

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

This manual describes the connection method with host computer, communication parameters and communication data (except for parameters in engineering mode) of the RB100/400/500/700/900.

For detailed host communication such as protocol description, refer to the **Communication Instruction Manual (IMR02C16-ED)**. The manual can be downloaded from the official RKC website: [http://www.rkcinst.com/english/manual\\_load.htm](http://www.rkcinst.com/english/manual_load.htm).

## 1. CONNECTION TO HOST COMPUTER



**WARNING**

To prevent electric shock or instrument failure, turn off the power before connecting or disconnecting the instrument and peripheral equipment.

Make sure that lugs or unshielded cables of the communication terminals are not touched to the screw heads, lugs, or unshielded cables of the power supply terminals to prevent electric shock or instrument failure. Use additional care when two lugs are screwed to one communication terminal.

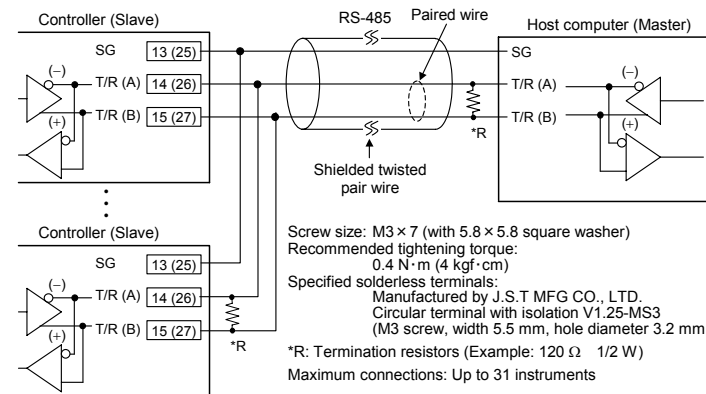
The cable must be provided by the customer.

### 1.1 Communication Terminal Number and Signal Details

Terminal No.		Signal name	Symbol
RB100/400/500/900	RB700		
13	25	Signal ground	SG
14	26	Send/Receive data	T/R (A)
15	27	Send/Receive data	T/R (B)

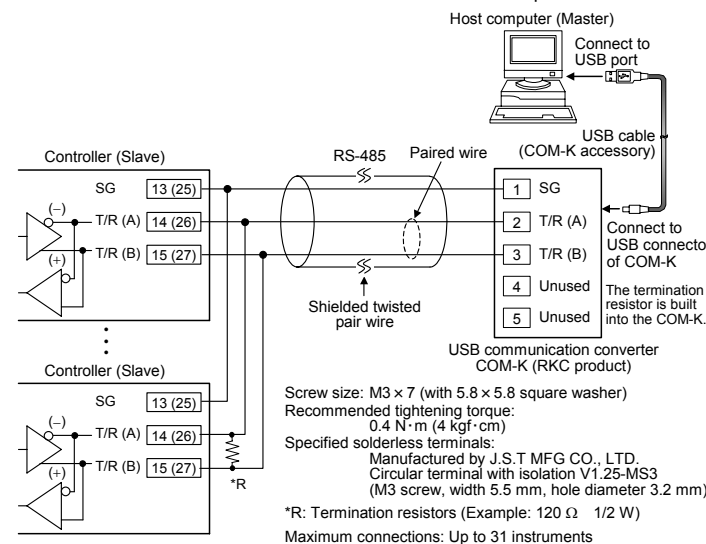
### 1.2 Wiring Method

#### When the interface of host computer (Master) is RS-485



#### When the host computer (Master) has a USB connector

Connect the USB communication converter between the host computer and the controller.



For the COM-K, refer to the **COM-K Instruction Manual (IMR01Z01-ED)**.

## 2. SETTING

To establish communication parameters between host computer and controller, it is necessary to set the following parameters.

When all communication parameter settings have been completed, turn the power off and then on to make the new set values take effect.

This instrument returns to the PV/SV monitor screen if no key operation is performed for more than 1 minute.

This section describes the parameters which must be set for communication. For the mode/parameters transfer and data setting, refer to the **RB series Quick Operation Manual (IMR02C39-ED)** and **RB series Parameter List (IMR02C40-ED)**.

### Description of each parameters (Engineering mode F60)

Symbol	Name	Data range	Description	Factory set value
F60. (F60.)	Function block 60	This is the first parameter symbol of Function block 60.		
CMPS (CMPS)	Communication protocol	0: RKC communication 1: Modbus	Use to select a protocol of Communication function.	Depends on model code
Add (Add)	Device address (Slave address)	0 to 99 (Modbus: 1 to 99)	Do not use the same device address for more than one instrument in multi-drop connection.	0 (Modbus: 1)
bPS (bPS)	Communication speed	0: 2400 bps 1: 4800 bps 2: 9600 bps 3: 19200 bps	Set the same Communication speed for both the controller (slave) and the host computer (master).	3
bit (bit)	Data bit configuration	Refer to <b>Data bit configuration table</b>	Set the same Data bit configuration for both the controller (slave) and the host computer (master).	0
INT (INT)	Interval time	0 to 250 ms	The Interval time for the controller 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.	10

#### Data bit configuration:

Set value	Data bit	Parity bit	Stop bit	Settable communication
0	8	Without	1	RKC communication
1	8	Without	2	
2	8	Even	1	
3	8	Even	2	
4	8	Odd	1	
5	8	Odd	2	Modbus

Set value	Data bit	Parity bit	Stop bit	Settable communication
6	7	Without	1	RKC communication
7	7	Without	2	
8	7	Even	1	
9	7	Even	2	
10	7	Odd	1	
11	7	Odd	2	

#### Interval time:

The Interval time for the controller 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 controller may send data before the host computer is ready to receive it. In this case, communication transmission cannot be conducted correctly.

## 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 controller to send data:

- Response wait time after controller sends BCC in polling procedure
- Response wait time after controller sends ACK or NAK in selecting procedure

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

#### RKC communication (Polling procedure)

Procedure details	Time
Response send time after controller receives ENQ	60 ms max.
Response send time after controller receives ACK	60 ms max.
Response send time after controller receives NAK	60 ms max.
Response send time after controller sends BCC	52 ms max.

#### RKC communication (Selecting procedure)

Procedure details	Time
Response send time after controller receives BCC	65 ms max.
Response wait time after controller sends ACK	52 ms max.
Response wait time after controller sends NAK	52 ms max.

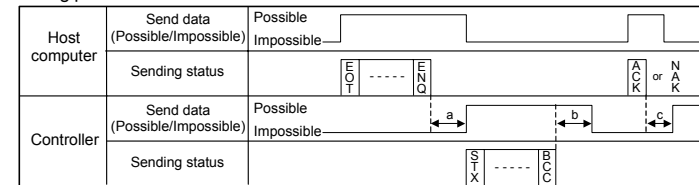
#### Modbus

Procedure details	Time
Read holding registers [03H]	
Response send time after the slave receives the query message	60 ms max.
Preset single register [06H]	
Response send time after the slave receives the query message	65 ms max.
Diagnostics (loopback test) [08H]	
Response send time after the slave receives the query message	60 ms max.

### RS-485 Send/Receive timing (RKC communication)

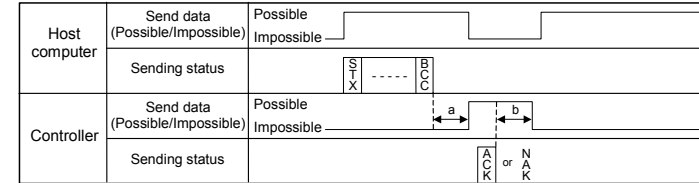
RS-485 communication is conducted through two wires, therefore the transmission and reception of data requires precise timing.

#### Polling procedure



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

#### Selecting procedure



- a: Response send time after the controller receives BCC + Interval time
- b: Response wait time after the controller sends ACK or Response wait time after the controller 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 controller to process data.

- In Polling procedure, Response wait time after the controller sends BCC
- In Selecting procedure, Response wait time after the controller 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.

### Data backup

The nonvolatile memory (EEPROM) for data backup has limitations on the number of memory rewrite times (approx. 1,000,000 times). If set values are frequently changed through communication, please select "Buffer mode" in the EEPROM mode (Identifier: EB).

### Modbus data processing precautions

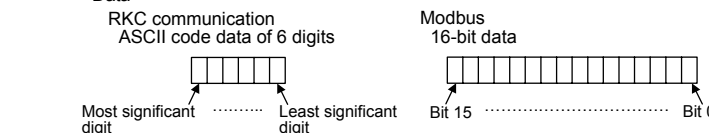
- The numeric range of data used in Modbus protocol is 0000H to FFFFH. Only the set value within the setting range is effective.
- FFFFH represents -1.
- Data with decimal point is treated as data without decimal point on the Modbus protocol.
- If data (holding register) exceeding the accessible address range is accessed, an error response message is returned.
- Read data of unused item is a default value.
- Any attempt to write to an unused item is not processed as an error. Data cannot be written into an unused item.
- If data range or address 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.
- An attribute of the item for functions which are not in the controller is RO (read only). If read action to this item is performed, the read data will be "0." If write action to this item is performed, no error message is indicated and no data is written.
- Commands should be sent at 24 bit-time intervals after the master receives the response message.

## 4. COMMUNICATION DATA LIST

The communication data map shows data which can be used for communication between the host computer and controller.

#### Explanation of data map items

- Modbus register address  
HEX: Hexadecimal DEC: Decimal
- Attribute (A method of how communication data items are read or written when viewed from the host computer is described)  
RO: Read only data (Host computer ← Controller)  
RW: Read and Write data (Host computer ↔ Controller)
- Data



### Communication data (RKC communication)

During Polling/Selecting mode, data transmission can be continuously made by ACK in the following ranges:

- From Measured value (PV) monitor to Manipulated output ON/OFF state monitor [cool-side]
- From Model code to Integrated operating time monitor

Name	RKC Identifier	Attribute	Data range	Factory set value
Measured value (PV) monitor	M1	RO	Within input range For input range, refer to 4. MODEL CODE of RB series Installation Manual (IMR02C38-ED).	—
Current transformer 1 (CT1) input value monitor	M2	RO	0.0 to 100.0 A	—
Current transformer 2 (CT2) input value monitor	M3	RO		—
Event 1 state monitor	AA	RO	0: Event 1 OFF 1: Event 1 ON	—
Event 2 state monitor	AB	RO	0: Event 2 OFF 1: Event 2 ON	—
Burnout state monitor	B1	RO	0: OFF 1: ON (burnout)	—
Error code	ER	RO	1: Adjustment data error 2: Data back-up error 4: A/D conversion error (Including temperature compensation error)	—
RUN/STOP transfer	SR	R/W	0: RUN 1: STOP	0
Set value 1 (SV1)	S1	R/W	Setting limiter low to Setting limiter high	0
Event 1 set value (EV1)	A1	R/W	Deviation action: -Input span to +Input span Input value or set value action: Same as input range	TC/RTD: 50 (50.0) VI: 5.0
Event 1 set value (EV1) [high]			- Input span to + Input span (When event code U, X, Y or Z is selected.)	
Event 2 set value (EV2)	A2	R/W	The data range is the same as Event 1 set value (EV1).	TC/RTD: 50 (50.0) VI: 5.0
Event 2 set value (EV2) [high]			The data range is the same as Event 1 set value (EV1) [high].	
Heater break alarm 1 (HBA1) set value	A3	R/W	0.0 to 100.0 A	0.0
Heater break alarm 2 (HBA2) set value	A4	R/W		0.0
Control loop break alarm (LBA) time	A5	R/W	0 to 7200 seconds (0: Unused)	480
LBA deadband (LBD)	A6	R/W	0 to Input span	0
Autotuning (AT)	G1	R/W	0: PID control 1: AT	0
Unused	G2	R/W	Must be always "0"	
Proportional band [heat-side]	P1	R/W	TC/RTD inputs: 1 (0.1) to Input span (Unit: °C [°F]) Voltage (V)/Current (I) inputs: 0.1 to 100.0 % of Input span 0 (0.0): ON/OFF action	TC/RTD: 30 (30.0) VI: 3.0
Integral time	I1	R/W	1 to 3600 seconds (0: PD action)	240
Derivative time	D1	R/W	1 to 3600 seconds (0: PI action)	60
Anti-reset windup (ARW)	W1	R/W	1 to 100 % of proportional band [heat-side] (0: Integral action is always OFF)	100
Proportional cycle time [heat-side]	T0	R/W	0 to 100 seconds (0: Setting below 1 second is possible for Proportional cycle time [heat-side] in the Engineering mode) M: Relay contact output V: Voltage pulse output T: Triac output D: Open collector output	M: 20 V, T, D: 2
Proportional band [cool-side]	P2	R/W	1 to 1000 % of proportional band [heat-side] (ON/OFF control of cool-side only is not possible)	100
Overlap/Deadband	V1	R/W	TC/RTD inputs: -10 (-10.0) to +10 (+10.0) °C [°F] Voltage (V)/Current (I) inputs: -10.0 to +10.0 % of Input span	0 (0.0)
Proportional cycle time [cool-side]	T1	R/W	0 to 100 seconds (0: Setting below 1 second is possible for Proportional cycle time [cool-side] in the Engineering mode)	M: 20 V, T, D: 2
PV bias	PB	R/W	TC/RTD inputs: -1999 (-199.9) to +9999 (+999.9) °C [°F] Voltage (V)/Current (I) inputs: - Input span to + Input span	0 (0.0)
Set lock level	LK	R/W	0 to 10 For details of Set lock level, refer to 5. Engineering Mode of RB series Parameter List (IMR02C40-ED). The Set data lock function is effective only for the setting performed by key operation. Locked items by Set data lock function can be changed via communication.	0
EEPROM mode	EB	R/W	0: Backup mode (Set values stored to the EEPROM when set values are changed.) 1: Buffer mode (No set values stored to the EEPROM when set values are changed.)	0
EEPROM state	EM	RO	0: The content of the EEPROM does not coincide with that of the RAM. 1: The content of the EEPROM coincides with that of the RAM.	—
Interlock release	IR	R/W	To release the interlock, write "0 (zero)."	0
Event 1 timer	TD	R/W	0 to 600 seconds	0
Event 2 timer	TG	R/W	Data can be written only in STOP mode.	0

Name	RKC Identifier	Attribute	Data range	Factory set value
Manipulated output value (MV1) monitor [heat-side]	O1	RO	Within output limiter range	—
Manipulated output value (MV2) monitor [cool-side]	O2	RO		—
Manipulated output ON/OFF state monitor [heat-side]	Q1	RO	0: Output OFF 1: Output ON	—
Manipulated output ON/OFF state monitor [cool-side]	Q2	RO		—
Model code	ID	RO	Model code (character) [32-digit]	—
ROM version monitor	VR	RO	ROM version [8-digit]	—
Comprehensive event state	AJ	RO	Least significant digit: Event 1 (EV1) 2nd digit: Event 2 (EV2) 3rd digit: Event 3 (EV3) 4th digit: Event 4 (EV4) 5th digit: Burnout Most significant digit: Unused Data 0: OFF 1: ON	—
Digital input (DI) state monitor	L1	RO	Least significant digit: DI1 2nd digit: DI2 3rd digit to Most significant digit: Unused Data 0: OFF 1: ON	—
Output state monitor	Q3	RO	Least significant digit: Output 1 (OUT1) 2nd digit: Output 2 (OUT2) 3rd digit: Digital output 1 (DO1) 4th digit: Digital output 2 (DO2) 5th digit: Digital output 3 (DO3) Most significant digit: Digital output 4 (DO4) Data 0: OFF 1: ON	—
Set value (SV) display while the setting change rate limiter is working	MS	RO	Setting limiter low to Setting limiter high	—
Remaining time monitor	TR	RO	00:00 to 99:59 (min : sec or hour : min)	—
Event 3 state monitor	AC	RO	0: Event 3 OFF 1: Event 3 ON	—
Event 4 state monitor	AD	RO	0: Event 4 OFF 1: Event 4 ON	—
Operation mode state monitor	L0	RO	Least significant digit: STOP 2nd digit: RUN 3rd digit: Manual (During RUN) 4th digit to Most significant digit: Unused Data 0: OFF 1: ON	—
Actual SV selection number	LZ	RO	1 to 4 SV number in Timer 3 and Timer 4 functions.	—
Auto (AUTO)/Manual (MAN) transfer	J1	R/W	0: Auto (AUTO) mode 1: Manual (MAN) mode	0
Monitor selection (no display)	LP	R/W	0 to 15 (Decimal) * Bit 0: Current transformer1 (CT1) input value monitor Bit 1: Current transformer 2 (CT2) input value monitor Bit 2: Manipulated output value (MV) monitor <sup>a</sup> Bit 3: Remaining time monitor Bit 4 to Bit 7: Unused <sup>a</sup> MV monitors is not displayed with Heat/Cool control type. Data 0: Display 1: No display	0
Mode selection (no display)	LM	R/W	0 to 255 (Decimal) * Bit 0: Auto (AUTO)/Manual (MAN) transfer <sup>a</sup> Bit 1: Set data unlock/lock transfer <sup>a</sup> Bit 2: Interlock release <sup>a</sup> Bit 3: Disable RUN/STOP key operation <sup>b</sup> Bit 4 to Bit 6: Unused Bit 7: Displays F21 and after <sup>c</sup> <sup>a</sup> Data 0: Display 1: No display <sup>b</sup> Data 0: Enable RUN/STOP key operation 1: Disable RUN/STOP key operation <sup>c</sup> Data 0: No display F21 through F91 1: Display F21 through F91	0
Set value 2 (SV2)	S2	R/W	Setting limiter low to Setting limiter high	0
Set value 3 (SV3)	S3	R/W		0
Set value 4 (SV4)	S4	R/W		0
SV selection	ZB	R/W	1 to 4 One of the 4 set values can be selected and used for control.	1
F01 block selection (no display)	DA	R/W	0: Display 1: No display	1
Timer 1	TH	R/W	00:01 to 99:59 (min : sec or hour : min)	00:01
Timer 2	TI	R/W		00:01
Timer 3	TJ	R/W		00:01
Timer 4	TK	R/W		00:01
Timer function	ZC	R/W	0: Unused 1 to 4: Timer function 1 to Timer function 4	0
Repeat execution times	RR	R/W	0 to 9999 (9999: Infinite times)	0
F02 block selection (no display)	DK	R/W	0: Display 1: No display	1
Setting change rate limiter (up)	HH	R/W	0 (0.0) to Input span (Unit: °C [°F]/unit time)	0 (0.0)
Setting change rate limiter (low)	HL	R/W		0 (0.0)
F03 block selection (no display)	DL	R/W	0: Display 1: No display	1

\* Set the bit data after converting it to decimal.

Name	RKC Identifier	Attribute	Data range	Factory set value
Event 1 set value (EV1) [low]	BT	R/W	-Input span to +Input span (When event code U, X, Y or Z is selected)	TC/RTD: -50 (-50.0) VI: -5.0
Event 2 set value (EV2) [low]	BU	R/W	The data range is the same as Event 1 set value (EV1) [low].	TC/RTD: -50 (-50.0) VI: -5.0
Event 3 set value (EV3)	A7	R/W	The data range is the same as Event 1 set value (EV1).	TC/RTD: 50 (50.0) VI: 5.0
Event 3 set value (EV3) [high]			The data range is the same as Event 1 set value (EV1) [high].	
Event 3 set value (EV3) [low]	BV	R/W	The data range is the same as Event 1 set value (EV1) [low].	TC/RTD: -50 (-50.0) VI: -5.0
Event 4 set value (EV4)	A8	R/W	The data range is the same as Event 1 set value (EV1).	TC/RTD: 50 (50.0) VI: 5.0
Event 4 set value (EV4) [high]			The data range is the same as Event 1 set value (EV1) [high].	
Event 4 set value (EV4) [low]	BW	R/W	The data range is the same as Event 1 set value (EV1) [low].	TC/RTD: -50 (-50.0) VI: -5.0
F04 block selection (no display)	DM	R/W	0: Display 1: No display	0
Startup tuning (ST)	ST	R/W	0: ST unused 1: Execute once 2: Execute always	0
F05 block selection (no display)	DN	R/W	0: Display 1: No display	0
Fine tuning setting	CB	R/W	-3 to +3 (0: Unused)	0
F06 block selection (no display)	DO	R/W	0: Display 1: No display	0
F07 block selection (no display)	DQ	R/W	0: Display 1: No display	0
Minimum ON/OFF time of proportioning cycle [heat-side]	VI	R/W	0 to 1000 ms	0
Output limiter high [Heat-side output limiter (high)]	OH	R/W	PID control: Output limiter low to 105.0 % Heat/Cool PID control: 0.0 to 105.0 %	105.0
Output limiter low [Cool-side output limiter (high)]	OL	R/W	PID control*: -5.0 % to Output limiter high * Output limiter high > Output limiter low Heat/Cool PID control: 0.0 to 105.0 %	PID control: -5.0 Heat/Cool PID control: 105.0
Minimum ON/OFF time of proportioning cycle [cool-side]	VJ	R/W	0 to 1000 ms	0
F08 block selection (no display)	DR	R/W	0: Display 1: No display	0
PV digital filter	F1	R/W	0 to 100 seconds (0: Unused)	1
F09 block selection (no display)	DS	R/W	0: Display 1: No display	0
Manual manipulated output value (MV)	ON	R/W	PID control: Output limiter low to Output limiter high Heat/Cool PID control: - Cool-side output limiter (high) to + Heat-side output limiter (high)	0.0
F10 block selection (no display)	DT	R/W	0: Display 1: No display	1
Holding peak value ambient temperature monitor	HP	RO	-10 to +100 °C	—
Integrated operating time monitor	UT	RO	0 to 9999 hours	—
For communication data (Engineering mode), refer to the <b>Communication Instruction Manual (IMR02C16-EC)</b> .				

### ■ Communication data (Modbus)

Name	Modbus register address		Attribute	Data range	Factory set value
	HEX	DEC			
Measured value (PV) monitor	0	0	RO		
Current transformer 1 (CT1) input value monitor	1	1	RO		
Current transformer 2 (CT2) input value monitor	2	2	RO		
Event 1 state monitor	3	3	RO		
Event 2 state monitor	4	4	RO		
Burnout state monitor	5	5	RO		
Set value 1 (SV1)	6	6	R/W		
Event 1 set value (EV1)	7	7	R/W		
Event 1 set value (EV1) [high]					
Event 2 set value (EV2)	8	8	R/W		
Event 2 set value (EV2) [high]					
Heater break alarm 1 (HBA1) set value	9	9	R/W		
Heater break alarm 2 (HBA2) set value	A	10	R/W		
Control loop break alarm (LBA) time	B	11	R/W		
LBA deadband (LBD)	C	12	R/W		
Autotuning (AT)	D	13	R/W		
Unused	E	14	—		

For data range and factory set value, refer to **■ Communication data (RKC communication)**.

Name	Modbus register address		Attribute	Data range	Factory set value
	HEX	DEC			
Proportional band [heat-side]	F	15	R/W		
Integral time	10	16	R/W		
Derivative time	11	17	R/W		
Anti-reset windup (ARW)	12	18	R/W		
Proportional cycle time [heat-side]	13	19	R/W		
Proportional band [cool-side]	14	20	R/W		
Overlap/Deadband	15	21	R/W		
Proportional cycle time [cool-side]	16	22	R/W		
PV bias	17	23	R/W		
Set lock level	18	24	R/W		
RUN/STOP transfer	19	25	R/W		
Unused	1A	26	—		
EEPROM mode	1B	27	R/W		
EEPROM state	1C	28	RO		
Manipulated output value (MV1) monitor [heat-side]	1D	29	RO		
Manipulated output value (MV2) monitor [cool-side]	1E	30	RO		
Unused	1F	31	—		
	2C	44	—		
Manipulated output ON/OFF state monitor [heat-side]	2D	45	RO		
Manipulated output ON/OFF state monitor [cool-side]	2E	46	RO		
Comprehensive event state	2F	47	RO	Bit data Bit 0: Event 1 (EV1) Bit 1: Event 2 (EV2) Bit 2: Event 3 (EV3) Bit 3: Event 4 (EV4) Bit 4: Burnout Bit 5 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 31]	—
Digital input (DI) state monitor	30	48	RO	Bit data Bit 0: DI1 Bit 1: DI2 Bit 2 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 3]	—
Output state monitor	31	49	RO	Bit data Bit 0: Output 1 (OUT1) Bit 1: Output 2 (OUT2) Bit 2: Digital output 1 (DO1) Bit 3: Digital output 2 (DO2) Bit 4: Digital output 3 (DO3) Bit 5: Digital output 4 (DO4) Bit 6 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 63]	—
Set value (SV) display while the setting change rate limiter is working	32	50	RO		
Remaining time monitor	33	51	RO		
Event 3 state monitor	34	52	RO		
Event 4 state monitor	35	53	RO		
Error code	36	54	RO	Bit data Bit 0: Adjustment data error Bit 1: Data back-up error Bit 2: A/D conversion error (Including temperature compensation error) Bit 3 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 7]	—
Operation mode state monitor	37	55	RO	Bit data Bit 0: STOP Bit 1: RUN Bit 2: Manual (During RUN) Bit 3 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 7]	—
Actual SV selection number	38	56	RO		
Auto (AUTO)/Manual (MAN) transfer	39	57	R/W		
Interlock release	3A	58	R/W		
Monitor selection (no display)	3B	59	R/W	Bit data Bit 0: Current transformer1 (CT1) input value monitor Bit 1: Current transformer2 (CT2) input value monitor Bit 2: Manipulated output value (MV) monitor <sup>a</sup> Bit 3: Remaining time monitor Bit 4 to Bit 15: Unused <sup>a</sup> MV monitors is not displayed with Heat/Cool control type. Data 0: Display 1: No display [Decimal number: 0 to 15]	0

For data range and factory set value, refer to **■ Communication data (RKC communication)**.

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Name	Modbus register address		Attribute	Data range	Factory set value
	HEX	DEC			
Mode selection (no display)	3C	60	R/W	Bit data Bit 0: Auto (AUTO)/Manual (MAN) transfer <sup>a</sup> Bit 1: Set data unlock/lock transfer <sup>a</sup> Bit 2: Interlock release <sup>a</sup> Bit 3: Disable RUN/STOP key operation <sup>b</sup> Bit 4 to Bit 6: Unused Bit 7: Displays F21 and after <sup>c</sup> Bit 8 to Bit 15: Unused <sup>a</sup> Data 0: Display 1: No display <sup>b</sup> Data 0: Enable RUN/STOP key operation 1: Disable RUN/STOP key operation <sup>c</sup> Data 0: No display F21 through F91 1: Display F21 through F91 [Decimal number: 0 to 255]	0
Set value 2 (SV2)	3D	61	R/W		
Set value 3 (SV3)	3E	62	R/W		
Set value 4 (SV4)	3F	63	R/W		
SV selection	40	64	R/W		
F01 block selection (no display)	41	65	R/W		
Timer 1	42	66	R/W	1 to 5999 (sec or min)	1
Timer 2	43	67	R/W		1
Timer 3	44	68	R/W		1
Timer 4	45	69	R/W		1
Timer function	46	70	R/W		
Repeat execution times	47	71	R/W		
F02 block selection (no display)	48	72	R/W		
Setting change rate limiter (up)	49	73	R/W		
Setting change rate limiter (low)	4A	74	R/W		
F03 block selection (no display)	4B	75	R/W		
Event 1 set value (EV1) [low]	4C	76	R/W		
Event 2 set value (EV2) [low]	4D	77	R/W		
Event 3 set value (EV3)	4E	78	R/W		
Event 3 set value (EV3) [high]					
Event 3 set value (EV3) [low]	4F	79	R/W		
Event 4 set value (EV4)	50	80	R/W		
Event 4 set value (EV4) [high]					
Event 4 set value (EV4) [low]	51	81	R/W		
F04 block selection (no display)	52	82	R/W		
Startup tuning (ST)	53	83	R/W		
F05 block selection (no display)	54	84	R/W		
Fine tuning setting	55	85	R/W		
F06 block selection (no display)	56	86	R/W		
F07 block selection (no display)	57	87	R/W		
Minimum ON/OFF time of proportioning cycle [heat-side]	58	88	R/W		
Output limiter high [Heat-side output limiter (high)]	59	89	R/W		
Output limiter low [Cool-side output limiter (high)]	5A	90	R/W		
Minimum ON/OFF time of proportioning cycle [cool-side]	5B	91	R/W		
F08 block selection (no display)	5C	92	R/W		
PV digital filter	5D	93	R/W		
F09 block selection (no display)	5E	94	R/W		
Manual manipulated output value (MV)	5F	95	R/W		
F10 block selection (no display)	60	96	R/W		
For communication data (Engineering mode), refer to the <b>Communication Instruction Manual (IMR02C16-EC)</b> .					

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