



Temperature Controller

FZ110/FZ400/FZ900

Instruction Manual
[Host Communication]

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.

- Windows is a trademark of Microsoft Corporation.
- Modbus is a registered trademark of Schneider Electric.
- Company names and product names used in this manual are the trademarks or registered trademarks of the respective companies.

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
0	1	2	3	4	5	6	7	8	9	-	.
A	B (b)	C	c	D (d)	E	F	G	H	I	J	K
A	b	C	c	d	E	F	G	H	I	J	K
L	M	N	n	O (o)	P	Q	R	S	T	t	U
L	M	N	n	o	P	Q	R	S	T	t	U
u	V	W	X	Y	Z	Degree	/	Prime	* (Asterisk)	→	
u	V	W	X	Y	Z	°	/	'	*	→	

7-segment character

0	1	2	3	4	5	6	7	8	9	Minus	Period
0	1	2	3	4	5	6	7	8	9	-	.
A	B (b)	C	c	D (d)	E	F	G	H	I	J	K
A	b	C	c	d	E	F	G	H	I	J	K
L	M	N (n)	O (o)	P	Q	R	S	T	t	U	u
L	M	N	o	P	Q	R	S	T	t	U	u
V	W	X	Y	Z	Degree	/	Prime	* (Asterisk)			
V	W	X	Y	Z	°	/	'	*			

■ 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
FBR	Feedback resistance		

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
FZ110/FZ400/FZ900 Installation Manual	IMR03A01-E□	This manual is enclosed with instrument. This manual explains the mounting and wiring.
FZ110/FZ400/FZ900 Quick Operation Manual	IMR03A02-E□	This manual is enclosed with instrument. This manual explains the basic key operation, mode menu, and data setting.
FZ110/FZ400/FZ900 Parameter List	IMR03A03-E□	This manual is enclosed with instrument. This list is a compilation of the parameter data of each mode.
FZ110/FZ400/FZ900 Instruction Manual [Part 1: Hardware]	IMR03A04-E□	This manual describes installation, wiring, troubleshooting and product specification.
FZ110/FZ400/FZ900 Instruction Manual [Part 2: Parameters/Functions]	IMR03A05-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.
FZ110/FZ400/FZ900 Instruction Manual [Host Communication]	IMR03A07-E7	This manual you are reading now. This manual explains RKC communication protocol (ANSI X3.28-1976) and Modbus relating to communication parameters setting.
FZ110/FZ400/FZ900 Instruction Manual [PLC Communication]	IMR03A08-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
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☐	I want to know how to cope with errors	7. TROUBLESHOOTING
☐	I want to know the specification of the host communication	8. SPECIFICATIONS
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MEMO

OUTLINE

1

This chapter describes the host communication of FZ110/400/900.

The communication function makes it possible to monitor and set the data of the Temperature Controller FZ110/400/900 from a host computer. The FZ110/400/900 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 FZ110/400/900 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.

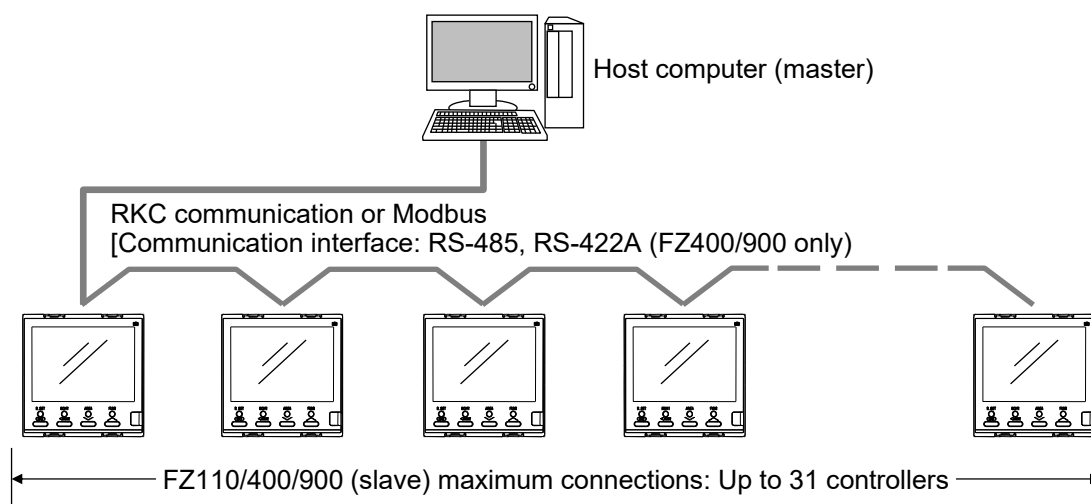
■ Host communication (RKC communication, Modbus) [Optional]

Communication interface: RS-485

RS-422A (FZ400/900 only)

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

One host computer (master) can communicate with up to 31 FZ110/400/900s.



● 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 Ndf*).

☞ 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 FZ110/400/900
- 6 digits data, Communication data of FZ110/400/900
- 6 digits data, Communication data equivalent to our REX-D series (RKC communication identifiers are compatible)

The RKC communication identifiers for the REX-D series can be used to handle the communication data of the FZ110/400/900 corresponding to the REX-D series.

If there is no relevant communication data on the FZ110/400/900, dummy data is used.

● Modbus

- Double word, Communication data of FZ110/400/900
- Single word, Communication data of FZ110/400/900
- 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 FZ110/400/900 corresponding to the FB series.

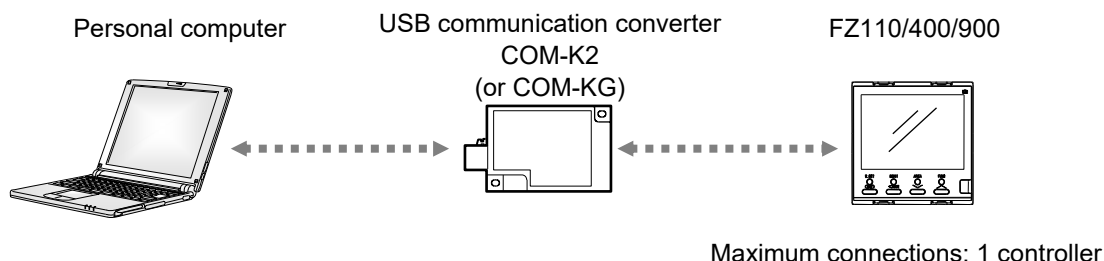
If there is no relevant communication data on the FZ110/400/900, the data is handled as undefined data.

■ Loader communication

Loader communication allows FZ110/400/900 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 FZ110/400/900s, allowing setup to be accomplished much more quickly than when the data is set in each FZ110/400/900 using the front panel keys.

RKC USB communication converter COM-K2 or COM-KG (sold separately) is required for the loader communication.



NOTE

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



Loader communication can be used on a FZ110/400/900 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 FZ110/400/900 from a programmable controller (PLC).

The FZ110/400/900 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 **FZ110/FZ400/FZ900 Instruction Manual [PLC Communication] (IMR03A08-E□)**.

■ Communication Tool PROTEM2

PROTEM2 is an integrated configuration support software to manage parameter setting and measured values of our controllers (including FZ110/400/900).

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.

WIRING

2

This chapter describes how to connect to the host computer.

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⚠ 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 mm²

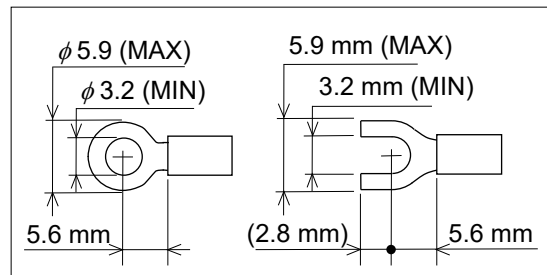
Specified dimension:

Refer to Fig. at the right

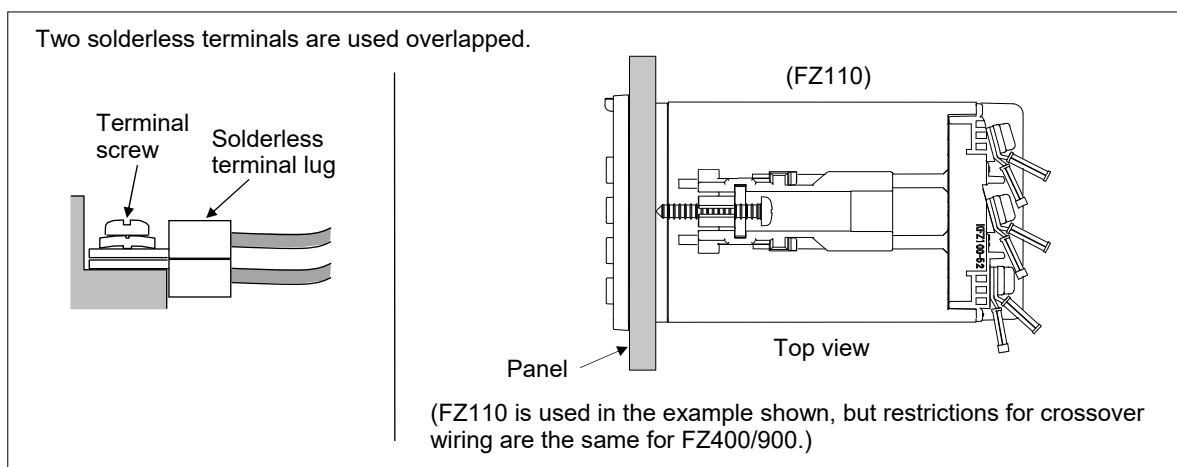
Specified solderless terminal:

Manufactured by J.S.T MFG CO., LTD.

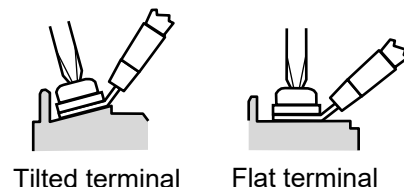
Circular terminal with isolation V1.25-MS3



- 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.

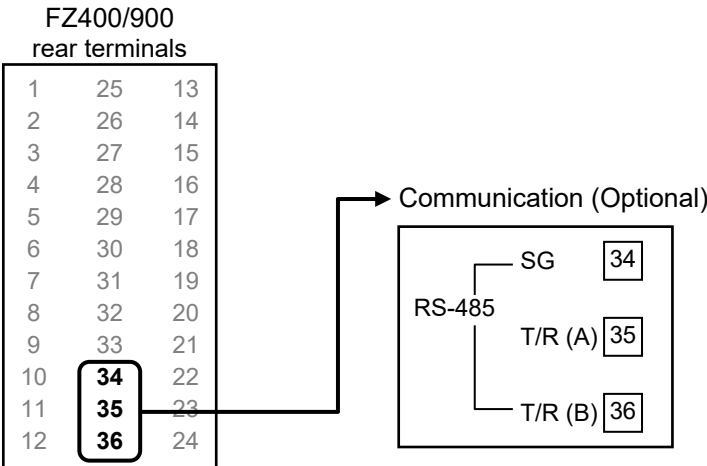
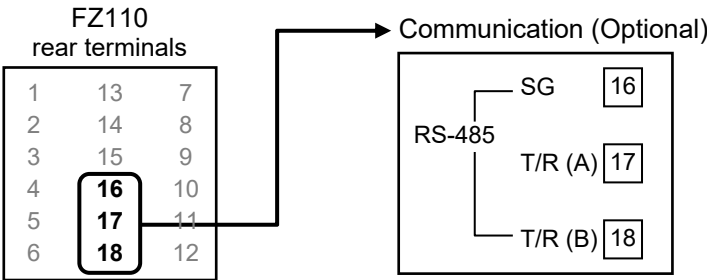


2.2 Wiring for Host Communication

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 FZ110/400/900

■ Communication terminal number and signal details

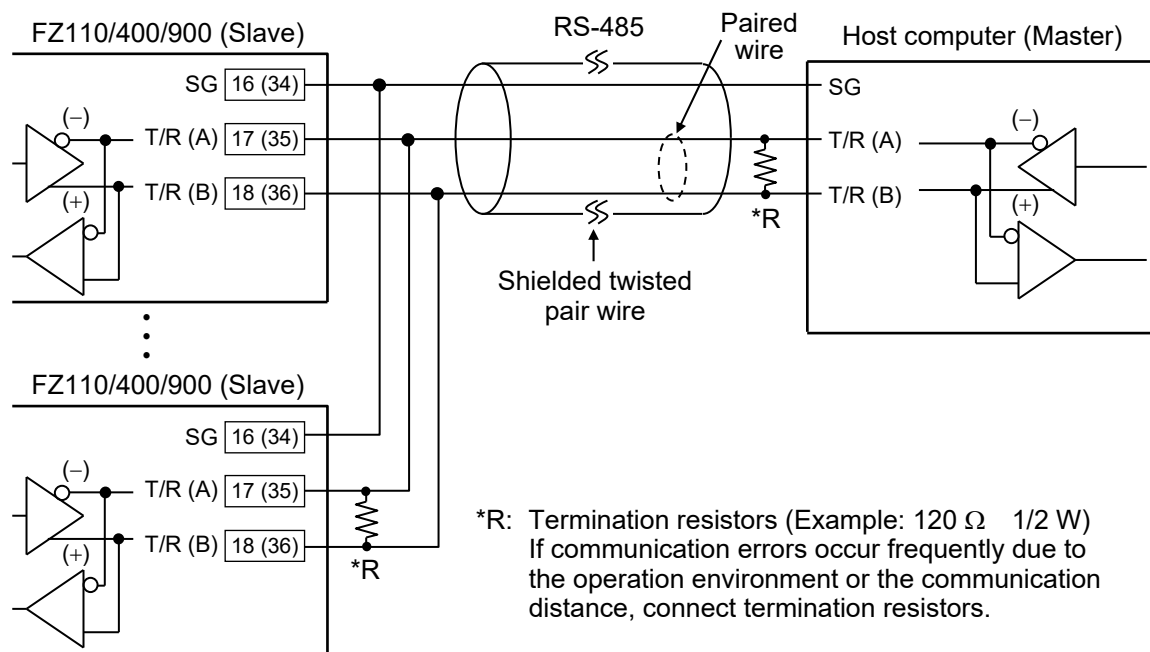


RS-485

FZ110 terminal No.	FZ400/900 terminal No.	Symbol	Signal name
16	34	SG	Signal ground
17	35	T/R (A)	Send data/Receive data
18	36	T/R (B)	Send data/Receive data

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

● Wiring example



Maximum connections: Up to 31 FZ110/400/900s

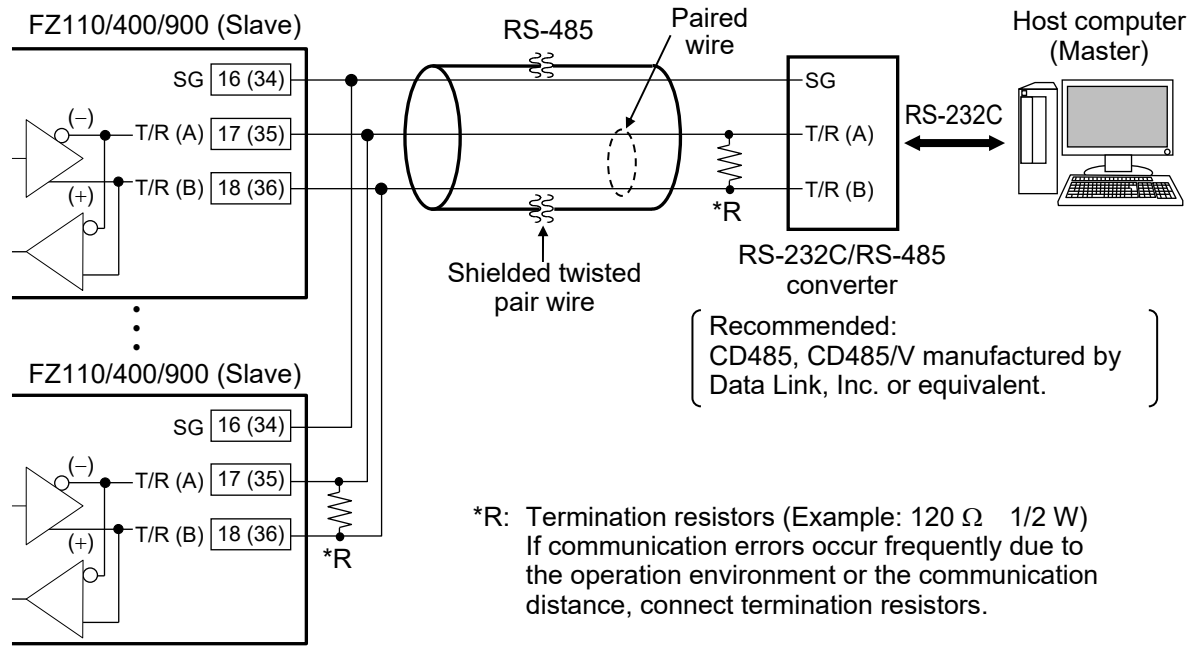


The communication cable and termination resistor(s) must be provided by the customer.

■ 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



Maximum connections: Up to 31 FZ110/400/900s

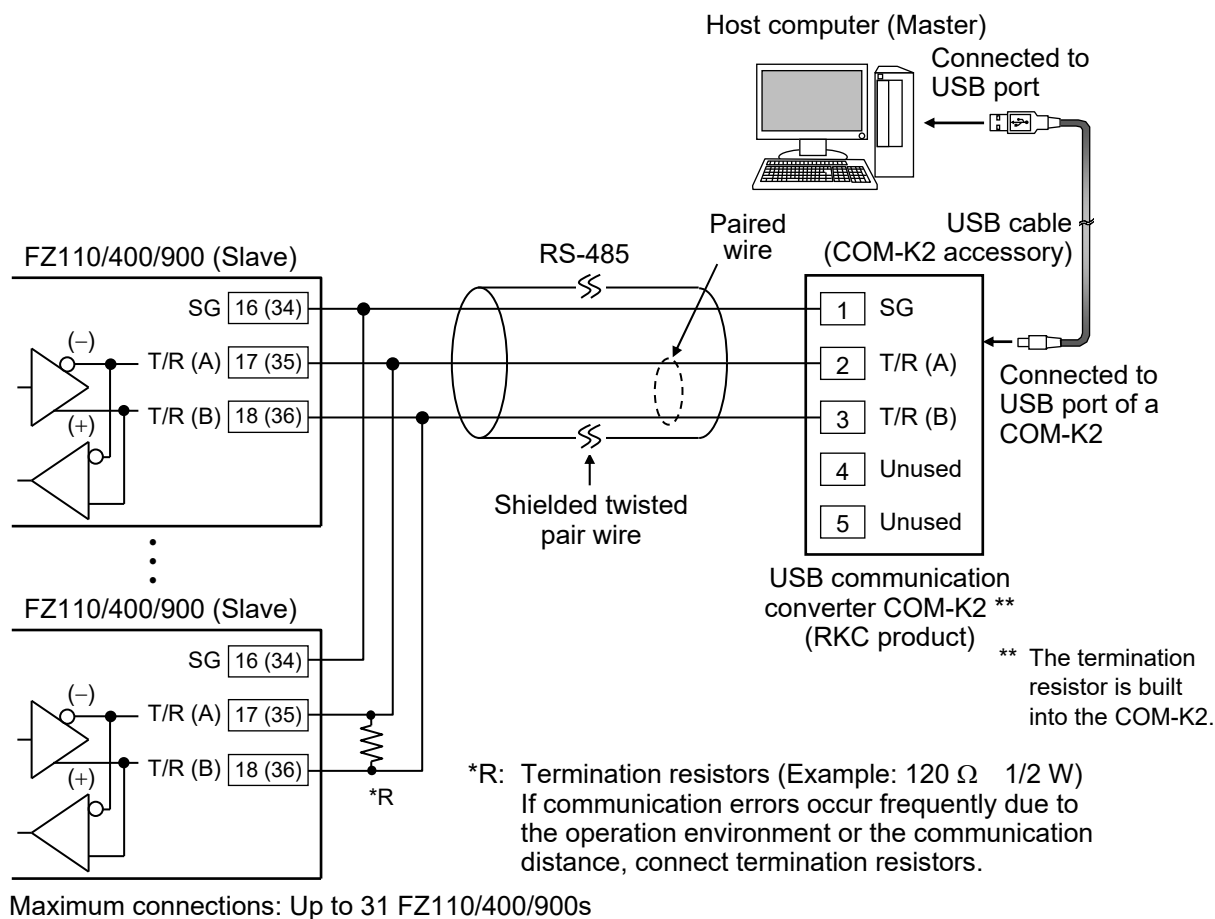


The communication cable and termination resistor(s) must be provided by the customer.

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

Connect the USB communication converter between the host computer and the FZ110/400/900.

● Wiring example



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



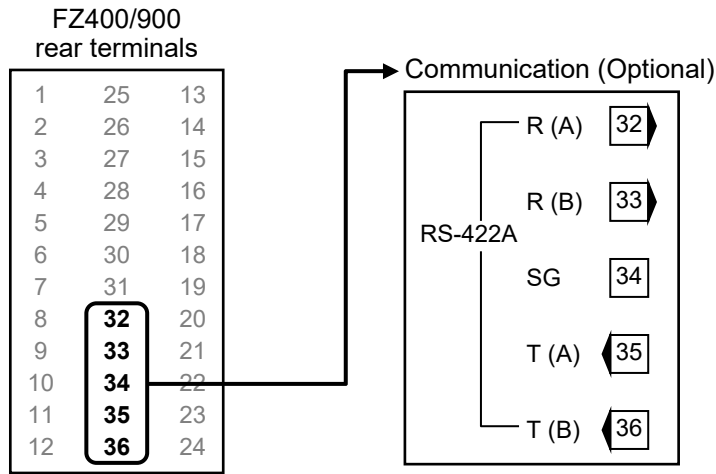
Recommended USB communication converter: **COM-K2** or **COM-KG (RKC product)**

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 FZ400/900

■ Communication terminal number and signal details

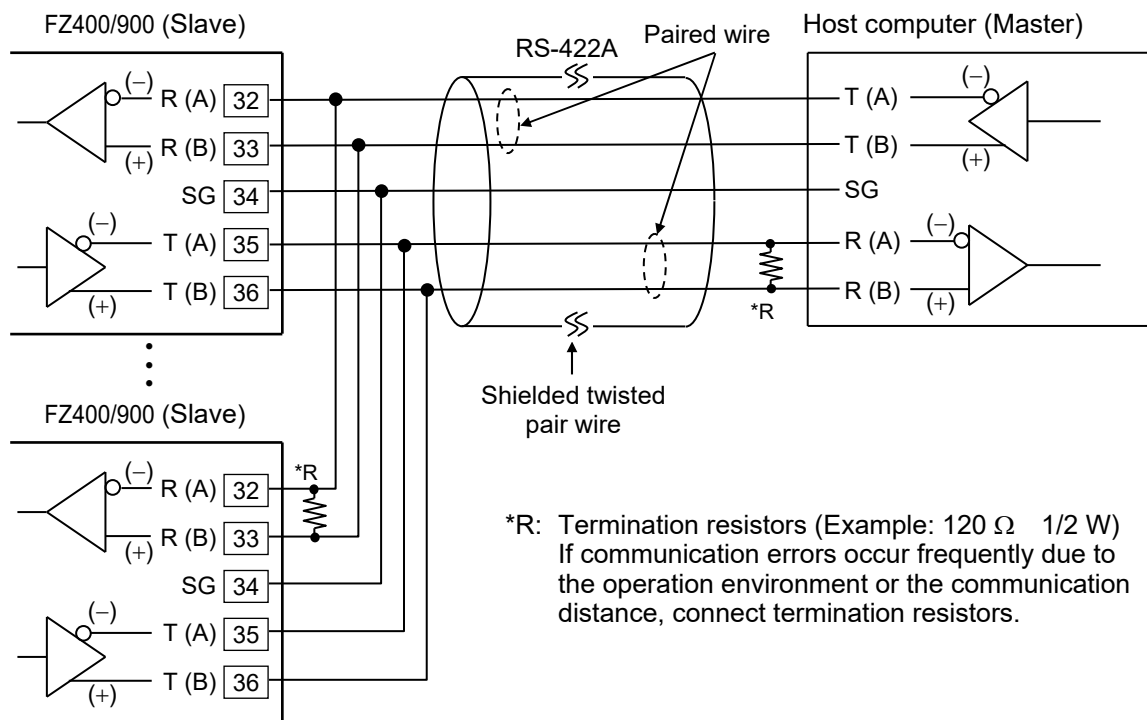


RS-422A

FZ400/900 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



Maximum connections: Up to 31 FZ400/900s

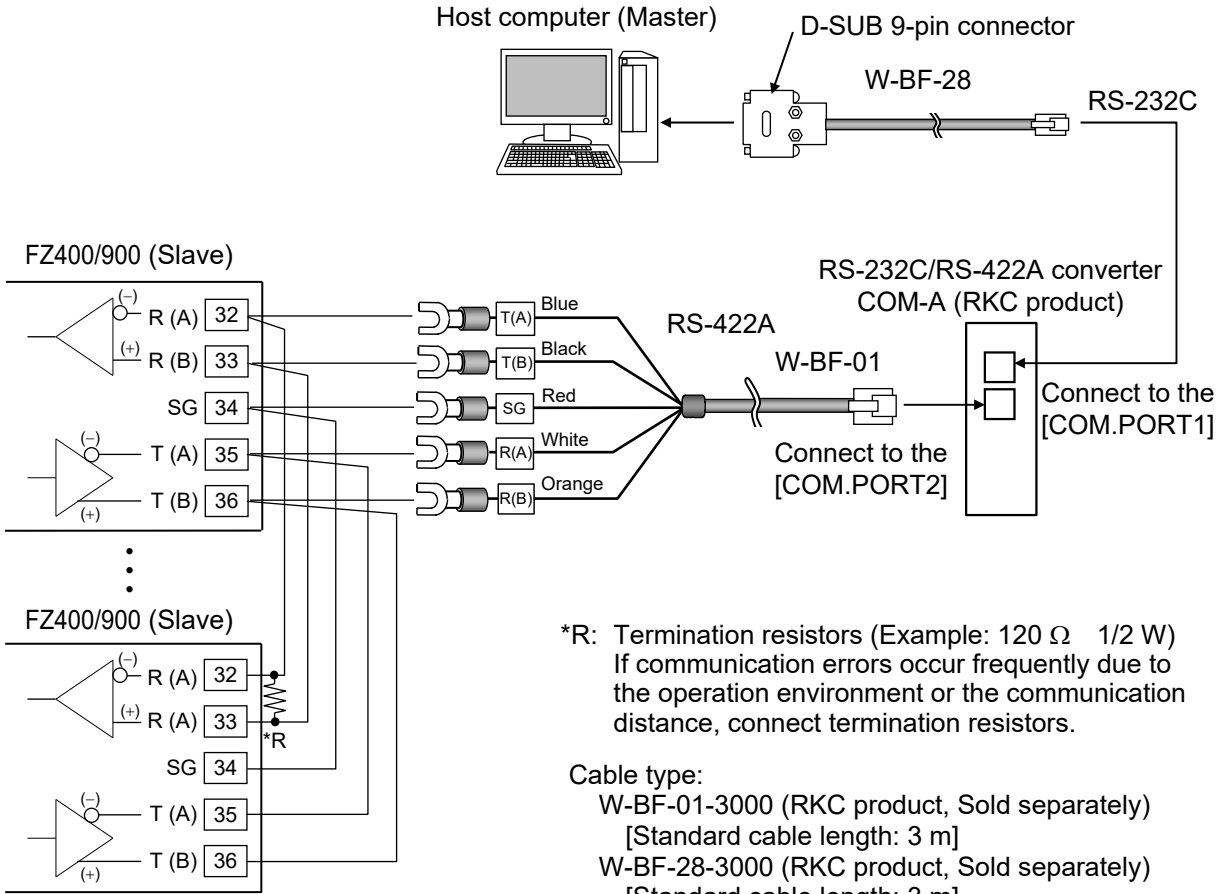


The cable and termination resistor(s) must be provided by the customer.

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

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

● Wiring example



Maximum connections: Up to 31 FZ400/900s



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.

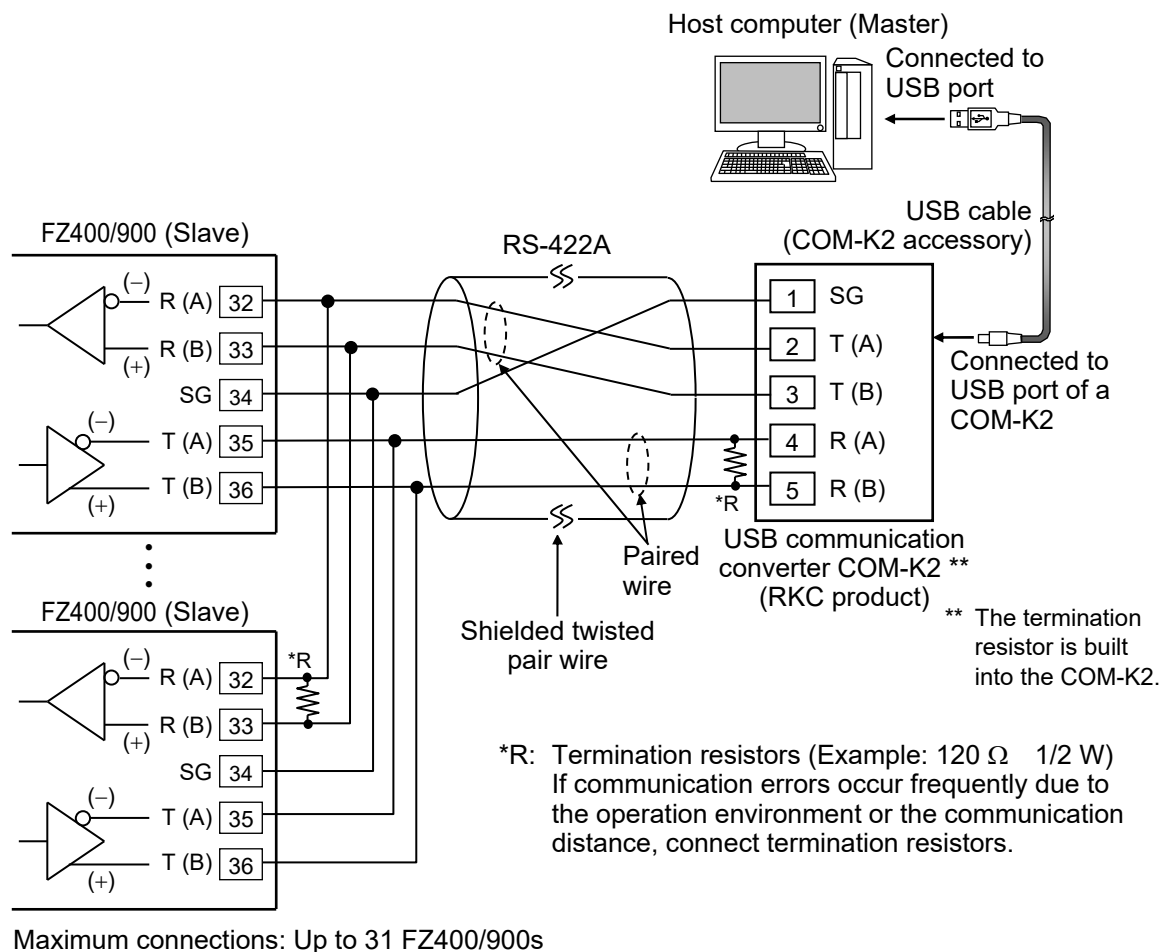


Recommended RS-232C/RS-422A converter: **COM-A** (RKC product)
For the COM-A, refer to the **COM-A/COM-B Instruction Manual**.

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

Connect the USB communication converter between the host computer and the FZ400/900.

● Wiring example



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



Recommended USB communication converter: **COM-K2** or **COM-KG (RKC product)**

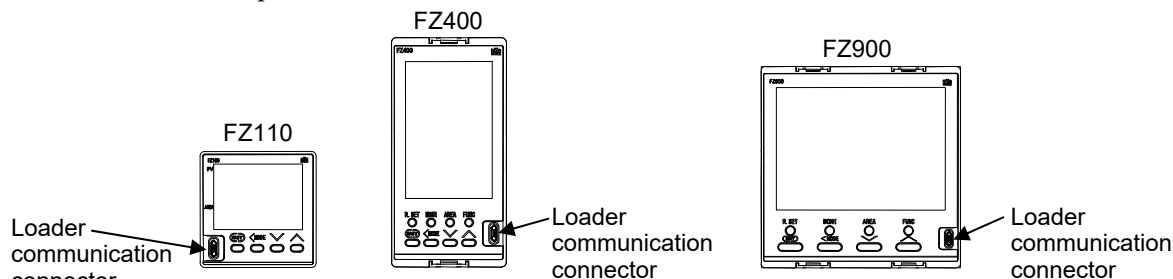
For the COM-K2, refer to the **COM-K2 Instruction Manual**.

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.



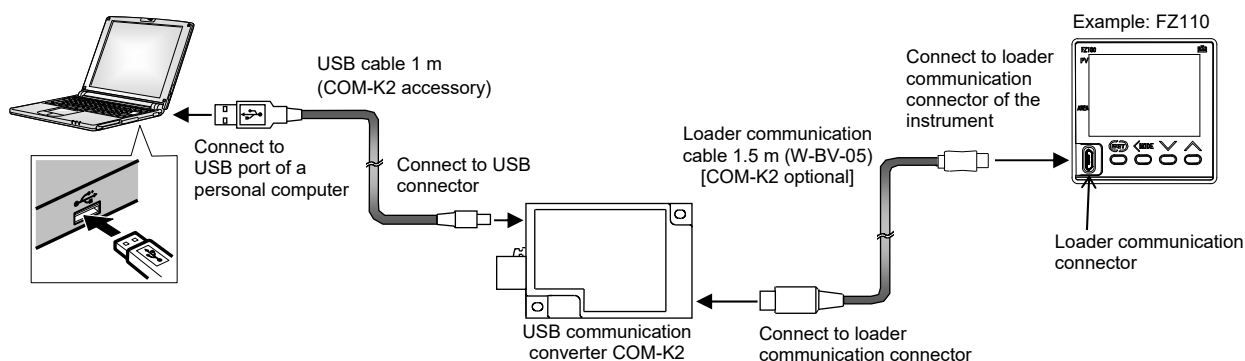
■ Wiring method

Connect the FZ110/400/900, 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 FZ110/400/900 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.

PARAMETER SETTING

3

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

3.1 Setting of Communication Parameter	3-2
3.1.1 Description of each parameter	3-2
3.1.2 Setting procedure	3-4
3.2 Selection of Communication Data Type	3-5
3.2.1 Communication data type	3-5
3.2.2 Description of each parameter	3-6
3.2.3 Setting procedure	3-7
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■ Processing times during data send/receive	3-8
■ RS-485 (2-wire system) send/receive timing (RKC communication)	3-9
■ Fail-safe	3-9

3.1 Setting of Communication Parameter

3.1.1 Description of each parameter

To establish communication between host computer (master) and FZ110/400/900 (slave), it is necessary to set the following parameters. The communication related parameters can be found in the Function block No. 60: communication (5C1) of Engineering mode.

The communication status can be monitored at “Communication response monitor.”

■ Function block No. 60: Communication (5C1)

No.	Symbol	Name	Data range	Description	Factory set value
—	<i>F_n60</i>	Function block No. 60	This is the first parameter symbol of Function block No. 60.		—
282	<i>[MPS]</i>	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	<i>Addr</i>	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 FZ110/400/900 in multi-drop connection. Each FZ110/400/900 must have a unique address in multi-drop connection.	RKC communication: 0 Modbus: 1 PLC communication: 0
284	<i>bps</i>	Communication speed	0: 2400 bps 1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: 57600 bps	Set the same communication speed for both the FZ110/400/900 (slave) and the host computer (master).	3
285	<i>bit</i>	Data bit configuration	0 to 11 Refer to Data bit configuration table (P. 3-3)	Set the same data bit configuration for both the FZ110/400/900 (slave) and the host computer (master).	0
286	<i>INT</i>	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 FZ110/400/900. Adjust the interval time when the switchover between send and receive is not appropriate.	10
287	<i>[MRM]</i>	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 FZ110/400/900 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 FZ110/400/900 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

Communication response monitor



SV display unit

Communication response monitor

- 0: Normal response
 - 1: Overrun error
 - 2: Parity error
 - 4: Framing error
 - 8: Receive buffer overflow
- If two or more errors occur, the error values are summed up.
Errors are displayed in the hexadecimal format (0 to F).

0 (fixed)

Reception status monitor

Each time signal is received, 0 and 1 are displayed in turns.

Transmission status monitor

Each time signal is sent, 0 and 1 are displayed in turns.

Lights off

3.1.2 Setting procedure

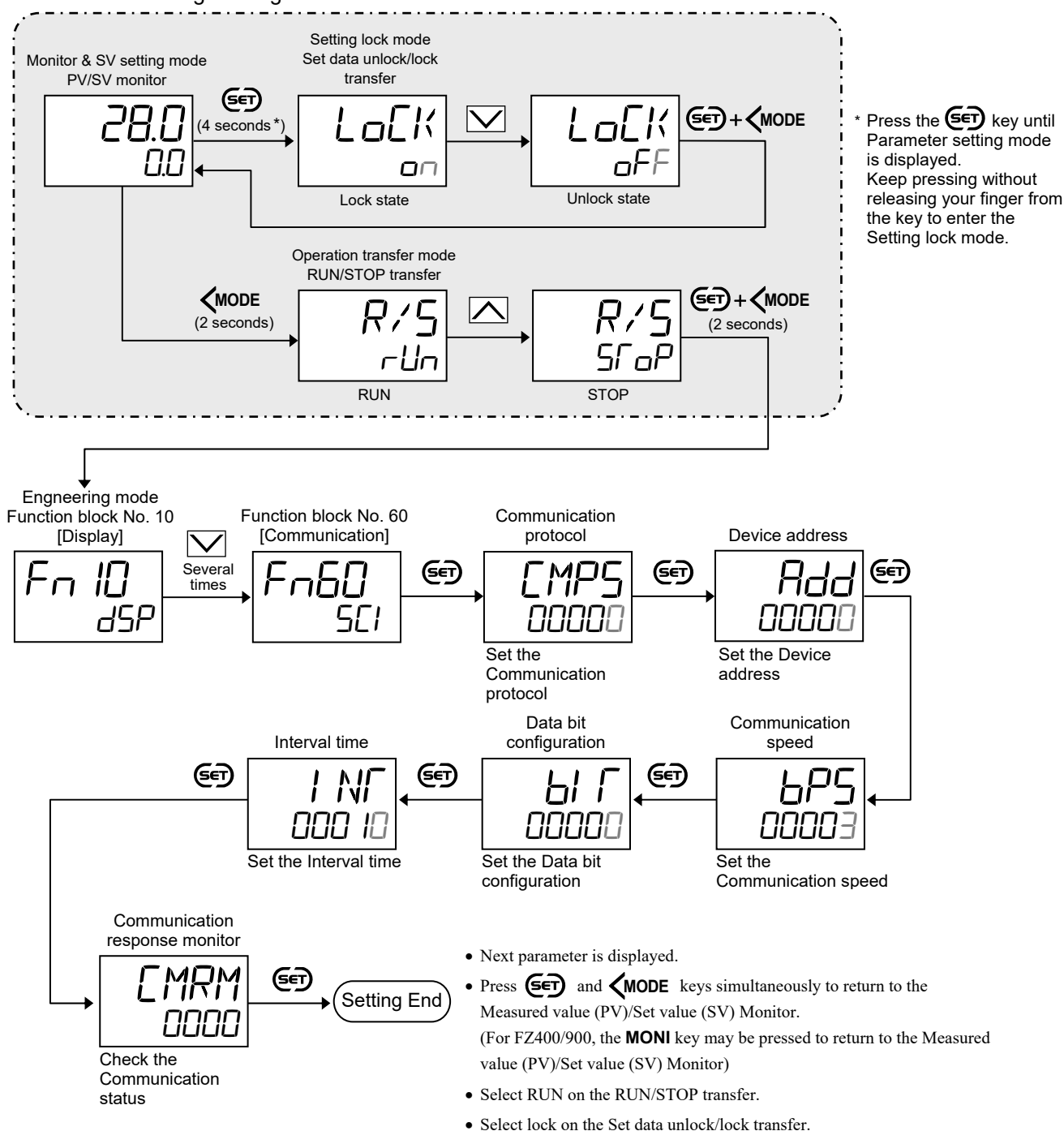
The communication related parameters can be found in the Function block No. 60: Communication (SCI) of Engineering mode.

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

To enter the Engineering mode



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 Ndf).

 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 FZ110/400/900	0
• 6 digits data, Communication data of FZ110/400/900	1
• 6 digits data, Communication data equivalent to our REX-D series (RKC communication identifiers are compatible) The RKC communication identifiers for the REX-D series can be used to handle the communication data of the FZ110/400/900 corresponding to the REX-D series. If there is no relevant communication data on the FZ110/400/900, dummy data is used.	2

 For the data map of RKC communication, **6.3.1 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word] (P. 6-9)**.

■ Modbus

Communication data type	Set value of Input data type
• Double word, Communication data of FZ110/400/900  For details, refer to the 6.3.1 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word] (P. 6-9) .	0
• Single word, Communication data of FZ110/400/900  For details, refer to the 6.4.1 FZ110/400/900 communication data [Modbus single word] (P. 6-106) .	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 FZ110/400/900 corresponding to the FB series. If there is no relevant communication data on the FZ110/400/900, the data is handled as undefined data.  For details, refer to the 6.4.4 FB series equivalent communication data [Modbus single word] (P. 6-135) .	1 (or 2*)

* Select "2" only when you need to handle the REX-D equivalent data in RKC communication.

3.2.2 Description of each parameter

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

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

No.	Symbol	Name	Data range	Description	Factory set value
—	Fn21	Function block No. 21	This is the first parameter symbol of Function block No. 21		
⋮	⋮	⋮	⋮	⋮	⋮
165	Input data type	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: Number of measured value digits: 4 Number of RKC communication data digits: 6 Our REX-D series equivalent (Some identifiers are replaced with the REX-D series equivalent identifiers) Modbus data: Single word * PLC communication data: Single word * Including our FB series equivalent data Select “2” only when you need to handle REX-D series equivalent data in RKC communication. When changing the Input data type from 0 to 1 (or 2) 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 FZ400/900: hour/minute/second, hour/minute, minute/second FZ110: hour/minute, minute/second In case of Input data type 1 hour/minute, minute/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. 6-45)

Modbus Double word: 018CH, 018DH (Refer to P. 6-45)

Modbus Single word: 20C6H (Refer to P. 6-113)

3.2.3 Setting procedure

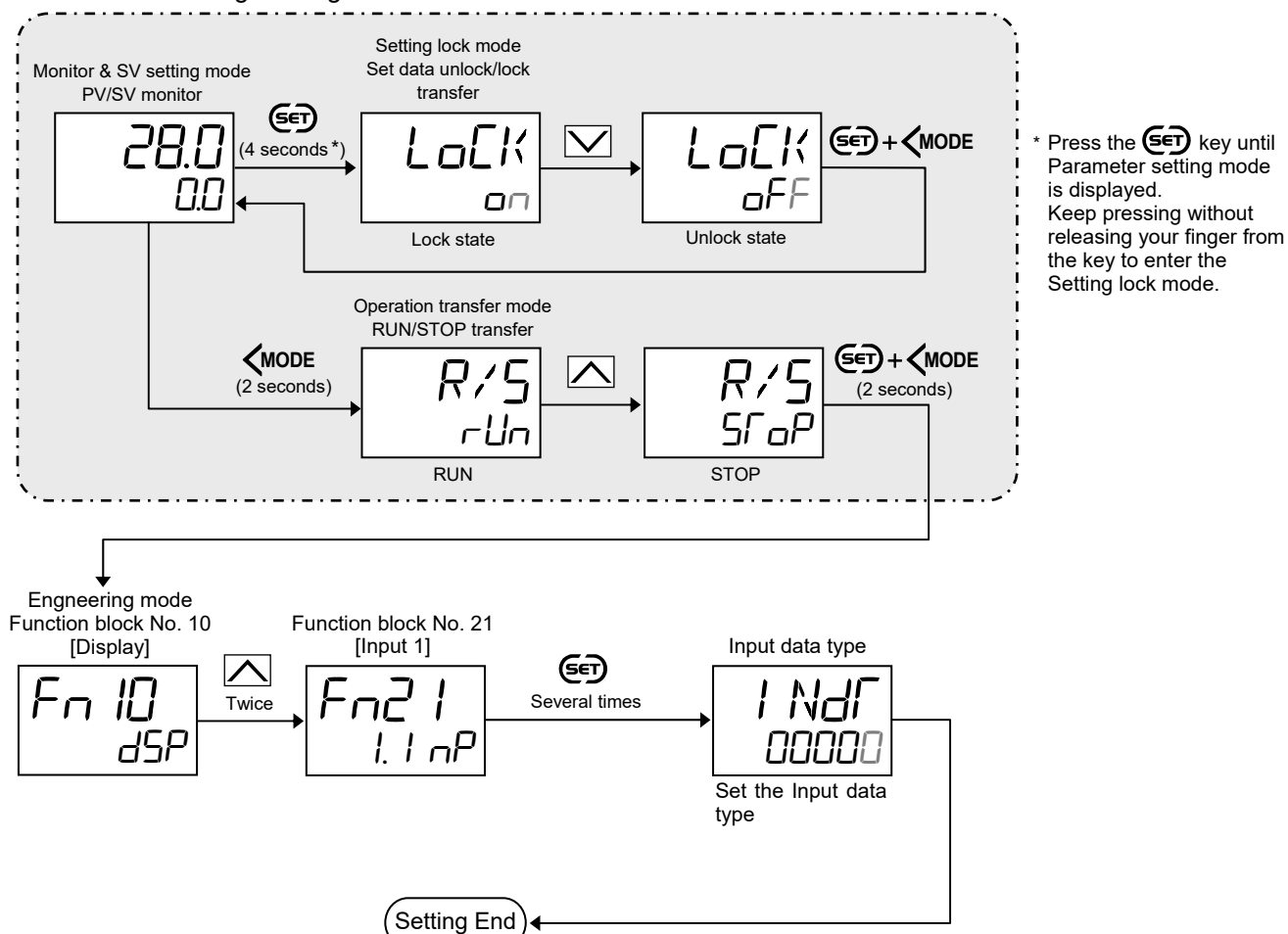
The Input data type can be found in the Function block No. 21: Input 1 (1.1 nP) of Engineering mode.

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.
(For FZ400/900, 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 FZ110/400/900 to send data:

- Response wait time after FZ110/400/900 sends BCC in polling procedure
- Response wait time after FZ110/400/900 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 FZ110/400/900 receives ENQ	4.48 ms max.
Response send time after FZ110/400/900 receives ACK	4.64 ms max.
Response send time after FZ110/400/900 receives NAK	4.64 ms max.
Response send time after FZ110/400/900 sends BCC	304 μs max.

RKC communication (Selecting procedure) processing times

Procedure details	Time
Response send time after FZ110/400/900 receives BCC	150.4 ms max.
Response wait time after FZ110/400/900 sends ACK	276 μs max.
Response wait time after FZ110/400/900 sends NAK	276 μs max.

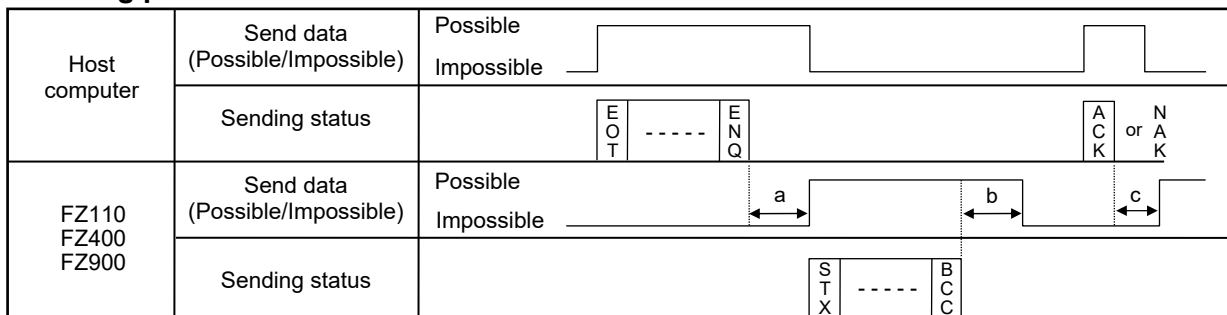
Modbus processing times

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

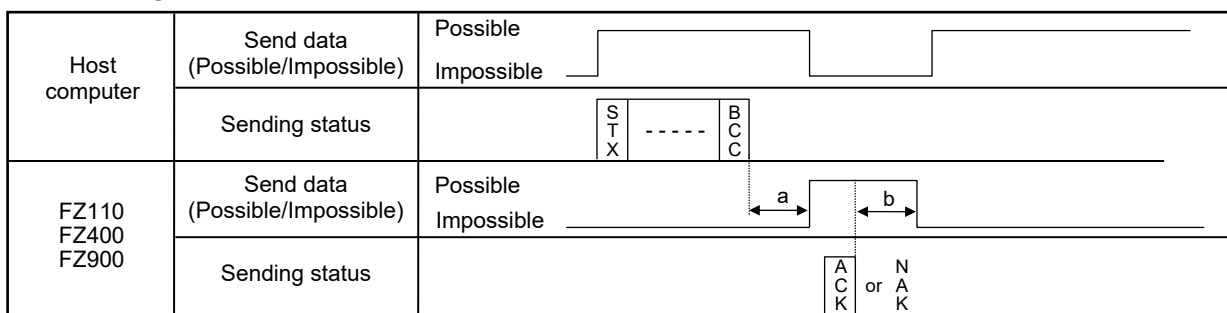


a: Response send time after the FZ110/400/900 receives [ENQ] + Interval time

b: Response send time after the FZ110/400/900 sends BCC

c: Response send time after the FZ110/400/900 receives [ACK] + Interval time or
Response send time after the FZ110/400/900 receives [NAK] + Interval time

● Selecting procedure



a: Response send time after the FZ110/400/900 receives BCC + Interval time

b: Response wait time after the FZ110/400/900 sends ACK or Response wait time after the
FZ110/400/900 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 FZ110/400/900 to process data:

- In polling procedure, Response wait time after the FZ110/400/900 sends BCC
- In selecting procedure, Response wait time after the FZ110/400/900 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.

4.1 Polling	4-2
4.1.1 Polling procedures	4-3
4.1.2 Polling procedure example	4-7
4.2 Selecting	4-8
4.2.1 Selecting procedures	4-8
4.2.2 Selecting procedure example	4-12

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 FZ110/400/900 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.



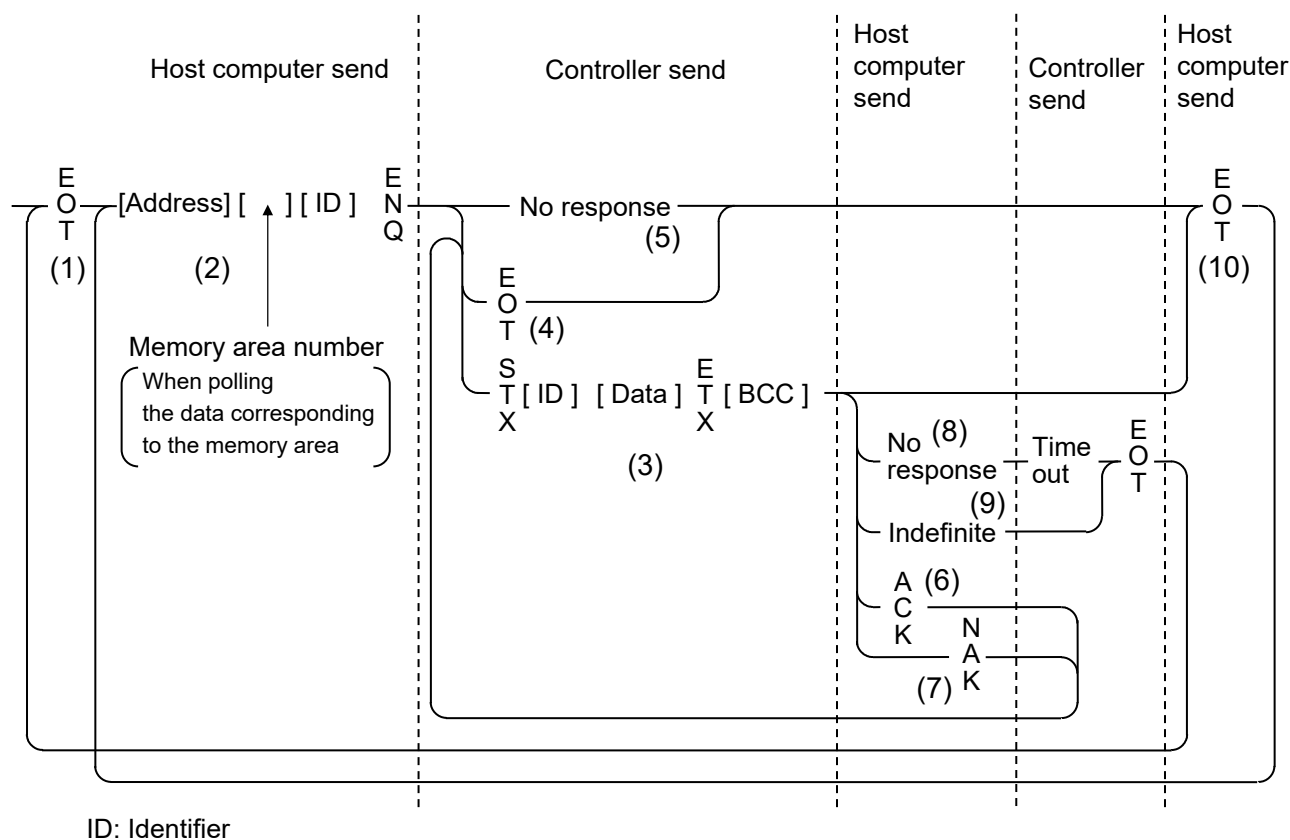
Data send/receive state (communication data monitoring and setting) of RKC communication can be checked by using the following software:

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:



4.1.1 Polling procedures

(1) Data link initialization

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

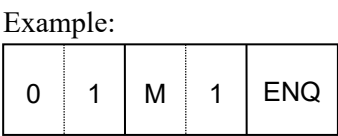
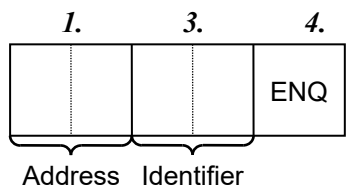
(2) Data sent from host computer - Polling sequence

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.

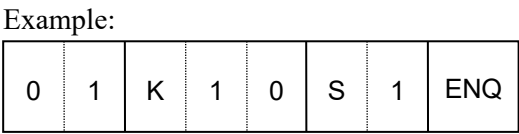
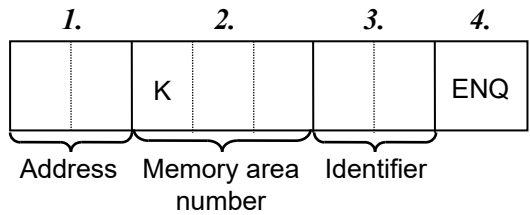
■ When no Memory area number is specified

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



■ When the Memory area number is specified

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



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. 6-9)**.

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.	2.	3.	4.	5.
STX	Identifier	Data	ETX	BCC

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. 6-9)**.

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).”



The data length in RKC communication (7 or 6 digits) can be set at Input data type (*Input Data*).
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	

$$\text{BCC} = 4\text{DH} \oplus 31\text{H} \oplus 30\text{H} \oplus 30\text{H} \oplus 31\text{H} \oplus 30\text{H} \oplus 30\text{H} \oplus 2\text{EH} \oplus 30\text{H} \oplus 03\text{H} = 50\text{H}$$

($\oplus$: *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. 6-9)**.

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

(7) NAK (Negative acknowledgment)

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.

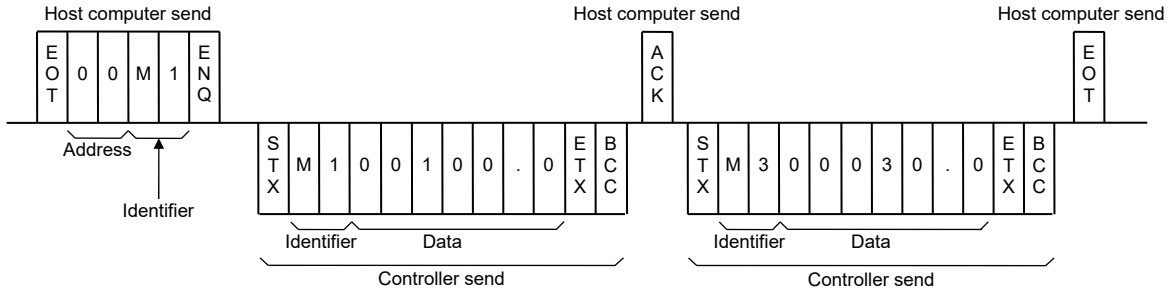
(10) EOT (Data link termination)

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.

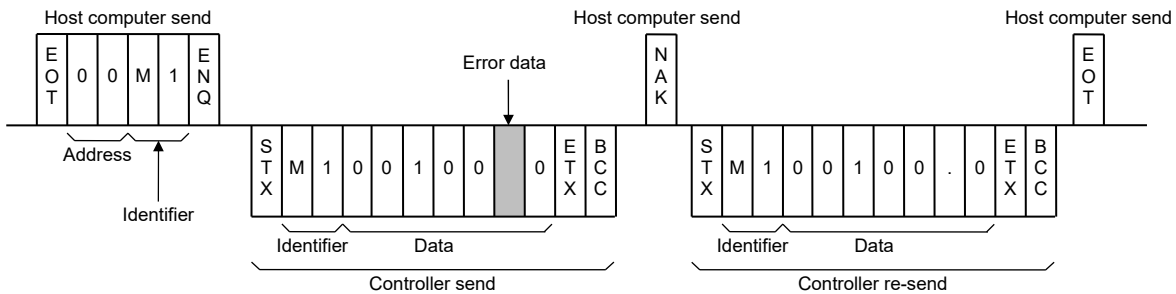
4.1.2 Polling procedure example

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

■ Normal transmission

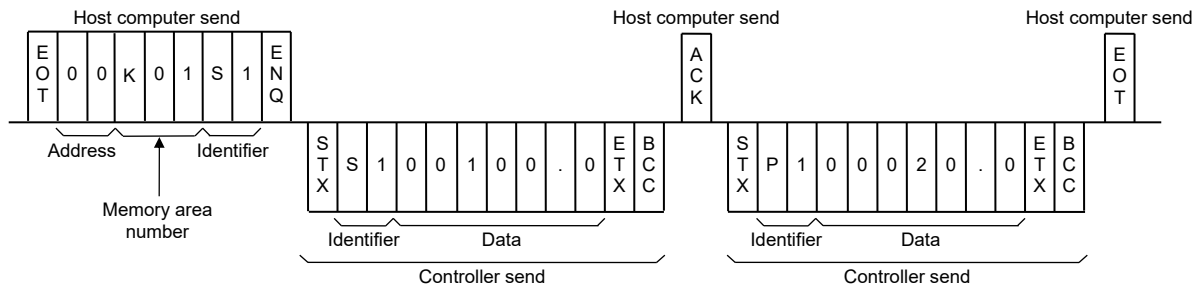


■ Error transmission

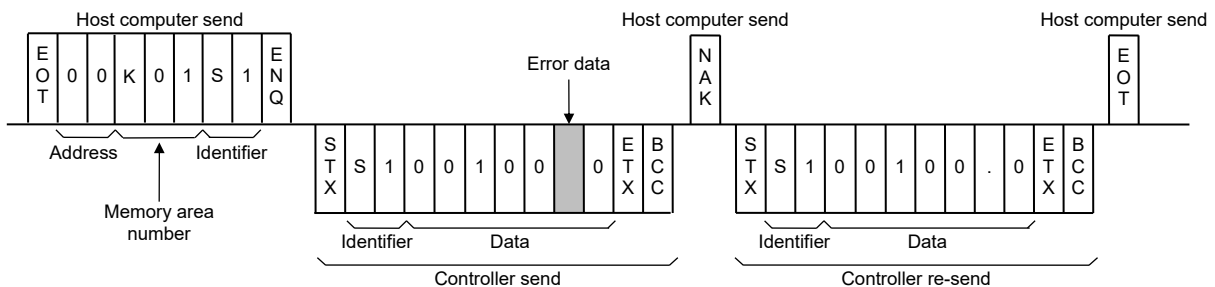


(2) When the items corresponding to the memory area are polled [Example: Input 1_Set value (SV) S1]

■ Normal transmission

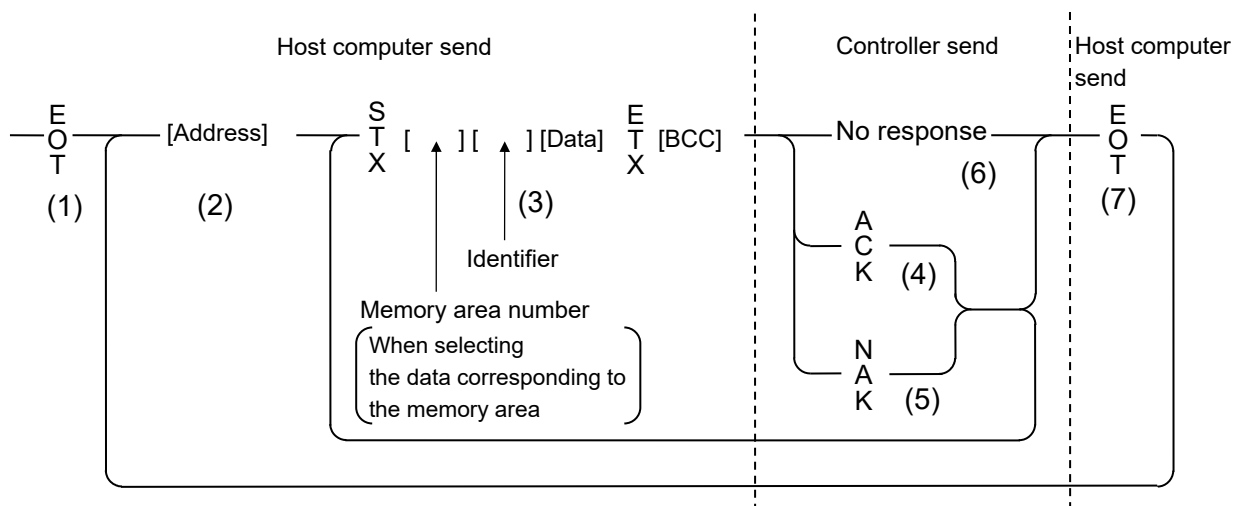


■ Error transmission



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. 6-9)**.

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).”

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 (I NdlF).
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	-0.5	-0.058	$.05$	-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 can not receive the selecting address, STX, ETX or BCC.

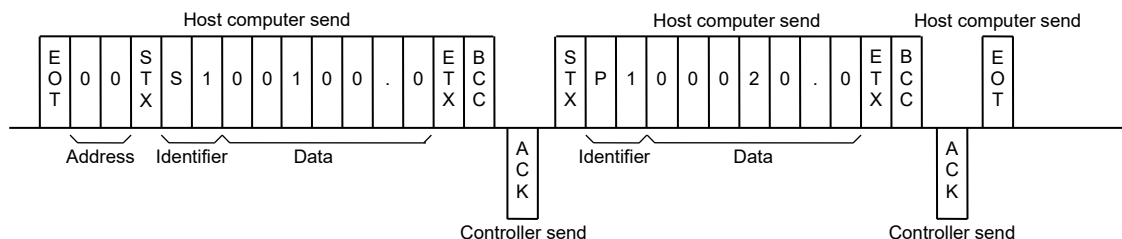
(7) EOT (Data link termination)

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.

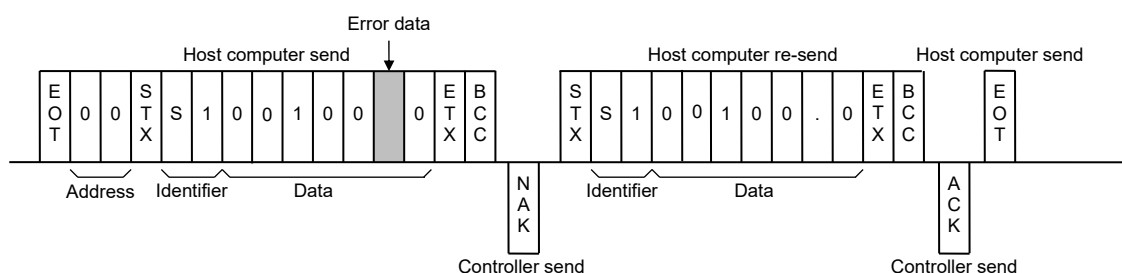
4.2.2 Selecting procedure example

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

■ Normal transmission

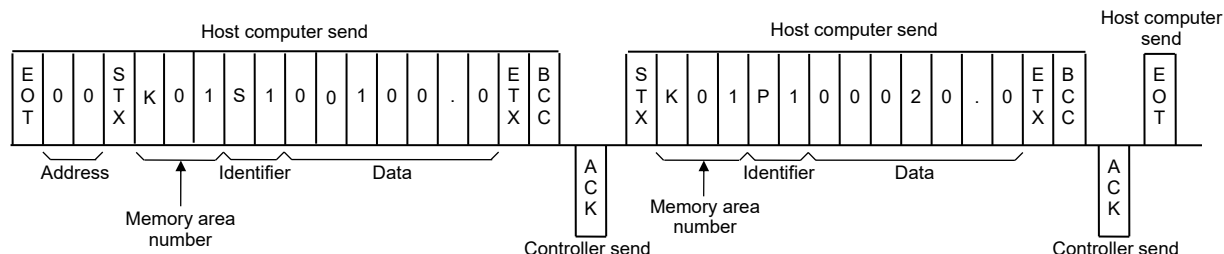


■ Error transmission

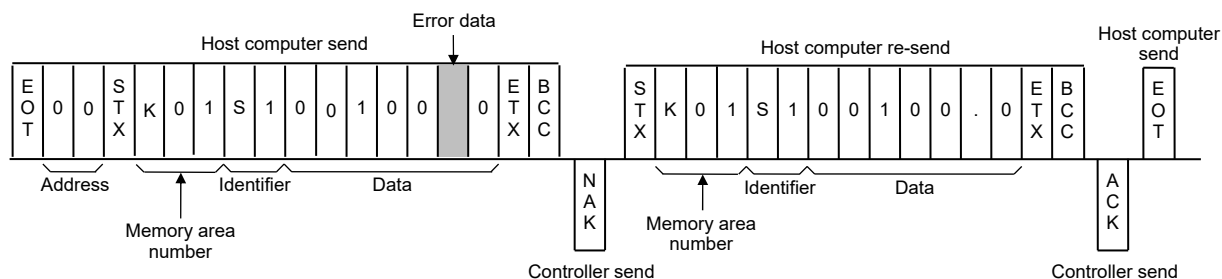


(2) When the items corresponding to the memory area are selected [Example: Input 1_Set value (SV) S1]

■ Normal transmission



■ Error transmission



MODBUS PROTOCOL

5

This chapter describes the Modbus protocol.

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In this chapter a host computer is called Master and FZ110/400/900 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 F110/400/900.



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)

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

* 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 register or write to Preset multiple registers [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.

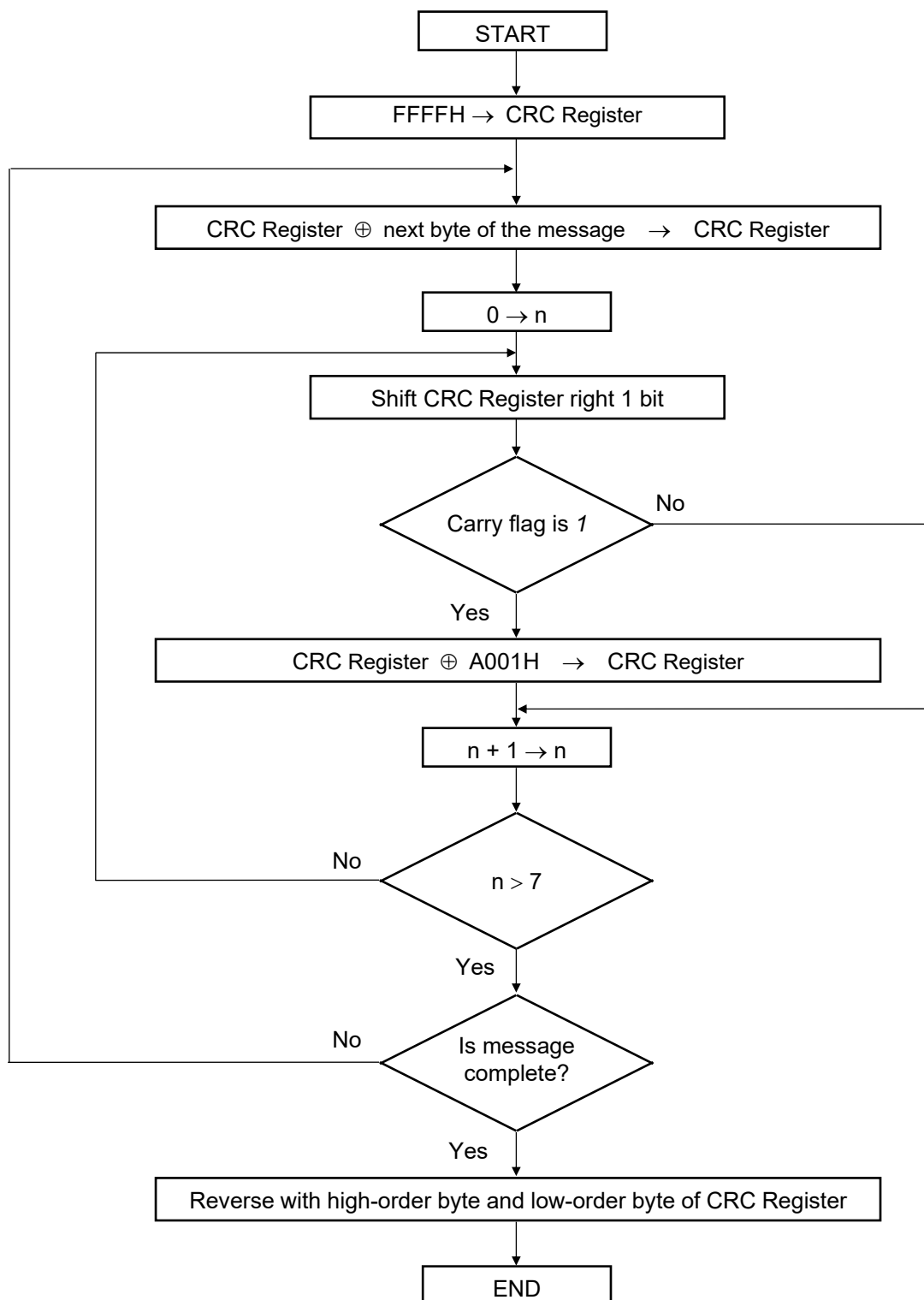
5.5 Calculating CRC-16

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* ($\oplus$) 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 $\oplus$ 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_message_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, uint16 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_message_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_message_length++] = crcl;
    z_p [z_message_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	} First holding register address } The setting must be between 1 (0001H) and 62 (003EH).
Function code		03H	
Starting number	High	00H	
	Low	00H	
Quantity	High	00H	
	Low	04H	
CRC-16	High	44H	
	Low	3AH	

Normal response message

Slave address		02H	→ Number of holding registers × 2
Function code		03H	
Number of data		08H	
First holding register contents (Low-order word of the first data)	High	00H	
	Low	62H	
Next holding register contents (High-order word of the first data)	High	00H	
	Low	00H	
Next holding register contents (Low-order word of the next data)	High	00H	
	Low	14H	
Next holding register contents (High-order word of the next data)	High	00H	
	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	} First holding register address
Function code		03H	
Starting number	High	00H	
	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	→ Number of holding registers × 2
Function code		03H	
Number of data		08H	
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 FZ110/400/900).

Example: Loopback test for slave address 1

Query message

Slave address		01H	} Test code must be set to "00."
Function code		08H	
Test code	High	00H	
	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 (for data designation) *	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 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word] (P. 6-9).	Refer to 6.4.1 FZ110/400/900 communication data [Modbus single word] (P. 6-106), 6.4.4 FB series equivalent communication data [Modbus single word] (P. 6-135).

* Register address for data designation are settable only when the controller is in STOP mode. However, only checking can be made even in the RUN state.

 For the data mapping address list, refer to the **6.3.3 Data mapping address [Modbus double word]** (P. 6-101), **6.4.3 Data mapping address [Modbus single word]** (P. 6-131).

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	001E	001F	30	31
Event 2 state monitor	0020	0021	32	33

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: 001EH or 001FH
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: 0020H or 0021H

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	} First holding register address (1500H)
Function code		03H	
Starting number	High	15H	
	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		Write register address to be mapped to the register address for the designation of data
	HEX	DEC	
Input 1_Measured value (PV)	2000	8192	
Input 1_Manipulated output value monitor [heat-side]	2007	8199	
Event 1 state monitor	200F	8207	
Event 2 state monitor	2010	8208	

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	200F
Register address setting 4 [Read/write address: 1503H]	1003	4099	2010

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 0B5FH for double word or 2500H to 282FH for single word) to read data from or write data to the Memory area.

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

If any Memory area number to perform data read and write is specified by the Setting memory area number (0500H), data corresponding to the specified Memory area number is called up to the register addresses of memory area from 0501H to 0548H. 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 FB series *.

* The data equivalent to our FB series refers to the communication data of our FB series compatible with the FZ110/400/900.

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

The direct designation method uses register address (0500H to 0B5FH for double word or 2500H to 282FH 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	0501	1280	1281	2500	9472
	⋮	⋮	⋮	⋮	⋮	⋮
	0564	0565	1380	1381	2532	9522
Memory area 2	0566	0567	1382	1383	2533	9523
	⋮	⋮	⋮	⋮	⋮	⋮
	05CA	05CB	1482	1483	2565	9573
Memory area 3	05CC	05CD	1484	1485	2566	9574
	⋮	⋮	⋮	⋮	⋮	⋮
	0630	0631	1584	1585	2598	9624
Memory area 4	0632	0633	1586	1587	2599	9625
	⋮	⋮	⋮	⋮	⋮	⋮
	0696	0697	1686	1687	25CB	9675
Memory area 5	0698	0699	1688	1689	25CC	9676
	⋮	⋮	⋮	⋮	⋮	⋮
	06FC	06FD	1788	1789	25FE	9726
Memory area 6	06FE	06FF	1790	1791	25FF	9727
	⋮	⋮	⋮	⋮	⋮	⋮
	0762	0763	1890	1891	2631	9777

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 7	0764	0765	1892	1893	2632	9778
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 8	07C8	07C9	1992	1993	2664	9828
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 9	082E	082F	2094	2095	2697	9879
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 10	0830	0831	2096	2097	2698	9880
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 11	0894	0895	2196	2197	26CA	9930
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 12	0896	0897	2198	2199	26CB	9931
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 13	08FA	08FB	2298	2299	26FD	9981
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 14	08FC	08FD	2300	2301	26FE	9982
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 15	0960	0961	2400	2401	2730	10032
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 16	0962	0963	2402	2403	2731	10033
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 17	09C6	09C7	2502	2503	2763	10083
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 18	09C8	09C9	2504	2505	2764	10084
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 19	0A2C	0A2D	2604	2605	2796	10134
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 20	0A2E	0A2F	2606	2607	2797	10135
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 21	0A92	0A93	2706	2707	27C9	10185
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 22	0A94	0A95	2708	2709	27CA	10186
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 23	0AF8	0AF9	2808	2809	27FC	10236
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 24	0AFA	0AFB	2810	2811	27FD	10237
	⋮	⋮	⋮	⋮	⋮	⋮
Memory area 25	0B5E	0B5F	2910	2911	282F	10287
	⋮	⋮	⋮	⋮	⋮	⋮

☞ For the memory area data list, refer to the **6.3.2 Memory area data (Direct designation method) [Modbus double word] (P. 6-76)**, **6.4.2 Memory area data (Direct designation method) [Modbus single word] (P. 6-119)**.

☞ The memory area data is used in three groups for the Level PID. For details of Level PID, refer to the **FZ110/FZ400/FZ900 Instruction Manual [Part 2: Parameters/Functions] (IMR03A05-E□)**.

■ Area designation method (Single word)

If any Memory area number to perform data read and write is specified by the Setting memory area number (0500H), data corresponding to the specified Memory area number is called up to the register addresses of memory area from 0501H to 0548H. 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 FB series *.

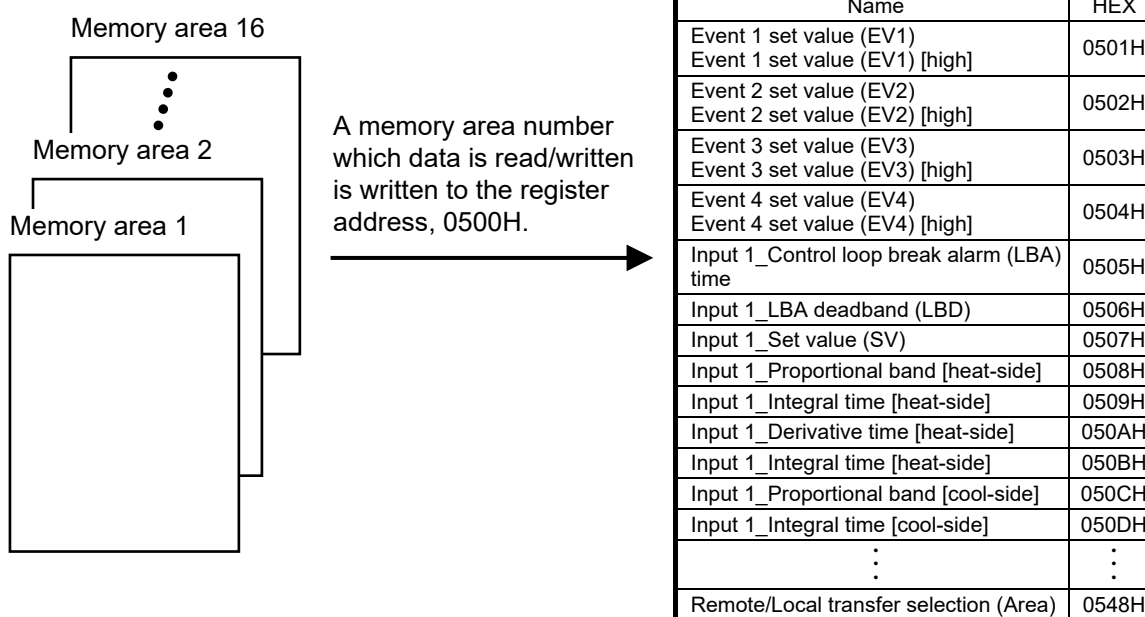
* The data equivalent to our FB series refers to the communication data of our FB series compatible with the FZ110/400/900.

(HEX: Hexadecimal number DEC: Decimal number)

Setting memory area number (Register address designating the memory area.)	HEX: 0500H DEC: 1280
Register address of memory area data (Register address for data read and data write.)	HEX: 0501H to 0548H DEC: 1281 to 1352

☞ For the memory area data list, refer to the **6.4.5 Memory area data equivalent to the FB series (Area designation method) [Modbus single word] (P. 6-149)**.

Data corresponding to a specified Memory area number is called up to the register addresses from 0501H to 0548H.



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 0548H.
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 0548H.
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	FZ110/400/900 communication data HEX: Low-order word: 0068H High-order word: 0069H DEC: Low-order word: 104 High-order word: 105	- FZ110/400/900 communication data HEX: 2034H DEC: 8244 - FB series equivalent communication data * HEX: 0024H DEC: 0036
Control area (Area now used for control)	FZ110/400/900 communication data HEX: 0082H to 00E7H DEC: 130 to 231	- FZ110/400/900 communication data HEX: 2041H to 2073H DEC: 8257 to 8307 - FB series equivalent communication data * HEX: 0026H to 0039H, 00A5H, 00A6H, 00A9H, 00AAH DEC: 0038 to 0057, 0165, 0166, 0169, 0170

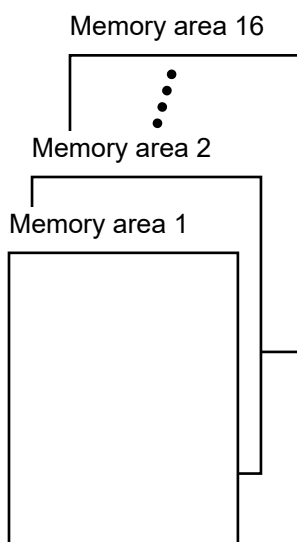
* The data equivalent to our FB series refers to the communication data of our FB series compatible with the FZ110/400/900.

 For the control area data list, refer to the **6.3.1 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word]** (P. 6-9), **6.4.1 FZ110/400/900 communication data [Modbus single word]** (P. 6-106) and **6.4.4 FB series equivalent communication data [Modbus single word]** (P. 6-135).

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

● FZ110/400/900 communication data (Double word)

Data corresponding to a specified Memory area number is called up to the register addresses from 0082H to 00E7H



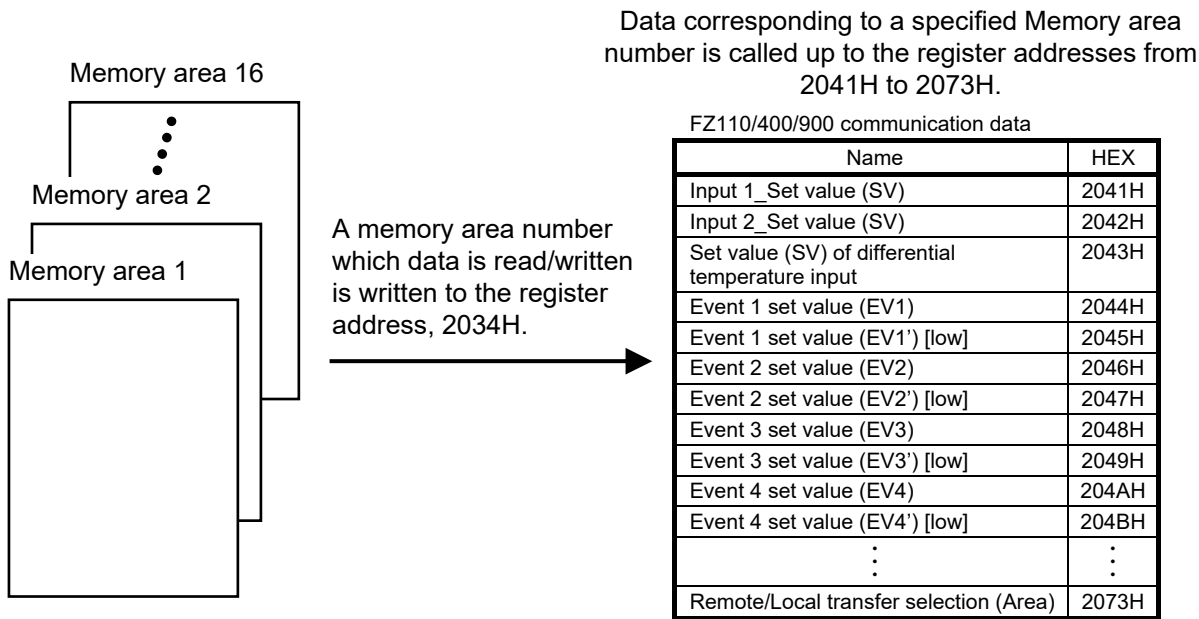
Write the Memory area No.
used for the control to
register address.
Write into
Low-order word: 0068H
High-order word: 0069H

Name	HEX	
	Low-order	High-order
Input 1_Set value (SV)	0082	0083
Input 2_Set value (SV)	0084	0085
Set value (SV) of differential temperature input	0086	0087
Event 1 set value (EV1)	0088	0089
Event 1 set value (EV1') [low]	008A	008B
Event 2 set value (EV2)	008C	008D
Event 2 set value (EV2') [low]	008E	008F
Event 3 set value (EV3)	0090	0091
Event 3 set value (EV3') [low]	0092	0093
Event 4 set value (EV4)	0094	0095
Event 4 set value (EV4') [low]	0096	0097
Input 1_Proportional band [heat-side]	0098	0099
Input 1_Integral time [heat-side]	009A	009B
Input 1_Derivative time [heat-side]	009C	009D
Input 1_Control response parameter	009E	009F
Input 1_Proactive intensity	00A0	00A1
Input 1_Manual reset	00A2	00A3
Input 1_FF amount	00A4	00A5
⋮	⋮	⋮
Remote/Local transfer selection (Area)	00E6	00E7

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: 0068H High-order word: 0069H).
Data in Memory area 3 is called up to the register addresses from 0082H to 00E7H.
- 2. Control is performed by using data in the register addresses from 0082H to 00E7H.

● **FZ110/400/900 communication data (Single word)**

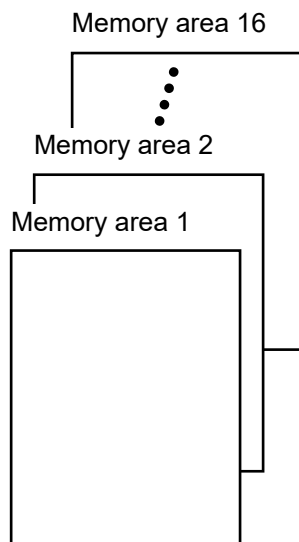


Example: When performing control by calling up data in Memory area 3 (Single word)

- 1. The Memory area number, “3” is written to the Memory area transfer (2034H).
Data in Memory area 3 is called up to the register addresses from 2041H to 2073H.
- 2. Control is performed by using data in the register addresses from 2041H to 2073H.

● FB series equivalent communication data (Single word)

Data corresponding to a specified Memory area number is called up to the register addresses from 2041H to 2073H, 0026H to 0039H, 00A5H, 00A6H, 00A9H and 00AAH.



Write the Memory area No.
used for the control to
register address.
Write into 0024H.

FZ110/400/900 communication data

Name	HEX
Input 1_Set value (SV)	2041H
Input 2_Set value (SV)	2042H
Set value (SV) of differential temperature input	2043H
Event 1 set value (EV1)	2044H
Event 1 set value (EV1') [low]	2045H
Event 2 set value (EV2)	2046H
Event 2 set value (EV2') [low]	2047H
⋮	⋮
Remote/Local transfer selection (Area)	2073H

FB series equivalent communication data

Name	HEX
Event 1 set value (EV1)	0026H
Event 1 set value (EV1) [high]	
Event 2 set value (EV2)	0027H
Event 2 set value (EV2) [high]	
Event 3 set value (EV3)	0028H
Event 3 set value (EV3) [high]	
Event 4 set value (EV4)	0029H
Event 4 set value (EV4) [high]	
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 FZ110/400/900 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 of the data in the Memory area for control, use the control area (2041H to 2073H) of FZ110/400/900 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 0548H).
- 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.

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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**

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

 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	
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 ⋮ 015C	0001 ⋮ 015D	0 ⋮ 348	1 ⋮ 349	Data of FZ110/400/900 (Normal setting data) Refer to 6.3.1 FZ110/400/900 Communication data [RKC communication identifier/ Modbus double word] (P. 6-9).
015E ⋮ 02E4	015F ⋮ 02E5	350 ⋮ 740	351 ⋮ 741	Data of FZ110/400/900 (Data in the Engineering mode) Refer to 6.3.1 FZ110/400/900 Communication data [RKC communication identifier/ Modbus double word] (P. 6-9).
02E6 ⋮ 04FE	02E7 ⋮ 04FF	742 ⋮ 1278	743 ⋮ 1279	Illegal registers
0500 ⋮ 0B5E	0501 ⋮ 0B5F	1280 ⋮ 2910	1281 ⋮ 2911	Memory area data of FZ110/400/900 Refer to 6.3.2 Memory area data (Direct designation method) [Modbus double word] (P. 6-76).
0B60 ⋮ 0FFE	0B61 ⋮ 0FFF	2912 ⋮ 4094	2913 ⋮ 4095	Illegal registers
1000 ⋮ 103E	1001 ⋮ 103F	4096 ⋮ 4158	4097 ⋮ 4159	Mapping setting of FZ110/400/900 (32) Refer to ■ Register address for data designation of 6.3.3 Data mapping address [Modbus double word] (P. 6-101).
1040 ⋮ 14FE	1041 ⋮ 14FF	4160 ⋮ 5374	4161 ⋮ 5375	Illegal registers
1500 ⋮ 153E	1501 ⋮ 153F	5376 ⋮ 5438	5377 ⋮ 5439	Mapping data of FZ110/400/900 (32) Refer to ■ Register address for data read/write of 6.3.3 Data mapping address [Modbus double word] (P. 6-104).
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. 6-135).
00E1 ⋮ 04FF	225 ⋮ 1279	Illegal registers
0500 ⋮ 0548	1280 ⋮ 1352	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. 6-149).
0549 ⋮ 0FFF	1353 ⋮ 4095	Illegal registers
1000 ⋮ 101F	4096 ⋮ 4127	Mapping setting of FZ110/400/900 (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. 6-131).
1020 ⋮ 14FF	4128 ⋮ 5375	Illegal registers
1500 ⋮ 151F	5376 ⋮ 5407	Mapping data of FZ110/400/900 (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. 6-133).
1520 ⋮ 1FFF	5408 ⋮ 8191	Illegal registers
2000 ⋮ 20AE	8192 ⋮ 8366	Data of FZ110/400/900 (Normal setting data items) Refer to 6.4.1 FZ110/400/900 communication data [Modbus single word] (P. 6-106).
20AF ⋮ 2172	8367 ⋮ 8562	Data of FZ110/400/900 (Data in the Engineering mode) Refer to 6.4.1 FZ110/400/900 communication data [Modbus single word] (P. 6-106).
2173 ⋮ 24FF	8563 ⋮ 9471	Illegal registers
2500 ⋮ 282F	9472 ⋮ 10287	Memory area data of FZ110/400/900 Refer to 6.4.2 Memory area data (Direct designation method) [Modbus single word] (P. 6-119).
2830 ⋮ 7FFF	10288 ⋮ 32767	Illegal registers

* The communication identifiers of FZ110/400/900 equivalent to our FB series can be used.

If there is no relevant communication data on the FZ110/400/900, the data is handled as undefined data.



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).**

6.2 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 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word] (P. 6-9)**.

(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) [FZ110/400/900]	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 [FZ110/400/900]	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
 [FZ400/900]: FZ400/900 data compatible
 (This function is disabled on the FZ110)
 [FZ110/400/900]: FZ110/400/900 data compatible

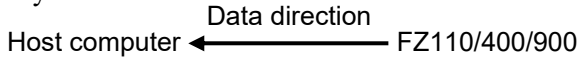
☞ For undefined registers and illegal registers, refer to **5.7 Caution for Handling Communication Data (P. 5-13)**.

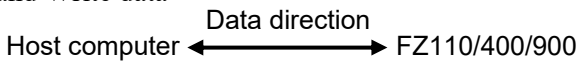
(3) **Identifier:** Identifier for RKC communication

(4) **Digits:** Number of digits for RKC communication

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

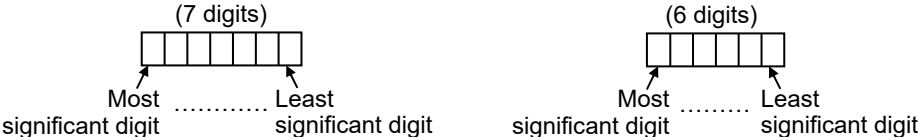
(6) **Attribute:** A method of how communication data items are read or written when viewed from the host computer is described.

RO: Read only data


R/W: Read and Write data


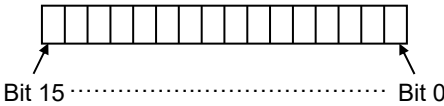
(7) **Data range:** Read or write range of communication data

• ASCII code data (RKC communication)



☞ The data length in RKC communication (7 or 6 digits) can be set at **Input data type (I Ndl)** (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

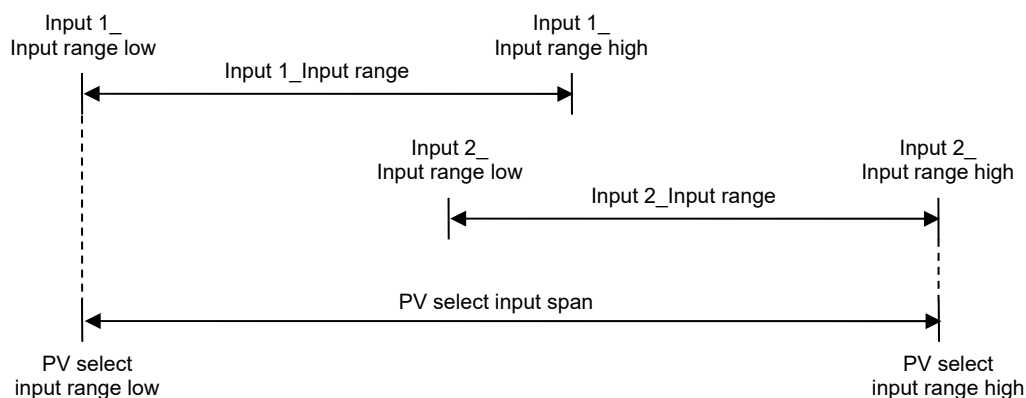
PV select input range high as Input range high

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 179

Data in the Engineering mode:

No. 180 to 375

Data of identifiers compatible with other models (dummy data): No. 376 to 387



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 FZ110/400/900 communication data [Modbus single word] (P. 6-106)**.

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
1	Input 1_Measured value (PV) [FZ110/400/900]	2000	8192	1
2	Input 1_Set value (SV) monitor [FZ110/400/900]	2001	8193	2

(1) No.: Communication data number

(2) Name: Communication data name
 [FZ400/900]: FZ400/900 data compatible
 (This function is disabled on the FZ110)
 [FZ110/400/900]: FZ110/400/900 data compatible

(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 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word] (P. 6-9)** for communication data numbers.

Find the same number in the data map **6.3.1 FZ110/400/900 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) [FZ110/400/900]	MI	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 [FZ110/400/900]	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 175

Data in the Engineering mode: No. 176 to 371

 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. 6-135).

(1) No.	(2) Name		(3) Register address		(4) 6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
1	Measured value (PV)	Input 1_Measured value (PV) [FZ110/400/900]	0000	0	1
2	Current transformer 1 (CT1) input value monitor	Current transformer 1 (CT1) input value monitor [FZ110/400/900]	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 FZ110/400/900.

Relevant data of FZ110/400/900:

The data of FZ110/400/900 equivalent to the communication data of our FB series.

[FZ400/900]: FZ400/900 data compatible
(This function is disabled on the FZ110)

[FZ110/400/900]: FZ110/400/900 data compatible

(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 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word]** (P. 6-9) for communication data numbers.

Find the same number in the data map **6.3.1 FZ110/400/900 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) [FZ110/400/900]	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 [FZ110/400/900]	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 FZ110/400/900 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) [FZ110/400/900]	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 [FZ110/400/900]	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) [FZ400/900]	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 [FZ400/900]	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) [FZ400/900]	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 [FZ400/900]	L2	7	000A	000B	10	11	RO	In case of Input data type 0 –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 [FZ400/900]	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] [FZ110/400/900]	O1	7 or 6	000E	000F	14	15	RO	–5.0 to +105.0 %	—
9	Input 1_Manipulated output value monitor [cool-side] [FZ110/400/900]	O2	7 or 6	0010	0011	16	17	RO	–5.0 to +105.0 %	—
10	Input 2_Manipulated output value monitor [FZ400/900]	O0	7 or 6	0012	0013	18	19	RO	–5.0 to +105.0 %	—
11	Current transformer 1 (CT1) input value monitor [FZ110/400/900]	M3	7 or 6	0014	0015	20	21	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.	—	
	Second current transformer input value (CT2) (REX-D series equivalent) [FZ110/400/900] In case of Input data type 2									
12	Current transformer 2 (CT2) input value monitor [FZ400/900]	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 [FZ110/400/900]	TR	7	0018	0019	24	25	RO	In case of Input data type 0 • 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 • Modbus 0 to 35999 seconds * 0 to 11999 seconds 0 to 5999 minutes * Monitoring is available only on FZ400/900. [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 • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds [Data range of Memory area soak time monitor can be selected on the Soak time unit.]	—
14	Remote setting input value monitor [FZ110/400/900]	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.]	—
	Dummy data （REX-D series: For the Step set-value (SV2)） [FZ110/400/900] In case of Input data type 2			—	—	—	—	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
15	Feedback resistance (FBR) input value [FZ110/400/900]	M2	7 or 6	001C	001D	28	29	RO	0.0 to 100.0 % In case of Input data type “2,” it is “First current transformer input value (CT1)” of our REX-D equivalent parameter.	—
	First current transformer input value (CT1) (REX-D series equivalent) [FZ110/400/900] In case of Input data type 2			—	—	—	—	RO		—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
16	Event 1 state monitor [FZ110/400/900]	AA	7 or 6	001E	001F	30	31	RO	0: OFF 1: ON	—
17	Event 2 state monitor [FZ110/400/900]	AB	7 or 6	0020	0021	32	33	RO	0: OFF 1: ON	—
18	Event 3 state monitor [FZ110/400/900]	AG	7 or 6	0022	0023	34	35	RO	0: OFF 1: ON	—
19	Event 4 state monitor [FZ110/400/900]	AH	7 or 6	0024	0025	36	37	RO	0: OFF 1: ON	—
20	Heater break alarm 1 (HBA1) state monitor [FZ110/400/900]	AC	7 or 6	0026	0027	38	39	RO	0: OFF 1: ON	—
21	Heater break alarm 2 (HBA2) state monitor [FZ400/900]	AD	7 or 6	0028	0029	40	41	RO	0: OFF 1: ON	—
22	Control loop break alarm 1 (LBA1) state monitor [FZ110/400/900]	AE	7 or 6	002A	002B	42	43	RO	0: OFF 1: ON	—
23	Control loop break alarm 2 (LBA2) state monitor [FZ400/900]	AF	7 or 6	002C	002D	44	45	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			
24	Comprehensive event state [FZ110/400/900]	AJ	7 or 6	002E	002F	46	47	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.	—
25	Input 1_Burnout state monitor [FZ110/400/900]	B1	7 or 6	0030	0031	48	49	RO	0: OFF 1: ON	—
26	Input 2_Burnout state monitor [FZ400/900]	B0	7 or 6	0032	0033	50	51	RO	0: OFF 1: ON	—
27	Feedback resistance (FBR) break monitor [FZ110/400/900]	B2	7 or 6	0034	0035	52	53	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			
28	DI state monitor [FZ110/400/900]	L1	7 or 6	0036	0037	54	55	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			
29	OUT state monitor [FZ110/400/900]	Q1	7 or 6	0038	0039	56	57	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.	—
30	DO state monitor [FZ110/400/900]	Q2	7 or 6	003A	003B	58	59	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			
31	Overall operation status [FZ110/400/900]	L0	7 or 6	003C	003D	60	61	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 (Cascade control 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.	—
32	Input 1_PID memory [FZ110/400/900]	PC	7 or 6	003E	003F	62	63	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.]	—
33	Input 2_PID memory [FZ400/900]	PD	7 or 6	0040	0041	64	65	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.]	—
34	Input 1_Peak hold monitor [FZ110/400/900]	HQ	7 or 6	0042	0043	66	67	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.]	—
35	Input 1_Bottom hold monitor [FZ110/400/900]	FQ	7 or 6	0044	0045	68	69	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.]	—
36	Input 2_Peak hold monitor [FZ400/900]	HR	7 or 6	0046	0047	70	71	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			
37	Input 2_Bottom hold monitor [FZ400/900]	FR	7 or 6	0048	0049	72	73	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.]	—
38	Input 1_AT remaining time monitor [FZ110/400/900]	AN	7 or 6	004A	004B	74	75	RO	RKC communication 0 hours 00 minutes to 48 hours 00 minutes	—
									Modbus 0 to 2880 minutes	—
39	Input 2_AT remaining time monitor [FZ400/900]	AO	7 or 6	004C	004D	76	77	RO	RKC communication 0 hours 00 minutes to 48 hours 00 minutes	—
									Modbus 0 to 2880 minutes	—
40	Input 1_AT/ST status monitor [FZ110/400/900]	AP	7 or 6	004E	004F	78	79	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.	—
41	Input 2_AT/ST status monitor [FZ400/900]	AQ	7 or 6	0050	0051	80	81	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.	—
42	Error code [FZ110/400/900]	ER	7 or 6	0052	0053	82	83	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			
43	Integrated operating time [FZ110/400/900]	UT	7 or 6	0054	0055	84	85	RO	0 to 65535 hours	—
44	Peak hold monitor of ambient temperature [FZ110/400/900]	HP	7 or 6	0056	0057	86	87	RO	−120 to +120 °C	—
45	ROM version [FZ110/400/900]	VR	7 or 6	—	—	—	—	RO	Version of ROM built in the instrument	—
46	Model code monitor [FZ110/400/900]	ID	32	—	—	—	—	RO	Model code	—
47	Instrument number monitor [FZ110/400/900]	RX	10	—	—	—	—	RO	Instrument serial number	—
48	Retransmission output 1 decimal point position [FZ110/400/900]	—	—	0058	0059	88	89	RO	0: No decimal place 3: Three decimal place 1: One decimal place 4: Four decimal place 2: Two 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 Remote setting input value Input 1_Measured value (PV) Input 1_SV monitor value Input 1_Local SV 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_SV monitor value Input 2_Local SV Input 2_Deviation	—
49	Retransmission output 2 decimal point position [FZ110/400/900]	—	—	005A	005B	90	91	RO		—
50	Retransmission output 3 decimal point position [FZ110/400/900]	—	—	005C	005D	92	93	RO	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	—

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
51	Event 1 decimal point position [FZ110/400/900]	—	—	005E	005F	94	95	RO	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places 4: Four decimal places	—
52	Event 2 decimal point position [FZ110/400/900]	—	—	0060	0061	96	97	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.	—
53	Event 3 decimal point position [FZ110/400/900]	—	—	0062	0063	98	99	RO		—
54	Event 4 decimal point position [FZ110/400/900]	—	—	0064	0065	100	101	RO		When the Event type is Manipulated output value: 1 (One decimal place)
55	Interlock release [FZ110/400/900]	IL	7 or 6	0066	0067	102	103	R/W	0: Interlock release 1: Interlock state “1: Interlock state” is for monitoring the interlocked state. Do not write “1.”	0
56	Memory area transfer [FZ110/400/900]	ZA	7 or 6	0068	0069	104	105	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
57	Input 1_Hold reset [FZ110/400/900]	CQ	7 or 6	006A	006B	106	107	R/W	0: Hold 1: Reset Returns to Hold state automatically after reset.	0
58	Input 2_Hold reset [FZ400/900]	CR	7 or 6	006C	006D	108	109	R/W	0: Hold 1: Reset Returns to Hold state automatically after reset.	0
59	Bottom suppression start signal [FZ110/400/900]	S8	7 or 6	006E	006F	110	111	R/W	0 to 3 0: No forced ON +1: Input 1_Bottom suppression action Forced ON +2: Input 2_Bottom suppression action_Fforced ON	0
60	RUN/STOP transfer [FZ110/400/900]	SR	7 or 6	0070	0071	112	113	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			
61	Input 1_Autotuning (AT) [FZ110/400/900]	G1	7 or 6	0072	0073	114	115	R/W	0: PID control 1: Start Autotuning When the Autotuning (AT) is finished, the control will automatically return to “0.”	0
62	Input 2_Autotuning (AT) [FZ400/900]	G0	7 or 6	0074	0075	116	117	R/W	0: PID control 1: Start Autotuning When the Autotuning (AT) is finished, the control will automatically return to “0.”	0
63	Input 1_Startup tuning (ST) [FZ110/400/900]	ST	7 or 6	0076	0077	118	119	R/W	0: ST unused 1: Execute once * 2: Execute always * When the ST is finished, the control will automatically return to “0.”	0
64	Input 2_Startup tuning (ST) [FZ400/900]	SZ	7 or 6	0078	0079	120	121	R/W	0: ST unused 1: Execute once * 2: Execute always * When the ST is finished, the control will automatically return to “0.”	0
65	Input 1_Auto/Manual transfer [FZ110/400/900]	J1	7 or 6	007A	007B	122	123	R/W	0: Auto mode 1: Manual mode	0
66	Input 2_Auto/Manual transfer [FZ400/900]	J0	7 or 6	007C	007D	124	125	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			
67	Remote/Local transfer [FZ110/400/900]	C1	7 or 6	007E	007F	126	127	R/W	When Select function for input 2 is: “Remote setting input” [FZ400/900] 0: Local mode 1: Remote mode	0
									When Remote setting input is specified: [FZ110] 0: Local mode 1: Remote mode	
									When Select function for input 2 is: “Cascade control” [FZ400/900] 0: Single control 1: Cascade control	0
									When Select function for input 2 is: “Control with PV select” [FZ400/900] 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” [FZ400/900] 0: 2-loop control 1: Differential temperature control	0
68	Control area Local/External transfer [FZ110/400/900]	E1	7 or 6	0080	0081	128	129	R/W	0: Local mode 1: External mode	0
69	Input 1_Set value (SV) [FZ110/400/900]★	S1	7 or 6	0082	0083	130	131	R/W	Input 1_Setting limiter low to Input 1_Setting limiter high [Varies with the setting of the Decimal point position.]	0
70	Input 2_Set value (SV) [FZ400/900]★	S0	7 or 6	0084	0085	132	133	R/W	Input 2_Setting limiter low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	0
71	Set value (SV) of differential temperature input [FZ400/900]★	S3	7 or 6	0086	0087	134	135	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			
72	Event 1 set value (EV1) When Event 1 type is either high or low limit with individual setting Event 1 set value (EV1) [high] [FZ110/400/900] ★	A1	7 or 6	0088	0089	136	137	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.] ● 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 %	TC/RTD inputs: 10 V/I inputs: 5 % of input span 50.0

★ 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			
73	Event 1 set value (EV1') [low] [FZ110/400/900]★	BT	7 or 6	008A	008B	138	139	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.] ● 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.]	TC/RTD inputs: –10 V/I inputs: –5 % of input span
74	Event 2 set value (EV2) When Event 2 type is either high or low limit with individual setting Event 2 set value (EV2) [high] [FZ110/400/900]★	A2	7 or 6	008C	008D	140	141	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
75	Event 2 set value (EV2') [low] [FZ110/400/900]★	BU	7 or 6	008E	008F	142	143	R/W	Same as Event 1 set value (EV1') [low]	
76	Event 3 set value (EV3) When Event 3 type is either high or low limit with individual setting Event 3 set value (EV3) [high] [FZ110/400/900]★	A7	7 or 6	0090	0091	144	145	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			
77	Event 3 set value (EV3') [low] [FZ110/400/900] ★	BV	7 or 6	0092	0093	146	147	R/W	Same as Event 1 set value (EV1') [low]	
78	Event 4 set value (EV4) When Event 4 type is either high or low limit with individual setting Event 4 set value (EV4) [high] [FZ110/400/900] ★	A8	7 or 6	0094	0095	148	149	R/W	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
79	Event 4 set value (EV4') [low] [FZ110/400/900] ★	BW	7 or 6	0096	0097	150	151	R/W	Same as Event 1 set value (EV1') [low]	
80	Input 1_Proportional band [heat-side] [FZ110/400/900] ★	P1	7 or 6	0098	0099	152	153	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
81	Input 1_Integral time [heat-side] [FZ110/400/900] ★	I1	7 or 6	009A	009B	154	155	R/W	PID control or Heat/Cool PID control 0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action Position proportioning PID control 1 to 3600 seconds, 0.1 to 3600.0 seconds or 0.01 to 360.00 seconds [Varies with the setting of the Integral/Derivative time decimal point position.]	240
82	Input 1_Derivative time [heat-side] [FZ110/400/900] ★	D1	7 or 6	009C	009D	156	157	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	PID control or Heat/Cool PID control: 60 Position proportioning PID control: 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			
83	Input 1_Control response parameter [FZ110/400/900] ★	CA	7 or 6	009E	009F	158	159	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	PID control or Position proportioning PID control: 0 Heat/Cool PID control: 2
84	Input 1_Proactive intensity [FZ110/400/900] ★	ZP	7 or 6	00A0	00A1	160	161	R/W	0 to 4 0: No function	2
85	Input 1_Manual reset [FZ110/400/900] ★	MR	7 or 6	00A2	00A3	162	163	R/W	−100.0 to +100.0 %	0.0
86	Input 1_FF amount [FZ110/400/900] ★	F3	7 or 6	00A4	00A5	164	165	R/W	−100.0 to +100.0 %	0.0
87	Input 1_Output limiter high [heat-side] [FZ110/400/900] ★	OH	7 or 6	00A6	00A7	166	167	R/W	Input 1_Output limiter low [heat-side] to 105.0 %	105.0
88	Input 1_Output limiter low [heat-side] [FZ110/400/900] ★	OX	7 or 6	00A8	00A9	168	169	R/W	−5.0 % to Input 1_Output limiter high [heat-side]	−5.0
89	Input 1_Control loop break alarm (LBA) time [FZ110/400/900] ★	A5	7 or 6	00AA	00AB	170	171	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0
90	Input 1_LBA deadband (LBD) [FZ110/400/900] ★	V3	7 or 6	00AC	00AD	172	173	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
		A6								
91	Input 2_Proportional band [FZ400/900] ★	P0	7 or 6	00AE	00AF	174	175	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			
92	Input 2_Integral time [FZ400/900] ★	I0	7 or 6	00B0	00B1	176	177	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240
93	Input 2_Derivative time [FZ400/900] ★	D3	7 or 6	00B2	00B3	178	179	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60
94	Input 2_Control response parameter [FZ400/900] ★	C8	7 or 6	00B4	00B5	180	181	R/W	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	0
95	Input 2_Proactive intensity [FZ400/900] ★	ZQ	7 or 6	00B6	00B7	182	183	R/W	0 to 4 0: No function	2
96	Input 2_Manual reset [FZ400/900] ★	MQ	7 or 6	00B8	00B9	184	185	R/W	−100.0 to +100.0 %	0.0
97	Input 2_FF amount [FZ400/900] ★	F4	7 or 6	00BA	00BB	186	187	R/W	−100.0 to +100.0 %	0.0
98	Input 2_Output limiter high [FZ400/900] ★	OO	7 or 6	00BC	00BD	188	189	R/W	Input 2_Output limiter low to 105.0 %	105.0
99	Input 2_Output limiter low [FZ400/900] ★	OS	7 or 6	00BE	00BF	190	191	R/W	−5.0 % to Input 2_Output limiter high	−5.0
100	Input 2_Control loop break alarm (LBA) time [FZ400/900] ★	A9	7 or 6	00C0	00C1	192	193	R/W	0 to 7200 seconds 0: No function	LBA function is specified: 480 LBA function is not specified: 0
101	Input 2_LBA deadband (LBD) [FZ400/900] ★	V4	7 or 6	00C2	00C3	194	195	R/W	0 to Input 2_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			
102	Input 1_Proportional band [cool-side] [FZ110/400/900] ★	P2	7 or 6	00C4	00C5	196	197	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
103	Input 1_Integral time [cool-side] [FZ110/400/900] ★	I2	7 or 6	00C6	00C7	198	199	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240
104	Input 1_Derivative time [cool-side] [FZ110/400/900] ★	D2	7 or 6	00C8	00C9	200	201	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60
105	Input 1_Overlap/Deadband [FZ110/400/900] ★	V1	7 or 6	00CA	00CB	202	203	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
106	Input 1_Output limiter high [cool-side] [FZ110/400/900] ★	OL	7 or 6	00CC	00CD	204	205	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] [FZ110/400/900] ★								PID control or Position proportioning PID control –5.0 % to Input 1_Output limiter high [heat-side] Same data as RKC communication identifier OX	–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			
107	Input 1_Output limiter low [cool-side] [FZ110/400/900]★	OY	7 or 6	00CE	00CF	206	207	R/W	−5.0 % to Input 1_Output limiter high [cool-side]	−5.0
108	Select Trigger type for Memory area transfer [FZ110/400/900]★	EY	7 or 6	00D0	00D1	208	209	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
109	Area soak time [FZ110/400/900]★	TM	7	00D2	00D3	210	211	R/W	In case of Input data type 0 • 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 • Modbus 0 to 35999 seconds * 0 to 11999 seconds 0 to 5999 minutes * Settable only for FZ400/900 [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0 minutes 00 seconds) Modbus: 0 (0 seconds)
			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 • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0 minutes 00 seconds) Modbus: 0 (0 seconds)
110	Link area number [FZ110/400/900]★	LP	7 or 6	00D4	00D5	212	213	R/W	0 to 16 0: No function	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_Setting change rate limiter (up) [FZ110/400/900]★	HH	7 or 6	00D6	00D7	214	215	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
112	Input 1_Setting change rate limiter (down) [FZ110/400/900]★	HL	7 or 6	00D8	00D9	216	217	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
113	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]★	J2	7 or 6	00DA	00DB	218	219	R/W	0: No transfer 1: Auto mode (bumpless) 2: Auto mode (bump) 3: Manual mode (bumpless) 4: Manual mode (bump)	0
114	Input 1_Manipulated output value (Area) [FZ110/400/900]★	O8	7 or 6	00DC	00DD	220	221	R/W	PID control, Position proportioning PID control –5.0 to +105.0 % Heat/Cool PID control –105.0 to +105.0 %	PID control, Position proportioning PID control: –5.0 Heat/Cool PID control: 0.0
115	Input 2_Setting change rate limiter (up) [FZ400/900]★	HX	7 or 6	00DE	00DF	222	223	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0
116	Input 2_Setting change rate limiter (down) [FZ400/900]★	HY	7 or 6	00E0	00E1	224	225	R/W	0 to Input 2_Input span 0: No function [Varies with the setting of the Decimal point position.]	0
117	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]★	J3	7 or 6	00E2	00E3	226	227	R/W	0: No transfer 1: Auto mode (bumpless) 2: Auto mode (bump) 3: Manual mode (bumpless) 4: Manual mode (bump)	0
118	Input 2_Manipulated output value (Area) [FZ400/900]★	O9	7 or 6	00E4	00E5	228	229	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			
119	Remote/Local transfer selection (Area) [FZ110/400/900] ★	C2	7 or 6	00E6	00E7	230	231	R/W	When Select function for input 2 is: “Remote setting input” [FZ400/900] 0: No transfer 1: Local mode 2: Remote mode ----- When Remote setting input is specified: [FZ110] 0: No transfer 1: Local mode 2: Remote mode ----- When Select function for input 2 is: “Cascade control” [FZ400/900] 0: No transfer 1: Single control 2: Cascade control ----- When Select function for input 2 is: “Control with PV select” [FZ400/900] 0: No transfer 1: Input 1 2: Input 2 ----- When Select function for input 2 is: “2-loop control/Differential temperature control” [FZ400/900] 0: No transfer 1: 2-loop control 2: Differential temperature control	0
120	Display update cycle [FZ110/400/900]	HE	7 or 6	00E8	00E9	232	233	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

★ 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			
121	Input 1_PV bias [FZ110/400/900]	PB	7 or 6	00EA	00EB	234	235	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
122	Input 1_PV digital filter [FZ110/400/900]	F1	7 or 6	00EC	00ED	236	237	R/W	0.0 to 100.0 seconds 0.0: Filter OFF	0.0
123	Input 1_PV ratio [FZ110/400/900]	PR	7 or 6	00EE	00EF	238	239	R/W	0.500 to 1.500	1.000
124	Input 1_PV low input cut-off [FZ110/400/900]	DP	7 or 6	00F0	00F1	240	241	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
125	Input 2_PV bias (RS bias) [FZ110/400/900]	RB	7 or 6	00F2	00F3	242	243	R/W	– (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.] In the case of FZ400/900, RS bias is selected by selecting “Remote setting input” at Select function for input 2. In the case of FZ110, RS bias is selected by selecting “Remote setting input.”	0
126	Input 2_PV digital filter (RS digital filter) [FZ110/400/900]	F2	7 or 6	00F4	00F5	244	245	R/W	0.0 to 100.0 seconds 0.0: Filter OFF In the case of FZ400/900, RS digital filter is selected by selecting “Remote setting input” at Select function for input 2. In the case of FZ110, RS digital filter is selected by selecting “Remote setting input.”	0.0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
127	Input 2_PV ratio (RS ratio) [FZ110/400/900]	RR	7 or 6	00F6	00F7	246	247	R/W	Input 2_PV ratio 0.500 to 1.500 RS ratio 0.001 to 9.999 In the case of FZ400/900, RS ratio is selected by selecting “Remote setting input” at Select function for input 2. In the case of FZ110, RS ratio is selected by selecting “Remote setting input.”	1.000
128	Input 2_PV low input cut-off [FZ400/900]	DS	7 or 6	00F8	00F9	248	249	R/W	0.00 to 25.00 % of Input 2_Input span	0.00
129	OUT1 proportional cycle time [FZ110/400/900]	T0	7 or 6	00FA	00FB	250	251	R/W	0.1 to 100.0 seconds	Relay contact output: 20.0 Voltage pulse output, Transistor output: Note1
130	OUT2 proportional cycle time [FZ110/400/900]	T1	7 or 6	00FC	00FD	252	253	R/W	0.1 to 100.0 seconds	Relay contact output: 20.0 Voltage pulse output, Transistor output: Note2
131	OUT3 proportional cycle time [FZ110/400/900]	T2	7 or 6	00FE	00FF	254	255	R/W	0.1 to 100.0 seconds	Voltage pulse output: Note3

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			
132	OUT1 minimum ON/OFF time of proportional cycle [FZ110/400/900]	OP	7 or 6	0100	0101	256	257	R/W	0 to 1000 ms	0
133	OUT2 minimum ON/OFF time of proportional cycle [FZ110/400/900]	OQ	7 or 6	0102	0103	258	259	R/W	0 to 1000 ms	0
134	OUT3 minimum ON/OFF time of proportional cycle [FZ110/400/900]	OR	7 or 6	0104	0105	260	261	R/W	0 to 1000 ms	0
135	Heater break alarm 1 (HBA1) set value [FZ110/400/900]	A3	7 or 6	0106	0107	262	263	R/W	0.0 to 100.0 A 0.0: HBA function OFF	0.0
136	Number of heater break alarm 1 (HBA1) delay times [FZ110/400/900]	TH	7 or 6	0108	0109	264	265	R/W	0 to 255 times	5
137	Heater break alarm 2 (HBA2) set value [FZ400/900]	A4	7 or 6	010A	010B	266	267	R/W	0.0 to 100.0 A 0.0: HBA function OFF	0.0
138	Number of heater break alarm 2 (HBA2) delay times [FZ400/900]	TI	7 or 6	010C	010D	268	269	R/W	0 to 255 times	5
139	Input 1_Manual manipulated output value [FZ110/400/900]	ON	7 or 6	010E	010F	270	271	R/W	PID control, Position proportioning 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, Position proportioning 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 $\leq 0.0\%$
 - Input 1_Output limiter low [heat-side] is $\leq 0.0\%$: 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 $\leq 0.0\%$
 - Input 1_Output limiter low [cool-side] is $\leq 0.0\%$: –(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] $\leq 0.0\%$, and Input 1_Output limiter high [heat-side] $\leq 0.0\%$

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
140	Input 1_Level PID setting 1 * [FZ110/400/900]	Q4	7 or 6	0110	0111	272	273	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 〕
141	Input 1_Level PID setting 2 * [FZ110/400/900]	Q5	7 or 6	0112	0113	274	275	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_ Level PID setting 1
142	Input 1_Level PID setting 3 * [FZ110/400/900]	Q6	7 or 6	0114	0115	276	277	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1
143	Input 1_Level PID setting 4 * [FZ110/400/900]	Q7	7 or 6	0116	0117	278	279	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1
144	Input 1_Level PID setting 5 * [FZ110/400/900]	Q8	7 or 6	0118	0119	280	281	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1
145	Input 1_Level PID setting 6 * [FZ110/400/900]	Q9	7 or 6	011A	011B	282	283	R/W	Same as Input 1_Level PID setting 1	Same as Input 1_Level PID setting 1
146	Input 1_Level PID setting 7 * [FZ110/400/900]	QA	7 or 6	011C	011D	284	285	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			
147	Input 1_ON/OFF action differential gap [FZ110/400/900]	MH	7 or 6	011E	011F	286	287	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
148	Input 1_ON/OFF action differential gap (upper) [FZ110/400/900]	IV	7 or 6	0120	0121	288	289	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
149	Input 1_ON/OFF action differential gap (lower) [FZ110/400/900]	IW	7 or 6	0122	0123	290	291	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
150	Input 2_Manual manipulated output value [FZ400/900]	OM	7 or 6	0124	0125	292	293	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			
151	Input 2_Level PID setting 1 * [FZ400/900]	QB	7 or 6	0126	0127	294	295	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
152	Input 2_Level PID setting 2 * [FZ400/900]	QC	7 or 6	0128	0129	296	297	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
153	Input 2_Level PID setting 3 * [FZ400/900]	QD	7 or 6	012A	012B	298	299	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
154	Input 2_Level PID setting 4 * [FZ400/900]	QE	7 or 6	012C	012D	300	301	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
155	Input 2_Level PID setting 5 * [FZ400/900]	QF	7 or 6	012E	012F	302	303	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
156	Input 2_Level PID setting 6 * [FZ400/900]	QG	7 or 6	0130	0131	304	305	R/W	Same as Input 2_Level PID setting 1	Same as Input 2_Level PID setting 1
157	Input 2_Level PID setting 7 * [FZ400/900]	QH	7 or 6	0132	0133	306	307	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			
158	Input 2_ON/OFF action differential gap [FZ400/900]	MG	7 or 6	0134	0135	308	309	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
159	Input 2_ON/OFF action differential gap (upper) [FZ400/900]	IX	7 or 6	0136	0137	310	311	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
160	Input 2_ON/OFF action differential gap (lower) [FZ400/900]	IY	7 or 6	0138	0139	312	313	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
161	Input 1_AT bias [FZ110/400/900]	GB	7 or 6	013A	013B	314	315	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
162	Input 2_AT bias [FZ400/900]	GA	7 or 6	013C	013D	316	317	R/W	– (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.]	0
163	Open/Close output neutral zone [FZ110/400/900]	V2	7 or 6	013E	013F	318	319	R/W	0.1 to 10.0 % of output	2.0
164	Open/Close output differential gap [FZ110/400/900]	VH	7 or 6	0140	0141	320	321	R/W	0.1 to 5.0 % of output	1.0
165	FF amount learning [FZ110/400/900]	G7	7 or 6	0142	0143	322	323	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			
166	Input 1_Determination point of external disturbance [FZ110/400/900]	G8	7 or 6	0144	0145	324	325	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
167	Input 2_Determination point of external disturbance [FZ400/900]	G9	7 or 6	0146	0147	326	327	R/W	– (Input 2_Input span) to + (Input 2_Input span) [Varies with the setting of the Decimal point position.]	–1
168	Cascade_Proportional band (master-side) [FZ400/900]	MP	7 or 6	0148	0149	328	329	R/W	TC/RTD inputs 1 (0.1, 0.01) to Input 1_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.1 to 1000.0 % of Input 1_Input span	TC/RTD inputs: 30 V/I inputs: 3.0
169	Cascade_Integral time (master-side) [FZ400/900]	MI	7 or 6	014A	014B	330	331	R/W	1 to 3600 seconds, 0.1 to 3600.0 seconds or 0.01 to 360.00 seconds [Varies with the setting of the Integral/Derivative time decimal point position.]	240
170	Cascade_Derivative time (master-side) [FZ400/900]	MD	7 or 6	014C	014D	332	333	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60
171	Cascade_Proportional band (slave-side) [FZ400/900]	SP	7 or 6	014E	014F	334	335	R/W	TC/RTD inputs: 1 (0.1, 0.01) to Input 2_Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.1 to 1000.0 % of Input 2_Input span	TC/RTD inputs: 30 V/I inputs: 3.0
172	Cascade_Integral time (slave-side) [FZ400/900]	SI	7 or 6	0150	0151	336	337	R/W	1 to 3600 seconds, 0.1 to 3600.0 seconds or 0.01 to 360.00 seconds [Varies with the setting of the Integral/Derivative time decimal point position.]	240
173	Cascade_Derivative time (slave-side) [FZ400/900]	SD	7 or 6	0152	0153	338	339	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60
174	Cascade_Digital filter [FZ400/900]	RD	7 or 6	0154	0155	340	341	R/W	0.0 to 100.0 seconds 0.0: Filter OFF	10.0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
175	Cascade_Scale high [FZ400/900]	RN	7 or 6	0156	0157	342	343	R/W	Cascade_Scale low to Input 2_Setting limiter high [Varies with the setting of the Decimal point position.]	Input 2_ Setting limiter high
176	Cascade_Scale low [FZ400/900]	RO	7 or 6	0158	0159	344	345	R/W	Input 2_Setting limiter low to Cascade_Scale high [Varies with the setting of the Decimal point position.]	Input 2_ Setting limiter low
177	PV select transfer level [FZ400/900]	L8	7 or 6	015A	015B	346	347	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
178	PV select transfer time [FZ400/900]	L9	7 or 6	015C	015D	348	349	R/W	0.0 to 100.0 seconds	0.0

Items 180 to 375 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			
180	STOP display selection [FZ110/400/900]	DX	7 or 6	015E	015F	350	351	R/W	0: Stop on PV display 1: Stop on SV display 2: Stop on MV display FZ400/900: 0 to 2 FZ110: 0 to 1	1
181	ALM lamp lighting condition [FZ110/400/900]	LY	7 or 6	0160	0161	352	353	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			
182	PV flashing display at input error [FZ110/400/900]	DU	7 or 6	0162	0163	354	355	R/W	0: Flashing display 1: Non-flashing display	0
183	Show/Hide Input 1_SV [FZ110/400/900]	H8	7 or 6	0164	0165	356	357	R/W	0: Hide Input 1_SV 1: Show Input 1_SV	1
184	Show/Hide Input 2_SV [FZ400/900]	HN	7 or 6	0166	0167	358	359	R/W	0: Hide Input 2_SV 1: Show Input 2_SV	1
185	Show/Hide Input 1_MV [FZ400/900]	H9	7 or 6	0168	0169	360	361	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
186	Show/Hide Input 2_MV [FZ400/900]	HO	7 or 6	016A	016B	362	363	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
187	Select hide items in Monitor mode [FZ110/400/900]	LN	7 or 6	016C	016D	364	365	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			
188	Select hide items in Operation transfer mode [FZ110/400/900]	LM	7 or 6	016E	016F	366	367	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 (Cascade mode 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
189	Data registration [FZ110/400/900]	KN	7 or 6	0170	0171	368	369	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
190	FUNC key assignment [FZ400/900]	FK	7 or 6	0172	0173	370	371	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 (Cascade mode 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			
191	FUNC key operation selection [FZ400/900]	FL	7 or 6	0174	0175	372	373	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
192	Input 1_Input type [FZ110/400/900]	XI	7 or 6	0176	0177	374	375	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.
193	Input 1_Display unit [FZ110/400/900]	PU	7 or 6	0178	0179	376	377	R/W	0: °C 1: °F	Same as the display unit of the input range code specified at the time of order.
194	Input 1_Decimal point position [FZ110/400/900]	XU	7 or 6	017A	017B	378	379	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: 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			
195	Input 1_Input range high [FZ110/400/900]	XV	7 or 6	017C	017D	380	381	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
196	Input 1_Input range low [FZ110/400/900]	XW	7 or 6	017E	017F	382	383	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
197	Input 1_Input error determination point (high) [FZ110/400/900]	AV	7 or 6	0180	0181	384	385	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)
198	Input 1_Input error determination point (low) [FZ110/400/900]	AW	7 or 6	0182	0183	386	387	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)
199	Input 1_Temperature compensation calculation [FZ110/400/900]	R0	7 or 6	0184	0185	388	389	R/W	0: No temperature compensation calculation 1: With temperature compensation calculation	1
200	Input 1_Burnout direction [FZ110/400/900]	BS	7 or 6	0186	0187	390	391	R/W	0: Upscale 1: Downscale	0
201	Input 1_Square root extraction [FZ110/400/900]	XH	7 or 6	0188	0189	392	393	R/W	0: Unused 1: Used	0
202	Input 1_Inverting input [FZ110/400/900]	IB	7 or 6	018A	018B	394	395	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			
203	Input data type [FZ110/400/900]	SE	7 or 6	018C	018D	396	397	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: Number of measured value digits: 4 Number of RKC communication data digits: 6 Our REX-D equivalent (Some identifiers are replaced with the REX-D equivalent identifiers) Modbus data: Single word * * Including our FB series equivalent data Select “2” only when you need to handle REX-D equivalent data in RKC communication. When changing the Input data type from 0 to 1 (or 2) 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 FZ400/900: hour/minute/second, hour/minute, minute/second FZ110: hour/minute, minute/second In case of Input data type 1 hour/minute, minute/second The time unit is selectable at Soak time unit (RKC communication: RU, Modbus: 02B0H to 02B1H)	Depends on 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				
204	Input 2_Input type [FZ110/400/900]	XR	7 or 6	018E	018F	398	399	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 • When Measured Input 2 is selected for FZ400/900: 0 to 24 • When Remote setting input is selected for FZ400/900: 15 to 24 • When Remote setting input is selected for FZ110: 15 to 22	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 Input 1_Input type When Remote setting input is specified at the time of order, but the input type is not specified: 17
	Dummy data (REX-D series: Current transformer type selection) [FZ110/400/900] In case of Input data type 2			—	—	—	—	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			
205	Input 2_Display unit [FZ400/900]	PT	7 or 6	0190	0191	400	401	R/W	0: °C 1: °F	Same as Input 1_Display unit
206	Input 2_Decimal point position [FZ400/900]	XZ	7 or 6	0192	0193	402	403	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: 0 to 4 In case of Input data type 1: 0 to 3	Same as Input 1_Decimal point position
207	Input 2_Input range high [FZ110/400/900]	XX	7 or 6	0194	0195	404	405	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
208	Input 2_Input range low [FZ110/400/900]	XY	7 or 6	0196	0197	406	407	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
209	Input 2_Input error determination point (high) [FZ400/900]	AX	7 or 6	0198	0199	408	409	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)
210	Input 2_Input error determination point (low) [FZ400/900]	AY	7 or 6	019A	019B	410	411	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)

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
211	Input 2_Temperature compensation calculation [FZ400/900]	R1	7 or 6	019C	019D	412	413	R/W	0: No temperature compensation calculation 1: With temperature compensation calculation	1
212	Input 2_Burnout direction [FZ400/900]	BR	7 or 6	019E	019F	414	415	R/W	0: Upscale 1: Downscale	0
213	Input 2_Square root extraction [FZ400/900]	XG	7 or 6	01A0	01A1	416	417	R/W	0: Unused 1: Used	0
214	Input 2_Inverting input [FZ400/900]	IC	7 or 6	01A2	01A3	418	419	R/W	0: Unused 1: Used	0
215	DI1 function selection [FZ110/400/900]	H2	7 or 6	01A4	01A5	420	421	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 (Cascade mode 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			
216	DI2 function selection [FZ110/400/900]	H3	7 or 6	01A6	01A7	422	423	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
217	DI3 function selection [FZ110/400/900]	H4	7 or 6	01A8	01A9	424	425	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
218	DI4 function selection [FZ400/900]	H5	7 or 6	01AA	01AB	426	427	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
219	DI5 function selection [FZ400/900]	H6	7 or 6	01AC	01AD	428	429	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
220	DI6 function selection [FZ400/900]	H7	7 or 6	01AE	01AF	430	431	R/W	0 to 14 Same as DI1 function selection (0 to 14)	Based on Model code
221	DI logic invert [FZ110/400/900]	D0	7 or 6	01B0	01B1	432	433	R/W	0 to 31 0: No logic invert +1: RUN/STOP transfer +2: Auto/Manual transfer +4: Remote/Local transfer (Cascade mode 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
222	Area switching time (Without area set signal) [FZ110/400/900]	LJ	7 or 6	01B2	01B3	434	435	R/W	1 to 5 seconds	2

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
223	OUT1 function selection [FZ110/400/900]	E0	7 or 6	01B4	01B5	436	437	R/W	0: No assignment 1: Input 1_Control output [heat-side] or [open-side] 2: Input 1_Control output [cool-side] or [close-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 (Cascade control 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
224	OUT2 function selection [FZ110/400/900]	E2	7 or 6	01B6	01B7	438	439	R/W	Same as OUT1 function selection	Based on Model code
225	OUT3 function selection [FZ110/400/900]	E3	7 or 6	01B8	01B9	440	441	R/W	Same as OUT1 function selection	4

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
226	OUT1 logic calculation selection [FZ110/400/900]	W0	7 or 6	01BA	01BB	442	443	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
227	OUT2 logic calculation selection [FZ110/400/900]	W2	7 or 6	01BC	01BD	444	445	R/W	Same as OUT1 logic calculation selection	Based on Model code
228	OUT3 logic calculation selection [FZ110/400/900]	W3	7 or 6	01BE	01BF	446	447	R/W	Same as OUT1 logic calculation selection	4
229	Energized/De-energized selection [FZ110/400/900]	NA	7 or 6	01C0	01C1	448	449	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

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
230	Interlock selection [FZ110/400/900]	LF	7 or 6	01C2	01C3	450	451	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
231	Output action at control stop [FZ110/400/900]	SS	7 or 6	01C4	01C5	452	453	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
232	Universal output type selection (OUT3) [FZ110/400/900]	XO	7 or 6	01C6	01C7	454	455	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			
233	Retransmission output 1 type [FZ110/400/900]	LA	7 or 6	01C8	01C9	456	457	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			
234	Retransmission output 1 scale high [FZ110/400/900]	HV	7 or 6	01CA	01CB	458	459	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			
235	Retransmission output 1 scale low [FZ110/400/900]	HW	7 or 6	01CC	01CD	460	461	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 (When 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
236	Retransmission output 2 type [FZ110/400/900]	LB	7 or 6	01CE	01CF	462	463	R/W	Same as Retransmission output 1 type	0
237	Retransmission output 2 scale high [FZ110/400/900]	CV	7 or 6	01D0	01D1	464	465	R/W	Same as Retransmission output 1 scale high	
238	Retransmission output 2 scale low [FZ110/400/900]	CW	7 or 6	01D2	01D3	466	467	R/W	Same as Retransmission output 1 scale low	
239	Retransmission output 3 type [FZ110/400/900]	LC	7 or 6	01D4	01D5	468	469	R/W	Same as Retransmission output 1 type	1

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
240	Retransmission output 3 scale high [FZ110/400/900]	EV	7 or 6	01D6	01D7	470	471	R/W	Same as Retransmission output 1 scale high	
241	Retransmission output 3 scale low [FZ110/400/900]	EW	7 or 6	01D8	01D9	472	473	R/W	Same as Retransmission output 1 scale low	
242	DO1 function selection [FZ110/400/900]	E4	7 or 6	01DA	01DB	474	475	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 (Cascade control 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
243	DO2 function selection [FZ110/400/900]	E5	7 or 6	01DC	01DD	476	477	R/W	Same as DO1 function selection	Based on Model code
244	DO3 function selection [FZ400/900]	E6	7 or 6	01DE	01DF	478	479	R/W	Same as DO1 function selection	Based on Model code
245	DO4 function selection [FZ400/900]	E7	7 or 6	01E0	01E1	480	481	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			
246	DO1 logic calculation selection [FZ110/400/900]	W4	7 or 6	01E2	01E3	482	483	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
247	DO2 logic calculation selection [FZ110/400/900]	W5	7 or 6	01E4	01E5	484	485	R/W	Same as DO1 logic calculation selection	Based on Model code
248	DO3 logic calculation selection [FZ400/900]	W6	7 or 6	01E6	01E7	486	487	R/W	Same as DO1 logic calculation selection	Based on Model code
249	DO4 logic calculation selection [FZ400/900]	W7	7 or 6	01E8	01E9	488	489	R/W	Same as DO1 logic calculation selection	Based on Model code
250	Event 1 assignment [FZ400/900]	FA	7 or 6	01EA	01EB	490	491	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			
251	Event 1 type [FZ110/400/900]	XA	7 or 6	01EC	01ED	492	493	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, c} 20: MV low [heat-side] ^{b, c} 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. ^c When the instrument is specified as position proportioning PID control with feedback resistance, this item becomes Feedback resistance (FBR) input.	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
252	Event 1 hold action [FZ110/400/900]	WA	7 or 6	01EE	01EF	494	495	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			
253	Event 1 differential gap [FZ110/400/900]	HA	7 or 6	01F0	01F1	496	497	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
254	Event 1 timer [FZ110/400/900]	TD	7 or 6	01F2	01F3	498	499	R/W	0.0 to 600.0 seconds	0.0
255	Event 2 assignment [FZ400/900]	FB	7 or 6	01F4	01F5	500	501	R/W	Same as Event 1 assignment	
256	Event 2 type [FZ110/400/900]	XB	7 or 6	01F6	01F7	502	503	R/W	Same as Event 1 type	
257	Event 2 hold action [FZ110/400/900]	WB	7 or 6	01F8	01F9	504	505	R/W	Same as Event 1 hold action	
258	Event 2 differential gap [FZ110/400/900]	HB	7 or 6	01FA	01FB	506	507	R/W	Same as Event 1 differential gap	
259	Event 2 timer [FZ110/400/900]	TG	7 or 6	01FC	01FD	508	509	R/W	Same as Event 1 timer	
260	Event 3 assignment [FZ400/900]	FC	7 or 6	01FE	01FF	510	511	R/W	Same as Event 1 assignment	
261	Event 3 type [FZ110/400/900]	XC	7 or 6	0200	0201	512	513	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			
262	Event 3 hold action [FZ110/400/900]	WC	7 or 6	0202	0203	514	515	R/W	Same as Event 1 hold action	
263	Event 3 differential gap [FZ110/400/900]	HC	7 or 6	0204	0205	516	517	R/W	Same as Event 1 differential gap	
264	Event 3 timer [FZ110/400/900]	TE	7 or 6	0206	0207	518	519	R/W	Same as Event 1 timer	
265	Event 4 assignment [FZ400/900]	FD	7 or 6	0208	0209	520	521	R/W	Same as Event 1 assignment	
266	Event 4 type [FZ110/400/900]	XD	7 or 6	020A	020B	522	523	R/W	Same as Event 1 type	
267	Event 4 hold action [FZ110/400/900]	WD	7 or 6	020C	020D	524	525	R/W	Same as Event 1 hold action	
268	Event 4 differential gap [FZ110/400/900]	HD	7 or 6	020E	020F	526	527	R/W	Same as Event 1 differential gap	
269	Event 4 timer [FZ110/400/900]	TF	7 or 6	0210	0211	528	529	R/W	Same as Event 1 timer	
270	CT1 assignment [FZ110/400/900]	ZF	7 or 6	0212	0213	530	531	R/W	0: None 1: OUT1 2: OUT2 3: OUT3	1
271	CT1 type [FZ110/400/900]	YE	7 or 6	0214	0215	532	533	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			
272	CT1 ratio [FZ110/400/900]	XS	7 or 6	0216	0217	534	535	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
273	CT1 low input cut-off [FZ110/400/900]	M5	7 or 6	0218	0219	536	537	R/W	0.0 to 1.0 A	0.0
274	CT2 assignment [FZ400/900]	ZG	7 or 6	021A	021B	538	539	R/W	0: None 1: OUT1 2: OUT2 3: OUT3	Based on Model code
275	CT2 type [FZ400/900]	YF	7 or 6	021C	021D	540	541	R/W	0: CTL-6-P-N 1: CTL-12-S56-10L-N 2: CTL-6-P-Z	Based on Model code
276	CT2 ratio [FZ400/900]	XT	7 or 6	021E	021F	542	543	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
277	CT2 low input cut-off [FZ400/900]	M7	7 or 6	0220	0221	544	545	R/W	0.0 to 1.0 A	0.0
278	Hot/Cold start [FZ110/400/900]	XN	7 or 6	0222	0223	546	547	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			
279	Manual manipulated output value selection [FZ110/400/900]	OT	7 or 6	0224	0225	548	549	R/W	0: The last manipulated output value (Balanceless-bumpless function) 1: Manual manipulated output value	0
280	SV tracking [FZ110/400/900]	XL	7 or 6	0226	0227	550	551	R/W	0 to 3 0: No SV tracking function +1: SV tracking at transferring Remote/Local * * Including Cascade mode transfer, 2-loop control/Differential temperature control transfer +2: SV tracking at transferring Auto/Manual To select two or more functions, sum each value.	1
281	Integral/Derivative time decimal point position [FZ110/400/900]	PK	7 or 6	0228	0229	552	553	R/W	0: No decimal place 1: One decimal place 2: Two decimal places	0
282	ST start condition [FZ110/400/900]	SU	7 or 6	022A	022B	554	555	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
283	Input 1_Control action [FZ110/400/900]	XE	7 or 6	022C	022D	556	557	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] 5: Brilliant II Position proportioning PID control (reverse action) 6: Brilliant II Position proportioning PID control (direct action) For cascade control, only 0 or 1 is selectable.	Control action specified at the time of order.
284	Input 1_Output change rate limiter (up) [heat-side] [FZ110/400/900]	PH	7 or 6	022E	022F	558	559	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
285	Input 1_Output change rate limiter (down) [heat-side] [FZ110/400/900]	PL	7 or 6	0230	0231	560	561	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			
286	Input 1_Action (high) input error [FZ110/400/900]	WH	7 or 6	0232	0233	562	563	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
287	Input 1_Action (low) input error [FZ110/400/900]	WL	7 or 6	0234	0235	564	565	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
288	Input 1_Manipulated output value at input error [FZ110/400/900]	OE	7 or 6	0236	0237	566	567	R/W	PID control, Position proportioning PID control –5.0 to +105.0 % Heat/Cool PID control –105.0 to +105.0 %	PID control, Position proportioning PID control: –5.0 Heat/Cool PID control: 0.0
289	Input 1_Manipulated output value at STOP [heat-side] [FZ110/400/900]	OF	7 or 6	0238	0239	568	569	R/W	–5.0 to +105.0 %	–5.0
290	Input 1_Start determination point [FZ110/400/900]	SX	7 or 6	023A	023B	570	571	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
291	Input 1_Level PID action selection [FZ110/400/900]	PP	7 or 6	023C	023D	572	573	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			
292	Input 1_Level PID differential gap [FZ110/400/900]	L5	7 or 6	023E	023F	574	575	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
293	Input 2_Control action [FZ400/900]	XF	7 or 6	0240	0241	576	577	R/W	0: Brilliant II PID control (direct action) 1: Brilliant II PID control (reverse action)	Same as Input 1_ Control action
294	Input 2_Output change rate limiter (up) [FZ400/900]	PX	7 or 6	0242	0243	578	579	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: No function	0.0
295	Input 2_Output change rate limiter (down) [FZ400/900]	PY	7 or 6	0244	0245	580	581	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: No function	0.0
296	Input 2_Action (high) input error [FZ400/900]	WX	7 or 6	0246	0247	582	583	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
297	Input 2_Action (low) input error [FZ400/900]	WY	7 or 6	0248	0249	584	585	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
298	Input 2_Manipulated output value at input error [FZ400/900]	PE	7 or 6	024A	024B	586	587	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			
299	Input 2_Manipulated output value at STOP [FZ400/900]	OJ	7 or 6	024C	024D	588	589	R/W	−5.0 to +105.0 %	−5.0
300	Input 2_Start determination point [FZ400/900]	SW	7 or 6	024E	024F	590	591	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
301	Input 2_Level PID action selection [FZ400/900]	PO	7 or 6	0250	0251	592	593	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
302	Input 2_Level PID differential gap [FZ400/900]	L6	7 or 6	0252	0253	594	595	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
303	Action at feedback resistance (FBR) input error [FZ110/400/900]	SY	7 or 6	0254	0255	596	597	R/W	0: Action depending on the value action at STOP 1: Control action continued	0
304	Feedback adjustment [FZ400/900]	FV	7 or 6	0256	0257	598	599	R/W	0: Adjustment end 1: During adjustment on the open-side 2: During adjustment on the close-side 3: Adjustment error	0
305	Control motor time [FZ110/400/900]	TN	7 or 6	0258	0259	600	601	R/W	5 to 1000 seconds	10
306	Integrated output limiter [FZ110/400/900]	OK	7 or 6	025A	025B	602	603	R/W	0.0 to 200.0 % of control motor time 0.0: No function	150.0
307	Valve action at STOP [FZ110/400/900]	VS	7 or 6	025C	025D	604	605	R/W	0: Close-side output OFF, Open-side output OFF 1: Close-side output ON, Open-side output OFF 2: Close-side output OFF, Open-side output ON	0
308	Action at saturated output [FZ400/900]	UZ	7 or 6	025E	025F	606	607	R/W	0: Invalid (The close-side [or open-side] output turns to OFF when the valve position is fully closed [or opened]). 1: Valid (The close-side [or open-side] output remains ON state when the valve position is fully closed [or opened]).	0
309	Input 1_Output change rate limiter (up) [cool-side] [FZ110/400/900]	PM	7 or 6	0260	0261	608	609	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			
310	Input 1_ Output change rate limiter (down) [cool-side] [FZ110/400/900]	PN	7 or 6	0262	0263	610	611	R/W	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
311	Input 1_ Manipulated output value at STOP [cool-side] [FZ110/400/900]	OG	7 or 6	0264	0265	612	613	R/W	−5.0 to +105.0 %	−5.0
312	Undershoot suppression factor [FZ110/400/900]	KB	7 or 6	0266	0267	614	615	R/W	0.000 to 1.000	Water cooling: 0.100 Air cooling: 0.250 Cooling linear: 1.000
313	Overlap/Deadband reference point [FZ110/400/900]	UY	7 or 6	0268	0269	616	617	R/W	0.0 to 1.0	0.0
314	Bottom suppression function [FZ110/400/900]	G6	7 or 6	026A	026B	618	619	R/W	0: No function 1: FF amount is added by level 2: FF amount is forcibly added	0
315	Select function for input 2 [FZ110/400/900]	KL	7 or 6	026C	026D	620	621	R/W	0: No function 1: Remote setting input 2: 2-loop control/Differential temperature control 3: Control with PV select 4: Cascade control (Slave single ↔ Cascade) * 5: Cascade control (Master single ↔ Cascade) * 6: Input circuit error alarm *This parameter cannot be specified if the instrument is a Heat/Cool PID or a Position proportioning PID type. • When Measured input 2 is selected for FZ400/900 at the time of order: 0 to 6 • When the Remote settting input is selected for FZ400/900 or when the Remote setting input is selected for FZ110: 0 to 1	• FZ400/900: When the Remote setting input is specified: 1 When the Measured input 2 is specified: 2 • FZ110: 1
316	Cascade_AT mode (master-side) [FZ400/900]	GK	7 or 6	026E	026F	622	623	R/W	0: Easy adjustment (AT: one cycle) 1: Load factor adjustment (AT: 2 cycles)	TC/RTD inputs: 0 V/I inputs: 1
317	Cascade_AT mode (slave-side) [FZ400/900]	GL	7 or 6	0270	0271	624	625	R/W	0: Easy adjustment (AT: one cycle) 1: Load factor adjustment (AT: 2 cycles)	TC/RTD inputs: 0 V/I inputs: 1
318	Selection of PV select trigger [FZ400/900]	L7	7 or 6	0272	0273	626	627	R/W	0: Switching by level 1: Switching by signal (Key, DI and Communication)	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value																																																				
				HEX		DEC																																																								
				Low-order	High-order	Low-order	High-order																																																							
319	Input circuit error alarm set value [FZ400/900]	L4	7 or 6	0274	0275	628	629	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																																																				
320	Communication protocol [FZ110/400/900]	IS	7 or 6	0276	0277	630	631	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																																																				
321	Device address [FZ110/400/900]	IP	7 or 6	0278	0279	632	633	R/W	RKC communication: 0 to 99 Modbus: 1 to 99 PLC communication: 0 to 30	RKC communication: 0 Modbus: 1 PLC communication: 0																																																				
322	Communication speed [FZ110/400/900]	IR	7 or 6	027A	027B	634	635	R/W	0: 2400 bps 1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: 57600 bps	3																																																				
323	Data bit configuration [FZ110/400/900]	IQ	7 or 6	027C	027D	636	637	R/W	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	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	6	7	None	1	7	7	None	2	8	7	Even	1	9	7	Even	2	10	7	Odd	1	11	7	Odd	2	0
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																																																											
6	7	None	1																																																											
7	7	None	2																																																											
8	7	Even	1																																																											
9	7	Even	2																																																											
10	7	Odd	1																																																											
11	7	Odd	2																																																											

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
324	Interval time [FZ110/400/900]	IT	7 or 6	027E	027F	638	639	R/W	0 to 250 ms	10
325	Register type [FZ110/400/900]	QZ	7 or 6	0280	0281	640	641	R/W	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.)	0
326	Register start number (High-order 4-bit) [FZ110/400/900]	QS	7 or 6	0282	0283	642	643	R/W	0 to 15	0
327	Register start number (Low-order 16-bit) [FZ110/400/900]	QX	7 or 6	0284	0285	644	645	R/W	0 to 65535	1000
328	Monitor item register bias [FZ110/400/900]	R3	7 or 6	0286	0287	646	647	R/W	12 to 65535	12
329	Setting item register bias [FZ110/400/900]	R4	7 or 6	0288	0289	648	649	R/W	0 to 65535	0
330	Instrument link recognition time [FZ110/400/900]	QT	7 or 6	028A	028B	650	651	R/W	0 to 255 seconds	5
331	PLC response waiting time [FZ110/400/900]	VT	7 or 6	028C	028D	652	653	R/W	0 to 3000 ms	255
332	PLC communication start time [FZ110/400/900]	R5	7 or 6	028E	028F	654	655	R/W	1 to 255 seconds	5
333	Slave register bias [FZ110/400/900]	R8	7 or 6	0290	0291	656	657	R/W	0 to 65535	80

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
334	Number of recognizable devices [FZ110/400/900]	QU	7 or 6	0292	0293	658	659	R/W	0 to 30	8
335	Station number [FZ110/400/900]	QV	7 or 6	0294	0295	660	661	R/W	0 to 31	0
336	PC number [FZ110/400/900]	QW	7 or 6	0296	0297	662	663	R/W	0 to 255	255
337	Monitor item selection 1 [FZ110/400/900]	R6	7 or 6	0298	0299	664	665	R/W	0 to 65535	3459
338	Monitor item selection 2 [FZ110/400/900]	R7	7 or 6	029A	029B	666	667	R/W	0 to 65535	16512
339	Monitor item selection 3 [FZ110/400/900]	R9	7 or 6	029C	029D	668	669	R/W	0 to 65535	1024
340	Setting item selection 1 [FZ110/400/900]	RE	7 or 6	029E	029F	670	671	R/W	0 to 65535	16480
341	Setting item selection 2 [FZ110/400/900]	RF	7 or 6	02A0	02A1	672	673	R/W	0 to 65535	7850
342	Setting item selection 3 [FZ110/400/900]	RG	7 or 6	02A2	02A3	674	675	R/W	0 to 65535	32768
343	Setting item selection 4 [FZ110/400/900]	RH	7 or 6	02A4	02A5	676	677	R/W	0 to 65535	771
344	Setting item selection 5 [FZ110/400/900]	RI	7 or 6	02A6	02A7	678	679	R/W	0 to 65535	0

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
345	Setting item selection 6 [FZ110/400/900]	RJ	7 or 6	02A8	02A9	680	681	R/W	0 to 65535	5
346	Setting item selection 7 [FZ110/400/900]	RK	7 or 6	02AA	02AB	682	683	R/W	0 to 65535	0
347	Setting item selection 8 [FZ110/400/900]	RL	7 or 6	02AC	02AD	684	685	R/W	0 to 65535	0
348	Setting change rate limiter unit time [FZ110/400/900]	HU	7 or 6	02AE	02AF	686	687	R/W	1 to 3600 seconds	60
349	Soak time unit [FZ110/400/900]	RU	7	02B0	02B1	688	689	R/W	In case of Input data type 0 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	1
			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	1
350	Input 1_Setting limiter high [FZ110/400/900]	SH	7 or 6	02B2	02B3	690	691	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 ⎫
351	Input 1_Setting limiter low [FZ110/400/900]	SL	7 or 6	02B4	02B5	692	693	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 ⎫

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
352	Input 2_Setting limiter high [FZ400/900]	U0	7 or 6	02B6	02B7	694	695	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
353	Input 2_Setting limiter low [FZ400/900]	U1	7 or 6	02B8	02B9	696	697	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
354	Initialization [FZ110/400/900]	DC	7 or 6	02BA	02BB	698	699	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
355	Set data unlock/lock transfer [FZ110/400/900]	LU	7 or 6	02BC	02BD	700	701	R/W	0: Unlock state 1: Lock state	0
356	Set lock level [FZ110/400/900]	LK	7 or 6	02BE	02BF	702	703	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 * FZ400/900: The data of Set value (SV) and Interlock release can be locked. FZ110: The data of Set value (SV), Interlock release and Memory area transfer can be locked.	00000

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
356	Set lock level [FZ110/400/900] (Continued from the previous page)	LK	7 or 6	02BE	02BF	702	703	R/W	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 * FZ400/900: The data of Set value (SV) and Interlock release can be locked. FZ110: The data of Set value (SV), Interlock release and Memory area transfer can be locked.	0
357	Area lock [FZ400/900]	LL	7 or 6	02C0	02C1	704	705	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
358	Select Blind function [FZ110/400/900]	BQ	7 or 6	02C2	02C3	706	707	R/W	0: Blind function: OFF 1: Blind function: ON	0
359	Parameter select direct registration [FZ110/400/900]	LD	7 or 6	02C4	02C5	708	709	R/W	0: Direct registration: OFF 1: Direct registration: ON	0
360	Parameter select setting 1 [FZ110/400/900]	BA	7 or 6	02C6	02C7	710	711	R/W	0 to 303 (Screen No.) 0: No registration	0
361	Parameter select setting 2 [FZ110/400/900]	BB	7 or 6	02C8	02C9	712	713	R/W	0 to 303 (Screen No.) 0: No registration	0
362	Parameter select setting 3 [FZ110/400/900]	BC	7 or 6	02CA	02CB	714	715	R/W	0 to 303 (Screen No.) 0: No registration	0
363	Parameter select setting 4 [FZ110/400/900]	BD	7 or 6	02CC	02CD	716	717	R/W	0 to 303 (Screen No.) 0: No registration	0
364	Parameter select setting 5 [FZ110/400/900]	BE	7 or 6	02CE	02CF	718	719	R/W	0 to 303 (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			
365	Parameter select setting 6 [FZ110/400/900]	BF	7 or 6	02D0	02D1	720	721	R/W	0 to 303 (Screen No.) 0: No registration	0
366	Parameter select setting 7 [FZ110/400/900]	BG	7 or 6	02D2	02D3	722	723	R/W	0 to 303 (Screen No.) 0: No registration	0
367	Parameter select setting 8 [FZ110/400/900]	BH	7 or 6	02D4	02D5	724	725	R/W	0 to 303 (Screen No.) 0: No registration	0
368	Parameter select setting 9 [FZ110/400/900]	BI	7 or 6	02D6	02D7	726	727	R/W	0 to 303 (Screen No.) 0: No registration	0
369	Parameter select setting 10 [FZ110/400/900]	BJ	7 or 6	02D8	02D9	728	729	R/W	0 to 303 (Screen No.) 0: No registration	0
370	Parameter select setting 11 [FZ110/400/900]	BK	7 or 6	02DA	02DB	730	731	R/W	0 to 303 (Screen No.) 0: No registration	0
371	Parameter select setting 12 [FZ110/400/900]	BL	7 or 6	02DC	02DD	732	733	R/W	0 to 303 (Screen No.) 0: No registration	0
372	Parameter select setting 13 [FZ110/400/900]	BM	7 or 6	02DE	02DF	734	735	R/W	0 to 303 (Screen No.) 0: No registration	0
373	Parameter select setting 14 [FZ110/400/900]	BN	7 or 6	02E0	02E1	736	737	R/W	0 to 303 (Screen No.) 0: No registration	0
374	Parameter select setting 15 [FZ110/400/900]	BO	7 or 6	02E2	02E3	738	739	R/W	0 to 303 (Screen No.) 0: No registration	0
375	Parameter select setting 16 [FZ110/400/900]	BP	7 or 6	02E4	02E5	740	741	R/W	0 to 303 (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			
376	Dummy data (REX-F400/700/900: For Bar-graph display selection) [FZ110/400/900]	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
377	Dummy data (REX-F400/700/900: For Second alarm energized/de-energized selection) [FZ110/400/900]	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
378	Dummy data (REX-F400/700/900: For Local mode/computer mode identification) [FZ110/400/900]	RA	7 or 6	—	—	—	—	RO	The read data is “0.”	0
379	Dummy data (REX-F400/700/900: For Operation execution (RUN)/STOP transfer) [FZ110/400/900]	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
380	Dummy data (REX-F400/700/900: For First alarm action selection at input abnormality) [FZ110/400/900]	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
381	Dummy data (REX-F400/700/900: For Second alarm action selection at input abnormality) [FZ110/400/900]	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
382	Dummy data (REX-D series: For Output limit [high-limit] (OUT2)) [FZ110/400/900]	OI	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
383	Dummy data (REX-D series: For Auto-tuning (AT) differential gap) [FZ110/400/900]	GH	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
384	Dummy data (REX-D series: For AUTO/MAN function selection) [FZ110/400/900]	PQ	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

No.	Name	Identifier	Digits	Register address				Attribute	Data range	Factory set value
				HEX		DEC				
				Low-order	High-order	Low-order	High-order			
385	Dummy data (REX-D series: For Fazzy) [FZ110/400/900]	XP	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-D series: For Air cooling/ water cooling selection) [FZ110/400/900]	XQ	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
387	Dummy data (REX-D series: For Anti-reset windup (ARW)) [FZ110/400/900]	W1	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 0B5FH 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) [FZ110/400/900]	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) [FZ400/900]	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 [FZ400/900]	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] [FZ110/400/900]	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.]	

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
4	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900] (Continued from the previous page)	0506	0507	1286	1287	R/W	● Manipulated output value –5.0 to +105.0 %	50.0
5	Event 1 set value (EV1') [low] [FZ110/400/900]	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.] ● 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.]	TC/RTD inputs: –10 V/I inputs: –5 % of input span
6	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	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] [FZ110/400/900]	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] [FZ110/400/900]	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] [FZ110/400/900]	0510	0511	1296	1297	R/W	Same as Event 1 set value (EV1') [low]	

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
10	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	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] [FZ110/400/900]	0514	0515	1300	1301	R/W	Same as Event 1 set value (EV1') [low]	
12	Input 1_Proportional band [heat-side] [FZ110/400/900]	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] [FZ110/400/900]	0518	0519	1304	1305	R/W	PID control or Heat/Cool PID control 0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action Position proportioning PID control 1 to 3600 seconds, 0.1 to 3600.0 seconds or 0.01 to 360.00 seconds [Varies with the setting of the Integral/Derivative time decimal point position.]	240
14	Input 1_Derivative time [heat-side] [FZ110/400/900]	051A	051B	1306	1307	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	PID control or Heat/Cool PID control: 60 Position proportioning PID control: 0
15	Input 1_Control response parameter [FZ110/400/900]	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 or Position proportioning PID control: 0 Heat/Cool PID control: 2
16	Input 1_Proactive intensity [FZ110/400/900]	051E	051F	1310	1311	R/W	0 to 4 0: No function	2
17	Input 1_Manual reset [FZ110/400/900]	0520	0521	1312	1313	R/W	−100.0 to +100.0 %	0.0

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
18	Input 1_FF amount [FZ110/400/900]	0522	0523	1314	1315	R/W	−100.0 to +100.0 %	0.0
19	Input 1_Output limiter high [heat-side] [FZ110/400/900]	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] [FZ110/400/900]	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 [FZ110/400/900]	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) [FZ110/400/900]	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 [FZ400/900]	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
24	Input 2_Integral time [FZ400/900]	052E	052F	1326	1327	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240
25	Input 2_Derivative time [FZ400/900]	0530	0531	1328	1329	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60
26	Input 2_Control response parameter [FZ400/900]	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 [FZ400/900]	0534	0535	1332	1333	R/W	0 to 4 0: No function	2
28	Input 2_Manual reset [FZ400/900]	0536	0537	1334	1335	R/W	−100.0 to +100.0 %	0.0
29	Input 2_FF amount [FZ400/900]	0538	0539	1336	1337	R/W	−100.0 to +100.0 %	0.0

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
30	Input 2_Output limiter high [FZ400/900]	053A	053B	1338	1339	R/W	Input 2_Output limiter low to 105.0 %	105.0
31	Input 2_Output limiter low [FZ400/900]	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 [FZ400/900]	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) [FZ400/900]	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] [FZ110/400/900]	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] [FZ110/400/900]	0544	0545	1348	1349	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240
36	Input 1_Derivative time [cool-side] [FZ110/400/900]	0546	0547	1350	1351	R/W	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
37	Input 1_Overlap/Deadband [FZ110/400/900]	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] [FZ110/400/900]	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] [FZ110/400/900]						PID control or Position proportioning 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] [FZ110/400/900]	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 [FZ110/400/900]	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				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
41	Area soak time [FZ110/400/900]	0550	0051	1360	1361	R/W	In case of Input data type 0 • 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 • Modbus 0 to 35999 seconds * 0 to 11999 seconds 0 to 5999 minutes * Settable only for FZ400/900 [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0 minutes 00 seconds) Modbus: 0 (0 seconds)
		0550	0051	1360	1361	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 • Modbus (Single word only) 0 to 5999 minutes 0 to 11999 seconds [Data range of Area soak time can be selected on the Soak time unit.]	RKC communication: 0:00 (0 minutes 00 seconds) Modbus: 0 (0 seconds)
42	Link area number [FZ110/400/900]	0552	0553	1362	1363	R/W	0 to 16 0: No function	0
43	Input 1_Setting change rate limiter (up) [FZ110/400/900]	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) [FZ110/400/900]	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

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
45	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	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) [FZ110/400/900]	055A	055B	1370	1371	R/W	PID control, Position proportioning PID control –5.0 to +105.0 % Heat/Cool PID control –105.0 to +105.0 %	PID control, Position proportioning PID control: –5.0 Heat/Cool PID control: 0.0
47	Input 2_Setting change rate limiter (up) [FZ400/900]	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
48	Input 2_Setting change rate limiter (down) [FZ400/900]	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) [FZ400/900]	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) [FZ400/900]	0562	0563	1378	1379	R/W	–5.0 to +105.0 %	–5.0

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
51	Remote/Local transfer selection (Area) [FZ110/400/900]	0564	0565	1380	1381	R/W	When Select function for input 2 is: “Remote setting input” [FZ400/900] 0: No transfer 1: Local mode 2: Remote mode ----- When Remote setting input is specified: [FZ110] 0: No transfer 1: Local mode 2: Remote mode ----- When Select function for input 2 is: “Cascade control” [FZ400/900] 0: No transfer 1: Single control 2: Cascade control ----- When Select function for input 2 is: “Control with PV select” [FZ400/900] 0: No transfer 1: Input 1 2: Input 2 ----- When Select function for input 2 is: “2-loop control/Differential temperature control” [FZ400/900] 0: No transfer 1: 2-loop control 2: Differential temperature control	0

■ Memory area 2 to 5 data

Register address for Memory area 2 to 5.

For details of attribute, data range and factory set values, refer to the same line No. in ■ Memory area 1 data (P.6-76).

Low: Low-order High: High-order

No.	Name	Memory area2				Memory area3				Memory area 4				Memory area 5			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	Input 1_Set value (SV) [FZ110/400/900]	0566	0567	1382	1383	05CC	05CD	1484	1485	0632	0633	1586	1587	0698	0699	1688	1689
2	Input 2_Set value (SV) [FZ400/900]	0568	0569	1384	1385	05CE	05CF	1486	1487	0634	0635	1588	1589	069A	069B	1690	1691
3	Set value (SV) of differential temperature input [FZ400/900]	056A	056B	1386	1387	05D0	05D1	1488	1489	0636	0637	1590	1591	069C	069D	1692	1693
4	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900]	056C	056D	1388	1389	05D2	05D3	1490	1491	0638	0639	1592	1593	069E	069F	1694	1695
5	Event 1 set value (EV1') [low] [FZ110/400/900]	056E	056F	1390	1391	05D4	05D5	1492	1493	063A	063B	1594	1595	06A0	06A1	1696	1697
6	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	0570	0571	1392	1393	05D6	05D7	1494	1495	063C	063D	1596	1597	06A2	06A3	1698	1699
7	Event 2 set value (EV2') [low] [FZ110/400/900]	0572	0573	1394	1395	05D8	05D9	1496	1497	063E	063F	1598	1599	06A4	06A5	1700	1701
8	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900]	0574	0575	1396	1397	05DA	05DB	1498	1499	0640	0641	1600	1601	06A6	06A7	1702	1703
9	Event 3 set value (EV3') [low] [FZ110/400/900]	0576	0577	1398	1399	05DC	05DD	1500	1501	0642	0643	1602	1603	06A8	06A9	1704	1705
10	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	0578	0579	1400	1401	05DE	05DF	1502	1503	0644	0645	1604	1605	06AA	06AB	1706	1707
11	Event 4 set value (EV4') [low] [FZ110/400/900]	057A	057B	1402	1403	05E0	05E1	1504	1505	0646	0647	1606	1607	06AC	06AD	1708	1709

No.	Name	Memory area 2				Memory area 3				Memory area 4				Memory area 5			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
12	Input 1_Proportional band [heat-side] [FZ110/400/900]	057C	057D	1404	1405	05E2	05E3	1506	1507	0648	0649	1608	1609	06AE	06AF	1710	1711
13	Input 1_Integral time [heat-side] [FZ110/400/900]	057E	057F	1406	1407	05E4	05E5	1508	1509	064A	064B	1610	1611	06B0	06B1	1712	1713
14	Input 1_Derivative time [heat-side] [FZ110/400/900]	0580	0581	1408	1409	05E6	05E7	1510	1511	064C	064D	1612	1613	06B2	06B3	1714	1715
15	Input 1_Control response parameter [FZ110/400/900]	0582	0583	1410	1411	05E8	05E9	1512	1513	064E	064F	1614	1615	06B4	06B5	1716	1717
16	Input 1_Proactive intensity [FZ110/400/900]	0584	0585	1412	1413	05EA	05EB	1514	1515	0650	0651	1616	1617	06B6	06B7	1718	1719
17	Input 1_Manual reset [FZ110/400/900]	0586	0587	1414	1415	05EC	05ED	1516	1517	0652	0653	1618	1619	06B8	06B9	1720	1721
18	Input 1_FF amount [FZ110/400/900]	0588	0589	1416	1417	05EE	05EF	1518	1519	0654	0655	1620	1621	06BA	06BB	1722	1723
19	Input 1_Output limiter high [heat-side] [FZ110/400/900]	058A	058B	1418	1419	05F0	05F1	1520	1521	0656	0657	1622	1623	06BC	06BD	1724	1725
20	Input 1_Output limiter low [heat-side] [FZ110/400/900]	058C	058D	1420	1421	05F2	05F3	1522	1523	0658	0659	1624	1625	06BE	06BF	1726	1727
21	Input 1_Control loop break alarm (LBA) time [FZ110/400/900]	058E	058F	1422	1423	05F4	05F5	1524	1525	065A	065B	1626	1627	06C0	06C1	1728	1729
22	Input 1_LBA deadband (LBD) [FZ110/400/900]	0590	0591	1424	1425	05F6	05F7	1526	1527	065C	065D	1628	1629	06C2	06C3	1730	1731
23	Input 2_Proportional band [FZ400/900]	0592	0593	1426	1427	05F8	05F9	1528	1529	065E	065F	1630	1631	06C4	06C5	1732	1733
24	Input 2_Integral time [FZ400/900]	0594	0595	1428	1429	05FA	05FB	1530	1531	0660	0661	1632	1633	06C6	06C7	1734	1735
25	Input 2_Derivative time [FZ400/900]	0596	0597	1430	1431	05FC	05FD	1532	1533	0662	0663	1634	1635	06C8	06C9	1736	1737
26	Input 2_Control response parameter [FZ400/900]	0598	0599	1432	1433	05FE	05FF	1534	1535	0664	0665	1636	1637	06CA	06CB	1738	1739

No.	Name	Memory area 2				Memory area 3				Memory area 4				Memory area 5			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
27	Input 2_Proactive intensity [FZ400/900]	059A	059B	1434	1435	0600	0601	1536	1537	0666	0667	1638	1639	06CC	06CD	1740	1741
28	Input 2_Manual reset [FZ400/900]	059C	059D	1436	1437	0602	0603	1538	1539	0668	0669	1640	1641	06CE	06CF	1742	1743
29	Input 2_FF amount [FZ400/900]	059E	059F	1438	1439	0604	0605	1540	1541	066A	066B	1642	1643	06D0	06D1	1744	1745
30	Input 2_Output limiter high [FZ400/900]	05A0	05A1	1440	1441	0606	0607	1542	1543	066C	066D	1644	1645	06D2	06D3	1746	1747
31	Input 2_Output limiter low [FZ400/900]	05A2	05A3	1442	1443	0608	0609	1544	1545	066E	066F	1646	1647	06D4	06D5	1748	1749
32	Input 2_Control loop break alarm (LBA) time [FZ400/900]	05A4	05A5	1444	1445	060A	060B	1546	1547	0670	0671	1648	1649	06D6	06D7	1750	1751
33	Input 2_LBA deadband (LBD) [FZ400/900]	05A6	05A7	1446	1447	060C	060D	1548	1549	0672	0673	1650	1651	06D8	06D9	1752	1753
34	Input 1_Proportional band [cool-side] [FZ110/400/900]	05A8	05A9	1448	1449	060E	060F	1550	1551	0674	0675	1652	1653	06DA	06DB	1754	1755
35	Input 1_Integral time [cool-side] [FZ110/400/900]	05AA	05AB	1450	1451	0610	0611	1552	1553	0676	0677	1654	1655	06DC	06DD	1756	1757
36	Input 1_Derivative time [cool-side] [FZ110/400/900]	05AC	05AD	1452	1453	0612	0613	1554	1555	0678	0679	1656	1657	06DE	06DF	1758	1759
37	Input 1_Overlap/Deadband [FZ110/400/900]	05AE	05AF	1454	1455	0614	0615	1556	1557	067A	067B	1658	1659	06E0	06E1	1760	1761
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900]	05B0	05B1	1456	1457	0616	0617	1558	1559	067C	067D	1660	1661	06E2	06E3	1762	1763
39	Input 1_Output limiter low [cool-side] [FZ110/400/900]	05B2	05B3	1458	1459	0618	0619	1560	1561	067E	067F	1662	1663	06E4	06E5	1764	1765
40	Select Trigger type for Memory area transfer [FZ110/400/900]	05B4	05B5	1460	1461	061A	061B	1562	1563	0680	0681	1664	1665	06E6	06E7	1766	1767

No.	Name	Memory area 2				Memory area 3				Memory area 4				Memory area 5			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
41	Area soak time [FZ110/400/900]	05B6	05B7	1462	1463	061C	061D	1564	1565	0682	0683	1666	1667	06E8	06E9	1768	1769
42	Link area number [FZ110/400/900]	05B8	05B9	1464	1465	061E	061F	1566	1567	0684	0685	1668	1669	06EA	06EB	1770	1771
43	Input 1_Setting change rate limiter (up) [FZ110/400/900]	05BA	05BB	1466	1467	0620	0621	1568	1569	0686	0687	1670	1671	06EC	06ED	1772	1773
44	Input 1_Setting change rate limiter (down) [FZ110/400/900]	05BC	05BD	1468	1469	0622	0623	1570	1571	0688	0689	1672	1673	06EE	06EF	1774	1775
45	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	05BE	05BF	1470	1471	0624	0625	1572	1573	068A	068B	1674	1675	06F0	06F1	1776	1777
46	Input 1_Manipulated output value (Area) [FZ110/400/900]	05C0	05C1	1472	1473	0626	0627	1574	1575	068C	068D	1676	1677	06F2	06F3	1778	1779
47	Input 2_Setting change rate limiter (up) [FZ400/900]	05C2	05C3	1474	1475	0628	0629	1576	1577	068E	068F	1678	1679	06F4	06F5	1780	1781
48	Input 2_Setting change rate limiter (down) [FZ400/900]	05C4	05C5	1476	1477	062A	062B	1578	1579	0690	0691	1680	1681	06F6	06F7	1782	1783
49	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]	05C6	05C7	1478	1479	062C	062D	1580	1581	0692	0693	1682	1683	06F8	06F9	1784	1785
50	Input 2_Manipulated output value (Area) [FZ400/900]	05C8	05C9	1480	1481	062E	062F	1582	1583	0694	0695	1684	1685	06FA	06FB	1786	1787
51	Remote/Local transfer selection (Area) [FZ110/400/900]	05CA	05CB	1482	1483	0630	0631	1584	1585	0696	0697	1686	1687	06FC	06FD	1788	1789

■ Memory area 6 to 9 data

Register address for Memory area 6 to 9.

For details of attribute, data range and factory set values, refer to the same line No. in ■ Memory area 1 data (P.6-76).

Low: Low-order High: High-order

No.	Name	Memory area 6				Memory area 7				Memory area 8				Memory area 9			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	Input 1_Set value (SV) [FZ110/400/900]	06FE	06FF	1790	1791	0764	0765	1892	1893	07CA	07CB	1994	1995	0830	0831	2096	2097
2	Input 2_Set value (SV) [FZ400/900]	0700	0701	1792	1793	0766	0767	1894	1895	07CC	07CD	1996	1997	0832	0833	2098	2099
3	Set value (SV) of differential temperature input [FZ400/900]	0702	0703	1794	1795	0768	0769	1896	1897	07CE	07CF	1998	1999	0834	0835	2100	2101
4	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900]	0704	0705	1796	1797	076A	076B	1898	1899	07D0	07D1	2000	2001	0836	0837	2102	2103
5	Event 1 set value (EV1') [low] [FZ110/400/900]	0706	0707	1798	1799	076C	076D	1900	1901	07D2	07D3	2002	2003	0838	0839	2104	2105
6	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	0708	0709	1800	1801	076E	076F	1902	1903	07D4	07D5	2004	2005	083A	083B	2106	2107
7	Event 2 set value (EV2') [low] [FZ110/400/900]	070A	070B	1802	1803	0770	0771	1904	1905	07D6	07D7	2006	2007	083C	083D	2108	2109
8	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900]	070C	070D	1804	1805	0772	0773	1906	1907	07D8	07D9	2008	2009	083E	083F	2110	2111
9	Event 3 set value (EV3') [low] [FZ110/400/900]	070E	070F	1806	1807	0774	0775	1908	1909	07DA	07DB	2010	2011	0840	0841	2112	2113
10	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	0710	0711	1808	1809	0776	0777	1910	1911	07DC	07DD	2012	2013	0842	0843	2114	2115
11	Event 4 set value (EV4') [low] [FZ110/400/900]	0712	0713	1810	1811	0778	0779	1912	1913	07DE	07DF	2014	2015	0844	0845	2116	2117

No.	Name	Memory area 6				Memory area 7				Memory area 8				Memory area 9			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
12	Input 1_Proportional band [heat-side] [FZ110/400/900]	0714	0715	1812	1813	077A	077B	1914	1915	07E0	07E1	2016	2017	0846	0847	2118	2119
13	Input 1_Integral time [heat-side] [FZ110/400/900]	0716	0717	1814	1815	077C	077D	1916	1917	07E2	07E3	2018	2019	0848	0849	2120	2121
14	Input 1_Derivative time [heat-side] [FZ110/400/900]	0718	0719	1816	1817	077E	077F	1918	1919	07E4	07E5	2020	2021	084A	084B	2122	2123
15	Input 1_Control response parameter [FZ110/400/900]	071A	071B	1818	1819	0780	0781	1920	1921	07E6	07E7	2022	2023	084C	084D	2124	2125
16	Input 1_Proactive intensity [FZ110/400/900]	071C	071D	1820	1821	0782	0783	1922	1923	07E8	07E9	2024	2025	084E	084F	2126	2127
17	Input 1_Manual reset [FZ110/400/900]	071E	071F	1822	1823	0784	0785	1924	1925	07EA	07EB	2026	2027	0850	0851	2128	2129
18	Input 1_FF amount [FZ110/400/900]	0720	0721	1824	1825	0786	0787	1926	1927	07EC	07ED	2028	2029	0852	0853	2130	2131
19	Input 1_Output limiter high [heat-side] [FZ110/400/900]	0722	0723	1826	1827	0788	0789	1928	1929	07EE	07EF	2030	2031	0854	0855	2132	2133
20	Input 1_Output limiter low [heat-side] [FZ110/400/900]	0724	0725	1828	1829	078A	078B	1930	1931	07F0	07F1	2032	2033	0856	0857	2134	2135
21	Input 1_Control loop break alarm (LBA) time [FZ110/400/900]	0726	0727	1830	1831	078C	078D	1932	1933	07F2	07F3	2034	2035	0858	0859	2136	2137
22	Input 1_LBA deadband (LBD) [FZ110/400/900]	0728	0729	1832	1833	078E	078F	1934	1935	07F4	07F5	2036	2037	085A	085B	2138	2139
23	Input 2_Proportional band [FZ400/900]	072A	072B	1834	1835	0790	0791	1936	1937	07F6	07F7	2038	2039	085C	085D	2140	2141
24	Input 2_Integral time [FZ400/900]	072C	072D	1836	1837	0792	0793	1938	1939	07F8	07F9	2040	2041	085E	085F	2142	2143
25	Input 2_Derivative time [FZ400/900]	072E	072F	1838	1839	0794	0795	1940	1941	07FA	07FB	2042	2043	0860	0861	2144	2145
26	Input 2_Control response parameter [FZ400/900]	0730	0731	1840	1841	0796	0797	1942	1943	07FC	07FD	2044	2045	0862	0863	2146	2147

No.	Name	Memory area 6				Memory area 7				Memory area 8				Memory area 9			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
27	Input 2_Proactive intensity [FZ400/900]	0732	0733	1842	1843	0798	0799	1944	1945	07FE	07FF	2046	2047	0864	0865	2148	2149
28	Input 2_Manual reset [FZ400/900]	0734	0735	1844	1845	079A	079B	1946	1947	0800	0801	2048	2049	0866	0867	2150	2151
29	Input 2_FF amount [FZ400/900]	0736	0737	1846	1847	079C	079D	1948	1949	0802	0803	2050	2051	0868	0869	2152	2153
30	Input 2_Output limiter high [FZ400/900]	0738	0739	1848	1849	079E	079F	1950	1951	0804	0805	2052	2053	086A	086B	2154	2155
31	Input 2_Output limiter low [FZ400/900]	073A	073B	1850	1851	07A0	07A1	1952	1953	0806	0807	2054	2055	086C	086D	2156	2157
32	Input 2_Control loop break alarm (LBA) time [FZ400/900]	073C	073D	1852	1853	07A2	07A3	1954	1955	0808	0809	2056	2057	086E	086F	2158	2159
33	Input 2_LBA deadband (LBD) [FZ400/900]	073E	073F	1854	1855	07A4	07A5	1956	1957	080A	080B	2058	2059	0870	0871	2160	2161
34	Input 1_Proportional band [cool-side] [FZ110/400/900]	0740	0741	1856	1857	07A6	07A7	1958	1959	080C	080D	2060	2061	0872	0873	2162	2163
35	Input 1_Integral time [cool-side] [FZ110/400/900]	0742	0743	1858	1859	07A8	07A9	1960	1961	080E	080F	2062	2063	0874	0875	2164	2165
36	Input 1_Derivative time [cool-side] [FZ110/400/900]	0744	0745	1860	1861	07AA	07AB	1962	1963	0810	0811	2064	2065	0876	0877	2166	2167
37	Input 1_Overlap/Deadband [FZ110/400/900]	0746	0747	1862	1863	07AC	07AD	1964	1965	0812	0813	2066	2067	0878	0879	2168	2169
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900]	0748	0749	1864	1865	07AE	07AF	1966	1967	0814	0815	2068	2069	087A	087B	2170	2171
39	Input 1_Output limiter low [cool-side] [FZ110/400/900]	074A	074B	1866	1867	07B0	07B1	1968	1969	0816	0817	2070	2071	087C	087D	2172	2173
40	Select Trigger type for Memory area transfer [FZ110/400/900]	074C	074D	1868	1869	07B2	07B3	1970	1971	0818	0819	2072	2073	087E	087F	2174	2175

No.	Name	Memory area 6				Memory area 7				Memory area 8				Memory area 9			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
41	Area soak time [FZ110/400/900]	074E	074F	1870	1871	07B4	07B5	1972	1973	081A	081B	2074	2075	0880	0881	2176	2177
42	Link area number [FZ110/400/900]	0750	0751	1872	1873	07B6	07B7	1974	1975	081C	081D	2076	2077	0882	0883	2178	2179
43	Input 1_Setting change rate limiter (up) [FZ110/400/900]	0752	0753	1874	1875	07B8	07B9	1976	1977	081E	081F	2078	2079	0884	0885	2180	2181
44	Input 1_Setting change rate limiter (down) [FZ110/400/900]	0754	0755	1876	1877	07BA	07BB	1978	1979	0820	0821	2080	2081	0886	0887	2182	2183
45	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	0756	0757	1878	1879	07BC	07BD	1980	1981	0822	0823	2082	2083	0888	0889	2184	2185
46	Input 1_Manipulated output value (Area) [FZ110/400/900]	0758	0759	1880	1881	07BE	07BF	1982	1983	0824	0825	2084	2085	088A	088B	2186	2187
47	Input 2_Setting change rate limiter (up) [FZ400/900]	075A	075B	1882	1883	07C0	07C1	1984	1985	0826	0827	2086	2087	088C	088D	2188	2189
48	Input 2_Setting change rate limiter (down) [FZ400/900]	075C	075D	1884	1885	07C2	07C3	1986	1987	0828	0829	2088	2089	088E	088F	2190	2191
49	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]	075E	075F	1886	1887	07C4	07C5	1988	1989	082A	082B	2090	2091	0890	0891	2192	2193
50	Input 2_Manipulated output value (Area) [FZ400/900]	0760	0761	1888	1889	07C6	07C7	1990	1991	082C	082D	2092	2093	0892	0893	2194	2195
51	Remote/Local transfer selection (Area) [FZ110/400/900]	0762	0763	1890	1891	07C8	07C9	1992	1993	082E	082F	2094	2095	0894	0895	2196	2197

■ Memory area 10 to 13 data

Register address for Memory area 10 to 13.

For details of attribute, data range and factory set values, refer to the same line No. in ■ Memory area 1 data (P.6-76).

Low: Low-order High: High-order

No.	Name	Memory area 10				Memory area 11				Memory area 12				Memory area 13			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	Input 1_Set value (SV) [FZ110/400/900]	0896	0897	2198	2199	08FC	08FD	2300	2301	0962	0963	2402	2403	09C8	09C9	2504	2505
2	Input 2_Set value (SV) [FZ400/900]	0898	0899	2200	2201	08FE	08FF	2302	2303	0964	0965	2404	2405	09CA	09CB	2506	2507
3	Set value (SV) of differential temperature input [FZ400/900]	089A	089B	2202	2203	0900	0901	2304	2305	0966	0967	2406	2407	09CC	09CD	2508	2509
4	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900]	089C	089D	2204	2205	0902	0903	2306	2307	0968	0969	2408	2409	09CE	09CF	2510	2511
5	Event 1 set value (EV1') [low] [FZ110/400/900]	089E	089F	2206	2207	0904	0905	2308	2309	096A	096B	2410	2411	09D0	09D1	2512	2513
6	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	08A0	08A1	2208	2209	0906	0907	2310	2311	096C	096D	2412	2413	09D2	09D3	2514	2515
7	Event 2 set value (EV2') [low] [FZ110/400/900]	08A2	08A3	2210	2211	0908	0909	2312	2313	096E	096F	2414	2415	09D4	09D5	2516	2517
8	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900]	08A4	08A5	2212	2213	090A	090B	2314	2315	0970	0971	2416	2417	09D6	09D7	2518	2519
9	Event 3 set value (EV3') [low] [FZ110/400/900]	08A6	08A7	2214	2215	090C	090D	2316	2317	0972	0973	2418	2419	09D8	09D9	2520	2521
10	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	08A8	08A9	2216	2217	090E	090F	2318	2319	0974	0975	2420	2421	09DA	09DB	2522	2523
11	Event 4 set value (EV4') [low] [FZ110/400/900]	08AA	08AB	2218	2219	0910	0911	2320	2321	0976	0977	2422	2423	09DC	09DD	2524	2525

No.	Name	Memory area 10				Memory area 11				Memory area 12				Memory area 13			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
12	Input 1_Proportional band [heat-side] [FZ110/400/900]	08AC	08AD	2220	2221	0912	0913	2322	2323	0978	0979	2424	2425	09DE	09DF	2526	2527
13	Input 1_Integral time [heat-side] [FZ110/400/900]	08AE	08AF	2222	2223	0914	0915	2324	2325	097A	097B	2426	2427	09E0	09E1	2528	2529
14	Input 1_Derivative time [heat-side] [FZ110/400/900]	08B0	08B1	2224	2225	0916	0917	2326	2327	097C	097D	2428	2429	09E2	09E3	2530	2531
15	Input 1_Control response parameter [FZ110/400/900]	08B2	08B3	2226	2227	0918	0919	2328	2329	097E	097F	2430	2431	09E4	09E5	2532	2533
16	Input 1_Proactive intensity [FZ110/400/900]	08B4	08B5	2228	2229	091A	091B	2330	2331	0980	0981	2432	2433	09E6	09E7	2534	2535
17	Input 1_Manual reset [FZ110/400/900]	08B6	08B7	2230	2231	091C	091D	2332	2333	0982	0983	2434	2435	09E8	09E9	2536	2537
18	Input 1_FF amount [FZ110/400/900]	08B8	08B9	2232	2233	091E	091F	2334	2335	0984	0985	2436	2437	09EA	09EB	2538	2539
19	Input 1_Output limiter high [heat-side] [FZ110/400/900]	08BA	08BB	2234	2235	0920	0921	2336	2337	0986	0987	2438	2439	09EC	09ED	2540	2541
20	Input 1_Output limiter low [heat-side] [FZ110/400/900]	08BC	08BD	2236	2237	0922	0923	2338	2339	0988	0989	2440	2441	09EE	09EF	2542	2543
21	Input 1_Control loop break alarm (LBA) time [FZ110/400/900]	08BE	08BF	2238	2239	0924	0925	2340	2341	098A	098B	2442	2443	09F0	09F1	2544	2545
22	Input 1_LBA deadband (LBD) [FZ110/400/900]	08C0	08C1	2240	2241	0926	0927	2342	2343	098C	098D	2444	2445	09F2	09F3	2546	2547
23	Input 2_Proportional band [FZ400/900]	08C2	08C3	2242	2243	0928	0929	2344	2345	098E	098F	2446	2447	09F4	09F5	2548	2549
24	Input 2_Integral time [FZ400/900]	08C4	08C5	2244	2245	092A	092B	2346	2347	0990	0991	2448	2449	09F6	09F7	2550	2551
25	Input 2_Derivative time [FZ400/900]	08C6	08C7	2246	2247	092C	092D	2348	2349	0992	0993	2450	2451	09F8	09F9	2552	2553
26	Input 2_Control response parameter [FZ400/900]	08C8	08C9	2248	2249	092E	092F	2350	2351	0994	0995	2452	2453	09FA	09FB	2554	2555

No.	Name	Memory area 10				Memory area 11				Memory area 12				Memory area 13			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
27	Input 2_Proactive intensity [FZ400/900]	08CA	08CB	2250	2251	0930	0931	2352	2353	0996	0997	2454	2455	09FC	09FD	2556	2557
28	Input 2_Manual reset [FZ400/900]	08CC	08CD	2252	2253	0932	0933	2354	2355	0998	0999	2456	2457	09FE	09FF	2558	2559
29	Input 2_FF amount [FZ400/900]	08CE	08CF	2254	2255	0934	0935	2356	2357	099A	099B	2458	2459	0A00	0A01	2560	2561
30	Input 2_Output limiter high [FZ400/900]	08D0	08D1	2256	2257	0936	0937	2358	2359	099C	099D	2460	2461	0A02	0A03	2562	2563
31	Input 2_Output limiter low [FZ400/900]	08D2	08D3	2258	2259	0938	0939	2360	2361	099E	099F	2462	2463	0A04	0A05	2564	2565
32	Input 2_Control loop break alarm (LBA) time [FZ400/900]	08D4	08D5	2260	2261	093A	093B	2362	2363	09A0	09A1	2464	2465	0A06	0A07	2566	2567
33	Input 2_LBA deadband (LBD) [FZ400/900]	08D6	08D7	2262	2263	093C	093D	2364	2365	09A2	09A3	2466	2467	0A08	0A09	2568	2569
34	Input 1_Proportional band [cool-side] [FZ110/400/900]	08D8	08D9	2264	2265	093E	093F	2366	2367	09A4	09A5	2468	2469	0A0A	0A0B	2570	2571
35	Input 1_Integral time [cool-side] [FZ110/400/900]	08DA	08DB	2266	2267	0940	0941	2368	2369	09A6	09A7	2470	2471	0A0C	0A0D	2572	2573
36	Input 1_Derivative time [cool-side] [FZ110/400/900]	08DC	08DD	2268	2269	0942	0943	2370	2371	09A8	09A9	2472	2473	0A0E	0A0F	2574	2575
37	Input 1_Overlap/Deadband [FZ110/400/900]	08DE	08DF	2270	2271	0944	0945	2372	2373	09AA	09AB	2474	2475	0A10	0A11	2576	2577
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900]	08E0	08E1	2272	2273	0946	0947	2374	2375	09AC	09AD	2476	2477	0A12	0A13	2578	2579
39	Input 1_Output limiter low [cool-side] [FZ110/400/900]	08E2	08E3	2274	2275	0948	0949	2376	2377	09AE	09AF	2478	2479	0A14	0A15	2580	2581
40	Select Trigger type for Memory area transfer [FZ110/400/900]	08E4	08E5	2276	2277	094A	094B	2378	2379	09B0	09B1	2480	2481	0A16	0A17	2582	2583

No.	Name	Memory area 10				Memory area 11				Memory area 12				Memory area 13			
		Register address				Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
41	Area soak time [FZ110/400/900]	08E6	08E7	2278	2279	094C	094D	2380	2381	09B2	09B3	2482	2483	0A18	0A19	2584	2585
42	Link area number [FZ110/400/900]	08E8	08E9	2280	2281	094E	094F	2382	2383	09B4	09B5	2484	2485	0A1A	0A1B	2586	2587
43	Input 1_Setting change rate limiter (up) [FZ110/400/900]	08EA	08EB	2282	2283	0950	0951	2384	2385	09B6	09B7	2486	2487	0A1C	0A1D	2588	2589
44	Input 1_Setting change rate limiter (down) [FZ110/400/900]	08EC	08ED	2284	2285	0952	0953	2386	2387	09B8	09B9	2488	2489	0A1E	0A1F	2590	2591
45	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	08EE	08EF	2286	2287	0954	0955	2388	2389	09BA	09BB	2490	2491	0A20	0A21	2592	2593
46	Input 1_Manipulated output value (Area) [FZ110/400/900]	08F0	08F1	2288	2289	0956	0957	2390	2391	09BC	09BD	2492	2493	0A22	0A23	2594	2595
47	Input 2_Setting change rate limiter (up) [FZ400/900]	08F2	08F3	2290	2291	0958	0959	2392	2393	09BE	09BF	2494	2495	0A24	0A25	2596	2597
48	Input 2_Setting change rate limiter (down) [FZ400/900]	08F4	08F5	2292	2293	095A	095B	2394	2395	09C0	09C1	2496	2497	0A26	0A27	2598	2599
49	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]	08F6	08F7	2294	2295	095C	095D	2396	2397	09C2	09C3	2498	2499	0A28	0A29	2600	2601
50	Input 2_Manipulated output value (Area) [FZ400/900]	08F8	08F9	2296	2297	095E	095F	2398	2399	09C4	09C5	2500	2501	0A2A	0A2B	2602	2603
51	Remote/Local transfer selection (Area) [FZ110/400/900]	08FA	08FB	2298	2299	0960	0961	2400	2401	09C6	09C7	2502	2503	0A2C	0A2D	2604	2605

■ Memory area 14 to 16 data

Register address for Memory area 14 to 16.

For details of attribute, data range and factory set values, refer to the same line No. in ■ Memory area 1 data (P.6-76).

Low: Low-order High: High-order

No.	Name	Memory area 14				Memory area 15				Memory area 16			
		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) [FZ110/400/900]	0A2E	0A2F	2606	2607	0A94	0A95	2708	2709	0AFA	0AFB	2810	2811
2	Input 2_Set value (SV) [FZ400/900]	0A30	0A31	2608	2609	0A96	0A97	2710	2711	0AFC	0AFD	2812	2813
3	Set value (SV) of differential temperature input [FZ400/900]	0A32	0A33	2610	2611	0A98	0A99	2712	2713	0AFE	0AFF	2814	2815
4	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900]	0A34	0A35	2612	2613	0A9A	0A9B	2714	2715	0B00	0B01	2816	2817
5	Event 1 set value (EV1') [low] [FZ110/400/900]	0A36	0A37	2614	2615	0A9C	0A9D	2716	2717	0B02	0B03	2818	2819
6	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	0A38	0A39	2616	2617	0A9E	0A9F	2718	2719	0B04	0B05	2820	2821
7	Event 2 set value (EV2') [low] [FZ110/400/900]	0A3A	0A3B	2618	2619	0AA0	0AA1	2720	2721	0B06	0B07	2822	2823
8	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900]	0A3C	0A3D	2620	2621	0AA2	0AA3	2722	2723	0B08	0B09	2824	2825
9	Event 3 set value (EV3') [low] [FZ110/400/900]	0A3E	0A3F	2622	2623	0AA4	0AA5	2724	2725	0B0A	0B0B	2826	2827
10	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	0A40	0A41	2624	2625	0AA6	0AA7	2726	2727	0B0C	0B0D	2828	2829
11	Event 4 set value (EV4') [low] [FZ110/400/900]	0A42	0A43	2626	2627	0AA8	0AA9	2728	2729	0B0E	0B0F	2830	2831

No.	Name	Memory area 14				Memory area 15				Memory area 16			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
12	Input 1_Proportional band [heat-side] [FZ110/400/900]	0A44	0A45	2628	2629	0AAA	0AAB	2730	2731	0B10	0B11	2832	2833
13	Input 1_Integral time [heat-side] [FZ110/400/900]	0A46	0A47	2630	2631	0AAC	0AAD	2732	2733	0B12	0B13	2834	2835
14	Input 1_Derivative time [heat-side] [FZ110/400/900]	0A48	0A49	2632	2633	0AAE	0AAF	2734	2735	0B14	0B15	2836	2837
15	Input 1_Control response parameter [FZ110/400/900]	0A4A	0A4B	2634	2635	0AB0	0AB1	2736	2737	0B16	0B17	2838	2839
16	Input 1_Proactive intensity [FZ110/400/900]	0A4C	0A4D	2636	2637	0AB2	0AB3	2738	2739	0B18	0B19	2840	2841
17	Input 1_Manual reset [FZ110/400/900]	0A4E	0A4F	2638	2639	0AB4	0AB5	2740	2741	0B1A	0B1B	2842	2843
18	Input 1_FF amount [FZ110/400/900]	0A50	0A51	2640	2641	0AB6	0AB7	2742	2743	0B1C	0B1D	2844	2845
19	Input 1_Output limiter high [heat-side] [FZ110/400/900]	0A52	0A53	2642	2643	0AB8	0AB9	2744	2745	0B1E	0B1F	2846	2847
20	Input 1_Output limiter low [heat-side] [FZ110/400/900]	0A54	0A55	2644	2645	0ABA	0ABB	2746	2747	0B20	0B21	2848	2849
21	Input 1_Control loop break alarm (LBA) time [FZ110/400/900]	0A56	0A57	2646	2647	0ABC	0ABD	2748	2749	0B22	0B23	2850	2851
22	Input 1_LBA deadband (LBD) [FZ110/400/900]	0A58	0A59	2648	2649	0ABE	0ABF	2750	2751	0B24	0B25	2852	2853
23	Input 2_Proportional band [FZ400/900]	0A5A	0A5B	2650	2651	0AC0	0AC1	2752	2753	0B26	0B27	2854	2855
24	Input 2_Integral time [FZ400/900]	0A5C	0A5D	2652	2653	0AC2	0AC3	2754	2755	0B28	0B29	2856	2857
25	Input 2_Derivative time [FZ400/900]	0A5E	0A5F	2654	2655	0AC4	0AC5	2756	2757	0B2A	0B2B	2858	2859
26	Input 2_Control response parameter [FZ400/900]	0A60	0A61	2656	2657	0AC6	0AC7	2758	2759	0B2C	0B2D	2860	2861

No.	Name	Memory area 14				Memory area 15				Memory area 16			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
27	Input 2_Proactive intensity [FZ400/900]	0A62	0A63	2658	2659	0AC8	0AC9	2760	2761	0B2E	0B2F	2862	2863
28	Input 2_Manual reset [FZ400/900]	0A64	0A65	2660	2661	0ACA	0ACB	2762	2763	0B30	0B31	2864	2865
29	Input 2_FF amount [FZ400/900]	0A66	0A67	2662	2663	0ACC	0ACD	2764	2765	0B32	0B33	2866	2867
30	Input 2_Output limiter high [FZ400/900]	0A68	0A69	2664	2665	0ACE	0ACF	2766	2767	0B34	0B35	2868	2869
31	Input 2_Output limiter low [FZ400/900]	0A6A	0A6B	2666	2667	0AD0	0AD1	2768	2769	0B36	0B37	2870	2871
32	Input 2_Control loop break alarm (LBA) time [FZ400/900]	0A6C	0A6D	2668	2669	0AD2	0AD3	2770	2771	0B38	0B39	2872	2873
33	Input 2_LBA deadband (LBD) [FZ400/900]	0A6E	0A6F	2670	2671	0AD4	0AD5	2772	2773	0B3A	0B3B	2874	2875
34	Input 1_Proportional band [cool-side] [FZ110/400/900]	0A70	0A71	2672	2673	0AD6	0AD7	2774	2775	0B3C	0B3D	2876	2877
35	Input 1_Integral time [cool-side] [FZ110/400/900]	0A72	0A73	2674	2675	0AD8	0AD9	2776	2777	0B3E	0B3F	2878	2879
36	Input 1_Derivative time [cool-side] [FZ110/400/900]	0A74	0A75	2676	2677	0ADA	0ADB	2778	2779	0B40	0B41	2880	2881
37	Input 1_Overlap/Deadband [FZ110/400/900]	0A76	0A77	2678	2679	0ADC	0ADD	2780	2781	0B42	0B43	2882	2883
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900]	0A78	0A79	2680	2681	0ADE	0ADF	2782	2783	0B44	0B45	2884	2885
39	Input 1_Output limiter low [cool-side] [FZ110/400/900]	0A7A	0A7B	2682	2683	0AE0	0AE1	2784	2785	0B46	0B47	2886	2887
40	Select Trigger type for Memory area transfer [FZ110/400/900]	0A7C	0A7D	2684	2685	0AE2	0AE3	2786	2787	0B48	0B49	2888	2889

No.	Name	Memory area 14				Memory area 15				Memory area 16			
		Register address				Register address				Register address			
		HEX		DEC		HEX		DEC		HEX		DEC	
		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
41	Area soak time [FZ110/400/900]	0A7E	0A7F	2686	2687	0AE4	0AE5	2788	2789	0B4A	0B4B	2890	2891
42	Link area number [FZ110/400/900]	0A80	0A81	2688	2689	0AE6	0AE7	2790	2791	0B4C	0B4D	2892	2893
43	Input 1_Setting change rate limiter (up) [FZ110/400/900]	0A82	0A83	2690	2691	0AE8	0AE9	2792	2793	0B4E	0B4F	2894	2895
44	Input 1_Setting change rate limiter (down) [FZ110/400/900]	0A84	0A85	2692	2693	0AEA	0AEB	2794	2795	0B50	0B51	2896	2897
45	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	0A86	0A87	2694	2695	0AEC	0AED	2796	2797	0B52	0B53	2898	2899
46	Input 1_Manipulated output value (Area) [FZ110/400/900]	0A88	0A89	2696	2697	0AEE	0AEF	2798	2799	0B54	0B55	2900	2901
47	Input 2_Setting change rate limiter (up) [FZ400/900]	0A8A	0A8B	2698	2699	0AF0	0AF1	2800	2801	0B56	0B57	2902	2903
48	Input 2_Setting change rate limiter (down) [FZ400/900]	0A8C	0A8D	2700	2701	0AF2	0AF3	2802	2803	0B58	0B59	2904	2905
49	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]	0A8E	0A8F	2702	2703	0AF4	0AF5	2804	2805	0B5A	0B5B	2906	2907
50	Input 2_Manipulated output value (Area) [FZ400/900]	0A90	0A91	2704	2705	0AF6	0AF7	2806	2807	0B5C	0B5D	2908	2909
51	Remote/Local transfer selection (Area) [FZ110/400/900]	0A92	0A93	2706	2707	0AF8	0AF9	2808	2809	0B5E	0B5F	2910	2911

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



NOTE

Register address for data designation are settable only when the controller is in STOP mode. However, only checking can be made even in the RUN state.

No.	Name	Registeraddress				Attribute	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

No.	Name	Register address				Attribute	Data range	Factory set value
		HEX		DEC				
		Low-order	High-order	Low-order	High-order			
12	Register address setting 12 [Read/write address: Low-order word 1516H, high-order word 1517H]	1016	1017	4118	4119	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
13	Register address setting 13 [Read/write address: Low-order word 1518H, high-order word 1519H]	1018	1019	4120	4121	R/W		–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				Attribute	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	Based on the data specified at 1000H to 103FH.		
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			
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				Attribute	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	Based on the data specified at 1000H to 103FH.		
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			
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			

6.4 Modbus (Single Word) Data

6.4.1 FZ110/400/900 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 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word] (P. 6-9)**.



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) [FZ110/400/900]	2000	8192	1
2	Input 1_Set value (SV) monitor [FZ110/400/900]	2001	8193	2
3	Input 2_Measured value (PV) [FZ400/900]	2002	8194	3
4	Input 2_Set value (SV) monitor [FZ400/900]	2003	8195	4
5	PV select Measured value (PV) [FZ400/900]	2004	8196	5
6	Measured value (PV) of differential temperature input [FZ400/900]	2005	8197	6
7	Set value (SV) monitor of differential temperature input [FZ400/900]	2006	8198	7
8	Input 1_Manipulated output value monitor [heat-side] [FZ110/400/900]	2007	8199	8
9	Input 1_Manipulated output value monitor [cool-side] [FZ110/400/900]	2008	8200	9
10	Input 2_Manipulated output value monitor [FZ400/900]	2009	8201	10
11	Current transformer 1 (CT1) input value monitor [FZ110/400/900]	200A	8202	11
12	Current transformer 2 (CT2) input value monitor [FZ400/900]	200B	8203	12

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
13	Memory area soak time monitor [FZ110/400/900]	200C	8204	13
14	Remote setting input value monitor [FZ110/400/900]	200D	8205	14
15	Feedback resistance (FBR) input value [FZ110/400/900]	200E	8206	15
16	Event 1 state monitor [FZ110/400/900]	200F	8207	16
17	Event 2 state monitor [FZ110/400/900]	2010	8208	17
18	Event 3 state monitor [FZ110/400/900]	2011	8209	18
19	Event 4 state monitor [FZ110/400/900]	2012	8210	19
20	Heater break alarm 1 (HBA1) state monitor [FZ110/400/900]	2013	8211	20
21	Heater break alarm 2 (HBA2) state monitor [FZ400/900]	2014	8212	21
22	Control loop break alarm 1 (LBA1) state monitor [FZ110/400/900]	2015	8213	22
23	Control loop break alarm 2 (LBA2) state monitor [FZ400/900]	2016	8214	23
24	Comprehensive event state [FZ110/400/900]	2017	8215	24

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
25	Input 1_Burnout state monitor [FZ110/400/900]	2018	8216	25
26	Input 2_Burnout state monitor [FZ400/900]	2019	8217	26
27	Feedback resistance (FBR) break monitor [FZ110/400/900]	201A	8218	27
28	DI state monitor [FZ110/400/900]	201B	8219	28
29	OUT state monitor [FZ110/400/900]	201C	8220	29
30	DO state monitor [FZ110/400/900]	201D	8221	30
31	Overall operation status [FZ110/400/900]	201E	8222	31
32	Input 1_PID memory [FZ110/400/900]	201F	8223	32
33	Input 2_PID memory [FZ400/900]	2020	8224	33
34	Input 1_Peak hold monitor [FZ110/400/900]	2021	8225	34
35	Input 1_Bottom hold monitor [FZ110/400/900]	2022	8226	35
36	Input 2_Peak hold monitor [FZ400/900]	2023	8227	36
37	Input 2_Bottom hold monitor [FZ400/900]	2024	8228	37
38	Input 1_AT remaining time monitor [FZ110/400/900]	2025	8229	38
39	Input 2_AT remaining time monitor [FZ400/900]	2026	8230	39
40	Input 1_AT/ST status monitor [FZ110/400/900]	2027	8231	40

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
41	Input 2_AT/ST status monitor [FZ400/900] [FZ400/900]	2028	8232	41
42	Error code [FZ110/400/900]	2029	8233	42
43	Integrated operating time [FZ110/400/900]	202A	8234	43
44	Peak hold monitor of ambient temperature [FZ110/400/900]	202B	8235	44
45	Retransmission output 1 decimal point position [FZ110/400/900]	202C	8236	48
46	Retransmission output 2 decimal point position [FZ110/400/900]	202D	8237	49
47	Retransmission output 3 decimal point position [FZ110/400/900]	202E	8238	50
48	Event 1 decimal point position [FZ110/400/900]	202F	8239	51
49	Event 2 decimal point position [FZ110/400/900]	2030	8240	52
50	Event 3 decimal point position [FZ110/400/900]	2031	8241	53
51	Event 4 decimal point position [FZ110/400/900]	2032	8242	54
52	Interlock release [FZ110/400/900]	2033	8243	55
53	Memory area transfer [FZ110/400/900]	2034	8244	56
54	Input 1_Hold reset [FZ110/400/900]	2035	8245	57
55	Input 2_Hold reset [FZ400/900]	2036	8246	58
56	Bottom suppression start signal [FZ110/400/900]	2037	8247	59

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
57	RUN/STOP transfer [FZ110/400/900]	2038	8248	60
58	Input 1_Autotuning (AT) [FZ110/400/900]	2039	8249	61
59	Input 2_Autotuning (AT) [FZ400/900]	203A	8250	62
60	Input 1_Startup tuning (ST) [FZ110/400/900]	203B	8251	63
61	Input 2_Startup tuning (ST) [FZ400/900]	203C	8252	64
62	Input 1_Auto/Manual transfer [FZ110/400/900]	203D	8253	65
63	Input 2_Auto/Manual transfer [FZ400/900]	203E	8254	66
64	Remote/Local transfer [FZ110/400/900]	203F	8255	67
65	Control area Local/External transfer [FZ110/400/900]	2040	8256	68
66	Input 1_Set value (SV) [FZ110/400/900] ★	2041	8257	69
67	Input 2_Set value (SV) [FZ400/900] ★	2042	8258	70
68	Set value (SV) of differential temperature input [FZ400/900] ★	2043	8259	71
69	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900] ★	2044	8260	72
70	Event 1 set value (EV1') [low] [FZ110/400/900] ★	2045	8261	73
71	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900] ★	2046	8262	74

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

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
72	Event 2 set value (EV2') [low] [FZ110/400/900] ★	2047	8263	75
73	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900] ★	2048	8264	76
74	Event 3 set value (EV3') [low] [FZ110/400/900] ★	2049	8265	77
75	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900] ★	204A	8266	78
76	Event 4 set value (EV4') [low] [FZ110/400/900] ★	204B	8267	79
77	Input 1_Proportional band [heat-side] [FZ110/400/900] ★	204C	8268	80
78	Input 1_Integral time [heat-side] [FZ110/400/900] ★	204D	8269	81
79	Input 1_Derivative time [heat-side] [FZ110/400/900] ★	204E	8270	82
80	Input 1_Control response parameter [FZ110/400/900] ★	204F	8271	83
81	Input 1_Proactive intensity [FZ110/400/900] ★	2050	8272	84
82	Input 1_Manual reset [FZ110/400/900] ★	2051	8273	85
83	Input 1_FF amount [FZ110/400/900] ★	2052	8274	86
84	Input 1_Output limiter high [heat-side] [FZ110/400/900] ★	2053	8275	87
85	Input 1_Output limiter low [heat-side] [FZ110/400/900] ★	2054	8276	88
86	Input 1_Control loop break alarm (LBA) time [FZ110/400/900] ★	2055	8277	89

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

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
87	Input 1_LBA deadband (LBD) [FZ110/400/900] ★	2056	8278	90
88	Input 2_Proportional band [FZ400/900] ★	2057	8279	91
89	Input 2_Integral time [FZ400/900] ★	2058	8280	92
90	Input 2_Derivative time [FZ400/900] ★	2059	8281	93
91	Input 2_Control response parameter [FZ400/900] ★	205A	8282	84
92	Input 2_Proactive intensity [FZ400/900] ★	205B	8283	95
93	Input 2_Manual reset [FZ400/900] ★	205C	8284	96
94	Input 2_FF amount [FZ400/900] ★	205D	8285	97
95	Input 2_Output limiter high [FZ400/900] ★	205E	8286	98
96	Input 2_Output limiter low [FZ400/900] ★	205F	8287	99
97	Input 2_Control loop break alarm (LBA) time [FZ400/900] ★	2060	8288	100
98	Input 2_LBA deadband (LBD) [FZ400/900] ★	2061	8289	101
99	Input 1_Proportional band [cool-side] [FZ110/400/900] ★	2062	8290	102
100	Input 1_Integral time [cool-side] [FZ110/400/900] ★	2063	8291	103
101	Input 1_Derivative time [cool-side] [FZ110/400/900] ★	2064	8292	104
102	Input 1_Overlap/Deadband [FZ110/400/900] ★	2065	8293	105

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

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
103	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900] ★	2066	8294	106
104	Input 1_Output limiter low [cool-side] [FZ110/400/900] ★	2067	8295	107
105	Select Trigger type for Memory area transfer [FZ110/400/900] ★	2068	8296	108
106	Area soak time [FZ110/400/900] ★	2069	8297	109
107	Link area number [FZ110/400/900] ★	206A	8298	110
108	Input 1_Setting change rate limiter (up) [FZ110/400/900] ★	206B	8299	111
109	Input 1_Setting change rate limiter (down) [FZ110/400/900] ★	206C	8300	112
110	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900] ★	206D	8301	113
111	Input 1_Manipulated output value (Area) [FZ110/400/900] ★	206E	8302	114
112	Input 2_Setting change rate limiter (up) [FZ400/900] ★	206F	8303	115
113	Input 2_Setting change rate limiter (down) [FZ400/900] ★	2070	8304	116
114	Input 2_Auto/Manual transfer selection (Area) [FZ400/900] ★	2071	8305	117
115	Input 2_Manipulated output value (Area) [FZ400/900] ★	2072	8306	118
116	Remote/Local transfer selection (Area) [FZ110/400/900] ★	2073	8307	119

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

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
117	Display update cycle [FZ110/400/900]	2074	8308	120
118	Input 1_PV bias [FZ110/400/900]	2075	8309	121
119	Input 1_PV digital filter [FZ110/400/900]	2076	8310	122
120	Input 1_PV ratio [FZ110/400/900]	2077	8311	123
121	Input 1_PV low input cut-off [FZ110/400/900]	2078	8312	124
122	Input 2_PV bias (RS bias) [FZ110/400/900]	2079	8313	125
123	Input 2_PV digital filter (RS digital filter) [FZ110/400/900]	207A	8314	126
124	Input 2_PV ratio (RS ratio) [FZ110/400/900]	207B	8315	127
125	Input 2_PV low input cut-off [FZ400/900]	207C	8316	128
126	OUT1 proportional cycle time [FZ110/400/900]	207D	8317	129
127	OUT2 proportional cycle time [FZ110/400/900]	207E	8318	130
128	OUT3 proportional cycle time [FZ110/400/900]	207F	8319	131
129	OUT1 minimum ON/OFF time of proportional cycle [FZ110/400/900]	2080	8320	132
130	OUT2 minimum ON/OFF time of proportional cycle [FZ110/400/900]	2081	8321	133
131	OUT3 minimum ON/OFF time of proportional cycle [FZ110/400/900]	2082	8322	134
132	Heater break alarm 1 (HBA1) set value [FZ110/400/900]	2083	8323	135

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
133	Number of heater break alarm 1 (HBA1) delay times [FZ110/400/900]	2084	8324	136
134	Heater break alarm 2 (HBA2) set value [FZ400/900]	2085	8325	137
135	Number of heater break alarm 2 (HBA2) delay times [FZ400/900]	2086	8326	138
136	Input 1_Manual manipulated output value [FZ110/400/900]	2087	8327	139
137	Input 1_Level PID setting 1 [FZ110/400/900]	2088	8328	140
138	Input 1_Level PID setting 2 [FZ110/400/900]	2089	8329	141
139	Input 1_Level PID setting 3 [FZ110/400/900]	208A	8330	142
140	Input 1_Level PID setting 4 [FZ110/400/900]	208B	8331	143
141	Input 1_Level PID setting 5 [FZ110/400/900]	208C	8332	144
142	Input 1_Level PID setting 6 [FZ110/400/900]	208D	8333	145
143	Input 1_Level PID setting 7 [FZ110/400/900]	208E	8334	146
144	Input 1_ON/OFF action differential gap [FZ110/400/900]	208F	8335	147
145	Input 1_ON/OFF action differential gap (upper) [FZ110/400/900]	2090	8336	148
146	Input 1_ON/OFF action differential gap (lower) [FZ110/400/900]	2091	8337	149
147	Input 2_Manual manipulated output value [FZ400/900]	2092	8338	150
148	Input 2_Level PID setting 1 [FZ400/900]	2093	8339	151

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
149	Input 2_Level PID setting 2 [FZ400/900]	2094	8340	152
150	Input 2_Level PID setting 3 [FZ400/900]	2095	8341	153
151	Input 2_Level PID setting 4 [FZ400/900]	2096	8342	154
152	Input 2_Level PID setting 5 [FZ400/900]	2097	8343	155
153	Input 2_Level PID setting 6 [FZ400/900]	2098	8344	156
154	Input 2_Level PID setting 7 [FZ400/900]	2099	8345	157
155	Input 2_ON/OFF action differential gap [FZ400/900]	209A	8346	158
156	Input 2_ON/OFF action differential gap (upper) [FZ400/900]	209B	8347	159
157	Input 2_ON/OFF action differential gap (lower) [FZ400/900]	209C	8348	160
158	Input 1_AT bias [FZ110/400/900]	209D	8349	161
159	Input 2_AT bias [FZ400/900]	209E	8350	162
160	Open/Close output neutral zone [FZ110/400/900]	209F	8351	163
161	Open/Close output differential gap [FZ110/400/900]	20A0	8352	164
162	FF amount learning [FZ110/400/900]	20A1	8353	165
163	Input 1_Determination point of external disturbance [FZ110/400/900]	20A2	8354	166
164	Input 2_Determination point of external disturbance [FZ400/900]	20A3	8355	167

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
165	Cascade_Proportional band (master-side) [FZ400/900]	20A4	8356	168
166	Cascade_Integral time (master-side) [FZ400/900]	20A5	8357	169
167	Cascade_Derivative time (master-side) [FZ400/900]	20A6	8358	170
168	Cascade_Proportional band (slave-side) [FZ400/900]	20A7	8359	171
169	Cascade_Integral time (slave-side) [FZ400/900]	20A8	8360	172
170	Cascade_Derivative time (slave-side) [FZ400/900]	20A9	8361	173
171	Cascade_Digital filter [FZ400/900]	20AA	8362	174
172	Cascade_Scale high [FZ400/900]	20AB	8363	175
173	Cascade_Scale low [FZ400/900]	20AC	8364	176
174	PV select transfer level [FZ400/900]	20AD	8365	177
175	PV select transfer time [FZ400/900]	20AE	8366	178

Items 176 to 371 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	
176	STOP display selection [FZ110/400/900]	20AF	8367	180
177	ALM lamp lighting condition [FZ110/400/900]	20B0	8368	181
178	PV flashing display at input error [FZ110/400/900]	20B1	8369	182
179	Show/Hide Input 1_SV [FZ110/400/900]	20B2	8370	183
180	Show/Hide Input 2_SV [FZ400/900]	20B3	8371	184
181	Show/Hide Input 1_MV [FZ400/900]	20B4	8372	185
182	Show/Hide Input 2_MV [FZ400/900]	20B5	8373	186
183	Select hide items in Monitor mode [FZ110/400/900]	20B6	8374	187
184	Select hide items in Operation transfer mode [FZ110/400/900]	20B7	8375	188

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
185	Data registration [FZ110/400/900]	20B8	8376	189
186	FUNC key assignment [FZ400/900]	20B9	8377	190
187	FUNC key operation selection [FZ400/900]	20BA	8378	191
188	Input 1_Input type [FZ110/400/900]	20BB	8379	192
189	Input 1_Display unit [FZ110/400/900]	20BC	8380	193
190	Input 1_Decimal point position [FZ110/400/900]	20BD	8381	194
191	Input 1_Input range high [FZ110/400/900]	20BE	8382	195
192	Input 1_Input range low [FZ110/400/900]	20BF	8383	196
193	Input 1_Input error determination point (high) [FZ110/400/900]	20C0	8384	197

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
194	Input 1_Input error determination point (low) [FZ110/400/900]	20C1	8385	198
195	Input 1_Temperature compensation calculation [FZ110/400/900]	20C2	8386	199
196	Input 1_Burnout direction [FZ110/400/900]	20C3	8387	200
197	Input 1_Square root extraction [FZ110/400/900]	20C4	8388	201
198	Input 1_Inverting input [FZ110/400/900]	20C5	8389	202
199	Input data type [FZ110/400/900]	20C6	8390	203
200	Input 2_Input type [FZ110/400/900]	20C7	8391	204
201	Input 2_Display unit [FZ400/900]	20C8	8392	205
202	Input 2_Decimal point position [FZ400/900]	20C9	8393	206
203	Input 2_Input range high [FZ110/400/900]	20CA	8394	207
204	Input 2_Input range low [FZ110/400/900]	20CB	8395	208
205	Input 2_Input error determination point (high) [FZ400/900]	20CC	8396	209
206	Input 2_Input error determination point (low) [FZ400/900]	20CD	8397	210
207	Input 2_Temperature compensation calculation [FZ400/900]	20CE	8398	211
208	Input 2_Burnout direction [FZ400/900]	20CF	8399	212
209	Input 2_Square root extraction [FZ400/900]	20D0	8400	213

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
210	Input 2_Inverting input [FZ400/900]	20D1	8401	214
211	DI1 function selection [FZ110/400/900]	20D2	8402	215
212	DI2 function selection [FZ110/400/900]	20D3	8403	216
213	DI3 function selection [FZ110/400/900]	20D4	8404	217
214	DI4 function selection [FZ400/900]	20D5	8405	218
215	DI5 function selection [FZ400/900]	20D6	8406	219
216	DI6 function selection [FZ400/900]	20D7	8407	220
217	DI logic invert [FZ110/400/900]	20D8	8408	221
218	Area switching time (Without area set signal) [FZ110/400/900]	20D9	8409	222
219	OUT1 function selection [FZ110/400/900]	20DA	8410	223
220	OUT2 function selection [FZ110/400/900]	20DB	8411	224
221	OUT3 function selection [FZ110/400/900]	20DC	8412	225
222	OUT1 logic calculation selection [FZ110/400/900]	20DD	8413	226
223	OUT2 logic calculation selection [FZ110/400/900]	20DE	8414	227
224	OUT3 logic calculation selection [FZ110/400/900]	20DF	8415	228
225	Energized/De-energized selection [FZ110/400/900]	20E0	8416	229

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
226	Interlock selection [FZ110/400/900]	20E1	8417	230
227	Output action at control stop [FZ110/400/900]	20E2	8418	231
228	Universal output type selection (OUT3) [FZ110/400/900]	20E3	8419	232
229	Retransmission output 1 type [FZ110/400/900]	20E4	8420	233
230	Retransmission output 1 scale high [FZ110/400/900]	20E5	8421	234
231	Retransmission output 1 scale low [FZ110/400/900]	20E6	8422	235
232	Retransmission output 2 type [FZ110/400/900]	20E7	8423	236
233	Retransmission output 2 scale high [FZ110/400/900]	20E8	8424	237
234	Retransmission output 2 scale low [FZ110/400/900]	20E9	8425	238
235	Retransmission output 3 type [FZ110/400/900]	20EA	8426	239
236	Retransmission output 3 scale high [FZ110/400/900]	20EB	8427	240
237	Retransmission output 3 scale low [FZ110/400/900]	20EC	8428	241
238	DO1 function selection [FZ110/400/900]	20ED	8429	242
239	DO2 function selection [FZ110/400/900]	20EE	8430	243
240	DO3 function selection [FZ400/900]	20EF	8431	244
241	DO4 function selection [FZ400/900]	20F0	8432	245

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
242	DO1 logic calculation selection [FZ110/400/900]	20F1	8433	246
243	DO2 logic calculation selection [FZ110/400/900]	20F2	8434	247
244	DO3 logic calculation selection [FZ400/900]	20F3	8435	248
245	DO4 logic calculation selection [FZ400/900]	20F4	8436	249
246	Event 1 assignment [FZ400/900]	20F5	8437	250
247	Event 1 type [FZ110/400/900]	20F6	8438	251
248	Event 1 hold action [FZ110/400/900]	20F7	8439	252
249	Event 1 differential gap [FZ110/400/900]	20F8	8440	253
250	Event 1 timer [FZ110/400/900]	20F9	8441	254
251	Event 2 assignment [FZ400/900]	20FA	8442	255
252	Event 2 type [FZ110/400/900]	20FB	8443	256
253	Event 2 hold action [FZ110/400/900]	20FC	8444	257
254	Event 2 differential gap [FZ110/400/900]	20FD	8445	258
255	Event 2 timer [FZ110/400/900]	20FE	8446	259
256	Event 3 assignment [FZ400/900]	20FF	8447	260
257	Event 3 type [FZ110/400/900]	2100	8448	261

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
258	Event 3 hold action [FZ110/400/900]	2101	8449	262
259	Event 3 differential gap [FZ110/400/900]	2102	8450	263
260	Event 3 timer [FZ110/400/900]	2103	8451	264
261	Event 4 assignment [FZ400/900]	2104	8452	265
262	Event 4 type [FZ110/400/900]	2105	8453	266
263	Event 4 hold action [FZ110/400/900]	2106	8454	267
264	Event 4 differential gap [FZ110/400/900]	2107	8455	268
265	Event 4 timer [FZ110/400/900]	2108	8456	269
266	CT1 assignment [FZ110/400/900]	2109	8457	270
267	CT1 assignment [FZ110/400/900]	210A	8458	271
268	CT1 ratio [FZ110/400/900]	210B	8459	272
269	CT1 low input cut-off [FZ110/400/900]	210C	8460	273
270	CT2 assignment [FZ400/900]	210D	8461	274
271	CT2 type [FZ400/900]	210E	8462	275
272	CT2 ratio [FZ400/900]	210F	8463	276
273	CT2 low input cut-off [FZ400/900]	2110	8464	277

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
274	Hot/Cold start [FZ110/400/900]	2111	8465	278
275	Manual manipulated output value selection [FZ110/400/900]	2112	8466	279
276	SV tracking [FZ110/400/900]	2113	8467	280
277	Integral/Derivative time decimal point position [FZ110/400/900]	2114	8468	281
278	ST start condition [FZ110/400/900]	2115	8469	282
279	Input 1_Control action [FZ110/400/900]	2116	8470	283
280	Input 1_Output change rate limiter (up) [heat-side] [FZ110/400/900]	2117	8471	284
281	Input 1_Output change rate limiter (down) [heat-side] [FZ110/400/900]	2118	8472	285
282	Input 1_Action (high) input error [FZ110/400/900]	2119	8473	286
283	Input 1_Action (low) input error [FZ110/400/900]	211A	8474	287
284	Input 1_Manipulated output value at input error [FZ110/400/900]	211B	8475	288
285	Input 1_Manipulated output value at STOP [heat-side] [FZ110/400/900]	211C	8476	289
286	Input 1_Start determination point [FZ110/400/900]	211D	8477	290
287	Input 1_Level PID action selection [FZ110/400/900]	211E	8478	291
288	Input 1_Level PID differential gap [FZ110/400/900]	211F	8479	292
289	Input 2_Control action [FZ400/900]	2120	8480	293

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
290	Input 2_Output change rate limiter (up) [FZ400/900]	2121	8481	294
291	Input 2_Output change rate limiter (down) [FZ400/900]	2122	8482	295
292	Input 2_Action (high) input error [FZ400/900]	2123	8483	296
293	Input 2_Action (low) input error [FZ400/900]	2124	8484	297
294	Input 2_Manipulated output value at input error [FZ400/900]	2125	8485	298
295	Input 2_Manipulated output value at STOP [FZ400/900]	2126	8486	299
296	Input 2_Start determination point [FZ400/900]	2127	8487	300
297	Input 2_Level PID action selection [FZ400/900]	2128	8488	301
298	Input 2_Level PID differential gap [FZ400/900]	2129	8489	302
299	Action at feedback resistance (FBR) input error [FZ110/400/900]	212A	8490	303
300	Feedback adjustment [FZ400/900]	212B	8491	304
301	Control motor time [FZ110/400/900]	212C	8492	305
302	Integrated output limiter [FZ110/400/900]	212D	8493	306
303	Valve action at STOP [FZ110/400/900]	212E	8494	307
304	Action at saturated output [FZ400/900]	212F	8495	308
305	Input 1_Output change rate limiter (up) [cool-side] [FZ110/400/900]	2130	8496	309

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
306	Input 1_Output change rate limiter (down) [cool-side] [FZ110/400/900]	2131	8497	310
307	Input 1_Manipulated output value at STOP [cool-side] [FZ110/400/900]	2132	8498	311
308	Undershoot suppression factor [FZ110/400/900]	2133	8499	312
309	Overlap/Deadband reference point [FZ110/400/900]	2134	8500	313
310	Bottom suppression function [FZ110/400/900]	2135	8501	314
311	Select function for input 2 [FZ110/400/900]	2136	8502	315
312	Cascade_AT mode (master-side) [FZ400/900]	2137	8503	316
313	Cascade_AT mode (slave-side) [FZ400/900]	2138	8504	317
314	Selection of PV select trigger [FZ400/900]	2139	8505	318
315	Input circuit error alarm set value [FZ400/900]	213A	8506	319
316	Communication protocol [FZ110/400/900]	213B	8507	320
317	Device address [FZ110/400/900]	213C	8508	321
318	Communication speed [FZ110/400/900]	213D	8509	322
319	Data bit configuration [FZ110/400/900]	213E	8510	323
320	Interval time [FZ110/400/900]	213F	8511	324
321	Register type [FZ110/400/900]	2140	8512	325

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
322	Register start number (High-order 4-bit) [FZ110/400/900]	2141	8513	326
323	Register start number (Low-order 16-bit) [FZ110/400/900]	2142	8514	327
324	Monitor item register bias [FZ110/400/900]	2143	8515	328
325	Setting item register bias [FZ110/400/900]	2144	8516	329
326	Instrument link recognition time [FZ110/400/900]	2145	8517	330
327	PLC response waiting time [FZ110/400/900]	2146	8518	331
328	PLC communication start time [FZ110/400/900]	2147	8519	332
329	Slave register bias [FZ110/400/900]	2148	8520	333
330	Number of recognizable devices [FZ110/400/900]	2149	8521	334
331	Station number [FZ110/400/900]	214A	8522	335
332	PC number [FZ110/400/900]	214B	8523	336
333	Monitor item selection 1 [FZ110/400/900]	214C	8524	337
334	Monitor item selection 2 [FZ110/400/900]	214D	8525	338
335	Monitor item selection 3 [FZ110/400/900]	214E	8526	339
336	Setting item selection 1 [FZ110/400/900]	214F	8527	340
337	Setting item selection 2 [FZ110/400/900]	2150	8528	341

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
338	Setting item selection 3 [FZ110/400/900]	2151	8529	342
339	Setting item selection 4 [FZ110/400/900]	2152	8530	343
340	Setting item selection 5 [FZ110/400/900]	2153	8531	344
341	Setting item selection 6 [FZ110/400/900]	2154	8532	345
342	Setting item selection 7 [FZ110/400/900]	2155	8533	346
343	Setting item selection 8 [FZ110/400/900]	2156	8534	347
344	Setting change rate limiter unit time [FZ110/400/900]	2157	8535	348
345	Soak time unit [FZ110/400/900]	2158	8536	349
346	Input 1_Setting limiter high [FZ110/400/900]	2159	8537	350
347	Input 1_Setting limiter low [FZ110/400/900]	215A	8538	351
348	Input 2_Setting limiter high [FZ400/900]	215B	8539	352
349	Input 2_Setting limiter low [FZ400/900]	215C	8540	353
350	Initialization [FZ110/400/900]	215D	8541	354
351	Set data unlock/lock transfer [FZ110/400/900]	215E	8542	355
352	Set lock level [FZ110/400/900]	215F	8543	356
353	Area lock [FZ400/900]	2160	8544	357

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
354	Select Blind function [FZ110/400/900]	2161	8545	358
355	Parameter select direct registration [FZ110/400/900]	2162	8546	359
356	Parameter select setting 1 [FZ110/400/900]	2163	8547	360
357	Parameter select setting 2 [FZ110/400/900]	2164	8548	361
358	Parameter select setting 3 [FZ110/400/900]	2165	8549	362
359	Parameter select setting 4 [FZ110/400/900]	2166	8550	363
360	Parameter select setting 5 [FZ110/400/900]	2167	8551	364
361	Parameter select setting 6 [FZ110/400/900]	2168	8552	365
362	Parameter select setting 7 [FZ110/400/900]	2169	8553	366
363	Parameter select setting 8 [FZ110/400/900]	216A	8554	367
364	Parameter select setting 9 [FZ110/400/900]	216B	8555	368
365	Parameter select setting 10 [FZ110/400/900]	216C	8556	369
366	Parameter select setting 11 [FZ110/400/900]	216D	8557	370
367	Parameter select setting 12 [FZ110/400/900]	216E	8558	371
368	Parameter select setting 13 [FZ110/400/900]	216F	8559	372
369	Parameter select setting 14 [FZ110/400/900]	2170	8560	373

No.	Name	Register address		6.3.1 Reference No.
		HEX	DEC	
370	Parameter select setting 15 [FZ110/400/900]	2171	8561	374
371	Parameter select setting 16 [FZ110/400/900]	2172	8562	375

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

Register addresses 2500H to 282FH 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.6-76)**, **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 6 data

No.	Name	Memory area 1		Memory area 2		Memory area 3		Memory area 4		Memory area 5		Memory area 6		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
1	Input 1_Set value (SV) [FZ110/400/900]	2500	9472	2533	9523	2566	9574	2599	9625	25CC	9676	25FF	9727	1
2	Input 2_Set value (SV) [FZ400/900]	2501	9473	2534	9524	2567	9575	259A	9626	25CD	9677	2600	9728	2
3	Set value (SV) of differential temperature input [FZ400/900]	2502	9474	2535	9525	2568	9576	259B	9627	25CE	9678	2601	9729	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900]	2503	9475	2536	9526	2569	9577	259C	9628	25CF	9679	2602	9730	4
5	Event 1 set value (EV1') [low] [FZ110/400/900]	2504	9476	2537	9527	256A	9578	259D	9629	25D0	9680	2603	9731	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	2505	9477	2538	9528	256B	9579	259E	9630	25D1	9681	2604	9732	6
7	Event 2 set value (EV2') [low] [FZ110/400/900]	2506	9478	2539	9529	256C	9580	259F	9631	25D2	9682	2605	9733	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900]	2507	9479	253A	9530	256D	9581	25A0	9632	25D3	9683	2606	9734	8
9	Event 3 set value (EV3') [low] [FZ110/400/900]	2508	9480	253B	9531	256E	9582	25A1	9633	25D4	9684	2607	9735	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	2509	9481	253C	9532	256F	9583	25A2	9634	25D5	9685	2608	9736	10

No.	Name	Memory area 1		Memory area 2		Memory area 3		Memory area 4		Memory area 5		Memory area 6		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
11	Event 4 set value (EV4') [low] [FZ110/400/900]	250A	9482	253D	9533	2570	9584	25A3	9635	25D6	9686	2609	9737	11
12	Input 1_Proportional band [heat-side] [FZ110/400/900]	250B	9483	253E	9534	2571	9585	25A4	9636	25D7	9687	260A	9738	12
13	Input 1_Integral time [heat-side] [FZ110/400/900]	250C	9484	253F	9535	2572	9586	25A5	9637	25D8	9688	260B	9739	13
14	Input 1_Derivative time [heat-side] [FZ110/400/900]	250D	9485	2540	9536	2573	9587	25A6	9638	25D9	9689	260C	9740	14
15	Input 1_Control response parameter [FZ110/400/900]	250E	9486	2541	9537	2574	9588	25A7	9639	25DA	9690	260D	9741	15
16	Input 1_Proactive intensity [FZ110/400/900]	250F	9487	2542	9538	2575	9589	25A8	9640	25DB	9691	260E	9742	16
17	Input 1_Manual reset [FZ110/400/900]	2510	9488	2543	9539	2576	9590	25A9	9641	25DC	9692	260F	9743	17
18	Input 1_FF amount [FZ110/400/900]	2511	9489	2544	9540	2577	9591	25AA	9642	25DD	9693	2610	9744	18
19	Input 1_Output limiter high [heat-side] [FZ110/400/900]	2512	9490	2545	9541	2578	9592	25AB	9643	25DE	9694	2611	9745	19
20	Input 1_Output limiter low [heat-side] [FZ110/400/900]	2513	9491	2546	9542	2579	9593	25AC	9644	25DF	9695	2612	9746	20
21	Input 1_Control loop break alarm (LBA) time [FZ110/400/900]	2514	9492	2547	9543	257A	9594	25AD	9645	25E0	9696	2613	9747	21
22	Input 1_LBA deadband (LBD) [FZ110/400/900]	2515	9493	2548	9544	257B	9595	25AE	9646	25E1	9697	2614	9748	22
23	Input 2_Proportional band [FZ400/900]	2516	9494	2549	9545	257C	9596	25AF	9647	25E2	9698	2615	9749	23
24	Input 2_Integral time [FZ400/900]	2517	9495	254A	9546	257D	9597	25B0	9648	25E3	9699	2616	9750	24
25	Input 2_Derivative time [FZ400/900]	2518	9496	254B	9547	257E	9598	25B1	9649	25E4	9700	2617	9751	25

No.	Name	Memory area 1		Memory area 2		Memory area 3		Memory area 4		Memory area 5		Memory area 6		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
26	Input 2_Control response parameter [FZ400/900]	2519	9497	254C	9548	257F	9599	25B2	9650	25E5	9701	2618	9752	26
27	Input 2_Proactive intensity [FZ400/900]	251A	9498	254D	9549	2580	9600	25B3	9651	25E6	9702	2619	9753	27
28	Input 2_Manual reset [FZ400/900]	251B	9499	254E	9550	2581	9601	25B4	9652	25E7	9703	261A	9754	28
29	Input 2_FF amount [FZ400/900]	251C	9500	254F	9551	2582	9602	25B5	9653	25E8	9704	261B	9755	29
30	Input 2_Output limiter high [FZ400/900]	251D	9501	2550	9552	2583	9603	25B6	9654	25E9	9705	261C	9756	30
31	Input 2_Output limiter low [FZ400/900]	251E	9502	2551	9553	2584	9604	25B7	9655	25EA	9706	261D	9757	31
32	Input 2_Control loop break alarm (LBA) time [FZ400/900]	251F	9503	2552	9554	2585	9605	25B8	9656	25EB	9707	261E	9758	32
33	Input 2_LBA deadband (LBD) [FZ400/900]	2520	9504	2553	9555	2586	9606	25B9	9657	25EC	9708	261F	9759	33
34	Input 1_Proportional band [cool-side] [FZ110/400/900]	2521	9505	2554	9556	2587	9607	25BA	9658	25ED	9709	2620	9760	34
35	Input 1_Integral time [cool-side] [FZ110/400/900]	2522	9506	2555	9557	2588	9608	25BB	9659	25EE	9710	2621	9761	35
36	Input 1_Derivative time [cool-side] [FZ110/400/900]	2523	9507	2556	9558	2589	9609	25BC	9660	25EF	9711	2622	9762	36
37	Input 1_Overlap/Deadband [FZ110/400/900]	2524	9508	2557	9559	258A	9610	25BD	9661	25F0	9712	2623	9763	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900]	2525	9509	2558	9560	258B	9611	25BE	9662	25F1	9713	2624	9764	38
39	Input 1_Output limiter low [cool-side] [FZ110/400/900]	2526	9510	2559	9561	258C	9612	25BF	9663	25F2	9714	2625	9765	39
40	Select Trigger type for Memory area transfer [FZ110/400/900]	2527	9511	255A	9562	258D	9613	25C0	9664	25F3	9715	2626	9766	40

No.	Name	Memory area 1		Memory area 2		Memory area 3		Memory area 4		Memory area 5		Memory area 6		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
41	Area soak time [FZ110/400/900]	2528	9512	255B	9563	258E	9614	25C1	9665	25F4	9716	2627	9767	41
42	Link area number [FZ110/400/900]	2529	9513	255C	9564	258F	9615	25C2	9666	25F5	9717	2628	9768	42
43	Input 1_Setting change rate limiter (up) [FZ110/400/900]	252A	9514	255D	9565	2590	9616	25C3	9667	25F6	9718	2629	9769	43
44	Input 1_Setting change rate limiter (down) [FZ110/400/900]	252B	9515	255E	9566	2591	9617	25C4	9668	25F7	9719	262A	9770	44
45	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	252C	9516	255F	9567	2592	9618	25C5	9669	25F8	9720	262B	9771	45
46	Input 1_Manipulated output value (Area) [FZ110/400/900]	252D	9517	2560	9568	2593	9619	25C6	9670	25F9	9721	262C	9772	46
47	Input 2_Setting change rate limiter (up) [FZ400/900]	252E	9518	2561	9569	2594	9620	25C7	9671	25FA	9722	262D	9773	47
48	Input 2_Setting change rate limiter (down) [FZ400/900]	252F	9519	2562	9570	2595	9621	25C8	9672	25FB	9723	262E	9774	48
49	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]	2530	9520	2563	9571	2596	9622	25C9	9673	25FC	9724	262F	9775	49
50	Input 2_Manipulated output value (Area) [FZ400/900]	2531	9521	2564	9572	2597	9623	25CA	9674	25FD	9725	2630	9776	50
51	Remote/Local transfer selection (Area) [FZ110/400/900]	2532	9522	2565	9573	2598	9624	25CB	9675	25FE	9726	2631	9777	51

■ Memory area 7 to 12 data

No.	Name	Memory area 7		Memory area 8		Memory area 9		Memory area 10		Memory area 11		Memory area 12		6.3.2 Reference No.
		Register address		Register address		Registeraddress		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
1	Input 1_Set value (SV) [FZ110/400/900]	2632	9778	2665	9829	2698	9880	26CB	9931	26FE	9982	2731	10033	1
2	Input 2_Set value (SV) [FZ400/900]	2633	9779	2666	9830	2699	9881	26CC	9932	26FF	9983	2732	10034	2
3	Set value (SV) of differential temperature input [FZ400/900]	2634	9780	2667	9831	269A	9882	26CD	9933	2700	9984	2733	10035	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900]	2635	9781	2668	9832	269B	9883	26CE	9934	2701	9985	2734	10036	4
5	Event 1 set value (EV1') [low] [FZ110/400/900]	2636	9782	2669	9833	269C	9884	26CF	9935	2702	9986	2735	10037	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	2637	9783	266A	9834	269D	9885	26D0	9936	2703	9987	2736	10038	6
7	Event 2 set value (EV2') [low] [FZ110/400/900]	2638	9784	266B	9835	269E	9886	26D1	9937	2704	9988	2737	10039	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900]	2639	9785	266C	9836	269F	9887	26D2	9938	2705	9989	2738	10040	8
9	Event 3 set value (EV3') [low] [FZ110/400/900]	263A	9786	266D	9837	26A0	9888	26D3	9939	2706	9990	2739	10041	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	263B	9787	266E	9838	26A1	9889	26D4	9940	2707	9991	273A	10042	10
11	Event 4 set value (EV4') [low] [FZ110/400/900]	263C	9788	266F	9839	26A2	9890	26D5	9941	2708	9992	273B	10043	11
12	Input 1_Proportional band [heat-side] [FZ110/400/900]	263D	9789	2670	9840	26A3	9891	26D6	9942	2709	9993	273C	10044	12
13	Input 1_Integral time [heat-side] [FZ110/400/900]	263E	9790	2671	9841	26A4	9892	26D7	9943	270A	9994	273D	10045	13

No.	Name	Memory area 7		Memory area 8		Memory area 9		Memory area 10		Memory area 11		Memory area 12		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
14	Input 1_Derivative time [heat-side] [FZ110/400/900]	263F	9791	2672	9842	26A5	9893	26D8	9944	270B	9995	273E	10046	14
15	Input 1_Control response parameter [FZ110/400/900]	2640	9792	2673	9843	26A6	9894	26D9	9945	270C	9996	273F	10047	15
16	Input 1_Proactive intensity [FZ110/400/900]	2641	9793	2674	9844	26A7	9895	26DA	9946	270D	9997	2740	10048	16
17	Input 1_Manual reset [FZ110/400/900]	2642	9794	2675	9845	26A8	9896	26DB	9947	270E	9998	2741	10049	17
18	Input 1_FF amount [FZ110/400/900]	2643	9795	2676	9846	26A9	9897	26DC	9948	270F	9999	2742	10050	18
19	Input 1_Output limiter high [heat-side] [FZ110/400/900]	2644	9796	2677	9847	26AA	9898	26DD	9949	2710	10000	2743	10051	19
20	Input 1_Output limiter low [heat-side] [FZ110/400/900]	2645	9797	2678	9848	26AB	9899	26DE	9950	2711	10001	2744	10052	20
21	Input 1_Control loop break alarm (LBA) time [FZ110/400/900]	2646	9798	2679	9849	26AC	9900	26DF	9951	2712	10002	2745	10053	21
22	Input 1_LBA deadband (LBD) [FZ110/400/900]	2647	9799	267A	9850	26AD	9901	26E0	9952	2713	10003	2746	10054	22
23	Input 2_Proportional band [FZ400/900]	2648	9800	267B	9851	26AE	9902	26E1	9953	2714	10004	2747	10055	23
24	Input 2_Integral time [FZ400/900]	2649	9801	267C	9852	26AF	9903	26E2	9954	2715	10005	2748	10056	24
25	Input 2_Derivative time [FZ400/900]	264A	9802	267D	9853	26B0	9904	26E3	9955	2716	10006	2749	10057	25
26	Input 2_Control response parameter [FZ400/900]	264B	9803	267E	9854	26B1	9905	26E4	9956	2717	10007	274A	10058	26
27	Input 2_Proactive intensity [FZ400/900]	264C	9804	267F	9855	26B2	9906	26E5	9957	2718	10008	274B	10059	27
28	Input 2_Manual reset [FZ400/900]	264D	9805	2680	9856	26B3	9907	26E6	9958	2719	10009	274C	10060	28

No.	Name	Memory area 7		Memory area 8		Memory area 9		Memory area 10		Memory area 11		Memory area 12		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
29	Input 2_FF amount [FZ400/900]	264E	9806	2681	9857	26B4	9908	26E7	9959	271A	10010	274D	10061	29
30	Input 2_Output limiter high [FZ400/900]	264F	9807	2682	9858	26B5	9909	26E8	9960	271B	10011	274E	10062	30
31	Input 2_Output limiter low [FZ400/900]	2650	9808	2683	9859	26B6	9910	26E9	9961	271C	10012	274F	10063	31
32	Input 2_Control loop break alarm (LBA) time [FZ400/900]	2651	9809	2684	9860	26B7	9911	26EA	9962	271D	10013	2750	10064	32
33	Input 2_LBA deadband (LBD) [FZ400/900]	2652	9810	2685	9861	26B8	9912	26EB	9963	271E	10014	2751	10065	33
34	Input 1_Proportional band [cool-side] [FZ110/400/900]	2653	9811	2686	9862	26B9	9913	26EC	9964	271F	10015	2752	10066	34
35	Input 1_Integral time [cool-side] [FZ110/400/900]	2654	9812	2687	9863	26BA	9914	26ED	9965	2720	10016	2753	10067	35
36	Input 1_Derivative time [cool-side] [FZ110/400/900]	2655	9813	2688	9864	26BB	9915	26EE	9966	2721	10017	2754	10068	36
37	Input 1_Overlap/Deadband [FZ110/400/900]	2656	9814	2689	9865	26BC	9916	26EF	9967	2722	10018	2755	10069	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900]	2657	9815	268A	9866	26BD	9917	26F0	9968	2723	10019	2756	10070	38
39	Input 1_Output limiter low [cool-side] [FZ110/400/900]	2658	9816	268B	9867	26BE	9918	26F1	9969	2724	10020	2757	10071	39
40	Select Trigger type for Memory area transfer [FZ110/400/900]	2659	9817	268C	9868	26BF	9919	26F2	9970	2725	10021	2758	10072	40
41	Area soak time [FZ110/400/900]	265A	9818	268D	9869	26C0	9920	26F3	9971	2726	10022	2759	10073	41
42	Link area number [FZ110/400/900]	265B	9819	268E	9870	26C1	9921	26F4	9972	2727	10023	275A	10074	42
43	Input 1_Setting change rate limiter (up) [FZ110/400/900]	265C	9820	268F	9871	26C2	9922	26F5	9973	2728	10024	275B	10075	43

No.	Name	Memory area 7		Memory area 8		Memory area 9		Memory area 10		Memory area 11		Memory area 12		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
44	Input 1_Setting change rate limiter (down) [FZ110/400/900]	265D	9821	2690	9872	26C3	9923	26F6	9974	2729	10025	275C	10076	44
45	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	265E	9822	2691	9873	26C4	9924	26F7	9975	272A	10026	275D	10077	45
46	Input 1_Manipulated output value (Area) [FZ110/400/900]	265F	9823	2692	9874	26C5	9925	26F8	9976	272B	10027	275E	10078	46
47	Input 2_Setting change rate limiter (up) [FZ400/900]	2660	9824	2693	9875	26C6	9926	26F9	9977	272C	10028	275F	10079	47
48	Input 2_Setting change rate limiter (down) [FZ400/900]	2661	9825	2694	9876	26C7	9927	26FA	9978	272D	10029	2760	10080	48
49	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]	2662	9826	2695	9877	26C8	9928	26FB	9979	272E	10030	2761	10081	49
50	Input 2_Manipulated output value (Area) [FZ400/900]	2663	9827	2696	9878	26C9	9929	26FC	9980	272F	10031	2762	10082	50
51	Remote/Local transfer selection (Area) [FZ110/400/900]	2664	9828	2697	9879	26CA	9930	26FD	9981	2730	10032	2763	10083	51

■ Memory area 13 to 16 data

No.	Name	Memory area 13		Memory area 14		Memory area 15		Memory area 16		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
1	Input 1_Set value (SV) [FZ110/400/900]	2764	10084	2797	10135	27CA	10186	27FD	10237	1
2	Input 2_Set value (SV) [FZ400/900]	2765	10085	2798	10136	27CB	10187	27FE	10238	2
3	Set value (SV) of differential temperature input [FZ400/900]	2766	10086	2799	10137	27CC	10188	27FF	10239	3
4	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900]	2767	10087	279A	10138	27CD	10189	2800	10240	4
5	Event 1 set value (EV1') [low] [FZ110/400/900]	2768	10088	279B	10139	27CE	10190	2801	10241	5
6	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	2769	10089	279C	10140	27CF	10191	2802	10242	6
7	Event 2 set value (EV2') [low] [FZ110/400/900]	276A	10090	279D	10141	27D0	10192	2803	10243	7
8	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900]	276B	10091	279E	10142	27D1	10193	2804	10244	8
9	Event 3 set value (EV3') [low] [FZ110/400/900]	276C	10092	279F	10143	27D2	10194	2805	10245	9
10	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	276D	10093	27A0	10144	27D3	10195	2806	10246	10
11	Event 4 set value (EV4') [low] [FZ110/400/900]	276E	10094	27A1	10145	27D4	10196	2807	10247	11
12	Input 1_Proportional band [heat-side] [FZ110/400/900]	276F	10095	27A2	10146	27D5	10197	2808	10248	12
13	Input 1_Integral time [heat-side] [FZ110/400/900]	2770	10096	27A3	10147	27D6	10198	2809	10249	13

No.	Name	Memory area 13		Memory area 14		Memory area 15		Memory area 16		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
14	Input 1_Derivative time [heat-side] [FZ110/400/900]	2771	10097	27A4	10148	27D7	10199	280A	10250	14
15	Input 1_Control response parameter [FZ110/400/900]	2772	10098	27A5	10149	27D8	10200	280B	10251	15
16	Input 1_Proactive intensity [FZ110/400/900]	2773	10099	27A6	10150	27D9	10201	280C	10252	16
17	Input 1_Manual reset [FZ110/400/900]	2774	10100	27A7	10151	27DA	10202	280D	10253	17
18	Input 1_FF amount [FZ110/400/900]	2775	10101	27A8	10152	27DB	10203	280E	10254	18
19	Input 1_Output limiter high [heat-side] [FZ110/400/900]	2776	10102	27A9	10153	27DC	10204	280F	10255	19
20	Input 1_Output limiter low [heat-side] [FZ110/400/900]	2777	10103	27AA	10154	27DD	10205	2810	10256	20
21	Input 1_Control loop break alarm (LBA) time [FZ110/400/900]	2778	10104	27AB	10155	27DE	10206	2811	10257	21
22	Input 1_LBA deadband (LBD) [FZ110/400/900]	2779	10105	27AC	10156	27DF	10207	2812	10258	22
23	Input 2_Proportional band [FZ400/900]	277A	10106	27AD	10157	27E0	10208	2813	10259	23
24	Input 2_Integral time [FZ400/900]	277B	10107	27AE	10158	27E1	10209	2814	10260	24
25	Input 2_Derivative time [FZ400/900]	277C	10108	27AF	10159	27E2	10210	2815	10261	25
26	Input 2_Control response parameter [FZ400/900]	277D	10109	27B0	10160	27E3	10211	2816	10262	26
27	Input 2_Proactive intensity [FZ400/900]	277E	10110	27B1	10161	27E4	10212	2817	10263	27
28	Input 2_Manual reset [FZ400/900]	277F	10111	27B2	10162	27E5	10213	2818	10264	28

No.	Name	Memory area 13		Memory area 14		Memory area 15		Memory area 16		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
29	Input 2_FF amount [FZ400/900]	2780	10112	27B3	10163	27E6	10214	2819	10265	29
30	Input 2_Output limiter high [FZ400/900]	2781	10113	27B4	10164	27E7	10215	281A	10266	30
31	Input 2_Output limiter low [FZ400/900]	2782	10114	27B5	10165	27E8	10216	281B	10267	31
32	Input 2_Control loop break alarm (LBA) time [FZ400/900]	2783	10115	27B6	10166	27E9	10217	281C	10268	32
33	Input 2_LBA deadband (LBD) [FZ400/900]	2784	10116	27B7	10167	27EA	10218	281D	10269	33
34	Input 1_Proportional band [cool-side] [FZ110/400/900]	2785	10117	27B8	10168	27EB	10219	281E	10270	34
35	Input 1_Integral time [cool-side] [FZ110/400/900]	2786	10118	27B9	10169	27EC	10220	281F	10271	35
36	Input 1_Derivative time [cool-side] [FZ110/400/900]	2787	10119	27BA	10170	27ED	10221	2820	10272	36
37	Input 1_Overlap/Deadband [FZ110/400/900]	2788	10120	27BB	10171	27EE	10222	2821	10273	37
38	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900]	2789	10121	27BC	10172	27EF	10223	2822	10274	38
39	Input 1_Output limiter low [cool-side] [FZ110/400/900]	278A	10122	27BD	10173	27F0	10224	2823	10275	39
40	Select Trigger type for Memory area transfer [FZ110/400/900]	278B	10123	27BE	10174	27F1	10225	2824	10276	40
41	Area soak time [FZ110/400/900]	278C	10124	27BF	10175	27F2	10226	2825	10277	41
42	Link area number [FZ110/400/900]	278D	10125	27C0	10176	27F3	10227	2826	10278	42
43	Input 1_Setting change rate limiter (up) [FZ110/400/900]	278E	10126	27C1	10177	27F4	10228	2827	10279	43

No.	Name	Memory area 13		Memory area 14		Memory area 15		Memory area 16		6.3.2 Reference No.
		Register address		Register address		Register address		Register address		
		HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	
44	Input 1_Setting change rate limiter (down) [FZ110/400/900]	278F	10127	27C2	10178	27F5	10229	2828	10280	44
45	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	2790	10128	27C3	10179	27F6	10230	2829	10281	45
46	Input 1_Manipulated output value (Area) [FZ110/400/900]	2791	10129	27C4	10180	27F7	10231	282A	10282	46
47	Input 2_Setting change rate limiter (up) [FZ400/900]	2792	10130	27C5	10181	27F8	10232	282B	10283	47
48	Input 2_Setting change rate limiter (down) [FZ400/900]	2793	10131	27C6	10182	27F9	10233	282C	10284	48
49	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]	2794	10132	27C7	10183	27FA	10234	282D	10285	49
50	Input 2_Manipulated output value (Area) [FZ400/900]	2795	10133	27C8	10184	27FB	10235	282E	10286	50
51	Remote/Local transfer selection (Area) [FZ110/400/900]	2796	10134	27C9	10185	27FC	10236	282F	10287	51

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 FZ110/400/900 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



NOTE

Register address for data designation 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		Attribute	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

No.	Name	Register address		Attribute	Data range	Factory set value
		HEX	DEC			
16	Register address setting 16 [Read/write address: 150FH]	100F	4111	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 4FFFFH (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
17	Register address setting 17 [Read/write address: 1510H]	1010	4112	R/W		–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		Attribute	Data range	Factory set value
		HEX	DEC			
1	Data specified Register address setting 1 (1000H)	1500	5376	Based on the data specified at 1000H to 101FH.		
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			
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		Attribute	Data range	Factory set value
		HEX	DEC			
23	Data specified Register address setting 23 (1016H)	1516	5398	Based on the data specified at 1000H to 101FH.		
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			
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 FZ110/400/900 Communication data [RKC communication identifier/Modbus double word] (P. 6-9)**.

The “FB series equivalent communication data” means the data of our FB series controllers compatible with the data of FZ110/400/900.



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 FZ110/400/900:	HEX	DEC	
1	Measured value (PV)	Input 1_Measured value (PV) [FZ110/400/900]	0000	0	1
2	Current transformer 1 (CT1) input value monitor	Current transformer 1 (CT1) input value monitor [FZ110/400/900]	0001	1	11
3	Current transformer 2 (CT2) input value monitor	Current transformer 2 (CT2) input value monitor [FZ400/900]	0002	2	12
4	Set value (SV) monitor	Input 1_Set value (SV) monitor [FZ110/400/900]	0003	3	2
5	Remote setting (RS) input value monitor	Remote setting input value monitor [FZ110/400/900]	0004	4	14
6	Burnout state monitor	Input 1_Burnout state monitor [FZ110/400/900]	0005	5	25
7	Burnout state monitor of feedback resistance input	Feedback resistance (FBR) break monitor [FZ110/400/900]	0006	6	27
8	Event 1 state monitor	Event 1 state monitor [FZ110/400/900]	0007	7	16
9	Event 2 state monitor	Event 2 state monitor [FZ110/400/900]	0008	8	17
10	Event 3 state monitor	Event 3 state monitor [FZ110/400/900]	0009	9	18

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
11	Event 4 state monitor	Event 4 state monitor [FZ110/400/900]	000A	10	19
12	Heater break alarm 1 (HBA1) state monitor	Heater break alarm 1 (HBA1) state monitor [FZ110/400/900]	000B	11	20
13	Heater break alarm 2 (HBA2) state monitor	Heater break alarm 2 (HBA2) state monitor [FZ400/900]	000C	12	21
14	Manipulated output value (MV1) monitor [heat-side]	Input 1_Manipulated output value monitor [heat-side] [FZ110/400/900]	000D	13	8
15	Manipulated output value (MV2) monitor [cool-side]	Input 1_Manipulated output value monitor [cool-side] [FZ110/400/900]	000E	14	9
16	Error code	Error code [FZ110/400/900]	000F	15	42
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 [FZ110/400/900]	0013	19	13
21	Integrated operating time monitor	Integrated operating time [FZ110/400/900]	0014	20	43
22	Holding peak value ambient temperature monitor	Peak hold monitor of ambient temperature [FZ110/400/900]	0015	21	44
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	—

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
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) [FZ110/400/900]	0020	32	61
34	Auto/Manual transfer	Input 1_Auto/Manual transfer [FZ110/400/900]	0021	33	65
35	Remote/Local transfer	When Select function for input 2 is: “Remote setting input” [FZ400/900] Remote/Local transfer When Remote setting input is specified [FZ110] Remote/Local transfer When Select function for input 2 is: “Control with PV select” [FZ400/900] Input transfer of Control with PV select When Select function for input 2 is: “2-loop control/Differential temperature control” [FZ400/900] 2-loop control/Differential temperature control When Select function for input 2 is: “Cascade control” [FZ400/900] Cascade mode transfer	0022	34	67
36	RUN/STOP transfer	RUN/STOP transfer [FZ110/400/900]	0023	35	60
37	Memory area transfer	Memory area transfer [FZ110/400/900]	0024	36	56
38	Interlock release	Interlock release [FZ110/400/900]	0025	37	55
39	Event 1 set value (EV1)	Event 1 set value (EV1) [FZ110/400/900] When Event 1 type is either high or low limit with individual setting [FZ110/400/900] Event 1 set value (EV1) [high]	0026	38	72

★ 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 FZ110/400/900:	HEX	DEC	
40	Event 2 set value (EV2) ★	Event 2 set value (EV2) [FZ110/400/900] ★ When Event 2 type is either high or low limit with individual setting [FZ110/400/900] Event 2 set value (EV2) [high] ★	0027	39	74
41	Event 3 set value (EV3) ★	Event 3 set value (EV3) [FZ110/400/900] ★ When Event 3 type is either high or low limit with individual setting [FZ110/400/900] Event 3 set value (EV3) [high] ★	0028	40	76
42	Event 4 set value (EV4) ★	Event 4 set value (EV4) [FZ110/400/900] ★ When Event 4 type is either high or low limit with individual setting [FZ110/400/900] Event 4 set value (EV4) [high] ★	0029	41	78
43	Control loop break alarm (LBA) time ★	Input 1_Control loop break alarm (LBA) time [FZ110/400/900] ★	002A	42	89
44	LBA deadband ★	Input 1_LBA deadband (LBD) [FZ110/400/900] ★	002B	43	90
45	Set value (SV) ★	Input 1_Set value (SV) [FZ110/400/900] ★	002C	44	69
46	Proportional band [heat-side] ★	Input 1_Proportional band [heat-side] [FZ110/400/900] ★	002D	45	80
47	Integral time [heat-side] ★	Input 1_Integral time [heat-side] [FZ110/400/900] ★	002E	46	81
48	Derivative time [heat-side] ★	Input 1_Derivative time [heat-side] [FZ110/400/900] ★	002F	47	82
49	Control response parameter ★	Input 1_Control response parameter [FZ110/400/900] ★	0030	48	83
50	Proportional band [cool-side] ★	Input 1_Proportional band [cool-side] [FZ110/400/900] ★	0031	49	102
51	Integral time [cool-side] ★	Input 1_Integral time [cool-side] [FZ110/400/900] ★	0032	50	103

★ 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 FZ110/400/900:	HEX	DEC	
52	Derivative time [cool-side] ★	Input 1_Derivative time [cool-side] [FZ110/400/900] ★	0033	51	104
53	Overlap/Deadband ★	Input 1_Overlap/Deadband [FZ110/400/900] ★	0034	52	105
54	Manual reset ★	Input 1_Manual reset [FZ110/400/900] ★	0035	53	85
55	Setting change rate limiter (up) ★	Input 1_Setting change rate limiter (up) [FZ110/400/900] ★	0036	54	111
56	Setting change rate limiter (down) ★	Input 1_Setting change rate limiter (down) [FZ110/400/900] ★	0037	55	112
57	Area soak time ★	Area soak time [FZ110/400/900] ★	0038	56	109
58	Link area number ★	Link area number [FZ110/400/900] ★	0039	57	110
59	Heater break alarm 1 (HBA1) set value	Heater break alarm 1 (HBA1) set value [FZ110/400/900]	003A	58	135
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 [FZ400/900]	003D	61	137
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 [FZ110/400/900]	0040	64	121
66	PV digital filter	Input 1_PV digital filter [FZ110/400/900]	0041	65	122
67	PV ratio	Input 1_PV ratio [FZ110/400/900]	0042	66	120
68	PV low input cut-off	Input 1_PV low input cut-off [FZ110/400/900]	0043	67	124

★ 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 FZ110/400/900:	HEX	DEC	
69	RS bias Cascade control: Cascade bias Ratio setting: Ratio setting bias	When Select function for input 2 is: “Remote setting input” [FZ400/900] RS bias When Remote setting input is specified [FZ110] RS bias Input 2_PV bias [FZ110/400/900] No applicable models Cascade bias Ratio setting bias	0044	68	125
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” [FZ400/900] RS digital filter When Remote setting input is specified [FZ110] RS digital filter When Select function for input 2 is: “Cascade control” [FZ400/900] Cascade Digital filter Input 2_PV digital filter is invalid Input 2_PV digital filter [FZ110/400/900] No applicable models Ratio setting digital filter	0045	69	126 (Cascade digital filter is 174)
71	RS ratio Cascade control: Cascade ratio Ratio setting: Ratio setting ratio	When Select function for input 2 is: “Remote setting input” [FZ400/900] RS ratio When Remote setting input is specified [FZ110] RS ratio Input 2_PV ratio [FZ110/400/900] No applicable models Cascade ratio Ratio setting ratio	0046	70	127
72	Proportional cycle time [heat-side]	OUT1 proportional cycle time [FZ110/400/900]	0047	71	129
73	Proportional cycle time [cool-side]	OUT2 proportional cycle time [FZ110/400/900]	0048	72	130
74	Manual manipulated output value	Input 1_Manual manipulated output value [FZ110/400/900]	0049	73	139

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
75	Set lock level	Set lock level [FZ110/400/900]	004A	74	356
76	STOP display	STOP display selection [FZ110/400/900]	004B	75	180
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 [FZ110/400/900]	0052	82	192
84	Display unit	Input 1_Display unit [FZ110/400/900]	0053	83	193
85	Decimal point position	Input 1_Decimal point position [FZ110/400/900]	0054	84	194
86	Input scale high	Input 1_Input range high [FZ110/400/900]	0055	85	195
87	Input scale low	Input 1_Input range low [FZ110/400/900]	0056	86	196
88	Input error determination point (high)	Input 1_Input error determination point (high) [FZ110/400/900]	0057	87	197
89	Input error determination point (low)	Input 1_Input error determination point (low) [FZ110/400/900]	0058	88	198
90	Burnout direction	Input 1_Burnout direction [FZ110/400/900]	0059	89	200
91	Square root extraction	Input 1_Square root extraction [FZ110/400/900]	005A	90	201
92	Undefined register (Power supply frequency)	Undefined register (No applicable models)	005B	91	—
93	Undefined register (Sampling cycle)	Undefined register (No applicable models)	005C	92	—

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
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 [FZ110/400/900]	0064	100	229
102	Alarm (ALM) lamp lighting condition 1	ALM lamp lighting condition [FZ110/400/900]	0065	101	181
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 [FZ110/400/900]	0067	103	231
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 [FZ110/400/900]	006E	110	233
112	Transmission output scale high	Retransmission output 1 scale high [FZ110/400/900]	006F	111	234
113	Transmission output scale low	Retransmission output 1 scale low [FZ110/400/900]	0070	112	235

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
114	Event 1 type	Event 1 type [FZ110/400/900]	0071	113	251
115	Event 1 hold action	Event 1 hold action [FZ110/400/900]	0072	114	252
116	Undefined register (Event 1 interlock)	Undefined register (No applicable models)	0073	115	—
117	Event 1 differential gap	Event 1 differential gap [FZ110/400/900]	0074	116	253
118	Event 1 differential gap	Event 1 timer [FZ110/400/900]	0075	117	254
119	Undefined register (Force ON of Event 1 action)	Undefined register (No applicable models)	0076	118	—
120	Event 2 type	Event 2 type [FZ110/400/900]	0077	119	256
121	Event 2 hold action	Event 2 hold action [FZ110/400/900]	0078	120	257
122	Undefined register (Event 2 interlock)	Undefined register (No applicable models)	0079	121	—
123	Event 2 differential gap	Event 2 differential gap [FZ110/400/900]	007A	122	258
124	Event 2 delay timer	Event 2 timer [FZ110/400/900]	007B	123	259
125	Undefined register (Force ON of Event 2 action)	Undefined register (No applicable models)	007C	124	—
126	Event 3 type	Event 3 type [FZ110/400/900]	007D	125	261
127	Event 3 hold action	Event 3 hold action [FZ110/400/900]	007E	126	262
128	Undefined register (Event 3 interlock)	Undefined register (No applicable models)	007F	127	—
129	Event 3 differential gap	Event 3 differential gap [FZ110/400/900]	0080	128	263
130	Event 3 delay timer	Event 3 timer [FZ110/400/900]	0081	129	264
131	Undefined register (Force ON of Event 3 action)	Undefined register (No applicable models)	0082	130	—

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
132	Event 4 type	Event 4 type [FZ110/400/900]	0083	131	266
133	Event 4 hold action	Event 4 hold action [FZ110/400/900]	0084	132	267
134	Undefined register (Event 4 interlock)	Undefined register (No applicable models)	0085	133	—
135	Event 4 differential gap	Event 4 differential gap [FZ110/400/900]	0086	134	268
136	Event 4 delay timer	Event 4 timer [FZ110/400/900]	0087	135	269
137	Undefined register (Force ON of Event 4 action)	Undefined register (No applicable models)	0088	136	—
138	CT1 ratio	CT1 ratio [FZ110/400/900]	0089	137	272
139	CT1 assignment	CT1 assignment [FZ110/400/900]	008A	138	270
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 [FZ110/400/900]	008C	140	136
142	CT2 ratio	CT2 ratio [FZ400/900]	008D	141	276
143	CT2 assignment	CT2 assignment [FZ400/900]	008E	142	274
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 [FZ400/900]	0090	144	138
146	Hot/Cold start	Hot/Cold start [FZ110/400/900]	0091	145	278
147	Start determination point	Input 1_Start determination point [FZ110/400/900]	0092	146	290
148	External input type	Select function for input 2 [FZ110/400/900]	0093	147	315
149	Undefined register (Master channel selection)	Undefined register (No applicable models)	0094	148	—

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
150	SV tracking	SV tracking [FZ110/400/900]	0095	149	280
151	MV transfer function [Action taken when changed to Manual mode from Auto mode]	Manual manipulated output value selection [FZ110/400/900]	0096	150	279
152	Control action	Input 1_Control action [FZ110/400/900]	0097	151	283
153	Integral/derivative time decimal point position	Integral/Derivative time decimal point position [FZ110/400/900]	0098	152	281
154	Undefined register (Derivative action)	Undefined register (No applicable models)	0099	153	—
155	Undershoot suppression factor	Undershoot suppression factor [FZ110/400/900]	009A	154	312
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) [FZ110/400/900]	009C	156	148
158	ON/OFF action differential gap (lower)	Input 1_ON/OFF action differential gap (lower) [FZ110/400/900]	009D	157	149
159	Action (high) at input error	Input 1_Action (high) input error [FZ110/400/900]	009E	158	286
160	Action (low) at input error	Input 1_Action (low) input error [FZ110/400/900]	009F	159	287
161	Manipulated output value at input error	Input 1_Manipulated output value at input error [FZ110/400/900]	00A0	160	288
162	Manipulated output value (MV1) at STOP mode	Input 1_Manipulated output value at STOP [heat-side] [FZ110/400/900]	00A1	161	289
163	Manipulated output value (MV2) at STOP mode	Input 1_Manipulated output value at STOP [cool-side] [FZ110/400/900]	00A2	162	311
164	Output change rate limiter (up) [MV1]	Input 1_Output change rate limiter (up) [heat-side] [FZ110/400/900]	00A3	163	284
165	Output change rate limiter (down) [MV1]	Input 1_Output change rate limiter (up) [heat-side] [FZ110/400/900]	00A4	164	285

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
166	Output limiter high (MV1)	Input 1_Output limiter high [heat-side] [FZ110/400/900] ★	00A5	165	87
167	Output limiter low (MV1)	Input 1_Output limiter low [heat-side] [FZ110/400/900] ★	00A6	166	88
168	Output change rate limiter (up) [MV2]	Input 1_Output change rate limiter (up) [cool-side] [FZ110/400/900]	00A7	167	309
169	Output change rate limiter (down) [MV2]	Input 1_Output change rate limiter (down) [cool-side] [FZ110/400/900]	00A8	168	310
170	Output limiter high (MV2)	Input 1_Output limiter high [cool-side] [FZ110/400/900] ★	00A9	169	106
171	Output limiter low (MV2)	Input 1_Output limiter low [cool-side] [FZ110/400/900] ★	00AA	170	107
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 [FZ110/400/900]	00AD	173	161
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	—
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	—

★ 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 FZ110/400/900:	HEX	DEC	
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	Open/Close output neutral zone	Open/Close output neutral zone [FZ110/400/900]	00C4	196	163
198	Open/Close output differential gap	Open/Close output differential gap [FZ110/400/900]	00C5	197	164
199	Action at feedback resistance (FBR) input error	Action at feedback resistance (FBR) input error [FZ110/400/900]	00C6	198	303
200	Feedback adjustment	Feedback adjustment [FZ400/900]	00C7	199	304
201	Control motor time	Control motor time [FZ110/400/900]	00C8	200	305
202	Integrated output limiter	Integrated output limiter [FZ110/400/900]	00C9	201	306
203	Valve action at STOP	Valve action at STOP [FZ110/400/900]	00CA	202	307
204	Startup tuning (ST)	Input 1_Startup tuning (ST) [FZ110/400/900]	00CB	203	63
205	Undefined register (ST proportional band adjusting factor)	Undefined register (No applicable models)	00CC	204	—

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
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	—
208	ST start condition	ST start condition [FZ110/400/900]	00CF	207	282
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 [FZ110/400/900]	00D5	213	348
215	Soak time unit	Soak time unit [FZ110/400/900]	00D6	214	349
216	Setting limiter high	Input 1_Setting limiter high [FZ110/400/900]	00D7	215	350
217	Setting limiter low	Input 1_Setting limiter low [FZ110/400/900]	00D8	216	351
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 [FZ110/400/900]	00DA	218	182
220	Overlap/Deadband reference point	Overlap/Deadband reference point [FZ110/400/900]	00DB	219	313
221	Action at saturated output	Action at saturated output [FZ400/900]	00DC	220	308
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 [FZ110/400/900]	00E0	224	68

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.6-76)**, **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		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
1	Setting memory area number Specify the Memory area No. Data range: 1 to 16 (Factory set value: 1)		0500	1280	—
2	Event 1 set value (EV1)	Event 1 set value (EV1) [FZ110/400/900]	0501	1281	4
		When Event 1 type is either high or low limit with individual setting [FZ110/400/900] Event 1 set value (EV1) [high]			
3	Event 2 set value (EV2)	Event 2 set value (EV2) [FZ110/400/900]	0502	1282	6
		When Event 2 type is either high or low limit with individual setting [FZ110/400/900] Event 2 set value (EV2) [high]			
4	Event 3 set value (EV3)	Event 3 set value (EV3) [FZ110/400/900]	0503	1283	8
		When Event 3 type is either high or low limit with individual setting [FZ110/400/900] Event 3 set value (EV3) [high]			
5	Event 4 set value (EV4)	Event 4 set value (EV4) [FZ110/400/900]	0504	1284	10
		When Event 4 type is either high or low limit with individual setting [FZ110/400/900] Event 4 set value (EV4) [high]			
6	Control loop break alarm (LBA) time	Input 1 _ Control loop break alarm (LBA) time [FZ110/400/900]	0505	1285	21

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
7	LBA deadband	Input 1_LBA deadband (LBD) [FZ110/400/900]	0506	1286	22
8	Set value (SV)	Input 1_Set value (SV) [FZ110/400/900]	0507	1287	1
9	Proportional band [heat-side]	Input 1_Proportional band [heat-side] [FZ110/400/900]	0508	1288	12
10	Integral time [heat-side]	Input 1_Integral time [heat-side] [FZ110/400/900]	0509	1289	13
11	Derivative time [heat-side]	Input 1_Derivative time [heat-side] [FZ110/400/900]	050A	1290	14
12	Control response parameter	Input 1_Integral time [heat-side] [FZ110/400/900]	050B	1291	15
13	Proportional band [cool-side]	Input 1_Proportional band [cool-side] [FZ110/400/900]	050C	1292	34
14	Integral time [cool-side]	Input 1_Integral time [cool-side] [FZ110/400/900]	050D	1293	35
15	Derivative time [cool-side]	Input 1_Derivative time [cool-side] [FZ110/400/900]	050E	1294	36
16	Overlap/Deadband	Input 1_Overlap/Deadband [FZ110/400/900]	050F	1295	37
17	Manual reset	Input 1_Manual reset [FZ110/400/900]	0510	1296	17
18	Setting change rate limiter (up)	Input 1_Setting change rate limiter (up) [FZ110/400/900]	0511	1297	43
19	Setting change rate limiter (down)	Input 1_Setting change rate limiter (down) [FZ110/400/900]	0512	1298	44
20	Area soak time	Area soak time [FZ110/400/900]	0513	1299	41
21	Link area number	Link area number [FZ110/400/900]	0514	1300	42
22	Undefined register	Undefined register	0515	1301	—

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
23	_____	Input 1_Set value (SV) [FZ110/400/900]	0516	1302	1
24	_____	Input 2_Set value (SV) [FZ400/900]	0517	1303	2
25	_____	Set value (SV) of differential temperature input [FZ400/900]	0518	1304	3
26	_____	Event 1 set value (EV1) Event 1 set value (EV1) [high] [FZ110/400/900]	0519	1305	4
27	_____	Event 1 set value (EV1') [low] [FZ110/400/900]	051A	1306	5
28	_____	Event 2 set value (EV2) Event 2 set value (EV2) [high] [FZ110/400/900]	051B	1307	6
29	_____	Event 2 set value (EV2') [low] [FZ110/400/900]	051C	1308	7
30	_____	Event 3 set value (EV3) Event 3 set value (EV3) [high] [FZ110/400/900]	051D	1309	8
31	_____	Event 3 set value (EV3') [low] [FZ110/400/900]	051E	1310	9
32	_____	Event 4 set value (EV4) Event 4 set value (EV4) [high] [FZ110/400/900]	051F	1311	10
33	_____	Event 4 set value (EV4') [low] [FZ110/400/900]	0520	1312	11
34	_____	Input 1_Proportional band [heat-side] [FZ110/400/900]	0521	1313	12
35	_____	Input 1_Integral time [heat-side] [FZ110/400/900]	0522	1314	13
36	_____	Input 1_Derivative time [heat-side] [FZ110/400/900]	0523	1315	14

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
37	_____	Input 1_Control response parameter [FZ110/400/900]	0524	1316	15
38	_____	Input 1_Proactive intensity [FZ110/400/900]	0525	1317	16
39	_____	Input 1_Manual reset [FZ110/400/900]	0526	1318	17
40	_____	Input 1_FF amount [FZ110/400/900]	0527	1319	18
41	_____	Input 1_Output limiter high [heat-side] [FZ110/400/900]	0528	1320	19
42	_____	Input 1_Output limiter low [heat-side] [FZ110/400/900]	0529	1321	20
43	_____	Input 1_Control loop break alarm (LBA) time [FZ110/400/900]	052A	1322	21
44	_____	Input 1_LBA deadband (LBD) [FZ110/400/900]	052B	1323	22
45	_____	Input 2_Proportional band [FZ400/900]	052C	1324	23
46	_____	Input 2_Integral time [FZ400/900]	052D	1325	24
47	_____	Input 2_Derivative time [FZ400/900]	052E	1326	25
48	_____	Input 2_Control response parameter [FZ400/900]	052F	1327	26
49	_____	Input 2_Proactive intensity [FZ400/900]	0530	1328	27
50	_____	Input 2_Manual reset [FZ400/900]	0531	1329	28
51	_____	Input 2_FF amount [FZ400/900]	0532	1330	29
52	_____	Input 2_Output limiter high [FZ400/900]	0533	1331	30

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
53	_____	Input 2_Output limiter low [FZ400/900]	0534	1332	31
54	_____	Input 2_Control loop break alarm (LBA) time [FZ400/900]	0535	1333	32
55	_____	Input 2_LBA deadband (LBD) [FZ400/900]	0536	1334	33
56	_____	Input 1_Proportional band [cool-side] [FZ110/400/900]	0537	1335	34
57	_____	Input 1_Integral time [cool-side] [FZ110/400/900]	0538	1336	35
58	_____	Input 1_Derivative time [cool-side] [FZ110/400/900]	0539	1337	36
59	_____	Input 1_Overlap/Deadband [FZ110/400/900]	053A	1338	37
60	_____	Input 1_Output limiter high [cool-side] Input 1_Output limiter low [heat-side] [FZ110/400/900]	053B	1339	38
61	_____	Input 1_Output limiter low [cool-side] [FZ110/400/900]	053C	1340	39
62	_____	Select Trigger type for Memory area transfer [FZ110/400/900]	053D	1341	40
63	_____	Area soak time [FZ110/400/900]	053E	1342	41
64	_____	Link area number [FZ110/400/900]	053F	1343	42
65	_____	Input 1_Setting change rate limiter (up) [FZ110/400/900]	0540	1344	43
66	_____	Input 1_Setting change rate limiter (down) [FZ110/400/900]	0541	1345	44
67	_____	Input 1_Auto/Manual transfer selection (Area) [FZ110/400/900]	0542	1346	45
68	_____	Input 1_Manipulated output value (Area) [FZ110/400/900]	0543	1347	46

No.	Name		Register address		6.3.1 Reference No.
	Data equivalent to our FB series:	Relevant data of FZ110/400/900:	HEX	DEC	
69	_____	Input 2_Setting change rate limiter (up) [FZ400/900]	0544	1348	47
70	_____	Input 2_Setting change rate limiter (down) [FZ400/900]	0545	1349	48
71	_____	Input 2_Auto/Manual transfer selection (Area) [FZ400/900]	0546	1350	49
72	_____	Input 2_Manipulated output value (Area) [FZ400/900]	0547	1351	50
73	_____	Remote/Local transfer selection (Area) [FZ110/400/900]	0548	1352	51

TROUBLE SHOOTING

7

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

7.1 RKC Communication.....	7-3
7.2 Modbus	7-4

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.

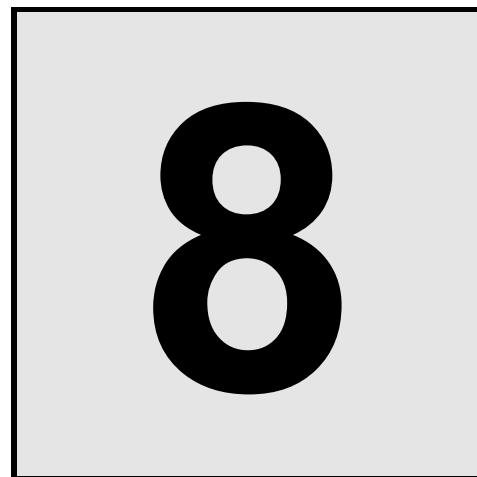
7.1 RKC Communication

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.

SPECIFICATIONS



This chapter describes the specification of the host communication.

8.1 RKC Communication.....	8-2
8.2 Modbus	8-3
8.3 Loader Communication	8-4

8.1 RKC Communication

Interface:	Based on RS-485, EIA standard Based on RS-422A, EIA standard (FZ400/900 only)
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
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 ($120\ \Omega$ 1/2 W)
Xon/Xoff control:	None
Maximum connections:	Up to 31 controllers
Signal logic:	RS-485/RS-422A

Signal logic	Logic
$V(A) - V(B) \geq 1.5\text{ V}$	0 (SPACE)
$V(A) - V(B) \leq -1.5\text{ V}$	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.)
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8.2 Modbus

Interface:	Based on RS-485, EIA standard Based on RS-422A, EIA standard (FZ400/900 only)
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
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
$V(A) - V(B) \geq 1.5 \text{ V}$	0 (SPACE)
$V(A) - V(B) \leq -1.5 \text{ V}$	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.)
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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.

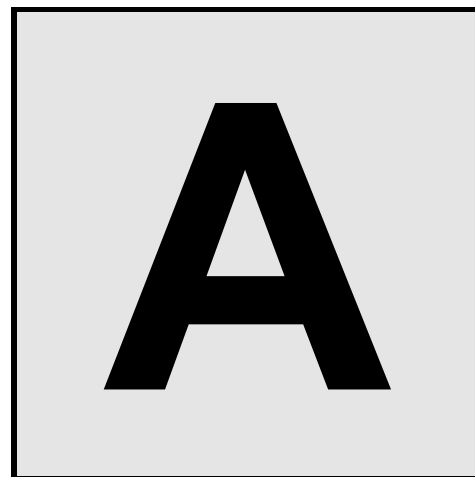


While the instrument is powered by COM-K2 or COM-KG, if power is applied to the instrument, the instrument will be reset and starts for normal operation.



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

APPENDIX



A.1 ASCII 7-Bit Code Table	A-2
A.2 Communication Data Equivalent to Our REX-D Series	A-3
A.3 Communication Data Equivalent to Our REX-F400/700/900	A-4

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-D Series

The RKC communication identifiers for the REX-D series can be used to handle the communication data of the FZ110/400/900 corresponding to the REX-D series. If there is no relevant communication data on the FZ110/400/900, dummy data is used.

To use the data equivalent to our REX-D series, you have to set “2” at Input data type (*Input*). This means RKC communication data (6 digits) equivalent to REX-D series.

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

● REX-D series equivalent communication data items not available on FZ110/400/900

REX-D series communication data name	Identifier	Digits	Attribute	Data range	Factory set value
Step set-value (SV2)	S2	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
Current transformer type selection	XR	6	R/W		0
Output limit [high-limit] (OUT2)	OI	6	R/W		0
Auto-tuning (AT) differential gap	GH	6	R/W		0
AUTO/MAN function selection	PQ	6	R/W		0
Fazzy	XP	6	R/W		0
Air cooling/ water cooling selection	XQ	6	R/W		0
Anti-reset windup (ARW)	W1	6	R/W		0

 When Input data type is set to “2,” the following communication items of FZ110/400/900 will be switched to the data equivalent to the REX-D series (attribute, data range, factory set value).

Identifier	In case of Input data type 0 or 1	In case of Input data type 2
	FZ110/400/900 communication data	REX-D series communication data
M3	Current transformer 1 (CT1) input value monitor	Second current transformer input value (CT2)
M2	Feedback resistance (FBR) input value	First current transformer input value (CT1)

A.3 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 FZ110/400/900 corresponding to the REX-F400/700/900. If there is no relevant communication data on the FZ110/400/900, dummy data is used.

To use the data equivalent to our REX-F400/700/900, you have to set “1” at Input data type (*Input*). 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 FZ110/400/900

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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MEMO



RKC INSTRUMENT INC.

HEADQUARTERS: 16-6, KUGAHARA 5-CHOME, OHTA-KU TOKYO 146-8515 JAPAN

PHONE: 03-3751-9799 (+81 3 3751 9799)

E-mail: info@rkcinst.co.jp

Website: <https://www.rkcinst.co.jp/english/>

