Service Manual Air-to-Water Hydromodule + Tank

Indoor Unit Outdoor Unit WH-ADC0916H9E8 WH-UD09HE8 WH-UD12HE8 WH-UD16HE8 WH-UD16HE8 Destination Europe Image: Comparison of the second seco

\land 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 Δ 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.



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WH-ADC0916H9E8 WH-UD09HE8

Item Unit		Outdoor Unit				
Performance Test Condition				EN 14511		
		Condition (Ambient/Water)		A35W7		
Cooling Capacity		kW	7.00			
		BTU/h	23900			
		kcal/h				
		W/W		3.17		
		kcal/hW		2.72		
		Condition (Ambient/Water)	A7W35		A2W35	
Heating Capacity		kW	9.00		9.00	
0 - 1 - 3		BTU/h	30700		30700	
		kcal/h	7740		7740	
Heating COP		W/W	4.84		3.59	
		kcal/hW	4.16		3.08	
		Condition (Ambient/Water)	A35W7	A7W35	A2W35	
Noise Level		dB (A)	Cooling: 49	Heating: 51	_	
		Power Level dB	Cooling: 67	Heating: 68	—	
Air Flow		m³/min (ft³/min)				
Refrigeration Control Device			Expansion Valve			
Refrigeration Oil		cm ³	FV50S (1200)			
Refrigerant (R410A)		kg (oz)	2.55 (90.0)			
	Height	mm (inch)	1340 (52-3/4)			
Dimension	Width	mm (inch)	900 (35-7/16)			
	Depth	mm (inch)	320 (12-19/32)			
Net Weight		kg (lbs)	107 (236)			
Pipe Diameter	Liquid	mm (inch)	9.52 (3/8)			
	Gas	mm (inch)	15.88 (5/8)			
Standard Length		m (ft)	5 (16.4)			
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)	50 (0.5)			
Refrigeration Charge Less	1	m (ft)	10 (32.8)			
	Туре			Hermetic Motor		
Compressor	Motor Type			Brushless (4-poles)		
	Rated Output	kW		4.30		
	Туре			Propeller Fan		
	Material			PP		
Fan	Motor Type			DC (8-poles)		
	Input Power	W		_		
	Output Power	W	Cooli	60	- ++)	
	Fan Speed	rpm	Heati	ng: 550 (Top), 590 (Bo ng: 490 (Top), 530 (Bo	ottom)	
	Fin material			Aluminium (Pre Coat)		
Heat Exchanger	Fin Type			Corrugated Fin		
	Row × Stage × FPI			2 × 51 x 18		
	Size (W × H × L)	mm	903.7 x 1295.4 x 38.1			

Item		Unit	Outdoor Unit		
		ø	Three		
Power Source (Phase, Voltag	e, Cycle)	V		400	
		Hz		50	
Input Power		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		kW	Cooling: 2.21	Heating: 1.86	Heating: 2.51
Maximum Input Power For He	eatpump System	kW		5.85	
Power Supply 1 : Phase (Ø) /	Max. Current (A) / Max. Ir	nput Power (W)		3Ø / 8.8 / 5.85k	
Power Supply 2 : Phase (Ø) / Max. Current (A) / Max. Input Power (W)			3Ø / 13.0 / 9.00k		
Power Supply 3 : Phase (Ø) / Max. Current (A) / Max. Input Power		nput Power (W)	<u> </u>		
Starting Current		А	3.4		
Running Current		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		А	Cooling: 3.4	Heating: 2.8	Heating: 3.8
Maximum Current For Heatpu	imp System	А	8.8		
Power Factor Power factor means total figure of compressor and outdoor fan motor.		%	Cooling: 95	Heating: 96	Heating: 96
Power Cord	Number of core			-	
	Length	m (ft)		-	
Thermostat			Electronic Control		
Protection Device				Electronic Control	

Item		Unit	Indoor Unit			
Performance Test Condition	า		EN 14511			
Operation Pange	Outdoor Ambient	°C (min. / max.)	Cooling: 16 / 43 Heating: -20 / 35			
	Water Outlet	°C (min. / max.)	Heating (Tar	Cooling: 5 / 20 Heating (Tank): - / 65*, Heating (Circuit): 20 / 55		
Internal Pressure Differentia	al	kPa		Cooling: 15.0 Heating: 23.0		
		Condition (Ambient/Water)	A35W7	A7W35	A2W35	
Noise Level		dB (A)	Cooling: 33	Cooling: 33	_	
		Power Level dB	Cooling: 46	Cooling: 46	—	
	Depth	mm (inch)		717 (28-7/32)		
Dimension	Width	mm (inch)		598 (23-17/32)		
	Height	mm (inch)		1800 (70-27/32)		
Net Weight		kg (lbs)		126 (278)		
Refrigerant Pipe Diameter	Liquid	mm (inch)	9.52 (3/8)			
	Gas	mm (inch)	15.88 (5/8)			
Water Dine Diameter	Room	mm (inch)	31 (1-1/4)			
Water Fipe Diameter	Shower	mm (inch)	19 (3/4)			
Water Drain Hose Inner Dia	ameter	mm (inch)	12.10 (17/36)			
	Motor Type		DC Motor			
Pump	No. of Speed			7 (Software Selection)		
	Input Power	W		52		
	Туре			Brazed Plate		
	No. of Plates			52		
Hot Water Coil	Size (H x W x L)	mm		93 x 119 x 376		
	Water Flow Rate	l/min (m ³ /h)		Cooling: 20.1 (1.2) Heating: 25.8 (1.5)		
Pressure Relief Valve Wate	er Circuit	kPa	Open	: 300, Close: 265 and I	below	
Flow Switch	Туре			Magnetic Lead Switch		
	Set Point	l/min		11.1		
Pressure Release Valve		kPa	Open: 1150±200, Close: 700 and below		nd below	

Item		Unit	Indoor Unit
Protection Device		А	Residual Current Circuit Breaker (25)
	Volume	I	10
Expansion vessel	MWP	bar	3
Capacity of Integrated Elect	ric Heater / OLP TEMP	kW / °C	9.00 / 80
Tank Volume (Spec / Nett)		L	200 / 185
Max. Tank Water Set Temp	erature	°C	65
Tank Coil Surface		m²	1.8
Maximum Working	Heat / Cool	Bar	3.0
Pressure	Tank Circuit	Bar	8.0
Operating Pressure	Tank Unit	Bar	3.5
Operating Pressure	Expansion Relief Valve	Bar	8.0
Expansion Vessel Pre-char	ge Pressure (DHW Circuit)	Bar	3.5
Pressure Reducing Valve S	et Pressure (DHW Circuit)	Bar	3.5
	Material		En-1.4521
Pressure Vessel	Volume	L	185
	Design Pressure	Bar	10
	Material		EN-1.4162 / EN-1.4521
	Diameter	mm	22
Heat Exchanger	Thickness	mm	0.8
	Surface Area	m²	1.8
	Total Length	m	25

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.

• Specifications are subjected to change without prior notice for further improvement.

• * Above 55°C, only possible with backup heater operation.

WH-ADC0916H9E8 WH-UD12HE8

Item Unit		Unit	Outdoor Unit			
Performance Test Condition	1			EN 14511		
		Condition (Ambient/Water)		A35W7		
Cooling Capacity		kW	10.00			
		BTU/h				
		kcal/h				
		W/W		2.85		
Cooling EER		kcal/hW		2.45		
		Condition (Ambient/Water)	A7W35		A2W35	
Heating Capacity		kW	12.00		11.40	
······································		BTU/h	41000		38900	
		kcal/h	10320		9800	
		W/W	4.74		3.44	
		kcal/hW	4.08		2.96	
		Condition (Ambient/Water)	A35W7	A7W35	A2W35	
Noise Level		dB (A)	Cooling: 50	Heating: 52	—	
		Power Level dB	Cooling: 68	Heating: 69	—	
Air Flow		m³/min (ft³/min)		Cooling: 93.3 (3290) Heating: 80.0 (2830)		
Refrigeration Control Device			Expansion Valve			
Refrigeration Oil		cm ³	FV50S (1200)			
Refrigerant (R410A)		kg (oz)	2.55 (90.0)			
	Height	mm (inch)	1340 (52-3/4)			
Dimension	Width	mm (inch)	900 (35-7/16)			
	Depth	mm (inch)	320 (12-19/32)			
Net Weight		kg (lbs)	107 (236)			
Pine Diameter	Liquid	mm (inch)		9.52 (3/8)		
	Gas	mm (inch)		15.88 (5/8)		
Standard Length		m (ft)	5 (16.4)			
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)	50 (0.5)			
Refrigeration Charge Less		m (ft)	10 (32.8)			
	Туре			Hermetic Motor		
Compressor	Motor Type			Brushless (4-poles)		
	Rated Output	kW		4.30		
	Туре			Propeller Fan		
	Material			PP		
	Motor Type			DC (8-poles)		
⊢an	Input Power	W				
	Output Power	W		60		
	Fan Speed	rpm	Cooli Heati	ng: 600 (Top), 640 (Bo ng: 510 (Top), 550 (Bo	ottom) ottom)	
	Fin material			Aluminium (Pre Coat)	
Hoat Exchanger	Fin Type			Corrugated Fin		
Tieat Excitatiget	Row × Stage × FPI			2 × 51 x 18		
	Size (W × H × L)	mm	903.7 x 1295.4 x 38.1			

Item		Unit	Outdoor Unit			
		ø	Three			
Power Source (Phase, Voltag	le, Cycle)	V		400		
		Hz		50		
Input Power		Condition (Ambient/Water)	A35W7	A7W35	A2W35	
'		kW	Cooling: 3.51	Heating: 2.53	Heating: 3.31	
Maximum Input Power For He	eatpump System	kW		5.85		
Power Supply 1 : Phase (Ø) / Max. Current (A) / Max. Input Power (W)		nput Power (W)		3Ø / 8.8 / 5.85k		
Power Supply 2 : Phase (Ø) / Max. Current (A) / Max. Input Power (V			3Ø / 13.0 / 9.00k			
Power Supply 3 : Phase (Ø) / Max. Current (A) / Max. Inp		nput Power (W)	<u> </u>			
Starting Current		А	5.3			
Running Current		Condition (Ambient/Water)	A35W7	A7W35	A2W35	
		А	Cooling: 5.3	Heating: 3.8	Heating: 5.0	
Maximum Current For Heatpu	ımp System	А	8.8			
Power Factor Power factor means total figure of compressor and outdoor fan motor		%	Cooling: 96 Heating: 96			
Dewer Card	Number of core			-		
Power Cord	Length	m (ft)		-		
Thermostat				Electronic Control		
Protection Device			Electronic Control			

Item		Unit	Indoor Unit		
Performance Test Condition	n		EN 14511		
Operation Range	Outdoor Ambient	°C (min. / max.)	Cooling: 16 / 43 Heating: -20 / 35		
	Water Outlet	°C (min. / max.)	Heating (Ta	Cooling: 5 / 20 nk): - / 65*, Heating (Circ	cuit): 20 / 55
Internal Pressure Differentia	al	kPa		Cooling: 28.0 Heating: 39.0	
		Condition (Ambient/Water)	A35W7	A7W35	A2W35
Noise Level		dB (A)	Cooling: 33	Cooling: 33	<u> </u>
		Power Level dB	Cooling: 46	Cooling: 46	—
	Depth	mm (inch)		717 (28-7/32)	
Dimension	Width	mm (inch)		598 (23-17/32)	
	Height	mm (inch)	1800 (70-27/32)		
Net Weight		kg (lbs)	126 (278)		
Defrigerent Dine Diemeter	Liquid	mm (inch)	9.52 (3/8)		
Refrigerant Pipe Diameter	Gas	mm (inch)	15.88 (5/8)		
Matan Dina Diamatan	Room	mm (inch)	31 (1-1/4)		
water Pipe Diameter	Shower	mm (inch)	19 (3/4)		
Water Drain Hose Inner Dia	ameter	mm (inch)	12.10 (17/36)		
	Motor Type			DC Motor	
Pump	No. of Speed			7 (Software Selection)	
	Input Power	W		82	
	Туре			Brazed Plate	
	No. of Plates			52	
Hot Water Coil	Size (H x W x L)	mm		93 x 119 x 376	
	Water Flow Rate	l/min (m ³ /h)		Cooling: 28.7 (1.7) Heating: 34.4 (2.1)	
Pressure Relief Valve Wate	er Circuit	kPa	Open: 300, Close: 265 and below		elow
Flow Switch	Туре			Magnetic Lead Switch	
	Set Point	l/min		11.1	
Pressure Release Valve		kPa	Open: 1150±200, Close: 700 and below		d below

Item		Unit	Indoor Unit
Protection Device		А	Residual Current Circuit Breaker (25)
	Volume	I	10
	MWP	bar	3
Capacity of Integrated Elect	ric Heater / OLP TEMP	kW / °C	9.00 / 80
Tank Volume (Spec / Nett)		L	200 / 185
Max. Tank Water Set Temp	erature	°C	65
Tank Coil Surface		m²	1.8
Maximum Working	Heat / Cool	Bar	3.0
Pressure	Tank Circuit	Bar	8.0
Operating Pressure	Tank Unit	Bar	3.5
Operating Pressure	Expansion Relief Valve	Bar	8.0
Expansion Vessel Pre-char	ge Pressure (DHW Circuit)	Bar	3.5
Pressure Reducing Valve S	et Pressure (DHW Circuit)	Bar	3.5
	Material		En-1.4521
Pressure Vessel	Volume	L	185
	Design Pressure	Bar	10
	Material		EN-1.4162 / EN-1.4521
	Diameter	mm	22
Heat Exchanger	Thickness	mm	0.8
	Surface Area	m²	1.8
	Total Length	m	25

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.

• Specifications are subjected to change without prior notice for further improvement.

• * Above 55°C, only possible with backup heater operation.

WH-ADC0916H9E8 WH-UD16HE8

Item Unit		Unit	Outdoor Unit		
Performance Test Condition	ו			EN 14511	
		Condition (Ambient/Water)		A35W7	
Cooling Capacity		kW			
		BTU/h			
		kcal/h			
		W/W		2.56	
		kcal/hW		2.20	
		Condition (Ambient/Water)	A7W35		A2W35
Heating Capacity		kW	16.00		13.00
		BTU/h	54600		44300
		kcal/h	13760		11180
Heating COP		W/W	4.28		3.28
		kcal/hW	3.68		2.82
		Condition (Ambient/Water)	A35W7	A7W35	A2W35
Noise Level		dB (A)	Cooling: 54	Heating: 55	
		Power Level dB	Cooling: 72	Heating: 72	—
Air Flow		m³/min (ft³/min)	Cooling: 97.8 (3450) Heating: 90.0 (3180)		
Refrigeration Control Device			Expansion Valve		
Refrigeration Oil		cm ³	FV50S (1200)		
Refrigerant (R410A)		kg (oz)	2.55 (90.0)		
	Height	mm (inch)	1340 (52-3/4)		
Dimension	Width	mm (inch)	900 (35-7/16)		
	Depth	mm (inch)	320 (12-19/32)		
Net Weight		kg (lbs)	107 (236)		
Pine Diameter	Liquid	mm (inch)		9.52 (3/8)	
	Gas	mm (inch)		15.88 (5/8)	
Standard Length		m (ft)	5 (16.4)		
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)	50 (0.5)		
Refrigeration Charge Less		m (ft)	10 (32.8)		
	Туре			Hermetic Motor	
Compressor	Motor Type			Brushless (4-pole	s)
	Rated Output	kW		4.30	
	Туре			Propeller Fan	
	Material			PP	
	Motor Type			DC (8-poles)	
Fan	Input Power	W		_	
	Output Power	W		60	
	Fan Speed	rpm	Cooli Heati	ing: 630 (Top), 670 ing: 580 (Top), 620	(Bottom) (Bottom)
	Fin material			Aluminium (Pre Co	pat)
Hoat Exchanger	Fin Type			Corrugated Fin	
neat Exchanger	Row × Stage × FPI			2 × 51 x 18	
	Size (W × H × L)	mm	903.7 x 1295.4 x 38.1		

Item		Unit	Outdoor Unit		
		ø	Three		
Power Source (Phase, Voltag	e, Cycle)	V		400	
		Hz		50	
Input Power		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		kW	Cooling: 4.76	Heating: 3.74	Heating: 3.96
Maximum Input Power For He	eatpump System	kW		6.59	
Power Supply 1 : Phase (Ø) /	Max. Current (A) / Max. Ir	nput Power (W)		3Ø / 9.9 / 6.59k	
Power Supply 2 : Phase (Ø) / Max. Current (A) / Max. Input Power (W)			3Ø / 13.0 / 9.00k		
Power Supply 3 : Phase (Ø) / Max. Current (A) / Max. Input Power (V		nput Power (W)	<u> </u>		
Starting Current		А	7.1		
Running Current		Condition (Ambient/Water)	A35W7	A7W35	A2W35
		А	Cooling: 7.1	Heating: 5.7	Heating: 6.0
Maximum Current For Heatpu	ımp System	А		9.9	
Power Factor Power factor means total figure of compressor and outdoor fan motor.		%	Cooling: 97	Heating: 95	Heating: 96
Bower Cord	Number of core			-	
Power Cord	Length	m (ft)	-		
Thermostat			Electronic Control		
Protection Device			Electronic Control		

Item		Unit	Indoor Unit		
Performance Test Condition	า		EN 14511		
Operation Range	Outdoor Ambient	°C (min. / max.)	Cooling: 16 / 43 Heating: -20 / 35		
	Water Outlet	°C (min. / max.)	Cooling: 5 / 20 Heating (Tank): - / 65*, Heating (Circuit): 20 / 55		
Internal Pressure Differentia	al	kPa		Cooling: 40.0 Heating: 69.0	
		Condition (Ambient/Water)	A35W7	A7W35	A2W35
Noise Level		dB (A)	Cooling: 33	Cooling: 33	<u> </u>
		Power Level dB	Cooling: 46	Cooling: 46	—
	Depth	mm (inch)		717 (28-7/32)	
Dimension	Width	mm (inch)		598 (23-17/32)	
	Height	mm (inch)		1800 (70-27/32)	
Net Weight		kg (lbs)	126 (278)		
Pofrigorant Pino Diamotor	Liquid	mm (inch)	9.52 (3/8)		
Reingerant Pipe Diameter	Gas	mm (inch)	15.88 (5/8)		
Water Bine Diameter	Room	mm (inch)	31 (1-1/4)		
Water Fipe Diameter	Shower	mm (inch)	19 (3/4)		
Water Drain Hose Inner Dia	ameter	mm (inch)	12.10 (17/36)		
	Motor Type			DC Motor	
Pump	No. of Speed			7 (Software Selection)	
	Input Power	W		132	
	Туре			Brazed Plate	
	No. of Plates			52	
Hot Water Coil	Size (H x W x L)	mm		93 x 119 x 376	
	Water Flow Rate	l/min (m³/h)		Cooling: 35.0 (2.1) Heating: 45.9 (2.8)	
Pressure Relief Valve Wate	er Circuit	kPa	Open	: 300, Close: 265 and I	below
Flow Switch	Туре			Magnetic Lead Switch	
	Set Point	l/min		11.1	
Pressure Release Valve		kPa	Open: 1150±200, Close: 700 and below		nd below

Item		Unit	Indoor Unit
Protection Device		А	Residual Current Circuit Breaker (25)
	Volume		10
Expansion vessel	MWP	bar	3
Capacity of Integrated Elect	ric Heater / OLP TEMP	kW / °C	9.00 / 80
Tank Volume (Spec / Nett)		L	200 / 185
Max. Tank Water Set Temp	erature	°C	65
Tank Coil Surface		m²	1.8
Maximum Working	Heat / Cool	Bar	3.0
Pressure	Tank Circuit	Bar	8.0
Operating Processo	Tank Unit	Bar	3.5
Operating Pressure	Expansion Relief Valve	Bar	8.0
Expansion Vessel Pre-charg	ge Pressure (DHW Circuit)	Bar	3.5
Pressure Reducing Valve S	et Pressure (DHW Circuit)	Bar	3.5
	Material		En-1.4521
Pressure Vessel	Volume	L	185
	Design Pressure	Bar	10
	Material		EN-1.4162 / EN-1.4521
	Diameter	mm	22
Heat Exchanger	Thickness	mm	0.8
	Surface Area	m²	1.8
	Total Length	m	25

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.

• Specifications are subjected to change without prior notice for further improvement.

• * Above 55°C, only possible with backup heater operation.

Features

- Inverter Technology
 - Energy saving
- High Efficiency
- Environment Protection
 - Non-ozone depletion substances refrigerant (R410A)

Long Installation Piping

- Long piping up to 30 meter with height difference 20 meter
- o Flexible 4-way piping for outdoor unit

• Easy to use control panel

- o Auto mode
- o Holiday mode
- Dry concrete function
- Weekly timer setting

A-class energy efficiency pump

• Water pump speed can be set by selection at control panel

• Improved deice cycle

• Protection Feature

- o Random auto restart after power failure for safety restart operation
- Gas leakage protection
- Prevent compressor reverse cycle
- o Inner protector to protect compressor

• Serviceability Feature

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

Main Components



Outdoor Unit



Dimensions

Indoor Unit



Outdoor Unit



Refrigeration and Water Cycle Diagram

WH-ADC0916H9E8 WH-UD09/12/16HE8



Model		Piping size (Torque)			
Tank Unit Outdoor Unit		Gas	Liquid		
ADC0916H9E8	WH-UD09HE8 / WH-UD12HE8 / WH-UD16HE8	Ø15.88 mm (5/8") [65 N•m]	Ø9.52 mm (3/8") [42 N•m]		

Electronic Circuit Diagram

Indoor Unit



WH-UD09HE8 WH-UD12HE8 WH-UD16HE8



Installation Instruction

Field Supply Accessories (Optional)

No.	Part		Model	Specifications	Maker	
	2-way valve kit	Electromotoric Actuator	SFA21/18	AC230V	Siemens	
	*Cooling model	2-port Valve	VVI46/25		Siemens	
	Room Thormostat	Wired	PAW-A2W-RTWIRED	AC2201/		
	Room mermostat	Wireless PAW-A2W-RTWIF		AC230V	-	
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	-	-	
xiii	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.

Indoor Unit

Select the Best Location

- 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 it is 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 an uneven surface.



To Drill a Hole in the Wall and Install a Sleeve of Piping

- 1 Make a Ø70 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.

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.



Piping Installation

Typical Piping Installation



Access to Internal Components

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.



2X (screw)

• Open and Close Top Front Plate

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

Model		Piping size (Torque)		
Tank Unit Outdoor Unit		Gas	Liquid	
ADC0916H9E8	WH-UX09HE8 / WH-UX12HE8 / WH-UX16HE8 / WH-UD09HE8 / WH-UD12HE8 / WH-UD16HE8	ø15.88mm (5/8") [65 N•m]	Ø9.52mm (3/8") [42 N•m]	



Do not overtighten, overtightening may cause gas leakage.

- 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.

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.



Water Piping Installation

- Avoid to use abnormally aggressive water which does not conform to EN 98/83 EC, hereunder Chloride content (maximum 250 mg/ litre), Sulphate content (maximum 250 mg/litre) and combination of Chloride / Sulphate content (maximum 300 mg/litre in total).
- 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 1¼"	117.6 N•m
© & @	RP ¾"	58.8 N•m



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 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 (a) to outlet connector of Panel/Floor heater.
- Connect Tank Unit Tube Connector (b) 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.

Мо	del	Rated Flow Rate (L/min)		
Tank Unit	Outdoor Unit	Cool	Heat	
ADC0916H9E8 -	WH-UX09HE8	20.1	25.8	
	WH-UX12HE8	28.7	34.4	
	WH-UX16HE8	35.0	45.9	
	WH-UD09HE8	20.1	25.8	
	WH-UD12HE8	28.7	34.4	
	WH-UD16HE8	35.0	45.9	

(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.
 - Recommended pre-charge pressure of the expansion vessel (field supply) = 0.35MPa (3.5 bars)
- 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) with below specification is strongly advised to be installed along the line of the tube connector © of Tank Unit. Refer Typical Piping Installation section to locate both of these valves.
- Recommended Pressure Reducing Valve specifications:

• Set pressure: 0.35 MPa (3.5 bars)

- Must connect a faucet to Tank Unit Tube Connector (a) and main 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 (b).
- 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 (Drain Tap) and Safety Relief Valve Pipework
- Safety Relief Valve 0.8MPa (8 bars) incorporated in Domestic Hot Water Tank.
- Drain Tap and Safety Relief Valve discharge fittings share the same drainage outlet.
- Use R¹/₂" male connector for this drainage outlet connection (Tube connector (9)).
- Piping must to be installed in a continuously downward direction. It must not be longer than 2m, with no more than 2 elbows, and must not allow condensation to build up or freezing to occur.
- The pipe from this drainage outlet fitting must not be shut off. The discharge must be freed.
- The end of this pipework must be in such a way so that the outlet is visible and can not cause any damage. Keep away from electrical components.
- It is recommended to fit a tundish into this (9) pipework. Tundish should be visible and positioned away from frost environment and electrical components.

(E) Drain Elbow and Hose Installation

- Fix the Drain Elbow and Packing to the bottom of Drain Water Hole (i).
- Use inner diameter 17 mm drain hose in the market.
- This hose must to 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.



This section is for authorized and licensed electrician only. Work behind the Control Board Cover 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.

Model		Connecting Cable Size
Tank Unit Outdoor Unit		Connecting Cable Size
ADC0916H9E8	WH-UX09HE8 / WH-UX12HE8 / WH-UX16HE8 / WH-UD09HE8 / WH-UD12HE8 / WH-UD16HE8	6 x 1.5 mm ²

- 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.
 - o 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.

Model		Power Supply	Cable Size	In a latin a Daviana	Recommended RCD	
Tank Unit	Outdoor Unit	Cord Cable Size		Isolating Devices		
	WH-UX09HE8 / WH-UX12HE8 / WH-UX16HE8 /	1	5 x 1.5 mm ²	20A	30mA, 4P, type A	
ADC0916H9E8	ADC0916H9E8 WH-UD09HE8 / WH-UD09HE8 / WH-UD12HE8 / WH-UD16HE8	2	5 x 1.5 mm ²	20A	30mA, 4P, 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 - Earth wire must be longer than other cables for safety reasons

Wire Stripping and Connecting Requirement



Connecting Requirement

For Tank Unit with UX09HE8 / UX12HE8 / UX16HE8 / UD09HE8 / UD12HE8 / UD16HE8

- 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 61000-3-3 and can be connected to current supply network.

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) (9 to "CLOSE".



Domestic Hot Water Tank Discharge (Drain Tap) (

- 2 Set all Tap / Shower "OPEN".
- 3 Start filling water to the Domestic Hot Water Tank via Tube Connector ©. 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.
- 5 Set the Domestic Hot Water Tank Discharge (Drain Tap) (1) to "OPEN" for 10 seconds to release air from this pipeline. Then set it "CLOSE".
- 6 Turn the Safety Relief Valve knob counterclockwise slightly and hold for 10 seconds to release air from this pipeline. Then recover the knob to original position.
- 7 Ensure Step 5 & 6 is carried out each time after charging water to Domestic Hot Water Tank.
- 8 To prevent back pressure from happening to the Safety Relief Valve, do turn the Safety Relief Valve knob counterclockwise.

• For Space Heating / Cooling

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



2 Set the Pressure Relief Valve level "DOWN".



- 3 Start filling water (with pressure more than 0.1 MPa (1 bar)) to the Space Heating / Cooling circuit via Tube Connector (a). Stop filling water if the free water flow through Pressure Relief Valve Drainage (b).
- 4 Turn ON the Tank Unit and make sure Water Pump 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) (9) to "OPEN".
- 3 Open Tap / Shower to allow air inlet.
- 4 Turn the Safety Relief Valve knob counterclockwise slightly and hold it until all air is released from this pipeline. Then recover the knob to original position after ensured the pipeline is emptied.
- 5 After discharge, set Domestic Hot Water Tank Discharge (Drain Tap) (9) to "CLOSE".

Reconfirmation

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). If necessary add water into Tank Unit (via Tube Connector (a)).

Check Pressure Relief Valve

- Check for correct operation of Pressure Relief Valve 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 Pre Pressure Checking

For Space Heating / Cooling

- Expansion Vessel 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

Ensure the RCCB set to "ON" condition before check RCCB.

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

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

- Push the "TEST" button on the RCCB. The lever would turn down and indicate "0", if it functions normal.
- Contact authorized dealer if the RCCB malfunction.
- Turn off the power supply to the Tank Unit.
- If RCCB functions normal, set the lever to "ON" again after testing finish.

Installation of Remote Controller as Room Thermostat

• Remote Controller 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.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.
 - 5 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 mm²), 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

• Remove the top case from the bottom case.



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



Mounting The Remote Controller

For exposed type

Preparation: Make 2 holes for screws using a driver.



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 to close the hole left after remove the Remote controller.
 - 1 Release the Remote controller cover's hooks from behind the Front Plate.



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



Test Run

- Before test run, make sure below items have been checked:
 - o 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.
 - In order to check whether the tank is full, switch heater once for about 10 min.
- Switch ON the power supply of the Tank Unit. Set the Tank Unit RCCB to "ON" condition. Then, please refer to the Operation Instruction for operation of Remote Controller.
- For normal operation, Water Pressure Gauge reading should be in between 0.05 MPa and 0.3 MPa. If necessary, adjust the Water Pump SPEED accordingly to obtain normal water pressure operating range. If adjust Water Pump SPEED cannot solve the problem, contact your local authorized dealer.
- After test run, please clean the Water Filter Set. Reinstall it after finish cleaning.

Reset Overload Protector

Overload Protector a serves the safety purpose to prevent the water over heating. When the Overload Protector 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.
- Fix the cover to the original fixing condition.



Maintenance

 In order to ensure safety and optimal performance of the Tank Unit, seasonal inspections on the Tank Unit, functional check of RCCB, 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 Water Filter Set

- Turn OFF power supply.
- Set the two valves for the Water Filter Set to "CLOSE".
- 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.
- Reinstall the mesh to the Water Filter Set and set back the clip on it.
- Set the two valves for the Water Filter Set to "OPEN".
- Turn ON power supply.

Maintenance for Safety Relief Valve

• It is strongly recommended to operate the valve 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

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

- 1. 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 to
- stop pump down operation. 5. Remove the refrigerant piping.

Outdoor Unit

Attached accessories

No.	Accessories part	Qty.	No.	Accessories part	Qty.
	Drain elbow			Protective bushing	
1	O)	1	3	æ	2
	U				
	Rubber cap				
2	Q	8			

Optional Accessory

No.	Accessories part	Qty.
4	Base Pan Heater CZ-NE3P	1

 It is strongly recommended to install a Base Pan Heater (optional) if the outdoor unit is install in cold climate area. Refer the Base Pan Heater (optional) installation instruction for details of installation.

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 for UD models and -28°C for UX models.
- 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)



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

	Piping size		Rated Length (m)					Additional
Model	Gas Liquid Fo		For Heat Pump Indoor Unit	For Hydromodule + Tank	Max. Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Refrigerant (g/m)
UX09*E5*, UX12*E5*, UD12*E5*, UD16*E5*, UX09*E8*, UX12*E8*, UX16*E8*, UD09*E8*, UD12*E8*, UD16*E8*	ø15.88mm (5/8")	Ø9.52mm (3/8")	7	5	20	3	30	50

Example:

If piping length is 30m, the quantity of additional refrigerant should be 1000g. [(30-10)m x 50 g/m = 1000g] GWP (R410A) = 2088

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.





Model	А	В	С	D	Е	F
UX09*E5*, UX12*E5*, UD12*E5*, UD16*E5*, UX09*E8*, UX12*E8*, UX16*E8*, UD09*E8*, UD12*E8*, UD16*E8*	620	140	15	355	450	44
					(Uni	it · 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). 1
 - 2 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. 0
 - cover the ø20mm holes with Rubber cap (refer to illustration below). 0
 - use a tray (field supply) when necessary to dispose the outdoor unit drain water. 0
- 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.



Connecting the Piping

Do not over tighten, over tightening may cause gas leakage.		
Model	Piping size (Torque)	
Woder	Gas	Liquid

Model	riping size (Torque)	
Wodel	Gas	Liquid
UX09*E5*, UX12*E5*, UD12*E5*, UD16*E5*, UX09*E8*, UX12*E8*, UX16*E8*, UD09*E8*,	ø15.88mm (5/8") [65 N•m]	Ø9.52mm (3/8") [42 N•m]
UD12*E8*, UD16*E8*		

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 torgue wrench to the specified torgue as stated in the table.

Local pipes can project in any of four directions.

- Make holes in the pipe panels for the pipes to pass through.
- Be sure to install the pipe panels to prevent rain from getting inside the outdoor unit. [Removing the service panel].
 - (1) Remove the three mounting screws.
 - (2) Slide the service panel downward to release the pawls.

After this, pull the service panel toward you to remove it



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.

Evacuation of the Equipment

WHEN INSTALLING AN AIR-TO-WATER HEAT PUMP, BE SURE TO EVACUATE THE AIR INSIDE THE UNIT AND PIPES in the following procedure.



- 1 Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
 - Be sure to connect the end of the charging hose with the push pin to the service port.
- 2 Connect the center hose of the charging set to a vacuum pump with check valve, or vacuum pump and vacuum pump adaptor.
- 3 Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.
- 4 Close the Low side value of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes. Note : BE SURE TO FOLLOW THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.
- 5 Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
- 6 Tighten the service port caps of the 3-way valve at a torque of 18 N•m with a torque wrench.
- Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to "OPEN" using a hexagonal wrench (4 mm).
- 8 Mount valve caps onto the 2-way valve and the 3-way valve.
 - Be sure to check for gas leakage.

- If gauge needle does not move from 0 cmHg (0 MPa) to –76 cmHg (–0.1 MPa), in step ③ above take the following measure:
- 1. If the leak stops when the piping connections are tightened further, continue working from step ③.
- 2. If the leak does not stop when the connections are retightened, repair location of leak.
- 3. Do not release refrigerant during piping work for installation and reinstallation. Take care of the liquid refrigerant, it may cause frostbite.

Air-tightness Test on the Refrigerant System

Before system charged with refrigerant and before the refrigerating system in put into operation, below site test procedure and acceptance criteria shall be verified by the certified technicians, and/or the installer:-

- Step 1: Pressure test for refrigerant leak detection:
- 1 Steps for pressure test, in accordance to ISO 5149.
- 2 Evacuate the system from refrigerant before the leak test, attach the gauge manifold set correctly and tightly. Charging hose of Low side connect to Gas side. (Charging hose of High side connect to Liquid side if applicable.)
- 3 Adjust the knob on the service valves, and regulator on the gauge set, so that test gas can be inserted through the centre manifold of the gauge set.
- 4 Insert Nitrogen gas into the system through the centre manifold and wait until the pressure within the system to reach about 1MPa (10 BarG) wait for a few hours and monitor the pressure reading on the gauges.
- 5 Please note that the system's pressure may rise slightly if the test is carried out on mid day, due to temperature rise. The inverse may happen when there is temperature drop at night. However, this variation will be minimal.
- 6 Waiting time depends on the size of the system. Larger systems may require 12 hours of waiting time. Leak detection within smaller system can be achieved in 4 hours.
- 7 Check if there is a constant pressure drop. Move to next step "Step 2: Refrigerant leak detection..." if there is any pressure drop. Otherwise, release the Nitrogen gas and, move to "Step 3: Vacuum test".
- 8 Next, insert a small amount of same refrigerant into the system through the centre hose, until the pressure reaches about 1MPa (10 BarG).



- Step 2: Refrigerant leak detection through Electronic halogen leak detector and/or ultrasonic leak detector:
 Use any one of below detector to check leaking.
 - Electronic halogen leak detector.
 - Switch on the unit.
 - Cover the test area from direct draft.
 - Pass the detection probe near test area and wait for audible and visible signals.
 - Ultrasonic Leak Detector
 - Make sure the area is quiet.
 - Switch on the ultrasonic leak detector.
 - Move the probe along your air conditioning system to test for leaks, and mark for repair.
 - Any leak detected at this level shall be repaired and retested, starting from "Step 1: Pressure test".

NOTE:

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0

- Always recover the refrigerant and Nitrogen gas into recovery cylinder after completion of a test.
- You must use the detection equipment with Detectable Leak Rate of 10⁻⁶ Pa.m³/s or better.
- Do not use refrigerant as test medium for system with total refrigerant charge more than 5kg.
- Test shall be performed with dry Nitrogen or another non-flammable, non-reactive, dried gas. Oxygen, air or mixtures containing them shall not be used.
- Step 3: Vacuum test:
 - 1 Perform Vacuum test to check leak / moisture if present.
 - 2 Refer to section "EVACUATION OF THE EQUIPMENT" to vacuum gas out of the air conditioning system.
 - 3 Wait for a few hours, depending on the size of the refrigerating system and monitor the pressure rise. If the pressure rises until 1 bar absolute, then there is leak. If the pressure rises, but it is lower than 1 bar absolute, then moisture is present.

Next, remove the moisture, or repair, and redo the refrigerant leak testing, starting from "Step 1: Pressure test".



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.
- 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



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.

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 x 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 Room thermostat cable must be (4 or 3 x min 0.5 mm²), 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 mm²), of type designation 60245 IEC 57 or heavier.
 - 4 Boiler contact cable shall be (2 x min 0.5 mm²), 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 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}.
 - 6 Room sensor zone 1 cable shall be (2 x min 0.3 mm²) double insulation layer of PVC-sheathed or rubbersheathed.
 - 7 Outdoor air sensor cable shall be (2 x min 0.3 mm²) double insulation layer of PVC-sheathed or rubbersheathed.





- 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 $(2 \text{ x min } 1.5 \text{ mm}^2)$, of type designation 60245 IEC 57 or heavier.
 - 4 Pool pump cable shall be $(2 \text{ x min } 1.5 \text{ mm}^2)$, of type designation 60245 IEC 57 or heavier.
 - 5 Room thermostat zone 1 and zone 2 cable shall be (4 x min 0.5 mm²), of type designation 60245 IEC 57 or heavier.
 - 6 Mixing valve zone 1 and zone 2 cable shall be (3 x min 1.5 mm²), of type designation 60245 IEC 57 or heavier.
 - 7 Room sensor zone 1 and zone 2 cable shall be (2 x min 0.3 mm²), 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 mm²), 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 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.

- 10 Demand signal cable shall be (2 x min 0.3 mm²), double insulation layer of PVC-sheathed or rubbersheathed cable.
- 11 SG signal cable shall be (3 x min 0.3 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.
- 12 Heat/Cool switch cable shall be (2 x min 0.3 mm²), double insulation layer of PVC-sheathed or rubbersheathed cable.
- 13 External compressor switch cable shall be (2 x min 0.3 mm²), double insulation layer of PVC-sheathed or rubber-sheathed cable.





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

Connection of the main PCB



• Signal inputs

Ontional Thormostat	L N =AC230V, Heat, Cool=Thermostat heat, Cool terminal
Optional memostat	
	Dry contact Open=not operate, Short=operate
External control	(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 the Optional PCB	st It does not work when using
Outdoor air sensor	AW-A2W-TSOD (Total cable length shall be 30m or less)	

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.
 - 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

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 (°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

Temperature (°C)	Resistance (kΩ)
40	3.615
35	4.375
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

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



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 Installation (Optional)

- Remove the Control Board Cover, 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: H series



Without Optional PCB



With Optional PCB

 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.



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



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



• 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.



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



WH-ADC0916H9E8 WH-UD09HE8

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 : 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



WH-ADC0916H9E8 WH-UD12HE8

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 : 23°C Indoor water outlet temperature : 18°C Piping length : 7 m 12.000 11.000 Capacity (kW) 10.000 9.000 8.000 7.000 16 19 22 25 28 31 34 37 40 Outdoor Temperature (°C)



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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



WH-ADC0916H9E8 WH-UD16HE8

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 : 23°C Indoor water outlet temperature : 18°C Piping length : 7 m 17.000 15.000 Capacity (kW) 13.000 11.000 9.000 7.000 16 19 22 25 28 31 34 37 40 Outdoor Temperature (°C)



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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 13.500 12.500 Capacity (kW) 11.500 10.500 9.500 8.500 3 6 9 30 12 15 18 21 24 27 Piping Length (m) 5.000 4.900 Input Power (kW) 4.800 4.700 4.600

4.500

3

6

9

12

Piping Length (m)

18

21

24

27

30

15

WH-UD09HE8

Water Out (°C)	3	0	3	5	4	0	4	5	5	0	5	5
Outdoor Air (°C)	Capacity (W)	Input Power (W)										
-15	8650	3060	8300	3210	7950	3410	7600	3610	7150	3710	6700	3810
-7	9350	2910	9000	3160	8850	3540	8700	3920	8300	3890	7900	3860
2	9310	2350	9000	2510	9000	2780	9000	3050	8900	3490	8800	3940
7	9000	1540	9000	1860	9000	2160	9000	2460	9000	2760	9000	3060
25	9000	1050	9000	1240	8730	1440	8460	1640	8280	1820	8100	2000

WH-UD12HE8

Water Out (°C)	3	0	3	5	4	0	4	5	5	0	5	5
Outdoor Air (°C)	Capacity (W)	Input Power (W)										
-15	9300	3460	8900	3620	8500	3790	8100	3950	7500	4050	7000	4160
-7	10400	3370	10000	3660	9600	3950	9200	4240	8700	4260	8200	4270
2	11800	3100	11400	3310	11000	3530	10600	3740	9800	3940	9100	4140
7	12000	2100	12000	2530	12000	2960	12000	3390	12000	3780	12000	4160
25	12000	1380	12000	1660	11800	1940	11700	2230	11500	2490	11400	2740

WH-UD16HE8

Water Out (°C)	3	0	3	5	4	0	4	5	5	0	5	5
Outdoor Air (°C)	Capacity (W)	Input Power (W)										
-15	10600	4090	10300	4380	10000	4670	9700	4960	8800	4940	7900	4910
-7	11900	4030	11400	4430	10800	4830	10300	5220	9600	5090	9000	4950
2	13500	3740	13000	3960	12400	4180	11900	4400	10800	4460	9800	4510
7	16000	3210	16000	3740	16000	4270	16000	4800	15200	5110	14500	5410
25	16000	2310	16000	2960	16000	3070	16000	3450	16000	3670	15900	3890

WH-ADC0916H9E8 WH-UD09HE8

Water In (°C)	1	2	1	9	23		
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)	
16	7500	1150	9100	1200	7000	1130	
25	8350	1770	10900	1780	7000	1240	
35	7000	2230	8300	2320	7000	1520	
43	5520	2540	7690	2770	5600	1800	

WH-ADC0916H9E8 WH-UD12HE8

Water In (°C)	1	2	1	9	23		
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)	
16	7860	1180	13150	1400	10000	1730	
25	12080	2900	15700	2050	10000	1970	
35	10000	2560	12000	2670	10000	2400	
43	7800	3800	11100	3190	8000	2850	

WH-ADC0916H9E8 WH-UD16HE8

Water In (°C)	1	2	1	9	23		
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)	
16	9200	1620	16400	2580	12200	2450	
25	14400	3920	19200	3830	12200	2790	
35	12200	4760	15000	4980	12200	2960	
43	7750	3400	13800	5950	9700	4000	