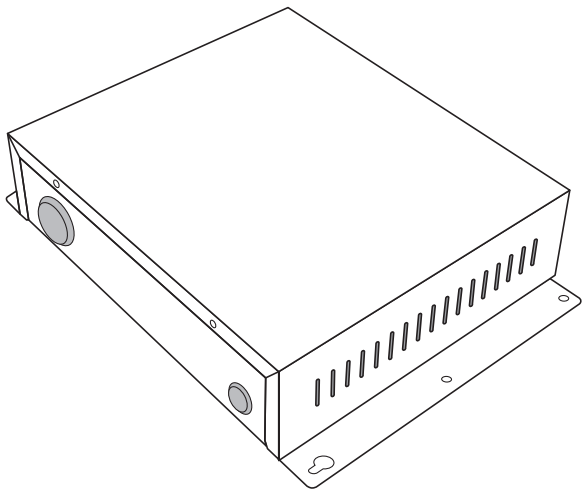
VRF SYSTEM
SIGNAL AMPLIFIER
UTY-VSGX

English

中文

INSTALLATION MANUAL

For authorized personnel only.



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PART NO. 9377898029

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 them 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 the installation 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 the installation 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.
- Install a leakage circuit breaker to power supply cable in accordance with the related laws and regulations and electric company standards.
- 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:

- 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 fall 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.

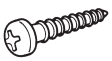
- Do not operate this unit when your hands are wet. Touching the unit with wet hands will cause an electric shock.
- If children may approach the unit, take preventive measures so that they cannot reach the unit.

⚠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. ACCESSORIES

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

Description	Q’ty	Application
Installation manual 	1	This book
Binder 	4	For mounting the power supply cable and transmission cable.
Screw (M4 x 20 mm) 	4	For mounting the signal amplifier.
Terminal resistor 	1	

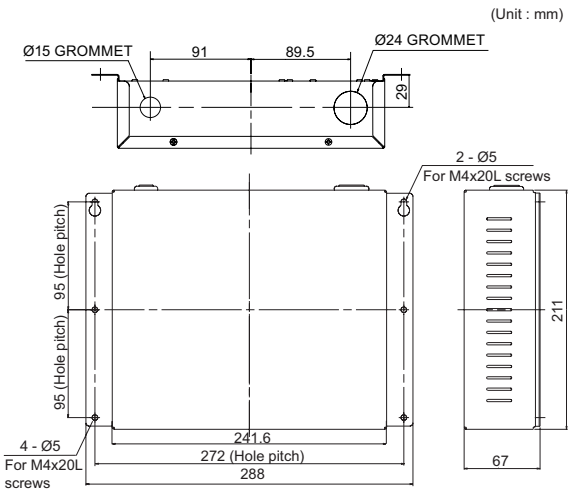
3. ELECTRICAL REQUIREMENT

Use	Size		Wire type	Remarks
Power supply cable	Maximum	1.25 mm^2	245 IEC 57 or equivalent	1 ø AC220 – 240 V 50/60Hz, 2 Cable + ground (Always ground the unit)
	Minimum	0.5 mm^2		
Transmission cable	0.33 mm^2		22AWG LEVEL4 (NEMA) nonpolar 2 core, twisted pair solid core Shielded	LONWORKS® compatible cable
Fuse capacity	3 A			

4. SELECTING AN INSTALLATION LOCATION

4.1. Dimensions

The signal amplifier is comprised of a main body and cover.



Power supply		220 – 240 V A.C. 50/60 Hz
Power consumption (W)		4.5
Temperature (°C)	**Operating**	0 – 46
	Packaged	-10 – 60
Humidity (%)	**Packaged**	0-95 (RH); No condensation
Dimensions (H × W × D) (mm)		67× 288 × 211
Weight (g)		1500

5. INSTALLATION PROCESS

⚠ WARNING

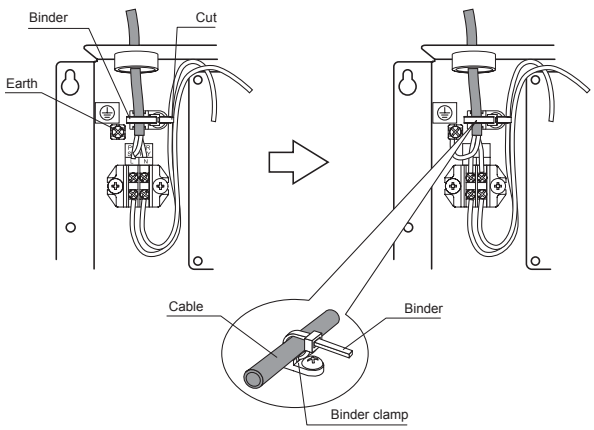
- Always use the accessories and specified installation work parts. Check the state of the installation parts. Not using the specified parts will cause units to fall off, water leakage, electric shock, fire, etc.
- Install at a place that can withstand the weight of the unit and install positively so 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.
- Install a circuit breaker.
  Otherwise, electric shock or fire 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.
- Before opening the case of this unit, completely discharge static electricity charged on your body. Not doing so will cause trouble.
- 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 case of this unit.
- Be careful so that the front cover does not fall after the front cover screws are removed.
  Otherwise, injury could result.

5.1. Connecting the power supply cables

(1) Remove the four screws (M4 × 6 mm), and then remove the cover.
(2) Pass the power supply cable through the bushing and pull it into the signal amplifier.
(3) Form the binders (push mount) provided into a ring shape and pass the power supply cable through it.
(4) Route the power supply cable to their respective terminal board and ground properly.
(5) After the wiring of the cables, press the binder (push mount) that had been shaped into a ring and insert it in the hole in the box for securing the binder (push mount).
(6) Securely tighten the binders (push mount) and then confirm that the cable will not come out.

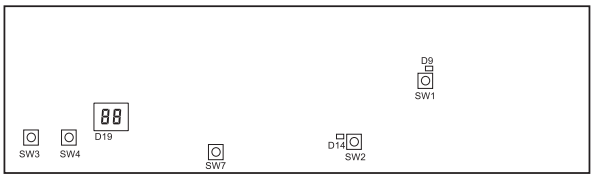


Tightening torque for installing cables to terminal board
0.8 to 1.2 N • m (8 to 12 kgf • cm)

5.2. Address setting

When connecting multiple signal amplifiers, perform the following address setting.

CIRCUIT BOARD LAYOUT

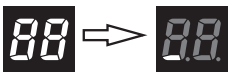


AUTOMATIC ADDRESS SETTING (Factory setting)

Please adjust the address to No.1.
The address is set from an outdoor unit by the automatic operation. (refer to manual)
*1 When the automatic address setting is selected, the display range is 9–16.

MANUAL ADDRESS SETTING

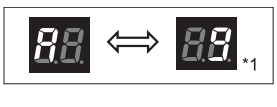
1. Turn on the power for the signal amplifier.



2. While holding down the set button (SW4), press and release the reset button (SW7) to enter the address setting mode. The address setting mode is activated only if the set button is held down when the reset button is released.

Address setting mode

3. Press the set button (SW4) to display the current address. The address is set to A1 at the factory.



4. Press the mode button (SW3) to select the address*. The displayed address changes as follows each time the mode button is pressed.

For automatic address setting **A** ⟺ **9**

A1 → A2 → A3 → A4 → A5
A8 ← A7 ← A6 ←

* If connecting multiple signal amplifiers, be sure to select a different address for each amplifier. If the same address is used for different signal amplifiers, communication cannot occur.

Ex.) Address No. 5 is selected.

5. Press the set button (SW4) to set the selected address.

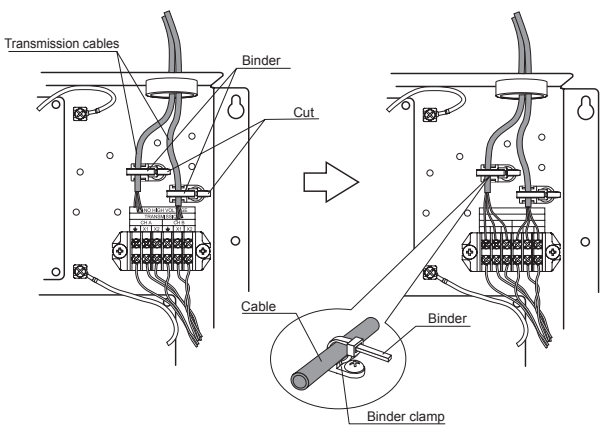
Ex.) Address No. 5 is set.

6. Turn the power off and on or press the reset button (SW7) to exit the address setting mode and return to the normal mode.
If an address setting error occurs ("26" is displayed on the D19 LED display), the address will not be set. Perform address setting again.

Normal mode — Address setting error

5.3. Connecting the transmission cables

(1) Turn the power off.
(2) Pass the transmission cables through the bushing and pull it into the signal amplifier.
(3) Form the binder (push mount) provided into a ring shape and pass the transmission cables and terminal resistor (if connected) through it.
(4) Route the transmission cables and terminal resistor to their respective terminal board properly.
(5) After the wiring of the cables, press the binder (push mount) that had been shaped into a ring and insert it in the holes in the box for securing the binder (push mount).
(6) Securely tighten the binder (push mount) and then confirm that the cable will not come out.
(7) Once the wiring of the cables has been completed, mount the cover to the signal amplifier. Use the screws (M4 × 6 mm) to mount the cover.
(8) Use the four screws (M4 × 20 mm) provided to mount the signal amplifier to the behind ceiling, wall, floor or other suitable location.



Tightening torque for installing cables to terminal board
0.8 to 1.2 N • m (8 to 12 kgf • cm)

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 the accessories or specified power cable and connection cables. Do not modify power cable and connection cables other than those specified, do not use extension cables, and do not use independent branch wiring. The allowable current will be exceeded and cause electric shock or fire.
- Install the connection cables securely to the terminal board. Confirm that external force is not applied to the cable. Use connection cables made of the specified cable. If intermediate connection or insertion fixing are imperfect, it will cause electric shock, fire, etc.
- When connecting the power cable and transmission cable, layout the wiring 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 ground work positively. Do not connect the ground cable to a telephone ground cable, water pipe, or conductor rod.
- Always fasten the outside covering of the connection cable with the cable clamp. (If the insulator is chafed, electric leakage may occur.)
- When performing cable wiring work, be sure that it does not touch the user. Doing so will cause injury or electric shock.
- 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 cable, signal cable and remote control cable 1 m away from television and radio to avoid distorted images and noise.
- 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 board 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.
- The terminal screws and ground screws have different shapes. Be sure to install the screws in the correct locations. If the screws are installed in the wrong locations, the circuit board could be damaged.

6.1. Wiring diagram

Refer to Fig. 1 on the next page.

- In the following case, signal amplifier is required.
  (1) When the total length of the transmission cable exceeded 500 m.
  AB+BC+BD+DE+EF+DG > 500 m
  (2) When transmission cable length between each unit* exceeded 400 m.
  (3) When the number of total unit* is over 64.
- Total transmission cable length: MAX 3600 m*1 (MAX 2000m*2)
  AB+BC+BD+DE+EF+DG+GH < 3600 m*1 (2000m*2)
  *1. In case of V-II Series system.
  *2. In case of V Series or S Series system.
- When a signal amplifier is installed, network is divided into two network segments. In a network segment (NS), divided by a signal amplifier, have to keep the following facts.
  (1) Total transmission cable length: MAX 500 m
  AB+BC+BD+DE+EF+DG < 500 m
  (2) Transmission cable length between each unit*: MAX 400 m
  (3) The number of total units*: MAX 64
  (4) The number of terminal resistor: 1
  (5) The number of total control units*: MAX 2
- The number of signal amplifiers connected to a network: MAX 8

* Unit means indoor unit, outdoor unit, signal amplifier, touch panel controller, PC controller and so on.

* Control unit means touch panel controller, PC controller and so on.

6.2. Check point

- Arrange so that there is no transmission cable between each network segment except the transmission cable which passed through the signal amplifier.
- Arrange so that there is only one terminal resistor for each network segment.
  Check the number of terminal resistors in each segment. If there are more than one terminal resistor connected to the outdoor units and signal amplifiers in a network segment, remove the additional terminal resistors.
- Do not install a signal amplifier between two outdoor units in the same refrigerant system.

6.3. Terminal resistor installation process

⚠ CAUTION

- Be sure to install the terminal resistors as specified. Install a terminal resistor for each network segment.

- If a terminal resistor is installed to more than one device in a single network segment, the entire communication system may be damaged.
- If a terminal resistor is not installed to any device in a single network segment, communication errors may occur.

- Be sure to install one terminal resistor in a network segment. The terminal resistor can be installed to an outdoor unit or to a signal amplifier.
- When a terminal resistor is installed to an outdoor unit, refer to the installation manual supplied with the outdoor unit.
- When installing multiple terminal resistors, observe the following conditions:

  (1) Divide the VRF system into multiple network segments.

  (2) Install a terminal resistor in each network segment. (Conditions for one segment: total number of outdoor units, indoor units, and signal amplifiers must be 64 units or less, or the total length of the transmission cables must be 500 m or less.)
- One terminal resistor is required for each network segment.
- When installing a terminal resistor, connect it between X1 and X2 of CHA or CHB on the transmission terminal board.
- The terminal resistors have no polarity.

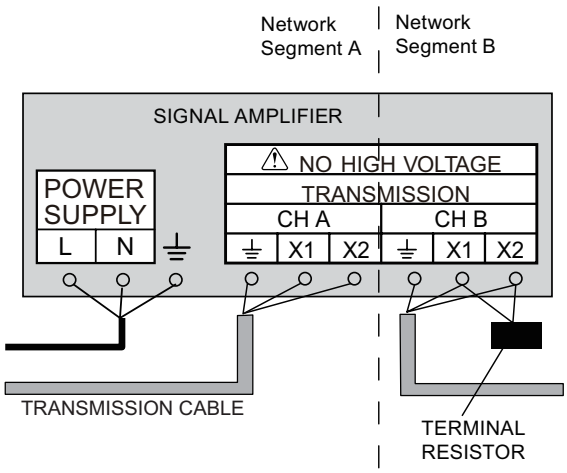
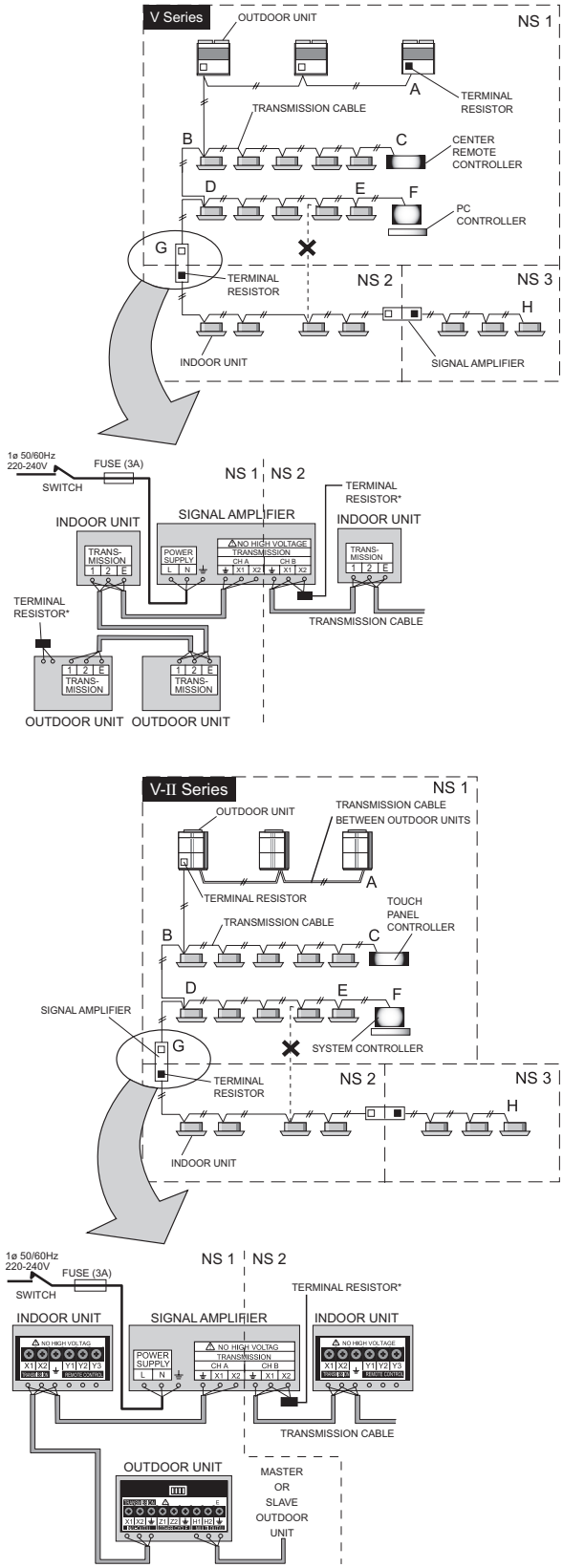


Fig.1

Note: The transmission cables for additional outdoor units are connected differently in the V Series and V-II Series. To connect the V-II Series, see the diagram of V-II Series.



7. TURNING ON POWER

⚠ CAUTION

- Before turning on the power, check that the voltage is within the rated range. If operated outside the rated range, erroneous operation cannot be prevented and cannot be compensated.

(1) Check the signal amplifier wiring.

(2) Check the wiring and switch settings for the VRF system and turn on the power for the VRF system. For the wiring and switch setting method, refer to the installation instruction sheet of each unit.

(3) Turn on the power for the signal amplifier.

- The signal amplifier is initialized for a period of approximately 5 seconds after the power is turned on.  is displayed on D19 during this period.
- After initial setting completely, the operation mode will be started.  is displayed on D19.

* Signal amplifier does not operate during initialization.

* If an error occurs, the D9 or D14 LED lights or flashes, or the error code is displayed on the right digit of the D19 LED display.

8. ERROR CODE DISPLAY

LED DISPLAY	Error contents
	Address setting error
	Main PCB error
D9 LED lit or flashing D9 D9	Communication error B
D14 LED lit or flashing D14 D14	Communication error A