

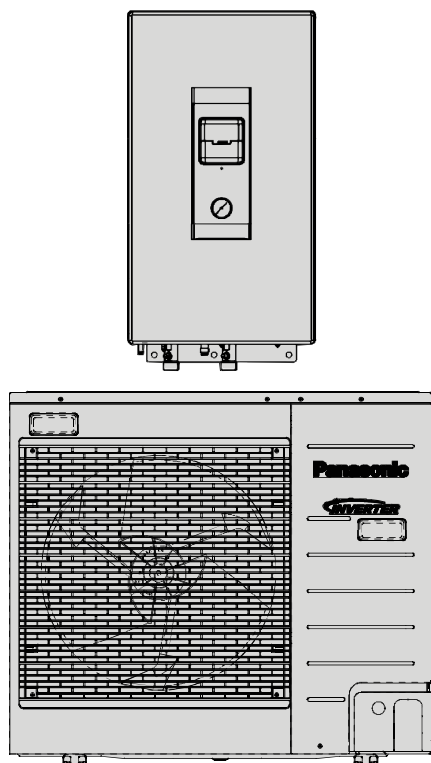
Service Manual

Air-to-Water Heatpump

Indoor Unit
WH-SDC07H3E5

Outdoor Unit
WH-UD07HE5

Destination
Europe



WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.



PRECAUTION OF LOW TEMPERATURE

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigerant circuit.

1. Safety Precautions

- Read the following “SAFETY PRECAUTIONS” carefully before installation.
- Electrical work must be installed by a licensed electrician. 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 ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.
- Please leave this installation manual with the unit after installation.

 WARNING	This indication shows the possibility of causing death or serious injury.
 CAUTION	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 from doing.
	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.

 WARNING		
1.	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.	
2.	Do not tie up the power supply cord into a bundle by band. Abnormal temperature rise on power supply cord may happen.	
3.	Keep plastic bag (packaging material) away from small children, it may cause suffocation.	
4.	Do not use pipe wrench to install refrigerant piping. It might deform the piping and cause the unit to malfunction.	
5.	Do not purchase unauthorized electrical parts for installation, service, maintenance and etc.. They might cause electrical shock or fire.	
6.	Do not modify the wiring of Indoor Unit for installation of other components (i.e. heater, etc). Overloaded wiring or wire connection points may cause electrical shock or fire.	
7.	Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury etc.	
8.	Do not use joint cable for Indoor / Outdoor Unit connection cable. Use specified Indoor / Outdoor Unit connection cable, refer to instruction CONNECT THE CABLE TO THE INDOOR UNIT and connect tightly for Indoor / 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.	
9.	For electrical work, follow local wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.	
10.	For water circuit installation work, follow to relevant European and national regulations (including EN61770) and local plumbing and building regulation codes.	
11.	Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.	
12.	• This is a R410A model, when connecting the piping, do not use any existing (R22) pipes and flare nuts. Using such same may cause abnormally high pressure in the refrigeration cycle (piping), and possibly result in explosion and injury. Use only R410A refrigerant. • Thickness of copper pipes used with R410A must be 0.8 mm or more. Never use copper pipes thinner than 0.8 mm. • It is desirable that the amount of residual oil is less than 40mg/10m.	
13.	When install or relocate Indoor Unit, do not let any substance other than the specified refrigerant, e.g. air etc. mix into refrigerant cycle (piping). Mixing of air etc. will cause abnormal high pressure in refrigeration cycle and result in explosion, injury etc..	
14.	Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.	
15.	Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.	
16.	Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.	

 WARNING		
17.	Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.	
18.	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.	
19.	During installation, install the refrigerant piping properly before run the compressor. Operation of compressor without fixing refrigeration piping and valves at opened condition will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.	
20.	During pump down operation, stop the compressor before remove the refrigeration piping. Removal of refrigerant piping while compressor is operating and valves are opened will cause suck-in of air, abnormal high pressure in refrigerant cycle and result in explosion, injury etc.	
21.	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.	
22.	After completion of installation, confirm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.	
23.	Ventilate the room if there is refrigerant gas leakage during operation. Extinguish all fire sources if present. It may cause toxic gas when the refrigerant contacts with fire.	
24.	Only use the supplied or specified installation parts, else, it may cause unit vibrate loose, water leakage, electrical shock or fire.	
25.	The unit is only for use in closed water system. Utilization in an open water circuit may lead to excessive corrosion of water piping and risk of incubating bacteria colonies, particularly Legionella, in water.	
26.	If there is any doubt about the installation procedure or operation, always contact the authorized dealer for advice and information.	
27.	Select a location where in case of water leakage, the leakage will not cause damage to other properties.	
28.	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.	
29.	Any work carried out on the Indoor Unit after removing any panels which is secured by screws, must be carried out under the supervision of authorized dealer and licensed installation contractor.	
30.	This unit must be properly earthed. The electrical earth must not be connected to a gas pipe, water pipe, the earth of lightning rod or a telephone. Otherwise there is a danger of electrical shock in the event of an insulation breakdown or electrical earth fault in the outdoor unit.	

 CAUTION		
1.	Do not install the Indoor 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.	
2.	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.	
3.	Do not install this appliance in a laundry room or other high humidity location. This condition will cause rust and damage to the unit.	
4.	Make sure the insulation of power supply cord does not contact hot part (i.e. refrigerant piping) to prevent from insulation failure (melt).	
5.	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.	
6.	Select an installation location which is easy for maintenance.	
7.	Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.	
8.	Power supply connection to Indoor Unit. - Power supply point should be in easily accessible place for power disconnection in case of emergency. - Must follow local national wiring standard, regulation and this installation instruction. - Strongly recommended to make permanent connection to a circuit breaker. - Power supply 1: Use approved 30A 2-poles circuit breaker with a minimum contact gap of 3.0 mm. - Power supply 2: Use approved 30A 2-poles circuit breaker with a minimum contact gap of 3.0 mm.	
9.	Ensure the correct polarity is maintained throughout all wiring. Otherwise, it will cause electrical shock or fire.	
10.	After installation, check the water leakage condition in connection area during test run. If leakage occurs, it will cause damage to other properties.	

 CAUTION

Installation work.

12. It may need two or more people to carry out the installation work. The weight of Indoor Unit might cause injury if carried by one person.



Specifications

WH-SDC07H3E5 WH-UD07HE5

Item		Unit	Outdoor Unit		
Performance Test Condition			EN 14511		
Cooling Capacity	Condition (Ambient/Water)		A35W7		
	kW		6.00		
	BTU/h		20500		
	kcal/h		5160		
Cooling EER	W/W		2.63		
	kcal/hW		2.26		
Heating Capacity	Condition (Ambient/Water)		A7W35	A2W35	
	kW		7.00	6.55	
	BTU/h		23900	22300	
	kcal/h		6020	5630	
Heating COP	W/W		4.46	3.34	
	kcal/hW		3.84	2.87	
Heating ErP	Low Temperature Application (W35)		Warmer	Average	Colder
	Application	Climate			
	Pdesign	kW	7.0	5.0	6.0
	Tbivalent / TOL	°C	2 / 2	-10 / -10	-15 / -22
	SCOP / ns	(W/W) / %	5.69 / 225	4.83 / 190	4.08 / 160
	Annual Consumption	kWh	1643	2140	3624
	Class		A++	A++	A++
	Medium Temperature Application (W55)		Warmer	Average	Colder
	Application	Climate			
	Pdesign	kW	6.0	7.0	6.0
	Tbivalent / TOL	°C	2 / 2	-6 / -10	-15 / -22
	SCOP / ns	(W/W) / %	4.07 / 160	3.32 / 130	2.95 / 115
	Annual Consumption	kWh	1971	4354	5022
	Class		A++	A++	A+
Noise Level	Condition (Ambient/Water)		A35W7	A7W35	A2W35
	dB (A)		Cooling: 48	Heating: 50	—
	Power Level dB		Cooling: 66	Heating: 68	—
Air Flow		m³/min (ft³/min)	Cooling: 56.3 (1987) Heating: 46.0 (1624)		
Refrigeration Control Device			Expansion Valve		
Refrigeration Oil		cm³	FV50S (900)		
Refrigerant (R410A)		kg (oz)	1.45 (51.2)		
Dimension	Height	mm (inch)	795 (31-5/16)		
	Width	mm (inch)	900 (35-7/16)		
	Depth	mm (inch)	320 (12-19/32)		
Net Weight		kg (lbs)	66 (146)		
Pipe Diameter	Liquid	mm (inch)	6.35 (1/4)		
	Gas	mm (inch)	15.88 (5/8)		
Standard Length		m (ft)	7 (23.0)		
Pipe Length Range		m (ft)	3 (9.8) ~ 30 (98.4)		
I/D & O/D Height Difference		m (ft)	20 (65.6)		
Additional Gas Amount		g/m (oz/ft)	30 (0.3)		
Refrigeration Charge Less		m (ft)	10 (32.8)		

Item		Unit	Outdoor Unit		
Compressor	Type		Hermetic Motor		
	Motor Type		Brushless (4-poles)		
	Rated Output	kW	1.70		
Fan	Type		Propeller Fan		
	Material		PP		
	Motor Type		DC (8-poles)		
	Input Power	W	—		
	Output Power	W	60		
	Fan Speed	rpm	Cooling: 670 Heating: 570		
Heat Exchanger	Fin material		Aluminium (Pre Coat)		
	Fin Type		Corrugated Fin		
	Row × Stage × FPI		2 × 30 × 17		
	Size (W × H × L)	mm	38.1 × 762.0 × 873.8:903.8		
Power Source (Phase, Voltage, Cycle)		Ø	Single		
		V	230		
		Hz	50		
Input Power		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		kW	Cooling: 2.28	Heating: 1.57	Heating: 1.96
Maximum Input Power For Heatpump System		kW	4.59		
Power Supply 1 : Phase (Ø) / Max. Current (A) / Max. Input Power (W)			1Ø / 21.0 / 4.59k		
Power Supply 2 : Phase (Ø) / Max. Current (A) / Max. Input Power (W)			1Ø / 13.0 / 3.00k		
Power Supply 3 : Phase (Ø) / Max. Current (A) / Max. Input Power (W)			— / — / —		
Starting Current		A	7.2		
Running Current		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		A	Cooling: 10.3	Heating: 7.2	Heating: 9.0
Maximum Current For Heatpump System		A	21.0		
Power Factor Power factor means total figure of compressor and outdoor fan motor.		%	Cooling: 96 Heating: 95		
Power Cord	Number of core		—		
	Length	m (ft)	—		
Thermostat			Electronic Control		
Protection Device			Electronic Control		

Item		Unit	Indoor Unit		
Performance Test Condition			EN 14511		
Operation Range	Outdoor Ambient	°C	Cooling: 16 ~ 43 Heating: -20 ~ 35		
	Water Outlet	°C	Cooling: 5 ~ 20 Heating: 20 ~ 55		
Internal Pressure Differential		kPa	Cooling: 18.0 Heating: 24.0		
Noise Level		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		dB (A)	Cooling: 30	Cooling: 30	—
		Power Level dB	Cooling: 43	Cooling: 43	—
Dimension	Height	mm (inch)	892 (35-1/8)		
	Width	mm (inch)	500 (19-11/16)		
	Depth	mm (inch)	340 (13-13/32)		
Net Weight		kg (lbs)	44 (97)		
Refrigerant Pipe Diameter	Liquid	mm (inch)	6.35 (1/4)		
	Gas	mm (inch)	15.88 (5/8)		
Water Pipe Diameter	Inlet	mm (inch)	28 (1-3/32)		
	Outlet	mm (inch)	28 (1-3/32)		
Water Drain Hose Inner Diameter		mm (inch)	12 (1/2)		

Item		Unit	Indoor Unit
Pump	Motor Type		DC Motor
	No. of Speed		7 (Software Selection)
	Input Power	W	48
Hot Water Coil	Type		Brazed Plate
	No. of Plates		48
	Size (H × W × L)	mm	82 × 93 × 325
	Water Flow Rate	l/min (m ³ /h)	Cooling: 17.6 (1.1) Heating: 20.1 (1.2)
Pressure Relief Valve Water Circuit		kPa	Open: 300, Close: 266 and below
Flow Switch			Electronic Sensor
Protection Device		A	Residual Current Circuit Breaker (30 ~ 40)
Expansion Vessel	Volume	l	10
	MWP	bar	3
Capacity of Integrated Electric Heater		kW	3.00

Note:

- Cooling capacities are based on outdoor air temperature of 35°C Dry Bulb with controlled indoor water inlet temperature of 12°C and water outlet temperature of 7°C.
- Heating capacities are based on outdoor air temperature of 7°C Dry Bulb (44.6°F Dry Bulb), 6°C Wet Bulb (42.8°F Wet Bulb) with controlled indoor water inlet temperature of 30°C and water outlet temperature of 35°C.
- Specification are subjected to change without prior notice for further improvement.
- Flow rate indicated are based on nominal capacity adjustment of leaving water temperature (LWT) 35°C and $\Delta T = 5^\circ\text{C}$.

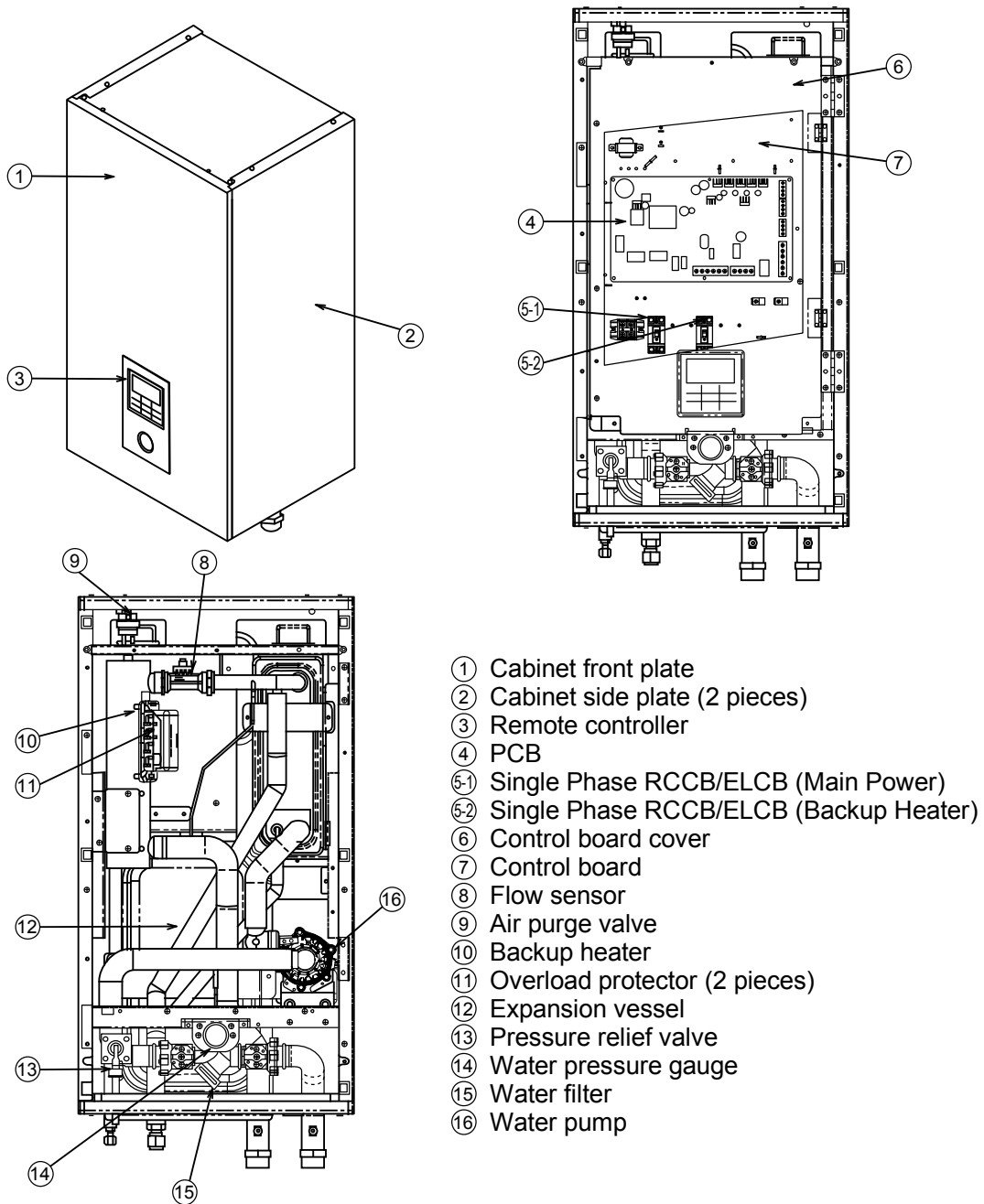
Features

- **Inverter Technology**
 - Energy saving
- **High Efficiency**
- **Compact Design**
- **Environment Protection**
 - Non-ozone depletion substances refrigerant (R410A)
- **Long Installation Piping**
 - Long piping up to 15 meter with height difference 5 meter
 - Flexible 4-way piping for outdoor unit
- **Easy to use control panel**
- **Weekly Timer setting**
- **Quality Improvement**
 - Random auto restart after power failure for safety restart operation
 - Gas leakage protection
 - Prevent compressor reverse cycle
 - Inner protector to protect compressor
- **Serviceability Improvement**
 - Breakdown Self Diagnosis function
 - System Status Check Buttons for servicing purpose
 - System Pumpdown Button for servicing purpose
 - Front maintenance design for outdoor unit
- **Operation Condition**

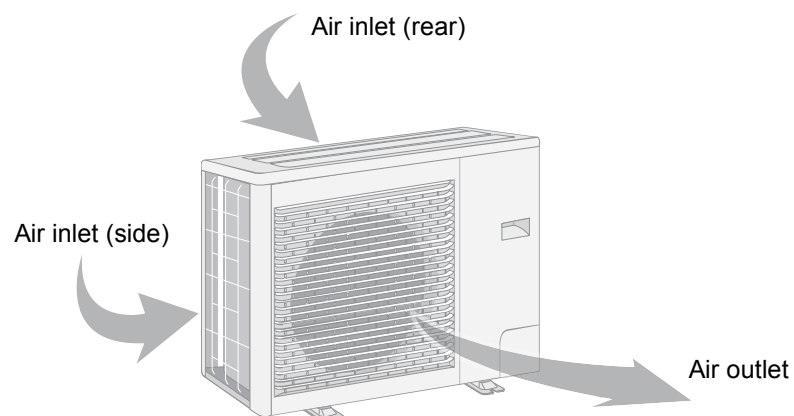
		Indoor	Outdoor
		Water outlet temperature (°C)	Ambient temperature (°C)
COOLING	Maximum	20	43
	Minimum	5	16
HEATING	Maximum	55	35
	Minimum	20	-20

NOTICE : When the outdoor temperature is out of the above temperature range, the heating capacity will drop significantly and outdoor unit might stop for protection control.

Main Components

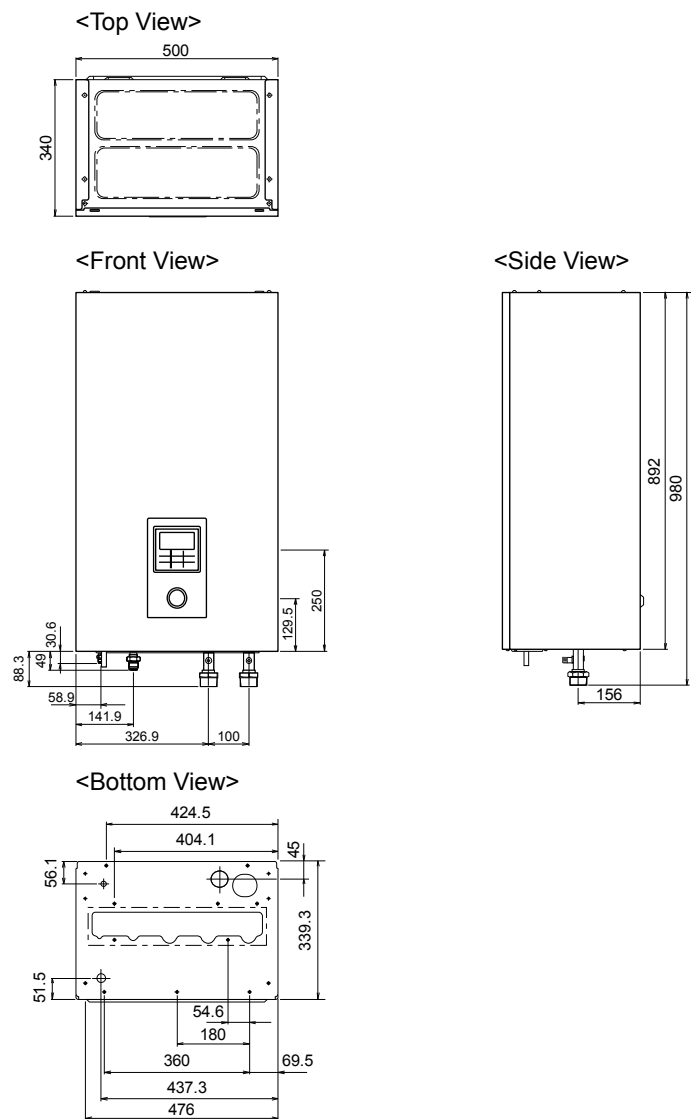


Outdoor Unit

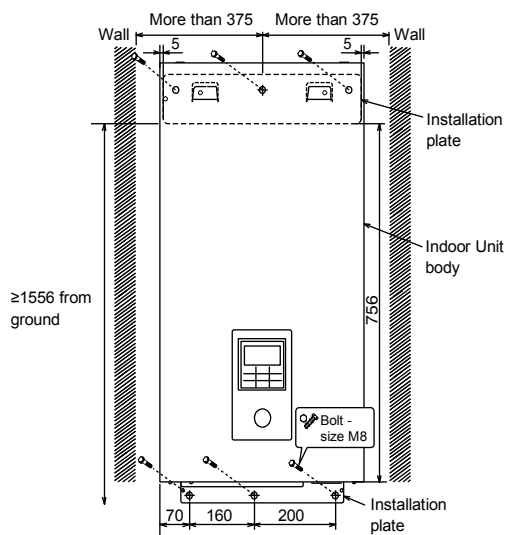


Dimensions

Indoor Unit



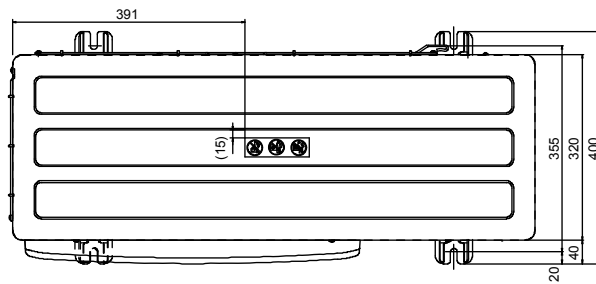
Relative position between the indoor unit and the installation plate <Front View>



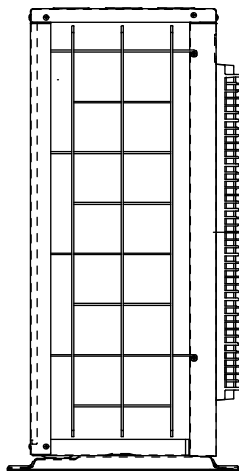
Unit: mm

Outdoor Unit

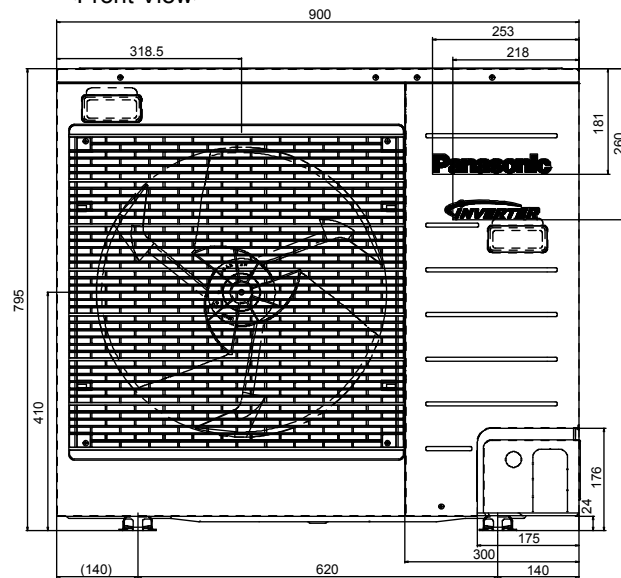
<Top View>



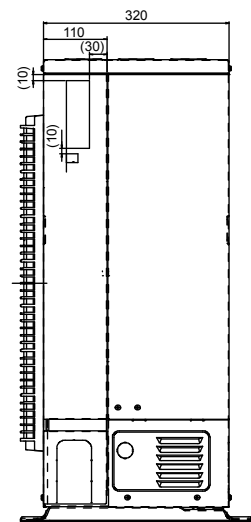
<Side view>



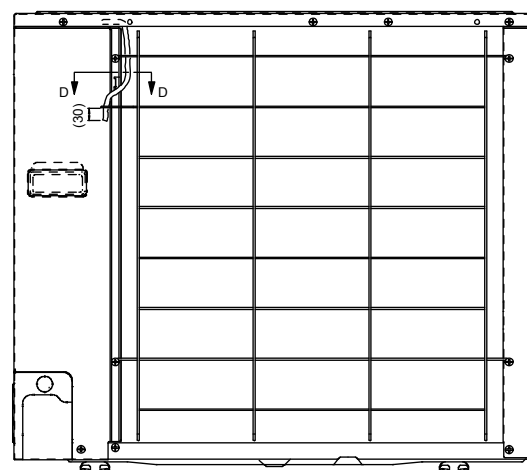
<Front View>



<Side View>

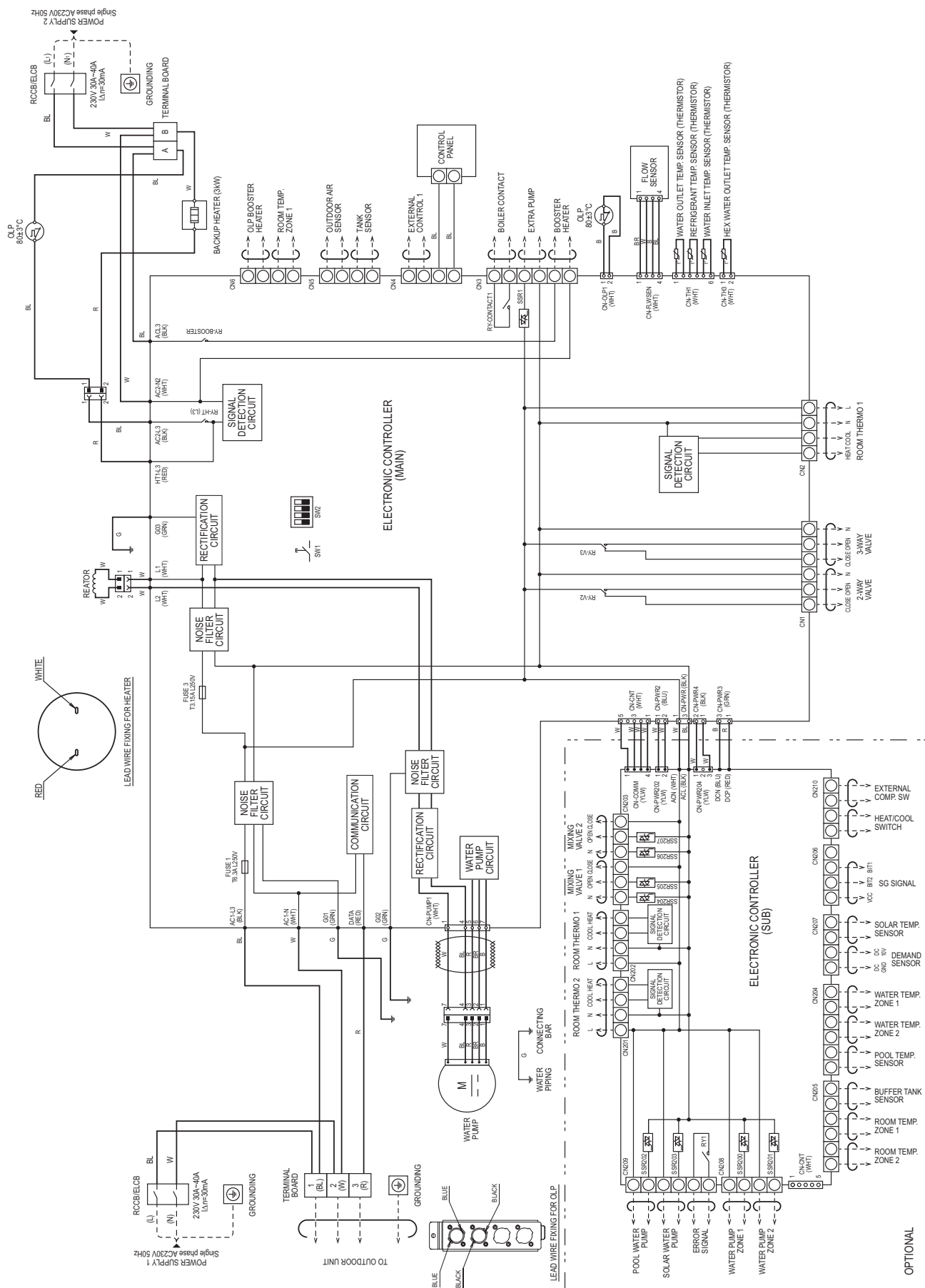


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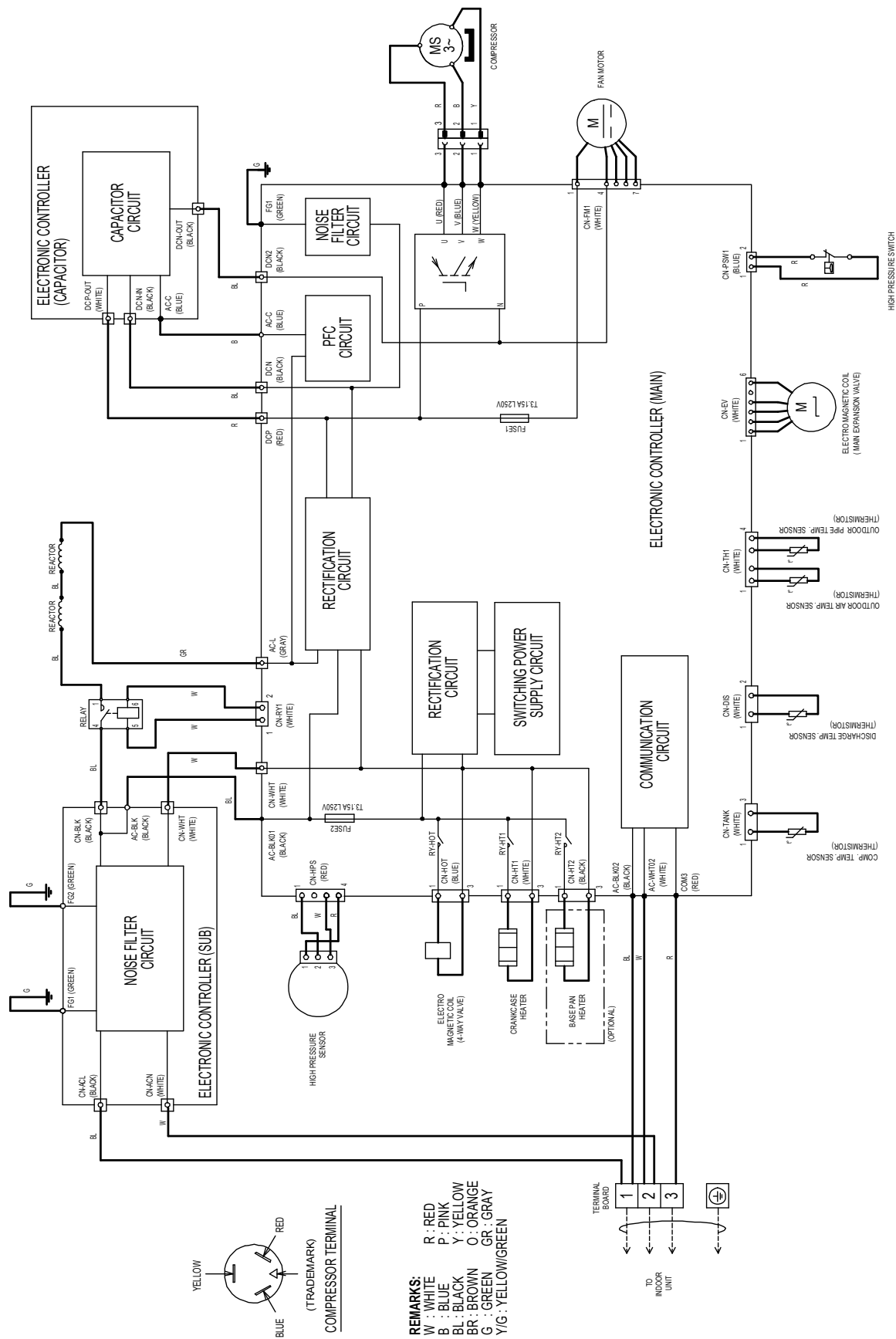


Unit: mm

Indoor Unit



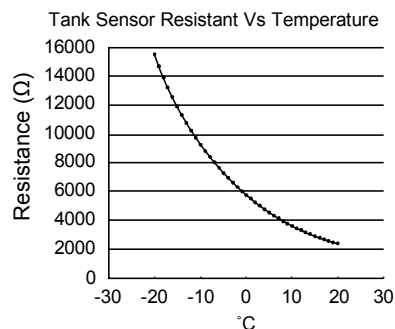
Outdoor Unit



How To Fix Cable

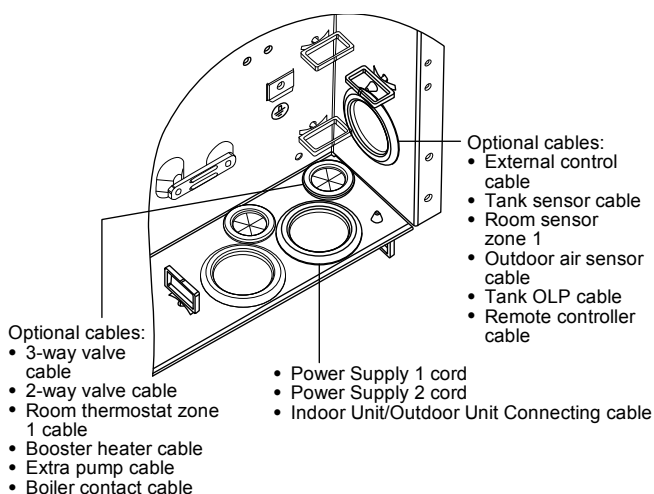
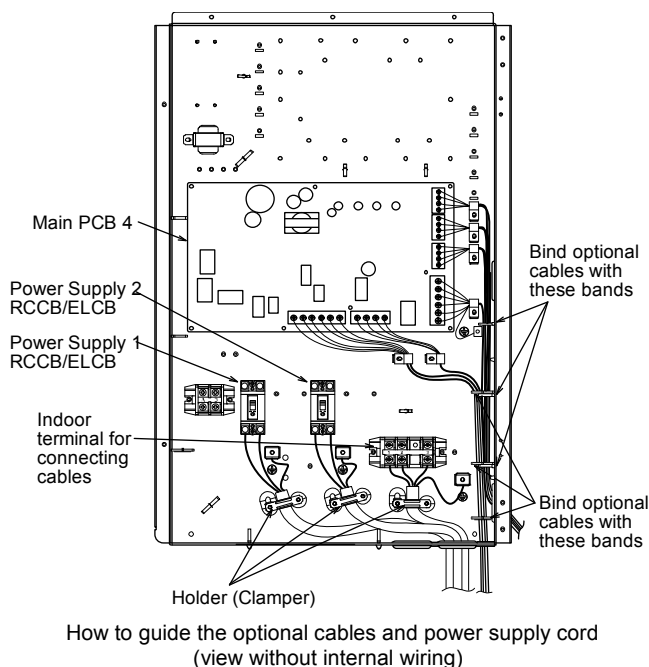
Connecting with external device (optional)

- 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.
 1. Two-way valve shall be spring and electronic type, refer to "Field Supply Accessories" table for details. Valve cable shall be (3 × min 1.5 mm²), 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. Three-way valve shall be spring and electronic type. Valve cable shall be (3 × min 1.5 mm²), of type designation 60245 IEC 57 or heavier, or similarly double insulation sheathed cable.
 - * note: - Shall be CE marking compliance component.
 - It shall be directed to heating mode when it is OFF.
 - Maximum load for the valve is 9.8VA.
 3. Room thermostat cable must be (4 or 3 × min 0.5 mm²), of type designation 60245 IEC 57 or heavier cord, or similarly double insulation sheathed cable.
 4. Maximum output power of booster heater shall be ≤ 3 kW. Booster heater cable must be (3 × min 1.5 mm²), of type designation 60245 IEC 57 or heavier.
 5. Extra pump cable shall be (2 × min 1.5 mm²), of type designation 60245 IEC 57 or heavier.
 6. Boiler contact cable shall be (2 × min 0.5 mm²), of type designation 60245 IEC 57 or heavier.
 7. External control shall be connected to 1-pole switch with min 3.0 mm contact gap. Its cable must be (2 × min 0.5 mm²), 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_{rms}.
 8. Tank sensor shall be resistance type, please refer to Graph 7.1 for the characteristic and details of sensor. Its cable shall be (2 × min 0.3 mm²), double insulation layer (with insulation strength of min 30V) of PVC-sheathed or rubber-sheathed cable.



Graph 7.1: Tank sensor characteristic

9. Room sensor zone 1 cable shall be (2 × min 0.3 mm²) double insulation layer of PVC-sheathed or rubber-sheathed.
10. Outdoor air sensor cable shall be (2 × min 0.3 mm²) double insulation layer of PVC-sheathed or rubber-sheathed.
11. Tank OLP cable must be (2 × min 0.5 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.

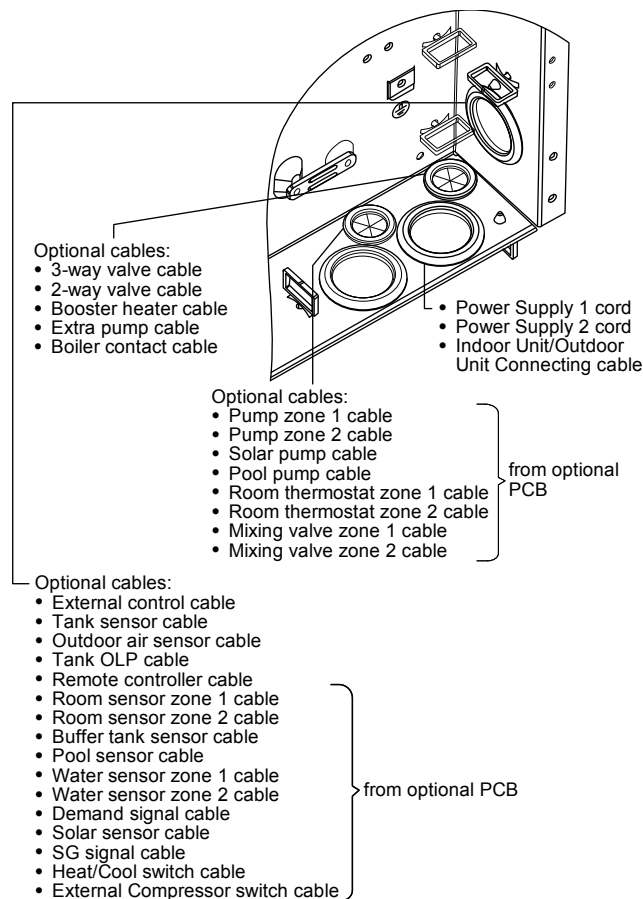


- For connection to optional PCB
 1. By connecting optional PCB, 2 Zone temperature control can be achieved. Please connect mixing

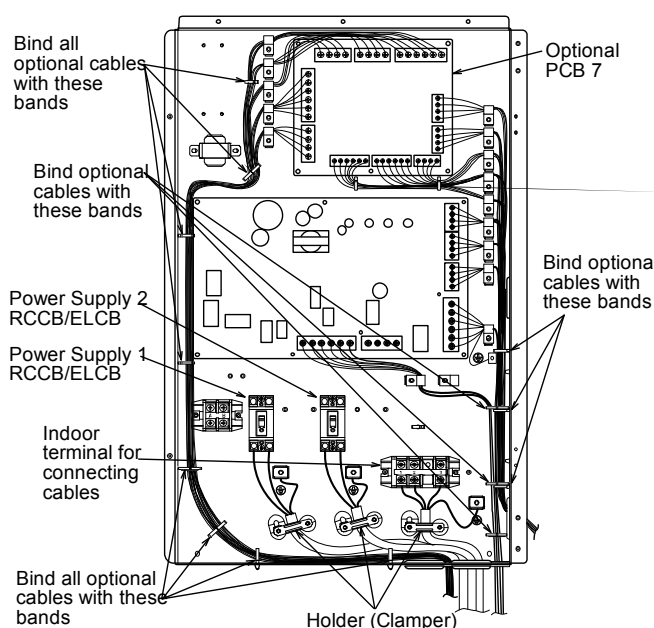
valves, water pumps and thermistors in zone 1 and zone 2 to each terminals in optional PCB.

Temperature of each zone can be controlled independently by remote controller.

2. Pump zone 1 and zone 2 cable shall be ($2 \times \min 1.5 \text{ mm}^2$), of type designation 60245 IEC 57 or heavier.
3. Solar pump cable shall be ($2 \times \min 1.5 \text{ mm}^2$), of type designation 60245 IEC 57 or heavier.
4. Pool pump cable shall be ($2 \times \min 1.5 \text{ mm}^2$), of type designation 60245 IEC 57 or heavier.
5. Room thermostat zone 1 and zone 2 cable shall be ($4 \times \min 0.5 \text{ mm}^2$), of type designation 60245 IEC 57 or heavier.
6. Mixing valve zone 1 and zone 2 cable shall be ($3 \times \min 1.5 \text{ mm}^2$), of type designation 60245 IEC 57 or heavier.
7. Room sensor zone 1 and zone 2 cable shall be ($2 \times \min 0.3 \text{ mm}^2$), 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 ($2 \times \min 0.3 \text{ mm}^2$), 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 ($2 \times \min 0.3 \text{ mm}^2$), double insulation layer of PVC-sheathed or rubber-sheathed cable.
10. Demand signal cable shall be ($2 \times \min 0.3 \text{ mm}^2$), double insulation layer of PVC-sheathed or rubber-sheathed cable.
11. SG signal cable shall be ($3 \times \min 0.3 \text{ mm}^2$), double insulation layer of PVC-sheathed or rubber-sheathed cable.
12. Heat/Cool switch cable shall be ($2 \times \min 0.3 \text{ mm}^2$), double insulation layer of PVC-sheathed or rubber-sheathed cable.
13. External compressor switch cable shall be ($2 \times \min 0.3 \text{ mm}^2$), double insulation layer of PVC-sheathed or rubber-sheathed cable.



Terminal screw on PCB	Maximum tightening torque N·m {kgf·cm}
M3	50 {5.1}
M4	120 {12.24}



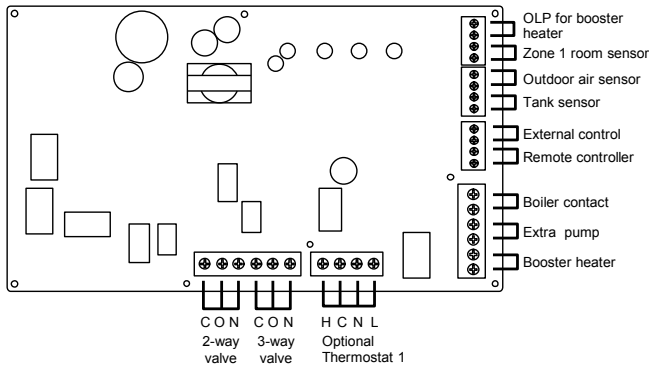
How to guide the optional cables and power supply cord
(view without internal wiring)

Connecting Cables Length

When connecting cables between Indoor 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
Three-way valve	50
Mixing valve	50
Room thermostat	50
Booster heater	50
Extra pump	50
Solar pump	50
Pool pump	50
Pump	50
Boiler contact	50
External control	50
Tank sensor	30
Room sensor	30
Outdoor air sensor	30
Tank OLP	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

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
OLP for booster heater	Dry contact Vcc-Bit1, Vcc-Bit2 open/short (System setup necessary) It is connected to the safety device (OLP) of DHW tank.
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.)

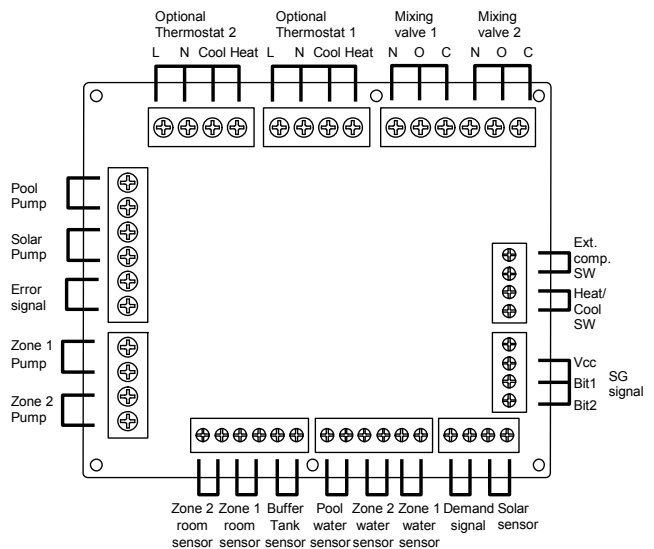
Outputs

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 indoor unit pump capacity is insufficient)
Booster heater	AC230V (Used when using booster heater in DHW tank)
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)
Tank sensor	Please use Panasonic specified part

Connection of Optional PCB (CZ-NS4P)



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

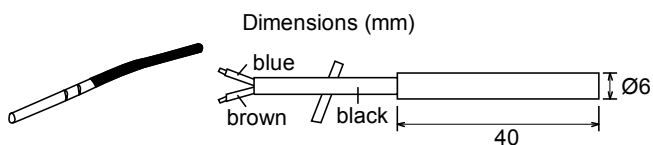
Mixing valve	AC230V N=Neutral Open, Close=mixture direction Operating time: 30s~120s
Pool pump	AC230V
Solar pump	AC230V
Zone pump	AC230V

■ Thermistor inputs

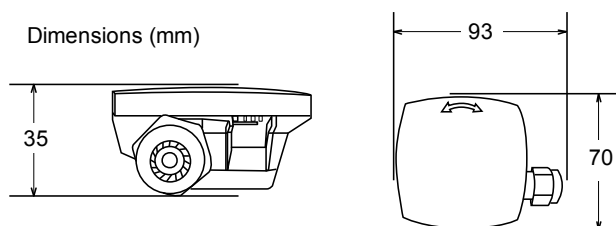
Zone room sensor	PAW-A2W-TSRT
Buffer tank sensor	PAW-A2W-TSBU
Pool water sensor	PAW-A2W-TSHC
Zone water sensor	PAW-A2W-TSHC
Solar sensor	PAW-A2W-TSSO

Recommended External Device Specification

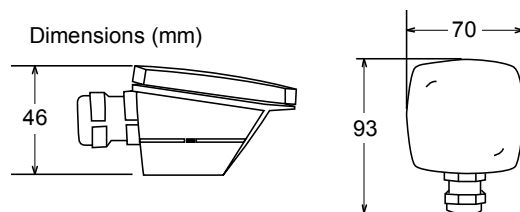
- This section explains about the external devices (optional) recommended by Panasonic. Please always ensure to use the correct external device during system installation.
 - For optional sensor.
1. Buffer tank sensor: PAW-A2W-TSBU
Use for measurement of the buffer tank temperature.
Insert the sensor into the sensor pocket and paste it on the buffer tank surface.



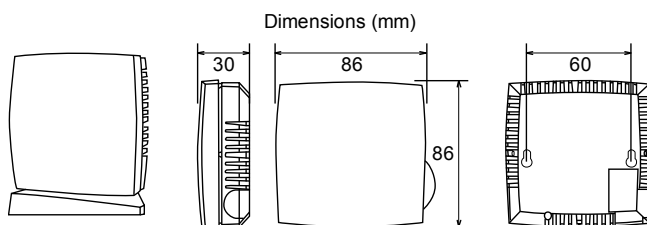
2. Zone water sensor: PAW-A2W-TSHC
Use to detect the water temperature of the control zone.
Mount it on the water piping by using the stainless steel metal strap and contact paste (both are included).



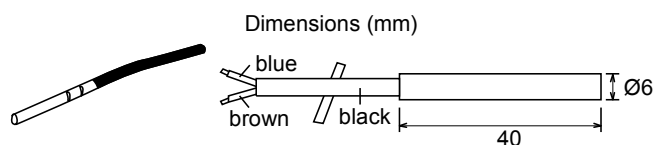
3. Outdoor sensor: PAW-A2W-TSOD
If the installation location of the outdoor unit is exposed to direct sunlight, the outdoor air temperature sensor will be unable to measure the actual outdoor ambient temperature correctly. In this case, optional outdoor temperature sensor can be fixed at a suitable location 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.



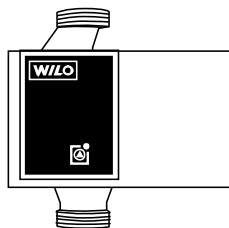
5. Solar sensor: PAW-A2W-TSSO
Use for measurement of the solar panel temperature.
Insert the sensor into the sensor pocket and paste it on the solar panel surface.



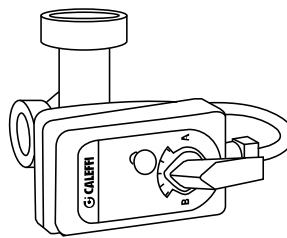
6. Please refer to the table below for sensor characteristic of the sensors mentioned above.

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



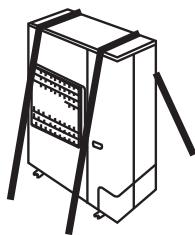
- For optional mixing valve.
Power supply: AC230V/50Hz (input open/output close)
Operating time: 30s~120s
Recommended part: 167032: made by Caleffi



Outdoor Unit

Select the Best Location

- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- Avoid installations in areas where the ambient temperature may drop below -20°C.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If outdoor unit installed near sea, region with high content of sulphur or oily location (e.g. machinery oil, etc), it lifespan maybe shorten.
- When installing the product in a place where it will be affected by typhoon or strong wind such as wind blowing between buildings, including the rooftop of a building and a place where there is no building in surroundings, fix the product with an overturn prevention wire, etc. (Overturn prevention fitting model number: K-KYZP15C) (For UD07*E5* and UD09*E5* only)



- If piping length is over 10 m, additional refrigerant should be added as shown in the table.

Model	Piping size		Rated Length (m)	Max. Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)
	Gas	Liquid					
UD03*E5* and UD05*E5*	ø12.7 mm (1/2")	ø6.35 mm (1/4")	5	5	3	15	20
UD07*E5* and UD09*E5*	ø15.88 mm (5/8")	ø6.35 mm (1/4")	5	20	3	30	30

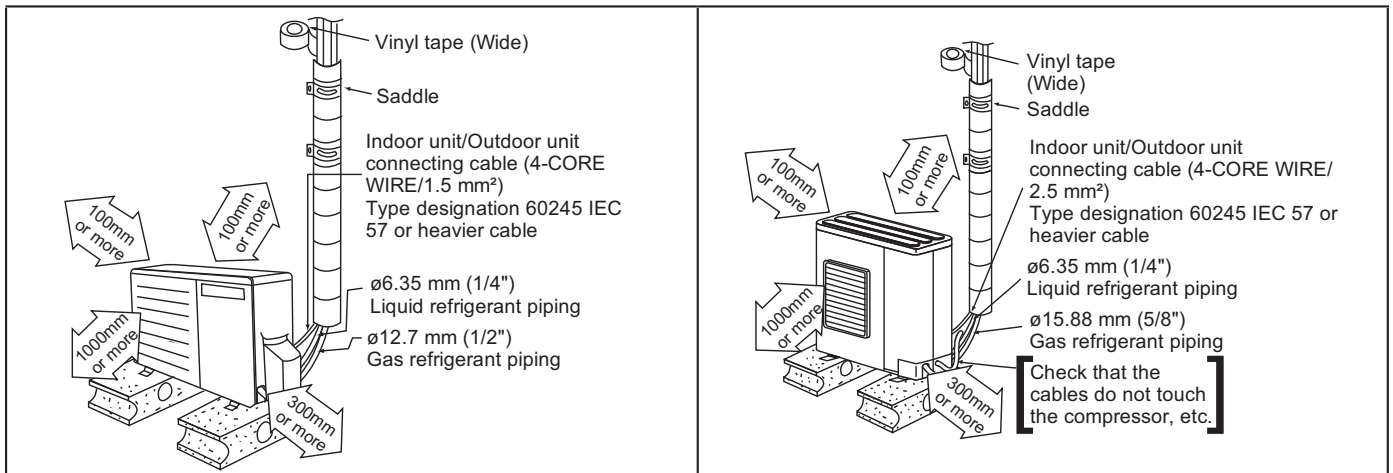
Example: For UD03*E5*

If piping length is 15m, the quantity of additional refrigerant should be 100g. [(15-10)m × 20 g/m = 100g]

Install The Outdoor Unit

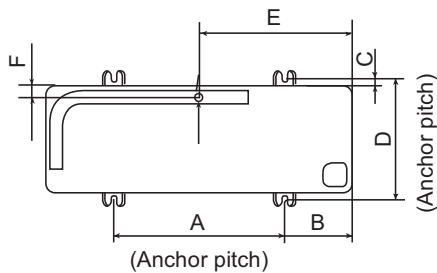
Installation Diagram

- It is advisable to avoid more than 2 blockage directions. For better ventilation & multiple-outdoor installation, please consult authorized dealer/specialist.
- This illustration is for explanation purposes only.



For UD03*E5* and UD05*E5*

For UD07*E5* and UD09*E5*



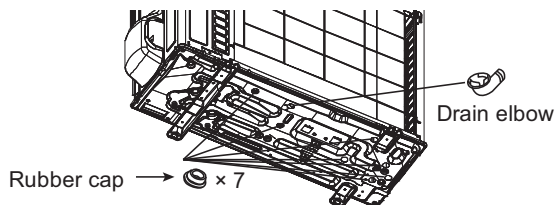
Model	A	B	C	D	E	F
UD03*E5* and UD05*E5*	540	160	20	330	430	46
UD07*E5* and UD09*E5*	620	140	15	355	450	44

(Unit : mm)

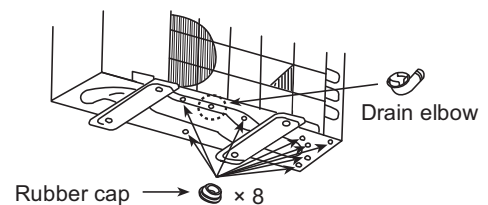
- After selecting the best location, start installation according to Installation Diagram.
- Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut (ø10 mm).
 - When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.

Disposal of Outdoor Unit Drain Water

- When a Drain elbow is used, please ensure to follow below:
 - the unit should be placed on a stand which is taller than 50 mm.
 - cover the ø20 mm holes with Rubber cap 2 (refer to illustration below).
 - use a tray (field supply) when necessary to dispose the outdoor unit drain water.
- If the unit is used in an area where temperature falls below 0°C for 2 or 3 consecutive days, it is recommended not to use the Drain elbow and Rubber cap, for the drain water freezes and the fan will not rotate.



UD03*E5* and UD05*E5*



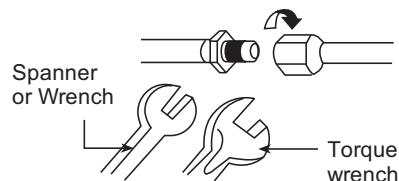
UD07*E5* and UD09*E5*

Connecting The Piping

Connecting the Piping to Outdoor Unit

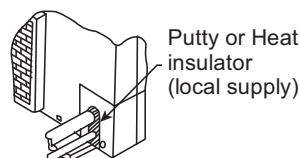
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe. Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

Model	Piping size (Torque)	
	Gas	Liquid
UD03*E5* and UD05*E5*	ø12.7 mm (1/2") [55 N•m]	ø6.35 mm (1/4") [18 N•m]
UD07*E5* and UD09*E5*	ø15.88 mm (5/8") [65 N•m]	ø6.35 mm (1/4") [18 N•m]



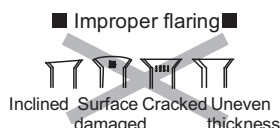
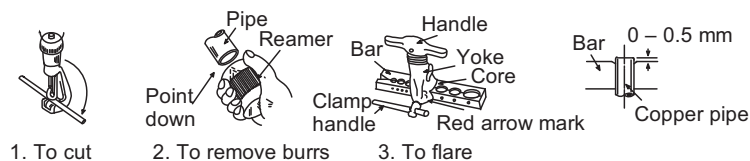
Be sure to use two spanners to tighten. (If the nuts are overtightened, it may cause the flares to break or leak.)

Close the tube joining area with putty heat insulator (local supply) without any gap as shown in below figure. (To prevent insects or small animal entering.) (For UD07*E5* and UD09*E5* only)



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.



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.

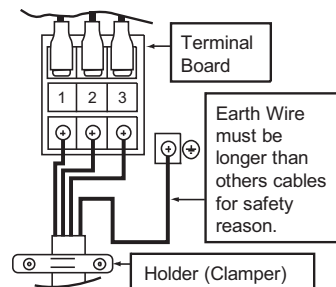
Connect The Cable To The Outdoor Unit

(FOR DETAIL REFER TO WIRING DIAGRAM AT UNIT)

1. Remove the control board cover from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed flexible cable (see below table), type designation 60245 IEC 57 or heavier cable.

Models	Flexible cable specification
UD03*E5* and UD05*E5*	4 × (1.5 mm ²)
UD07*E5* and UD09*E5*	4 × (2.5 mm ²)

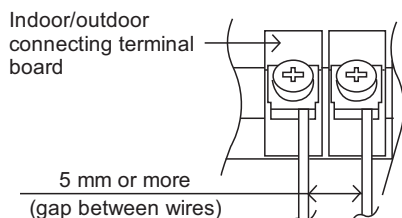
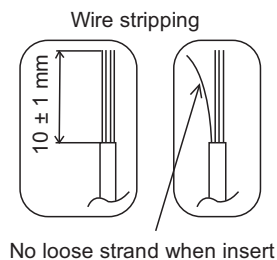
Terminals on the indoor unit	1	2	3	
Colour of wires				
Terminals on the outdoor unit	1	2	3	



 **WARNING**
 This equipment must be properly earthed.

3. Secure the cable onto the control board with the holder (clammer).
4. Attach the control board cover back to the original position with screw.

WIRE STRIPPING AND CONNECTING REQUIREMENT

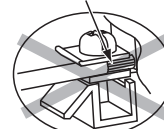


Conductor fully insert



ACCEPT

Conductor over insert



PROHIBITED

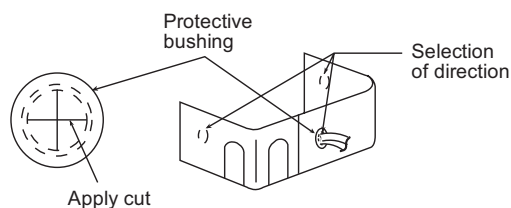
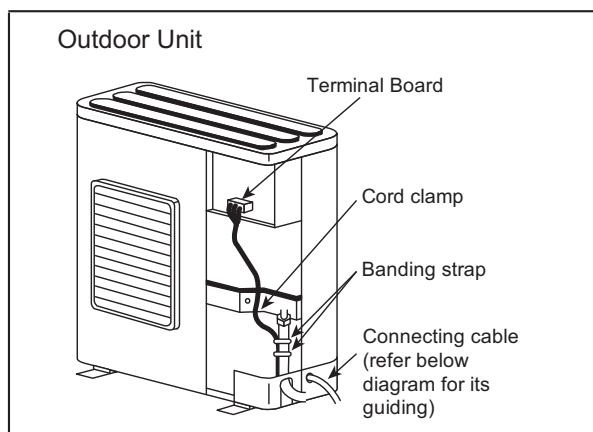
Conductor not fully insert



PROHIBITED

(For UD07*E5* and UD09*E5* only)

- Select required direction and apply protective bushing provided in accessories to protect cables from sharp edges.
- Once all wiring work has been completed, tie the cable and cord together with the binding strap so that they do not touch other parts such as the compressor and bare copper pipes.



DETAIL OF CONNECTING CABLE GUIDING

Pipe Insulation

1. Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
2. If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

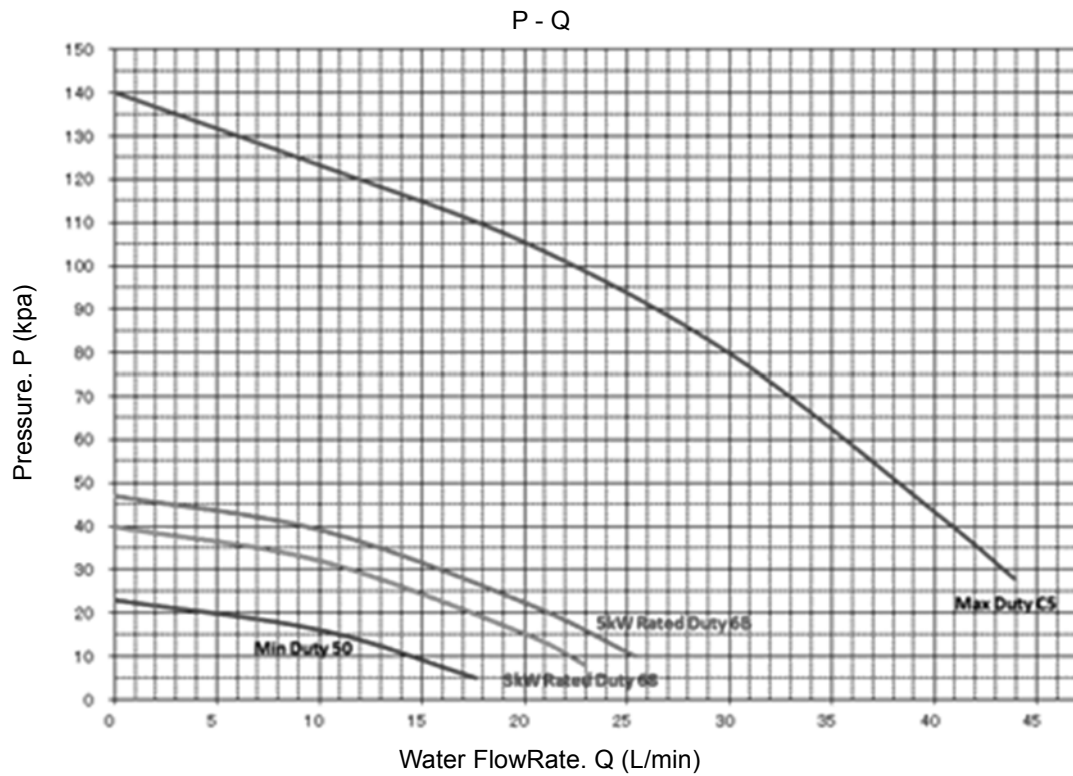
Maximum pump speed setting on remote control

- Standard pump speed is automatically controlled to get the designed water temperature different between water inlet and outlet (ΔT). Instead of setting the standard pump speed, maximum pump speed is manually adjusted by the installer according to water circuit pressure drop.

However, the following sequences do not follow maximum pump duty setting by remote control.

- Pump down mode
- Air purge mode
- Normal deice

1) P-Q graph for different pump HEX duty



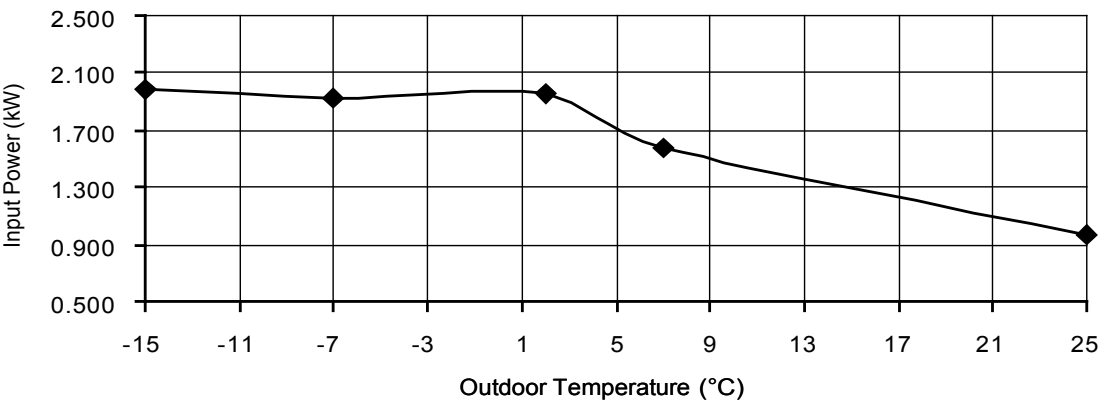
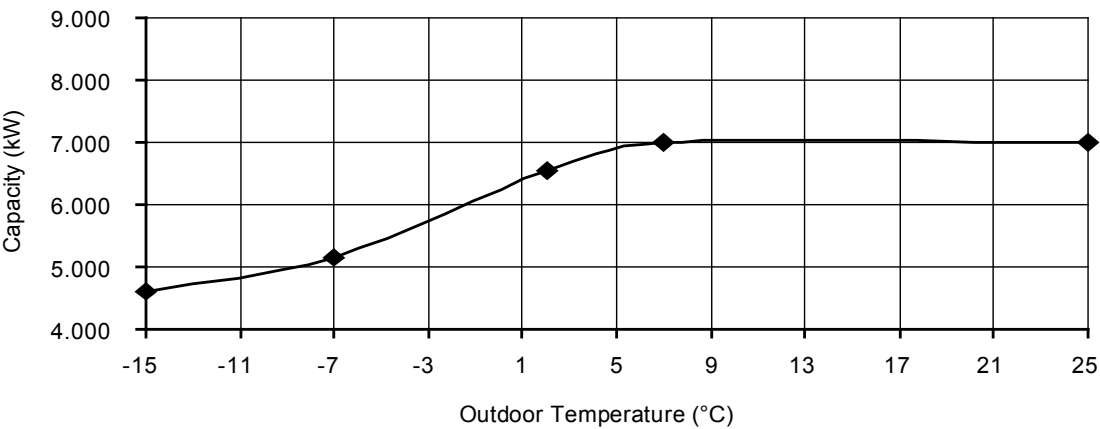
Technical Data

Operation Characteristics

WH-SDC07H3E5 WH-UD07HE5

Heating Characteristics at Different Outdoor Air Temperature

Condition
Outdoor air temperature : 7°C (DBT), 6°C (WBT)
Indoor water inlet temperature : 30°C
Indoor water outlet temperature : 35°C
Piping length : 7 m



Cooling Characteristics at Different Outdoor Air Temperature

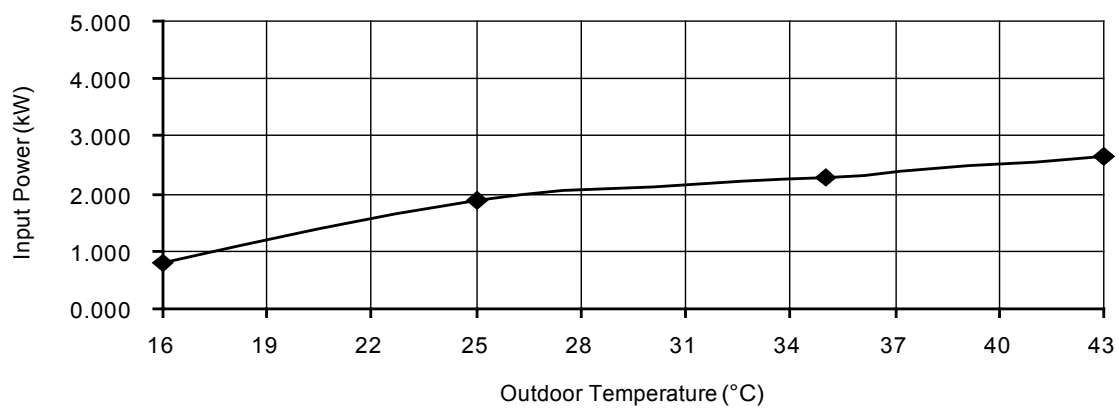
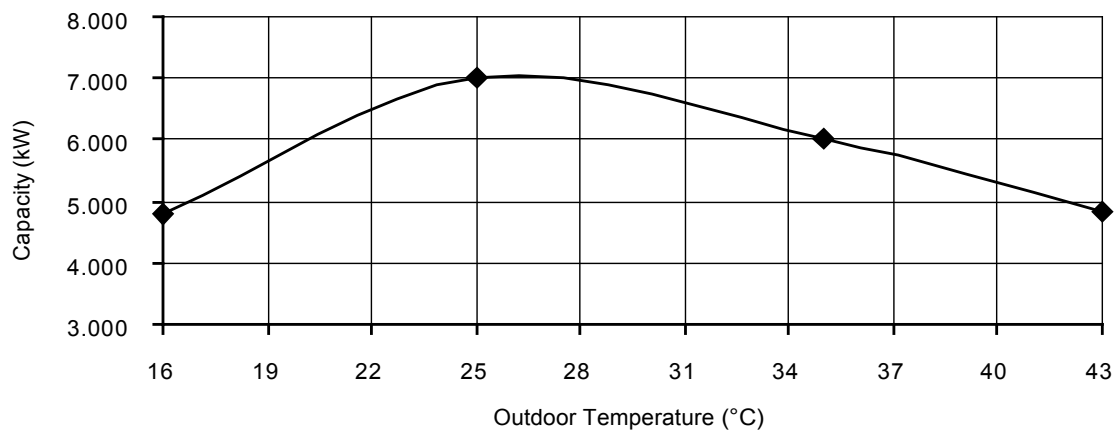
Condition

Outdoor air temperature : 35°C (DBT), -°C (WBT)

Indoor water inlet temperature : 12°C

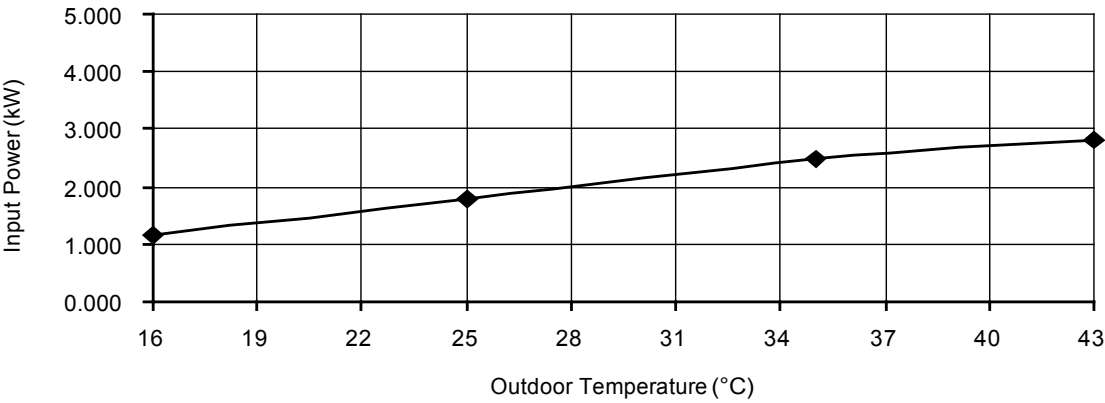
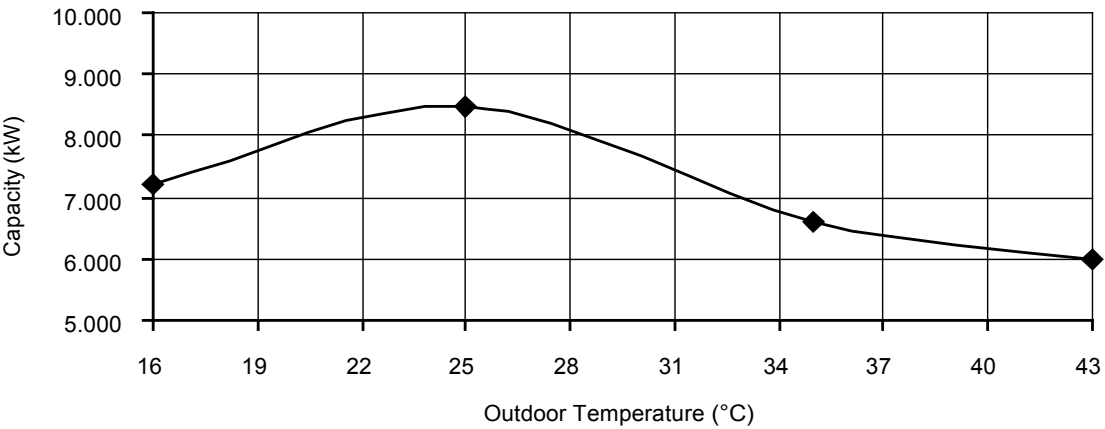
Indoor water outlet temperature : 7°C

Piping length : 7 m



Cooling Characteristics at Different Outdoor Air Temperature

Condition
Outdoor air temperature : 35°C (DBT), -°C (WBT)
Indoor water inlet temperature : 19°C
Indoor water outlet temperature : 14°C
Piping length : 7 m



Cooling Characteristics at Different Outdoor Air Temperature

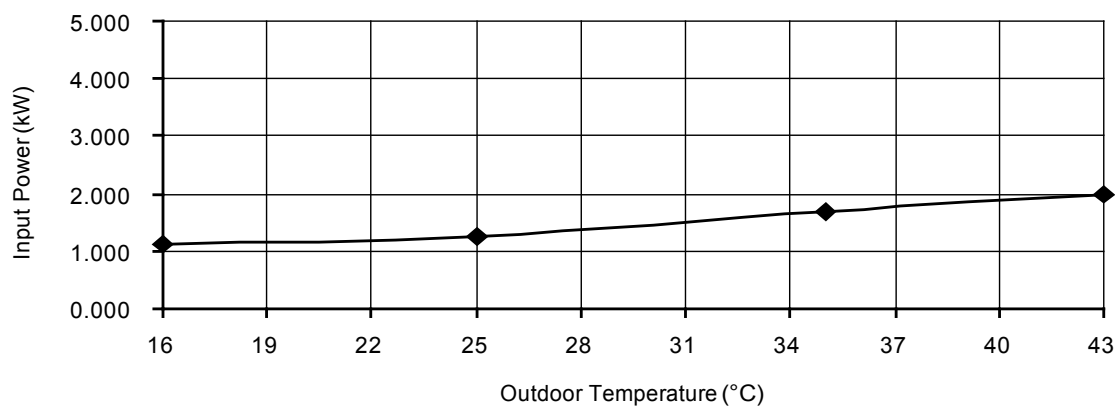
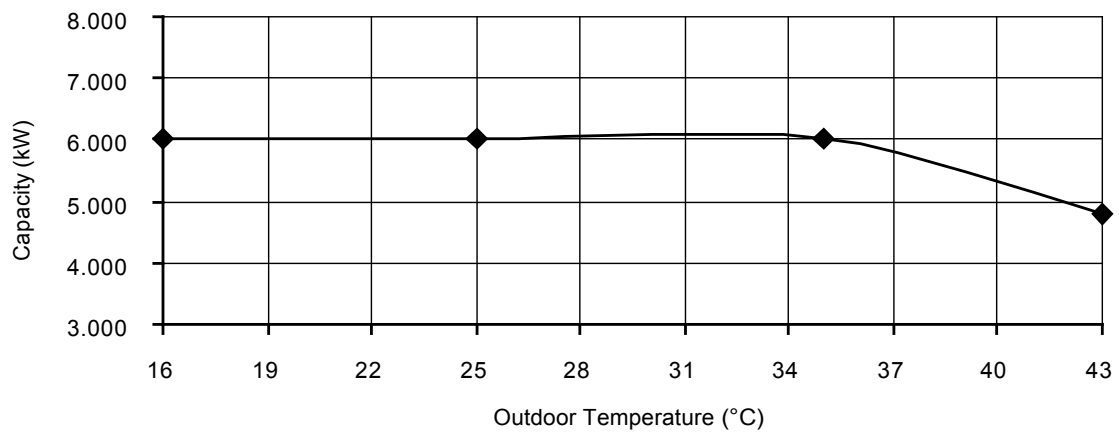
Condition

Outdoor air temperature : 35°C (DBT), -°C (WBT)

Indoor water inlet temperature : 23°C

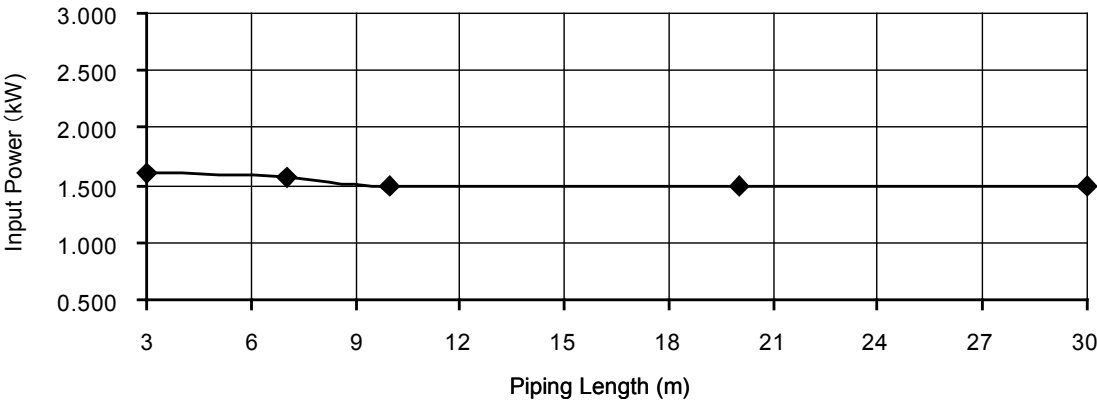
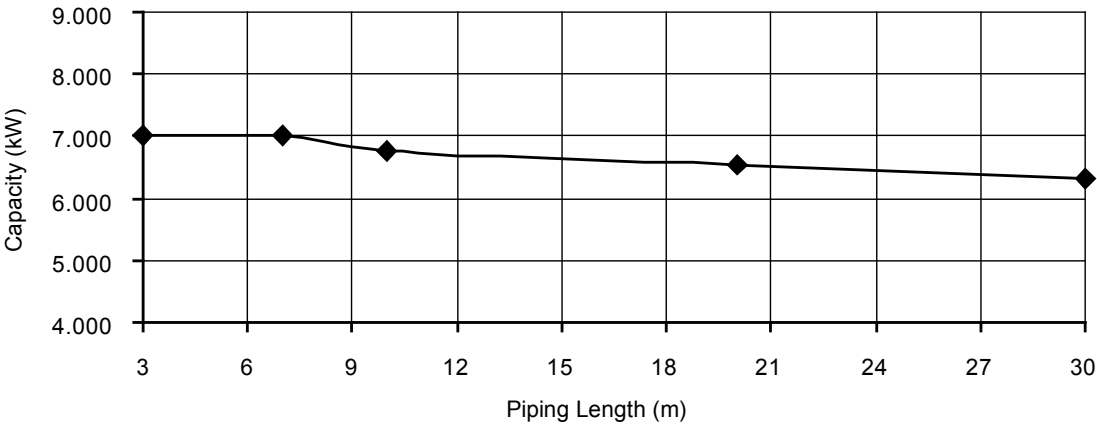
Indoor water outlet temperature : 18°C

Piping length : 7 m



Heating Characteristics at Different Piping Length

Condition
Outdoor air temperature : 7°C (DBT), 6°C (WBT)
Indoor water inlet temperature : 30°C
Indoor water outlet temperature : 35°C
Piping length : 7 m



Cooling Characteristics at Different Piping Length

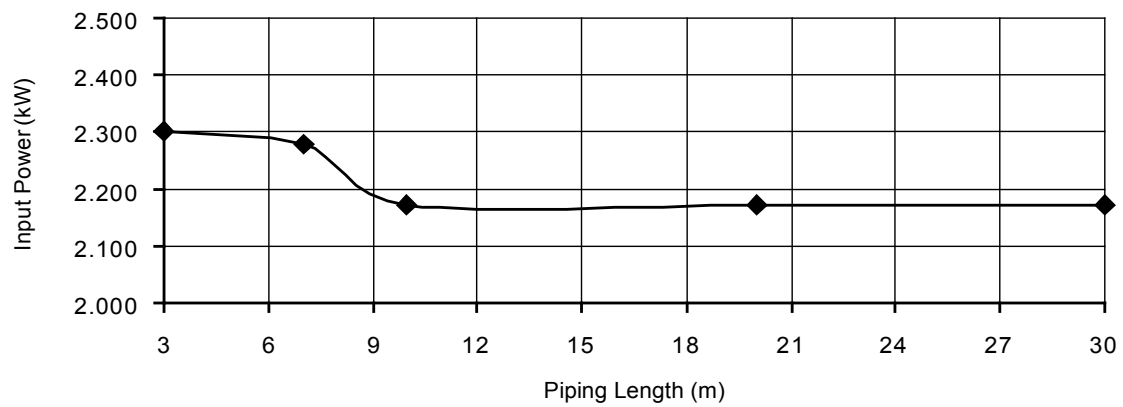
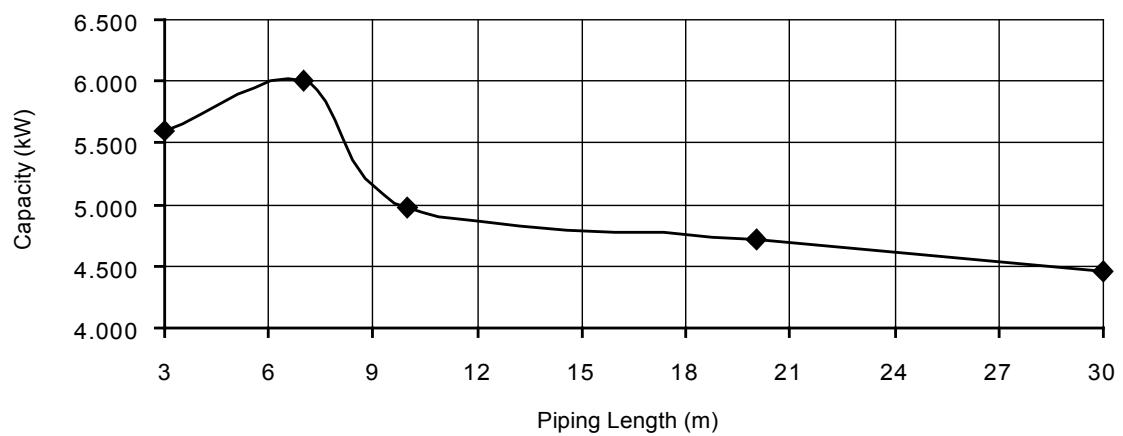
Condition

Outdoor air temperature : 35°C (DBT), -°C (WBT)

Indoor water inlet temperature : 12°C

Indoor water outlet temperature : 7°C

Piping length : 7 m



Heating Capacity Table

WH-UD07HE5

Water Out (°C)	35		40		45		50		55	
Outdoor Air (°C)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)
-15	4600	1980	4600	2190	4600	2400	4550	2630	4500	2860
-7	5150	1910	5075	2140	5000	2360	4900	2450	4800	2540
2	6550	1960	6575	2290	6600	2620	6300	2815	6000	3010
7	7000	1570	7000	1835	7000	2100	6900	2345	6800	2590
25	7000	970	6740	1140	6480	1310	6240	1430	6000	1550

Cooling Capacity Table

WH-SDC07H3E5 WH-UD07HE5

Water Out (°C)	7		14		18	
Outdoor Air (°C)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)
16	4800	800	7200	1160	6000	1130
25	7000	1900	8470	1780	6000	1270
35	6000	2280	6600	2480	6000	1680
43	4850	2650	6000	2820	4800	1980