



CONFIDENTIAL

THERMA VTM

AIR-TO-WATER HEAT PUMP

SERVICE MANUAL

(Exploded View)

CAUTION

Before Servicing the unit, read the safety precautions in General SVC manual.
Only for authorized service personnel.

TABLE OF CONTENTS

| | |
|----------------------------|----|
| 1. Model Information | 3 |
| 2. Specification | 6 |
| 3. Functions..... | 11 |
| 4. Components..... | 13 |
| 5. Cycle Diagrams | 17 |
| 6. Piping Diagrams | 18 |
| 7. Wiring Diagrams | 20 |
| 8. Exploded View | 24 |

1. Model Information

With advanced inverter technology, **THERMA V™** is suitable for applications like under floor heating, under floor cooling, and hot water generation. By Interfacing to various accessories user can customize the range of the application.

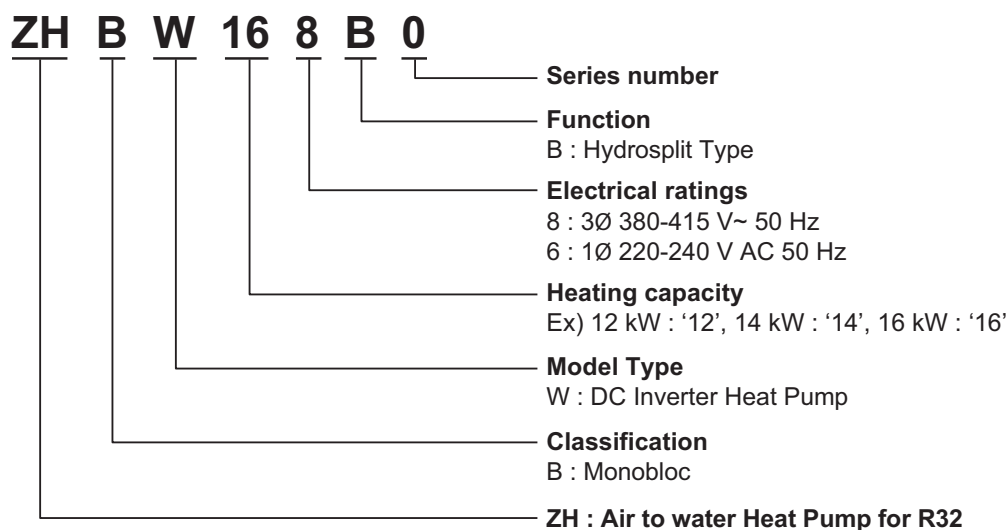
In this chapter, general information of **THERMA V™** is presented to identify the installation procedure. Before beginning installation, read this chapter carefully and find helpful information on installation.

1. Model Information

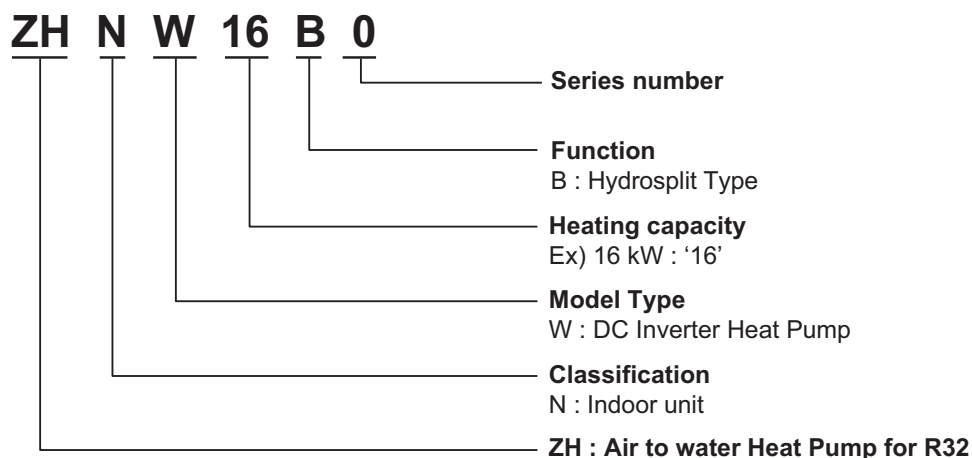
Model number nomenclature

Factory Model Name

Outdoor Unit



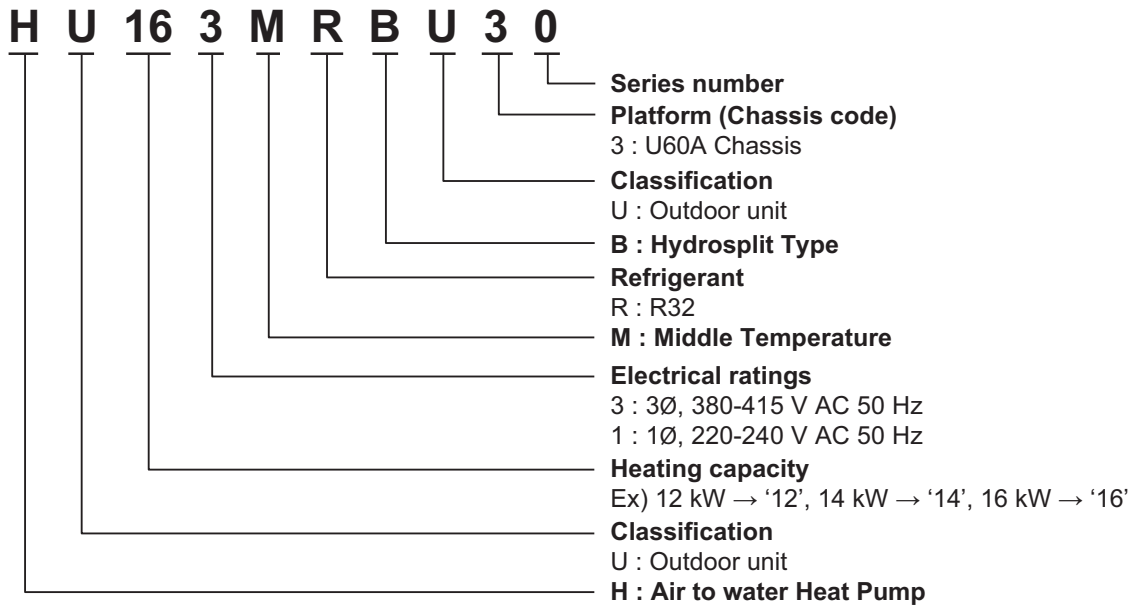
Indoor Unit



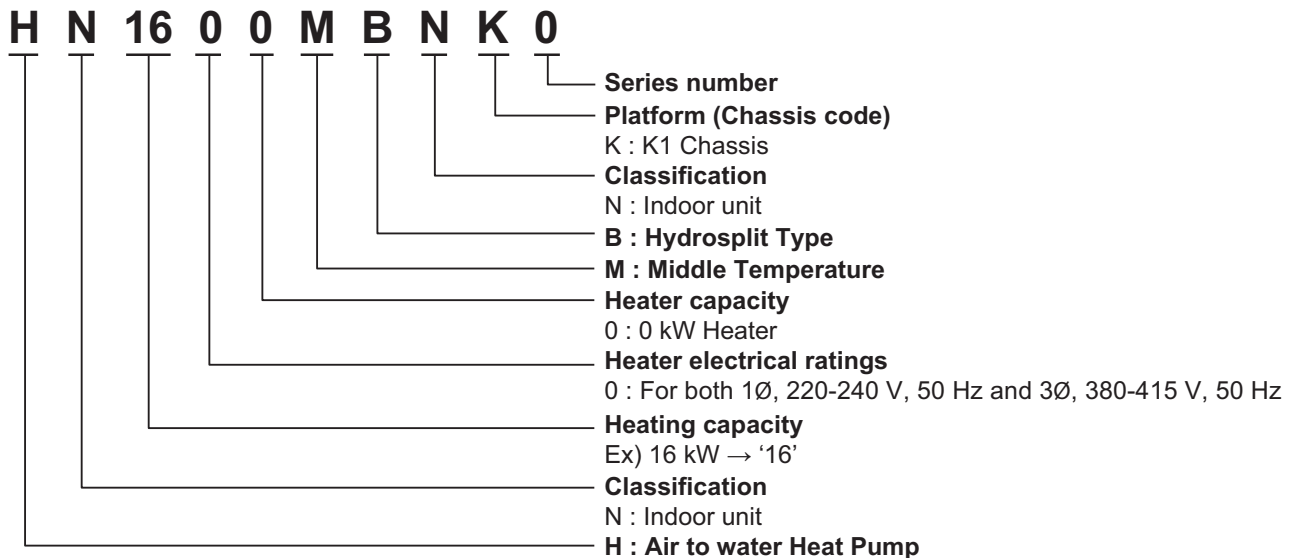
- Additional Information : Serial number is refer to the barcode on the product.
- Max allowable pressure High side / Low side : 4.32 MPa / 2.4 MPa
- Refrigerant : R32

Buyer Model Name

Outdoor Unit



Indoor Unit



- Additional Information : Serial number is refer to the barcode on the product.
- Max allowable pressure High side / Low side : 4.32 MPa / 2.4 MPa
- Refrigerant : R32

Model name and related information

| Model Name | | Capacity | | Power Source (Unit) |
|------------|----------|---------------|---------------|---------------------|
| Phase | Capacity | Heating(kW)*1 | Cooling(kW)*2 | |
| 1Ø | 12 kW | 12 | 12 | 220~240 V~ 50 Hz |
| | 14 kW | 14 | 14 | |
| | 16 kW | 16 | 16 | |
| 3Ø | 12 kW | 12 | 12 | 380-415 V~ 50 Hz |
| | 14 kW | 14 | 14 | |
| | 16 kW | 16 | 16 | |

*1 : tested under EN 14511 Heating condition

(water out temperature 35°C at outdoor ambient temperature 7°C / 6°C)

*2 : tested under EN 14511 Cooling condition

(water out temperature 18°C at outdoor ambient temperature 35°C / 24°C)

※ All appliances were tested at atmospheric pressure (1atm).

2. Specification

Indoor

| Indoor Unit | | | | ZHNW16B0 [HN1600MB NK0] | |
|--|------------------------------|---|-------------|---------------------------------------|-----------------|
| Operation Range (Leaving Water Temp.) | 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 Pumping Performance | | - | Variable capacity 10% to 100% | |
| | Power input | Min. ~ Max. | W | 3.5 ~ 140 | |
| Flow Sensor | Type | | - | Vortex | |
| | Model | | - | SIKA VVX20 | |
| | Measuring Range | | Min. ~ Max. | 5 ~ 80 | |
| | Flow(Trigger point) | | Min. ~ Max. | 15 | |
| Water Pressure Sensor | Model | | - | Sensata OFM(2HMP) | |
| | Measuring Range | Min. ~ Max. | MPa(G) | 0 ~ 2 | |
| Expansion Vessel | Volume | Max. | ~ | 8 | |
| | Water pressure | Max. | bar | 3 | |
| | | 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 | mm(inch) | Male PT 25.4(1) | |
| | | Outlet | mm(inch) | Male PT 25.4(1) | |
| Wiring Connections | | Communication Cable (H07RN-F) (included Earth) | mm² × cores | 0.75 x 4 | |
| Sound Power Level | | Heating | Rated | dB(A) | 44 |
| Dimensions | | Net | W × H × D | mm | 490 × 850 × 315 |
| | | Shipping | W × H × D | mm | 563 ×1082 × 375 |
| Weight | | Net | | kg | 30.3 |
| | | Shipping | | kg | 34.3 |

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.

Outdoor (1Ø)

| Nominal Capacity and Nominal Input | | | | | ZHBW126B0 [HU121MRB U30] | ZHBW146B0 [HU141MRB U30] | ZHBW166B0 [HU161MRB U30] |
|--------------------------------------|---------|-------------------------------|-----------------------------|-----|-----------------------------|-----------------------------|-----------------------------|
| - | - | Outdoor Temp. (°C) DB / WB | Leaving Water Temp. (°C) | - | | | |
| Capacity | Cooling | 35 / 24 | 18 | kW | 12.00 | 14.00 | 16.00 |
| | | | 7 | kW | 12.00 | 14.00 | 16.00 |
| | Heating | 7 / 6 | 35 | kW | 12.00 | 14.00 | 16.00 |
| | | | 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 |
| | | | 7 | kW | 4.44 | 5.38 | 6.40 |
| | Heating | 7 / 6 | 35 | kW | 2.38 | 2.86 | 3.33 |
| | | | 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 |
| | | | 7 | W/W | 2.70 | 2.60 | 2.50 |
| COP | Heating | 7 / 6 | 35 | W/W | 5.04 | 4.89 | 4.80 |
| | | | 55 | W/W | 2.90 | 2.85 | 2.80 |
| | | 2 / 1 | 35 | W/W | 3.65 | 3.63 | 3.60 |
| SCOP (Low temp. Average Climate) | | | | | 4.60 | 4.57 | 4.55 |
| SCOP (High temp. Average Climate) | | | | | 3.50 | 3.47 | 3.45 |
| Rated Water Flow Rate (at LWT 35 °C) | | | | LPM | 34.5 | 40.3 | 46.0 |

| Electrical Specifications | | | 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 | A | 23.0 | 24.0 | 25.0 |
| | Heating | A | 23.0 | 24.0 | 25.0 |
| Rated Running Current | Cooling | A | 11.2 | 14.4 | 17.8 |
| | Heating | A | 10.6 | 12.7 | 14.8 |
| Circuit Breaker | | A | 40.0 | 40.0 | 40.0 |
| Wiring Connections | Power Supply Cable (included Earth, H07RN-F) | mm ² × cores | 6.0 × 3 | 6.0 × 3 | 6.0 × 3 |

| Technical Specifications | | | | ZHBW126B0 [HU121MRB U30] | ZHBW146B0 [HU141MRB U30] | ZHBW166B0 [HU161MRB U30] |
|--------------------------|----------|-----------|-------|-----------------------------|-----------------------------|-----------------------------|
| Sound Power Level | Heating | Max. | dB(A) | 67 | 68 | 69 |
| | | Rated | dB(A) | 61 | 62 | 63 |
| | | Silent | dB(A) | 60 | 60 | 60 |
| Dimensions | Net | W × H × D | mm | 950 × 1,380 × 330 | 950 × 1,380 × 330 | 950 × 1,380 × 330 |
| | Shipping | W × H × D | mm | 1,140 × 1,462 × 461 | 1,140 × 1,462 × 461 | 1,140 × 1,462 × 461 |
| Weight | Net | | kg | 91.7 | 91.7 | 91.7 |
| | Shipping | | kg | 104.7 | 104.7 | 104.7 |

| 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 | Hermetic Sealed Scroll | Hermetic Sealed Scroll |
| | Model | | Model × No. | RJB036MAA × 1 | RJB036MAA × 1 | 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) | | - | 675.0 | 675.0 | 675.0 |
| | Precharged Amount | | g | 2,100 | 2,100 | 2,100 |
| | t-CO ₂ 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 | 2 | 2 | 2 |
| | | Column | EA | 32 | 32 | 32 |
| | | 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 |
| 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 | m ³ /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 |

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.

Outdoor (3Ø)

| Nominal Capacity and Nominal Input | | | | | ZHBW128B0 [HU123MRB U30] | ZHBW148B0 [HU143MRB U30] | ZHBW168B0 [HU163MRB U30] |
|--------------------------------------|---------|-------------------------------|-----------------------------|-----|-----------------------------|-----------------------------|-----------------------------|
| - | - | Outdoor Temp. (°C) DB / WB | Leaving Water Temp. (°C) | - | | | |
| Capacity | Cooling | 35 / 24 | 18 | kW | 12.00 | 14.00 | 16.00 |
| | | | 7 | kW | 12.00 | 14.00 | 16.00 |
| | Heating | 7 / 6 | 35 | kW | 12.00 | 14.00 | 16.00 |
| | | | 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 |
| | | | 7 | kW | 4.44 | 5.38 | 6.40 |
| | Heating | 7 / 6 | 35 | kW | 2.38 | 2.86 | 3.33 |
| | | | 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 |
| | | | 7 | W/W | 2.70 | 2.60 | 2.50 |
| COP | Heating | 7 / 6 | 35 | W/W | 5.04 | 4.89 | 4.80 |
| | | | 55 | W/W | 2.90 | 2.85 | 2.80 |
| | | 2 / 1 | 35 | W/W | 3.65 | 3.63 | 3.60 |
| SCOP (Low temp. Average Climate) | | | | | 4.60 | 4.57 | 4.55 |
| SCOP (High temp. Average Climate) | | | | | 3.50 | 3.47 | 3.45 |
| Rated Water Flow Rate (at LWT 35 °C) | | | | LPM | 34.5 | 40.3 | 46.0 |

| Electrical Specifications | | | 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 | A | 8.0 | 9.0 | 10.0 |
| | Heating | A | 8.0 | 9.0 | 10.0 |
| Rated Running Current | Cooling | A | 3.7 | 4.8 | 5.9 |
| | Heating | A | 3.5 | 4.2 | 4.9 |
| Circuit Breaker | | A | 16.0 | 16.0 | 16.0 |
| Wiring Connections | Power Supply Cable (included Earth, H07RN-F) | mm ² × cores | 2.5 × 5 | 2.5 × 5 | 2.5 × 5 |

| Technical Specifications | | | | ZHBW128B0 [HU123MRB U30] | ZHBW148B0 [HU143MRB U30] | ZHBW168B0 [HU163MRB U30] |
|--------------------------|----------|-----------|-------|-----------------------------|-----------------------------|-----------------------------|
| Sound Power Level | Heating | Max. | dB(A) | 67 | 68 | 69 |
| | | Rated | dB(A) | 61 | 62 | 63 |
| | | Silent | dB(A) | 60 | 60 | 60 |
| Dimensions | Net | W × H × D | mm | 950 × 1,380 × 330 | 950 × 1,380 × 330 | 950 × 1,380 × 330 |
| | Shipping | W × H × D | mm | 1,140 × 1,462 × 461 | 1,140 × 1,462 × 461 | 1,140 × 1,462 × 461 |
| Weight | Net | | kg | 91.7 | 91.7 | 91.7 |
| | Shipping | | kg | 104.7 | 104.7 | 104.7 |

Specification

| 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 | Hermetic Sealed Scroll | Hermetic Sealed Scroll |
| | Model | | Model × No. | RJB036MAA × 1 | RJB036MAA × 1 | 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) | | - | 675.0 | 675.0 | 675.0 |
| | Precharged Amount | | g | 2,100 | 2,100 | 2,100 |
| | t-CO ₂ 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 | 2 | 2 | 2 |
| | | Column | EA | 32 | 32 | 32 |
| | | 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 |
| 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 | m ³ /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 |

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.
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4. Performances are based on the following conditions :
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 - 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. Functions

Basic functions of Unit

Note

1. O : Applied, X : Not applied

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

Indoor Unit

| Category | Functions | ZHNW16B0 [HN1600MB NK0] |
|----------------------------------|--|-------------------------|
| 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 (Accessory) |
| 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 |
| | Integrated Dry Contact (CN-EXT) | O |
| | Water flow control | O |
| | Water pressure sensor | O |

Outdoor 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 | O | O |
| Convenience | Test function | X | X |
| | Wiring Error Check | X | X |
| | Peak Control | O | O |
| | Mode Lock | O | O |
| | Low noise operation | O | O |
| | Forced Cooling Operation (Outdoor Unit) | X | X |
| | Base Pan Heater | O | O |
| Network function | Network solution(LGAP) | O (Accessory) | O (Accessory) |

Accessory Compatibility List

Indoor unit

| Category | | Product | Remark | ZHNBW16B0 [HN1600MB NK0] |
|-------------------------|--|----------------------|--|-----------------------------|
| 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 |
| | | PDRYCB300 | 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 |
| | Meter Interface Module | PENKTH000 | Interface between IDU and Meter | O |
| | 2 Zone Valve Controller | PZNVVB200 | - | O |
| | Cover plate | PDC-HK10 | For K1 Chassis only | 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 |
| | | PHLTA | For Split | O |
| | DHW tank kit | PHLTB | For Monobloc | X |
| | | PHRSTA0 | included in PHLTA kit | O |
| | Mixing Valve | OSHA-MV | 3/4" DN20 | O |
| | | OSHA-MV1 | 1" DN20 | O |
| | Backup heater | AHEH066B [HA061B E1] | 220~240 V, 1Ø | O |
| | | AHEH068B [HA063B E1] | 380~415 V, 3Ø | O |
| | 3way valve | OSHA-3V | - | O |
| | Solar thermal kit | PHLLA | - | O |
| | Thermistor for 2nd Circuit or E/Heater | PRSTAT5K10 | - | O |
| | Drain pan | PHDPB | - | X |
| | | PHDPC | - | O |

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

Outdoor unit

| 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 |

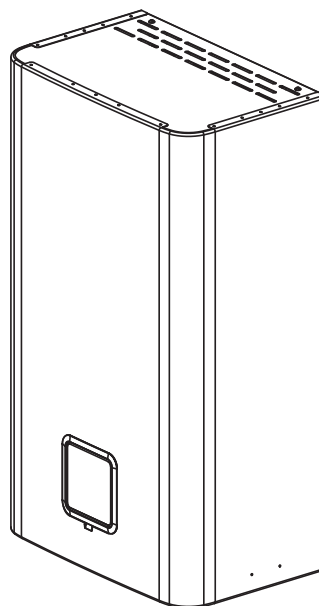
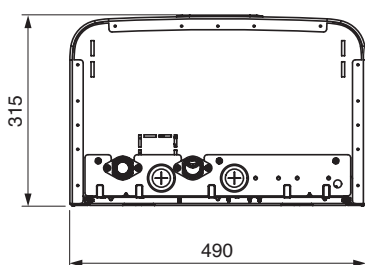
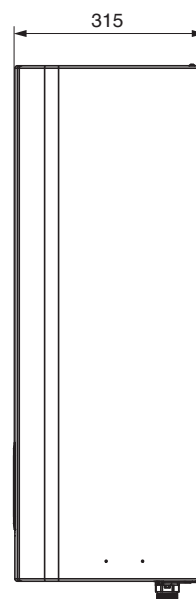
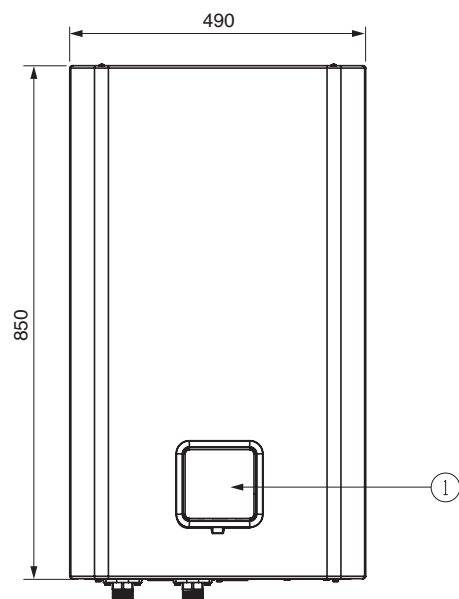
Note :

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))

4. Components

Indoor unit : External

(unit : mm)

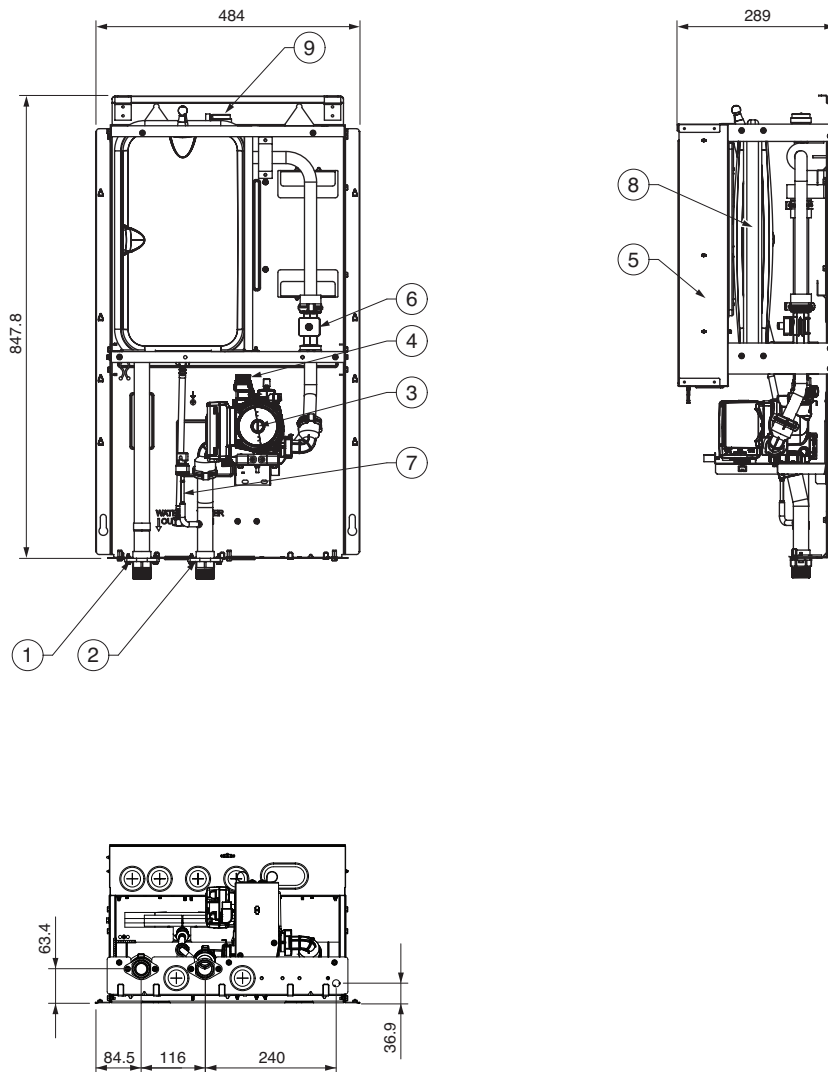


Description

| No | Name | Remark |
|----|---------------|----------------------------|
| 1 | Control Panel | Built-in Remote Controller |

Indoor unit : Internal

(unit : mm)

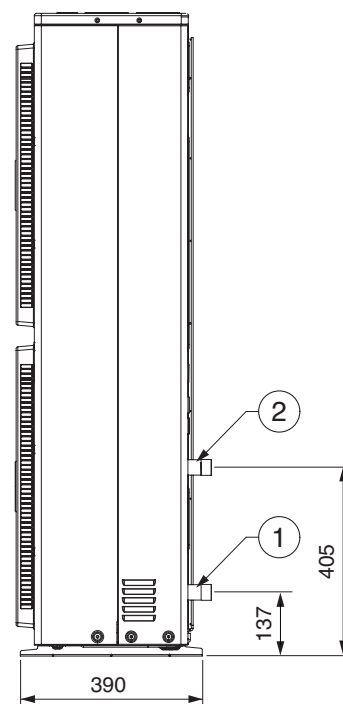
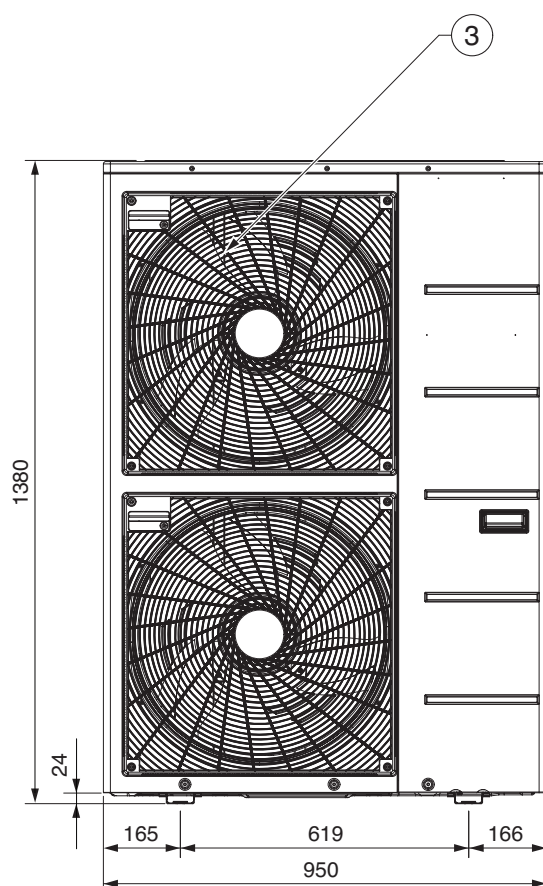
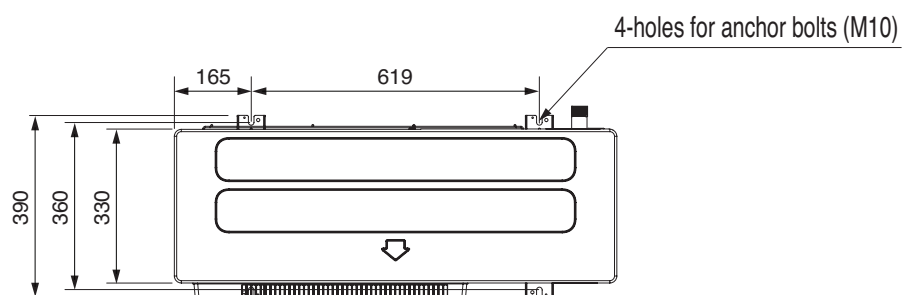


Description

| No | Name | Remark |
|----|---------------------|---|
| 1 | Leaving Water Pipe | Male PT 1 inch |
| 2 | Entering Water Pipe | Male PT 1 inch |
| 3 | Water Pump | Circulating the water |
| 4 | Safety Valve | Open at water pressure 3 bar |
| 5 | Control Box | PCB and terminal blocks |
| 6 | Flow Sensor | Range : 5 ~ 80 L/min |
| 7 | Pressure Sensor | Indicates circulating water pressure |
| 8 | Expansion Tank | Absorbing Volume change of heated water |
| 9 | Air Vent | Air Pumping when Charging water |

Outdoor unit : External

(unit : mm)

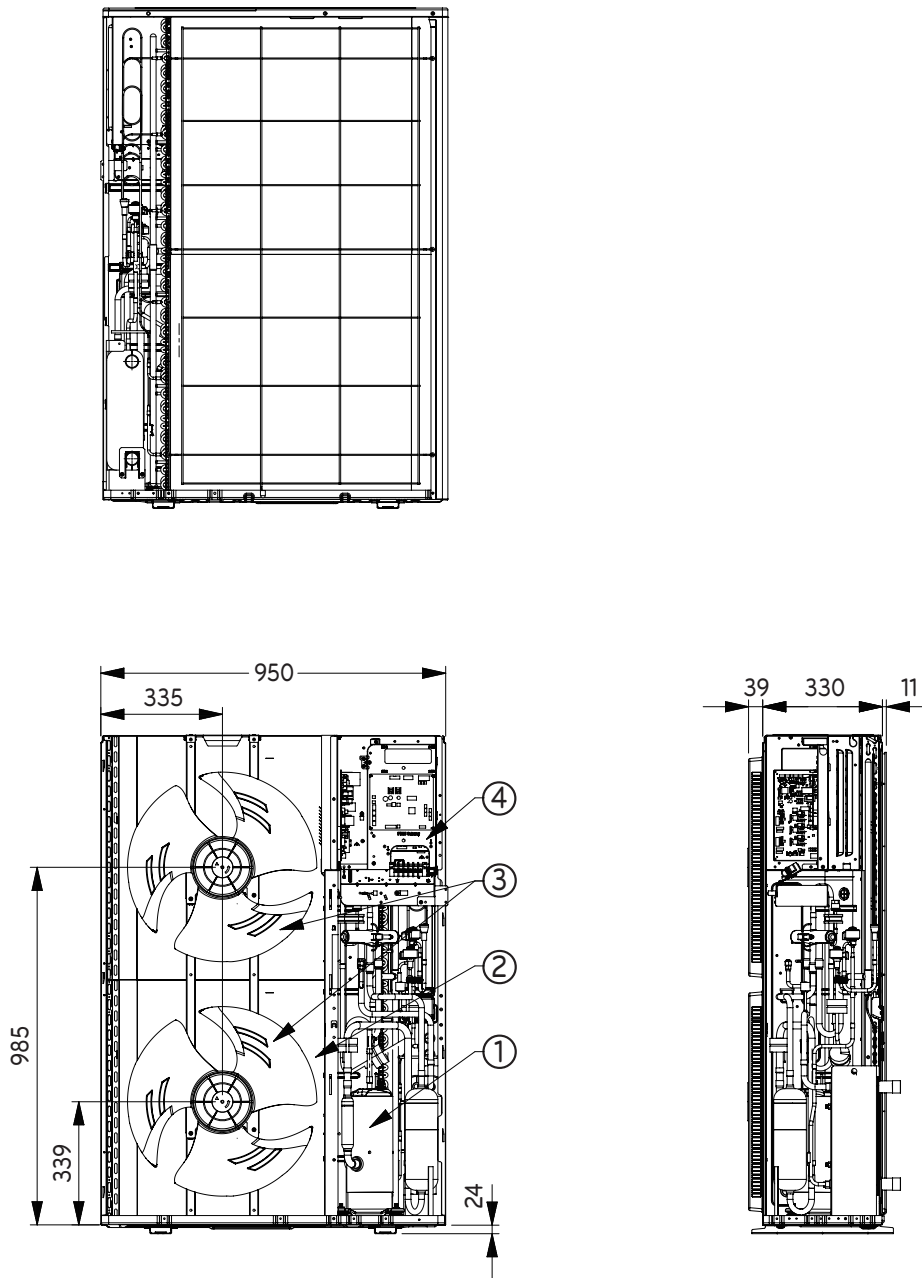


Description

| No | Name |
|----|----------------------|
| 1 | Entering Water Pipe |
| 2 | Leaving Water Pipe |
| 3 | Air discharge Grille |

Outdoor unit : Internal

(unit : mm)



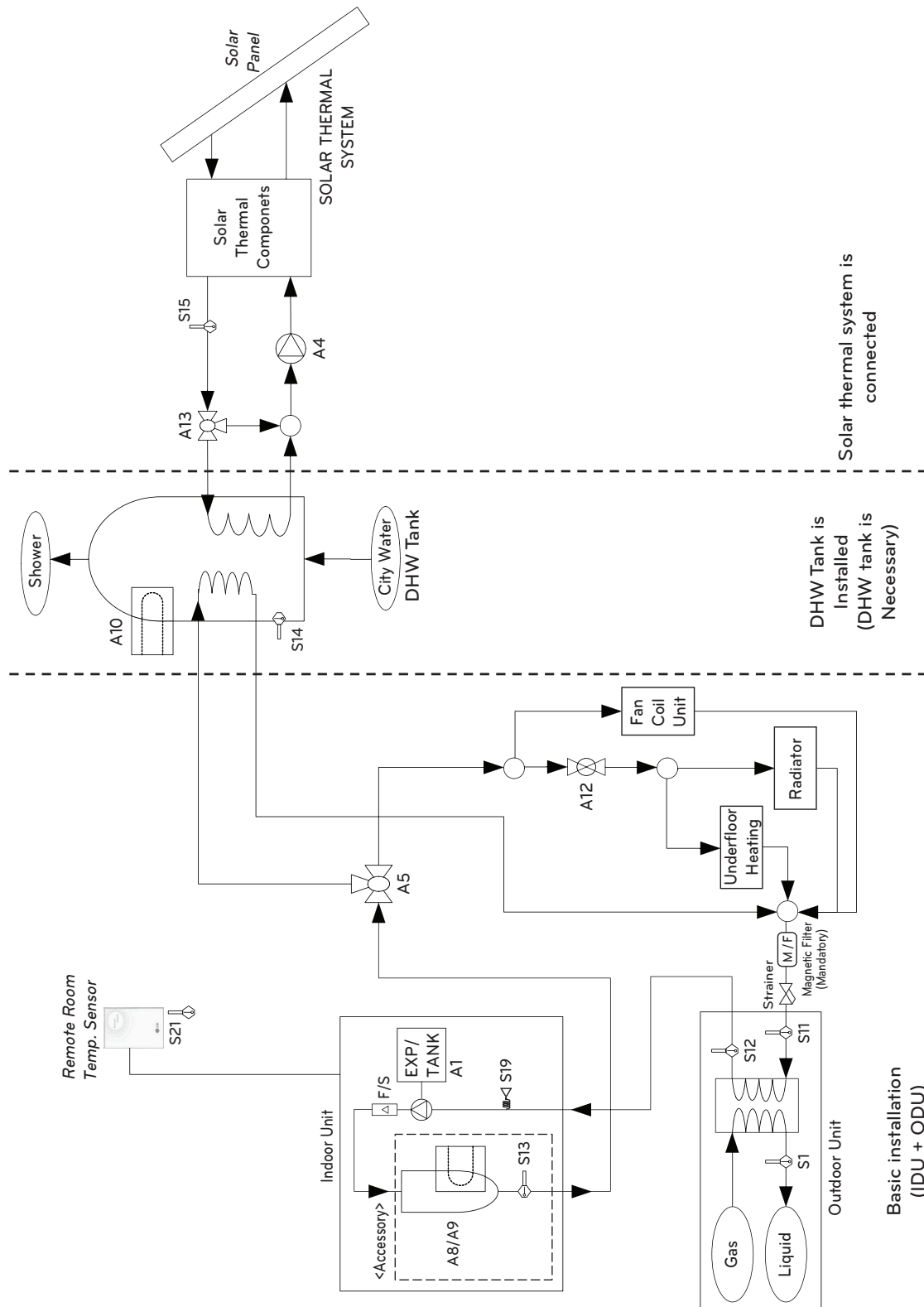
Description

| No | Name | Remark |
|----|-------------------------|--|
| 1 | Compressor | Increase pressure of the refrigerant. |
| 2 | Fin tube Heat Exchanger | Heat exchange between refrigerant and air. |
| 3 | Fan | Circulating the air. |
| 4 | Control Box | PCB and terminal blocks. |



- 17 -

6. Piping Diagrams



Solar thermal system is connected

DHW Tank is Installed (DHW tank is Necessary)

Basic installation (IDU + ODU)

<Inside of Hydrosplit Type>

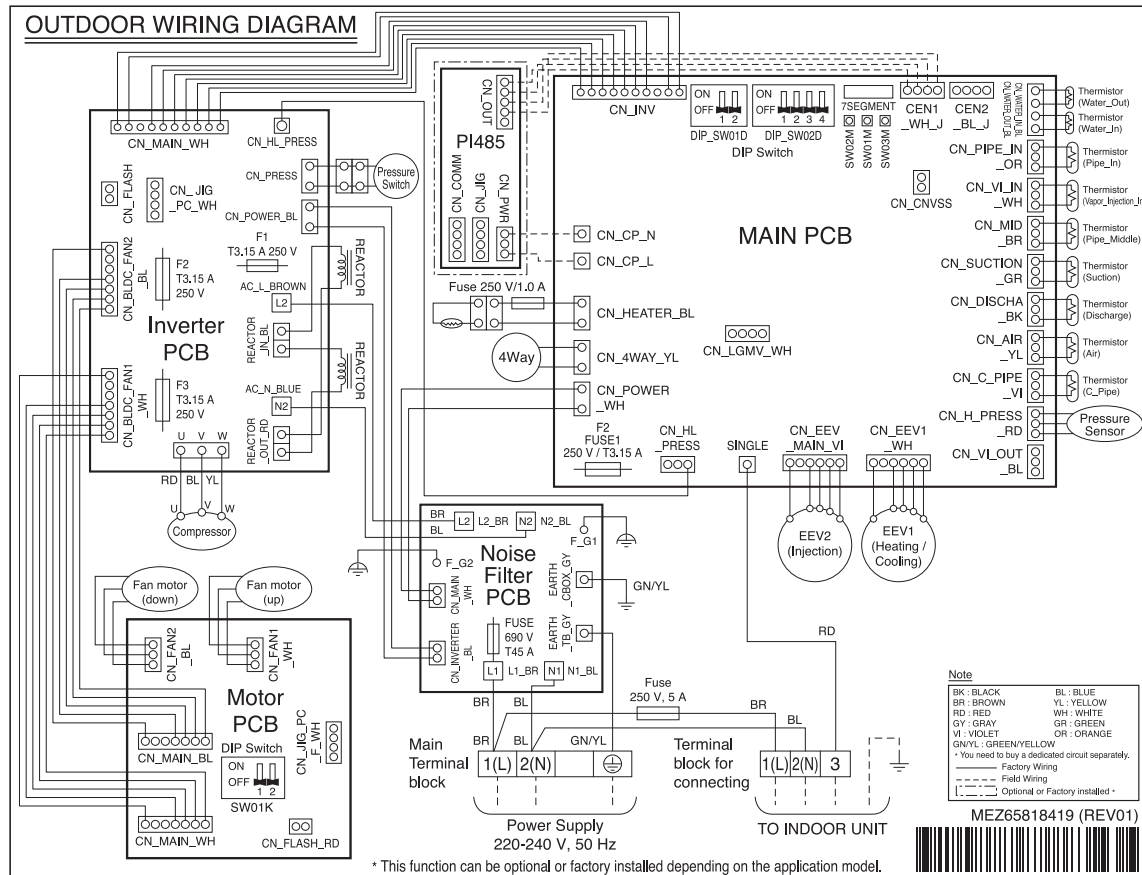
Description

| 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 Mandatory to install an additional filter on the heating water circuit. |
| Indoor Unit | S19 | Entering Water Pressure sensor | CN_H2O_PRESS | |
| | A8 / A9 | Backup heater | (No connector) | - Optional accessory (sold separately) - HA061B E1 : 1Ø, HA063B 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 |
| | 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 | Remoted Air temperature sensor | CN_ROOM2 | - 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 | - 3 rd 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) | - 3 rd party accessory and Field installation (sold separately) - Generating and storing DHW by AWHF or built-in electric heater |
| | A10 | Booster Heater | CN_TANK_HEATER | - 3 rd 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 | - 3 rd 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 | - 3 rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported |
| | A4 | External Water Pump | CN_PUMP_A4 | - 3 rd 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) | - 3 rd party accessory and Field installation (sold separately) |

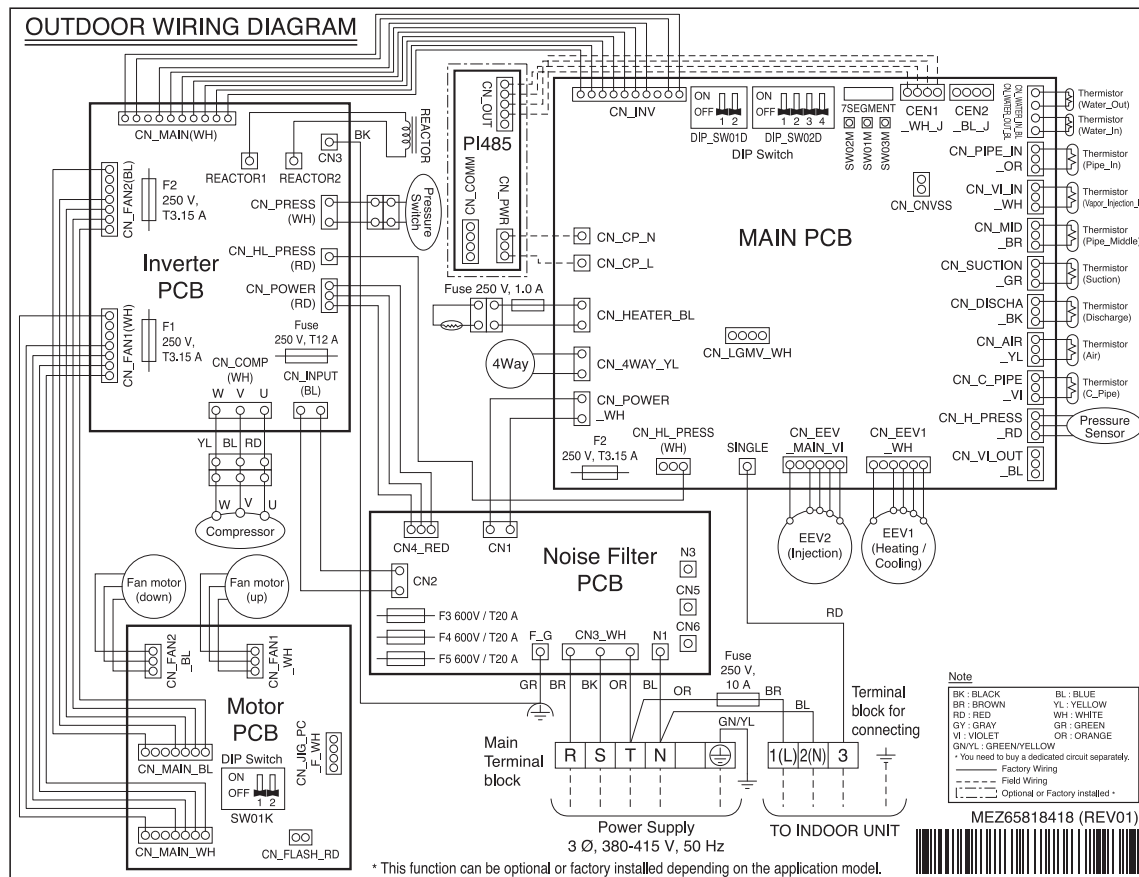
Indoor Unit(Including field wiring) : K1 Chassis, 1Ø, 3Ø



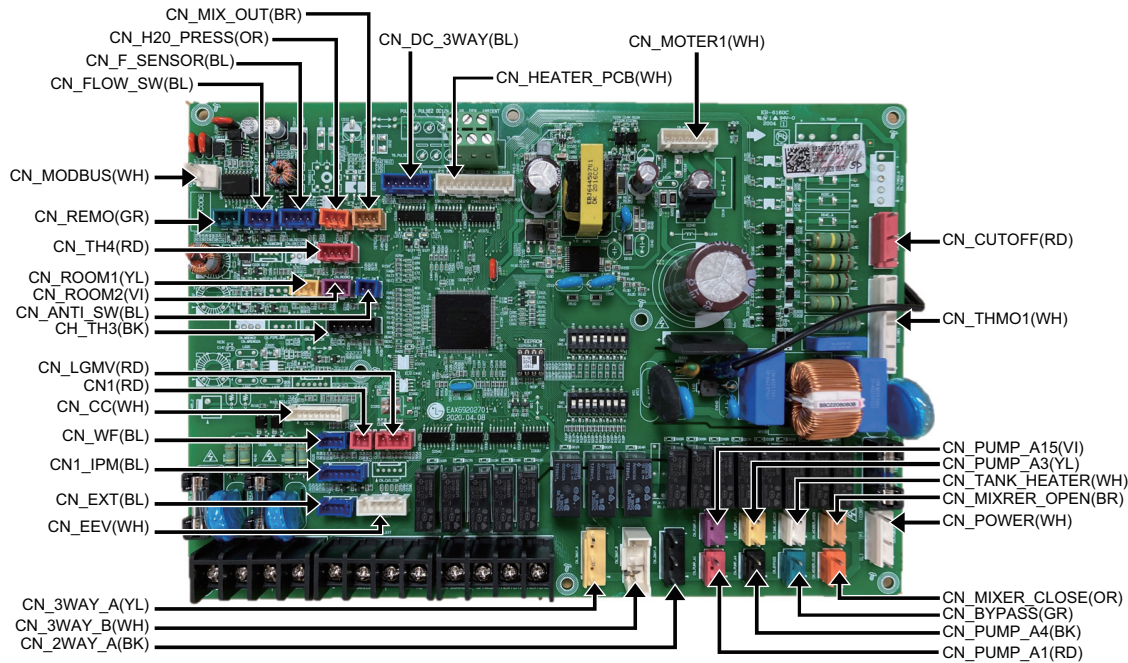
Outdoor Unit(Including field wiring) : U60A Chassis, 1Ø



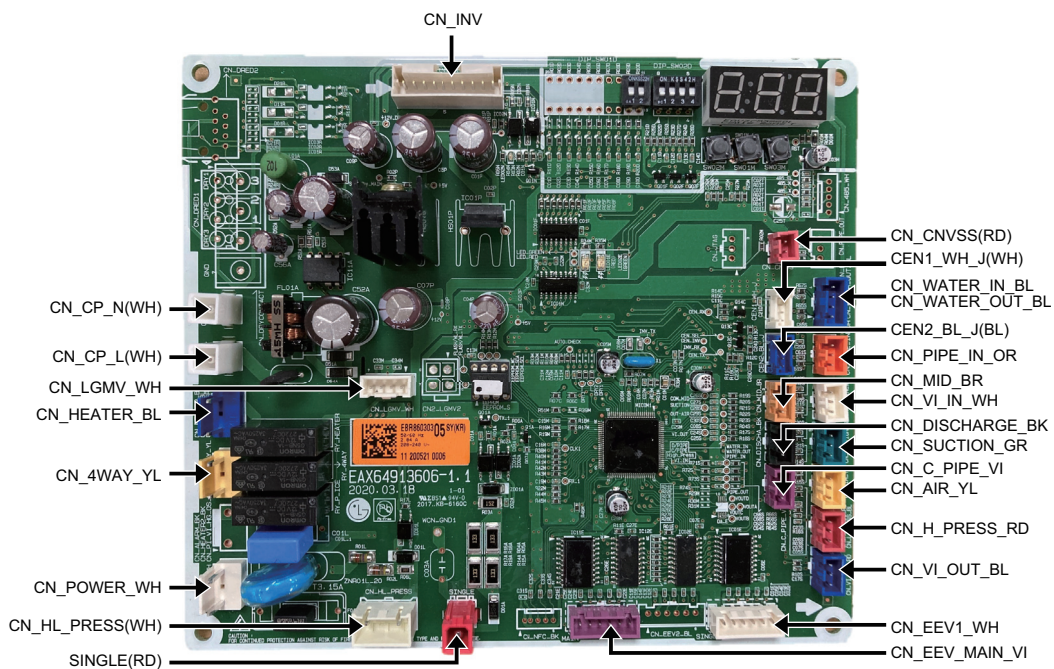
Outdoor Unit(Including field wiring) : U60A Chassis, 3Ø



Indoor PCB

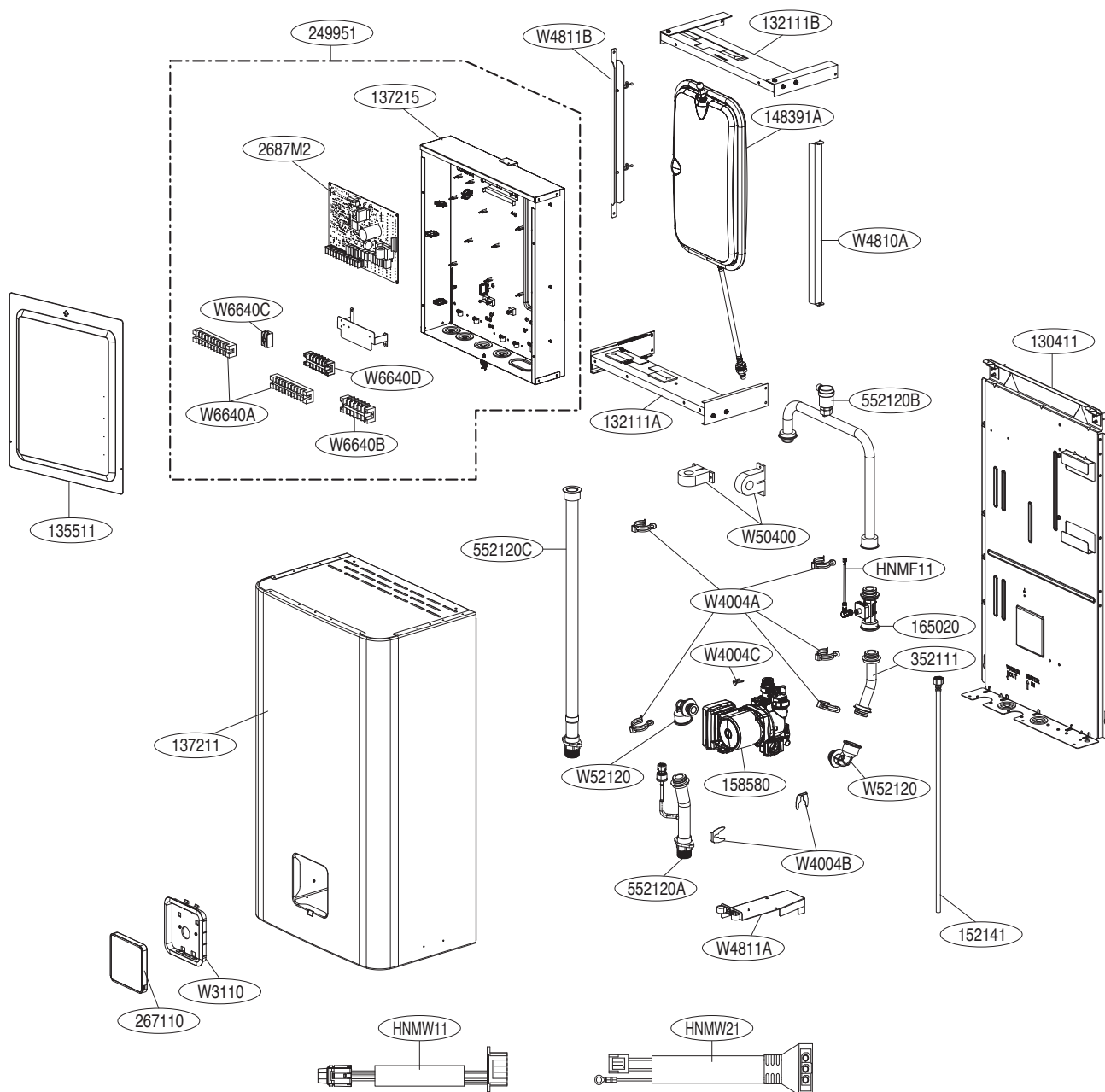


Outdoor PCB



8. Exploded View

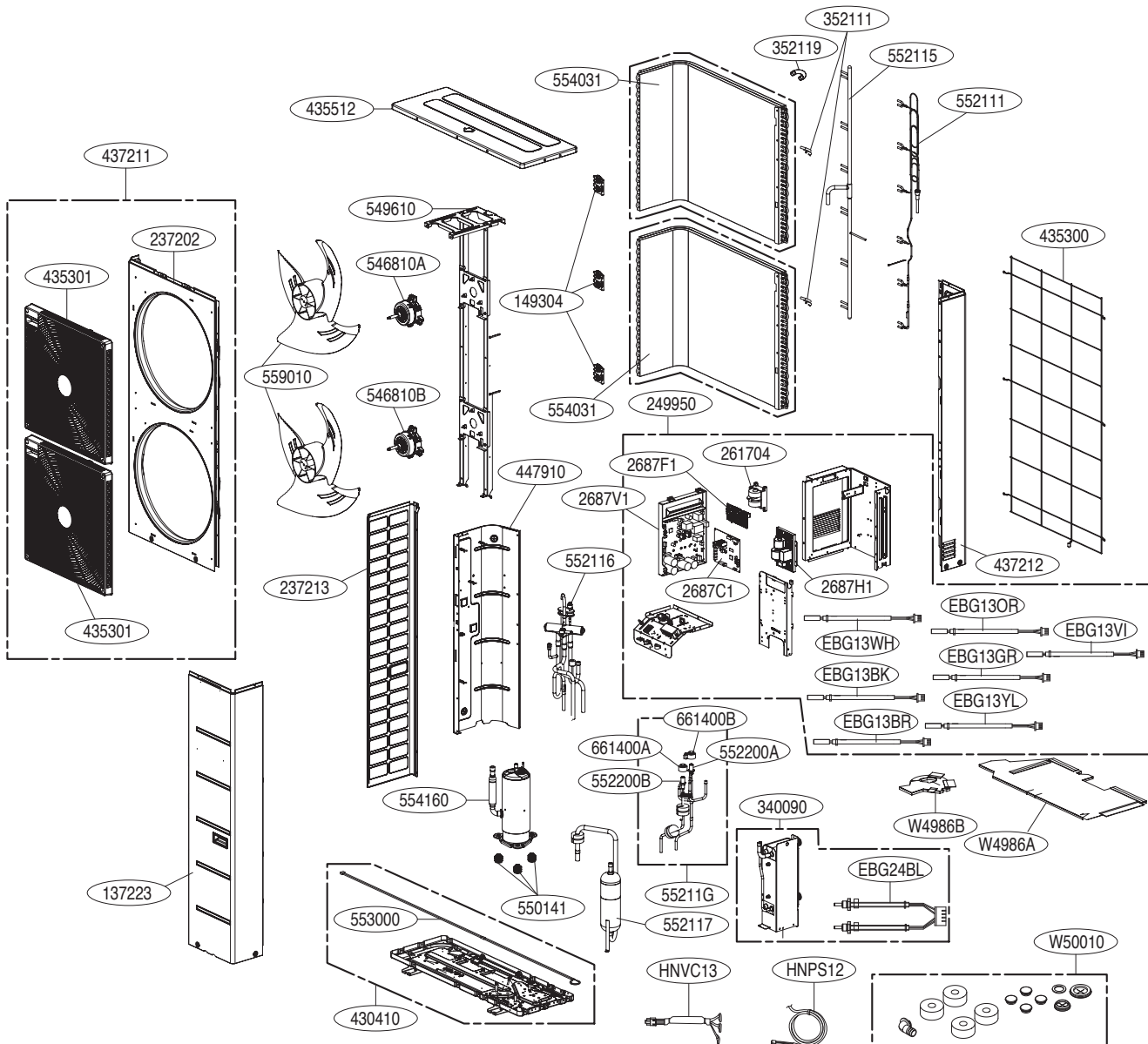
Indoor Unit



| Location No. | Description | Description | Housing color |
|--------------|-------------------------------|-------------------------|---------------|
| HNMW21 | Harness, single (CN_W_PUMP_A) | Pump AC Wire | White |
| HNMW11 | Harenss, multi (CN_MOTOR1) | Pump DC Wire | Red |
| HNMF11 | Harness, single (CN_EXT) | For external controller | Blue |

| Location No. | Description | Remark |
|--------------|-------------|---|
| W4004A | Clip | For assemble flow sensor or pipe |
| W4004B | Clip | For assemble pump and pipe |
| W4004C | Clip | For assemble pump and expansion tank hose |

Outdoor Unit (1Ø : 12, 14, 16 kW)



Thermistor Assembly,NTC

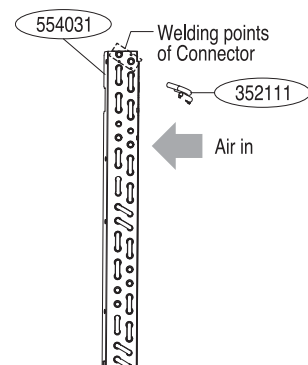
| Location No. | Thermistor Description | Housing Color |
|--------------|------------------------|---------------|
| EBG24BL | Water In/Water Out | Blue |
| EBG13WH | VI_IN | White |
| EBG13OR | Pipe In | Orange |
| EBG13GR | SUCTION | Green |
| EBG13BK | DISCHA | Black |
| EBG13YL | AIR | Yellow |
| EBG13BR | MID-PIPE | Brown |
| EBG13VI | CONDENSER_PIPE | Violet |

Condenser Assembly Repaired parts

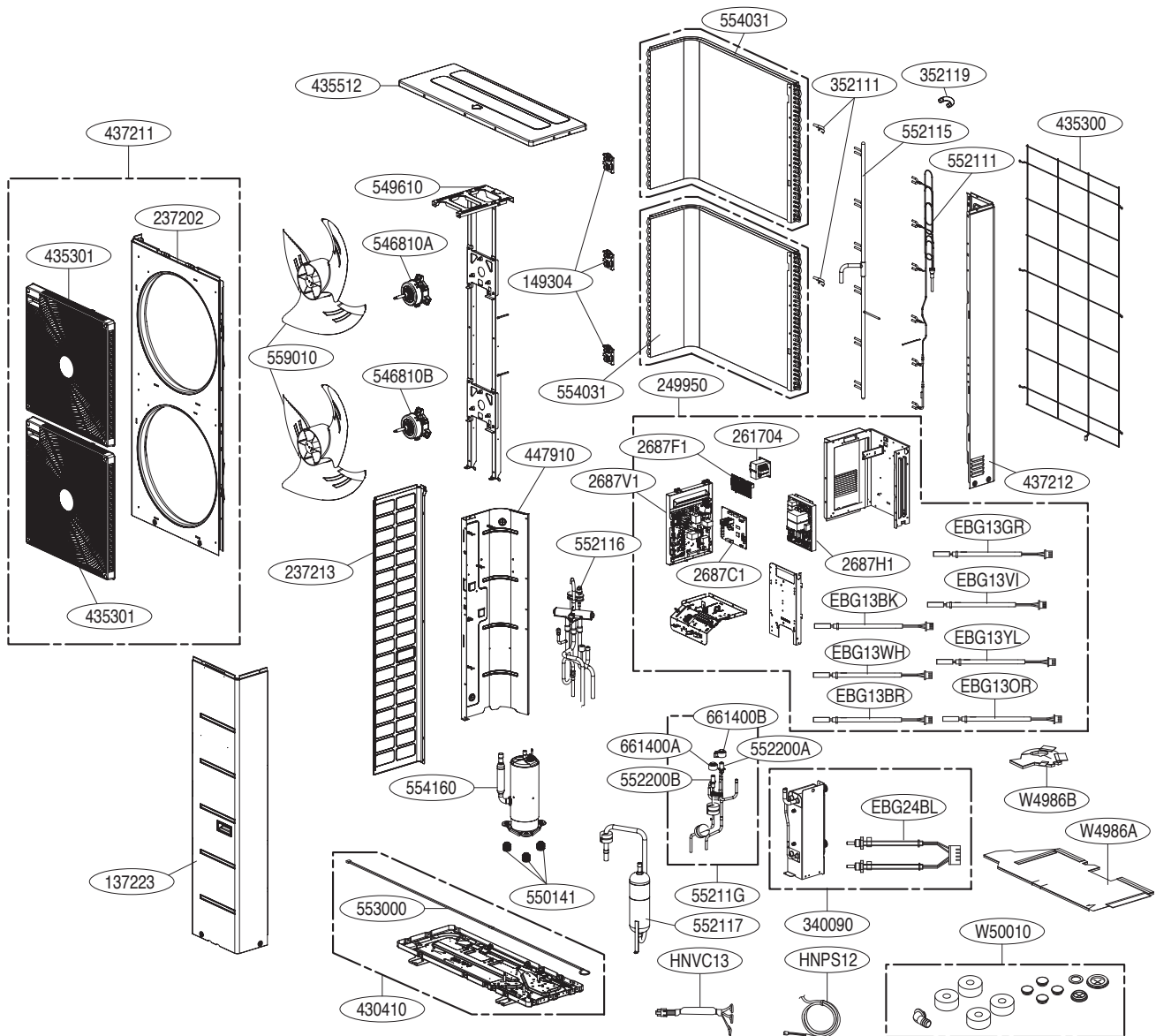
| Description | Location No. | Quantity |
|----------------------------|--------------|----------|
| Condenser Assembly,Bending | 554031 | 2 |
| Tube Assembly,Connector | 352111 | 2 |

Condenser Assembly

you need to buy these parts when repair condenser assembly.



Outdoor Unit (3Ø : 12, 14, 16 kW)



Thermistor Assembly,NTC

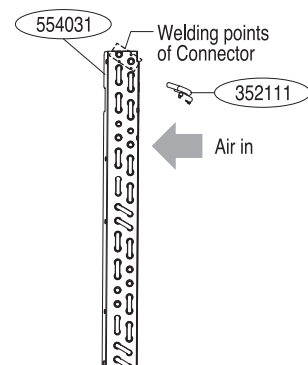
| Location No. | Thermistor Description | Housing Color |
|--------------|------------------------|---------------|
| EBG24BL | Water In/Water Out | Blue |
| EBG13WH | VI_IN | White |
| EBG13OR | Pipe In | Orange |
| EBG13GR | SUCTION | Green |
| EBG13BK | DISCHA | Black |
| EBG13YL | AIR | Yellow |
| EBG13BR | MID-PIPE | Brown |
| EBG13VI | CONDENSER_PIPE | Violet |

Condenser Assembly Repaired parts

| Description | Location No. | Quantity |
|----------------------------|--------------|----------|
| Condenser Assembly,Bending | 554031 | 2 |
| Tube Assembly,Connector | 352111 | 2 |

Condenser Assembly

you need to buy these parts when repair condenser assembly.





P/NO : MFL68681914