

## Installation Manual

### AIR-TO-WATER HYDROMODULE + TANK

WH-ADC0309J3E5UK



# CAUTION

## R32 REFRIGERANT

This AIR-TO-WATER HYDROMODULE + TANK contains and operates with refrigerant R32.

**THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.**

Refer to National, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and/or service of this product.

### Required tools for Installation Works

1 Philips screw driver	11 Thermometer
2 Level gauge	12 Megameter
3 Electric drill, hole core drill (ø70 mm)	13 Multimeter
4 Hexagonal wrench (4 mm)	14 Torque wrench
5 Spanner	18 N•m (1.8 kgf•m)
6 Pipe cutter	55 N•m (5.5 kgf•m)
7 Reamer	58.8 N•m (5.8 kgf•m)
8 Knife	65 N•m (6.5 kgf•m)
9 Gas leak detector	117.6 N•m (12.0 kgf•m)
10 Measuring tape	15 Vacuum pump
	16 Gauge manifold

Explanation of symbols displayed on the indoor unit or outdoor unit.

	<b>WARNING</b>	This symbol shows that this equipment uses a flammable refrigerant. If the refrigerant is leaked, together with an external ignition source, there is a possibility of ignition.
	<b>CAUTION</b>	This symbol shows that the Installation Manual should be read carefully.
	<b>CAUTION</b>	This symbol shows that a service personnel should be handling this equipment with reference to the Installation Manual.
	<b>CAUTION</b>	This symbol shows that there is information included in the Operation Manual and/or Installation Manual.

### SAFETY PRECAUTIONS

- Read the following "SAFETY PRECAUTIONS" carefully before installation of Air-To-Water Hydromodule + Tank (here after referred to as "Tank Unit").
- Electrical works and water installation works must be done by licensed electrician and licensed water system installer respectively. Be sure to use the correct rating and main circuit for the model to be installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation due to ignorance or negligence of the instructions will cause harm or damage, and the seriousness is classified by the following indications.
- Please leave this installation manual with the unit after installation.

	<b>WARNING</b>	This indication shows the possibility of causing death or serious injury.
	<b>CAUTION</b>	This indication shows the possibility of causing injury or damage to properties only.








































The items to be followed are classified by the symbols:

	Symbol with white background denotes item that is PROHIBITED.
	Symbol with dark background denotes item that must be carried out.

- Carry out test run to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.
- If there is any doubt about the installation procedure or operation, always contact the authorized dealer for advice and information.

### WARNING

	Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer. Any unfit method or using incompatible material may cause product damage, burst and serious injury.
	Do not use unspecified cord, modified cord, joint cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire.
	Do not tie up the power supply cord into a bundle by band. Abnormal temperature rise on power supply cord may happen.
	Keep plastic bag (packaging material) away from small children, it may cling to nose and mouth and prevent breathing.
	Do not use pipe wrench to install refrigerant piping. It might deform the piping and cause the unit to malfunction.
	Do not purchase unauthorized electrical parts for installation, service, maintenance and etc.. They might cause electrical shock or fire.
	Do not pierce or burn as the appliance is pressurized. Do not expose the appliance to heat, flame, sparks, or other sources of ignition. Else, it may explode and cause injury or death.

	Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury etc.
	Do not place containers with liquids on top of the Tank Unit. It may cause Tank Unit damage and/or fire could occurs if they leak or spill onto the Tank Unit.
	Do not use joint cable for Tank Unit / Outdoor Unit connection cable. Use specified Tank Unit / Outdoor Unit connection cable, refer to instruction  <b>CONNECT THE CABLE TO THE TANK UNIT</b> and connect tightly for Tank Unit / Outdoor Unit connection. Clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat up or fire at the connection.
	For electrical work, follow the national regulation, legislation and this installation instructions. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in the electrical work, it will cause electrical shock or fire.
	For water circuit installation work, follow to relevant European and national regulations (including EN61770) and local plumbing and building regulation codes.
	Engage authorized dealer or specialist for installation. If installation done by the user is incorrect, it will cause water leakage, electrical shock or fire.
	<ul style="list-style-type: none"> <li>• This is a R32 model, use piping, flare nut and tools which is specified for R32 refrigerant. Using of existing (R22) piping, flare nut and tools may cause abnormally high pressure in the refrigerant cycle (piping), and possibly result in explosion and injury.</li> <li>• Thickness for copper pipes used with R32 must be more than 0.8 mm. Never use copper pipes thinner than 0.8 mm.</li> <li>• It is desirable that the amount of residual oil is less than 40 mg/10 m.</li> </ul>
	When installing or relocating Tank Unit, do not let any substance other than the specified refrigerant, eg. air etc. mix into refrigeration cycle (piping). Mixing of air etc. will cause abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
	For refrigeration system work, install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.
	Install at a strong and firm location which is able to withstand weight of the set. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
	This equipment is strongly recommended to be installed with Residual Current Device (RCD) on-site according to the respective national wiring rules or country-specific safety measures in terms of residual current.
	During installation, install the refrigerant piping properly before running the compressor. Operation of compressor without fixing refrigeration piping and valves at opened position will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
	During pump down operation, stop the compressor before removing the refrigeration piping. Removal of refrigeration piping while compressor is operating and valves are opened will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
	Tighten the flare nut with torque wrench according to specified method. If the flare nut is over tightened, after a long period, the flare may break and cause refrigerant gas leakage.
	After completion of installation, confirm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.
	Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when the refrigerant contacts with fire.
	Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.
	If there is any doubt about the installation procedure or operation, always contact the authorized dealer for advice and information.
	Select a location where in case of water leakage, the leakage will not cause damage to other properties.
	When installing electrical equipment at wooden building of metal lath or wire lath, in accordance with electrical facility standard, no electrical contact between equipment and building is allowed. Insulator must be installed in between.
	Any work carried out on the Tank Unit after removing any panels which is secured by screws, must be carried out under the supervision of authorized dealer and licensed installation contractor.
	This system is multi supply appliance. All circuits must be disconnected before accessing the unit terminals.
	For cold water supply has a backflow regulator, check valve or water meter with check valve, provisions for thermal expansion of water in the hot water system must be provided. Otherwise it will cause water leakage.
	The piping installation work must be flushed before Tank Unit is connected to remove contaminants. Contaminants may damage the Tank Unit components.
	This installation may be subjected to building regulation approval applicable to respective country that may require to notify the local authority before installation.
	The Tank Unit must be shipped and stored in upright condition and dry environment. It may laid on its back when being moved into the building.
	Work done to the Tank Unit after remove the front plate cover that secured by screws, must be carried out under the supervision of authorized dealer, licensed installation contractor, skilled person and instructed person.
	Be aware that refrigerants may not contain an odour.
	This equipment must be properly earthed. Earth line must not be connected to gas pipe, water pipe, earth of lightning rod and telephone. Otherwise, it may cause electrical shock in case of equipment breakdown or insulation breakdown.
 <b>CAUTION</b>	
	Do not install the Tank Unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.
	Prevent liquid or vapor from entering sumps or sewers since vapor is heavier than air and may form suffocating atmospheres.
	Do not release refrigerant during piping work for installation, re-installation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
	Do not install this appliance in a laundry room or other high humidity location. This condition will cause rust and damage to the unit.
	Make sure the insulation of power supply cord does not contact hot part (i.e. refrigerant piping, water piping) to prevent from insulation failure (melt).
	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.
	Do not transport the Tank Unit with water inside the unit. It may cause damage to the unit.
	Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
	Select an installation location which is easy for maintenance. Incorrect installation, service or repair of this Tank Unit may increase the risk of rupture and this may result in loss damage or injury and/or property.
	<p>Power supply connection to Tank Unit.</p> <ul style="list-style-type: none"> <li>• Power supply point should be in easily accessible place for power disconnection in case of emergency.</li> <li>• Must follow local national wiring standard, regulation and this installation instruction.</li> <li>• Strongly recommended to make permanent connection to a circuit breaker. <ul style="list-style-type: none"> <li>- Power Supply 1: For WH-UD03JE5 and WH-UD05JE5, use approved 15/16A 2-poles circuit breaker with a minimum contact gap of 3.0mm.</li> <li>- For WH-UD07JE5 and WH-UD09JE5, use approved 25A 2-poles circuit breaker with a minimum contact gap of 3.0mm.</li> <li>- Power Supply 2: Use approved 16A 2-poles circuit breaker with a minimum contact gap of 3.0mm.</li> </ul> </li> </ul>

⚠	Ensure the correct polarity is maintained throughout all wiring. Otherwise, it will cause electrical shock or fire.
⚠	After installation, check the water leakage condition in connection area during test run. If leakage occurs, it will cause damage to other properties.
⚠	If the Tank Unit not operates for long time, the water inside the Tank Unit should be drained.
⚠	Installation work. It may need three or more people to carry out the installation work. The weight of Tank Unit might cause injury if carried by one person.

## PRECAUTION FOR USING R32 REFRIGERANT

- The basic installation work procedures are the same as conventional refrigerant (R410A, R22) models. However, pay careful attention to the following points:

⚠	When connecting flare at indoor side, make sure that the flare connection is used only once, if torqued up and released, the flare must be remade. Once the flare connection was torqued up correctly and leak test was made, thoroughly clean and dry the surface to remove oil, dirt and grease by following instructions of silicone sealant. Apply neutral cure (Alkoxy type) & ammonia-free silicone sealant that is non-corrosive to copper & brass to the external of the flared connection to prevent the ingress of moisture on both the gas & liquid sides. (Moisture may cause freezing and premature failure of the connection)
⚠	The appliance shall be stored, installed and operated in a well ventilated room with comply to Indoor Floor Area Requirement and without any continuously operating ignition source. Keep away from open flames, any operating gas appliances or any operating electric heater. Else, it may explode and cause injury or death.
⚠	Refer to "PRECAUTION FOR USING R32 REFRIGERANT" in outdoor unit installation manual for other precautions that need to pay attention to.

## INDOOR FLOOR AREA REQUIREMENT

- If the total refrigerant charge in the system is <math><1.84\text{ kg}</math>, no additional minimum floor area is required.
- If the total refrigerant charge in the system is  $\geq 1.84\text{ kg}$ , additional minimum floor area requirements is complied as described below:

Symbol	Description	Unit
$m_c$	Total refrigerant charge in system	kg
$m_{max}$	Maximum refrigerant charge allowed	kg
$m_{excess}$	$m_c - m_{max}$	kg
$H$	Installation height	m
$VA_{min}$	Minimum ventilation opening area	$\text{cm}^2$

Total refrigerant charge in system,  $m_c$  (kg)  
 = Pre-charged refrigerant amount in unit (kg)  
 + Additional refrigerant amount after installation (kg)

### A) Determine Maximum refrigerant charge allowed, $m_{max}$

- Calculate Installation Room Area,  $A_{room}$ .
- Based on Table I, select  $m_{max}$  which corresponds to the calculated  $A_{room}$  value.
- If  $m_{max} > m_c$ , the unit can be installed in the installation room with the specified installation height ( $H=600\text{mm}$ ) in Table I and without additional room area or any additional ventilation.
- Else, proceed to B) and C).

### B) Determine Total Floor Area of $A_{room}$ and $B_{room}$ compliance to $A_{min\ total}$

- Calculate the  $B_{room}$  area adjacent to the  $A_{room}$ .
- Determine the  $A_{min\ total}$  based on the Total Refrigerant Charge,  $m_c$  from Table II.
- The total floor area of both  $A_{room}$  and  $B_{room}$  must exceed  $A_{min\ total}$ .

### C) Determine Minimum Venting Opening Area, $VA_{min}$ for natural ventilation

- From Table III, calculate  $m_{excess}$ .
- Then determine  $VA_{min}$  corresponding to the calculated  $m_{excess}$  for natural ventilation between  $A_{room}$  and  $B_{room}$ .
- The unit can be installed at specific room only when the following conditions are fulfilled:
  - Two permanent openings, one at bottom, another at top, for ventilation purposes are made between  $A_{room}$  and  $B_{room}$ .
  - Bottom opening:**
    - Must comply to the minimum area requirement of  $VA_{min}$ .
    - Opening must be located 300mm from the floor.
    - At least 50% of required opening area must be 200mm from the floor.
    - The bottom of the opening shall not be higher than the point of release when the unit is installed and must be situated 100mm above the floor.
    - Must be as close as possible to the floor and lower than  $H$ .
  - Top opening:**
    - The total size of the Top opening must be more than 50% of  $VA_{min}$ .
    - Opening must be located 1500mm above the floor.
- The height of the openings must more than 20mm.
- A direct ventilation opening to outside is **NOT** encouraged for ventilation opening (the user can block the opening when it is cold).
- The value of  $H$  is considered as 0.6m to comply to IEC 60335-2-40:2018 Clause GG2.

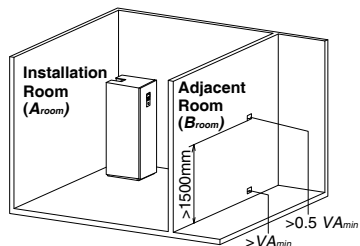


Table I – Maximum refrigerant charge allowed in a room

$A_{room}$ (m <sup>2</sup> )	Maximum refrigerant charge in a room ( $m_{max}$ ) (kg)
	$H=0.6m$
1	0.138
2	0.276
3	0.414
4	0.553
5	0.691
6	0.829
7	0.907
8	0.970
9	1.028
10	1.084
11	1.137
12	1.187
13	1.236
14	1.283
15	1.328
16	1.371
17	1.413
18	1.454
19	1.494
20	1.533
21	1.571
22	1.608
23	1.644
24	1.679
25	1.714
26	1.748
27	1.781
28	1.814
29	1.846
30	1.877
31	1.909
32	1.939
33	1.969
34	1.999
35	2.028
36	2.057
37	2.085
38	2.113
39	2.141
40	2.168
41	2.195
42	2.221
43	2.248
44	2.274

- For  $H$  values lower than 0.6m, the value of  $H$  is considered as 0.6m to comply to IEC 60335-2-40:2018 Clause GG2.
- For intermediate  $A_{room}$  values, the value that corresponds to the lower  $A_{room}$  value from the table is considered.  
Example:  
For  $A_{room} = 10.5$  m<sup>2</sup>, the value that corresponds to " $A_{room} = 10$  m<sup>2</sup>" is considered.

Table II – Minimum floor area

$m_c$ (kg)	Minimum floor area ( $A_{min total}$ ) (m <sup>2</sup> )
	$H=0.6m$
1.84	28.81
1.86	29.44
1.88	30.08
1.90	30.72
1.92	31.37
1.94	32.03
1.96	32.70
1.98	33.37
2.00	34.04
2.02	34.73
2.04	35.42
2.06	36.12
2.08	36.82
2.10	37.53
2.12	38.25
2.14	38.98
2.16	39.71
2.18	40.45
2.20	41.19
2.22	41.94
2.24	42.70
2.26	43.47
2.27	43.86






- For  $H$  values lower than 0.6m, the value of  $H$  is considered as 0.6m to comply to IEC 60335-2-40:2018 Clause GG2.
- For intermediate  $m_c$  values, the value that corresponds to the higher  $m_c$  value from the table is considered.  
Example:  
If  $m_c = 1.85$  kg, the value that corresponds to " $m_c = 1.86$  kg" is considered.
- Systems with total refrigerant charge lower than 1.84 kg are not subjected to any room area requirements.
- Charges above 2.27 kg are not allowed in the unit.

Table III – Minimum venting opening area for natural ventilation

$m_c$ (kg)	$m_{max}$ (kg)	$m_{excess}$ (kg) = $m_c - m_{max}$	Minimum venting opening area ( $VA_{min}$ ) (cm <sup>2</sup> )
			$H=0.6m$
2.27	0.1	2.17	878
2.27	0.3	1.97	797
2.27	0.5	1.77	716
2.27	0.7	1.57	635
2.27	0.9	1.37	570
2.27	1.1	1.17	538
2.27	1.3	0.97	485
2.27	1.5	0.77	414
2.27	1.7	0.57	326
2.27	1.9	0.37	224

- For  $H$  values lower than 0.6m, the value of  $H$  is considered as 0.6m to comply to IEC 60335-2-40:2018 Clause GG2.
- For intermediate  $m_{excess}$  values, the value that corresponds to the higher  $m_{excess}$  value from the table is considered.  
Example:  
 $m_{excess} = 1.45$  kg, the value that corresponds to " $m_{excess} = 1.6$  kg" is considered.

Attached accessories

No.	Accessory part	Qty.	No.	Accessory part	Qty.
1	Adjustable Feet 	4	4	Packing 	1
2	Reducing Adapter 	1	5	Remote Controller Cover 	1
3	Drain Elbow 	1			

Optional Accessories

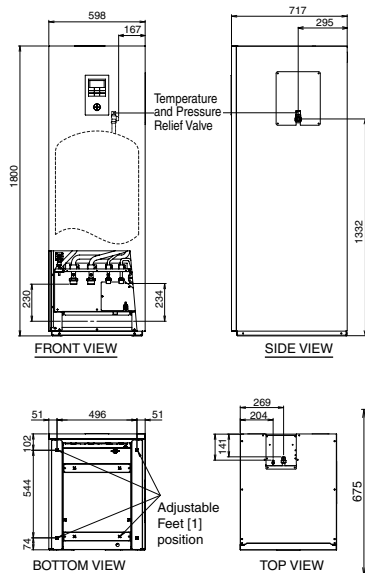
No.	Accessories part	Qty.
6	Optional PCB (CZ-NS4P)	1
7	Network Adaptor (CZ-TAW1) and Extension Cable (CZ-TAW1-CBL)	1

Field Supply Accessories (Optional)

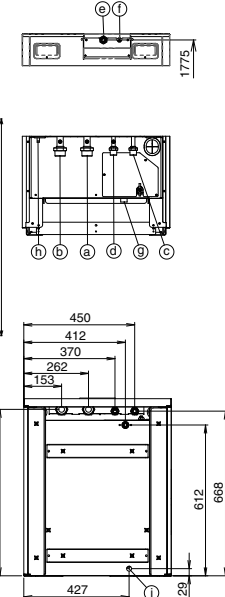
No.	Part	Model	Specifications	Maker	
i	2-way valve kit	Electromotoric Actuator	SFA21/18	AC230V	Siemens
	*Cooling model	2-port Valve	VV146/25		
ii	Room thermostat	Wired	PAW-A2W-RTWIRED	AC230V	-
		Wireless	PAW-A2W-RTWIRELESS		
iii	Mixing valve	-	167032	AC230V	Caleffi
iv	Pump	-	Yonos 25/6	AC230V	Wilo
v	Buffer tank sensor	-	PAW-A2W-TSBU	-	-
vi	Outdoor sensor	-	PAW-A2W-TSOD	-	-
vii	Zone water sensor	-	PAW-A2W-TSHC	-	-
viii	Zone room sensor	-	PAW-A2W-TSRT	-	-
ix	Solar sensor	-	PAW-A2W-TSSO	-	-

It is recommended to purchase the field supply accessories listed in above table.

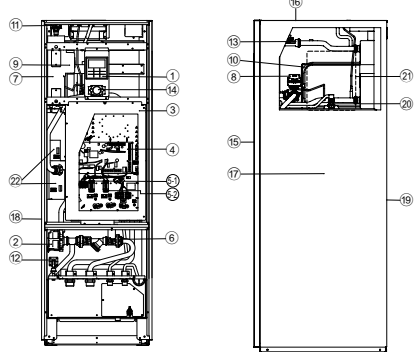
Dimension Diagram



Tube Position Diagram



Main Components Diagram



Checklist of Components

Part Name	Part No.
1 Remote Controller	ACXA34K00460 / ACXA34K00480
2 Water Pump	
3 Control Board Cover	
4 Main PCB	
5 Single Phase RCCB/ELCB (Main Power)	
6 Single Phase RCCB/ELCB (Backup Heater)	
7 Magnetic Water Filter Set	
8 Heater Assembly	
9 3-Way Valve	
10 Overload Protector (Not Visible)	
11 Air Purge Valve	ACXB62-00130
12 Pressure Relief Valve	B621136 / ACXB62-00100 / ACXB62-00740
13 Flow Sensor	B621135
14 Water Pressure Gauge	
15 Front Plate	
16 Top Plate	
17 Right Plate	
18 Left Plate	
19 Rear Plate	
20 Temperature and Pressure Relief Valve	
21 Access Plate (Not Visible)	
22 Tank Sensor (Not Visible)	

Tube Connector	Function	Connector Size
Ⓐ	Water Inlet (From Space Heating/Cooling)	R 1 1/4"
Ⓑ	Water Outlet (To Space Heating/Cooling)	R 1 1/4"
Ⓒ	Cold Water Inlet (Domestic Hot Water Tank)	R 3/4"
Ⓓ	Hot Water Outlet (Domestic Hot Water Tank)	R 3/4"
Ⓔ	Refrigerant Gas	7/8-14UNF
Ⓣ	Refrigerant Liquid	7/16-20UNF
Ⓗ	Domestic Hot Water Tank Discharge (Drain Tap) Type: Ball Valve	Rc 1/2"
Ⓘ	Pressure Relief Valve Drainage	---
Ⓛ	Drain Water Hole	---

# 1 SELECT THE BEST LOCATION

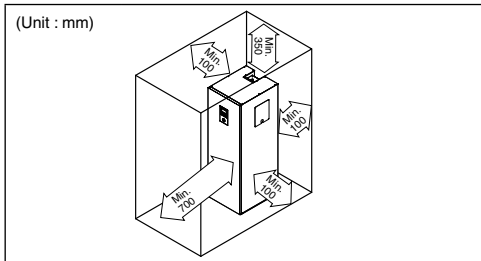
Before choosing the installation site, obtain user approval.

- Install the Tank Unit in indoors with frost free weather proof location only.
- Must install on a flat horizontal and solid hard surface.
- There should not be any heat source or steam near the Tank Unit.
- A place where air circulation in the room is good.
- A place where drainage can be easily done (e.g. Utility room).
- A place where Tank Unit's operation noise will not cause discomfort to the user.
- A place where Tank Unit is far from door way.
- A place where accessible for maintenance.
- Ensure to keep minimum distance of spaces as illustrated below from wall, ceiling, or other obstacles.
- A place where flammable gas leaking might not occur.
- Secure the Tank Unit to prevent it being knocked over accidentally or during earthquakes.

Please avoid installations which expose the Tank Unit to any of the following conditions:

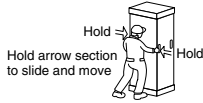
- Extraordinary environment conditions; installation in frost or exposure to unfavorable weather conditions.
- Voltage input exceeding the specified voltage.

## Required space for installation



## Transport and Handling

- Be careful during transporting the unit so that it is not damaged by impact.
- Only remove the packaging material once it has reached its desired installation location.
- It may need three or more people to carry out the installation work. The weight of Tank Unit might cause injury if carried by one person.
- The Tank Unit can be transported either in vertical or horizontal.
  - If it transported in horizontal, make sure Front of packaging material (printed with "FRONT") must facing upwards.
  - If it transported in vertical, use the hand holes on sides, slide and move to the desired location.
- Fix the Adjustable Feet, if the Tank unit installed on a uneven surface.



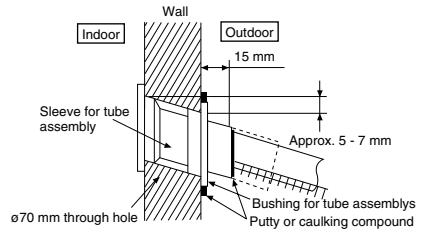
# 2 TO DRILL A HOLE IN THE WALL AND INSTALL A SLEEVE OF PIPING

1. Make a  $\varnothing 70$  mm through hole.
2. Insert the piping sleeve to the hole.
3. Fix the bushing to the sleeve.
4. Cut the sleeve until it extrudes about 15 mm from the wall.

**CAUTION**

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

5. Finish by sealing the sleeve with putty or caulking compound at the final stage.



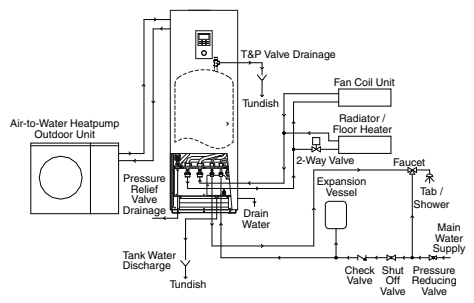
# 3 PIPING INSTALLATION

## WATER QUALITY REQUIREMENT

Must use water that complies with European water quality standard 98/83 EC. The lifespan of the Tank Unit will be shorter if groundwater (include spring water and well water) is used.

The Tank Unit shall not be used with the tap water containing contaminants such as salt, acid, and other impurities which may corrode the tank and its component.

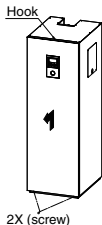
## Typical Piping Installation



Access to Internal Components

**WARNING**

This section is for authorized and licensed electrician/water system installer only. Work behind the front plate secured by screws must only be carried out under supervision of qualified contractor, installation engineer or service person.



**CAUTION**

Open or close the Front Plate carefully. The heavy Bottom Front Plate may injures the fingers.

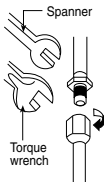
**Open and Close Front Plate 15**

1. Remove the 2 mounting screws of Bottom Front Plate 15.
2. Slide it upwards to unhook the Bottom Front Plate 15 hook.
3. Reverse above steps 1-2 for the close it.

Refrigerant Piping Installation

This Tank Unit is designed for combination with Panasonic Air-to-Water Heat Pump Outdoor Unit. If Outdoor Unit from other manufacturer are being used in combination with Panasonic Tank Unit, optimum operation and reliability of the system is not guaranteed. Thus warranty cannot be given in such case.

1. Connect Tank Unit to Air-to-Water Heatpump Outdoor Unit with correct piping size. Use Reducing Adapter 2 for Outdoor Unit WH-UD03JE5 and WH-UD05JE5 Refrigerant Gas piping connection.



Model	Tank Unit	Outdoor Unit	Piping size (Torque)		Use Reducing Adapter 2
			Gas	Liquid	
WH-ADC0309J3E5UK	WH-UD03JE5, WH-UD05JE5	WH-UD07JE5, WH-UD09JE5	ø12.7mm (1/2") [55 N·m]	ø6.35mm (1/4") [18 N·m]	Yes
			ø15.88mm (5/8") [65 N·m]	ø6.35mm (1/4") [18 N·m]	No

**CAUTION**

Do not overtighten, overtightening may cause gas leakage.

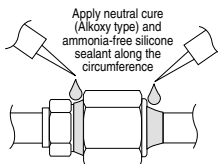
Do not pull and push refrigerant piping excessively. Deformed pipe may cause refrigerant leak.

2. Please make flare after inserting flare nut (located at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)
3. Do not use pipe wrench to open refrigerant piping. Flare nut may be broken and cause leakage. Use proper spanner or ring wrench.
4. 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.

Additional Precautions For R32 Models when connecting by flaring at indoor side

- 1. Ensure to do the re-flaring of pipes before connecting to units to avoid leaking.
- 2. Connections made between components of refrigerant system shall be accessible for ease of maintenance.

Seal sufficiently the flare nut (both gas and liquid sides) with neutral cure (Alkoxy type) & ammonia-free silicone sealant and insulation material to avoid the gas leak caused by freezing.



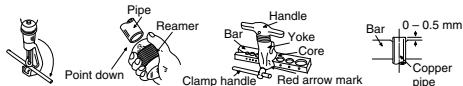
Neutral cure (Alkoxy type) & ammonia-free silicone sealant is only to be applied after pressure testing and cleaning up by following instructions of sealant, only to the outside of the connection. The aim is to prevent moisture from entering the connection joint and possible occurrence of freezing. Curing sealant will take some time. Make sure sealant will not peel off when wrapping the insulation.

**Checking for gas leakage**

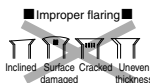
- Check for leakage of gas after air purging.
- See the in the installation manual for the outdoor.

**CUTTING AND FLARING THE PIPING**

1. Please cut using pipe cutter and then remove the burrs.
2. Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
3. Please make flare after inserting the flare nut onto the copper pipes.



1. To cut
2. To remove burrs
3. To flare

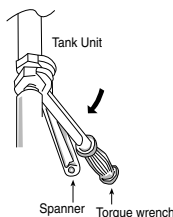


When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

**Water Piping Installation**

- Please engage a licensed water circuit installer to install this water circuit.
- This water circuit must comply with relevant European and national regulations (including EN61770), and local building regulation codes.
- Ensure the components installed in the water circuit could withstand water pressure during operation.
- Do not use worn out tube.
- Do not apply excessive force to pipes that may damage the pipes.
- Choose proper sealer which can withstand the pressures and temperatures of the system.
- Make sure to use two spanners to tighten the connection. Further tighten the nuts with torque wrench in specified torque as stated in the table.
- Cover the pipe 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 non-brass metallic piping is used for installation, make sure to insulate the pipes to prevent galvanic corrosion.
- Do not connect galvanised pipes, this will cause galvanic corrosion.
- Use correct nut for all Tank Unit tube connections and clean all tubes with tap water before installation. See Tube Position Diagram for detail.

Tube Connector	Nut Size	Torque
a & b	RP 1 1/4"	117.6 N·m
c & d	RP 3/4"	58.8 N·m



## ⚠ CAUTION

Do not overtighten, overtightening may cause water leakage.

- Make sure to insulate the water circuit pipes to prevent reduction of heating capacity.
- After installation, check the water leakage condition in connection area during test run.
- Failure to connect the tube appropriately might cause the Tank Unit malfunction.
- Protection From Frost:  
If the Tank Unit is being exposed to frost while power supply failure or pump operating failure, drain the system. When water is idle inside the system, freezing up is very likely to happen which could damage the system. Make sure the power supply is turned off before draining. Heater Assembly ⑦ may be damaged under dry heating.
- Corrosion Resistance:  
Duplex stainless steel is naturally corrosion resistant to mains water supply. No specific maintenance is required to maintain this resistance. However, please note that Tank Unit is not guaranteed for use with a private water supply.
- It is recommended to use a tray (field supply) to collect water from the Tank Unit if water leakage occur.

### (A) Space Heating/Cooling Pipework

- Connect Tank Unit Tube Connector ③ to outlet connector of Panel/Floor heater.
- Connect Tank Unit Tube Connector ④ to inlet connector of Panel/Floor heater.
- Failure to connect the tube appropriately might cause the Tank Unit malfunction.
- Refer below table for the rated flow rate of each particular Outdoor Unit.

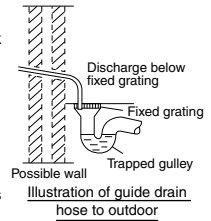
Model		Rated Flow Rate (l/min)	
Tank Unit	Outdoor Unit	Cool	Heat
WH-ADC0309J3E5UK	WH-UD03JE5	9.2	9.2
	WH-UD05JE5	12.9	14.3
	WH-UD07JE5	17.6	20.1
	WH-UD09JE5	20.1	25.8

### (B) Domestic Hot Water Tank Pipework

- It's strongly recommended to install an expansion vessel (field supply) in the Domestic Hot Water Tank circuit. Refer Typical Piping Installation section to locate the expansion vessel.
  - Expansion Vessel type and specifications:
    - Size : Not more than 3/4"
    - Pre-charge pressure : 0.35MPa (3.5 bars)
- If secondary return circuits are used then an additional expansion vessel may be required.
- In high water pressure or water supply is above 500kPa, please install the Pressure Reducing Valve for water supply. If the pressure higher than that, it might damage the Tank Unit.
- A Pressure Reducing Valve (field supply) and Pressure Relief Valve (field supply) with below specification must be installed along the line of the tube connector ③ of Tank Unit. Refer Typical Piping Installation section to locate both of these valves.
  - Pressure Reducing Valve type and specifications:
    - Size : Not more than 3/4"
    - Set Pressure : 0.35MPa (3.5 bars)
  - Pressure Relief Valve type and specifications:
    - Size : Not more than 3/4"
    - Set Pressure : 0.8MPa (8.0 bars)
- The pressure after pressure reducing valve is less than 0.35MPa (3.5 bars).
- Must connect a faucet to Tank Unit Tube Connector ④ and urban water supply, in order to supply water with appropriate temperature for shower or tap usage. Failure to do so might cause scalding.
- Failure to connect the tube appropriately might causing the Tank Unit malfunction.

### (C) Pressure Relief Valve Drainage Pipework

- Connect a drain hose to the Pressure Relief Valve hose outlet ⑩.
- The hose must be installed in a continuously downward direction and left open to the frost-free atmosphere.
- If drain hose is long, use a metal support fixture along the way to eliminate the wavy pattern of drain tube.
- The water may drip from this discharge hose. Therefore must guide the hose without close or block the outlet of the hose.
- Do not insert this hose into sewage hose or cleaning hose that may generate ammonia gas, sulphuric gas etc.
- If necessary, use a hose clamp to tighten the hose at drain hose connector to prevent it from leaking.
- Guide the drain hose to outdoor as illustrated at the right figure.

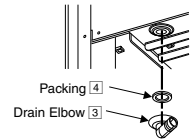


### (D) Domestic Hot Water Tank Discharge Pipework

- Use R1/2" male connector for Domestic Hot Water Tank Discharge (Drain Tap) ⑩ connection.
- Piping must be installed in a continuously downward direction and in a frost-free environment.
- Discharge pipes must be visible and away from electrical components.
- Guide the drain hose to outdoor as illustrated at the right figure.
- It is recommended to fit a tundish into this ⑩ pipework. Tundish should be visible and positioned away from frost environment and electrical components.

### (E) Drain Elbow and Hose Installation

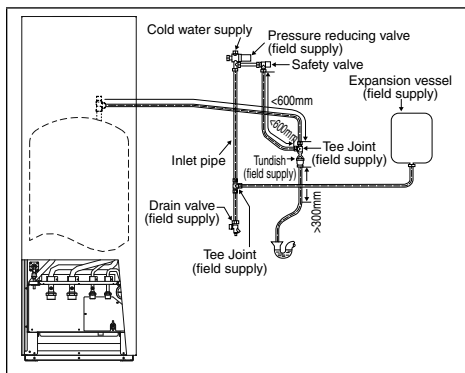
- Fix the Drain Elbow ③ and Packing ④ to the bottom of Drain Water Hole ①.
- Use inner diameter 17 mm drain hose in the market.
- This hose must be installed in a continuously downward direction and in a frost-free environment. Improper drain piping may cause water leakage hence damage the furnitures.
- Guides this hose outlet to outdoor only.
- Do not insert this hose into sewage or drain pipe that may generate ammonia gas, sulphuric 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.



### (F) Temperature and Pressure Relief Valve ⑳

The Temperature and Pressure Relief Valve ⑳ need appropriate discharge pipework. In accordance with Building Regulations a tundish must be fitted into the pipework within 600mm of the safety device. Due to the distance between the two safety devices it may be necessary to fit each safety device with its own tundish before run the pipework together to a safety discharge. The Right Plate ⑰ has a window so that the connection can be made to the factory fitted Temperature and Pressure Relief Valve ⑳. For access, first remove the 4 screws on the Access Plate ⑲. Then connect the Temperature and Pressure Relief Valve ⑳ to the discharge pipework (Ø15mm). Finally, reinstall the Access Plate ⑲. Always replace the plate so that no gaps exist between the plate and Right Plate ⑰ to avoid heat loss. The following instructions are a requirement of UK Building Regulations and must be adhere to. For the other countries please refer to local legislation. If there is any doubt the insulation procedure, always contact local building office.

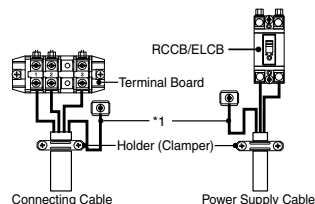
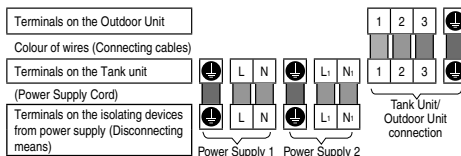




Model		Power Supply Cord	Cable Size	Isolating Devices	Recommended RCD
WH-ADC0309J3E5UK	WH-UD03JE5	1	3 x min 1.5 mm <sup>2</sup>	15/16A	30mA, 2P, type A
	WH-UD05JE5	2	3 x min 1.5 mm <sup>2</sup>	15/16A	30mA, 2P, type AC
	WH-UD07JE5	1	3 x min 2.5 mm <sup>2</sup>	25A	30mA, 2P, type A
	WH-UD09JE5	2	3 x min 1.5 mm <sup>2</sup>	15/16A	30mA, 2P, type AC

3. To avoid the cable and cord being damaged by sharp edges, the cable and cord must be passed through a bushing (located at the bottom of Control Board) before terminal board. The bushing must be used and must not be removed.

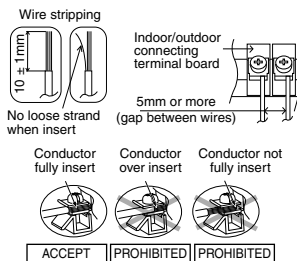
1. Connect the tundish and route the discharge pipe as shown above. Tundish should be visible and positioned away from frost environment and electrical components.
2. The tundish should be fitted vertically and as close to the safety device as possible and within 600mm of the device.
3. The tundish should be visible to users and positioned away from electrical devices.
4. The discharge pipe from the tundish should terminate in a safe place where there is no risk to person nearby to the discharge, be of metal construction and:
  - A) Be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long. Bends must be taken into account in calculating the flow resistance.
  - B) Have a vertical section of pipe at least 300mm long, below the tundish before any elbows or bends in the pipework.
  - C) Be installed with a continuous fall.
  - D) Have discharges visible at both the tundish and final point of discharge.



Terminal screw	Tightening torque cN•m (kgf•cm)
M4	157~196 {16~20}
M5	196~245 {20~25}

\*1 - Earth wire must be longer than other cables for safety reasons

### WIRE STRIPPING AND CONNECTING REQUIREMENT



## 4 CONNECT THE CABLE TO THE TANK UNIT

### ⚠ WARNING

This section is for authorized and licensed electrician only. Work behind the Control Board Cover (3) secured by screws must only be carried out under supervision of qualified contractor, installation engineer or service person.

### Fixing of Power Supply Cable and Connecting Cable

1. Connecting cable between Tank Unit and Outdoor Unit shall be approved polychloroprene sheathed flexible cord, type designation 60245 IEC 57 or heavier cord. See below table for cable size requirement.

Tank Unit	Model	Connecting Cable Size
	Outdoor Unit	
WH-ADC0309J3E5UK	WH-UD03JE5, WH-UD05JE5	4 x min 1.5 mm <sup>2</sup>
	WH-UD07JE5, WH-UD09JE5	4 x min 2.5 mm <sup>2</sup>

- Ensure the colour of wires of Outdoor Unit and the terminal no. are the same to the Tank Unit respectively.
  - Earth wire shall be longer than the other wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the Holder (Clamper).
2. An isolating device must be connected to the power supply cable.
    - Isolating device (disconnecting means) should have minimum 3.0 mm contact gap.
    - Connect the approved polychloroprene sheathed power supply 1 cord and power supply 2 cord and type designation 60245 IEC 57 or heavier cord to the terminal board, and to the other end of the cord to isolating device (Disconnecting means). See below table for cable size requirement.

### CONNECTING REQUIREMENT

For Tank Unit with WH-UD03JE5, WH-UD05JE5, WH-UD07JE5, WH-UD09JE5

- The equipment's Power Supply 1 complies with IEC/EN 61000-3-2.
- The equipment's Power Supply 1 complies with IEC/EN 61000-3-3 and can be connected to current supply network.
- The equipment's Power Supply 2 complies with IEC/EN 61000-3-2.
- The equipment's Power Supply 2 complies with IEC/EN 61000-3-11 and shall be connected to suitable supply network, with the following maximum permissible system impedance  $Z_{max} = 0.352 \text{ ohm } (\Omega)$  at the interface. Please liaise with supply authority to ensure that the Power Supply 2 is connected only to a supply of that impedance or less.

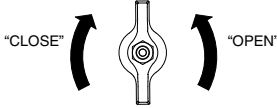
# 5 CHARGING AND DISCHARGING THE WATER

- Make sure all the piping installations are properly done before carry out below steps.

## CHARGE THE WATER

### For Domestic Hot Water Tank

1. Set the Domestic Hot Water Tank Discharge (Drain Tap) ⑩ to "CLOSE".

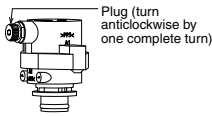


Domestic Hot Water Tank Discharge (Drain Tap) ⑩

2. Set all Tap / Shower "OPEN".
3. Start filling water to the Domestic Hot Water Tank via Tube Connector ⑨. After 20-40min, water should flow out from Tap / Shower. Else, please contact your local authorized dealer.
4. Check and make sure no water leaking at the tube connecting points.

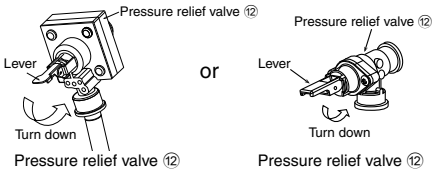
### For Space Heating / Cooling

1. Turn the plug on the Air Purge Valve ⑪ outlet anticlockwise by one complete turn from fully closed position.



Air purge valve ⑪

2. Set the Pressure Relief Valve ⑫ lever "DOWN".



3. Start filling water (with pressure more than 0.1 MPa (1 bar)) to the Space Heating / Cooling circuit via Tube Connector ⑨. Stop filling water if the free water flow through Pressure Relief Valve Drainage ⑬.
4. Turn ON the Tank Unit and make sure Water Pump ② is running.
5. Check and make sure no water leaking at the tube connecting points.

## DISCHARGE THE WATER

### For Domestic Hot Water Tank

1. Turn OFF power supply.
2. Set the Domestic Hot Water Tank Discharge (Drain Tap) ⑩ to "OPEN".
3. Open Tap / Shower to allow air inlet.
4. After discharge, set Domestic Hot Water Tank Discharge (Drain Tap) ⑩ to "CLOSE".

# 6 RECONFIRMATION

## WARNING

Be sure to switch off all power supply before performing each of the below checkings.

## CHECK WATER PRESSURE \* (0.1 MPa = 1 bar)

Water pressure should not lower than 0.05 MPa (with inspects the Water Pressure Gauge ⑭). If necessary add water into Tank Unit (via Tube Connector ⑨).

## CHECK PRESSURE RELIEF VALVE ⑫

- Check for correct operation of Pressure Relief Valve ⑫ by turning on the lever to become horizontal.
- If you do not hear a clacking sound (due to water drainage), contact your local authorized dealer.
- Push down the lever after finish checking.
- In case the water keep on draining out from the Tank Unit, switch off the system, and then contact your local authorized dealer.

## EXPANSION VESSEL ⑩ PRE PRESSURE CHECKING

### For Space Heating / Cooling

- Expansion Vessel ⑩ with 10 L air capacity and initial pressure of 1 bar is installed in this Tank Unit.
- Total amount of water in system should be below 200 L. (Inner volume of Tank Unit's piping is about 5 L)
- If total amount of water is over 200 L, please add another expansion vessel. (field supply)
- Please keep the installation height difference of system water circuit within 10 m.

## CHECK RCCB/ELCB

Ensure the RCCB/ELCB set to "ON" condition before check RCCB/ELCB. Turn on the power supply to the Tank Unit.

This testing could only be done when power is supplied to the Tank Unit.

## WARNING

Be careful not to touch parts other than RCCB/ELCB test button when the power is supplied to Tank 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 normal.
- Contact authorized dealer if the RCCB/ELCB malfunction.
- Turn off the power supply to the Tank Unit.
- If RCCB/ELCB functions normal, set the lever to "ON" again after testing finish.

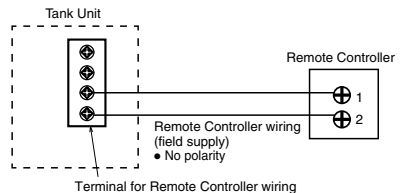
# 7 INSTALLATION OF REMOTE CONTROLLER AS ROOM THERMOSTAT

- Remote Controller ① mounted to the Tank Unit can be moved to the room and serve as Room Thermostat.

## 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 wall.
- Avoid the following locations for installation.
  1. By the window, etc. exposed to direct sunlight or direct air.
  2. In the shadow or backside of objects deviated from the room airflow.
  3. Location where condensation occurs (The Remote Controller is not moisture proof or drip proof.)
  4. Location near heat source.
- Uneven surface.
- Keep distance of 1 m or more from the TV, radio and PC. (Cause of fuzzy image or noise)

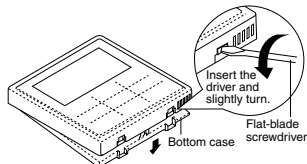
## Remote Controller Wiring



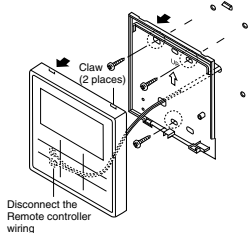
- Remote Controller cable shall be (2 x min 0.3 mm<sup>2</sup>), of double insulation PVC-sheathed or rubber sheathed cable. Total cable length shall be 50 m or less.
- Be careful not to connect cables to other terminals of Tank Unit (e.g. power source wiring terminal). Malfunction may occur.
- Do not bundle together with the power source wiring or store in the same metal tube. Operation error may occur.

**Remove The Remote Controller From Tank Unit**

1. Remove the top case from the bottom case.

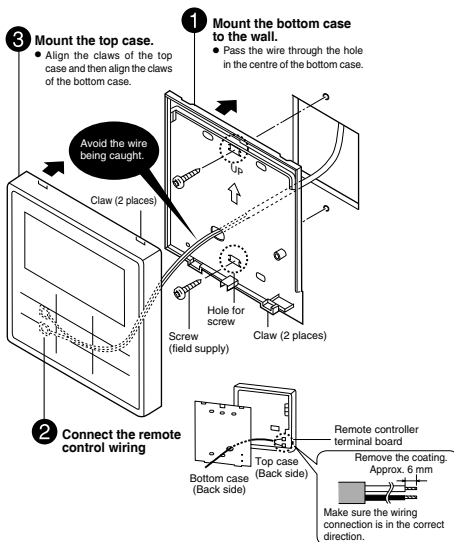


2. Remove the wiring between Remote controller and Tank Unit terminal.



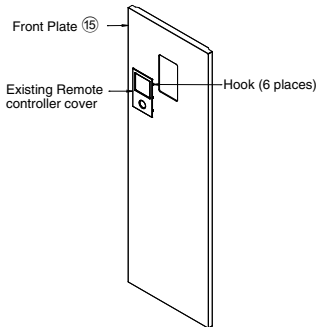
For embedded type

**Preparation:** Make 2 holes for screws using a driver.

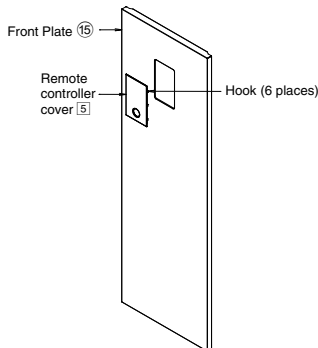


**Replace The Remote Controller Cover**

- Replace the existing Remote controller cover with Remote controller cover [5] to close the hole left after remove the Remote controller.
1. Release the Remote controller cover's hooks from behind the Front Plate [15].



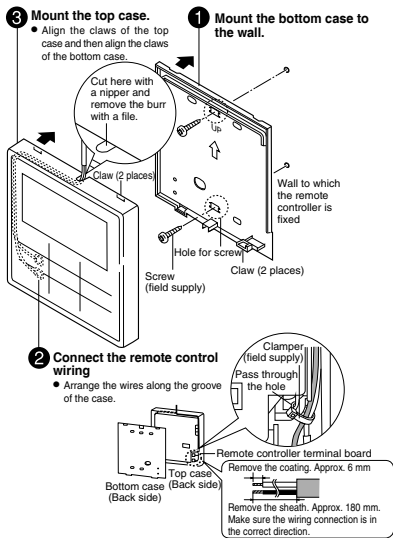
2. Press from front to fix the Remote controller cover [5] on the front plate.



**Mounting The Remote Controller**

For exposed type

**Preparation:** Make 2 holes for screws using a driver.



## 8 TEST RUN

- Before test run, make sure below items have been checked:
  - Pipework are properly done.
  - Electric cable connecting work are properly done.
  - Tank Unit is filled up with water and trapped air is released.
  - Please turn on the power supply after filling the tank until full.
- Switch ON the power supply of the Tank Unit. Set the Tank Unit RCCB /ELCB to "ON" condition. Then, please refer to the Operation Instruction for operation of Remote Controller ①.
- For normal operation, Water Pressure Gauge ⑭ reading should be in between 0.05 MPa and 0.3 MPa. If necessary, adjust the Water Pump ② SPEED accordingly to obtain normal water pressure operating range. If adjust Water Pump ② SPEED cannot solve the problem, contact your local authorized dealer.
- After test run, please clean the Magnetic Water Filter Set ⑥. Reinstall it after finish cleaning.

### CHECK WATER FLOW OF WATER CIRCUIT

Confirm the maximum water flow during main pump operation not less than 15 l/min.

\*Water flow can be check through service setup (Pump Max Speed) [Heating operation at low water temperature with lower water flow may trigger "H75" during defrost process.]

### RESET OVERLOAD PROTECTOR ⑨

Overload Protector ⑨ serves the safety purpose to prevent the water over heating. When the Overload Protector ⑨ a trip at high water temperature, take below steps to reset it.

- Take out the cover.
- Use a test pen to push the centre button gently in order to reset the Overload Protector ⑨.
- Fix the cover to the original fitting condition.



## 9 MAINTENANCE

- In order to ensure safety and optimal performance of the Tank Unit, seasonal inspections on the Tank Unit, functional check of RCCB/ELCB, field wiring and piping have to be carried out at regular intervals. This maintenance should be carried out by authorized dealer. Contact dealer for scheduled inspection.

### Maintenance for Magnetic Water Filter Set ⑥

- Turn OFF power supply.
- Set the two valves for the Magnetic Water Filter Set ⑥ to "CLOSE".
- Drain the Space Heating / Cooling circuit water with set the Pressure Relief Valve ⑫ lever UP, so that water pressure drop below 0.5 bar.
- Take off the clip, then gently pull out the mesh. Beware of small amount water drain out from it.
- Clean the mesh with warm water to remove all the stain. Use soft brush if necessary.
- Remove the bolt with magnet on brass cap with screwdriver to remove all iron powder.
- Reinstall the magnet and mesh to the Magnetic Water Filter Set ⑥ and set back the clip on it.
- Set the two valves for the Magnetic Water Filter Set ⑥ to "OPEN".
- Re-charging the water to Space Heating / Cooling circuit (refer Section 5 for details.)
- Turn ON power supply.

### Maintenance for Temperature and Pressure Relief Valve ⑳

- Manually operate the Temperature and Pressure Relief Valve ⑳ by turn the knob counter clockwise to ensure free water flow through discharge pipe at regular intervals to ensure it is not blocked and to remove lime deposit.

### PROPER PUMP DOWN PROCEDURE

#### ⚠ WARNING

Strictly follow the steps below for proper pump down procedure. Explosion may occur if the steps are not followed as per sequence.

- When the Tank Unit is not in operation (standby), enter the Service setup menu in the Remote Controller and select Pump down operation to turn it ON. (See APPENDIX for detail)
- After 10-15 minutes, (after 1 or 2 minutes in case very low ambient temperatures (< 10°C)), fully close 2 way valve on Outdoor Unit.
- After 3 minutes, fully close 3 way valve on Outdoor Unit.
- Press the "OFF/ON" switch on the Remote Controller ① to stop pump down operation.
- Remove the refrigerant piping.

### TECHNICAL DATA

● Model	WH-ADC0309J3E5UK
● Tank Capacity	200 L
- Nominal	185 L
- Actual	
● Weight	122 kg
- Empty	307 kg
- Full	
● Maximum Operating Pressure	3.0 bar
- Primary	3.5 bar
- Secondary	
● Maximum Operating Temperature	65°C
● Operating Pressure	3.5 bar
- Tank Unit	8.0 bar
- Expansion Relief Valve	
● Maximum Working / Design Pressure	3.0 bar
- Space Heating / Cooling	10.0 bar
- Tank Circuit	
● Standing Heat Loss	1.35 kWh/24h
● Reheat Time	87m 54s
● Temperature and Pressure Relief Valve	1/2" x 15mm
- Size	10 bar
- Pressure Relief	90°C - 95°C
- Temperature Relief	
● Primary Heater Pressure Drop	0.2 bar
● Primary Flow Rate (Nominal)	9.2 - 25.8 L/min
● Primary Heating Power Input / Flow Rate	32.2 kW / 15 L/min
● Hot Water Capacity as per EN 12897	177 L

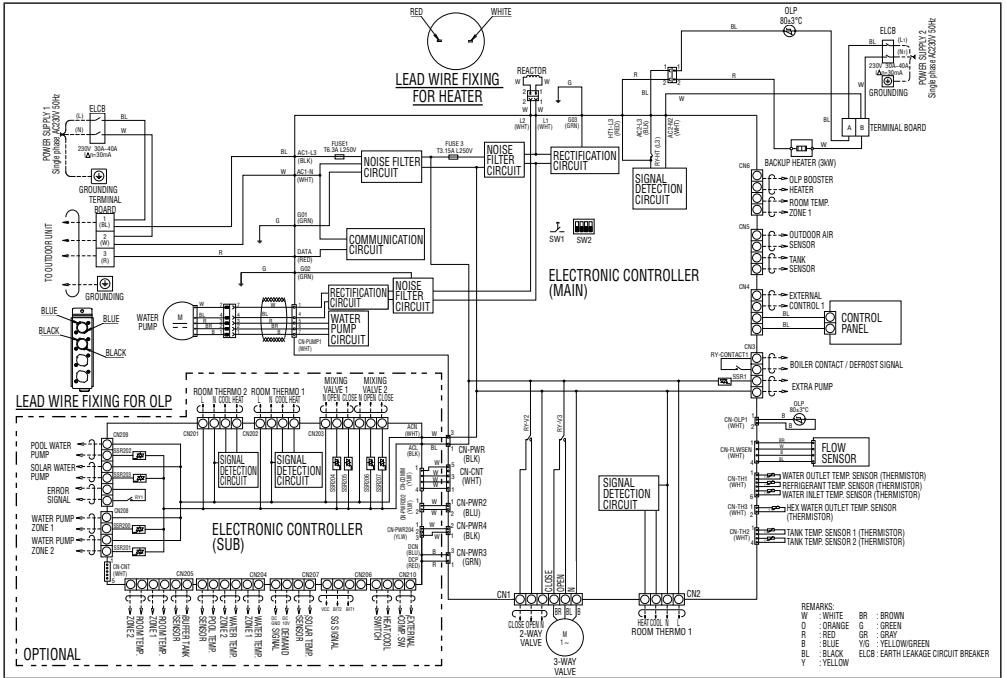
This Tank Unit comply with EN 12897.

### COLK100080 - Panasonic G3 Unvented Control Kit

Part Code	Description	WRAS Approval Number
CWIC355045	COMPACT INLET CONTROL 2.1/8.0 BAR	1702335
TUND219005	15*22MM TUNDISH SLIMLINE STRAIGHT BLACK	1805353
XVES050052	18L VERT POT VESSEL WHITE 2.2B	1102334
ZKIT510506	OSO HOTWATER ACCESSORY PACK	912308
HOSE202106A	3/4" BSP HOSE C/W SEALING WASHER-1000mm	1012358

Control of Water Temperature : PCB, Limit Thermostat

WIRING DIAGRAM



CHECK ITEMS

- Is the Tank Unit properly installed on the concrete floor?
- Is there any gas leakage at flare nut connections?
- Has the heat insulation been carried out at flare nut connection?
- Is the Pressure Relief Valve ⑫ operation normal?
- Is water pressure higher than 0.05 MPa?
- Is the water drainage work properly done?
- Is the power supply voltage within the rated voltage range?
- Is the cables being fixed to RCCB/ELCB and terminal board firmly?
- Is the cables being clamped firmly by holder (clammer)?
- Is the earth wire connection properly done?
- Is the RCCB/ELCB operation normal?
- Is the Remote Controller ① LCD operation normal?
- Is there any abnormal sound?
- Is the heating operation normal?
- Is the Tank unit water leak free on test run?

## APPENDIX

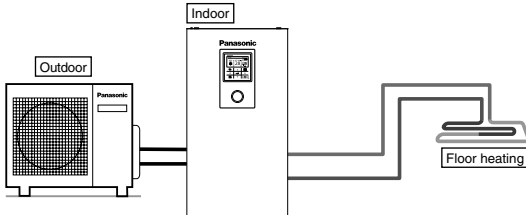
# 1 Variation of system

This section introduces variation of various systems using Air-To-Water Heatpump and actual setting method.

## 1-1 Introduce application related to temperature setting.

### Temperature setting variation for heating

#### 1. Remote Controller

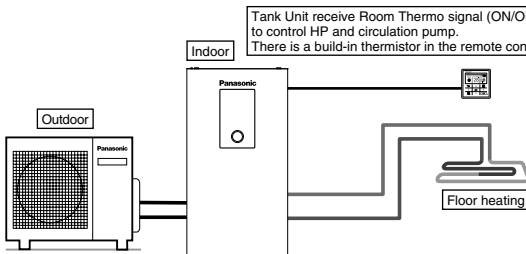


#### Setting of remote controller

Installer setting  
System setup  
Optional PCB connectivity - No  
  
Zone & Sensor:  
Water temperature

Connect floor heating or radiator directly to the Tank Unit.  
Remote controller is installed on Tank Unit.  
This is the basic form of the most simple system.

#### 2. Room Thermostat

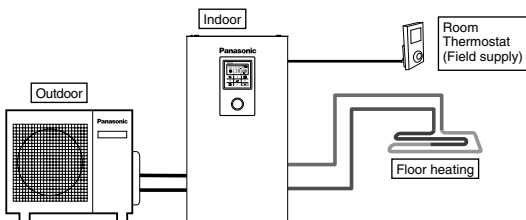


#### Setting of remote controller

Installer setting  
System setup  
Optional PCB connectivity - No  
  
Zone & Sensor:  
Room thermostat  
Internal

Connect floor heating or radiator directly to the Tank Unit.  
Remove remote controller from Tank Unit and install it in the room where floor heating is installed.  
This is an application that uses remote controller as Room Thermostat.

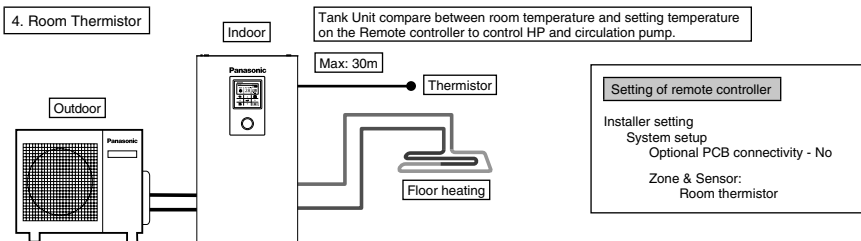
#### 3. External Room Thermostat



#### Setting of remote controller

Installer setting  
System setup  
Optional PCB connectivity - No  
  
Zone & Sensor:  
Room thermostat  
(External)

Connect floor heating or radiator directly to Tank Unit.  
Remote controller is installed on Tank Unit.  
Install separate external Room Thermostat (field supply) in the room where floor heating is installed.  
This is an application that uses external Room Thermostat.



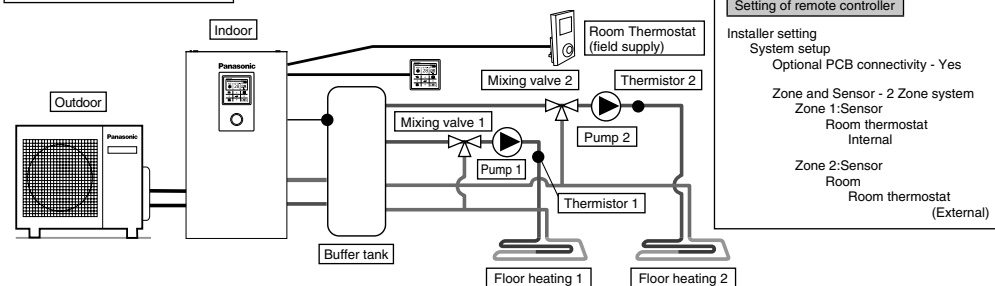
Connect floor heating or radiator directly to Tank Unit.  
Remote controller is installed on Tank Unit.  
Install separate external room thermistor (specified by Panasonic) in the room where floor heating is installed.  
This is an application that uses external room thermistor.

There are 2 kinds of circulation water temperature setting method.  
Direct: set direct circulation water temperature (fixed value)  
Compensation curve: set circulation water temperature depends on outdoor ambient temperature  
In case of Room thermo or Room thermistor, compensation curve can be set.  
In this case, compensation curve is shifted according to the thermo ON/OFF situation.

- (Example) If room temperature increasing speed is;  
very slow → shift up the compensation curve  
very fast → shift down the compensation curve

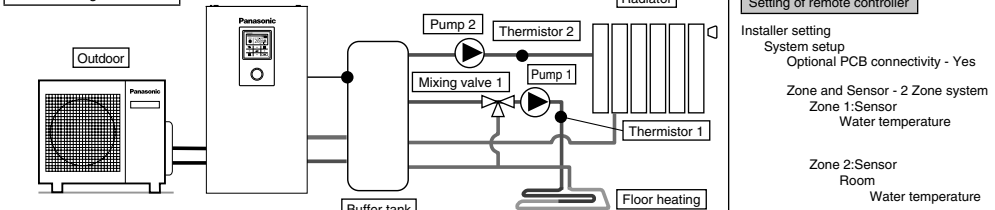
Examples of installations

Floor heating 1 + Floor heating 2

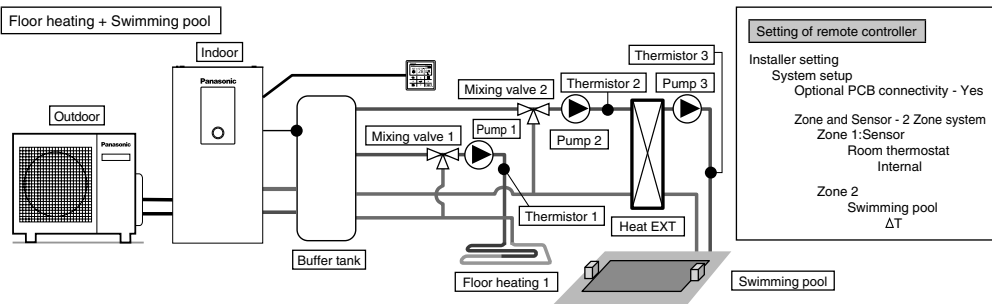


Connect floor heating to 2 circuits through buffer tank as shown in the figure.  
Install mixing valves, pumps and thermistors (specified by Panasonic) on both circuits.  
Remove remote controller from Tank Unit, install it in one of the circuit and use it as Room Thermostat.  
Install external Room Thermostat (field supply) in another circuit.  
Both circuits can set circulation water temperature independently.  
Install buffer tank thermistor on buffer tank.  
It requires connection setting of buffer tank and  $\Delta T$  temperature setting at heating operation separately.  
This system requires Optional PCB (CZ-NS4P).

Floor heating + Radiator



Connect floor heating or radiator to 2 circuits through buffer tank as shown in figure.  
Install pumps and thermistors (specified by Panasonic) on both circuits.  
Install mixing valve in the circuit with lower temperature among the 2 circuits.  
(Generally, if install floor heating and radiator circuit at 2 zones, install mixing valve in floor heating circuit.)  
Remote controller is installed on Tank Unit.  
For temperature setting, select circulation water temperature for both circuits.  
Both circuits can set circulation water temperature independently.  
Install buffer tank thermistor on buffer tank.  
It requires connection setting of buffer tank and  $\Delta T$  temperature setting at heating operation separately.  
This system requires the Optional PCB (CZ-NS4P).  
Mind that if there is no mixing valve at the secondary side, the circulation water temperature may get higher than setting temperature.



**Setting of remote controller**

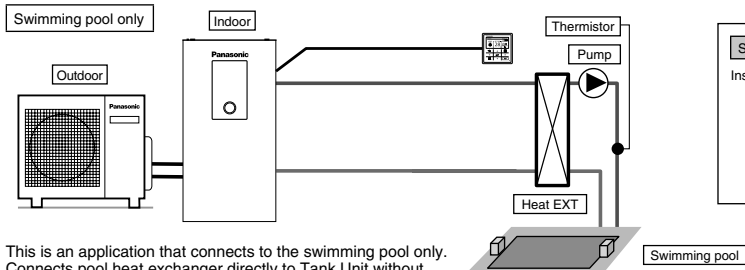
Installer setting  
 System setup  
 Optional PCB connectivity - Yes

Zone and Sensor - 2 Zone system  
 Zone 1:Sensor  
 Room thermostat  
 Internal

Zone 2  
 Swimming pool  
 ΔT

Connect floor heating and swimming pool to 2 circuits through buffer tank as shown in figure.  
 Install mixing valves, pumps and thermistors (specified by Panasonic) on both circuits.  
 Then, install additional pool heat exchanger, pool pump and pool sensor on pool circuit.  
 Remove remote controller from Tank Unit and install in room where floor heating is installed. Circulation water temperature of floor heating and swimming pool can be set independently.  
 Install buffer tank sensor on buffer tank.  
 It requires connection setting of buffer tank and ΔT temperature setting at heating operation separately. This system requires the Optional PCB (CZ-NS4P).

‡ Must connect swimming pool to "Zone 2".  
 If it is connected to swimming pool, operation of pool will stop when "Cooling" is operated.



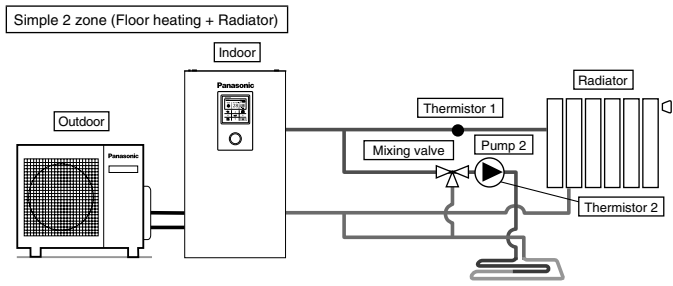
**Setting of remote controller**

Installer setting  
 System setup  
 Optional PCB connectivity - Yes

Zone and Sensor - 1 Zone system  
 Zone :Swimming pool  
 ΔT

This is an application that connects to the swimming pool only.  
 Connects pool heat exchanger directly to Tank Unit without using buffer tank.  
 Install pool pump and pool sensor (specified by Panasonic) at secondary side of the pool heat exchanger.  
 Remove remote controller from Tank Unit and install in room where floor heating is installed.  
 Temperature of swimming pool can be set independently.  
 This system requires the Optional PCB (CZ-NS4P).

In this application, cooling mode cannot be selected. (not display on remote controller)



**Setting of remote controller**

Installer setting  
 System setup  
 Optional PCB connectivity - Yes

Zone and Sensor - 2 Zone system  
 Zone 1:Sensor  
 Water temperature

Zone 2:Sensor  
 Room  
 Water temperature

Operation setup  
 Heat  
 ΔT for heating ON - 1°C

Cool  
 ΔT for cooling ON - 1°C

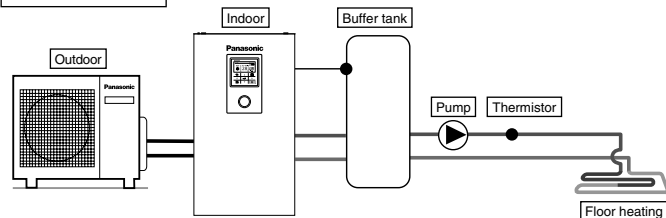
This is an example of simple 2 zone control without using buffer tank.  
 Built-in pump from Tank Unit served as a pump in zone 1.  
 Install mixing valve, pump and thermistor (specified by Panasonic) on zone 2 circuit.  
 Please be sure to assign high temperature side to zone 1 as temperature of zone 1 cannot be adjusted.  
 Zone 1 thermistor is required to display temperature of zone 1 on remote controller.  
 Circulation water temperature of both circuits can be set independently.  
 (However, temperature of high temperature side and low temperature side cannot be reversed)  
 This system requires the Optional PCB (CZ-NS4P).

(NOTE)

- Thermistor 1 does not affect operation directly. But error happens if it is not installed.
- Please adjust flow rate of zone 1 and zone 2 to be in balance. If it is not adjusted correctly, it may affects the performance. (If zone 2 pump flow rate is too high, there is possibility that no hot water flowing to zone 1.)  
 Flow rate can be confirmed by "Actuator Check" from maintenance menu.



## Buffer tank connection

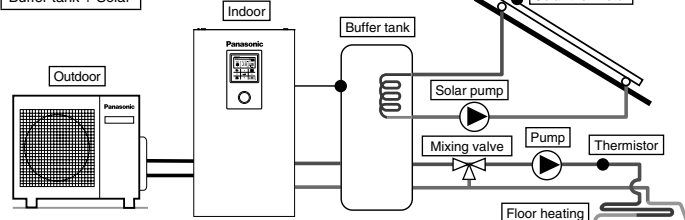


This is an application that connects the buffer tank to the Tank Unit.  
Buffer tank's temperature is detected by buffer tank thermistor (specified by Panasonic).  
This system requires Optional PCB (CZ-NS4P).

## Setting of remote controller

Installer setting  
System setup  
Optional PCB connectivity - Yes  
Buffer Tank connection - Yes  
 $\Delta T$  for buffer tank

## Buffer tank + Solar

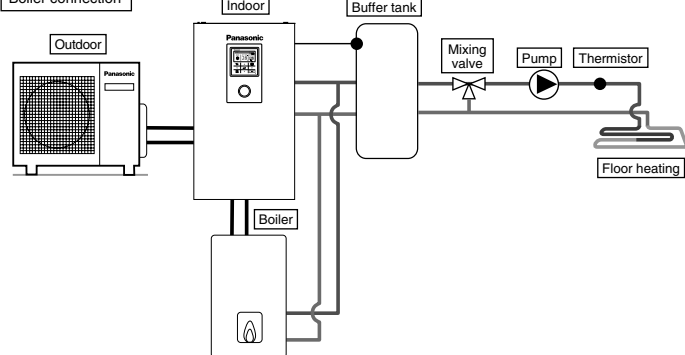


This is an application that connects the buffer tank to the Tank Unit before connecting to the solar water heater to heat up the tank.  
Buffer tank's temperature is detected by buffer tank thermistor (specified by Panasonic).  
Solar panel's temperature is detected by solar thermistor (specified by Panasonic).  
Buffer tank shall use tank with built-in solar heat exchange coil independently.  
During winter season, solar pump for circuit protection will be activated continuously. If does not want to activate the solar pump operation, please use glycol and set the anti-freezing operation start temperature to  $-20^{\circ}\text{C}$ .  
Heat accumulation operates automatically by comparing the temperature of tank thermistor and solar thermistor.  
This system requires Optional PCB (CZ-NS4P).

## Setting of remote controller

Installer setting  
System setup  
Optional PCB connectivity - Yes  
Buffer Tank connection - Yes  
 $\Delta T$  for buffer tank  
Solar connection - Yes  
Buffer tank  
 $\Delta T$  turn ON  
 $\Delta T$  turn OFF  
Antifreeze  
Hi limit

## Boiler connection



## Setting of remote controller

Installer setting  
System setup  
Optional PCB connectivity - Yes  
Bivalent - Yes  
Turn ON: outdoor temp  
Control pattern

This is an application that connects the boiler to the Tank Unit, to compensate for insufficient capacity by operate boiler when outdoor temperature drops & heat pump capacity is insufficient.  
Boiler is connected parallel with heat pump against heating circuit.  
Besides that, an application that connects to the DHW tank's circuit to heat up tank's hot water is also possible.  
Boiler output can be control by either SG ready input from optional PCB or Auto control by 3 modes selection pattern.  
(Operation setting of boiler shall be responsible by installer.)  
This system requires Optional PCB (CZ-NS4P) for SG ready input control or buffer tank temperature control.

Depending on the settings of the boiler, it is recommended to install buffer tank as temperature of circulating water may get higher. ( It must connect to buffer tank especially when select Advanced Parallel setting.)

**WARNING**

Panasonic is NOT responsible for incorrect or unsafe situation of the boiler system.

**CAUTION**

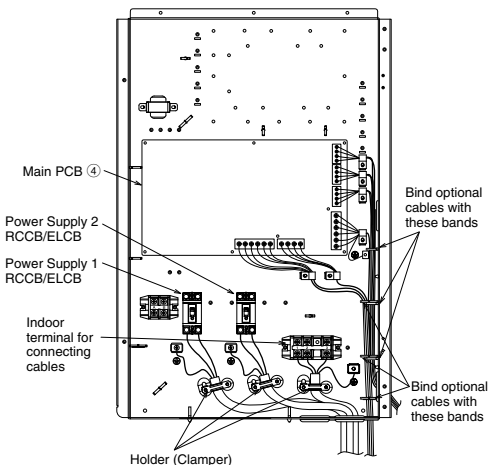
Make sure the boiler and its integration in the system complies with applicable legislation.  
Make sure the return water temperature from the heating circuit to the Tank Unit does NOT exceed  $55^{\circ}\text{C}$ .  
Boiler is turned off by safety control when the water temperature of the heating circuit exceed  $85^{\circ}\text{C}$ .

## 2 How to fix cable

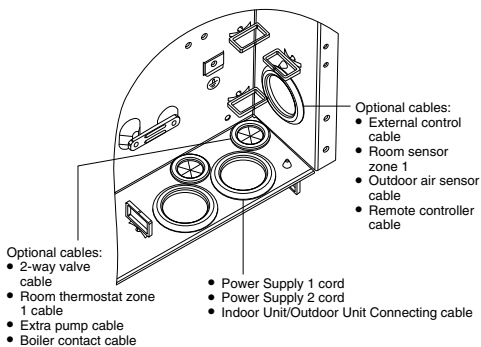
### Connecting with external device (optional)

- All connections shall follow to the local national wiring standard.
- It is strongly recommended to use manufacturer-recommended parts and accessories for installation.

- For connection to main PCB ④
1. Two-way valve shall be spring and electronic type, refer to "Field Supply Accessories" table for details. Valve cable shall be (3 x min 1.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier, or similarly double insulation sheathed cable.  
\*note: - Two-way Valve shall be CE marking compliance component.  
- Maximum load for the valve is 9.8VA.
  2. Room thermostat cable must be (4 or 3 x min 0.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier cord, or similarly double insulation sheathed cable.
  3. Extra pump cable shall be (2 x min 1.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier.
  4. Boiler contact cable shall be (2 x min 0.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier.
  5. External control shall be connected to 1-pole switch with min 3.0 mm contact gap. Its cable must be (2 x min 0.5 mm<sup>2</sup>), double insulation layer of PVC-sheathed or rubber-sheathed cable.  
\*note: - Switch used shall be CE compliance component.  
- Maximum operating current shall be less than 3A<sub>rms</sub>.
  6. Room sensor zone 1 cable shall be (2 x min 0.3 mm<sup>2</sup>) double insulation layer of PVC-sheathed or rubber-sheathed.
  7. Outdoor air sensor cable shall be (2 x min 0.3 mm<sup>2</sup>) double insulation layer of PVC-sheathed or rubber-sheathed.

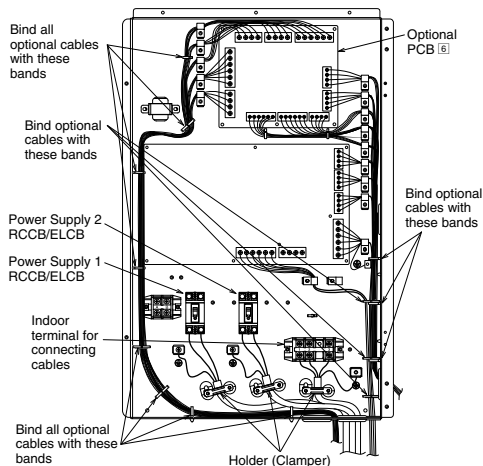


How to guide the optional cables and power supply cord  
(view without internal wiring)



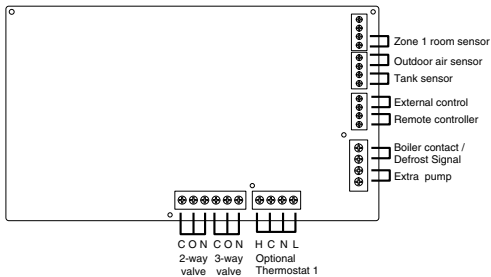
- For connection to Optional PCB ⑤

1. By connecting Optional PCB, 2 Zone temperature control can be achieved. Please connect mixing valves, water pumps and thermostats in zone 1 and zone 2 to each terminals in Optional PCB.  
Temperature of each zone can be controlled independently by remote controller.
2. Pump zone 1 and zone 2 cable shall be (2 x min 1.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier.
3. Solar pump cable shall be (2 x min 1.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier.
4. Pool pump cable shall be (2 x min 1.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier.
5. Room thermostat zone 1 and zone 2 cable shall be (4 x min 0.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier.
6. Mixing valve zone 1 and zone 2 cable shall be (3 x min 1.5 mm<sup>2</sup>), of type designation 60245 IEC 57 or heavier.
7. Room sensor zone 1 and zone 2 cable shall be (2 x min 0.3 mm<sup>2</sup>), double insulation layer (with insulation strength of minimum 30V) of PVC-sheathed or rubber-sheathed cable.
8. Buffer tank sensor, pool water sensor and solar sensor cable shall be (2 x min 0.3 mm<sup>2</sup>), double insulation layer (with insulation strength of minimum 30V) of PVC-sheathed or rubber-sheathed cable.
9. Water sensor zone 1 and zone 2 cable shall be (2 x min 0.3 mm<sup>2</sup>), double insulation layer of PVC-sheathed or rubber-sheathed cable.
10. Demand signal cable shall be (2 x min 0.3 mm<sup>2</sup>), double insulation layer of PVC-sheathed or rubber-sheathed cable.
11. SG signal cable shall be (3 x min 0.3 mm<sup>2</sup>), double insulation layer of PVC-sheathed or rubber-sheathed cable.
12. Heat/Cool switch cable shall be (2 x min 0.3 mm<sup>2</sup>), double insulation layer of PVC-sheathed or rubber-sheathed cable.
13. External compressor switch cable shall be (2 x min 0.3 mm<sup>2</sup>), double insulation layer of PVC-sheathed or rubber-sheathed cable.



How to guide the optional cables and power supply cord  
(view without internal wiring)

Connection of the main PCB



■ Signal inputs

Optional Thermostat	L N =AC230V, Heat, Cool=Thermostat heat, Cool terminal #It does not function when using the Optional PCB
External control	Dry contact Open=not operate, Short=operate (System setup necessary) Able to turn ON/OFF the operation by external switch
Remote controller	Connected (Please use 2 cores wire for relocation and extension. Total cable length shall be 50m or less.)

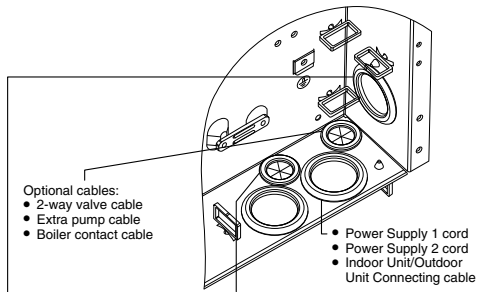
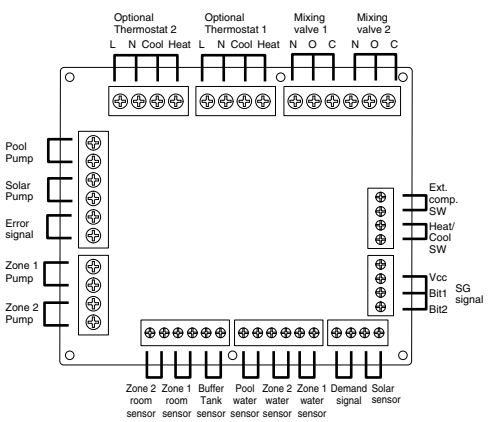
■ Outputs

3-way valve	AC230V N=Neutral Open, Close=direction (For circuit switching when connected to DHW tank)
2-way valve	AC230V N=Neutral Open, Close (Prevent water circuit pass through during cooling mode)
Extra pump	AC230V (Used when Tank Unit pump capacity is insufficient)
Boiler contact	Dry contact (System setup necessary)

■ Thermistor inputs

Zone 1 room sensor	PAW-A2W-TSRT #It does not work when using the Optional PCB
Outdoor air sensor	AW-A2W-TSOD (Total cable length shall be 30m or less)

Connection of Optional PCB (CZ-NS4P)



- Optional cables:
- 2-way valve cable
  - Extra pump cable
  - Boiler contact cable

- Optional cables:
- Pump zone 1 cable
  - Pump zone 2 cable
  - Solar pump cable
  - Pool pump cable
  - Room thermostat zone 1 cable
  - Room thermostat zone 2 cable
  - Mixing valve zone 1 cable
  - Mixing valve zone 2 cable
- from Optional PCB

- Optional cables:
- External control cable
  - Outdoor air sensor cable
  - Remote controller cable
  - Room sensor zone 1 cable
  - Room sensor zone 2 cable
  - Buffer tank sensor cable
  - Pool sensor cable
  - Water sensor zone 1 cable
  - Water sensor zone 2 cable
  - Demand signal cable
  - Solar sensor cable
  - SG signal cable
  - Heat/Cool switch cable
  - External Compressor switch cable
- from Optional PCB

Terminal screw on PCB	Maximum tightening torque cN•m (kgf•cm)
M3	50 {5.1}
M4	120 {12.24}

Connecting Cables Length

When connecting cables between Tank Unit and external devices, the length of the said cables must not exceed the maximum length as shown in the table.

External device	Maximum cables length (m)
Two-way valve	50
Mixing valve	50
Room thermostat	50
Extra pump	50
Solar pump	50
Pool pump	50
Pump	50
Boiler contact	50
External control	50
Room sensor	30
Outdoor air sensor	30
Buffer tank sensor	30
Pool water sensor	30
Solar sensor	30
Water sensor	30
Demand signal	50
SG signal	50
Heat/Cool switch	50
External compressor switch	50

■ Signal inputs

Optional Thermostat	L N =AC230V, Heat, Cool=Thermostat heat, Cool terminal
SG signal	Dry contact Vcc-Bit1, Vcc-Bit2 open/short (System setup necessary) Switching SW (Please connect to the 2 contacts controller)
Heat/Cool SW	Dry contact Open=Heat, Short=Cool (System setup necessary)
External comp.SW	Dry contact Open=Comp.ON, Short=Comp.OFF (System setup necessary)
Demand signal	DC 0~10V (System setup necessary) Please connect to the DC 0~10V controller.

■ Outputs

Mixing valve	AC230V N=Neutral Open, Close=mixture direction Operating time: 30s~120s
Pool pump	AC230V
Solar pump	AC230V
Zone pump	AC230V

■ Thermistor inputs

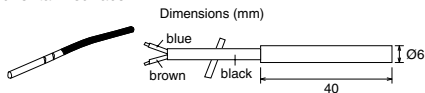
Zone room sensor	PAW-A2W-TSRT
Buffer tank sensor	PAW-A2W-TSBU
Pool water sensor	PAW-A2W-TSHC
Zone water sensor	PAW-A2W-TSHC
Solar sensor	PAW-A2W-TSSO

Recommended External Device Specification

- This section explains about the external devices (optional) recommended by Panasonic. Please always ensure to use the correct external device during system installation.
- For optional sensor.

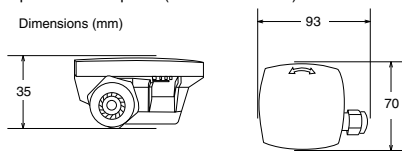
1. Buffer tank sensor: PAW-A2W-TSBU

Use for measurement of the buffer tank temperature. Insert the sensor into the sensor pocket and paste it on the buffer tank surface.



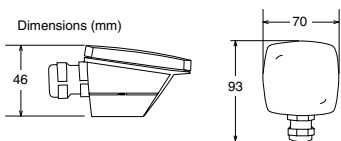
2. Zone water sensor: PAW-A2W-TSHC

Use to detect the water temperature of the control zone. Mount it on the water piping by using the stainless steel metal strap and contact paste (both are included).



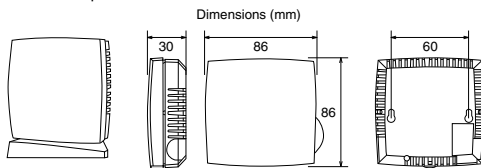
3. Outdoor sensor: PAW-A2W-TSOD

If the installation location of the outdoor unit is exposed to direct sunlight, the outdoor air temperature sensor will be unable to measure the actual outdoor ambient temperature correctly. In this case, optional outdoor temperature sensor can be fixed at a suitable location to more accurately measure ambient temperature.



4. Room sensor: PAW-A2W-TSRT

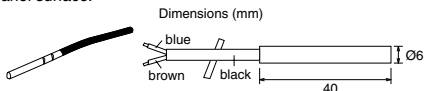
Install the room temperature sensor to the room which requires room temperature control.



5. Solar sensor: PAW-A2W-TSSO

Use for measurement of the solar panel temperature.

Insert the sensor into the sensor pocket and paste it on the solar panel surface.



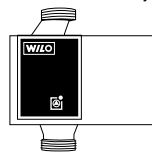
6. Please refer to the table below for sensor characteristic of the sensors mentioned above.

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
30	5.326	150	0.147
25	6.523	140	0.186
20	8.044	130	0.236
15	9.980	120	0.302
10	12.443	110	0.390
5	15.604	100	0.511
0	19.70	90	0.686
-5	25.05	80	0.932
-10	32.10	70	1.279
-15	41.45	65	1.504
-20	53.92	60	1.777
-25	70.53	55	2.106
-30	93.05	50	2.508
-35	124.24	45	3.003
-40	167.82	40	3.615
		35	4.375

- For optional pump.

Power supply: AC230V/50Hz, <500W

Recommended part: Yonos 25/6: made by Wilo

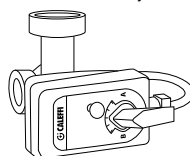


- For optional mixing valve.

Power supply: AC230V/50Hz (input open/output close)

Operating time: 30s~120s

Recommended part: 167032: made by Caleffi



## ⚠ WARNING

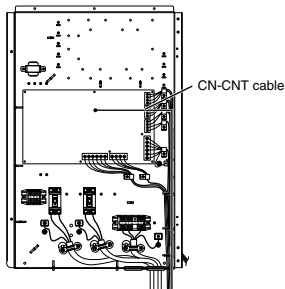
This section is for authorized and licensed electrician/water system installer only. Work behind the front plate secured by screws must only be carried out under supervision of qualified contractor, installation engineer or service person.

### Network Adaptor [7] Installation (Optional)

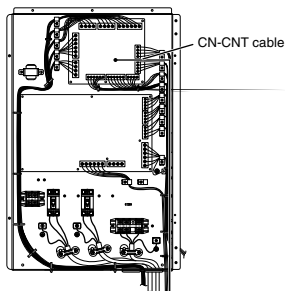
1. Remove the Control Board Cover (3), then connect the cable included with this adaptor to the CN-CNT connector on the printed circuit board.

- Pull the cable out of the Tank Unit so that there is no pinching.
- If an Optional PCB has been installed in the Tank Unit, connect to the CN-CNT connector of the Optional PCB.

Connection examples:

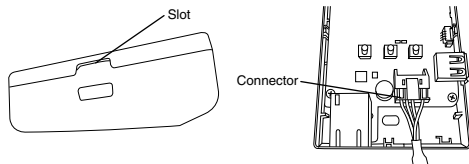


Without Optional PCB

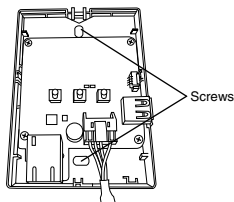


With Optional PCB

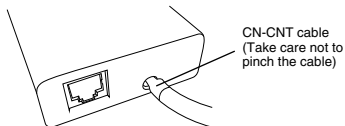
2. Insert a flat head screwdriver into the slot on the top of the adaptor and remove the cover. Connect the other end of the CN-CNT cable connector to the connector inside the adaptor.



3. On the wall near the Tank Unit, attach the adaptor by screwing screws through the holes in the back cover.

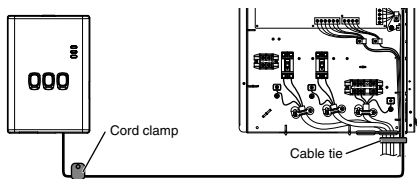


4. Pull the CN-CNT cable through the hole in the bottom of the adaptor and re-attach the front cover to the back cover.



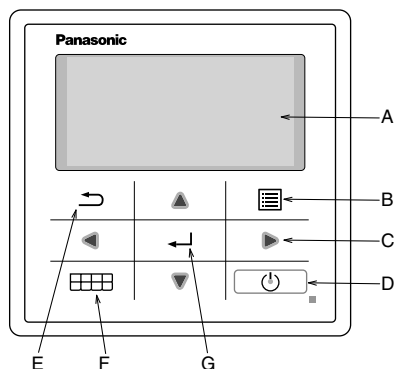
5. Use the included cord clamp to fix the CN-CNT cable to the wall.

Pull the cable around as shown in the diagram so that external forces cannot act on the connector in the adaptor. Furthermore, on the Tank Unit end, use the included cable tie to fix the cables together.

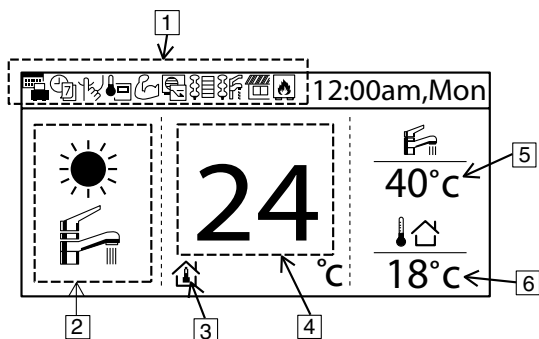


### 3 System installation

#### 3-1. Remote Controller Outline

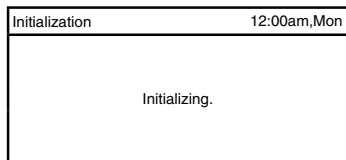


Name	Function
A: Main screen	Display information
B: Menu	Open/Close main menu
C: Triangle (Move)	Select or change item
D: Operate	Start/Stop operation
E: Back	Back to previous item
F: Quick Menu	Open/Close Quick menu
G: OK	Confirm

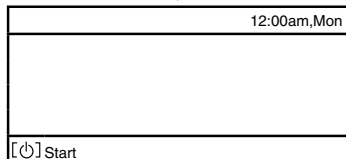


Name	Function
1: Function icon	Display set function/status
	Holiday mode
	Weekly timer
	Quiet mode
	Remote controller room thermostat
	Powerful mode
	Demand control
	Room heater
	Tank heater
	Solar
	Boiler
2: Mode	Display set mode/current status of mode
	Heating
	Auto
	Heat pump operating
	Cooling
	Hot water supply
	Auto heating
	Auto cooling
3: Temp setting	Set room temp
	Compensation curve
	Set direct water temp
	Set pool temp
4: Display Heat temp	Display current heating temperature (it is set temperature when enclosed by line)
5: Display tank temp	Display current tank temperature (it is set temperature when enclosed by line)
6: Outdoor temp	Display outdoor temp

### First time of power ON (Start of installation)



When power is ON, firstly initialization screen appears (10 sec)



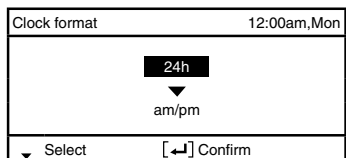
When initialization screen ends, it turns to normal screen.



When any button is pressed, language setting screen appears.  
(NOTE) If initial setting is not performed, it does not go into menu.



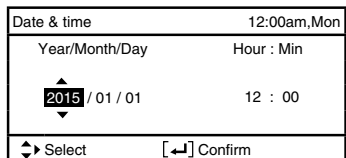
Set language & confirm



When language is set, setting screen of time display appears (24h/am/pm)



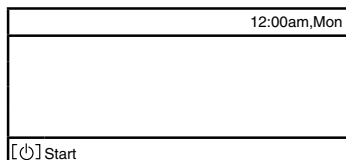
Set time display & confirm



YY/MM/DD/Time setup screen appears



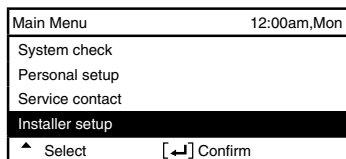
Set YY/MM/DD/Time & confirm



Back to initial screen

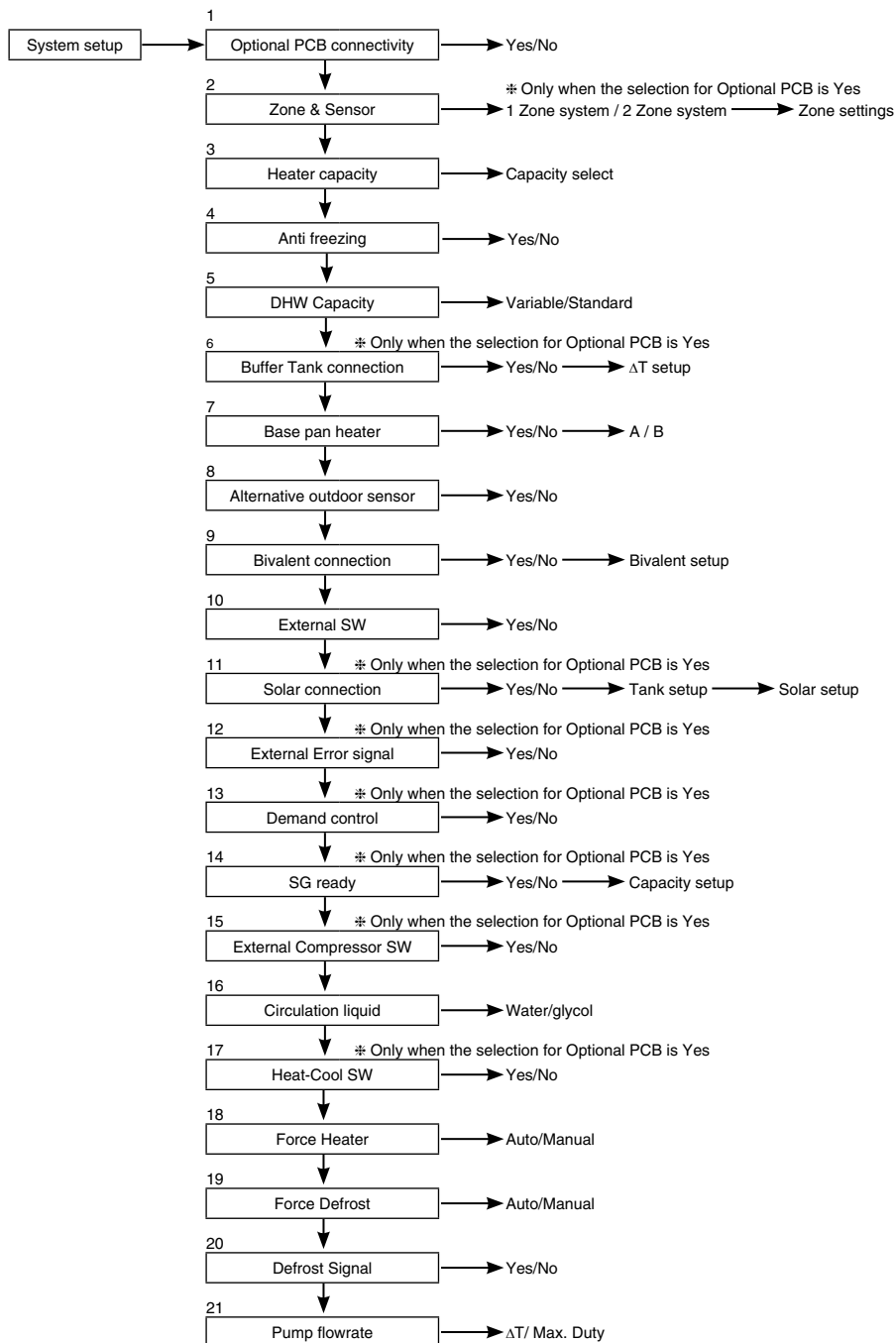


Press menu, select Installer setup

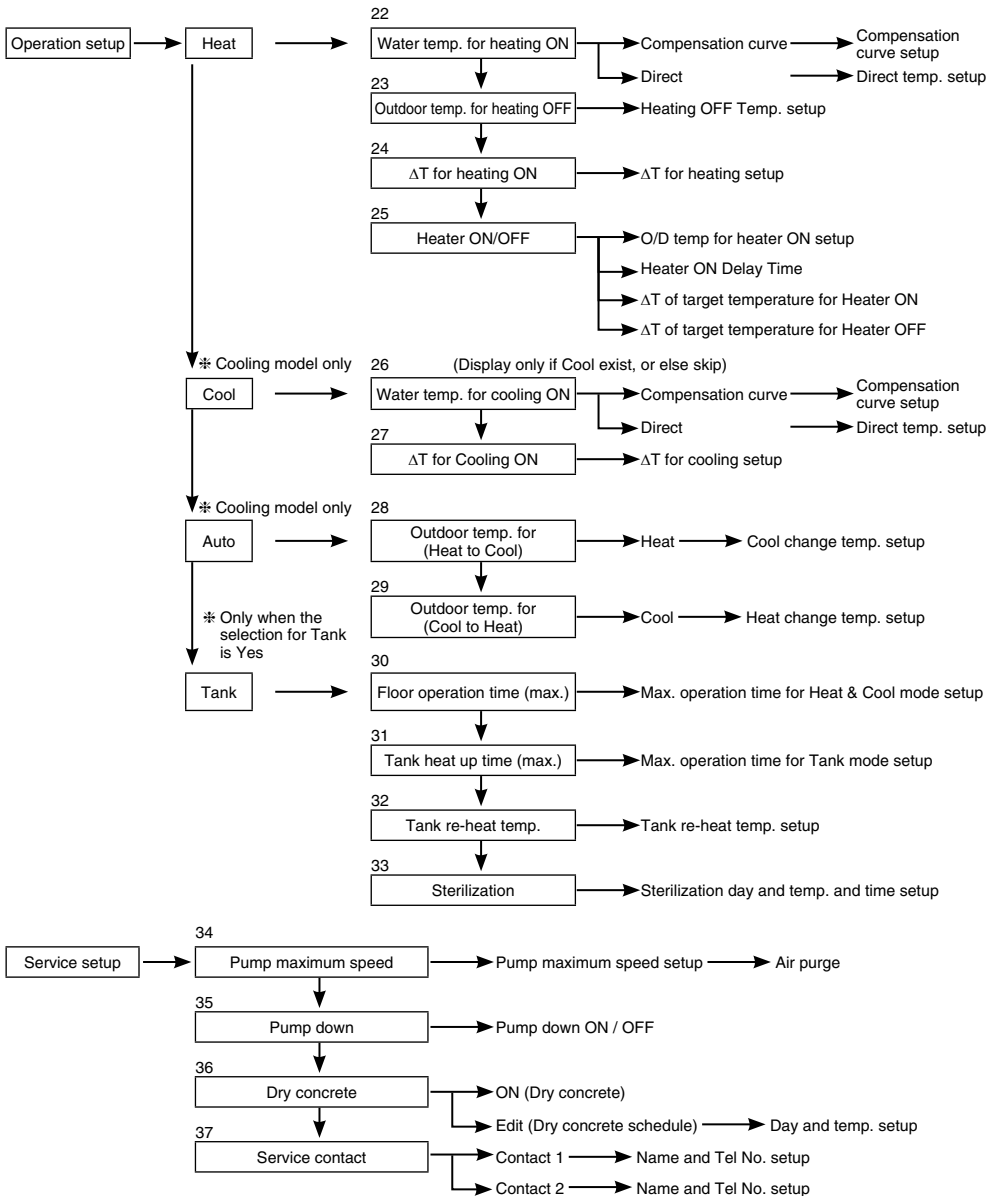


Confirm to go into Installer setup

## 3-2. Installer Setup







## 3-3. System Setup

<b>1. Optional PCB connectivity</b>	Initial setting: No	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: left;">System setup</td> <td style="text-align: right;">12:00am, Mon</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;"><b>Optional PCB connectivity</b></td> </tr> <tr> <td colspan="2">Zone &amp; Sensor</td> </tr> <tr> <td colspan="2">Heater capacity</td> </tr> <tr> <td colspan="2">Anti freezing</td> </tr> <tr> <td style="text-align: left;">▼ Select</td> <td style="text-align: right;">[↔] Confirm</td> </tr> </table>	System setup	12:00am, Mon	<b>Optional PCB connectivity</b>		Zone & Sensor		Heater capacity		Anti freezing		▼ Select	[↔] Confirm
System setup	12:00am, Mon													
<b>Optional PCB connectivity</b>														
Zone & Sensor														
Heater capacity														
Anti freezing														
▼ Select	[↔] Confirm													

If function below is necessary, please purchase and install Optional PCB.  
Please select Yes after installing Optional PCB.

- 2-zone control
- Pool
- Buffer tank
- Solar
- External error signal output
- Demand control
- SG ready
- Stop heat source unit by external SW

<b>2. Zone &amp; Sensor</b>	Initial setting: Room and Water temp.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: left;">System setup</td> <td style="text-align: right;">12:00am, Mon</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Optional PCB connectivity</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;"><b>Zone &amp; Sensor</b></td> </tr> <tr> <td colspan="2">Heater capacity</td> </tr> <tr> <td colspan="2">Anti freezing</td> </tr> <tr> <td style="text-align: left;">▲ Select</td> <td style="text-align: right;">[↔] Confirm</td> </tr> </table>	System setup	12:00am, Mon	Optional PCB connectivity		<b>Zone &amp; Sensor</b>		Heater capacity		Anti freezing		▲ Select	[↔] Confirm
System setup	12:00am, Mon													
Optional PCB connectivity														
<b>Zone &amp; Sensor</b>														
Heater capacity														
Anti freezing														
▲ Select	[↔] Confirm													

If no Optional PCB connectivity  
Select sensor of room temperature control from the following 3 items

- ① Water temperature (circulation water temperature)
- ② Room thermostat (Internal or External)
- ③ Room thermistor

When there is Optional PCB connectivity

- ① Select either 1 zone control or 2 zone control.  
If it is 1 zone, select either room or pool, select sensor  
If it is 2 zone, after select sensor of zone 1, select either room or pool for zone 2, select sensor

(NOTE) In 2 zone system, pool function can be set at zone 2 only.

<b>3. Heater capacity</b>	Initial setting: Depend on model	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: left;">System setup</td> <td style="text-align: right;">12:00am, Mon</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Optional PCB connectivity</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Zone &amp; Sensor</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;"><b>Heater capacity</b></td> </tr> <tr> <td colspan="2">Anti freezing</td> </tr> <tr> <td style="text-align: left;">▲ Select</td> <td style="text-align: right;">[↔] Confirm</td> </tr> </table>	System setup	12:00am, Mon	Optional PCB connectivity		Zone & Sensor		<b>Heater capacity</b>		Anti freezing		▲ Select	[↔] Confirm
System setup	12:00am, Mon													
Optional PCB connectivity														
Zone & Sensor														
<b>Heater capacity</b>														
Anti freezing														
▲ Select	[↔] Confirm													

If there is built-in Heater, set the selectable heater capacity.

(NOTE) There are models which cannot select heater.

<b>4. Anti freezing</b>	Initial setting: Yes	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: left;">System setup</td> <td style="text-align: right;">12:00am, Mon</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Optional PCB connectivity</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Zone &amp; Sensor</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Heater capacity</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;"><b>Anti freezing</b></td> </tr> <tr> <td style="text-align: left;">▲ Select</td> <td style="text-align: right;">[↔] Confirm</td> </tr> </table>	System setup	12:00am, Mon	Optional PCB connectivity		Zone & Sensor		Heater capacity		<b>Anti freezing</b>		▲ Select	[↔] Confirm
System setup	12:00am, Mon													
Optional PCB connectivity														
Zone & Sensor														
Heater capacity														
<b>Anti freezing</b>														
▲ Select	[↔] Confirm													

Operate anti-freezing of water circulation circuit.  
If select Yes, when the water temperature is reaching its freezing temperature, the circulation pump will start up. If the water temperature does not reach the pump stop temperature, back-up heater will be activated.

(NOTE) If set No, when the water temperature is reaching its freezing temperature or below 0°C, the water circulation circuit may freeze and cause malfunction.

<b>5. DHW Capacity</b>	Initial setting: Variable	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: left;">System setup</td> <td style="text-align: right;">12:00am, Mon</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Zone &amp; Sensor</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Heater capacity</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;">Anti freezing</td> </tr> <tr> <td colspan="2" style="background-color: #f0f0f0;"><b>DHW capacity</b></td> </tr> <tr> <td style="text-align: left;">▲ Select</td> <td style="text-align: right;">[↔] Confirm</td> </tr> </table>	System setup	12:00am, Mon	Zone & Sensor		Heater capacity		Anti freezing		<b>DHW capacity</b>		▲ Select	[↔] Confirm
System setup	12:00am, Mon													
Zone & Sensor														
Heater capacity														
Anti freezing														
<b>DHW capacity</b>														
▲ Select	[↔] Confirm													

Variable DHW capacity setting normally run with efficient boiling which is energy saving heating. But while hot water usage high and tank water temperature low, variable DHW mode will run with fast heat up which heat up the tank with high heating capacity.  
If standard DHW capacity setting is selected, heat pump run with heating rated capacity at tank heat up operation.

**6. Buffer Tank connection**

Initial setting: No

Select whether it is connected to buffer tank for heating or not.  
 If buffer tank is used, please set Yes.  
 Connect buffer tank thermistor and set,  $\Delta T$  ( $\Delta T$  use to increase primary side temp against secondary side target temp).  
 (NOTE) Does not display if there is no Optional PCB.  
 If the buffer tank capacity is not so large, please set larger value for  $\Delta T$ .

System setup	12:00am,Mon
Heater capacity	
Anti freezing	
Tank connection	
<b>Buffer tank connection</b>	
↕ Select	[↩] Confirm

**7. Base pan heater**

Initial setting: No

Select whether Base pan heater is installed or not.  
 If set Yes, select to use either heater A or B.

A: Turn on Heater when heating with defrost operation only  
 B: Turn on Heater at heating

System setup	12:00am,Mon
Tank connection	
Buffer tank connection	
Tank heater	
<b>Base pan heater</b>	
↕ Select	[↩] Confirm

**8. Alternative outdoor sensor**

Initial setting: No

Set Yes if outdoor sensor is installed.  
 Controlled by optional outdoor sensor without reading the outdoor sensor of heat pump unit.

System setup	12:00am,Mon
Buffer tank connection	
Tank heater	
Base pan heater	
<b>Alternative outdoor sensor</b>	
↕ Select	[↩] Confirm

**9. Bivalent connection**

Initial setting: No

Set if heat pump linked with boiler operation.  
 Connect the start signal of the boiler in boiler contact terminal (main PCB).  
 Set Bivalent connection to YES.  
 After that, please begin setting according to remote controller instruction.  
 Boiler icon will be displayed on remote controller top screen.

System setup	12:00am,Mon
Tank heater	
Base pan heater	
Alternative outdoor sensor	
<b>Bivalent connection</b>	
↕ Select	[↩] Confirm

After Bivalent connection Set YES, there is two option of control pattern to be select, (SG Ready / Auto)

- 1) SG ready (Only available to set when optional PCB set to YES)  
 - SG Ready input from optional PCB terminal control ON/OFF of boiler and heat pump as below condition

SG signal		Operation pattern
Vcc-bit1	Vcc-bit2	
Open	Open	Heat pump OFF, Boiler OFF
Short	Open	Heat pump ON, Boiler OFF
Open	Short	Heat pump OFF, Boiler ON
Short	Short	Heat pump ON, Boiler ON

\* This bivalent SG ready input is sharing same terminal as [14. SG ready] connection. Only one of these two setting can be set at the same time.

When one is set, another setting will reset to not set.

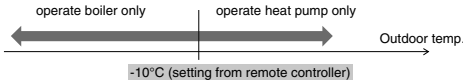
- 2) Auto (If Optional PCB no Set, bivalent control pattern will set to this auto as default value)  
 There are 3 different modes in the boiler auto pattern operation. Movement of each modes are shown below.

- ① Alternative (switch to boiler operation when drops below setting temperature)
- ② Parallel (allow boiler operation when drops below setting temperature)
- ③ Advanced Parallel (able to slightly delay boiler operation time of parallel operation)

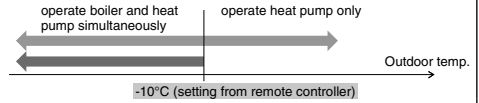
When the boiler operation is "ON", "boiler contact" is "ON", "  "(underscore) will be displayed below the boiler icon.  
 Please set target temperature of boiler to be the same as heat pump temperature.

When boiler temperature is higher than heat pump temperature, zone temperature cannot be achieved if mixing valve is not installed.  
 This product only allows one signal to control the boiler operation. Operation setting of boiler shall be responsible by installer.

**Alternative mode**

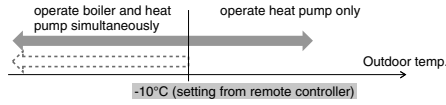


**Parallel mode**

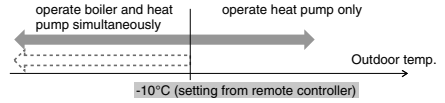


**Advanced Parallel mode**

**For heating**

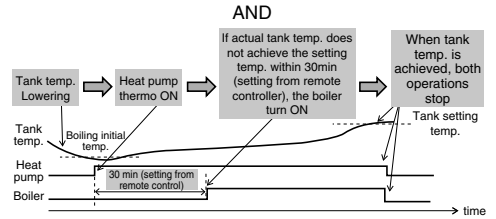
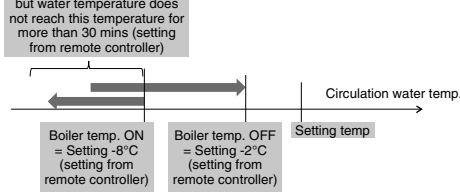


**For DHW tank**



Although heat pump operates but water temperature does not reach this temperature for more than 30 mins (setting from remote controller)

**AND**



In Advanced Parallel mode, setting for both heating and tank can be made simultaneously. During operation of "Heating/Tank" mode, when each time the mode is switched, the boiler output will be reset to OFF. Please have good understanding on the boiler control characteristic in order to select the optimal setting for the system.

**10. External SW**

Initial setting: No

Able to turn ON/OFF the operation by external switch.

System setup	12:00am, Mon
Base pan heater	
Alternative outdoor sensor	
Bivalent connection	
<b>External SW</b>	
⬇ Select	[↔] Confirm

**11. Solar connection**

Initial setting: No

Set when solar water heater is installed.

Setting include items below.

- ① Set either buffer tank or DHW tank for connection with solar water heater.
- ② Set temperature difference between solar panel thermistor and buffer tank or DHW tank thermistor to operate the solar pump.
- ③ Set temperature difference between solar panel thermistor and buffer tank or DHW tank thermistor to stop the solar pump.
- ④ Anti-freezing operation start temperature (please change setting based on usage of glycol.)
- ⑤ Solar pump stop operation when it exceeds high limit temperature (when tank temperature exceed designated temperature (70-90°C))

System setup	12:00am, Mon
Alternative outdoor sensor	
Bivalent connection	
External SW	
<b>Solar connection</b>	
⬇ Select	[↔] Confirm

**12. External Error Signal**

Initial setting: No

System setup 12:00am,Mon

Set when external error display unit is installed.  
Turn on Dry Contact SW when error happened.

(NOTE) Does not display when there is no Optional PCB.  
When error occurs, error signal will be ON.  
After turn off "close" from the display, error signal will still remain ON.

Bivalent connection
External SW
Solar connection
<b>External error signal</b>
◀ Select [↔] Confirm

**13. Demand control**

Initial setting: No

System setup 12:00am,Mon

Set when there is demand control.  
Adjust terminal voltage within 1 ~ 10 V to change the operating current limit.

(NOTE) Does not display when there is no Optional PCB.

External SW
Solar connection
External error signal
<b>Demand control</b>
◀ Select [↔] Confirm

Analog input [v]	Rate [%]
0.0	not activate
0.1 ~ 0.6	not activate
0.7	10
0.8	not activate
0.9 ~ 1.1	10
1.2	15
1.3	10
1.4 ~ 1.6	15
1.7	20
1.8	15
1.9 ~ 2.1	20
2.2	25
2.3	20
2.4 ~ 2.6	25
2.7	30
2.8	25
2.9 ~ 3.1	30
3.2	35
3.3	30
3.4 ~ 3.6	35
3.7	40
3.8	35

Analog input [v]	Rate [%]
3.9 ~ 4.1	40
4.2	45
4.3	40
4.4 ~ 4.6	45
4.7	50
4.8	45
4.9 ~ 5.1	50
5.2	55
5.3	50
5.4 ~ 5.6	55
5.7	60
5.8	55
5.9 ~ 6.1	60
6.2	65
6.3	60
6.4 ~ 6.6	65
6.7	70
6.8	65
6.9 ~ 7.1	70
7.2	75
7.3	70

Analog input [v]	Rate [%]
7.4 ~ 7.6	75
7.7	80
7.8	75
7.9 ~ 8.1	80
8.2	85
8.3	80
8.4 ~ 8.6	85
8.7	90
8.8	85
8.9 ~ 9.1	90
9.2	95
9.3	90
9.4 ~ 9.6	95
9.7	100
9.8	95
9.9 ~	100

\*A minimum operating current is applied on each model for protection purpose.  
\*0.2 voltage hysteresis is provided.  
\*The value of voltage after 2nd decimal point are cut off.

**14. SG ready**

Initial setting: No

System setup 12:00am,Mon

Switch operation of heat pump by open-short of 2 terminals.  
Setting belows are possible

SG signal	Working pattern
Vcc-bit1   Vcc-bit2	
Open   Open	Normal
Short   Open	Heat pump and Heater OFF
Open   Short	Capacity 1
Short   Short	Capacity 2

Solar connection
External error signal
Demand control
<b>SG ready</b>
◀ Select [↔] Confirm

Capacity setting 1

- DHW capacity \_\_\_%
- Heating capacity \_\_\_%
- Cooling capacity \_\_\_°C

Capacity setting 2

- DHW capacity \_\_\_%
- Heating capacity \_\_\_%
- Cooling capacity \_\_\_°C

} Set by SG ready setting of remote controller

(When SG ready set to YES, Bivalent control pattern will set to Auto.)

**15. External Compressor SW**

Initial setting: No

Set when external compressor SW is connected.  
SW is connected to external devices to control power consumption, ON signal will stop compressor's operation. (Heating operation etc. are not cancelled).

(NOTE) Does not display if there is no Optional PCB.

If follow Swiss standard power connection, need to turn on DIP SW of main unit PCB. ON/OFF signal used to ON/OFF tank heater (for sterilization purpose)

System setup	12:00am,Mon
External error signal	
Demand control	
SG ready	
<b>External compressor SW</b>	
◀ Select	[↵] Confirm

**16. Circulation Liquid**

Initial setting: Water

Set circulation of heating water.

There are 2 types of settings, water and anti-freeze function.

(NOTE) Please set glycol when using anti-freeze function.  
It may cause error if setting is wrong.

System setup	12:00am,Mon
Demand control	
SG ready	
External compressor SW	
<b>Circulation liquid</b>	
◀ Select	[↵] Confirm

**17. Heat-Cool SW**

Initial setting: Disable

Able to switch (fix) heating & cooling by external switch.

(Open) : Fix at Heating (Heating +DHW)

(Short) : Fix at Cooling (Cooling +DHW)

(NOTE) This setting is disabled for model without Cooling.

(NOTE) Does not display if there is no Optional PCB.

Timer function cannot be used. Cannot use Auto mode.

System setup	12:00am,Mon
SG ready	
External compressor SW	
Circulation liquid	
<b>Heat-Cool SW</b>	
▲ Select	[↵] Confirm

**18. Force Heater**

Initial setting: Manual

Under manual mode, user can turn on force heater through quick menu.

If selection is 'auto', force heater mode will turn automatically if pop up error happen during operation.

Force heater will operate follow the latest mode selection, mode selection is disable under force heater operation.

Heater source will ON during force heater mode.

System setup	12:00am,Mon
External compressor SW	
Circulation liquid	
Heat-Cool SW	
<b>Force Heater</b>	
▲ Select	[↵] Confirm

**19. Force Defrost**

Initial setting: Manual

Under manual code, user can turn on force defrost through quick menu.

If selection is 'auto', outdoor unit will run defrost operation once if heat pump have long hour of heating without any defrost operation before at low ambient condition.  
(Even auto is selected, user still can turn on force defrost through quick menu)

System setup	12:00am,Mon
Circulation liquid	
Heat-Cool SW	
Force heater	
<b>Force defrost</b>	
◀ Select	[↵] Confirm

**20. Defrost signal**

Initial setting: No

Defrost signal sharing same terminal as bivalent contact in main board. When defrost signal set to YES, bivalent connection reset to NO. Only one function can be set between defrost signal and bivalent.

When defrost signal set to YES, during defrost operation is running at outdoor unit defrost signal contact turn ON. Defrost signal contact turn OFF after defrost operation end.  
(Purpose of this contact output is to stop indoor fan coil or water pump during defrost operation).

System setup	12:00am, Mon
Heat-Cool SW	
Force heater	
Force defrost	
<b>Defrost signal</b>	
▲ Select	[↔] Confirm

**21. Pump flowrate**

Initial setting: ΔT

If pump flowrate setting is ΔT, unit adjust pump duty to get different of water inlet and outlet base on setting on \* ΔT for heating ON and \* ΔT for cooling ON in operation setup menu during room side operation.

If pump flowrate setting is set to Max. duty, unit will set the pump duty to the set duty at \*Pump maximum speed in service setup menu during room side operation.

System setup	12:00am, Mon
Force heater	
Force defrost	
Defrost signal	
<b>Pump flowrate</b>	
▲ Select	[↔] Confirm

**3-4. Operation Setup**

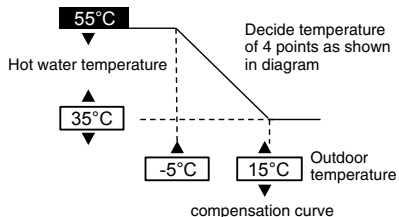
**Heat**

**22. Water temp. for heating ON**

Initial setting: compensation curve

Set target water temperature to operate heating operation.  
Compensation curve: Target water temperature change in conjunction with outdoor ambient temperature change.  
Direct: Set direct circulation water temperature.

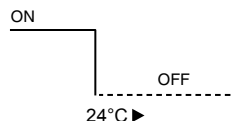
In 2 zone system, zone 1 and zone 2 water temperature can be set separately.



**23. Outdoor temp. for heating OFF**

Initial setting: 24°C

Set outdoor temp to stop heating.  
Setting range is 5°C - 35°C

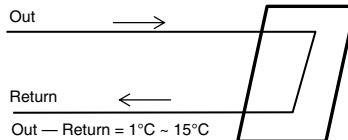


**24. ΔT for heating ON**

Initial setting: 5°C

Set temp difference between out temp & return temp of circulating water of Heating operation.

When temp gap is enlarged, it is energy saving but less comfort. When the gap gets smaller, energy saving effect gets worse but it is more comfortable.  
Setting range is 1°C - 15°C



**25. Heater ON/OFF**

a. Outdoor temp. for heater ON

Initial setting: 0°C

Set outdoor temp when back-up heater starts to operate.  
Setting range is -20°C ~ 15°C

User shall set whether to use or not to use heater.

b. Heater ON delay time

Initial setting: 30 minutes

Set delay time from compressor ON for heater to turn ON if not achieve water set temperature.  
Setting range is 10 minutes ~ 60 minutes

c. Heater ON: ΔT of target Temp

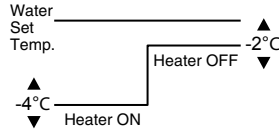
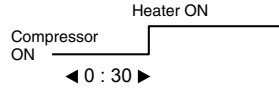
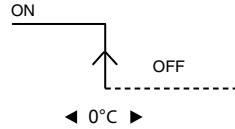
Initial setting: -4°C

Set water temperature for heater to turn on at heat mode.  
Setting range is -10°C ~ -2°C

d. Heater OFF: ΔT of target Temp

Initial setting: -2°C

Set water temperature for heater to turn off at heat mode.  
Setting range is -8°C ~ 0°C



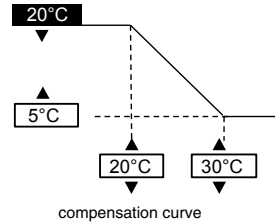
**Cool**

**26. Water temp. for cooling ON**

Initial setting: compensation curve

Set target water temperature to operate cooling operation.  
Compensation curve: Target water temperature change in conjunction with outdoor ambient temperature change.  
Direct: Set direct circulation water temperature.

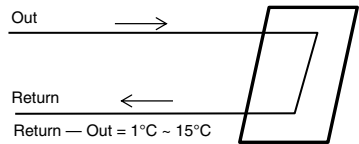
In 2 zone system, zone 1 and zone 2 water temperature can be set separately.



**27. ΔT for cooling ON**

Initial setting: 5°C

Set temp difference between out temp & return temp of circulating water of Cooling operation.  
When temp gap is enlarged, it is energy saving but less comfort. When the gap gets smaller, energy saving effect gets worse but it is more comfortable.  
Setting range is 1°C ~ 15°C



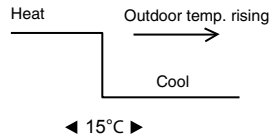
**Auto**

**28. Outdoor temp. for (Heat to Cool)**

Initial setting: 15°C

Set outdoor temp that switches from heating to cooling by Auto setting.  
Setting range is 5°C ~ 25°C

Timing of judgement is every 1 hour



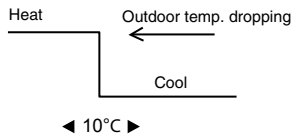


**29. Outdoor temp. for (Cool to Heat)**

Initial setting: 10°C

Set outdoor temp that switches from Cooling to Heating by Auto setting.  
Setting range is 5°C ~ 25°C

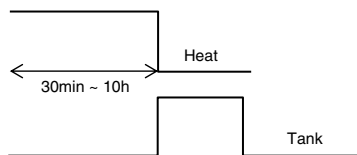
Timing of judgement is every 1 hour

**Tank****30. Floor operation time (max)**

Initial setting: 8h

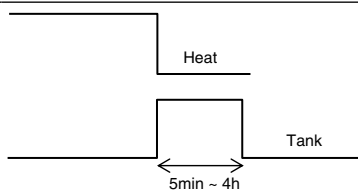
Set max operating hours of heating.  
When max operation time is shortened, it can boil the tank more frequently.

It is a function for Heating + Tank operation.

**31. Tank heat up time (max)**

Initial setting: 60min

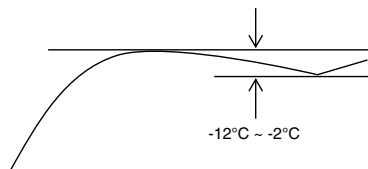
Set max boiling hours of tank.  
When max boiling hours are shortened, it immediately returns to Heating operation, but it may not fully boil the tank.

**32. Tank re-heat temp.**

Initial setting: -8°C

Set temp to perform reboil of tank water.  
(When boiled by heat pump only, (51°C - Tank re-heat temp) shall become max temp.)

Setting range is -12°C ~ -2°C

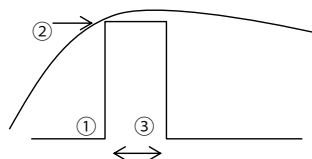
**33. Sterilization**

Initial setting: 65°C 10min

Set timer to perform sterilization.

- ① Set operating day & time. (Weekly timer format)
- ② Sterilization temp (55~75°C # If use back-up heater, it is 65°C)
- ③ Operation time (Time to run sterilization when it reached setting temp 5min ~ 60min)

User shall set whether to use or not to use sterilization mode.



### 3-5. Service Setup

#### 34. Pump maximum speed

Initial setting: Depend on model

Normally setting is not necessary.  
Please adjust when need to reduce the pump sound etc.  
Besides that, it has Air Purge function.

When \*Pump flow setting is Max. Duty, this duty set is the fix pump duty run during room side operation.

Service setup		12:00am, Mon
Flow rate	Max. Duty	Operation
88:8 L/min	0xCE	<b>Air Purge</b>
◀ Select		

#### 35. Pump down

Operate pump down operation

Service setup	12:00am, Mon
Pump down:	ON
[←] Confirm	

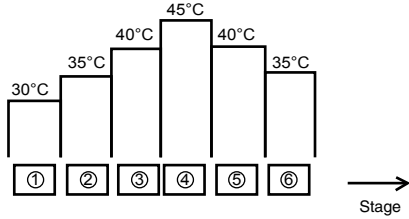
Pump down operation in progress!	
[⏻] OFF	

#### 36. Dry concrete

Operate concrete curing operation.  
Select Edit, set temp for every stage (1~99 1 is for 1 day).  
Setting range is 25~55°C

When it is turned ON, dry concrete starts.

When it is 2 zone, it dries both zones.



#### 37. Service contact

Able to set name & tel no. of contact person when there is breakdown etc. or client has trouble. (2 items)

Service setup	12:00am, Mon
Service contact:	
	Contact 1
	Contact 2
▲ Select	[←] Confirm

Contact-1: Bryan Adams	
ABC/ abc	0-9/ Other
A B C D E F G H I J K L M N O P Q R	
S T U V W X Y Z    a b c d e f g h i	
j k l m n o p q r s t u v w x y z	
▼ Select	[←] Enter

## 4 Service and maintenance

### When connect CN-CNT connector with computer

Please use optional USB cable to connect with CN-CNT connector.

After connected, it requests for driver. If PC is under Windows Vista or later version, it automatically installs the driver under internet environment.

If PC uses Windows XP or earlier version and there is no internet access, please get FTDI Ltd's USB - RS232C conversion IC driver (VCP driver) and install.  
<http://www.ftdichip.com/Drivers/VCP.htm>

### If forget Password and cannot operate remote controller

Press + + for 5 sec.

Password unlock screen appears, press Confirm and it shall reset.

Password will become 0000. Please reset it again.

(NOTE) Only display when it is locked by password.

## Maintenance menu

### Setting method of Maintenance menu

Maintenance menu	12:00am, Mon
<b>Actuator check</b>	
Test mode	
Sensor setup	
Reset password	
▼ Select	[↵] Confirm

Press + + for 5 sec.

Items that can be set

- ① Actuator check (Manual ON/OFF all functional parts)  
 (NOTE) As there is no protection action, please be careful not to cause any error when operating each part (do not turn on pump when there is no water etc.)
- ② Test mode (Test run)  
 Normally it is not used.
- ③ Sensor setup (offset gap of detected temp of each sensor within -2~2°C range)  
 (NOTE) Please use only when sensor is deviated.  
 It affects temperature control.
- ④ Reset password (Reset password)

## Custom menu

### Setting method of Custom menu

Custom menu	12:00am, Mon
<b>Cool mode</b>	
Back-up heater	
Reset energy monitor	
Reset operation history	
Smart DHW	
▼ Select	[↵] Confirm

Please press + + for 10 sec.

Items that can be set

- ① Cool mode (Set With/Without Cooling function) Default is without  
 (NOTE) As with/without Cool mode may affect electricity application, please be careful and do not simply change it.  
 In Cool mode, please be careful if piping is not insulated properly, dew may form on pipe and water may drip on the floor and damage the floor.
- ② Backup heater (Use/Do not use Backup heater)  
 (NOTE) It is different from to use/not to use backup heater set by client. When this setting is used, heater power on due to protection against frost will be disabled. (Please use this setting when it is required by utility company.)  
 By using this setting, it cannot defrost due to low Heating's setting temp and operation may stop (H75)  
 Please set under the responsibility of installer. When it stops frequently, it may be due to insufficient circulation flow rate, setting temp of heating is too low etc.
- ③ Reset energy monitor (delete memory of Energy monitor)  
 Please use when moving house and handover the unit.
- ④ Reset operation history (delete memory of operation history)  
 Please use when moving house and handover the unit.
- ⑤ Smart DHW (Set Smart DHW mode Parameter)
  - a) Start time: Tank reboil at lower ON Temp. onward.
  - b) Stop time: Tank reboil at normal ON Temp. onward.
  - c) ON Temp.: Tank Reboil Temp when Smart DHW start.

