

LG

TOTAL HVAC SOLUTION PROVIDER

ENGINEERING PRODUCT DATA BOOK

THERMAV™

Air-to-Water Heat Pump
(50Hz, R410A)

5BPM0-01J (Replace: 5BPM0-01H)





CONTENTS

Part 1. Monobloc Unit

Part 2. Design and installation

Part 3. Accessories



Part 1. Monobloc Unit

- 1. Features**
- 2. Nomenclature**
- 3. List of functions**
- 4. Specification**
- 5. Drawing**
- 6. Wiring Diagram**
- 7. Piping Diagram**
- 8. Operation Range**
- 9. Performance Data**
- 10. Electric characteristics**
- 11. Noise Criteria**
- 12. Controller**
- 13. Water Pressure Drop**

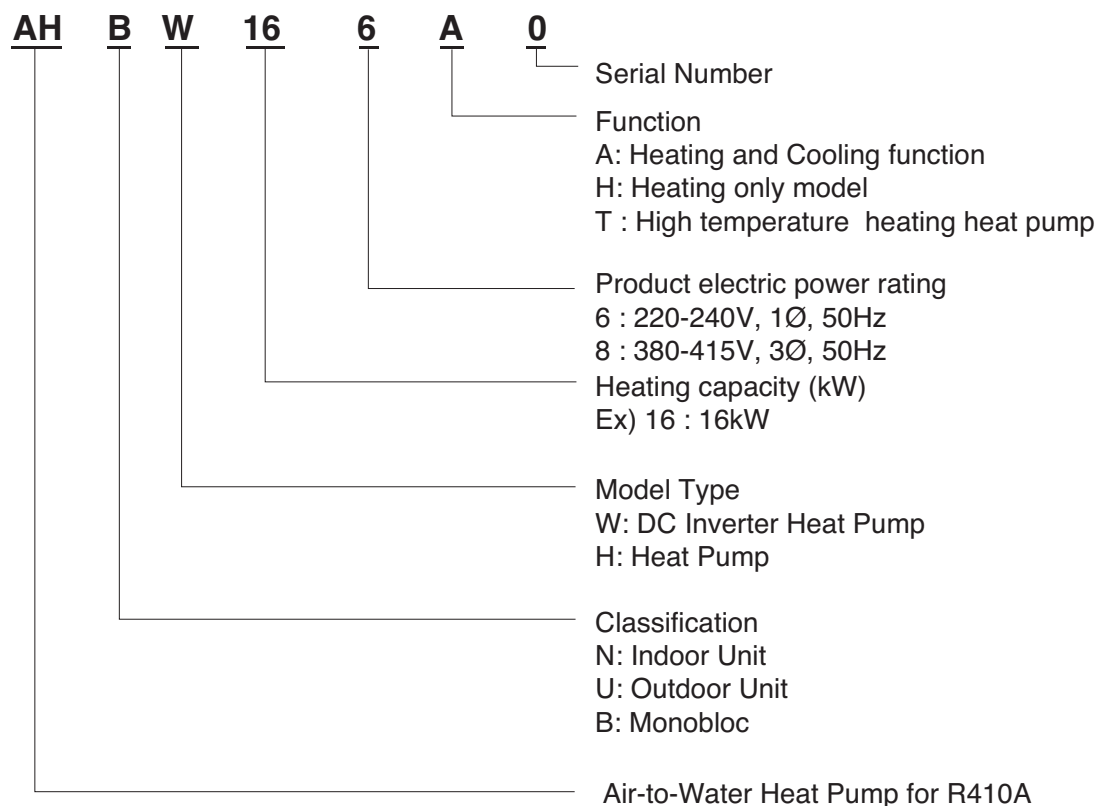
1. Features

- High energy efficiency
- Easy installation
- Total solution for cooling, heating & hot water
- No refrigerant piping work
- Fit for renovation of old boiler system
- Low operating cost and CO2 emission

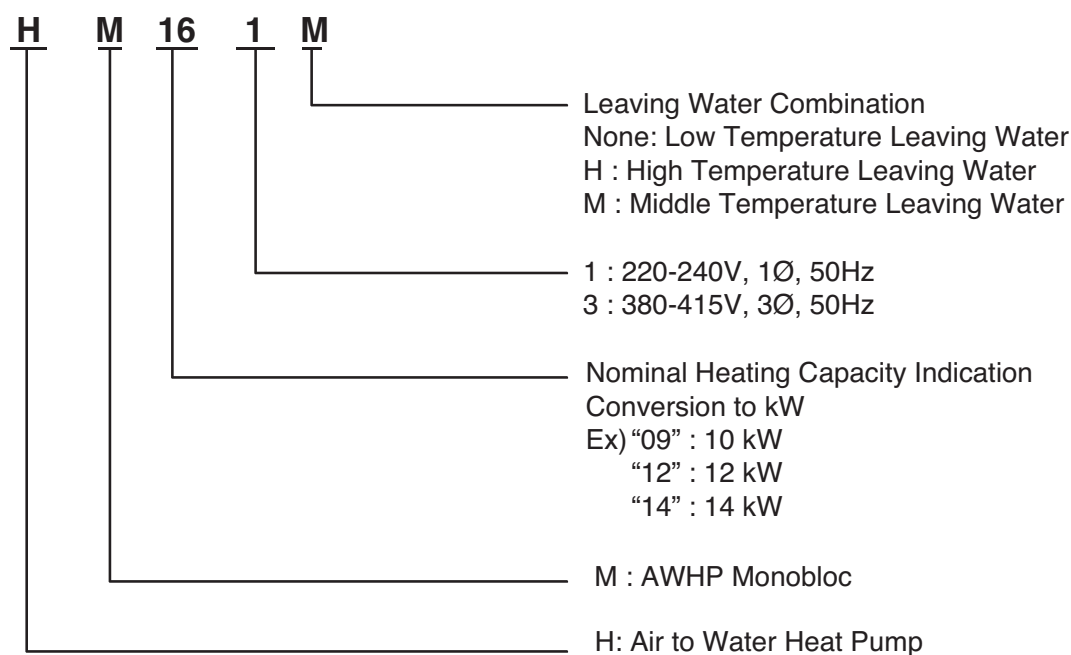


2. Nomenclature

2.1 Global Model Name



2.2 Europe Model Name



3. List of functions

3.1 Water side

Category	Functions	AHBW036H0 [HM031M]	AHBW056A0 [HM051M] AHBW076A0 [HM071M] AHBW096A0 [HM091M]
Installation	Drain pump	X	X
	E.S.P. control	X	X
	Electric heater	X	O
	High ceiling operation	X	X
	Auto Elevation Grille	X	X
Reliability	Hot start	X	X
	Self diagnosis	O	O
	Soft dry operation	X	X
Convenience	Auto changeover	X	X
	Auto cleaning	X	X
	Auto operation(artificial intelligence)	X	X
	Auto Restart	O	O
	Child lock	O	O
	Forced operation	X	X
	Group control	X	X
	Sleep mode	O	O
	Timer(on/off)	O	O
	Timer(weekly)	O	O
	Two thermistor control	X	X
Individual control	Standard Wired remote controller	O	O
	Deluxe wired remote controller	X	X
	Simple wired remote controller	X	X
	Simple Wired remote controller(for hotel use)	X	X
	Wireless remote controller	X	X
Network function	General central controller (Non LGAP)	O	O
	Network Solution(LGAP)	X	X
	Dry contact	PQDSA	PQDSA
Special function kit	PI 485(for Indoor Unit)	O	O
	Zone controller	X	X
	CTI(Communication transfer interface)	X	X
	Electronic thermostat	X	X
Others	Remote temperature sensor	PQRSTA0	PQRSTA0
	Group control wrie	X	X
	Telecom shelter controller	X	X
Air to Water Heat Pump Functions	Anti-condensation on floor(cooling)	X	O
	Water pump on / off Control	O	O
	Flow switch control	X	O
	Thermostat interface (230V AC)	O	O
	Thermostat interface (24V AC)	X	X
	Domestic Hot Water Tank heating (Install kit)	PHLTB	PHLTB
	Solar-thermal interface with Domestic Hot Water Tank (Solar thermal kit)	PHLLA	PHLLA
	PHEX anti-freezing control	O	O
	Water pump forced operation	O	O
	Autosetting according to ambient temperature	O	O
	Silent operation (with scheduler)	O	O
	Anti-overheating of water pipe	O	O
	Emergency operation	O	O
	Scheduler(Domestic Hot Water Tank Heating / Domestic Hot Water Tank Heater)	O	O
	Timer(Domestic Hot Water Tank Heating / Domestic Hot Water Tank Heater)	O	O
	Quick Domestic Hot Water Tank Heating	O	O
	Electric Heater Capacity Control	X	O
	Screed Drying Mode	O	O
	Sump Heater	O	O
	Base Pan Heater	X	O
	Dry Contact (Main PCB)	X	X

Note :

1. * : These functions need to connect the wired remote controller.
O : Applied, X : Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

3. List of functions

Category	Functions	AHBW126A0 [HM121M] AHBW146A0 [HM141M] AHBW166A0 [HM161M]	AHBW128A0 [HM123M] AHBW148A0 [HM143M] AHBW168A0 [HM163M]
Installation	Drain pump	X	X
	E.S.P. control	X	X
	Electric heater	O	O
	High ceiling operation	X	X
	Auto Elevation Grille	X	X
Reliability	Hot start	X	X
	Self diagnosis	O	O
	Soft dry operation	X	X
Convenience	Auto changeover	X	X
	Auto cleaning	X	X
	Auto operation(artificial intelligence)	X	X
	Auto Restart	O	O
	Child lock	O	O
	Forced operation	X	X
	Group control	X	X
	Sleep mode	O	O
	Timer(on/off)	O	O
	Timer(weekly)	O	O
Individual control	Two thermistor control	X	X
	Standard Wired remote controller	O	O
	Deluxe wired remote controller	X	X
	Simple wired remote controller	X	X
	Simple Wired remote controller(for hotel use)	X	X
	Wireless remote controller	X	X
Network function	General central controller (Non LGAP)	O	O
	Network Solution(LGAP)	X	X
	Dry contact	PQDSA	PQDSA
Special function kit	PI 485(for Indoor Unit)	O	O
	Zone controller	X	X
	CTI(Communication transfer interface)	X	X
Others	Electronic thermostat	X	X
	Remote temperature sensor	PQRSTA0	PQRSTA0
	Group control wrie	X	X
Air to Water Heat Pump Functions	Telecom shelter controller	X	X
	Anti-condensation on floor(cooling)	O	O
	Water pump on / off Control	O	O
	Flow switch control	O	O
	Thermostat interface (230V AC)	O	O
	Thermostat interface (24V AC)	X	X
	Domestic Hot Water Tank heating (Install kit)	PHLTB	PHLTB
	Solar-thermal interface with Domestic Hot Water Tank (Solar thermal kit)	PHLLA	PHLLA
	PHEX anti-freezing control	O	O
	Water pump forced operation	O	O
	Autosetting according to ambient temperature	O	O
	Silent operation (with scheduler)	O	O
	Anti-overheating of water pipe	O	O
	Emergency operation	O	O
	Scheduler(Domestic Hot Water Tank Heating / Domestic Hot Water Tank Heater)	O	O
	Timer(Domestic Hot Water Tank Heating / Domestic Hot Water Tank Heater)	O	O
	Quick Domestic Hot Water Tank Heating	O	O
	Electric Heater Capacity Control	O	O
	Screed Drying Mode	O	O
	Sump Heater	O	O
	Base Pan Heater	O	O
	Dry Contact (Main PCB)	O	O

Note :

1. * : These functions need to connect the wired remote controller.
O : Applied, X : Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

3. List of functions

3.2 Refrigerant side

Category	Functions	AHBW036H0 [HM031M]	AHBW056A0 [HM051M] AHBW076A0 [HM071M] AHBW096A0 [HM091M]
Reliability	Defrost / Deicing	O	O
	High pressure switch	X	X
	Low pressure switch	X	X
	Phase protection	X	X
	Restart delay (3-minutes)	O	O
	Self diagnosis	O	O
Convenience	Soft start	X	X
	Test function	O	O
	Wiring Error Check	X	X
	Peak Control	X	X
	Mode Lock	X	X
Network function	Forced Cooling Operation (Outdoor Unit)	X	X
	Network solution(LGAP)	X	X

Category	Functions	AHBW126A0 [HM121M] AHBW146A0 [HM141M] AHBW166A0 [HM161M]	AHBW128A0 [HM123M] AHBW148A0 [HM143M] AHBW168A0 [HM163M]
Reliability	Defrost / Deicing	O	O
	High pressure switch	X	X
	Low pressure switch	X	X
	Phase protection	X	O
	Restart delay (3-minutes)	O	O
	Self diagnosis	O	O
Convenience	Soft start	X	X
	Test function	O	O
	Wiring Error Check	X	X
	Peak Control	X	X
	Mode Lock	X	X
Network function	Forced Cooling Operation (Outdoor Unit)	X	X
	Network solution(LGAP)	X	X

Note :

1. * : These functions need to connect the wired remote controller.
O : Applied, X : Not applied

Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separate package.

4. Specification

Nominal Capacity and Nominal Input			AHBW036H0 [HM031M]
*1 Capacity	Cooling	kW	-
	Heating	kW	3.00
*1 Power Input	Cooling	kW	-
	Heating	kW	0.73
EER	Cooling	W/W	-
COP	Heating	W/W	4.10

Technical Specifications					AHBW036H0 [HM031M]	
Water Side	Operation Range	Cooling	For Fan Coil Unit	Min. ~ Max.	°C DB	-
			For under floor	Min. ~ Max.	°C DB	-
		Heating	For Fan Coil Unit / Radiator	Min. ~ Max.	°C DB	20 ~ 57
			For under floor	Min. ~ Max.	°C DB	20 ~ 57
	Water Pump	Type		-	Canned type for hot water circulation	
		Motor Type		-	Inverter	
		Steps of Pumping speed		-		
		Power input	Rated	W	45	
		Water Flow Rate	Min. / Rated	l /min	15.0 / 15.0	
	Heat Exchanger	Type		-	Brazed Plate HEX	
		Quantity			1	
		Number of Plate		EA	18	
		Head Loss	Rated	kPa	8.25	
		Water Flow Rate	Min	l /min	15.0	
	Expansion Vessel	System Water Volume	Max.	l	-	
		Pre-pressure		kPa	-	
	Piping Connections	Inlet		mm	25.4 (Female)	
		Outlet		mm	25.4 (Female)	
	Strainer	Mesh size	W x H	mm x mm	-	
		Material		-	-	
	Safety Valve	Pressure Limit	Upper Limit	bar	-	
	Devices for Water Circuit			-	-	
-				-		
Refrigerant Side	Operation Range (Outdoor Temperature)	Cooling	Min. ~ Max.	°C DB	-	
		Heating	Min. ~ Max.	°C DB	-20 ~ 30	
	Compressor	Type		-	Hermetic motor	
		Model		Model x No.	GKT141MBC	
		Motor Type		-	Brushless	
		Motor Output	Rated	W x No.	1,500 x 1	
	Heat Exchanger	(Row x Column x Fins per inch) x No.		-	(2 x 38 x 18) x 1	
	Refrigerant	Type		-	R410A	
		GWP (Global Warming Potential)		-	2,087.5	
		Precharged Amount		g(oz)	750 (26.5)	
		t-CO2 eq.		-	1.57	
		Control		-	Electronic Expansion Valve	
	Refrigerant Oil	Type		-	FVC68D	
		Charged Volume		cc x No.	470	
	Fan	Type		-	Propeller	
		Air Flow Rate	Rated	m³/min x No.	32.0 x 1	
	Fan Motor	Type		-	BLDC	
		Output		W x No.	124 x 1	
	Sound Pressure Level	Cooling	Rated	dB(A)		-
		Heating	Rated	dB(A)		47
	Sound Power Level	Heating	Max.	dB(A)		57
	Silent Sound Pressure Level	Heating	Rated	dB(A)		43
Silent Sound Power Level	Heating	Max.	dB(A)		53	
Dimensions	Unit	W x H x D	mm		950 x 834 x 330	
Weight	Unit		kg		61.0	

Electrical Specifications					AHBW036H0 [HM031M]
Outdoor Unit	Power Supply		V, Ø, Hz		220-240, 1, 50
	Maximum	Cooling	A		-
	Running Current	Heating	A		10.0
	Wiring Connections	Power Supply Cable (included Earth)		No x mm²	3 x 1.0 (H07RN-F)

Note :

1. Capacities and power inputs are based on the following conditions:

- *1 : Heating conditions - Inlet/Outlet Water Temperature 30°C/35°C;
Outdoor Air Temperature 7°CDB/6°CWB

2. Wiring cable size must comply with the applicable local and national code.

3. The specification may be subject to change without prior notice for purpose of improvement.

4. This product contains Fluorinated Greenhouse Gases.

4. Specification

Nominal Capacity and Nominal Input			AHBW056A0 [HM051M]	AHBW076A0 [HM071M]	AHBW096A0 [HM091M]
*1 Capacity	Cooling	kW	4.99	5.60	8.80
	Heating	kW	4.99	7.00	9.00
*1 Power Input	Cooling	kW	1.38	1.55	2.32
	Heating	kW	1.13	1.63	2.20
*1 EER	Cooling	W/W	3.61	3.61	3.79
*1 COP	Heating	W/W	4.40	4.30	4.10

Technical Specifications					AHBW056A0 [HM051M]	AHBW076A0 [HM071M]	AHBW096A0 [HM091M]	
Water Side	Operation Range	Cooling	For Fan Coil Unit	Min. ~ Max.	°C DB	6 ~ 30	6 ~ 30	6 ~ 30
			For under floor	Min. ~ Max.	°C DB	16 ~ 30	16 ~ 30	16 ~ 30
		Heating	For Fan Coil Unit / Radiator	Min. ~ Max.	°C DB	15 ~ 57	15 ~ 57	15 ~ 57
			For under floor	Min. ~ Max.	°C DB	15 ~ 57	15 ~ 57	15 ~ 57
	Water Pump	Type		-	Canned type for hot water circulation	Canned type for hot water circulation	Canned type for hot water circulation	
		Motor Type		-	Inverter	Inverter	Inverter	
		Steps of Pumping speed		-	-	-	-	
		Power input	Rated	W	45	45	45	
	Heat Exchanger	Water Flow Rate	Min. / Rated	l /min	15.0 / 15.0	15.0 / 20.0	15.0 / 26.0	
		Type		-	Brazed Plate HEX	Brazed Plate HEX	Brazed Plate HEX	
		Quantity		-	1	1	1	
		Number of Plate		EA	32	42	54	
	Expansion Vessel	Head Loss	Rated	kPa	10.18	11.54	11.71	
		Water Flow Rate	Min	l /min	15.0	20.0	26.0	
		System Water Volume	Max.	l	200	200	200	
		Pre-pressure		kPa	120	120	120	
	Piping Connections	Inlet		mm	25.4 (Female)	25.4 (Female)	25.4 (Female)	
		Outlet		mm	25.4 (Female)	25.4 (Female)	25.4 (Female)	
	Strainer	Mesh size	W x H	mm x mm	1 x 1	1 x 1	1 x 1	
		Material		-	Stainless Steel	Stainless Steel	Stainless Steel	
	Safety Valve	Pressure Limit	Upper Limit	bar	3.0	3.0	3.0	
	Devices for Water Circuit			-	Pressure gauge	Pressure gauge	Pressure gauge	
-				Drain / Fill valve	Drain / Fill valve	Drain / Fill valve		
Refrigerant Side	Operation Range (Outdoor Temperature)	Cooling	Min. ~ Max.	°C DB	5 ~ 48	5 ~ 48	5 ~ 48	
		Heating	Min. ~ Max.	°C DB	-20 ~ 35	-20 ~ 35	-20 ~ 35	
	Compressor	Type		-	Hermetic motor	Hermetic motor	Hermetic motor	
		Model		Model x No.	GJT240MAA	GJT240MAA	GJT240MAA	
		Motor Type		-	Twin Rotary	Twin Rotary	Twin Rotary	
		Motor Output	Rated	W x No.	2,100 x 1	2,100 x 1	2,100 x 1	
	Heat Exchanger	(Row x Column x Fins per inch) x No.		-	(2 x 38 x 14) x 1	(2 x 38 x 14) x 1	(2 x 38 x 14) x 1	
	Refrigerant	Type		-	R410A	R410A	R410A	
		GWP (Global Warming Potential)		-	2,087.5	2,087.5	2,087.5	
		Precharged Amount		g(oz)	1,200(42.3)	1,450(51.1)	1,600(56.4)	
		t-CO2 eq.		-	2.51	3.03	3.34	
	Refrigerant Oil	Control		-	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve	
		Type		-	FVC68D	FVC68D	FVC68D	
		Charged Volume		cc x No.	900	900	900	
		Fan	Type		-	Propeller	Propeller	Propeller
	Air Flow Rate		Rated	m³/min x No.	50.0 x 1	60.0 x 1	60.0 x 1	
	Fan Motor	Type		-	BLDC	BLDC	BLDC	
		Output		W x No.	124 x 1	124 x 1	124 x 1	
	Sound Pressure Level	Cooling	Rated	dB(A)	50	52	52	
		Heating	Rated	dB(A)	51	52	52	
Sound Power Level	Heating	Max.	dB(A)	63	65	67		
Silent Sound Pressure Level	Heating	Rated	dB(A)	48	48	48		
Silent Sound Power Level	Heating	Max.	dB(A)	58	58	58		
Dimensions	Unit	W x H x D	mm	1,239 x 907 x 390	1,239 x 907 x 390	1,239 x 907 x 390		
Weight	Unit		kg	97.0	98.0	99.0		

Electrical Specifications				AHBW056A0 [HM051M]	AHBW076A0 [HM071M]	AHBW096A0 [HM091M]
Outdoor Unit	Power Supply		V, Ø, Hz	220-240, 1, 50	220-240, 1, 50	220-240, 1, 50
	Maximum	Cooling	A	12.0	13.0	14.0
		Heating	A	13.0	14.0	15.0
	Running Current	Power Supply Cable (included Earth)		No x mm²	3 x 1.5 (H07RN-F)	3 x 1.5 (H07RN-F)
Heater	Power Supply		V, Ø, Hz	220-240, 1, 50	220-240, 1, 50	220-240, 1, 50
	Running current		A	19.5	19.5	19.5
	Wiring connection	Power Supply Cable (included Earth)	No x mm²	3 x 2.5 (H07RN-F)	3 x 2.5 (H07RN-F)	3 x 2.5 (H07RN-F)

Note :

- Capacities and power inputs are based on the following conditions:
 *1 : Cooling conditions - Inlet/Outlet Water Temperature 23°C/18°C;
 Outdoor Air Temperature 35°CDB/24°CWB
 Heating conditions - Inlet/Outlet Water Temperature 30°C/35°C;
 Outdoor Air Temperature 7°CDB/6°CWB

- Wiring cable size must comply with the applicable local and national code.
- The specification may be subject to change without prior notice for purpose of improvement.
- This product contains Fluorinated Greenhouse Gases.

4. Specification

Nominal Capacity and Nominal Input			AHBW126A0 [HM121M]	AHBW146A0 [HM141M]	AHBW166A0 [HM161M]
*1 Capacity	Cooling	kW	10.40	12.20	13.20
	Heating	kW	12.00	14.00	16.00
*1 Power Input	Cooling	kW	2.67	3.32	3.65
	Heating	kW	2.67	3.15	3.81
*1 EER	Cooling	W/W	3.89	3.67	3.62
*1 COP	Heating	W/W	4.49	4.44	4.20

Technical Specifications						AHBW126A0 [HM121M]	AHBW146A0 [HM141M]	AHBW166A0 [HM161M]
Water Side	Operation Range	Cooling	For Fan Coil Unit	Min. ~ Max.	°C DB	6 ~ 30	6 ~ 30	6 ~ 30
			For under floor	Min. ~ Max.	°C DB	16 ~ 30	16 ~ 30	16 ~ 30
		Heating	For Fan Coil Unit / Radiator	Min. ~ Max.	°C DB	15 ~ 57	15 ~ 57	15 ~ 57
			For under floor	Min. ~ Max.	°C DB	15 ~ 57	15 ~ 57	15 ~ 57
	Water Pump	Type			-	Canned type for hot water circulation	Canned type for hot water circulation	Canned type for hot water circulation
		Motor Type			-	Inverter	Inverter	Inverter
		Steps of Pumping speed			-	-	-	-
		Power input		Rated	W	130	130	130
	Heat Exchanger	Water Flow Rate		Min. / Rated	l / min	15.0 / 34.0	15.0 / 40.0	15.0 / 46.0
		Type			-	Brazed Plate HEX	Brazed Plate HEX	Brazed Plate HEX
		Quantity				1	1	1
		Number of Plate			EA	76	76	76
	Expansion Vessel	Head Loss		Rated	kPa	14.50	16.20	18.52
		Water Flow Rate		Min	l / min	34.0	40.0	46.0
		System Water Volume		Max.	l	200	200	200
		Pre-pressure			kPa	120	120	120
	Piping Connections	Inlet			mm	25.4 (Female)	25.4 (Female)	25.4 (Female)
		Outlet			mm	25.4 (Female)	25.4 (Female)	25.4 (Female)
	Strainer	Mesh size		W x H	mm x mm	1 x 1	1 x 1	1 x 1
		Material			-	Stainless Steel	Stainless Steel	Stainless Steel
	Safety Valve	Pressure Limit		Upper Limit	bar	3.0	3.0	3.0
		Devices for Water Circuit			-	Pressure gauge	Pressure gauge	Pressure gauge
Refrigerant Side	Operation Range (Outdoor Temperature)	Cooling		Min. ~ Max.	°C DB	5 ~ 48	5 ~ 48	5 ~ 48
				Min. ~ Max.	°C DB	-20 ~ 35	-20 ~ 35	-20 ~ 35
		Heating		Min. ~ Max.	°C DB	-20 ~ 35	-20 ~ 35	-20 ~ 35
				Min. ~ Max.	°C DB	-20 ~ 35	-20 ~ 35	-20 ~ 35
	Compressor	Type			-	Hermetic motor	Hermetic motor	Hermetic motor
		Model			Model x No.	GPT442MBA	GPT442MBA	GPT442MBA
		Motor Type			-	Twin Rotary	Twin Rotary	Twin Rotary
		Motor Output		Rated	W x No.	4,000 x 1	4,000 x 1	4,000 x 1
	Heat Exchanger	(Row x Column x Fins per inch) x No.			-	(2 x 32 x 14) x 2	(2 x 32 x 14) x 2	(2 x 32 x 14) x 2
		Type			-	R410A	R410A	R410A
		GWP (Global Warming Potential)			-	2,087.5	2,087.5	2,087.5
		Precharged Amount			g(oz)	2,200(77.6)	2,200(77.6)	2,200(77.6)
	Refrigerant	t-CO2 eq.			-	4.59	4.59	4.59
		Control			-	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
		Type			-	FVC68D	FVC68D	FVC68D
		Charged Volume			cc x No.	1,300	1,300	1,300
	Fan	Type			-	Propeller	Propeller	Propeller
		Air Flow Rate		Rated	m³/min x No.	60.0 x 2	60.0 x 2	60.0 x 2
	Fan Motor	Type			-	BLDC	BLDC	BLDC
		Output			W x No.	124 x 2	124 x 2	124 x 2
Sound Pressure Level	Cooling		Rated		dB(A)	54	54	54
	Heating		Rated		dB(A)	53	53	53
Sound Power Level	Heating		Max.		dB(A)	68	68	68
Silent Sound Pressure Level	Heating		Rated		dB(A)	50	50	50
Silent Sound Power Level	Heating		Max.		dB(A)	61	61	61
Dimensions	Unit		W x H x D		mm	1,239 x 1,450 x 390	1,239 x 1,450 x 390	1,239 x 1,450 x 390
Weight	Unit				kg	141.0	141.0	141.0

Electrical Specifications				AHBW126A0 [HM121M]	AHBW146A0 [HM141M]	AHBW166A0 [HM161M]
Outdoor Unit	Power Supply		V, Ø, Hz	220-240, 1, 50	220-240, 1, 50	220-240, 1, 50
	Maximum	Cooling	A	22.0	22.0	22.0
		Heating	A	25.0	25.0	25.0
	Running Current	Power Supply Cable (included Earth)		No x mm²	3 x 2.5 (H07RN-F)	3 x 2.5 (H07RN-F)
Heater	Power Supply		V, Ø, Hz	220-240, 1, 50	220-240, 1, 50	220-240, 1, 50
	Running current		A	29.0	29.0	29.0
	Wiring connection	Power Supply Cable (included Earth)	No x mm²	3 x 4.0 (H07RN-F)	3 x 4.0 (H07RN-F)	3 x 4.0 (H07RN-F)

Note :

- Capacities and power inputs are based on the following conditions:
 *1 : Cooling conditions - Inlet/Outlet Water Temperature 23°C/18°C;
 Outdoor Air Temperature 35°CDB/24°CWB
 Heating conditions - Inlet/Outlet Water Temperature 30°C/35°C;
 Outdoor Air Temperature 7°CDB/6°CWB

- Wiring cable size must comply with the applicable local and national code.
- The specification may be subject to change without prior notice for purpose of improvement.
- This product contains Fluorinated Greenhouse Gases.

4. Specification

Nominal Capacity and Nominal Input			AHBW128A0 [HM123M]	AHBW148A0 [HM143M]	AHBW168A0 [HM163M]
*1 Capacity	Cooling	kW	10.40	12.20	13.20
	Heating	kW	12.00	14.00	16.00
*1 Power Input	Cooling	kW	2.67	3.32	3.65
	Heating	kW	2.67	3.15	3.81
*1 EER	Cooling	W/W	3.89	3.67	3.62
*1 COP	Heating	W/W	4.49	4.44	4.20

Technical Specifications					AHBW128A0 [HM123M]	AHBW148A0 [HM143M]	AHBW168A0 [HM163M]	
Water Side	Operation Range	Cooling	For Fan Coil Unit	Min. ~ Max.	°C DB	6 ~ 30	6 ~ 30	6 ~ 30
			For under floor	Min. ~ Max.	°C DB	16 ~ 30	16 ~ 30	16 ~ 30
		Heating	For Fan Coil Unit / Radiator	Min. ~ Max.	°C DB	15 ~ 57	15 ~ 57	15 ~ 57
			For under floor	Min. ~ Max.	°C DB	15 ~ 57	15 ~ 57	15 ~ 57
	Water Pump	Type		-	Canned type for hot water circulation	Canned type for hot water circulation	Canned type for hot water circulation	
		Motor Type		-	Inverter	Inverter	Inverter	
		Steps of Pumping speed		-	-	-	-	
		Power input	Rated	W	130	130	130	
	Heat Exchanger	Water Flow Rate	Min. / Rated	l /min	15.0 / 34.0	15.0 / 40.0	15.0 / 46.0	
		Type		-	Brazed Plate HEX	Brazed Plate HEX	Brazed Plate HEX	
		Quantity		-	1	1	1	
		Number of Plate		EA	76	76	76	
	Expansion Vessel	Head Loss	Rated	kPa	14.50	16.20	18.52	
		Water Flow Rate	Min	l /min	34.0	40.0	46.0	
		System Water Volume	Max.	l	200	200	200	
		Pre-pressure		kPa	120	120	120	
	Piping Connections	Inlet		mm	25.4 (Female)	25.4 (Female)	25.4 (Female)	
		Outlet		mm	25.4 (Female)	25.4 (Female)	25.4 (Female)	
	Strainer	Mesh size	W x H	mm x mm	1 x 1	1 x 1	1 x 1	
		Material		-	Stainless Steel	Stainless Steel	Stainless Steel	
	Safety Valve	Pressure Limit	Upper Limit	bar	3.0	3.0	3.0	
	Devices for Water Circuit			-	Pressure gauge	Pressure gauge	Pressure gauge	
-				Drain / Fill valve	Drain / Fill valve	Drain / Fill valve		
Refrigerant Side	Operation Range (Outdoor Temperature)	Cooling	Min. ~ Max.	°C DB	5 ~ 48	5 ~ 48	5 ~ 48	
		Heating	Min. ~ Max.	°C DB	-20 ~ 35	-20 ~ 35	-20 ~ 35	
	Compressor	Type		-	Hermetic motor	Hermetic motor	Hermetic motor	
		Model		Model x No.	GPT442MAA	GPT442MAA	GPT442MAA	
		Motor Type		-	Twin Rotary	Twin Rotary	Twin Rotary	
		Motor Output	Rated	W x No.	4,000 x 1	4,000 x 1	4,000 x 1	
	Heat Exchanger	(Row x Column x Fins per inch) x No.		-	(2 x 32 x 14) x 2	(2 x 32 x 14) x 2	(2 x 32 x 14) x 2	
	Refrigerant	Type		-	R410A	R410A	R410A	
		GWP (Global Warming Potential)		-	2,087.5	2,087.5	2,087.5	
		Precharged Amount		g(oz)	2,200(77.6)	2,200(77.6)	2,200(77.6)	
		t-CO2 eq.		-	4.59	4.59	4.59	
	Refrigerant Oil	Control		-	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve	
		Type		-	FVC68D	FVC68D	FVC68D	
		Charged Volume		cc x No.	1,300	1,300	1,300	
		Fan	Type		-	Propeller	Propeller	Propeller
	Air Flow Rate		Rated	m³/min x No.	60.0 x 2	60.0 x 2	60.0 x 2	
	Fan Motor	Type		-	BLDC	BLDC	BLDC	
		Output		W x No.	124 x 2	124 x 2	124 x 2	
	Sound Pressure Level	Cooling	Rated	dB(A)	54	54	54	
		Heating	Rated	dB(A)	53	53	53	
Sound Power Level	Heating	Max.	dB(A)	68	68	68		
Silent Sound Pressure Level	Heating	Rated	dB(A)	50	50	50		
Silent Sound Power Level	Heating	Max.	dB(A)	61	61	61		
Dimensions	Unit	W x H x D	mm	1,239 x 1,450 x 390	1,239 x 1,450 x 390	1,239 x 1,450 x 390		
Weight	Unit		kg	145.0	145.0	145.0		

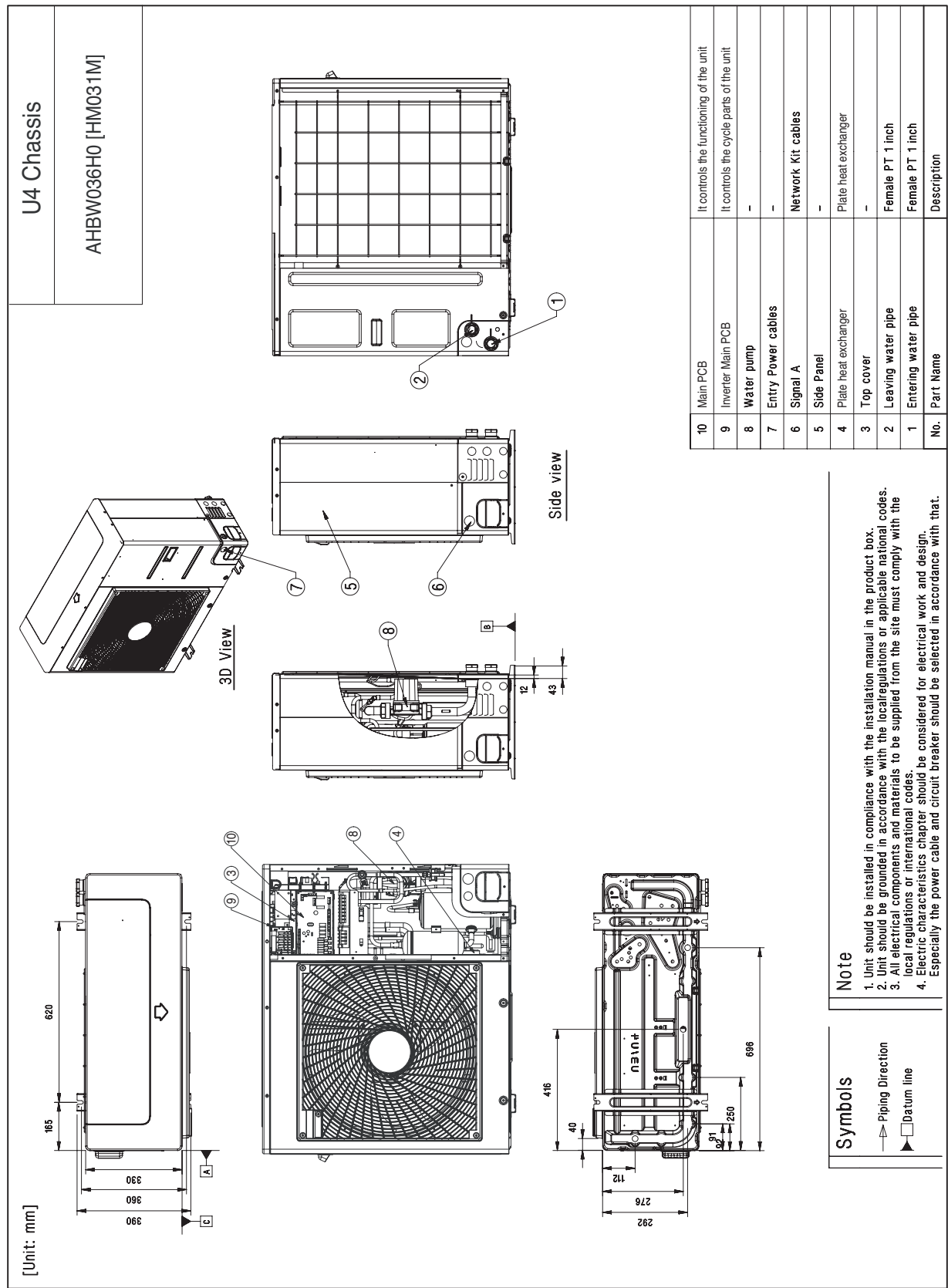
Electrical Specifications				AHBW128A0 [HM123M]	AHBW148A0 [HM143M]	AHBW168A0 [HM163M]
Outdoor Unit	Power Supply		V, Ø, Hz	380-415, 3, 50	380-415, 3, 50	380-415, 3, 50
	Maximum	Cooling	A	11.0	11.0	11.0
		Heating	A	11.0	11.0	11.0
	Running Current	Power Supply Cable (included Earth)		No x mm²	3 x 2.5 (H07RN-F)	3 x 2.5 (H07RN-F)
Wiring Connections	Power Supply Cable (included Earth)		No x mm²	3 x 2.5 (H07RN-F)	3 x 2.5 (H07RN-F)	3 x 2.5 (H07RN-F)
	Power Supply		V, Ø, Hz	380-415, 3, 50	380-415, 3, 50	380-415, 3, 50
	Running current		A	9.6	9.6	9.6
Heater	Wiring connection		No x mm²	3 x 4.0 (H07RN-F)	3 x 4.0 (H07RN-F)	3 x 4.0 (H07RN-F)
	Power Supply Cable (included Earth)		No x mm²	3 x 4.0 (H07RN-F)	3 x 4.0 (H07RN-F)	3 x 4.0 (H07RN-F)

Note :

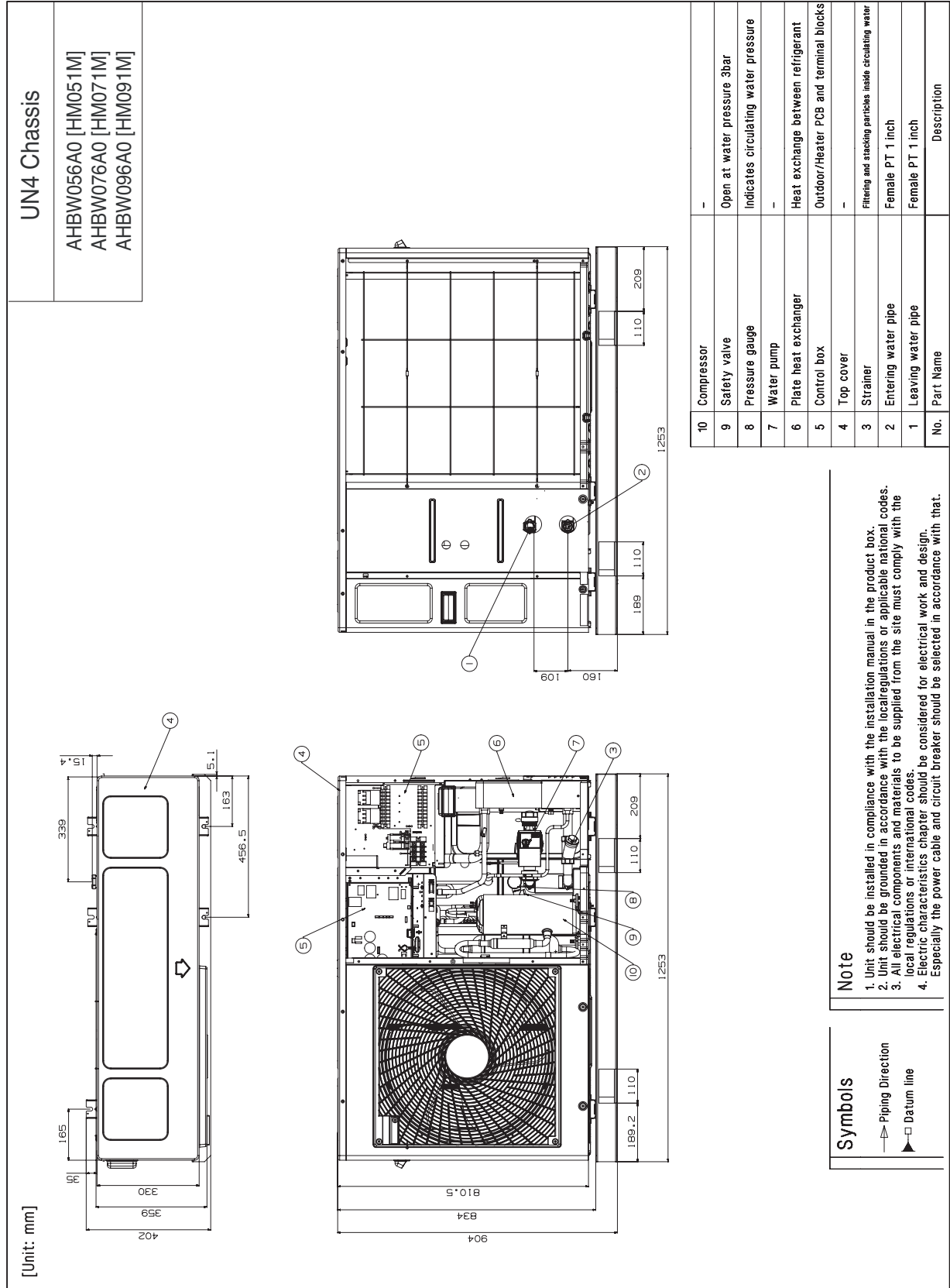
- Capacities and power inputs are based on the following conditions:
 *1 : Cooling conditions - Inlet/Outlet Water Temperature 23°C/18°C;
 Outdoor Air Temperature 35°CDB/24°CWB
 Heating conditions - Inlet/Outlet Water Temperature 30°C/35°C;
 Outdoor Air Temperature 7°CDB/6°CWB

- Wiring cable size must comply with the applicable local and national code.
- The specification may be subject to change without prior notice for purpose of improvement.
- This product contains Fluorinated Greenhouse Gases.

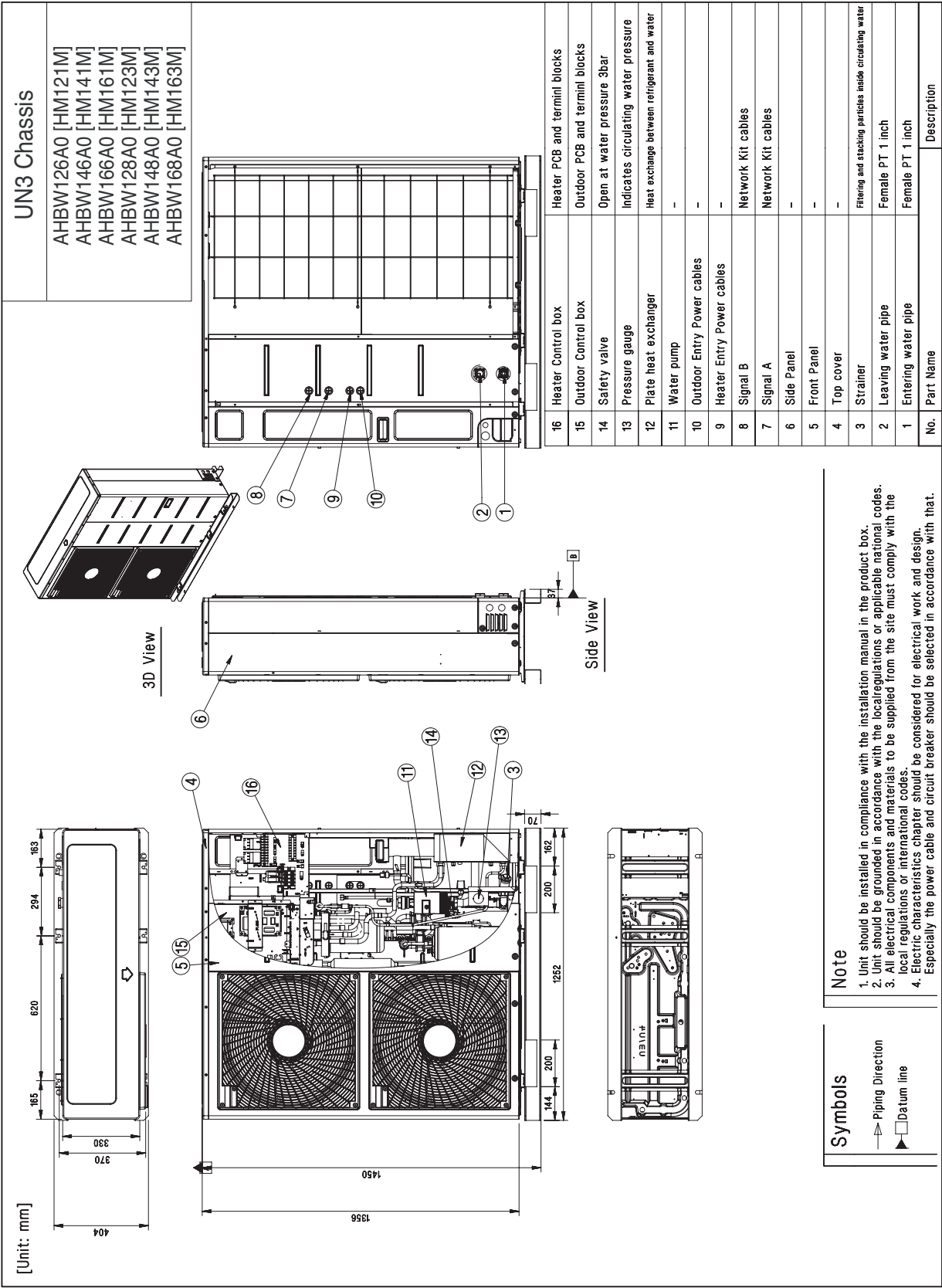
5. Drawing

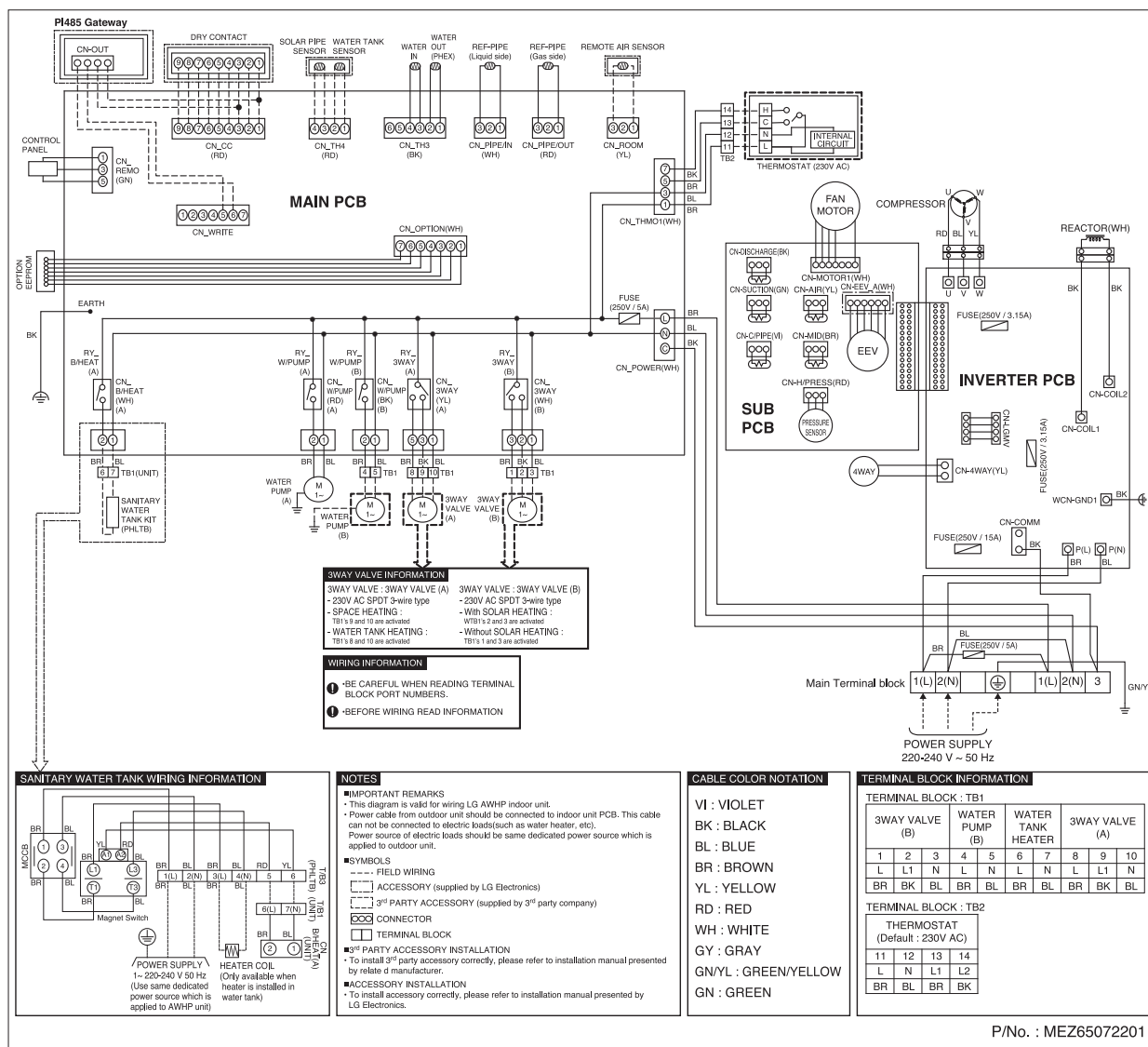


5. Drawing



5. Drawing



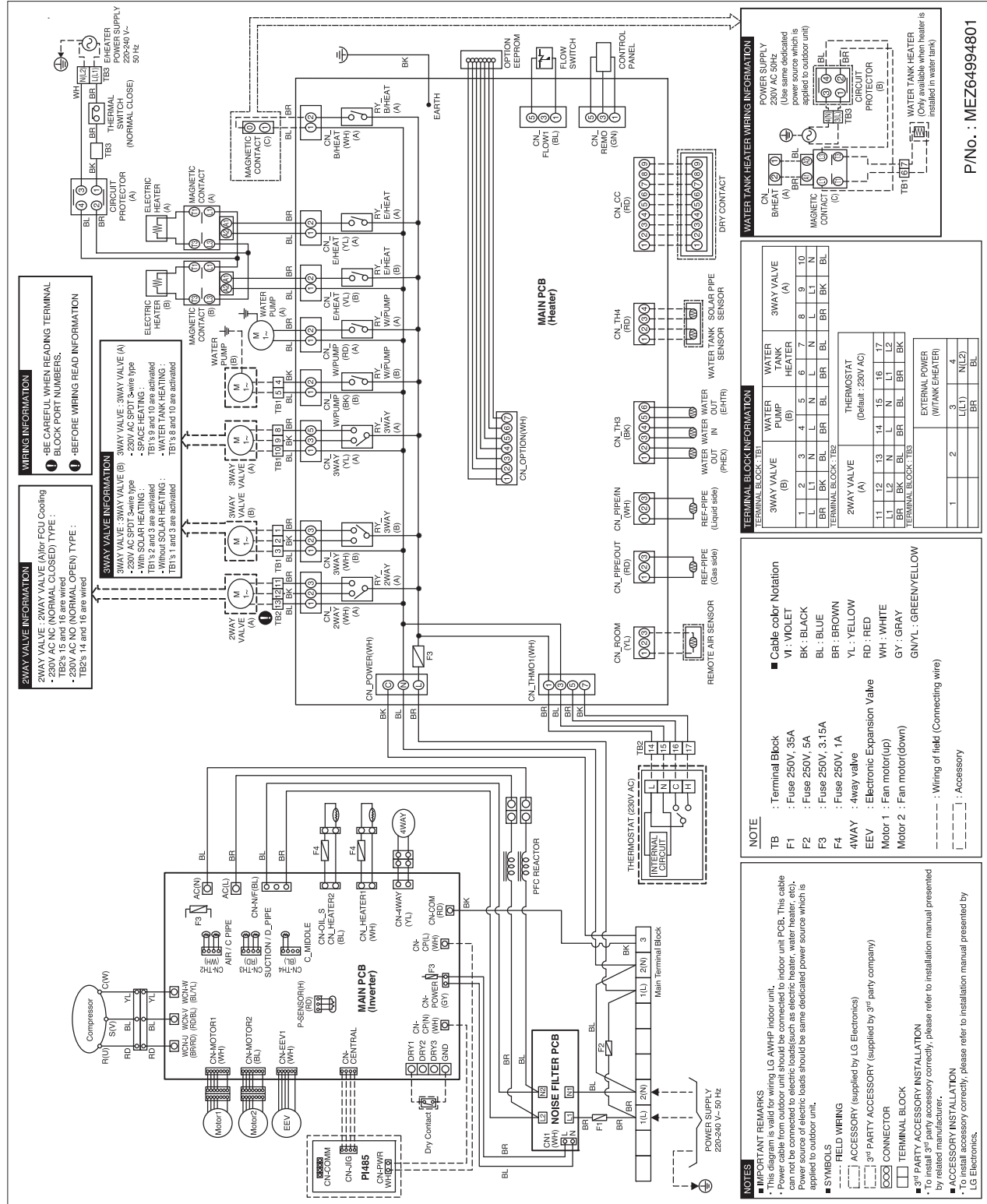


Models : AHBW056A0 [HM051M] / AHBW076A0 [HM071M] / AHBW096A0 [HM091M]



6. Wiring Diagram

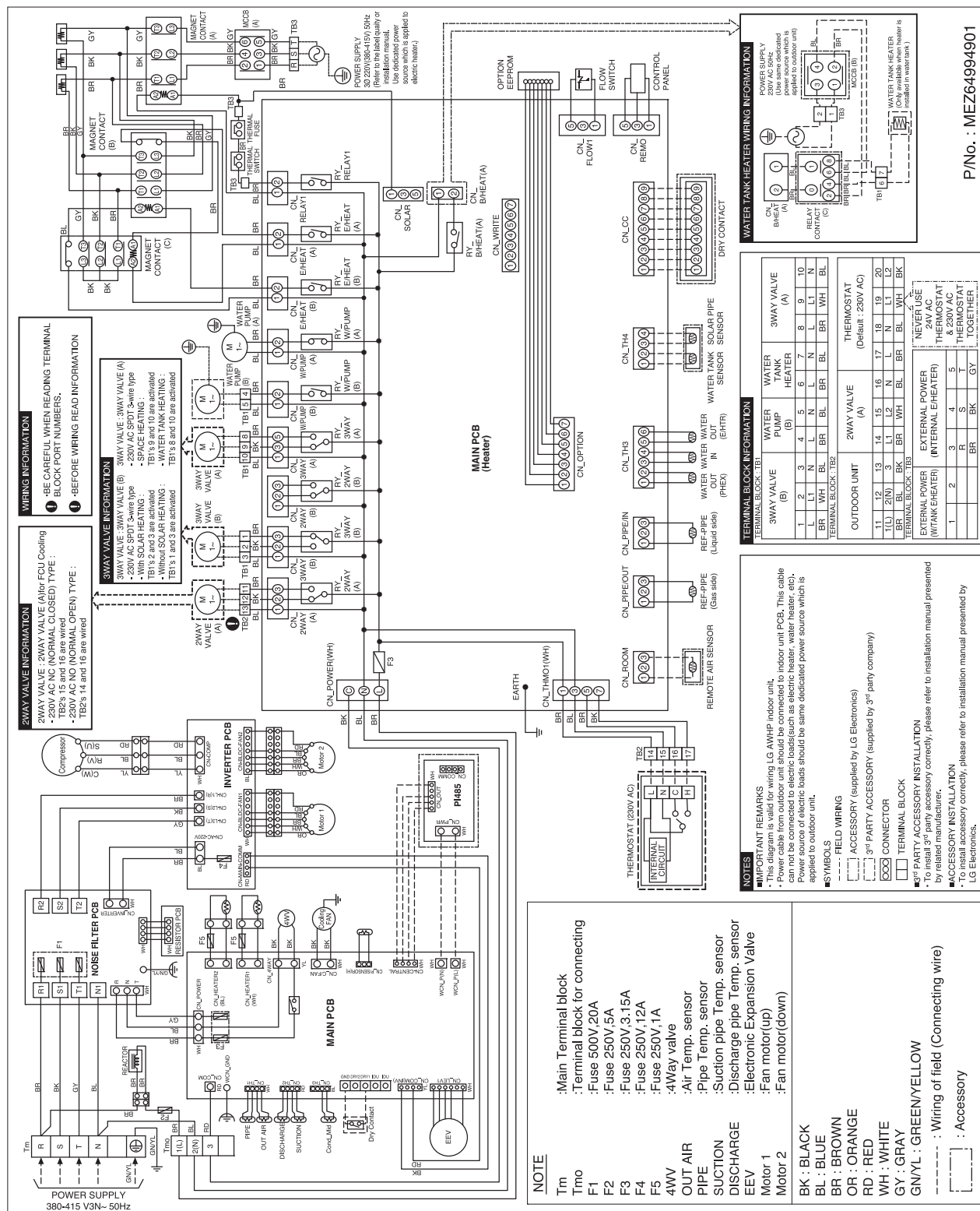
Models : AHBW126A0 [HM121M] / AHBW146A0 [HM141M] / AHBW166A0 [HM161M]



P/No. : MEZ64994801

6. Wiring Diagram

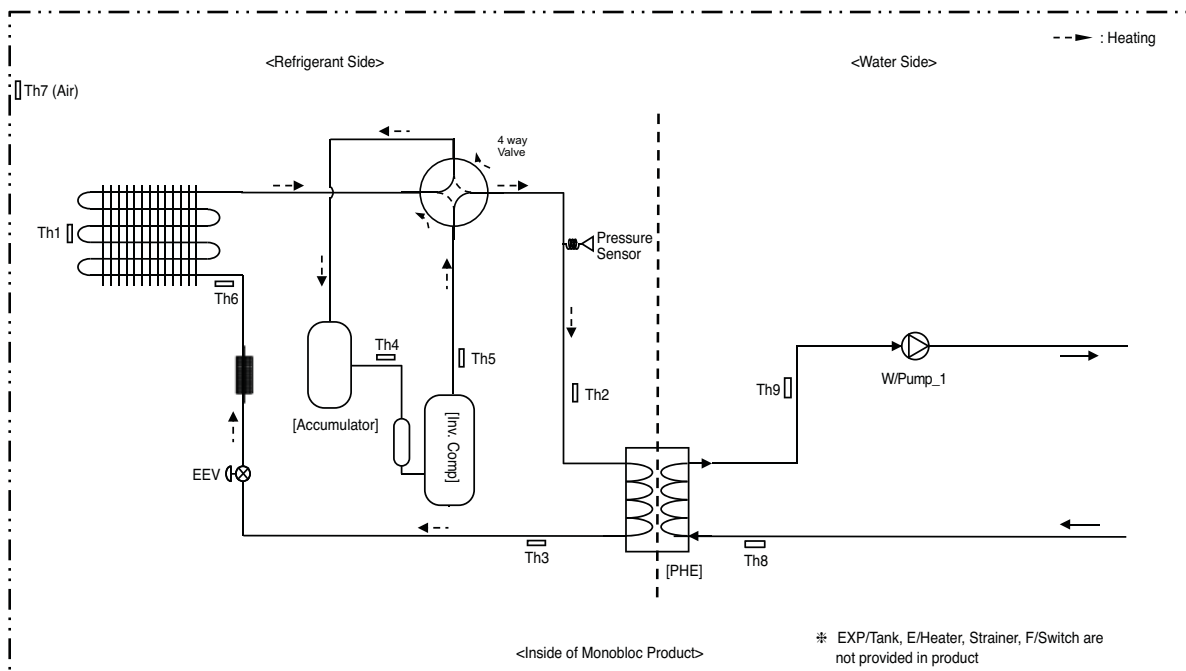
Models : AHBW128A0 [HM123M] / AHBW148A0 [HM143M] / AHBW168A0 [HM163M]



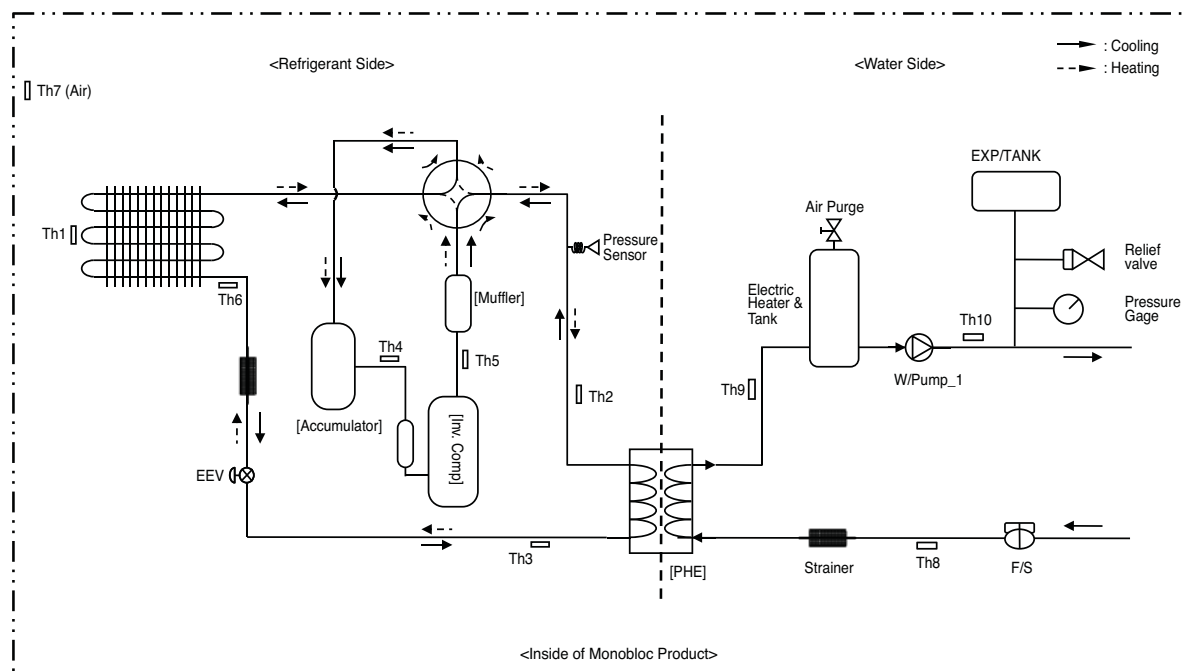
P/No. : MEZ64994901

■ Refrigerant side / Water side

Models : AHBW036H0 [HM031M]



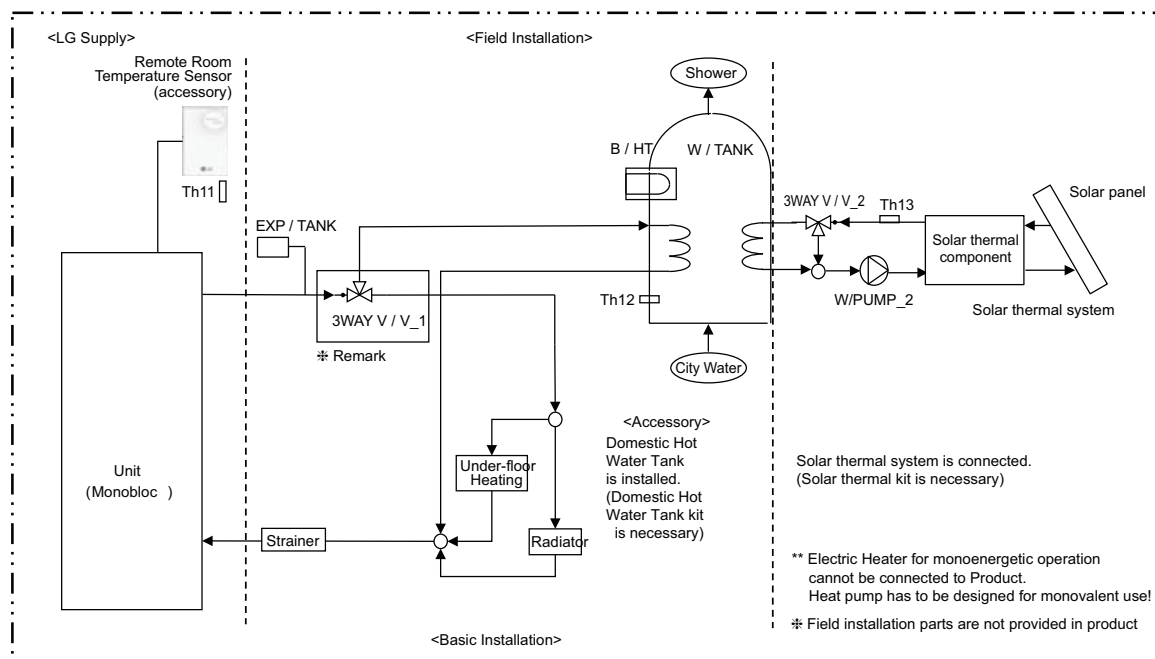
**Models : AHBW056A0 [HM051M] / AHBW076A0 [HM071M] / AHBW096A0 [HM091M]
AHBW126A0 [HM121M] / AHBW146A0 [HM141M] / AHBW166A0 [HM161M]
AHBW128A0 [HM123M] / AHBW148A0 [HM143M] / AHBW168A0 [HM163M]**



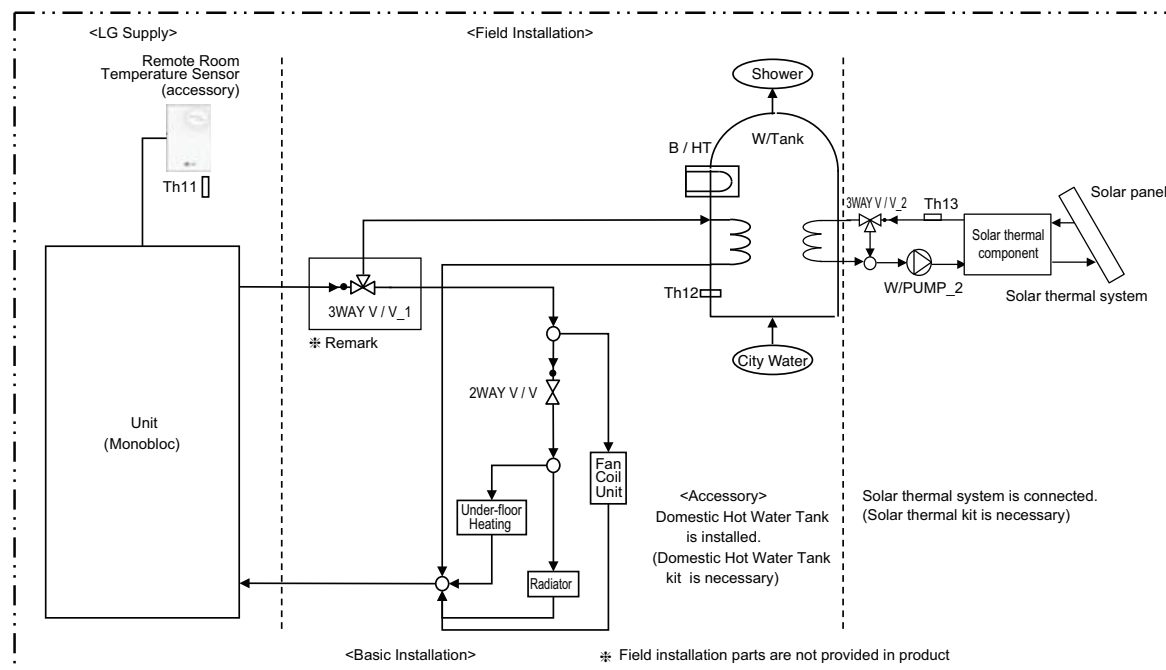
7. Piping Diagram

Field Installation

Models : AHBW036H0 [HM031M]



Models : AHBW056A0 [HM051M] / AHBW076A0 [HM071M] / AHBW096A0 [HM091M]
 AHBW126A0 [HM121M] / AHBW146A0 [HM141M] / AHBW166A0 [HM161M]
 AHBW128A0 [HM123M] / AHBW148A0 [HM143M] / AHBW168A0 [HM163M]

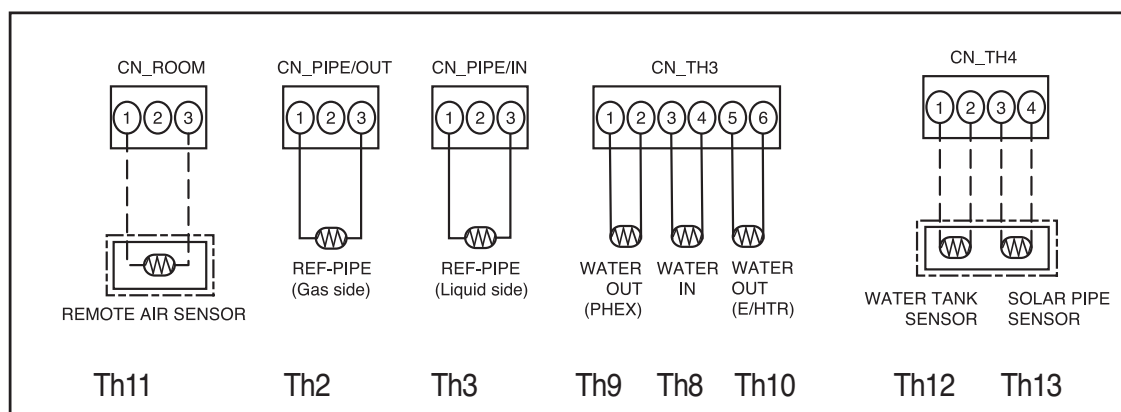


7. Piping Diagram

Description

Models : AHBW036H0 [HM031M]

Category	Symbol	Meaning	PCB Connector	Remarks
Unit	Th1	Condenser temperature sensor	CN_TH4	- Discription is expressed based on cooling mode.
	Th2	Outlet evaporator temperature sensor	CN_PIPE/OUT	- Discription is expressed based on cooling mode
	Th3	Inlet evaporator temperature sensor	CN_PIPE/IN	
	Th4	Compressor suction pipe temperature sensor	CN_TH3 (MAIN PCB)	- Th4 and Th5 are connected at 4 pin type connector CN_TH3 (MAIN PCB)
	Th5	Compressor discharge pipe temperature sensor		
	Th6	Condenser temperature sensor	CN_TH2 (MAIN PCB)	- Description is expressed based on cooling mode
	TH7	Air temperature sensor (Outdoor)		- Th6 and Th7 are connected at 4 pin type connector CN_TH2 (MAIN PCB)
	Th8	Entering water temperature sensor	CN_TH3 (IDU PCB)	- Th8 and Th9 are connected at 6 pin type connector CN_TH3 (IDU PCB)
	Th9	Leaving water temperature sensor		
	Th11	Remote air temperature sensor	CN_ROOM	- Optional accessory (sold separately) - Model: PQRSTA0
	EEV	Electronic Expansion Valve	CN_EEV1	
	W/Pump_1	Internal water pump	CN_W/PUMP(A)	- Operating power (1Ø 220-240V 50Hz) of internal water pump is supplied by the connector



7. Piping Diagram

Category	Symbol	Meaning	PCB Connector	Remarks
Field Installation	Th12	W/TANK water temperature sensor	CN_TH4	<ul style="list-style-type: none"> - Th12 and Th13 are connected at 4pin type connector CN_TH4 - Th12 is a part of Domestic Hot Water Tank kit. (model: PHLTB) - Th13 is a part of solar thermal kit. (model: PHLLA)
	Th13	Solar-heated water temperature sensor		
	F/S	Flow switch	(no connector)	
	Strainer	Strainer	(no connector)	- Filtering and stacking particles inside circulating water
	W/TANK	Domestic Hot Water Tank	(no connector)	<ul style="list-style-type: none"> - 3rd party accessory and field installation (sold separately) - Generating and storing Domestic hot water by AWHP or built-in electric heater
	3WAY V/V_1	<ul style="list-style-type: none"> - Flow control for water which is leaving from unit - Flow direction switching between under-floor and water tank 	CN_3WAY(A)	<ul style="list-style-type: none"> - 3rd party accessory and field installation (sold separately) - SPDT type 3way valve is supported
	3WAY V/V_2	<ul style="list-style-type: none"> - Flow control for water which is heated and circulated by SOLAR THERMAL SYSTEM. - Flow direction switching between SOLAR THERMAL SYSTEM and W/TANK 	CN_3WAY(B)	<ul style="list-style-type: none"> - 3rd party accessory and Field installation! (sold separately)! - SPDT type 3way valve is supported
	W_PUMP/2	External Water Pump	CN_W/PUMP (B)	<ul style="list-style-type: none"> - 3rd party accessory and Field installation (sold separately) - External water pump can be used when water pump of Solar Thermal System is incapable of circulation, (External pump can not be used in place of Built-in pump.)
	City Water	Water to be heated by unit and B/HT of W/TANK	(no connector)	- Field installation
	Shower	Water supplied to end-user	(no connector)	- Field installation
	SOLAR THERMAL SYSTEM	<p>This system can include following components : Solar panel, Sensors, Thermostats, Interim heat exchanger, Water pump, etc.</p> <ul style="list-style-type: none"> - To utilized hot water heated by SOLAR THERMAL SYSTEM, end-user must by LG AWHP Solar-Kit. 	(no connector)	- 3rd party accessory and Field installation (sold separately)

7. Piping Diagram

Models : AHBW056A0 [HM051M] / AHBW076A0 [HM071M] / AHBW096A0 [HM091M]
 AHBW126A0 [HM121M] / AHBW146A0 [HM141M] / AHBW166A0 [HM161M]
 AHBW128A0 [HM123M] / AHBW148A0 [HM143M] / AHBW168A0 [HM163M]

Category	Symbol	Meaning	PCB Connector	Remarks
Unit	Th1	Condenser temperature sensor	CN_TH4	- Discription is expressed based on cooling mode.
	Th2	Outlet evaporator temperature sensor	CN_PIPE/OUT	- Discription is expressed based on cooling mode
	Th3	Inlet evaporator temperature sensor	CN_PIPE/IN	
	Th4	Compressor suction pipe temperature sensor	CN_TH3 (MAIN PCB)	- Th4 and Th5 are connected at 4 pin type connector CN_TH3 (MAIN PCB)
	Th5	Compressor discharge pipe temperature sensor		
	Th6	Condenser temperature sensor	CN_TH2 (MAIN PCB)	- Description is expressed based on cooling mode - Th6 and Th7 are connected at 4 pin type connector CN_TH2 (MAIN PCB)
	TH7	Air temperature sensor(Outdoor)		
	Th8	Entering water temperature sensor	CN_TH3 (IDU PCB)	- Th8, Th9 and Th10 are connected at 6 pin type connector CN_TH3 (IDU PCB)
	Th9	Interim water temperature sensor		
	Th10	Leaving water temperature sensor		
	Th11	Remote air temperature sensor	CN_ROOM	- Optional accessory (sold separately) - Model: PQRSTA0
	EXP/TANK	Expansion tank	(no connector)	- Absorb volume change of heated water
	Electric Heater & Tank	Electric Heater	CN_HEATER 1 CN_HEATER 2	- Heating capacity is divided into two level : partial capacity by HEATER 1 and full capacity by HEATER 1 + HEATER 2. - Operating power(230V AC 50Hz) of HEATER 1 and HEATER 2 are supplied by external power source via magnetic switch connector and ELB.
	EEV	Electronic Expansion Valve	CN_EEV1	
	W/Pump_1	Internal water pump	CN_W/PUMP(A)	- Operating power of internal water pump is supplied by the connector
	F/S	Flow switch	(no connector)	
	Strainer	Strainer	(no connector)	- Filtering and stacking particles inside circulating water

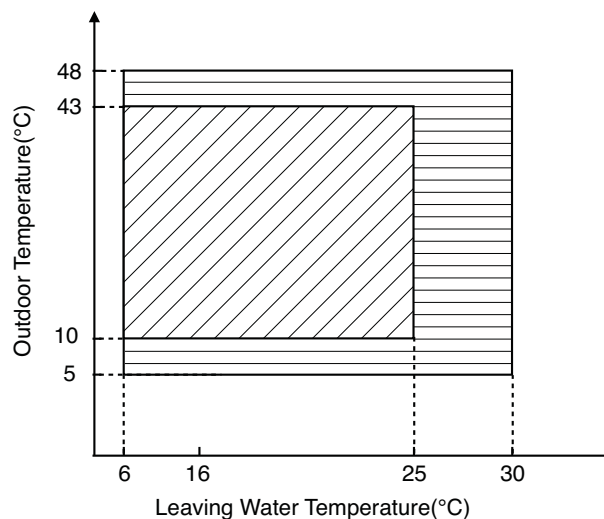
7. Piping Diagram



Category	Symbol	Meaning	PCB Connector	Remarks
Field Installation	2WAY V/V	To control water flow for Fan Coil Unit	CN_2WAY(A)	- 3rd party accessory and field installation (sold separately) - 2wire NO or NC type 2way valve is supported.
	Th12	W/TANK water temperature sensor	CN_TH4	- Th12 and Th13 are connected at 4pin type connector CN_TH4 - Th12 is a part of domestic hot water tank kit. (model: PHLTB) - Th13 is a part of solar thermal kit. (model: PHLLA)
	Th13	Solar-heated water temperature sensor	CN_TH4	
	W/TANK	Domestic hot water tank	(no connector)	- 3rd party accessory and field installation (sold separately) - Generating and storing domestic hot water by AWHP or built-in electric heater
	B/HT	Electric heater	CN_B/HEAT(A)	- 3rd party accessory and field installation (usually built-in at W / TANK) - Supplying additional water heating capacity
	3 WAY V/V_1	- Flow control for water which is leaving from unit - Flow direction switching between under-floor and water tank	CN_3WAY(A)	- 3rd party accessory and field installation (sold separately) - SPDT type 3way valve is supported
	3WAY V/V_2	- Flow control for water which is heated and circulated by SOLAR THERMAL SYSTEM. - Flow direction switching between SOLAR THERMAL SYSTEM and W/TANK	CN_3WAY(B)	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	W_PUMP_2	External Water Pump	CN_W/PUMP (B)	- 3rd party accessory and Field installation (sold separately) - External water pump can be used when water pump of Solar Thermal System is incapable of circulation, (External pump can not be used in place of Built-in pump.)
	SOLAR THERMAL SYSTEM	This system can include following components : Solar panel, Sensors, Thermostats, Interim heat exchanger, Water pump, etc. - To utilized hot water heated by SOLAR THERMAL SYSTEM, end-user must by LG AWHP Solar-Kit.	(no connector)	- 3rd party accessory and Field installation (sold separately)
	City Water	Water to be heated by unit and B/HT of W/TANK	(no connector)	- Field installation
	Shower	Water supplied to end-user	(no connector)	- Field installation

8. Operation Range

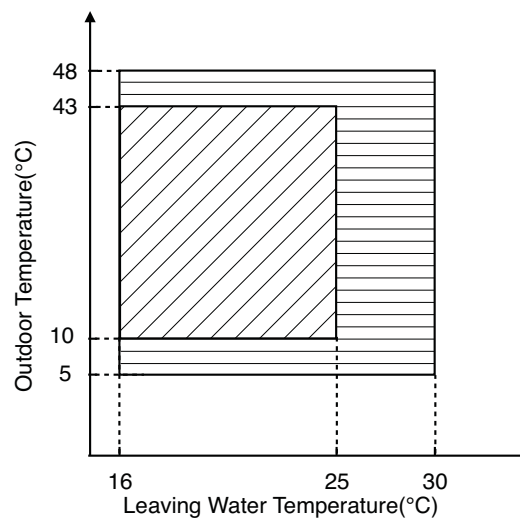
8.1 Cooling Operation

Fan Coil Unit



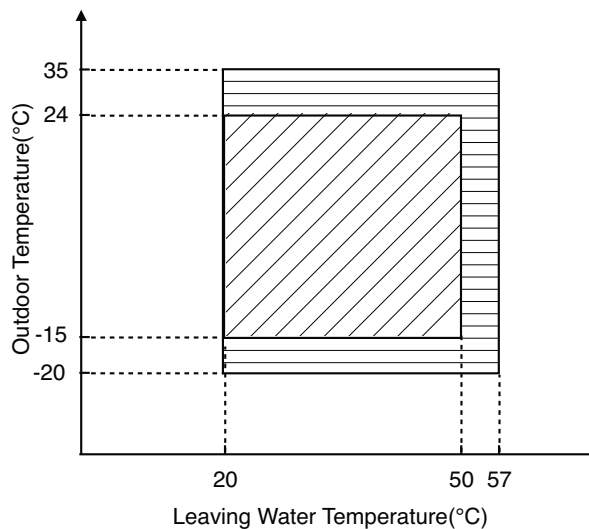
 Continuous Operation
 Operative



Under Floor



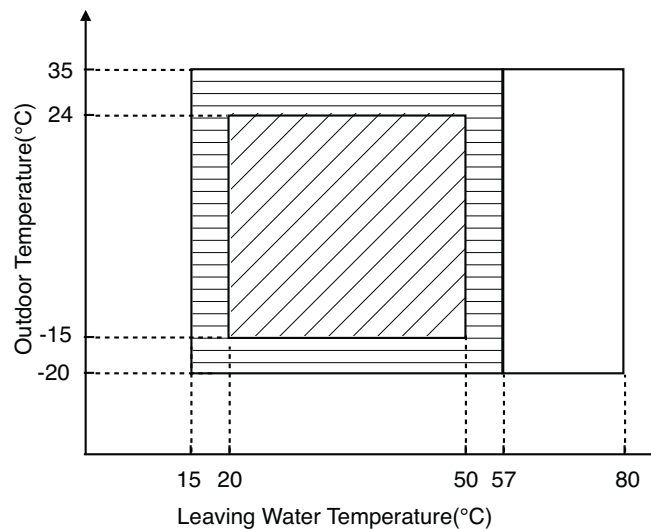
8.2 Heating Operation




3kW



 Continuous Operation
 Operative

5kW-16kW



 Continuous Operation
 Operative
 Electric heater operation only

Note : DHW heat pump operation : max 50°C
 DHW operation with electric heater : max 80°C

9. Performance Data

9.1 Cooling Operation

Model: AHBW056A0 [HM051M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	3.65	0.85	4.11	0.91	4.57	0.97	4.96	1.04	5.38	1.10	5.76	1.16		
30°C DB	4.15	1.32	4.35	1.34	4.70	1.45	5.13	1.39	5.24	1.37	5.47	1.35		
35°C DB	3.82	1.42	4.16	1.47	4.48	1.50	4.85	1.51	4.99	1.38	5.17	1.49	5.37	1.54
40°C DB	3.64	1.58	3.86	1.62	4.24	1.66	4.50	1.68	4.59	1.54	4.76	1.57	4.94	1.60
45°C DB	3.07	1.70	3.40	1.72	3.74	1.76	4.06	1.78	4.40	1.81	4.54	1.79	4.68	1.77

Model: AHBW076A0 [HM071M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	4.09	0.95	4.60	1.02	5.12	1.09	5.56	1.16	6.03	1.23	6.45	1.29		
30°C DB	4.64	1.47	4.87	1.49	5.27	1.61	5.75	1.55	5.87	1.53	6.12	1.51		
35°C DB	4.27	1.59	4.66	1.64	5.02	1.67	5.44	1.68	5.60	1.55	5.79	1.66	6.01	1.72
40°C DB	4.07	1.76	4.32	1.81	4.75	1.85	5.04	1.88	5.14	1.71	5.33	1.75	5.54	1.78
45°C DB	3.43	1.89	3.81	1.92	4.19	1.96	4.54	1.99	4.92	2.02	5.08	1.99	5.24	1.97

Model: AHBW096A0 [HM091M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	6.43	1.41	7.24	1.52	8.04	1.63	8.74	1.73	9.47	1.83	10.14	1.94		
30°C DB	7.30	2.20	7.66	2.23	8.28	2.42	9.03	2.32	9.22	2.29	9.62	2.26		
35°C DB	6.72	2.38	7.33	2.45	7.89	2.50	8.54	2.52	8.80	2.32	9.09	2.48	9.45	2.57
40°C DB	6.40	2.64	6.79	2.70	7.46	2.78	7.92	2.81	8.07	2.56	8.37	2.61	8.70	2.66
45°C DB	5.40	2.83	5.99	2.88	6.59	2.93	7.14	2.97	7.74	3.02	7.99	2.98	8.24	2.95

LWT : Leaving Water Temperature

TC: Total Capacity

PI: Power Input (kW)

Notice: Measuring procedure follows EN-14511

Notice: Above table values may not be matched according to installation condition

9. Performance Data

Model: AHBW126A0 [HM121M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	7.60	1.63	8.55	1.75	9.51	1.87	10.33	1.99	11.19	2.11	11.98	2.23		
30°C DB	8.62	2.53	9.05	2.57	9.78	2.78	10.67	2.67	10.90	2.64	11.37	2.60		
35°C DB	7.94	2.73	8.66	2.82	9.33	2.88	10.10	2.90	10.40	2.67	10.75	2.85	11.16	2.96
40°C DB	7.56	3.04	8.02	3.11	8.81	3.20	9.36	3.24	9.54	2.95	9.89	3.01	10.28	3.07
45°C DB	6.38	3.26	7.08	3.31	7.79	3.37	8.44	3.42	9.14	3.48	9.44	3.43	9.73	3.39

Model: AHBW146A0 [HM141M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	8.13	1.90	10.03	2.18	11.15	2.33	12.11	2.48	13.13	2.63	14.05	2.77		
30°C DB	9.24	2.96	10.61	3.20	11.47	3.46	12.52	3.32	12.79	3.28	13.34	3.23		
35°C DB	8.50	3.20	10.16	3.51	10.94	3.58	11.85	3.60	12.20	3.32	12.61	3.55	13.10	3.68
40°C DB	8.10	3.56	9.41	3.87	10.34	3.97	10.98	4.02	11.19	3.67	11.61	3.74	12.06	3.81
45°C DB	7.17	3.43	8.31	4.12	9.14	4.19	9.90	4.26	10.73	4.33	11.07	4.27	11.42	4.22

Model: AHBW166A0 [HM161M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	8.67	2.00	10.85	2.39	12.07	2.56	13.11	2.72	14.20	2.89	15.20	3.05		
30°C DB	9.85	3.11	11.48	3.52	12.41	3.80	13.55	3.65	13.84	3.60	14.43	3.55		
35°C DB	9.06	3.35	10.99	3.86	11.84	3.93	12.82	3.96	13.20	3.65	13.64	3.90	14.17	4.04
40°C DB	8.64	3.72	10.18	4.25	11.19	4.37	11.88	4.42	12.11	4.03	12.56	4.11	13.05	4.19
45°C DB	7.64	3.59	8.99	4.53	9.88	4.61	10.71	4.68	11.60	4.76	11.98	4.70	12.35	4.64

LWT : Leaving Water Temperature

TC: Total Capacity

PI: Power Input (kW)

Notice: Measuring procedure follows EN-14511

Notice: Above table values may not be matched according to installation condition

9. Performance Data

Model: AHBW128A0 [HM123M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	7.60	1.63	8.55	1.75	9.51	1.87	10.33	1.99	11.19	2.11	11.98	2.23		
30°C DB	8.62	2.53	9.05	2.57	9.78	2.78	10.67	2.67	10.90	2.64	11.37	2.60		
35°C DB	7.94	2.73	8.66	2.82	9.33	2.88	10.10	2.90	10.40	2.67	10.75	2.85	11.16	2.96
40°C DB	7.56	3.04	8.02	3.11	8.81	3.20	9.36	3.24	9.54	2.95	9.89	3.01	10.28	3.07
45°C DB	6.38	3.26	7.08	3.31	7.79	3.37	8.44	3.42	9.14	3.48	9.44	3.43	9.73	3.39

Model: AHBW148A0 [HM143M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	8.13	1.90	10.03	2.18	11.15	2.33	12.11	2.48	13.13	2.63	14.05	2.77		
30°C DB	9.24	2.96	10.61	3.20	11.47	3.46	12.52	3.32	12.79	3.28	13.34	3.23		
35°C DB	8.50	3.20	10.16	3.51	10.94	3.58	11.85	3.60	12.20	3.32	12.61	3.55	13.10	3.68
40°C DB	8.10	3.56	9.41	3.87	10.34	3.97	10.98	4.02	11.19	3.67	11.61	3.74	12.06	3.81
45°C DB	7.17	3.43	8.31	4.12	9.14	4.19	9.90	4.26	10.73	4.33	11.07	4.27	11.42	4.22

Model: AHBW168A0 [HM163M]

Outdoor Temperature	LWT 7°C		LWT 10°C		LWT 13°C		LWT 15°C		LWT 18°C		LWT 20°C		LWT 22°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
20°C DB	8.67	2.00	10.85	2.39	12.07	2.56	13.11	2.72	14.20	2.89	15.20	3.05		
30°C DB	9.85	3.11	11.48	3.52	12.41	3.80	13.55	3.65	13.84	3.60	14.43	3.55		
35°C DB	9.06	3.35	10.99	3.86	11.84	3.93	12.82	3.96	13.20	3.65	13.64	3.90	14.17	4.04
40°C DB	8.64	3.72	10.18	4.25	11.19	4.37	11.88	4.42	12.11	4.03	12.56	4.11	13.05	4.19
45°C DB	7.64	3.59	8.99	4.53	9.88	4.61	10.71	4.68	11.60	4.76	11.98	4.70	12.35	4.64

LWT : Leaving Water Temperature

TC: Total Capacity

PI: Power Input (kW)

Notice: Measuring procedure follows EN-14511

Notice: Above table values may not be matched according to installation condition

9. Performance Data

9.2 Heating Operation

Model: AHBW036H0 [HM031M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	2.02	1.15	1.86	1.13	1.63	1.17	1.56	1.09				
-15°C DB	2.52	1.12	2.33	1.10	2.04	1.14	1.95	1.12	1.89	1.20		
-7°C DB	2.57	0.94	2.45	0.95	2.24	1.02	2.17	1.04	2.05	1.06	1.97	1.13
-2°C DB	2.60	0.73	2.52	0.77	2.36	0.89	2.31	0.90	2.15	0.98	2.07	1.00
*2°C DB	2.64	0.75	2.55	0.80	2.39	0.88	2.34	0.89	2.18	0.93	2.09	0.94
7°C DB	3.10	0.69	3.00	0.73	2.81	0.84	2.75	0.85	2.56	0.92	2.46	0.94
10°C DB	3.27	0.72	3.24	0.77	3.09	0.82	3.04	0.87	2.70	0.90	2.49	0.91
15°C DB	3.45	0.64	3.39	0.64	3.24	0.73	3.15	0.81	2.89	0.91	2.33	0.81
18°C DB	3.55	0.66	3.50	0.67	3.34	0.75	3.21	0.82	3.00	0.93	2.24	0.75

Model: AHBW056A0 [HM051M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	3.36	1.78	3.10	1.76	2.73	1.83	2.60	1.70				
-15°C DB	4.20	1.74	3.88	1.72	3.41	1.78	3.25	1.74	3.15	1.88		
-7°C DB	4.28	1.46	4.07	1.48	3.74	1.59	3.62	1.62	3.42	1.65	3.28	1.69
-2°C DB	4.33	1.14	4.19	1.20	3.94	1.40	3.85	1.41	3.59	1.52	3.44	1.56
*2°C DB	4.39	1.29	4.24	1.33	3.99	1.36	3.89	1.48	3.63	1.46	3.49	1.53
7°C DB	5.16	1.08	4.99	1.13	4.69	1.32	4.58	1.33	4.27	1.43	4.10	1.47
10°C DB	5.45	1.12	5.39	1.20	5.15	1.28	5.07	1.36	4.51	1.41	4.15	1.42
15°C DB	5.75	0.99	5.65	1.00	5.40	1.14	5.24	1.26	4.81	1.42	3.89	1.27
18°C DB	5.91	1.04	5.83	1.05	5.57	1.18	5.35	1.29	5.00	1.45	3.73	1.18

Model: AHBW076A0 [HM071M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	4.70	2.55	4.34	2.52	3.82	2.61	3.64	2.43				
-15°C DB	5.87	2.49	5.43	2.46	4.77	2.54	4.55	2.49	4.40	2.68		
-7°C DB	6.00	2.08	5.71	2.12	5.23	2.28	5.06	2.31	4.78	2.35	4.58	2.43
-2°C DB	6.07	1.63	5.88	1.73	5.51	1.99	5.38	2.01	5.02	2.16	4.81	2.24
*2°C DB	6.15	1.86	5.95	1.92	5.58	1.97	5.23	2.08	5.08	2.15	4.71	2.19
7°C DB	7.23	1.54	7.00	1.63	6.56	1.88	6.41	1.90	5.98	2.04	5.73	2.11
10°C DB	7.63	1.61	7.55	1.72	7.21	1.84	7.09	1.94	6.31	2.02	5.81	2.04
15°C DB	8.04	1.42	7.91	1.42	7.56	1.63	7.34	1.80	6.74	2.02	5.44	1.82
18°C DB	8.28	1.48	8.16	1.50	7.80	1.68	7.49	1.84	7.00	2.08	5.22	1.68

LWT : Leaving Water Temperature

TC: Total Capacity

* : Total Capacity (Averaged value including defrost effect, kW)

PI: Power Input (kW)

Notice: Measuring procedure follows EN-14511

Notice: Above table values does not include humidification effect in the outdoor temperature below zero.

9. Performance Data

Model: AHBW096A0 [HM091M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	6.04	3.28	5.58	3.23	4.90	3.35	4.68	3.11				
-15°C DB	7.55	3.20	6.98	3.15	6.13	3.27	5.85	3.19	5.66	3.44		
-7°C DB	7.71	2.74	7.34	2.72	6.72	3.03	6.51	2.96	6.15	3.01	5.90	3.11
-2°C DB	7.80	2.10	7.56	2.33	7.08	2.57	6.93	2.59	6.46	2.78	6.19	2.86
*2°C DB	7.65	2.43	7.20	2.45	6.73	2.54	6.43	2.75	6.18	2.85	6.03	3.04
7°C DB	9.29	1.98	9.00	2.20	8.43	2.42	8.25	2.44	7.69	2.62	7.37	2.70
10°C DB	9.81	2.06	9.71	2.20	9.27	2.35	9.12	2.49	8.11	2.58	7.47	2.61
15°C DB	10.34	1.82	10.17	1.82	9.71	2.09	9.44	2.31	8.67	2.59	7.00	2.33
18°C DB	10.64	1.85	10.49	1.92	10.03	2.16	9.63	2.35	9.00	2.66	6.71	2.16

Model: AHBW126A0 [HM121M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	8.10	4.33	7.52	4.21	6.65	4.47	6.36	4.14				
-15°C DB	10.13	4.22	9.40	4.10	8.31	4.36	7.95	4.24	7.60	4.75		
-7°C DB	10.33	3.53	9.80	3.55	9.01	3.85	8.73	4.02	8.23	3.99	7.87	4.19
-2°C DB	10.45	2.79	10.05	2.80	9.45	3.35	9.21	3.33	8.63	3.57	8.25	3.75
*2°C DB	10.61	2.91	10.20	3.04	9.59	3.34	9.35	3.33	8.76	3.51	8.37	3.55
7°C DB	12.48	2.66	12.00	2.67	11.28	3.20	11.00	3.18	10.30	3.41	9.85	3.58
10°C DB	13.49	2.81	13.32	2.99	12.62	3.12	12.38	3.37	11.19	3.69	10.10	3.50
15°C DB	14.20	2.50	14.06	2.53	13.34	2.87	12.79	3.16	11.64	3.50	9.40	3.13
18°C DB	14.61	2.68	14.51	2.65	13.77	2.94	13.03	3.22	11.92	3.55	8.98	2.90

Model: AHBW146A0 [HM141M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	9.40	5.10	8.69	5.03	7.63	5.21	7.28	4.85				
-15°C DB	11.75	4.97	10.86	4.90	9.54	5.08	9.10	4.97	8.81	5.34		
-7°C DB	12.20	3.90	11.61	4.30	10.64	4.61	10.31	4.70	9.75	4.77	9.34	4.91
-2°C DB	12.48	3.36	12.08	3.44	11.32	4.11	11.07	4.14	10.33	4.45	9.90	4.58
*2°C DB	12.58	3.45	12.18	3.67	11.41	4.05	11.16	4.06	10.41	4.26	9.98	4.26
7°C DB	14.46	3.08	14.00	3.15	13.12	3.77	12.83	3.80	11.97	4.08	11.47	4.20
10°C DB	15.11	3.17	14.94	3.39	14.27	3.63	14.05	3.83	12.49	3.97	11.62	4.06
15°C DB	15.93	2.81	15.65	2.81	14.96	3.21	14.53	3.56	13.35	4.00	10.89	3.62
18°C DB	16.38	2.85	16.15	2.95	15.44	3.31	14.83	3.63	13.87	4.10	10.44	3.35

LWT : Leaving Water Temperature

TC: Total Capacity

* : Total Capacity (Averaged value including defrost effect, kW)

PI: Power Input (kW)

Notice: Measuring procedure follows EN-14511

Notice: Above table values does not include humidification effect in the outdoor temperature below zero.

9. Performance Data

Model: AHBW166A0 [HM161M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	10.68	5.90	9.84	5.88	8.58	5.86	8.16	5.56				
-15°C DB	13.35	5.75	12.30	5.73	10.73	5.71	10.20	5.70	10.00	5.88		
-7°C DB	13.62	5.10	13.01	4.93	11.86	5.04	11.48	5.16	10.89	5.38	10.46	5.43
-2°C DB	13.79	3.69	13.46	4.03	12.57	4.54	12.28	4.71	11.45	5.05	11.00	5.10
*2°C DB	13.94	3.99	13.50	4.23	12.71	4.56	12.41	4.65	11.58	4.83	11.12	4.78
7°C DB	16.40	3.49	16.00	3.81	14.95	4.29	14.60	4.45	13.62	4.77	13.08	4.82
10°C DB	17.08	3.62	16.93	3.87	16.29	4.25	16.08	4.38	14.07	4.69	13.10	4.62
15°C DB	18.03	3.18	17.59	3.16	16.94	3.64	16.67	4.05	15.44	4.60	12.35	4.11
18°C DB	18.55	3.40	18.15	3.32	17.49	3.77	17.02	4.14	16.27	4.77	11.90	3.80

Model: AHBW128A0 [HM123M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	8.10	4.33	7.52	4.21	6.74	4.55	6.43	4.25				
-15°C DB	10.13	4.22	9.40	4.10	8.42	4.44	8.04	4.36	7.66	4.68		
-7°C DB	10.35	3.54	9.82	3.56	9.18	3.97	8.92	4.11	8.38	4.10	7.92	4.34
-2°C DB	10.48	2.82	10.08	2.83	9.65	3.47	9.48	3.51	8.84	3.75	8.35	3.86
*2°C DB	10.61	2.91	10.20	3.04	9.77	3.45	9.59	3.48	8.94	3.65	8.45	3.60
7°C DB	12.48	2.66	12.00	2.67	11.49	3.27	11.28	3.31	10.52	3.54	9.94	3.64
10°C DB	13.49	2.81	13.32	2.99	12.63	3.22	12.43	3.41	11.24	3.61	10.10	3.53
15°C DB	14.20	2.50	14.06	2.53	13.18	2.84	12.77	3.14	11.70	3.51	9.45	3.15
18°C DB	14.61	2.68	14.51	2.65	13.61	2.92	13.02	3.20	12.11	3.59	9.05	2.91

Model: AHBW148A0 [HM143M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	9.40	5.10	8.69	5.03	7.79	5.30	7.43	5.00				
-15°C DB	11.75	4.97	10.86	4.90	9.74	5.17	9.29	5.12	8.82	5.26		
-7°C DB	11.99	3.84	11.41	4.22	10.66	4.69	10.38	4.77	9.73	4.78	9.09	5.02
-2°C DB	12.15	3.26	11.76	3.34	11.23	4.05	11.05	4.16	10.31	4.45	9.63	4.47
*2°C DB	12.29	3.37	11.90	3.58	11.36	4.05	11.19	4.14	10.43	4.32	9.74	4.18
7°C DB	14.46	3.08	14.00	3.15	13.37	3.82	13.16	3.92	12.27	4.20	11.46	4.22
10°C DB	15.11	3.17	14.94	3.39	14.46	3.79	14.26	3.95	12.91	4.04	11.55	4.06
15°C DB	15.93	2.81	15.65	2.81	14.89	3.21	14.56	3.56	13.44	4.02	10.85	3.62
18°C DB	16.38	2.85	16.15	2.95	15.38	3.31	14.87	3.64	14.06	4.14	10.43	3.35

LWT : Leaving Water Temperature

TC: Total Capacity

* : Total Capacity (Averaged value including defrost effect, kW)

PI: Power Input (kW)

Notice: Measuring procedure follows EN-14511

Notice: Above table values does not include humidification effect in the outdoor temperature below zero.

9. Performance Data

Model: AHBW168A0 [HM163M]

Outdoor Temperature	LWT 30°C		LWT 35°C		LWT 40°C		LWT 45°C		LWT 50°C		LWT 55°C	
	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI
-20°C DB	11.27	6.11	10.38	6.13	9.10	6.16	8.66	5.87				
-15°C DB	14.09	5.96	12.98	5.98	11.37	6.01	10.83	6.02	10.10	5.92		
-7°C DB	13.90	5.31	13.26	5.29	12.42	5.54	12.13	5.65	11.31	5.59	10.31	5.71
-2°C DB	13.78	3.93	13.44	4.04	13.07	4.69	12.94	4.90	12.07	5.25	11.00	5.13
*2°C DB	13.94	3.98	13.60	4.25	13.23	4.75	13.10	4.92	12.21	5.12	11.13	4.80
7°C DB	16.40	3.71	16.00	3.81	15.56	4.42	15.41	4.62	14.37	4.95	13.09	4.84
10°C DB	17.49	3.83	17.34	4.10	16.73	4.51	16.53	4.65	15.23	4.69	13.11	4.64
15°C DB	18.05	3.19	17.61	3.18	16.95	3.66	16.68	4.07	15.45	4.62	12.36	4.13
18°C DB	18.57	3.42	18.17	3.34	17.50	3.79	17.04	4.16	16.28	4.79	11.91	3.82

LWT : Leaving Water Temperature

TC: Total Capacity

* : Total Capacity (Averaged value including defrost effect, kW)

PI: Power Input (kW)

Notice: Measuring procedure follows EN-14511

Notice: Above table values does not include humidification effect in the outdoor temperature below zero.

9. Performance Data

9.3 NF PAC Test Result

Humidification Correction Factor for Heating Operation

The capacity table does not consider reduction in capacity when humidification effect in the outdoor temperature below zero. The capacity values considered these factors, in other words the integrated heating capacity values, can be obtained as follow :

Formula

Integrated Heating capacity = A

Value given in table of capacity characteristics = B

Integrated correction factor for humidification effect = C

→ $A=B \times C$

Correction factor for finding intergrated Heating capacity

Model	Outdoor Temperature	LWT 35°C		LWT 45°C		Sound Power Level[dB(A)]
		TC	PI	TC	PI	
AHBW036H0	-7°C DB	0.95	1.00	0.95	1.00	57.0
	7°C DB	1.00	1.00	1.05	0.94	
AHBW056A0	-7°C DB	0.95	1.10	0.95	1.05	64.3
	7°C DB	1.00	1.00	0.98	1.00	
AHBW076A0	-7°C DB	0.95	1.10	0.95	1.05	64.3
	7°C DB	1.00	1.00	1.00	1.00	
AHBW096A0	-7°C DB	0.95	1.10	0.95	1.10	64.3
	7°C DB	0.97	1.00	0.99	1.05	
AHBW126A0	-7°C DB	0.95	0.95	0.95	0.95	66.9
	7°C DB	1.00	1.00	1.00	1.00	
AHBW146A0	-7°C DB	0.95	0.95	0.95	0.95	66.9
	7°C DB	1.00	1.00	1.00	1.00	
AHBW166A0	-7°C DB	0.95	1.03	0.95	1.05	66.9
	7°C DB	1.00	1.00	1.00	0.96	
AHBW128A0	-7°C DB	0.95	0.95	0.95	0.95	66.9
	7°C DB	1.00	1.00	0.99	1.00	
AHBW148A0	-7°C DB	0.95	0.95	0.95	0.95	66.9
	7°C DB	1.00	1.00	1.00	1.00	
AHBW168A0	-7°C DB	0.95	1.00	0.95	1.00	66.9
	7°C DB	1.00	1.00	1.00	1.00	

10. Electric characteristics

Circuit breaker specification

- Select a power source that is capable of supplying the current required by the unit.
- Use a recognized circuit breaker between the power source and the unit.
A disconnection device to adequately disconnect all supply lines must be fitted.
- Applying below specification of breaker is recommended.
- Separate main power supply and heater supply.

Model names	Unit			Core Component Electrical Spec						Power Supply			
				COMP		Ref. side Fan motor Output		Electric Heater		For Unit		For electric heater (Without DHW)	
	Hz	Volts	Voltage-range	MSC	RLA	kW	FLA	kW	RLA	MCA	MFA	MCA	MFA
AHBW036H0 [HM031M]	50	220-240	Min. : 198 Max. : 264	-	8.0	0.124	0.475	-	-	10.0	16	-	-
AHBW056A0 [HM051M]				-	9.7	0.124	0.475	2 + 2	18.7	13.0	16	18.7	25
AHBW076A0 [HM071M]				-						14.0			
AHBW096A0 [HM091M]				-						15.0	20		
AHBW126A0 [HM121M]				-	17.0	0.248	0.95	3 + 3	28.1	25.0	32	28.1	32
AHBW146A0 [HM141M]				-									
AHBW166A0 [HM161M]				-									
AHBW128A0 [HM123M]	50	380-415	Min. : 342 Max. : 457	-	5.3	0.248	0.95	2 + 2 + 2	12.0	11.0	20	12.0	20
AHBW148A0 [HM143M]				-									
AHBW168A0 [HM163M]				-									

- DHW Heater : Domestic Hot Water tank heater

Notes:

1. Voltage range Voltage supplied to the unit terminals should be within the minimum and maximum range.
2. Maximum allowable voltage unbalance between phase is 2 %.
3. MCA could be replaced to the maximum operating input current. Select wire spec. based on the MCA.
4. MFA is used to select the circuit breaker and ELCB(Earth Leakage Circuit Breaker). Recommended circuit breaker is ELCB.
5. RLA are measured as the test condition.

MCA : Minimum Circuit Amperes (A)

MFA : Maximum Fuse Ampere

OFM : Outdoor Fan Motor

RLA : Rated Load Amperes (A)

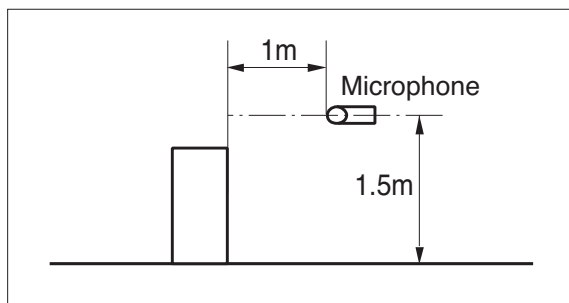
kW : Fan Motor rated output (kW)

FLA : Full Load Amperes (A)

11. Noise Criteria

11.1 Sound pressure level

Overall



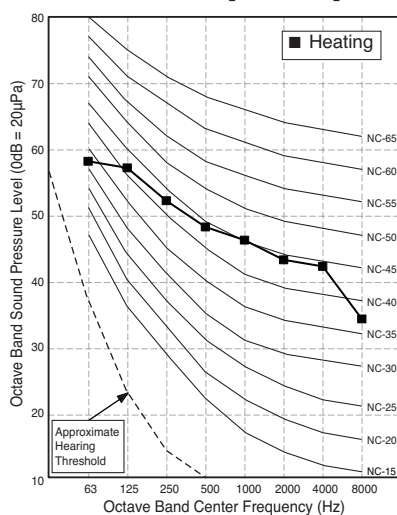
Notes:

- Sound measured at 1m away with 1.5m height.
- Data is valid at free field condition.
- Data is valid at nominal operation condition.
- Reference acoustic pressure acoustic 0dB = 20μPa.
- Sound level will vary depending on a range of factors such as the construction (acoustic absorption coefficient) of particular room in which the equipment is installed.
- The operating conditions are assumed to be standard.

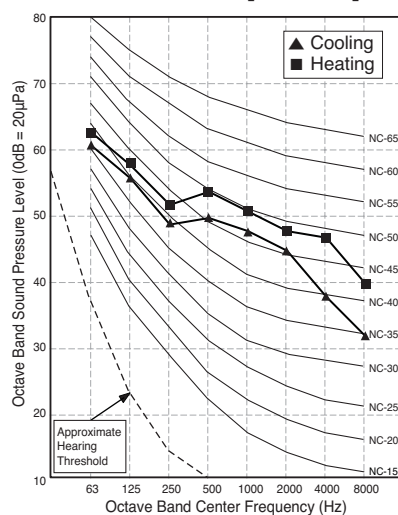
Model	Sound Pressure Level [dB(A)]	
	Cooling	Heating
AHBW036H0 [HM031M]	-	47
AHBW056A0 [HM051M]	50	51
AHBW076A0 [HM071M]	52	52
AHBW096A0 [HM091M]	52	52
AHBW126A0 [HM121M]	54	53

Model	Sound Pressure Level [dB(A)]	
	Cooling	Heating
AHBW146A0 [HM141M]	54	53
AHBW166A0 [HM161M]	54	53
AHBW128A0 [HM123M]	54	53
AHBW148A0 [HM143M]	54	53
AHBW168A0 [HM163M]	54	53

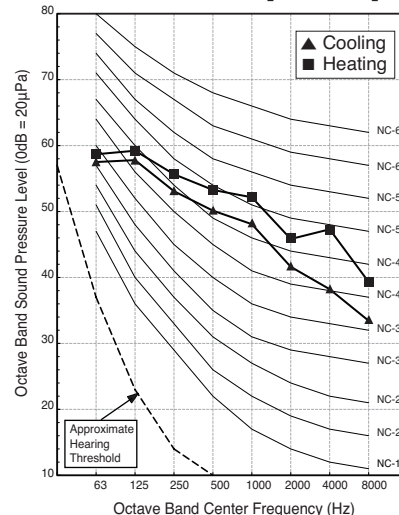
AHBW036H0 [HM031M]



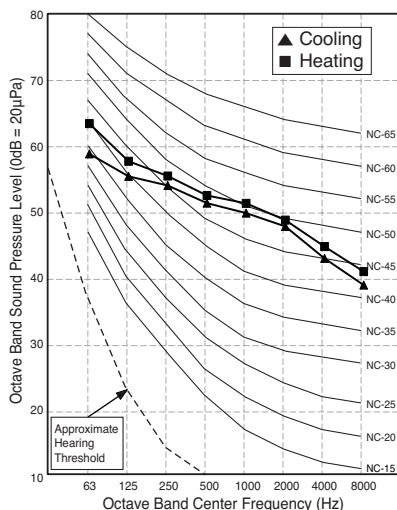
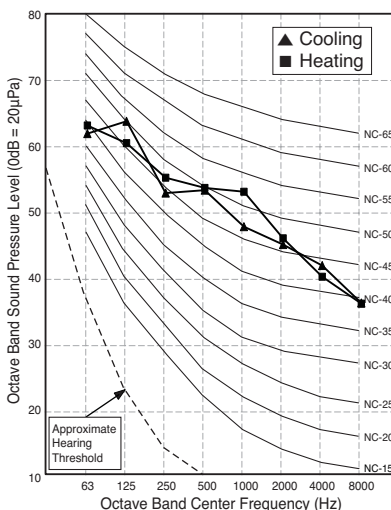
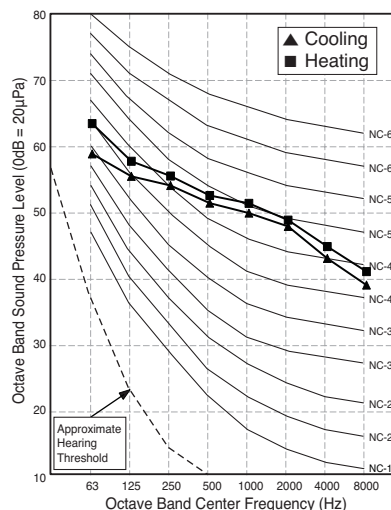
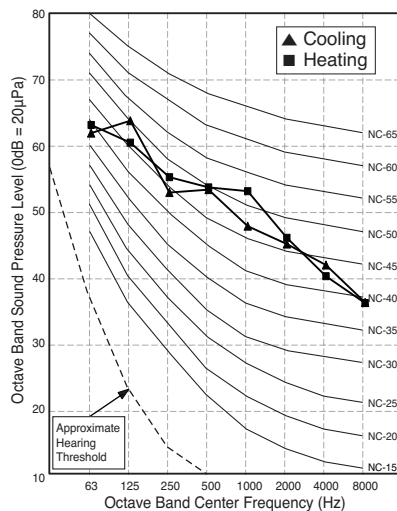
AHBW056A0 [HM051M]



**AHBW076A0 [HM071M]
AHBW096A0 [HM091M]**



11. Noise Criteria

AHBW126A0 [HM121M]

**AHBW146A0 [HM141M]
AHBW166A0 [HM161M]**

AHBW128A0 [HM123M]

**AHBW148A0 [HM143M]
AHBW168A0 [HM163M]**


Approximated SPL at specific distance:

- $SPL[dB] = A + 20 \times \log(B/C)$
- Where A[dB] : SPL at 1m distance
B[m] : 1m
C[m] : specific distance

11. Noise Criteria

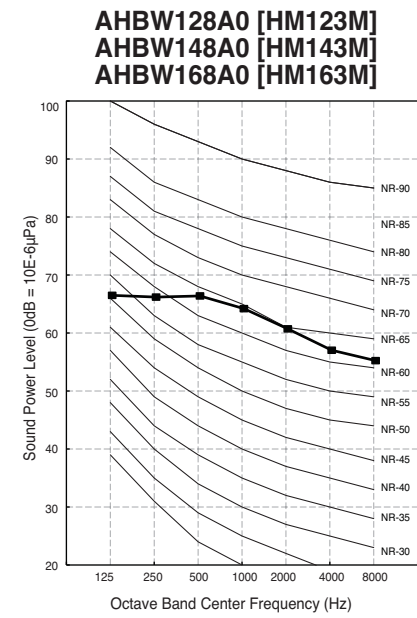
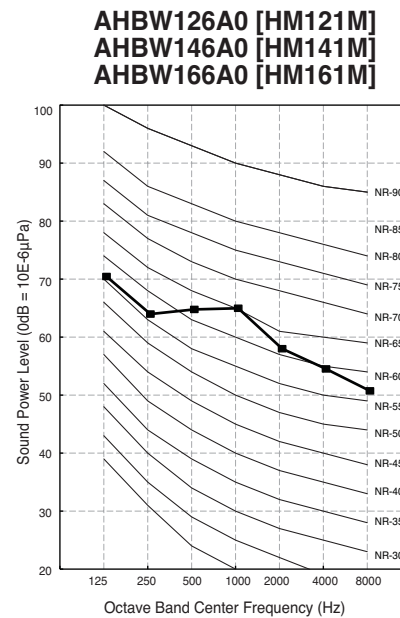
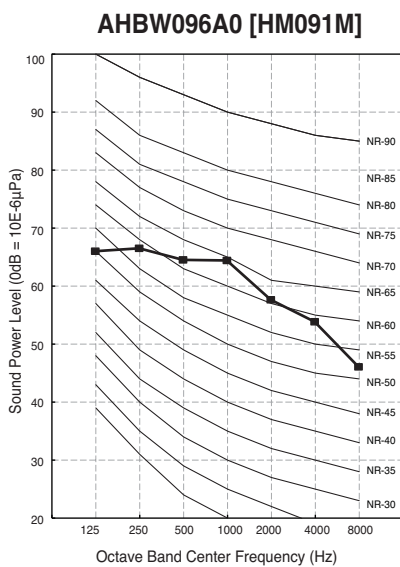
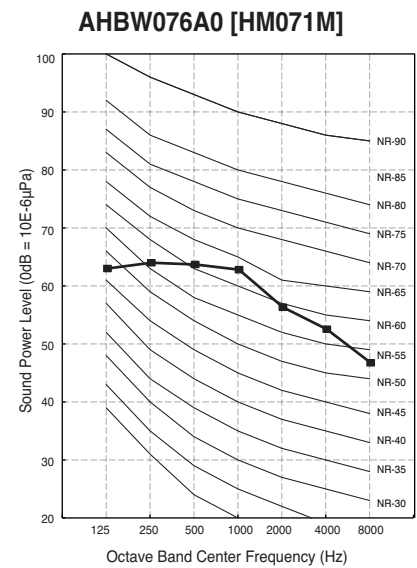
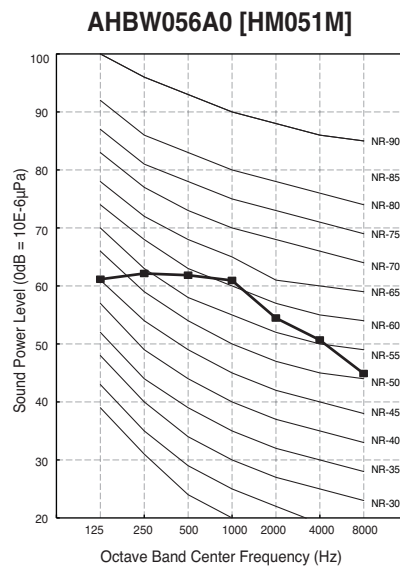
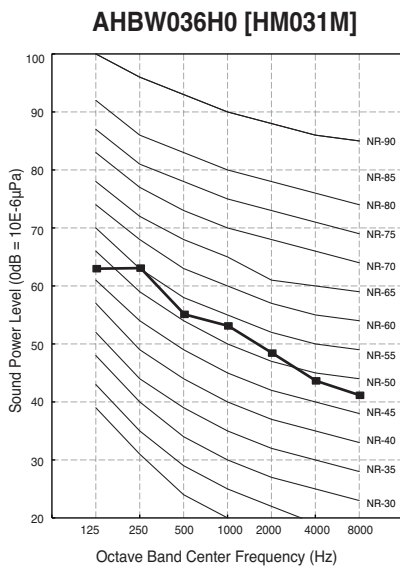
11.2 Sound power level

Notes:

1. Reference acoustic intensity 0dB = $10E-6\mu W/m^2$
2. Sound level will vary depending on a range of factors such as the construction (acoustic absorption coefficient) of particular room in which the equipment is installed.

Model	Sound power level dB(A)
	Heating
AHBW036H0 [HM031M]	55
AHBW056A0 [HM051M]	63
AHBW076A0 [HM071M]	65
AHBW096A0 [HM091M]	65
AHBW126A0 [HM121M]	67

Model	Sound power level dB(A)
	Heating
AHBW146A0 [HM141M]	67
AHBW166A0 [HM161M]	67
AHBW128A0 [HM123M]	67
AHBW148A0 [HM143M]	67
AHBW168A0 [HM163M]	67



11. Noise Criteria

11.3 Sound power level (NF PAC test)

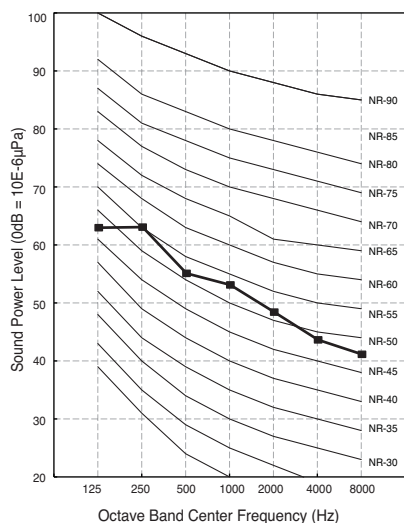
Notes:

1. Reference acoustic intensity $0\text{dB} = 10\text{E-}6\mu\text{W/m}^2$
2. Sound level will vary depending on a range of factors such as the construction (acoustic absorption coefficient) of particular room in which the equipment is installed.

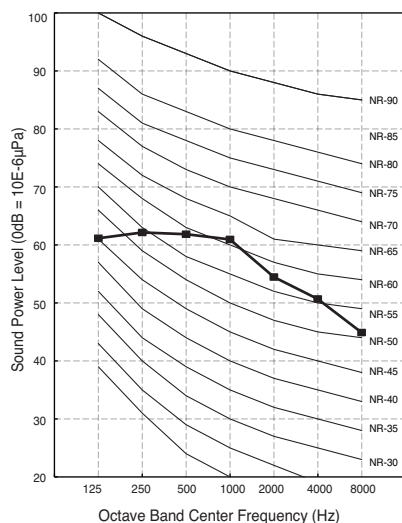
Model	Sound power level dB(A)
	Heating
AHBW036H0 [HM031M]	57
AHBW056A0 [HM051M]	63
AHBW076A0 [HM071M]	65
AHBW096A0 [HM091M]	67
AHBW126A0 [HM121M]	68

Model	Sound power level dB(A)
	Heating
AHBW146A0 [HM141M]	68
AHBW166A0 [HM161M]	68
AHBW128A0 [HM123M]	68
AHBW148A0 [HM143M]	68
AHBW168A0 [HM163M]	68

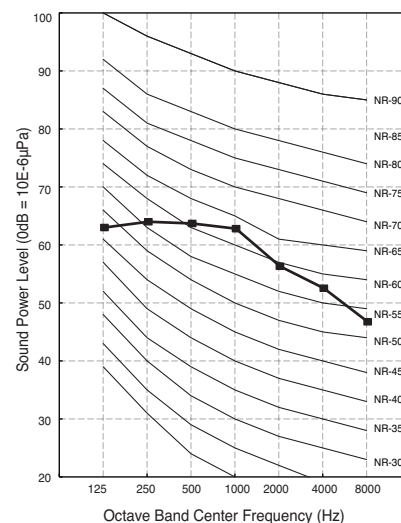
AHBW036H0 [HM031M]



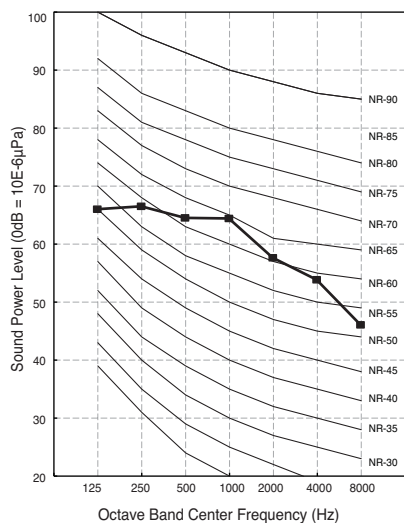
AHBW056A0 [HM051M]



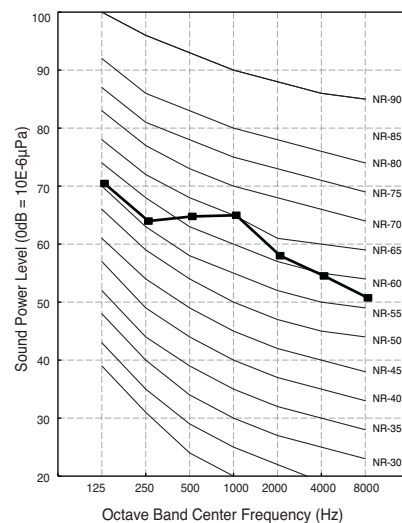
AHBW076A0 [HM071M]



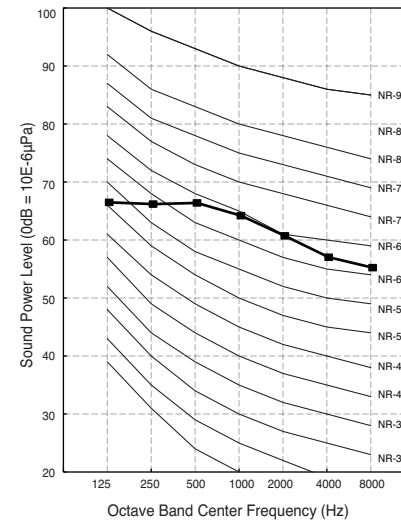
AHBW096A0 [HM091M]



**AHBW126A0 [HM121M]
AHBW146A0 [HM141M]
AHBW166A0 [HM161M]**

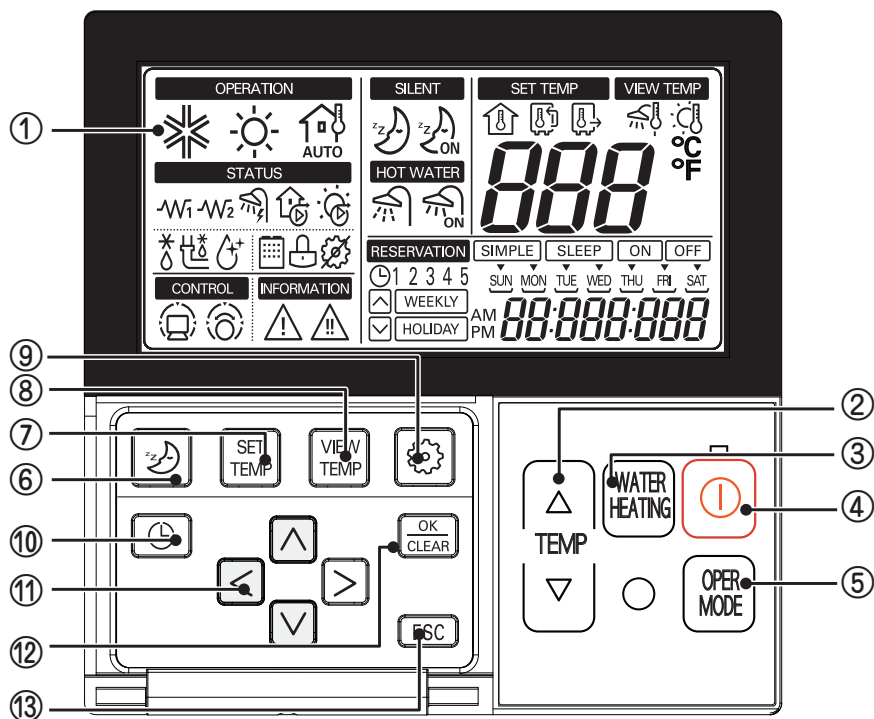


**AHBW128A0 [HM123M]
AHBW148A0 [HM143M]
AHBW168A0 [HM163M]**



12. Controller

Wired Remote Controller



No	Name
1	Display
2	Change Temperature Button
3	Water Heating Enable / Disable Button
4	Power Button
5	Operation Mode Selection Button
6	Silent Mode On / Off Button
7	Temperature Setting Mode Button
8	Temperature View Mode Button
9	Function Setting Button
10	Programming Button
11	Direction Button (Up, Down, Left, Right)
12	Set / Clear button
13	ESC Button

12. Controller



Electric heater STEP one



Electric heater STEP two

These icons indicate that the backup electric heater is operating.



Domestic hot water tank heater

This icon indicates that Domestic hot water tank electric heater which is located inside Domestic hot water tank is active.

The icon is not used when Domestic hot water tank is not installed.



Water pump

This icon indicates that the water pump inside the unit is active.



Auxiliary solar thermal pump

This icon indicates that auxiliary solar thermal pump is active.

NOTE : As installation of auxiliary solar thermal pump is not compulsory but recommendation according to field condition, this icon can be seen although no auxiliary solar thermal pump is installed.



Defrosting

This icon indicates that the defrost mode is active.

This mode is automatically operating.



Maintain lowest temperature

The purpose of this mode is maintaining the temperature to prevent damage by freezing of water pipe.



Disinfection

This icon indicates disinfecting operation is ongoing in Domestic hot water tank.



Compressor

This icon indicates that the compressor is active.



Child Lock



No function



Central Controller

This icon indicates that the product is controlled by the central controller.



Thermostat

This icon indicates connection with thermostat.



Slight trouble

This icon indicates that slight trouble is occurred.



Heavy trouble

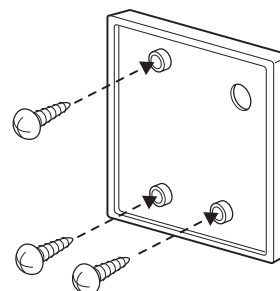
This icon indicates that heavy trouble is occurred.

12. Controller

Installation of Remote Controller

1. Please fix tightly using provided screw after placing remote controller setup board on the place where you like to setup.

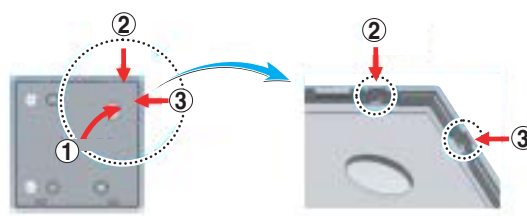
- Please set it up not to bend because poor setup could take place if setup board bends.
- Please set up remote controller board fit to the reclamation box if there is a reclamation box.



2. Can set up Wired remote controller cable into three directions.

- Setup direction: the surface of wall reclamation, upper, right
- If setting up remote controller cable into upper and right side, please set up after removing remote controller cable guide groove.

* Remove guide groove with long nose.



<Wire guide grooves>

① Reclamation to the surface of the wall

② Upper part guide groove

③ Right part guide groove

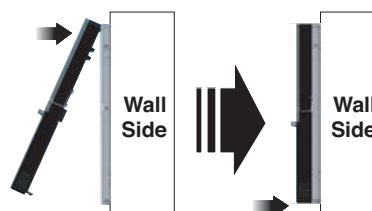
3. Please fix remote controller upper part into the setup board attached to the surface of the wall, as the picture below, and then, connect with setup board by pressing lower part.

- Please connect not to make a gap at the remote controller and setup board's upper and lower, right and left part.

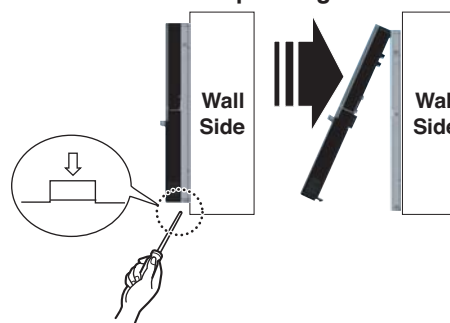
When separating remote controller from setup board, as the picture below, after inserting into the lower separating hole using screw driver and then, spinning clockwise, remote controller is separated.

- There are two separating holes. Please individually separate one at a time.
- Please be careful not to damage the inside components when separating.

<Connecting order>

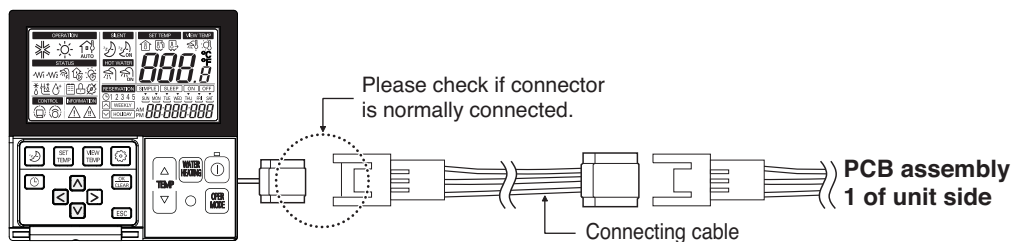


<Separating order>



12. Controller

4. Please connect Main PCB (Heater) and remote controller using connection cable.



5. Please use extension cable if the distance between wired remote controller and unit is more than 10m.

! CAUTION

When installing the wired remote controller, do not bury it in the wall.

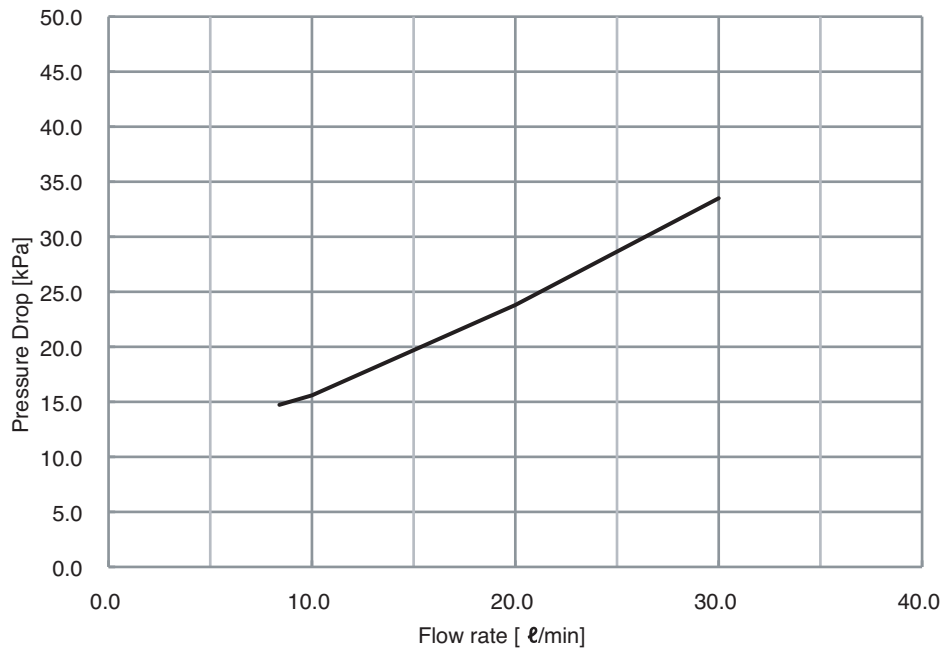
(It can cause damage in the temperature sensor.)

Do not install the cable to be 50m or above. (It can cause communication error.)

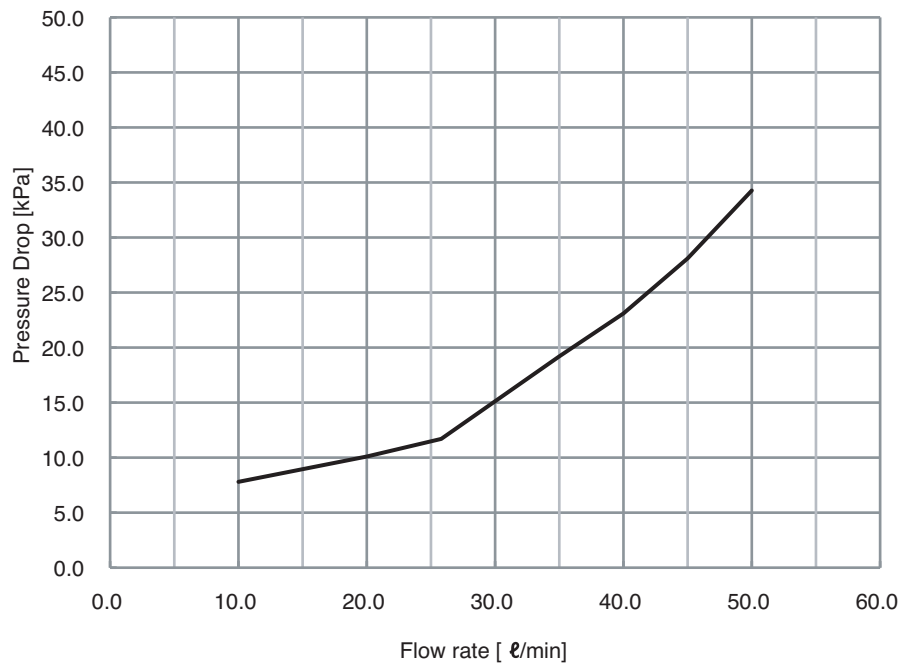
- When installing the extension cable, check the connecting direction of the connector of the remote controller side and the product side for correct installation.
- If you install the extension cable in the opposite direction, the connector will not be connected.
- Specification of extension cable: 2547 1007 22# 2 core 3 shield 5 or above.

13. Water Pressure Drop

AHBW036H0 [HM031M], AHBW056A0 [HM051M]

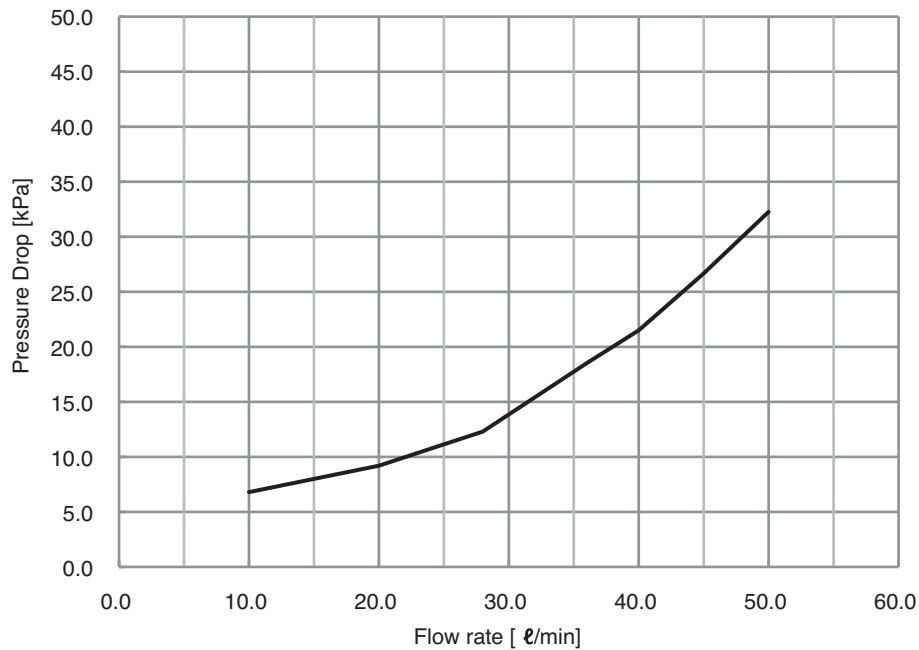


AHBW076A0 [HM071M], AHBW096A0 [HM091M]



13. Water Pressure Drop

AHBW126A0 [HM121M], AHBW146A0 [HM141M], AHBW166A0 [HM161M],
AHBW128A0 [HM123M], AHBW148A0 [HM143M], AHBW168A0 [HM163M]





Part 2. Design and installation

1. Alternative Refrigerant R410A

2. Select the Best Location

3. Installation Space

4. Water Control

5. Lifting Method

6. Installation

7. Electrical Wiring

8. Test Run

1. Alternative Refrigerant R410A

- The refrigerant R410A has the property of higher operating pressure in comparison with R22. Therefore, all materials have the characteristics of higher resisting pressure than R22 ones and this characteristic should be also considered during the installation.
R410A is an azeotrope of R32 and R125 mixed at 50:50, so the ozone depletion potential (ODP) of R410A is 0.

CAUTION

- The wall thickness of the piping should comply with the relevant local and national regulations for the designed pressure 3.8MPa
- Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state.
If the refrigerant is charged in its gaseous state, its composition changes and the system will not work properly.
- Do not place the refrigerant container under the direct rays of the sun to prevent it from exploding.
- For high-pressure refrigerant, any unapproved pipe must not be used.
- Do not heat pipes more than necessary to prevent them from softening.
- Be careful not to install wrongly to minimize economic loss because it is expensive in comparison with R22.

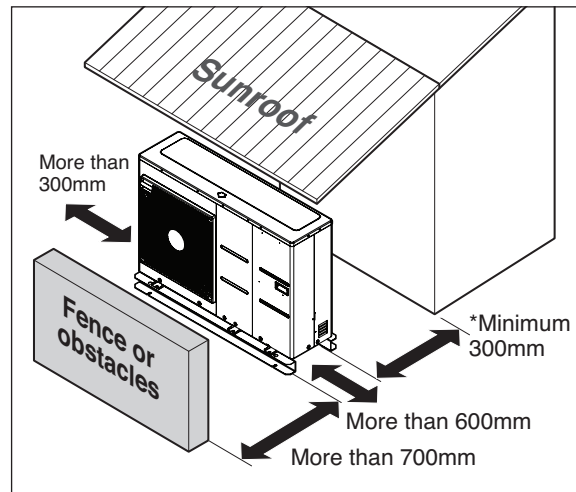
2. Select the Best Location

1. Select space for installing unit, which will meet the following conditions:
 - No direct thermal radiation from other heat sources
 - No possibility of annoying neighbors by noise from unit
 - No exposition to strong wind
 - With strength which bears weight of unit
 - Note that drain flows out of unit when heating
 - With space for air passage and service work shown next
 - Because of the possibility of fire, do not install unit to the space where generation, inflow, stagnation, and leakage of combustible gas is expected.
 - Avoid unit installation in a place where acidic solution and spray (sulfur) are often used.
 - Do not use unit under any special environment where oil, steam and sulfuric gas exist.
 - It is recommended to fence round the unit in order to prevent any person or animal from accessing the unit.
 - If installation site is area of heavy snowfall, then the following directions should be observed.
 - Make the foundation as high as possible.
 - Fit a snow protection hood.
2. Select installation location considering following conditions to avoid bad condition when additionally performing defrost operation.
 - Install the unit at a place well ventilated and having a lot of sunshine in case of installing the product at a place with a high humidity in winter (near beach, coast, lake, etc).
(Ex) Rooftop where sunshine always shines.
 - Performance of heating will be reduced and preheat time of the unit may be lengthened in case of installing the unit in winter at following location:
 - Shade position with a narrow space
 - Location with much moisture in neighboring floor.
 - Location with much humidity around.
 - Location where ventilation is good.It is recommended to install the unit at a place with a lot of sunshine as possible as.
 - Location where water gathers since the floor is not even.
3. When installing the unit in a place that is constantly exposed to a strong wind like a coast or on a high story of a building, secure a normal fan operation by using a duct or a wind shield.
 - Install the unit so that its discharge port faces to the wall of the building.
Keep a distance 300mm or more between the unit and the wall surface.
 - Supposing the wind direction during the operation season of the air conditioner, install the unit so that the discharge port is set at right angle to the wind direction.

3. Installation Space

3.1 General considerations

- If a sunroof is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the heat exchanger is not restricted.
- Ensure that the spaces indicated by arrows around front, back and side of the unit.
- Do not place animals and plants in the path of the warm air.
- Take the weight of the unit into account and select a place where noise and vibration are minimum.
- Select a place so that the warm air and noise from the unit do not disturb neighbors.
- The surface of the ground or the structure must be strong enough to bear the weight of the unit.



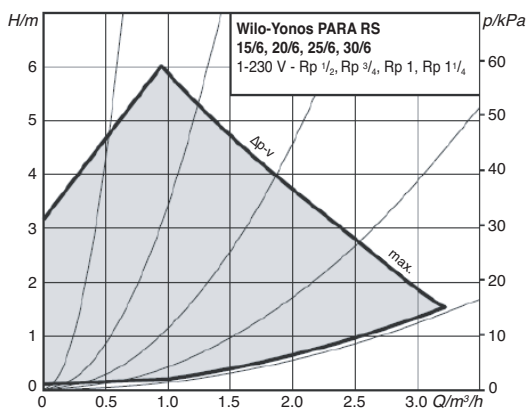
* : Please secure the space to install the shut-off valve and strainer.

4. Water Control

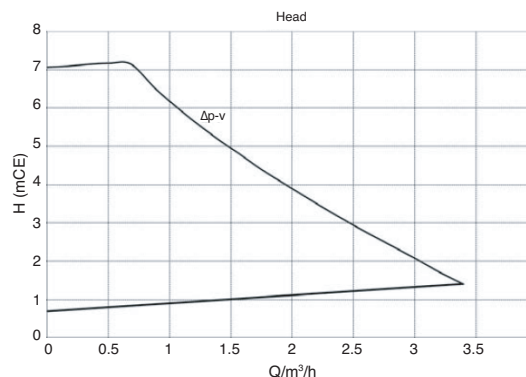
4.1 Water Pump Performance Graph

The water pump is three speed-adjustable (Maximum / Medium / Minimum), so it may be required to change default water pump speed in case of noise by water flow. In most case, however, it is strongly recommended to set speed as Maximum.

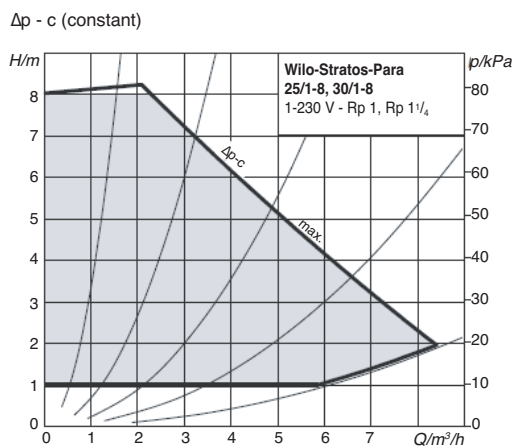
**AHBW036H0[HM031M]
AHBW056A0 [HM051M]**



**AHBW076A0 [HM071M]
AHBW096A0 [HM091M]**



**AHBW126A0 [HM121M] / AHBW128A0 [HM123M]
AHBW146A0 [HM141M] / AHBW148A0 [HM143M]
AHBW166A0 [HM161M] / AHBW168A0 [HM163M]**



Max. : high speed setting

Med. : low speed setting

Warning : Selecting a water flowrate outside the curves can cause damage to or malfunction of the unit.

 : Operation cutoff range

* To secure enough water flow rate, do not set water pump speed as "Min."

4. Water Control

4.2 Water quality

Water quality should be complied with EN 98/83 EC Directives. Requirement for resolved chemical ingredients is following table. Detailed water quality condition can be found in EN 98/83 EC Directives.

Parameter	Value	Parameter	Value
Acrylamide	0.10 $\mu\text{g/l}$	Fluoride	1.5 mg/l
Antimony	5.0 $\mu\text{g/l}$	Lead	10 $\mu\text{g/l}$
Arsenic	10 $\mu\text{g/l}$	Mercury	1.0 $\mu\text{g/l}$
Benzene	1.0 $\mu\text{g/l}$	Nickel	20 $\mu\text{g/l}$
Benzo(a)pyrene	0.010 $\mu\text{g/l}$	Nitrate	50 mg/l
Boron	1.0 mg/l	Nitrite	0.50 mg/l
Bromate	10 $\mu\text{g/l}$	Pesticides	0.10 $\mu\text{g/l}$
Cadmium	5.0 $\mu\text{g/l}$	Pesticides — Total	0.50 $\mu\text{g/l}$
Chromium	50 $\mu\text{g/l}$	Polycyclic aromatic hydrocarbons	0.10 $\mu\text{g/l}$
Copper	2.0 mg/l	Selenium	10 $\mu\text{g/l}$
Cyanide	50 $\mu\text{g/l}$	Tetrachloroethene and Trichloroethene	10 $\mu\text{g/l}$
1,2-dichloroethane	3.0 $\mu\text{g/l}$	Trihalomethanes — Total	100 $\mu\text{g/l}$
Epichlorohydrin	0.10 $\mu\text{g/l}$	Vinyl chloride	0.50 $\mu\text{g/l}$

- If the unit is installed at existing hydraulic water loop, it is important to clean hydraulic pipes to remove sludge and scale.
- Installing sludge strainer in the water loop is very important to prevent performance degrade.
- Chemical treatment to prevent rust should be performed by installer.

4.3 Frost protection

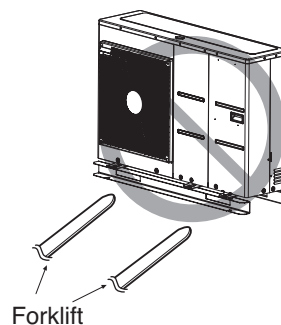
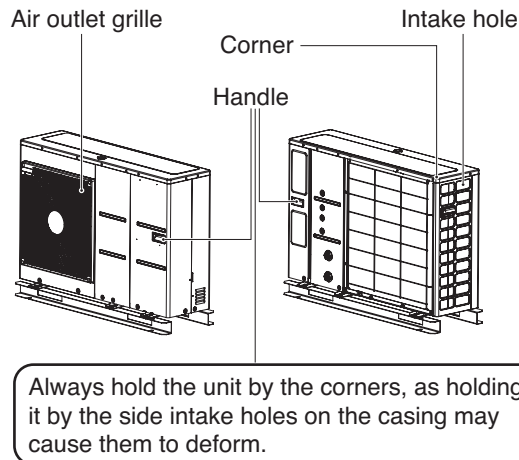
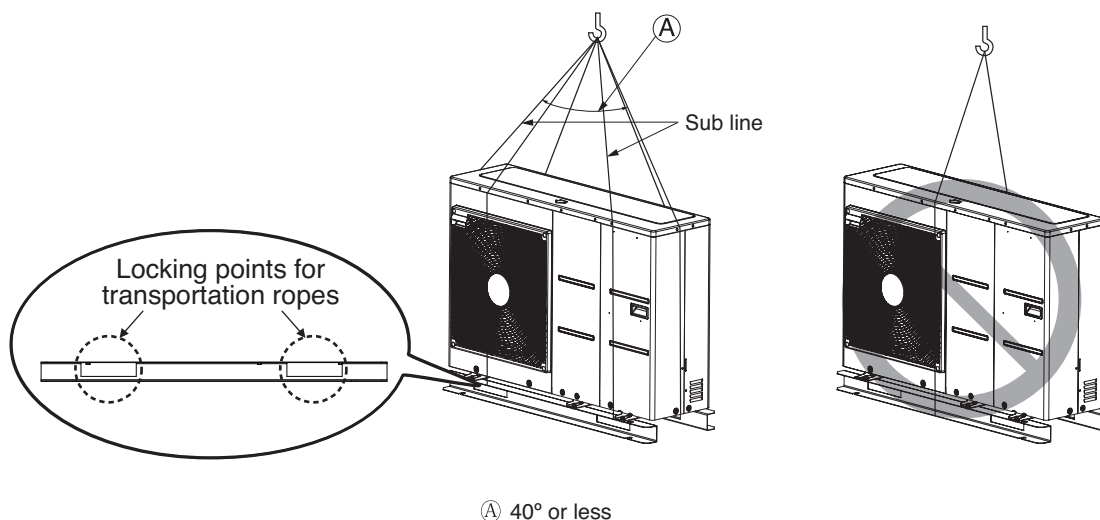
In areas of the country where entering water temperatures drop below 0 °C, the water pipe must be protected by using an approved antifreeze solution. Consult your AWHP unit supplier for locally approved solutions in your area. Calculate the approximate volume of water in the system. (Except the AWHP unit.) And add six liters to this total volume to allow for the water contained in AWHP unit.

Antifreeze type	Antifreeze mixing ratio					
	0°C	-5°C	-10°C	-15°C	-20°C	-25°C
Ethylene glycol	0%	12%	20%	30%	-	-
Propylene glycol	0%	17%	25%	33%	-	-
Methanol	0%	6%	12%	16%	24%	30%

- Use only one of the above antifreeze.
- If a antifreeze is used, pressure drop and capability degradation of the system can be occurred.
- If one of antifreezes is used, corrosion can be occurred. So please add corrosion inhibitor.
- Please check the concentration of the antifreeze periodically to keep same concentration.
- When the antifreeze is used (for installation or operation), take care to ensure that antifreeze must not be touched.
- Ensure to respect all laws and norms of your country about Anti-freeze usage.

5. Lifting Method

- When carrying the suspended unit, pass the ropes between legs of base panel under the unit.
- Always lift the unit with ropes attached at four points so that impact is not applied to the unit.
- Attach the ropes to the unit at an angle \textcircled{A} of 40° or less.
- Use only accessories and parts which are of the designated specification when installing.



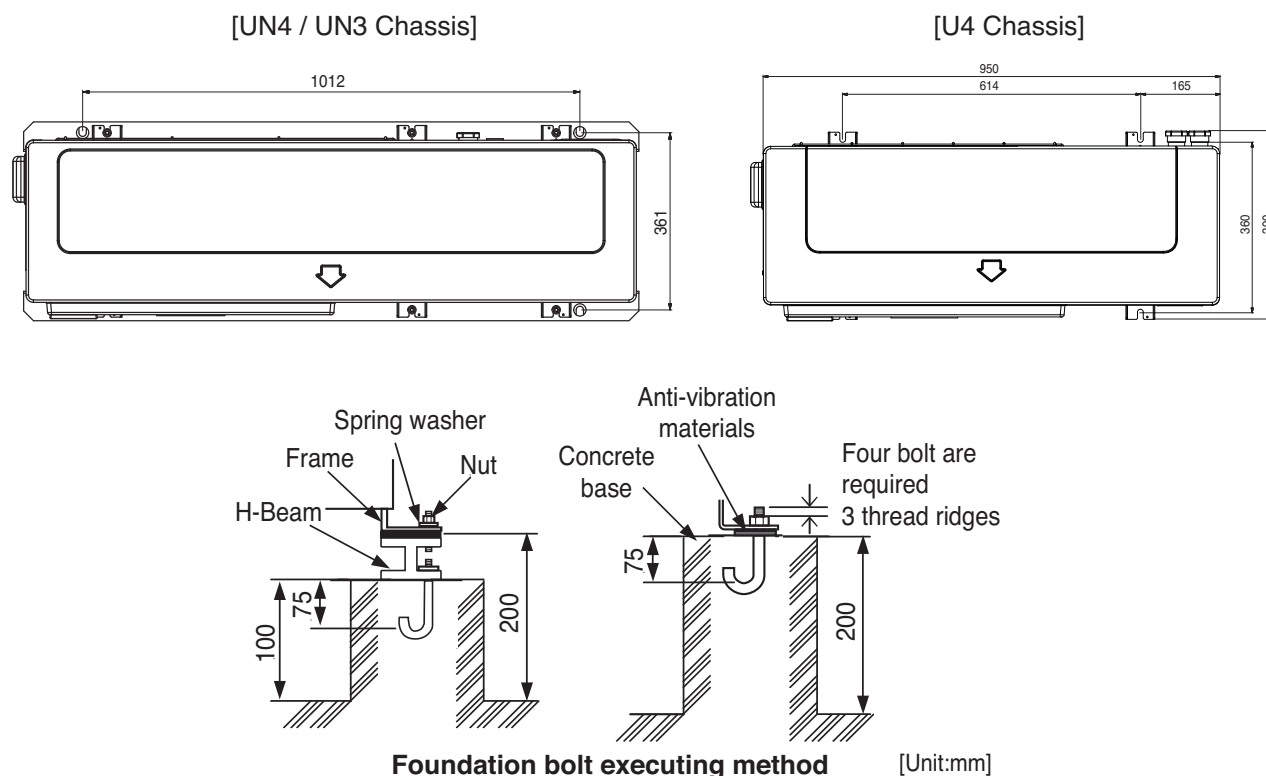
Be very careful while carrying the unit.

- Do not have only one person carry the unit if it is more than 20 kg (44.1 lbs).
- PP bands are used to pack some products. Do not use them as a mean for transportation because they are dangerous.
- Do not touch heat exchanger fins with your bare hands. Otherwise you may get a cut in your hands.
- Tear plastic packaging bag and scrap it so that children cannot play with it. Otherwise plastic packaging bag may suffocate children to death.
- When carrying the unit, be sure to support it at 4-points. Carrying and lifting the unit with 3-point support may make it unstable, resulting in a fall.

6. Installation

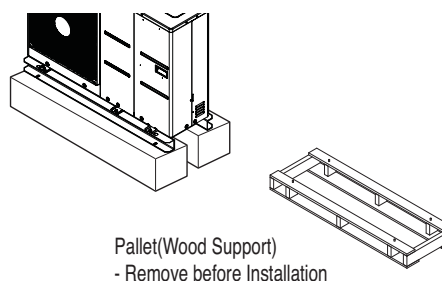
6.1 Foundation for Installation

- Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise after installation.
- Fix the unit securely by means of the foundation bolts. (Prepare 4sets of M12 foundation bolts, nuts and washers each which are available on the market.)
- It is best to screw in the foundation bolts until their length are 20mm from the foundation surface.



⚠ WARNING

- Be sure to remove the Pallet(Wood Support) of the bottom side of the unit Base Pan before fixing the bolt. It may cause the unstable state of the unit settlement, and may cause freezing of the heat exchanger resulting in abnormal operations.
- Be sure to remove the Pallet(Wood Support) of the bottom side of the unit before welding. Not removing Pallet(Wood Support) causes hazard of fire during welding.



6. Installation

6.2 Water Piping and Water Circuit Connection

1) General considerations

Followings are should be considered before beginning water circuit connection.

- Service space should be secured.
- Water pipes and connections should be cleaned using water.
- Space for installing external water pump should be provided if internal water pump capacity is not enough for installation field.
- Never connect electric power while proceeding water charging.

2) Water piping and water circuit connection

Definition of terms are as follow :

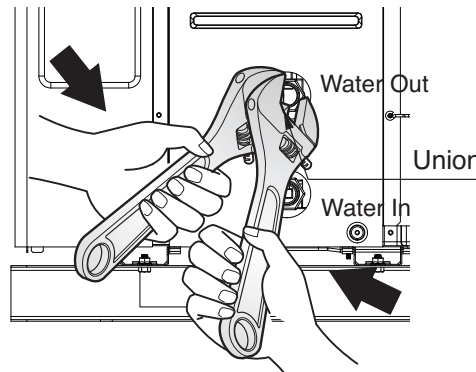
- Water piping : Installing pipes where water is flowing inside the pipe.
- Water circuit connecting : Making connection between the unit and water pipes or between pipes and pipes. Connecting valves or elbows are, for example, in this category.

Configuration of water circuit is shown in 6.3 Installation Scenes. All connections should be complied with presented diagram.

While installing water pipes, followings should be considered :

- While inserting or putting water pipes, close the end of the pipe with pipe cap to avoid dust entering.
- When cutting or welding the pipe, always be careful that inner section of the pipe should not be defective. For example, no weldments or no burrs are found inside the pipe.
- Drain piping should be provided in case of water discharge by the operation of the safety valve. This situation can be happened when the internal pressure is over 3.0 bar and water inside the unit will be discharged to drain hose.
- Pipe fittings (e.g. L-shape elbow, T-shape tee, diameter reducer, etc) should be tightened strongly to be free from water leakage.
- Connected sections should be leakage-proof treatment by applying tefron tape, rubber bushing, sealant solution, etc.
- Appropriate tools and tooling methods should be applied to prevent mechanical breakage of the connections.
- Operation time of flow valve(e.g. 3way valve or 2way valve) should be less than 90 seconds.
- While supplying water, pressure of supplying water should be 2.0 bar approximately.
- Pipe is insulated to prevent heat loss to external environment and to prevent dew generation on the surface of the pipe in cooling operation.

When the water pipes are connected.
It must be tightened the nut with wrench.
Otherwise pipes can be deformed.



6. Installation

⚠ WARNING

Water condensation on the floor

While cooling operation, it is very important to keep leaving water temperature higher than 16 °C.

Otherwise, dew condensation can be occurred on the floor.

If floor is in humid environment, do not set leaving water temperature below 18 °C.

Water condensation on the radiator

While cooling operation, cold water may not flow to the radiator. If cold water enters to the radiator, dew generation on the surface of the radiator can be occurred.

Drainage treatment

While cooling operation, condensed dew can drop down to the bottom of the unit. In this case, prepare drainage treatment (for example, vessel to contain condensed dew) to avoid water drop.

Shutoff Valve

- Shut-Off Valve is used to connect water pipe to unit.
- Tighten the flare nut with two spanner. (check the leak to the connection.)

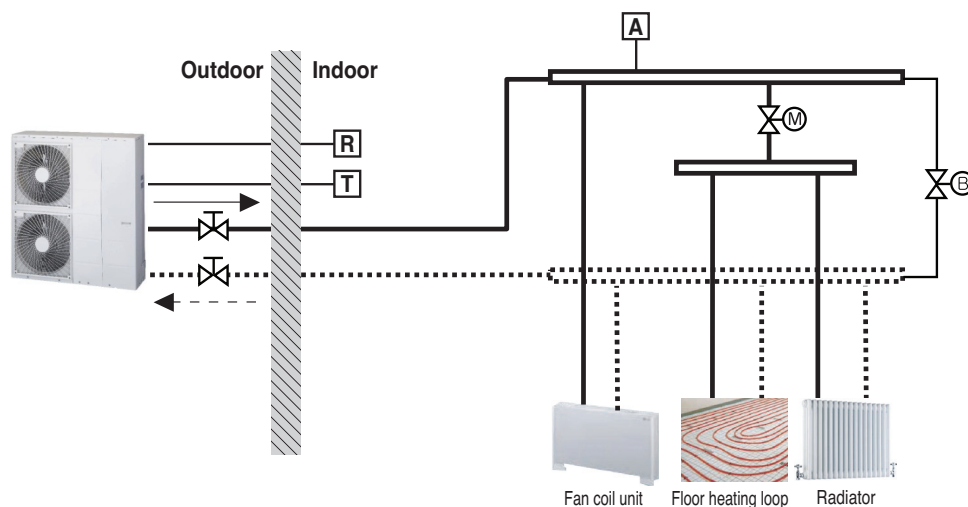
6.3 Installation Scenes

If is installed with pre-existing boiler, the boiler and **THERMAV™** should not be operated together. If entering water temperature of **THERMAV™** is above 57 °C, the system will stop operation to prevent mechanical damage of the unit. For detailed electric wiring and water piping, please contact authorized installer.

Some installation scenes are presented for example. As these scenes are conceptual figures, installer should optimize the installation scene according to the installation conditions.

1) CASE 1: Connecting heat emitters for heating and cooling

(Under floor loop, Fan coil unit, and Radiator)

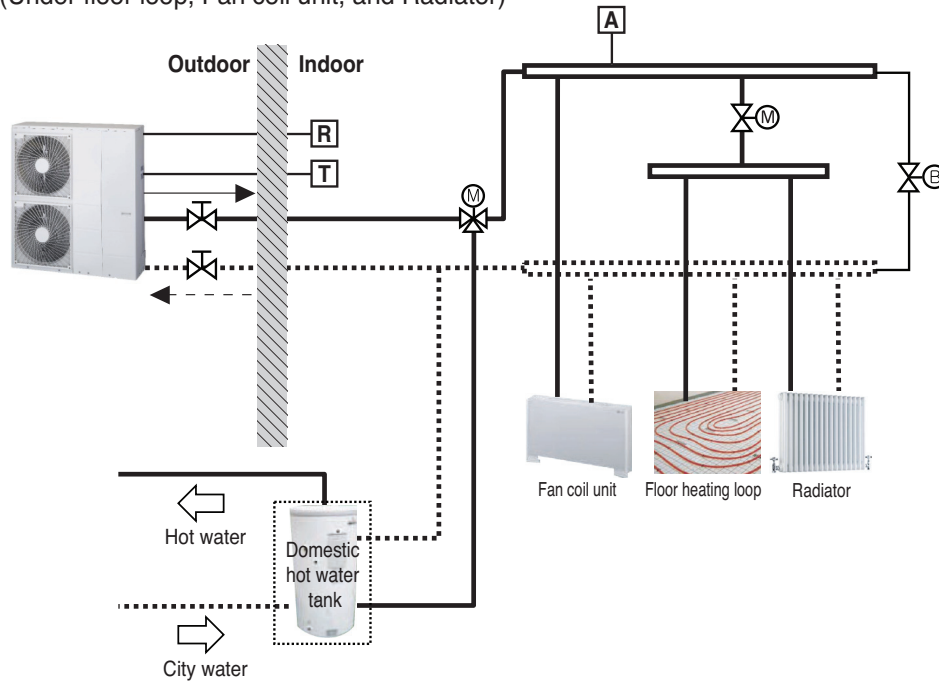


	Room thermostat(field supply)		By-pass valve(field supply)		Air vent
	2way valve (field supply)		Remote controller		Shut-off valve(field supply)
	Strainer (Mesh: 1 mm × 1 mm)				

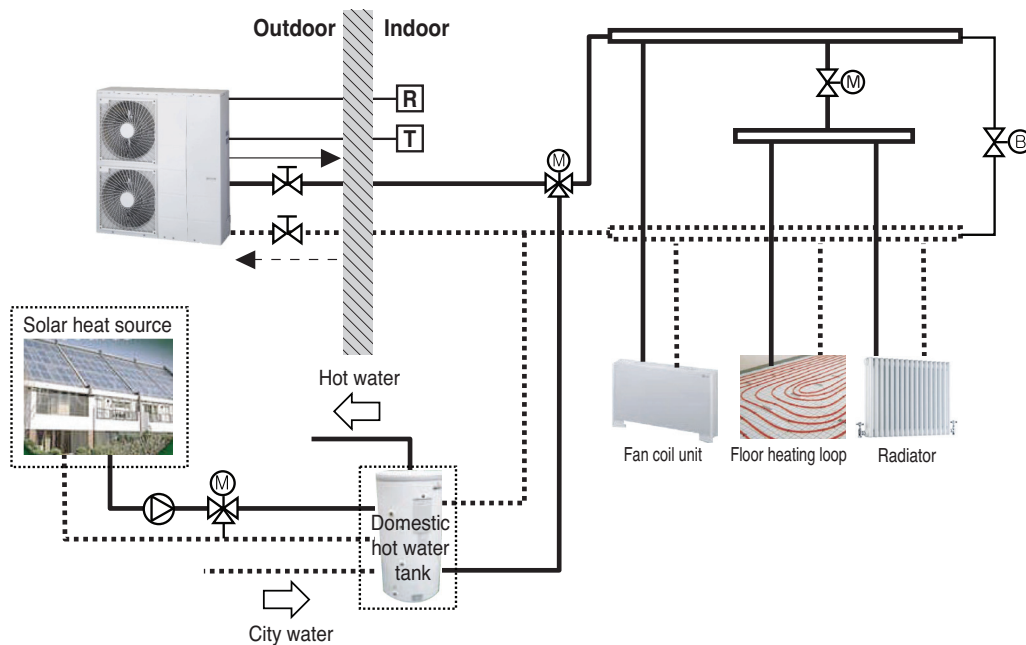
6. Installation

2) CASE 2: Connecting sanitary water tank

(Under floor loop, Fan coil unit, and Radiator)



3) CASE 3: Connecting Solar thermal system



A Air vent

T Room thermostat(Field supply)

M 2way valve
(Field supply)

B By-pass valve(Field supply)

M 3way valve
(Field supply)

R Remote controller

Shut-off valve(field supply)

6. Installation

6.4 Water charging

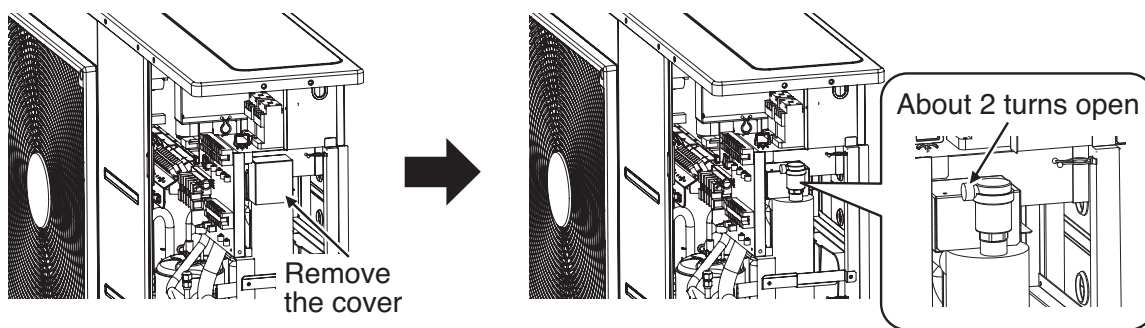
For water charging, please follow below procedures.

- Step 1.** Open all valves of whole water circuit. Supplied water should be charged not only inside the unit, but also in the under floor water circuit, sanitary water tank circuit, FCU water circuit, and any other water circuits controlled by the product.
- Step 2.** Connect supply water into drain valve and fill valve located at the side of the shut-off valve.
- Step 3.** Start to supply water. While supplying water, following should be kept.
- Pressure of supplying water should be 2.0 bar approximately.
 - For supplying water pressure, time to be taken from 0 bar to 2.0 bar should be more than 1 minute. Sudden water supply can yield water drain through safety valve.
 - About 2 turns open the cap of air vent to assure air purging (Refer to Figure 1). If air is exist inside the water circuit, then performance degrade, noise at the water pipe, mechanical damage at the surface of electric heater coil.
- Step 4.** Stop water supplying when the pressure gage located inside unit indicates 2.0 bar.
- Step 5.** Close drain valve and fill valve. Then wait for 20~30 seconds to observe water pressure being stabilized.
- Step 6.** If following conditions are satisfactory, then go to next(pipe insulation). Otherwise, go to step 3.
- Pressure gage indicates 2.0 bar. Note that sometimes pressure in decreased after step 5 due to water charging inside expansion vessel.
 - No air purging sound is heard or no water drop are popping out from air vent.

Pipe Insulation

Purpose of water pipe insulation is :

- To prevent heat loss to external environment
- To prevent dew generation on the surface of the pipe in cooling operation



<Figure 1>

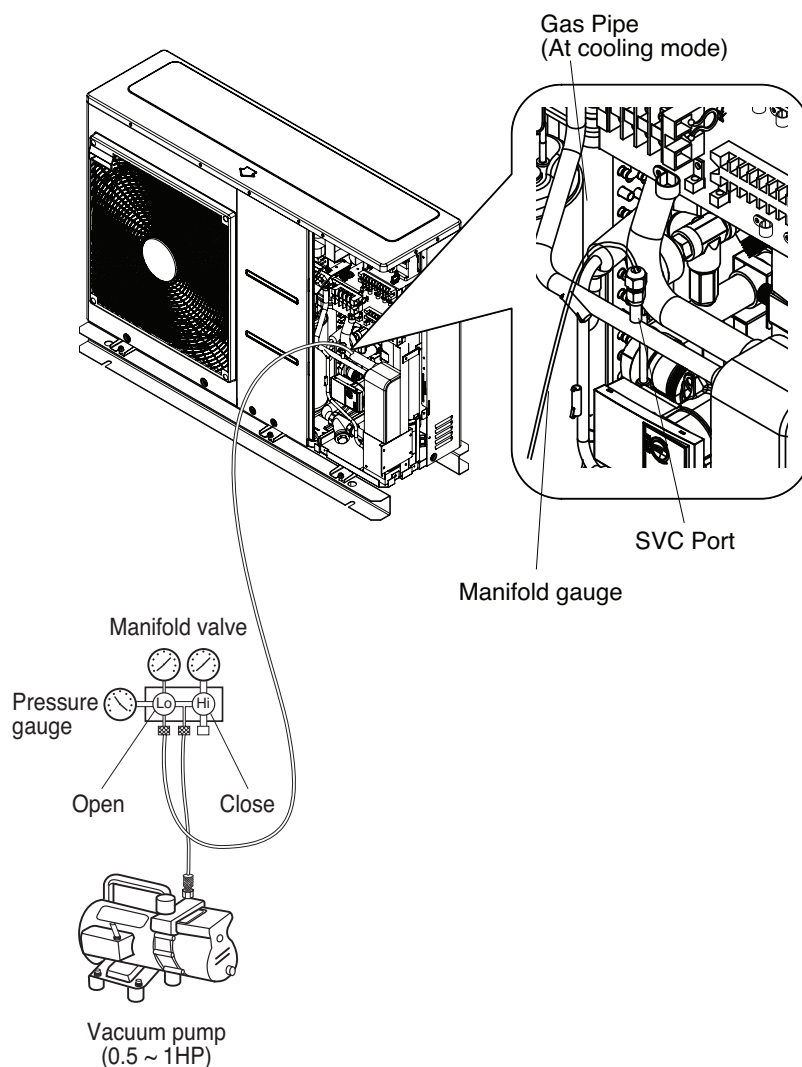
Procedures

1. Cover of electronic heater should be removed.
2. About 2 turns open the cap of air vent

6. Installation

6.5 Vacuum

To work of vacuum action. when the leak of refrigerant.



When selecting a vacuum, you should select one which is capable of achieving 0.2 Torr of ultimate vacuum. Degree of vacuum is expressed in Torr, micron, mmHg, and Pascal (Pa). The units correlate as follows:

	Unit	Standard atmospheric pressure	Perfect vacuum
Gauge Pressure	Pa	0	-1.033
Absolute Pressure	Pa	1.033	0
Torr	Torr	760	0
Micron	Micron	760000	0
mmHg	mmHg	0	760
Pa	Pa	1013.33	0

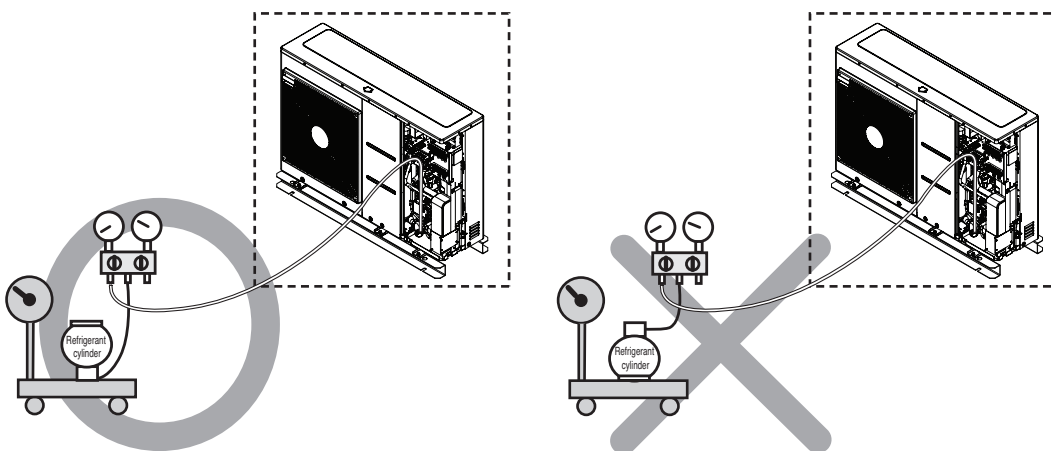
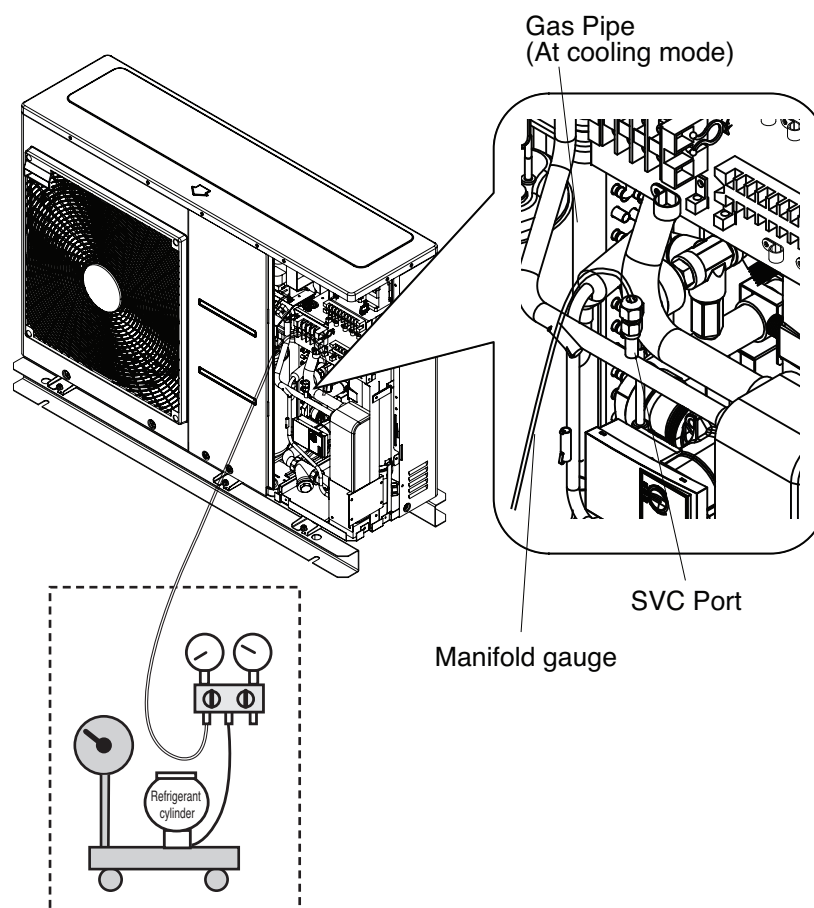
6. Installation

6.6 Charge of refrigerant

You should be charged after vacuum.

You can see amount of refrigerant at quality label.

Please to charge at cooling mode when there is not full charging.



7. Electrical Wiring

7.1 Areas of Caution

1. Follow ordinance of your governmental organization for technical standard related to electrical equipment, wiring regulations and guidance of each electric power company.

⚠ WARNING

Be sure to have authorized electrical engineers do the electric work using special circuits in accordance with regulations and this installation manual. If power supply circuit has a lack of capacity or electric work deficiency, it may cause an electric shock or fire.

2. Install the Unit transmission line away from the power source wiring so that it is not affected by electric noise from the power source. (Do not run it through the same conduit.)
3. Be sure to provide designated grounding work to Unit.

⚠ CAUTION

Be sure to correct the unit to earth. Do not connect earth line to any gas pipe, liquid pipe, lightning rod or telephone earth line. If earth is incomplete, it may cause an electric shock.

4. Give some allowance to wiring for electrical part box of Units, because the box is sometimes removed at the time of service work.
5. Never connect the main power source to terminal block of transmission line. If connected, electrical parts will be burnt out.
6. Only the transmission line specified should be connected to the terminal block for Unit transmission.

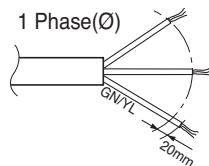
⚠ CAUTION

- This product have reversed phase protection detector that only works when the power is turned on. If there exists black out or the power goes on and off which the product is operating, attach a reversed phase protection circuit locally. running the product in reversed phase may break the compressor and other parts.
- Use the 2-core shield cables for communication lines. Never use them together with power lines.
- The conductive shielding layer of cable should be grounded to the metal part of both units.
- Never use multi-core cable
- As this unit is equipped with an inverter, to install a phase leading capacitor not only will deteriorate power factor improvement effect, but also may cause capacitor abnormal heating. Therefore, never install a phase leading capacitor.
- Make sure that the power unbalance ratio is not greater than 2%. If it is greater, the unit's lifespan will be reduced.
- Introducing with a missing N-phase or with a mistaken N-phase will break the equipment.

7. Electrical Wiring

◆ Wire specification

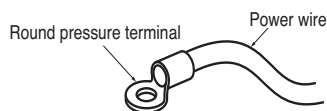
Power cable specification : The power cord connected to the unit should be complied with IEC 60245 or HD 22.4 S4 (Rubber insulated cord, type 60245 IEC 66 or H07RN-F)



If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

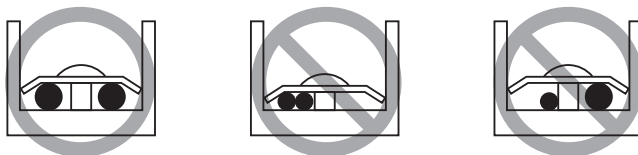
Terminal specification of power cable and related cautions :

Use round pressure terminals for connections to the power terminal block.



When none are available, follow the instructions below.

- Do not connect wiring of different thicknesses to the power terminal block. (Slack in the power wiring may cause abnormal heat.)
- When connecting wiring which is the same thickness, do as shown in the figure below.



7. Electrical Wiring

7.2 Wiring procedure for power cable

This cable is generally connected between external power source (such as main electric power distribution panel of user's house) and the unit. Before starting wiring, check if wire specification is suitable and read following directions and cautions VERY carefully.

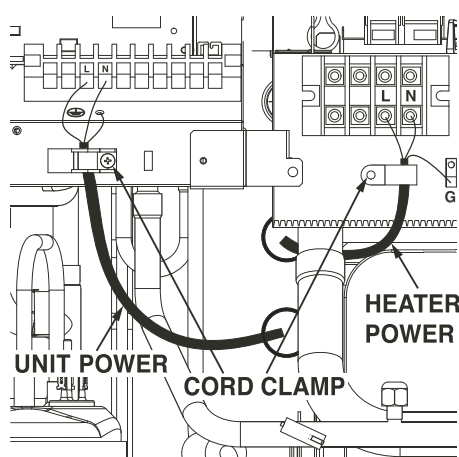
Step 1. : Disassemble side panel and front panel from the unit by loosening screws.

Step 2. : Connect power cable to main power terminal

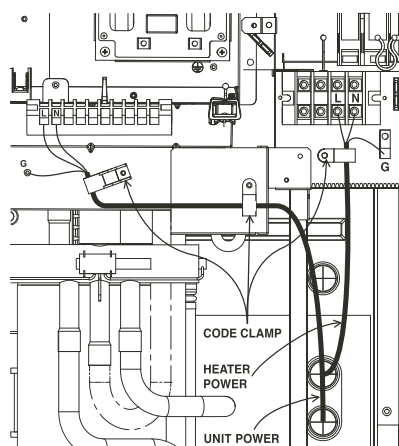
See below figure for detailed information. When connecting earth cable, the diameter of cable should refer to the below table. The earth cable is connected to the Control box case where earth symbol is \oplus marked.

Step 3. : Use cable clamps (or cord clamps) to prevent unintended move of power cable.

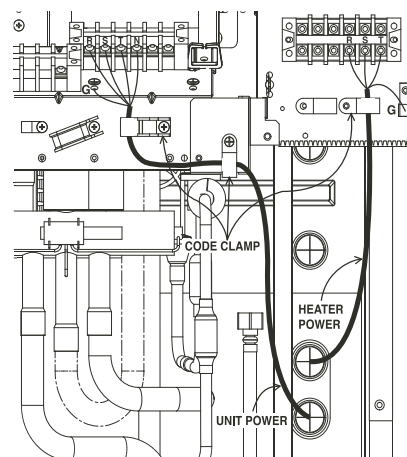
Step 4. : Reassemble the side panel to the unit by fastening screws.



(AHBW056A0/AHBW076A0/AHBW096A0)



(AHBW126A0/AHBW146A0/AHBW166A0)



(AHBW128A0, AHBW148A0, AHBW168A0)

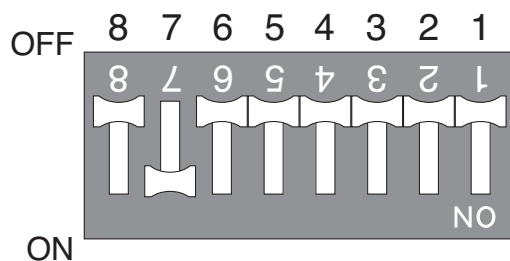
Failure to do these instruction can result in fire, electric shock or death.

- Make sure the power cable do not touch to copper tube.
- Make sure to fix [cord clamp] firmly to sustain the connection of terminal.
- Make sure to connect unit power & heater power separately.

7. Electrical Wiring

7.3 DIP switch information

- If you set Dip switch when power is on, the changed setting will not be applied immediately. The changed setting will be enabled only when Power is reset or by pressing Reset button.



Description	Setting	1	2	3	4	5	6	7	8
Role when central controller is equipped.	As Master	X							
	As slave	●							
Accessory installation information	Unit only		X	X					
	Unit + Domestic hot water tank is installed.		X	●					
	Unit + Domestic hot water tank +Solar thermal system is installed.		●	X					
Emergency operation Level.	High temperature cycle				X				
	Low temperature cycle				●				
¹⁾ External water pump installation information.	External water pump is NOT installed.					X			
	External water pump is installed.					●			
Selecting electric heater capacity.	²⁾ Step 2 capacity is used.						X	X	
	³⁾ Step 1 capacity is used.						X	●	
	Electric heater is not used.						●	X	
Thermostat installation information.	Thermostat is NOT installed.								X
	Thermostat is installed.								●
Default		X	X	X	X	X	X	●	X

1) Do not drive External water pump by power other than the pump built in the this Unit.

2) Step 1. operate heater partially.

3) Step 2. operate heater fully.

* For more information, please refer to installation manual.

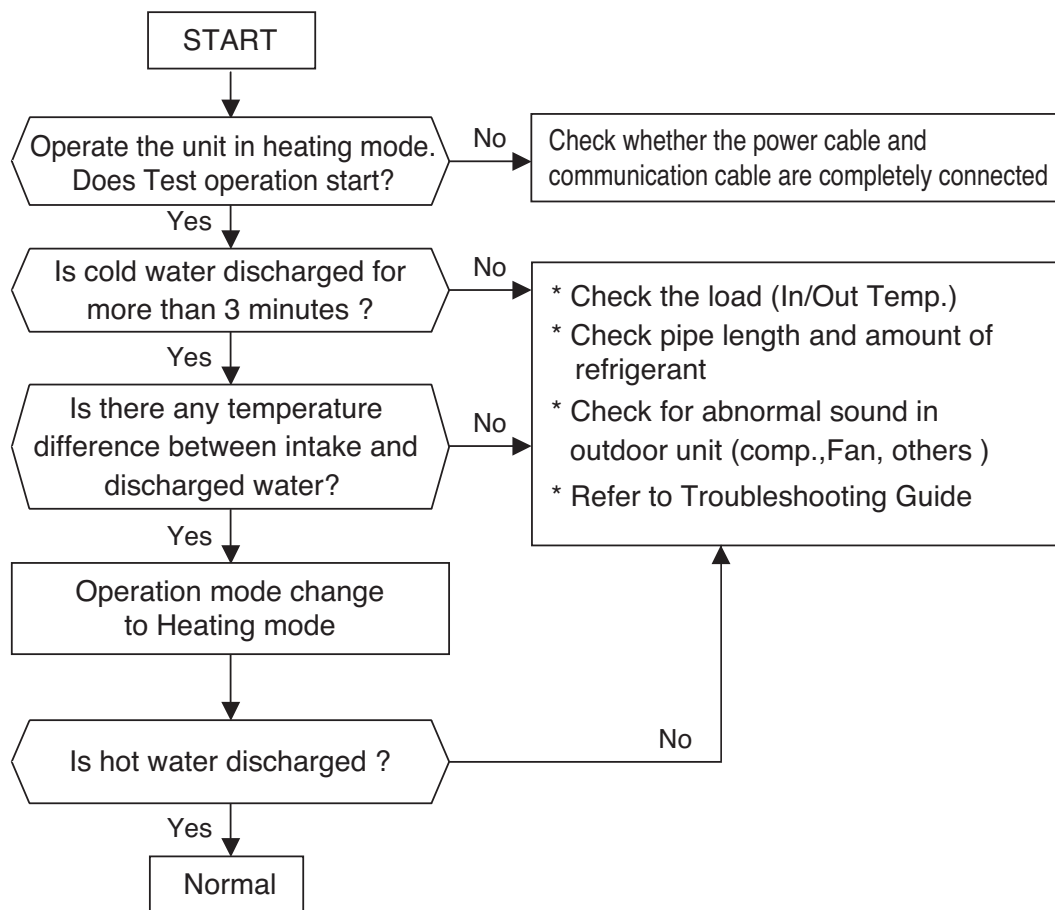
⚠ CAUTION

- "X" mark means dip switch must be off. Otherwise the function may not operates correctly.
- If each dip switch doesn't set correctly, unit will operate abnormally.
- In case of proceeding test run, start after checking if all unit is off.

8. Test Run

- Before starting operation, pre-check points are described in this chapter.

8.1 Test run flow chart



8. Test Run

8.2 Check List before Starting Operation

Turn off the power before changing wiring or handling unit.

No	Category	Item	Check Point
1	Electricity	Field wiring	<ul style="list-style-type: none"> • All switches having contacts for different poles should be wired tightly according to regional or national legislation. • Only qualified person can proceed wiring. • Wiring and local-supplied electric parts should be complied with European and regional regulations.
2		Protective devices	<ul style="list-style-type: none"> • Install ELB (earth leakage breaker) with 30 mA.
3		Earth wiring	<ul style="list-style-type: none"> • Earth should be connected. Do not earth to gas or city water pipe, metallic section of a building, surge absorber, etc.
4		Power supply	<ul style="list-style-type: none"> • Use dedicated power line.
5		Terminal block wiring	<ul style="list-style-type: none"> • Connections on the terminal block (inside of the unit) should be tightened.
6	Water	Charged water pressure	<ul style="list-style-type: none"> • After water charging, the pressure gage (in front of the unit) should indicate 200~250 kPa. Do not exceed 300 kPa.
7		Air purge	<ul style="list-style-type: none"> • During water charging, air should be taken out through the hole of the air purge. • If water does not splash out when the tip (at the top of the hole) is pressed, then air purging is not completed yet. If well purged, the water will splash out like fountain. • Be careful when testing air purge. Splashed water may make your dress wet.
8		By-pass valve	<ul style="list-style-type: none"> • By-pass valve should be installed and adjusted to secure enough water flow rate. If water flow rate is low, flow switch error (CH14) can be occurred.
9	Unit Installation	Parts inspection	<ul style="list-style-type: none"> • There should be no apparently damaged parts inside the unit.
10		Refrigerant leakage	<ul style="list-style-type: none"> • Refrigerant leakage degrades the performance. If leakage found, contact qualified LG air conditioning installation person.
11		Drainage treatment	<ul style="list-style-type: none"> • While cooling operation, condensed dew can drop down to the bottom of the unit. In this case, prepare drainage treatment (for example, vessel to contain condensed dew) to avoid water drop.

8. Test Run

8.3 Maintenance

To assure best performance of THERMAV™, it is required to perform periodical check and maintenance. It is recommended to proceed following check list for once a year.

Turn off the power before proceeding maintenance

No	Category	Item	Check Point
1	Water	Water pressure	<ul style="list-style-type: none"> • In normal state, the pressure gage (inside of the unit) should indicate 200~250 kPa. • If the pressure is less than 30 kPa, please recharge the water.
2		Strainer(Water filter)	<ul style="list-style-type: none"> • Disassemble strainer. Then wash the strainer to make it clean. • While disassembling the strainer, be careful for water flood out.
3		Safety valve	<ul style="list-style-type: none"> • Open the switch of the safety valve and check if water is flood out through the drain hose. • After checking, close the safety valve.
4	Electricity	Terminal block wiring	<ul style="list-style-type: none"> • Look and inspect if there is loosen or defected connection on the terminal block.

8.4 Check before Test run

1	Check to see whether there is any refrigerant leakage, and check whether the power or transmission cable is connected properly.
2	<p>Confirm that 500 V megger shows 2.0 MΩ or more between power supply terminal block and ground. Do not operate in the case of 2.0 MΩ or less.</p> <p>NOTE: Never carry out mega ohm check over terminal control board. Otherwise the control board may break.</p> <p>Immediately after mounting the unit or after leaving it turned off for an extended length of time, the resistance of the insulation between the power supply terminal board and the ground may decrease to approx. 2.0 MΩ as a result of refrigerant accumulation in the internal compressor.</p> <p>If the insulation resistance is less than 2.0 MΩ, turn on the main power supply.</p>



Part 3. Accessories

- 1. Dry Contact (PQDSA)* Supplied by accessory**
- 2. Remote Temperature Sensor (PQRSTA0)**
- 3. Domestic Hot Water Tank Kit(PHLTB)**
- 4. Solar Thermal Kit(PHLLA)**

1. Dry Contact (PQDSA)* Supplied by accessory

1.1 Overview

LG Dry Contact is a solution for automatic control of air conditioning system at the owner's behest. In simple words, it's a switch which can be used to turn the unit On/Off after getting the signal from external sources like key-in lock, door or window switch etc specially used in Hotel rooms.

It's a small PCB that either can be fit inside the control box of Indoor unit or can be outside the unit in a plastic case if there is no sufficient space inside the Indoor unit.

Apart from simple installation, it can also be linked to Central Controller via Indoor unit PI485 pcb. For this, all connecting wires & an additional small pcb for looping are also provided along with Dry Contact.

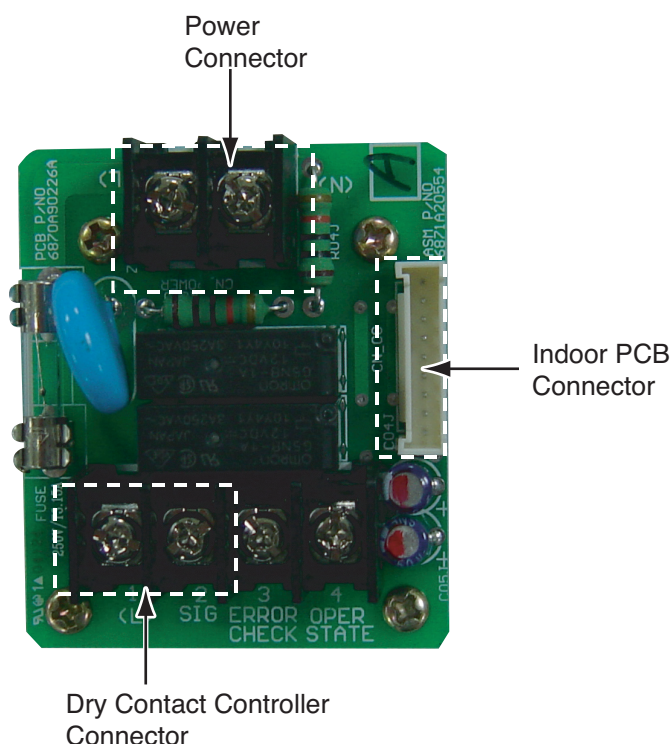
Dry Contact can be used in two ways.

1. It can be used to actually turn On/Off the system on receiving the signal from the source.
In this case, user doesn't need to use remote controller anymore to turn On/Off the system.
However all the further settings like temperature, fan speed, mode etc can be done through remote controller only.
2. Other way is almost similar as above but in this case, after getting the On signal from the external source, user has to turn On the system from remote controller only. Dry contact just activates the system.
However system can be turned Off directly from the external source. So only On mode is different here.

So in both of above conditions, system can't be operated without signal from external source which prevents unnecessary use of system & facilitates its operation only when its required.

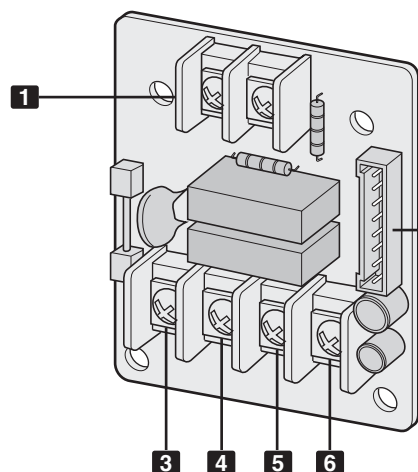
These settings can be selected from the remote controller whose details have been explained in the later part of this manual

So depending upon the requirement, Dry Contact offers a variety of applications to suit the customer's requirement in the best possible way.



1. Dry Contact (PQDSA)* Supplied by accessory

1.2 Part Description



- 1** CN-POWER : AC 220 V Connector
- 2** CN-CC : Indoor PCB Connector
- 3** CN_DRY (L) : DRY CONTROLLER Connector
- 4** CN_DRY (SIG) : DRY CONTROLLER Connector
- 5** CN_DRY (ERROR CHECK) : ERROR Check Display Connector
- 6** CN_DRY(OPER STATE): Operation Display Connector

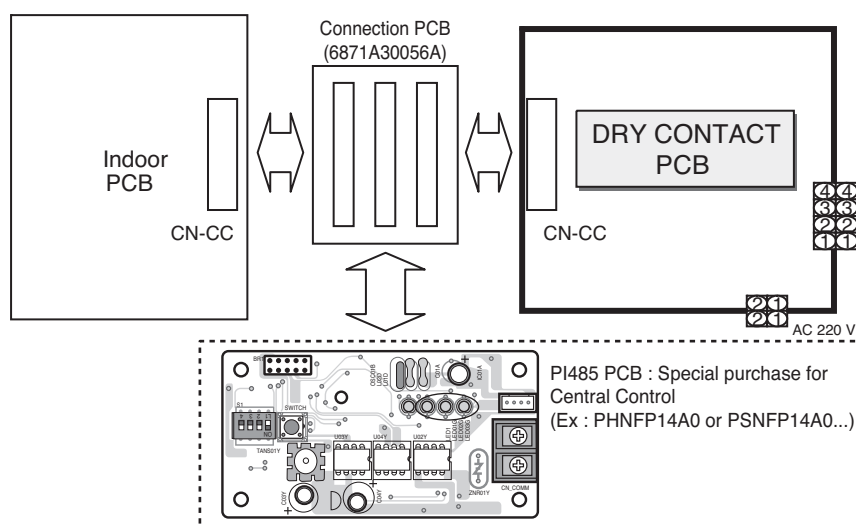
NOTE

- These cable using for connection between Dry contact and Indoor unit.
- So before using these things Please check the connector type first and use cables on proper indoor unit.

1.3 Installation Guide

1.3.1 Step 1

- DRY CONTACT PCB is installed as factory default.
- Connection of Dry contact & LG Central Controller in case of single constant models.



* Single Only

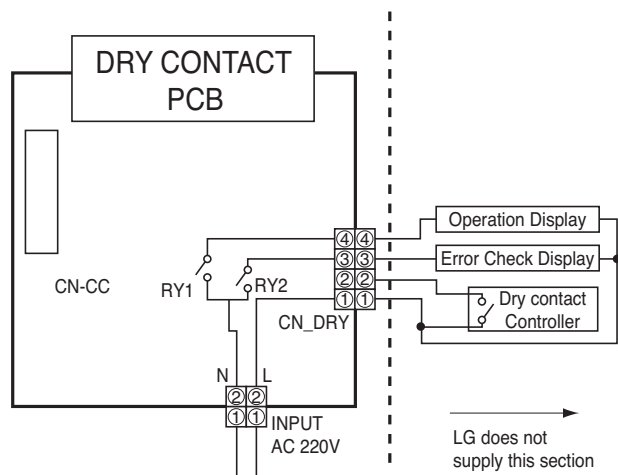
- When you install single product this PCB have to be added.

1. Dry Contact (PQDSA)* Supplied by accessory

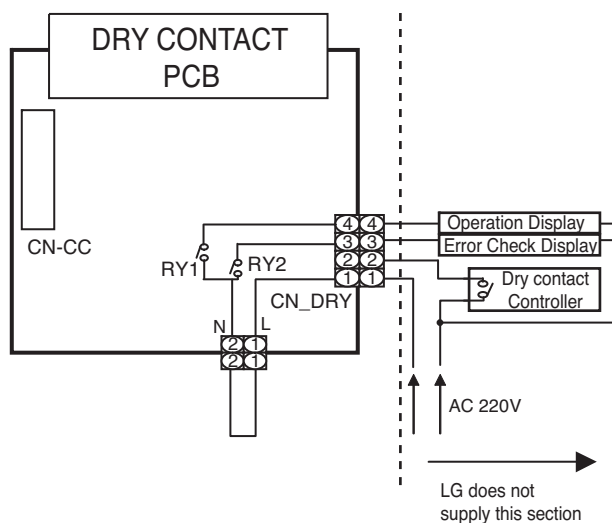
1.3.2 Step 2

Connect CN_DRY with Control Unit. (Fix SUB PCB into the proper location.)

- To apply power source through Dry Contact PCB.



- To apply power source directly to external source.

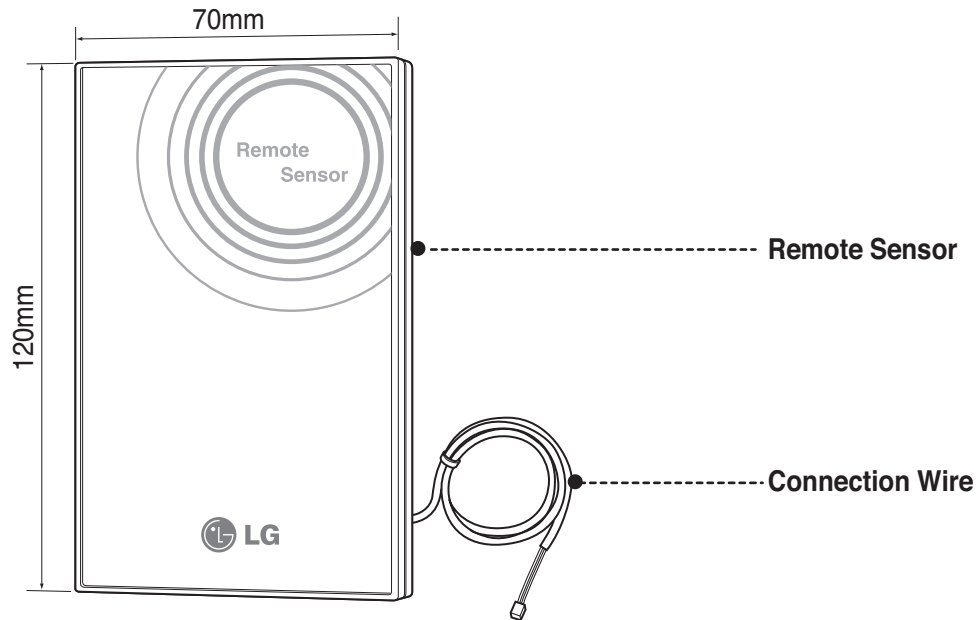


2. Remote Temperature Sensor (PQRSTA0)

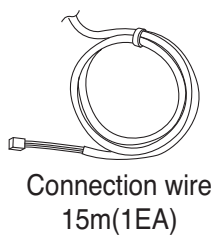
2.1 Part Description

Remote temperature sensor can be installed any place a user wants to detect the temperature.

2.1.1 Remote Sensor



2.1.2 Parts

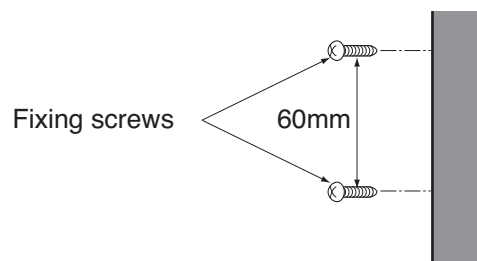


2. Remote Temperature Sensor (PQRSTA0)

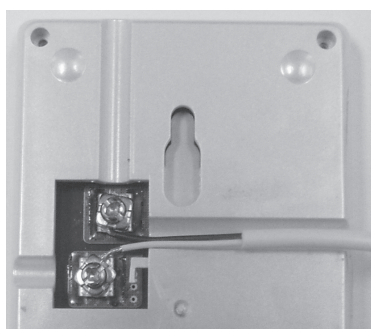
2.2 Installation Method

2.2.1 How to use

1. After deciding where the remote temperature sensor is installed, decide the location and height of the fixing screws.
(Interval between the screws : 60mm)
2. Insert the connector of the connection wire into the space for the connector in place of the room temperature sensor. (CN_ROOM)
3. Separately, set the option code of the attached controller on the indoor unit.



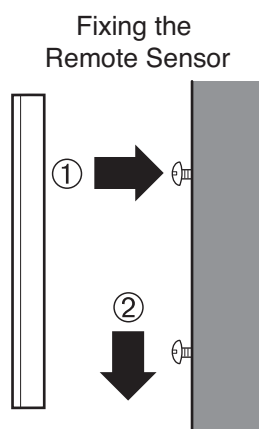
2.2.2 How to connect the remote temperature sensor and the connection wire



The Connection wire does not matter if you change the color of the wire because of non-polar

2.2.3 How to install the remote temperature sensor on the wall

Integrate the remote temperature sensor with the screws as the order of arrows.



⚠ CAUTION

1. Choose the place where the average temperature can be measured for the place the indoor unit operates.
2. Avoid direct sunlight.
3. Choose the place where the cooling/heating devices do not affect the remote sensor.
4. Choose the place where the outlet of the cooling fan do not affect the remote sensor.
5. Choose the place where the remote sensor isn't affected when door is open.

3. Domestic Hot Water Tank Kit(PHLTB)

Must be used for communication of Domestic Hot Water Tank and AWHP Unit.

3.1 Model

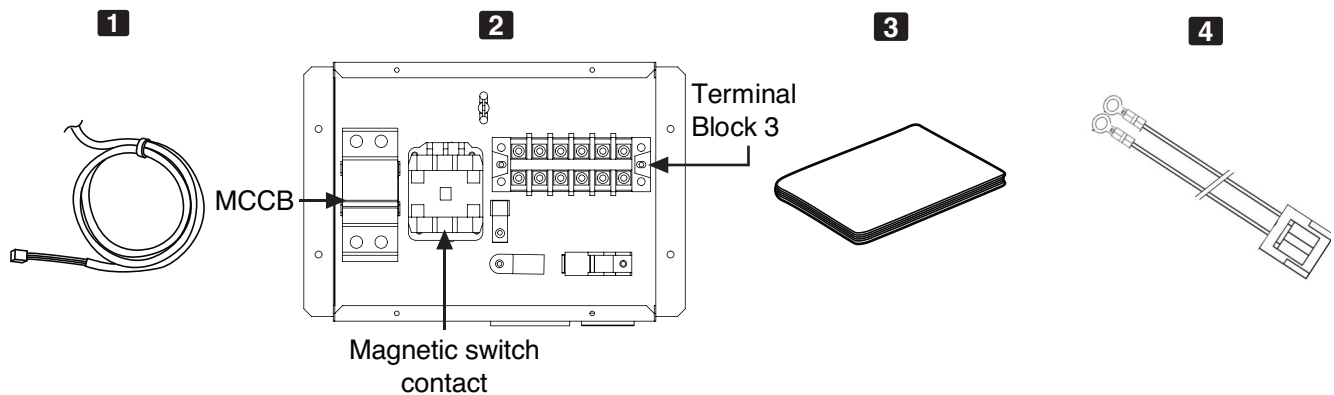


< PHLTB >

* When connecting PHLTB, please refer to the manual supplied with.

3.2 Part Description

- 1** Sensor (Thermister) – Th12
- 2** Water tank kit
- 3** Installation Manual
- 4** Multi harness (only AHBWXXXA0 model use)



3. Domestic Hot Water Tank Kit(PHLTB)

3.3 Installation Method

How to Install Domestic Hot Water Tank Kit

Follow below procedures Step 1 ~ Step 5.

Step 1. Uncover the water tank kit and locate it on the wall.

Step 2. Connect the water tank kit to the main power like the below figure 2.

Step 3. Connect the water tank kit to the Main PCB Assembly1 like the below figure 2.

Step 4. Connect power cord of Domestic Hot Water Tank heater. It is located inside of the tank.

Step 5. Find Domestic Hot Water Tank sensor. Plug it to 'CN_TH4' (Red Connector) of the main PCB assembly 1. The sensor should be mounted correctly to the sensor hole of Domestic Hot Water Tank. (figure. 1)

Step 6. Connect the Main PCB to terminal block with wire(Part 4) like figure 3.

* This wire is only for AHBWXXXA0 model.

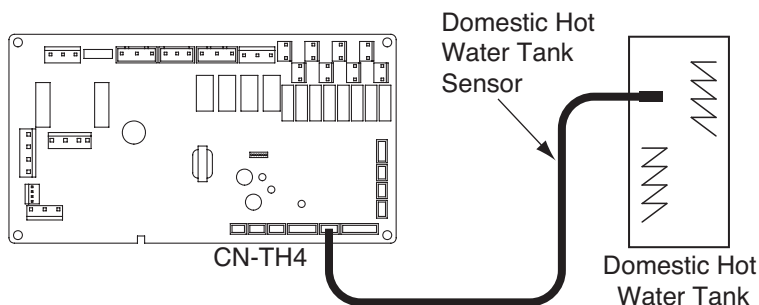


Fig. 1

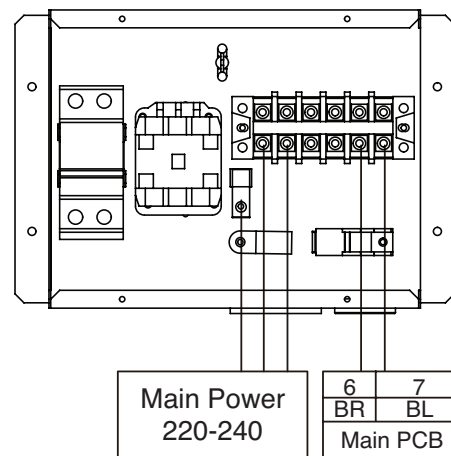


Fig. 2

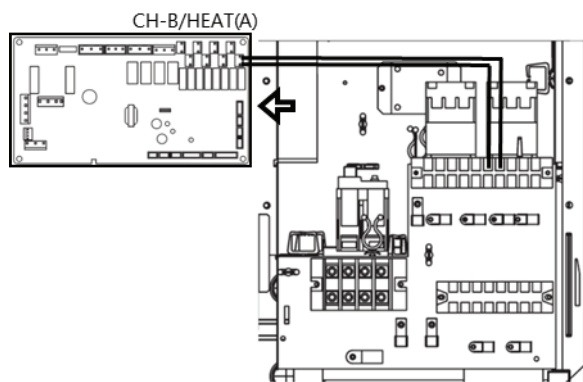


Fig. 3

CAUTION

Sensor mounting

Insert sensor into sensor socket and bolt it tightly.

4. Solar Thermal Kit(PHLLA)

- Must be used for communication of solar thermal component and indoor unit PCB.

4.1 Model

- PHLLA : Sensor's limit temperature 100°C

* When connecting PHLTB, please refer to the manual supplied with.

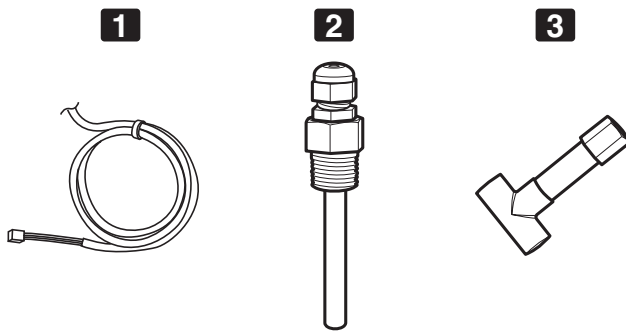
4.2 Part Description

1 Sensor (Thermister) – Th13

2 Sensor Adaptor

- It can be attached on T type pipe fitting attached in the pipe of solar thermal component
- Thermister is inserted in the sensor adaptor
- Connection 1/2"(12.7mm) BSP

3 T type pipe fitting (option)





P/No.: MFL66101106



Air Conditioner

20 Yeouido-dong, Yeongdeungpo-gu,
Yeouido P.O.Box 335 Seoul,
150-721, Korea.
<http://www.lgeaircon.com>

All rights reserved

Printed in Korea October / 2016
The specifications, designs, and
information in this brochure are subject to
change without notice.

The air conditioners manufactured by LG have received ISO9001 certificate for
quality assurance and ISO14001 certificate for environmental management system.