Service Manual

Air-to-Water Heatpump

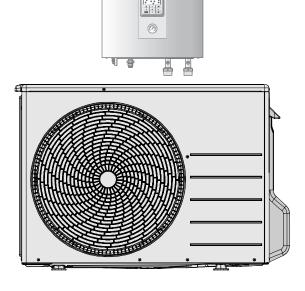
Indoor Unit

Outdoor Unit

WH-SDC05H3E5

WH-UD05HE5

Destination **Europe Turkey**



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.

PRECAUTION OF LOW TEMPERATURE

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



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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:

\Diamond	Symbol with white background denotes item that is PROHIBITED from doing.
0 0	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 install outdoor unit near handrail of veranda. When installing outdoor unit at veranda of high rise building, child may climb up to outdoor unit and cross over the handrail and causing accident.	0
2.	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.	\Diamond
3.	Do not tie up the power supply cord into a bundle by band. Abnormal temperature rise on power supply cord may happen.	\Diamond
4.	Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.	\Diamond
5.	Do not sit or step on the unit, you may fall down accidentally.	\Diamond
6.	Keep plastic bag (packaging material) away from small children, it may cause suffocation.	\Diamond
7.	Do not use pipe wrench to install refrigerant piping. It might deform the piping and cause the unit to malfunction.	\Diamond
8.	Do not purchase unauthorized electrical parts for installation, service, maintenance and etc They might cause electrical shock or fire.	\Diamond
9.	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.	\Diamond
10.	Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury etc.	\Diamond
11.	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.	0
12.	For water circuit installation work, follow to relevant European and national regulations (including EN61770) and local plumbing and building regulation codes.	0
13.	Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.	0
14.		0
	 Thickness or 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. 	
15.	When install or relocate Indoor / Outdoor 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.	0
16.	Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.	0
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.	0

	⚠ WARNING
18.	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 / OUTDOOR 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.
19.	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.
20.	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.
21.	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.
22.	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.
23.	After completion of installation, confirm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.
24.	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.
25.	Only use the supplied or specified installation parts, else, it may cause unit vibrate loose, water leakage, electrical shock or fire.
26.	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.
27.	If there is any doubt about the installation procedure or operation, always contact the authorized dealer for advice and information.
28.	Select a location where in case of water leakage, the leakage will not cause damage to other properties.
29.	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.
30.	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.
31.	This unit must be properly earthed. The electrical earth must not be connected to a gas pipe, water pipe, the earth of lightening 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 / Outdoor 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.	0
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.	\Diamond
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.	\Diamond
4.	Make sure the insulation of power supply cord does not contact hot part (i.e. refrigerant piping) to prevent from insulation failure (melt).	\Diamond
5.	Do not touch the sharp aluminium fin, sharp parts may cause injury.	\Diamond
6.	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.	\Diamond
7.	Select an installation location which is easy for maintenance.	0
8.	Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.	0
9.	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 15/16A 2-poles circuit breaker with a minimum contact gap of 3.0 mm. Power supply 2: Use approved 15/16A 2-poles circuit breaker with a minimum contact gap of 3.0 mm.	0
10.	Ensure the correct polarity is maintained throughout all wiring. Otherwise, it will cause electrical shock or fire.	0
11.	After installation, check the water leakage condition in connection area during test run. If leakage occurs, it will cause damage to other properties.	0

⚠ 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.



WH-SDC05H3E5 WH-UD05HE5

	Ite	em	Unit	Outdo	or Unit	
Performance Test Condition			EN 1	14511		
			Condition	A3:	5W7	
			(Ambient/Water) kW	4.50		
Coo	ling Capacity		BTU/h	15300		
			kcal/h		370	
			W/W			
Coo	ling EER				69	
			kcal/hW Condition		32	
			(Ambient/Water)	A7W35	A2W35	
Hea	ting Capacity		kW	5.00	4.20	
	g capacity		BTU/h	17100	14300	
			kcal/h	4300	3610	
11	tion COD		W/W	4.63	3.11	
неа	ting COP		kcal/hW	3.98	2.67	
			Condition (Ambient/Water)	A38	5W7	
Nois	se Level		dB (A)	Cooli	ng: 48	
			Power Level dB	Cooli	ng: 66	
		Application	Climate	Average – Low Temp (W35)	Average – Medium Temp (W55)	
		Pdesign	kW	5.0	4.0	
ing		Tbivalent	°C	-10	-10	
Heating	ErP	SCOP	(W/W) / %	4.88 / 195	3.25 / 130	
_		Annual Consumption	kWh	2116	2541	
		Class		A++	A++	
Air F	Flow		m³/min (ft³/min)	Cooling: 39.6 (1400) Heating: 31.8 (1120)		
Refr	igeration Control Devic	е			on Valve	
Refr	igeration Oil		cm ³	FV50S (450)		
Refr	igerant (R410A)		kg (oz)	1.20	(42.4)	
		Height	mm (inch)	622 (24-1/2)		
Dim	ension	Width	mm (inch)	824 (32-15/32)		
		Depth	mm (inch)	298 (11-24/32)		
Net	Weight	1	kg (lbs)	39 (86)		
		Liquid	mm (inch)	6.35 (1/4)		
Pipe	Diameter	Gas	mm (inch)	12.70	0 (1/2)	
Star	ndard Length	l	m (ft)	7 (23.0)		
	Length Range		m (ft)		15 (49.2)	
	& O/D Height Difference)	m (ft)		16.4)	
	itional Gas Amount		g/m (oz/ft)		(0.2)	
Refrigeration Charge Less		m (ft)		32.8)		
The state of the s		Туре	1		otor (Rotary)	
Compr	npressor	Motor Type		Brushless (4-poles)		
	.p. 2000.	Rated Output	kW	0.90		
		Туре			ller Fan	
		Material			PP	
		Motor Type			-poles)	
Fan		Input Power	W	,	_	
		Output Power	W	40		
			rpm		ng: 980	
		Fan Speed		Heating: 860		

ltem		Unit	Outdoor Unit		
	Fin material		Aluminium (Pre Coat)		
	Fin Type		Corrugated Fin		
Heat Exchanger	Row × Stage × FPI		2 × 28 × 17		
	Size (W × H × L)	mm	36.4 × 588 × 827.7 : 856.3		
		Ø	Single		
Power Source (Phase	, Voltage, Cycle)	V	230		
		Hz		50	
Input Power		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		kW	Cooling: 1.67	Heating: 1.08	Heating: 1.35
Maximum Input Power For Heatpump System		kW	2.59		
Power Supply 1 : Pha	se (Ø) / Max. Current (A) / Max.	Input Power (W)	1Ø / 12.0 / 2.59k		
Power Supply 2 : Phase (Ø) / Max. Current (A) / Max. Ir		Input Power (W)	1Ø / 13.0 / 3.00k		
Power Supply 3 : Pha	se (Ø) / Max. Current (A) / Max.	Input Power (W)		<u> </u>	
Starting Current		A	5.0		
Running Current		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		А	Cooling: 7.6	Heating: 5.0	Heating: 6.2
Maximum Current For	Heatpump System	Α	12.0		
Power Factor Power factor means total figure of compressor and outdoor fan motor.		%	A35W7 Cooling: 96	A7W35 Heating: 94	A2W35 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
operation range	Water Outlet	°C	Cooling: 5 ~ 20 Heating: 20 ~ 55
Internal Pressure Differentia	al	kPa	Cooling: 9.5 Heating: 12.3
		Condition (Ambient/Water)	A35W7
Noise Level		dB (A)	Cooling: 28
		Power Level dB	Cooling: 41
	Height	mm (inch)	892 (35-1/8)
Dimension	Width	mm (inch)	500 (19-11/16)
	Depth	mm (inch)	340 (13-13/32)
Net Weight		kg (lbs)	44 (97)
Defrigerent Dine Diemeter	Liquid	mm (inch)	6.35 (1/4)
Refrigerant Pipe Diameter	Gas	mm (inch)	12.70 (1/2)
Water Pipe Diameter	Inlet	mm (inch)	28 (1-3/32)
Water Fipe Diameter	Outlet	mm (inch)	28 (1-3/32)
Water Drain Hose Inner Dia	ımeter	mm (inch)	12 (15/32)
Pump	Motor Type		DC Motor
Pullip	Input Power	W	34
	Туре		Brazed Plate
	No. of Plates		48
Hot Water Coil	Size (H × W × L)	mm	82 × 93 × 325
	Water Flow Rate	l/min (m³/h)	Cooling: 12.9 (0.8) Heating: 14.3 (0.9)
Pressure Relief Valve Water Circuit		kPa	Open: 300, Close: 266 and below
Flow Switch			Electronic Sensor

Item		Unit	Indoor Unit
Protection Device		Α	Residual Current Circuit Breaker (30 ~ 40)
Expansion Vessel	Volume	I	10
Expansion vessei	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.

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

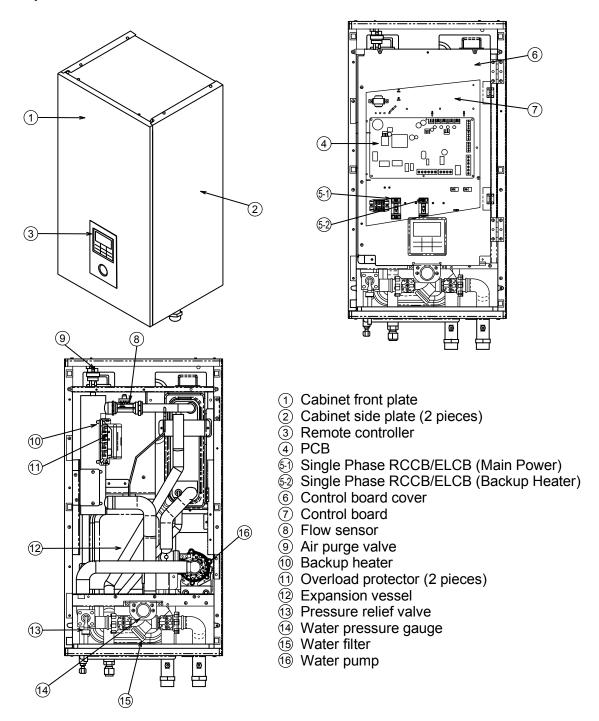
- Breakdown Self Diagnosis function
- System Status Check Buttons for servicing purpose
- System Pumpdown Button for servicing purpose
- Front maintenance design for outdoor unit

Operation Condition

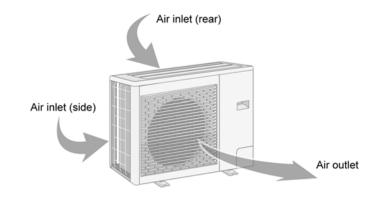
		Indoor	Outdoor
		Water outlet temperature (°C)	Ambient temperature (°C)
COOLING	Maximum	20	43
COOLING	Minimum	5	16
HEATING	Maximum	55	35
	Minimum	20	-20

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

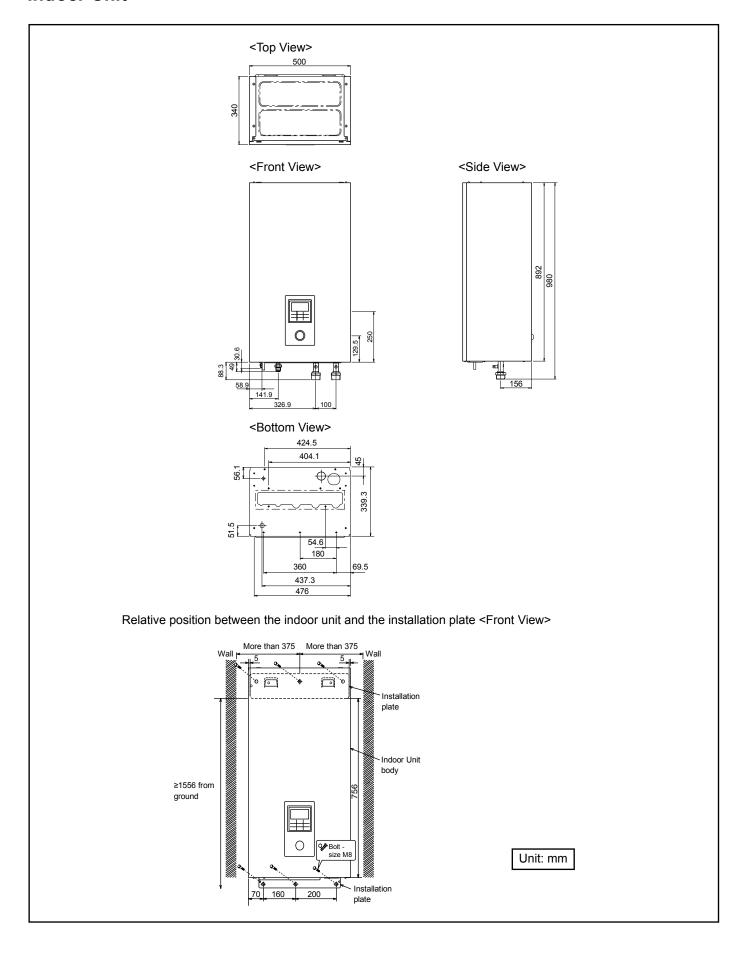


Outdoor Unit

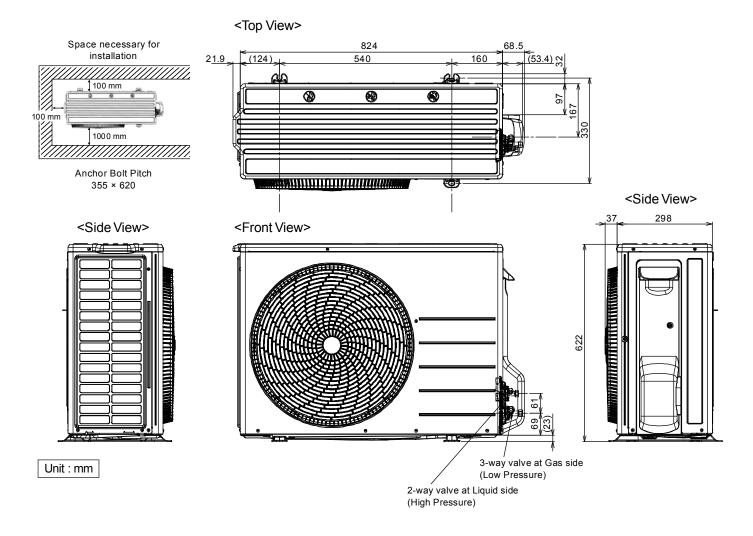


Dimensions

Indoor Unit

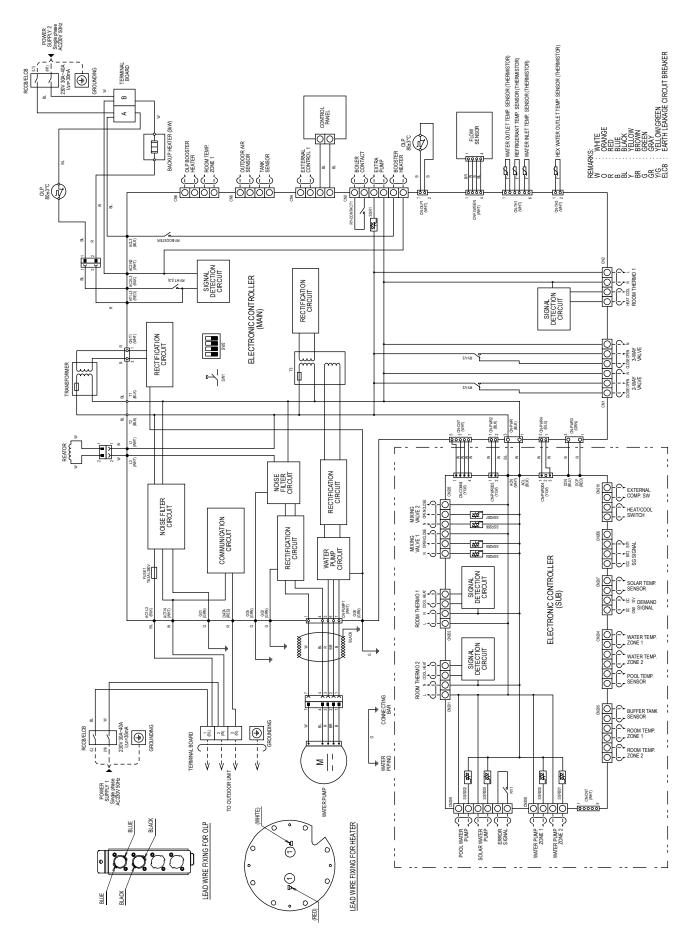


Outdoor Unit

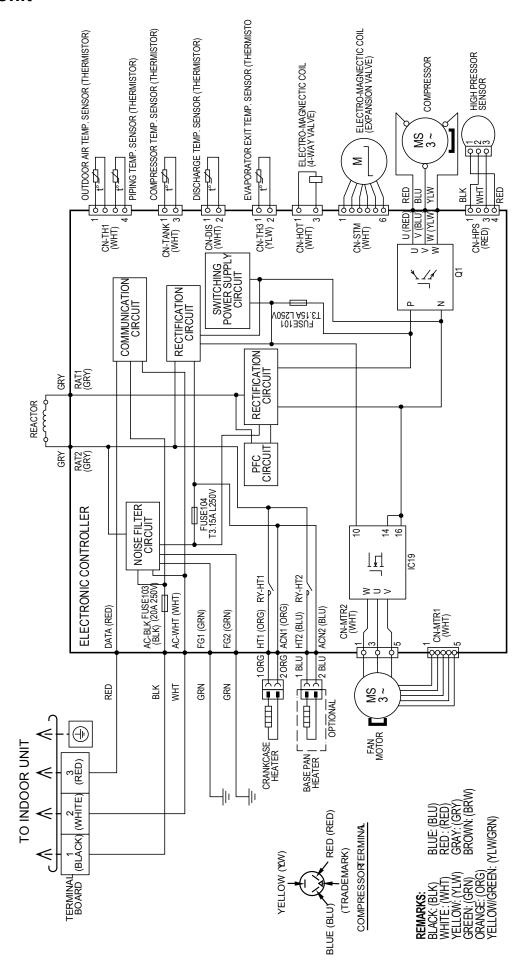


Wiring Connection Diagram

Indoor Unit



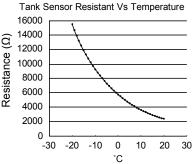
Outdoor Unit



How To Fix Cable

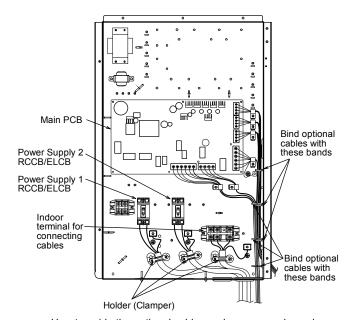
Connecting with external device (optional)

- All connections shall follow to the local national wiring standard.
- It is strongly recommended to use manufacturerrecommended parts and accessories for installation.
- For connection to main PCB.
- Two-way valve shall be spring and electronic type, refer to "Field Supply Accessories" table for details. Valve cable shall be $(3 \times min 1.5 mm^2)$, 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.
- 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.
- 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.
- 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.
- Extra pump cable shall be (2 × min 1.5 mm²), of type designation 60245 IEC 57 or heavier.
- Boiler contact cable shall be (2 × min 0.5 mm²), of type designation 60245 IEC 57 or heavier.
- 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 3Arms.
- 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.

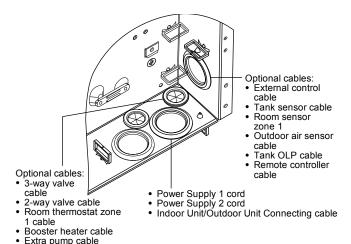


Graph 7.1: Tank sensor characteristic

- 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.

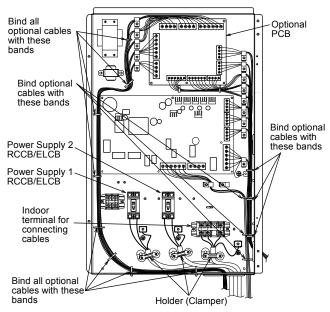


How to guide the optional cables and power supply cord (view without internal wiring)

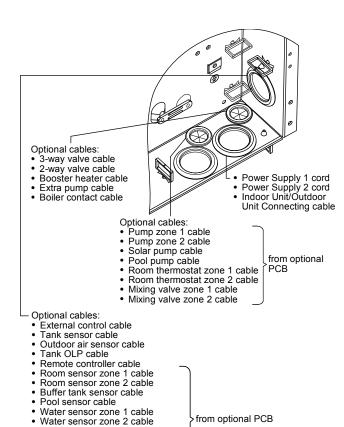


- Boiler contact cable
- For connection to optional PCB
- By connecting optional PCB, 2 Zone temperature control can be achieved. Please connect mixing

- 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 × min 1.5 mm²), of type designation 60245 IEC 57 or heavier.
- 3. Solar pump cable shall be (2 × min 1.5 mm²), of type designation 60245 IEC 57 or heavier.
- 4. Pool pump cable shall be (2 × min 1.5 mm²), of type designation 60245 IEC 57 or heavier.
- 5. Room thermostat zone 1 and zone 2 cable shall be (4 × min 0.5 mm²), of type designation 60245 IEC 57 or heavier.
- 6. Mixing valve zone 1 and zone 2 cable shall be (3 × min 1.5 mm²), of type designation 60245 IEC 57 or heavier.
- Room sensor zone 1 and zone 2 cable shall be (2 × min 0.3 mm²), double insulation layer (with insulation strength of minimum 30V) of PVC-sheathed or rubber-sheathed cable.
- Buffer tank sensor, pool water sensor and solar sensor cable shall be (2 × min 0.3 mm²), double insulation layer (with insulation strength of minimum 30V) of PVC-sheathed or rubbersheathed cable.
- Water sensor zone 1 and zone 2 cable shall be (2 x min 0.3 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.
- Demand signal cable shall be (2 × min 0.3 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.
- 11. SG signal cable shall be (3 × min 0.3 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.
- 12. Heat/Cool switch cable shall be (2 × min 0.3 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.
- 13. External compressor switch cable shall be (2 × min 0.3 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.



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



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

Demand signal cable

SG signal cable Heat/Cool switch cable

External Compressor switch cable

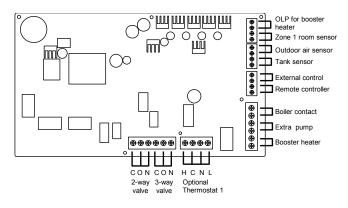
Solar sensor cable

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.)

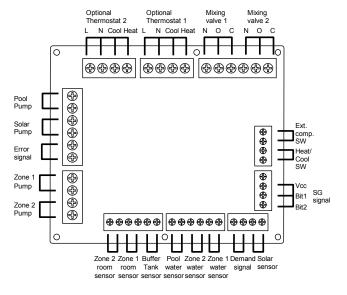
Outputs

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=Cool, Short=Heat (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

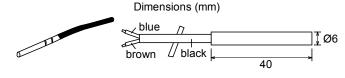
Thermistor inputs

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

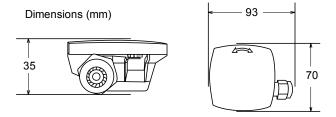
- This section explains about the external devices (optional) recommended by Panasonic. Please always ensure to use the correct external device during system installation.
- For optional sensor.
- Buffer tank sensor: PAW-A2W-TSBU
 Use for measurement of the buffer tank
 temperature.

Insert the sensor into the sensor pocket and paste it on the buffer tank surface.



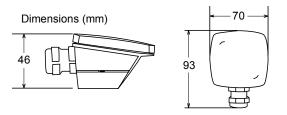
Zone water sensor: PAW-A2W- TSHC
 Use to detect the water temperature of the control zone.

Mount it on the water piping by using the stainless steel metal strap and contact paste (both are included).

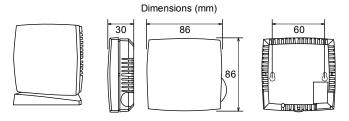


3. Outdoor sensor: PAW-A2W-TSOD

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.

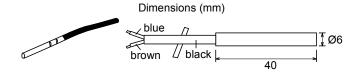


4. Room sensor: PAW-A2W- TSRT Install the room temperature sensor to the room which requires room temperature control.



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.

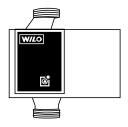


6. Please refer to the table below for sensor characteristic of the sensors mentioned above.

Temperature	Resistance
(°C)	(kΩ)
30	5.326
25	6.523
20	8.044
15	9.980
10	12.443
5	15.604
0	19.70
-5	25.05
-10	32.10
-15	41.45
-20	53.92
-25	70.53
-30	93.05
-35	124.24
-40	167.82

Temperature (°C)	Resistance (kΩ)
150	0.147
140	0.186
130	0.236
120	0.302
110	0.390
100	0.511
90	0.686
80	0.932
70	1.279
65	1.504
60	1.777
55	2.106
50	2.508
45	3.003
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.

Madal	Pipin	g size	Rated	Max. Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)
Model	Gas	Liquid	Length (m)				
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

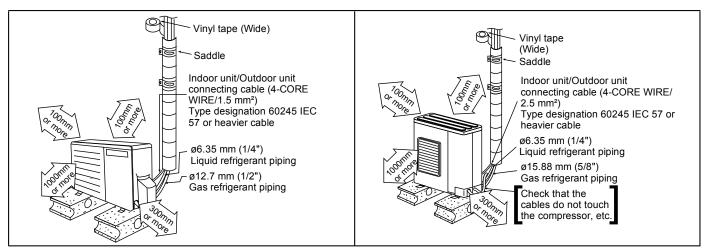
Example: For UD03*E5*

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

Install The Outdoor Unit

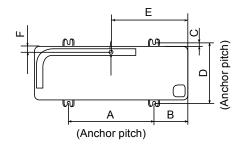
Installation Diagram

- 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*



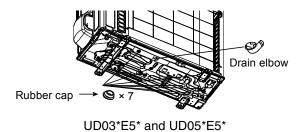
Model	Α	В	C	D	Е	F
UD03*E5* and UD05*E5*	540	160	20	330	430	46
UD07*E5* and UD09*E5*	620	140	15	355	450	44

(Unit: mm)

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

11.4.2.2 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.





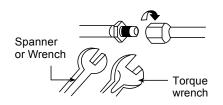
UD07*E5* and UD09*E5*

Connecting The Piping

Connecting the Piping to Outdoor Unit

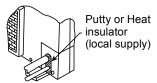
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe. Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

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

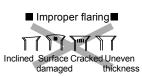


CUTTING AND FLARING THE PIPING

- 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.

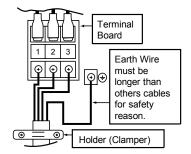
Connect The Cable To The Outdoor Unit

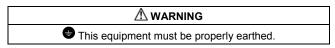
(FOR DETAIL REFER TO WIRING DIAGRAM AT UNIT)

- 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 mm²)
UD07*E5* and UD09*E5*	4 × (2.5 mm²)

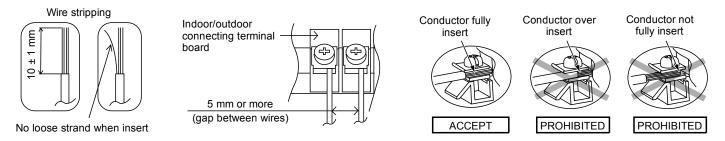
Terminals on the indoor unit	1	2	3	
Colour of wires				
Terminals on the outdoor unit	1	2	3	





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

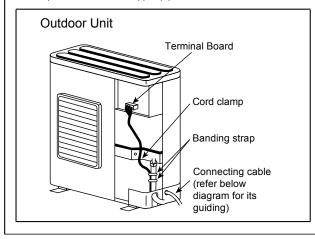
WIRE STRIPPING AND CONNECTING REQUIREMENT

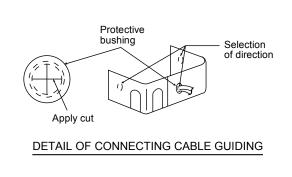


(For UD07*E5* and UD09*E5* only)

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.





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.

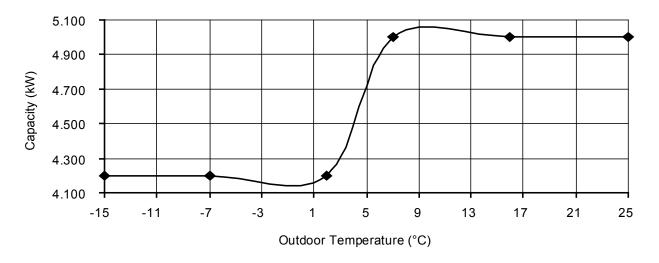
WH-SDC05H3E5 WH-UD05HE5

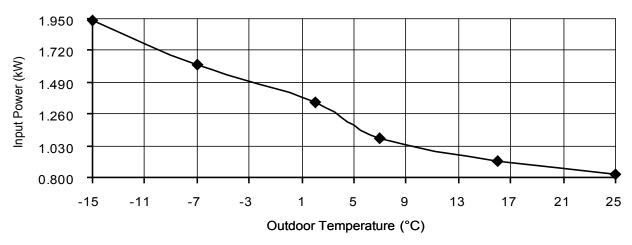
Heating Characteristics at Different Outdoor Air Temperature

Condition

Outdoor air temperature: 7°C (DBT), 6°C (WBT)

Indoor water inlet temperature : 30°C Indoor water outlet temperature : 35°C



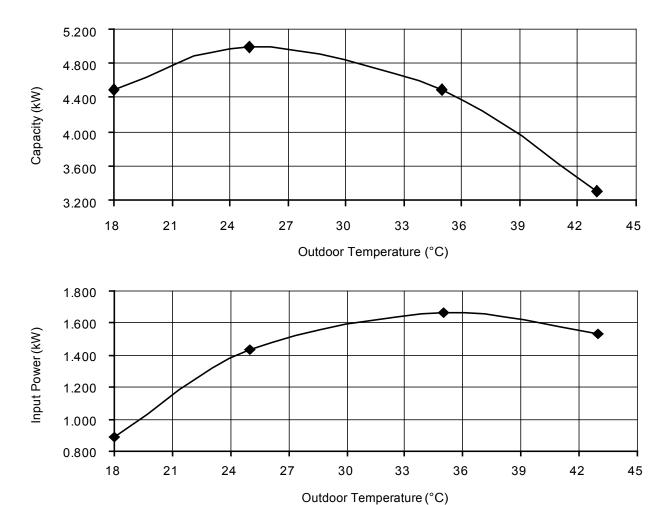


Cooling Characteristics at Different Outdoor Air Temperature

Condition

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

Indoor water inlet temperature : 12°C Indoor water outlet temperature : 7°C

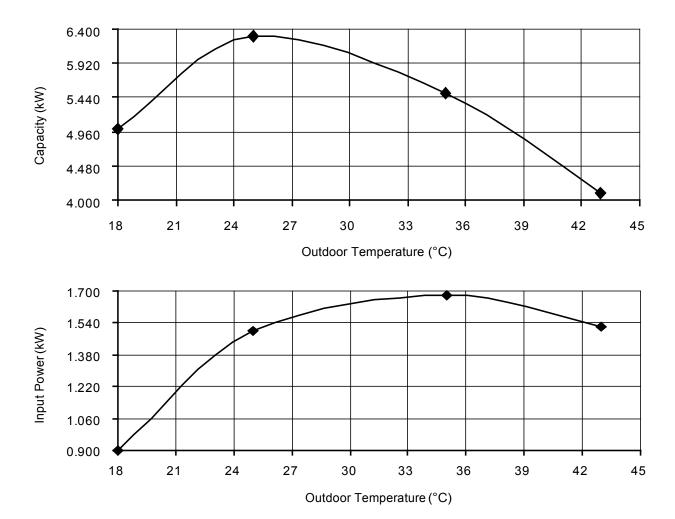


Cooling Characteristics at Different Outdoor Air Temperature

Condition

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

Indoor water inlet temperature : 19°C Indoor water outlet temperature : 14°C

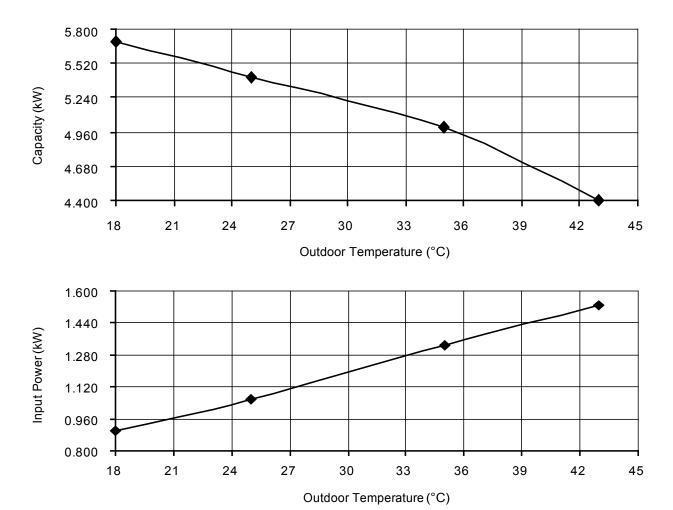


Cooling Characteristics at Different Outdoor Air Temperature

Condition

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

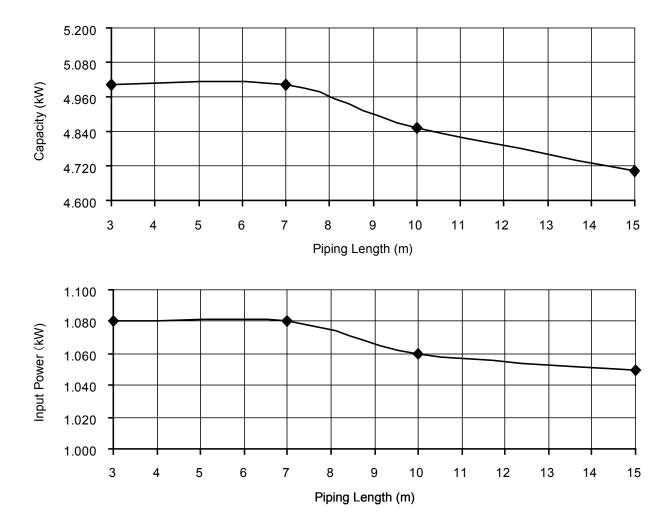
Indoor water inlet temperature : 23°C Indoor water outlet temperature : 18°C



Heating Characteristics at Different Piping Length Condition

Outdoor air temperature : 7°C (DBT), 6°C (WBT)

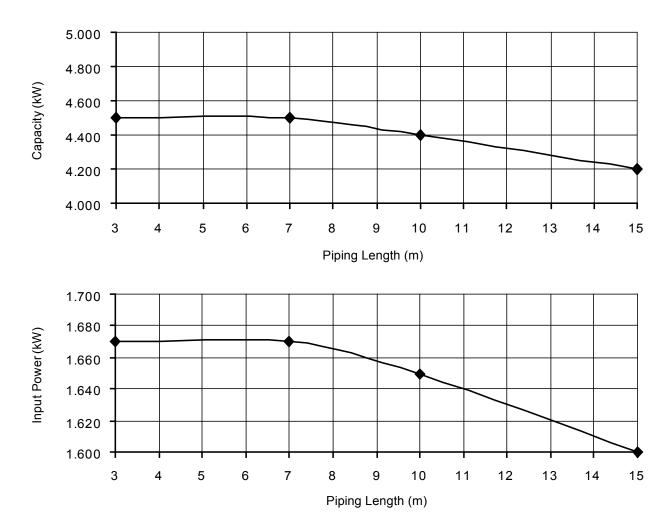
Indoor water inlet temperature: 30°C Indoor water outlet temperature: 35°C



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



Heating Capacity Table

WH-SDC05H3E5 WH-UD05HE5

Water Out (°C)	3	0	35		40		45		50		55	
Outdoor Air (°C)	Capacity (W)	Input Power (W)										
-15	4200	1750	4200	1940	3800	1960	3400	1980	3200	2050	3000	2120
-7	4200	1460	4200	1Í 60	4000	1720	3800	1820	3700	1950	3550	2080
2	4200	1220	4200	1350	4200	1500	4200	1650	4150	1860	4100	2070
7	5000	970	5000	1080	5000	1280	5000	1480	5000	1680	5000	1890
16	5000	830	5000	920	5000	1150	5000	1380	5000	1530	5000	1680
25	5000	740	5000	820	5000	1020	5000	1220	5000	1350	5000	1490

Cooling Capacity Table

WH-SDC05H3E5 WH-UD05HE5

Water Out (°C)	-	7	1	4	18		
Outdoor Air (°C)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	Capacity (W)	Input Power (W)	
18	4500	890	5000	900	5700	900	
25	5000	1430	6300	1500	5400	1060	
35	4500	1670	5500	1680	5000	1330	
43	3300	1530	4100	1520	4400	1530	