CONFIDENTIAL

THERMA V™

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.

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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

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

No.	Signification
1	ZH : Air-to-Water-Heat Pump for R32
2	Classification - U : Outdoor unit - B : Monobloc
3	Model Type - W : Inverter Heat Pump
4	Heating Capacity - Ex) 9 kW → '09'
5	Electrical ratings - 6 : 1 phase 220-240 V~ 50 Hz - 8 : 3 phase 380-415 V~ 50 Hz
6	Function - A : General heating heat pump - B : Hydrosplit Type
7	Series Number

Indoor Unit

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

No.	Signification
1	ZH : Air-to-Water-Heat Pump for R32
2	Classification - N: Indoor unit
3	Model Type - W : Inverter Heat Pump
4	Heating Capacity - Ex) 9 kW → '09'
5	Electrical ratings - 6 : 1 phase 220-240 V~ 50 Hz
6	Heater Capacity - Ex) 6 kW → '06'
7	Function - A : General heating heat pump
8	Series Number

- 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

Refrigerant	Series	No.								
		1	2	3	4	5	6	7	8	9
R32	4 Series	H	U	05	1	M	R	U4	4	-

No.	Signification
1	Air to water Heat Pump
2	Classification - U : Outdoor unit
3	Heating Capacity (kW) - Ex) 16 kW → '16'
4	Electrical ratings - 1 : 1Ø, 220-240V, 50 Hz - 3 : 3Ø, 380-415V, 50 Hz
5	Leaving Water Combination - M : Mid Temperature
6	Refrigerant - R : R32
7	Chassis - U60A, U36A
8	Series Number
9	Sales Region

Indoor Unit

Refrigerant	Series	No.									
		1	2	3	4	5	6	7	8	9	10
R32	5 Series	H	N	09	1	M	R	N	K	5	-

No.	Signification
1	Air-to-Water Heat Pump
2	Classification - N: Indoor unit
3	Heating Capacity (kW) - Ex) 16 kW → '16'
4	Heater electrical ratings - 1 : 1Ø, 220-240V, 50 Hz - 3 : 3Ø, 380-415V, 50 Hz
5	Leaving Water Combination - M : Middle Temperature
6	Refrigerant - R : R32
7	Classification - N : Indoor unit
8	Chassis - K1
9	Series Number
9	Sales Region

- 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
- The 'Sales Region' does not affect specifications and performance. It is omitted except when necessary.

Model name and related information

Model Name		Capacity		Power Source (Unit)
Phase	Capacity	Heating(kW)*1	Cooling(kW)*2	
1Φ	5 kW	5.5	5.5	220-240 V~ 50 Hz
	7 kW	7.0	7.0	
	9 kW	9.0	9.0	

*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				ZHNW09606A1 [HN091MR NK5]
Operation Range (Leaving Water Temperature)	Cooling	Min. ~ Max.	°C DB	5 ~ 27
	Heating	Min. ~ Max.	°C DB	15 ~ 65
	DHW *	Min. ~ Max.	°C DB	15 ~ 80
Water Pump	Type		-	Canned type for hot water circulation
	Model			GRUNDFOS UPM3K 20-75 CHBL
	Motor Type		-	BLDC
	Steps of Pump Performance		-	Variable speed 10% to 100%
	Power input	Min. ~ Max.	W	3 ~ 60
Heat Exchanger	Type		-	Brazed Plate HEX
	Quantity			1
	Water Volume		ℓ	0.7
Flow Sensor	Type		-	Vortex
	Model		-	SIKA VVX20
	Measuring Range	Min. ~ Max.	ℓ/min	5 ~ 80
	Flow (Trigger point)	Min.	ℓ/min	7
Expansion Vessel	Volume	Max.	ℓ	8
	Water pressure	Max.	bar	3
	Water pressure	Pre-charged	bar	1
Water Pressure Sensor	Model	-	-	Sensata OFM (2HMP)
	Measuring Range	Min. ~ Max.	bar(G)	0 ~ 20
Strainer	Mesh size		-	30 mesh
	Material		-	Stainless Steel
Relief valve	Pressure Limit	Upper Limit	bar	3.0
Piping Connections	Water Circuit	Inlet	mm(Inch)	Male PT 25.4(1)
		Outlet	mm(Inch)	Male PT 25.4(1)
	Refrigerant Circuit	Gas	mm(Inch)	Φ 15.88 (5/8)
		Liquid	mm(Inch)	Φ 9.52 (3/8)
Wiring Connections	Communication Cable (included Earth, H07RN-F)		mm^2 × cores	0.75 × 4
Sound Power Level	Heating	Rated	dB(A)	44
Dimensions	Net	W × H × D	mm	850 x 315 x 490
	Shipping	W × H × D	mm	1082 x 375 x 563
Weight	Net		kg	38.1
	Shipping		kg	42.6

Electrical Specification			ZHNW09606A1 [HN091MR NK5]
Backup Heater	Type	-	Sheath
	Number of Heating Coil	EA	2
	Capacity Combination	kW	3.0 + 3.0
	Operation	-	Automatic
	Heating Steps	Step	2
	Power Supply	V, Ø, Hz	220-240, 1, 50
	Rated Current	A	25.0
Wiring Connections	Power Cable (included Earth, H07RN-F)	mm^2 × cores	4.0 × 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.

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

Outdoor

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

Electrical Specifications			ZHUW056A0 [HU051MR U44]	ZHUW076A0 [HU071MR U44]	ZHUW096A0 [HU091MR U44]
Power Supply		V, Ø, Hz	220-240, 1, 50	220-240, 1, 50	220-240, 1, 50
Peak Control Running Current	Cooling	A	13.0	14.0	15.0
	Heating	A	13.0	14.0	15.0
Rated Running Current	Cooling	A	5.3	6.9	9.5
	Heating	A	5.0	6.3	8.6
Circuit Breaker		A	16.0	20.0	25.0
Wiring Connections	Power Supply Cable (included Earth, H07RN-F)	mm^2 × cores	4.0 × 3	4.0 × 3	4.0 × 3

Technical Specifications				ZHUW056A0 [HU051MR U44]	ZHUW076A0 [HU071MR U44]	ZHUW096A0 [HU091MR U44]
Sound Power Level	Heating	Rated	dB(A)	60	60	60
Sound Pressure Level (at 1m)	Heating	Rated	dB(A)	50	50	50
Dimensions	Net	W × H × D	mm	950 × 834 × 330	950 × 834 × 330	950 × 834 × 330
	Shipping	W × H × D	mm	1,065 × 918 × 461	1,065 × 918 × 461	1,065 × 918 × 461
Weight	Net		kg	60.0	60.0	60.0
	Shipping		kg	65.0	65.0	65.0

Note

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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 Units				ZHUW056A0 [HU051MR U44]	ZHUW076A0 [HU071MR U44]	ZHUW096A0 [HU091MR U44]
Operation Range (Outdoor Temperature)	Cooling	Min. ~ Max.	°C DB	5 ~ 48	5 ~ 48	5 ~ 48
	Heating	Min. ~ Max.	°C DB	-25 ~ 35	-25 ~ 35	-25 ~ 35
Compressor	Type		-	Hermetic Sealed Scroll		
	Model		Model × No.	RJB036MAA × 1		
	Motor Type		-	BLDC	BLDC	BLDC
	Displacement		cm^3/Rev.	31.6	31.6	31.6
Refrigerant	Type		-	R32	R32	R32
	GWP (Global Warming Potential)		-	675.0	675.0	675.0
	Precharged Amount		g	1,500	1,500	1,500
	t-CO2 eq.		-	1.013	1.013	1.013
	Control		-	Electronic Expansion Valve		
Refrigerant Oil	Type		-	FW68D	FW68D	FW68D
	Charged Volume		cc × No.	1,100	1,100	1,100
Piping Connections	Gas		Type	Flare	Flare	Flare
			mm(Inch)	Φ 15.88 (5/8)	Φ 15.88 (5/8)	Φ 15.88 (5/8)
	Liquid		Type	Flare	Flare	Flare
			mm(Inch)	Φ 9.52 (3/8)	Φ 9.52 (3/8)	Φ 9.52 (3/8)
	Piping Length	Standard	m	5	5	5
		Max.	m	50	50	50
	Piping Level Difference	Max.	m	30	30	30
	Chargeless-Pipe Length		m	10.0	10.0	10.0
	Additional Charging Volume		g/m	40.0	40.0	40.0
Heat Exchanger	Quantity		EA	1	1	1
	Specification	Row	EA	2	2	2
		Column	EA	38	38	38
		FPI	EA	14	14	14
Fan	Type		-	Propeller	Propeller	Propeller
	Air Flow Rate	Rated	m^3/min × No.	60.0 × 1	60.0 × 1	60.0 × 1
Fan Motor	Type		-	BLDC	BLDC	BLDC
	Output		W × No.	124 × 1	124 × 1	124 × 1

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4. Performances are based on the following conditions :
   - Cooling : Inlet/Outlet Water Temp. 23°C/18°C, Outdoor Air Temp. 35°CDB / 24°CWB
   - Heating : Inlet/Outlet Water Temp. 30°C/35°C, Outdoor Air Temp. 7°CDB / 6°CWB
   - Interconnected Pipe Length is standard length and difference of Elevation (Outdoor ~ Indoor Unit) is Zero.
5. This product contains Fluorinated greenhouse gases.
6. Sound Performances are based on the following conditions.
   - Sound Power Level : Measured according to EN14825.
   - Sound Pressure Level : Calculated value according to distance of sound power.

3. 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	ZHNW09606A1 [HN091MR NK5]
Installation	Backup heater (Operation)	O
Reliability	Self diagnosis	O
Convenience	Auto Restart	O
	Child lock	O
	Sleep mode	O
	Timer (on/off)	O
	Timer (weekly)	O
	Two thermistor control	X
Network function	Network solution(LGAP)	O (Accessory)
	Modbus connectivity (without gateway)	O
Air to Water Heat Pump Functions	Anti-condensation on floor (cooling)	O
	Digital output for external pump	O
	Flow sensor	O
	Thermostat interface (230V AC)	O
	Thermostat interface (24V AC)	X
	DHW(Domestic Hot Water) tank kit	O (Accessory)
	Therma V solar kit	O (Accessory)
	PHEX anti-freezing control	O
	Water pump anti-stuck function	O
	Weather compensation for heating and cooling (Auto mode)	O
	Low noise operation	O
	Anti-overheating of water pipe	O
	Emergency operation	O
	Weather Dependent Operation with Thermostat	O
	Scheduler (DHW Tank Heater)	O
	Timer (Domestic Hot Water Tank Heater)	O
	Quick Domestic Hot Water Tank Heating	O
	Screed Drying Mode	O
	Base Pan Heater	O
	Integrated Dry Contact (CN-EXT)	O
	Energy Monitoring	O
	DHW Recirculation	O

Outdoor Unit

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

Accessory Compatibility List

Indoor unit

Category		Product	Remark	ZHNW09606A1 [HN091MR NK5]
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
	Zone Controller	ABZCA	-	X
	Group control wire	PZCWRCG3	0.25 m	X
	2-Remo Control Wire	PZCWRC2	0.25 m	X
	Extension wire	PZCWRC1	10 m	O
	Wi-Fi controller *	PWFMDD200	-	O
	Meter Interface***	PENKTH000	Interface between IDU and Meter	O
Accessory Kit for AWHP	DHW tanks (Single coil)	OSHW-200F	200L	O
		OSHW-300F	300L	O
		OSHW-500F	500L	O
	DHW tanks (Double coil)	OSHW-300FD	300L	O
	DHW tank kit	PHLTA	For Split	O
		PHLTB	For Monobloc	X
	DHW sensor	PHRSTA0	included in PHLTA kit	O
	Mixing valve	OSHA-MV	3/4” DN20	O
		OSHA-MV1	1” DN20	O
	3way valve	OSHA-3V	-	O
	Solar thermal kit	PHLLA	-	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
	Drain pan	PHDPC	-	O
	Cover plate	PDC-HK10	For Split, IWT	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	ZHUW056A0 [HU051MR U44] ZHUW076A0 [HU071MR U44] ZHUW096A0 [HU091MR U44]
Central Controller	AC EZ	PQCSZ250S0	AC EZ	X
	AC Ez Touch	PACEZA000	AC Ez Touch	O
	AC Smart	PACS4B000	AC Smart IV	O
		PACS5A000	AC Smart 5	O
	ACP	PACP4B000	ACP IV	O
		PACP5A000	ACP 5	O
	AC Manager **	PACM4B000	AC Manager IV	O
		PACM5A000	AC Manager 5	O
	Cloud Gateway	PWFMDB200	Cloud Gateway	O
Gateway	IDU PI485	PHNFP14A0	Connected with Indoor Units	X
		PSNFP14A0	Connected with Indoor Units	X
	ODU PI485	PP485A00T	PI485 Gateway	O
	BACnet	PQNFB17C0	ACP BACnet	O
	Lonworks	PLNWKB000	ACP Lonworks	O
ETC	PDI	PPWRDB000	PDI Standard	O
		PQNUD1S40	PDI Premium	O
	ACS IO Module	PEXPMB000	-	X

Note

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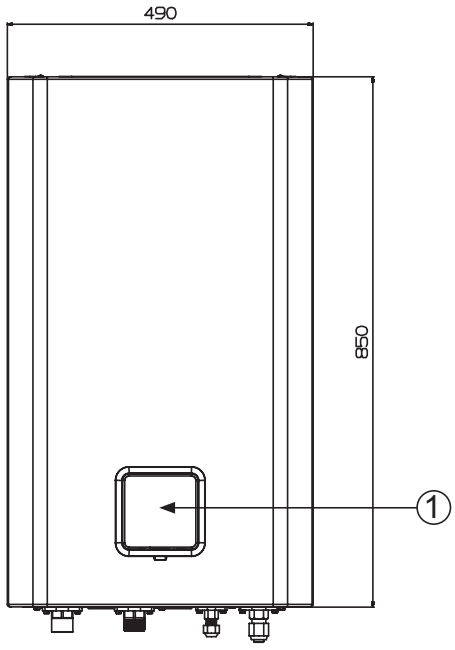
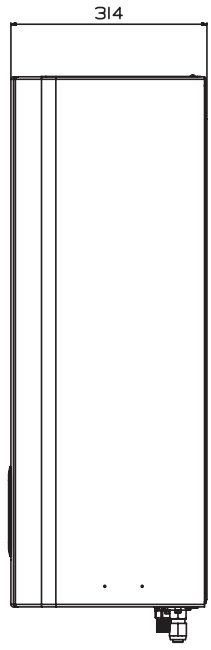
2. * : Some advanced functions controlled by individual controller cannot be operated.
3. ** : ACP, AC Smart, ACP BACnet or ACP Lonworks is needed.
4. If you need more detail, please refer to the manual of product.
   (http://partner.lge.com/global : Home> Doc.Library> Product > Control(BECON)))

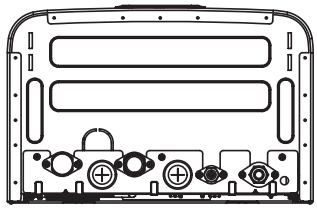
4. Components

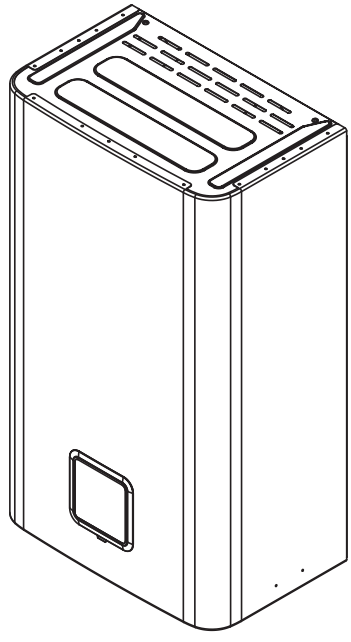
Indoor unit : External

(unit : mm)







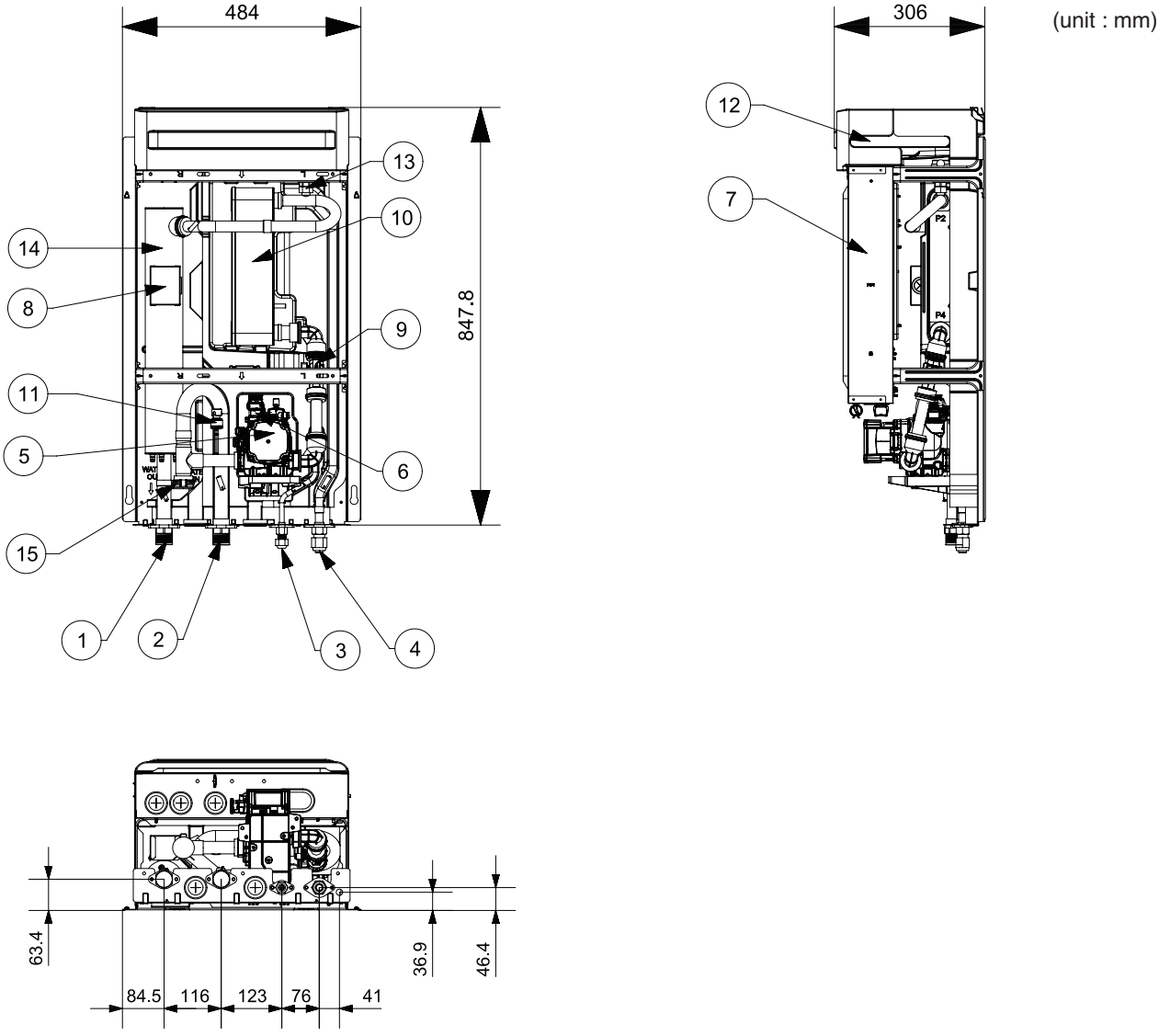


Description

No	Name	Remark
1	Control Panel	Built-in Remote Controller

Indoor unit : Internal

(unit : mm)

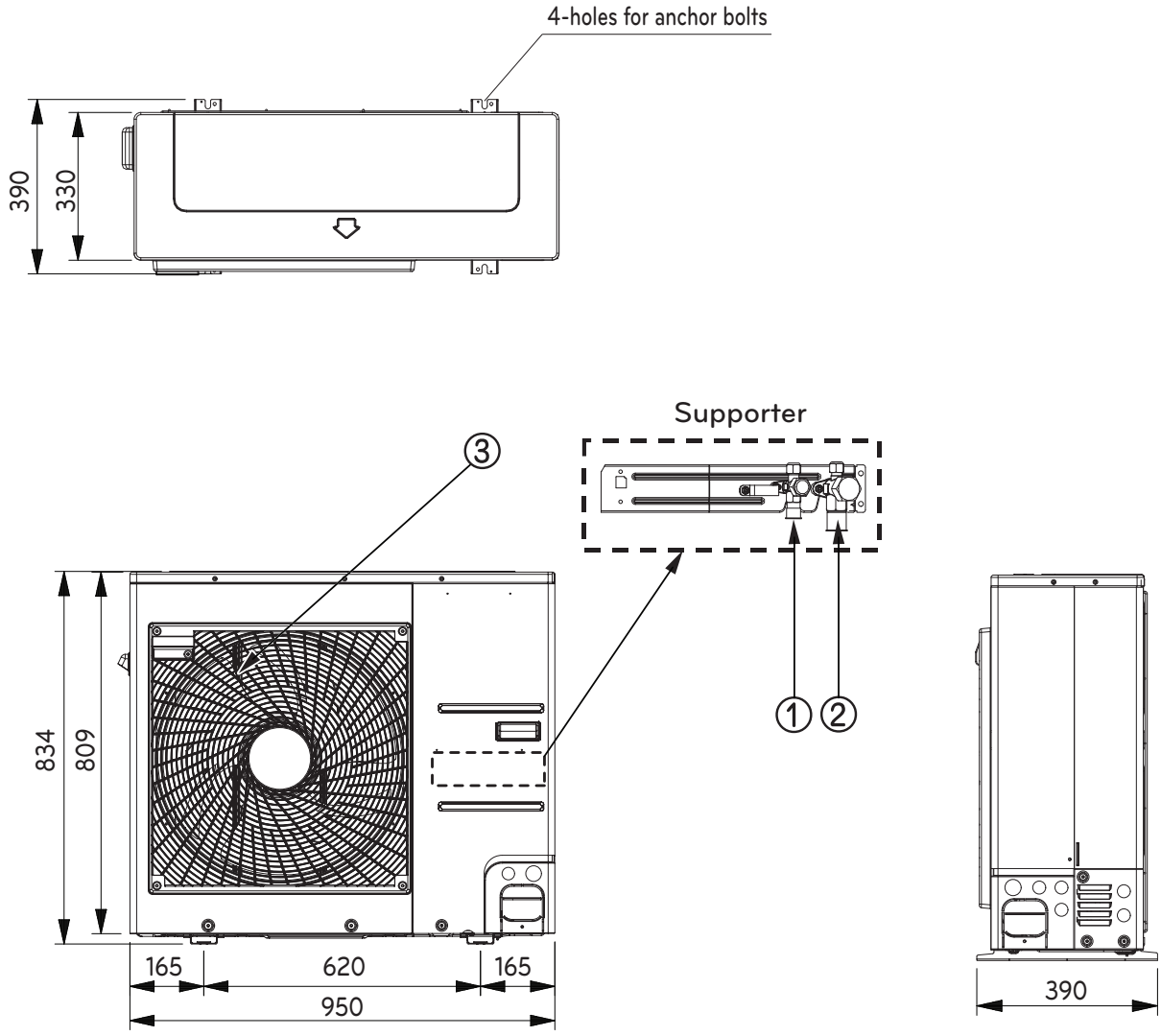


Description

No	Name	Remark
1	Leaving Water Pipe	Male PT 1 inch
2	Entering Water Pipe	Male PT 1 inch
3	Refrigerant Pipe	Ø 9.52 mm
4	Refrigerant Pipe	Ø 15.88 mm
5	Water Pump	Circulating the water
6	Safety Valve	Open at water pressure 3 bar
7	Control Box	PCB and terminal blocks
8	Thermal switch	Cut-off power input to electric heater at 90 °C (manual return at 55 °C)
9	Flow Sensor	Range : 7 ~ 80 L/min
10	Plate Heat Exchanger	Heat exchange between refrigerant and water
11	Pressure Sensor	Indicates circulating water pressure
12	Expansion Tank	Absorbing Volume change of heated water
13	Air Vent	Air purging when Charging water
14	Backup heater	6 kW
15	Strainer	Filtering and stacking particles inside circulating water

Outdoor unit : External

(unit : mm)

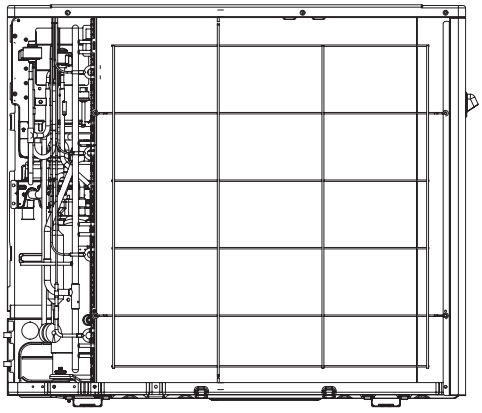


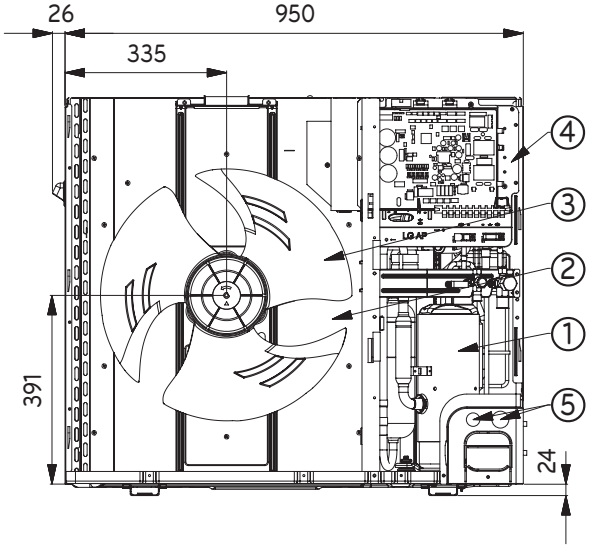
Description

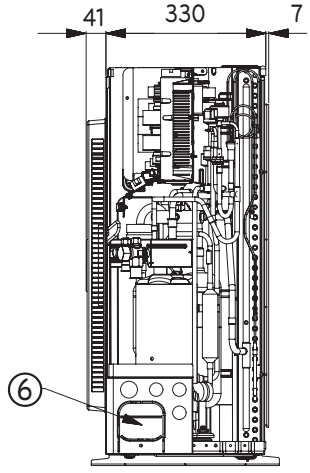
No	Name	Remark
1	Liquid-side Service Valve	Ø 9.52 mm
2	Gas-side Service Valve	Ø 15.88 mm
3	Air discharge Grill	Hot or cold air can be discharged.

Outdoor unit : Internal

(unit : mm)



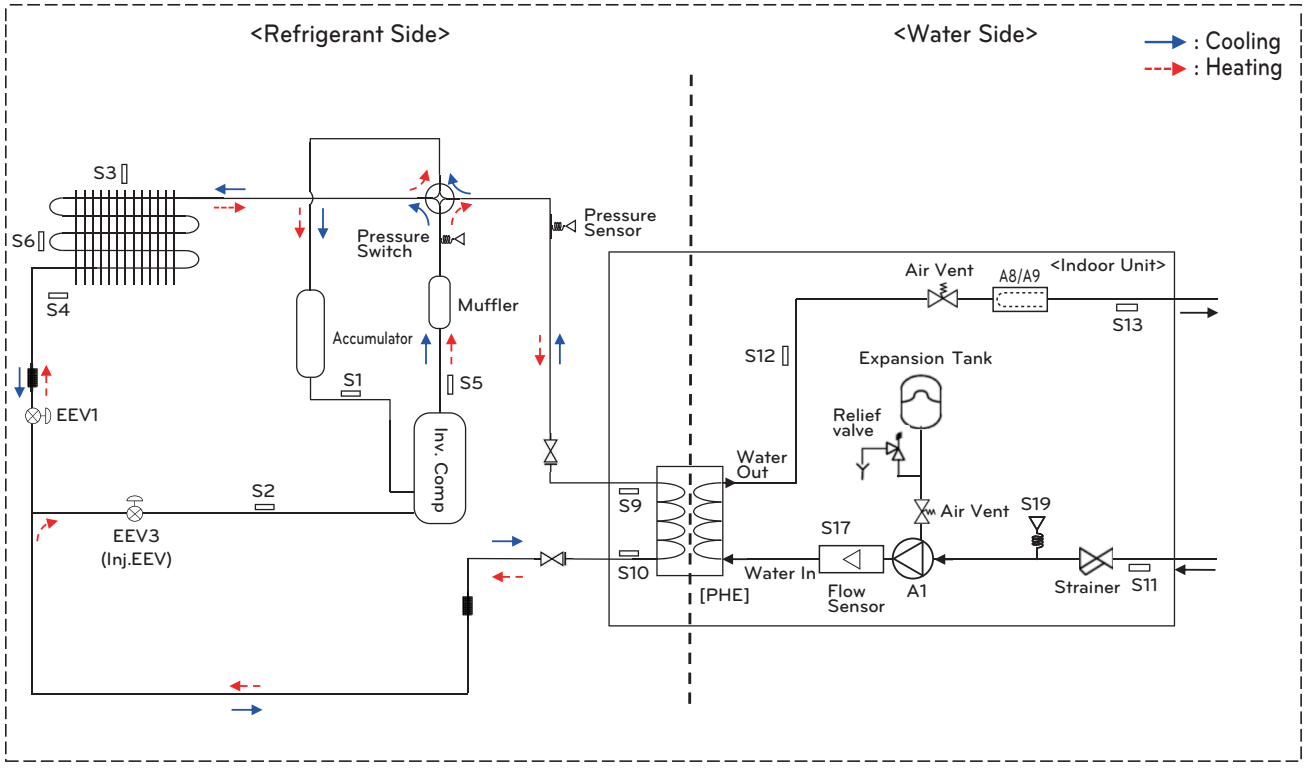




Description

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.
5	Power and Communication Cable Hole	Connect to terminal blocks.
6	Pipe Routing Hole	The pipes can be connectable in three directions.

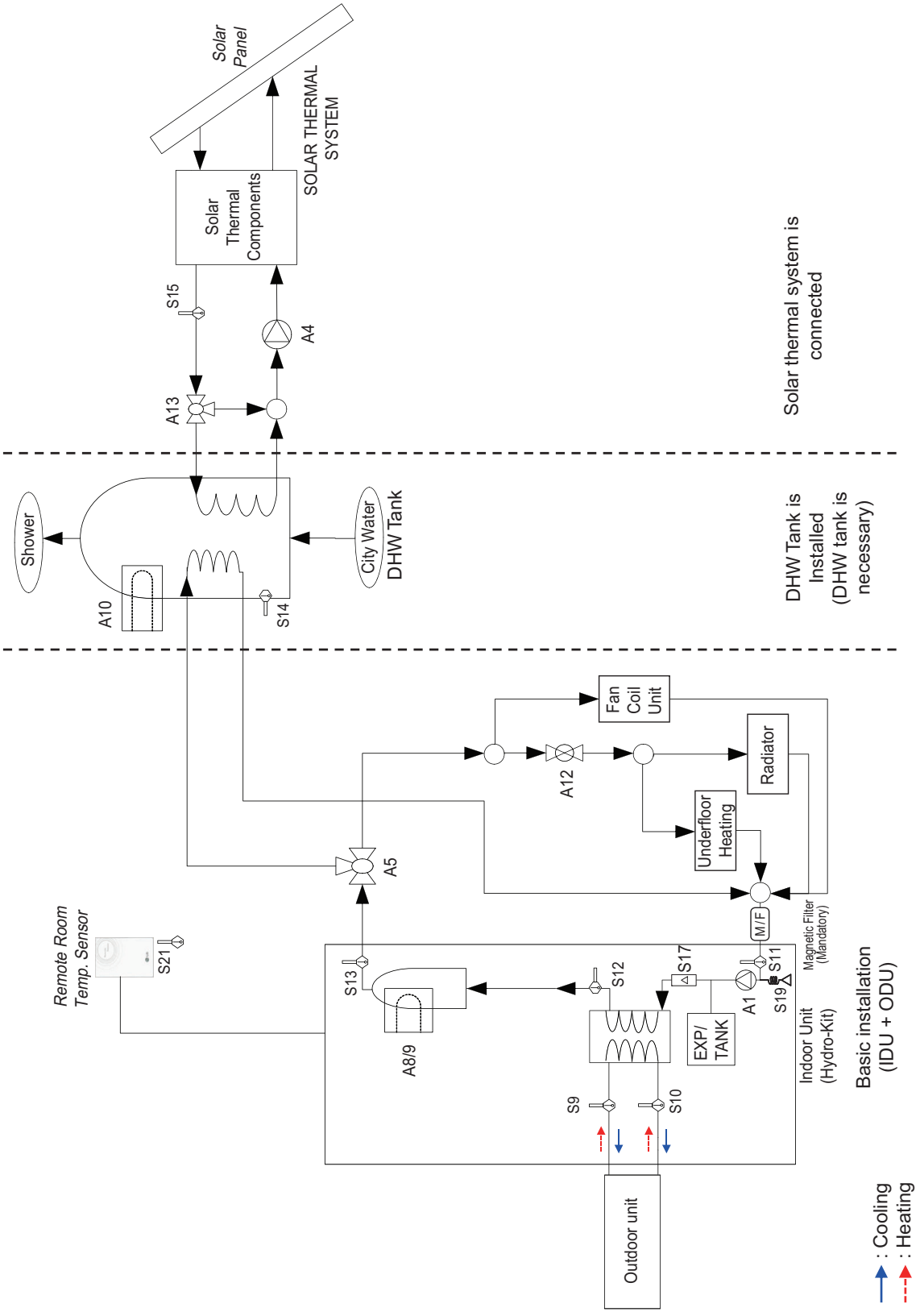
5. Cycle Diagrams



Description

Category	Symbol	Meaning	PCB Connector
Refrigerant side	S1	Compressor-suction pipe temperature sensor	CN_SUCTION(GR)
	S2	Injection EEV discharge temperature sensor	CN_VI_IN(WH)
	S3	Outdoor air temperature sensor	CN_AIR(YL)
	S4	Outdoor-HEX temperature sensor	CN_C_PIPE(VI)
	S5	Compressor-discharge pipe temperature sensor	CN_DISCHARGE(BK)
	S6	Outdoor-HEX middle temperature sensor	CN_MID(BR)
	S9	PHEX gas temperature sensor	CN_PIPE_OUT(RD)
	S10	PHEX liquid temperature sensor	CN_PIPE_IN(WH)
	EEV1	Electronic Expansion Valve (Heating/Cooling)	CN_EEV1(WH)
	EEV3	Electronic Expansion Valve (Injection)	CN_EEV3(YL)
Water Side	S11	Inlet water temperature sensor (WATER IN)	CN_TH3(BK)
	S12	Outlet water temperature sensor (PHEX OUT)	
	S13	Backup heater outlet sensor (WATER OUT)	
	S17	Flow sensor	CN_F_SENSOR(BL)
	S19	Water pressure sensor	CN_H2O_PRESS(OR)
	A1	Main water pump	CN_PUMP_A1(RD)
	A8	Electric backup heater (Step1)	CN_L1
			CN_N1
	A9	Electric backup heater (Step 2)	CN_L2
			CN_N2

6. Piping Diagrams



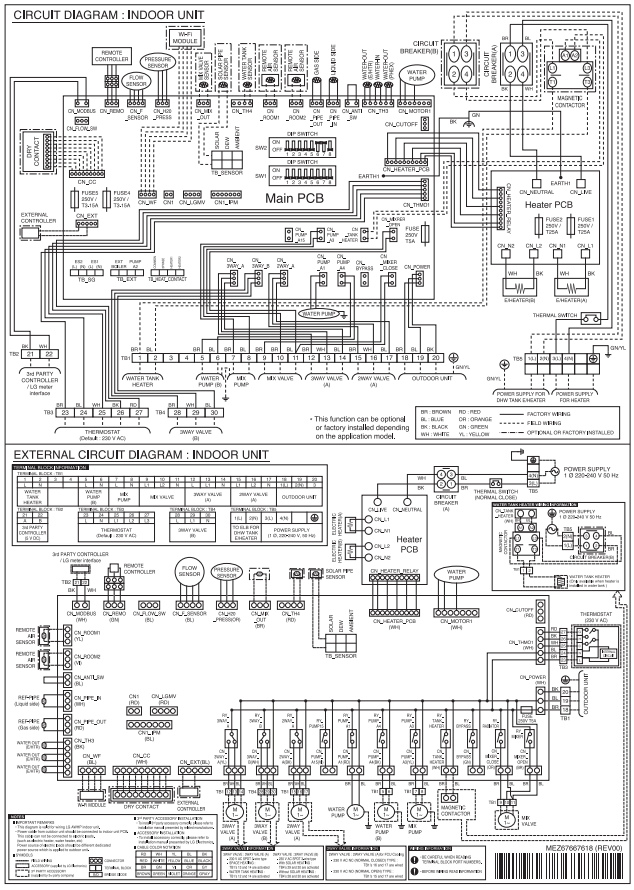
Description

Category	Symbol	Meaning	PCB Connector	Remarks
Indoor unit / Main circuit	S9	Refrigerant temperature sensor (Gas side)	CN_PIPE_OUT	- NTC5kOhm
	S10	Refrigerant temperature sensor (Liquid side)	CN_PIPE_IN	- NTC5kOhm
	S11	Entering water temperature sensor	CN_TH3 (WATER IN)	- NTC5kOhm - S11,S12 and S13 are connected at 6-pin-type connector CN_TH3
	S12	Leaving water temperature sensor	CN_TH3 (PHEX OUT)	
	S13	Electric heater outlet temperature sensor	CN_TH3 (HEATER OUT)	
	S17	Flow Sensor	CN_F_SENSOR	- to monitor water flow rate
	S19	Entering Water Pressure sensor	CN_H2O_PRESS	- to monitor water pressure
	S20	Reserved	TB_SENSOR (AMBIENT)	
	S21	Remote room air sensor (Direct circuit)	CN_ROOM1	- Accessory: PQRSTA0 - NTC10kOhm
	A1	Internal water pump	CN_PUMP_A1 CN_MOTOR1	- Power is supplied via CN_PUMP_A1 - PWM signal is supplied via CN_MOTOR1
	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.
	A8 / A9	Backup heater (2 steps)	Coil 1: CN_L1, CN_N1 Coil 2: CN_L2, CN_N2 on HEATER-PCB	- Operating power(230 V AC 50 Hz) is supplied by external power source via Terminal block.
	A12	2-way valve to block underfloor circuit from cooling water	CN_2WAY_A	- 3rd party accessory and Field installation (sold separately) - 2-wire NO- or NC-type 2-way valve is supported.
	EXP/TANK	Expansion vessel	-	- Absorbs volume change of heating water
	CTR/PNL	Control panel / Remote controller	CN_REMO	
	M/F	Magnetic filter	-	- 3rd party accessory and Field installation (sold separately) - It is Mandatory to install an additional filter on the heating water circuit.
Domestic hot water circuit	S14	DHW tank temperature	CN_TH4 (BOOST)	- S14 is connected at 4-pin-type connector CN_TH4 - Accessory: PHRSTA0 - S14 is a part of DHW tank kit (Model : PHLTA)
	A5	3-way valve for changing between heating(cooling) and DHW tank	CN_3WAY_A	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	A10	DHW boost heater	CN_TANK_HEATER	- 3rd party accessory and Field installation (sold separately) - Operating power (230 V AC 50 Hz) is supplied by external power source via Terminal block. - Accessory: PHLTA (Relay, harness and DHW sensor)
	W/TANK	Domestic hot water tank	-	- Accessory (OSHW-series) or third-party tank suitable for heat pumps.
	A15	Reserved	CN_PUMP A15	
	S23	Reserved	CN_RECIRC	
Solarthermal circuit	S15	Solar collector sensor	TB_SENSOR (SOLAR)	- 3rd party accessory and Field installation (sold separately) - PT1000
	S16	Reserved	CN_TH4 (SOLAR)	-for solar collector sensor use S15
	A4	Solar collector pump	CN_PUMP_A4	- 3rd party accessory and Field installation (sold separately)
	A13	3way-valve Solar	CN_3WAY_B	- 3rd party accessory and Field installation (sold separately) - SPDT type 3way valve is supported.
	Solarthermal system	Solarthermal equipment such as collector, solar pump, PT1000 sensor, solar heat-exchanger	-	- 3rd party accessory and Field installation (sold separately)

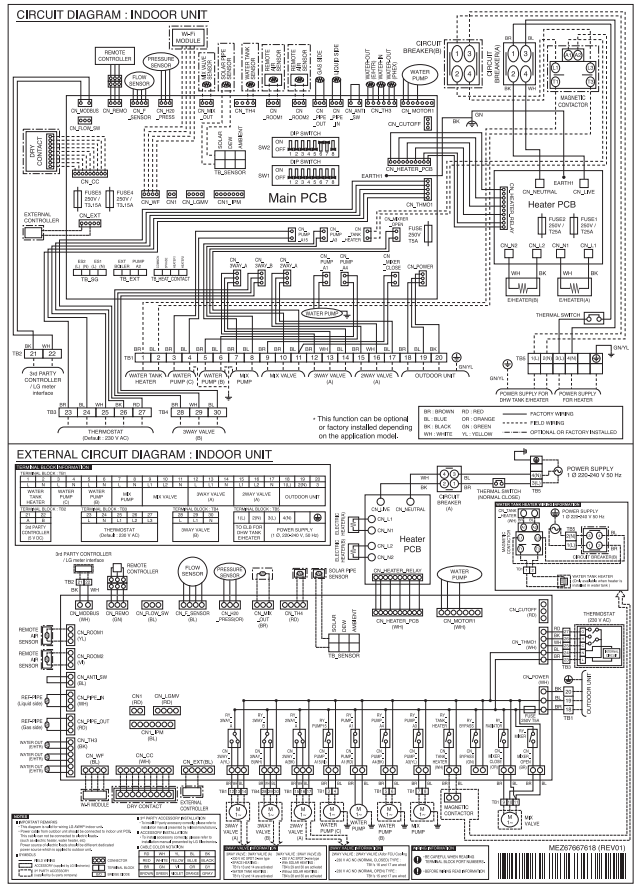
7. Wiring Diagrams

Indoor Unit(Including field wiring) : Electric Heater 1Φ

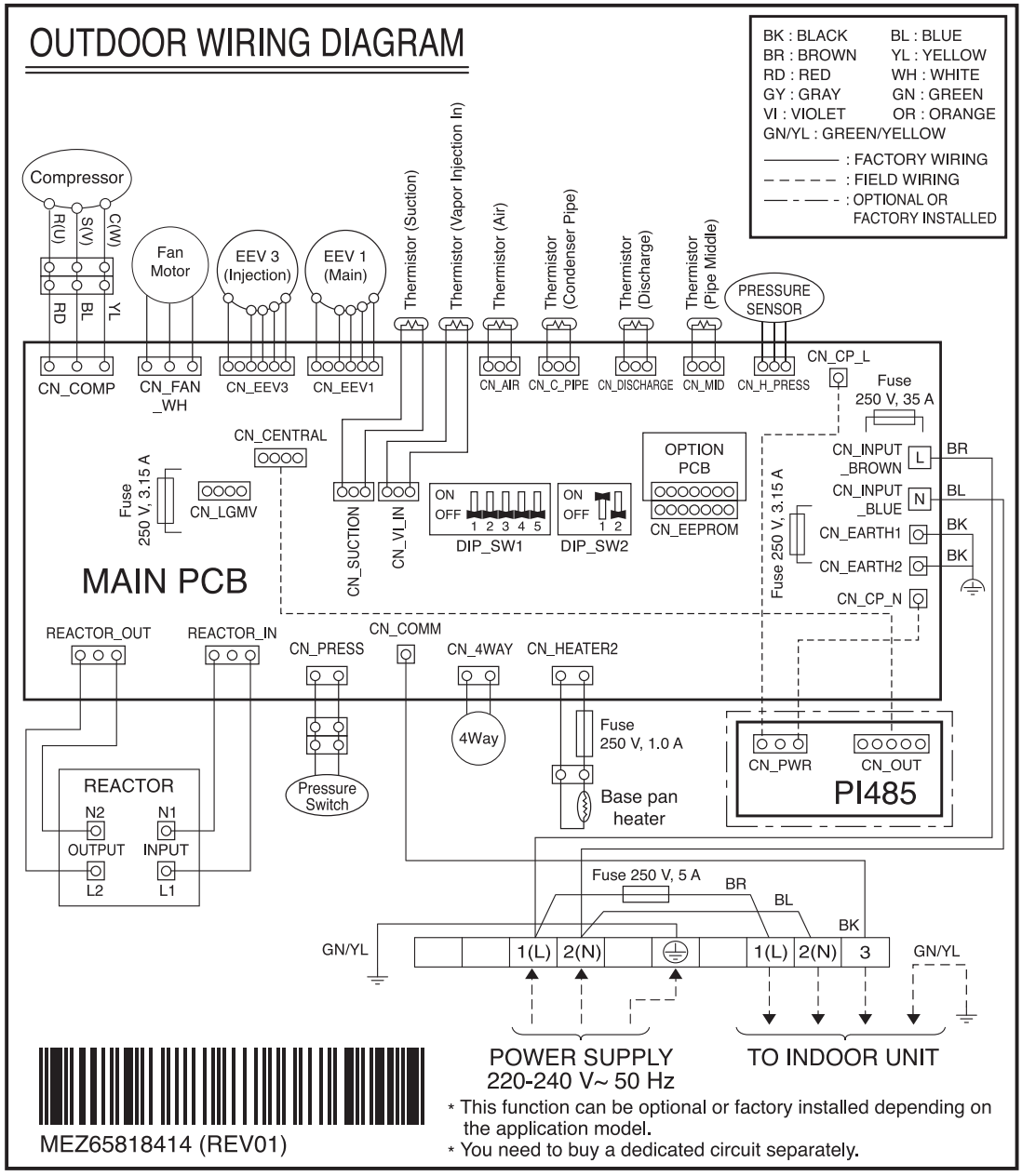
Until July. 31, 2021



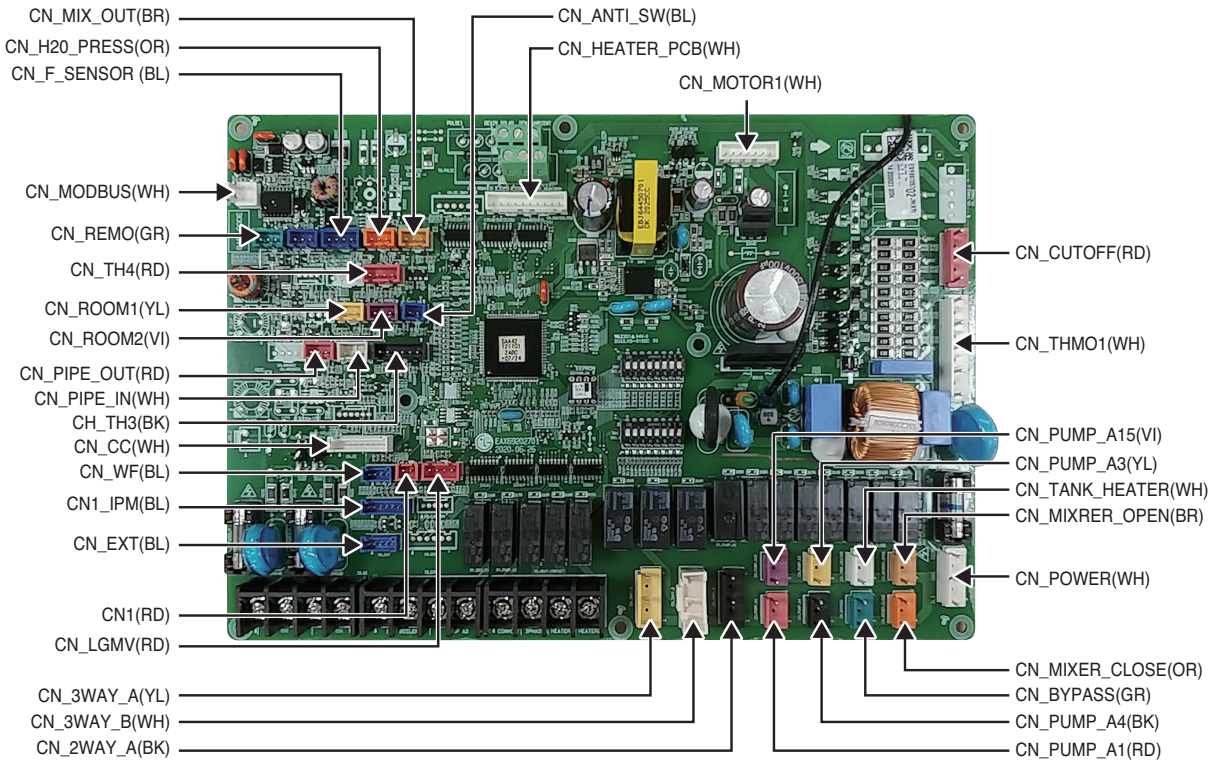
From Aug. 1, 2021



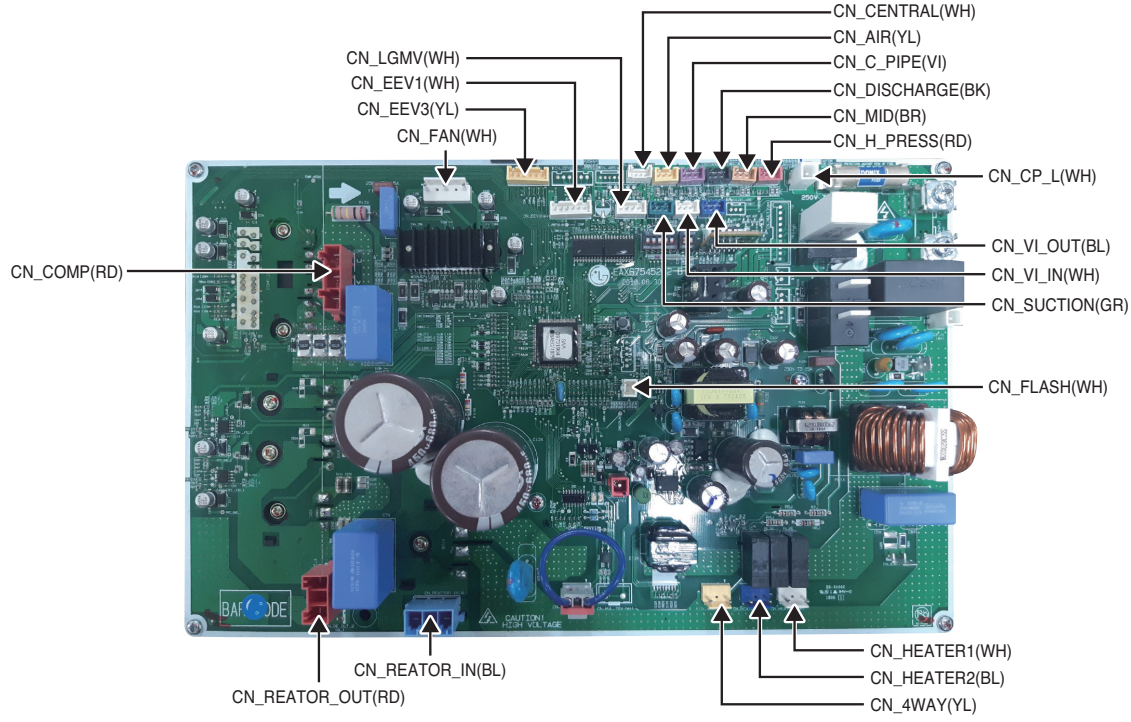
Outdoor Unit(Including field wiring) : U36A Chassis, 1Φ



Indoor PCB



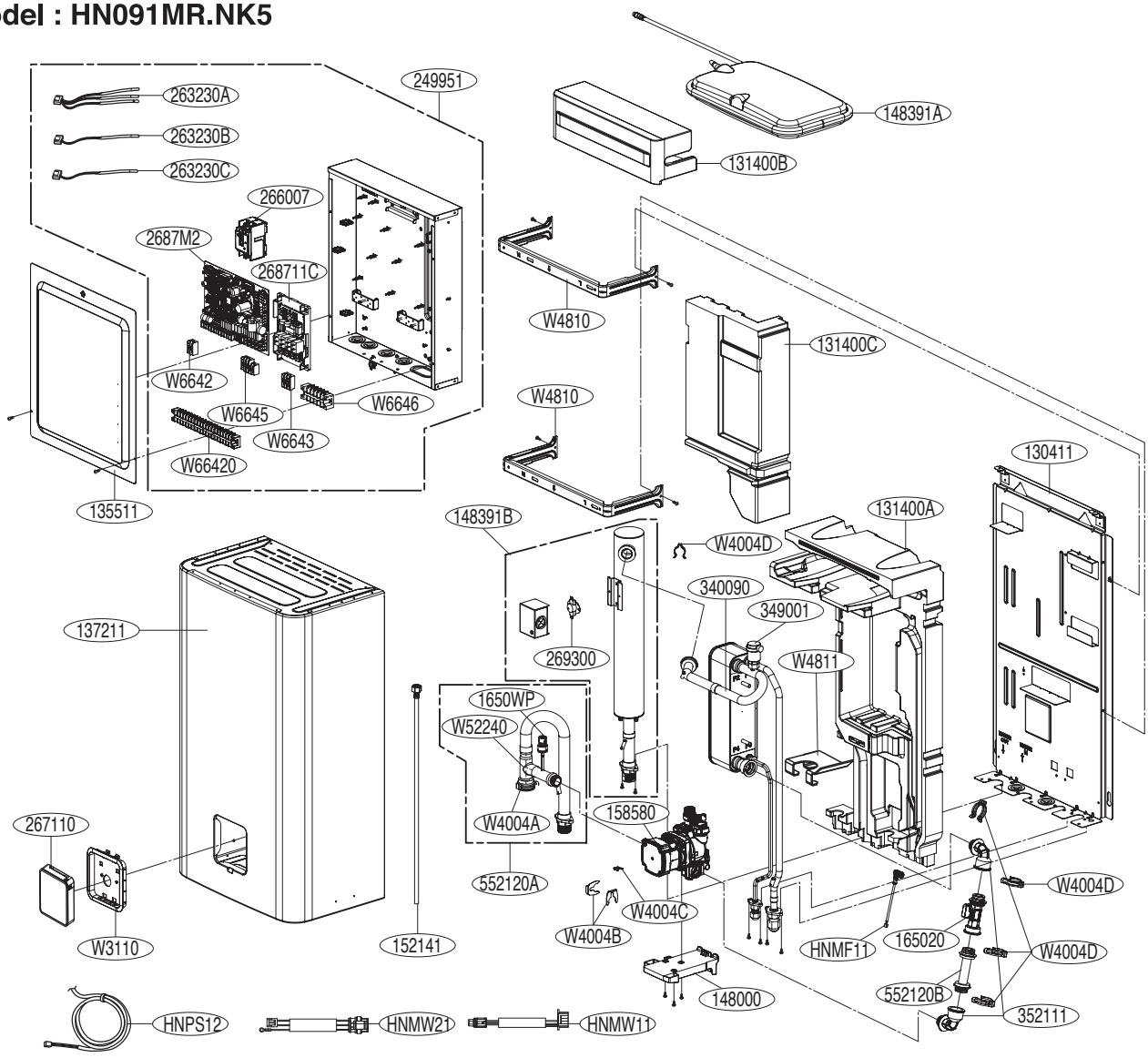
Outdoor PCB



8. Exploded View

Indoor Unit

Model : HN091MR.NK5

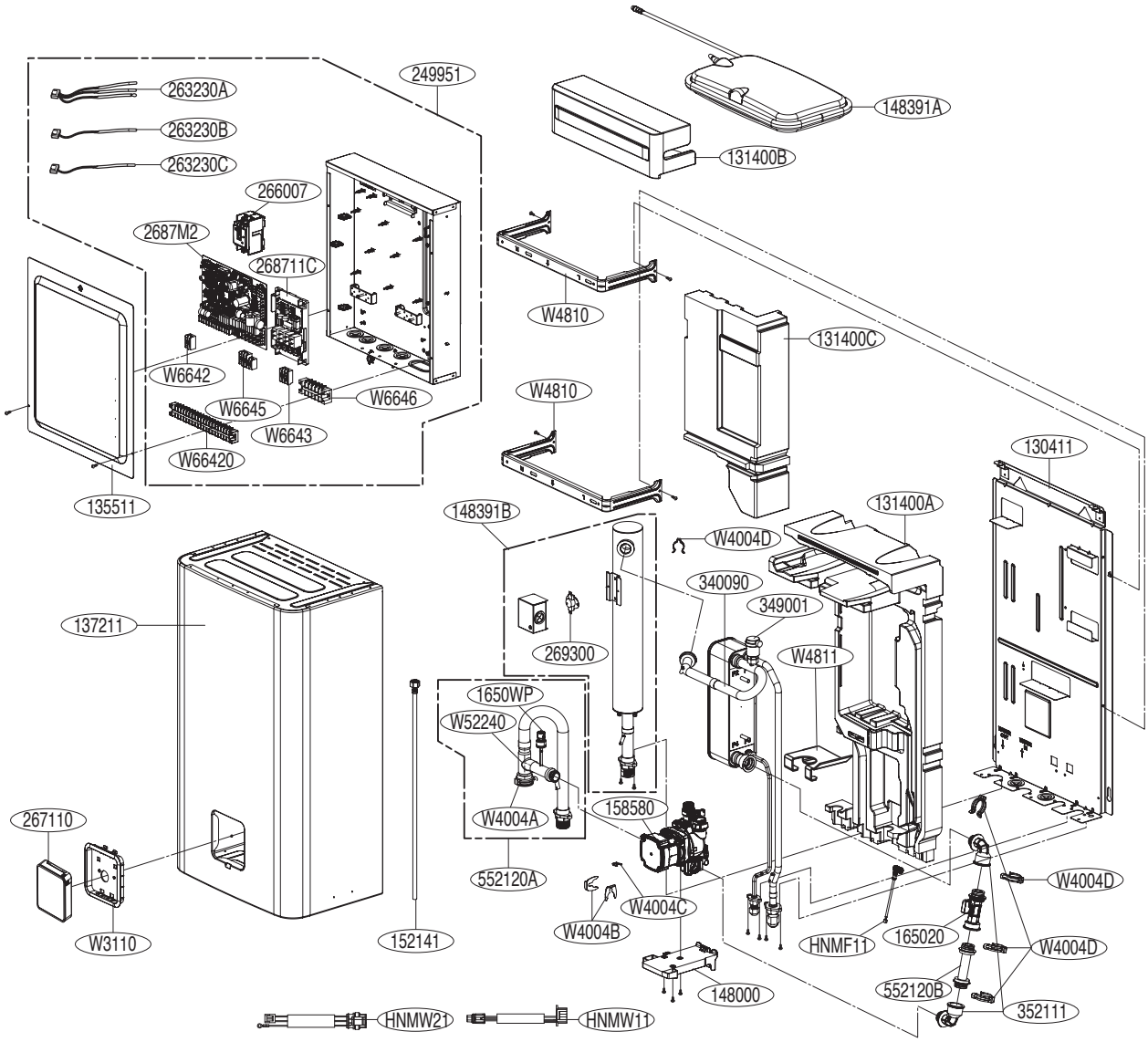


Location No.	Description	Description	Housing color
263230A	Thermistor,NTC (CN_TH3)	Water out / Water in / PHEX out temperature sensor	Black
263230B	Thermistor,NTC (CN_PIPE_IN)	PHEX liquid temperature sensor	White
263230C	Thermistor,NTC (CN_PIPE_OUT)	PHEX gas temperature sensor	Red

Location No.	Description	Description	Housing color
HNMW21	Harness, single (CN_W_PUMP_A)	Pump AC Wire	Red
HNMW11	Harenss, multi (CN_MOTOR1)	Pump DC Wire	White
HNPS12	Harness, single (CN_EXT)	For external controller	Blue
HNMF11	Harness, single (CN_F_METER)	Flow sensor wire	Blue

Location No.	Description	Remark
W4004A	Clip	For assemble strainer
W4004B	Clip	For assemble pump and pipe
W4004C	Clip	For assemble pump and expansion tank hose
W4004D	Clip	For assemble flow sensor and and pipe

Model : HN091MR.NK5RU



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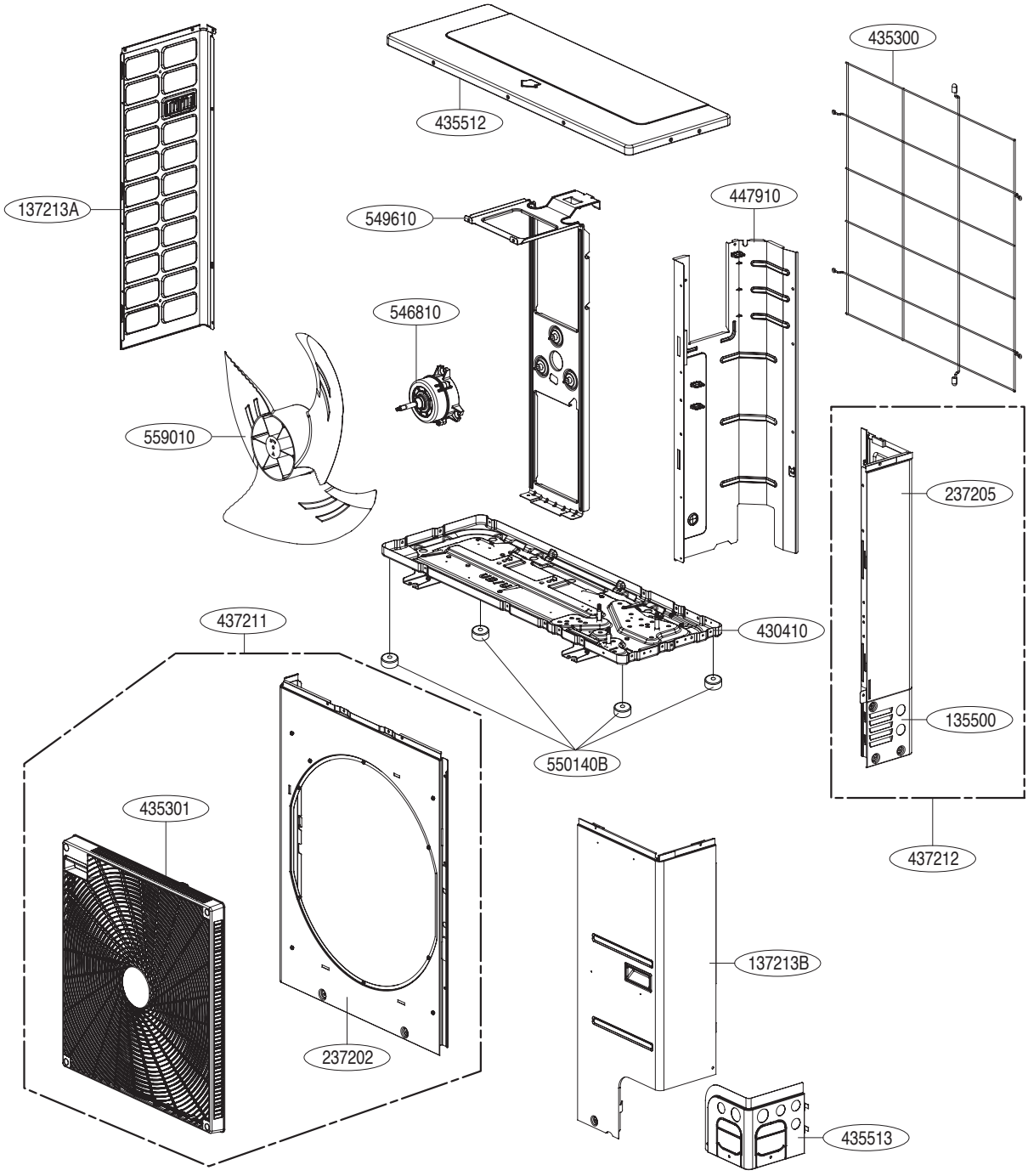
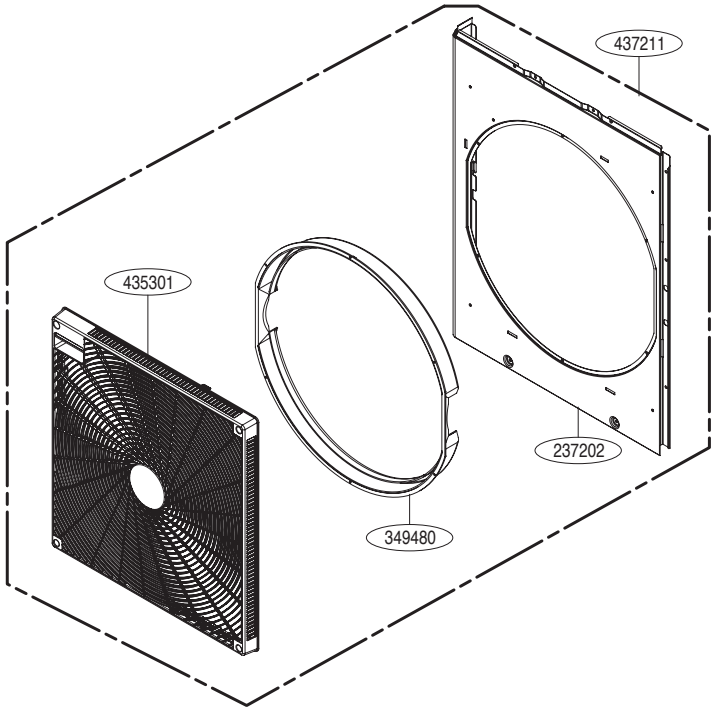
W4004C	Clip	For assemble pump and expansion tank hose
W4004D	Clip	For assemble flow sensor and and pipe

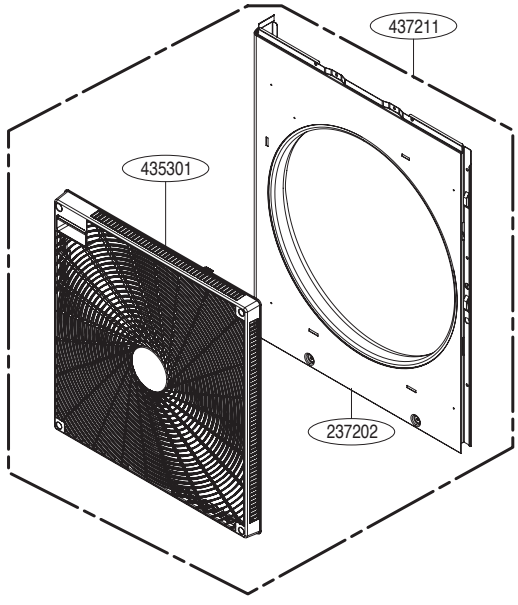
Outdoor Unit



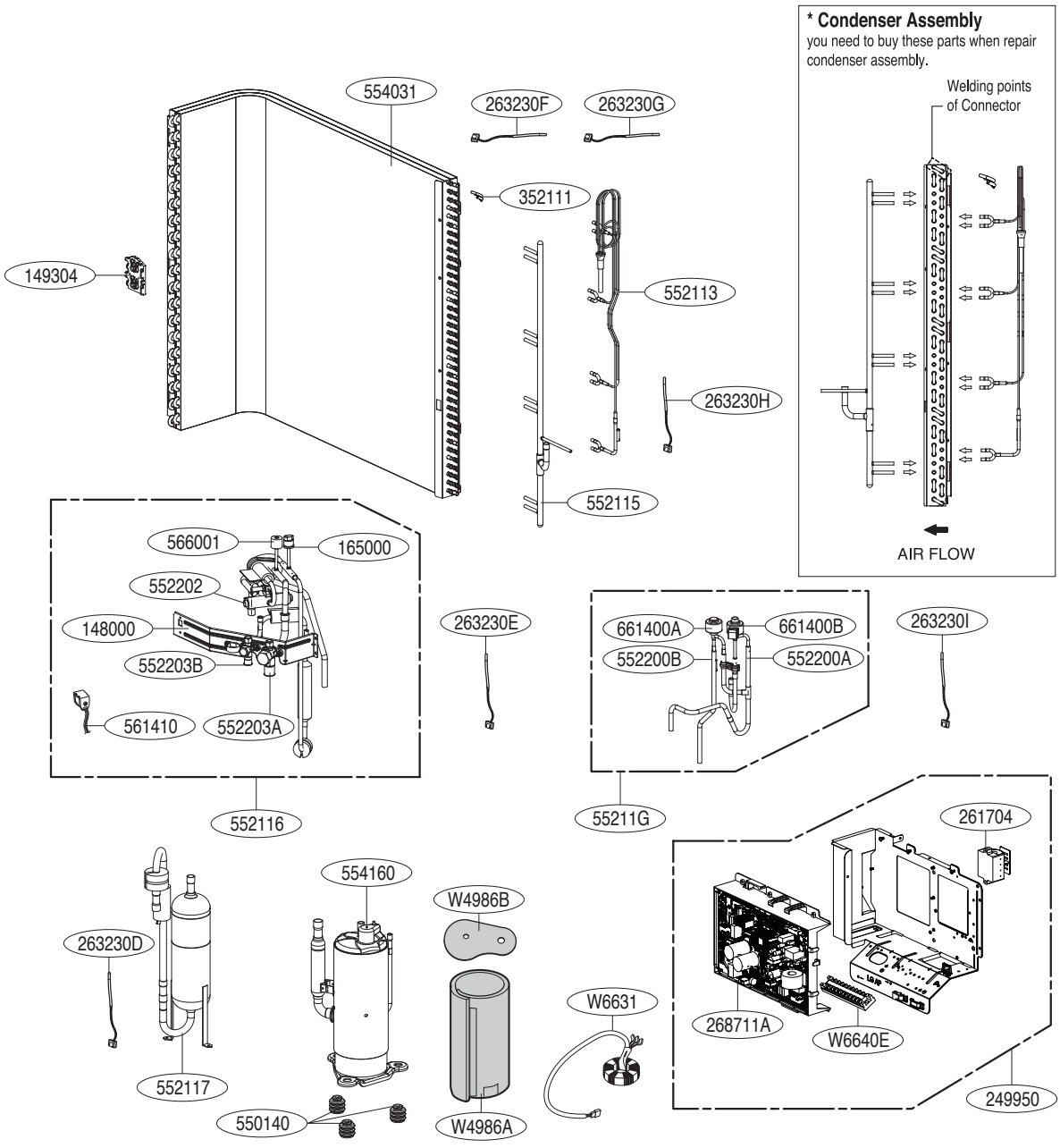
Panel, Front (Until Jan. 31, 2021)



Panel, Front (From Feb. 1, 2021)



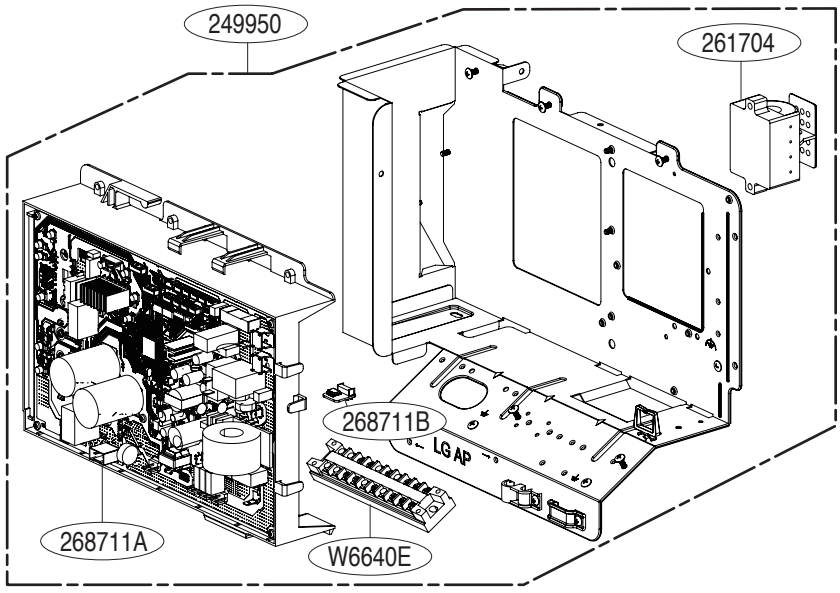
Location No.	Description	Production date	
		Until Jan. 31, 2021	From Feb. 1, 2021
437211	Panel Assembly, Front(Outdoor)	AGL72770337	AGL72770348
237202	Panel, Front	MGC53382901	MGC66162401
349480	Orifice	MFX63082101	
435301	Grille, Discharge	MDX64291901	MDX64291901



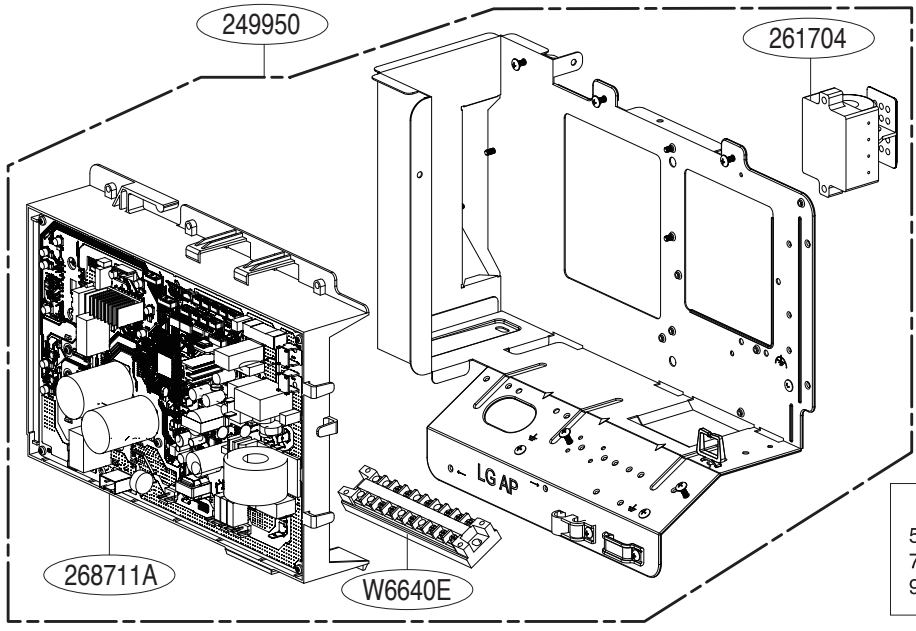
Thermistor Assembly,NTC

Location No.	Thermistor Description	Housing Color
263230D	Compressor-suction pipe temperature sensor	Green
263230E	Compressor-discharge pipe temperature sensor	Black
263230F	Outdoor air temperature sensor	Yellow
263230G	Outdoor-HEX middle temperature sensor	Brown
263230H	Outdoor-HEX temperature sensor	Violet
263230I	Inlet IHEX temperature sensor	White

Case Assembly,Control Box (Until April, 2021)



Case Assembly,Control Box (From May, 2021)

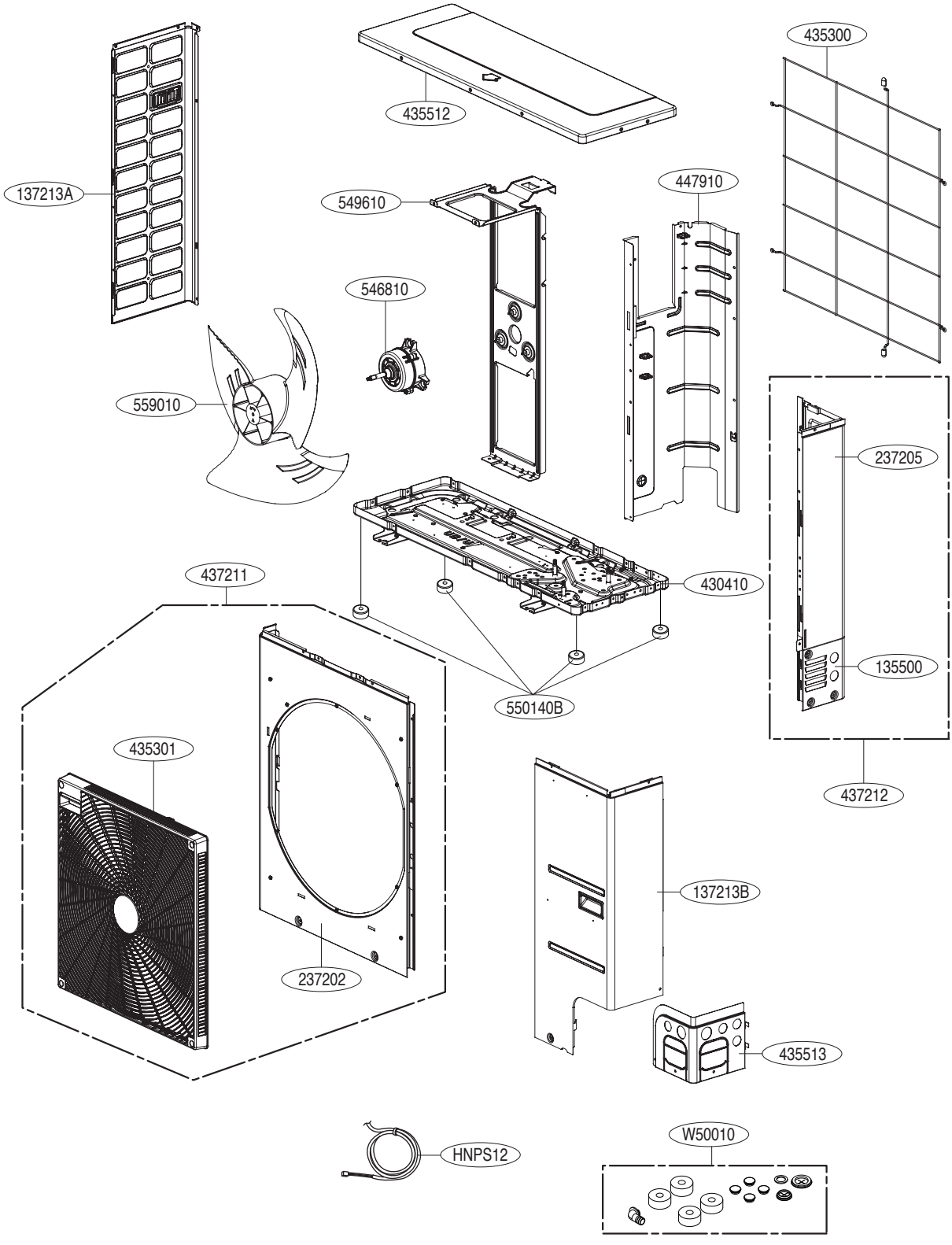


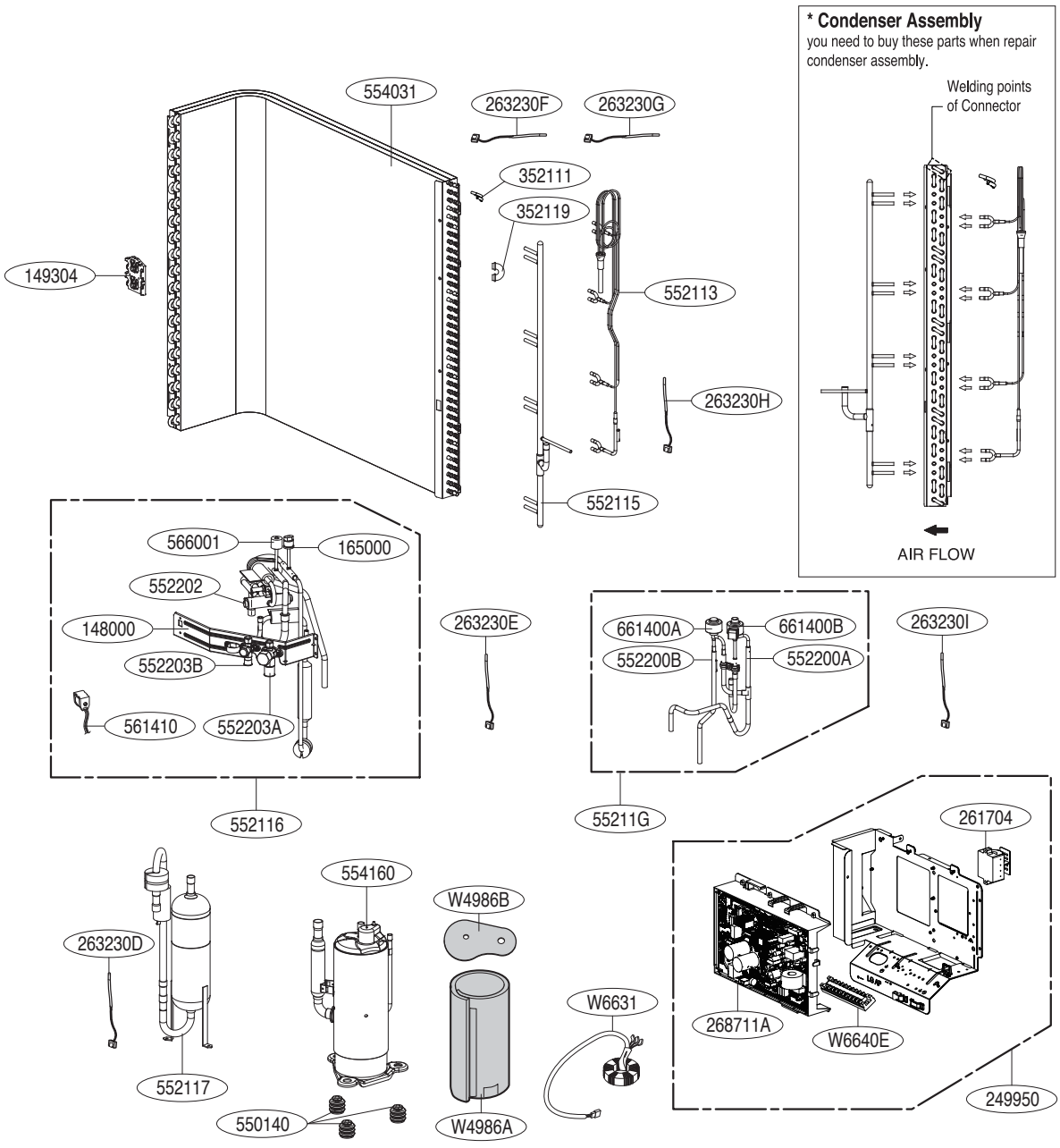
SVC Bulletin No.
5kW : DMZ202100048-01
7kW : DMZ202100049-01
9kW : DMZ202100050-01

Location No.	Description	P/No. (Production date)	
		Until April,2021	From May, 2021
649950	Case Assembly,Control Box	ABQ30061304	ABQ30061304
268711A	PCB Assembly,Inverter	EBR84691007	EBR84691025 (1Φ 5 kW)
			EBR84691026 (1Φ 7 kW)
			EBR84691027 (1Φ 9 kW)
268711B	PCB Assembly,Sub	EBR85059015 (1Φ 5 kW)	-
		EBR85059016 (1Φ 7 kW)	
		EBR85059017 (1Φ 9 kW)	
W6640E	Connector,Terminal Block	3A00493K	3A00493K
261704	Transformer,Reactor	EBJ61970010	EBJ61970010

Outdoor Unit

Model : HU091MR.U44RU





Thermistor Assembly,NTC

Location No.	Thermistor Description	Housing Color
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263230I	Inlet IHEX temperature sensor	White

P/NO : MFL68681917