LG

THERMA V™

Air-to-Water Heat Pump / Hydrosplit Type
R32 / 50Hz
5BPU5-02A (Replaces 5BPU5-01A)

TOTAL HVAC SOLUTION PROVIDER

ENGINEERING PRODUCT DATA BOOK

LG
Life's Good

P/No. : MFL66101124

General Information
Indoor Unit
Outdoor unit
Design and installation

THERMA V™

Hydrosplit Type

General Information

1. Model Line Up
2. Nomenclature

1. Model line up

1.1 Indoor Unit

Category	Tye	External Appearance	Electric heater Capacity (kW)	Model Name Heating Capacity * (kW) 16.0
Hydrosplit Type	Hydro Box		6.0	ZHNW16C1 [HN1600MC NK1]
	IWT (Integrated Water Tank)		6.0	ZHNW20606Y0 [HN1616Y NB1]

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

1.2 Outdoor Unit

Category		Model Name Heating Capacity (kW) 12	14	16
1 Phase Model 1 Ø, 220-240 V, 50 Hz		ZHBW126B0 [HU121MRB U30]	ZHBW146B0 [HU141MRB U30]	ZHBW166B0 [HU161MRB U30]
Combination	ZHNW16C1 [HN1600MC NK1]	O	O	O
	ZHNW20606Y0 [HN1616Y NB1]	O	O	O
3 Phase Model 3 Ø, 380-415 V, 50 Hz		ZHBW128B0 [HU123MRB U30]	ZHBW148B0 [HU143MRB U30]	ZHBW168B0 [HU163MRB U30]
Combination	ZHNW16C1 [HN1600MC NK1]	O	O	O
	ZHNW20606Y0 [HN1616Y NB1]	O	O	O
External Appearance				

2. Nomenclature

2.1 Indoor Unit (For Hydro box type)

■ Factory Model Name

Model Name	ZH	N	W	16	C	1
No.	1	2	3	4	5	6

No.	Signification
1	**Air-to-Water Heat Pump for R32**
2	**Classification** N : Indoor unit
3	**Model Type** W : Inverter Heat Pump
4	**Heating Capacity (kW)** Ex) 16kW → '16'
5	**Function** B : Hydrosplit 1-Pipe Type C : Hydrosplit 2-Pipe Type
6	**Serial number**

■ Buyer Model Name

Model Name	H	N	16	0	0	M	C	N	K	1
No.	1	2	3	4	5	6	7	8	9	10

No.	Signification
1	**Air-to-Water Heat Pump**
2	**Classification** N : Indoor unit
3	**Heating Capacity (kW)** Ex) 16kW → '16'
4	**Electrical ratings** 0 : for both 1Ø, 220-240V, 50 Hz and 3Ø, 380-415V, 50Hz
5	**Heating Capacity (kW)** Ex) 0kW → '0'
6	**Leaving Water Combination** M: Mid Temperature
7	**Function** B : Hydrosplit 1-pipe Type C : Hydrosplit 2-pipe Type
8	**Classification** N : Indoor unit
9	**Platform (Chassis code)** K : K1 Chassis
10	**Serial number**

2. Nomenclature

2.2 Indoor Unit (For IWT type)

■ Factory Model Name

Model Name	ZH	N	W	20	6	06	Y	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
3	**Model Type** W : Inverter Heat Pump
4	**Water Volume (ℓ) (for IWT)** Ex) 200ℓ→ '20'
5	**Electrical ratings** 6 : 1Ø, 220-240V, 50 Hz
6	**Heater Capacity (kW)** Ex) 6kW → ‘06’
7	**Function** Y: Integrated water tank Type for Hydrosplit
8	**Serial number**

■ Buyer Model Name

Model Name	H	N	16	1	6	Y	N	B	1
No.	1	2	3	4	5	6	7	8	9

No.	Signification
1	**Air-to-Water Heat Pump for R32**
2	**Classification** N : Indoor unit
3	**Heating Capacity (kW)** Ex) 16kW → ‘16’
4	**Electrical ratings** 1 : 1Ø, 220-240V, 50 Hz
5	**Heater Capacity (kW)** Ex) 6kW → ‘6’
6	**Function** Y : Integrated water tank Type for Hydrosplit
7	**Function** N : Indoor unit
8	**Platform (Chassis code)** B : Integrated water tank Platform
9	**Serial number**

2. Nomenclature

2.3 Outdoor Unit

■ Factory Model Name

Model Name	ZH	B	W	16	8	B	0
No.	1	2	3	4	5	6	7

No.	Signification
1	**Air-to-Water Heat Pump for R32**
2	**Classification** B : Monobloc Type
3	**Model Type** W : Inverter Heat Pump
4	**Heating Capacity (kW)** Ex) 16kW → '16'
5	**Electrical ratings** 6: 1Ø, 220-240V, 50 Hz 8 : 3Ø, 380-415V, 50 Hz
6	**Function** B : Hydrosplit
7	**Serial number**

■ Buyer Model Name

Model Name	H	U	16	3	M	R	B	U	3	0
No.	1	2	3	4	5	6	7	8	9	10

No.	Signification
1	**Air-to-Water Heat Pump**
2	**Classification** U : Outdoor unit
3	**Heating Capacity (kW)** Ex) 16kW : '16'
4	**Electrical ratings** 1: 1Ø, 220-240V, 50 Hz 3 : 3Ø, 380-415V, 50 Hz
5	**Leaving Water Combination** M : Mid Temperature
6	**Type of Refrigerant** R : R32
7	**Function** B : Hydrosplit
8	**Classification** U : Outdoor unit
9	**Platform (Chassis code)** 3 : U60A Chassis
10	**Serial number**

THERMA V™

Hydrosplit Type

Hydro Box Unit

1. List of Functions
2. Specification
3. Dimensions
4. Wiring Diagram
5. Piping Diagram
6. Hydraulic Performance
7. Sound Levels

1. List of Functions

■ Basic functions of Unit

Category	Functions	ZHNW16C1 [HN1600MC NK1]
Installation	Backup heater (Operation)	O (Accessory)
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
	Modbus connectivity(without gateway)	O
Air to Water Heat Pump Functions	Anti-condensation on floor (cooling)	O
	Digital output for external pump	O
	Current flow rate monitoring	O
	Thermostat interface (230V AC)	O
	Thermostat interface (24V AC)	X
	Solar thermal system*	O (Accessory)
	DHW(Domestic Hot Water) heating	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 heating	O
	External input and output control(CN_EXT)	O
	Water flow control	O
	Water pressure monitoring	O
	Digital input for energy saving (ESS)	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.
2. * : This function requires the 3rd party accessory, PT-1000 sensor. (field supply)

1. List of Functions

■ Accessory Compatibility List

Category		Product	Remark	ZHNW16C1 [HN1600MC NK1]
Wired Remote Controller	Standard	PREMTW101	New standard (White)	O
Dry Contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
	Communication Type	PDRYCB400	2 Points Dry Contact (For Setback)	X
		PDRYCB320	For 3rd party Thermostat	O
		PDRYCB500	Dry Contact for Modbus	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Group control wire	PZCWRCG3	0.25 m	X
	2-Remo Control Wire	PZCWRC2	0.25 m	O
	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***	PENKTH000	Interface between IDU and Meter	O
	2 Zone Valve Controller	PZNVVB200	-	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 (1Φ)	O
		PHLTB	For Monobloc	X
		PHLTC	For Split (3Φ)	O
	DHW sensor	PHRSTA0	included in PHLTA kit	O
	Thermostatic mixing valve	OSHA-MV	3/4” DN20	O
		OSHA-MV1	1” DN25	O
	Backup heater	AHEH036A [HA031M E1]	220-240 V, 1Φ (For Monobloc)	X
		AHEH066A [HA061M E1]	220-240 V, 1Φ (For Monobloc)	X
		AHEH068A [HA063M E1]	380-415 V, 3Φ (For Monobloc)	X
		AHEH066B [HA061B E1]	220-240 V, 1Φ (For Hydrosplit HN1600MB NK0)	X
		AHEH068B [HA063B E1]	380-415 V, 3Φ (For Hydrosplit HN1600MB NK0)	X
		AHEH066C [HA061C E1]	220-240 V, 1Φ (For Hydrosplit HN1600MC NK1)	O
		AHEH068C [HA063C E1]	380-415 V, 3Φ (For Hydrosplit HN1600MC NK1)	O
	3way valve	OSHA-3V	-	O
	Solar thermal kit	PHLLA	-	X
	2nd Circuit or E/Heater Thermistor	PRSTAT5K10	-	O
	Drain pan	PHDPB	-	X
		PHDPC	-	O
	Cover Plate	PDC-HK10	For K1 Chassis only	O
	Buffer Tank (40ℓ)	OSHB-40KT	For IWT(integrable)	X
	DHW expansion vessel (8ℓ)	OSHE-12KT	For IWT (integrable)	X

Note

1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product.
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				ZHNW16C1 [HN1600MC NK1]
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 UPML 20-105 CHBL
	Motor Type		-	BLDC
	Steps of Pump Performance		-	Variable capacity 10% to 100%
	Power input	Min. ~ Max.	W	14 ~ 140
Flow Sensor	Type		-	Vortex
	Model		-	SIKA VVX20
	Measuring Range	Min. ~ Max.	ℓ/min	5 ~ 80
	Flow (Trigger point)	Min.	ℓ/min	15
Water Pressure Sensor	Model	-	-	Sensata OFM(2HMP)
	Measuring Range	Min. ~ Max.	bar(G)	0 ~ 20
Expansion Vessel	Volume	Max.	ℓ	8
	Water pressure	Max.	bar	3
	Water pressure	Pre-charged	bar	1
Relief valve	Pressure Limit	Upper Limit	bar	3.0
Devices for Water Circuit	-		-	Relief valve / Flow sensor
			-	Drain hose
			-	Pressure sensor / Air vent valve
Piping Connections	Water Circuit	Inlet to PHEX	mm(Inch)	Male PT 25.4(1)
		Inlet to Heat Load	mm(Inch)	Male PT 25.4(1)
		Outlet from PHEX	mm(Inch)	Male PT 25.4(1)
		Outlet from Heat Load	mm(Inch)	Male PT 25.4(1)
Wiring Connections	Power and Communication Cable (Included Earth, H07RN-F)		mm^2 x cores	0.75 x 4C
Sound Power Level	Heating	Rated	dB(A)	44
Dimensions	Unit	W × H × D	mm	490 × 850 × 315
	Packed Unit	W × H × D	mm	563 ×1,082 × 375
Weight	Unit		kg	30.5
	Packed Unit		kg	34.5
Exterior	Color		-	Nobel White
	RAL Code		-	RAL 9016

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 code. 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 power level is measured on the rated condition in according with ISO 9614 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.
4. * DHW 58~80°C operating is available only when the booster heater is operating.

2. Specifications

◆ Backup Heater

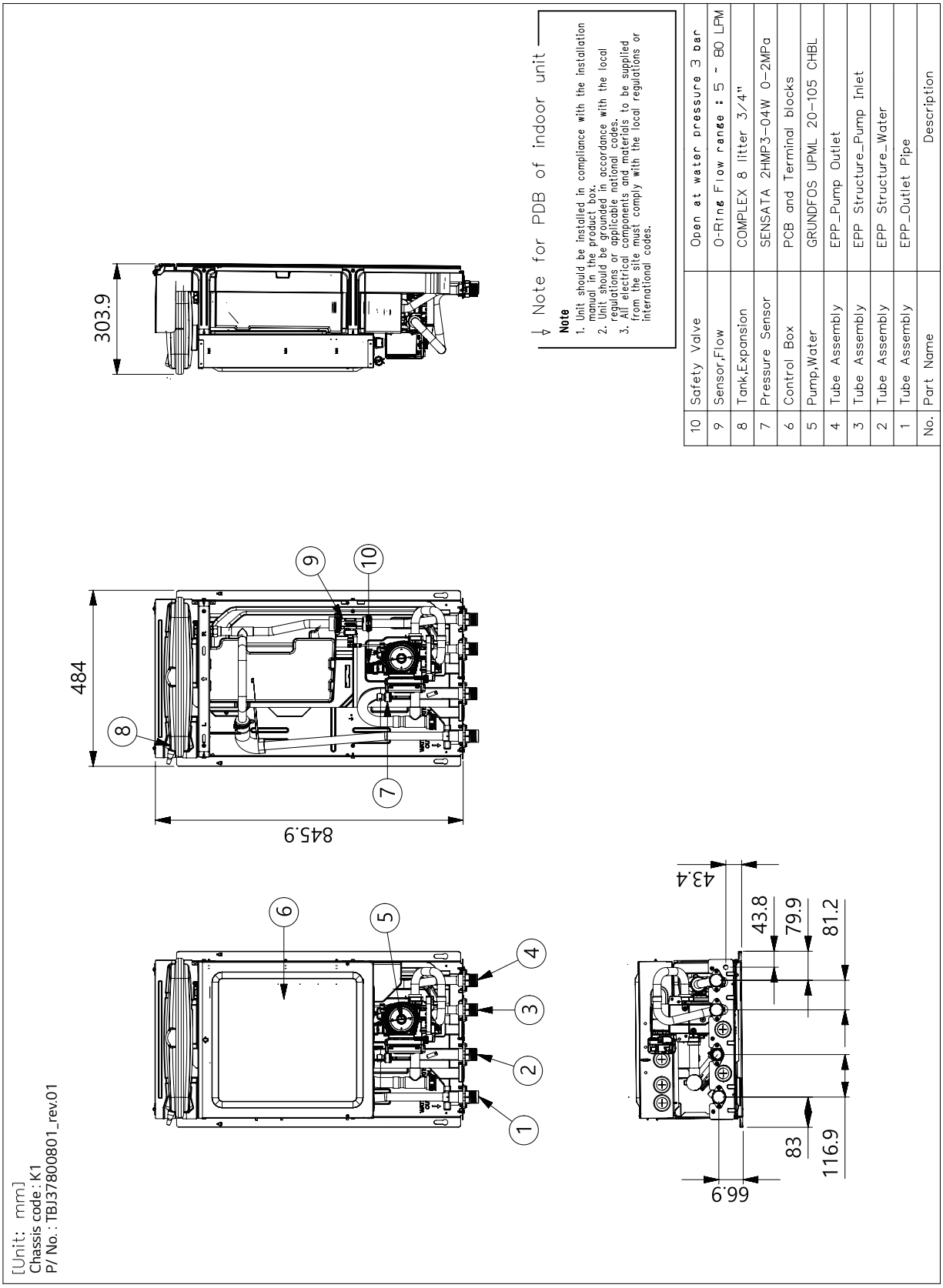
Electrical Specification		AHEH066C [HA061C E1]	AHEH068C [HA063C E1]
Type	-	Sheath	Sheath
Power Supply	V, Ø, Hz	220-240, 1, 50	380-415, 3, 50
Power Connection Wiring	-	L1, N, Earth	R, S, T, N, Earth
Number of Heating Coil	EA	2	3
Capacity Combination	kW	3 + 3	2 + 2 + 2
Operation	-	Automatic	Automatic
Heating Steps	Step	1	1
Net Dimensions (W X H X D)	mm	-	-
Shipping Dimensions (W X H X D)	mm	738 x 293 x 309	738 x 293 x 309
New Weight	kg	4.3	4.7
Shipping Weight	kg	5.8	6.1
Current(Rated)	A	24	8.7
Power Cable (Included Earth, H07RN-F)	mm² x cores	6.0 x 3C	2.5 x 5C
Communication Cable (H07RN-F)	mm² x cores	-	-
Circuit Breaker (ELCB)	A	40	20

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.

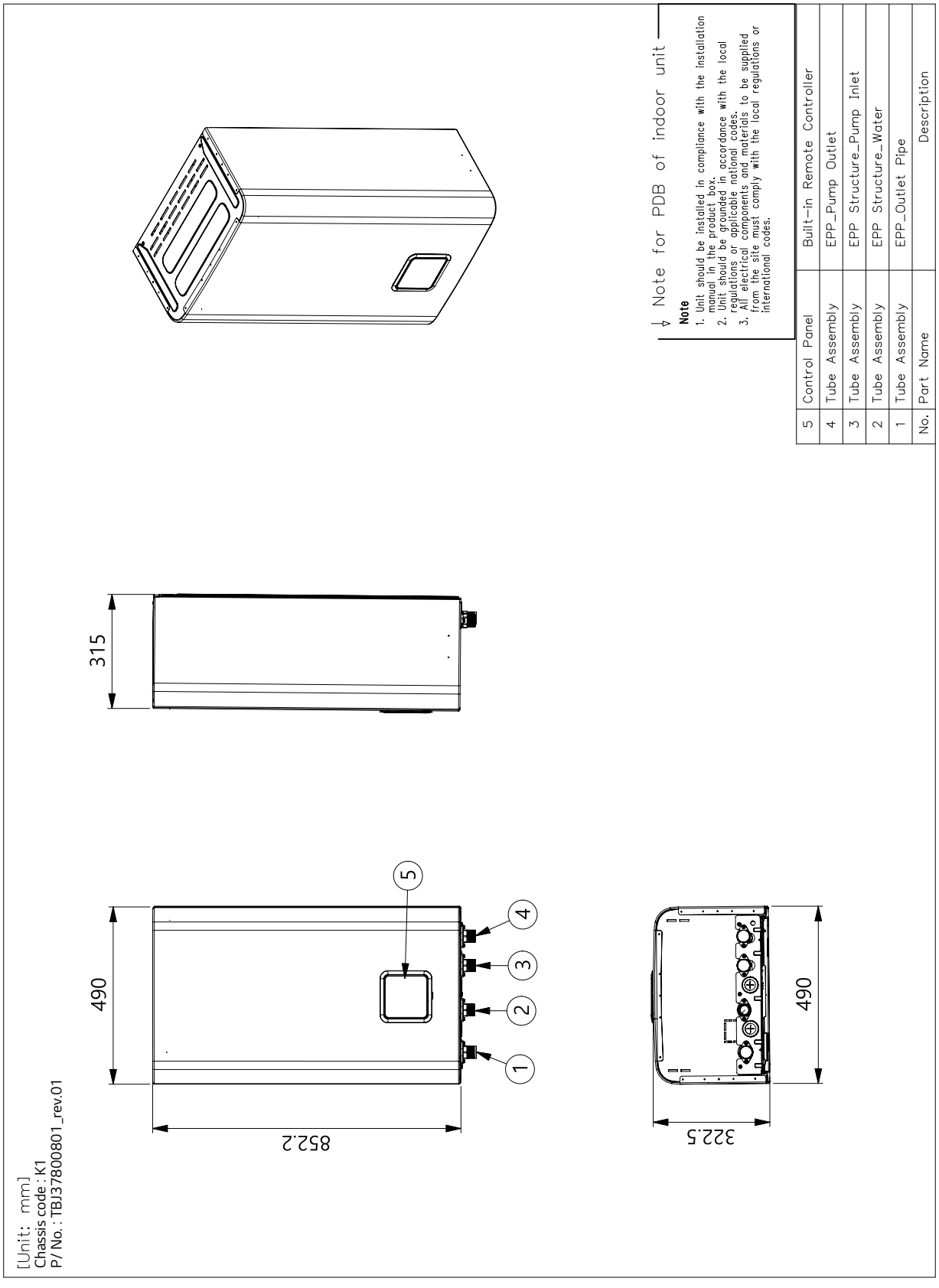
3. Dimensions

3.1 Internal Layout



3. Dimensions

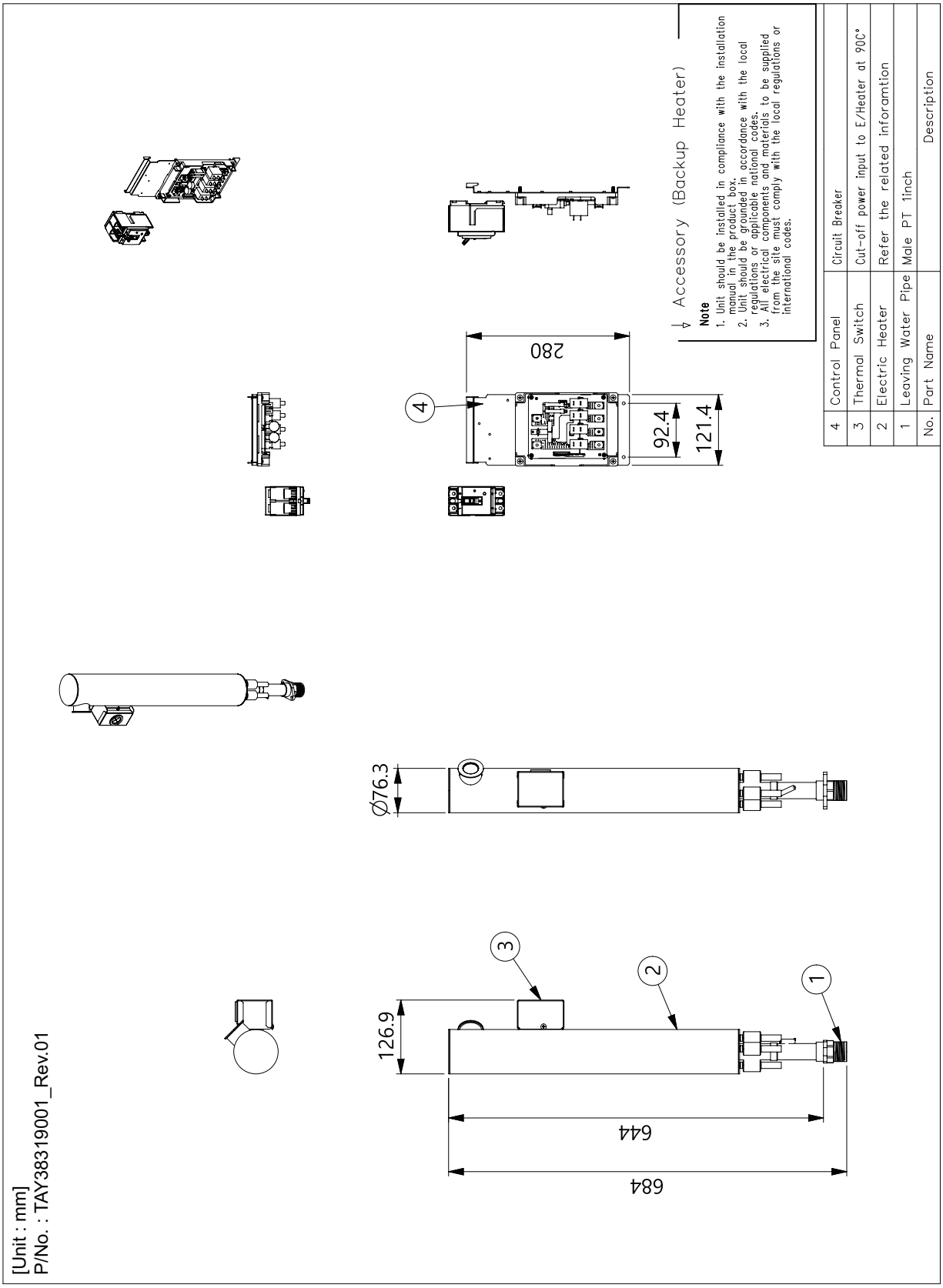
3.2 External Layout



3. Dimensions

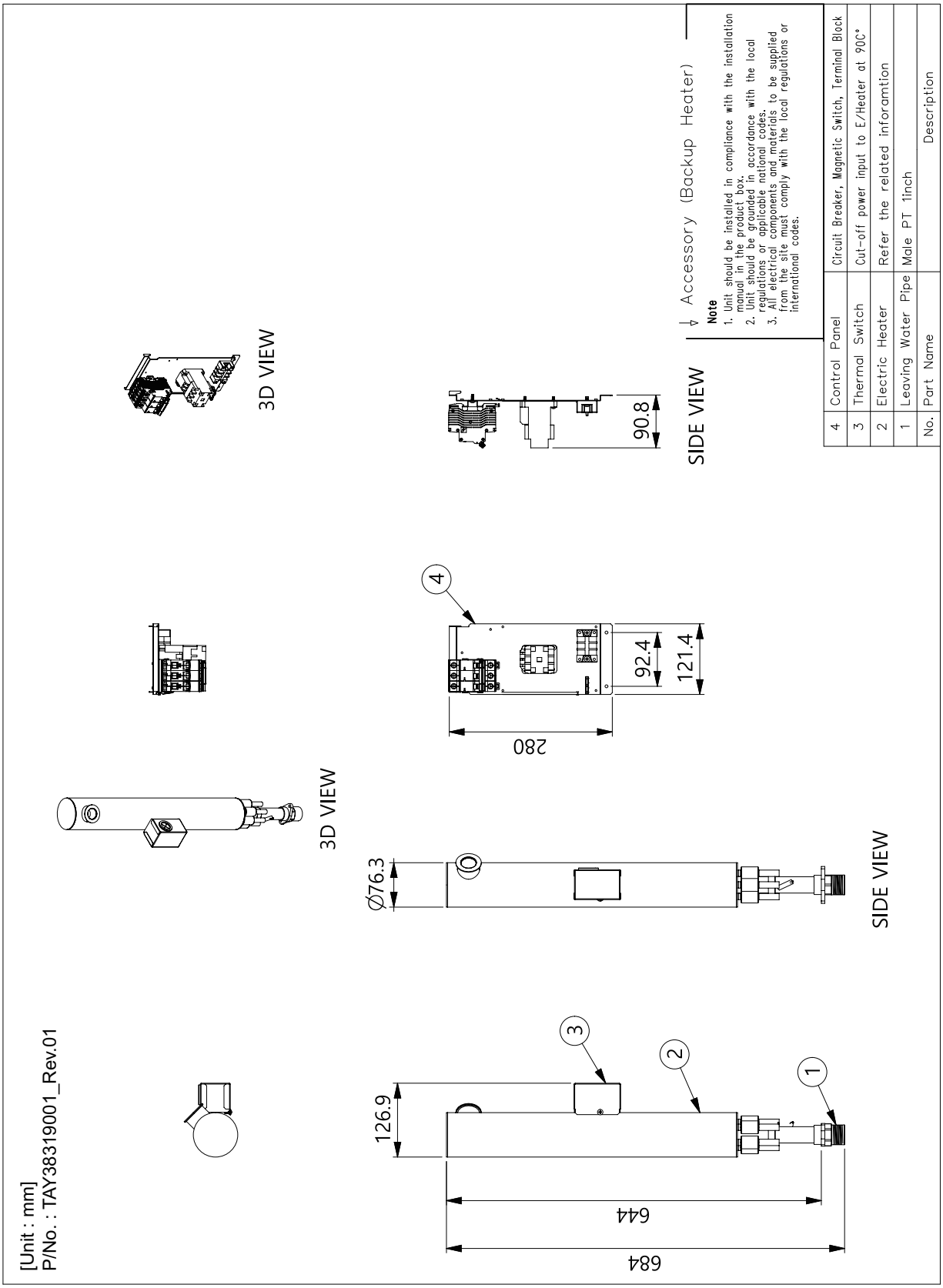
3.3 Backup Heater

◆ **1Phase**



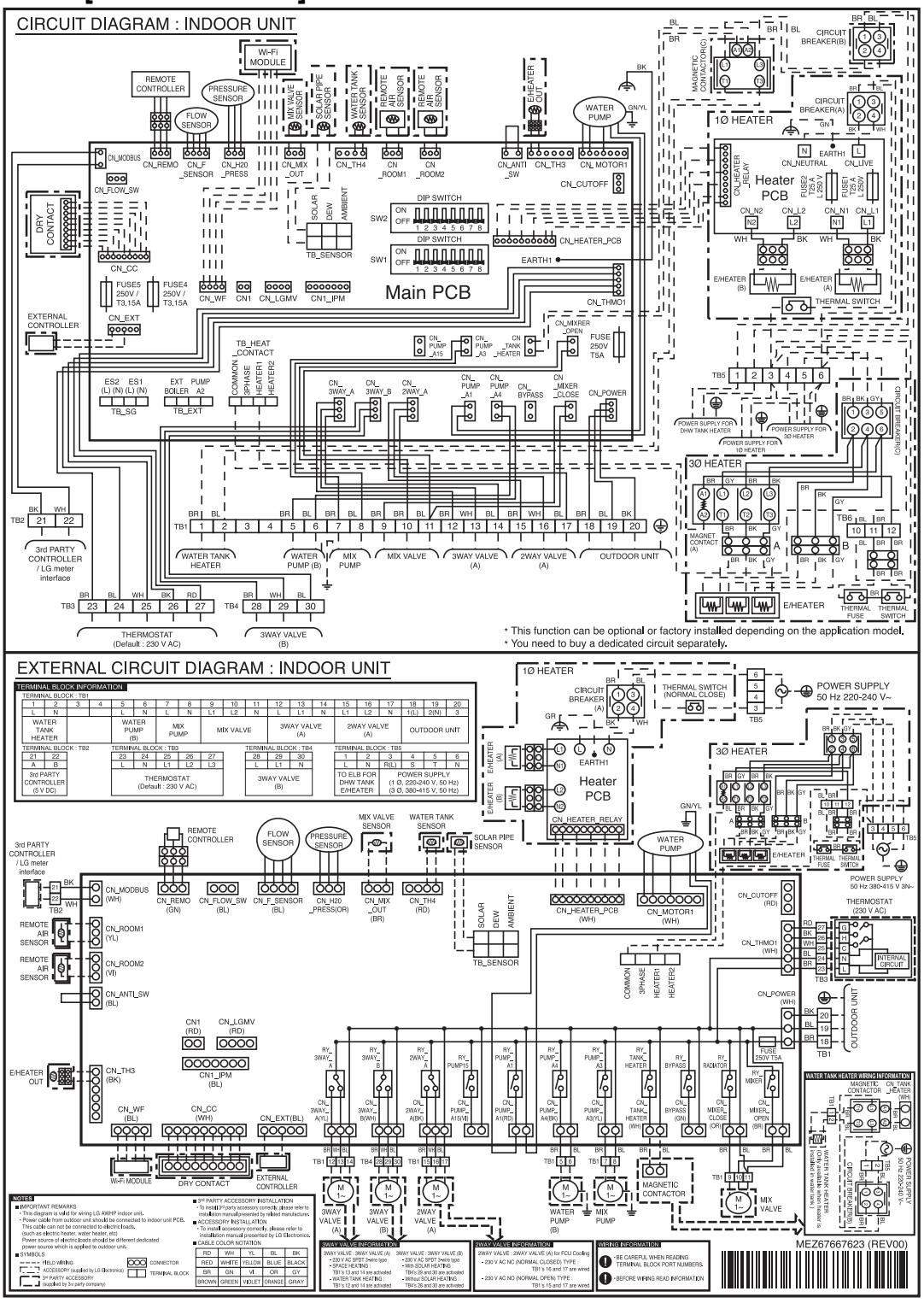
3. Dimensions

◆ 3Phase



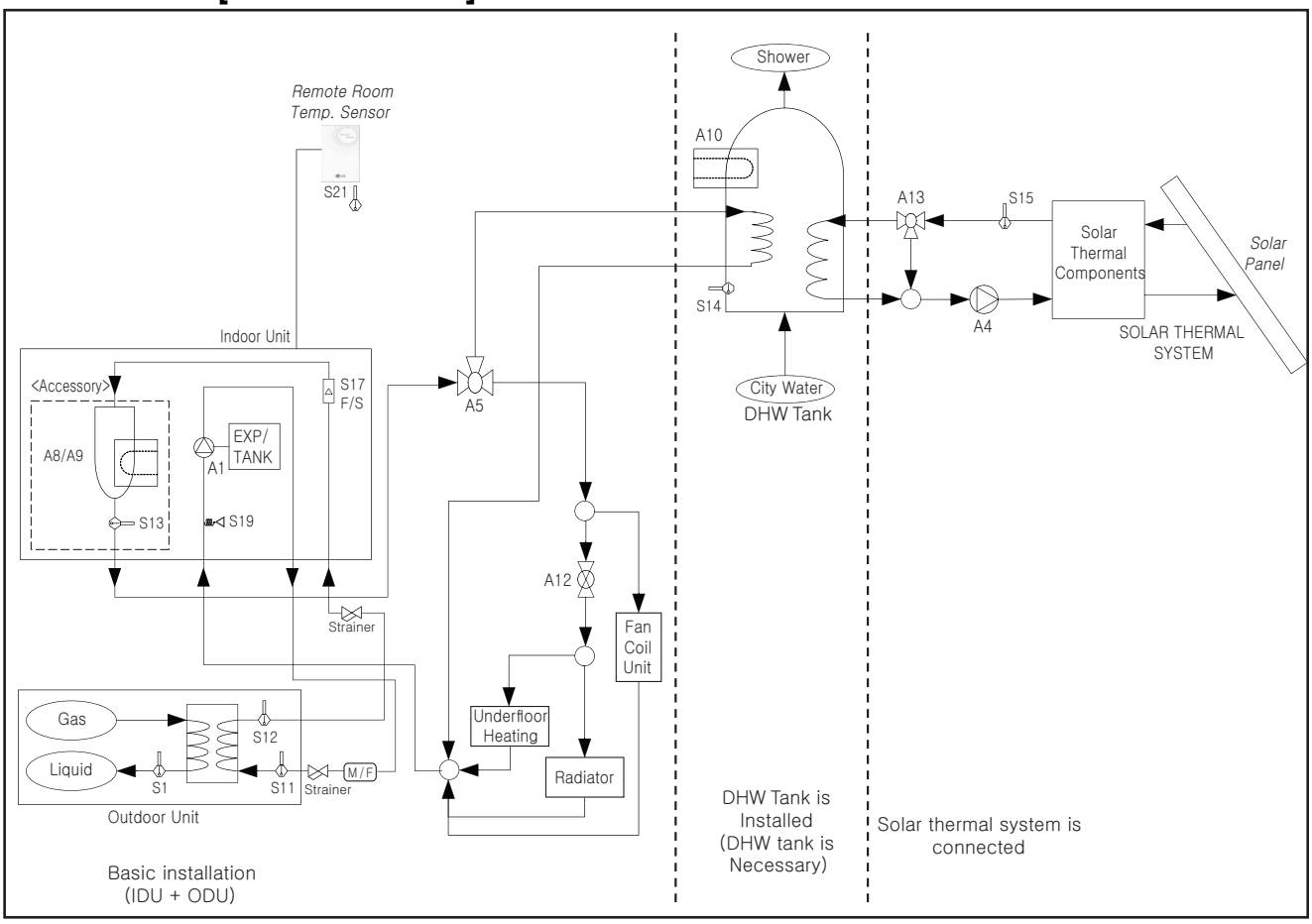
4. Wiring Diagrams

■ ZHNW16C1 [HN1600MC NK1]



5. Piping Diagram

■ ZHNW16C1 [HN1600MC NK1]



5. Piping Diagram

Category	Symbol	Meaning	PCB Connector	Remarks
Outdoor Unit	S1	Refrigerant temperature sensor (Liquid side)	CN_PIPE_IN	-Meaning is expressed based on Cooling mode.
	S12	Outlet water temperature sensor	CN_WATER_OUT	-Leaving water temperature sensor
	S11	Inlet water temperature sensor	CN_WATER_IN	-Entering water temperature sensor
	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
Indoor Unit	S19	Entering Water Pressure sensor	CN_H20_PRESS	
	A8 / A9	Backup heater	(No connector)	-Optional accessory (sole separately) - HA061C E1 : 1Ø, HA063C E1 : 3Ø
	S13	Outlet sensor of backup heater	CN_TH3	- Accessory supplied with Backup heater
	A1	Internal Water Pump	CN_MOTOR1 CN_PUMP_A1	- Water Pump is connected at CN_MOTOR1 and CN_PUMP_A1
	A2	External Pump	TB_EXT(PUMP A2)	- voltage-free contact - External water pump if head of internal pump is not sufficient or if parallel buffer tank is used
	EXP/TANK	Expansion Tank	(No connector)	- Absorb volume change of heated water.
	S17	Flow sensor	CN_F_SENSOR	- To monitor water flow rate in the system
	S21	Remotes room air sensor (Direct circuit)	CN_ROOM1	- Optional accessory (sold separately) - PQRSTA0
	CTR/PNL	Control Panel (or 'Remote Controller')	CN_REMO	- Pre built-in at indoor unit
	A12	To control water flow for Fan Coil Unit	CN_2WAY_A	- 3rd party accessory and Field installation (sold separately) - 2 wire NO and NC type 2way valve is supported
Water Heating	W/TANK	DHW Tank	(No connector)	- 3rd party accessory and Field installation (sold separately) - Generating and storing DHW by AWHP or built-in electric heater
	A10	Booster Heater	CN_TANK_HEATER	- 3rd party accessory and Field installation (usually built-in at W/TANK) - Supplying additional water heating capacity
	A5	- 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)
	CITY WATER	Water to be heated by indoor unit and B/HT 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 are connected at 4 pin type connector CN_TH4 - S14 is a part of DHW tank kit (Model : PHLTA)
Solar Heating	S15	Solar-heated water temperature sensor	TB_SENSOR SOLAR	- 3rd party accessory and Field installation (sold separately) - PT1000
	A13	- 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
	A4	Solar collector pump	CN_PUMP_A4	- 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, Sensor, Thermostats, Interim heat exchanger, Water pump, etc.	(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.

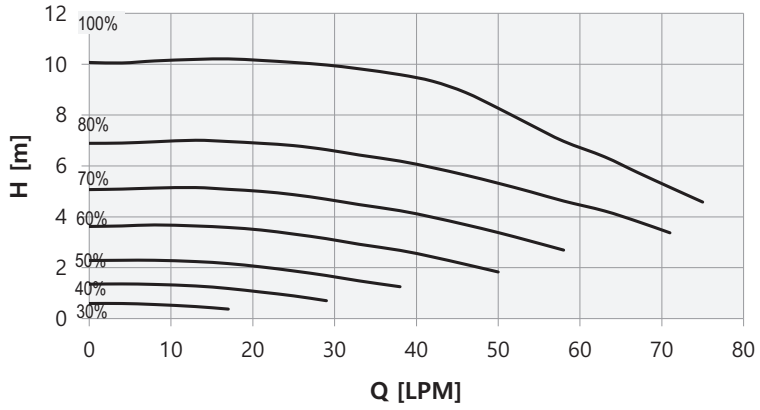
■ Pressure Drop

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)
16	46.00	9.0	1.4	7.6	20
14	40.25	9.3	1.1	8.2	
12	34.50	9.8	0.8	9.0	

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.

Q-H Chart



Note

Performance test based on standard ISO 9906 with pre-pressure 2.0bar and liquid temperature 20°C.

7. Sound levels

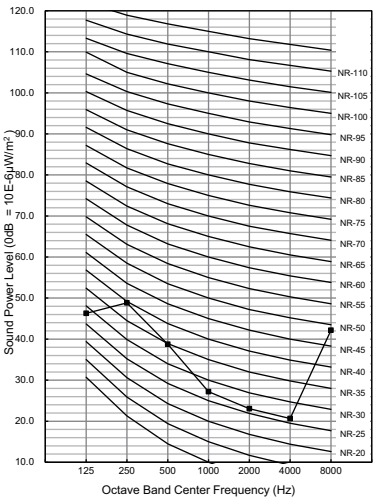
■ Sound Power Level

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.
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.
6. Sound power level is measured on the rated condition in accordance with ISO 9614 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.

Model	Sound Power Level [dB(A)]
ZHNW16C1 [HN1600MC NK1]	44

ZHNW16C1 [HN1600MC NK1]



THERMA V™

Hydrosplit Type

IWT Unit

1. List of Functions
2. Specification
3. Dimensions
4. Wiring Diagram
5. Piping Diagram
6. Hydraulic Performance
7. Sound Levels

Appendix information

MFL66101125_01A

1. List of Functions

■ List of functions

Category	Functions	ZHNW20606Y0 [HN1616Y NB1]
Installation	Electric heater	O
	Domestic Hot Water Tank heater*	X
	Screed Drying Mode	O
Reliability	Self diagnosis	O
Convenience	Auto Restart operation	O
	Child lock	O
	Sleep mode	O
	Timer (on/off)	O
	Timer (weekly)	O
	Remote room temperature sensing	O
Network function	Network solution (LGAP)	O
	Modbus connectivity (without gateway)	O
Special function	Outdoor Temperature sensing	O
	Zone control (2 heating circuits)	O
	Zone control (max. 4 heating circuits)	X
	Wi-Fi control	O
	Group control	X
	2-Remo control	O
	External controller (CN-EXT)	O
Water Circuit Control	Thermostat Interface (230V AC)	O
	Thermostat Interface (24V AC)	X
	Water Pump ON / OFF Control	O
	Water Pump Forced Operation	O
	Current flow rate monitoring	O
	Solar-Thermal system	X
	Anti-Condensation on floor (cooling)	O
	PHEX Anti-Freezing Control	O
	Anti-overheating of Water Pipe	O
	Emergency Operation	O
	Seasonal auto mode	O
	Low Noise Operation	O
	Scheduler	O
	Timer	O
	Quick Domestic Hot Water Tank Heating	O
	Electric heater capacity control by wiring	O
	Dry Contact	O
	Water flow sensor	O
	Water pressure monitoring	O
	Digital input for energy saving (ESS)	O
Remote Controller Supply	Wired Remote Controller	O
	Wireless Remote Controller	X

Note

1. O : Applied, X : Not applied
2. Some functions can be limited by remote controller.
3. *:Tank can be heated by Electric heater

1. List of Functions

■ Accessory Compatibility List

Category		Product	Remark	ZHNW20606Y0 [HN1616Y NB1]
Wired Remote Controller	Standard	PREMTW101	New standard (White)	O
Dry Contact	Simple Contact	PDRYCB000	Simple Dry Contact	O
	Communication Type	PDRYCB400	2 Points Dry Contact (For Setback)	X
		PDRYCB320	For 3rd party Thermostat	O
		PDRYCB500	Dry Contact for Modbus	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Group control wire	PZCWRCG3	0.25 m	X
	2-Remo Control Wire	PZCWRC2	0.25 m	O
	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***	PENKTH000	Interface between IDU and Meter	O
	2 Zone Valve Controller	PZNVVB200	-	O
Accessory Kit for AWHP	Thermostatic mixing valve	OSHA-MV	3/4” DN20	O
		OSHA-MV1	1” DN25	O
	3way valve	OSHA-3V	-	X
	Solar thermal kit	PHLLA	For hydro box	X
	2nd Circuit Thermistor	PRSTAT5K10	-	O
	Backup heater	AHEH036A [HA031M E1]	220-240 V, 1Φ (For Monobloc)	X
		AHEH066A [HA061M E1]	220-240 V, 1Φ (For Monobloc)	X
		AHEH068A [HA063M E1]	380-415 V, 3Φ (For Monobloc)	X
		AHEH066B [HA061B E1]	220-240 V, 1Φ (For Hydrosplit HN1600MB NK0)	X
		AHEH068B [HA063B E1]	380-415 V, 3Φ (For Hydrosplit HN1600MB NK0)	X
		AHEH066C [HA061C E1]	220-240 V, 1Φ (For Hydrosplit HN1600MC NK1)	X
		AHEH068C [HA063C E1]	380-415 V, 3Φ (For Hydrosplit HN1600MC NK1)	X
	Drain pan	PHDPB	For hydro box unit	X
	Cover plate	PDC-HK10	For Split, IWT	O
	Buffer Tank (40ℓ)	OSHB-40KT	For IWT (integrable)	O
	DHW expansion vessel (8ℓ)	OSHE-12KT	For IWT (integrable)	O
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	Without case	X
		PSNFP14A0	With case	X
	ODU PI485	PMNFP14A1	PI 485 Gateway	O
	BACnet	PQNFB17C0	ACP BACnet	O
	Lonworks	PLNWKB000	ACP Lonworks	O
	Modbus	PMBUSB00A	-	O
ETC	PDI	PPWRDB000	PDI Standard	O
		PQNUD1S40	PDI Premium	O
	ACS IO Module	PEXPMB000	-	X

Note

1. O: Possible, X: Impossible, - : Not applicable, Embedded : Included with product.
2. * : Some advanced functions controlled by individual controller cannot be operated.
3. ** : It could not be operated some functions.
4. *** Meter interface cannot be connected at the same time with 3rd-party controller.

2. Specifications

◆ Technical Specifications

Indoor Unit Model Name				ZHNW20606Y0 [HN1616Y NB1]
Operation Range (Leaving Water)	Cooling (Min.~Max.)		°C	5 ~ 27
	Heating (Min.~Max.)		°C	15 ~ 65
	Domestic Hot Water (Min.~Max.)*		°C	15 ~ 80
DHW Tank	Type		-	Hydro module with integrated hot water tank
	Material		-	Enameled steel
	Water Volume		ℓ	200
	Internal Thermal Protect limit		°C	85
	Rated pressure (Pressure limit)		bar	10
	Insulation	Material	-	Polyurethane foam
		Thickness	mm	50
		Heat loss (for 24hr)	kWh	1.46
Buffer Tank (Accessory)	Water Volume		ℓ	40
	Material		-	P235GH steel (DIN EN 10028 - 2)
	Insulation Material		-	Closed cell foamed rubber
	Dimensions(W x H x D)		mm	518 x 560 x 175
	Weight		kg	24
Main water pump	Type		-	Canned type for hot water circulation
	Model		-	Grundfos UPML 25-105 130 PWM A
	Motor type		-	BLDC
	Steps of Pump Performance		-	Variable speed 10% to 100%
	Power input		W	14 ~ 140
DHW water Pump	Model		-	WILO ZRS 15/6-3 KU
	Steps of Speed		step	3 (Default : 1)
	Power input		W	45 ~ 85
Expansion vessel	Water Volume		ℓ	12
	Factory pre-charge		bar	0.75
	Max.pressure		bar	3
DHW Expansion vessel (Accessory)	Water Volume		ℓ	8
	Factory pre-charge		bar	3
	Max. pressure		bar	10
	Weight		kg	2.5
Heat Exchanger (Water ↔ DHW)	Type		-	Brazed Plate HEX
	Number of Plates		EA	26
3 Way Valve	Flow coefficient		K_{vs}	8
Safety Valve	Pressure Limit	Upper Limit	bar	3
DHW Safety valve	Pressure Limit	Upper Limit	bar	10
Flow Sensor	Model		-	SIKA VVXC9SNBUC00252P
	Measuring range	Min. ~ Max.	ℓ/min	5 ~ 80
	Flow(Trigger point)	Min.	ℓ/min	15
Water Pressure sensor	Model	-	-	Sensata OFM(2HMP)
	Measuring Range	Min. ~ Max.	Bar (G)	0 ~ 20
Strainer	Type		-	Intergrated to valve
	Mesh size		mesh	42.3 (0.6mm)
DHW Strainer	Mesh size		mesh	50.8 (0.5 mm)
Wiring Connections	Power and Communication Cable (H07RN-F) (included Earth)		mm^2 x cores	0.75 x 4C
Piping Connections	Water Circuit	Inlet	mm(inch)	Female Ø 22 (G1")
		Outlet	mm(inch)	Female Ø 22 (G1")
		Inlet from outdoor unit	mm(inch)	Female Ø 22 (G1")
		Outlet to outdoor unit	mm(inch)	Female Ø 22 (G1")
	DHW Tank Water Circuit	Cold Inlet	mm(inch)	Female Ø 19.75 (G3/4")
		Hot Outlet	mm(inch)	Female Ø 19.75 (G3/4")
		Recirculation	mm(inch)	Female Ø 19.75 (G3/4")
Sound Power Level			dB(A)	43
Dimensions (W × H × D)		Unit	mm	601 × 1,812 × 685
		Shipping	mm	640 × 2,050 × 790
Weight		Unit	kg	130
		Shipping	kg	146
Exterior	Color		-	White
	RAL Code		-	RAL 9002

Note

1. * : DHW 58~80℃ operating is available only when the Eletric heater is operating.
2. Due to our policy of innovation some specifications may be changed without notification.
3. Wiring cable size must comply with the applicable local and national codes and “Electric characteristics” chapter should be considered for electrical work and design.
4. LWT : Leaving Water Temperature, OAT : Outdoor Air Temperature.
5. Sound power level is measured on the rated condition in according with ISO 9614 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.
6. Performances are accordance with EN14511 and reflect ErP testing conditions. Above gives the declared values at rated conditions acc. ErP regulation.
7. This product contains fluorinated greenhouse gases.

2. Specifications

◆ Electrical Specifications

Indoor Unit Model Name			ZHNW20606Y0 [HN1616Y NB1]
Electric Heater (Case 1)	Power Supply	V, Ø, Hz	220-240, 1, 50
	Power Supply Cable (H07RN-F) (Included Earth)*	mm^2x cores	4.0 x 3C
	Power connection wiring**	-	L1,N,Earth
	Heater Type	-	Sheath
	Number of Heating Coil	EA	1
	Capacity Combination	kW	2.0
	Operation	-	Automatic
	Rated Current	A	8.7
	Maximum Current	A	11.1
	Fuses	A	16
	Maximum electrical power***	kW	2.52
Electric Heater (Case 2)	Power Supply	V, Ø, Hz	220-240, 1, 50
	Power Supply Cable (H07RN-F) (Included Earth)*	mm^2x cores	4.0 x 3C
	Power connection wiring**	-	L1,N,Earth (needs connect Bridge to L2 from L1)
	Heater Type	-	Sheath
	Number of Heating Coil	EA	2
	Capacity Combination	kW	2.0 + 2.0
	Operation	-	Automatic
	Rated Current	A	17.4
	Maximum Current	A	19.9
	Fuses	A	20
	Maximum electrical power***	kW	4.52
Electric Heater (Case 3)	Power Supply	V, Ø, Hz	380-415, 3, 50
	Power Supply Cable (H07RN-F) (Included Earth)*	mm^2x cores	2.5 x 5C
	Power connection wiring**	-	L1,L2,L3,N,Earth
	Heater Type	-	Sheath
	Number of Heating Coil	EA	3
	Capacity Combination	kW	2.0 + 2.0 + 2.0
	Operation	-	Automatic
	Rated Current	A	8.7
	Maximum Current	A	11.1
	Fuses	A	16 + 16 + 16
	Maximum electrical power***	kW	6.52

Note

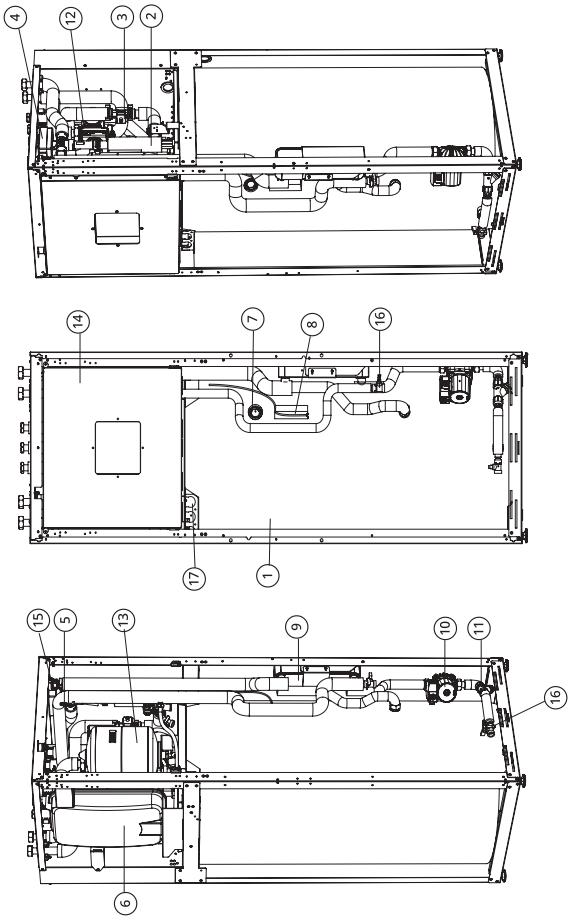
1. * Wiring cable size must comply with the applicable local and national codes. And “Electric characteristics” chapter should be considered for electrical work and design. Especially the power cable and circuit breaker should be selected in accordance with that.
2. ** The size of Electrical Heater and the Fuses depend on the choice of the connection power.
3. *** Joint maximal load (circulation pumps, electronic valves ...) which can be connected to or powered by the internal unit, must not exceed the specified value. Higher consumed parts (i.e. pumps) should have their own supply.
4. The guideline about cable is taken into account laying B2 from the table A.52.4 – IEC 60364-5-52. The cable in the installation pipe is fixed to the wall.

3. Drawing

3.1 Internal Layout

Note
1. Unit should be installed in compliance with the installation manual in the product box.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials to be supplied from the site must comply with the local regulations or international codes.

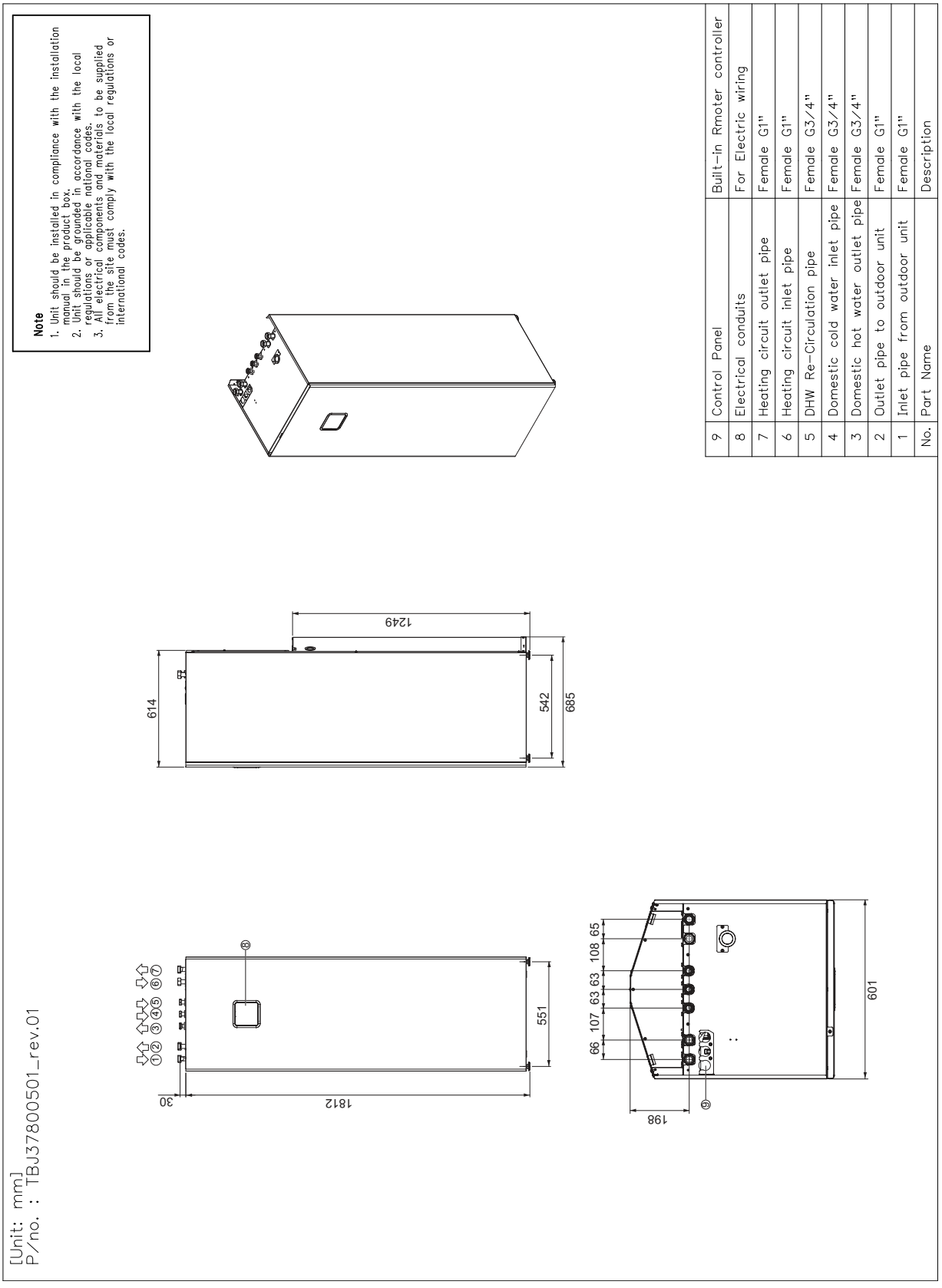
No.	Part Name	Description
1	Domestic hot water tank	200 L
2	Electric heater	6 kW
3	Flow Sensor	SIKA VVX20 5-80 LPM
4	3 Way valve	Heating / DHW circuit
5	Water pressure sensor	SENSATA 2HMP
6	Expansion vessel	12 L for Heating circuit
7	Magnesium anode	For DHW tank
8	DHW tank sensor	temperature sensor
9	Plate heat exchanger	Heat exchange (Water / DHW tank)
10	DHW water pump	WILO ZRS 15/6-3
11	Strainer For DHW tank	Filtering and stacking particles
12	Main water pump	GRUNDFOS UPML 25-105 130
13	Expansion vessel	8 L For DHW circuit (Accessory)
14	Control box	PCB and terminal blocks
15	Air vent	Air Purging when charging water
16	Drain cock	Valve for water draining
17	Electrical conduits	For Electric wiring



[Unit: mm]
P/no. : TBJ37800501_rev.01

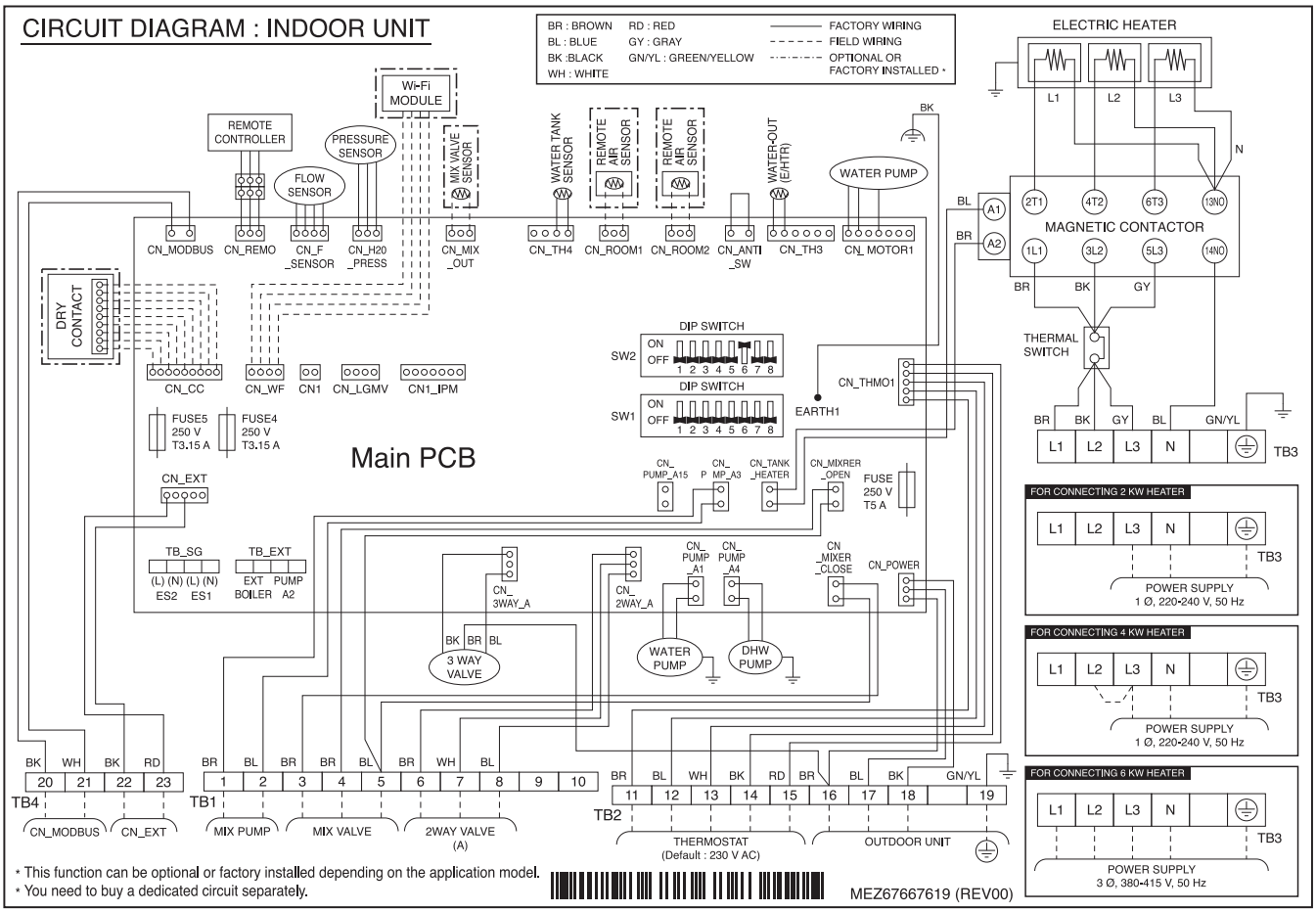
3. Drawing

3.2 External Layout



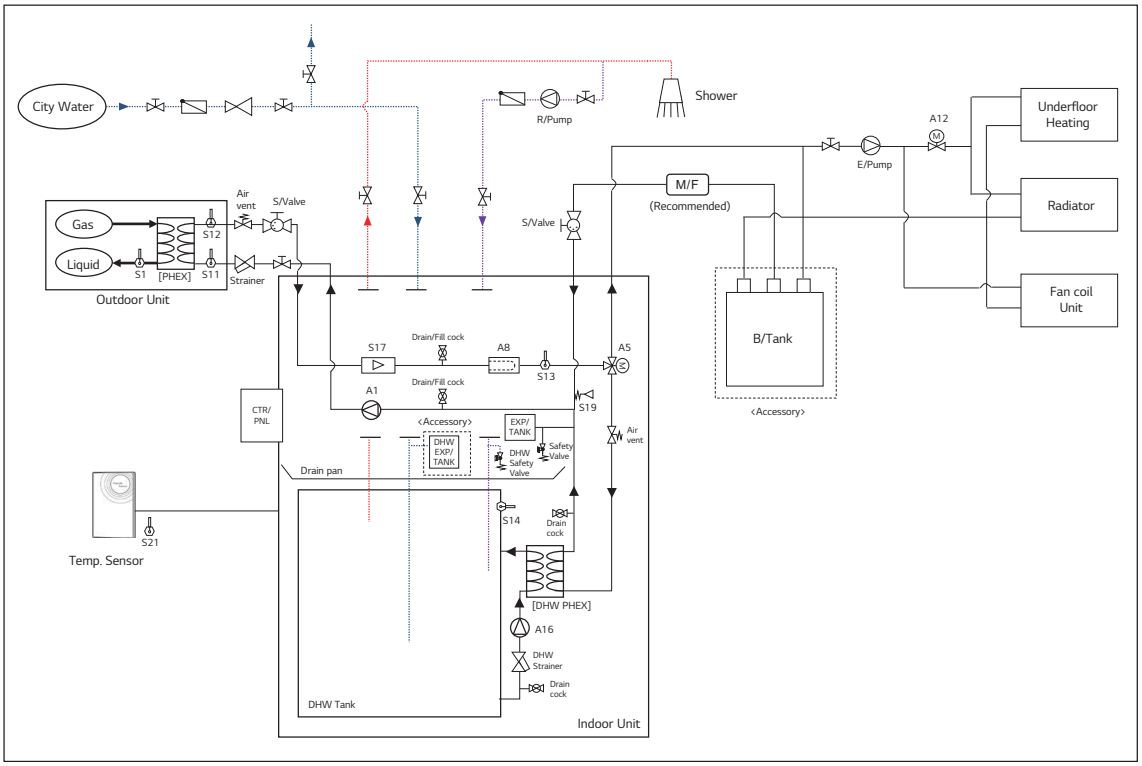
4. Wiring diagrams

■ ZHNW20606Y0 [HN1616Y NB1]



5. Piping diagrams

■ ZHNW20606Y0 [HN1616Y NB1]



5. Piping diagrams

Category	Symbol	Meaning	PCB Connector	Remark
Outdoor unit	S1	Refrigerant temperature sensor (Liquid side)	CN_PIPE_IN	Meaning is expressed based on Cooling mode.
	S11	Inlet water temperature sensor	CN_WATER_IN	Entering water temperature sensor
	S12	Outlet water temperature sensor	CN_WATER_OUT	Leaving water temperature sensor
	Strainer	-	(No connector)	To protect the product, be sure to install a strainer on the outdoor unit water inlet pipe.
	Air vent	-	(No connector)	Field installation
				Install an air vent on the highest point of the water connection between outdoor and indoor unit.
Indoor unit	S19	Entering Water Pressure sensor	CN_H20_PRESS	To monitor water pressure
	A8	Electrical heater	CN_TANK_HEATER	Operating power is supplied by external power source via Terminal block
	S13	Electric heater outlet sensor	CN_TH3	Electric heater outlet sensor
	A1	Main water pump	CN_MOTOR1	Power is supplied via CN_PUMP_A1
			CN_PUMP_A1	PWM signal is supplied via CN_MOTOR1
	S17	Flow sensor	CN_F_SENSOR	To monitor water flow rate
	EXP/TANK	Expansion vessel for heating circuit	(No connector)	Absorbs volume change of heating water
	DHW EXP/TANK	Expansion vessel for DHW heating circuit	(No connector)	Optional accessory (sold separately)
				OSHE-12KT (8 L expansion tank tank integrated into IWT unit)
	A5	3Way Valve	CN_3WAY_A	Flow control of heating water in the indoor unit.
				Flow direction switching between underfloor and water tank.
	S14	DHW tank temperature sensor	CN_TH4	DHW tank temperature sensor
	A16	DHW Water pump	CN_PUMP_A4	DHW tank water charging pump
	S/Valve	Shut-off valve with strainer	(No connector)	Install to inlet water pipe at indoor unit.
	S21	Remoted Air Temperature sensor	(Direct circuit) CN_ROOM1 (Mixing circuit) CN_ROOM2	Optional accessory (sold separately)
				PQRSTA0
	CTR/PNL	Control Panel (or Remote controller)	CN_REMO	Pre built-in at indoor unit
Heating circuit	Buffer Tank	Buffer tank for heating circuit	(No connector)	Optional accessory (sold separately)
				OSHB-40KT (40 L buffer tank integrated into IWT unit)
	E/pump	External pump	TB_EXT_PUMP A2	Field installation
				To control the water flow at the rear of the buffer tank
	A12	To control water flow for Fan coil unit	CN_2WAY_A	Field installation
	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
DHW circuit	R/Pump	Recirculation pump for DHW tank	-	Field installation
	DHW HEATING SYSTEM	This system can include following components : Pressure reducing valve, shut-off valve, check valve, etc.	(No connector)	The hydraulic connection for DHW heating system has to be installed in accordance with the national and local regulations to enable the water flow in full force.

6. Hydraulic Performance

The main 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.

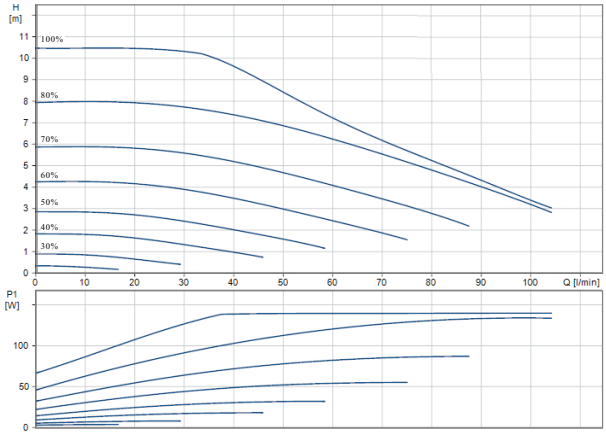
■ Pressure Drop

Capacity [kW]	Rated flow-rate [LPM]	Pump Head [m]	Product pressure drop * [m]	Serviceable Head [m]	Min.flow-rate [LPM] (Recommend)
16	46.00	8.9	1.4	7.5	20
14	40.25	9.6	1.1	8.5	
12	34.50	10.2	0.8	9.4	

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.
- Above date is valid at Rated flow rate with delta-temperature of 5 Kelvin
- * Hydrosplit IWT should further consider the pressure drop depending on the length of indoor and outdoor piping.

◆ Grundfos UPML 25-105 130 PWM A



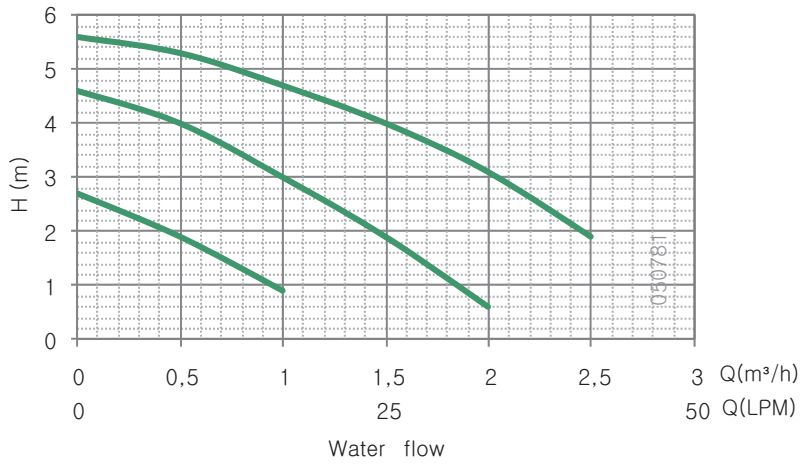
Note

Performance test based on standard ISO 9906 with pre-pressure 2.0bar and liquid temperature 20°C.

6. Hydraulic Performance

The DHW water pump is three speed-adjustable (Maximum / Medium / Minimum), but Minimum step is not used. It is recommended to use Maximum or Medium steps. In case of noise by water flow, it may be required to change default water pump speed. In most case, however, it is strongly recommended to set speed as Maximum.

■ Wilo ZRS 15/6-3 KU



Note

Performance test based on standard ISO 9906 with pre-pressure 2.0bar and liquid temperature 20°C.

⚠ WARNING

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

7. Sound levels

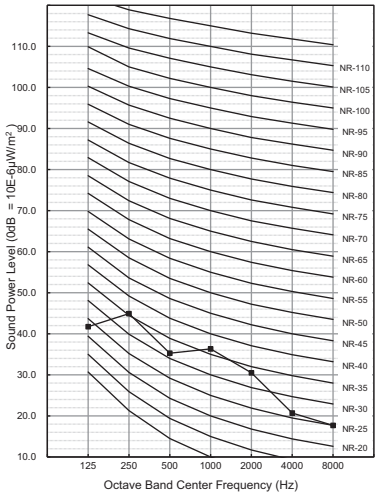
■ Sound Power Level

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.
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.
6. Sound power level is measured on the rated condition in accordance with ISO 9614 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.

Model	Sound Power Level [dB(A)]
ZHNW20606Y0 [HN1616Y NB1]	43

ZHNW20606Y0 [HN1616Y NB1]



THERMA V™

Hydrosplit Type

Outdoor unit

1. List of functions
2. Specification
3. Dimensions
4. Wiring Diagram
5. Piping Diagram
6. Performance Data
7. Operation Range
8. Electric Characteristics
9. Sound Levels

1. List of functions

■ Basic functions of Unit

Category	Functions	ZHBW126B0 [HU121MRB U30] ZHBW146B0 [HU141MRB U30] ZHBW166B0 [HU161MRB U30]	ZHBW128B0 [HU123MRB U30] ZHBW148B0 [HU143MRB U30] ZHBW168B0 [HU163MRB U30]
Reliability	Defrost / Deicing	O	O
	High pressure switch	O	O
	Low pressure switch	X	X
	Phase protection	X	O
	Restart delay (3-minutes)	O	O
	Self diagnosis	O	O
	Soft start	X	X
Convenience	Test function	X	X
	Low Noise Operation	O	O
	Wiring Error Check	X	X
	Peak Control	O	O
	Mode Lock	O	O
	Forced Cooling Operation (Outdoor Unit)	X	X
	Base Pan Heater	O	O
	SLC(Smart Load Control)	X	X
Network function	Network solution(LGAP)	O (Accessory)	O (Accessory)

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	ZHBW126B0 [HU121MRB U30] ZHBW146B0 [HU141MRB U30] ZHBW166B0 [HU161MRB U30] ZHBW128B0 [HU123MRB U30] ZHBW148B0 [HU143MRB U30] ZHBW168B0 [HU163MRB U30]
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	Without case	X
		PSNFP14A0	With case	X
	ODU PI485	PMNFP14A1	PI 485 Gateway	O
	BACnet	PQNFB17C0	ACP BACnet	O
	Lonworks	PLNWKB000	ACP Lonworks	O
	Modbus	PMBUSB00A	-	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 or AC Smart 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

2.1 Nominal Capacity and Power Input

Nominal Capacity and Nominal Input				Indoor Unit	ZHNW16C1 [HN1600MC NK1]		
					ZHNW20606Y0 [HN1616Y NB1]		
-	Condition	Outdoor Temp. (℃) DB / WB	Leaving Water Temp. (℃)	Outdoor Unit	ZHBW126B0 [HU121MRB U30]	ZHBW146B0 [HU141MRB U30]	ZHBW166B0 [HU161MRB U30]
Capacity	Cooling	35 / 24	18	kW	12.00	14.00	16.00
		35 / 24	7	kW	12.00	14.00	16.00
	Heating	7 / 6	35	kW	12.00	14.00	16.00
		7 / 6	55	kW	11.00	11.50	12.00
		2 / 1	35	kW	11.00	12.00	13.80
Power Input	Cooling	35 / 24	18	kW	2.53	3.26	4.00
		35 / 24	7	kW	4.44	5.38	6.40
	Heating	7 / 6	35	kW	2.38	2.86	3.33
		7 / 6	55	kW	3.79	4.04	4.29
		2 / 1	35	kW	3.01	3.31	3.83
EER	Cooling	35 / 24	18	W/W	4.75	4.30	4.00
		35 / 24	7	W/W	2.70	2.60	2.50
COP	Heating	7 / 6	35	W/W	5.04	4.89	4.80
		7 / 6	55	W/W	2.90	2.85	2.80
		2 / 1	35	W/W	3.65	3.63	3.60
SCOP (Low temp. Average)*					4.60	4.57	4.55
SCOP (High temp. Average)*					3.50	3.47	3.45
Rated Water Flow Rate (at LWT 35℃)				LPM	34.5	40.3	46.0

Nominal Capacity and Nominal Input	Indoor Unit	ZHNW20606Y0 [HN1616Y NB1]		
	Outdoor Unit	ZHBW126B0 [HU121MRB U30]	ZHBW146B0 [HU141MRB U30]	ZHBW166B0 [HU161MRB U30]
Water Heating Efficiency (profile L)**	%	120	120	120

Electrical Specifications			Indoor Unit	ZHNW16C1 [HN1600MC NK1]		
				ZHNW20606Y0 [HN1616Y NB1]		
			Outdoor Unit	ZHBW126B0 [HU121MRB U30]	ZHBW146B0 [HU141MRB U30]	ZHBW166B0 [HU161MRB U30]
Power Supply			V, Ø, Hz	220-240, 1, 50	220-240, 1, 50	220-240, 1, 50
Peak Control Running Current	Cooling	Step1	A	23.0	24.0	25.0
		Step2	A	20.0	21.0	22.0
	Heating	Step1	A	23.0	24.0	25.0
		Step2	A	20.0	21.0	22.0
Rated Running Current	Cooling		A	11.2	14.4	17.7
	Heating		A	10.6	12.7	14.8
Circuit breaker (Minimum)			A	40.0	40.0	40.0
Wiring Connections	Power Supply Cable (Included Earth, H07RN-F)		mm^2 x cores	6.0 x 3C	6.0 x 3C	6.0 x 3C

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 power level is measured on the rated condition in accordance with ISO 9614 standard. Therefore, these values can be increased owing to ambient conditions during operation.
4. Performances are based on the following conditions (It is according to EN14511) :
   - Interconnected Pipe Length is standard length and difference of Elevation (Outdoor ~ Indoor Unit) is 0m.
5. This product contains Fluorinated greenhouse gases.

*: These values are accordance with EN14825.
**: These values are accordance with EN16147.

2. Specifications

Nominal Capacity and Nominal Input				Indoor Unit	ZHNW16C1 [HN1600MC NK1]		
					ZHNW20606Y0 [HN1616Y NB1]		
-	Condition	Outdoor Temp. (℃) DB / WB	Leaving Water Temp. (℃)	Outdoor Unit	ZHBW128B0 [HU123MRB U30]	ZHBW148B0 [HU143MRB U30]	ZHBW168B0 [HU163MRB U30]
Capacity	Cooling	35 / 24	18	kW	12.00	14.00	16.00
		35 / 24	7	kW	12.00	14.00	16.00
	Heating	7 / 6	35	kW	12.00	14.00	16.00
		7 / 6	55	kW	11.00	11.50	12.00
		2 / 1	35	kW	11.00	12.00	13.80
Power Input	Cooling	35 / 24	18	kW	2.53	3.26	4.00
		35 / 24	7	kW	4.44	5.38	6.40
	Heating	7 / 6	35	kW	2.38	2.86	3.33
		7 / 6	55	kW	3.79	4.04	4.29
		2 / 1	35	kW	3.01	3.31	3.83
EER	Cooling	35 / 24	18	W/W	4.75	4.30	4.00
		35 / 24	7	W/W	2.70	2.60	2.50
COP	Heating	7 / 6	35	W/W	5.04	4.89	4.80
		7 / 6	55	W/W	2.90	2.85	2.80
		2 / 1	35	W/W	3.65	3.63	3.60
SCOP (Low temp. Average)*					4.60	4.57	4.55
SCOP (High temp. Average)*					3.50	3.47	3.45
Rated Water Flow Rate (at LWT 35℃)				LPM	34.5	40.3	46.0

Nominal Capacity and Nominal Input	Indoor Unit	ZHNW20606Y0 [HN1616Y NB1]		
	Outdoor Unit	ZHBW128B0 [HU123MRB U30]	ZHBW148B0 [HU143MRB U30]	ZHBW168B0 [HU163MRB U30]
Water Heating Efficiency (profile L)**	%	120	120	120

Electrical Specifications			Indoor Unit	ZHNW16C1 [HN1600MC NK1]		
				ZHNW20606Y0 [HN1616Y NB1]		
			Outdoor Unit	ZHBW128B0 [HU123MRB U30]	ZHBW148B0 [HU143MRB U30]	ZHBW168B0 [HU163MRB U30]
Power Supply			V, Ø, Hz	380-415, 3, 50	380-415, 3, 50	380-415, 3, 50
Peak Control Running Current	Cooling	Step1	A	8.0	9.0	10.0
		Step2	A	6.0	7.0	8.0
	Heating	Step1	A	8.0	9.0	10.0
		Step2	A	6.0	7.0	8.0
Rated Running Current	Cooling		A	3.7	4.8	5.9
	Heating		A	3.5	4.2	4.9
Circuit breaker (Minimum)			A	16.0	16.0	16.0
Wiring Connections	Power Supply Cable (Included Earth, H07RN-F)		mm^2 x cores	2.5 x 5C	2.5 x 5C	2.5 x 5C

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 power level is measured on the rated condition in accordance with ISO 9614 standard. Therefore, these values can be increased owing to ambient conditions during operation.
4. Performances are based on the following conditions (It is according to EN14511) :
   - Interconnected Pipe Length is standard length and difference of Elevation (Outdoor ~ Indoor Unit) is 0m.
5. This product contains Fluorinated greenhouse gases.

*: These values are accordance with EN14825.

**: These values are accordance with EN16147.

2. Specifications

2.2 Outdoor unit

Outdoor Units				ZHBW126B0 [HU121MRB U30]	ZHBW146B0 [HU141MRB U30]	ZHBW166B0 [HU161MRB U30]
Operation Range (Outdoor Temp.)	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		cm³/Rev.	31.6	31.6	31.6
Refrigerant	Type		-	R32	R32	R32
	GWP (Global Warming Potential)		-	675.0	675.0	675.0
	Precharged Amount		g	2,100	2,100	2,100
	t-CO2 eq.		-	1.418	1.418	1.418
	Control		-	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Refrigerant Oil	Type		-	FW68D	FW68D	FW68D
	Charged Volume		cc × No.	1,100	1,100	1,100
Heat Exchanger	Type		-	Fin & Tube	Fin & Tube	Fin & Tube
	Quantity		-	2	2	2
	Specification	Row	EA	32	32	32
		Column	EA	2	2	2
		FPI	EA	14	14	14
Plate Heat Exchanger	Type		-	Brazed Plate HEX	Brazed Plate HEX	Brazed Plate HEX
	Quantity		-	1	1	1
	Number of Plate		EA	76	76	76
Piping Connections	Water Circuit	Inlet	mm(Inch)	Male PT 25.4(1)	Male PT 25.4(1)	Male PT 25.4(1)
		Outlet	mm(Inch)	Male PT 25.4(1)	Male PT 25.4(1)	Male PT 25.4(1)
Strainer	Mesh size		-	30 mesh	30 mesh	30 mesh
	Material		-	Stainless Steel	Stainless Steel	Stainless Steel
Fan	Type		-	Propeller	Propeller	Propeller
	Air Flow Rate	Rated	m³/min × No.	76.3 × 2	76.3 × 2	76.3 × 2
Fan Motor	Type		-	BLDC	BLDC	BLDC
	Output		W × No.	124 × 2	124 × 2	124 × 2
Sound Power Level	Heating	Max.	dB(A)	67	68	69
		Rated	dB(A)	61	62	63
		Low Noise	dB(A)	60	60	60
Dimensions	Unit	W × H × D	mm	950 × 1,380 × 330	950 × 1,380 × 330	950 × 1,380 × 330
	Packed Unit	W × H × D	mm	1,140 × 1,462 × 461	1,140 × 1,462 × 461	1,140 × 1,462 × 461
Weight	Unit		kg	91.7	91.7	91.7
	Packed Unit		kg	104.7	104.7	104.7
Exterior	Color		-	Warm Gray	Warm Gray	Warm Gray
	RAL Code		-	RAL 7044	RAL 7044	RAL 7044

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 power level is measured on the rated condition in according with ISO 9614 standard. Therefore, these values can be increased owing to ambient conditions during operation.
4. Performances are based on the following conditions (It is according to EN14511) :
   - Interconnected Pipe Length is standard length and difference of Elevation (Outdoor ~ Indoor Unit) is 0m.
5. This product contains Fluorinated greenhouse gases.
6. Strainer is accessory provided with the outdoor unit.

2. Specifications

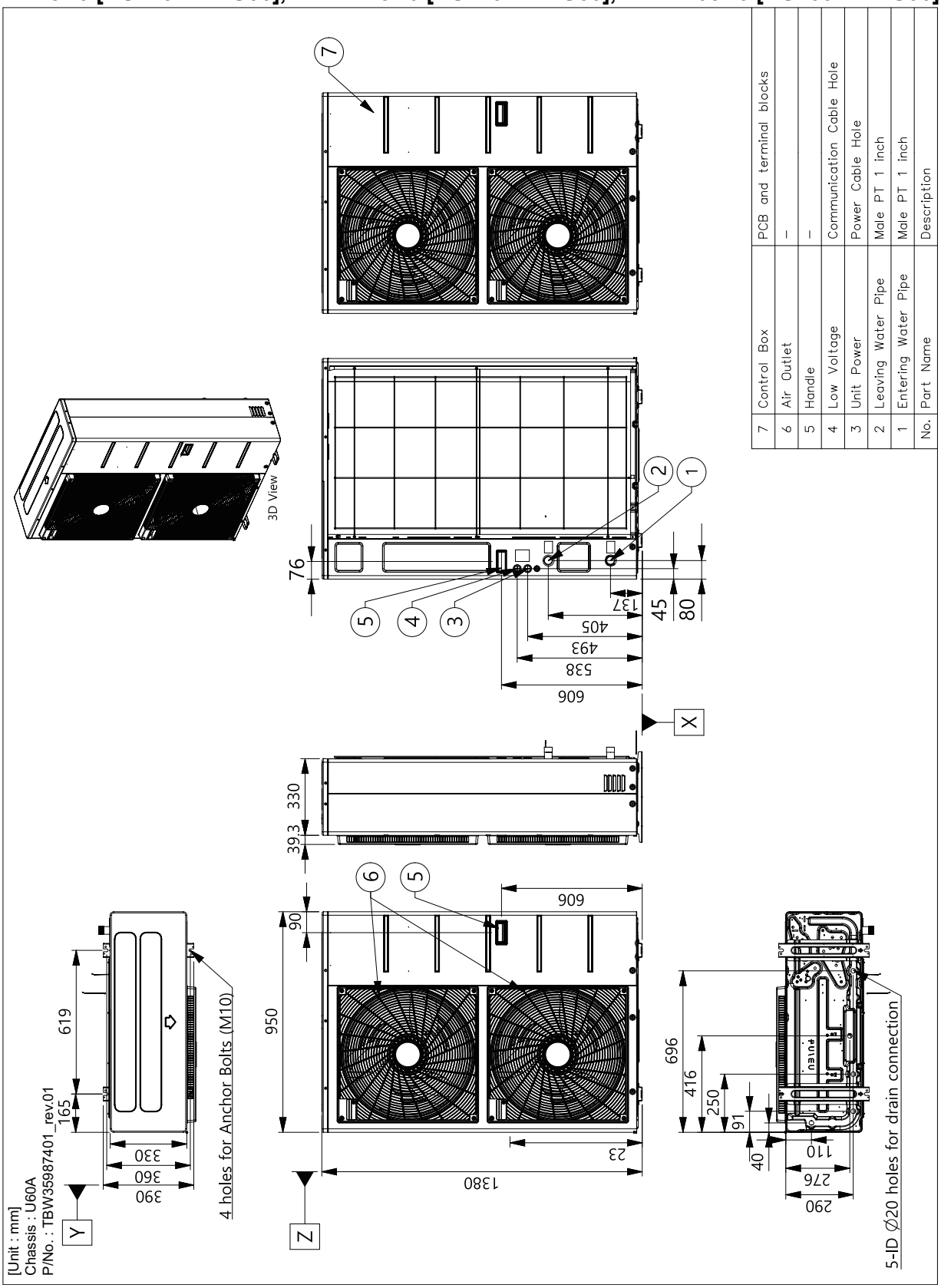
Outdoor Units				ZHBW128B0 [HU123MRB U30]	ZHBW148B0 [HU143MRB U30]	ZHBW168B0 [HU163MRB U30]
Operation Range (Outdoor Temp.)	Cooling	Min. ~ Max.	°C DB	5 ~ 48	5 ~ 48	5 ~ 48
	Heating	Min. ~ Max.	°C DB	-25 ~ 35	-25 ~ 35	-25 ~ 35
Compressor	Type		-	Hermetic Sealed Scroll		
	Model		Model × No.	RJB036MAA × 1		
	Motor Type		-	BLDC	BLDC	BLDC
	Displacement		cm³/Rev.	31.6	31.6	31.6
Refrigerant	Type		-	R32	R32	R32
	GWP (Global Warming Potential)		-	675.0	675.0	675.0
	Precharged Amount		g	2,100	2,100	2,100
	t-CO2 eq.		-	1.418	1.418	1.418
	Control		-	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Refrigerant Oil	Type		-	FW68D	FW68D	FW68D
	Charged Volume		cc × No.	1,100	1,100	1,100
Heat Exchanger	Type		-	Fin & Tube	Fin & Tube	Fin & Tube
	Quantity		-	2	2	2
	Specification	Row	EA	32	32	32
		Column	EA	2	2	2
		FPI	EA	14	14	14
Plate Heat Exchanger	Type		-	Brazed Plate HEX	Brazed Plate HEX	Brazed Plate HEX
	Quantity		-	1	1	1
	Number of Plate		EA	76	76	76
Piping Connections	Water Circuit	Inlet	mm(Inch)	Male PT 25.4(1)	Male PT 25.4(1)	Male PT 25.4(1)
		Outlet	mm(Inch)	Male PT 25.4(1)	Male PT 25.4(1)	Male PT 25.4(1)
Strainer	Mesh size		-	30 mesh	30 mesh	30 mesh
	Material		-	Stainless Steel	Stainless Steel	Stainless Steel
Fan	Type		-	Propeller	Propeller	Propeller
	Air Flow Rate	Rated	m³/min × No.	76.3 × 2	76.3 × 2	76.3 × 2
Fan Motor	Type		-	BLDC	BLDC	BLDC
	Output		W × No.	124 × 2	124 × 2	124 × 2
Sound Power Level	Heating	Max.	dB(A)	67	68	69
		Rated	dB(A)	61	62	63
		Low noise	dB(A)	60	60	60
Dimensions	Unit	W × H × D	mm	950 × 1,380 × 330	950 × 1,380 × 330	950 × 1,380 × 330
	Packed Unit	W × H × D	mm	1,140 × 1,462 × 461	1,140 × 1,462 × 461	1,140 × 1,462 × 461
Weight	Unit		kg	91.7	91.7	91.7
	Packed Unit		kg	104.7	104.7	104.7
Exterior	Color		-	Warm Gray	Warm Gray	Warm Gray
	RAL Code		-	RAL 7044	RAL 7044	RAL 7044

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 power level is measured on the rated condition in according with ISO 9614 standard. Therefore, these values can be increased owing to ambient conditions during operation.
4. Performances are based on the following conditions (It is according to EN14511) :
   - Interconnected Pipe Length is standard length and difference of Elevation (Outdoor ~ Indoor Unit) is 0m.
5. This product contains Fluorinated greenhouse gases.

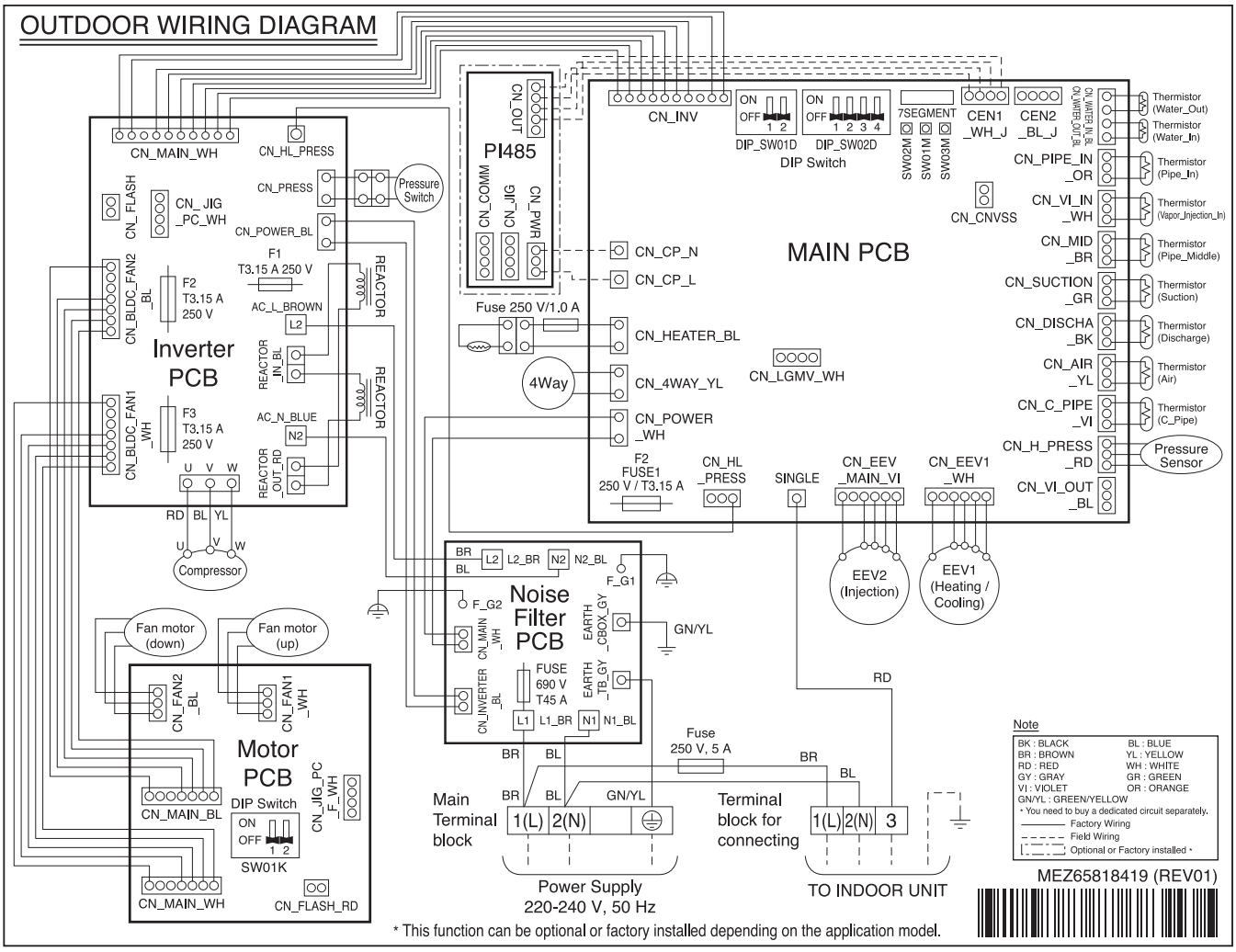
3. Dimensions

◆ ZHBW126B0 [HU121MRB U30],ZHBW146B0 [HU141MRB U30],ZHBW166B0 [HU161MRB U30], ZHBW128B0 [HU123MRB U30],ZHBW148B0 [HU143MRB U30],ZHBW168B0 [HU163MRB U30]



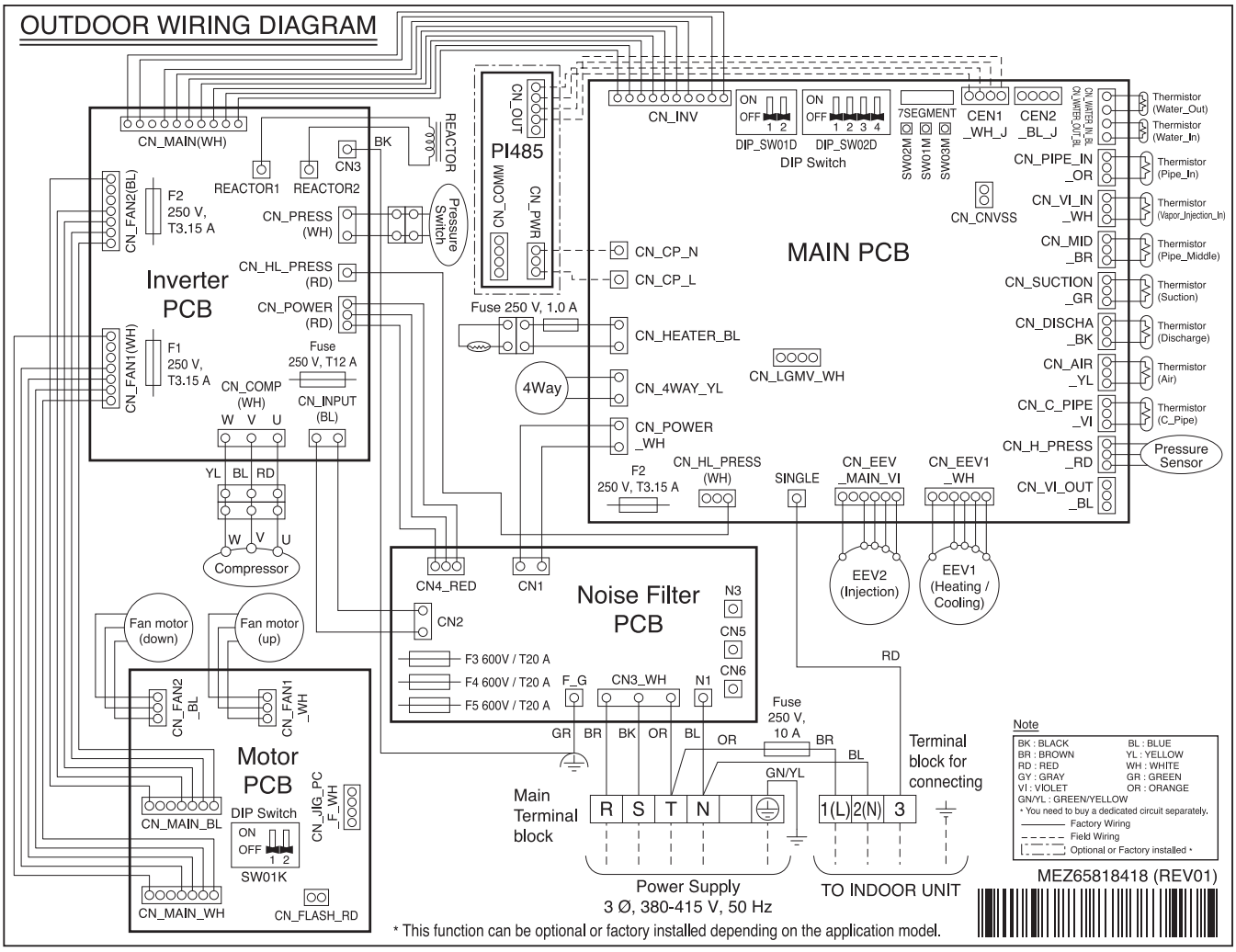
4. Wiring Diagram

◆ ZHBW126B0 [HU121MRB U30], ZHBW146B0 [HU141MRB U30], ZHBW166B0 [HU161MRB U30]



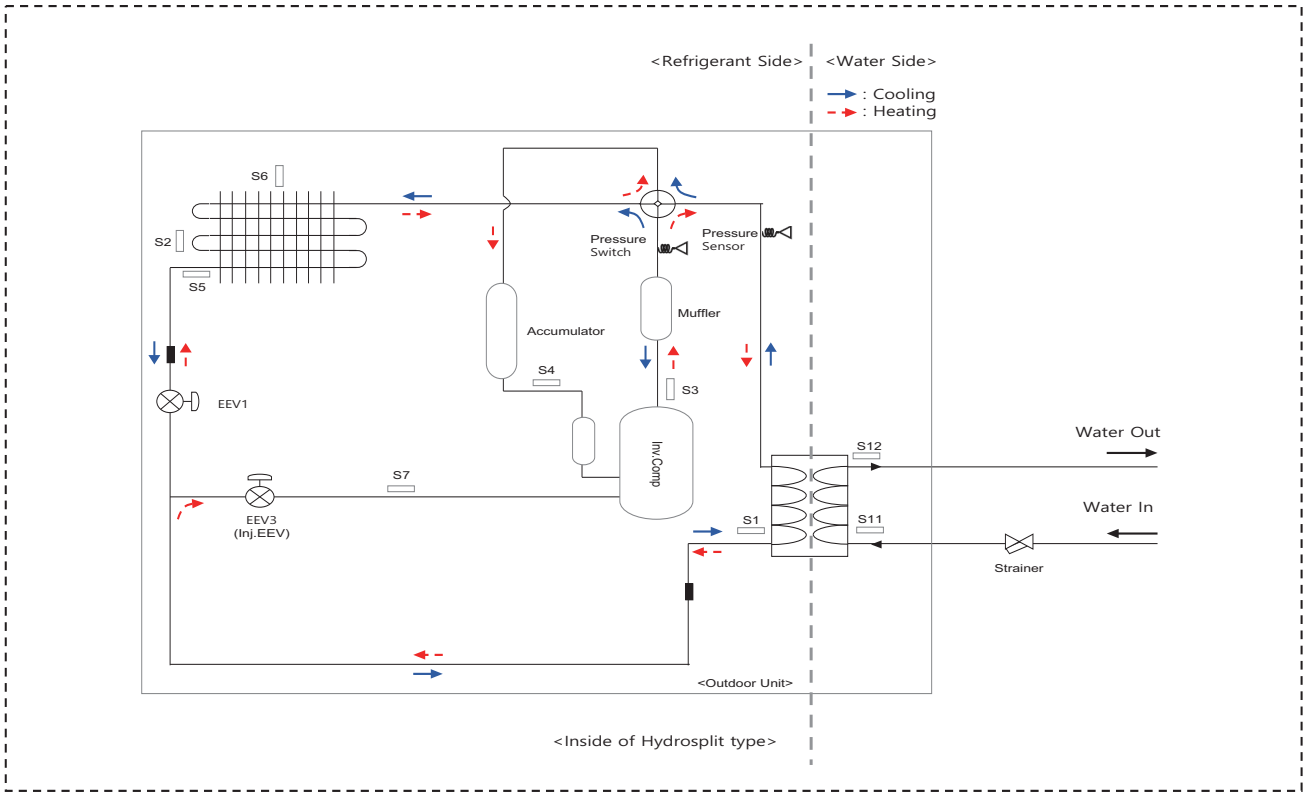
4. Wiring Diagram

◆ ZHBW128B0 [HU123MRB U30], ZHBW148B0 [HU143MRB U30], ZHBW168B0 [HU163MRB U30]



5. Piping Diagram

◆ ZHBW126B0 [HU121MRB U30], ZHBW146B0 [HU141MRB U30],ZHBW166B0 [HU161MRB U30], ZHBW128B0 [HU123MRB U30], ZHBW148B0 [HU143MRB U30], ZHBW168B0 [HU163MRB U30]



Category	Symbol	Meaning	PCB Connector
Refrigerant side	S1	PHEX liquid temperature sensor	CN_PIPE_IN
	S2	Outdoor-HEX middle temperature sensor	CN_MID
	S3	Compressor-discharge pipe temperature sensor	CN_DISCHARGE
	S4	Compressor-suction pipe temperature sensor	CN_SUCTION
	S5	Outdoor-HEX temperature sensor	CN_C_PIPE
	S6	Outdoor air temperature sensor	CN_AIR
	S7	Compressor-injection pipe temperature sensor	CN_VI_IN
	EEV1	Electronic Expansion Valve (Heating/Cooling)	CN_EEV1
	EEV2	Electronic Expansion Valve (Injection)	CN_EEV_MAIN
Water Side	S12	Outlet water temperature sensor	CN_WATER_OUT
	S11	Inlet water temperature sensor	CN_WATER_IN

6. Performance Data

6.1 Cooling Operation

■ Maximum Cooling Capacity

◆ ZHBW126B0 [HU121MRB U30] / ZHBW128B0 [HU123MRB U30]

Outdoor Temperature [°C DB]	Water flow rate 34.5 LPM													
	LWT 7 °C		LWT 10 °C		LWT 13 °C		LWT 15 °C		LWT 18 °C		LWT 20 °C		LWT 22 °C	
	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER
10	12.00	5.19	12.00	5.61	12.00	6.08	12.00	6.44	12.00	7.04	12.00	7.50	12.00	8.01
20	12.00	5.00	12.00	5.60	12.00	6.36	12.00	6.99	12.00	8.17	12.00	9.19	12.00	10.49
30	12.00	3.89	12.00	4.38	12.00	5.02	12.00	5.55	12.00	6.57	12.00	7.49	12.00	8.68
35	12.00	3.29	12.00	3.68	12.00	4.19	12.00	4.60	12.00	5.39	12.00	6.08	12.00	6.96
40	11.75	2.69	12.00	3.06	12.00	3.44	12.00	3.75	12.00	4.32	12.00	4.81	12.00	5.42
45	11.50	2.20	12.00	2.53	12.00	2.81	12.00	3.04	12.00	3.45	12.00	3.80	12.00	4.21

◆ ZHBW146B0 [HU141MRB U30] / ZHBW148B0 [HU143MRB U30]

Outdoor Temperature [°C DB]	Water flow rate 40.3 LPM													
	LWT 7 °C		LWT 10 °C		LWT 13 °C		LWT 15 °C		LWT 18 °C		LWT 20 °C		LWT 22 °C	
	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER
10	14.00	4.82	14.00	5.21	14.00	5.62	14.00	5.91	14.00	6.36	14.00	6.68	14.00	7.00
20	14.00	4.67	14.00	5.24	14.00	5.93	14.00	6.47	14.00	7.44	14.00	8.22	14.00	9.13
30	14.00	3.66	14.00	4.14	14.00	4.73	14.00	5.21	14.00	6.10	14.00	6.85	14.00	7.78
35	14.00	3.10	14.00	3.49	14.00	3.96	14.00	4.34	14.00	5.04	14.00	5.63	14.00	6.35
40	13.75	2.56	14.00	2.90	14.00	3.26	14.00	3.55	14.00	4.07	14.00	4.49	14.00	5.01
45	13.50	2.10	14.00	2.40	14.00	2.67	14.00	2.89	14.00	3.26	14.00	3.57	14.00	3.92

◆ ZHBW166B0 [HU161MRB U30] / ZHBW168B0 [HU163MRB U30]

Outdoor Temperature [°C DB]	Water flow rate 46.0 LPM													
	LWT 7 °C		LWT 10 °C		LWT 13 °C		LWT 15 °C		LWT 18 °C		LWT 20 °C		LWT 22 °C	
	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER	TC	EER
10	16.00	4.49	16.00	4.92	16.00	5.34	16.00	5.60	16.00	5.94	16.00	6.12	16.00	6.25
20	16.00	4.11	16.00	4.65	16.00	5.26	16.00	5.69	16.00	6.39	16.00	6.86	16.00	7.34
30	16.00	3.26	16.00	3.71	16.00	4.24	16.00	4.64	16.00	5.33	16.00	5.85	16.00	6.43
35	16.00	2.82	16.00	3.19	16.00	3.64	16.00	3.97	16.00	4.56	16.00	5.01	16.00	5.51
40	15.75	2.38	16.00	2.72	16.00	3.08	16.00	3.35	16.00	3.82	16.00	4.18	16.00	4.59
45	15.50	2.01	16.00	2.31	16.00	2.60	16.00	2.81	16.00	3.18	16.00	3.46	16.00	3.77

Note

1. DB : Dry bulb temperature(℃), LWT : Leaving water temperature(℃), LPM : Liter per minute (ℓ/min)
2. TC : Total capacity(kW), EER: Energy efficiency ratio(kW/kW), COP : Coefficient of performance (kW/kW)
3. Direct interpolation is permissible. Do not extrapolate.
4. Measuring procedure follows EN14511.
   - 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.
5. The Shaded areas are not guaranteed continuous operation.

6. Performance Data

6.2 Heating Operation

■ Maximum Heating Capacity (Include defrost effect)

◆ ZHBW126B0 [HU121MRB U30] / ZHBW128B0 [HU123MRB U30]

Outdoor Temperature [°C DB]	Water flow rate 34.5 LPM								Water flow rate 21.6LPM				Water flow rate 17.3 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	9.66	2.13	8.85	1.85	8.42	1.58	8.29	1.47								
-20	10.13	2.34	10.00	2.13	9.88	1.91	9.75	1.70	9.63	1.49						
-15	11.50	2.55	11.50	2.40	11.50	2.25	11.50	2.10	11.50	1.95	11.50	1.80				
-7	12.00	3.16	12.00	3.00	12.00	2.85	12.00	2.70	12.00	2.55	12.00	2.40	12.00	2.25		
-4	12.00	3.58	12.00	3.26	12.00	2.97	12.00	2.78	12.00	2.59	12.00	2.39	12.00	2.20	12.00	2.05
-2	12.00	3.80	12.00	3.45	12.00	3.14	12.00	2.90	12.00	2.77	12.00	2.53	12.00	2.34	12.00	2.15
2	12.00	4.42	12.00	3.86	12.00	3.46	12.00	3.16	12.00	2.93	12.00	2.73	12.00	2.54	12.00	2.35
7	12.00	5.25	12.00	5.04	12.00	4.28	12.00	3.93	12.00	3.60	12.00	3.10	12.00	2.82	12.00	2.60
10	12.00	5.58	12.00	5.29	12.00	4.62	12.00	4.17	12.00	3.83	12.00	3.46	12.00	3.10	12.00	2.75
15	12.00	6.49	12.00	5.89	12.00	5.26	12.00	4.90	12.00	4.35	12.00	3.87	12.00	3.45	12.00	3.09
18	12.00	6.94	12.00	6.30	12.00	5.60	12.00	5.33	12.00	4.71	12.00	4.18	12.00	3.72	12.00	3.32
20	12.00	7.23	12.00	6.56	12.00	5.93	12.00	5.38	12.00	4.96	12.00	4.38	12.00	3.89	12.00	3.47
35	12.00	8.50	12.00	7.87	12.00	7.22	12.00	6.90	12.00	6.20	12.00	5.25	12.00	4.94	12.00	4.54

◆ ZHBW146B0 [HU141MRB U30] / ZHBW148B0 [HU143MRB U30]

Outdoor Temperature [°C DB]	Water flow rate 40.3 LPM								Water flow rate 25.2 LPM				Water flow rate 20.1LPM			
	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	10.04	2.08	9.21	1.80	8.76	1.53	8.62	1.41								
-20	11.82	2.26	11.25	2.05	10.95	1.84	10.67	1.63	10.59	1.55						
-15	12.52	2.57	12.90	2.30	13.26	2.15	12.88	2.00	12.81	1.85	12.63	1.72				
-7	14.00	3.12	14.00	2.95	14.00	2.79	14.00	2.63	14.00	2.46	14.00	2.30	14.00	2.14		
-4	14.00	3.47	14.00	3.16	14.00	2.90	14.00	2.70	14.00	2.50	14.00	2.35	14.00	2.10	14.00	1.96
-2	14.00	3.68	14.00	3.34	14.00	3.04	14.00	2.82	14.00	2.68	14.00	2.43	14.00	2.24	14.00	2.05
2	14.00	4.26	14.00	3.72	14.00	3.34	14.00	3.04	14.00	2.83	14.00	2.63	14.00	2.44	14.00	2.25
7	14.00	5.09	14.00	4.89	14.00	4.17	14.00	3.85	14.00	3.50	14.00	3.10	14.00	2.82	14.00	2.51
10	14.00	5.42	14.00	4.94	14.00	4.48	14.00	4.17	14.00	3.83	14.00	3.38	14.00	3.03	14.00	2.73
15	14.00	6.30	14.00	5.72	14.00	5.13	14.00	4.90	14.00	4.35	14.00	3.87	14.00	3.45	14.00	3.09
18	14.00	6.74	14.00	6.12	14.00	5.43	14.00	5.33	14.00	4.71	14.00	4.18	14.00	3.72	14.00	3.32
20	14.00	7.02	14.00	6.37	14.00	5.76	14.00	5.38	14.00	4.96	14.00	4.38	14.00	3.89	14.00	3.47
35	14.00	8.24	14.00	7.64	14.00	7.00	14.00	6.90	14.00	6.20	14.00	5.25	14.00	4.94	14.00	4.54

◆ ZHBW166B0 [HU161MRB U30] / ZHBW168B0 [HU163MRB U30]

Outdoor Temperature [°C DB]	Water flow rate 46.0 LPM								Water flow rate 28.8 LPM				Water flow rate 23.0 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	10.98	1.96	10.00	1.70	9.50	1.44	9.33	1.36								
-20	13.43	2.34	12.54	2.18	12.03	2.08	11.78	1.60	11.47	1.56						
-15	14.23	2.70	14.39	2.26	14.50	2.17	13.95	1.92	13.86	1.78	13.12	1.65				
-7	16.00	3.05	16.00	2.80	16.00	2.64	16.00	2.48	16.00	2.31	16.00	2.15	16.00	1.99		
-4	16.00	3.36	16.00	3.07	16.00	2.80	16.00	2.59	16.00	2.40	16.00	2.20	16.00	2.05	16.00	1.82
-2	16.00	3.51	16.00	3.19	16.00	2.91	16.00	2.76	16.00	2.51	16.00	2.30	16.00	2.10	16.00	1.92
2	16.00	3.76	16.00	3.41	16.00	3.14	16.00	3.13	16.00	2.83	16.00	2.56	16.00	2.33	16.00	2.12
7	16.00	5.13	16.00	4.80	16.00	4.09	16.00	3.72	16.00	3.38	16.00	2.96	16.00	2.67	16.00	2.41
10	16.00	5.71	16.00	5.08	16.00	4.51	16.00	4.02	16.00	3.60	16.00	3.24	16.00	2.89	16.00	2.60
15	16.00	6.76	16.00	5.97	16.00	5.28	16.00	4.67	16.00	4.16	16.00	3.69	16.00	3.29	16.00	2.95
18	16.00	7.38	16.00	6.52	16.00	5.75	16.00	5.07	16.00	4.49	16.00	3.98	16.00	3.54	16.00	3.16
20	16.00	7.78	16.00	6.87	16.00	6.06	16.00	5.34	16.00	4.72	16.00	4.17	16.00	3.71	16.00	3.31
35	16.00	8.62	16.00	7.98	16.00	7.28	16.00	6.57	16.00	5.90	16.00	5.28	16.00	4.71	16.00	3.81

Note

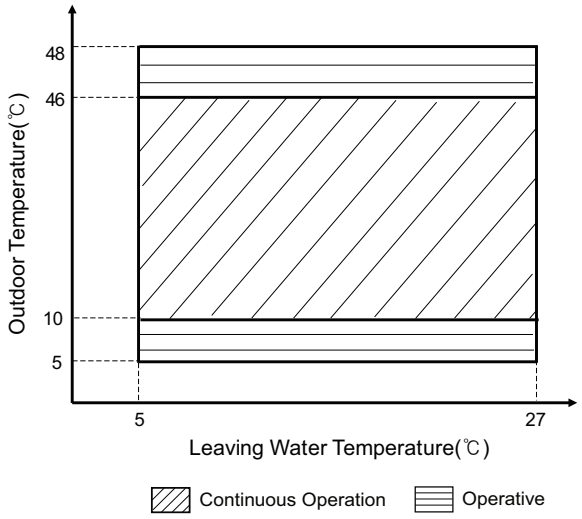
1. DB : Dry bulb temperature(℃), LWT : Leaving water temperature(℃), LPM : Liter per minute (ℓ/min)
2. TC : Total capacity(kW), EER: Energy efficiency ratio(kW/kW), COP : Coefficient of performance (kW/kW)
3. Direct interpolation is permissible. Do not extrapolate.
4. Measuring procedure follows EN14511.
   - 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.
5. The Shaded areas are not guaranteed continuous operation.

7. Operation Range

■ Cooling

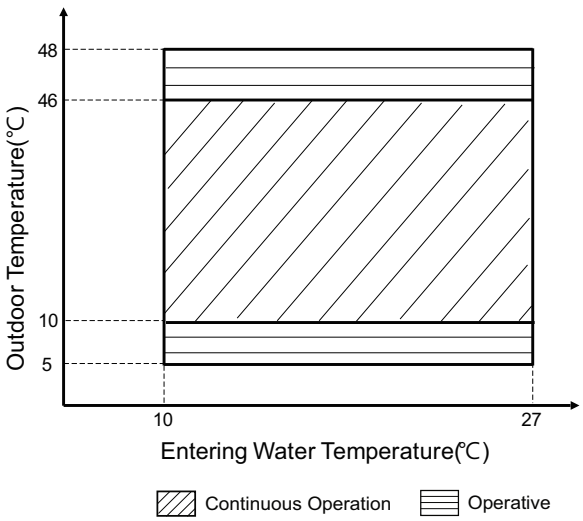
Cooling

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



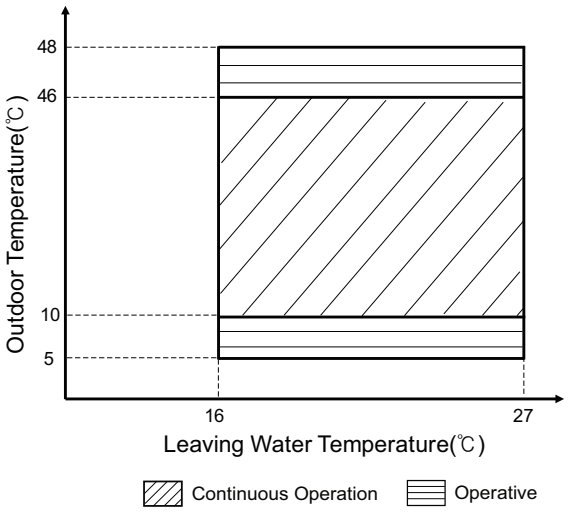
Cooling

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



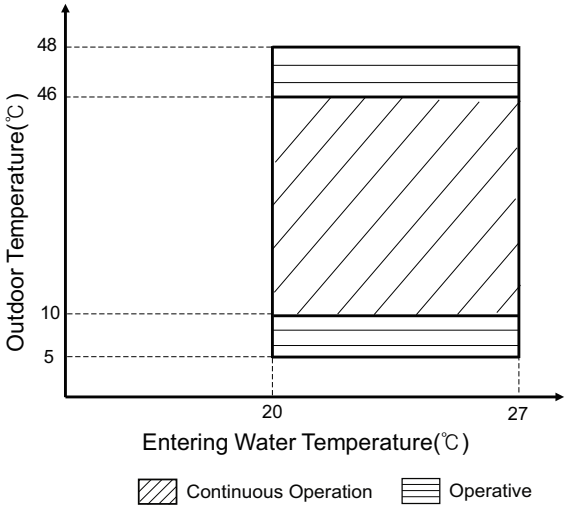
Cooling

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



Cooling

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

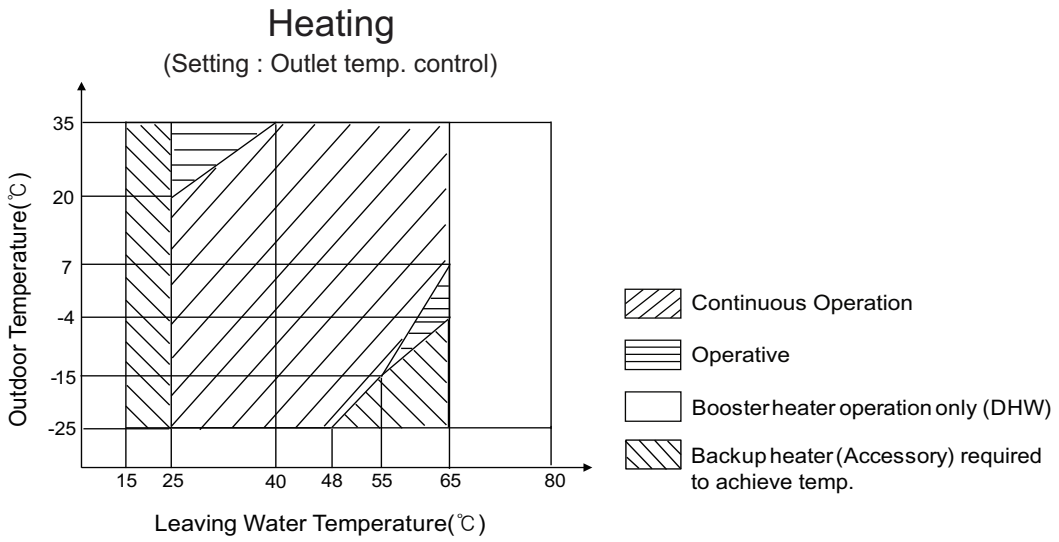


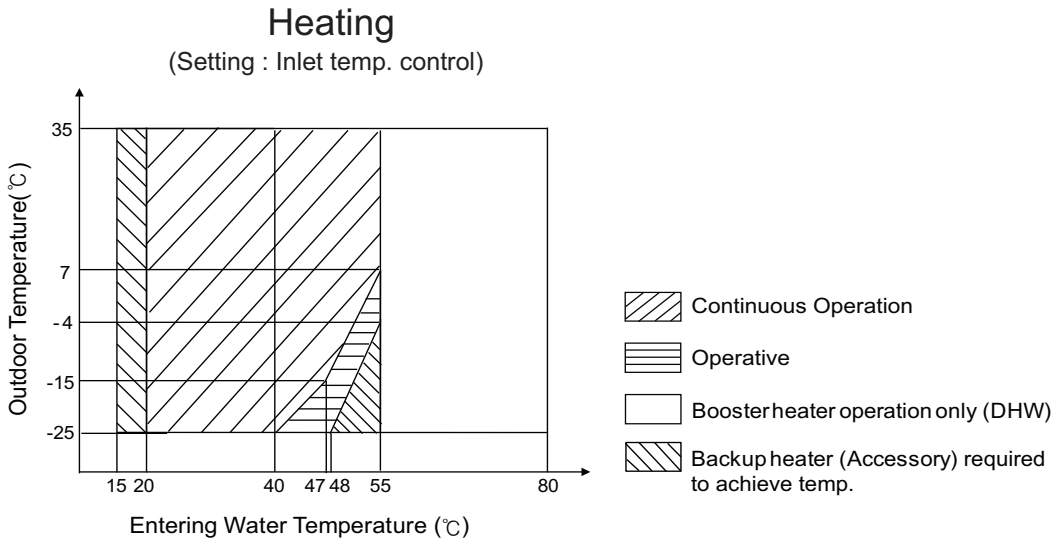
Note

- 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. 58 °C
- DHW operation with booster 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.**

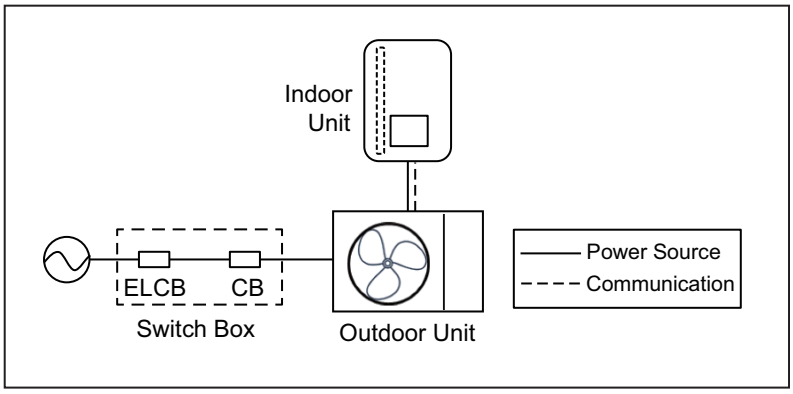
8. Electric characteristics

■ Hydro box type

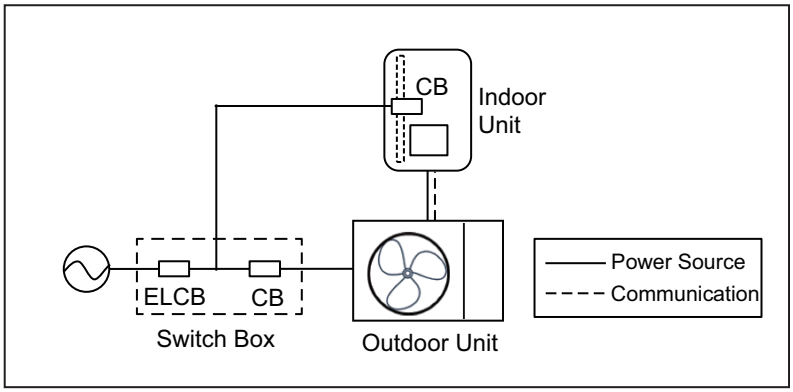
Model		
Indoor Unit	**Outdoor Unit**	**Phase / Volts / Hz**
ZHNW16C1 [HN1600MC NK1]	ZHBW126B0 [HU121MRB U30]	1Ø / 220-240V / 50Hz
	ZHBW146B0 [HU141MRB U30]	
	ZHBW166B0 [HU161MRB U30]	
	ZHBW128B0 [HU123MRB U30]	3 Ø / 380-415 V /50Hz
	ZHBW148B0 [HU143MRB U30]	
	ZHBW168B0 [HU163MRB U30]	

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

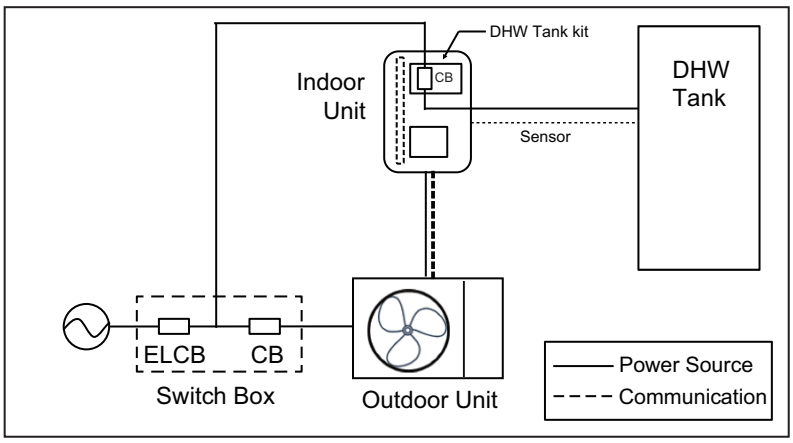
[Power Supply for Heat Pump]



[Power Supply for Backup Heater]



[Power Supply for DHW Boost Heater]



Note

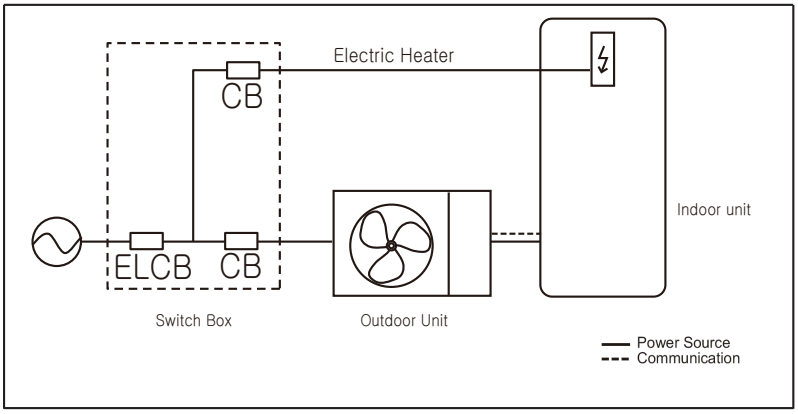
1. Voltage supplied to the unit terminals should be within the minimum and maximum range.
2. Maximum allowable voltage unbalance between phase is 2%.
3. All installation site must require attachment of an earth leakage breaker. [circuit breaker type is ELCB(Earth Leakage Circuit Breaker)].

8. Electric characteristics

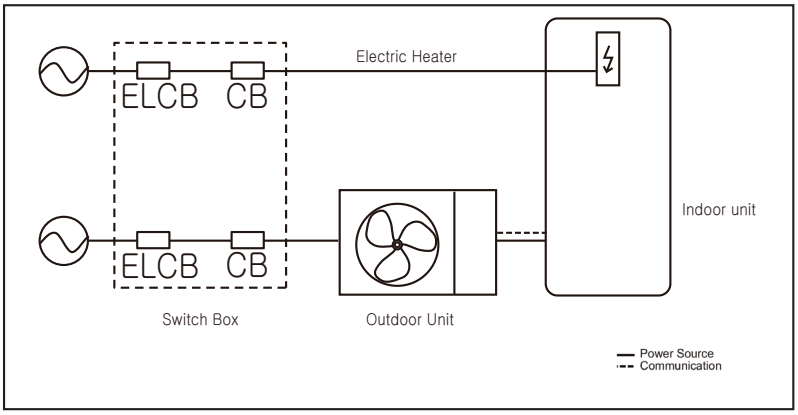
■ IWT Unit

Model			Built-In Electric Heater
Indoor Unit	**Outdoor Unit**	**Phase / Volts / Hz**	**Capacity(kW)***
ZHNW20606Y0 [HN1616Y NB1]	ZHBW126B0 [HU121MRB U30]	1 / 220-240V / 50Hz	1Ø 2 (2)
	ZHBW146B0 [HU141MRB U30]		
	ZHBW166B0 [HU161MRB U30]		1Ø 4 (2+2)
	ZHBW128B0 [HU123MRB U30]		
	ZHBW148B0 [HU143MRB U30]		3Ø 6 (2+2+2)
	ZHBW168B0 [HU163MRB U30]		

[Power Supply]
- When the electrical phase of outdoor unit and heater is same



[Power Supply]
- When the electrical phase of outdoor unit and heater is NOT same



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)].
4. *The capacity of Electrical Heater depend on the choice of the connection power.

9. Sound levels

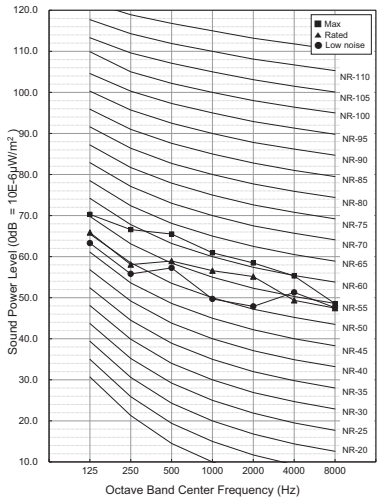
9.1 Sound power level

Note

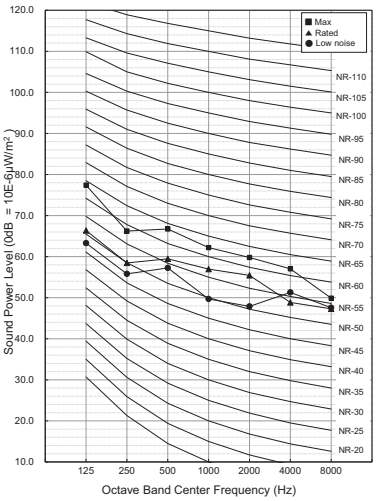
1. Data is valid at diffuse field condition.
2. Reference acoustic intensity 0dB = 10E-6μW/m^2
3. Sound power level is measured on the rated condition in the reverberation rooms. Refer to the Model Specifications for nominal conditions(Power source and Ambient temperature, etc)
4. Sound levels can be 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.
6. Sound power level is measured on the rated condition in accordance with ISO 9614 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.

Model	Sound Power Level [dB(A)]		
	Heating		
	Rated	Low Noise	Max
ZHBW126B0 [HU121MRB U30] ZHBW128B0 [HU123MRB U30]	61	60	67
ZHBW146B0 [HU141MRB U30] ZHBW148B0 [HU143MRB U30]	62	60	68
ZHBW166B0 [HU161MRB U30] ZHBW168B0 [HU163MRB U30]	63	60	69

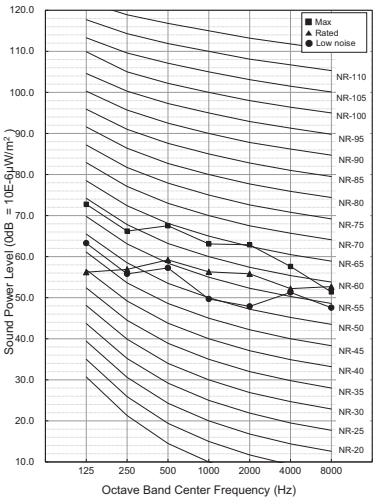
ZHBW126B0 [HU121MRB U30]
ZHBW128B0 [HU123MRB U30]



ZHBW146B0 [HU141MRB U30]
ZHBW148B0 [HU143MRB U30]



ZHBW166B0 [HU161MRB U30]
ZHBW168B0 [HU163MRB U30]



THERMA V™

Hydrosplit

Design and installation

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

1. 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

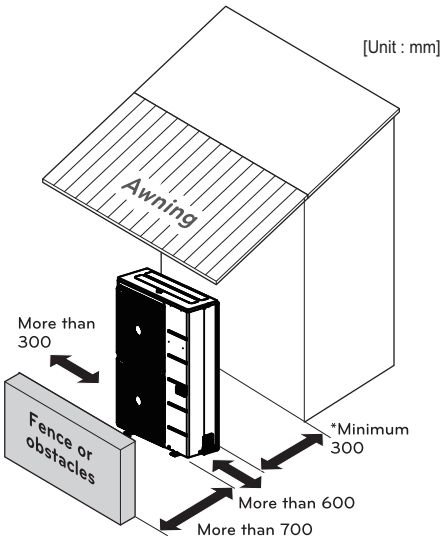
Select space for installing unit, which will meet the following conditions:

- 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

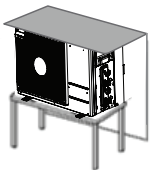
- If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
- Ensure that the spaces indicated by arrows around front, back and side of the unit.
- Do not place animals and plants in the path of the warm or cold air.
- Take the unit weight into account and select a place where noise and vibration are minimum.
- Select a place so that the air flow and noise from the unit do not disturb neighbors.
- Place that can sufficiently endure the weight and vibration of the outdoor unit and where even installation is possible.
- Place that has no direct influence of snow or rain.
- Place with no danger of extreme snowfall or icicle drop.
- Place without weak floor or base such as decrepit part of the building or with a lot of snow accumulation.



* Please secure the space, considering field installation of the shut-off valve and strainer.

3.2 Seasonal wind and cautions in winter

- Sufficient measures are required in a snow area or severe cold area in winter so that product can be operated well.
- Get ready for seasonal wind or snow in winter even in other areas.
- Install a suction and discharge duct not to let in snow or rain.
- Install the outdoor unit not to come in contact with snow directly. If snow piles up and freezes on the air suction hole, the system may malfunction. If it is installed at snowy area, attach the hood to the system.
- Install the outdoor unit at the higher installation console by 50cm than the average snowfall (annual average snowfall) if it is installed at the area with much snowfall.
- Where snow accumulated on the upper part of the Outdoor Unit by more than 10cm, always remove snow for operation.



Note

1. The height of H frame must be more than 2 times the snowfall and its width shall not exceed the width of the product. (If width of the frame is wider than that of the product, snow may accumulate)
2. Don't install the suction hole and discharge hole of the Outdoor Unit facing the seasonal wind.

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.
  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 °dH			
	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

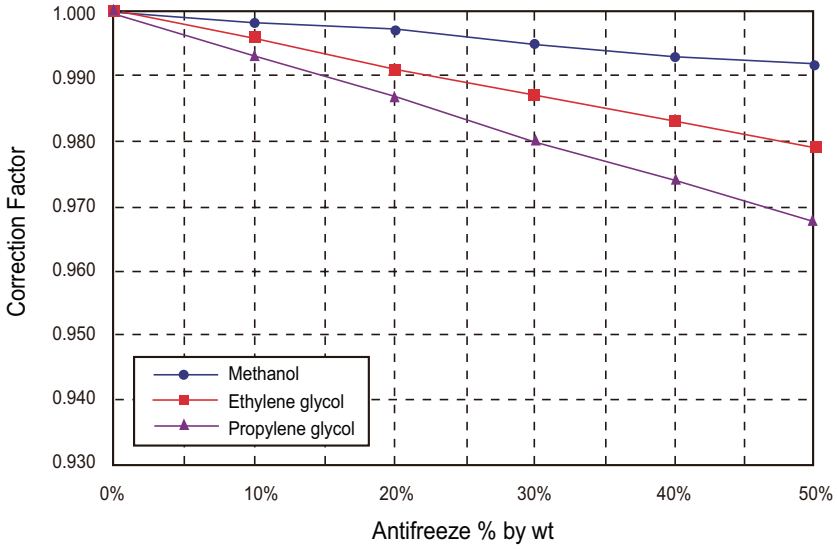
- Use only one of the above antifreeze.
- If a antifreeze is used, pressure drop and capability degradation of the system can be occurred.
- If one of antifreezes is used, corrosion can be occurred. So please add corrosion inhibitor.
- Please check the concentration of the antifreeze periodically to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

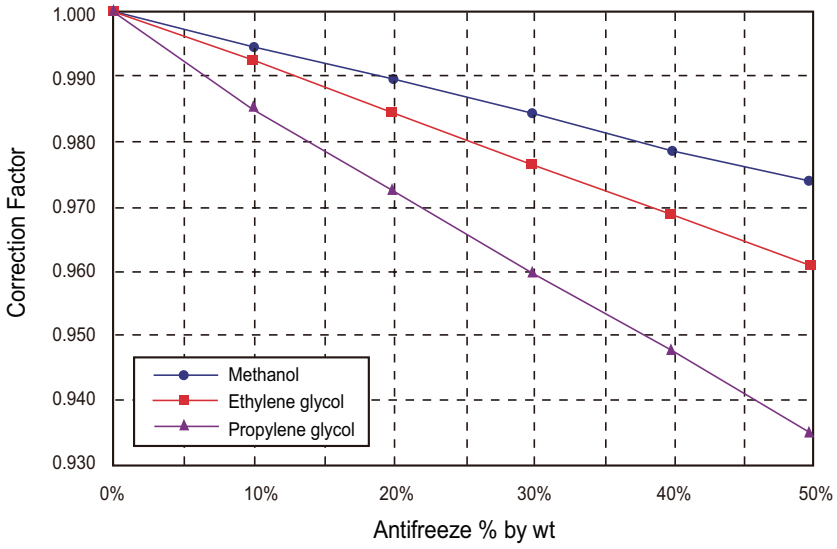
4.3 Capacity correction factor by antifreeze

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



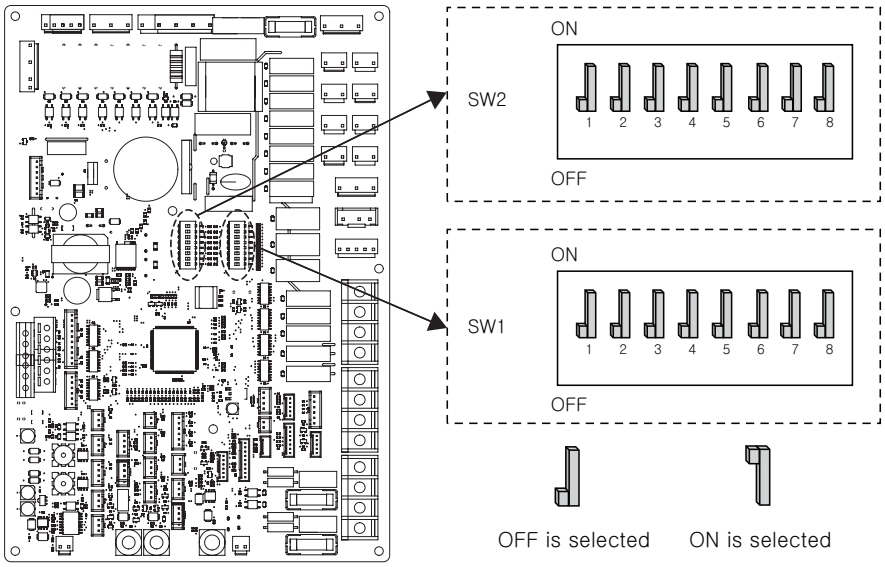
5. Dip Switch Setting

5.1 Information

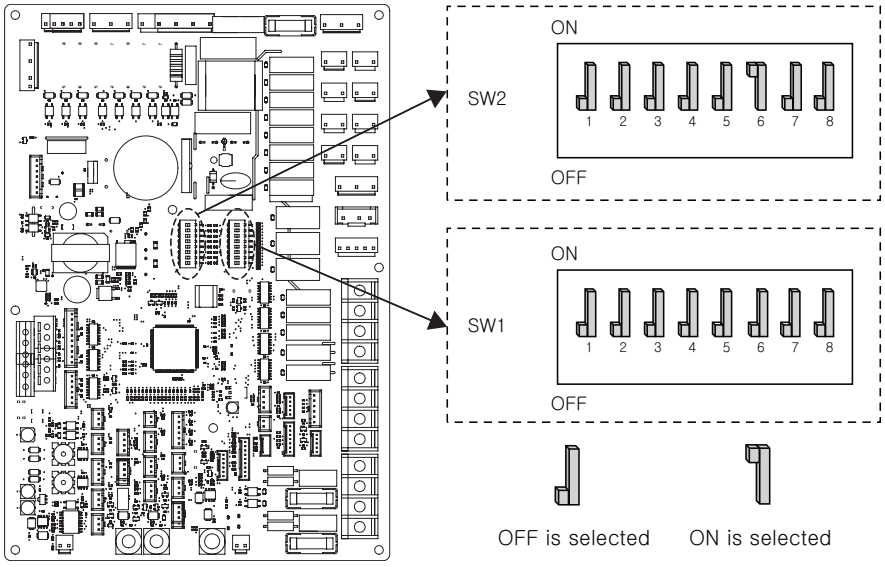
Turn off electric power supply before setting DIP switch

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

■ Indoor PCB (For Hydro box type)



■ Indoor PCB (For IWT type)



5. Dip Switch Setting

◆ Dip switch SW1

Description	Setting		Default
MODBUS Communication Type	1	As Master (LG extension modules)	1
	1	As Slave (3rd party controller)	
MODBUS Function	2	REGINE	2
	2	Unified Open Protocol	
ANTIFREEZE	8	Antifreeze agent is not used	8
	8	Antifreeze agent in used*	

Note

*Possibility to allow colder water temperature by setting.

Bridge at CN_ANTI_SW on Hydro_PCB must be dis-connected to enable setting.

◆ Dip switch SW2 (For Hydro box Type)

Description	Setting		Default
Group Control	1	As Master	1
	1	As Slave	
Accessory installation information	2 3	Heat pumpe is installed (Heating(Cooling) circuit only)	2 3
	2 3	Heat Pump + DHW tank is installed	
	2 3	Heat Pump + DHW tank + Solar thermal system is installed	
Cycle	4	Heating Only	4
	4	Heating & Cooling	
Room Air Sensor	5	Room Air Sensor is not installed	5
	5	Room Air Sensor is installed	
Selecting backup heater capacity	6 7	Backup heater is not used	6 7
	6 7	Full capacity is used	
	6 7	Backup heater is not used	
	6 7	Backup heater is not used	
Thermostat installation information	8	Thermostat is NOT installed	8
	8	Thermostat is installed	

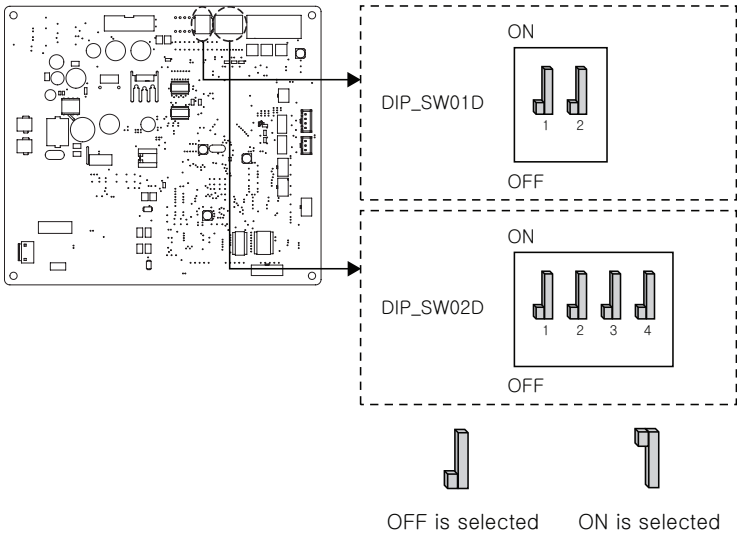
5. Dip Switch Setting

◆ Dip switch SW2 (For IWT Type)

Description	Setting		Default
Group Control	1	As Master	1
	1	As Slave	
Accessory installation information	2 3	DHW intergrated indoor unit + Outdoor unit is installed	2 3
	2 3		
	2 3		
Cycle	4	Heating Only	4
	4	Heating & Cooling	
Room Air Sensor	5	Room Air Sensor is not installed	5
	5	Room Air Sensor is installed	
Selecting backup heater capacity	6 7	Electric heater is not used	6 7
	6 7	Electric heater is used	
Thermostat installation information	8	Thermostat is NOT installed	8
	8	Thermostat is installed	

5. Dip Switch Setting

■ Outdoor Unit Main PCB



◆ Dip switch SW1

Description	Setting	Default
Low Noise Mode	2 Always mode : Maintain Low noise mode for target temperature	2
	2 Parial mode : Escape Low noise mode for target temperature	

◆ Dip switch SW2

Description	Setting	Default
Peak Control	1 2 Max Mode	1 2
	1 2 Peak Control Step 1 : To limit maximum current (Power saving)	
	1 2 Peak Control Step 2 : To limit maximum current (Super Power saving)	

- Only the switch in the table has a function.
- When setting the Partial 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.
The specifications, designs, and information in this brochure are subject to change without notice.