	0
17	Input 2_Proportional band [Input 2_proportional band]	0520	0521	1312	1313	R/W	TC/RTD inputs 0 (0.0, 0.00) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 1000.0 % of Input 2_Input span 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0

No.	Name	Register address				Attri-bute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
18	Input 2_Integral time [Input 2_integral time]	0522	0523	1314	1315	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240.00
19	Input 2_Derivative time [Input 2_derivative time]	0524	0525	1316	1317	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds, 0.00 to 360.00 seconds or 0.000 to 36.000 seconds 0 (0.0, 0.00, 0.000): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60.00
20	Input 2_Control response parameter [Input 2_control response parameter]	0526	0527	1318	1319	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	0
21	Undefined registers	0528	0529	1320	1321	—	—	—
22	Input 1_Setting change rate limiter (up) [Input 1_setting change rate limiter (up)]	052A	052B	1322	1323	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: No function [Varies with the setting of the Decimal point position.]	0
23	Input 1_Setting change rate limiter (down) [Input 1_setting change rate limiter (down)]	052C	052D	1324	1325	R/W	0 to Input 1_Input span (When Control with PV select: 0 to PV select input span) 0: No function [Varies with the setting of the Decimal point position.]	0
24	Input 2_Setting change rate limiter (up) [Input 2_setting change rate limiter (up)]	052E	052F	1326	1327	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0
25	Input 2_Setting change rate limiter (down) [Input 2_setting change rate limiter (down)]	0530	0531	1328	1329	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
26	Area soak time	0532	0533	1330	1331	R/W	In case of Input data type 0 or 2 • RKC communication 0 hours 00 minutes 00 seconds to 9 hours 59 minutes 59 seconds 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus 0 to 35999 seconds 0 to 11999 seconds 0 to 5999 minutes 0 to 5999 seconds (10 ms) (Calculation is performed every 50 ms.) [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0.00 seconds) Modbus: 0
							In case of Input data type 1 • RKC communication 0 hours 00 minutes to 99 hours 59 minutes 0 minutes 00 seconds to 199 minutes 59 seconds 0.00 seconds to 59.99 seconds (Calculation is performed every 50 ms.) • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds 0 to 5999 seconds (10 ms) (Calculation is performed every 50 ms.) [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0.00 seconds) Modbus: 0
27	Link area number	0534	0535	1332	1333	R/W	0 to 16 0: No function	0

6.4 Modbus (Single Word) Data

6.4.1 GZ400/GZ900 communication data [Modbus single word]

The following table shows single word register address of Modbus.
For attribute, data range, and factory set values, refer to **6.3.1 GZ400/GZ900 Communication data [RKC communication identifier/Modbus double word] (P. 6-12)**.

When Input data type is set to "1," the communication data will be Modbus single word.

Switchover between the single word and the double word can be done at Input data type.
For the Input data type, refer to the **3.2 Selection of Communication Data Type (P. 3-5)**.

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
1	Input 1_Measured value (PV)	2000	8192	1
2	Input 1_Set value (SV) monitor	2001	8193	2
3	Input 2_Measured value (PV)	2002	8194	3
4	Input 2_Set value (SV) monitor	2003	8195	4
5	PV select Measured value (PV)	2004	8196	5
6	Measured value (PV) of differential temperature input	2005	8197	6
7	Set value (SV) monitor of differential temperature input	2006	8198	7
8	Input 1_Manipulated output value monitor [heat-side]	2007	8199	8
9	Input 1_Manipulated output value monitor [cool-side]	2008	8200	9
10	Input 2_Manipulated output value monitor	2009	8201	10
11	Current transformer 1 (CT1) input value monitor	200A	8202	11
12	Current transformer 2 (CT2) input value monitor	200B	8203	12
13	Memory area soak time monitor	200C	8204	13
14	Remote setting input value monitor	200D	8205	14
15	Event 1 state monitor	200E	8206	15

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
16	Event 2 state monitor	200F	8207	16
17	Event 3 state monitor	2010	8208	17
18	Event 4 state monitor	2011	8209	18
19	Heater break alarm 1 (HBA1) state monitor	2012	8210	19
20	Heater break alarm 2 (HBA2) state monitor	2013	8211	20
21	Control loop break alarm 1 (LBA1) state monitor	2014	8212	21
22	Control loop break alarm 2 (LBA2) state monitor	2015	8213	22
23	Comprehensive event state	2016	8214	23
24	Input 1_Burnout state monitor	2017	8215	24
25	Input 2_Burnout state monitor	2018	8216	25
26	DI state monitor	2019	8217	26
27	OUT state monitor	201A	8218	27
28	DO state monitor	201B	8219	28
29	Overall operation status	201C	8220	29
30	Input 1_PID memory	201D	8221	30
31	Input 2_PID memory	201E	8222	31
32	Input 1_Peak hold monitor	201F	8223	32

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
33	Input 1_Bottom hold monitor	2020	8224	33
34	Input 2_Peak hold monitor	2021	8225	34
35	Input 2_Bottom hold monitor	2022	8226	35
36	Input 1_AT remaining time monitor	2023	8227	36
37	Input 2_AT remaining time monitor	2024	8228	37
38	Input 1_AT/ST status monitor	2025	8229	38
39	Input 2_AT/ST status monitor	2026	8230	39
40	Error code	2027	8231	40
41	Integrated operating time	2028	8232	41
42	Peak hold monitor of ambient temperature	2029	8233	42
43	Retransmission output 1 decimal point position	202A	8234	46
44	Retransmission output 2 decimal point position	202B	8235	47
45	Retransmission output 3 decimal point position	202C	8236	48
46	Event 1 decimal point position	202D	8237	49
47	Event 2 decimal point position	202E	8238	50
48	Event 3 decimal point position	202F	8239	51
49	Event 4 decimal point position	2030	8240	52
50	Interlock release	2031	8241	53
51	Memory area transfer	2032	8242	54
52	Input 1_Hold reset	2033	8243	55
53	Input 2_Hold reset	2034	8244	56
54	Bottom suppression start signal	2035	8245	57
55	RUN/STOP transfer	2036	8246	58
56	Input 1_Autotuning (AT)	2037	8247	59
57	Input 2_Autotuning (AT)	2038	8248	60
58	Input 1_Startup tuning (ST)	2039	8249	61
59	Input 2_Startup tuning (ST)	203A	8250	62
60	Input 1_Auto/Manual transfer	203B	8251	63
61	Input 2_Auto/Manual transfer	203C	8252	64
62	Remote/Local transfer	203D	8253	65
63	Control area Local/External transfer	203E	8254	66
64	Input 1_Set value (SV) ★	203F	8255	67
65	Input 2_Set value (SV) ★	2040	8256	68
66	Set value (SV) of differential temperature input ★	2041	8257	69
67	Event 1 set value (EV1) Event 1 set value (EV1) [high] ★	2042	8258	70
68	Event 1 set value (EV1') [low] ★	2043	8259	71
69	Event 2 set value (EV2) Event 2 set value (EV2) [high] ★	2044	8260	72
70	Event 2 set value (EV2') [low] ★	2045	8261	73
71	Event 3 set value (EV3) Event 3 set value (EV3) [high] ★	2046	8262	74
72	Event 3 set value (EV3') [low] ★	2047	8263	75
73	Event 4 set value (EV4) Event 4 set value (EV4) [high] ★	2048	8264	76
74	Event 4 set value (EV4') [low] ★	2049	8265	77
75	Input 1_Proportional band [heat-side] ★	204A	8266	78
76	Input 1_Integral time [heat-side] ★	204B	8267	79
77	Input 1_Derivative time [heat-side] ★	204C	8268	80
78	Input 1_Control response parameter ★	204D	8269	81
79	Input 1_Proactive intensity ★	204E	8270	82

★ Parameters which can be used in multi-memory area function

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
80	Input 1_Manual reset ★	204F	8271	83
81	Input 1_FF amount ★	2050	8272	84
82	Input 1_Output limiter high [heat-side] ★	2051	8273	85
83	Input 1_Output limiter low [heat-side] ★	2052	8274	86
84	Input 1_Control loop break alarm (LBA) time ★	2053	8275	87
85	Input 1_LBA deadband (LBD) ★	2054	8276	88
86	Input 2_Proportional band ★	2055	8277	89
87	Input 2_Integral time ★	2056	8278	90
88	Input 2_Derivative time ★	2057	8279	91
89	Input 2_Control response parameter ★	2058	8280	92
90	Input 2_Proactive intensity ★	2059	8281	93
91	Input 2_Manual reset ★	205A	8282	94
92	Input 2_FF amount ★	205B	8283	95
93	Input 2_Output limiter high ★	205C	8284	96
94	Input 2_Output limiter low ★	205D	8285	97
95	Input 2_Control loop break alarm (LBA) time ★	205E	8286	98
96	Input 2_LBA deadband (LBD) ★	205F	8287	99
97	Input 1_Proportional band [cool-side] ★	2060	8288	100
98	Input 1_Integral time [cool-side] ★	2061	8289	101
99	Input 1_Derivative time [cool-side] ★	2062	8290	102
100	Input 1_Overlap/Deadband ★	2063	8291	103
101	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] ★	2064	8292	104

★ Parameters which can be used in multi-memory area function

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
102	Input 1_Output limiter low [cool-side] ★	2065	8293	105
103	Select Trigger type for Memory area transfer ★	2066	8294	106
104	Area soak time ★	2067	8295	107
105	Link area number ★	2068	8296	108
106	Input 1_Setting change rate limiter (up) ★	2069	8297	109
107	Input 1_Setting change rate limiter (down) ★	206A	8298	110
108	Input 1_Auto/Manual transfer selection (Area) ★	206B	8299	111
109	Input 1_Manipulated output value (Area) ★	206C	8300	112
110	Input 2_Setting change rate limiter (up) ★	206D	8301	113
111	Input 2_Setting change rate limiter (down) ★	206E	8302	114
112	Input 2_Auto/Manual transfer selection (Area) ★	206F	8303	115
113	Input 2_Manipulated output value (Area) ★	2070	8304	116
114	Remote/Local transfer selection (Area) ★	2071	8305	117
115	Input 1_Number of knee point ★	2072	8306	118
116	Input 1_Knee point input value 1 ★	2073	8307	119
117	Input 1_Knee point input value 2 ★	2074	8308	120
118	Input 1_Knee point input value 3 ★	2075	8309	121
119	Input 1_Knee point input value 4 ★	2076	8310	122
120	Input 1_Knee point input value 5 ★	2077	8311	123
121	Input 1_Knee point correction value 1 ★	2078	8312	124
122	Input 1_Knee point correction value 2 ★	2079	8313	125
123	Input 1_Knee point correction value 3 ★	207A	8314	126

★ Parameters which can be used in multi-memory area function

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
124	Input 1_Knee point correction value 4 ★	207B	8315	127
125	Input 1_Knee point correction value 5 ★	207C	8316	128
126	Input 2_Number of knee point ★	207D	8317	129
127	Input 2_Knee point input value 1 ★	207E	8318	130
128	Input 2_Knee point input value 2 ★	207F	8319	131
129	Input 2_Knee point input value 3 ★	2080	8320	132
130	Input 2_Knee point input value 4 ★	2081	8321	133
131	Input 2_Knee point input value 5 ★	2082	8322	134
132	Input 2_Knee point correction value 1 ★	2083	8323	135
133	Input 2_Knee point correction value 2 ★	2084	8324	136
134	Input 2_Knee point correction value 3 ★	2085	8325	137
135	Input 2_Knee point correction value 4 ★	2086	8326	138
136	Input 2_Knee point correction value 5 ★	2087	8327	139
137	Display update cycle	2088	8328	140
138	Input 1_PV bias	2089	8329	141
139	Input 1_PV digital filter	208A	8330	142
140	Input 1_PV ratio	208B	8331	143
141	Input 1_PV low input cut-off	208C	8332	144
142	Input 2_PV bias (RS bias)	208D	8333	145
143	Input 2_PV digital filter (RS digital filter)	208E	8334	146
144	Input 2_PV ratio (RS ratio)	208F	8335	147
145	Input 2_PV low input cut-off	2090	8336	148

★ Parameters which can be used in multi-memory area function

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
146	OUT1 proportional cycle time	2091	8337	149
147	OUT2 proportional cycle time	2092	8338	150
148	OUT3 proportional cycle time	2093	8339	151
149	OUT1 minimum ON/OFF time of proportional cycle	2094	8340	152
150	OUT2 minimum ON/OFF time of proportional cycle	2095	8341	153
151	OUT3 minimum ON/OFF time of proportional cycle	2096	8342	154
152	Heater break alarm 1 (HBA1) set value	2097	8343	155
153	Number of heater break alarm 1 (HBA1) delay times	2098	8344	156
154	Heater break alarm 2 (HBA2) set value	2099	8345	157
155	Number of heater break alarm 2 (HBA2) delay times	209A	8346	158
156	Input 1_Manual manipulated output value	209B	8347	159
157	Input 1_Level PID setting 1	209C	8348	160
158	Input 1_Level PID setting 2	209D	8349	161
159	Input 1_Level PID setting 3	209E	8350	162
160	Input 1_Level PID setting 4	209F	8351	163
161	Input 1_Level PID setting 5	20A0	8352	164
162	Input 1_Level PID setting 6	20A1	8353	165
163	Input 1_Level PID setting 7	20A2	8354	166
164	Input 1_ON/OFF action differential gap	20A3	8355	167
165	Input 1_ON/OFF action differential gap (upper)	20A4	8356	168
166	Input 1_ON/OFF action differential gap (lower)	20A5	8357	169
167	Input 2_ Manual manipulated output value	20A6	8358	170
168	Input 2_Level PID setting 1	20A7	8359	171

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
169	Input 2_Level PID setting 2	20A8	8360	172
170	Input 2_Level PID setting 3	20A9	8361	173
171	Input 2_Level PID setting 4	20AA	8362	174
172	Input 2_Level PID setting 5	20AB	8363	175
173	Input 2_Level PID setting 6	20AC	8364	176
174	Input 2_Level PID setting 7	20AD	8365	177
175	Input 2_ON/OFF action differential gap	20AE	8366	178
176	Input 2_ON/OFF action differential gap (upper)	20AF	8367	179
177	Input 2_ON/OFF action differential gap (lower)	20B0	8368	180
178	Input 1_AT bias	20B1	8369	181
179	Input 2_AT bias	20B2	8370	182
180	FF amount learning	20B3	8371	183
181	Input 1_Determination point of external disturbance	20B4	8372	184
182	Input 2_Determination point of external disturbance	20B5	8373	185
183	PV select transfer level	20B6	8374	186
184	PV select transfer time	20B7	8375	187

Items 185 to 380 are data in the Engineering mode.

⚠ WARNING

Communication data the Engineering mode should be set according to the application before setting any parameter related to operation. Once the communication data in the Engineering mode are set correctly, no further changes need to be made to parameters 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 Engineering mode.

NOTE

Parameters in Engineering mode are settable only when the controller is in STOP mode. However, only checking can be made even in the RUN state.

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
185	STOP display selection	20B8	8376	188
186	ALM lamp lighting condition	20B9	8377	189
187	PV flashing display at input error	20BA	8378	190
188	Show/Hide Input 1_SV	20BB	8379	191
189	Show/Hide Input 2_SV	20BC	8380	192
190	Show/Hide Input 1_MV	20BD	8381	193
191	Show/Hide Input 2_MV	20BE	8382	194
192	Select hide items in Monitor mode	20BF	8383	195
193	Select hide items in Operation transfer mode	20C0	8384	196
194	Data registration	20C1	8385	197
195	FUNC key assignment	20C2	8386	198
196	FUNC key operation selection	20C3	8387	199
197	Input 1_Input type	20C4	8388	200

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
198	Input 1_Display unit	20C5	8389	201
199	Input 1_Decimal point position	20C6	8390	202
200	Input 1_Input range high	20C7	8391	203
201	Input 1_Input range low	20C8	8392	204
202	Input 1_Input error determination point (high)	20C9	8393	205
203	Input 1_Input error determination point (low)	20CA	8394	206
204	Input 1_Temperature compensation calculation	20CB	8395	207
205	Input 1_Burnout direction	20CC	8396	208
206	Input 1_Selection of knee point function	20CD	8397	209
207	Input 1_Selection of correction value setting	20CE	8398	210
208	Input 1_Knee point correction limit value	20CF	8399	211
209	Input 1_Square root extraction	20D0	8400	212
210	Input 1_Inverting input	20D1	8401	213

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
211	Input data type	20D2	8402	214
212	Power supply frequency	20D3	8403	215
213	Input 2_Input type	20D4	8404	216
214	Input 2_Display unit	20D5	8405	217
215	Input 2_Decimal point position	20D6	8406	218
216	Input 2_Input range high	20D7	8407	219
217	Input 2_Input range low	20D8	8408	220
218	Input 2_Input error determination point (high)	20D9	8409	221
219	Input 2_Input error determination point (low)	20DA	8410	222
220	Input 2_Temperature compensation calculation	20DB	8411	223
221	Input 2_Burnout direction	20DC	8412	224
222	Input 2_Selection of knee point function	20DD	8413	225
223	Input 2_Selection of correction value setting	20DE	8414	226
224	Input 2_Knee point correction limit value	20DF	8415	227
225	Input 2_Square root extraction	20E0	8416	228
226	Input 2_Inverting input	20E1	8417	229
227	DI1 function selection	20E2	8418	230
228	DI2 function selection	20E3	8419	231
229	DI3 function selection	20E4	8420	232
230	DI4 function selection	20E5	8421	233
231	DI5 function selection	20E6	8422	234
232	DI6 function selection	20E7	8423	235
233	DI logic invert	20E8	8424	236
234	Area switching time (Without area set signal)	20E9	8425	237

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
235	OUT1 function selection	20EA	8426	238
236	OUT2 function selection	20EB	8427	239
237	OUT3 function selection	20EC	8428	240
238	OUT1 logic calculation selection	20ED	8429	241
239	OUT2 logic calculation selection	20EE	8430	242
240	OUT3 logic calculation selection	20EF	8431	243
241	Energized/De-energized selection	20F0	8432	244
242	Interlock selection	20F1	8433	245
243	Output action at control stop	20F2	8434	246
244	Universal output type selection (OUT3)	20F3	8435	247
245	Retransmission output 1 type	20F4	8436	248
246	Retransmission output 1 scale high	20F5	8437	249
247	Retransmission output 1 scale low	20F6	8438	250
248	Retransmission output 2 type	20F7	8439	251
249	Retransmission output 2 scale high	20F8	8440	252
250	Retransmission output 2 scale low	20F9	8441	253
251	Retransmission output 3 type	20FA	8442	254
252	Retransmission output 3 scale high	20FB	8443	255
253	Retransmission output 3 scale low	20FC	8444	256
254	DO1 function selection	20FD	8445	257
255	DO2 function selection	20FE	8446	258
256	DO3 function selection	20FF	8447	259
257	DO4 function selection	2100	8448	260
258	DO1 logic calculation selection	2101	8449	261

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
259	DO2 logic calculation selection	2102	8450	262
260	DO3 logic calculation selection	2103	8451	263
261	DO4 logic calculation selection	2104	8452	264
262	Event 1 assignment	2105	8453	265
263	Event 1 type	2106	8454	266
264	Event 1 hold action	2107	8455	267
265	Event 1 differential gap	2108	8456	268
266	Event 1 timer	2109	8457	269
267	Event 2 assignment	210A	8458	270
268	Event 2 type	210B	8459	271
269	Event 2 hold action	210C	8460	272
270	Event 2 differential gap	210D	8461	273
271	Event 2 timer	210E	8462	274
272	Event 3 assignment	210F	8463	275
273	Event 3 type	2110	8464	276
274	Event 3 hold action	2111	8465	277
275	Event 3 differential gap	2112	8466	278
276	Event 3 timer	2113	8467	279
277	Event 4 assignment	2114	8468	280
278	Event 4 type	2115	8469	281
279	Event 4 hold action	2116	8470	282
280	Event 4 differential gap	2117	8471	283
281	Event 4 timer	2118	8472	284
282	CT1 assignment	2119	8473	285

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
283	CT1 type	211A	8474	286
284	CT1 ratio	211B	8475	287
285	CT1 low input cut-off	211C	8476	288
286	CT2 assignment	211D	8477	289
287	CT2 type	211E	8478	290
288	CT2 ratio	211F	8479	291
289	CT2 low input cut-off	2120	8480	292
290	Hot/Cold start	2121	8481	293
291	Manual manipulated output value selection	2122	8482	294
292	SV tracking	2123	8483	295
293	Integral/Derivative time decimal point position	2124	8484	296
294	ST start condition	2125	8485	297
295	Input 1_Control action	2126	8486	298
296	Input 1_Output change rate limiter (up) [heat-side]	2127	8487	299
297	Input 1_Output change rate limiter (down) [heat-side]	2128	8488	300
298	Input 1_Action (high) input error	2129	8489	301
299	Input 1_Action (low) input error	212A	8490	302
300	Input 1_Manipulated output value at input error	212B	8491	303
301	Input 1_ Manipulated output value at STOP [heat-side]	212C	8492	304
302	Input 1_Start determination point	212D	8493	305
303	Input 1_Level PID action selection	212E	8494	306
304	Input 1_Level PID differential gap	212F	8495	307
305	Input 2_Control action	2130	8496	308
306	Input 2_Output change rate limiter (up)	2131	8497	309

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
307	Input 2_Output change rate limiter (down)	2132	8498	310
308	Input 2_Action (high) input error	2133	8499	311
309	Input 2_Action (low) input error	2134	8500	312
310	Input 2_Manipulated output value at input error	2135	8501	313
311	Input 2_ Manipulated output value at STOP	2136	8502	314
312	Input 2_Start determination point	2137	8503	315
313	Input 2_Level PID action selection	2138	8504	316
314	Input 2_Level PID differential gap	2139	8505	317
315	Input 1_Output change rate limiter (up) [cool-side]	213A	8506	318
316	Input 1_Output change rate limiter (down) [cool-side]	213B	8507	319
317	Input 1_ Manipulated output value at STOP [cool-side]	213C	8508	320
318	Undershoot suppression factor	213D	8509	321
319	Overlap/Deadband reference point	213E	8510	322
320	Bottom suppression function	213F	8511	323
321	Select function for input 2	2140	8512	324
322	Selection of PV select trigger	2141	8513	325
323	Input circuit error alarm set value	2142	8514	326
324	Communication protocol	2143	8515	327
325	Device address	2144	8516	328
326	Communication speed	2145	8517	329
327	Data bit configuration	2146	8518	330
328	Interval time	2147	8519	331
329	Register type	2148	8520	332
330	Register start number (High-order 4-bit)	2149	8521	333

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
331	Register start number (Low-order 16-bit)	214A	8522	334
332	Monitor item register bias	214B	8523	335
333	Setting item register bias	214C	8524	336
334	Instrument link recognition time	214D	8525	337
335	PLC response waiting time	214E	8526	338
336	PLC communication start time	214F	8527	339
337	Slave register bias	2150	8528	340
338	Number of recognizable devices	2151	8529	341
339	Station number	2152	8530	342
340	PC number	2153	8531	343
341	Monitor item selection 1	2154	8532	344
342	Monitor item selection 2	2155	8533	345
343	Monitor item selection 3	2156	8534	346
344	Setting item selection 1	2157	8535	347
345	Setting item selection 2	2158	8536	348
346	Setting item selection 3	2159	8537	349
347	Setting item selection 4	215A	8538	350
348	Setting item selection 5	215B	8539	351
349	Setting item selection 6	215C	8540	352
350	Setting item selection 7	215D	8541	353
351	Setting item selection 8	215E	8542	354
352	Setting change rate limiter unit time	215F	8543	355
353	Soak time unit	2160	8544	356
354	Input 1_Setting limiter high	2161	8545	357

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
355	Input 1_Setting limiter low	2162	8546	358
356	nput 2_Setting limiter high	2163	8547	359
357	Input 2_Setting limiter low	2164	8548	360
358	Initialization	2165	8549	361
359	Set data unlock/lock transfer	2166	8550	362
360	Set lock level	2167	8551	363
361	Area lock	2168	8552	364
362	Select Blind function	2169	8553	365
363	Fix parameter setting	216A	8554	366
364	Parameter select direct registration	216B	8555	367
365	Parameter select setting 1	216C	8556	368
366	Parameter select setting 2	216D	8557	369
367	Parameter select setting 3	216E	8558	370
368	Parameter select setting 4	216F	8559	371
369	Parameter select setting 5	2170	8560	372
370	Parameter select setting 6	2171	8561	373
371	Parameter select setting 7	2172	8562	374
372	Parameter select setting 8	2173	8563	375
373	Parameter select setting 9	2174	8564	376
374	Parameter select setting 10	2175	8565	377
375	Parameter select setting 11	2176	8566	378
376	Parameter select setting 12	2177	8567	379
377	Parameter select setting 13	2178	8568	380
378	Parameter select setting 14	2179	8569	381

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
379	Parameter select setting 15	217A	8570	382
380	Parameter select setting 16	217B	8571	383

6.4.2 Memory area data (Direct designation method) [Modbus single word]

Register addresses 2500H to 298FH are used to check and change set values belonging to the Memory area. For the details of attribute, data range and factory set values, refer to ■ **Memory area 1 data (P.6-80), 6.3.2 Memory area data (Direct designation method) [Modbus double word]**.

☞ For the Memory area, refer to the **5.9 How to Use Memory Area Data (P. 5-18)**.

Memory area 1 to 3 data

No.	Name	Memory area 1 data		Memory area 2 data		Memory area 3 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
1	Input 1_Set value (SV)	2500	9472	2549	9545	2592	9618	1
2	Input 2_Set value (SV)	2501	9473	254A	9546	2593	9619	2
3	Set value (SV) of differential temperature input	2502	9474	254B	9547	2594	9620	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	2503	9475	254C	9548	2595	9621	4
5	Event 1 set value (EV1') [low]	2504	9476	254D	9549	2596	9622	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	2505	9477	254E	9550	2597	9623	6
7	Event 2 set value (EV2') [low]	2506	9478	254F	9551	2598	9624	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	2507	9479	2550	9552	2599	9625	8
9	Event 3 set value (EV3') [low]	2508	9480	2551	9553	259A	9626	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	2509	9481	2552	9554	259B	9627	10
11	Event 4 set value (EV4') [low]	250A	9482	2553	9555	259C	9628	11
12	Input 1_Proportional band [heat-side]	250B	9483	2554	9556	259D	9629	12
13	Input 1_Integral time [heat-side]	250C	9484	2555	9557	259E	9630	13
14	Input 1_Derivative time [heat-side]	250D	9485	2556	9558	259F	9631	14
15	Input 1_Control response parameter	250E	9486	2557	9559	25A0	9632	15
16	Input 1_Proactive intensity	250F	9487	2558	9560	25A1	9633	16
17	Input 1_Manual reset	2510	9488	2559	9561	25A2	9634	17
18	Input 1_FF amount	2511	9489	255A	9562	25A3	9635	18
19	Input 1_Output limiter high [heat-side]	2512	9490	255B	9563	25A4	9636	19
20	Input 1_Output limiter low [heat-side]	2513	9491	255C	9564	25A5	9637	20
21	Input 1_Control loop break alarm (LBA) time	2514	9492	255D	9565	25A6	9638	21
22	Input 1_LBA deadband (LBD)	2515	9493	255E	9566	25A7	9639	22
23	Input 2_Proportional band	2516	9494	255F	9567	25A8	9640	23
24	Input 2_Integral time	2517	9495	2560	9568	25A9	9641	24
25	Input 2_Derivative time	2518	9496	2561	9569	25AA	9642	25
26	Input 2_Control response parameter	2519	9497	2562	9570	25AB	9643	26
27	Input 2_Proactive intensity	251A	9498	2563	9571	25AC	9644	27
28	Input 2_Manual reset	251B	9499	2564	9572	25AD	9645	28
29	Input 2_FF amount	251C	9500	2565	9573	25AE	9646	29
30	Input 2_Output limiter high	251D	9501	2566	9574	25AF	9647	30
31	Input 2_Output limiter low	251E	9502	2567	9575	25B0	9648	31
32	Input 2_Control loop break alarm (LBA) time	251F	9503	2568	9576	25B1	9649	32
33	Input 2_LBA deadband (LBD)	2520	9504	2569	9577	25B2	9650	33
34	Input 1_Proportional band [cool-side]	2521	9505	256A	9578	25B3	9651	34
35	Input 1_Integral time [cool-side]	2522	9506	256B	9579	25B4	9652	35
36	Input 1_Derivative time [cool-side]	2523	9507	256C	9580	25B5	9653	36
37	Input 1_Overlap/Deadband	2524	9508	256D	9581	25B6	9654	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	2525	9509	256E	9582	25B7	9655	38
39	Input 1_Output limiter low [cool-side]	2526	9510	256F	9583	25B8	9656	39
40	Select Trigger type for Memory area transfer	2527	9511	2570	9584	25B9	9657	40
41	Area soak time	2528	9512	2571	9585	25BA	9658	41
42	Link area number	2529	9513	2572	9586	25BB	9659	42
43	Input 1_Setting change rate limiter (up)	252A	9514	2573	9587	25BC	9660	43
44	Input 1_Setting change rate limiter (down)	252B	9515	2574	9588	25BD	9661	44
45	Input 1_Auto/Manual transfer selection (Area)	252C	9516	2575	9589	25BE	9662	45
46	Input 1_Manipulated output value (Area)	252D	9517	2576	9590	25BF	9663	46
47	Input 2_Setting change rate limiter (up)	252E	9518	2577	9591	25C0	9664	47

Memory area 1 to 3 data

No.	Name	Memory area 1 data		Memory area 2 data		Memory area 3 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
48	Input 2_Setting change rate limiter (down)	252F	9519	2578	9592	25C1	9665	48
49	Input 2_Auto/Manual transfer selection (Area)	2530	9520	2579	9593	25C2	9666	49
50	Input 2_Manipulated output value (Area)	2531	9521	257A	9594	25C3	9667	50
51	Remote/Local transfer selection (Area)	2532	9522	257B	9595	25C4	9668	51
52	Input 1_Number of knee point	2533	9523	257C	9596	25C5	9669	52
53	Input 1_Knee point input value 1	2534	9524	257D	9597	25C6	9670	53
54	Input 1_Knee point input value 2	2535	9525	257E	9598	25C7	9671	54
55	Input 1_Knee point input value 3	2536	9526	257F	9599	25C8	9672	55
56	Input 1_Knee point input value 4	2537	9527	2580	9600	25C9	9673	56
57	Input 1_Knee point input value 5	2538	9528	2581	9601	25CA	9674	57
58	Input 1_Knee point correction value 1	2539	9529	2582	9602	25CB	9675	58
59	Input 1_Knee point correction value 2	253A	9530	2583	9603	25CC	9676	59
60	Input 1_Knee point correction value 3	253B	9531	2584	9604	25CD	9677	60
61	Input 1_Knee point correction value 4	253C	9532	2585	9605	25CE	9678	61
62	Input 1_Knee point correction value 5	253D	9533	2586	9606	25CF	9679	62
63	Input 2_Number of knee point	253E	9534	2587	9607	25D0	9680	63
64	Input 2_Knee point input value 1	253F	9535	2588	9608	25D1	9681	64
65	Input 2_Knee point input value 2	2540	9536	2589	9609	25D2	9682	65
66	Input 2_Knee point input value 3	2541	9537	258A	9610	25D3	9683	66
67	Input 2_Knee point input value 4	2542	9538	258B	9611	25D4	9684	67
68	Input 2_Knee point input value 5	2543	9539	258C	9612	25D5	9685	68
69	Input 2_Knee point correction value 1	2544	9540	258D	9613	25D6	9686	69
70	Input 2_Knee point correction value 2	2545	9541	258E	9614	25D7	9687	70
71	Input 2_Knee point correction value 3	2546	9542	258F	9615	25D8	9688	71
72	Input 2_Knee point correction value 4	2547	9543	2590	9616	25D9	9689	72
73	Input 2_Knee point correction value 5	2548	9544	2591	9617	25DA	9690	73

Memory area 4 to 6 data

No.	Name	Memory area 4 data		Memory area 5 data		Memory area 6 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
1	Input 1_Set value (SV)	25DB	9691	2624	9764	266D	9837	1
2	Input 2_Set value (SV)	25DC	9692	2625	9765	266E	9838	2
3	Set value (SV) of differential temperature input	25DD	9693	2626	9766	266F	9839	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	25DE	9694	2627	9767	2670	9840	4
5	Event 1 set value (EV1') [low]	25DF	9695	2628	9768	2671	9841	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	25E0	9696	2629	9769	2672	9842	6
7	Event 2 set value (EV2') [low]	25E1	9697	262A	9770	2673	9843	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	25E2	9698	262B	9771	2674	9844	8
9	Event 3 set value (EV3') [low]	25E3	9699	262C	9772	2675	9845	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	25E4	9700	262D	9773	2676	9846	10
11	Event 4 set value (EV4') [low]	25E5	9701	262E	9774	2677	9847	11
12	Input 1_Proportional band [heat-side]	25E6	9702	262F	9775	2678	9848	12
13	Input 1_Integral time [heat-side]	25E7	9703	2630	9776	2679	9849	13
14	Input 1_Derivative time [heat-side]	25E8	9704	2631	9777	267A	9850	14
15	Input 1_Control response parameter	25E9	9705	2632	9778	267B	9851	15
16	Input 1_Proactive intensity	25EA	9706	2633	9779	267C	9852	16
17	Input 1_Manual reset	25EB	9707	2634	9780	267D	9853	17
18	Input 1_FF amount	25EC	9708	2635	9781	267E	9854	18
19	Input 1_Output limiter high [heat-side]	25ED	9709	2636	9782	267F	9855	19
20	Input 1_Output limiter low [heat-side]	25EE	9710	2637	9783	2680	9856	20
21	Input 1_Control loop break alarm (LBA) time	25EF	9711	2638	9784	2681	9857	21
22	Input 1_LBA deadband (LBD)	25F0	9712	2639	9785	2682	9858	22
23	Input 2_Proportional band	25F1	9713	263A	9786	2683	9859	23
24	Input 2_Integral time	25F2	9714	263B	9787	2684	9860	24
25	Input 2_Derivative time	25F3	9715	263C	9788	2685	9861	25
26	Input 2_Control response parameter	25F4	9716	263D	9789	2686	9862	26
27	Input 2_Proactive intensity	25F5	9717	263E	9790	2687	9863	27
28	Input 2_Manual reset	25F6	9718	263F	9791	2688	9864	28
29	Input 2_FF amount	25F7	9719	2640	9792	2689	9865	29
30	Input 2_Output limiter high	25F8	9720	2641	9793	268A	9866	30
31	Input 2_Output limiter low	25F9	9721	2642	9794	268B	9867	31
32	Input 2_Control loop break alarm (LBA) time	25FA	9722	2643	9795	268C	9868	32
33	Input 2_LBA deadband (LBD)	25FB	9723	2644	9796	268D	9869	33
34	Input 1_Proportional band [cool-side]	25FC	9724	2645	9797	268E	9870	34
35	Input 1_Integral time [cool-side]	25FD	9725	2646	9798	268F	9871	35
36	Input 1_Derivative time [cool-side]	25FE	9726	2647	9799	2690	9872	36
37	Input 1_Overlap/Deadband	25FF	9727	2648	9800	2691	9873	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	2600	9728	2649	9801	2692	9874	38
39	Input 1_Output limiter low [cool-side]	2601	9729	264A	9802	2693	9875	39
40	Select Trigger type for Memory area transfer	2602	9730	264B	9803	2694	9876	40
41	Area soak time	2603	9731	264C	9804	2695	9877	41
42	Link area number	2604	9732	264D	9805	2696	9878	42
43	Input 1_Setting change rate limiter (up)	2605	9733	264E	9806	2697	9879	43
44	Input 1_Setting change rate limiter (down)	2606	9734	264F	9807	2698	9880	44
45	Input 1_Auto/Manual transfer selection (Area)	2607	9735	2650	9808	2699	9881	45
46	Input 1_Manipulated output value (Area)	2608	9736	2651	9809	269A	9882	46

Memory area 4 to 6 data

No.	Name	Memory area 4 data		Memory area 5 data		Memory area 6 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
47	Input 2_Setting change rate limiter (up)	2609	9737	2652	9810	269B	9883	47
48	Input 2_Setting change rate limiter (down)	260A	9738	2653	9811	269C	9884	48
49	Input 2_Auto/Manual transfer selection (Area)	260B	9739	2654	9812	269D	9885	49
50	Input 2_Manipulated output value (Area)	260C	9740	2655	9813	269E	9886	50
51	Remote/Local transfer selection (Area)	260D	9741	2656	9814	269F	9887	51
52	Input 1_Number of knee point	260E	9742	2657	9815	26A0	9888	52
53	Input 1_Knee point input value 1	260F	9743	2658	9816	26A1	9889	53
54	Input 1_Knee point input value 2	2610	9744	2659	9817	26A2	9890	54
55	Input 1_Knee point input value 3	2611	9745	265A	9818	26A3	9891	55
56	Input 1_Knee point input value 4	2612	9746	265B	9819	26A4	9892	56
57	Input 1_Knee point input value 5	2613	9747	265C	9820	26A5	9893	57
58	Input 1_Knee point correction value 1	2614	9748	265D	9821	26A6	9894	58
59	Input 1_Knee point correction value 2	2615	9749	265E	9822	26A7	9895	59
60	Input 1_Knee point correction value 3	2616	9750	265F	9823	26A8	9896	60
61	Input 1_Knee point correction value 4	2617	9751	2660	9824	26A9	9897	61
62	Input 1_Knee point correction value 5	2618	9752	2661	9825	26AA	9898	62
63	Input 2_Number of knee point	2619	9753	2662	9826	26AB	9899	63
64	Input 2_Knee point input value 1	261A	9754	2663	9827	26AC	9900	64
65	Input 2_Knee point input value 2	261B	9755	2664	9828	26AD	9901	65
66	Input 2_Knee point input value 3	261C	9756	2665	9829	26AE	9902	66
67	Input 2_Knee point input value 4	261D	9757	2666	9830	26AF	9903	67
68	Input 2_Knee point input value 5	261E	9758	2667	9831	26B0	9904	68
69	Input 2_Knee point correction value 1	261F	9759	2668	9832	26B1	9905	69
70	Input 2_Knee point correction value 2	2620	9760	2669	9833	26B2	9906	70
71	Input 2_Knee point correction value 3	2621	9761	266A	9834	26B3	9907	71
72	Input 2_Knee point correction value 4	2622	9762	266B	9835	26B4	9908	72
73	Input 2_Knee point correction value 5	2623	9763	266C	9836	26B5	9909	73

Memory area 7 to 9 data

No.	Name	Memory area 7 data		Memory area 8 data		Memory area 9 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
1	Input 1_Set value (SV)	26B6	9910	26FF	9983	2748	10056	1
2	Input 2_Set value (SV)	26B7	9911	2700	9984	2749	10057	2
3	Set value (SV) of differential temperature input	26B8	9912	2701	9985	274A	10058	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	26B9	9913	2702	9986	274B	10059	4
5	Event 1 set value (EV1') [low]	26BA	9914	2703	9987	274C	10060	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	26BB	9915	2704	9988	274D	10061	6
7	Event 2 set value (EV2') [low]	26BC	9916	2705	9989	274E	10062	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	26BD	9917	2706	9990	274F	10063	8
9	Event 3 set value (EV3') [low]	26BE	9918	2707	9991	2750	10064	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	26BF	9919	2708	9992	2751	10065	10
11	Event 4 set value (EV4') [low]	26C0	9920	2709	9993	2752	10066	11
12	Input 1_Proportional band [heat-side]	26C1	9921	270A	9994	2753	10067	12
13	Input 1_Integral time [heat-side]	26C2	9922	270B	9995	2754	10068	13
14	Input 1_Derivative time [heat-side]	26C3	9923	270C	9996	2755	10069	14
15	Input 1_Control response parameter	26C4	9924	270D	9997	2756	10070	15
16	Input 1_Proactive intensity	26C5	9925	270E	9998	2757	10071	16
17	Input 1_Manual reset	26C6	9926	270F	9999	2758	10072	17
18	Input 1_FF amount	26C7	9927	2710	10000	2759	10073	18
19	Input 1_Output limiter high [heat-side]	26C8	9928	2711	10001	275A	10074	19
20	Input 1_Output limiter low [heat-side]	26C9	9929	2712	10002	275B	10075	20
21	Input 1_Control loop break alarm (LBA) time	26CA	9930	2713	10003	275C	10076	21
22	Input 1_LBA deadband (LBD)	26CB	9931	2714	10004	275D	10077	22
23	Input 2_Proportional band	26CC	9932	2715	10005	275E	10078	23
24	Input 2_Integral time	26CD	9933	2716	10006	275F	10079	24
25	Input 2_Derivative time	26CE	9934	2717	10007	2760	10080	25
26	Input 2_Control response parameter	26CF	9935	2718	10008	2761	10081	26
27	Input 2_Proactive intensity	26D0	9936	2719	10009	2762	10082	27
28	Input 2_Manual reset	26D1	9937	271A	10010	2763	10083	28
29	Input 2_FF amount	26D2	9938	271B	10011	2764	10084	29
30	Input 2_Output limiter high	26D3	9939	271C	10012	2765	10085	30
31	Input 2_Output limiter low	26D4	9940	271D	10013	2766	10086	31
32	Input 2_Control loop break alarm (LBA) time	26D5	9941	271E	10014	2767	10087	32
33	Input 2_LBA deadband (LBD)	26D6	9942	271F	10015	2768	10088	33
34	Input 1_Proportional band [cool-side]	26D7	9943	2720	10016	2769	10089	34
35	Input 1_Integral time [cool-side]	26D8	9944	2721	10017	276A	10090	35
36	Input 1_Derivative time [cool-side]	26D9	9945	2722	10018	276B	10091	36
37	Input 1_Overlap/Deadband	26DA	9946	2723	10019	276C	10092	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	26DB	9947	2724	10020	276D	10093	38
39	Input 1_Output limiter low [cool-side]	26DC	9948	2725	10021	276E	10094	39
40	Select Trigger type for Memory area transfer	26DD	9949	2726	10022	276F	10095	40
41	Area soak time	26DE	9950	2727	10023	2770	10096	41
42	Link area number	26DF	9951	2728	10024	2771	10097	42
43	Input 1_Setting change rate limiter (up)	26E0	9952	2729	10025	2772	10098	43
44	Input 1_Setting change rate limiter (down)	26E1	9953	272A	10026	2773	10099	44
45	Input 1_Auto/Manual transfer selection (Area)	26E2	9954	272B	10027	2774	10100	45
46	Input 1_Manipulated output value (Area)	26E3	9955	272C	10028	2775	10101	46

Memory area 7 to 9 data

No.	Name	Memory area 7 data		Memory area 8 data		Memory area 9 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
47	Input 2_Setting change rate limiter (up)	26E4	9956	272D	10029	2776	10102	47
48	Input 2_Setting change rate limiter (down)	26E5	9957	272E	10030	2777	10103	48
49	Input 2_Auto/Manual transfer selection (Area)	26E6	9958	272F	10031	2778	10104	49
50	Input 2_Manipulated output value (Area)	26E7	9959	2730	10032	2779	10105	50
51	Remote/Local transfer selection (Area)	26E8	9960	2731	10033	277A	10106	51
52	Input 1_Number of knee point	26E9	9961	2732	10034	277B	10107	52
53	Input 1_Knee point input value 1	26EA	9962	2733	10035	277C	10108	53
54	Input 1_Knee point input value 2	26EB	9963	2734	10036	277D	10109	54
55	Input 1_Knee point input value 3	26EC	9964	2735	10037	277E	10110	55
56	Input 1_Knee point input value 4	26ED	9965	2736	10038	277F	10111	56
57	Input 1_Knee point input value 5	26EE	9966	2737	10039	2780	10112	57
58	Input 1_Knee point correction value 1	26EF	9967	2738	10040	2781	10113	58
59	Input 1_Knee point correction value 2	26F0	9968	2739	10041	2782	10114	59
60	Input 1_Knee point correction value 3	26F1	9969	273A	10042	2783	10115	60
61	Input 1_Knee point correction value 4	26F2	9970	273B	10043	2784	10116	61
62	Input 1_Knee point correction value 5	26F3	9971	273C	10044	2785	10117	62
63	Input 2_Number of knee point	26F4	9972	273D	10045	2786	10118	63
64	Input 2_Knee point input value 1	26F5	9973	273E	10046	2787	10119	64
65	Input 2_Knee point input value 2	26F6	9974	273F	10047	2788	10120	65
66	Input 2_Knee point input value 3	26F7	9975	2740	10048	2789	10121	66
67	Input 2_Knee point input value 4	26F8	9976	2741	10049	278A	10122	67
68	Input 2_Knee point input value 5	26F9	9977	2742	10050	278B	10123	68
69	Input 2_Knee point correction value 1	26FA	9978	2743	10051	278C	10124	69
70	Input 2_Knee point correction value 2	26FB	9979	2744	10052	278D	10125	70
71	Input 2_Knee point correction value 3	26FC	9980	2745	10053	278E	10126	71
72	Input 2_Knee point correction value 4	26FD	9981	2746	10054	278F	10127	72
73	Input 2_Knee point correction value 5	26FE	9982	2747	10055	2790	10128	73

Memory area 10 to 12 data

No.	Name	Memory area 10 data		Memory area 11 data		Memory area 12 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
1	Input 1_Set value (SV)	2791	10129	27DA	10202	2823	10275	1
2	Input 2_Set value (SV)	2792	10130	27DB	10203	2824	10276	2
3	Set value (SV) of differential temperature input	2793	10131	27DC	10204	2825	10277	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	2794	10132	27DD	10205	2826	10278	4
5	Event 1 set value (EV1') [low]	2795	10133	27DE	10206	2827	10279	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	2796	10134	27DF	10207	2828	10280	6
7	Event 2 set value (EV2') [low]	2797	10135	27E0	10208	2829	10281	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	2798	10136	27E1	10209	282A	10282	8
9	Event 3 set value (EV3') [low]	2799	10137	27E2	10210	282B	10283	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	279A	10138	27E3	10211	282C	10284	10
11	Event 4 set value (EV4') [low]	279B	10139	27E4	10212	282D	10285	11
12	Input 1_Proportional band [heat-side]	279C	10140	27E5	10213	282E	10286	12
13	Input 1_Integral time [heat-side]	279D	10141	27E6	10214	282F	10287	13
14	Input 1_Derivative time [heat-side]	279E	10142	27E7	10215	2830	10288	14
15	Input 1_Control response parameter	279F	10143	27E8	10216	2831	10289	15
16	Input 1_Proactive intensity	27A0	10144	27E9	10217	2832	10290	16
17	Input 1_Manual reset	27A1	10145	27EA	10218	2833	10291	17
18	Input 1_FF amount	27A2	10146	27EB	10219	2834	10292	18
19	Input 1_Output limiter high [heat-side]	27A3	10147	27EC	10220	2835	10293	19
20	Input 1_Output limiter low [heat-side]	27A4	10148	27ED	10221	2836	10294	20
21	Input 1_Control loop break alarm (LBA) time	27A5	10149	27EE	10222	2837	10295	21
22	Input 1_LBA deadband (LBD)	27A6	10150	27EF	10223	2838	10296	22
23	Input 2_Proportional band	27A7	10151	27F0	10224	2839	10297	23
24	Input 2_Integral time	27A8	10152	27F1	10225	283A	10298	24
25	Input 2_Derivative time	27A9	10153	27F2	10226	283B	10299	25
26	Input 2_Control response parameter	27AA	10154	27F3	10227	283C	10300	26
27	Input 2_Proactive intensity	27AB	10155	27F4	10228	283D	10301	27
28	Input 2_Manual reset	27AC	10156	27F5	10229	283E	10302	28
29	Input 2_FF amount	27AD	10157	27F6	10230	283F	10303	29
30	Input 2_Output limiter high	27AE	10158	27F7	10231	2840	10304	30
31	Input 2_Output limiter low	27AF	10159	27F8	10232	2841	10305	31
32	Input 2_Control loop break alarm (LBA) time	27B0	10160	27F9	10233	2842	10306	32
33	Input 2_LBA deadband (LBD)	27B1	10161	27FA	10234	2843	10307	33
34	Input 1_Proportional band [cool-side]	27B2	10162	27FB	10235	2844	10308	34
35	Input 1_Integral time [cool-side]	27B3	10163	27FC	10236	2845	10309	35
36	Input 1_Derivative time [cool-side]	27B4	10164	27FD	10237	2846	10310	36
37	Input 1_Overlap/Deadband	27B5	10165	27FE	10238	2847	10311	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	27B6	10166	27FF	10239	2848	10312	38
39	Input 1_Output limiter low [cool-side]	27B7	10167	2800	10240	2849	10313	39
40	Select Trigger type for Memory area transfer	27B8	10168	2801	10241	284A	10314	40
41	Area soak time	27B9	10169	2802	10242	284B	10315	41
42	Link area number	27BA	10170	2803	10243	284C	10316	42
43	Input 1_Setting change rate limiter (up)	27BB	10171	2804	10244	284D	10317	43
44	Input 1_Setting change rate limiter (down)	27BC	10172	2805	10245	284E	10318	44
45	Input 1_Auto/Manual transfer selection (Area)	27BD	10173	2806	10246	284F	10319	45
46	Input 1_Manipulated output value (Area)	27BE	10174	2807	10247	2850	10320	46

Memory area 10 to 12 data

No.	Name	Memory area 10 data		Memory area 11 data		Memory area 12 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
47	Input 2_Setting change rate limiter (up)	27BF	10175	2808	10248	2851	10321	47
48	Input 2_Setting change rate limiter (down)	27C0	10176	2809	10249	2852	10322	48
49	Input 2_Auto/Manual transfer selection (Area)	27C1	10177	280A	10250	2853	10323	49
50	Input 2_Manipulated output value (Area)	27C2	10178	280B	10251	2854	10324	50
51	Remote/Local transfer selection (Area)	27C3	10179	280C	10252	2855	10325	51
52	Input 1_Number of knee point	27C4	10180	280D	10253	2856	10326	52
53	Input 1_Knee point input value 1	27C5	10181	280E	10254	2857	10327	53
54	Input 1_Knee point input value 2	27C6	10182	280F	10255	2858	10328	54
55	Input 1_Knee point input value 3	27C7	10183	2810	10256	2859	10329	55
56	Input 1_Knee point input value 4	27C8	10184	2811	10257	285A	10330	56
57	Input 1_Knee point input value 5	27C9	10185	2812	10258	285B	10331	57
58	Input 1_Knee point correction value 1	27CA	10186	2813	10259	285C	10332	58
59	Input 1_Knee point correction value 2	27CB	10187	2814	10260	285D	10333	59
60	Input 1_Knee point correction value 3	27CC	10188	2815	10261	285E	10334	60
61	Input 1_Knee point correction value 4	27CD	10189	2816	10262	285F	10335	61
62	Input 1_Knee point correction value 5	27CE	10190	2817	10263	2860	10336	62
63	Input 2_Number of knee point	27CF	10191	2818	10264	2861	10337	63
64	Input 2_Knee point input value 1	27D0	10192	2819	10265	2862	10338	64
65	Input 2_Knee point input value 2	27D1	10193	281A	10266	2863	10339	65
66	Input 2_Knee point input value 3	27D2	10194	281B	10267	2864	10340	66
67	Input 2_Knee point input value 4	27D3	10195	281C	10268	2865	10341	67
68	Input 2_Knee point input value 5	27D4	10196	281D	10269	2866	10342	68
69	Input 2_Knee point correction value 1	27D5	10197	281E	10270	2867	10343	69
70	Input 2_Knee point correction value 2	27D6	10198	281F	10271	2868	10344	70
71	Input 2_Knee point correction value 3	27D7	10199	2820	10272	2869	10345	71
72	Input 2_Knee point correction value 4	27D8	10200	2821	10273	286A	10346	72
73	Input 2_Knee point correction value 5	27D9	10201	2822	10274	286B	10347	73

Memory area 13 to 15 data

No.	Name	Memory area 13 data		Memory area 14 data		Memory area 15 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
1	Input 1_Set value (SV)	286C	10348	28B5	10421	28FE	10494	1
2	Input 2_Set value (SV)	286D	10349	28B6	10422	28FF	10495	2
3	Set value (SV) of differential temperature input	286E	10350	28B7	10423	2900	10496	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	286F	10351	28B8	10424	2901	10497	4
5	Event 1 set value (EV1') [low]	2870	10352	28B9	10425	2902	10498	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	2871	10353	28BA	10426	2903	10499	6
7	Event 2 set value (EV2') [low]	2872	10354	28BB	10427	2904	10500	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	2873	10355	28BC	10428	2905	10501	8
9	Event 3 set value (EV3') [low]	2874	10356	28BD	10429	2906	10502	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	2875	10357	28BE	10430	2907	10503	10
11	Event 4 set value (EV4') [low]	2876	10358	28BF	10431	2908	10504	11
12	Input 1_Proportional band [heat-side]	2877	10359	28C0	10432	2909	10505	12
13	Input 1_Integral time [heat-side]	2878	10360	28C1	10433	290A	10506	13
14	Input 1_Derivative time [heat-side]	2879	10361	28C2	10434	290B	10507	14
15	Input 1_Control response parameter	287A	10362	28C3	10435	290C	10508	15
16	Input 1_Proactive intensity	287B	10363	28C4	10436	290D	10509	16
17	Input 1_Manual reset	287C	10364	28C5	10437	290E	10510	17
18	Input 1_FF amount	287D	10365	28C6	10438	290F	10511	18
19	Input 1_Output limiter high [heat-side]	287E	10366	28C7	10439	2910	10512	19
20	Input 1_Output limiter low [heat-side]	287F	10367	28C8	10440	2911	10513	20
21	Input 1_Control loop break alarm (LBA) time	2880	10368	28C9	10441	2912	10514	21
22	Input 1_LBA deadband (LBD)	2881	10369	28CA	10442	2913	10515	22
23	Input 2_Proportional band	2882	10370	28CB	10443	2914	10516	23
24	Input 2_Integral time	2883	10371	28CC	10444	2915	10517	24
25	Input 2_Derivative time	2884	10372	28CD	10445	2916	10518	25
26	Input 2_Control response parameter	2885	10373	28CE	10446	2917	10519	26
27	Input 2_Proactive intensity	2886	10374	28CF	10447	2918	10520	27
28	Input 2_Manual reset	2887	10375	28D0	10448	2919	10521	28
29	Input 2_FF amount	2888	10376	28D1	10449	291A	10522	29
30	Input 2_Output limiter high	2889	10377	28D2	10450	291B	10523	30
31	Input 2_Output limiter low	288A	10378	28D3	10451	291C	10524	31
32	Input 2_Control loop break alarm (LBA) time	288B	10379	28D4	10452	291D	10525	32
33	Input 2_LBA deadband (LBD)	288C	10380	28D5	10453	291E	10526	33
34	Input 1_Proportional band [cool-side]	288D	10381	28D6	10454	291F	10527	34
35	Input 1_Integral time [cool-side]	288E	10382	28D7	10455	2920	10528	35
36	Input 1_Derivative time [cool-side]	288F	10383	28D8	10456	2921	10529	36
37	Input 1_Overlap/Deadband	2890	10384	28D9	10457	2922	10530	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	2891	10385	28DA	10458	2923	10531	38
39	Input 1_Output limiter low [cool-side]	2892	10386	28DB	10459	2924	10532	39
40	Select Trigger type for Memory area transfer	2893	10387	28DC	10460	2925	10533	40
41	Area soak time	2894	10388	28DD	10461	2926	10534	41
42	Link area number	2895	10389	28DE	10462	2927	10535	42
43	Input 1_Setting change rate limiter (up)	2896	10390	28DF	10463	2928	10536	43
44	Input 1_Setting change rate limiter (down)	2897	10391	28E0	10464	2929	10537	44
45	Input 1_Auto/Manual transfer selection (Area)	2898	10392	28E1	10465	292A	10538	45
46	Input 1_Manipulated output value (Area)	2899	10393	28E2	10466	292B	10539	46

Memory area 13 to 15 data

No.	Name	Memory area 13 data		Memory area 14 data		Memory area 15 data		6.3.2 Reference No.
		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	
47	Input 2_Setting change rate limiter (up)	289A	10394	28E3	10467	292C	10540	47
48	Input 2_Setting change rate limiter (down)	289B	10395	28E4	10468	292D	10541	48
49	Input 2_Auto/Manual transfer selection (Area)	289C	10396	28E5	10469	292E	10542	49
50	Input 2_Manipulated output value (Area)	289D	10397	28E6	10470	292F	10543	50
51	Remote/Local transfer selection (Area)	289E	10398	28E7	10471	2930	10544	51
52	Input 1_Number of knee point	289F	10399	28E8	10472	2931	10545	52
53	Input 1_Knee point input value 1	28A0	10400	28E9	10473	2932	10546	53
54	Input 1_Knee point input value 2	28A1	10401	28EA	10474	2933	10547	54
55	Input 1_Knee point input value 3	28A2	10402	28EB	10475	2934	10548	55
56	Input 1_Knee point input value 4	28A3	10403	28EC	10476	2935	10549	56
57	Input 1_Knee point input value 5	28A4	10404	28ED	10477	2936	10550	57
58	Input 1_Knee point correction value 1	28A5	10405	28EE	10478	2937	10551	58
59	Input 1_Knee point correction value 2	28A6	10406	28EF	10479	2938	10552	59
60	Input 1_Knee point correction value 3	28A7	10407	28F0	10480	2939	10553	60
61	Input 1_Knee point correction value 4	28A8	10408	28F1	10481	293A	10554	61
62	Input 1_Knee point correction value 5	28A9	10409	28F2	10482	293B	10555	62
63	Input 2_Number of knee point	28AA	10410	28F3	10483	293C	10556	63
64	Input 2_Knee point input value 1	28AB	10411	28F4	10484	293D	10557	64
65	Input 2_Knee point input value 2	28AC	10412	28F5	10485	293E	10558	65
66	Input 2_Knee point input value 3	28AD	10413	28F6	10486	293F	10559	66
67	Input 2_Knee point input value 4	28AE	10414	28F7	10487	2940	10560	67
68	Input 2_Knee point input value 5	28AF	10415	28F8	10488	2941	10561	68
69	Input 2_Knee point correction value 1	28B0	10416	28F9	10489	2942	10562	69
70	Input 2_Knee point correction value 2	28B1	10417	28FA	10490	2943	10563	70
71	Input 2_Knee point correction value 3	28B2	10418	28FB	10491	2944	10564	71
72	Input 2_Knee point correction value 4	28B3	10419	28FC	10492	2945	10565	72
73	Input 2_Knee point correction value 5	28B4	10420	28FD	10493	2946	10566	73

Memory area 16 data

No.	Name	Memory area 16 data		6.3.2項 参照No.
		Register address		
		HEX	DEC	
1	Input 1_Set value (SV)	2947	10567	1
2	Input 2_Set value (SV)	2948	10568	2
3	Set value (SV) of differential temperature input	2949	10569	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high]	294A	10570	4
5	Event 1 set value (EV1') [low]	294B	10571	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high]	294C	10572	6
7	Event 2 set value (EV2') [low]	294D	10573	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high]	294E	10574	8
9	Event 3 set value (EV3') [low]	294F	10575	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high]	2950	10576	10
11	Event 4 set value (EV4') [low]	2951	10577	11
12	Input 1_Proportional band [heat-side]	2952	10578	12
13	Input 1_Integral time [heat-side]	2953	10579	13
14	Input 1_Derivative time [heat-side]	2954	10580	14
15	Input 1_Control response parameter	2955	10581	15
16	Input 1_Proactive intensity	2956	10582	16
17	Input 1_Manual reset	2957	10583	17
18	Input 1_FF amount	2958	10584	18
19	Input 1_Output limiter high [heat-side]	2959	10585	19
20	Input 1_Output limiter low [heat-side]	295A	10586	20
21	Input 1_Control loop break alarm (LBA) time	295B	10587	21
22	Input 1_LBA deadband (LBD)	295C	10588	22
23	Input 2_Proportional band	295D	10589	23
24	Input 2_Integral time	295E	10590	24
25	Input 2_Derivative time	295F	10591	25
26	Input 2_Control response parameter	2960	10592	26
27	Input 2_Proactive intensity	2961	10593	27
28	Input 2_Manual reset	2962	10594	28
29	Input 2_FF amount	2963	10595	29
30	Input 2_Output limiter high	2964	10596	30
31	Input 2_Output limiter low	2965	10597	31
32	Input 2_Control loop break alarm (LBA) time	2966	10598	32
33	Input 2_LBA deadband (LBD)	2967	10599	33
34	Input 1_Proportional band [cool-side]	2968	10600	34
35	Input 1_Integral time [cool-side]	2969	10601	35
36	Input 1_Derivative time [cool-side]	296A	10602	36
37	Input 1_Overlap/Deadband	296B	10603	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	296C	10604	38
39	Input 1_Output limiter low [cool-side]	296D	10605	39
40	Select Trigger type for Memory area transfer	296E	10606	40
41	Area soak time	296F	10607	41
42	Link area number	2970	10608	42
43	Input 1_Setting change rate limiter (up)	2971	10609	43
44	Input 1_Setting change rate limiter (down)	2972	10610	44
45	Input 1_Auto/Manual transfer selection (Area)	2973	10611	45
46	Input 1_Manipulated output value (Area)	2974	10612	46

Memory area 16 data

No.	Name	Memory area 16 data		6.3.2項 参照No.
		Register address		
		HEX	DEC	
47	Input 2_Setting change rate limiter (up)	2975	10613	47
48	Input 2_Setting change rate limiter (down)	2976	10614	48
49	Input 2_Auto/Manual transfer selection (Area)	2977	10615	49
50	Input 2_Manipulated output value (Area)	2978	10616	50
51	Remote/Local transfer selection (Area)	2979	10617	51
52	Input 1_Number of knee point	297A	10618	52
53	Input 1_Knee point input value 1	297B	10619	53
54	Input 1_Knee point input value 2	297C	10620	54
55	Input 1_Knee point input value 3	297D	10621	55
56	Input 1_Knee point input value 4	297E	10622	56
57	Input 1_Knee point input value 5	297F	10623	57
58	Input 1_Knee point correction value 1	2980	10624	58
59	Input 1_Knee point correction value 2	2981	10625	59
60	Input 1_Knee point correction value 3	2982	10626	60
61	Input 1_Knee point correction value 4	2983	10627	61
62	Input 1_Knee point correction value 5	2984	10628	62
63	Input 2_Number of knee point	2985	10629	63
64	Input 2_Knee point input value 1	2986	10630	64
65	Input 2_Knee point input value 2	2987	10631	65
66	Input 2_Knee point input value 3	2988	10632	66
67	Input 2_Knee point input value 4	2989	10633	67
68	Input 2_Knee point input value 5	298A	10634	68
69	Input 2_Knee point correction value 1	298B	10635	69
70	Input 2_Knee point correction value 2	298C	10636	70
71	Input 2_Knee point correction value 3	298D	10637	71
72	Input 2_Knee point correction value 4	298E	10638	72
73	Input 2_Knee point correction value 5	298F	10639	73

6.4.3 Data mapping address [Modbus single word]

Necessary data can be read/written at one time by assigning any desired data (max. 32) continuously.

For GZ400/900 data: max. 32 (Register address setting 1 to 32)
For our FB series equivalent data: max. 16 (Register address setting 1 to 16)

☞ For the Data mapping, refer to the **5.8 How to Use Modbus Data Mapping (P. 5-15)**.

■ Register address for data designation

No.	Name	Register address		Attri-bute	Data range	Factory set value
		HEX	DEC			
1	Register address setting 1 [Read/write address: 1500H]	1000	4096	R/W	Set the register address of data to be assigned to 1500H to 151FH Decimal number: −1 to 20479 (−1: Without mapping) Hexadecimal numeral: FFFFH to 4FFFH (FFFFH: Without mapping) The register addresses for data designation (1000H to 101FH) and read/write (1500H to 151FH) will be invalid (without mapping), even if set.	−1
2	Register address setting 2 [Read/write address: 1501H]	1001	4097	R/W		−1
3	Register address setting 3 [Read/write address: 1502H]	1002	4098	R/W		−1
4	Register address setting 4 [Read/write address: 1503H]	1003	4099	R/W		−1
5	Register address setting 5 [Read/write address:1504H]	1004	4100	R/W		−1
6	Register address setting 6 [Read/write address: 1505H]	1005	4101	R/W		−1
7	Register address setting 7 [Read/write address: 1506H]	1006	4102	R/W		−1
8	Register address setting 8 [Read/write address: 1507H]	1007	4103	R/W		−1
9	Register address setting 9 [Read/write address: 1508H]	1008	4104	R/W		−1
10	Register address setting 10 [Read/write address: 1509H]	1009	4105	R/W		−1
11	Register address setting 11 [Read/write address: 150AH]	100A	4106	R/W		−1
12	Register address setting 12 [Read/write address: 150BH]	100B	4107	R/W		−1
13	Register address setting 13 [Read/write address: 150CH]	100C	4108	R/W		−1
14	Register address setting 14 [Read/write address: 150DH]	100D	4109	R/W		−1
15	Register address setting 15 [Read/write address: 150EH]	100E	4110	R/W		−1
16	Register address setting 16 [Read/write address: 150FH]	100F	4111	R/W		−1

No.	Name	Register address		Attri-bute	Data range	Factory set value
		HEX	DEC			
17	Register address setting 17 [Read/write address: 1510H]	1010	4112	R/W	Set the register address of data to be assigned to 1500H to 151FH Decimal number: −1 to 20479 (−1: Without mapping) Hexadecimal numeral: FFFFH to 4FFFH (FFFFH: Without mapping) The register addresses for data designation (1000H to 101FH) and read/write (1500H to 151FH) will be invalid (without mapping), even if set.	−1
18	Register address setting 18 [Read/write address: 1511H]	1011	4113	R/W		−1
19	Register address setting 19 [Read/write address: 1512H]	1012	4114	R/W		−1
20	Register address setting 20 [Read/write address: 1513H]	1013	4115	R/W		−1
21	Register address setting 21 [Read/write address: 1514H]	1014	4116	R/W		−1
22	Register address setting 22 [Read/write address: 1515H]	1015	4117	R/W		−1
23	Register address setting 23 [Read/write address: 1516H]	1016	4118	R/W		−1
24	Register address setting 24 [Read/write address: 1517H]	1017	4119	R/W		−1
25	Register address setting 25 [Read/write address: 1518H]	1018	4120	R/W		−1
26	Register address setting 26 [Read/write address: 1519H]	1019	4121	R/W		−1
27	Register address setting 27 [Read/write address: 151AH]	101A	4122	R/W		−1
28	Register address setting 28 [Read/write address: 151BH]	101B	4123	R/W		−1
29	Register address setting 29 [Read/write address: 151CH]	101C	4124	R/W		−1
30	Register address setting 30 [Read/write address: 151DH]	101D	4125	R/W		−1
31	Register address setting 31 [Read/write address: 151EH]	101E	4126	R/W		−1
32	Register address setting 32 [Read/write address: 151FH]	101F	4127	R/W		−1

■ Register address for data read/write

No.	Name	Register address		Attri-bute	Data range	Factory set value
		HEX	DEC			
1	Data specified Register address setting 1 (1000H)	1500	5376			
2	Data specified Register address setting 2 (1001H)	1501	5377			
3	Data specified Register address setting 3 (1002H)	1502	5378			
4	Data specified Register address setting 4 (1003H)	1503	5379			
5	Data specified Register address setting 5 (1004H)	1504	5380			
6	Data specified Register address setting 6 (1005H)	1505	5381			
7	Data specified Register address setting 7 (1006H)	1506	5382			
8	Data specified Register address setting 8 (1007H)	1507	5383			
9	Data specified Register address setting 9 (1008H)	1508	5384			
10	Data specified Register address setting 10 (1009H)	1509	5385			
11	Data specified Register address setting 11 (100AH)	150A	5386			
12	Data specified Register address setting 12 (100BH)	150B	5387		Based on the data specified at 1000H to 101FH.	
13	Data specified Register address setting 13 (100CH)	150C	5388			
14	Data specified Register address setting 14 (100DH)	150D	5389			
15	Data specified Register address setting 15 (100EH)	150E	5390			
16	Data specified Register address setting 16 (100FH)	150F	5391			
17	Data specified Register address setting 17 (1010H)	1510	5392			
18	Data specified Register address setting 18 (1011H)	1511	5393			
19	Data specified Register address setting 19 (1012H)	1512	5394			
20	Data specified Register address setting 20 (1013H)	1513	5395			
21	Data specified Register address setting 21 (1014H)	1514	5396			
22	Data specified Register address setting 22 (1015H)	1515	5397			

No.	Name	Register address		Attri-bute	Data range	Factory set value
		HEX	DEC			
23	Data specified Register address setting 23 (1016H)	1516	5398			
24	Data specified Register address setting 24 (1017H)	1517	5399			
25	Data specified Register address setting 25 (1018H)	1518	5400			
26	Data specified Register address setting 26 (1019H)	1519	5401			
27	Data specified Register address setting 27 (101AH)	151A	5402			
28	Data specified Register address setting 28 (101BH)	151B	5403		Based on the data specified at 1000H to 101FH.	
29	Data specified Register address setting 29 (101CH)	151C	5404			
30	Data specified Register address setting 30 (101DH)	151D	5405			
31	Data specified Register address setting 31 (101EH)	151E	5406			
32	Data specified Register address setting 32 (101FH)	151F	5407			

6.4.4 FB series equivalent communication data [Modbus single word]

These are register addresses for our FB series equivalent data.
For attribute, data range, and factory set values, refer to **6.3.1 GZ400/GZ900 communication data [RKC communication identifier/Modbus double word] (P. 6-12)**.

The “FB series equivalent communication data” means the data of our FB series controllers compatible with the data of GZ400/900.

When Input data type is set to “1,” the communication data will be Modbus single word (including data equivalent to our FB series).

Switchover between the single word and the double word can be done at Input data type.
For the Input data type, refer to the **3.2 Selection of Communication Data Type (P. 3-5)**.

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
1	Measured value (PV)	Input 1_Measured value (PV)	0000	0	1
2	Current transformer 1 (CT1) input value monitor	Current transformer 1 (CT1) input value monitor	0001	1	11
3	Current transformer 2 (CT2) input value monitor	Current transformer 2 (CT2) input value monitor	0002	2	12
4	Set value (SV) monitor	Input 1_Set value (SV) monitor	0003	3	2
5	Remote setting (RS) input value monitor	Remote setting input value monitor	0004	4	14
6	Burnout state monitor	Input 1_Burnout state monitor	0005	5	25
7	Undefined register (Burnout state monitor of feedback resistance input)	Undefined register (No applicable models)	0006	6	—
8	Event 1 state monitor	Event 1 state monitor	0007	7	16
9	Event 2 state monitor	Event 2 state monitor	0008	8	17
10	Event 3 state monitor	Event 3 state monitor	0009	9	18
11	Event 4 state monitor	Event 4 state monitor	000A	10	19
12	Heater break alarm 1 (HBA1) state monitor	Heater break alarm 1 (HBA1) state monitor	000B	11	20
13	Heater break alarm 2 (HBA2) state monitor	Heater break alarm 2 (HBA2) state monitor	000C	12	21
14	Manipulated output value (MV1) monitor [heat-side]	Input 1_Manipulated output value monitor [heat-side]	000D	13	8
15	Manipulated output value (MV2) monitor [cool-side]	Input 1_Manipulated output value monitor [cool-side]	000E	14	9

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
16	Error code	Error code	000F	15	40
17	Undefined register (Digital input (DI) state monitor)	Undefined register (No applicable models)	0010	16	—
18	Undefined register (Output state monitor)	Undefined register (No applicable models)	0011	17	—
19	Undefined register (Operation mode state monitor)	Undefined register (No applicable models)	0012	18	—
20	Memory area soak time monitor	Memory area soak time monitor	0013	19	13
21	Integrated operating time monitor	Integrated operating time	0014	20	41
22	Holding peak value ambient temperature monitor	Peak hold monitor of ambient temperature	0015	21	42
23	Undefined register (Power feed forward input value monitor)	Undefined register (No applicable models)	0016	22	—
24	Undefined register (Backup memory state monitor)	Undefined register (No applicable models)	0017	23	—
25	Undefined register	Undefined register	0018	24	—
26	Undefined register	Undefined register	0019	25	—
27	Undefined register	Undefined register	001A	26	—
28	Undefined register	Undefined register	001B	27	—
29	Undefined register	Undefined register	001C	28	—
30	Undefined register	Undefined register	001D	29	—
31	Undefined register	Undefined register	001E	30	—
32	Undefined register	Undefined register	001F	31	—
33	PID/AT transfer	Input 1_Autotuning (AT)	0020	32	59
34	Auto/Manual transfer	Input 1_Auto/Manual transfer	0021	33	63
35	Remote/Local transfer	When Select function for input 2 is: “Remote setting input” Remote/Local transfer When Select function for input 2 is: “Control with PV select” Input transfer of Control with PV select When Select function for input 2 is: “2-loop control/Differential temperature control” 2-loop control/Differential temperature control	0022	34	65
36	RUN/STOP transfer	RUN/STOP transfer	0023	35	58
37	Memory area transfer	Memory area transfer	0024	36	54

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
38	Interlock release	Interlock release	0025	37	53
39	Event 1 set value (EV1) ★	Event 1 set value (EV1) ★ When Event 1 type is either high or low limit with individual setting Event 1 set value (EV1) [high] ★	0026	38	70
40	Event 2 set value (EV2) ★	Event 2 set value (EV2) ★ When Event 2 type is either high or low limit with individual setting Event 2 set value (EV2) [high] ★	0027	39	72
41	Event 3 set value (EV3) ★	Event 3 set value (EV3) ★ When Event 3 type is either high or low limit with individual setting Event 3 set value (EV3) [high] ★	0028	40	74
42	Event 4 set value (EV4) ★	Event 4 set value (EV4) ★ When Event 4 type is either high or low limit with individual setting Event 4 set value (EV4) [high] ★	0029	41	76
43	Control loop break alarm (LBA) time ★	Input 1_Control loop break alarm (LBA) time ★	002A	42	87
44	LBA deadband ★	Input 1_LBA deadband (LBD) ★	002B	43	88
45	Set value (SV) ★	Input 1_Set value (SV) ★	002C	44	67
46	Proportional band [heat-side] ★	Input 1_Proportional band [heat-side] ★	002D	45	78
47	Integral time [heat-side] ★	Input 1_Integral time [heat-side] ★	002E	46	79
48	Derivative time [heat-side] ★	Input 1_Derivative time [heat-side] ★	002F	47	80
49	Control response parameter ★	Input 1_Control response parameter ★	0030	48	81
50	Proportional band [cool-side] ★	Input 1_Proportional band [cool-side] ★	0031	49	100
51	Integral time [cool-side] ★	Input 1_Integral time [cool-side] ★	0032	50	101
52	Derivative time [cool-side] ★	Input 1_Derivative time [cool-side] ★	0033	51	102
53	Overlap/Deadband ★	Input 1_Overlap/Deadband ★	0034	52	103
54	Manual reset ★	Input 1_Manual reset ★	0035	53	83
55	Setting change rate limiter (up) ★	Input 1_Setting change rate limiter (up) ★	0036	54	109
56	Setting change rate limiter (down) ★	Input 1_Setting change rate limiter (down) ★	0037	55	110

★ Parameters which can be used in multi-memory area function

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
57	Area soak time ★	Area soak time ★	0038	56	107
58	Link area number ★	Link area number ★	0039	57	108
59	Heater break alarm 1 (HBA1) set value	Heater break alarm 1 (HBA1) set value	003A	58	155
60	Undefined register (Heater break determination point 1)	Undefined register (No applicable models)	003B	59	—
61	Undefined register (Heater melting determination point 1)	Undefined register (No applicable models)	003C	60	—
62	Heater break alarm 2 (HBA2) set value	Number of heater break alarm 2 (HBA2) delay times	003D	61	157
63	Undefined register (Heater break determination point 2)	Undefined register (No applicable models)	003E	62	—
64	Undefined register (Heater melting determination point 2)	Undefined register (No applicable models)	003F	63	—
65	PV bias	Input 1_PV bias	0040	64	141
66	PV digital filter	Input 1_PV digital filter	0041	65	142
67	PV ratio	Input 1_PV ratio	0042	66	143
68	PV low input cut-off	Input 1_PV low input cut-off	0043	67	144
69	RS bias Cascade control: Cascade bias Ratio setting: Ratio setting bias	When Select function for input 2 is: “Remote setting input” RS bias Input 2_PV bias No applicable models Cascade bias Ratio setting bias	0044	68	145
70	RS digital filter Cascade control: Cascade digital filter Ratio setting: Ratio setting digital filter	When Select function for input 2 is: “Remote setting input” RS digital filter Input 2_PV digital filter No applicable models Cascade digital filter Ratio setting digital filter	0045	69	146

★ Parameters which can be used in multi-memory area function

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
71	RS ratio Cascade control: Cascade ratio Ratio setting: Ratio setting ratio	When Select function for input 2 is: “Remote setting input” RS ratio Input 2_PV ratio No applicable models Cascade ratio Ratio setting ratio	0046	70	147
72	Proportional cycle time [heat-side]	OUT1 proportional cycle time	0047	71	149
73	Proportional cycle time [cool-side]	OUT2 proportional cycle time	0048	72	150
74	Manual manipulated output value	Input 1_Manual manipulated output value	0049	73	159
75	Set lock level	Set lock level	004A	74	363
76	STOP display	STOP display selection	004B	75	188
77	Undefined register (Bar graph display)	Undefined register (No applicable models)	004C	76	—
78	Undefined register (Bar graph display resolution)	Undefined register (No applicable models)	004D	77	—
79	Undefined register (Direct key 1)	Undefined register (No applicable models)	004E	78	—
80	Undefined register (Direct key 2)	Undefined register (No applicable models)	004F	79	—
81	Undefined register (Direct key 3)	Undefined register (No applicable models)	0050	80	—
82	Undefined register (Direct key type)	Undefined register (No applicable models)	0051	81	—
83	Input type	Input 1_Input type	0052	82	200
84	Display unit	Input 1_Display unit	0053	83	201
85	Decimal point position	Input 1_Decimal point position	0054	84	202
86	Input scale high	Input 1_Input range high	0055	85	203
87	Input scale low	Input 1_Input range low	0056	86	204
88	Input error determination point (high)	Input 1_Input error determination point (high)	0057	87	205
89	Input error determination point (low)	Input 1_Input error determination point (low)	0058	88	206
90	Burnout direction	Input 1_Burnout direction	0059	89	208

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
91	Square root extraction	Input 1_Square root extraction	005A	90	212
92	Power supply frequency	Power supply frequency	005B	91	215
93	Undefined register (Sampling cycle)	Undefined register (No applicable models)	005C	92	—
94	Undefined register (Remote setting input type)	Undefined register (No applicable models)	005D	93	—
95	Undefined register (Digital input (DI) assignment)	Undefined register (No applicable models)	005E	94	—
96	Undefined register (Output assignment)	Undefined register (No applicable models)	005F	95	—
97	Undefined register (Timer 1)	Undefined register (No applicable models)	0060	96	—
98	Undefined register (Timer 2)	Undefined register (No applicable models)	0061	97	—
99	Undefined register (Timer 3)	Undefined register (No applicable models)	0062	98	—
100	Undefined register (Timer 4)	Undefined register (No applicable models)	0063	99	—
101	Energized/De-energized	Energized/De-energized selection	0064	100	244
102	Alarm (ALM) lamp lighting condition 1	ALM lamp lighting condition	0065	101	189
103	Undefined register (Alarm (ALM) lamp lighting condition 2)	Undefined register (No applicable models)	0066	102	—
104	Output status at STOP mode	Output action at control stop	0067	103	246
105	Undefined register	Undefined register	0068	104	—
106	Undefined register	Undefined register	0069	105	—
107	Undefined register	Undefined register	006A	106	—
108	Undefined register	Undefined register	006B	107	—
109	Undefined register	Undefined register	006C	108	—
110	Undefined register	Undefined register	006D	109	—
111	Transmission output type	Retransmission output 1 type	006E	110	248
112	Transmission output scale high	Retransmission output 1 scale high	006F	111	249
113	Transmission output scale low	Retransmission output 1 scale low	0070	112	250
114	Event 1 type	Event 1 type	0071	113	266

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
115	Event 1 hold action	Event 1 hold action	0072	114	267
116	Undefined register (Event 1 interlock)	Undefined register (No applicable models)	0073	115	—
117	Event 1 differential gap	Event 1 differential gap	0074	116	268
118	Event 1 differential gap	Event 1 timer	0075	117	269
119	Undefined register (Force ON of Event 1 action)	Undefined register (No applicable models)	0076	118	—
120	Event 2 type	Event 2 type	0077	119	271
121	Event 2 hold action	Event 2 hold action	0078	120	272
122	Undefined register (Event 2 interlock)	Undefined register (No applicable models)	0079	121	—
123	Event 2 differential gap	Event 2 differential gap	007A	122	273
124	Event 2 delay timer	Event 2 timer	007B	123	274
125	Undefined register (Force ON of Event 2 action)	Undefined register (No applicable models)	007C	124	—
126	Event 3 type	Event 3 type	007D	125	276
127	Event 3 hold action	Event 3 hold action	007E	126	277
128	Undefined register (Event 3 interlock)	Undefined register (No applicable models)	007F	127	—
129	Event 3 differential gap	Event 3 differential gap	0080	128	278
130	Event 3 delay timer	Event 3 timer	0081	129	279
131	Undefined register (Force ON of Event 3 action)	Undefined register (No applicable models)	0082	130	—
132	Event 4 type	Event 4 type	0083	131	281
133	Event 4 hold action	Event 4 hold action	0084	132	282
134	Undefined register (Event 4 interlock)	Undefined register (No applicable models)	0085	133	—
135	Event 4 differential gap	Event 4 differential gap	0086	134	283
136	Event 4 delay timer	Event 4 timer	0087	135	284
137	Undefined register (Force ON of Event 4 action)	Undefined register (No applicable models)	0088	136	—

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
138	CT1 ratio	CT1 ratio	0089	137	287
139	CT1 assignment	CT1 assignment	008A	138	285
140	Undefined register (Heater break alarm 1 (HBA1) type)	Undefined register (No applicable models)	008B	139	—
141	Number of heater break alarm 1 (HBA1) delay times	Number of heater break alarm 1 (HBA1) delay times	008C	140	156
142	CT2 ratio	CT2 ratio	008D	141	291
143	CT2 assignment	CT2 assignment	008E	142	289
144	Undefined register (Heater break alarm 2 (HBA2) type)	Undefined register (No applicable models)	008F	143	—
145	Number of heater break alarm 2 (HBA2) delay times	Number of heater break alarm 2 (HBA2) delay times	0090	144	158
146	Hot/Cold start	Hot/Cold start	0091	145	293
147	Start determination point	Input 1_Start determination point	0092	146	305
148	External input type	Select function for input 2	0093	147	324
149	Undefined register (Master channel selection)	Undefined register (No applicable models)	0094	148	—
150	SV tracking	SV tracking	0095	149	295
151	MV transfer function [Action taken when changed to Manual mode from Auto mode]	Manual manipulated output value selection	0096	150	294
152	Control action	Input 1_Control action	0097	151	298
153	Integral/derivative time decimal point position	Integral/Derivative time decimal point position	0098	152	296
154	Undefined register (Derivative action)	Undefined register (No applicable models)	0099	153	—
155	Undershoot suppression factor	Undershoot suppression factor	009A	154	321
156	Undefined register (Derivative gain)	Undefined register (No applicable models)	009B	155	—
157	ON/OFF action differential gap (upper)	Input 1_ON/OFF action differential gap (upper)	009C	156	168
158	ON/OFF action differential gap (lower)	Input 1_ON/OFF action differential gap (lower)	009D	157	179
159	Action (high) at input error	Input 1_Action (high) input error	009E	158	301
160	Action (low) at input error	Input 1_Action (low) input error	009F	159	302

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
161	Manipulated output value at input error	Input 1_Manipulated output value at input error	00A0	160	303
162	Manipulated output value (MV1) at STOP mode	Input 1_ Manipulated output value at STOP [heat-side]	00A1	161	304
163	Manipulated output value (MV2) at STOP mode	Input 1_ Manipulated output value at STOP [cool-side]	00A2	162	320
164	Output change rate limiter (up) [MV1]	Input 1_Output change rate limiter (up) [heat-side]	00A3	163	299
165	Output change rate limiter (down) [MV1]	Input 1_Output change rate limiter (up) [heat-side]	00A4	164	300
166	Output limiter high (MV1)	Input 1_Output limiter high [heat-side] ★	00A5	165	85
167	Output limiter low (MV1)	Input 1_Output limiter low [heat-side] ★	00A6	166	86
168	Output change rate limiter (up) [MV2]	Input 1_Output change rate limiter (up) [cool-side]	00A7	167	318
169	Output change rate limiter (down) [MV2]	Input 1_Output change rate limiter (down) [cool-side]	00A8	168	319
170	Output limiter high (MV2)	Input 1_Output limiter high [cool-side] ★	00A9	169	104
171	Output limiter low (MV2)	Input 1_Output limiter low [cool-side] ★	00AA	170	105
172	Undefined register (Power feed forward selection)	Undefined register (No applicable models)	00AB	171	—
173	Undefined register (Power feed forward gain)	Undefined register (No applicable models)	00AC	172	—
174	AT bias	Input 1_AT bias	00AD	173	181
175	Undefined register (AT cycles)	Undefined register (No applicable models)	00AE	174	—
176	Undefined register (Output value with AT turned on)	Undefined register (No applicable models)	00AF	175	—
177	Undefined register (Output value with AT turned off)	Undefined register (No applicable models)	00B0	176	—
178	Undefined register (AT differential gap time)	Undefined register (No applicable models)	00B1	177	—
179	Undefined register (Proportional band adjusting factor [heat-side])	Undefined register (No applicable models)	00B2	178	—
180	Undefined register (Integral time adjusting factor [heat-side])	Undefined register (No applicable models)	00B3	179	—
181	Undefined register (Derivative time adjusting factor [heat-side])	Undefined register (No applicable models)	00B4	180	—
182	Undefined register (Proportional band adjusting factor [cool-side])	Undefined register (No applicable models)	00B5	181	—
183	Undefined register (Integral time adjusting factor [cool-side])	Undefined register (No applicable models)	00B6	182	—

★ Parameters which can be used in multi-memory area function

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
184	Undefined register (Derivative time adjusting factor [cool-side])	Undefined register (No applicable models)	00B7	183	—
185	Undefined register (Proportional band limiter (high) [heat-side])	Undefined register (No applicable models)	00B8	184	—
186	Undefined register (Proportional band limiter (low) [heat-side])	Undefined register (No applicable models)	00B9	185	—
187	Undefined register (Integral time limiter (high) [heat-side])	Undefined register (No applicable models)	00BA	186	—
188	Undefined register (Integral time limiter (low) [heat-side])	Undefined register (No applicable models)	00BB	187	—
189	Undefined register (Derivative time limiter (high) [heat-side])	Undefined register (No applicable models)	00BC	188	—
190	Undefined register (Derivative time limiter (low) [heat-side])	Undefined register (No applicable models)	00BD	189	—
191	Undefined register (Proportional band limiter (high) [cool-side])	Undefined register (No applicable models)	00BE	190	—
192	Undefined register (Proportional band limiter (low) [cool-side])	Undefined register (No applicable models)	00BF	191	—
193	Undefined register (Integral time limiter (high) [cool-side])	Undefined register (No applicable models)	00C0	192	—
194	Undefined register (Integral time limiter (low) [cool-side])	Undefined register (No applicable models)	00C1	193	—
195	Undefined register (Derivative time limiter (high) [cool-side])	Undefined register (No applicable models)	00C2	194	—
196	Undefined register (Derivative time limiter (low) [cool-side])	Undefined register (No applicable models)	00C3	195	—
197	Undefined register (Open/Close output neutral zone)	Undefined register (No applicable models)	00C4	196	—
198	Undefined register (Open/Close output differential gap)	Undefined register (No applicable models)	00C5	197	—
199	Undefined register (Action at feedback resistance (FBR) input error)	Undefined register (No applicable models)	00C6	198	—
200	Undefined register (Feedback adjustment)	Undefined register (No applicable models)	00C7	199	—
201	Undefined register (Control motor time)	Undefined register (No applicable models)	00C8	200	—
202	Undefined register (Integrated output limiter)	Undefined register (No applicable models)	00C9	201	—
203	Undefined register (Valve action at STOP)	Undefined register (No applicable models)	00CA	202	—
204	Startup tuning (ST)	Input 1_Startup tuning (ST)	00CB	203	61
205	Undefined register (ST proportional band adjusting factor)	Undefined register (No applicable models)	00CC	204	—
206	Undefined register (ST integral time adjusting factor)	Undefined register (No applicable models)	00CD	205	—
207	Undefined register (ST derivative time adjusting factor)	Undefined register (No applicable models)	00CE	206	—

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
208	ST start condition	ST start condition	00CF	207	297
209	Undefined register (Automatic temperature rise group)	Undefined register (No applicable models)	00D0	208	—
210	Undefined register (Automatic temperature rise learning)	Undefined register (No applicable models)	00D1	209	—
211	Undefined register (Automatic temperature rise dead time)	Undefined register (No applicable models)	00D2	210	—
212	Undefined register (Automatic temperature rise gradient data)	Undefined register (No applicable models)	00D3	211	—
213	Undefined register (RUN/STOP group)	Undefined register (No applicable models)	00D4	212	—
214	Setting change rate limiter unit time	Setting change rate limiter unit time	00D5	213	355
215	Soak time unit	Soak time unit	00D6	214	356
216	Setting limiter high	Input 1_Setting limiter high	00D7	215	357
217	Setting limiter low	Input 1_Setting limiter low	00D8	216	358
218	Undefined register (PV transfer function)	Undefined register (No applicable models)	00D9	217	—
219	PV flashing display at input error	PV flashing display at input error	00DA	218	190
220	Overlap/Deadband reference point	Overlap/Deadband reference point	00DB	219	322
221	Undefined register (Action at saturated output)	Undefined register (No applicable models)	00DC	220	—
222	Undefined register	Undefined register	00DD	221	—
223	Undefined register	Undefined register	00DE	222	—
224	Undefined register	Undefined register	00DF	223	—
225	Control area Local/External transfer	Control area Local/External transfer	00E0	224	66

6.4.5 Memory area data equivalent to the FB series (Area designation method) [Modbus single word]

Register addresses 0500H to 0548H are used to check and change set values belonging to the Memory area.
For the details of attribute, data range and factory set values, refer to ■ **Memory area 1 data (P.6-80), 6.3.2 Memory area data (Direct designation method) [Modbus double word]**.

☞ For Memory area, refer to the **5.9 How to Use Memory Area Data (P. 5-18)**.

No.	Name		Register address		6.3.2 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
1	Setting memory area number Specify the Memory area No. Data range: 1 to 16 (Factory set vaule: 1)		0500	1280	—
2	Event 1 set value (EV1)	Event 1 set value (EV1) When Event 1 type is either high or low limit with individual setting Event 1 set value (EV1) [high]	0501	1281	4
3	Event 2 set value (EV2)	Event 2 set value (EV2) When Event 2 type is either high or low limit with individual setting Event 2 set value (EV2) [high]	0502	1282	6
4	Event 3 set value (EV3)	Event 3 set value (EV3) When Event 3 type is either high or low limit with individual setting Event 3 set value (EV3) [high]	0503	1283	8
5	Event 4 set value (EV4)	Event 4 set value (EV4) When Event 4 type is either high or low limit with individual setting Event 4 set value (EV4) [high]	0504	1284	10
6	Control loop break alarm (LBA) time	Input 1_Control loop break alarm (LBA) time	0505	1285	21
7	LBA deadband	Input 1_LBA deadband (LBD)	0506	1286	22
8	Set value (SV)	Input 1_Set value (SV)	0507	1287	1
9	Proportional band [heat-side]	Input 1_Proportional band [heat-side]	0508	1288	12
10	Integral time [heat-side]	Input 1_Integral time [heat-side]	0509	1289	13
11	Derivative time [heat-side]	Input 1_Derivative time [heat-side]	050A	1290	14

No.	Name		Register address		6.3.2 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
12	Control response parameter	Input 1_Integral time [heat-side]	050B	1291	15
13	Proportional band [cool-side]	Input 1_Proportional band [cool-side]	050C	1292	34
14	Integral time [cool-side]	Input 1_Integral time [cool-side]	050D	1293	35
15	Derivative time [cool-side]	Input 1_Derivative time [cool-side]	050E	1294	36
16	Overlap/Deadband	Input 1_Overlap/Deadband	050F	1295	37
17	Manual reset	Input 1_Manual reset	0510	1296	17
18	Setting change rate limiter (up)	Input 1_Setting change rate limiter (up)	0511	1297	43
19	Setting change rate limiter (down)	Input 1_Setting change rate limiter (down)	0512	1298	44
20	Area soak time	Area soak time	0513	1299	41
21	Link area number	Link area number	0514	1300	42
22	Undefined register	Undefined register	0515	1301	—
23	———	Input 1_Set value (SV)	0516	1302	1
24	———	Input 2_Set value (SV)	0517	1303	2
25	———	Set value (SV) of differential temperature input	0518	1304	3
26	———	Event 1 set value (EV1) Event 1 set value (EV1) [high]	0519	1305	4
27	———	Event 1 set value (EV1') [low]	051A	1306	5
28	———	Event 2 set value (EV2) Event 2 set value (EV2) [high]	051B	1307	6
29	———	Event 2 set value (EV2') [low]	051C	1308	7
30	———	Event 3 set value (EV3) Event 3 set value (EV3) [high]	051D	1309	8
31	———	Event 3 set value (EV3') [low]	051E	1310	9
32	———	Event 4 set value (EV4) Event 4 set value (EV4) [high]	051F	1311	10
33	———	Event 4 set value (EV4') [low]	0520	1312	11

No.	Name		Register address		6.3.2 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
34	———	Input 1_Proportional band [heat-side]	0521	1313	12
35	———	Input 1_Integral time [heat-side]	0522	1314	13
36	———	Input 1_Derivative time [heat-side]	0523	1315	14
37	———	Input 1_Control response parameter	0524	1316	15
38	———	Input 1_Proactive intensity	0525	1317	16
39	———	Input 1_Manual reset	0526	1318	17
40	———	Input 1_FF amount	0527	1319	18
41	———	Input 1_Output limiter high [heat-side]	0528	1320	19
42	———	Input 1_Output limiter low [heat-side]	0529	1321	20
43	———	Input 1_Control loop break alarm (LBA) time	052A	1322	21
44	———	Input 1_LBA deadband (LBD)	052B	1323	22
45	———	Input 2_Proportional band	052C	1324	23
46	———	Input 2_Integral time	052D	1325	24
47	———	Input 2_Derivative time	052E	1326	25
48	———	Input 2_Control response parameter	052F	1327	26
49	———	Input 2_Proactive intensity	0530	1328	27
50	———	Input 2_Manual reset	0531	1329	28
51	———	Input 2_FF amount	0532	1330	29
52	———	Input 2_Output limiter high	0533	1331	30
53	———	Input 2_Output limiter low	0534	1332	31
54	———	Input 2_Control loop break alarm (LBA) time	0535	1333	32
55	———	Input 2_LBA deadband (LBD)	0536	1334	33

No.	Name		Register address		6.3.2 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
56	———	Input 1_Proportional band [cool-side]	0537	1335	34
57	———	Input 1_Integral time [cool-side]	0538	1336	35
58	———	Input 1_Derivative time [cool-side]	0539	1337	36
59	———	Input 1_Overlap/Deadband	053A	1338	37
60	———	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side]	053B	1339	38
61	———	Input 1_Output limiter low [cool-side]	053C	1340	39
62	———	Select Trigger type for Memory area transfer	053D	1341	40
63	———	Area soak time	053E	1342	41
64	———	Link area number	053F	1343	42
65	———	Input 1_Setting change rate limiter (up)	0540	1344	43
66	———	Input 1_Setting change rate limiter (down)	0541	1345	44
67	———	Input 1_Auto/Manual transfer selection (Area)	0542	1346	45
68	———	Input 1_Manipulated output value (Area)	0543	1347	46
69	———	Input 2_Setting change rate limiter (up)	0544	1348	47
70	———	Input 2_Setting change rate limiter (down)	0545	1349	48
71	———	Input 2_Auto/Manual transfer selection (Area)	0546	1350	49
72	———	Input 2_Manipulated output value (Area)	0547	1351	50
73	———	Remote/Local transfer selection (Area)	0548	1352	51
74	———	Input 1_Number of knee point	0549	1353	52
75	———	Input 1_Knee point input value 1	054A	1354	53
76	———	Input 1_Knee point input value 2	054B	1355	54
77	———	Input 1_Knee point input value 3	054C	1356	55
78	———	Input 1_Knee point input value 4	054D	1357	56
79	———	Input 1_Knee point input value 5	054E	1358	57

No.	Name		Register address		6.3.2 Reference No.
	Data equivalent to our FB series:	Relevant data of GZ400/900:	HEX	DEC	
80	———	Input 1_Knee point correction value 1	054F	1359	58
81	———	Input 1_Knee point correction value 2	0550	1360	59
82	———	Input 1_Knee point correction value 3	0551	1361	60
83	———	Input 1_Knee point correction value 4	0552	1362	61
84	———	Input 1_Knee point correction value 5	0553	1363	62
85	———	Input 2_Number of knee point	0554	1364	63
86	———	Input 2_Knee point input value 1	0555	1365	64
87	———	Input 2_Knee point input value 2	0556	1366	65
88	———	Input 2_Knee point input value 3	0557	1367	66
89	———	Input 2_Knee point input value 4	0558	1368	67
90	———	Input 2_Knee point input value 5	0559	1369	68
91	———	Input 2_Knee point correction value 1	055A	1370	69
92	———	Input 2_Knee point correction value 2	055B	1371	70
93	———	Input 2_Knee point correction value 3	055C	1372	71
94	———	Input 2_Knee point correction value 4	055D	1373	72
95	———	Input 2_Knee point correction value 5	055E	1374	73

7

TROUBLE SHOOTING

This chapter describes how to cope with errors during the communication.

⚠ WARNING

- To prevent electric shock or instrument failure, always turn off the system power before replacing the instrument.
- To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.
- To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.
- To prevent electric shock or instrument failure, do not touch the inside of the instrument.
- All wiring must be performed by authorized personnel with electrical experience in this type of work.

⚠ CAUTION

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.

This section lists some of the main causes and solutions for communication problems.
If you cannot solve a problem, please contact RKC sales office or the agent, on confirming the type name and specifications of the product.

7.1 RKC Communication

Problem	Possible cause	Solution
No response	Wrong connection, no connection or disconnection of the communication cable	Confirm the connection method or condition and connect correctly
	Breakage, wrong wiring, or imperfect contact of the communication cable	Confirm the wiring or connector and repair or replace the wrong one
	Mismatch of the setting data of communication speed and data bit configuration with those of the host computer	Confirm the settings and set them correctly
	Wrong address setting	
	Error in the data format	Re-examine the communication program
	Transmission line is not set to the receive state after data send (for RS-485)	
	Communication protocol setting is wrong	Set "0: RKC communication" at Communication protocol referring to **3.1 Setting of Communication Parameter (P. 3-2)**.
EOT return	The specified identifier is invalid	Confirm the identifier is correct or that with the correct function is specified. Otherwise correct it
	Error in the data format	Reexamine the communication program
NAK return	Error occurs on the line (parity bit error, framing error, etc.)	Confirm the cause of error, and solve the problem appropriately. (Confirm the transmitting data, and resend data)
	BCC error	
	The data exceeds the setting range	Confirm the setting range and transmit correct data
	The specified identifier is invalid	Confirm the identifier is correct or that with the correct function is specified. Otherwise correct it

7.2 Modbus

Problem	Possible cause	Solution
No response	Wrong connection, no connection or disconnection of the communication cable	Confirm the connection method or condition and connect correctly
	Breakage, wrong wiring, or imperfect contact of the communication cable	Confirm the wiring or connector and repair or replace the wrong one
	Mismatch of the setting data of communication speed and data bit configuration with those of the host computer	Confirm the settings and set them correctly
	Wrong address setting	
	A transmission error (overrun error, framing error, parity error or CRC-16 error) is found in the query message	Re-transmit after time-out occurs or verify communication program
	The time interval between adjacent data in the query message is too long, exceeding 24-bit time	
	Communication protocol setting is wrong	Set “1” or “2” at Communication protocol referring to **3.1 Setting of Communication Parameter (P. 3-2)**. 1: Modbus (Order of data transfer: high-order word to low-order word) 2: Modbus (Order of data a transfer: low-order word to high-order word)
Error code 1	Function code error (Specifying nonexistent function code)	Confirm the function code
Error code 2	When the mismatched address is specified.	Confirm the address of holding register
Error code 3	When the specified number of data items in the query message exceeds the maximum number of data items available	Confirm the setting data
Error code 4	Self-diagnostic error	Turn off the power to the instrument. If the same error occurs when the power is turned back on, please contact RKC sales office or the agent.

8

SPECIFICATIONS

This chapter describes the specification of the host communication.

8.1 RKC Communication

Interface: Based on RS-485, EIA standard
Based on RS-422A, EIA standard

Connection method: 2-wire system, half-duplex multi-drop connection

Synchronous method: Start/Stop synchronous type

Communication speed: 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps

Protocol: ANSI X3.28-1976 subcategories 2.5 and A4
Polling/Selecting type

Data bit configuration: Start bit: 1
Data bit: 7 or 8
Parity bit: None, Odd or Even
Stop bit: 1 or 2

Error control: Vertical parity (With parity bit selected)
Horizontal parity (BCC check)

Communication code: ASCII 7-bit code

Termination resistor: Externally terminal connected (120 Ω 1/2 W)

Xon/Xoff control: None

Maximum connections: Up to 31 controllers

Signal logic: RS-485/RS-422A

Signal logic	Logic
V (A) – V (B) ≥ 1.5 V	0 (SPACE)
V (A) – V (B) ≤ –1.5 V	1 (MARK)

Voltage between V (A) and V (B) is the voltage of (A) terminal for the (B) terminal.

Maximum transmission distance:
1.2 km (This is the maximum value specified in the standard and actual value depends on the product specification.)

8.2 Modbus

Interface: Based on RS-485, EIA standard
Based on RS-422A, EIA standard

Connection method: 2-wire system, half-duplex multi-drop connection

Synchronous method: Start/Stop synchronous type

Communication speed: 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps

Data bit configuration: Start bit: 1
Data bit: 8
Parity bit: None, Odd or Even
Stop bit: 1 or 2

Protocol: Modbus

Signal transmission mode: Remote Terminal Unit (RTU) mode

Function code: 03H (Read holding registers)
06H (Preset single register)
08H (Diagnostics: loopback test)
10H (Preset multiple registers [Write multiple registers])

Error check method: CRC-16

Error code: 1: Function code error
2: When the mismatched address is specified.
3: • The maximum number (Read from a read holding resistor or write to Preset multiple resistors [Write multiple registers]) has been exceeded.
• The setting of the number of data (the number of requested byte) is not set to a double of the requested number of data at the time of "Preset multiple registers (Write multiple registers)"
4: Self-diagnostic error response

Termination resistor: Externally terminal connected (Example: 120 Ω 1/2 W)

Maximum connections: Up to 31 controllers

Signal logic: RS-485/RS-422A

Signal logic	Logic
V (A) – V (B) ≥ 1.5 V	0 (SPACE)
V (A) – V (B) ≤ –1.5 V	1 (MARK)

Voltage between V (A) and V (B) is the voltage of (A) terminal for the (B) terminal.

Maximum transmission distance:
1.2 km (This is the maximum value specified in the standard and actual value depends on the product specification.)

8.3 Loader Communication

Protocol:	For RKC communication protocol only (ANSI X3.28-1976 subcategories 2.5 and A4)
Synchronous method:	Start/Stop synchronous type
Communication speed:	38400 bps
Data bit configuration:	Start bit: 1 Data bit: 8 Parity bit: None Stop bit: 1 Number of communication data digits: 7(fixed)
Maximum connections:	1 point
Connection method:	Exclusive cable (W-BV-05)
Interval time:	10 ms

When the instrument is powered off, power can be supplied to the instrument from COM-K2 or COM-KG. This function is exclusive for parameter setting, and the instrument functions as follows.

- Control is stopped (Output is off, relay remains open).
- Host communication is stopped.
- The PV/SV monitor shows "LoAd" for the Measured value (PV) display and "----" for the Set value (SV) display. The LCD backlight is partially turned off.

While the instrument is powered by COM-K2 or COM-KG, if power is applied to the instrument, the instrument will be reset and starts for normal operation.

When the instrument is normally powered, the host communication can be used simultaneously.

APPENDIX A

A.1 ASCII 7-Bit Code Table

This table is only for use with RKC communication.

					b7	0	0	0	0	1	1	1	1
					b6	0	0	1	1	0	0	1	1
					b5	0	1	0	1	0	1	0	1
b5 to b7	b4	b3	b2	b1		0	1	2	3	4	5	6	7
	0	0	0	0	0	NUL	DLE	SP	0	@	P	‘	p
	0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
	0	0	1	0	2	STX	DC2	”	2	B	R	b	r
	0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
	0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
	0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
	0	1	1	0	6	ACK	SYM	&	6	F	V	f	v
	0	1	1	1	7	BEL	ETB	’	7	G	W	g	w
	1	0	0	0	8	BS	CAN	(	8	H	X	h	x
	1	0	0	1	9	HT	EM	)	9	I	Y	i	y
	1	0	1	0	A	LF	SUB	*	:	J	Z	j	z
	1	0	1	1	B	VT	ESC	+	;	K	[	k	{
	1	1	0	0	C	FF	FS	,	<	L	¥	l	|
	1	1	0	1	D	CR	GS	-	=	M	]	m	}
	1	1	1	0	E	SO	RS	.	>	N	^	n	~
	1	1	1	1	F	SI	US	/	?	O	_	o	DEL

A.2 Communication Data Equivalent to Our REX-F400/700/900

The RKC communication identifiers for the REX-F400/700/900 can be used to handle the communication data of the GZ400/900 corresponding to the REX-F400/700/900. If there is no relevant communication data on the GZ400/900, dummy data is used.

To use the data equivalent to our REX-F400/700/900, you have to set "1" at Input data type (I Ndr). This means RKC communication data (6 digits).

☞ For the Input data type, refer to the **3.2 Selection of Communication Data Type (P. 3-5)**.

● REX-F400/700/900 equivalent communication data items not available on GZ400/900

REX-F400/700/900 communication data name	Identifier	Digits	Attribute	Data range	Factory set value
Bar-graph display selection	**DA**	6	R/W	Dummy data The read data is "0." When data is written, a normal response message will be returned to the all of the values, but "0" will be written.	0
Second alarm energized/ de-energized selection	**NB**	6	R/W		0
Local mode/computer mode identification	**RA**	6	RO		0
Operation execution (RUN)/STOP transfer	**DH**	6	R/W		0
First alarm action selection at input abnormality	**OA**	6	R/W		0
Second alarm action selection at input abnormality	**OB**	6	R/W		0

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