FUJITSU

REFRIGERANT R32
INVERTER

AIR TO WATER

Comfort series

SERVICE MANUAL

OUTDOOR

WOYA060KLT

WOYA080KLT

FUJITSU GENERAL LIMITED

DA_CF001EF_03
2021.03.01

Notices:

- Product specifications and design are subject to change without notice for future improvement.
- For further details, please check with our authorized dealer.

CONTENTS

REFRIGERANT R32
INVERTER

WATERSTAGE™
INNOVATIVE SOLUTION OF DOMESTIC HEATING

1. GENERAL INFORMATION UNIT

2020.12.15
SA_CH01_CF001EF_02

CONTENTS

1. GENERAL INFORMATION UNIT

GENERAL INFORMATION

1. Specifications

1-1. Outdoor unit

■ Nominal capacity and nominal input

Model name			Hydraulic indoor unit		WSYA050ML3	WSYA080ML3	
			Outdoor unit		WOYA060KLT	WOYA060KLT	WOYA080KLT
Power supply					1 Ø 230 V ~ 50 Hz		
-15°C/+45°C Floor heating		Heating capacity	Nominal	kW	3.50	4.00	5.00
		Input power	Nominal	kW	1.81	2.05	2.62
		COP	Nominal		1.93	1.95	1.91
-10°C/+55°C Floor heating		Heating capacity	Nominal	kW	3.75	4.00	5.00
		Input power	Nominal	kW	2.19	2.31	2.96
		COP	Nominal		1.71	1.73	1.69
-10°C/+35°C Floor heating		Heating capacity	Nominal	kW	4.00	4.50	5.60
		Input power	Nominal	kW	1.49	1.69	2.38
		COP	Nominal		2.68	2.67	2.35
-7°C/+35°C Floor heating		Heating capacity	Nominal	kW	4.40	5.00	5.70
		Input power	Nominal	kW	1.59	1.90	2.13
		COP	Nominal		2.76	2.63	2.68
-7°C/+55°C Floor heating		Heating capacity	Nominal	kW	3.90	4.25	5.30
		Input power	Nominal	kW	2.11	2.25	2.79
		COP	Nominal		1.85	1.89	1.90
+2°C/+35°C Floor heating	COP priority	Heating capacity	Nominal	kW	2.50		3.40
		Input power	Nominal	kW	0.651		0.863
		COP	Nominal		3.84		3.94
	Capacity priority	Heating capacity	Nominal	kW	4.50	5.30	6.30
		Input power	Nominal	kW	1.33	1.65	1.96
		COP	Nominal		3.39	3.22	3.21
+7°C/+35°C Floor heating		Heating capacity	Minimum	kW	1.93		1.97
			Nominal		4.50	5.50	7.50
			Maximum		7.75	9.37	9.85
		Input power	Nominal	kW	0.949	1.18	1.69
		COP	Nominal		4.74	4.65	4.43
+7°C/+45°C Floor heating		Heating capacity	Nominal	kW	4.50	5.50	7.50
		Input power	Nominal	kW	1.26	1.54	2.20
		COP	Nominal		3.57	3.56	3.41
+7°C/+55°C Floor heating		Heating capacity	Nominal	kW	4.50	5.50	7.00
		Input power	Nominal	kW	1.70	2.06	2.63
		COP	Nominal		2.64	2.67	2.66

NOTE: Test conditions are complied with EN14511-2

GENERAL INFORMATION

■ Technical specifications

Outdoor unit model name				WOYA060KLT	WOYA080KLT
Enclosure		Material		Steel sheet	
		Color		Beige Approximate color of Munsell 10YR 7.5/1.0NN	
Dimensions (H × W × D)	Net		mm	632 × 799 × 290	716 × 820 × 315
	Gross			692 × 940 × 375	776 × 961 × 450
Weight	Net		kg	39	42
	Gross			43	46
Heat exchanger		Dimensions (H × W × D)	mm	588 × 881 × 36.38	672 × 881 × 36.38
		Fin pitch		1.3	
		Rows × Stages		2 × 28	2 × 32
		Pipe type		Copper	
		Fin type	Type (Material)	Corrugate (Aluminum)	
			Surface treatment	Corrosion resistance	
Fan	Airflow rate	Heating	m^3/h	2,100	3,120
	Type × Q'ty			Propeller fan × 1	
	Discharge direction			Horizontal	
	Motor quantity			1	
	Motor output		W	49	
Compressor	Type			DC 2 rotary × 1	
	Motor output		W	1,200	
Operation range	Heating	Minimum	°CDB	-20	
		Maximum	°CWB	35	
	Sanitary water	Minimum	°CDB	-20	
		Maximum	°CWB	35	
Refrigerant		Type (Global Warming Potential)		R32 (675)	
		Charge	g	970	1,020
		Control		Expansion valve (electric type)	
		Number of circuits		1	
Refrigerant oil		Type		RmM68AF	
		Charged volume	l	0.55	
Connection pipe	Connection method	Liquid	mm	Flare connection	
		Gas		Flare connection	
	Size (standard)	Liquid	mm	Ø6.35	
		Gas		Ø12.70	
	Pre-charge length		m	15	
	Max. length			30	
	Min. length			3.0	
	Additional refrigerant charge		g/m	25	
	Max. height difference		m	20	
	Defrost method			Reverse cycle	
	Defrost control			Outdoor unit heat exchanger temperature sensor	
Capacity control method				Inverter control	

GENERAL INFORMATION

■ Product fiche

Model name	Hydraulic indoor unit		WSYA050ML3		WSYA080ML3			
	Outdoor unit		WOYA060KLT		WOYA060KLT		WOYA080KLT	
Temperature application		°C	55	35	55	35	55	35
Declared load profile			—	—	—	—	—	—
Seasonal space heating energy efficiency class			A++	A+++	A++	A+++	A++	A+++
Water heating energy efficiency class			—	—	—	—	—	—
Rated heat output		kW	5	5	5	6	6	7
Supplementary heater		kW	3	3	3	3	3	3
Annual energy consumption		kWh	3,035	2,322	3,411	2,594	3,903	2,982
Annual electricity consumption		kWh	—	—	—	—	—	—
Annual fuel consumption		GJ	Not applicable					
Seasonal space heating energy efficiency		%	125	175	125	175	128	177
Water heating energy efficiency		%	—	—	—	—	—	—
Sound power level	Hydraulic unit	dB	40	—	40	—	40	—
Work only during off-peak hours			Not applicable					
Specific precautions in assembled, installed, or maintained			Refer to the installation and operating manuals.					
Rated heat output	Colder climate	kW	—	—	—	—	—	—
	Warmer climate	kW	5	6	5	6	6	6
Annual energy consumption	Colder climate	kWh	—	—	—	—	—	—
	Warmer climate	kWh	1,772	1,253	1,809	1,351	1,911	1,294
Annual electricity consumption	Colder climate	kWh	—	—	—	—	—	—
	Warmer climate	kWh	—	—	—	—	—	—
Seasonal space heating energy efficiency	Colder climate	%	—	—	—	—	—	—
	Warmer climate	%	157	236	156	230	159	228
Water heating energy efficiency	Colder climate	%	—	—	—	—	—	—
	Warmer climate	%	—	—	—	—	—	—
Sound power level	Outdoor unit	dB	57	—	57	—	60	—

NOTES:

- Product fiche according to Commission Delegated Regulation (EU) 811/2013
- Acoustic noise information:
  - The maximum sound pressure level is less than 70 dB (A) for both hydraulic unit and outdoor unit.
  - According to IEC 704-1 and ISO 3744.
- If the air to water heat pump is operated under higher temperature conditions than those listed, the built-in protection circuit may operate to prevent internal circuit damage. Also, during cooling modes, if the unit is used under conditions of lower temperatures than those listed above, the heat exchanger may freeze, leading to water leakage and other damage.
- Do not use this unit for any purposes other than the Heating and Cooling.

GENERAL INFORMATION

■ Product information

Model name	Hydraulic indoor unit			WSYA050ML3		WSYA080ML3			
	Outdoor unit			WOYA060KLT		WOYA060KLT		WOYA080KLT	
Air-to-water heat pump				Yes					
Water-to-water heat pump				No					
Brine-to-water heat pump				No					
Low-temperature heat pump				No					
Equipped with a supplementary heater				Yes					
Heat pump combination heater				No*1					
Temperature application			°C	55	35	55	35	55	35
Rated heat output*2		P_{rated}	kW	5	5	5	6	6	7
Seasonal space heating energy efficiency		ηs	%	125	175	125	175	128	177
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j									
T_j = –7°C		P_{dh}	kW	4.2	4.4	4.7	5.0	5.5	5.8
T_j = +2°C		P_{dh}	kW	2.5	2.7	2.9	3.0	3.3	3.5
T_j = +7°C		P_{dh}	kW	1.9	2.1	1.8	2.1	2.1	2.3
T_j = +12°C		P_{dh}	kW	2.3	2.4	2.3	2.4	2.4	2.5
T_j = bivalent temperature		P_{dh}	kW	4.2	4.4	4.7	5.0	5.5	5.8
T_j = operation limit temperature		P_{dh}	kW	3.8	4.0	4.0	4.5	5.0	5.6
T_j = –15°C (if TOL < –20°C)		P_{dh}	kW	—	—	—	—	—	—
Bivalent temperature		T_{biv}	°C	-7	-7	-7	-7	-7	-7
Cycling interval capacity for heating		P_{cych}	kW	Not applicable					
Degradation co-efficient*3		C_{dh}		0.9	0.9	0.9	0.9	0.9	0.9
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j									
T_j = –7°C		COP_d		1.99	2.84	1.97	2.74	1.91	2.70
T_j = +2°C		COP_d		3.11	4.40	3.11	4.38	3.18	4.35
T_j = +7°C		COP_d		4.25	5.85	4.29	6.04	4.52	6.32
T_j = +12°C		COP_d		5.91	7.39	6.06	7.43	6.37	8.07
T_j = bivalent temperature		COP_d		1.99	2.84	1.97	2.74	1.91	2.70
T_j = operation limit temperature		COP_d		1.71	2.68	1.73	2.67	1.69	2.35
T_j = –15°C (if TOL < –20°C)		COP_d		—	—	—	—	—	—
Operation limit temperature		TOL	°C	-10	-10	-10	-10	-10	-10
Cycling interval efficiency		COP_{cyc}		Not applicable					
Heating water operating limit temperature		WTOL	°C	55	55	55	55	55	55
Power consumption in modes other than active mode									
Off mode		P_{OFF}	kW	0.004	0.004	0.004	0.004	0.004	0.004
Thermostat-off mode		P_{TO}	kW	0.013	0.012	0.013	0.012	0.014	0.014
Standby mode		P_{SB}	kW	0.010	0.010	0.010	0.010	0.010	0.010
Crankcase heater mode		P_{CK}	kW	0.000	0.000	0.000	0.000	0.000	0.000
Supplementary heater									
Rated heat output*2		P_{SUP}	kW	0.9	1.0	1.3	1.1	1.2	0.9
Type of energy input				Electric					
Other items									
Capacity control				Variable					
Sound power level	Indoor unit	L_{WA}	dB	40	—	40	—	40	—
	Outdoor unit	L_{WA}	dB	57	—	57	—	60	—
Annual energy consumption		Q_{HE}	kWh	3,035	2,322	3,411	2,594	3,903	2,982
Emissions of nitrogen oxides		NO_x	mg/kWh	Not applicable					
Rated airflow rate	Outdoor unit		m^3/h	2,100	1,640	2,100	2,100	3,120	3,120
Declared load profile				—	—	—	—	—	—
Daily electricity consumption		Q_{elec}	kWh	—	—	—	—	—	—
Annual energy consumption		AEC	kWh	—	—	—	—	—	—
Water heating energy efficiency		η_{wh}	%	—	—	—	—	—	—
Daily fuel consumption		Q_{fuel}	kWh	Not applicable					
Contact details				FUJITSU GENERAL (EURO) GmbH Fritz-Vomfelde-Straße 26-32, 40547 Düsseldorf, Germany					

NOTES:

- Product information according to Commission Delegated Regulation (EU) 811/2013
- Product information is based on the average climate condition.
- *1: When using an optional component, this function is available.
- *2: For heat pump space heaters and heat pump combination heaters, the rated heat output P_{rated} is equal to the design load for heating $P_{designh}$, and the rated heat output of a supplementary heater P_{sup} is equal to the supplementary capacity for heating sup (T_j).
- *3: If C_{dh} is not determined by measurement then the default degradation coefficient is C_{dh} = 0.9.

GENERAL INFORMATION

● Energy efficiency value

Application: 35°C								
Model name	**Hydraulic indoor unit**		**WSYA050ML3**		**WSYA080ML3**			
	Outdoor unit		**WOYA060KLT**		**WOYA060KLT**		**WOYA080KLT**	
Seasonal energy efficiency of heat pump for space heating	%		175		175		177	
Type of temperature control								
Outdoor sensor (included in the package)			II	—	II	—	II	—
Modulating room thermostat (outdoor sensor included in the package)			—	IV	—	IV	—	IV
Bonus	%		2	4	2	4	2	4
Seasonal space heating energy efficiency of package in average climate conditions	%		177	179	177	179	179	181
Energy class of the packages			A+++	A+++	A+++	A+++	A+++	A+++
Seasonal space heating energy efficiency of package in warmer climate conditions	%		238	240	232	234	230	232
Seasonal space heating energy efficiency of package in colder climate conditions	%		—	—	—	—	—	—

Application: 55°C								
Model name	**Hydraulic indoor unit**		**WSYA050ML3**		**WSYA080ML3**			
	Outdoor unit		**WOYA060KLT**		**WOYA060KLT**		**WOYA080KLT**	
Seasonal energy efficiency of heat pump for space heating	%		125		125		128	
Type of temperature control								
Outdoor sensor (included in the package)			II	—	II	—	II	—
Modulating room thermostat (outdoor sensor included in the package)			—	IV	—	IV	—	IV
Bonus	%		2	4	2	4	2	4
Seasonal space heating energy efficiency of package in average climate conditions	%		127	129	127	129	130	132
Energy class of the packages			A++	A++	A++	A++	A++	A++
Seasonal space heating energy efficiency of package in warmer climate conditions	%		159	161	158	160	161	163
Seasonal space heating energy efficiency of package in colder climate conditions	%		—	—	—	—	—	—

● Class of temperature controller

Controller class		II	VI
Contribution to energy efficiency	%	2	4

NOTE: Controller class VI: UTW-C55XA, UTW-C58XD, UTW-C74TXF, UTW-C74HXF, UTW-C78XD

■ Electrical specifications

Outdoor unit model name				**WOYA060KLT**	**WOYA080KLT**
Available voltage range				198—264 V	
Power supply		Voltage	V	1 Ø 230	
		Frequency	Hz	50	
Maximum operating current*1		Heating	A	13.0	18.0
Wiring spec.*2	Main fuse (circuit breaker) current		A	16	20
	Power cable		mm^2	2.5 or more	
	Transmission cable	Size	mm^2	1.5 or more	
		Max. length	m	31	
Wiring connections quantity*3		For power supply		3	
		For connection with indoor		4	

NOTES:

- *1: Maximum operating current is the total current of the indoor unit and the outdoor unit.
- *2: Selected based on Japan Electrotechnical Standard and Codes Committee E0005.
- *3: Included earth wiring.

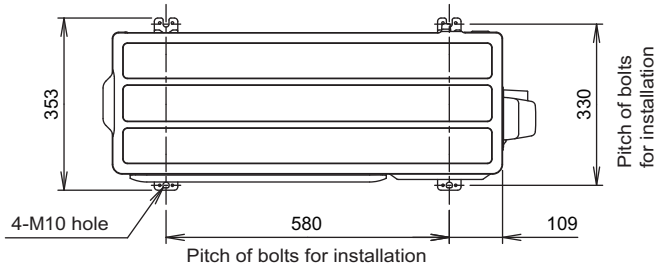
GENERAL INFORMATION

2. Dimensions

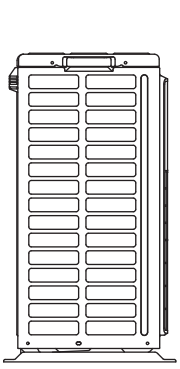
2-1. Outdoor unit

■ Model: WOYA060KLT

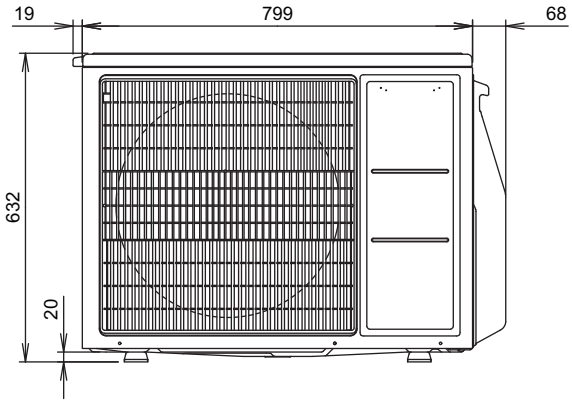
Unit: mm



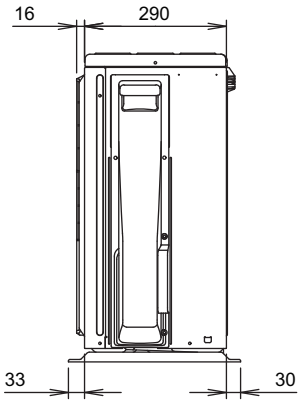
Top view



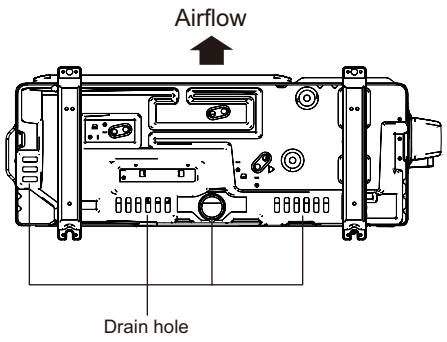
Side view



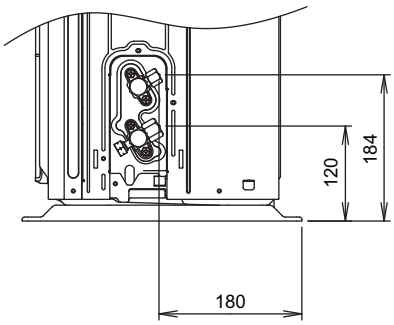
Front view



Side view



Bottom view

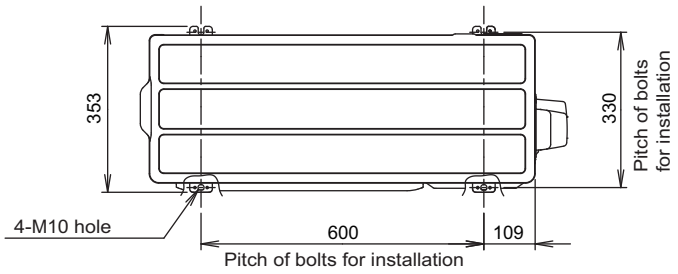


Side view (Valve part)

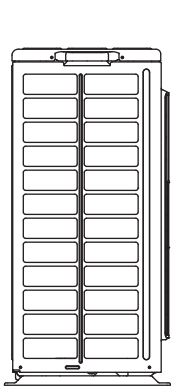
GENERAL INFORMATION

■ Model: WOYA080KLT

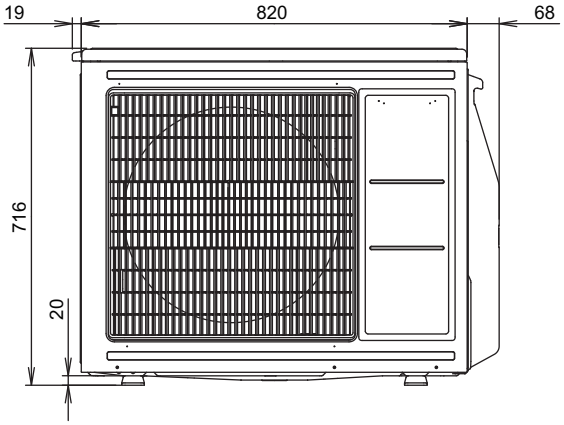
Unit: mm



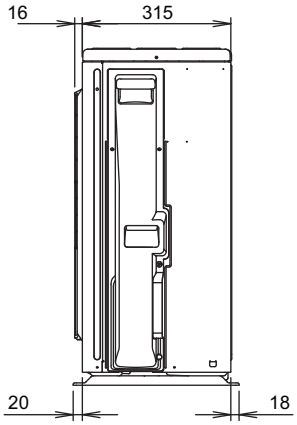
Top view



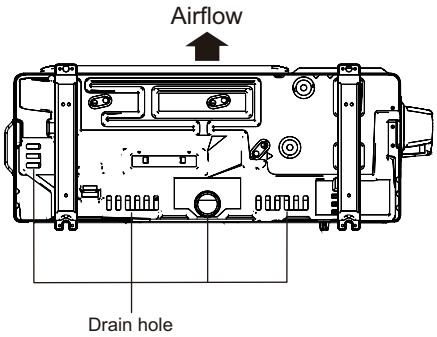
Side view



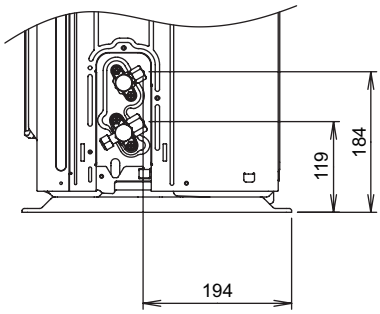
Front view



Side view



Bottom view



Side view (Valve part)

GENERAL INFORMATION

REFRIGERANT R32

INVERTER

WATERSTAGE™

INNOVATIVE SOLUTION OF DOMESTIC HEATING

2. TECHNICAL DATA AND PARTS LIST

2020.04.22
SA_CH02_CF001EF_01

CONTENTS

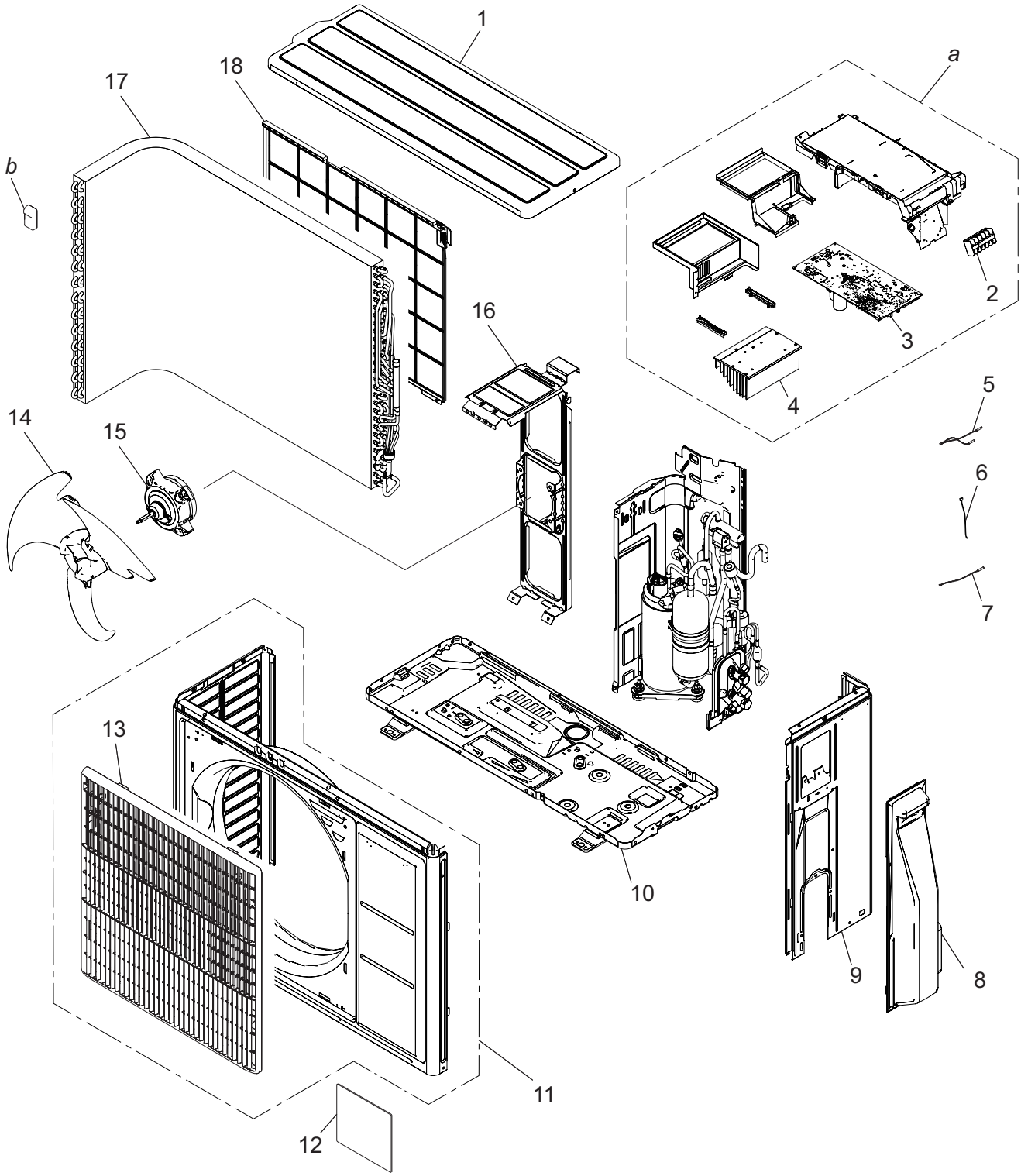
2. TECHNICAL DATA AND PARTS LIST

TECHNICAL DATA AND PARTS LIST

1. Outdoor unit parts list

1-1. Model: WOYA060KLT

■ Exterior parts and chassis

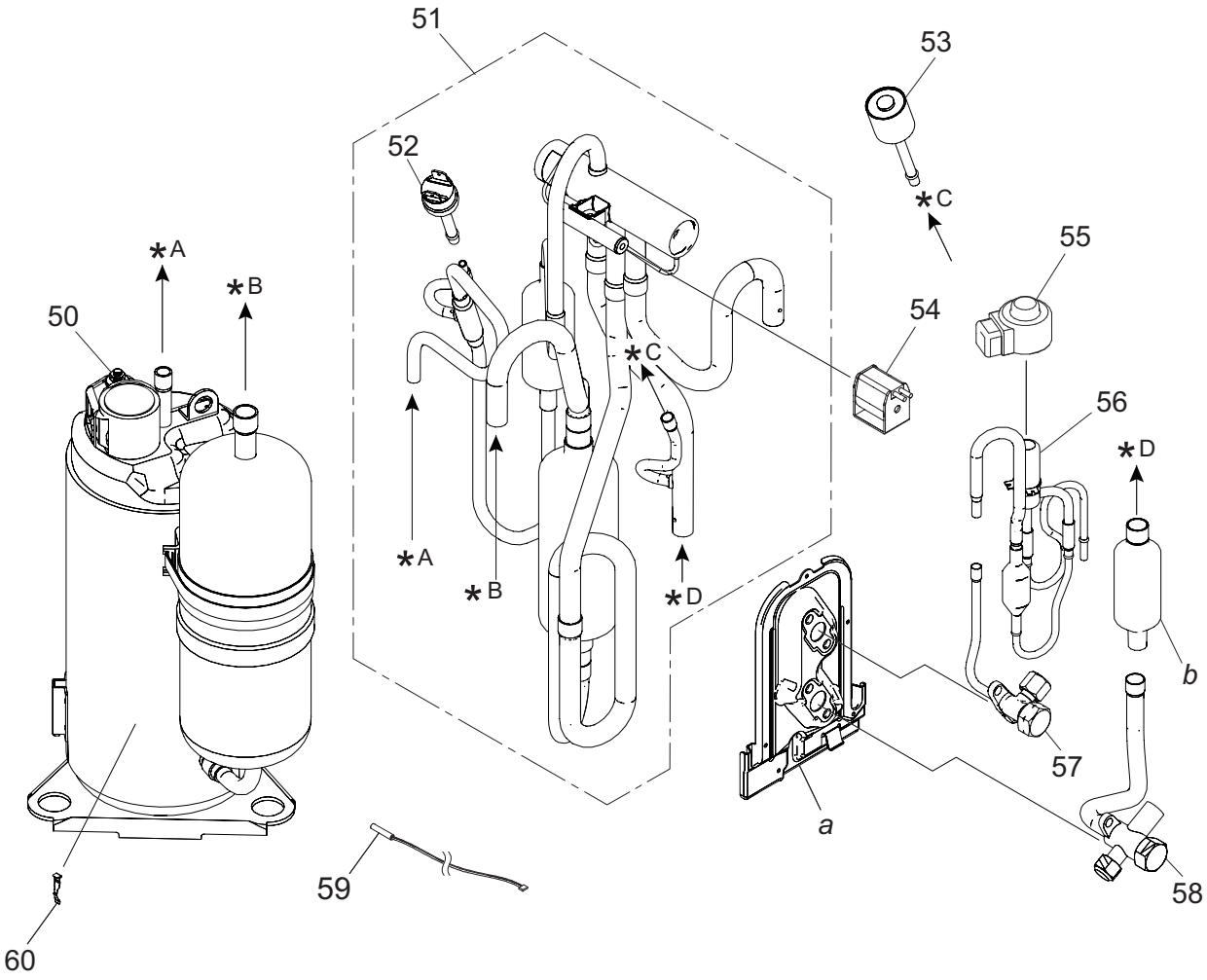


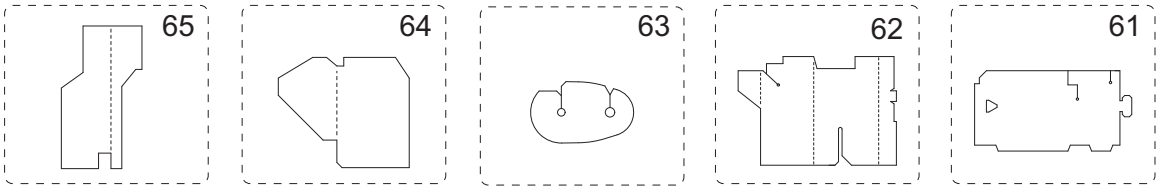
TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name	Service part
1	9322556028	Top panel assy	♦
2	9900435028	Terminal	♦
3	9709683880	Main PCB	♦
4	9322420039	Heat sink	♦
5	9900727079	Thermistor assy	♦
6	9900565060	Thermistor assy (Outdoor temp.)	♦
7	9901065019	Thermistor assy (Heat exchanger)	♦
8	9322570024	Switch cover assy	♦
9	9322552099	Cabinet right assy	♦
10	9323550025	Base assy	♦
11	9322555021	Front panel assy	♦
12	9319151007	Emblem	♦
13	9322149008	Blow grille	♦
14	9322150004	Propeller fan	♦
15	9603601003	Brushless motor	♦
16	9322553027	Motor bracket assy	♦
17	9317089753	Condenser total assy	♦
18	9322811028	Protective net assy	♦
a	—	Inverter assy	—
b	—	Hair pin cushion	—

TECHNICAL DATA AND PARTS LIST

■ Compressor





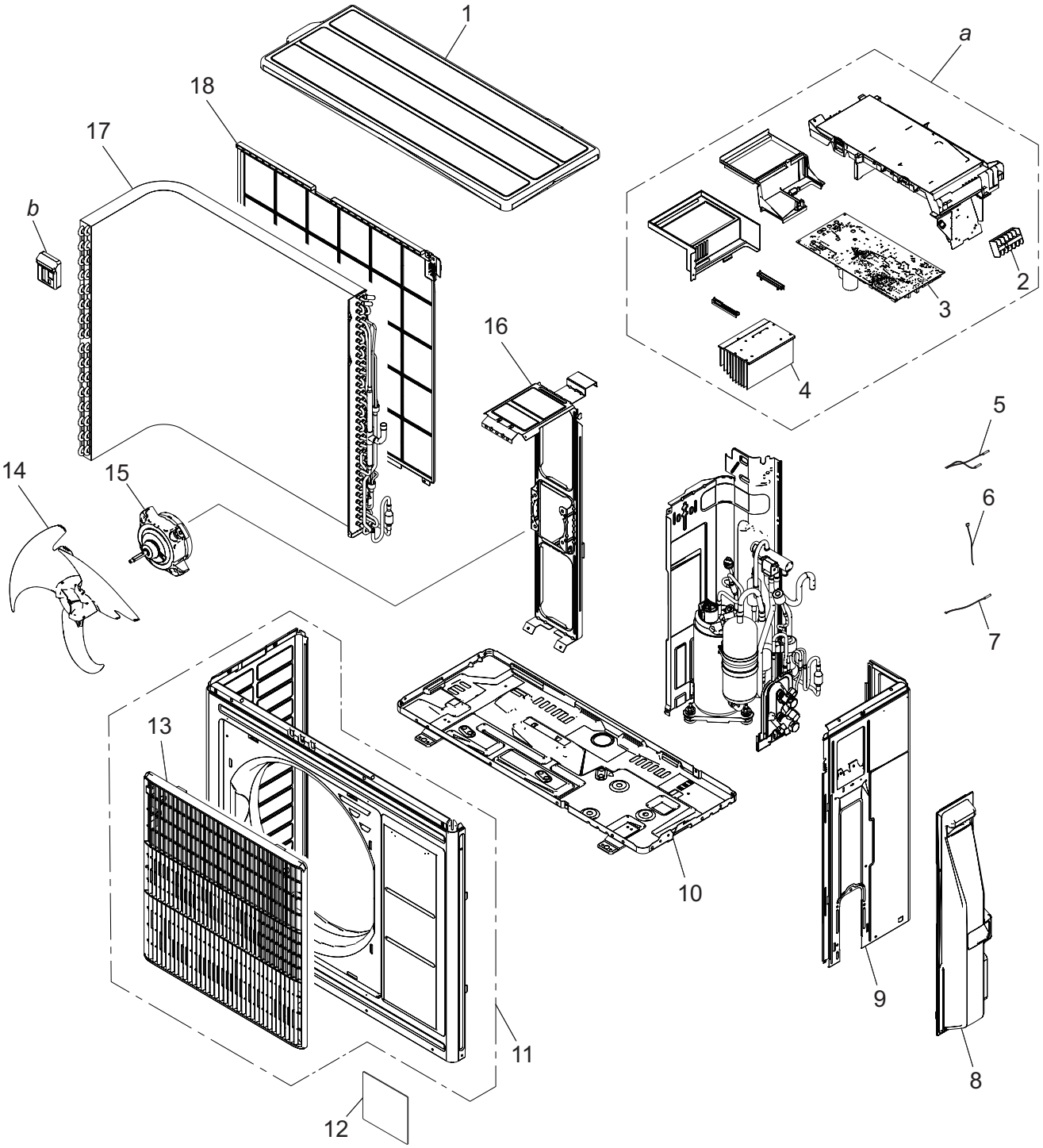
TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name	Service part
50	9810633002	Compressor	♦
51	9384281005	4-way valve assy	♦
52	9900186029	Pressure switch	♦
53	9970178115	Sensor	♦
54	9970110160	Solenoid	♦
55	9970173028	Expansion valve coil	♦
56	9384282002	Pulse motor valve assy	♦
57	9322474001	2-way valve assy	♦
58	9387831016	3-way valve assy	♦
59	9900985011	Thermistor (Compressor temp.)	♦
60	9810028006	Thermistor stopper	♦
61	9322503008	S-insulator B	♦
62	9322847003	S-insulator F	♦
63	9322501004	S-insulator H	♦
64	9323045002	S-insulator V	♦
65	9322824004	S-insulator K	♦
a	—	Valve bracket	—
b	—	Muffler	—

TECHNICAL DATA AND PARTS LIST

1-2. Model: WOYA080KLT

■ Exterior parts and chassis

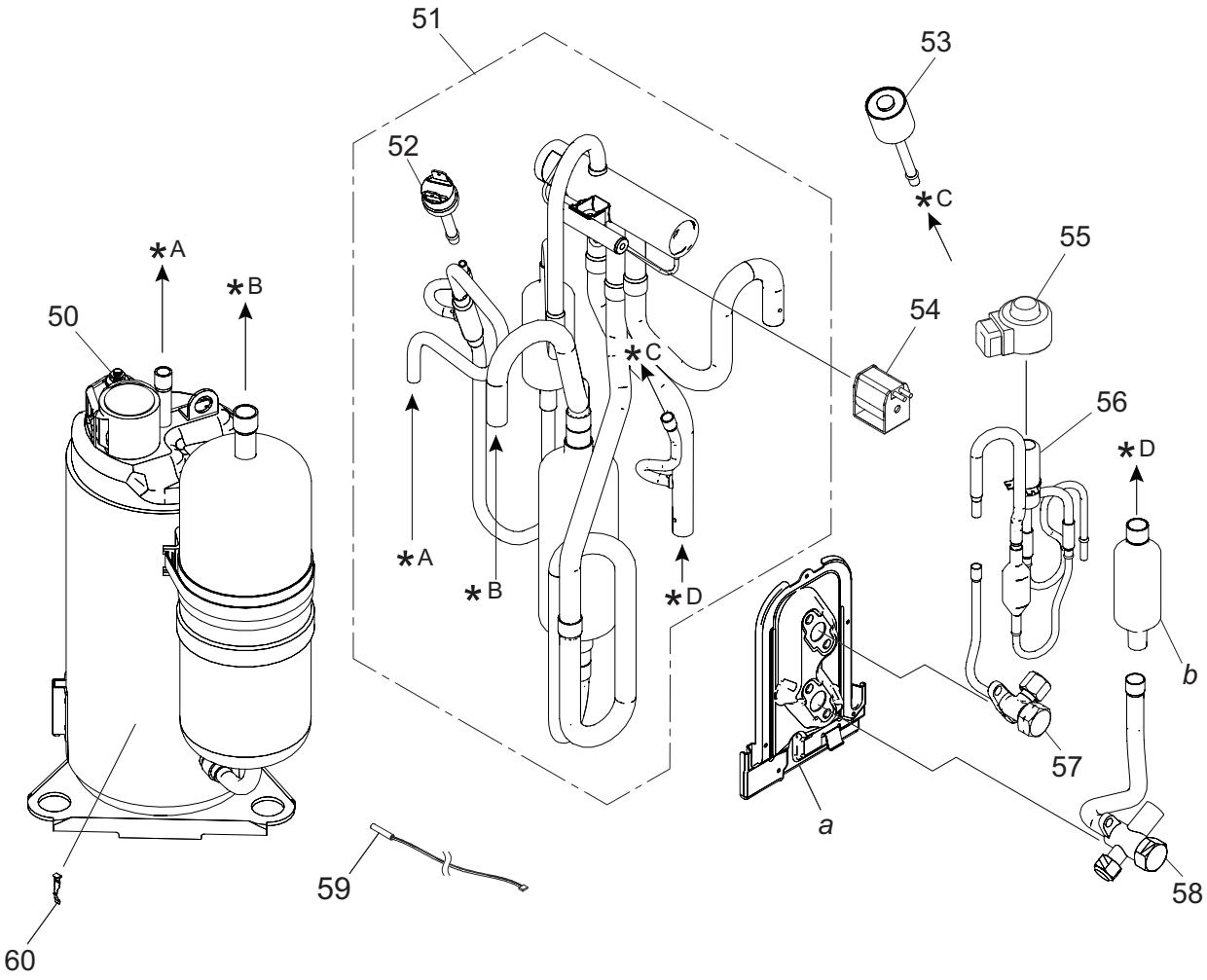


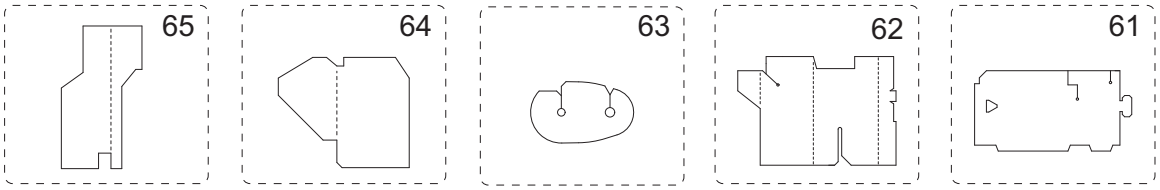
TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name	Service part
1	9322556073	Top panel assy	♦
2	9900435028	Terminal	♦
3	9709683897	Main PCB	♦
4	9322421043	Heat sink	♦
5	9900727116	Thermistor assy	♦
6	9900565060	Thermistor assy (Outdoor temp.)	♦
7	9901065019	Thermistor assy (Heat exchanger)	♦
8	9322570031	Switch cover assy	♦
9	9322552150	Cabinet right assy	♦
10	9322322036	Base assy	♦
11	9322555038	Front panel assy	♦
12	9319151007	Emblem	♦
13	9322149008	Blow grille	♦
14	9322150004	Propeller fan	♦
15	9603601003	Brushless motor	♦
16	9322553034	Motor bracket assy	♦
17	9317089760	Condenser total assy	♦
18	9322811042	Protective net assy	♦
a	—	Inverter assy	—
b	—	Hair pin cushion	—

TECHNICAL DATA AND PARTS LIST

■ Compressor





TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name	Service part
50	9810633002	Compressor	♦
51	9384281005	4-way valve assy	♦
52	9900186029	Pressure switch	♦
53	9970178115	Sensor	♦
54	9970110160	Solenoid	♦
55	9970173028	Expansion valve coil	♦
56	9384282002	Pulse motor valve assy	♦
57	9322474001	2-way valve assy	♦
58	9387831016	3-way valve assy	♦
59	9900985011	Thermistor (Compressor temp.)	♦
60	9810028006	Thermistor stopper	♦
61	9322503008	S-insulator B	♦
62	9322529008	S-insulator F	♦
63	9322501004	S-insulator H	♦
64	9323045002	S-insulator V	♦
65	9322824004	S-insulator K	♦
a	—	Valve bracket	—
b	—	Muffler	—

REFRIGERANT R32
INVERTER

WATERSTAGE™
INNOVATIVE SOLUTION OF DOMESTIC HEATING

3. TROUBLESHOOTING

2020.04.22
SA_CH03_CF001EF_01

1 ERROR DISPLAY

1-1 HYDRAULIC UNIT DISPLAY

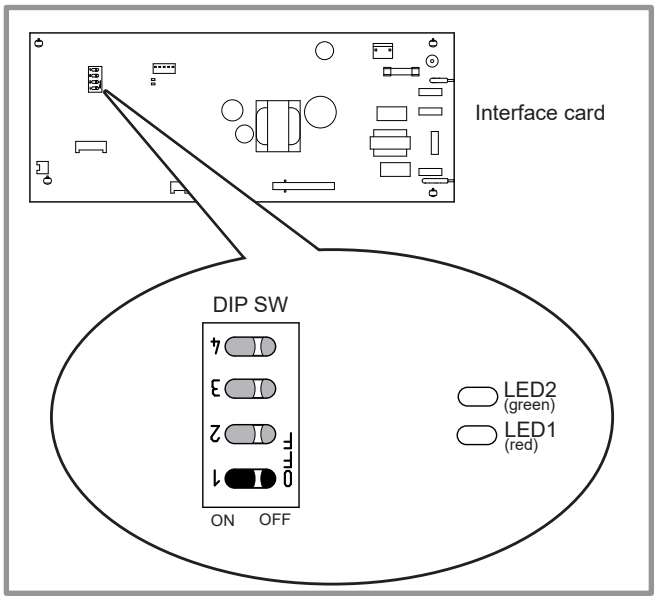


figure 1 - Location of DIP switch and diodes on the hydraulic unit card.

You can check the “Error LED blinks” when an error occurs.

Error Contents	Error Code	Trouble shooting
Serial communication error	11	1,2
Combination error	23	3
Outdoor unit main PCB model information error	62	4
Inverter error	63	5
PFC circuit error	64	6
Trip terminal L error	65	7
Discharge thermistor error	71	8
Compressor thermistor error	72	9
Heat exchanger outlet thermistor error	73	10

Error Contents	Error Code	Trouble shooting
Outdoor thermistor error	74	11
Electric expansion valve thermistor error	78	12
Current sensor error	84	13
Pressure sensor error / Pressure switch error	86	14
Trip detection	94	15
Compressor rotor position detection error	95	16
Outdoor unit fan motor error	97	17
Discharge temperature error	A1	18
Compressor temperature error	A3	19
Low pressure error	A5	20

2 TROUBLESHOOTING WITH ERROR CODE

Troubleshooting 1 **OUTDOOR UNIT Error Method:** **Serial communication error (Serial Reverse Transfer Error)**	**Indicate:** Green 1 flash / Red 1 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	When the hydraulic unit cannot receive the serial signal from Outdoor unit more than 2minutes after power ON, or the hydraulic unit cannot receive the serial signal more than 15 seconds during normal operation.

Forecast of Cause:

1. Connection failure 2. External cause 3. Main PCB failure

Check Point 1-1 : Reset the power and operate

- Does Error indication show again?

NO → **Check Point 1-2: Check external cause such as noise**

- Check the complete insulation of the grounding.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).

YES

Check Point 2 : Check Connection

- Check any loose or removed connection line of hydraulic unit and Outdoor unit.
  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.

OK

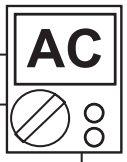
Check Point 3 : Check the voltage of power supply

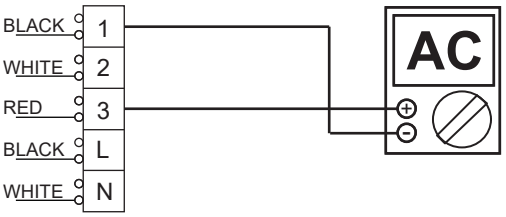
- Check the voltage of power supply
  >> Check if AC198V (AC220V -10%) - 264V (AC240V +10%) appears at Outdoor Unit Terminal L - N.

OK

Check Point 4 : Check Serial Signal (Reverse Transfer Signal)

- Check Serial Signal (Reverse Transfer Signal)
  >> Check if Indicated value swings between AC90V and AC270V at Outdoor Unit Terminal 1 - 3.
  >> If it is abnormal, Check Outdoor unit fan motor (PARTS INFORMATION 4)
  >> If Outdoor fan motor is abnormal, replace Outdoor unit fan motor and Main PCB.
  >> If Outdoor fan motor is normal, replace Main PCB.





Troubleshooting 2 **HYDRAULIC UNIT Error Method:** **Serial communication error (Serial Forward Transfer Error)**	**Indicate or Display:** Green 1 flash / Red 1 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Hydraulic unit interface PCB	When the outdoor unit cannot properly receive the serial signal from hydraulic unit for 10 seconds or more.

Forecast of Cause:

1. Connection failure 2. External cause

Check Point 1-1 : Reset the power and operate

- Does Error indication show again?

NO → **Check Point 1-2: Check external cause such as noise**

- Check if the ground connection is proper.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).

YES

Check Point 2 : Check Connection

- Check any loose or removed connection line of Hydraulic unit and Outdoor unit.
  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
- Check connection condition in control unit. (If there is loose connector, open cable or mis-wiring)

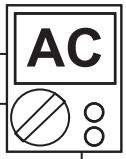
OK

Check Point 3 : Check the voltage of power supply

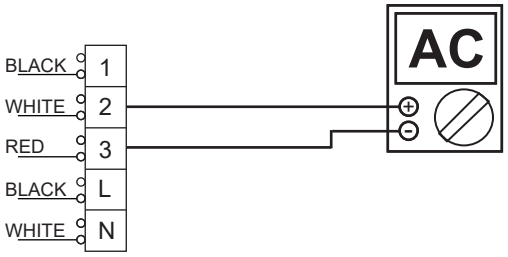
- Check the voltage of power supply
  >> Check if AC198V (AC220V -10%) - 264V (AC240V +10%) appears at Outdoor Unit Terminal L - N.

OK

Check Point 4 : Check Serial Signal (Forward Transfer Signal)



- Check Serial Signal (Forward Transfer Signal)
  >> Check if indicated value swings berween AC30v and AC130V at outdoor unit terminal 2 - 3.
  >> If it is abnormal, replace Controller PCB.



Troubleshooting 3 **HYDRAULIC UNIT Error Method:** **Combination error**	**Indicate or Display:** Green 2 flash / Red 3 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Hydraulic unit interfase PCB	1. The outdoor unit receives the serial signal of applied refrigerant information from hydraulic unit. When the refrigerant is R410a. 2. The combination of Hydraulic unit and Outdoor unit isn't alloed.

Forecast of Cause:

1. The combination of hydraulic unit and outdoor unit is incorrect

Check Point 1 : Check the type of hydraulic unit and outdoor unit

- Check the type of the connected hydraulic unit and outdoor unit.
  >> If abnormal condition is found, correct it.

OK

Check Point 2 : Replace Main PCB

▶ **If Check Point 1 do not improve the symptom, replace PCB hydraulic unit or outdoor unit.**

Troubleshooting 4 **OUTDOOR UNIT Error Method:** **Outdoor unit main PCB model information error**	**Indicate or Display:** Green 6 flash / Red 2 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	Access to EEPROM failed due to some cause after outdoor unit started.

Forecast of Cause:

1. External cause (Noise, temporary open, voltage drop) 2. Main PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO → Check Point 1-2 : Check external cause

- Check if temporary voltage drop was not generated.
- Check if momentary open was not generated.
- Check if ground is connection correctly or there are no related cables near the power line.

YES → Check Point 2 : Replace Main PCB

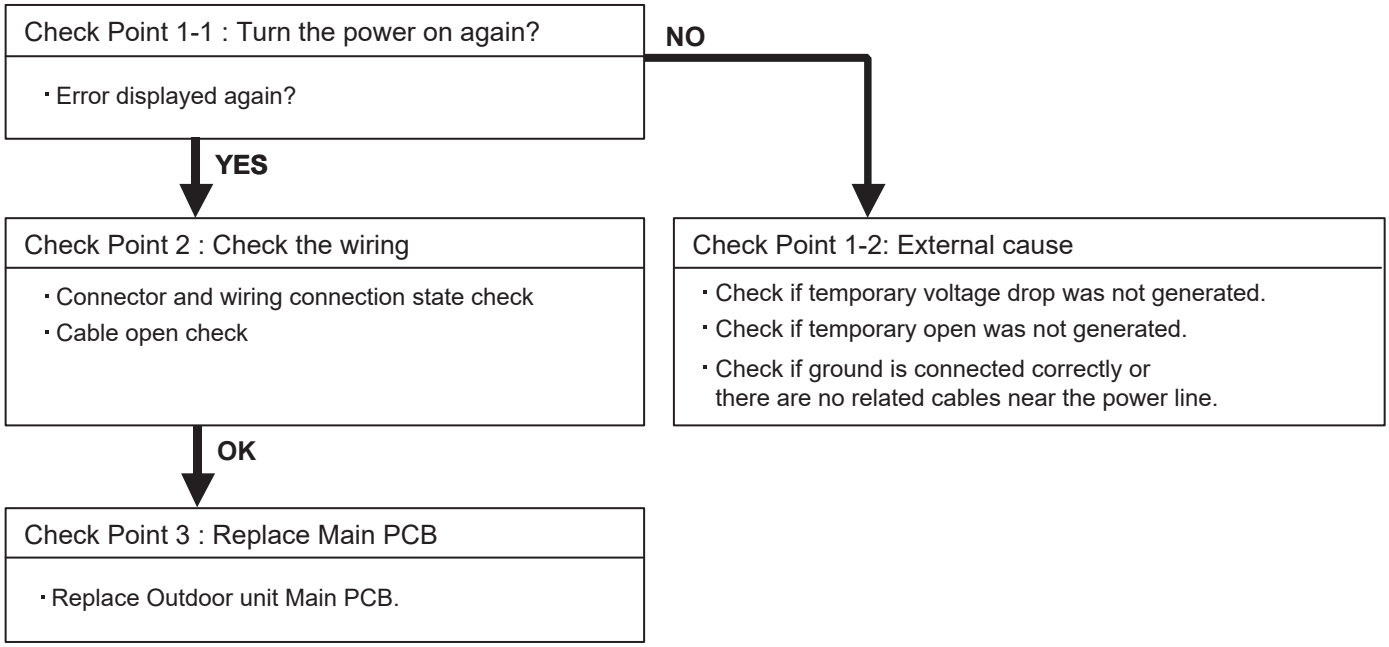
▶ **Change Main PCB.**

Troubleshooting 5 **OUTDOOR UNIT Error Method:** **Inverter error**	**Indicate or Display:** Green 6 flash / Red 3 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	▪ Error information received from Outdoor unit Main PCB

Forecast of Cause :

1. External cause.
2. Power supply to Main PCB wiring disconnection, open
3. Outdoor unit Main PCB failure



Troubleshooting 6 **OUTDOOR UNIT Error Method:** **PFC circuit error**	**Indicate or Display:** Green 6 flash / Red 4 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	When inverter output DC voltage is higher than 420V for over 3 seconds, the compressor stops. If the same operation is repeated 5 times, the compressor stops permanently.

Forecast of Cause :

1. External cause 2. Connector connection failure 3. Main PCB failure

Check Point 1 : Check external cause on units (Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

OK

Check Point 2 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 3 : Replace Main PCB

▶ **If Check Point 1, 2 do not improve the symptom, change Main PCB.**

Troubleshooting 7 **OUTDOOR UNIT Error Method:** **Trip terminal L error**	**Indicate or Display:** Green 6 flash / Red 5 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	When the signal from FO terminal of IPM is "L"(=0V) while the compressor stops.

Forecast of Cause:

1. Outdoor unit Main PCB failure

Check Point 1 : Replace Main PCB
▶ **Replace Outdoor unit Main PCB.**

Troubleshooting 8 **OUTDOOR UNIT Error Method:** **Discharge Thermistor Error**	**Indicate or Display:** Green 7 flash / Red 1 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Discharge temperature thermistor	・Discharge temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection failure, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

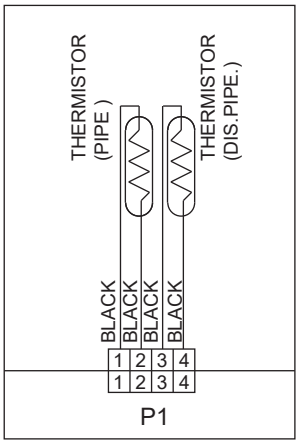
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check
  (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 5".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB P1:3-4 voltage value =5V
  Remove the thermistor from Main PCB, check the voltage.



►**If the voltage does not appear, replace Main PCB, and execute the check operation again.**

Troubleshooting 9 **OUTDOOR UNIT Error Method:** **Compressor Temp. Thermistor Error**	**Indicate or Display:** Green 7 flash / Red 2 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Compressor temperature thermistor	・Compressor temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection failure, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

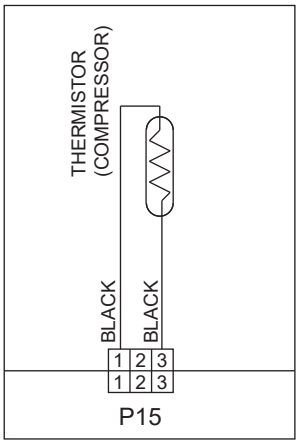
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check
  (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 5".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB P15:1-3 voltage value =5V
  Remove the thermistor from Main PCB, check the voltage.



▶**If the voltage does not appear, replace Main PCB, and execute the check operation again.**

Troubleshooting 10 **OUTDOOR UNIT Error Method:** **Heat Ex. Outlet Thermistor Error**	**Indicate or Display:** Green 7 flash / Red 3 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Heat exchanger Outlet temperature thermistor	・Heat exchanger outlet temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection failure, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

Check Point 2 : Check the thermistor

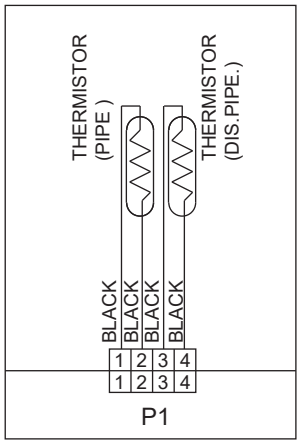
- ☐ Thermistor characteristics check
  (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 5".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB P1 :1-2 voltage value =5V

Remove the thermistor from Main PCB, check the voltage.



►**If the voltage does not appear, replace Main PCB, and execute the check operation again.**

Troubleshooting 11 **OUTDOOR UNIT Error Method:** **Outdoor Thermistor Error**	**Indicate or Display:** Green 7 flash / Red 4 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor temperature thermistor	・Outdoor temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection failure, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

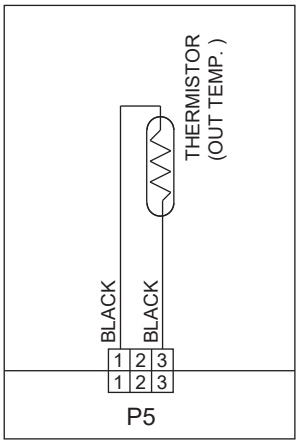
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check
  (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 5".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB P5:1-3 voltage value =5V
  Remove the thermistor from Main PCB, check the voltage.



►**If the voltage does not appear, replace Main PCB, and execute the check operation again.**

Troubleshooting 12 **OUTDOOR UNIT Error Method:** **Expansion valve Thermistor Error**	**Indicate or Display:** Green 7 flash / Red 8 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Expansion valve temperature thermistor	▪ Expansion valve temperature thermistor short or open detected

Forecast of Cause :
1. Connector connection defective, open
2. Thermistor failure
3. Main PCB failure

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

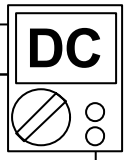
OK

Check Point 2 : Check the thermistor

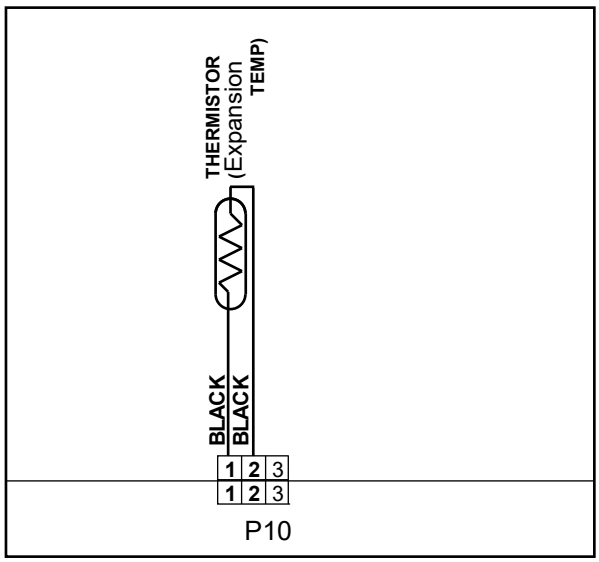
- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 5".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)



- ☐ Main PCB (P10:1-2) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Expansion valve temperature thermistor (P10:1-2)

▶ **If the voltage do not appear, replace Main PCB, and execute the check operation again.**

Troubleshooting 13 **OUTDOOR UNIT Error Method:** **Current sensor error**	**Indicate or Display:** Green 8 flash / Red 4 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	When Input Current Sensor has detected 0A, while Inverter Compressor is operating at higher than 56rps, after 1minute upon starting the Compressor. (Except during the defrost operation)

Forecast of Cause :

1. Defective connection of electric components 2. External cause 3. Main PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO

YES

Check Point 2 :
Check connections of Outdoor Unit Electrical Components

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 3 : Replace Main PCB

▶ **If Check Point 1, 2 do not improve the symptom, change Main PCB.**

Check Point 1-2 :
Check external cause on units
(Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line.(Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

Troubleshooting 14 **OUTDOOR UNIT Error Method:** **Pressure switch error** **Pressure sensor error**	**Indicate or Display:** Green 8 flash / Red 6 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
High pressure switch Pressure sensor	When the power was turned on, "high pressure switch : open" was detected. Pressure sensor short or open detected.

Forecast of Cause :

1. Connector disconnection, open
2. Characteristics failure
3. Main PCB failure

Pressure switch

Check Point 1 : Check the pressure switch connection state

- Connector and wiring connection state check
- Cable open check

OK

Check Point 2 : Check the high pressure switch characteristics

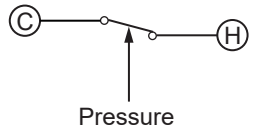
- Switch characteristics check
  * For the characteristics of high pressure switch, refer to below.

OK

Check Point 3 : Replace Main PCB

- **Change Main PCB, and execute the check operation again.**

- Type of contact



- Characteristics of pressure switch (P20)

	Pressure switch
Contact : Short ⇒ Open	4.2±0.1MPa
Contact : Open ⇒ Short	3.2±0.15MPa

Pressure sensor

Check Point 1 : Check the pressure sensor connection state

- Connector and wiring connection state check
- Cable open check

OK

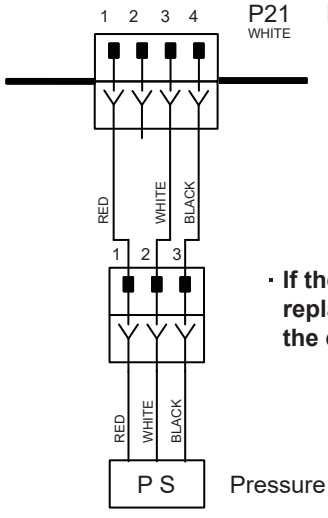
Check Point 2 : Check the pressure sensor

- Pressure sensor characteristics check
  (Disconnect the pressure sensor from the PCB and check.)
  * For the pressure sensor characteristics, refer to the “Service Parts information 6”.

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- **Main PCB (P21:1-4) voltage value = 5.0V**
  Remove the pressure sensor from Main PCB, check the valtage.



- **If the voltage do not appear, replace Main PCB, and execute the check operation again.**

Troubleshooting 15 **OUTDOOR UNIT Error Method:** **Trip detection**	**Indicate or Display:** Green 9 flash / Red 4 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor	・"**Protection stop** by overcurrent generation after inverter compressor start processing completed" generated consecutively 10 times. *The number of generations is reset if the start-up of the compressor succeeds.

Forecast of Cause :
1. Outdoor unit fan operation defective, foreign matter on hear exchanger, excessive rise of ambient temperature
2. Main PCB
3. Inverter compressor failure (lock, winding short)

Check Point 1 : Check the outdoor unit fan operation, heat exchanger, ambient temperature

・No obstructions in air passages?
・Heat exchange fins clogged
・Outdoor unit fan motor check
・Ambient temperature not raised by the effect of other heat sources?
・Discharged air not sucked in?

OK

Check Point 2: Replace Main PCB

▶ **If Check Point 1 do not improve the symptom, change Main PCB.**

OK

Check Point 3: Replace Compressor

▶ **If Check Point 2 do not improve the symptom, change Compressor.**

Troubleshooting 16 **OUTDOOR UNIT Error Method:** **Compressor rotor position detection error**	**Indicate or Display:** Green 9 flash / Red 5 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor	"Protection stop by "overcurrent generation at inverter compressor starting" restart" generated consecutively 50 times x 3 sets (total 150 times)

Forecast of Cause :

1. Defective connection of electric components 2. Main PCB failure 3. Compressor failure

Check Point 1 : Check Noise from Compressor

- Turn on Power and check operation noise.

▶ **If an abnormal noise show, replace Compressor.**

OK

Check Point 2 : Check connection of around the Compressor components

For Compressor Terminal, Main PCB

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open. (Refer to PARTS INFORMATION 2)

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 3: Replace Main PCB

▶ **If Check Point 1,2 do not improve the symptom, change Main PCB.**

OK

Check Point 4: Replace Compressor

▶ **If Check Point 3 do not improve the symptom, change Compressor.**

Troubleshooting 17 **OUTDOOR UNIT Error Method:** **Outdoor Unit Fan Motor Error**	**Indicate or Display:** Green 9 flash / Red 7 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Outdoor unit fan motor	① When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor stops. ② After fan motor restarts, if the same operation within 60sec is repeated 3 times in a row, compressor and fan motor stops. ③ If ① and ② repeats 5 times in a row, compressor and fan motor stops permanently.

Forecast of Cause:

1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure
4. Outdoor unit fan motor failure

Check Point 1 : Check rotation of Fan

・Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.

OK

Check Point 2 : Check ambient temp. around motor

・Check excessively high temperature around the motor.
(If there is any surrounding equipment that causes heat)
>>Upon the temperature coming down, restart operation.

OK

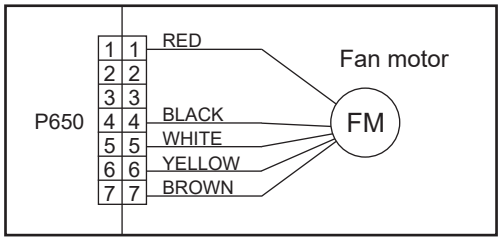
Check Point 3 : Check Outdoor unit fan motor

・Check Outdoor unit fan motor. **(PARTS INFORMATION 4)**
>>If Outdoor Fan Motor is abnormal, replace Outdoor fan motor and Main PCB.

OK

Check Point 4 : Check Output Voltage of Main PCB

・Check outdoor unit circuit diagram and the voltage. (Measure at Main PCB side connector)



Read wire	DC voltage
Red - Black	280V (AC220V-10%) ~ 373V (AC240+10%)
White - Black	15±1.5V

▶ **If the voltage is not correct, replace Main PCB.**

Troubleshooting 18 **OUTDOOR UNIT Error Method:** **Discharge Temp. Error**	**Indicate or Display:** Green 10 flash / Red 1 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Discharge temperature thermistor	▪ "Protection stop by "discharge temperature ≧ 110°C during compressor operation"" generated 2 times within 24 hours.

Forecast of Cause :

1. 3-way valve not opened
2. EEV defective, strainer clogged
3. Outdoor unit operation failure, foreign matter on heat exchanger
4. Discharge temperature thermistor failure
5. Insufficient refrigerant

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV open?
- ☐ Strainer clogging check (before and after EEV, ACM, oil return) Refer to "Service Parts Information 3"

OK

Check Point 3 : Check the outdoor unit fan,heat exchanger

- ☐ Check for foreign object at heat exchanger
- ☐ Check if fan can be rotated by hand.
- ☐ Motor check(PARTS INFORMATION 4)

OK

Check Point 4 : Check the discharge temp. thermistor

- ☐ Discharger temp. thermistor characteristics check (Check by disconnecting thermistor from PCB. **Refer to the Troubleshooting 9**)

OK

Check Point 5 : Check the refrigerant amount

- ☐ Leak check

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV open?
- ☐ Strainer clogging check (before and after EEV, ACM, oil return) Refer to "Service Parts Information 3"

OK

Troubleshooting 19 **OUTDOOR UNIT Error Method:** **Compressor Temp. Error**	**Indicate or Display:** Green 10 flash / Red 3 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Compressor temperature thermistor	▪ "Protection stop by "compressor temperature ≧ 108°C during compressor operation"" generated 2 times within 24 hours.

Forecast of Cause :

1. 3-way valve not opened
2. EEV defective, strainer clogged
3. Outdoor unit operation failure, foreign matter on heat exchanger
4. Compressor temperature thermistor failure
5. Insufficient refrigerant

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- ☐ If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV open?
- ☐ Strainer clogging check (before and after EEV, ACM, oil return) Refer to "Service Parts Information 3"

OK

Check Point 3 : Check the outdoor unit fan,heat exchanger

- ☐ Check for foreign object at heat exchanger
- ☐ Check if fan can be rotated by hand.
- ☐ Motor check(PARTS INFORMATION 4)

OK

Check Point 4 : Check the compressor temp. thermistor

- ☐ Compressor temp. thermistor characteristics check (Check by disconnecting thermistor from PCB. **Refer to the Troubleshooting 9**)

OK

Check Point 5 : Check the refrigerant amount

- ☐ Leak check

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- ☐ If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- ☐ EEV open?
- ☐ Strainer clogging check (before and after EEV, ACM, oil return) Refer to "Service Parts Information 3"

OK

Troubleshooting 20 **OUTDOOR UNIT Error Method:** **Low pressure Error**	**Indicate or Display:** Green 10 flash / Red 5 flash **Outdoor unit : No indication**

Detective Actuators:	**Detective details:**
Pressure sensor	▪ "Protection stop by suction pressure ≦ 0.02MPa continued for 5 minutes" repeats 5 times within 2 hours.

Forecast of Cause :
1. Suction pressure sensor connector disconnection, open
2. Suction pressure sensor defective
3. Main PCB defective

Check Point 1 : Check the suction pressure sensor connection state

- ☐ Connector connection state check
- ☐ Cable open check

OK

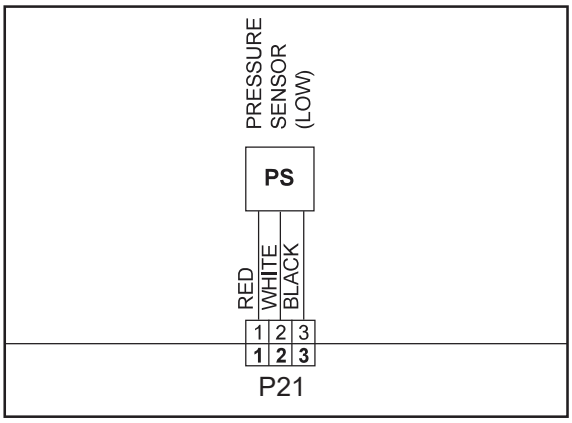
Check Point 2 : Check the suction pressure sensor

- ☐ Sensor characteristics check
  * For the characteristics of the suction pressure sensor, refer to the "Service Parts Information 6".

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

- ☐ Main PCB (P21 : 1-3) voltage value = 5V
  Remove the sensor from Main PCB, check the voltage.



Suction pressure sensor (P21 : 1-3)

►**If the voltage does not appear, replace Main PCB and set up original address.**

3 TROUBLESHOOTING WITH NO ERROR CODE

Troubleshooting 21

Outdoor unit - No Power

Forecast of Cause:

1.Power Supply failure 2. External cause
3.Electrical Components defective

Check Point 1 : Check Installation Condition

- Isn't the breaker down?
- Check loose or removed connection cable.

>>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.

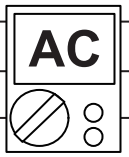
OK

Check Point 2 : Check external cause on units (Voltage drop or Noise)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line.
  (Neon bulb or electric equipment that may cause harmonic wave)
  Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components



- Check the voltage of power supply.

>> Check if AC198 - 264V appears at Outdoor unit Terminal L - N.

NO

YES

- Check Fuse in Main PCB.

>> If Fuse is open, check if the wiring between Terminal and Main PCB is loose, and replace Fuse.

OK

▶ **If the symptom does not change by above Check 3, replace Main PCB.**

Troubleshooting 22

No Operation (Power is ON)

Forecast of Cause:

1. Setting/ Connection failure 2. External cause
3. Electrical Component defective

Check Point 1 : Check Hydraulic unit and Outdoor unit installation condition

- Are these Hydraulic unit and Outdoor Unit suitable model numbers to connect?

>> If there is some abnormal condition, correct it by referring to Installation manual and Data & Technical Manual.

OK

Turn off Power and check/ correct followings.

- Is there loose or removed communication line of Hydraulic Unit and Outdoor Unit?

OK

Check Point 2 : Check external cause on units (Voltage drop or Noise)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line.
  (Neon bulb or electric equipment that may cause harmonic wave)
  Check the complete insulation of grounding.

>> If the symptom dose not change by above check 1,2 replace main PCB of outdoor unit.

Troubleshooting 23

No Cooling / No Heating

Forecast of Cause:

1. Hydraulic Unit error 2. Outdoor Unit error
3. Effect by Surrounding environment
4. Connection Pipe / Connection Wire failure 5. Refrigeration cycle failure

Check Point 1 : Check Hydraulic Unit

- Does Hydraulic unit FAN run on HIGH FAN?
- Is Air Filter dirty?
- Is Heat Exchanger clogged?
- Check if Energy save function is operated.

OK

Check Point 2 : Check Outdoor Unit Operation

- Check if Outdoor Unit is operating
- Check any objects that obstruct the air flow route.
- Check clogged Heat Exchanger.
- Is the Valve open?

OK

Check Point 3 : Check Site Condition

- Is capacity of Hydraulic unit fitted to Room size?
- Any windows open? Or direct sunlight ?

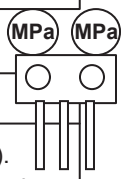
OK

Check Point 4 : Check Hydraulic unit/ Outdoor unit Installation Condition

- Check connection pipe (specified pipe length & Pipe diameter?)
- Check any loose or removed communication line.

>> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.

OK



Check Point 5 : Check Refrigeration cycle

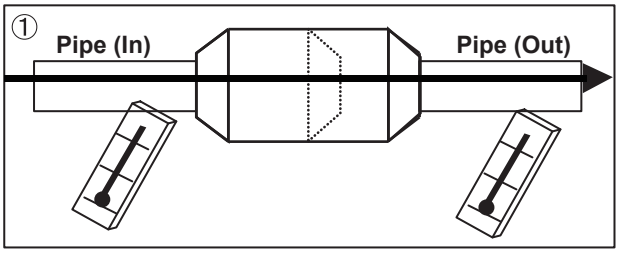
- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.

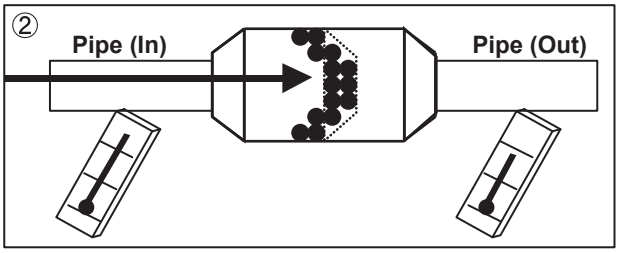
>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

- Check EEV (PARTS INFORMATION 3)
- Check Compressor (PARTS INFORMATION 1,2)

Attention

Strainer normally does not have temperature difference between inlet and outlet as shown in ①, but if there is a difference like shown in ②, there is a possibility of inside clogged. In this case, replace Strainer.





4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If Outdoor Unit LED displays Error, refer to Trouble shooting)

Does not start up

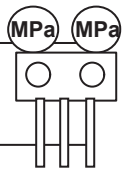
- Is there open or loose connection cable?
- Check Main PCB, connection of Compressor, and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor is considered (Locked compressor due to clogged dirt or less oil)

Replace Compressor

Stops soon after starting up

- Is there open or loose connection cable?
- Is Gas pipe valve open? (Low pressure is too low)
- Check if Refrigerant is leaking. (Recharge Refrigerant)



- Check if capillary tube, strainer is clogged. (PARTS INFORMATION 3)
- Check Main PCB, connection of Compressor,and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor can be considered. (Compression part broken or valve defective.)

Replace Compressor

Abnormal noise

- Check if vibration noise by loose bolt or contact noise of piping is happening.

▶Defective Compressor can be considered. (due to inside dirt clogging or broken component)

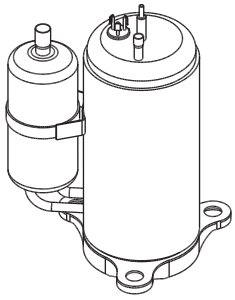
Replace Compressor

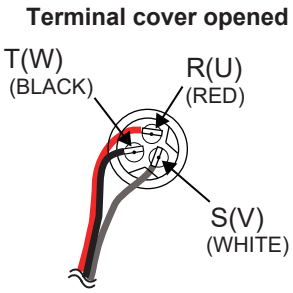
SERVICE PARTS INFORMATION 2

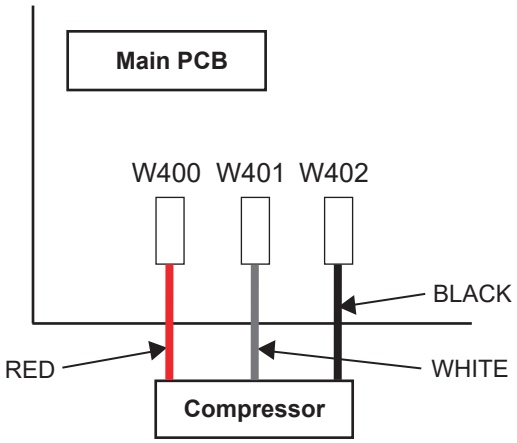
Inverter Compressor

Check Point 1 : Check Connection

・Check terminal connection of Compressor
(loose or incorrect wiring)



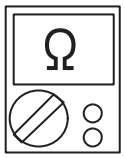


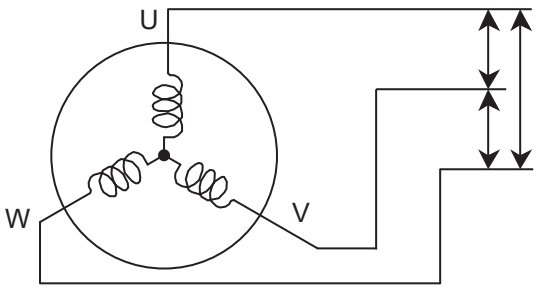


Check Point 2 : Check Winding Resistance

・Check winding resistance of each terminal

▶**If the resistance value is 0Ω or infinite, replace Compressor.**





Resistance Value :
1.299Ω at 20°C

Check Point 3 : Replace Main PCB

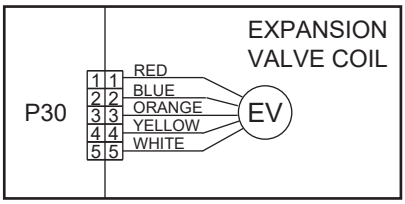
▶**If the symptom does not change with above Check 1, 2, replace Main PCB.**

SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve
(EEV)

Check Point 1 : Check Connections

・Check connection of connector
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV

・Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	**46**Ω ± **4**Ω at 20°C
Yellow - Red	
Orange - Red	
Blue - Red	

▶ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Noise at start up

▪ Turn on Power and check operation noise.

▶ **If an abnormal noise does not show, replace Main PCB.**

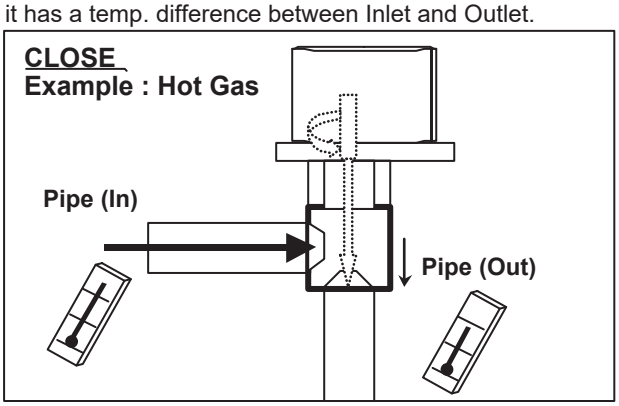
Check Point 4 : Check Voltage from Main PCB.

▪ Remove Connector and check Voltage (DC12V)

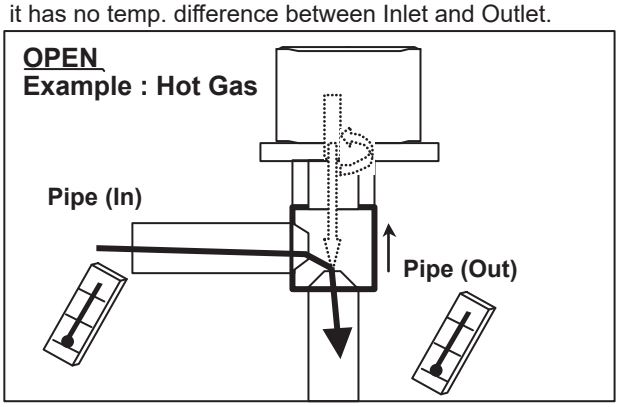
▶ **If it does not appear, replace Main PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

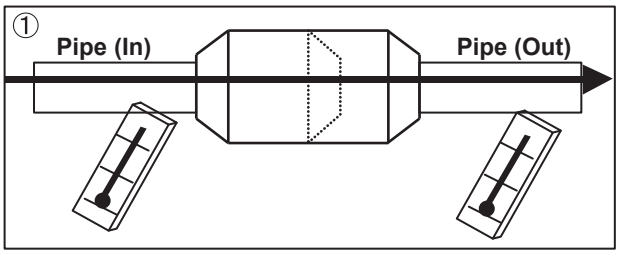


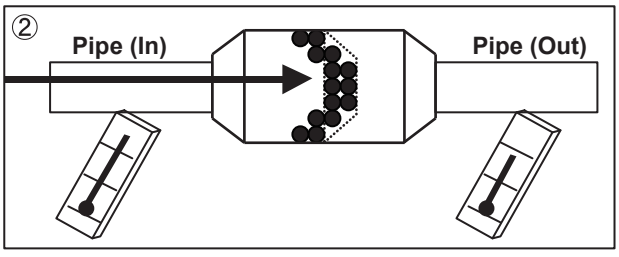
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in ① ,
but if there is a difference as shown in ② , there is a possibility of inside clogged. In this case, replace Strainer.





SERVICE PARTS INFORMATION 4

Outdoor unit fan motor

Check Point 1 : Check rotation of Fan

・Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
>>If Fan or Bearing is abnormal, replace it.

Check Point 2 : Check resistance of Outdoor Fan Motor

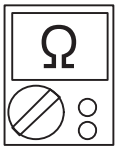
・Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
>>If they are short-circuited (below 300 kΩ), replace Outdoor fan motor and Main PCB.

Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Earth terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	Feed back (FG)

SERVICE PARTS INFORMATION 5

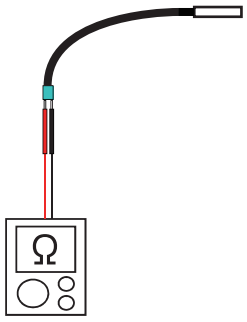
Thermistor

Check Point : Check Thermistor resistance value



☐ Remove connector and check Thermistor resistance value.

Temperature [°C]	Resistance Value [kΩ]		
	Thermistor A	Thermistor B	Thermistor C
-30	1013.1	95.6	224.3
-20	531.6	50.3	115.2
-10	292.9	27.8	62.3
0	168.6	16.1	35.2
10	100.9	9.6	20.7
20	62.5	6.0	12.6
30	40.0	3.8	8.0
40	26.3	2.5	5.2
50	17.8	1.7	3.5
60	12.3	1.2	2.4
70	8.7	0.8	---
80	6.3	0.6	---
90	4.6	---	---
100	3.4	---	---
110	2.6	---	---
120	2.0	---	---
Applicable Thermistors	Discharge temp. TH Compressor temp. TH Ex. valve temp. TH	Heat exchanger. TH	Outdoor temp. TH



SERVICE PARTS INFORMATION 6

Pressure Sensor

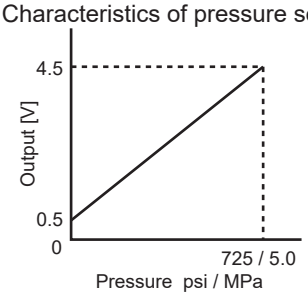
1. Discharge Pressure Sensor

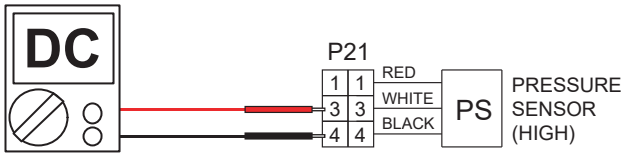
Check Point : Check Voltage from Main PCB

DC

☐ With the connector connected to the PCB, measure the voltage between P21:3-4 of the Main PCB.

▪ Characteristics of pressure sensor





psi	0.0	14.5	29.0	43.5	58.0	72.5	101.5	116.0	130.5	145.0	174.0	203.0	232.0	261.0	290.0
MPa	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.20	1.40	1.60	1.80	2.00
Output (V)	0.50	0.58	0.66	0.74	0.82	0.90	1.06	1.14	1.22	1.30	1.46	1.62	1.78	1.94	2.10

psi	319.0	348.0	377.0	406.0	435.0	464.0	493.0	522.0	551.0	580.0	609.0	638.0	667.0	696.0	725.0
MPa	2.20	2.40	2.60	2.80	3.00	3.20	3.40	3.60	3.80	4.00	4.20	4.40	4.60	4.80	5.00
Output (V)	2.26	2.42	2.58	2.74	2.90	3.06	3.22	3.38	3.54	3.70	3.86	4.02	4.18	4.34	4.50

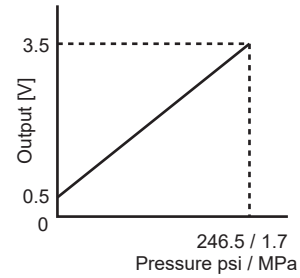
2. Suction Pressure Sensor

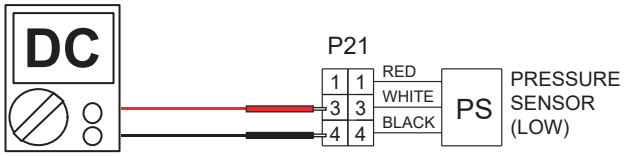
Check Point : Check Voltage from Main PCB

DC

☐ With the connector connected to the PCB, measure the voltage between P21:3-4 of the Main PCB.

▪ Characteristics of pressure sensor





psi	0.0	14.5	29.0	43.5	58.0	72.5	101.5	116.0	130.5	145.0	159.5	174.0	188.5	203.0	217.5
MPa	0.00	0.10	0.20	0.30	0.40	0.50	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50
Output (V)	0.50	0.68	0.85	1.03	1.21	1.38	1.74	1.91	2.09	2.27	2.44	2.62	2.79	2.97	3.15

psi	232.0	246.5
Mpa	1.60	1.70
Output (V)	3.32	3.50

REFRIGERANT R32
INVERTER

WATERSTAGE™
INNOVATIVE SOLUTION OF DOMESTIC HEATING

4. FIELD WORKING

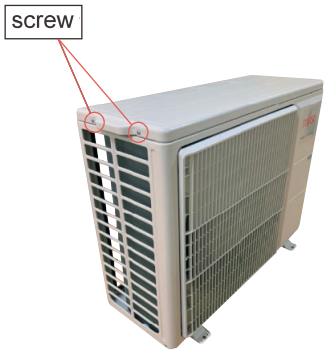
2020.04.22
SA_CH04_CF001EF_01

1 Disassembly Process of Outdoor Unit

1.1 WO*A060KLT and WO*A080KLT

1.1.1 Appearance

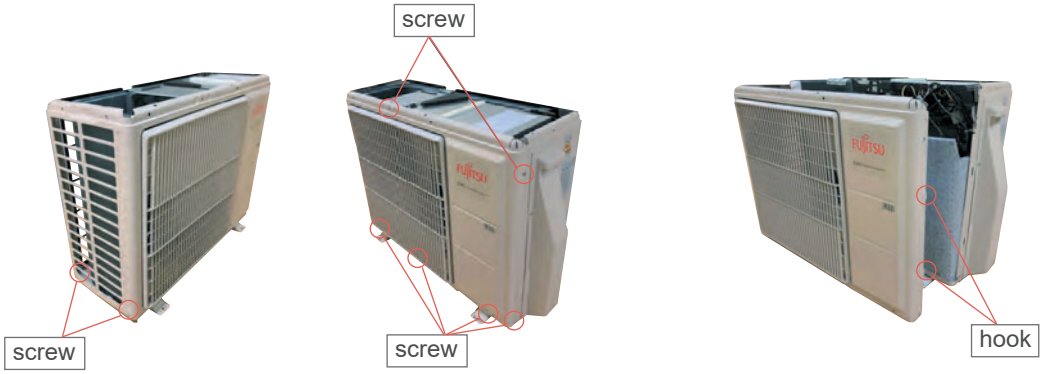
1.1.2 TOP PANEL removal



Remove the mounting screws.

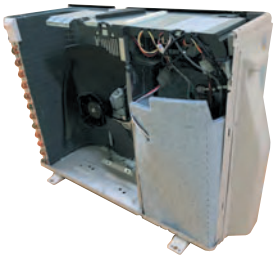
Remove the TOP PANEL.

1.1.3 FRONT PANEL removal

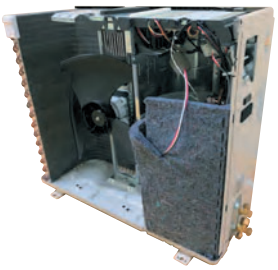


Remove the mounting screws (8 in total).

WOYA060KLT



WOYA080KLT



Remove the FRONT PANEL

1.1.4 VALVE COVER removal

WOYA060KLT

Remove the 3 mounting screws

Remove the VALVE COVER removal

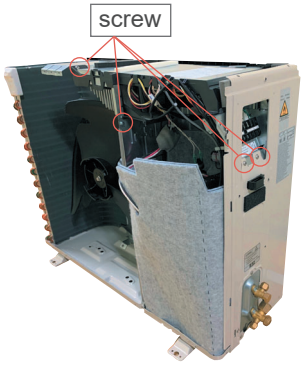
WOYA080KLT

Remove the 3 mounting screws

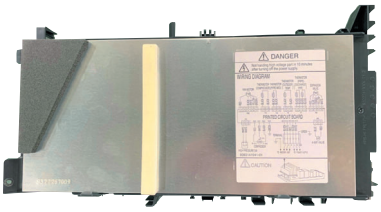
Remove the VALVE COVER removal

1.1.5 MAIN PCB removal

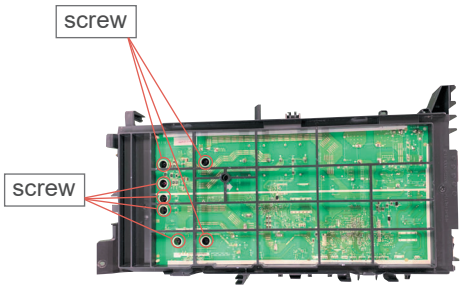
WOYA060KLT and WOYA080KLT



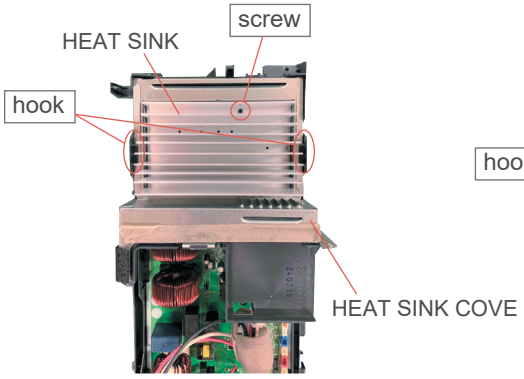
Remove the connectors and wires.
Remove the 4 mounting screws.
Remove the INVERTER ASSY.



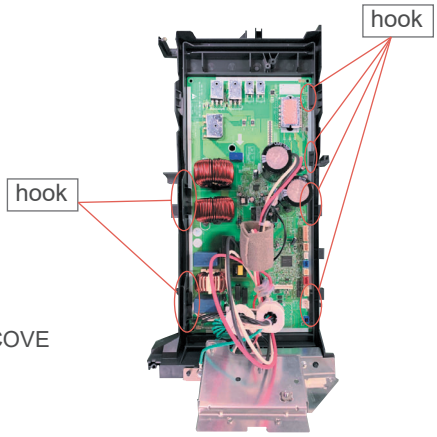
Remove the INVERTER BOX COVER by sliding upward.



Remove the 7 mounting screws.



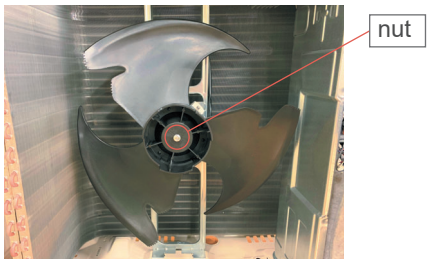
Remove the HEAT SINK COVER by remove the hook.
Remove the mounting screw.
Remove the HEAT SINK.



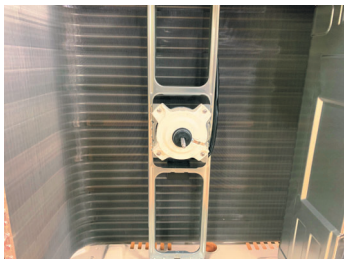
Remove the hook.
Remove the MAIN PCB.

Spread the heat dissipation compound on the other side of IPM when you exchange Main PCB by the repair.

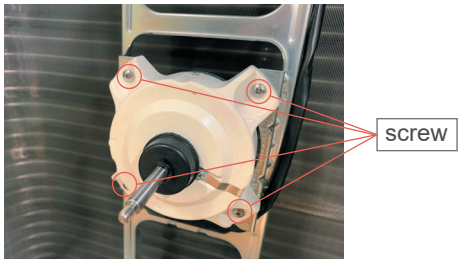
1.1.6 FAN MOTOR removal



Remove the FAN nut.



Remove the PROPELLER FAN.



Remove the 4 screws.
Loose the clamp, remove the lead wires and FAN MOTOR.

1.1.7 CABINET RIGHT ASSY removal

WOYA060KLT

Remove the 6 mounting screws.

Remove the CABINET RIGHT ASSY by sliding upward.

WOYA080KLT

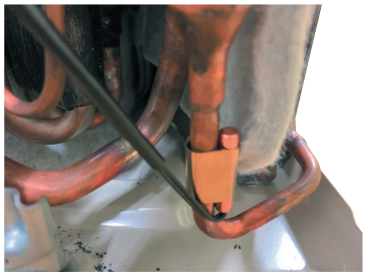
Remove the 7 mounting screws

Remove the CABINET RIGHT ASSY by sliding upward.

1.1.8 THERMISTOR removal

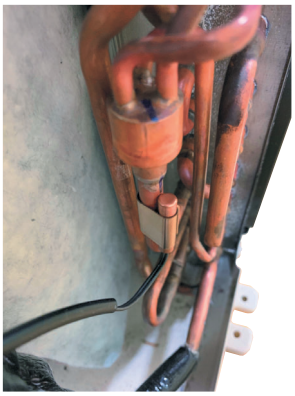
HEAT EXCHANGER THERMISTOR

WOYA060KLT



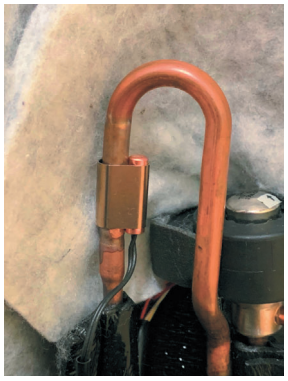
Remove the THERMISTOR.

WOYA080KLT



Remove the THERMISTOR.

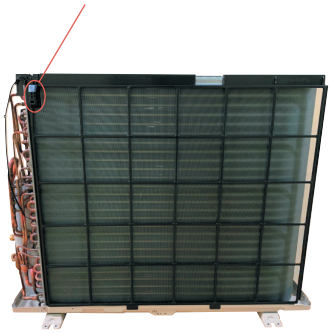
EEV THERMISTOR

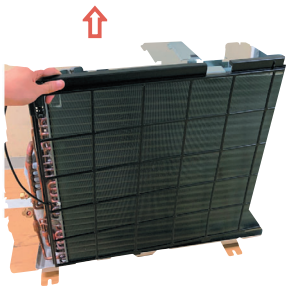


Remove the THERMISTOR.

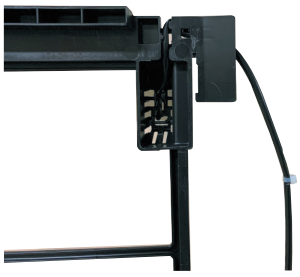
OUTDOORE THERMISTOR

HOLDER are integrated with the PROTECTIVE NET.





Remove the PROTECTIVE NET by lifting.



Remove the THERMISTOR.

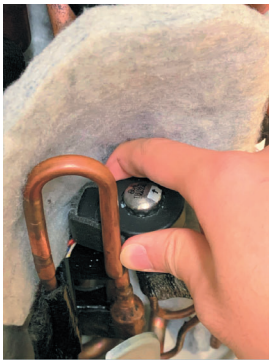
1.1.9 SOLENOID COIL removal

4 WAY VALVE

Remove the mounting screw

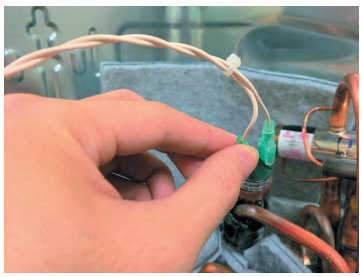
Remove the SOLENOID COIL

1.1.10 EEV COIL removal



Remove the EEV coil by hand.

1.1.11 PRESSURE SWITCH removal



Remove the connectors.

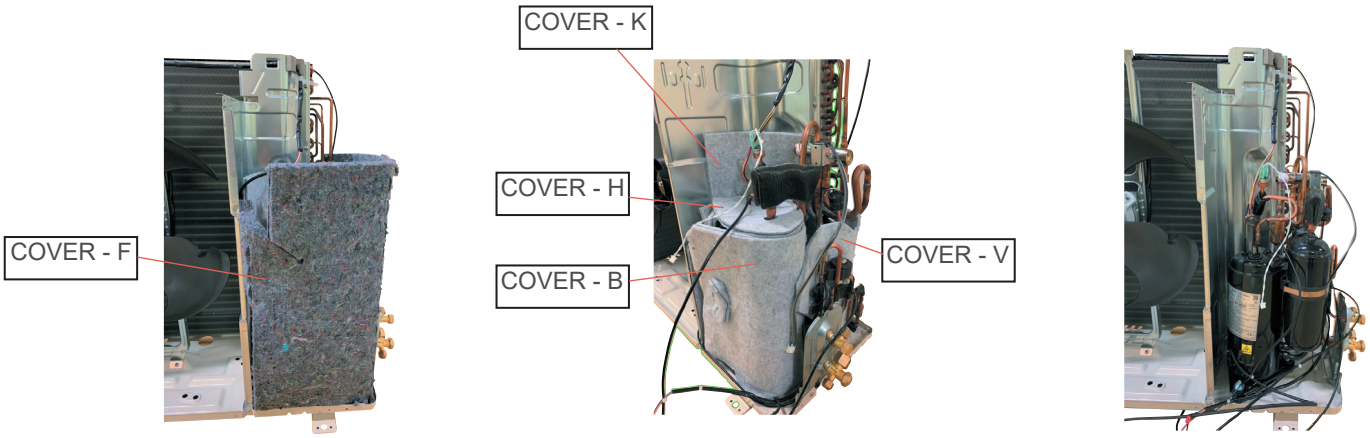
1.1.12 COMPRESSOR removal

Precautions for exchange of compressor.

Do not allow moisture or debris to get inside refrigerant pipes during work.

Procedure for compressor removal.

1 Turn off the power
2 Remove the TOP PANEL, FRONT PANEL and CABINET RIGHT ASSY.
3 Fully close the 3Way valve (gas) and 2Way valve (liquid)
4 Collect the refrigerant from the 3Way valve.
Start the following work after completely collecting the refrigerant.
Do not reuse the refrigerant that has been collected.



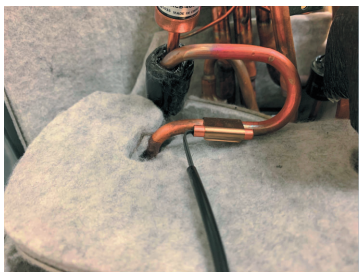
Remove the COVER-B, F, H, V, K.

Remove the TERMINAL COVER

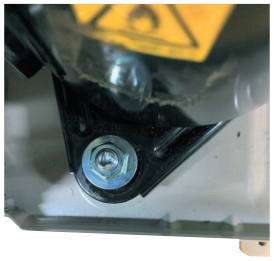
Remove the connectors.
[R(U) : RED, T(W) : BLACK, S(V) : WHITE]

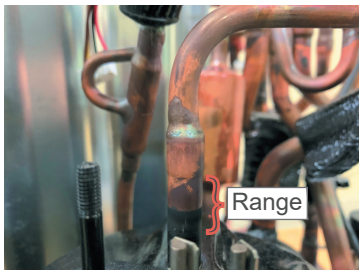
Remove the Thermistor (comp. temp.)
and Thermistor (Discharge)

Remove the Thermistor (Discharge)

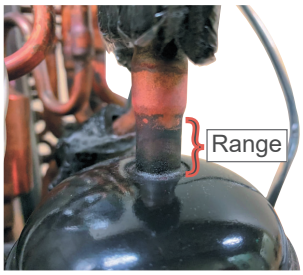


Remove the COMP. VOLTS.
(3 places)





Cut the Discharge pipe in this range.



Cut the Suction pipe in this range.
Remove the COMPRESSOR.

- Keep their shape better.
- There is a possibility of catching fire to oil when removing by the welding without cutting it.

Procedure for compressor installation

Reverse procedure to removing the compressor.

Precautions for installation of compressor.

1 When brazing, do not apply the flame to the terminal.

2 When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.