INSTALLATION INSTRUCTIONS

Panasonic

Air-to-Water Heatpump

for Refrigerant R410A

■ **R410A Models**

Model No.

Indoor Units			
Type	Indoor Unit Type	Rated Capacity	
		80	125
W1	Air-to-Water	S-80MW1E5	S-125MW1E5

ENGLISH

Read through the Installation Instructions before you proceed with the installation.
In particular, you will need to read under the “IMPORTANT!” section at the top of the page.

FRANÇAIS

Lisez les instructions d’installation avant de commencer l’installation.
En particulier, vous devez lire la section “IMPORTANT!” en haut de la plage.

ESPAÑOL

Lea las Instrucciones de instalación antes de proceder con la instalación del equipo.
En concreto, deberá leer detenidamente la sección “¡IMPORTANTE!” situada al principio de la página.

DEUTSCH

Lesen Sie die Einbauanleitung, bevor Sie mit der Installation beginnen.
Insbesondere die Hinweise im Abschnitt “WICHTIG!” oben auf der Seite müssen unbedingt gelesen werden.

ITALIANO

Leggere le Istruzioni di installazione prima di procedere con l’installazione.
Prestare particolare attenzione alla sezione “IMPORTANTE!” all’inizio della pagina.

NEDERLANDS

Lees de installatie-instructies zorgvuldig door voor u begint met de installatie.
U moet vooral het gedeelte waar “BELANGRIJK!” boven staat heel goed lezen.

PORTUGUÊS

Leia cuidadosamente as instruções de instalação antes de prosseguir com a instalação.
Em particular, é necessário ler as informações na secção “IMPORTANTE!” na parte superior da página.

ΕΛΛΗΝΙΚΆ

Διαβάστε τις Οδηγίες εγκατάστασης πριν συνεχίσετε με την εγκατάσταση.
Συγκεκριμένα, θα χρειαστεί να διαβάσετε την ενότητα «ΣΗΜΑΝΤΙΚΟ!» στο πάνω μέρος της σελίδας.

БЪЛГАРСКИ

Прочетете инструкциите за инсталиране преди да продължите с инсталирането.
В частност, ще трябва да прочетете раздела „ВАЖНО!“ в горната част на страницата.

IMPORTANT!

Please Read Before Starting

This Air-to-Water must be installed by the sales dealer or installer.
This information is provided for use only by authorized persons.
Be sure to read the installation instructions relevant to the VRF system connected to this Air-to-Water and all appliances connected to the VRF system.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- This Air-to-Water shall be installed in accordance with National Wiring Regulations.
- For water circuit installation work, follow to relevant European and national regulations (including EN61770) and local plumbing and building regulation.
- The unit is only for use in a closed water system. Utilization in an open water circuit may lead to excessive corrosion of water piping and risk of incubating bacteria colonies, particularly Legionella, in water.
- Pay close attention to all warning and caution notices given in this manual.

⚠ **WARNING** This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

⚠ **CAUTION** This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

⚠ **WARNING** Do not modify the wiring of indoor/outdoor unit for installation of other components (i.e. heater, etc). Overloaded wiring or wire connection points may cause electrical shock or fire.

⚠ **CAUTION** Do not apply excessive force to water pipes that may damage the pipes. If water leakage occurs, it will cause flooding and damage to other properties.

Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.

SPECIAL PRECAUTIONS

⚠ WARNING When Wiring

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system.
  Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death.**
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.
- Provide a power outlet to be used exclusively for each unit.
- Provide a power outlet exclusively for each unit, and full disconnection means having a contact separation in all poles must be incorporated in the fixed wiring in accordance with the wiring rules.
- To prevent possible hazards from insulation failure, the unit must be grounded.
- This equipment is strongly recommended to be installed with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case of equipment breakdown or insulation breakdown.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner or Air-to-Water can cut your fingers.

When Installing…

Select an installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.

…In a Room

Properly insulate any tubing run inside a room to prevent “sweating” that can cause dripping and water damage to walls and floors.

⚠ CAUTION Keep the fire alarm and the air outlet at least 1.5 m away from the unit.

…In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

…In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

…In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

…In laundry rooms

Do not install in laundry rooms. Indoor unit is not drip proof.

When Connecting Refrigerant Tubing

Pay particular attention to refrigerant leakages.

⚠ WARNING

- When performing piping work, do not mix air except for specified refrigerant (R410A) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle.
- If the refrigerant comes in contact with a flame, it produces a toxic gas.
- Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury, etc.
- Ventilate the room immediately, in the event that is refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of toxic gas.
- Keep all tubing runs as short as possible.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.
- Do not leak refrigerant while piping work for an installation or re-installation, and while repairing refrigeration parts. Handle liquid refrigerant carefully as it may cause frostbite.

When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal chips or bits of wiring have been left inside the unit.

⚠ WARNING

- This product must not be modified or disassembled under any circumstances. Modified or disassembled unit may cause fire, electric shock or injury.
- Do not clean inside the indoor and outdoor units by users. Engage authorized dealer or specialist for cleaning.
- In case of malfunction of this appliance, do not repair by yourself. Contact the sales dealer or service dealer for repair.

⚠CAUTION

- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may get injured.
- Ventilate any enclosed areas when installing or testing the refrigeration system. Leaked refrigerant gas, on contact with fire or heat, can produce dangerous toxic gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of toxic gas.

Others

⚠CAUTION

- Do not sit or step on the unit, you may fall down accidentally.
- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may get injured.
- Do not stick any object into the FAN CASE.
  You may be injured and the unit may be damaged.

NOTICE

The English text is the original instructions. Other languages are translations of the original instructions.

IMPORTANT INFORMATION REGARDING THE REFRIGERANT USED

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent gases into the atmosphere.

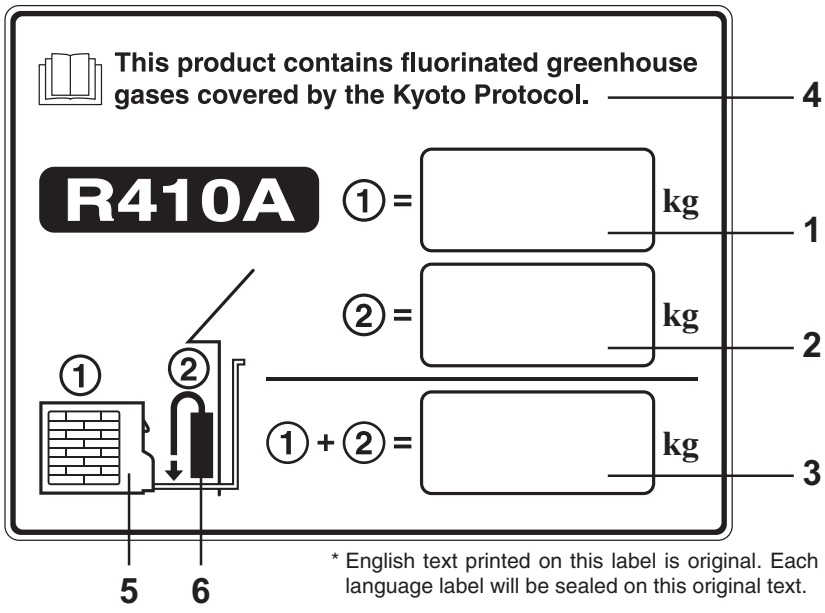
Refrigerant type: R410A
GWP(1) value: 1975
(1)GWP = global warming potential

Periodical inspections for refrigerant leaks may be required depending on European or local legislation.
Please contact your local dealer for more information.

Sample label: MF2 type outdoor unit

Please fill in with indelible ink,
■ ① the factory refrigerant charge of the product
■ ② the additional refrigerant amount charged in the field and
■ ① + ② the total refrigerant charge
on the refrigerant charge label supplied with the product.

The filled out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the service cover).



* English text printed on this label is original. Each language label will be sealed on this original text.

1. Factory refrigerant charge of the product: see unit name plate
2. Additional refrigerant amount charged in the field
3. Total refrigerant charge
4. Contains fluorinated greenhouse gases covered by the Kyoto Protocol
5. Outdoor unit
6. Refrigerant cylinder and manifold for charging

CONTENTS

Page

IMPORTANT! 2
Please Read Before Starting

IMPORTANT INFORMATION REGARDING THE REFRIGERANT USED 4

1. GENERAL 6
- 1-1. Main Components
- 1-2. Tools Required for Installation (not supplied)
- 1-3. Accessories Supplied with Unit
- 1-4. Field Supply Accessories
- 1-5. Type of Copper Tube and Insulation Material
- 1-6. Additional Materials Required for Installation

2. SELECTING THE INSTALLATION SITE. 8
- 2-1. Indoor Unit

3. HOW TO INSTALL THE INDOOR UNIT 8
- 3-1. Select the Best Location
- 3-2. How to Fix Installation Plate
- 3-3. To Drill a Hole in the Wall and Install a Piping Sleeve
- 3-4. Indoor Unit Installation
- 3-5. Water Piping Installation
- 3-6. Indoor Unit Refrigerant Piping Installation
- 3-7. Drain Hose Installation
- 3-8. Drain Elbow and Hose Installation

4. ELECTRICAL WIRING 11
- 4-1. General Precautions on Wiring
- 4-2. Recommended Wire Length and Wire Diameter for Power Supply System
- 4-3. Wiring System Diagram

■ **For stranded wiring**

■ **Examples of shield wires**

■ **Wiring sample**

5. HOW TO PROCESS TUBING 15
- 5-1. Connecting the Refrigerant Tubing
- 5-2. Connecting Tubing Between Indoor and Outdoor Units
- 5-3. Insulating the Refrigerant Tubing
- 5-4. Taping the Tubes
- 5-5. Finishing the Installation

Page

6. HOW TO INSTALL THE HIGH-SPEC WIRED REMOTE CONTROLLER (OPTIONAL PART) 17
- 6-1. Installation Location
- 6-2. Mounting
- 6-3. Dimensions

7. TEST RUN 19
- 7-1. How to Remove Front Plate
- 7-2. How to Remove Side Cabinet
- 7-3. Initial Setting for Air-to-Water Unit
- 7-4. Detailed settings for Air-to-Water (extract)

8. OVERLOAD PROTECTOR 23

9. CHECK WATER PRESSURE 24

10. CHECK PRESSURE RELIEF VALVE 24

11. CHECK AIR PURGE VALVE 24

12. CHECK RCCB/ELCB 24

13. APPENDIX 24

■ **Troubleshooting**

■ **Error Code**

■ **Tips for Energy Saving**

ENGLISH

1. GENERAL

This booklet briefly outlines where and how to install the Air-to-Water system. Please read over the entire set of instructions for the indoor units and make sure all accessory parts listed are with the indoor units before beginning.

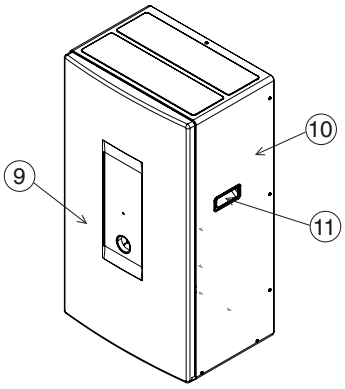
1-1. Main Components

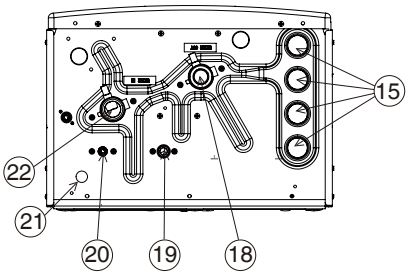
Indoor unit

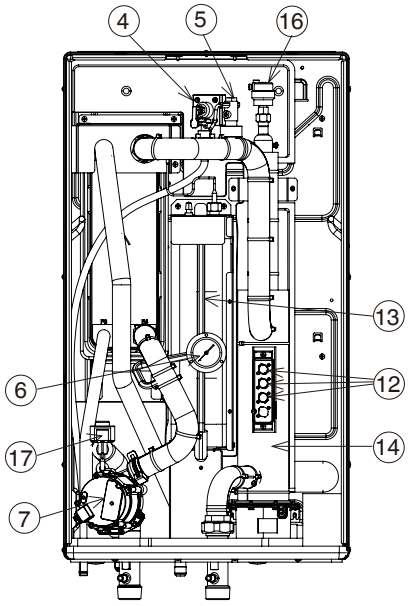
1. PCB (Main)
2. PCB (Relay Board)
3. PCB (3WAY)
4. Pressure relief valve
5. Flow switch
6. Pressure gauge
7. Water pump
8. 1 phase RCCB/ELCB
9. Cabinet front plate
10. Cabinet
11. Handle (2 pieces)
12. Overload protector (3 pieces)
13. Expansion vessel
14. Heater assembly
15. Bushing
16. Air purge valve
17. Expansion valve

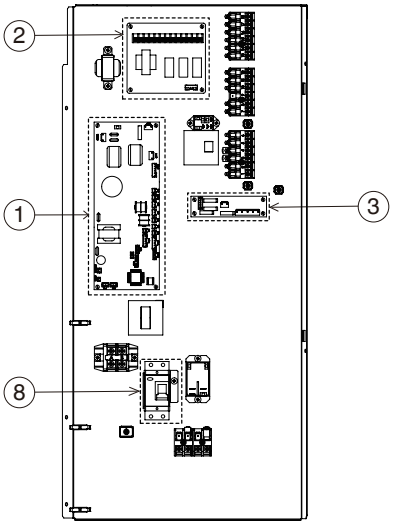
Connector name

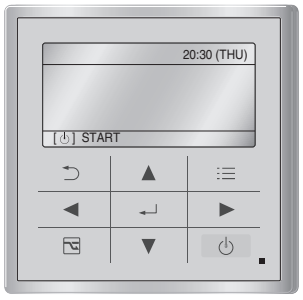
18. Water outlet
19. Gas refrigerant
20. Liquid refrigerant
21. Water drainage
22. Water inlet











* Only one High-spec Wired Remote Controller (CZ-RTC5) is necessary for one Air-to-Water.
* Sub-remote controller cannot be connected.
* Group controller function cannot be used for Air-to-Water unit.

1-2. Tools Required for Installation (not supplied)

1. Flathead screwdriver
2. Phillips head screwdriver
3. Knife or wire stripper
4. Tape measure
5. Carpenter's level
6. Sabre saw or keyhole saw
7. Hacksaw
8. Core bits
9. Hammer
10. Drill
11. Tube cutter
12. Tube flaring tool
13. Torque wrench
14. Adjustable wrench
15. Reamer (for deburring)

1-3. Accessories Supplied with Unit

No.	Accessories	Qty.	No.	Accessories	Qty.	No.	Accessories	Qty.
1	Installation plate 	1	4	PS Foam 	2	7	Drain elbow 	1
2	Screw 	3	5	Long Banding Strap 	4			
3	Installation plate 	1	6	Packing 	1			

1-4. Field Supply Accessories

No.	Optional Parts	Qty.		Model	Source	Maker
i	2-way Valve Kit	1	Electromotoric Actuator	SFA21/18	AC230V	Siemens
			2-port Valve	VVI46/25	--	Siemens
ii	Room Thermostat	1	Analog Type	RAA20	AC230V	Siemens
			Programmable Type	REV200		

1-5. Type of Copper Tube and Insulation Material

If you wish to purchase these materials separately from a local source, you will need:

1. Deoxidized annealed copper tube for refrigerant tubing.
   Cut each tube to the appropriate lengths +30 cm to 40 cm to dampen vibration between units.
2. Foamed polyethylene insulation for copper tubes as required to precise length of tubing. Wall thickness of the insulation should be not less than 8 mm.
3. Use insulated copper wire for field wiring. Wire size varies with the total length of wiring.
   Refer to **4. ELECTRICAL WIRING** for details.

CAUTION

Check local electrical codes and regulations before obtaining wire. Also, check any specified instructions or limitations.

1-6. Additional Materials Required for Installation

1. Refrigeration (armored) tape
2. Insulated staples or clamps for connecting wire (See your local codes.)
3. Putty
4. Refrigeration tubing lubricant
5. Clamps or saddles to secure refrigerant tubing
6. Scale for weighing

2. SELECTING THE INSTALLATION SITE

2-1. Indoor Unit

AVOID:

- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.
- direct sunlight.
- locations near heat sources which may affect the performance of the unit.
- locations where external air may enter the room directly. This may cause “condensation” on the air discharge ports, causing them to spray or drip water.
- locations where the remote controller will be splashed with water or affected by dampness or humidity.
- installing the remote controller behind curtains or furniture.
- locations where high-frequency emissions are generated.

DO:

- select an appropriate position from which every corner of the room can be uniformly cooled.
- select a location where the ceiling is strong enough to support the weight of the unit.

WARNING

- select a location which can support a load that is four times the indoor unit weight.

- select a location where tubing and drain pipe have the shortest run to the outdoor unit.
- allow room for operation and maintenance as well as unrestricted air flow around the unit.
- install the unit within the maximum elevation difference above or below the outdoor unit and within a total tubing length (L) from the outdoor unit as detailed in the installation instructions packed with the outdoor unit.
- allow room for mounting the remote controller about 1 m off the floor, in an area that is not in direct sunlight nor in the flow of cool air from the indoor unit.

NOTE

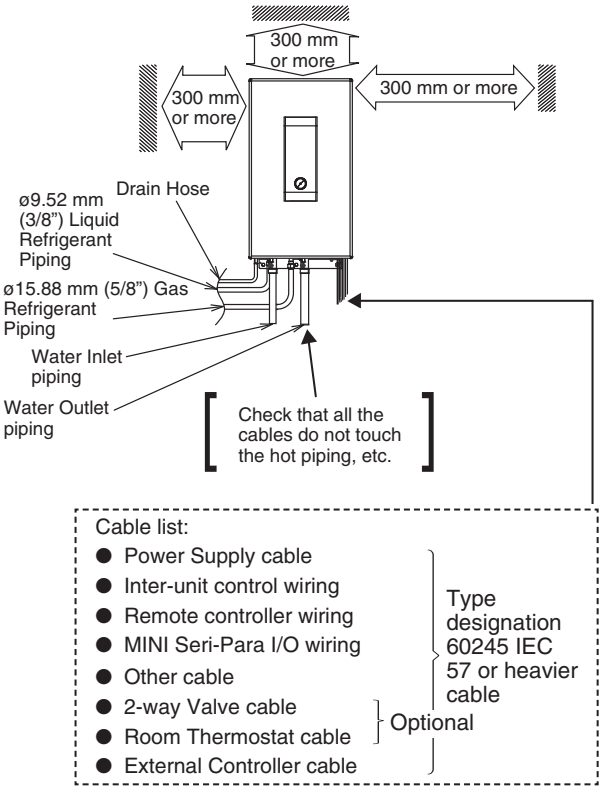
Air delivery will be degraded if the distance from the floor to the ceiling is greater than 3 m.

3. HOW TO INSTALL THE INDOOR UNIT

3-1. Select the Best Location

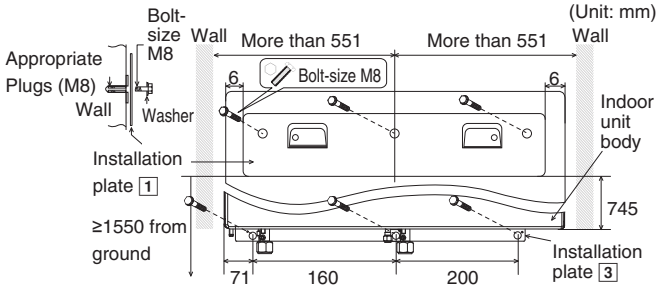
- There should not be any heat source or steam near the unit.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- Recommended installation height for indoor unit shall be at least 800 mm.
- Must install on a vertical wall.
- When install electrical equipment at wooden building of metal lath or wire lath, according to electrical facility technical standard, no electrical contact between equipment and building is allowed. Insulator must be installed in between.
- Do not install the indoor unit at outside a building. This is designed for indoor installation only.

1. The indoor unit must be within a maintenance space.



3-2. How to Fix Installation Plate

The mounting wall is strong and solid enough to prevent it from vibration.



The centre of installation plate should be at more than 551 mm at right and left of the wall.
The distance from installation plate edge to ground should more than 1550 mm.

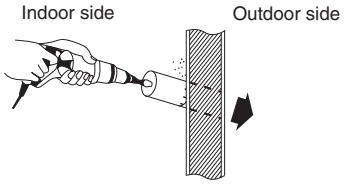
- Always mount the installation plate horizontally by aligning the marking thread and using a level gauge.
- Mount the installation plate on the wall with 6 sets of plug, bolt and washer (all non-supply) with size M8.

CAUTION

Also avoid areas where electrical wiring or conduits are located.

The above precautions are also applicable if tubing goes through the wall in any other location.

(1) Using a sabre saw, keyhole saw or hole-cutting drill attachment, cut a hole in the wall.



NOTE

Hole should be made at a slight downward slant to the outdoor side.

Hole Dia. (mm)
70

3-3. To Drill a Hole in the Wall and Install a Piping Sleeve

(1) Insert the piping sleeve to the hole.

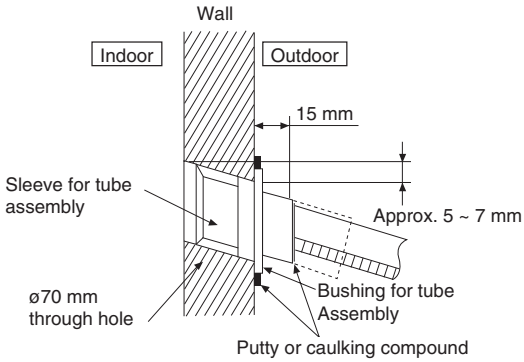
(2) Fix the bushing to the sleeve.

(3) Cut the sleeve until it extrudes about 15 mm from the wall.

CAUTION

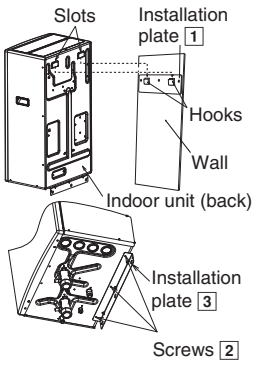
When the wall is hollow, please be sure to use the Piping sleeve assembly to prevent dangers caused by mice biting the connection cable.

(4) Finish by sealing the sleeve with putty or caulking compound at the final stage.



3-4. Indoor Unit Installation

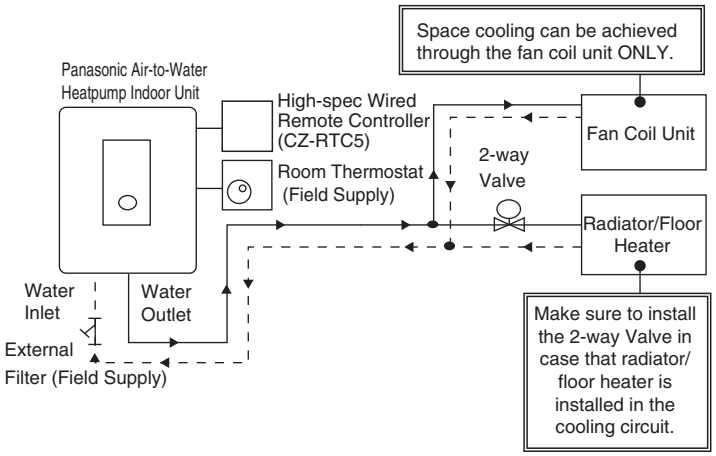
1. Engage the slots on the indoor unit to the hooks of installation plate 1. Ensure the hooks are properly seated on the installation plate by moving it left and right.
2. Fix the screws 2 to the holes on the hooks of installation plate 3, as illustrated at right.



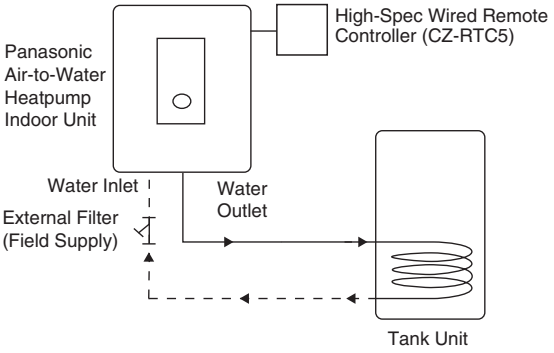
3-5. Water Piping Installation

- The minimum requirement of water in the system is 50 litres. If this value could not be achieved, please install additional buffer tank (field supply).
- Water inlet and water outlet in indoor unit are used for connection to water circuit.
  Please request a licensed technician to install this water circuit.
- This water circuit must comply with all relevant European and national regulations, i.e. IEC/EN 61770.
- Be careful not to deform the piping with excessive force when doing piping connection job.
- Use Rp 1-1/4" nut for both water inlet and outlet connection and clean all pipings with tap water before connecting to the indoor unit.
- Cover the piping end to prevent dirt and dust when inserting it through a wall.
- Choose proper sealer which can withstand the pressures and temperatures of the system.
- If an existing tank is to be connected to this indoor/outdoor unit, ensure the pipings are clean before water piping installation is carried out.
- An external filter (30 mesh or more, field supplied) must be installed before the water inlet of the indoor unit (with "WATER IN" indication).
- Water operating temperatures (Minimum ~ Maximum) : 5 °C ~ 65 °C
- Water operating pressures (Minimum ~ Maximum) : 0.05 MPa ~ 0.3 MPa

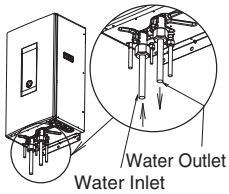
Water Piping Installation of Air-Conditioning mode



Water Piping Installation of TANK mode



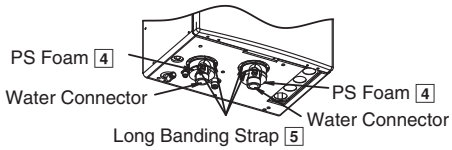
- Be sure to use two spanners to tighten the connection. Tighten the nuts with torque wrench: 117.6 N•m {1176 kgf•cm}.
- If non-brass metallic piping is used for installation, make sure to insulate the pipings to prevent galvanic corrosion.
- Make sure to insulate the water circuit pipings to prevent reduction of heating capacity.
- After installation, check the water leakage condition in connection area during test run.



⚠ CAUTION
Do not overtighten, overtightening may cause water leakage.

Insulation

- Mount the PS foam [4] and long banding strap [5] to water inlet and outlet connectors, as shown in below illustration.



Expansion Vessel

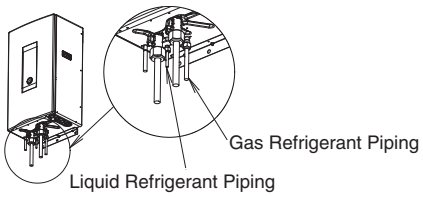
- Expansion Vessel with 10 L air capacity and initial pressure of 1 bar is installed in this indoor unit.
- Total amount of water in system should be below 200 L. (Note: This amount of water does not include the tank unit volume)
- If total amount of water is over 200 L, please add expansion vessel. (field supply)
- Please keep the installation height difference of system water circuit within 10 m. (Inner volume of same indoor unit is about 5 L)

3-6. Indoor Unit Refrigerant Piping Installation

1. Please make flare after inserting flare nut (located at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)
2. Do not use pipe wrench to open refrigerant piping. Flare nut may be broken and cause leakage. Use proper spanner or ring wrench.
3. Connect the piping:
   - Align the centre of piping and sufficiently tighten the flare nut with fingers.
   - Further tighten the flare nut with torque wrench in specified torque as stated in the table.

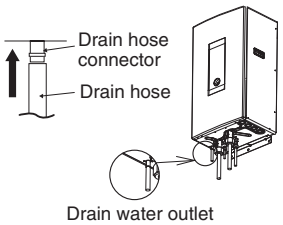
Model	Piping size (Torque)	
	Gas	Liquid
S-80MW1E5 S-125MW1E5	ø15.88 mm (5/8") 65 N•m {650 kgf•cm}	ø9.52 mm (3/8") 42 N•m {420 kgf•cm}

⚠ CAUTION
Do not overtighten, overtightening may cause gas leakage.



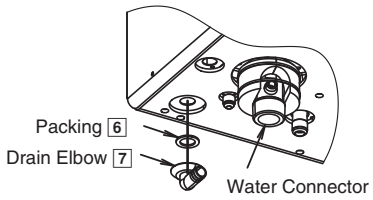
3-7. Drain Hose Installation

- Use inner diameter 15 mm drain hose in the market.
- This hose must be installed in a continuously downward direction and in a frost-free environment.
- Do not insert this hose into sewage or drain hose that may generate ammonia gas, sulfuric gas, etc.
- If necessary, use hose clamp to further tighten the hose at drain hose connector to prevent leakage.
- Water will drip from this hose, therefore the outlet of this hose must be installed in an area where the outlet cannot become blocked.



3-8. Drain Elbow and Hose Installation

- Fix the drain elbow [7] and packing [6] to the bottom of indoor unit, as shown in below illustration.
- Use inner diameter 17 mm drain hose in the market.
- This hose must be installed in a continuously downward direction and in a frost-free environment.
- Guides this hose's outlet to outdoor only.
- Do not insert this hose into sewage or drain hose that may generate ammonia gas, sulfuric gas, etc.
- If necessary, use hose clamp to further tighten the hose at drain hose connector to prevent leakage.
- Water will drip from this hose, therefore the outlet of this hose must be installed in an area where the outlet cannot become blocked.



4. ELECTRICAL WIRING

4-1. General Precautions on Wiring

(1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.

(2) Provide a power outlet to be used exclusively for each unit, and a power supply disconnect and circuit breaker for overcurrent protection should be provided in the exclusive line.

(3) To prevent possible hazards from insulation failure, the unit must be grounded.

(4) Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.

(5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.

(6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.

(7) Regulations on wire diameters differ from locality to locality. For field wiring rules, please refer to your LOCAL ELECTRICAL CODES before beginning.
You must ensure that installation complies with all relevant rules and regulations.

(8) To prevent malfunction of the Air-to-Water caused by electrical noise, care must be taken when wiring as follows:
- The remote control wiring and the inter-unit control wiring should be wired apart from the inter-unit power wiring.
- Use shielded wires for inter-unit control wiring between units and ground the shield on both sides.
- Use shielded wires for remote control wiring between units and ground the shield on indoor unit's side.

(9) If the power supply cable of this appliance is damaged, it must be replaced by a repair shop appointed by the manufacturer, because special-purpose tools are required.

4-2. Recommended Wire Length and Wire Diameter for Power Supply System

Power supply	(A) Power supply cable	
	Minimum power supply cables ⓁⓃ⏚	Length (m)*1
220/230/240V~	2 mm²	Max. 130

Leakage current breaker	Circuit breaker (Minimum capacity)	
	Switch	Fuse
20A	20A	20A

(B) Inter-unit (between outdoor and indoor units) control wiring	
Control wiring ⓊⓊ	Length (m)
0.75 mm² (AWG #18) Use shielded wiring *2	Max. 1000

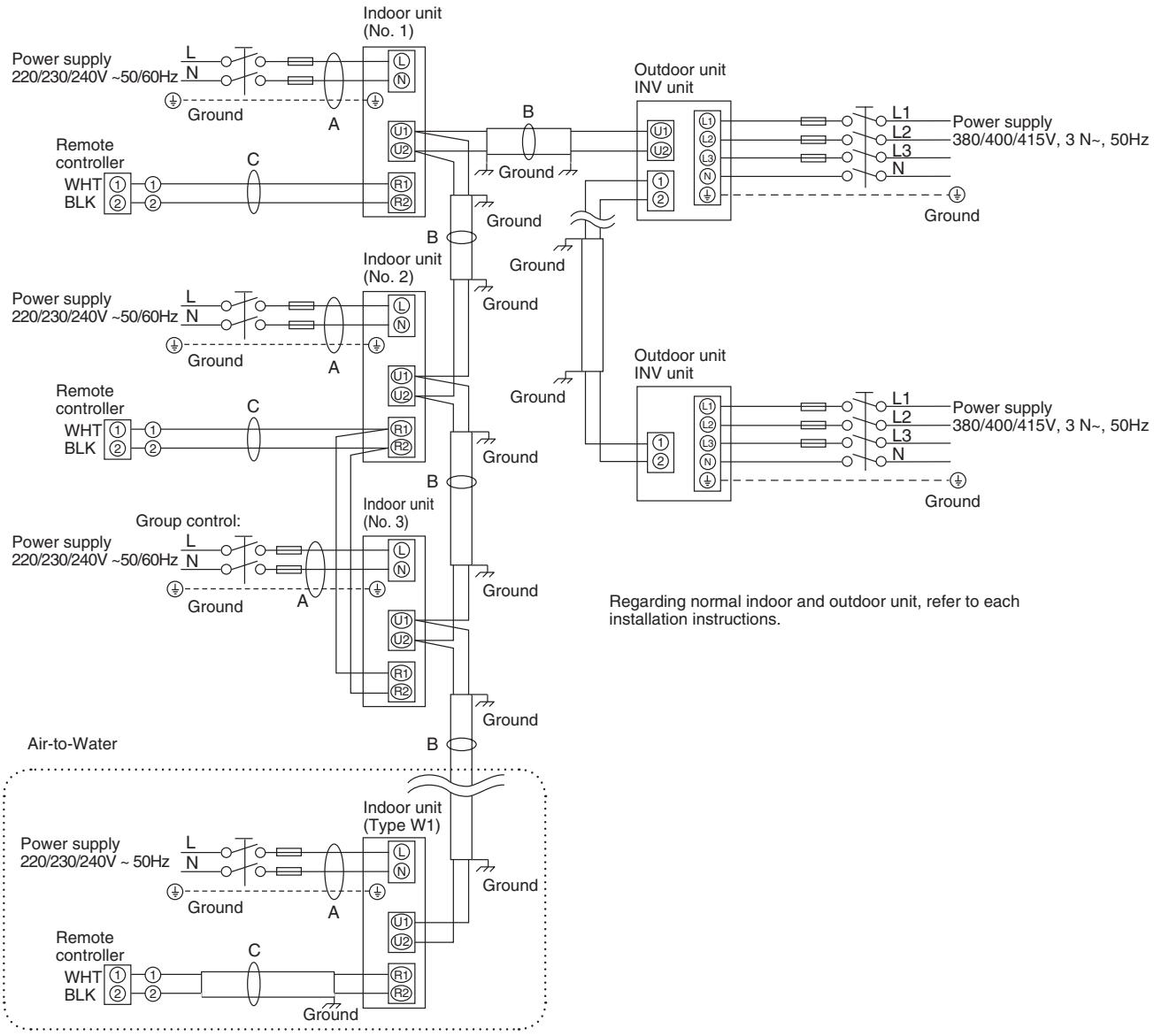
(C) Remote control wiring	
Remote control wiring ⓇⓇ	Length (m)
0.75 mm² (AWG #18) Use shielded wiring *2	Max. 500

*1 This maximum length shows a 2% voltage drop

*2 With ring-type wire terminal
Only for Air-to-Water unit

ENGLISH

4-3. Wiring System Diagram



NOTE

(1) Refer to “4-2. Recommended Wire Length and Wire Diameter for Power Supply System” for the explanation of “A”, “B” and “C” in the above diagram.

(2) The layout of terminal boards in your equipment may differ from the diagram. Be sure to confirm the actual terminal boards.

(3) Refrigerant Circuit (R.C.) address should be set before turning the power on.

(4) Regarding R.C. address setting, refer to the installation instructions supplied with the outdoor unit. Auto address setting can be executed by remote controller automatically.

(5) Sub-remote controller cannot be connected.

(6) Group controller function cannot be used for Air-to-Water unit.

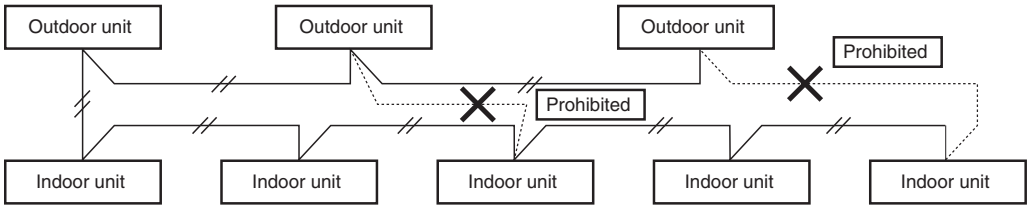
WARNING

This equipment must be properly earthed.

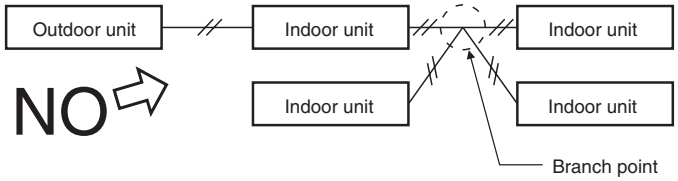
⚠ CAUTION

(1) When linking the outdoor units in a network, disconnect the terminal extended from the short plug from all outdoor units except any one of the outdoor units.
(When shipping: In shorted condition.)
For a system without link (no wiring connection between outdoor units), do not remove the short plug.

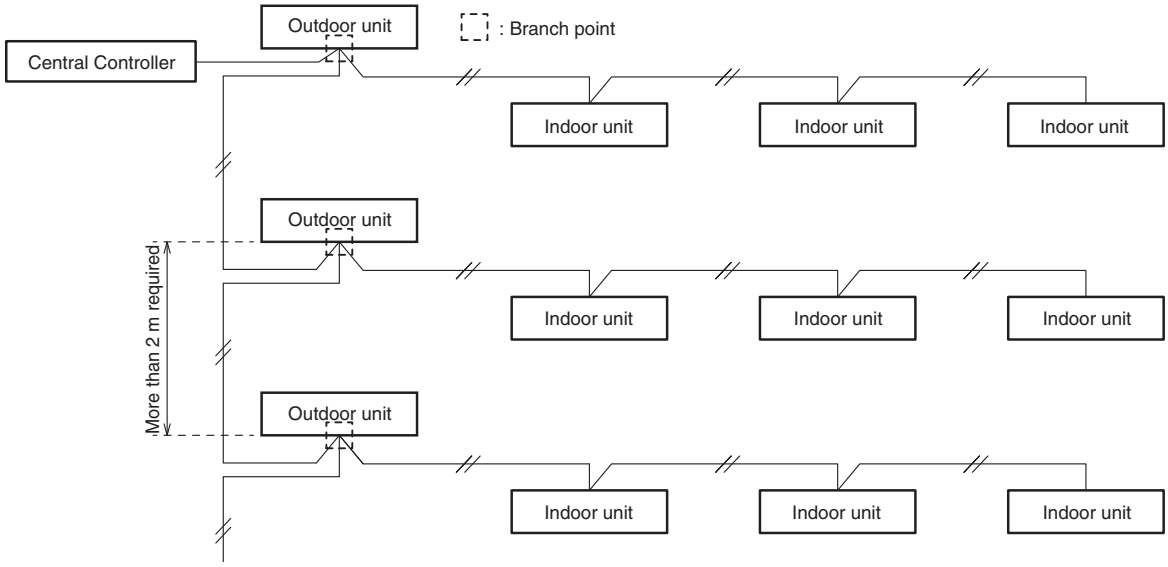
(2) Do not install the inter-unit control wiring in a way that forms a loop.



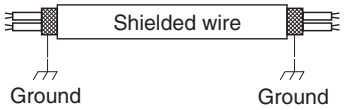
(3) Do not install the inter-unit control wiring such as star branch wiring. Star branch wiring causes mis-address setting.



(4) If branching the inter-unit control wiring, the number of branch points should be 16 or fewer.



(5) Use shielded wires for inter-unit control wiring (B) and ground the shield on both sides, otherwise misoperation from noise may occur.
Connect wiring as shown in Section "4-3. Wiring System Diagram".



(6) • Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 5 or 3 *1.5 mm^2 flexible cord. Type designation 60245 IEC57 (H05RN-F, GP85PCP etc.) or heavier cord.
• Use the standard power supply cables for Europe (such as H05RN-F or H07RN-F which conform to CENELEC (HAR) rating specifications) or use the cables based on IEC standard. (60245 IEC57, 60245 IEC66)

⚠ WARNING

Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also occur. Therefore, ensure that all wiring is tightly connected.

When connecting each power wire to the terminal, follow the instructions on "How to connect wiring to the terminal" and fasten the wire securely with the terminal screw.

How to connect wiring to the terminal

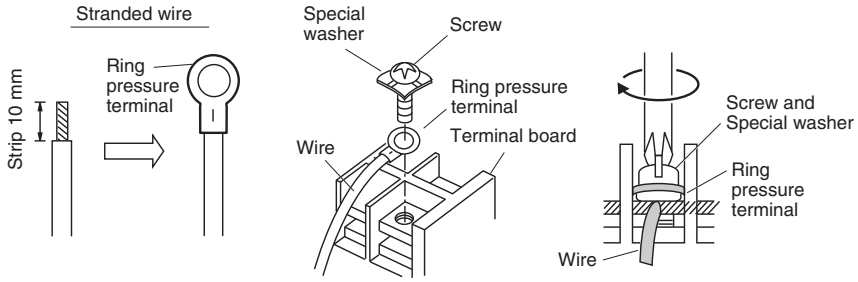
■ **For stranded wiring**

(1) Cut the wire end with cutting pliers, then strip the insulation to expose the stranded wiring about 10 mm and tightly twist the wire ends.

(2) Using a Phillips head screwdriver, remove the terminal screw(s) on the terminal board.

(3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring pressure terminal.

(4) Place the ring pressure terminal, and replace and tighten the removed terminal screw using a screwdriver.



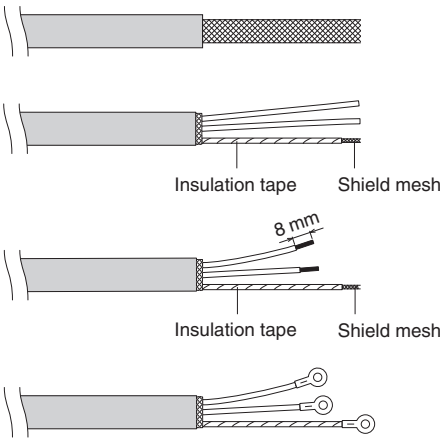
■ **Examples of shield wires**

(1) Remove cable coat not to scratch braided shield.

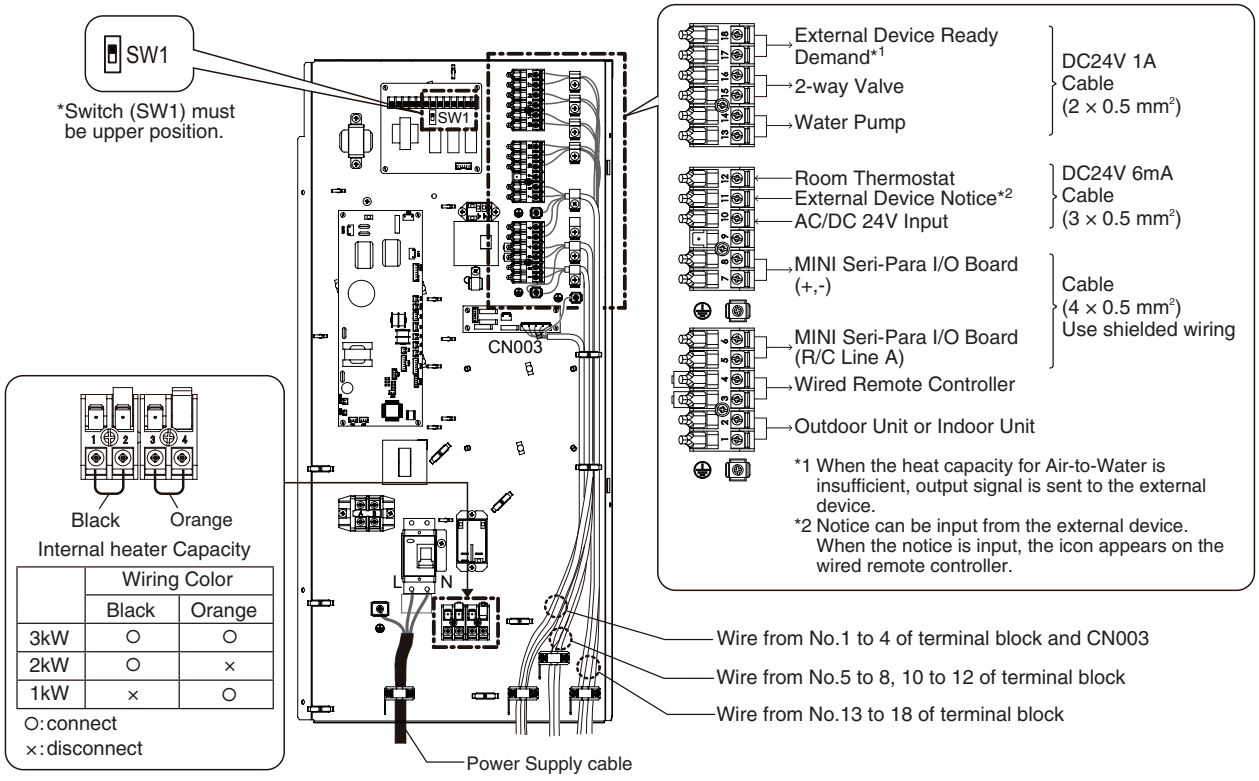
(2) Unbraid the braided shield carefully and twist the unbraided shield wires tightly together. Insulate the shield wires by covering them with an insulation tube or wrapping insulation tape around them.

(3) Remove coat of signal wire.

(4) Attach ring pressure terminals to the signal wires and the shield wires insulated in Step (2).



■ **Wiring sample**



5. HOW TO PROCESS TUBING

5-1. Connecting the Refrigerant Tubing

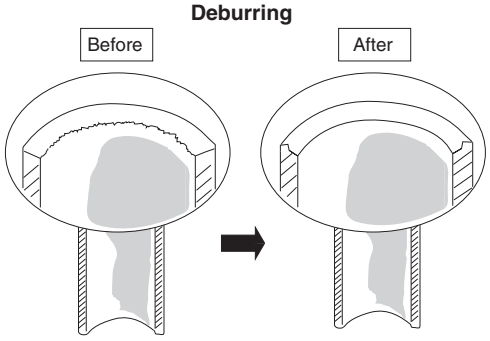
Use of the Flaring Method

Many of conventional split system air conditioners employ the flaring method to connect refrigerant tubes which run between indoor and outdoor units. In this method, the copper tubes are flared at each end and connected with flare nuts.

Flaring Procedure with a Flare Tool

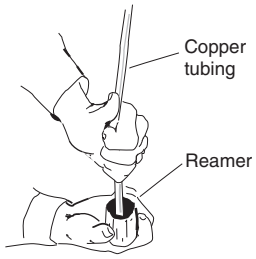
(1) Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 30 ~ 50 cm longer than the tubing length you estimate.

(2) Remove burrs at the end of the copper tube with a tube reamer or a similar tool. This process is important and should be done carefully to make a good flare. Be sure to keep any contaminants (moisture, dirt, metal filings, etc.) from entering the tubing.



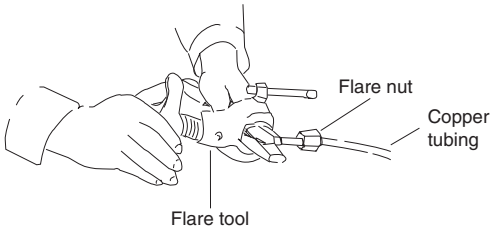
NOTE

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube.



(3) Remove the flare nut from the unit and be sure to mount it on the copper tube.

(4) Make a flare at the end of copper tube with a flare tool.



NOTE

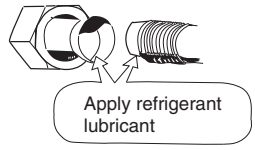
A good flare should have the following characteristics:

- inside surface is glossy and smooth
- edge is smooth
- tapered sides are of uniform length

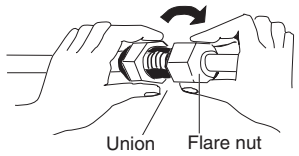
Caution Before Connecting Tubes Tightly

(1) Apply a sealing cap or water-proof tape to prevent dust or water from entering the tubes before they are used.

(2) Be sure to apply refrigerant lubricant (ether oil) to the surface of a flare before making piping connections. Pay attention not to attach the oil to the surface of screw. This is effective for reducing gas leaks.



(3) For proper connection, align the union tube and flare tube straight with each other, then screw in the flare nut lightly at first to obtain a smooth match.



- Adjust the shape of the liquid tube using a tube bender at the installation site and connect it to the liquid tubing side valve using a flare.

Cautions During Brazing

- **Replace air inside the tube with nitrogen gas to prevent copper oxide film from forming during the brazing process. (Oxygen, carbon dioxide and Freon are not acceptable.)**
- **Do not allow the tubing to get too hot during brazing. The nitrogen gas inside the tubing may overheat, causing refrigerant system valves to become damaged. Therefore allow the tubing to cool when brazing.**
- **Use a reducing valve for the nitrogen cylinder.**
- **Do not use agents intended to prevent the formation of oxide film. These agents adversely affect the refrigerant and refrigerant oil, and may cause damage or malfunctions.**

5-2. Connecting Tubing Between Indoor and Outdoor Units

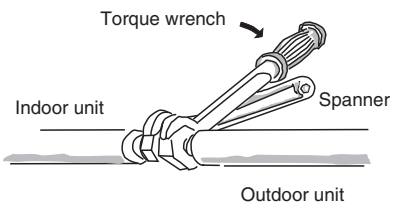
(1) Tightly connect the indoor-side refrigerant tubing extended from the wall with the outdoor-side tubing.

(2) To fasten the flare nuts, apply specified torque.

Indoor Unit Tubing Connection (ℓ_1, ℓ_2...ℓ_{n-1})

Indoor unit type	80	125
Gas tubing (mm)	ø15.88	
Liquid tubing (mm)	ø9.52	

- When removing the flare nuts from the tubing connections, or when tightening them after connecting the tubing, be sure to use a torque wrench and a spanner.



If the flare nuts are over-tightened, the flare may be damaged, which could result refrigerant leakage and cause in injury or asphyxiation to room occupants.

- For the flare nuts at tubing connections, be sure to use the flare nuts that were supplied with the unit, or else flare nuts for R410A (type 2). The refrigerant tubing that is used must be of the correct wall thickness as shown in the table.

Tube diameter	Tightening torque, approximate	Tube thickness
ø9.52 mm (3/8")	34 – 42 N · m {340 – 420 kgf · cm}	0.8 mm
ø15.88mm (5/8")	68 – 82 N · m {680 – 820 kgf · cm}	1.0 mm

Because the pressure is approximately 1.6 times higher than conventional refrigerant pressure, the use of ordinary flare nuts (type 1) or thin-walled tubes may result in tube rupture, injury, or asphyxiation caused by refrigerant leakage.

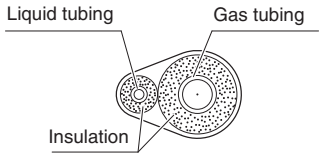
- In order to prevent damage to the flare caused by over-tightening of the flare nuts, use the table above as a guide when tightening.
- When tightening the flare nut on the liquid tube, use an adjustable wrench with a nominal handle length of 200 mm.

5-3. Insulating the Refrigerant Tubing

Tubing Insulation

- Thermal insulation must be applied to all unit tubing, including distribution joint (purchased separately).

Two tubes arranged together



* For gas tubing, the insulation material must be heat resistant to 120°C or above. For other tubing, it must be heat resistant to 80°C or above.

Insulation material thickness must be 10 mm or greater.

If the conditions inside the ceiling exceed DB 30°C and RH 70%, increase the thickness of the gas tubing insulation material by 1 step.

CAUTION

If the exterior of the outdoor unit valves has been finished with square duct covering, make sure you allow sufficient space to use the valves and to allow the panels to be attached and removed.

NOTE

Gas Leakage Detector

Note that the gas leakage detector should be capable of detecting the refrigerant R410A.

Air Purging

Refer to “AIR PURGING” in the separate Installation Instructions for the outdoor unit in regard to air purging with a vacuum pump (for test run) preparation.

Taping the flare nuts

Cover up the tubing connections with the supplied flare insulator. Then fasten the insulator at both ends with the vinyl clamps (field supply).

Insulation material

The material used for insulation must have good insulation characteristics, be easy to use, be age resistant, and must not easily absorb moisture.

Never grasp the drain or refrigerant connecting outlets when moving the unit.

CAUTION

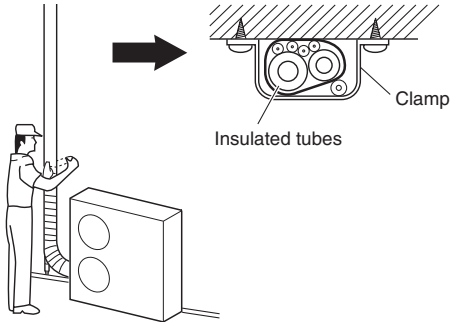
After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.

5-4. Taping the Tubes

(1) At this time, the refrigerant tubes (and electrical wiring if local codes permit) should be taped together with armoring tape in 1 bundle.

(2) Wrap the armoring tape from the bottom of the outdoor unit to the top of the tubing where it enters the wall. As you wrap the tubing, overlap half of each previous tape turn.

(3) Clamp the tubing bundle to the wall, using 1 clamp approx. each meter.

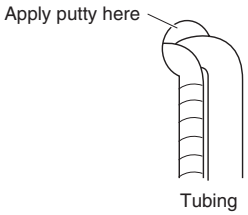


NOTE

Do not wind the armoring tape too tightly since this will decrease the heat insulation effect. Also ensure that the condensation drain hose splits away from the bundle and drips clear of the unit and the tubing.

5-5. Finishing the Installation

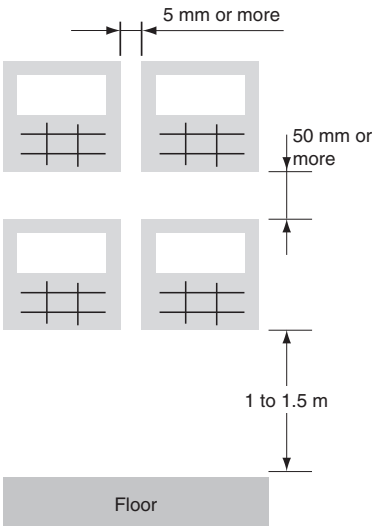
After finishing insulating and taping over the tubing, use sealing putty to seal off the hole in the wall to prevent rain and draft from entering.



6. HOW TO INSTALL THE HIGH-SPEC WIRED REMOTE CONTROLLER (OPTIONAL PART)

6-1. Installation Location

- Install at the height of 1 to 1.5 m from the floor (Location where average room temperature can be detected).
- Install vertically against the floor.
- When installing more than 1 remote controller next to each other, keep distance of 5 mm on the right and left and 50 mm on top and bottom.
- Avoid the following locations for installation.
  - By the window, etc. exposed to direct sunlight or direct air
  - In the shadow or backside of objects deviated from the room air flow.
  - Location where condensation occurs. The remote controller is not moisture proof or drip proof.
  - Location near heat source
  - Uneven surface
- Keep distance of 1 m or more from the TV, radio and PC. (Cause of fuzzy images or noise)

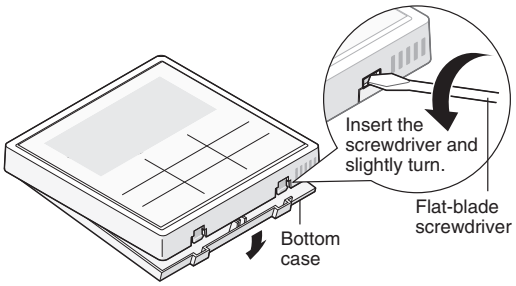


NOTE

- Be careful not to connect cables to other terminals of indoor units (e.g. power source wiring terminal). Malfunction may occur.
- Do not bundle together with the power source wiring or store in the same metal tube. Operation error may occur.
- If noise is induced to the unit power supply, attach a noise filter.

6-2. Mounting

1. Remove the bottom case.



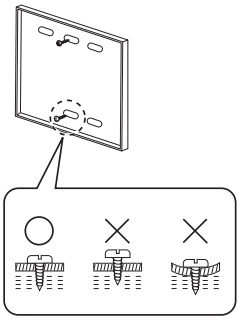
2. Mount to the wall.

   There are two types of mounting: Exposed type and Embedded type for the wired remote controller. See the next page for the details.

NOTE

Mounting the bottom case

- Tighten the screws securely until the screw heads touch the bottom case. Otherwise, loose screw heads may hit the PCB and cause malfunction when mounting the top case.
- Do not over-tighten the screws. The bottom case may be deformed, resulting in fall of the unit.

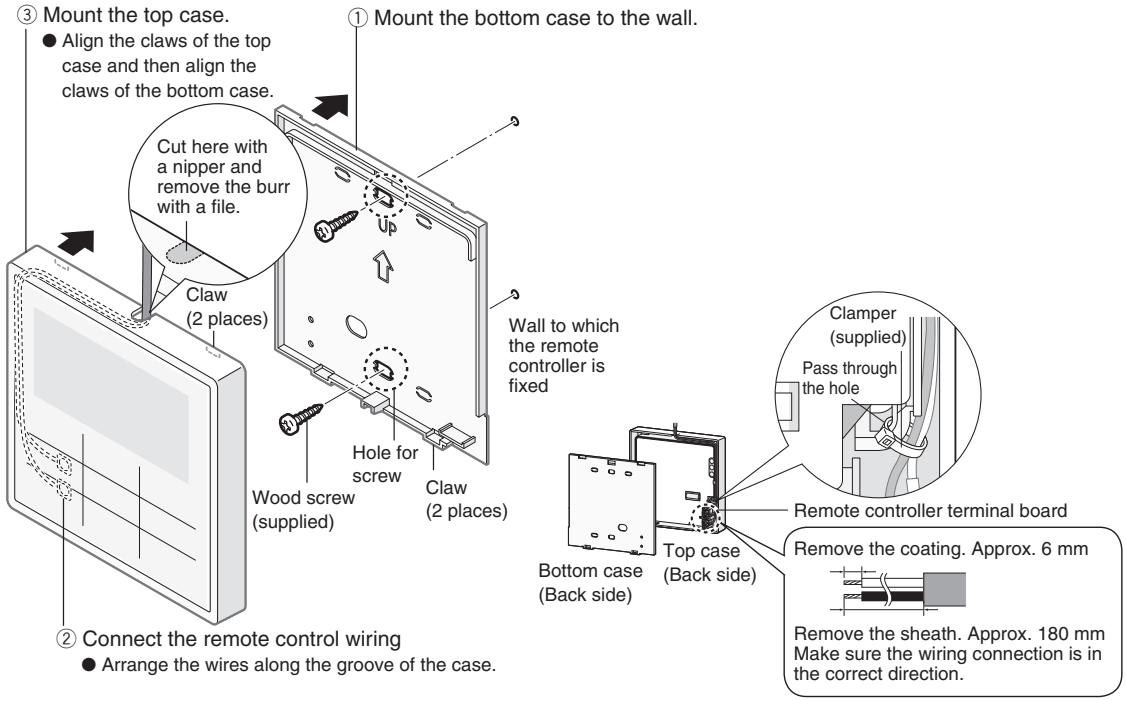


Connecting the remote control wiring

- Arrange the wires as shown in the illustration for ② in step 2, avoiding unnecessary wires being stored in the remote controller case. Caught wires may destroy the PCB.
- Avoid wires touching parts on the PCB. Caught wires may destroy the PCB.

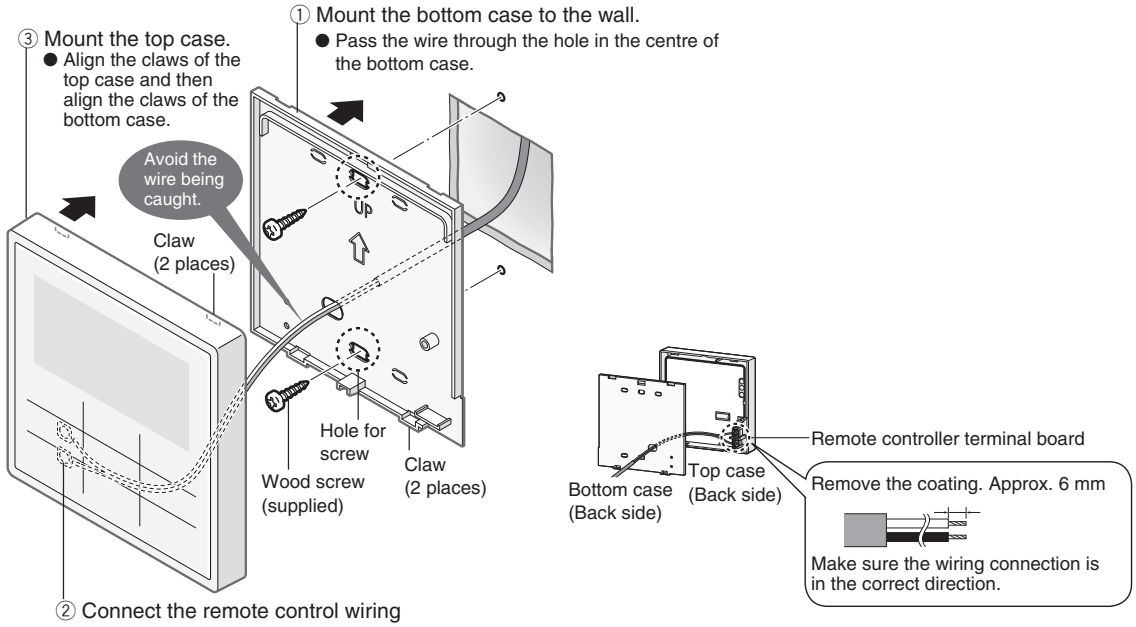
2-1. Exposed type

Preparation: Make 2 holes for screws using a screwdriver.

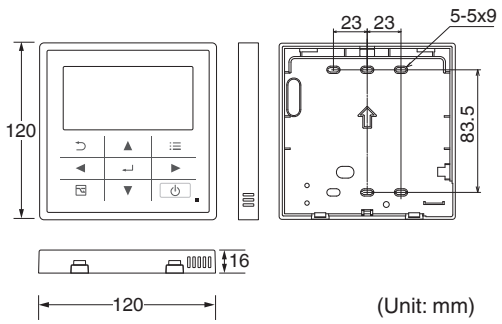


2-2. Embedded type

Preparation: Make 2 holes for screws using a screwdriver.



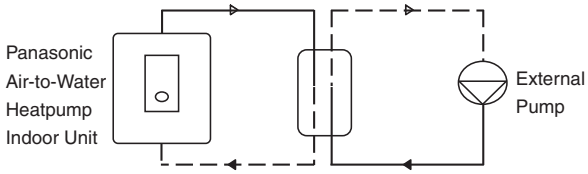
6-3. Dimensions



(Unit: mm)

7. TEST RUN

■ Test Run of Water Circuit

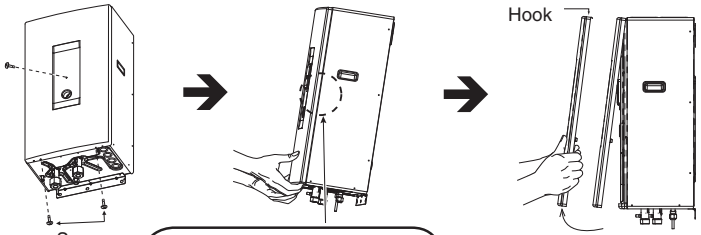
⚠CAUTION	
	● When external pump is used, be sure to install it in independent water circuit and not direct to the Air-to-Water heatpump indoor unit circuit.

7-1. How to Remove Front Plate

Please follow the steps below to remove the front plate. Before removing the front plate of indoor unit, always switch off all power supply (i.e. indoor unit power supply, heater power supply and tank unit power supply).

1. Remove the 2 mounting screws which located at bottom of the front plate and 1 mounting screw at the front of the plate.
2. Gently pull the lower section of the front plate towards you to remove the front plate from left and right hooks.
3. Hold the left edge and right edge of front plate to lift up front plate from hooks.

When reinstalling the front plate, first set the 2 hooks, which located at the top of front plate, into the slots at cabinet. Then carry out above steps in the reverse order.

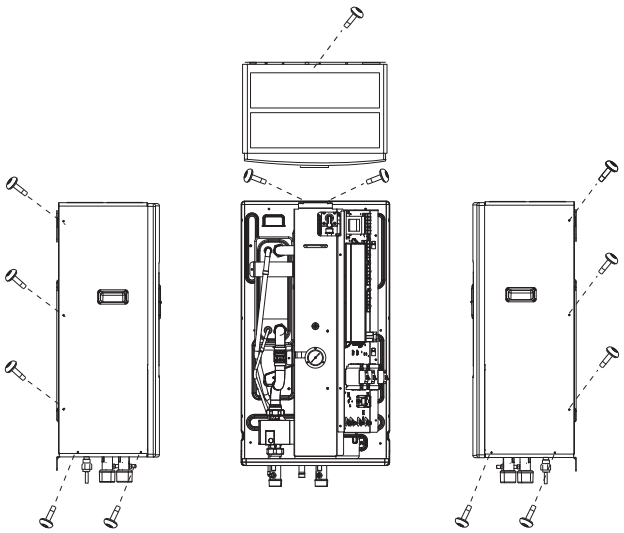


Fix the left and right hooks to cabinet slot properly when reinstalling front plate.

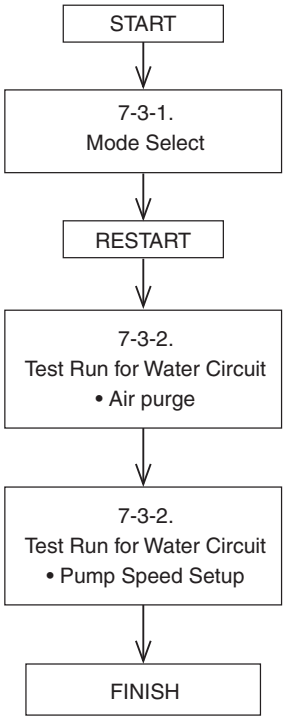
7-2. How to Remove Side Cabinet

Please follow the steps below to remove the side cabinet. Before removing the front plate of indoor unit always switch off all power supply (i.e. indoor power supply, heater power supply and tank unit power supply).

1. Perform the steps in “7-1. How to Remove Front Plate”.
2. Remove all the 13 mounting screws on the left, right and top of the side cabinet.
3. Gently remove the side cabinet by holding both of the handles.

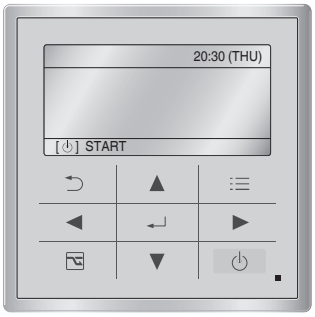


7-3. Initial Setting for Air-to-Water Unit



7-3-1. Mode Select

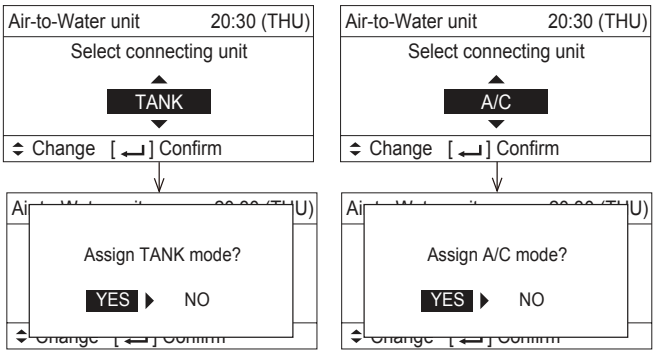
High-spec Wired Remote Controller (CZ-RTC5)



■ When switching on the power for the first time after installation, it is necessary to make the initial setting for the Air-to-Water unit.

Press the ▼ or ▲ button to select “TANK” or “A/C” and press the ↵ button to finish this process.

After confirmation, the system restarts automatically.

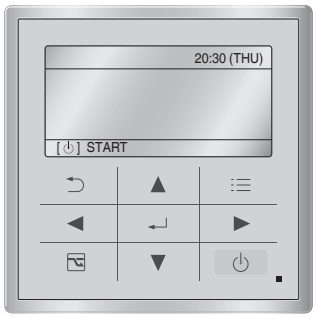


* To complete the initial setting, it is necessary to carry out the Test Run for Water Circuit.
* If the Test Run for Water Circuit is not complete, “L16” alarm will occur.

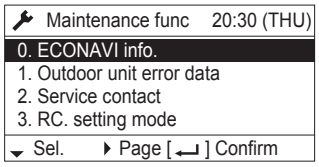
7-3-2. Test Run for Water Circuit

* You cannot perform the test run of refrigerant circuit if test run for water circuit has not been completed.
* First, pour water into the water circuit.

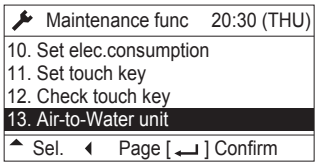
High-spec Wired Remote Controller (CZ-RTC5)



1. Keep pressing the ↩, ↵ and ▶ buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display.



2. Press the ▼ or ▲ button to see each menu. If you wish to see the next screen instantly, press the ◀ or ▶ button.
   Select “13. Air-to-Water unit” on the LCD display and press the ↵ button.

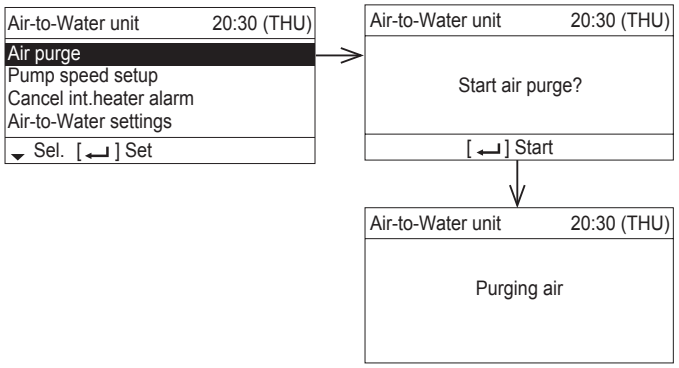


• Air purge

Press the ▼ or ▲ button to see each menu. If you wish to see the next screen instantly, press the ◀ or ▶ button.

Select “Air purge” on the LCD display and press the ↵ button.

After 30 minutes have passed, the following process becomes automatically effective. (Pump will start operation.)



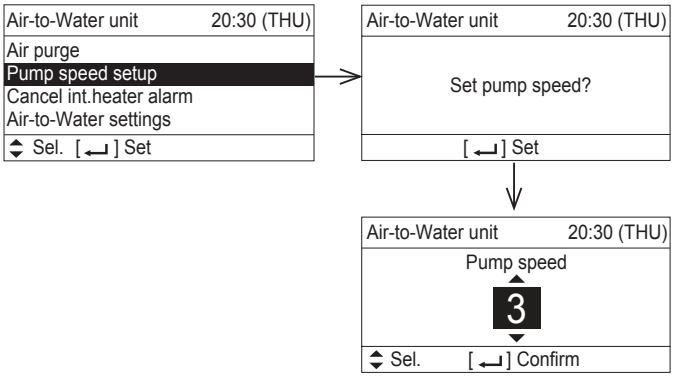
Pump will start operation for Air purge.
After 10 minutes have passed, the air purge is ended (pump stops).
It is possible to press ↩ button to cancel.

* Do not proceed to the Pump speed setup until the air purge is completed.

• Pump speed setup

Press the ▼ or ▲ button to see each menu. If you wish to see the next screen instantly, press the ◀ or ▶ button.

Select “Pump speed setup” on the LCD display and press the ↵ button.



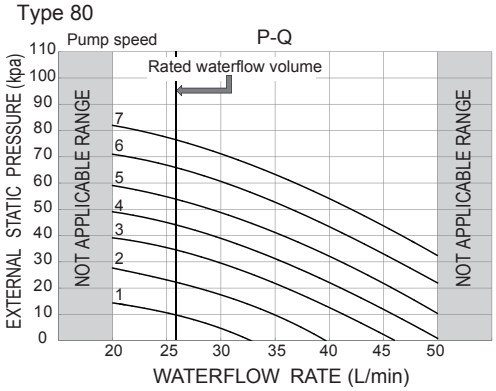
The default setting is SPEED 3. Please ensure the minimum flow rate is not less than 13 L/min and not more than 50 L/min.
The available external static pressure (kPa) in function of the water flow rate (L/min) is shown in the P-Q graph.
Press the ▲ or ▼ button to change the pump speed and press the ↵ button to confirm the pump speed. It is possible to press the ↩ button to cancel.

* Before adjusting the water flow rate, make sure that the total water volume in the installation is a minimum of 50 litres for heating side.

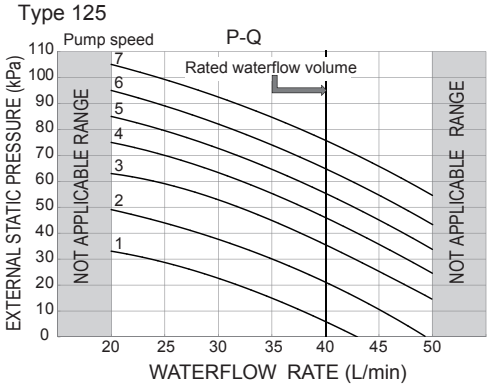
NOTE

Do not perform both test run for water circuit and auto addressing at the same time. The address of indoor unit will not be set correctly.

Type 80

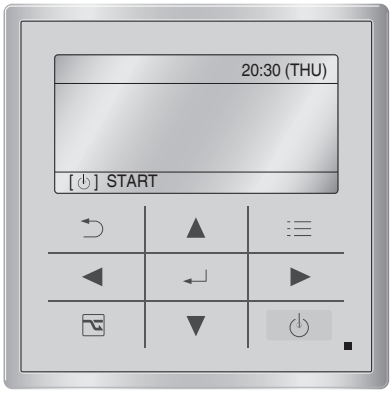


Type 125



7-4. Detailed settings for Air-to-Water (extract)

High-spec Wired Remote Controller (CZ-RTC5)



1. Keep pressing the [↩], [↵] and [▶] buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display.

Maintenance func 20:30 (THU)
0. ECONAVI info.
1. Outdoor unit error data
2. Service contact
3. RC. setting mode
Sel. Page [↵] Confirm

2. Press the [▼] or [▲] button to see each menu. If you wish to see the next screen instantly, press the [◀] or [▶] button.
   Select “13. Air-to-Water unit” on the LCD display and press the [↵] button.

Maintenance func 20:30 (THU)
10. Set elec.consumption
11. Set touch key
12. Check touch key
13. Air-to-Water unit
Sel. Page [↵] Confirm

3. Press the [▼] or [▲] button to see each menu. If you wish to see the next screen instantly, press the [◀] or [▶] button.
   Select “Air-to-Water settings” on the LCD display and press the [↵] button.

Air-to-Water unit 20:30 (THU)
Air purge
Pump speed setup
Cancel int.heater alarm
Air-to-Water settings
Sel. [↵] Set

4. The “Air-to-Water settings” screen appears on the LCD display.
   Select the “Code no.” by pressing the [▼] or [▲] button for changes.

Air-to-Water settings 20:30 (THU)	
Code no.	Set data
02	0000
Sel.	Next

5. Select the “Set data” by pressing the [◀] or [▶] button.
   Select one of the “Set data” by pressing the [▼] or [▲] button.
   Then press the [↵] button.

Code no.	Menu	Set data	TANK mode	Air-Conditioning mode
02	Mode select (TANK, A/C)	0000: No * 0001: TANK 0002: A/C	○	○
04	Heating curve function use	0000: No 0001: Yes *	–	○
05	Existence of External device	0000: No * 0001: Yes	○	–
06	Optional thermo sensor use	0000: No * 0001: R/C 0002: Remote sensor 0003: Ext. thermo	–	○
07	2-way Valve	0000: Normal Open 0001: Normal Close *	–	○
22	Outdoor temperature using internal heater	-20°C ~ 25°C (* 0°C)	○	○
31	Temperature for sterilization	50°C ~ 65°C (* 55°C)	○	–
52	ON/OFF timing of external device	25°C ~ 65°C (* 40°C)	○	–
53	ON/OFF timing of water pump for detecting the tank temperature	1~12 ×10 min. (* 2×10 min.)	○	–
54	External Water Pump connection	0000: No * 0001: Yes	○	○

* Default setting

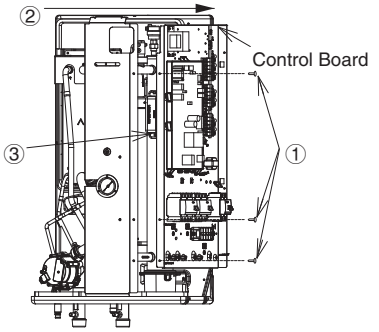
8. OVERLOAD PROTECTOR

If "P07" alarm appears on the remote controller, perform the following steps.

How to Service Overload Protector

Perform the steps in "7-2. How to Remove Side Cabinet" before performing the steps below.

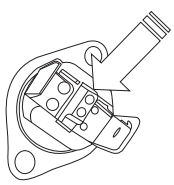
1. Remove these 3 screws.
2. Push control board apart after removing the 3 screws to this direction.
3. Remove terminal cover's screw.
4. Follow the steps in "Reset Overload Protector" to service the OLP.



Reset Overload Protector

Overload Protector serves the safety purpose to prevent the water over heating. When the Overload Protector trip at high water temperature, take below steps to reset it.

1. Remove OLP Cover.
2. Use a test pen to push the centre button gently in order to reset the Overload Protector.
3. Fix the OLP Cover to the original fixing condition.



Cancel the "P07" alarm of remote controller

High-spec Wired Remote Controller (CZ-RTC5)

1. Keep pressing the ⮌, ↵ and ▶ buttons simultaneously for 4 or more seconds.
   The "Maintenance func" screen appears on the LCD display.

Maintenance func 20:30 (THU)
0. ECONAVI info.
1. Outdoor unit error data
2. Service contact
3. RC. setting mode
▼ Sel. ▸ Page [↵] Confirm

2. Press the ▼ or ▲ button to see each menu. If you wish to see the next screen instantly, press the ◀ or ▶ button.
   Select "13. Air-to-Water unit" on the LCD display and press the ↵ button.

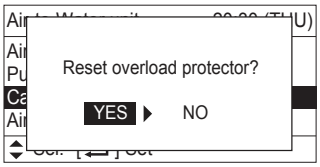
Maintenance func 20:30 (THU)
10. Set elec.consumption
11. Set touch key
12. Check touch key
13. Air-to-Water unit
▲ Sel. ◂ Page [↵] Confirm

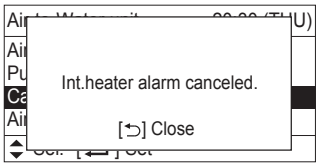
3. Press the ▼ or ▲ button to see each menu. Select "Cancel int. heater alarm" on the LCD display and press the ↵ button.

Air-to-Water unit 20:30 (THU)
Air purge
Pump speed setup
Cancel int.heater alarm
Air-to-Water settings
▲▼ Sel. [↵] Set

After resetting OLP of internal heater (press the button for reset overload protector), reset the alarm from the remote controller.

If this is not checked, "P07" alarm is not canceled.





ENGLISH

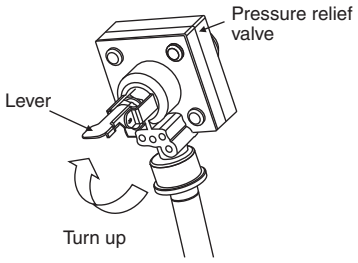
9. CHECK WATER PRESSURE

*(0.1 MPa = 1 bar)

Water pressure should not lower than 0.05 MPa (with inspects the pressure gauge 5). If necessary, add tap water into tank unit. Refer to tank unit installation instructions for details on how to add water.

10. CHECK PRESSURE RELIEF VALVE

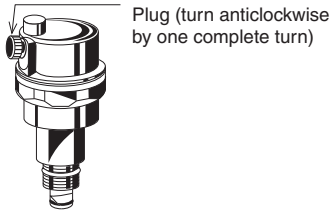
- Check for correction operation of pressure relief valve by turning up the lever to become horizontal. Refer to figure of “Pressure relief valve”.
- If you do not hear a clacking sound (due to water drainage), contact your local authorized dealer.
- Turn down the lever after the check is finished.
- In case the water keeps drained out from the unit, switch off the system, and then contact your local authorized dealer.



Pressure relief valve

11. CHECK AIR PURGE VALVE

Air purge valve must be installed at all high points in a closed water circuit system. An automatic air purge valve is provided inside the indoor unit. To automatically purge the air from the system, turn the plug on the air outlet anticlockwise by one complete turn from fully closed position. Excessive air is automatically purged if the plug is kept in this position.



Air purge valve

12. CHECK RCCB/ELCB

Ensure the RCCB/ELCB set to “ON” condition before checking RCCB/ELCB.
Turn on the power supply to the Indoor Unit.
This testing could only be done when power is supplied to the Indoor Unit.

⚠ WARNING
Be careful not to touch parts other than RCCB/ELCB test button when the power is supplied to Indoor Unit. Else, electrical shock may happen.

- Push the “TEST” button on the RCCB/ELCB. The lever would turn down and indicate “0”, if it functions normally.
- Contact authorized dealer if the RCCB/ELCB malfunction.
- Turn off the power supply to the Indoor Unit.
- If RCCB/ELCB functions normal, set the lever to “ON” again after the test is finished.

13. APPENDIX

■ Troubleshooting

If your Air-to-Water does not work properly, first check the following points before requesting service. If it still does not work properly, contact your dealer or a service center.

- **Indoor unit**

Symptom		Cause
Noise	Sound like streaming water during operation or after operation	● Sound of water flowing inside unit ● Sound of refrigerant liquid flowing inside unit ● Sound of drainage water through drain pipe
Dewdrop	Dewdrop gets accumurated near bottom during operation	Cold water accumlates dewdrop on the water piping.

- **Outdoor unit**

Symptom		Cause
No operation	When power is turned ON instantly.	Operation is not acticated for the first approx. 3 minutes because compressor protection circuit is activated.
	When operation is stopped and resumed immediately.	
Noise	Noise often occurs in heating mode.	During defrost operation
Steam	Steam often occurs in heating mode.	
When stopped by remote controller, outdoor unit fan is sometimes operating for a while even though outdoor compressor is stopped.		Fan rotating makes operation smoothly.

■ **Error Code**

Code		How to Release
E03	Remote controller communication error	Automatic
E04	Abnormal indoor/outdoor communication error	Automatic
F01	Abnormal refrigerant sensor 1 (E1)	Automatic
F02	Abnormal water outlet sensor 1 (E2)	Automatic
F03	Abnormal refrigerant sensor 2 (E3)	Automatic
F10	Abnormal water intlet sensor (TA)	Automatic
F11	Abnormal water outlet sensor 2 (BL)	Automatic
L13	Mismatched indoor unit	Reset (On and off of the power supply)
L16	Test run for water circuit is not finished	Do test run for water circuit
L25	Unmatched remote controller	Reset (On and off of the power supply)
P07	Abnormal Internal heater overload	Cancel from the remote controller
P09	Abnormal water flow	Re-run
P12	Abnormal water pump speed	Re-run

■ **Check Before Requiring Services**

Symptom	Cause	Remedy
Air-to-Water unit does not run at all although power is turned on.	Power failure or after power failure	Press ON/OFF operation button on remote controller again.
	Operation button is turned off.	● Switch on power if breaker is turned off. ● If breaker has been tripped, consult your dealer without turning it on.
	Fuse blow out.	If blown out, consult your dealer.
Poor cooling or heating performance	Water circuit of indoor unit is clogged with dust or obstacles.	Remove dust or obstruction.
	Water temperature is very cold (heating).	Preheat the water over 25°C. (operate only Air-to-Water unit)
	Air intake or air discharge port of outdoor units is clogged with dust or obstacles.	Remove dust or obstruction.
	Improper temperature settings	Refer to " ■ Tips for Energy Saving".
	Room is exposed to direct sunlight in cooling mode.	
	Doors and/or windows are open.	
	Too much heat sources in cooling mode.	Use minimum heat sources and in a short time.
	Too many people in the room in cooling mode.	Reduce temperature settings or change to "High" or "Strong".

If your Air-to-Water unit still does not work properly although you checked the points as described above, first stop the operation and turn off the power switch. Then contact your dealer and report the serial number and symptom.
Never repair your Air-to-Water unit by yourself since it is very dangerous for you to do so.
You also report if the inspection mark ⚠ and the letters E, F, H, L, P in combination with the numbers appear on the LCD of the remote control unit.

■ **Tips for Energy Saving**

Avoid

- **Do not block the air intake and outlet or water intake and outlet of the unit. If either is obstructed, the unit will not work well, and may be damaged.**
- Do not let direct sunlight into the room.
  Use sunshades, blinds or curtains.
  If the walls and ceiling of the room are warmed by the sun, it will take longer to cool the room.

Do

- Always try to keep the water clean. A luck of water flow will impair the performance of the unit.
- To prevent conditioned air from escaping, keep windows, doors and any other openings closed.

NOTE

Should the power fail while the unit is running

If the power supply for this unit is temporarily cut off, the unit will automatically resume operation once power is restored using the same settings before the power was interrupted.