LG

TOTAL HVAC SOLUTION PROVIDER

ENGINEERING PRODUCT DATA BOOK

THERMA V™

Air-to-Water Heat Pump / Split Type
R32 / 50Hz
5BPU0-01B (Replaces 5BPU0-01A)

LG
Life's Good

P/No. : MFL66101114

THERMA V™

Split Type

General Information

Indoor unit

Outdoor unit

Design and installation

THERMA V™

Split Type

General Information

1. Model Line Up
2. Nomenclature

1. Model line up

1.1 Indoor Unit

Category	Type	External Appearance	Heater Capacity [kW]	Model Name
				Heating Capacity * (kW)
				9.0
AWHP Split Type	Hydro Box Type		6.0	ZHNW09606A0 [HN0916M NK4]

Note
* : Actual system capacity would be different accordance with combination of outdoor unit.

1.2 Outdoor Unit

Category		Model Name		
		Heating Capacity (kW)		
		5.5	7.0	9.0
1 Phase Model **1 Ø, 220-240 V, 50 Hz**		ZHUW056A0 [HU051MR U44]	ZHUW076A0 [HU071MR U44]	ZHUW096A0 [HU091MR U44]
Combination	ZHNW09606A0 [HN0916M NK4]	O	O	O
External Appearance				

2. Nomenclature

2.1 Indoor Unit

■ Global Name

Model Name	ZH	N	W	09	6	06	A	0
No.	1	2	3	4	5	6	7	8

No.	Signification
1	**Air-to-Water Heat Pump for R32**
2	**Classification** N : Indoor unit of Split type
3	**Model Type** W : Inverter Heat Pump
4	**Heating Capacity (kW)** Ex) 9kW → '09'
5	**Electrical ratings** 6 : 1Ø, 220-240V, 50 Hz
6	**Heater Capacity (kW)** Ex) 06kW → ‘06’
7	**Function** A : General heating heat pump
8	**Serial number**

2. Nomenclature

■ European Name

Model Name	H	N	09	1	6	M	.	N	K	4
No.	1	2	3	4	5	6		7	8	9

No.	Signification
1	**Air-to-Water Heat Pump**
2	**Classification** N : Indoor unit of Split type
3	**Heating Capacity (kW)** Ex) 9kW → '09'
4	**Heater Electrical ratings** 1 : 1Ø, 220-240V, 50 Hz
5	**Heater Capacity (kW)** Ex) 6kW → ‘6’
6	**Leaving Water Combination** M : Mid Temperature
7	**Classification** N : Indoor unit of Split type
8	**Platform (Chassis code)** K : K1 Chassis
9	**Serial number**

2. Nomenclature

2.2 Outdoor Unit

■ Global Name

Model Name	ZH	U	W	09	6	A	0
No.	1	2	3	4	5	6	7

No.	Signification
1	**Air-to-Water Heat Pump for R32**
2	**Classification** U : Outdoor unit of Split type
3	**Model Type** W : Inverter Heat Pump
4	**Heating Capacity (kW)** Ex) 9kW → '09'
5	**Electrical ratings** 6 : 1Ø, 220-240V, 50 Hz
6	**Function** A : General heating heat pump
7	**Serial number**

2. Nomenclature

■ European Name

Model Name	H	U	09	1	M	R	.	U	4	4
No.	1	2	3	4	5	6		7	8	9

No.	Signification
1	**Air-to-Water Heat Pump**
2	**Classification** U : Outdoor unit of Split type
3	**Heating Capacity (kW)** Ex) 9kW : '09'
4	**Electrical ratings** 1 : 1Ø, 220-240V, 50 Hz
5	**Leaving Water Combination** M : Mid Temperature
6	**Type of Refrigerant** R : R32
7	**Classification** U : Outdoor unit of Split type
8	**Platform (Chassis code)** 4 : U4 Chassis
9	**Serial number**

THERMA V™

Split Type

Indoor unit

1. List of Functions

■ Basic functions of Unit

Category	Functions	ZHNW09606A0 [HN0916M NK4]
Installation	Backup heater (Operation)	O
Reliability	Self diagnosis	O
Convenience	Auto Restart	O
	Child lock	O
	Sleep mode	O
	Timer (on/off)	O
	Timer (weekly)	O
	Two thermistor control	X
Network function	Network solution(LGAP)	O
Air to Water Heat Pump Functions	Anti-condensation on floor (cooling)	O
	Digital output for external pump	O
	Flow sensor	O
	Thermostat interface (230V AC)	O
	Thermostat interface (24V AC)	X
	DHW(Domestic Hot Water) tank kit	O (Accessory)
	Therma V solar kit	O (Accessory)
	PHEX anti-freezing control	O
	Water pump anti-stuck function	O
	Weather compensation for heating and cooling (Auto mode)	O
	Low noise operation	O
	Anti-overheating of water pipe	O
	Emergency operation	O
	Weather Dependent Operation with Thermostat	O
	Scheduler (DHW Tank Heater)	O
	Timer (Domestic Hot Water Tank Heater)	O
	Quick Domestic Hot Water Tank Heating	O
	Screed Drying Mode	O
	Base Pan Heater	O
	Integrated Dry Contact (CN-EXT)	O

Note

1. O : Applied, X : Not applied
   Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.
   Accessory line-ups varies by region, so check your local catalogue or local sales material.

1. List of Functions

■ Accessory Compatibility List

Category		Product	Remark	ZHNW09606A0 [HN0916M NK4]
Dry Contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
	Communication Type	PDRYCB400	2 Points Dry Contact (For Setback)	X
		PDRYCB300	For 3rd party Thermostat	O
		PDRYCB500	Dry Contact for Modbus	X
ETC	Remote temperature sensor	PQRSTA0	Wire : 15 m	O
	Zone Controller	ABZCA	-	X
	Group control wire	PZCWRCG3	0.25 m	X
	2-Remo Control Wire	PZCWRC2	0.25 m	X
	Extension wire	PZCWRC1	10 m	O
	Wi-Fi controller *	PWFMDD200	USB Cable : 0.6 m Extension cable : 0.5 m	O
	Wi-Fi Extension cable	PWYREW000	USB Extension cable : 10 m	O
	Meter Interface Module ***	PENKTH000	Interface between IDU and Meter	O
Accessory Kit for AWHP	DHW tanks (Single coil)	OSHW-200F	200 L	O
		OSHW-300F	300 L	O
		OSHW-500F	500 L	O
	DHW tanks (Double coil)	OSHW-300FD	300 L	O
	DHW tank kit	PHLTA	For Split	O
		PHLTB	For Monobloc	X
	DHW sensor	PHRSTA0	included in PHLTA kit	O
	Mixing valve	OSHA-MV	3/4” DN20	O
		OSHA-MV1	1” DN20	O
	3way valve	OSHA-3V	-	O
	Solar thermal kit	PHLLA	-	O
	2nd Circuit Thermistor	PRSTAT5K10	-	O
	Backup heater	AHEH036A [HA031M E1] AHEH066A [HA061M E1]	220-240 V, 1Φ	X
	Drain pan	PHDPB	-	O

Note

1. O: Possible, X: Impossible, - : Not applicable
2. * : Some advanced functions controlled by individual controller cannot be operated.
3. ** : It could not be operated some functions.
4. If you need more detail, please refer to the ***BECON*** PDB or the manual of product. (http://partner.lge.com/global : Home> Doc.Library> Product > Control(BECON))

*** Meter interface cannot be connected at the same time with 3rd-party controller.

2. Specifications

Indoor Unit				ZHNW09606A0 [HN0916M NK4]
Operation Range (Leaving Water Temperature)	Cooling	Min. ~ Max.	°C DB	5 ~ 27
	Heating	Min. ~ Max.	°C DB	15 ~ 65
	DHW *	Min. ~ Max.	°C DB	15 ~ 80
Water Pump	Type		-	Canned type for hot water circulation
	Model			GRUNDFOS UPM3K 20-75 CHBL
	Motor Type		-	BLDC
	Steps of Pump Performance		-	Variable capacity 10% to 100%
	Power input	Min. ~ Max.	W	3 ~ 60
Heat Exchanger	Type		-	Brazed Plate HEX
	Quantity			1
	Number of Plate		EA	54
	Water Volume		ℓ	0.7
Flow Sensor	Type		-	Vortex
	Model		-	SIKA VVX20
	Measuring Range	Min. ~ Max.	ℓ/min	5 ~ 80
	Flow (Trigger point)	Min.	ℓ/min	7
Expansion Vessel	Volume	Max.	ℓ	8
	Water pressure	Max.	bar	3
	Water pressure	Pre-charged	bar	1
Strainer	Mesh size		-	28 mesh
	Material		-	Stainless Steel
Relief valve	Pressure Limit	Upper Limit	bar	3.0
Piping Connections	Water Circuit	Inlet	mm(Inch)	Male PT 25(1)
		Outlet	mm(Inch)	Male PT 25(1)
	Refrigerant Circuit	Gas	mm(Inch)	Φ 15.88 (5/8)
		Liquid	mm(Inch)	Φ 9.52 (3/8)
Wiring Connections	Communication Cable (included Earth)		No × mm^2	4 × 0.75 (H07RN-F)
Sound Power Level	Heating	Rated	dB(A)	44
Dimensions	Unit	W × H × D	mm	490 × 850 × 315
	Packed Unit	W × H × D	mm	563 ×1082 × 375
Weight	Unit		kg	41.0
	Packed Unit		kg	47.0

Electrical Specification			ZHNW09606A0 [HN0916M NK4]
Backup Heater	Type	-	Sheath
	Number of Heating Coil	EA	2
	Capacity Combination	kW	3.0 + 3.0
	Operation	-	Automatic
	Heating Steps	Step	2
	Power Supply	V, Ø, Hz	220-240, 1, 50
	Rated Current	A	25.0
Wiring Connections	Power Cable (Included Earth)	No × mm^2	3 × 1.5 (H07RN-F)

Note

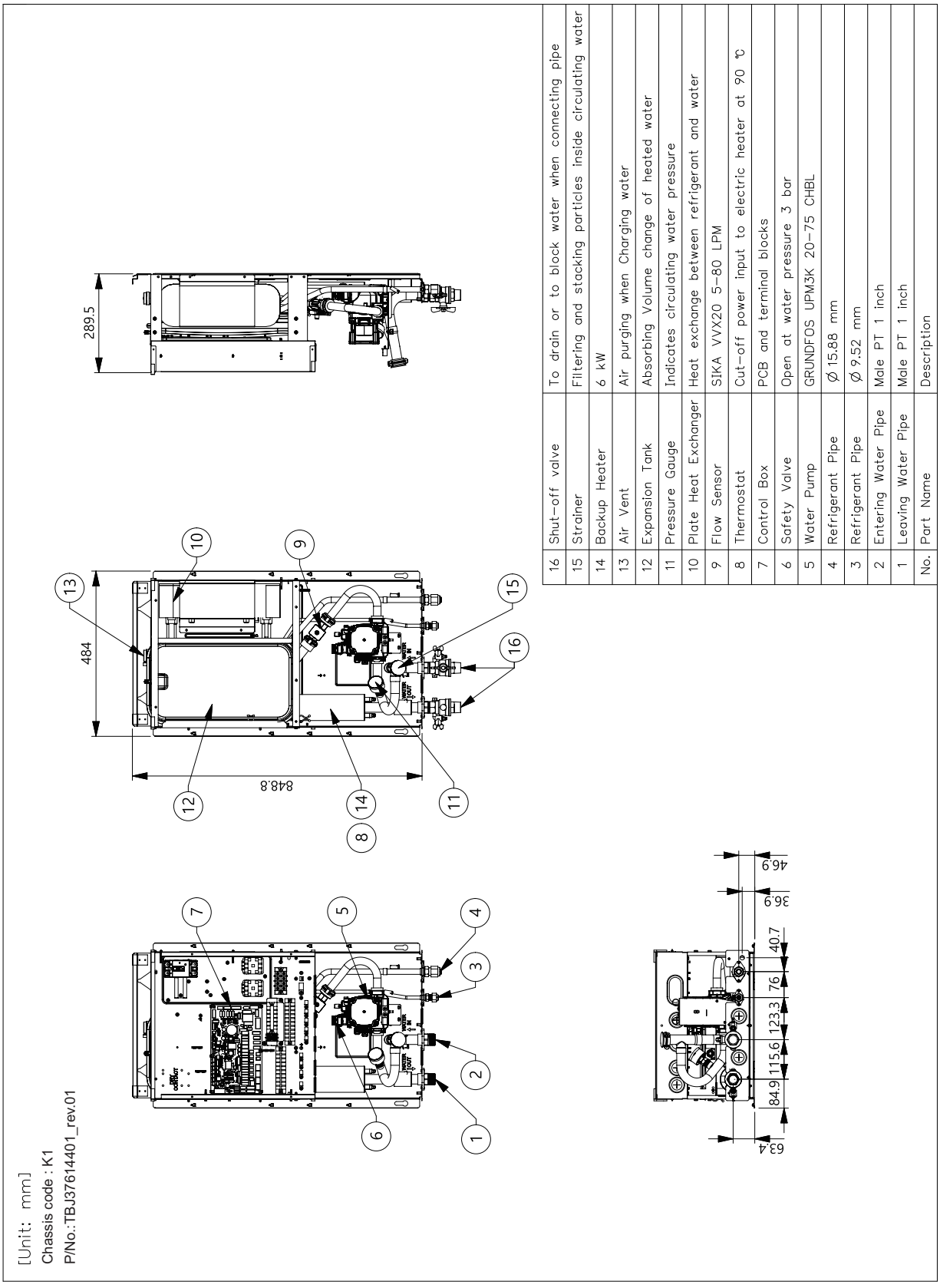
1. Due to our policy of innovation some specifications may be changed without notification.
2. Wiring cable size must comply with the applicable local and national codes. And “Electric characteristics” chapter should be considered for electrical work and design. Especially the power cable and circuit breaker should be selected in accordance with that.
3. Sound Level Values are measured at Noise Measuring chamber accordance with standard. Therefore, these values depend on the ambient conditions and values are normally higher in actual operation.
4. Performances are based on the following conditions :
   - Cooling : Inlet/Outlet Water Temp. 23°C/18°C, Outdoor Air Temp. 35°CDB / 24°CWB
   - Heating : Inlet/Outlet Water Temp. 30°C/35°C, Outdoor Air Temp. 7°CDB / 6°CWB
   - Interconnected Pipe Length is standard length and difference of Elevation (Outdoor ~ Indoor Unit) is Zero.
5. This product contains Fluorinated greenhouse gases.
6. Sound Performances are based on the following conditions.
   - Sound Power Level : Measured according to EN14825.
   - Sound Pressure Level : Calculated value according to distance of sound power.

- At least 25A circuit breaker can be used.

* DHW 55~80°C Operating is available only when the booster heater is operating.

3. Dimensions

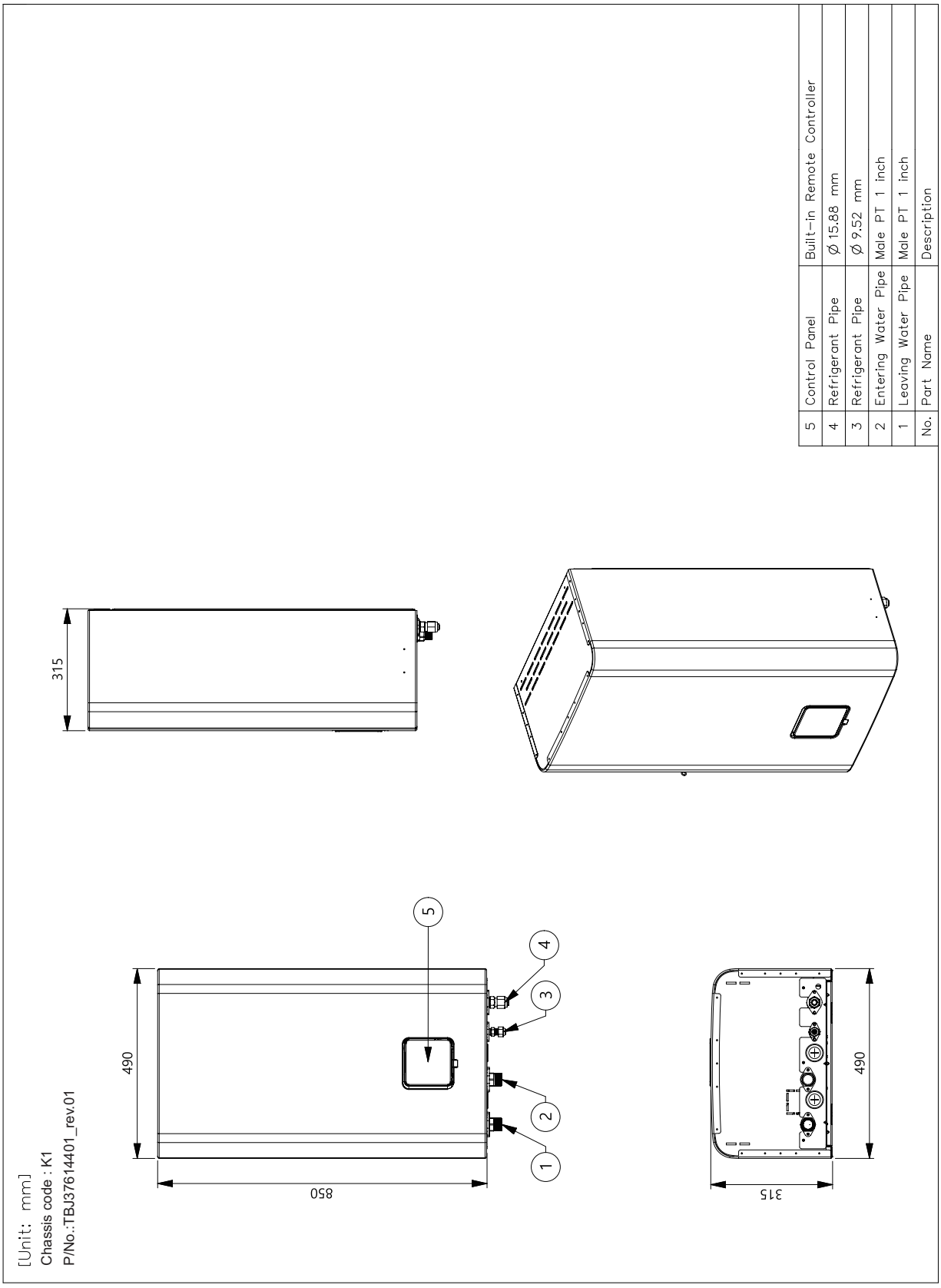
3.1 Internal Layout



No.	Part Name	Description
1	Leaving Water Pipe	Male PT 1 inch
2	Entering Water Pipe	Male PT 1 inch
3	Refrigerant Pipe	Ø 9.52 mm
4	Refrigerant Pipe	Ø 15.88 mm
5	Water Pump	GRUNDFOS UPM3K 20-75 CHBL
6	Safety Valve	Open at water pressure 3 bar
7	Control Box	PCB and terminal blocks
8	Thermostat	Cut-off power input to electric heater at 90 ℃
9	Flow Sensor	SIKA VVX20 5-80 LPM
10	Plate Heat Exchanger	Heat exchange between refrigerant and water
11	Pressure Gauge	Indicates circulating water pressure
12	Expansion Tank	Absorbing Volume change of heated water
13	Air Vent	Air purging when Charging water
14	Backup Heater	6 kW
15	Strainer	Filtering and stacking particles inside circulating water
16	Shut-off valve	To drain or to block water when connecting pipe

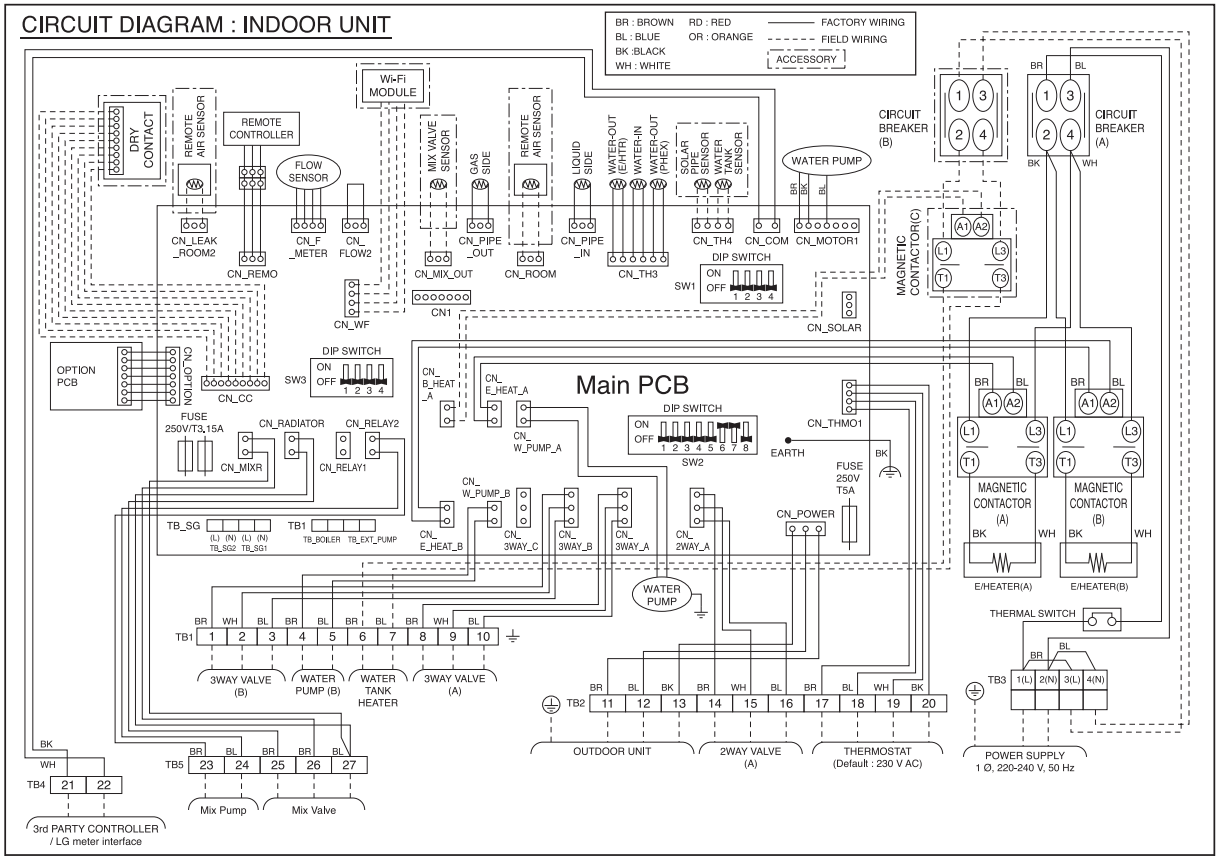
3. Dimensions

3.2 External Layout



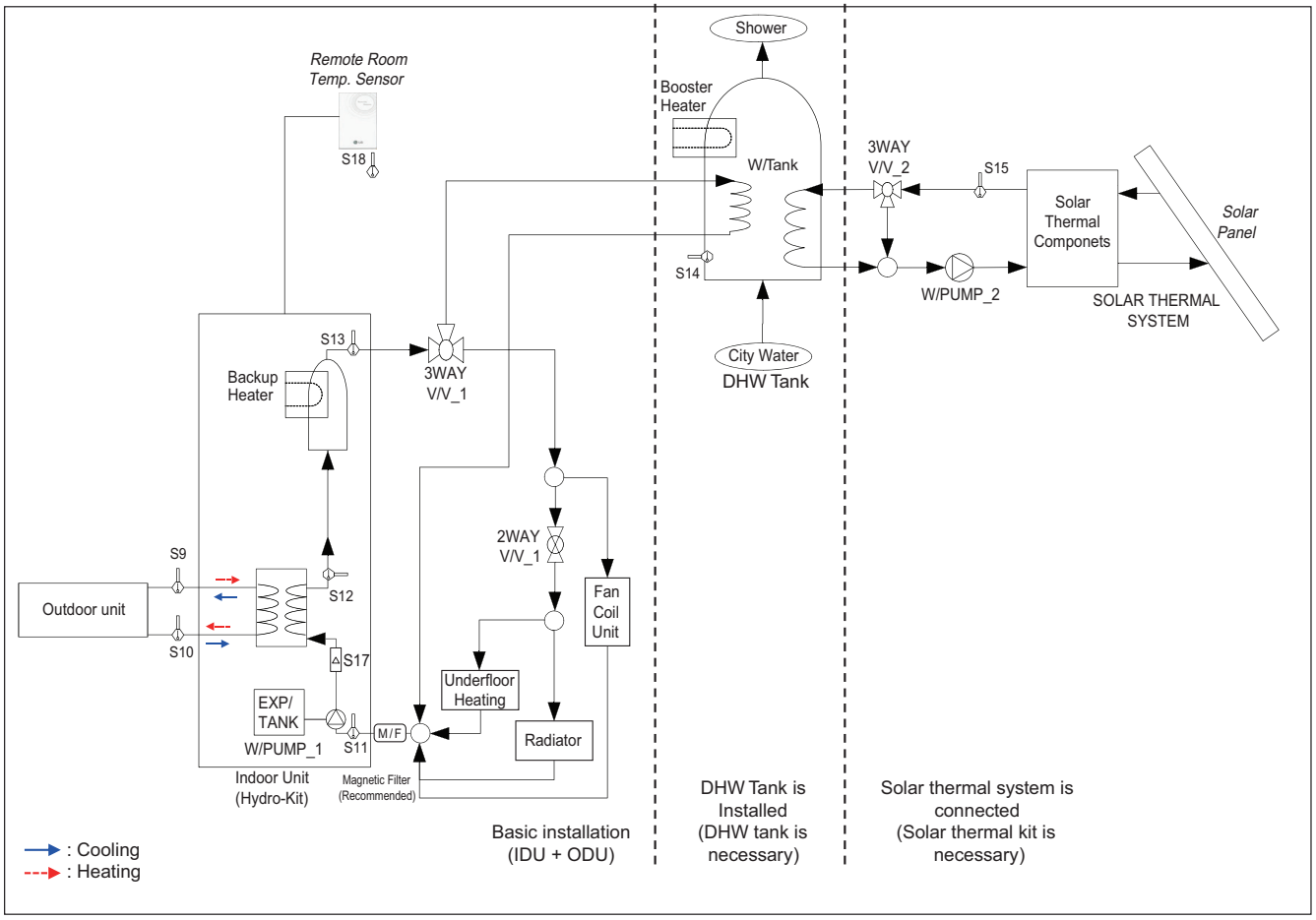
4. Wiring Diagrams

■ ZHNW09606A0 [HN0916M NK4]



5. Piping Diagram

■ ZHNW09606A0 [HN0916M NK4]



5. Piping Diagram

Category	Symbol	Meaning	PCB Connector	Remarks
Indoor Unit	S9	Refrigerant temperature sensor (Gas side)	CN_PIPE_OUT	- Meaning is expressed based on Cooling mode.
	S10	Refrigerant temperature sensor (Liquid side)	CN_PIPE_IN	
	S11	Entering Water temperature sensor	CN_TH3 (WATER IN) (PHEX OUT) (WATER OUT)	- S11, S12 and S13 are connected at 6 pin type connector CN_TH3.
	S12	Leaving Water temperature sensor		
	S13	Backup heater outlet temperature sensor		
	S17	Flow Sensor	CN_F_METER	- To monitor water flow rate in the system.
	Backup Heater		CN_E_HEAT_A CN_E_HEAT_B	- Heating capacity is divided into two level : partial capacity by E/HEAT(A) and full capacity by E_HEAT_A + E_HEAT_B. - Operating power(230 V AC 50 Hz) of E_HEAT_A and E_HEAT_B are supplied by external power source via relay connector and ELB.
	W_PUMP1	Internal Water Pump	CN_MOTOR1 CN_W_PUMP_A	- Power is connected at CN_W_PUMP_A PWM-signal is connected at CN_MOTOR1
	EXP/TANK	Expansion Tank	(no connector)	- Absorb volume change of heated water,
	S18	Remote Air sensor (Room 1/Direct circuit)	CN_ROOM	- Optional accessory (sold separately)
	CTR/PNL	Control Panel (or 'Remote Controller')	CN_REMO	- Pre built-in at indoor unit
	2WAY V/V_1	To block underfloor heating from cooling water	CN_2WAY_A	- 3rd party accessory and Field installation (sold separately) - 2 wire NO or NC type 2way valve is supported.
	M / F	Magnetic Filter	(no connector)	- 3rd party accessory and Field installation (sold separately) - It is strongly recommended to install an additional filter on the heating water circuit.
Water Heating	W/TANK	DHW Tank	(no connector)	- Accessory and Field installation (sold separately) - Generating and storing DHW by AWHP or built-in backup heater
	Booster Heater		CN_B_HEAT_A	- Accessory and Field installation (usually built-in at W/TANK) - Supplying additional water heating capacity.
	3WAY V/V_1	- Flow control for water which is leaving from indoor unit. - Flow direction switching between underfloor and water tank	CN_3WAY_A	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	CITY WATER	Water to be heated by Indoor unit and Booster Heater of W/TANK	(no connector)	- Field installation
	SHOWER	Water supplied to end-user	(no connector)	- Field installation
	S14	W/TANK water temperature sensor	CN_TH4	- S14 and S15 are connected at 4 pin type connector CN_TH4. - S14 is a part of DHW tank kit. - S15 is a part of solar thermal kit
Solar Heating	S15	Solar-heated water temperature sensor		
	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) - If water pump of SOLAR THERMAL SYSTEM is incapable of circulation,external water pump can be used.
	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 install Solar-Kit accessory provided by LG.	(no connector)	- 3rd party accessory and Field installation (sold separately)

6. Hydraulic Performance

The water pump is variable type which is capable to change flow rate, so it may be required to change default water pump capacity in case of noise by water flow. In most case, however, it is strongly recommended to set capacity as Maximum.

■ Pressure Drop

Capacity [kW]	Rated flow-rate [LPM]	Pump Head [m] (at rated flow-rate)	Product pressure drop [m] (Plate heat exchanger)	Serviceable Head [m]	Min. flow-rate [LPM] (Recommend)
5	15.8	7.5	0.2	7.3	15
7	20.1	7.3	0.3	7.0	
9	25.9	6.1	0.4	5.7	

Note

- To secure enough water flow rate, do not set water pump capacity as Minimum.
  It can lead unexpected flow rate error CH14.
- When installing the product, install additional pump in consideration of the pressure loss and pump performance.
- If flow-rate is low, overloading of product can occur.

7. Sound levels

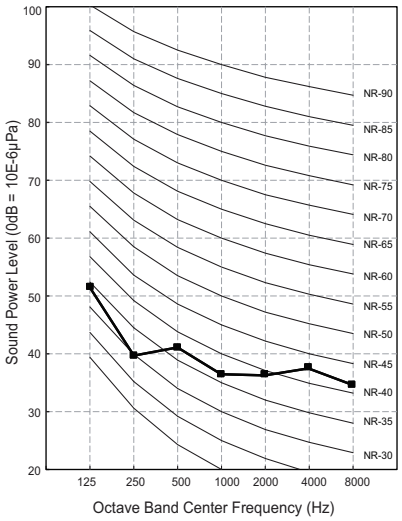
■ Sound Power Level

Note

1. Data is valid at diffuse field condition.
2. Reference acoustic intensity 0dB = 10E-6μW/m^2
3. Sound power level is measured on the rated condition in the reverberation rooms. Refer to the Model Specifications for nominal conditions(Power source and Ambient temperature, etc)
4. Sound levels can be increased in accordance with installation and operating conditions. (Operating conditions include some functional condition like Static pressure mode, air guide use, Room target temperature setting, etc and these functions are different in accordance with each model.)
5. Sound level will vary depending on a range of factors such as the construction (acoustic absorption coefficient) of particular room in which the equipment in installed.

Model	Sound Power Level [dB(A)]
ZHNW09606A0 [HN0916M NK4]	44

ZHNW09606A0 [HN0916M NK4]



THERMA V™

Split Type

Outdoor unit

1. List of functions

■ Basic functions of Unit

Category	Functions	ZHUW056A0 [HU051MR U44] ZHUW076A0 [HU071MR U44] ZHUW096A0 [HU091MR U44]
Reliability	Defrost / Deicing	O
	High pressure switch	O
	Low pressure switch	X
	Phase protection	X
	Restart delay (3-minutes)	O
	Self diagnosis	O
	Soft start	X
Convenience	Test function	X
	Wiring Error Check	X
	Peak Control	O
	Mode Lock	O
	Low Noise Operation	O
	Forced Cooling Operation (Outdoor Unit)	X
Network function	Network solution(LGAP)	O

Note

1. O : Applied, X : Not applied
   Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.
   Accessory line-ups varies by region, so check your local catalogue or local sales material.

■ Accessory Compatibility List

Category		Product	Remark	ZHUW056A0 [HU051MR U44] ZHUW076A0 [HU071MR U44] ZHUW096A0 [HU091MR U44]
Central Controller	AC EZ	PQCSZ250S0	AC EZ	X
	AC Ez Touch	PACEZA000	AC Ez Touch	O
	AC Smart	PACS4B000	AC Smart IV	O
		PACS5A000	AC Smart 5	O
	ACP	PACP4B000	ACP IV	O
		PACP5A000	ACP 5	O
	AC Manager **	PACM4B000	AC Manager IV	O
		PACM5A000	AC Manager 5	O
Gateway	IDU PI485	PHNFP14A0	Connected with Indoor Units	X
		PSNFP14A0	Connected with Indoor Units	X
	ODU PI485	PMNFP14A1	PI 485 Gateway	O
	BACnet	PQNFB17C0	ACP BACnet	O
	Lonworks	PLNWKB000	ACP Lonworks	O
ETC	PDI	PPWRDB000	PDI Standard	O
		PQNUD1S40	PDI Premium	O
	ACS IO Module	PEXPMB000	-	X

Note

1. O: Possible, X: Impossible, - : Not applicable
2. * : Some advanced functions controlled by individual controller cannot be operated.
3. ** : ACP, AC Smart, ACP BACnet or ACP Lonworks is needed.
4. If you need more detail, please refer to the manual of product.
   (http://partner.lge.com/global : Home> Doc.Library> Product > Control(BECON))

2. Specifications

Nominal Capacity and Nominal Input					ZHUW056A0 [HU051MR U44]	ZHUW076A0 [HU071MR U44]	ZHUW096A0 [HU091MR U44]
-	Condition	Outdoor Temp. (℃) DB / WB	Leaving Water Temp. (℃)	-			
Capacity	Cooling	35 / 24	18	kW	5.50	7.00	9.00
		35 / 24	7	kW	5.50	7.00	9.00
	Heating	7 / 6	35	kW	5.50	7.00	9.00
		7 / 6	55	kW	5.50	5.50	5.50
		2 / 1	35	kW	3.30	4.20	5.40
Power Input	Cooling	35 / 24	18	kW	1.20	1.56	2.14
		35 / 24	7	kW	1.96	2.59	3.46
	Heating	7 / 6	35	kW	1.12	1.43	1.94
		7 / 6	55	kW	1.57	1.57	1.57
		2 / 1	35	kW	0.94	1.20	1.54
EER	Cooling	35 / 24	18	W/W	4.60	4.50	4.20
		35 / 24	7	W/W	2.80	2.70	2.60
COP	Heating	7 / 6	35	W/W	4.90	4.90	4.65
		7 / 6	55	W/W	3.50	3.50	3.50
		2 / 1	35	W/W	3.52	3.51	3.50
SCOP (Low temp. Average)					4.65	4.65	4.65
SCOP (High temp. Average)					3.23	3.23	3.23
Rated Water Flow Rate (at LWT 35℃)				LPM	15.8	20.1	25.9

Electrical Specifications			ZHUW056A0 [HU051MR U44]	ZHUW076A0 [HU071MR U44]	ZHUW096A0 [HU091MR U44]
Power Supply		V, Ø, Hz	220-240, 1, 50	220-240, 1, 50	220-240, 1, 50
Maximum Running Current	Cooling	A	21.0	22.0	23.0
	Heating	A	21.0	22.0	23.0
Peak Control Running Current	Cooling	A	17.0	17.0	17.0
	Heating	A	17.0	17.0	17.0
Rated Running Current	Cooling	A	5.3	6.9	9.5
	Heating	A	5.0	6.3	8.6
Wiring Connections	Power Supply Cable (included Earth)	No × mm^2	3 × 4.0 (H07RN-F)	3 × 4.0 (H07RN-F)	3 × 4.0 (H07RN-F)

Technical Specifications				ZHUW056A0 [HU051MR U44]	ZHUW076A0 [HU071MR U44]	ZHUW096A0 [HU091MR U44]
Sound Power Level	Heating	Rated	dB(A)	60	60	60
Sound Pressure Level (at 1m)	Heating	Rated	dB(A)	50	50	50
Dimensions	Unit	W × H × D	mm	950 × 834 × 330	950 × 834 × 330	950 × 834 × 330
	Packed Unit	W × H × D	mm	1,065 × 618 × 461	1,065 × 618 × 461	1,065 × 618 × 461
Weight	Unit		kg	60.0	60.0	60.0
	Packed Unit		kg	65.0	65.0	65.0

Note

1. Due to our policy of innovation some specifications may be changed without notification.
2. Wiring cable size must comply with the applicable local and national codes. And “Electric characteristics” chapter should be considered for electrical work and design. Especially the power cable and circuit breaker should be selected in accordance with that.
3. Sound Level Values are measured at Noise Measuring chamber accordance with standard. Therefore, these values depend on the ambient conditions and values are normally higher in actual operation.
4. Performances are based on the following conditions :
   - Cooling : Inlet/Outlet Water Temp. 23°C/18°C, Outdoor Air Temp. 35°CDB / 24°CWB
   - Heating : Inlet/Outlet Water Temp. 30°C/35°C, Outdoor Air Temp. 7°CDB / 6°CWB
   - Interconnected Pipe Length is standard length and difference of Elevation (Outdoor ~ Indoor Unit) is Zero.
5. This product contains Fluorinated greenhouse gases.
6. Sound Performances are based on the following conditions.
   - Sound Power Level : Measured according to EN14825.
   - Sound Pressure Level : Calculated value according to distance of sound power.

* At least 25A circuit breaker can be used.

2. Specifications

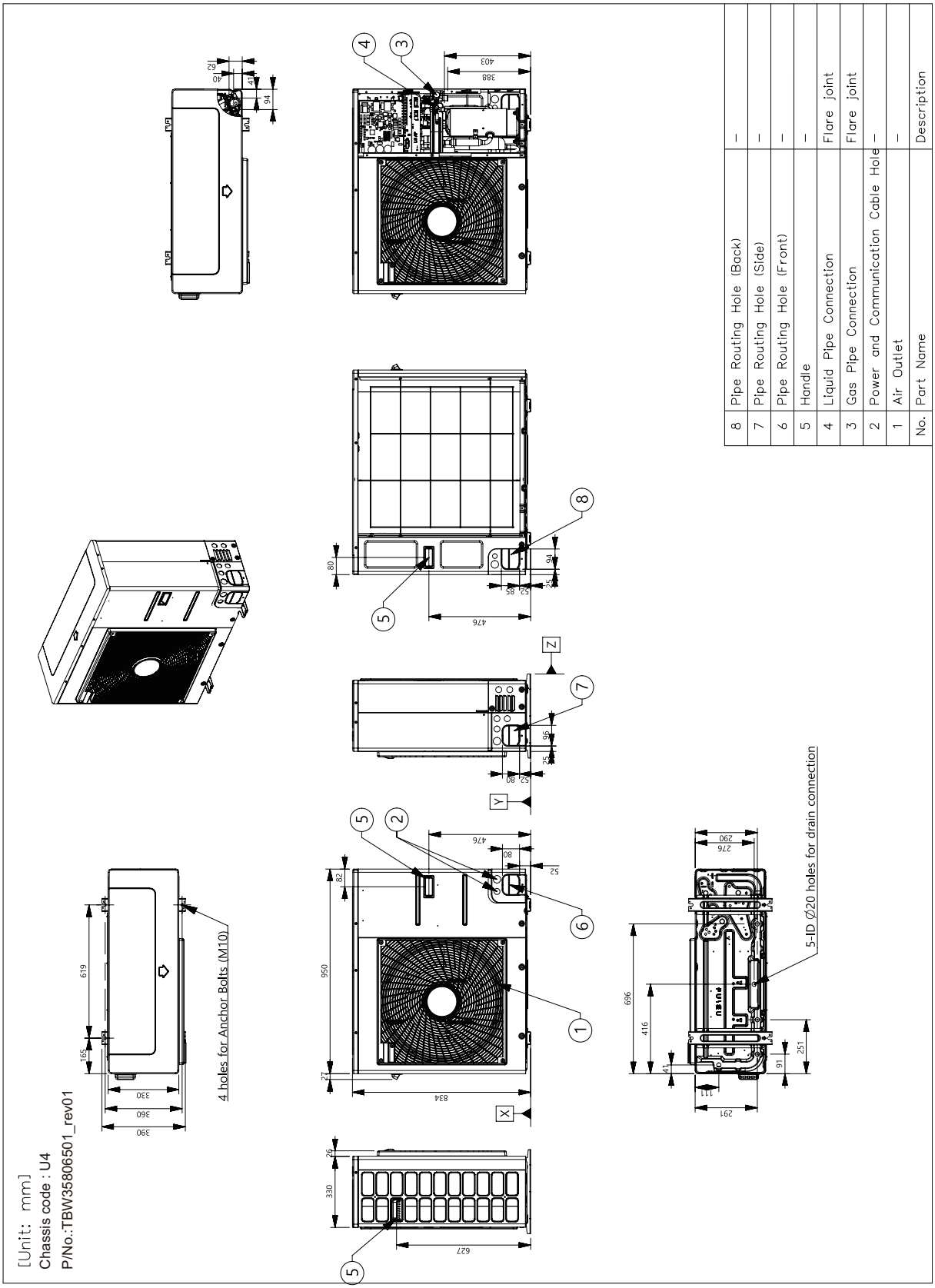
Outdoor Units				ZHUW056A0 [HU051MR U44]	ZHUW076A0 [HU071MR U44]	ZHUW096A0 [HU091MR U44]
Operation Range (Outdoor Temperature)	Cooling	Min. ~ Max.	°C DB	5 ~ 48	5 ~ 48	5 ~ 48
	Heating	Min. ~ Max.	°C DB	-25 ~ 35	-25 ~ 35	-25 ~ 35
Compressor	Type		-	Hermetic Sealed Scroll		
	Model		Model × No.	RJB036MAA × 1		
	Motor Type		-	BLDC	BLDC	BLDC
	Displacement		cm^3/Rev.	31.6	31.6	31.6
Refrigerant	Type		-	R32	R32	R32
	GWP (Global Warming Potential)		-	675	675	675
	Precharged Amount		g	1,500	1,500	1,500
	t-CO2 eq.		-	1.013	1.013	1.013
	Control		-	Electronic Expansion Valve		
Refrigerant Oil	Type		-	FW68D	FW68D	FW68D
	Charged Volume		cc × No.	1,100	1,100	1,100
Piping Connections	Gas		Type	Flare	Flare	Flare
			mm(Inch)	Φ 15.88 (5/8)	Φ 15.88 (5/8)	Φ 15.88 (5/8)
	Liquid		Type	Flare	Flare	Flare
			mm(Inch)	Φ 9.52 (3/8)	Φ 9.52 (3/8)	Φ 9.52 (3/8)
	Piping Length	Standard	m	5	5	5
		Max.	m	50	50	50
	Piping Level Difference	Max.	m	30	30	30
	Chargeless-Pipe Length		m	10	10	10
	Additional Charging Volume		g/m	30	30	30
Heat Exchanger	Quantity		EA	1	1	1
	Specification	Row	EA	2	2	2
		Column	EA	38	38	38
		FPI	EA	14	14	14
Fan	Type		-	Propeller	Propeller	Propeller
	Air Flow Rate	Rated	m^3/min × No.	60.0 × 1	60.0 × 1	60.0 × 1
Fan Motor	Type		-	BLDC	BLDC	BLDC
	Output		W × No.	124 × 1	124 × 1	124 × 1

Note

1. Due to our policy of innovation some specifications may be changed without notification.
2. Wiring cable size must comply with the applicable local and national codes. And “Electric characteristics” chapter should be considered for electrical work and design. Especially the power cable and circuit breaker should be selected in accordance with that.
3. Sound Level Values are measured at Noise Measuring chamber accordance with standard. Therefore, these values depend on the ambient conditions and values are normally higher in actual operation.
4. Performances are based on the following conditions :
   - Cooling : Inlet/Outlet Water Temp. 23°C/18°C, Outdoor Air Temp. 35°CDB / 24°CWB
   - Heating : Inlet/Outlet Water Temp. 30°C/35°C, Outdoor Air Temp. 7°CDB / 6°CWB
   - Interconnected Pipe Length is standard length and difference of Elevation (Outdoor ~ Indoor Unit) is Zero.
5. This product contains Fluorinated greenhouse gases.
6. Sound Performances are based on the following conditions.
   - Sound Power Level : Measured according to EN14825.
   - Sound Pressure Level : Calculated value according to distance of sound power.

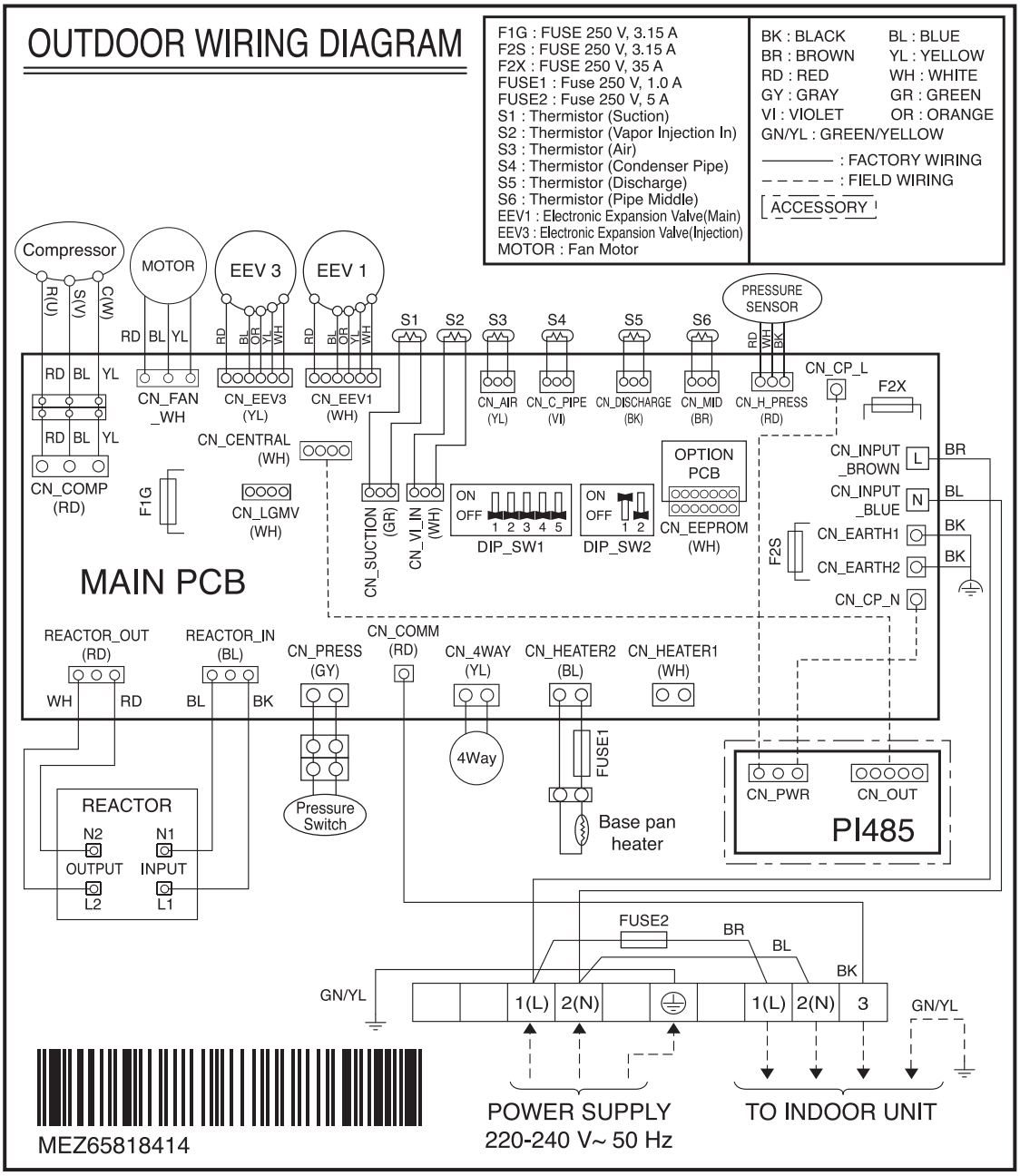
3. Dimensions

◆ ZHUW056A0 [HU051MR U44], ZHUW076A0 [HU071MR U44], ZHUW096A0 [HU091MR U44]



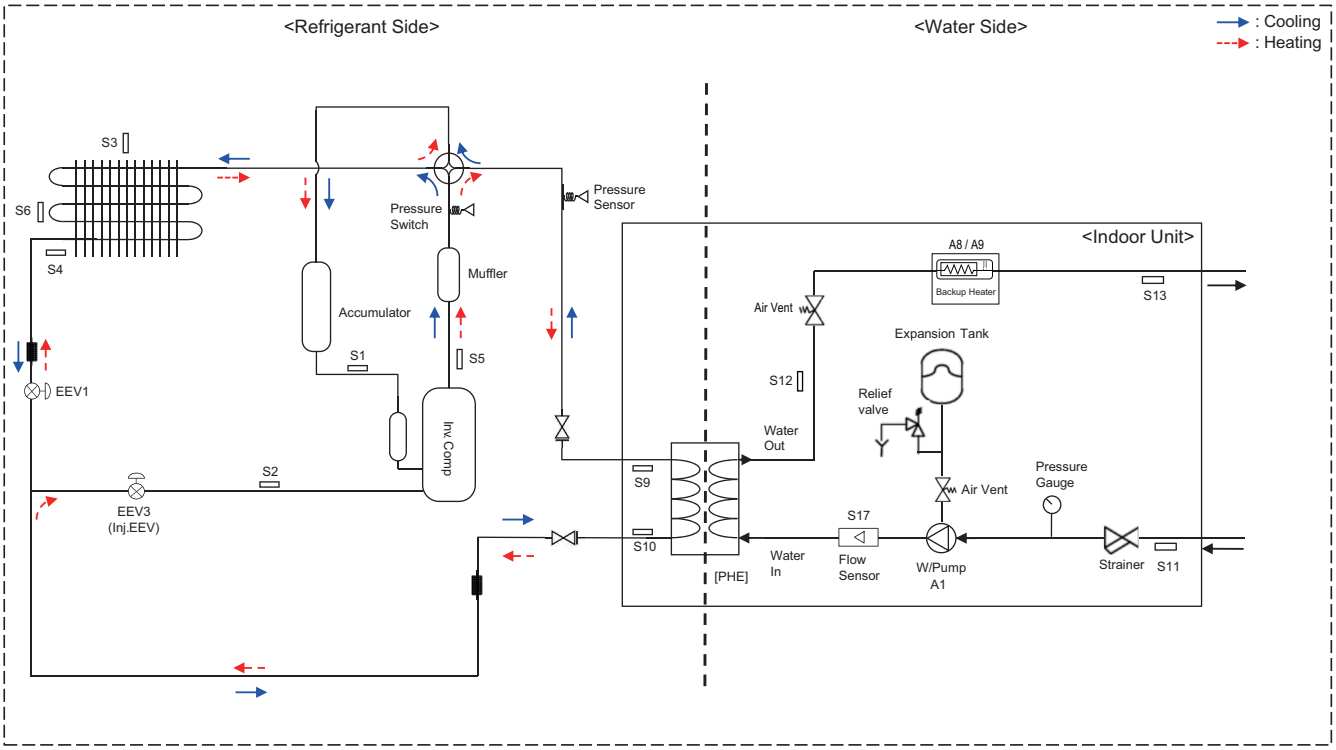
4. Wiring Diagram

◆ **ZHUW056A0 [HU051MR U44], ZHUW076A0 [HU071MR U44], ZHUW096A0 [HU091MR U44]**



5. Piping Diagram

◆ ZHUW056A0 [HU051MR U44], ZHUW076A0 [HU071MR U44], ZHUW096A0 [HU091MR U44]



Category	Symbol	Meaning	PCB Connector
Refrigerant side	S1	Compressor-suction pipe temperature sensor	CN_SUCTION(GR)
	S2	Injection EEV discharge temperature sensor	CN_VI_IN(WH)
	S3	Outdoor air temperature sensor	CN_AIR(YL)
	S4	Outdoor-HEX temperature sensor	CN_C_PIPE(VI)
	S5	Compressor-discharge pipe temperature sensor	CN_DISCHARGE(BK)
	S6	Outdoor-HEX middle temperature sensor	CN_MID(BR)
	S9	PHEX gas temperature sensor	CN_PIPE_OUT(RD)
	S10	PHEX liquid temperature sensor	CN_PIPE_IN(WH)
	EEV1	Electronic Expansion Valve	CN_EEV1(WH)
	EEV3	Electronic Expansion Valve (Injection)	CN_EEV3(YL)
Water Side	S11	Inlet water temperature sensor (WATER IN)	CN_TH3(BK)
	S12	Outlet water temperature sensor (PHEX OUT)	
	S13	Backup heater outlet sensor (WATER OUT)	
	S17	Flow sensor	CN_F_METER(BL)
	A1	Main water pump	CN_W_PUMP_A(RD)
	A8	Electric backup heater (Step1)	CN_E_HEAT_A(YL)
	A9	Electric backup heater (Step 2)	CN_E_HEAT_B(VL)

6. Performance Data

6.1 Cooling Operation

■ Maximum Cooling Capacity

◆ ZHUW056A0 [HU051MR U44]

Outdoor Temperature [°C DB]	Water flow rate 15.8 LPM													
	LWT 7 °C		LWT 10 °C		LWT 13 °C		LWT 15 °C		LWT 18 °C		LWT 20 °C		LWT 22 °C	
	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP
10	6.42	4.57	6.95	4.85	7.49	5.13	7.85	5.31	8.39	5.59	8.75	5.78	9.11	5.96
20	6.05	3.86	6.37	4.23	6.70	4.61	6.91	4.86	7.23	5.23	7.45	5.48	7.66	5.74
30	5.68	3.15	5.79	3.62	5.90	4.09	5.97	4.41	6.08	4.88	6.15	5.19	6.22	5.51
35	5.50	2.80	5.50	3.32	5.50	3.84	5.50	4.18	5.50	4.60	5.50	5.05	5.50	5.39
40	5.32	2.45	5.34	2.84	5.35	3.24	5.37	3.50	5.38	3.90	5.40	4.17	5.41	4.43
45	5.13	2.09	5.17	2.37	5.21	2.64	5.23	2.83	5.27	3.10	5.29	3.29	5.32	3.47

◆ ZHUW076A0 [HU071MR U44]

Outdoor Temperature [°C DB]	Water flow rate 20.1 LPM													
	LWT 7 °C		LWT 10 °C		LWT 13 °C		LWT 15 °C		LWT 18 °C		LWT 20 °C		LWT 22 °C	
	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP
10	8.17	4.37	8.85	4.64	9.54	4.91	9.99	5.09	10.68	5.35	11.13	5.53	11.59	5.71
20	7.70	3.70	8.11	4.06	8.52	4.42	8.80	4.66	9.21	5.01	9.48	5.25	9.75	5.49
30	7.23	3.03	7.37	3.48	7.51	3.93	7.60	4.22	7.74	4.67	7.83	4.97	7.92	5.27
35	7.00	2.70	7.00	3.19	7.00	3.68	7.00	4.01	7.00	4.50	7.00	4.83	7.00	5.15
40	6.77	2.37	6.79	2.74	6.81	3.11	6.83	3.36	6.85	3.74	6.87	3.99	6.88	4.24
45	6.53	2.03	6.58	2.29	6.63	2.55	6.66	2.72	6.70	2.98	6.74	3.15	6.77	3.32

◆ ZHUW096A0 [HU091MR U44]

Outdoor Temperature [°C DB]	Water flow rate 25.9 LPM													
	LWT 7 °C		LWT 10 °C		LWT 13 °C		LWT 15 °C		LWT 18 °C		LWT 20 °C		LWT 22 °C	
	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP
10	10.50	4.08	11.38	4.33	12.26	4.58	12.85	4.75	13.73	5.00	14.31	5.16	14.90	5.33
20	9.90	3.49	10.43	3.81	10.96	4.14	11.31	4.35	11.84	4.68	12.19	4.89	12.54	5.11
30	9.30	2.90	9.48	3.30	9.65	3.69	9.77	3.96	9.95	4.36	10.06	4.63	10.18	4.89
35	9.00	2.60	9.00	3.04	9.00	3.47	9.00	3.76	9.00	4.20	9.00	4.49	9.00	4.78
40	8.70	2.30	8.73	2.63	8.76	2.96	8.78	3.18	8.81	3.50	8.83	3.72	8.85	3.94
45	8.40	2.01	8.46	2.23	8.52	2.44	8.56	2.59	8.62	2.81	8.66	2.95	8.70	3.10

Note

1. DB : Dry bulb temperature(℃), LWT : Leaving water temperature(℃), LPM : Liters per minute (ℓ/min)
2. TC : Total capacity(kW), COP : Coefficient of performance (kW/kW)
3. Direct interpolation is permissible. Do not extrapolate.
4. Measuring procedure follows EN-14511.
   - Rated values are based on standard conditions, and it can be found on specifications.
   - Above table values may not be matched according to installation condition. Except for rated value, the performance is not guaranteed.
   - In accordance with the test standard(or nations), the results may vary.

6. Performance Data

6.2 Heating Operation

■ Maximum Heating Capacity (Include defrost effect)

◆ ZHUW056A0 [HU051MR U44]

Outdoor Temperature [°C DB]	Water flow rate 15.8 LPM								Water flow rate 9.9 LPM				Water flow rate 7.9 LPM			
	LWT 30 °C		LWT 35 °C		LWT 40 °C		LWT 45 °C		LWT 50 °C		LWT 55 °C		LWT 60 °C		LWT 65 °C	
	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP
-25	4.02	1.96	3.90	1.84	3.78	1.72	3.66	1.60								
-20	4.64	2.59	4.51	2.07	4.38	1.90	4.26	1.74	4.13	1.57						
-15	5.26	2.51	5.12	2.30	4.99	2.09	4.85	1.88	4.72	1.66	4.58	1.45				
-7	5.50	2.88	5.50	2.70	5.50	2.53	5.50	2.35	5.50	2.18	5.50	2.00	5.50	1.83		
-4	5.50	3.18	5.50	2.97	5.50	2.75	5.50	2.53	5.50	2.31	5.50	2.10	5.50	1.88		
-2	5.50	3.41	5.50	3.14	5.50	2.88	5.50	2.61	5.50	2.34	5.50	2.08	5.50	1.81		
2	5.50	3.79	5.50	3.50	5.50	3.21	5.50	2.93	5.50	2.64	5.50	2.36	5.50	2.07	5.50	1.79
7	5.50	5.37	5.50	4.90	5.50	4.43	5.50	3.97	5.50	3.50	5.50	3.03	5.50	2.57	5.50	2.10
10	5.50	5.84	5.50	5.34	5.50	4.83	5.50	4.32	5.50	3.81	5.50	3.30	5.50	2.79	5.50	2.29
15	5.50	6.64	5.50	6.06	5.50	5.48	5.50	4.91	5.50	4.33	5.50	3.75	5.50	3.17	5.50	2.60
18	5.50	7.11	5.50	6.50	5.50	5.88	5.50	5.26	5.50	4.64	5.50	4.02	5.50	3.40	5.50	2.78
20	5.50	7.43	5.50	6.79	5.50	6.14	5.50	5.49	5.50	4.85	5.50	4.20	5.50	3.55	5.50	2.91
35	5.50	9.81	5.50	8.96	5.50	8.11	5.50	7.25	5.50	6.40	5.50	5.55	5.50	4.69	5.50	3.84

◆ ZHUW076A0 [HU071MR U44]

Outdoor Temperature [°C DB]	Water flow rate 20.1 LPM								Water flow rate 12.6 LPM				Water flow rate 10.0 LPM			
	LWT 30 °C		LWT 35 °C		LWT 40 °C		LWT 45 °C		LWT 50 °C		LWT 55 °C		LWT 60 °C		LWT 65 °C	
	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP
-25	5.00	1.95	4.85	1.78	4.71	1.62	4.56	1.45								
-20	5.58	2.52	5.43	2.02	5.27	1.84	5.11	1.66	4.95	1.49						
-15	6.17	2.44	6.00	2.25	5.83	2.06	5.66	1.88	5.49	1.69	5.32	1.50				
-7	7.00	2.76	7.00	2.60	7.00	2.44	7.00	2.28	7.00	2.11	7.00	1.95	7.00	1.79		
-4	7.00	3.07	7.00	2.87	7.00	2.66	7.00	2.45	7.00	2.24	7.00	2.04	7.00	1.83		
-2	7.00	3.27	7.00	3.04	7.00	2.82	7.00	2.59	7.00	2.37	7.00	2.14	7.00	1.91		
2	7.00	3.65	7.00	3.40	7.00	3.15	7.00	2.90	7.00	2.66	7.00	2.41	7.00	2.16	7.00	1.91
7	7.00	5.35	7.00	4.90	7.00	4.45	7.00	4.00	7.00	3.55	7.00	3.10	7.00	2.65	7.00	2.20
10	7.00	5.77	7.00	5.28	7.00	4.80	7.00	4.31	7.00	3.83	7.00	3.34	7.00	2.86	7.00	2.37
15	7.00	6.46	7.00	5.92	7.00	5.37	7.00	4.83	7.00	4.29	7.00	3.74	7.00	3.20	7.00	2.66
18	7.00	6.88	7.00	6.30	7.00	5.72	7.00	5.14	7.00	4.56	7.00	3.99	7.00	3.41	7.00	2.83
20	7.00	7.16	7.00	6.55	7.00	5.95	7.00	5.35	7.00	4.75	7.00	4.15	7.00	3.54	7.00	2.94
35	7.00	9.24	7.00	8.46	7.00	7.69	7.00	6.91	7.00	6.13	7.00	5.35	7.00	4.58	7.00	3.80

◆ ZHUW096A0 [HU091MR U44]

Outdoor Temperature [°C DB]	Water flow rate 25.9 LPM								Water flow rate 16.2 LPM				Water flow rate 12.9 LPM			
	LWT 30 °C		LWT 35 °C		LWT 40 °C		LWT 45 °C		LWT 50 °C		LWT 55 °C		LWT 60 °C		LWT 65 °C	
	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP	TC	COP
-25	6.40	1.85	6.20	1.70	6.00	1.55	5.80	1.40								
-20	7.23	2.45	7.00	1.96	6.77	1.80	6.54	1.64	6.31	1.48						
-15	8.06	2.39	7.80	2.22	7.54	2.05	7.28	1.89	7.02	1.72	6.76	1.55				
-7	9.00	2.65	9.00	2.50	9.00	2.35	9.00	2.20	9.00	2.05	9.00	1.90	9.00	1.75		
-4	9.00	2.98	9.00	2.78	9.00	2.58	9.00	2.38	9.00	2.18	9.00	1.98	9.00	1.78		
-2	9.00	3.16	9.00	2.97	9.00	2.78	9.00	2.59	9.00	2.40	9.00	2.21	9.00	2.02		
2	9.00	3.57	9.00	3.35	9.00	3.13	9.00	2.91	9.00	2.69	9.00	2.47	9.00	2.25	9.00	2.04
7	9.00	5.04	9.00	4.65	9.00	4.26	9.00	3.87	9.00	3.48	9.00	3.08	9.00	2.69	9.00	2.30
10	9.00	5.39	9.00	4.97	9.00	4.55	9.00	4.13	9.00	3.71	9.00	3.30	9.00	2.88	9.00	2.46
15	9.00	5.97	9.00	5.50	9.00	5.04	9.00	4.58	9.00	4.11	9.00	3.65	9.00	3.19	9.00	2.72
18	9.00	6.32	9.00	5.83	9.00	5.33	9.00	4.84	9.00	4.35	9.00	3.86	9.00	3.37	9.00	2.88
20	9.00	6.55	9.00	6.04	9.00	5.53	9.00	5.02	9.00	4.51	9.00	4.00	9.00	3.50	9.00	2.99
35	9.00	8.29	9.00	7.64	9.00	7.00	9.00	6.35	9.00	5.71	9.00	5.07	9.00	4.42	9.00	3.78

Note

1. DB : Dry bulb temperature(℃), LWT : Leaving water temperature(℃), LPM : Liters per minute (ℓ/min)
2. TC : Total capacity(kW), COP : Coefficient of performance (kW/kW)
3. Direct interpolation is permissible. Do not extrapolate.
4. Measuring procedure follows EN-14511.
   - Rated values are based on standard conditions, and it can be found on specifications.
   - Above table values may not be matched according to installation condition. Except for rated value, the performance is not guaranteed.
   - In accordance with the test standard(or nations), the results may vary.

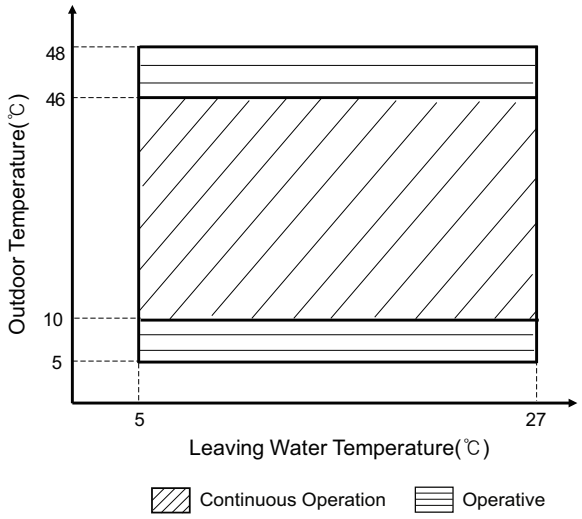
- The shaded areas are not guaranteed continuous operation.

7. Operation Range

■ Cooling

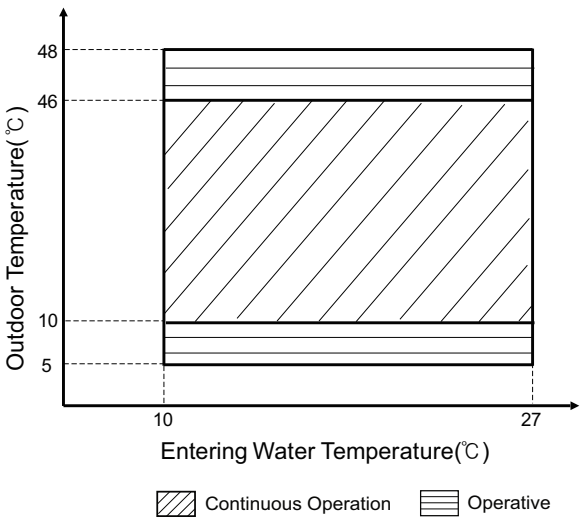
Cooling

(Settings : Outlet temp. control / Fan coil unit used)



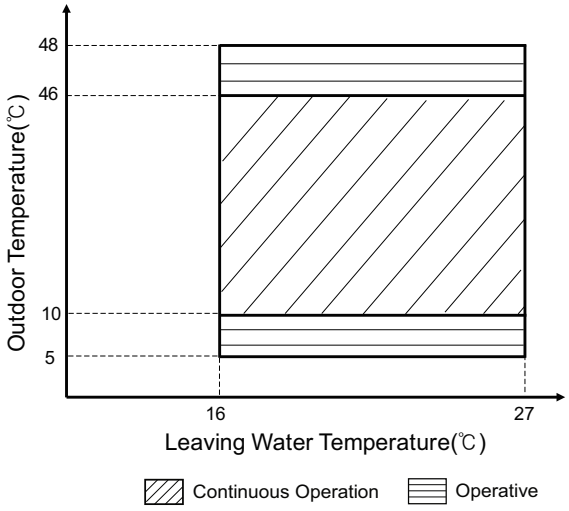
Cooling

(Settings : Inlet temp. control / Fan coil unit used)



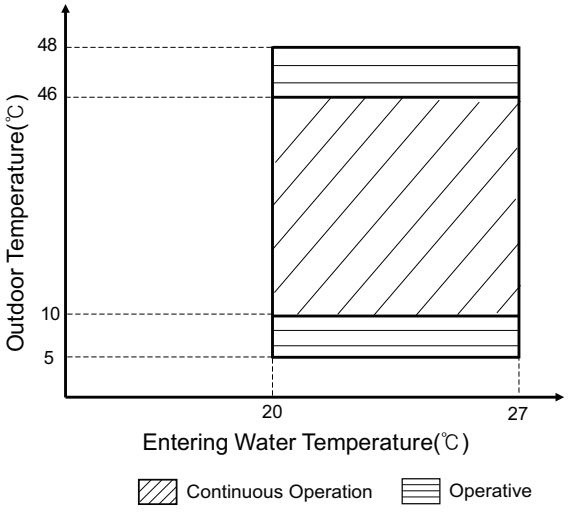
Cooling

(Settings : Outlet temp. control / Fan coil unit not used)



Cooling

(Settings : Inlet temp. control / Fan coil unit not used)

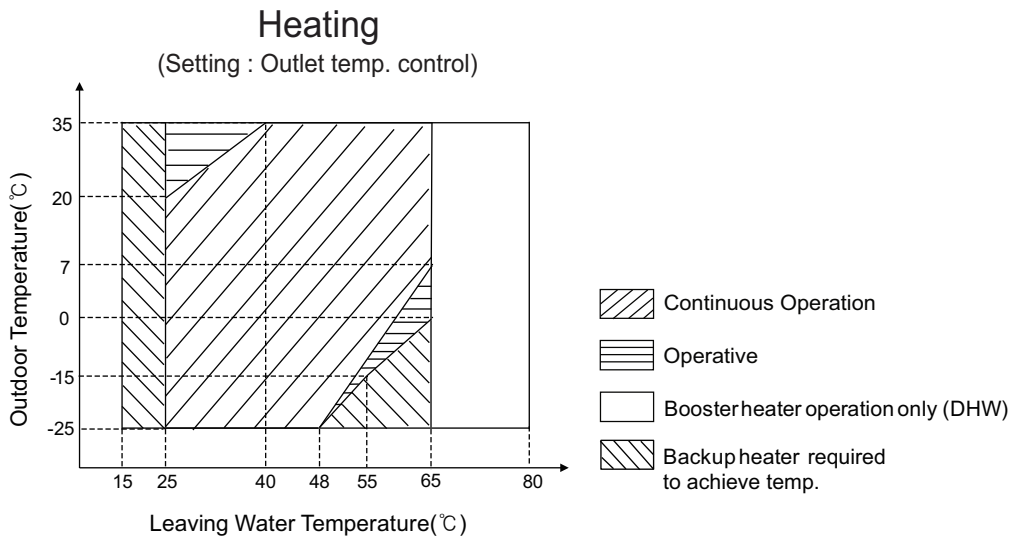


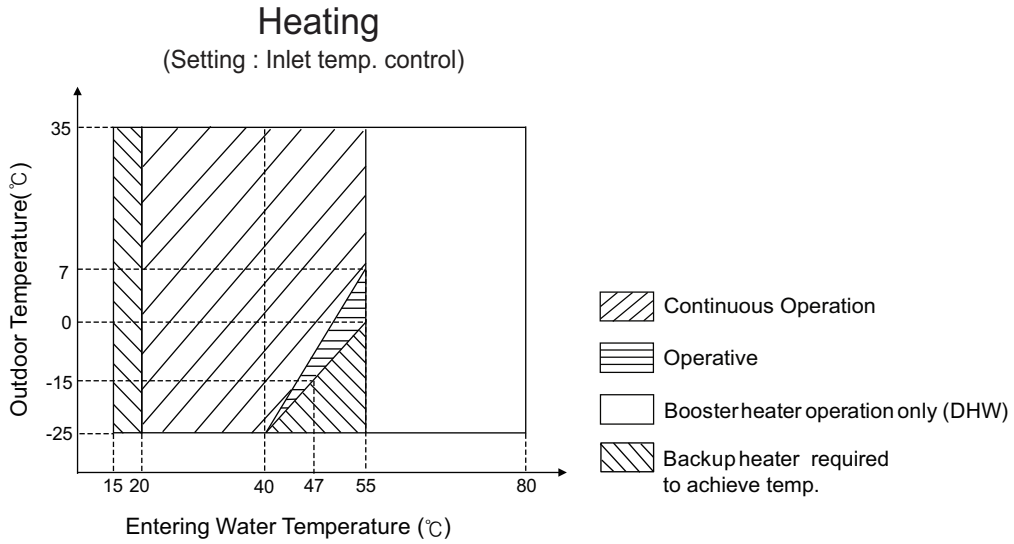
Note

- Continuous Operation : It is possible to operate continuously, but capacity is not guaranteed.
- Operative : It is not guaranteed continuous operation.

7. Operation Range

■ Heating





Note

- Continuous Operation : It is possible to operate continuously, but capacity is not guaranteed.
- Operative : It is not guaranteed continuous operation.
- DHW Heat pump operation : max. 55 °C
- DHW operation with Backup heater : max. 80 °C

8. Electric characteristics

■ Wiring of Main Power Supply and Equipment Capacity

1. Use a separate power supply for the Outdoor Unit and Backup Heater.
2. Bear in mind ambient conditions (ambient temperature,direct sunlight, rain liquid,etc.) when proceeding with the wiring and connections
3. The wire size is the minimum value for metal conduit wiring. The power cord size should be 1 rank thicker taking into account the line voltage drops. Make sure the power-supply voltage does not drop more than 10%.
4. Specific wiring requirements should adhere to the wiring regulations of the region.
5. Power supply cords of parts of appliances for outdoor use should not be lighter than polychloroprene sheathed flexible cord.
6. Don't install an individual switch or electrical outlet to disconnect the indoor unit separately from the power supply.

⚠ WARNING

- **Follow ordinance of your governmental organization for technical standard related to electrical equipment, wiring regulations and guidance of each electric power company.**
- **Make sure to use specified wires for connections so that no external force is imparted to terminal connections. If connections are not fixed firmly, it may cause heating or fire.**
- **Make sure to use the appropriate type of overcurrent protection switch. Note that generated overcurrent may include some amount of direct current.**

⚠ CAUTION

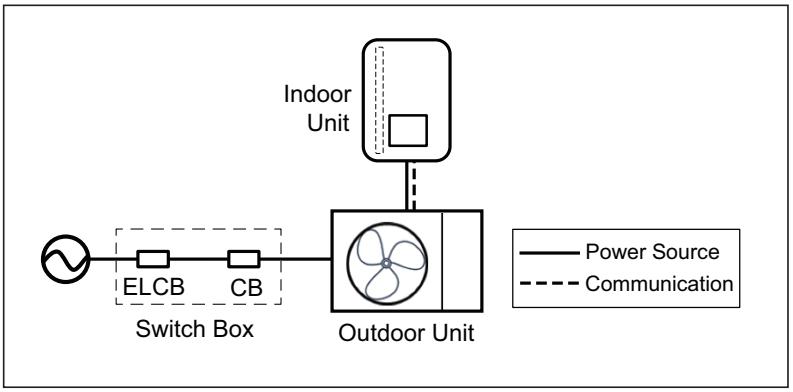
- **All installation site must require attachment of an earth leakage breaker. If no earth leakage breaker is installed, it may cause an electric shock.**
- **Do not use anything other than breaker and fuse with correct capacity. Using fuse and wire or copper wire with too large capacity may cause a malfunction of unit or fire.**

8. Electric characteristics

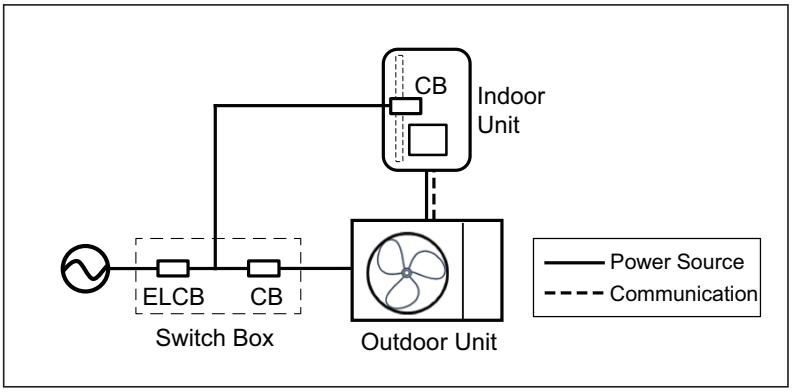
Model			Backup Heater	
Indoor Unit	**Outdoor Unit**	**Phase / Volts / Hz**	**Capacity (kW)**	**Phase / Volts**
ZHNW09606A0 [HN0916M NK4]	ZHUW056A0 [HU051MR U44]	1 / 220-240V / 50Hz	3 + 3	1 / 220-240 V
	ZHUW076A0 [HU071MR U44]			
	ZHUW096A0 [HU091MR U44]			

DHW Boost Heater	Power Supply for DHW Boost Heater	
	Phase / Volts / Hz	**Capacity (kW)**
Integral part of DHW tanks [OSHW-x00F(D)]	1 Ø / 220-240 V / 50 Hz	2.4

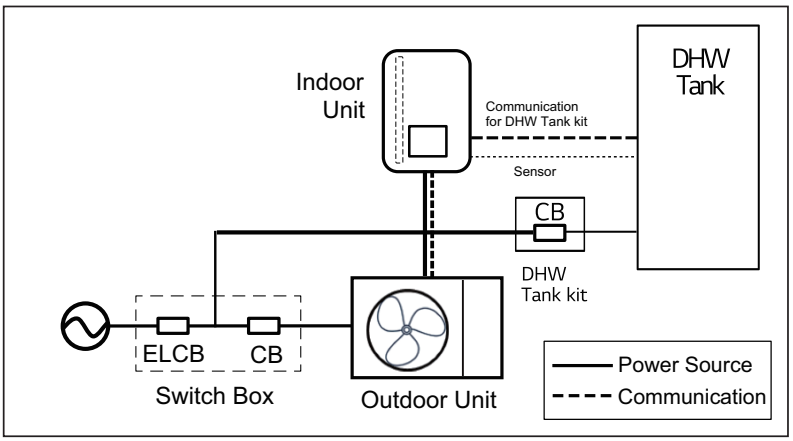
[Power Supply for Heat Pump]



[Power Supply for Backup Heater]



[Power Supply for DHW Boost Heater]



Note

1. Voltage supplied to the unit terminals should be within the minimum and maximum range.
2. Maximum allowable voltage unbalance between phase is 2%.
3. All installation site must require attachment of an earth leakage breaker. [circuit breaker type is ELCB (Earth Leakage Circuit Breaker)].

- At least 25A circuit breaker can be used.

9. Sound levels

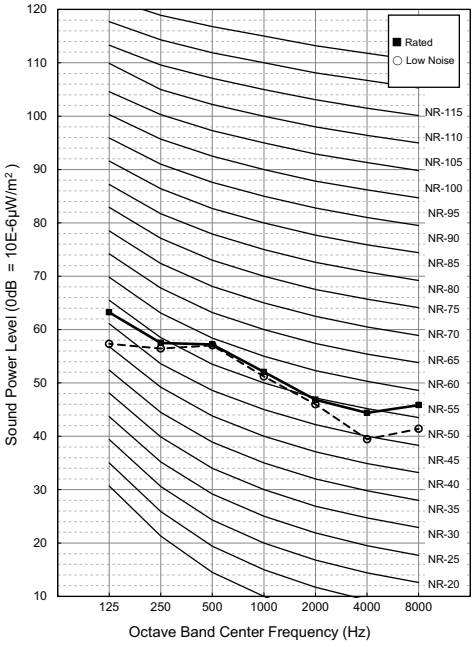
9.1 Sound power level

Note

1. Data is valid at diffuse field condition.
2. Reference acoustic intensity 0dB = 10E-6μW/m^2
3. Sound power level is measured on the rated condition in the reverberation rooms. Refer to the Model Specifications for nominal conditions(Power source and Ambient temperature, etc)
4. Sound levels can be increased in accordance with installation and operating conditions.
5. Sound level will vary depending on a range of factors such as the construction (acoustic absorption coefficient) of particular installed place in which the equipment in installed.

Model	Sound Power Level [dB(A)]	
	Heating	
	Rated	Low Noise
ZHUW056A0 [HU051MR U44]	60	58
ZHUW076A0 [HU071MR U44]	60	58
ZHUW096A0 [HU091MR U44]	60	58

ZHUW056A0 [HU051MR U44]
ZHUW076A0 [HU071MR U44]
ZHUW096A0 [HU091MR U44]



THERMA V™

Split Type

Design and installation

1. Alternative Refrigerant R32
2. Select the Best Location
3. Installation Space
4. Water Control
5. Dip Switch Setting

1. Alternative Refrigerant R32

The refrigerant R32 has the higher efficiency and more friendly for environment in comparison with R410A. It has a lower GWP (Global Warming Potential) value, and higher efficiency than R410A. The Ozone Depletion Potential (ODP) of R32 is 0, and Global Warming Potential(GWP) is 675.

Refrigerant piping consists of copper/steel pipes, joints, and other fittings. All components must be selected and installed in conformity with the standards pertaining to the Refrigeration Safety Regulation. Same piping as for R410A can be used.

⚠ WARNING

- This product contains fluorinated greenhouse gases (Refrigerant type : R32). Do NOT emit refrigerant gases into the atmosphere.
- The refrigerant R32 is Slightly Flammable gas. But it does not leak normally. If the refrigerant leaks in the installed place and contact with burning energy, it may cause fire, or a harmful gas.
- If there are some leak, turn off any combustible devices, ventilate the installed place, and contact the dealer from which you purchased the unit. Do not use the unit until the refrigerant leaked is repaired.
- Only use R32 as refrigerant. Other substances may cause explosions and accidents.

⚠ CAUTION

- The wall thickness of the piping should comply with the relevant local and national regulations for the designed pressure.
- For high-pressure refrigerant, any unapproved pipe must not be used.
- Do not heat pipes more than necessary to prevent them from softening.

2. Select the Best Location

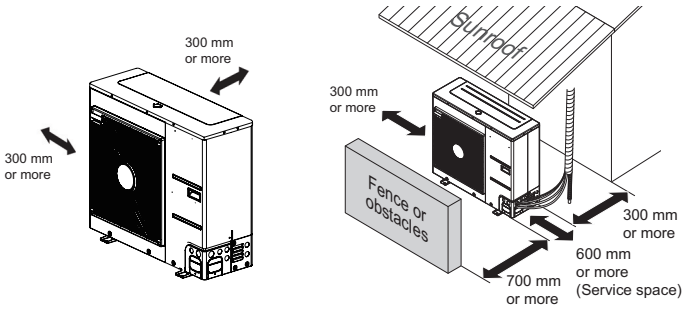
Select space for installing unit, which will meet the following conditions:

- 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
- 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.
- Select installation location considering following conditions to avoid bad condition when additionally performing defrost operation.
  1. 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).
  2. Performance of heating will be reduced and pre-heat time of the unit may be lengthened in case of installing the unit in winter at following location:
     1) Shade position with a narrow space
     2) Location with much humidity around.
     3) Location where liquid gathers since the floor is not even.
- 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.
  1. Install the unit so that its discharge port faces to the wall of the building. Keep a distance 300 mm or more between the unit and the wall surface.
  2. Supposing the wind direction during the operation season of the unit, install the unit so that the discharge port is set at right angle to the wind direction.

3. Installation Space

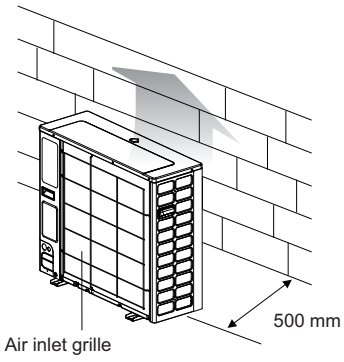
3.1 Clearance around outdoor units

- Ensure that the space around the back is or more more than 300 mm on the opposite to the PCB side and secure 600 mm space near the compressor and PCB side of the air conditioner for service.

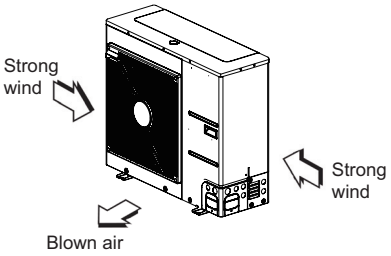


※ Outdoor unit is representative. Actual appearance of outdoor unit may be different but clearances will stay the same.

- Install the unit so that its discharge port faces to the wall of the building. Keep a distance 500mm 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.



Turn the air outlet side toward the building's wall, fence or windbreak screen.



Set the outlet side at a right angle to the direction of the wind.

※ Outdoor unit is representative. Actual appearance of outdoor unit may be different but clearances will stay the same.

4. Water Control

4.1 Water quality

Water quality should be complied with EN 98/83 EC Directives.

⚠ CAUTION

- If the product 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.
- It is strongly recommended to install an additional filter on the heating water circuit. Especially to remove metallic particles from the heating piping, it is advised to use a magnetic or cyclone filter, which can remove small particles. Small particles may damage the unit and will NOT be removed by the standard filter of the heat pump system.
- Water quality check should be implemented before completing the installation of system.
  (Water range will be according s/UNE 122076:2004 IN and EN12499)
  Detailed guide can be found in the table as below.

Water contents	Value			
pH	7.5~9.0			
Conductivity	10~500 uS/cm			
TDS (Total dissolved solids)	8~400 ppm			
Alkalinity (HCO_3^-)	60~300 (mg/L)			
Total hardness	4 ~ 8.5 ºdH			
	71.4 ~ 151.7 (mg/L)			
Iron (Fe)	≤ 0.2 (mg/L)			
Sulphate (SO_4^{2-})	≤ 100 (mg/L)			
Nitrite (NO_3^-)	≤ 100 (mg/L)			
Free chlorine (Cl_2)	≤ 1 (mg/L)			
Chlorides (Cl^-)	ppm		STS316	STS304
	pH7	15℃	3,000	180
		40℃	500	50
		60℃	200	30
		80℃	125	20
	pH9	15℃	18,000	700
		40℃	2,600	250
		60℃	1,000	170
		80℃	550	130

4. Water Control

4.2 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 heat pump unit supplier for locally approved solutions in your area.

Calculate the approximate volume of water in the system. And add the water volume contained in the heat pump to this total volume.

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

CAUTION

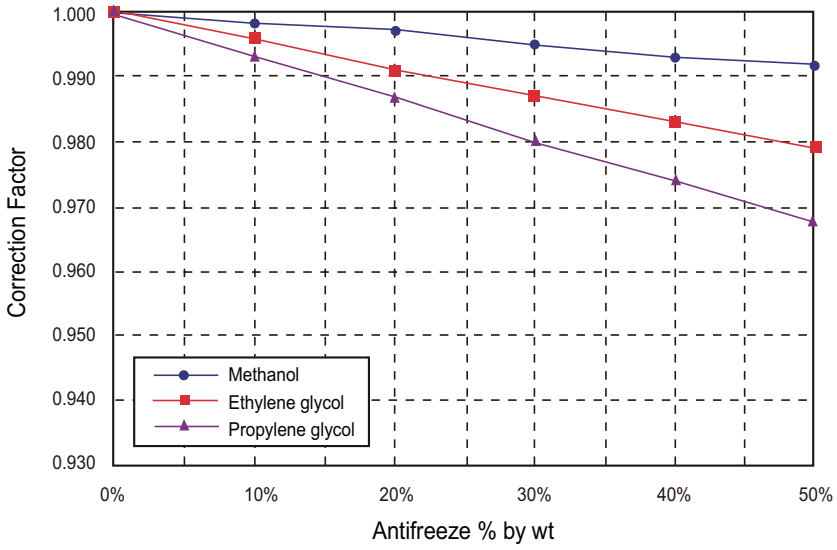
- Use only one of the above antifreeze.
- If a antifreeze is used, pressure drop and capability degradation of the system can be occurred.
- If one of antifreezes is used, corrosion can be occurred. So please add corrosion inhibitor.
- Please check the concentration of the antifreeze periodically to 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 antifreeze usage.

4. Water Control

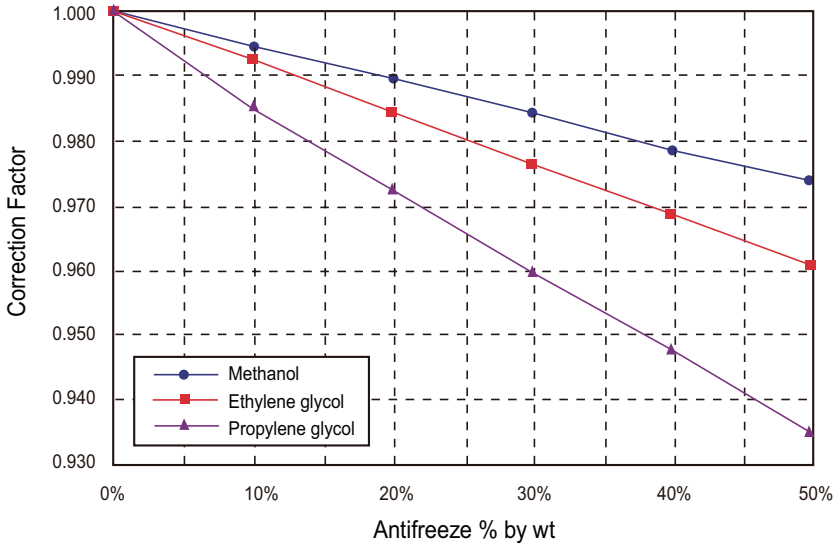
4.3 Capacity correction factor by antifreeze

Antifreeze Type	Item	Antifreeze % by wt				
		10%	20%	30%	40%	50%
Methanol	Cooling	0.998	0.997	0.995	0.993	0.992
	Heating	0.995	0.990	0.985	0.979	0.974
	Pressure Drop	1.023	1.057	1.091	1.122	1.160
Ethylene glycol	Cooling	0.996	0.991	0.987	0.983	0.979
	Heating	0.993	0.985	0.977	0.969	0.961
	Pressure Drop	1.024	1.068	1.124	1.188	1.263
Propylene glycol	Cooling	0.993	0.987	0.980	0.974	0.968
	Heating	0.966	0.973	0.960	0.948	0.935
	Pressure Drop	1.040	1.098	1.174	1.273	1.405

◆ **Correction factor of cooling capacity**



◆ **Correction factor of heating capacity**



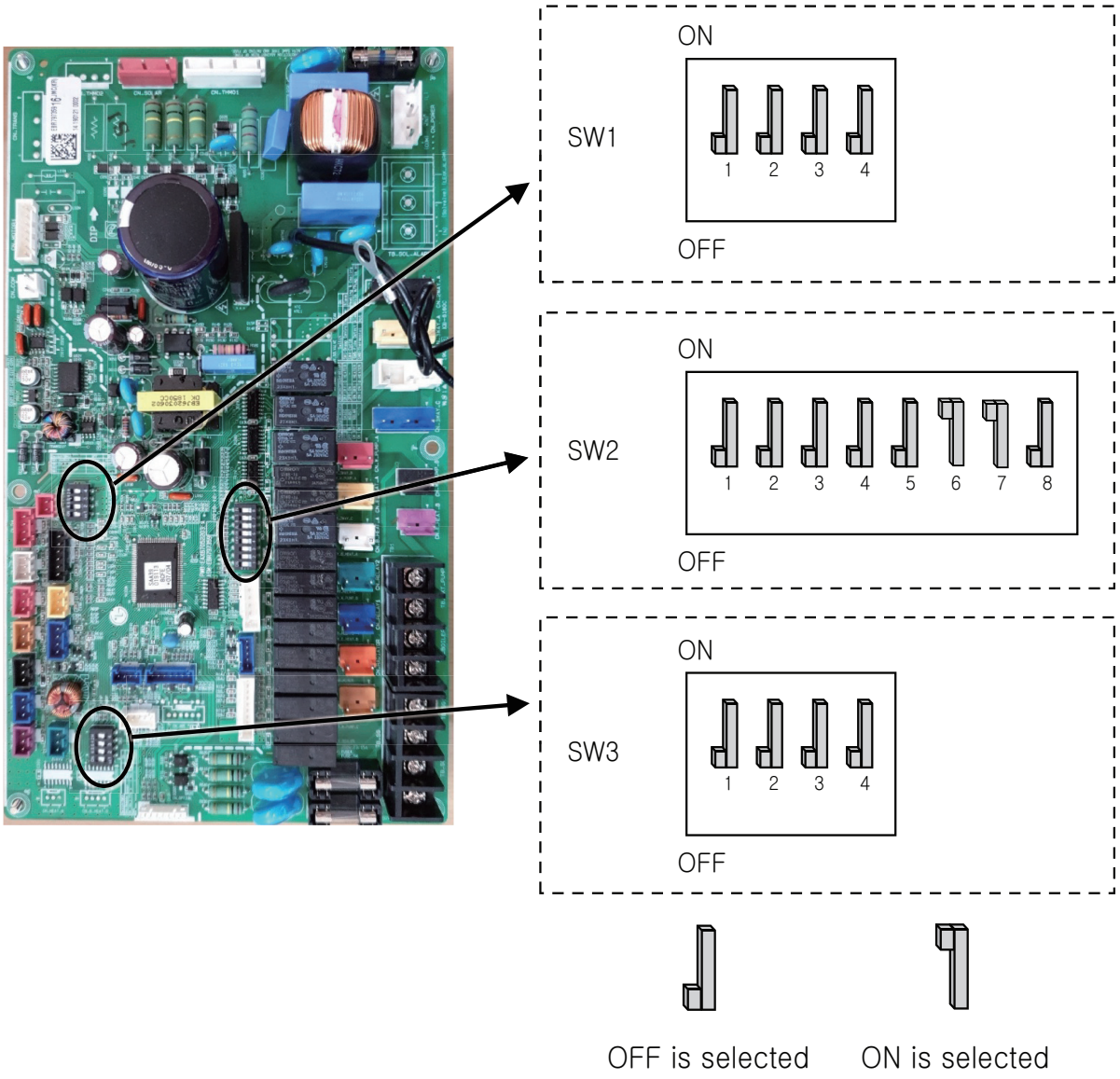
5. Dip Switch Setting

5.1 Information

Turn off electric power supply before setting DIP switch

- Whenever adjusting DIP switch, turn off electric power supply to avoid electric shock.

■ Indoor PCB (Hydro-PCB)



5. Dip Switch Setting

◆ Dip switch SW1

Description	Setting			Default
MODBUS Communication Type *	1	OFF	Master (LG extension modules)	OFF
		ON	Slave (3rd party controller)	
Reserved	2	-	Reserved	
Reserved	3	-	Reserved	
Reserved	4	-	Reserved	

◆ Dip switch SW2

Description	Setting			Default
Central controller	1	OFF	Master	OFF
		ON	Slave	
Accessory installation information	2	OFF	Heat pump is installed(Heating (Cooling) circuit only)	OFF / OFF
	3	OFF		
	2	OFF	Heat pump + DHW tank is installed	
	3	ON		
	2	ON	Heat pump + DHW tank + Solar thermal systemis installed	
	3	OFF		
	2	ON	Reserved (Do not select)	
	3	ON		
Cycle	4	OFF	Heating Only	OFF
		ON	Heating & Cooling	
Flow Sensor Detection	5	OFF	Always	OFF
		ON	While water pump is on	
Selecting Backup Heater capacity	6	OFF	Backup Heater is not used	ON / ON
	7	OFF		
	6	OFF	Half capacity is used	
	7	ON		
	6	ON	Unused	
	7	OFF		
	6	ON	Full capacity is used	
	7	ON		
Thermostat installation information	8	OFF	Thermostat is not installed	OFF
		ON	Thermostat is installed	

◆ Dip switch SW3

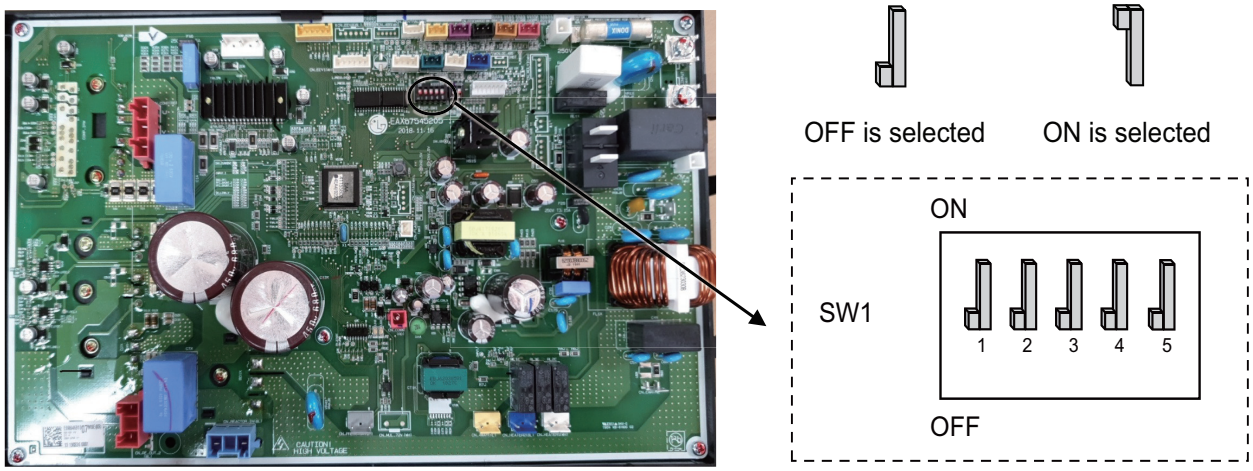
Description	Setting			Default
(Remote) Room air sensor	1	OFF	Remote sensor is not installed (Accessory)	OFF
		ON	Remote sensor is installed (Accessory)	
Antifreeze mode	2	OFF	Antifreeze is NOT applied.	
		ON	Antifreeze is applied. (Adjustable anti-freeze temp.) **	
Reserved	3	-	Reserved	
Reserved	4	-	Reserved	

* RTU must be installed to use this function.

** Bridge at CN_FLOW2 on Hydro-PCB must be dis-connected to enable setting.

5. Dip Switch Setting

■ Outdoor Unit



◆ Dip switch SW1

Description	Setting			Default
Low Noise Mode	2	OFF	Normal Low Noise Mode	OFF
		ON	Limited Low Noise Mode	
Peak Control	3	OFF	Max Mode	
		ON	Peak Control : To limit maximum current (Power saving)	

- Only DIP-switch no. 2 and no.3 has a function. Others have no function.
- When setting the limited low noise mode, mode can be exited to secure capacity after operating for a certain time.

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