

UTY-VMSX

INSTALLATION MANUAL

MODBUS CONVERTOR FOR INDOOR UNIT

For authorized service personnel only.

English

INSTALLATIONSANLEITUNG

MODBUS-KONVERTER FÜR INNENGERÄT

Nur für autorisiertes Fachpersonal.

Deutsch

MANUEL D'INSTALLATION

CONVERTISSEUR MODBUS POUR UNITÉ INTÉRIEURE

Pour le personnel agréé uniquement.

Français

MANUAL DE INSTALACIÓN

CONVERTIDOR MODBUS PARA LA UNIDAD INTERIOR

Únicamente para personal de servicio autorizado.

Español

MANUALE DI INSTALLAZIONE

CONVERTITORE MODBUS PER UNITÀ INTERNE

A uso esclusivo del personale tecnico autorizzato.

Italiano

ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ

ΜΕΤΑΤΡΟΠΕΑΣ MODBUS ΓΙΑ ΕΣΩΤΕΡΙΚΗ ΜΟΝΑΔΑ

Μόνο για εξουσιοδοτημένο τεχνικό προσωπικό.

Ελληνικά

MANUAL DE INSTALAÇÃO

CONVERSOR MODBUS PARA UNIDADE INTERIOR

Apenas para técnicos autorizados.

Português

РУКОВОДСТВО ПО УСТАНОВКЕ

КОНВЕРТОР MODBUS ДЛЯ ВНУТРЕННЕГО МОДУЛЯ

Только для авторизованного обслуживающего персонала.

Русский

MONTAJ KILAVUZU

İÇ ÜNİTE İÇİN MODBUS DÖNÜŞTÜRÜCÜ

Yalnızca yetkili servis personeli için.

Türkçe

安装说明书

室内机用 Modbus 信号转换器

仅针对授权的专业维修人员。

中文

富士通将军有限公司
FUJITSU GENERAL LIMITED



[Original instructions]

PART NO. 9374707140-02

INSTALLATION MANUAL


PART NO. 9374707140-02
MODBUS CONVERTOR for Indoor unit

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1. SAFETY PRECAUTIONS

- The "SAFETY PRECAUTIONS" indicated in this manual contain important information pertaining to your safety. Be sure to observe them.
- Request the user to keep this manual on hand for future use, such as for relocating or repairing the unit.

 WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
Perform electrical work by an authorized service personnel in accordance with this manual and the electrical wiring regulations or implementation regulations of the country. Also do not install this unit by yourself. Improper electric work will cause electric shock or a fire.	
Perform installation work in accordance with this manual. Request an authorized service personnel to perform installation work. Do not install this unit by yourself. Improper installation will cause injury, electric shock, fire, etc.	
In the event of a malfunction (burning smell, etc.), immediately stop operation, turn off the electrical breaker, and consult authorized service personnel.	
Use a power source exclusively for this unit. Never share the power source with other electrical equipment. Doing so will cause fire and electric shock.	
Do not install the unit in the following areas: <ul style="list-style-type: none">• Do not install the unit near a source of heat, steam, or flammable gas.• Area filled with mineral oil or containing a large amount of splashed oil or steam, such as a kitchen. It will deteriorate plastic parts, causing the parts to fail or the unit to leak water.• Area that generates substances that adversely affect the equipment, such as sulfuric gas, chlorine gas, acid, or alkali. It will cause the copper pipes and brazed joints to corrode, which can cause refrigerant leakage.• Area containing equipment that generates electromagnetic interference. It will cause the control system to malfunction, preventing the unit from operating normally.• Area that can cause combustible gas to leak, contains suspended carbon fibers or flammable dust, or volatile inflammables such as paint thinner or gasoline. If gas leaks and settles around the unit, it can cause a fire.• Do not use the unit for special purposes, such as storing food, raising animals, growing plants, or preserving precision devices or art objects. It can degrade the quality of the preserved or stored objects.• Install the unit in a well-ventilated place avoiding rains and direct sunlight.	
Do not operate this unit when your hands are wet. Touching the unit with wet hands will cause an electric shock.	
If children may approach the unit, take preventive measures so that they cannot reach the unit.	



CAUTION

This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user or damage to property.







Pay abundant care when transporting this unit because it is a precision device. Improper transportation will cause trouble.
Do not touch the switches with sharp objects. Doing so will cause injury, trouble, or electric shock.
Do not expose this unit directly to water. Doing so will cause trouble, electric shock, or heating.
Do not set vessels containing a liquid on this unit. Doing so will cause heating, fire, or electric shock.
Dispose of the packing materials safely. Tear and dispose of the plastic packing bags so that children cannot play with them. There is the danger of suffocation if children play with the original plastic bags.
Do not insert articles into the slit parts of this unit. Doing so will cause trouble, heating, or electric shock.

2. MAIN UNIT AND ACCESSORIES

Important: Download the interface specifications from the website before starting installation work.

<http://www.fujitsu-general.com/global/support/>

The following installation parts are supplied. Use them as required.

Name and Shape	Q'ty	Application
MODBUS convertor 	1	Main unit
Installation manual 	1	This manual
Cable tie 	4	For mounting the transmission cable.
Screw (M4 x 16 mm) 	3	For mounting the MODBUS Convertor.
Connector cable 	1	For connecting to indoor unit (1.5m)
MODBUS connector 	1	For connecting the cable and attaching the board connector.

3. ELECTRICAL REQUIREMENT

Use	Size		Wire type	Remarks
MODBUS cable	Maximum	1.25 mm ² (16AWG)	AWG16-26 3Wire+ Sheathed PVC cable	
	Minimum	0.128 mm ² (26AWG)		

MODBUS is registered trademark of Schneider Electric SA.

* : Use shielded cable in accordance with local rules for MODBUS cable.

4. MODBUS COMMUNICATION SPECIFICATIONS

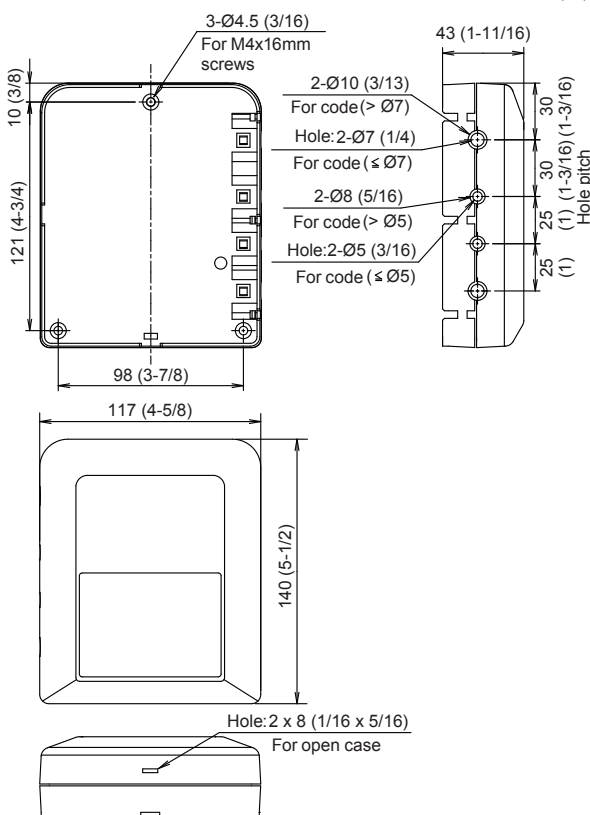
Transfer mode	RTU mode
Communication method	Half-duplex operation, Master/slave method
Communication speed	9600bps / 19200bps
Synchronous system	Asynchronous communication method
Data bit	8 bit
Parity	even/odd/none
Stop bit	2 bit (no parity) / 1 bit
Network	3 wire RS485
Maximum cable length	1000 (m)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

5. SELECTING AN INSTALLATION LOCATION

5.1. Dimensions

The MODBUS Converter is comprised of a body and cover.

Unit : mm (in.)



Power consumption (W)		1.2
Temperature °C(°F)	Operating	0–46 (32–114)
	Packaged	–10–60 (14–140)
Humidity (%)	Packaged	0–95 (RH); No condensation
Dimensions H x W x D mm(in.)		43 x 117 x 140 (1-11/16 x 4-5/8 x 5-1/2)
Weight g (oz.)		200 (7)

6. WIRING

⚠ WARNING

Before starting installation work, turn off the power of this unit and the connection destination. Do not turn on the power again until installation is completed. Otherwise, it will cause electric shock or fire.

Use specified cables or accessory cables to connect to this unit. Do not modify the cables to connect this unit other than those specified, do not use extension cables, and do not use independent branch wiring. It may cause electric shock or fire.

Install the transmission cables securely to the terminal block. Confirm that external force is not applied to the cable. Use transmission cables made of the specified cable. If intermediate connection or insertion fixing are imperfect, it will cause electric shock, fire, etc.

When connecting the cables to this unit, route the cables so that the cover of this unit is securely fixed. If the cover is imperfectly fixed, it may cause fire or overheating of the terminals.

Perform earth (ground) work positively. Do not connect the earth (ground) cable to a telephone cable, water pipe, or conductor rod.

Always fasten the outside covering of the transmission cables with the cable clamp. (If the insulator is chafed, electric leakage may occur.)

Perform all wiring works so that the user does not touch the wiring. Otherwise, injury or electric shock could result.

If any cable is damaged, do not repair or modify it yourself. Improper work will cause electric shock or fire.

⚠ CAUTION

Do not bind the remote controller cable and the transmission cable together with or parallel to the power supply cable of the indoor and outdoor units. It may cause erroneous operation.

When performing wiring work, be careful not to damage the cable or injure yourself. Also, connect the connectors securely. Loose connectors will cause trouble, heating, fire, or electric shock.

Install the indoor and outdoor units, power supply cable, transmission cable and remote control cable 1 m (40 in.) away from television and radio to avoid distorted images and noise. Otherwise, a malfunction could result.

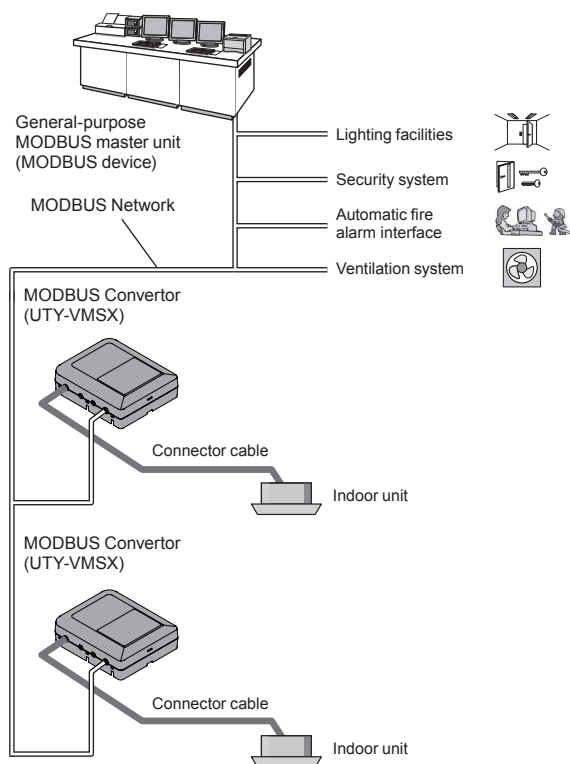
Perform wiring so that water does not enter this unit along the external wiring. Always install a trap to the wiring or take other countermeasures. Otherwise it will cause trouble or electric shock or fire.

Confirm the name of each unit and name of each terminal block of the unit and connect the wiring in accordance with the directions given in the manual so that there is no incorrect wiring. Incorrect wiring will damage the electric parts and cause smoke and fire.

When installing the connection cables near a source of electromagnetic waves, use shielded cable. Otherwise, a breakdown or malfunction could result.

6.1. Wiring method

PROPER SYSTEM DIAGRAM



Maximum connectable indoor unit number per 1 MODBUS Converter

1

Maximum number of connected MODBUS Converter units to one MODBUS master unit

Without repeater

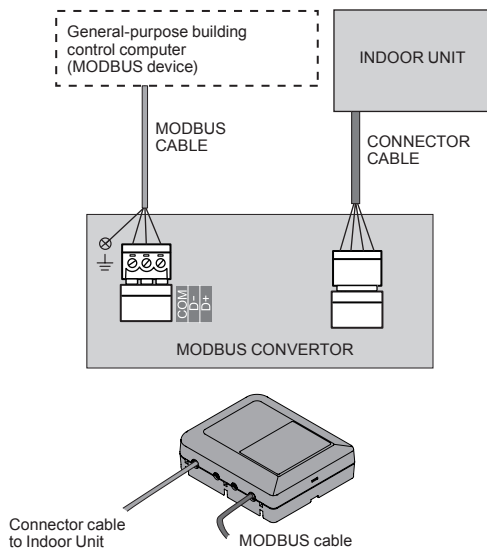
31

With repeater

247*

* Due to the limit in the number of slave addresses

ELECTRICAL WIRING

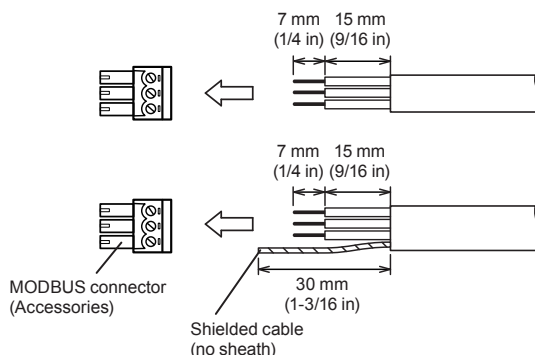


Note :

- Use shield cable for transmission cable.
- The shield metal should be earthed (grounded).
- Do not forget to earth (ground) the MODBUS Converter.

6.2. Unit wiring

6.2.1. MODBUS cable



Tightening torque for installing cables to MODBUS connector

0.22 to 0.25 N · m (1.9 to 2.2 lbf · in) (2.2 to 2.5 kgf · cm)

7. INSTALLING THE MODBUS CONVERTOR

⚠ WARNING

Always use the accessories and specified installation work parts. Check the state of the installation parts. Not using the specified parts will cause units to fall off, electric shock, fire, etc.

Install at a place that can withstand the weight of the unit and install positively so that the unit will not topple or fall.

When installing this unit, make sure that there are no children nearby. Otherwise, injury or electric shock could result.

⚠ CAUTION

Do not set the DIP switch or rotary switch of this unit except as specified in this installation manual or the instruction manual supplied with the air conditioner. Setting the switches other than specified will cause an accident or trouble.

Use an insulated screwdriver to set the DIP switches.

Before opening the cover of this unit, completely discharge static electricity charged on your body. Otherwise, failure or malfunction could result.

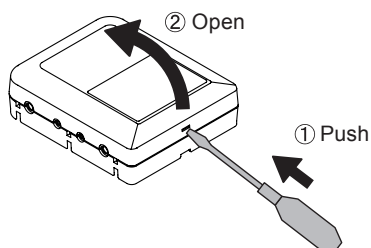
Do not touch the circuit board and circuit board parts directly with your hands. Otherwise, injury or electric shock could result.

Tightening the mounting screws too tight will damage the body of this unit.

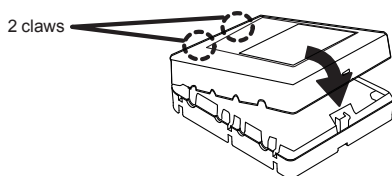
Be careful so that the cover does not fall after the cover screws are removed. Otherwise, injury could result.

7.1. Connecting the transmission cables

- (1) Turn off the power of the connecting unit.
- (2) Insert the driver, etc. into the hole (For open case) and open the top cover.

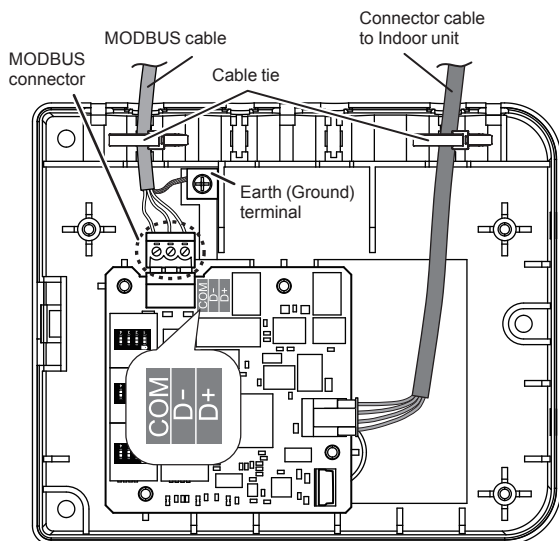


- (3) Connect the transmission cable to accessory MODBUS Connector to connect to MODBUS network.
- (4) Connect the MODBUS cables to RS485_A+ (D+), RS485_B- (D-), and Common (COM) according to the polarity of the master unit.
- (5) Attach the MODBUS connector to the board terminal.
- (6) When using MODBUS cable with shield, earth (ground) at one end of cable. Connect the shield to the Earth (Ground) terminal. However, the Earth (Ground) terminal of this unit is not earthed (grounded) directly, earth (ground) at the opposite side end or earth (ground) using separately purchased cable. Do not connect the shield to the Common (COM).
- (7) Connect the connector cable for indoor unit to the specified connector firmly.
- (8) Securely tighten the cable tie and then confirm that the cable will not come out.
- (9) Once the wiring of the cables has been completed, fit the 2 claws of top cover and close the cover.

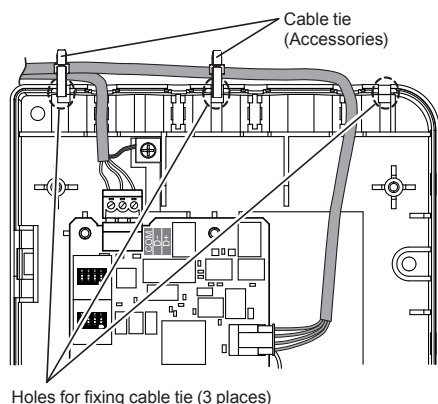


- (10) Use the 3 screws (M4 × 16 mm) provided to mount the MODBUS converter to the behind ceiling, wall, floor or other suitable location.

* The hole for a cable can be widened as necessary. When passing the thick cable through the hole, widen it.

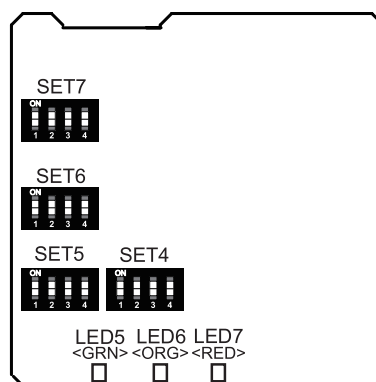


Fix the connector cable even outside the main unit as necessary. Fix the cable with cable tie using 3 fixing holes.



8. CIRCUIT BOARD SETTING

Set MODBUS converter DIP switch SET4, SET5, SET6, SET7.



- (1) MODBUS communication setting: MODBUS slave address setting (SET4/5)

Address can be set. (1 to 247)

MODBUS converter address	DIP Switch Setting ON: ● / OFF: ○							
	SET5-1	SET5-2	SET5-3	SET5-4	SET4-1	SET4-2	SET4-3	SET4-4
1	★○	★○	★○	★○	★○	★○	★○	★●
2	○	○	○	○	○	○	○	●
3	○	○	○	○	○	○	●	●
4	○	○	○	○	○	●	○	○
5	○	○	○	○	○	●	○	●
6	○	○	○	○	○	●	●	○
7	○	○	○	○	○	●	●	●
8	○	○	○	○	●	○	○	○
9	○	○	○	○	●	○	○	●
10	○	○	○	○	●	○	●	○
11	○	○	○	○	●	○	●	●
12	○	○	○	○	●	●	○	○
13	○	○	○	○	●	●	○	●
14	○	○	○	○	●	●	●	○
15	○	○	○	○	●	●	●	●
16	○	○	○	●	○	○	○	○
17	○	○	○	●	○	○	○	●
18	○	○	○	●	○	○	●	○
19	○	○	○	○	○	○	○	●
20	○	○	○	●	○	●	○	○
21	○	○	○	●	○	●	○	●
22	○	○	○	●	○	●	●	○
23	○	○	○	●	○	●	●	●
24	○	○	○	●	●	○	○	○

MODBUS converter address	DIP Switch Setting ON:● / OFF:○							
	SET5-1	SET5-2	SET5-3	SET5-4	SET4-1	SET4-2	SET4-3	SET4-4
25	○	○	○	●	●	○	○	●
26	○	○	○	●	●	○	●	○
27	○	○	○	●	●	○	●	●
28	○	○	○	●	●	●	○	○
29	○	○	○	●	●	●	○	●
30	○	○	○	●	●	●	●	○
31	○	○	○	●	●	●	●	●
32	○	○	●	○	○	○	○	○
33	○	○	●	○	○	○	○	●
34	○	○	●	○	○	○	●	○
35	○	○	●	○	○	○	●	●
36	○	○	●	○	○	●	○	○
37	○	○	●	○	○	●	○	●
38	○	○	●	○	○	●	●	○
39	○	○	●	○	○	●	●	●
40	○	○	●	○	●	○	○	○
41	○	○	●	○	●	○	○	●
42	○	○	●	○	●	○	●	○
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66	○	●	○	○	○	○	●	○
67	○	●	○	○	○	○	●	●
68	○	●	○	○	○	●	○	○
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130	●	○	○	○	○	○	○	○
131	●	○	○	○	○	○	○	●
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133	●	○	○	○	○	○	●	○
134	●	○	○	○	○	○	●	○
135	●	○	○	○	○	○	●	●
136	●	○	○	○	○	●	○	○
137	●	○	○	○	○	●	○	○
138	●	○	○	○	○	●	○	○
139	●	○	○	○	○	●	○	●
140	●	○	○	○	○	●	●	○
141	●	○	○	○	○	●	●	○
142	●	○	○	○	○	●	●	○
143	●	○	○	○	○	●	●	●
144	●	○	○	○	○	○	○	○
145	●	○	○	○	○	○	○	○
146	●	○	○	○	○	○	○	○
147	●	○	○	○	○	○	○	○
148	●	○	○	○	○	○	○	○
149	●	○	○	○	○	○	○	○
150	●	○	○	○	○	○	○	○
151	●	○	○	○	○	○	○	○
152	●	○	○	○	○	○	○	○
153	●	○	○	○	○	○	○	○
154	●	○	○	○	○	○	○	○
155	●	○	○	○	○	○	○	○
156	●	○	○	○	○	○	○	○
157	●	○	○	○	○	○	○	○
158	●	○	○	○	○	○	○	○
159	●	○	○	○	○	○	○	○
160	●	○	○	○	○	○	○	○
161	●	○	○	○	○	○	○	○
162	●	○	○	○	○	○	○	○

MODBUS converter address	DIP Switch Setting ON:● / OFF:○							
	SET5-1	SET5-2	SET5-3	SET5-4	SET4-1	SET4-2	SET4-3	SET4-4
163	●	○	●	○	○	○	●	●
164	●	○	●	○	○	●	○	○
165	●	○	●	○	○	●	○	●
166	●	○	●	○	○	●	●	○
167	●	○	●	○	○	●	●	●
168	●	○	●	○	●	○	○	○
169	●	○	●	○	●	○	○	●
170	●	○	●	○	●	○	●	○
171	●	○	●	○	●	○	●	●
172	●	○	●	○	●	●	○	○
173	●	○	●	○	●	●	○	●
174	●	○	●	○	●	●	●	○
175	●	○	●	○	●	●	●	●
176	●	○	●	●	○	○	○	○
177	●	○	●	●	○	○	○	●
178	●	○	●	●	○	○	●	○
179	●	○	●	●	○	○	●	●
180	●	○	●	●	○	●	○	○
181	●	○	●	●	○	●	○	●
182	●	○	●	●	○	●	●	○
183	●	○	●	●	○	●	●	●
184	●	○	●	●	●	○	○	○
185	●	○	●	●	●	○	○	●
186	●	○	●	●	●	○	○	○
187	●	○	●	●	●	○	●	●
188	●	○	●	●	●	●	○	○
189	●	○	●	●	●	●	○	●
190	●	○	●	●	●	●	●	○
191	●	○	●	●	●	●	●	●
192	●	●	○	○	○	○	○	○
193	●	●	○	○	○	○	○	●
194	●	●	○	○	○	○	●	○
195	●	●	○	○	○	○	●	●
196	●	●	○	○	○	●	○	○
197	●	●	○	○	○	●	○	●
198	●	●	○	○	○	●	●	○
199	●	●	○	○	○	●	●	●
200	●	●	○	○	●	○	○	○
201	●	●	○	○	●	○	○	●
202	●	●	○	○	●	○	●	○
203	●	●	○	○	●	○	○	●
204	●	●	○	○	●	●	○	○
205	●	●	○	○	●	●	○	●
206	●	●	○	○	●	●	●	○
207	●	●	○	○	●	●	●	●
208	●	●	○	●	○	○	○	○
209	●	●	○	●	○	○	○	●
210	●	●	○	●	○	○	●	○
211	●	●	○	●	○	○	●	●
212	●	●	○	●	○	●	○	○
213	●	●	○	●	○	●	○	●
214	●	●	○	●	○	●	●	○
215	●	●	○	●	○	●	●	●
216	●	●	○	●	●	○	○	○
217	●	●	○	●	●	○	○	●
218	●	●	○	●	●	○	●	○
219	●	●	○	●	●	○	●	●
220	●	●	○	●	●	●	○	○
221	●	●	○	●	●	●	○	●
222	●	●	○	●	●	●	●	○
223	●	●	○	●	●	●	●	●
224	●	●	●	○	○	○	○	○
225	●	●	●	○	○	○	○	●
226	●	●	●	○	○	○	●	○
227	●	●	●	○	○	○	●	●
228	●	●	●	○	○	○	○	○
229	●	●	●	○	○	●	○	●

230	●	●	●	○	○	●	●	○
231	●	●	●	○	○	●	●	●
232	●	●	●	○	●	○	○	○
233	●	●	●	○	●	○	○	●
234	●	●	●	○	●	○	●	○
235	●	●	●	○	●	○	●	●
236	●	●	●	○	●	●	○	○
237	●	●	●	○	●	●	○	●
238	●	●	●	○	●	●	●	○
239	●	●	●	○	●	●	●	●
240	●	●	●	●	○	○	○	○
241	●	●	●	●	○	○	○	●
242	●	●	●	●	○	○	●	○
243	●	●	●	●	○	○	●	●
244	●	●	●	●	○	●	○	○
245	●	●	●	●	○	●	○	●
246	●	●	●	●	○	●	●	○
247	●	●	●	●	○	●	●	●

(★: Factory setting)

- (2) MODBUS communication setting: Baud rate setting (SET6-4)
ON: 19200bps
OFF: 9600bps (Default)
 - (3) MODBUS communication setting: Parity setting (SET6-3)
ON: odd
OFF: even (Default)
* When the STOP bit setting is "2bit," parity is set to "None" regardless of the setting of this switch.
 - (4) MODBUS communication setting: Stop bit setting (SET6-2)
Stop bit can be set (1 bit or 2 bit).
ON: 2bit
OFF: 1bit (Default)
 - (5) MODBUS communication setting: MODBUS communication terminal resistance (SET7-4)
MODBUS communication terminal resistance can be set (Valid or invalid).
Terminal resistance: 120Ω
Set the terminal resistances as necessary.
For MODBUS system, terminal resistances are necessary at the both ends of communication line. (Total 2 terminal resistances)
Set the terminal resistances at the both ends to be valid and set the terminal resistances other than at the both ends to be invalid.
ON: Terminal resistance valid
OFF: Terminal resistance invalid (Default)
- * The switches from (1) to (4) are read at the time of power-on. Even if these switches are changed after power-on, the setting is not reflected.
- (6) Unused SW
SET6-1, SET7-1 to 3: Not used
All Default settings: "OFF"

9. TURNING ON THE POWER

⚠ CAUTION

Recheck the wiring. Incorrect wiring will cause trouble.

- (1) Check the wiring of MODBUS converter.
 - (2) Check the wiring and switches of units connected to convertor before tuning on the power.
 - (3) Check that the switches of MODBUS converter are correct.
 - (4) Refer to the indoor unit operating manual and turn on the power of indoor unit.
- The MODBUS Converter is initialized for a period of approximately a few seconds after the power is turned on. LED5 (green) and LED6 (orange) flash.
 - After initial setting is completed, operation will be restarted automatically. LED5 (green) lights.
- * MODBUS Converter does not operate during initialization.
If an error occurs, the LED5, LED6, LED7 lights or flashes.

10. LED DISPLAY

10.1. Normal code

Normal indications			Normal contents
LED5 (green)	LED6 (orange)	LED7 (red)	
■	□	□	Normal starting
■	■	□	MODBUS sending or receiving
▲ (Flashes alternately)		□	Start sequence or address rewriting

Display mode ■ : On
□ : Off
▲ : 1.0s ON / 1.0s OFF

10.2. Error code

For the error indications of devices connected to the convertor, refer to each manual.

Error indications			Error contents
LED5 (green)	LED6 (orange)	LED7 (red)	
● (11)	● (1)	◇	Peripheral unit main PCB error

Display mode ● : 0.5s ON / 0.5s OFF
◇ : 0.1s ON / 0.1s OFF
() : Number of flashing

