

# INTERFACE SPECIFICATION

## MODBUS CONVERTOR UTY-VMGX

PART NO. 9708438030-03

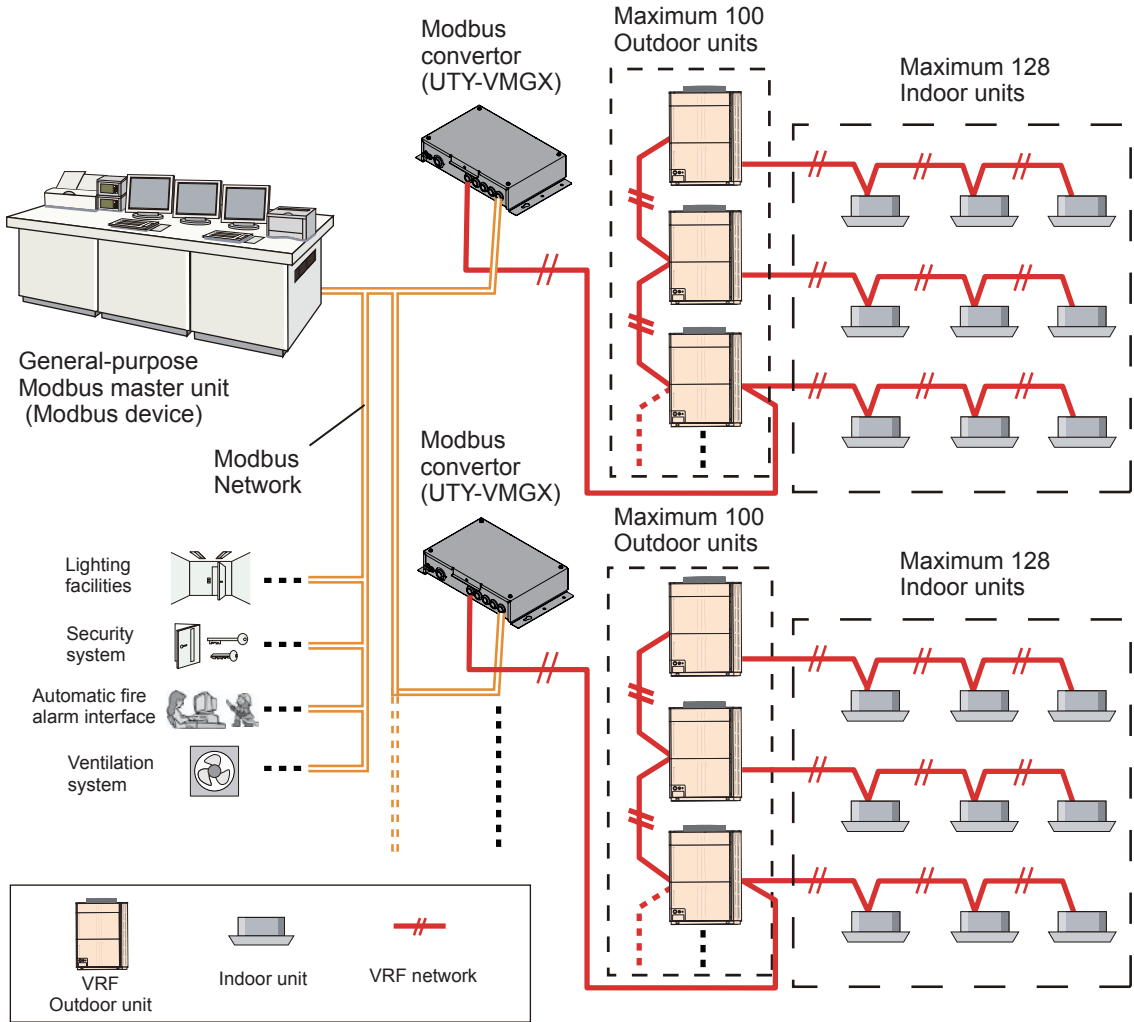
**FUJITSU GENERAL LIMITED**

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**(1) What is the Modbus Converter ?**

The converter for connecting our VRF Network System to the system built by Modbus , an open network, to manage mutually between BMS and VRF system.

**(2) Maximum Controllable number per 1 Modbus Converter.**

Indoor Unit	128
Outdoor Unit	100

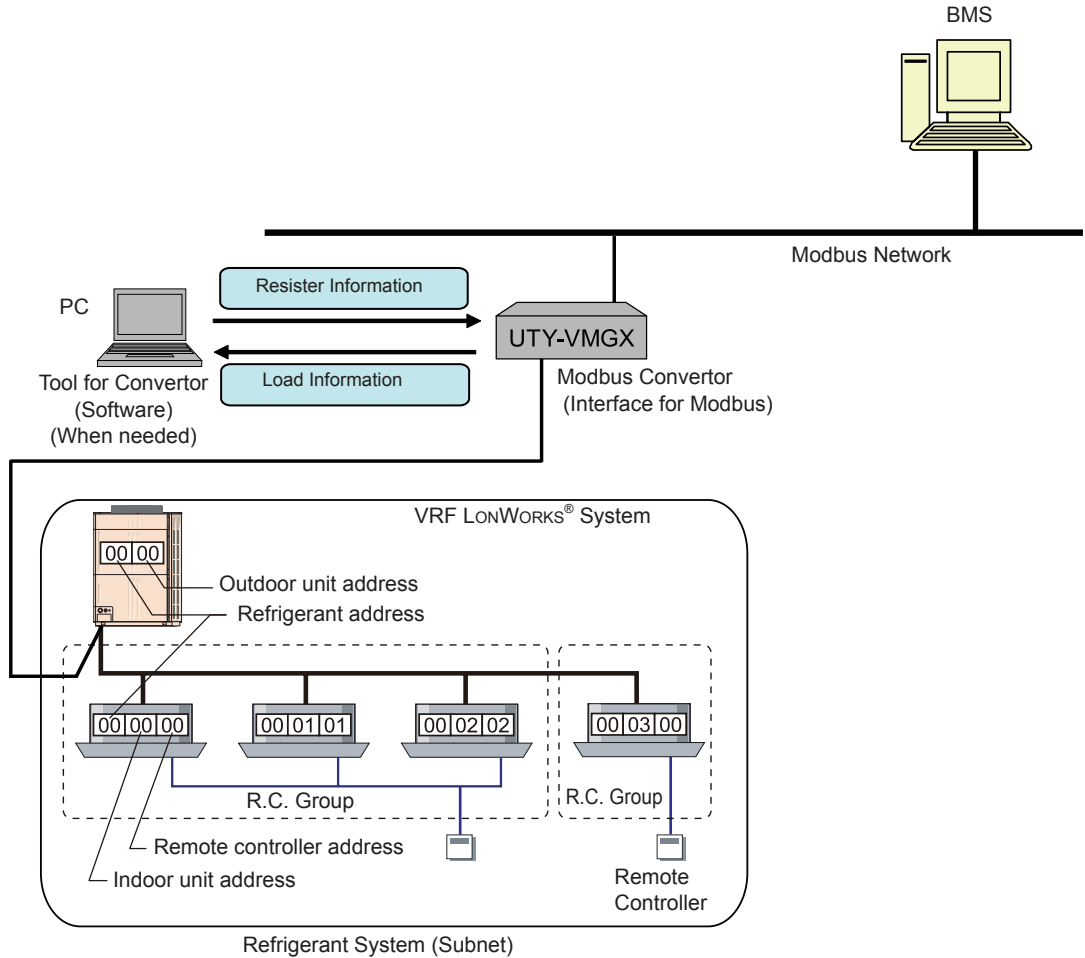
**(3) Maximum connectable number per 1 BMS.**

Modbus Converter without repeater	31
Modbus Converter with repeater	247

**(4) Maximum connectable number per 1 VRF Network System.**

Modbus Converter	9
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2-1. Total System Configuration Layout



## **Refrigerant System**

This is a system that is composed of indoor units, outdoor unit as well as those of relevant controller. All of the units and the equipment are connected with the same refrigerant circuit.

## **R.C. Group**

This is the control unit of indoor units that have been connected with 1 remote controller cable, or single indoor unit.

These 2 kinds of control units are the smallest unit controlled.

Up to 16 indoor units in same group is connectable to 1 controller unit.

## **Refrigerant Address (0 ... 99)**

This is the ID individually assigned to each refrigerant system and is used for control.

## **Outdoor Unit Address (0 ...3)**

This is the ID individually assigned to each outdoor unit and used for control.

## **Indoor Unit Address (0 ...63)**

This is the ID individually assigned to each indoor unit and used for control.

## **Remote Controller Address (0 ...15)**

This is the ID individually assigned to the indoor units forming each R.C.Group and is used for control.

When you control the indoor unit in a R.C.Group, please give control instructions to the indoor unit of a remote controller address "00."

The unit will not operate even if an instruction is given to the indoor unit of a remote controller address other than "00."

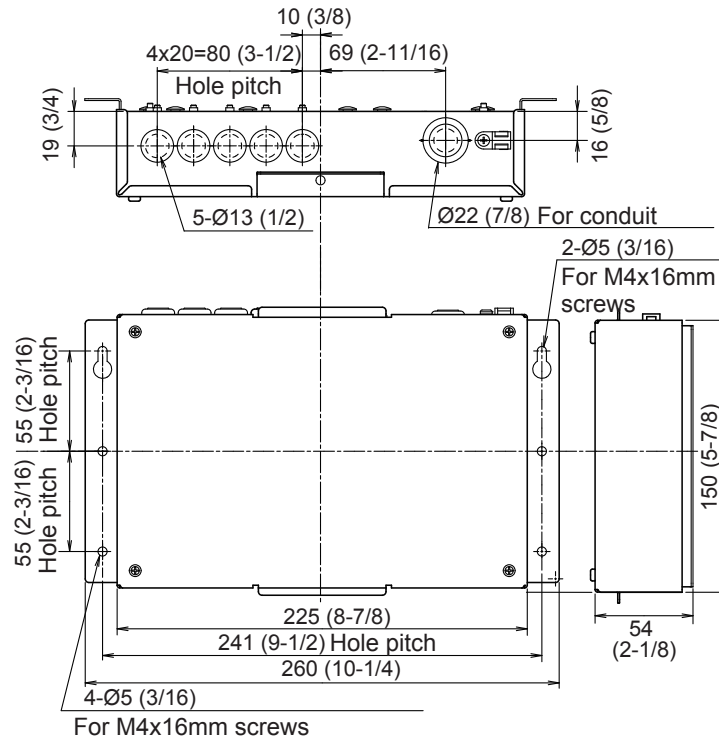
## **Convertor Address**

This is the Address individually assigned to the Modbus Convertor for VRF Network System. It is a necessary address for exchanging information with BMS.

When setting address, please be sure that the address of Network Convertor is not overlap the address of other controller like, Touch Panel Controller & Network Convertor for Group Remote Controller.

The Modbus convertor is comprised of a body and cover.

Unit : mm (in)



### 4-1. Operating Environment

Power supply	1Ø AC208–240V 50/60Hz	
Power consumption (W)	2.0	
Temperature °C (°F)	Operating	0–46 (32–114)
	Packaged	-10–60 (14–140)
Humidity (%)	Packaged	0–95 (RH); No condensation
Dimensions H × W × D mm(in)	54 x 260 x 150 (2-1/8 x 10-1/4 x 5-7/8)	
Weight g (oz)	1100 (39)	

### 4-2. Transmission (Hardware)

Use	Size		Wire type	Remarks
Power supply cable	Maximum	1.25 mm <sup>2</sup> (16AWG)	60245 IEC 57 or equivalent	1 ø AC208-240 V 50/60 Hz, 2-Wire + ground (Always ground the unit)
	Minimum	0.5 mm <sup>2</sup> (20AWG)		
Transmission cable	0.33 mm <sup>2</sup> (22AWG)		LEVEL4 (NEMA) non-polar 2 core, twisted pair solid core Shielded	LONWORKS® compatible cable
MODBUS cable	Maximum	1.25 mm <sup>2</sup> (16AWG)	AWG16-26 3Wire+ Sheathed PVC cable	
	Minimum	0.128 mm <sup>2</sup> (26AWG)		
Fuse capacity	2 A			

### 4-3. Function

Item*1	Control*2			Monitor Information*3			Convertor
	Indoor Unit		Outdoor Unit	Indoor Unit		Outdoor Unit	
	Individual*4	Batch*5	Individual*4	Individual*4	Batch*5	Individual*4	
ON/OFF command *6	●	●		●	●		
Operation mode setting	●	●		●			
Temperature setting	●	●		●			
Airflow mode setting	●	●		●			
Set point temperature limit setting	●	●		●			
Thermostat off setting *6 *7	●	●		●			
Centrally control (Filter reset)	●	●		●			
Centrally control (All mode)	●	●		●			
Centrally control (Timer mode)	●	●		●			
Centrally control (Set temperature mode)	●	●		●			
Centrally control (ON/OFF mode)	●	●		●			
Centrally control (ON mode)	●	●		●			
Centrally control (Operation mode)	●	●		●			
Emergency stop setting		●			●		
Filter sign reset	●			●			
Antifreeze setting	●			●			
Energy save mode setting	●			●			
Vertical/horizontal airflow direction louver setting	●			●			
Time setting		●					
Outdoor unit low noise			●			●	
Outdoor unit capacity save			●			●	
Room temperature				●			
Error code status				●			●
Indoor unit status				●			
Maintenance mode					●		
Error status					●		
Modbus communication setting information							●
Model name							●
Software version							●



\*1 Refer to the product manuals for each function.

\*2 Modbus network → VRF network system

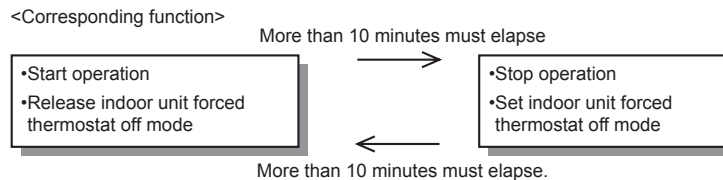
\*3 VRF network system → Modbus network

\*4 For any indoor unit or outdoor unit registered on Converter and corresponding to the address.

\*5 For all indoor units registered on Converter and corresponding to the address.

\*6 To protect the compressor of the outdoor unit, please carefully read and understand the following cautions that may affect the operation of the compressor before executing the setting.

- When performing periodical settings like schedule settings for the following functions, perform the setting to all the indoor units in the same refrigerant system simultaneously, conforming to the timing restriction described below.



\*7 Forced thermostat OFF instruction

- Only one equipment can send these instructions for each refrigerant system.
- When these instructions are sent by multiple equipments, the system may not respond as instructed or may malfunction.

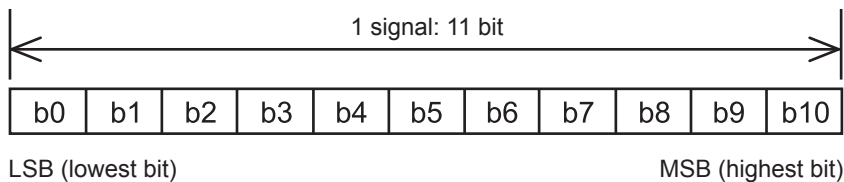
This manual describes Modbus protocol interface specifications of Modbus Convertor. Modbus Convertor is equipped with the Modbus Slave function. Specifications that are not detailed in this manual conform to the following MODBUS specifications.

- Modbus Application Protocol Specification V1.1b3
- Modbus over Serial Line Specification and Implementation Guide V1.02

<http://www.modbus.org/>

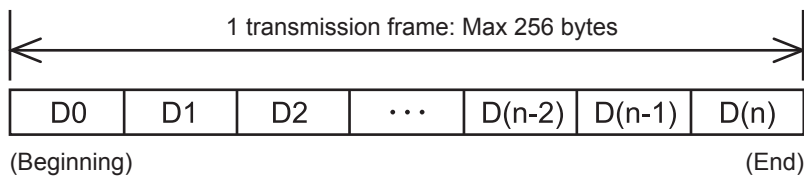
This interface specification specifies the operation of Modbus that works on the RS485 serial line, where a slave device sends a response to a request from the master device. Multiple slave devices are connected to the RS485 bus. Modbus uses the Modbus RTU mode with the frame format shown below.

### Signal composition



Bit name	Number of bit	Content
b0	1 bit	Start bit
b1 to b8	8 bit	Data bit
b9	1 bit	Parity bit or stop bit (When no parity)
b10	1 bit	Stop bit

### Transmission frame composition



Octet name	Number of bit	Content
D0	1 byte	Transmission destination / transmission source slave address
D1	1 byte	Function code
D2 to D(n-2)	MAX 252 byte	Frame data
D(n-1) to D(n)	2 byte	Error check

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## COMMUNICATION SPECIFICATIONS

Transfer mode	RTU mode
Communication method	Half-duplex operation, Master/slave method
Communication speed	9600bps / 19200bps
Synchronous system	Asynchronous communication method
Data bit	8 bit
Parity	even/odd/none
Stop bit	2 bit (no parity) / 1 bit
Network	3 wire RS485
Maximum cable length	1000 (m) (3280 (ft))

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## SUPPORTED FUNCTION LIST

Function code	Function name	Modbus register address*1	Max number of reading / writing address
0x03	Read holding register	40001 to 49999	125 addresses
0x04*2	Read Input register	30001 to 39999	125 addresses
0x06	Write single holding register	40001 to 49999	1 address
0x10	Write multiple holding registers	40001 to 49999	123 addresses

\*1 Modbus register address put in transmission frame data is calculated by subtracting 1 from the residue obtained by dividing the described Modbus register address by 10000.

Example) Modbus register address 35555 is put in frame data as 5554  
(Subtract 1 from the residue obtained by dividing 35555 by 10000.)

\*2 In the following cases, the response value is "0" for the request of "Function code: 0x04".

- When the indoor unit or outdoor unit has no function

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## EXCEPTION RESPONSE

Exception code	Exception name	Exception content
0x01	Invalid function code	Unsupported function code destination
0x02	Invalid Modbus address	Non-existent Modbus register address destination

Unit No	Modbus register address	Function	Functional detail	Value
Modbus Converter	30001	Communication speed information	Modbus communication speed set to Modbus Converter	0: 9600bps 1: 19200bps
	30002	Slave address information	Modbus slave address information set to Modbus Converter	bit0 to bit7: 1 to 247
	30003	Model name information 1	Model name information 1 of Modbus Converter	bit0 to bit7: (1) bit8 to bit15: (2) (UTY-(1) (2) (3) (4))
	30004	Model name information 2	Model name information 2 of Modbus Converter	bit0 to bit7: (3) bit8 to bit15: (4) (UTY-(1) (2) (3) (4))
	30005 to 30006	(Reserved Modbus register address)		
	30007	Software version information	Software version information of Modbus Converter	bit0 to bit3: (1) bit4 to bit7: (2) bit8 to bit11: (3) bit12 to bit15: (4) (Version: E□□□V (1) (2)P (3) (4) L△△△-☆)
	30008	(Reserved Modbus register address)		
	30009	Error monitoring	Error monitoring of Modbus Converter	bit0: Error/No error (0: No error, 1: Error) bit8 to bit11: Error code subsection bit12 to bit15: Error code section
	30010 to 30050	(Reserved Modbus register address)		

Unit No	Modbus register address	Function	Functional detail	Value
Indoor Unit No.1	30051	VRF address information	VRF address information	bit0 to bit7: Ref. address (0 to 99) bit8 to bit15: Unit address (0 to 63)
	30052	(Reserved Modbus register address)		
	30053	Master and slave information	Indoor unit master and slave information in remote controller group.	0: Master 1: Slave
	30054	Operation mode status	Operation mode status monitoring	1: Auto 2: Cool 3: Dry 4: Heat 5: Fan
	30055	Operation ON/OFF status	Operation ON/OFF status monitoring	1: Stop 2: Operation
	30056	Set temperature status	Set temperature status monitoring	bit0 to bit8: Set value (Temperature = Set value / 4) Example) 0°C = 0, 20°C = 80, 30°C =120 by every 0.25°C
	30057	Airflow status	Airflow status monitoring	1: Auto 2: Quiet 3: Low 4: Med 5: High 6: Med-Low 7: Med-High
	30058	Indoor temperature status	Indoor temperature monitoring	bit0 to bit8: Set value (Temperature = Set value / 4) Example) 0°C = 0, 20°C = 80, 30°C =120 by every 0.25°C
	30059	Error monitoring	Error status monitoring	bit0: Error/No error (0: No error, 1: Error) bit8 to bit11: Error code subsection bit12 to bit15: Error code section
	30060	Vertical air direction position status	Vertical air direction position status monitoring	1: Swing 2: Position 1 3: Position 2 4: Position 3 5: Position 4
	30061	Horizontal air direction position status	Horizontal air direction position status monitoring	1: Swing 2: Position 1 3: Position 2 4: Position 3 5: Position 4 6: Position 5
	30062	Remote controller operation prohibition setting status	Remote controller operation prohibition setting status monitoring	bit0: ALL operation settings (0: Not inhibit, 1: Inhibit) bit1: Timer setting (0: Not inhibit, 1: Inhibit) bit2: Room temperature setting (0: Not inhibit, 1: Inhibit) bit3: Operation mode setting (0: Not inhibit, 1: Inhibit) bit4: Start/Stop operation setting (0: Not inhibit, 1: Inhibit) bit5: Start operation setting (0: Not inhibit, 1: Inhibit) bit6: Filter Reset operation (0: Not inhibit, 1: Inhibit)

Unit No	Modbus register address	Function	Functional detail	Value
Indoor Unit No.1	30063	Filter sign status	Filter sign monitoring	0: No sign 1: Filter sign
	30064	Economy mode operation status	Economy mode operation status monitoring	1: Normal operation 2: Save operation
	30065	Antifreeze operation status	Antifreeze operation status monitoring	1: Normal operation 2: Antifreeze operation
	30066	Temperature upper and lower limit setting status (Cool/Dry)	Temperature upper and lower limit setting status monitoring of Cool/Dry operation mode	0: Invalid bit0 to bit7: Set value (Upper limit) bit8 to bit15: Set value (Lower limit) (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C
	30067	Temperature upper and lower limit setting status (Heat)	Temperature upper and lower limit setting status of Heat operation mode	0: Invalid bit0 to bit7: Set value (Upper limit) bit8 to bit15: Set value (Lower limit) (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C
	30068	Temperature upper and lower limit setting status (Auto)	Temperature upper and lower limit setting status of Auto operation mode	0: Invalid bit0 to bit7: Set value (Upper limit) bit8 to bit15: Set value (Lower limit) (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C
	30069	Indoor unit status	Indoor unit special status monitoring	bit0: Normal status (0: Special status, 1: Normal status) bit1: Defrosting (0: No defrosting status, 1: Defrosting status) bit2: Oil recovery (0: No oil recovery status, 1: Oil recovery status) bit3: Pump down (0: No pump down status, 1: Pump down status)
	30070	External thermo-off status	External thermo-off status monitoring	1: Release 2: Thermo-off
	30071 to 30110	(Reserved Modbus register address)		

Unit No	Modbus register address	Function	Functional detail	Value
Indoor Unit No.n (n = 2 to 128)	30051+60*(n-1)	VRF address information	VRF address information	bit0 to bit7: Ref. address (0 to 99) bit8 to bit15: Unit address (0 to 63)
	30052+60*(n-1)	(Reserved Modbus register address)		
	30053+60*(n-1)	Master and slave information	Indoor unit master and slave information in remote controller group.	0: Master 1: Slave
	30054+60*(n-1)	Operation mode status	Operation mode status monitoring	1: Auto 2: Cool 3: Dry 4: Heat 5: Fan
	30055+60*(n-1)	Operation ON/OFF status	Operation ON/OFF status monitoring	1: Stop 2: Operation
	30056+60*(n-1)	Set temperature status	Set temperature status monitoring	bit0 to bit8: Set value (Temperature = Set value / 4) Example) 0°C = 0, 20°C = 80, 30°C = 120 by every 0.25°C
	30057+60*(n-1)	Airflow status	Airflow status monitoring	1:Auto 2:Quiet 3:Low 4:Med 5:High 6:Med-Low 7:Med-High
	30058+60*(n-1)	Indoor temperature status	Indoor temperature monitoring	bit0 to bit8: Set value (Temperature = Set value / 4) Example) 0°C = 0, 20°C = 80, 30°C = 120 by every 0.25°C
	30059+60*(n-1)	Error monitoring	Error status monitoring	bit0: Error/No error (0: No error, 1: Error) bit8 to bit11: Error code subsection bit12 to bit15: Error code section
	30060+60*(n-1)	Vertical air direction position status	Vertical air direction position status monitoring	1: Swing 2: Position 1 3: Position 2 4: Position 3 5: Position 4
	30061+60*(n-1)	Horizontal air direction position status	Horizontal air direction position status monitoring	1: Swing 2: Position 1 3: Position 2 4: Position 3 5: Position 4 6: Position 5
	30062+60*(n-1)	Remote controller operation prohibition setting status	Remote controller operation prohibition setting status monitoring	bit0: ALL operation settings (0: Not inhibit, 1: Inhibit) bit1: Timer setting (0: Not inhibit, 1: Inhibit) bit2: Room temperature setting (0: Not inhibit, 1: Inhibit) bit3: Operation mode setting (0: Not inhibit, 1: Inhibit) bit4: Start/Stop operation setting (0: Not inhibit, 1: Inhibit) bit5: Start operation setting (0: Not inhibit, 1: Inhibit) bit6: Filter Reset operation (0: Not inhibit, 1: Inhibit)

"n" in the Unit No.

- Indicates the order of VRF address registered in the Converter.
- At initial setting of the address (Default, Scan, and PC), VRF address is registered in ascending order.
- The order of VRF address registered in the Converter can be confirmed from PC (Tool for Converter)

Unit No	Modbus register address	Function	Functional detail	Value
Indoor Unit No.n (n = 2 to 128)	30063+60*(n-1)	Filter sign status	Filter sign monitoring	0: No sign 1: Filter sign
	30064+60*(n-1)	Economy mode operation status	Economy mode operation status monitoring	1: Normal operation 2: Save operation
	30065+60*(n-1)	Antifreeze operation status	Antifreeze operation status monitoring	1: Normal operation 2: Antifreeze operation
	30066+60*(n-1)	Temperature upper and lower limit setting status (Cool/Dry)	Temperature upper and lower limit setting status monitoring of Cool/Dry operation mode	0: Invalid bit0 to bit7: Set value (Upper limit) bit8 to bit15: Set value (Lower limit) (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C = 120 by every 0.5°C
	30067+60*(n-1)	Temperature upper and lower limit setting status (Heat)	Temperature upper and lower limit setting status of Heat operation mode	0: Invalid bit0 to bit7: Set value (Upper limit) bit8 to bit15: Set value (Lower limit) (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C = 120 by every 0.5°C
	30068+60*(n-1)	Temperature upper and lower limit setting status (Auto)	Temperature upper and lower limit setting status of Auto operation mode	0: Invalid bit0 to bit7: Set value (Upper limit) bit8 to bit15: Set value (Lower limit) (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C = 120 by every 0.5°C
	30069+60*(n-1)	Indoor unit status	Indoor unit special status monitoring	bit0: Normal status (0: Special status, 1: Normal status) bit1: Defrosting (0: Non-defrosting status, 1: Defrosting status) bit2: Oil recovery (0: No oil recovery status, 1: Oil recovery status) bit3: Pump down (0: No pump down status, 1: Pump down status)
	30070+60*(n-1)	External thermo-off status	External thermo-off status monitoring	1: Release 2: Thermo-off
	30071+60*(n-1) to 30110+60*(n-1)	(Reserved Modbus register address)		



Unit No	Modbus register address	Function	Functional detail	Value
ALL Indoor Unit	37731	Error monitoring	Error status monitoring of all indoor units connecting to Modbus Converter	0: No errors of all indoor units 1: Some indoor units are error status
	37732	Operation ON/OFF status	Operation status monitoring of all indoor units connecting to Modbus Converter	1: All indoor units stop 2: Some indoor units are operating
	37733 to 37740	(Reserved Modbus register address)		
Outdoor Unit No.1	37741	VRF address information	VRF address information	bit0 to bit7: Ref. address (0 to 99) bit8 to bit15: Unit address (00 to 03)
	37742	Master and slave information	Outdoor units master and slave information.	0: Master 1: Slave
	37743	Outdoor unit low noise operation status	Outdoor unit low noise operation status monitoring	bit0: Performance priority valid / invalid (0: Performance priority invalid, 1: Performance priority valid) bit1 to bit2 0: Release 1: Level 1 2: Level 2 3: Level 3
	37744	Outdoor unit rated capacity save instruction monitoring	Outdoor unit rated capacity save operation monitoring	1: Release 2: 100% 3: 90% 4: 80% 5: 70% 6: 60% 7: 50% 8: 40%
	37745 to 37755	(Reserved Modbus register address)		
Outdoor Unit No.1 (n = 2 to 100)	37741+15*(n-1)	VRF address information	VRF address information	bit0 to bit7: Ref. address (0 to 99) bit8 to bit15: Unit address (00 to 03)
	37742+15*(n-1)	Master and slave information	Outdoor units master and slave information.	0: Master 1: Slave
	37743+15*(n-1)	Outdoor unit low noise operation status	Outdoor unit low noise operation status monitoring	bit0: Performance priority valid / invalid (0: Performance priority invalid, 1: Performance priority valid) bit1 to bit2 0: Release 1: Level 1 2: Level 2 3: Level 3
	37744+15*(n-1)	Outdoor unit rated capacity save instruction monitoring	Outdoor unit rated capacity save operation monitoring	1: Release 2: 100% 3: 90% 4: 80% 5: 70% 6: 60% 7: 50% 8: 40%
	37745+15*(n-1) to 37755+15*(n-1)	(Reserved Modbus register address)		
VRF System	39241	VRF system status	VRF system special status monitoring	bit0: Normal status (0: Special status 1: normal status) bit1: Bus priority (0: No bus priority status, 1: Bus priority status) bit2: Emergency stop (0: No emergency stop status, 1: Emergency stop status) bit3: Maintenance mode (0: No maintenance mode status, 1: Maintenance mode status)
	39242 to 39999	(Reserved Modbus register address)		

Unit No	Modbus register address	Function	Functional detail	Value
Indoor Unit No.1	40001	VRF address change	VRF address change	bit0: Ref No. Change / No change (0: No change, 1: Change) bit1 to bit7: Ref. address (0 to 99) bit8: Unit address Change / No change (0: No change, 1: Change) bit9 to bit15: Unit address (0 to 63)
	40002	Operation mode setting	Operation mode setting	0: No change 1: Auto 2: Cool 3: Dry 4: Heat 5: Fan
	40003	Operation ON/OFF setting	Operation ON/OFF setting	0: No change 1: Stop 2: Operation
	40004	Set temperature setting	Set temperature setting	bit0: Set temperature Change / No change (0: No change, 1: Change) bit1 to bit8: Set value (Temperature = Set value / 4) Example) 0°C = 0, 20°C = 80, 30°C =120 by every 0.5°C

\*1

\*1 Explanation for temperature setting :

When set temperature is changed to 20°C;

Bit 0: 1

Bit 1~8: "Set temperature x 4" to convert binary

20 x 4 = 80 (decimal)

80 (decimal) → 0101 0000 (binary)

Put binary bit from 0 to 8

Value is "0 1010 0001" (binary), 161 (decimal)

When set temperature is not changed;

Bit 0: 0

Value is 0 (binary), (decimal)

Celsius	Fahrenheit	Value		
		Dec	Bin	Hex
18	64.4	145	1001 0001	91
19	66.2	153	1001 1001	99
20	68.0	161	1010 0001	A1
21	69.8	169	1010 1001	A9
22	71.6	177	1011 0001	B1
23	73.4	185	1011 1001	B9
24	75.2	193	1100 0001	C1
25	77.0	201	1100 1001	C9
26	78.8	209	1101 0001	D1
27	80.6	217	1101 1001	D9
28	82.4	225	1110 0001	E1
29	84.2	233	1110 1001	E9
30	86.0	241	1111 0001	F1

Unit No	Modbus register address	Function	Functional detail	Value
Indoor Unit No.1	40005	Airflow setting	Airflow setting	0: No change 1: Auto 2: Quiet 3: Low 4: Med 5: High 6: Med-Low 7: Med-High
	40006	Vertical air direction position status	Vertical air direction position status monitoring	0: No change 1: Swing 2: Position 1 3: Position 2 4: Position 3 5: Position 4
	40007	Horizontal air direction position status	Horizontal air direction position status monitoring	0: No change 1: Swing 2: Position 1 3: Position 2 4: Position 3 5: Position 4 6: Position 5
	40008	Remote controller operation prohibition setting	Remote controller operation prohibition setting	bit0: Change / No change bit1: ALL operation settings (0: Not inhibit, 1: Inhibit) bit2: Timer setting (0: Not inhibit, 1: Inhibit) bit3: Room temperature setting (0: Not inhibit, 1: Inhibit) bit4: Operation mode setting (0: Not inhibit, 1: Inhibit) bit5: Start/Stop operation setting (0: Not inhibit, 1: Inhibit) bit6: Start operation setting (0: Not inhibit, 1: Inhibit) bit7: Filter Reset operation (0: Not inhibit, 1: Inhibit)
	40009	Filter sign reset	Filter sign reset	0: No change 1: Reset
	40010	Economy mode operation setting	Economy mode operation setting	0: No change 1: Normal operation 2: Save operation
	40011	Antifreeze operation setting	Antifreeze operation setting	0: No change 1: Release 2: Antifreeze operation

Unit No	Modbus register address	Function	Functional detail	Value	
Indoor Unit No.1	40012	Temperature upper and lower limit Upper limit value setting (Cool/Dry)	Upper limit value setting for temperature upper and lower limit of Cool/Dry operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40013	Temperature upper and lower limit Lower limit value setting (Cool/Dry)	Lower limit value setting for temperature upper and lower limit of Cool/Dry operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40014	Temperature upper and lower limit Upper limit value setting (Heat)	Upper limit value setting for temperature upper and lower limit of Heat operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40015	Temperature upper and lower limit Lower limit value setting (Heat)	Lower limit value setting for temperature upper and lower limit of Heat operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40016	Temperature upper and lower limit: Upper limit value setting (Auto)	Upper limit value setting for temperature upper and lower limit of Auto operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40017	Temperature upper and lower limit: Lower limit value setting (Auto)	Lower limit value setting for temperature upper and lower limit of Auto operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40018	External thermo-off setting	External thermo-off setting	0: No change 1: Release 2: Thermo-off	
	40019 to 40060	(Reserved Modbus register address)			

\* Note

Set the temperature upper and lower limit setting (40012 to 40017) as follows.

- Set the set value so that "lower limit value" is smaller than "upper limit value".
- When switching between "No limit" and "Limit", always change all the limits (40012 to 40017) at the same time by using the function code (0x10).

\*2: For setting details please refer to page 16

Unit No	Modbus register address	Function	Functional detail	Value
Indoor Unit No.n (n = 2 to 128)	40001+60*(n-1)	VRF address change	VRF address change	bit0: Ref No. Change / No change (0: No change, 1: Change) bit1 to bit7: Ref. address (0 to 99) bit8: Unit address change / no change (0: No change, 1: Change) bit9 to bit15: Unit address (0 to 63)
	40002+60*(n-1)	Operation mode setting	Operation mode setting	0: No change 1: Auto 2: Cool 3: Dry 4: Heat 5: Fan
	40003+60*(n-1)	Operation ON/OFF setting	Operation ON/OFF setting	0: No change 1: Stop 2: Operation
	40004+60*(n-1)	Set temperature setting	Set temperature setting	bit0: Set temperature Change / No change (0: No change, 1: Change) bit1 to bit8: Set value (Temperature = Set value / 4) Example) 0°C = 0, 20°C = 80, 30°C = 120 by every 0.25°C

\*1

\*1 Explanation for temperature setting :

When set temperature is changed to 20°C;

Bit 0: 1

Bit 1~8: "Set temperature x 4" to convert binary

20 x 4 = 80 (decimal)

80 (decimal) → 0101 0000 (binary)

Put binary bit from 0 to 8

Value is "0 1010 0001" (binary), 161 (decimal)

When set temperature is not changed;

Bit 0: 0

Value is 0 (binary), (decimal)

Celsius	Fahrenheit	Value		
		Dec	Bin	Hex
18	64.4	145	1001 0001	91
19	66.2	153	1001 1001	99
20	68.0	161	1010 0001	A1
21	69.8	169	1010 1001	A9
22	71.6	177	1011 0001	B1
23	73.4	185	1011 1001	B9
24	75.2	193	1100 0001	C1
25	77.0	201	1100 1001	C9
26	78.8	209	1101 0001	D1
27	80.6	217	1101 1001	D9
28	82.4	225	1110 0001	E1
29	84.2	233	1110 1001	E9
30	86.0	241	1111 0001	F1

Unit No	Modbus register address	Function	Functional detail	Value
Indoor Unit No.n (n = 2 to 128)	40005+60*(n-1)	Airflow setting	Airflow setting	0: No change 1: Auto 2: Quiet 3: Low 4: Med 5: High 6: Med-Low 7: Med-High
	40006+60*(n-1)	Vertical air direction position status	Vertical air direction position status monitoring	0: No change 1: Swing 2: Position 1 3: Position 2 4: Position 3 5: Position 4
	40007+60*(n-1)	Horizontal air direction position status	Horizontal air direction position status monitoring	0: No change 1: Swing 2: Position 1 3: Position 2 4: Position 3 5: Position 4 6: Position 5
	40008+60*(n-1)	Remote controller operation prohibition setting	Remote controller operation prohibition setting	bit0: Change / No change bit1: ALL operation settings (0: Not inhibit, 1: Inhibit) bit2: Timer setting (0: Not inhibit, 1: Inhibit) bit3: Room temperature setting (0: Not inhibit, 1: Inhibit) bit4: Operation mode setting (0: Not inhibit, 1: Inhibit) bit5: Start/Stop operation setting (0: Not inhibit, 1: Inhibit) bit6: Start operation setting (0: Not inhibit, 1: Inhibit) bit7: Filter Reset operation (0: Not inhibit, 1: Inhibit)

Unit No	Modbus register address	Function	Functional detail	Value	
Indoor Unit No.n (n = 2 to 128)	40009+60*(n-1)	Filter sign reset	Filter sign reset	0: No change 1: Reset	
	40010+60*(n-1)	Economy mode operation setting	Economy mode operation setting	0: No change 1: Normal operation 2: Save operation	
	40011+60*(n-1)	Antifreeze operation setting	Antifreeze operation setting	0: No change 1: Release 2: Antifreeze operation	
	40012+60*(n-1)	Temperature upper and lower limit Upper limit value setting (Cool/Dry)	Upper limit value setting for temperature upper and lower limit of Cool/Dry operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40013+60*(n-1)	Temperature upper and lower limit Lower limit value setting (Cool/Dry)	Lower limit value setting for temperature upper and lower limit of Cool/Dry operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40014+60*(n-1)	Temperature upper and lower limit Upper limit value setting (Heat)	Upper limit value setting for temperature upper and lower limit of Heat operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40015+60*(n-1)	Temperature upper and lower limit Lower limit value setting (Heat)	Lower limit value setting for temperature upper and lower limit of Heat operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40016+60*(n-1)	Temperature upper and lower limit: Upper limit value setting (Auto)	Upper limit value setting for temperature upper and lower limit of Auto operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40017+60*(n-1)	Temperature upper and lower limit: Lower limit value setting (Auto)	Lower limit value setting for temperature upper and lower limit of Auto operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	40018+60*(n-1)	External thermo-off setting	External thermo-off setting	0: No change 1: Release 2: Thermo-off	
40019+60*(n-1) to 40060+60*(n-1)"	(Reserved Modbus register address)				

\*2: For setting details please refer to page 19

Unit No	Modbus register address	Function	Functional detail	Value
ALL Indoor Unit	47681	Operation mode setting	Operation mode setting	0: No change 1: Auto 2: Cool 3: Dry 4: Heat 5: Fan
	47682	Operation ON/OFF setting	Operation ON/OFF setting	0: No change 1: Stop 2: Operation
	47683	Set temperature setting	Set temperature setting	bit0: Set temperature Change / No change (0: No change, 1: Change) bit1 to bit8: Set value (Temperature = Set value / 4) Example) 0°C = 0, 20°C = 80, 30°C =120 by every 0.25°C
	47684	Airflow setting	Airflow setting	0: No change 1:Auto 2:Quiet 3:Low 4:Med 5:High 6:Med-Low 7:Med-High
	47685	Remote controller operation prohibition setting status	Remote controller operation prohibition setting status monitoring	bit0: Change / No change bit1: ALL operation settings (0: Not inhibit, 1: Inhibit) bit2: Timer setting (0: Not inhibit, 1: Inhibit) bit3: Room temperature setting (0: Not inhibit, 1: Inhibit) bit4: Operation mode setting (0: Not inhibit, 1: Inhibit) bit5: Start/Stop operation setting (0: Not inhibit, 1: Inhibit) bit6: Start operation setting (0: Not inhibit, 1: Inhibit) bit7: Filter Reset operation (0: Not inhibit, 1: Inhibit)

\*1

\*1 Explanation for temperature setting :

When set temperature is changed to 20°C;

Bit 0: 1

Bit 1~8: "Set temperature x 4" to convert binary

20 x 4 = 80 (decimal)

80 (decimal) → 0101 0000 (binary)

Put binary bit from 0 to 8

Value is "0 1010 0001" (binary), 161 (decimal)

When set temperature is not changed;

Bit 0: 0

Value is 0 (binary), (decimal)

Celsius	Fahrenheit	Value		
		Dec	Bin	Hex
18	64.4	145	1001 0001	91
19	66.2	153	1001 1001	99
20	68.0	161	1010 0001	A1
21	69.8	169	1010 1001	A9
22	71.6	177	1011 0001	B1
23	73.4	185	1011 1001	B9
24	75.2	193	1100 0001	C1
25	77.0	201	1100 1001	C9
26	78.8	209	1101 0001	D1
27	80.6	217	1101 1001	D9
28	82.4	225	1110 0001	E1
29	84.2	233	1110 1001	E9
30	86.0	241	1111 0001	F1



Unit No	Modbus register address	Function	Functional detail	Value	
ALL Indoor Unit	47686	Temperature upper and lower limit Upper limit value setting (Cool/Dry)	Upper limit value setting for temperature upper and lower limit of Cool/Dry operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	47687	Temperature upper and lower limit Lower limit value setting (Cool/Dry)	Lower limit value setting for temperature upper and lower limit of Cool/Dry operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	47688	Temperature upper and lower limit Upper limit value setting (Heat)	Upper limit value setting for temperature upper and lower limit of Heat operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	47689	Temperature upper and lower limit Lower limit value setting (Heat)	Lower limit value setting for temperature upper and lower limit of Heat operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	47690	Temperature upper and lower limit: Upper limit value setting (Auto)	Upper limit value setting for temperature upper and lower limit of Auto operation mode	bit0: Upper limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	47691	Temperature upper and lower limit: Lower limit value setting (Auto)	Lower limit value setting for temperature upper and lower limit of Auto operation mode	bit0: Lower limit temperature Change / No change (0: No change, 1: Change) bit1 to bit8: 0: Invalid 1 to 255 : Set value (Temperature = Set value / 4) Example) 0.5°C = 2, 20°C = 80, 30°C =120 by every 0.5°C	*2
	47692	External thermo-off setting	External thermo-off setting	0: No change 1: Release 2: Thermo-off	
	47693	Emergency stop instruction	Emergency stop instruction	0: Invalid 1: Release request 2: Emergency stop request	
	47694 to 47710	(Reserved Modbus register address)			

\*2: For setting details please refer to page 22

Unit No	Modbus register address	Function	Functional detail	Value
Outdoor Unit No.1	47711	VRF address change	VRF address change	bit0: Ref No. Change / No change (0: No change, 1: Change) bit1 to bit7: Ref. address (0 to 99) bit8: Unit address Change / No change (0: No change, 1: Change) bit9 to bit15: Unit address (0 to 3)
	47712	Outdoor unit low noise operation setting	Outdoor unit low noise operation setting	bit0: Change / No change bit1: Performance priority valid / invalid (0: Performance priority invalid, 1: Performance priority valid) bit2 to bit3 0: Release 1: Level 1 2: Level 2 3: Level 3
	47713	Outdoor unit rated capacity save instruction	Outdoor unit rated capacity save instruction	0: No change 1: Release 2: 100% 3: 90% 4: 80% 5: 70% 6: 60% 7: 50% 8: 40%
	47714 to 47725	(Reserved Modbus register address)		
Outdoor Unit No.n (n = 2 to 100)	47711+15*(n-1)	VRF address change	VRF address change	bit0: Ref No. Change / No change (0: No change, 1: Change) bit1 to bit7: Ref. address (0 to 99) bit8: Unit address Change / No change (0: No change, 1: Change) bit9 to bit15: Unit address (0 to 3)
	47712+15*(n-1)	Outdoor unit low noise operation setting	Outdoor unit low noise operation setting	bit0: Change / No change bit1: Performance priority valid / invalid (0: Performance priority invalid, 1: Performance priority valid) bit2 to bit3 0: Release 1: Level 1 2: Level 2 3: Level 3
	47713+15*(n-1)	Outdoor unit rated capacity save instruction	Outdoor unit rated capacity save operation	0: No change 1: Release 2: 100% 3: 90% 4: 80% 5: 70% 6: 60% 7: 50% 8: 40%
	47714+15*(n-1) to 47725+15*(n-1)	(Reserved Modbus register address)		

Unit No	Modbus register address	Function	Functional detail	Value
VRF System	49211	Emergency stop instruction	Emergency stop instruction	0: No change 1: Release request 2: Emergency stop request
	49212	System time adjustment (Year/Month)	System time setting (Year/Month)	0bit: Change / No change (0: No change, 1: Change) 1bit: Summer time (0: Normal, 1: Summer time) 2bit to 8bit: Year (Last two digits, 0 to 99), 9bit to 12bit: Month (1 to 12)
	49213	System time adjustment (Day/Day of week/Hour)	System time setting (Day/Day of week/Hour)	0bit: Request / No request (0: No request, 1: Request) 1bit to 5bit: Day (1 to 31) 6bit to 8bit: Day of week (0: Sun, 1: Mon, 2: Tue, 3: Wed, 4: Thu, 5: Fri, 6: Sat) 9bit to 13bit: Time (0 to 23)
	49214	System time adjustment (Minute/Second)	System time setting (Minute/Second)	0bit: Request / No request (0: No request, 1: Request) 1bit to 6bit: Minute (0 to 59) 7bit to 12bit: Second (0 to 59)
	49215 to 49999	(Reserved Modbus register address)		

\* Note

- For system time adjustment (49212 to 49214), always change all the limits at the same time by using the function code (0x10).