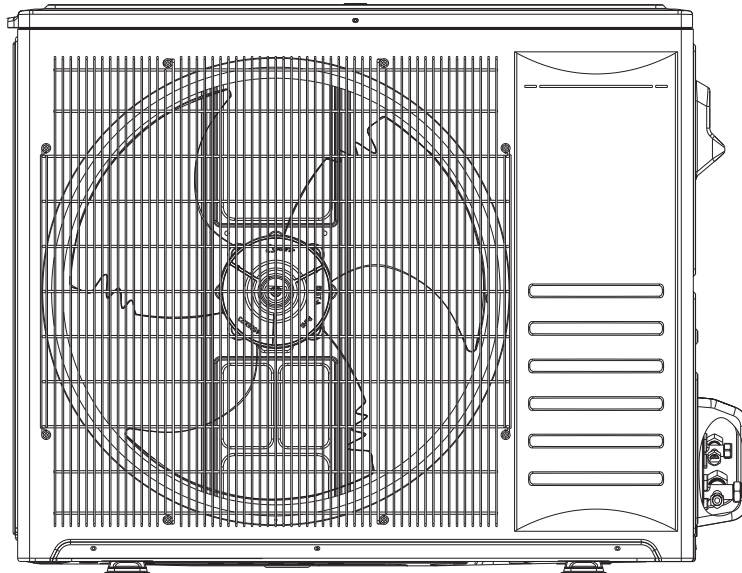




# TECHNICAL & SERVICE MANUAL V1.0

## Dc-Inverter air conditioners



### Outdoor Unit

#### Model:

4TYK8536B1000AA

4TYK8548B1000AA

4TYK8560B1000AA



# Introduction

## Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

**⚠ WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ CAUTION**

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

**NOTICE**

Indicates a situation that could result in equipment or property-damage only accidents.

## Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs and HCFCs such as saturated or unsaturated HFCs and HCFCs.

## Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

**⚠ WARNING**

**Proper Field Wiring and Grounding Required!**

Failure to follow code could result in death or serious injury. All field wiring **MUST** be performed by qualified personnel. Improperly installed and grounded field wiring poses **FIRE** and **ELECTROCUTION** hazards. To avoid these hazards, you **MUST** follow requirements for field wiring installation and grounding as described in NEC and your local/state electrical codes. Failure to follow code could result in death or serious injury.

**⚠ WARNING****Personal Protective Equipment (PPE) Required!**

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate MSDS/ SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

**⚠ WARNING****Follow EHS Policies!**

Failure to follow instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

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# Safety Summary

## Important notice

- We pursue a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- We cannot anticipate every possible circumstance that might involve a potential hazard.
- This air conditioner is designed for standard air conditioning only. Do not use this air conditioner for other purposes such as drying clothes, refrigerating foods or for any other cooling process. Do not let the air-out face animals or plants, it might have an adverse effect on them.
- The installer and system specialist shall secure safety against leakage according to local regulations or standards.
- Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness.

Definitions for identifying hazard levels are provided below with their respective signal words.

**⚠ DANGER**

Immediate hazards which WILL result in severe personal injury or death..

**⚠ WARNING**

Hazards or unsafe practices which COULD result in severe personal injury or death.

**⚠ CAUTION**

Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

**NOTE**

Useful information for operation and/or maintenance.

- Installation should be performed by the dealer or other professional personnel. Improper installation may cause water leakage, electrical shock, or fire.

**⚠ DANGER**

- Do not perform installation work, refrigerant piping work, drain piping and electrical wiring connection without referring to our installation manual. If the instructions are not followed, it may result in water leakage, electric shock or fire.
- Use refrigerant R410A in the refrigerant cycle.
- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If these devices are touched or readjusted, it may cause a serious accident.
- Refrigerant leakage can cause difficulty in breathing due to insufficient air. Turn OFF the main switch, extinguish any naked flames and contact your service contractor, if refrigerant leakage occurs.
- Do perform air-tight test. Do not charge oxygen, acetylene or other flammable and poisonous gas into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gas are extremely dangerous and can cause an explosion. It is recommended that nitrogen be used for this test.
- The installer and system specialist shall secure safety against refrigerant leakage according to local regulations or standards.
- Use an ELB (Electric Leakage Breaker). In the event of a fault, there is danger of an electric shock or a fire if it is not used.



**⚠ WARNING**

- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gas within approximately one (1) meter from the system. If circuit breaker or fuse is often activated, stop the system and contact your service contractor.
- Check that the ground wire is securely connected. If the unit is not correctly grounded, it will lead to electric shock. Do not connect the ground wiring to gas piping, water piping, lightning conductor or ground wiring for telephone.
- Before performing any brazing work, check to ensure that there is no flammable material around when using refrigerant. Be sure to wear leather gloves to prevent cold injuries.
- Protect the wires, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts, which may lead to fire.
- Fix the cables securely. External forces on the terminals could lead to fire.
- Install the air conditioner on a solid base that can support the unit weight. An inadequate base or incomplete installation may cause injury in the event the unit falls off the base. Incomplete connections or clamping may cause terminal overheating or fire.
- Make sure that the outdoor unit is not covered with snow or ice before operation.

**⚠ CAUTION**

- Do not step or put any material on the product.
- Do not put any foreign material on the unit or inside the unit.

**NOTE**

- It is recommended that the room be ventilated every 3 to 4 hours.
- The air conditioner may not work properly under the following circumstances. The power transformer provides the same power or power as the air conditioner. The electrical equipment is too close to the power supply of the air conditioner. With the sharp change of power consumption and switching action, the power supply of the air conditioner will generate a large induction surge voltage.

## Important notice

- Upon receiving this product, inspect it for any shipping damage. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct. The standard utilization of the unit shall be explained in these instructions. Therefore, the utilization of the unit other than those indicated in these instructions is not recommended. Please contact your local agent, as the occasion arises.

- *The figures in this manual are based on the external view of a standard model. Consequently, the shape may differ from that of the air conditioner you have selected.*

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# 1. General

## 1.1 Features

- 360 DC inverter driven technology  
With 360 all DC inverter driven technology, realize the compressor driving direction the same with rotary direction. Optimize energy-saving, and keep the compressor more stable and high efficient during operation. It can also guarantee more stable temperature control and reduce noise.
- Pressure sensor  
Inside the outdoor unit is the pressure sensor, which defects low pressure in cooling mode. The intelligent control can be realized by calculating the indoor coil temperature through the pressure valve.
- Smaller outdoor dimension for installation flexibility  
The side-discharge outdoor unit, saves roughly 36% more space than traditional air conditioners. More conveniently, it can be installed on wall, yard or on the roof.
- Convenient Installation  
The stop valve and connecting pipes are connected by welding, and indoor unit of other brands can freely be connected with this outdoor unit.
- Comfortable temperature control  
DC inverter power control uses its full capacity at startup to cool/warm quickly. As soon as the set temperature is reached, it carefully adjusts current frequency to prevent temperature fluctuation and energy loss.

## 1.2 Product lineup

Model (Btu/h) Type	36K	48K	60K
Outdoor unit	•	•	•



## 1. General

---

### 1.3 Nomenclature

#### Model Number Example

4 T X K 8 5 1 2 A 1 0 N 0 B A  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Digit 1 = Refrigerant  
4 = R410a

Digit 2 = Brand Name  
T = Mini Split Outdoor Unit

Digit 3 = Functional Type  
X = Heat Pump Inverter  
Y = Cooling Only Inverter

Digit 4 = Configuration Outdoor Unit  
K = Single Refrigerant Circuit  
M = Multiple Refrigerant circuit

Digit 5 = Efficiency Tier  
6 - 16+ SEER  
8 - 18+ SEER

Digit 6 = Connection Type  
5 - Flare

Digit 7,8 = Nominal Capacity  
09 = 9,000 Btu/h  
12 = 12,000 Btu/h  
18 = 18,000 Btu/h  
24 = 24,000 Btu/h  
30 = 30,000 Btu/h  
36 = 36,000 Btu/h  
42 = 42,000 Btu/h

Digit 9 = Major Development Sequence  
A = First Development Sequence  
B = Second Development Sequence  
C = Third Development Sequence

Digit 10 = Electric Power Supply Characteristics  
1 = 208-230/60/1

Digit 11 = Reserved for Future Use  
0 = Not currently used  
Y = Cooling Only Inverter

Digit 12 = Regional Markets Served (1:1 Systems)  
N = North America Market

Digit 13 = Reserved for Future Use  
0 = Not Currently Used

Digit 14 = Minor design Sequence  
A = First Design Sequence  
B = Second Design Sequence  
C = Third Design Sequence

Digit 15 = Service Digit  
A = First Sequence

## 1.4 Unit installation

1:1 system is the only compatible combination.

(Only one indoor unit can be connected with one outdoor unit.)

## 1.5 Working range

### Power Supply

<b>Working Voltage</b>	176V ~ 253V
<b>Voltage Imbalance</b>	Within a 3% deviation from each voltage at the main terminal of outdoor unit
<b>Starting Voltage</b>	Higher than 85% of the Rated Voltage

### Operating temperature range

This air conditioner is designed for the following outdoor operating temperatures.

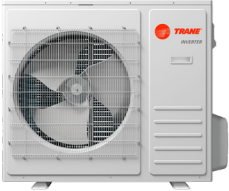

Type	Mode	Outdoor operation temperature range [°F (°C)]	
		Maximum	Minimum
DC-Inverter Split Air Conditioner(Cooling only type)	Cooling Operation	125 (52)	5 (-15)

### Storage condition

Temperature: -13~140°F (-25~60°C)

Humidity: 30%~80%

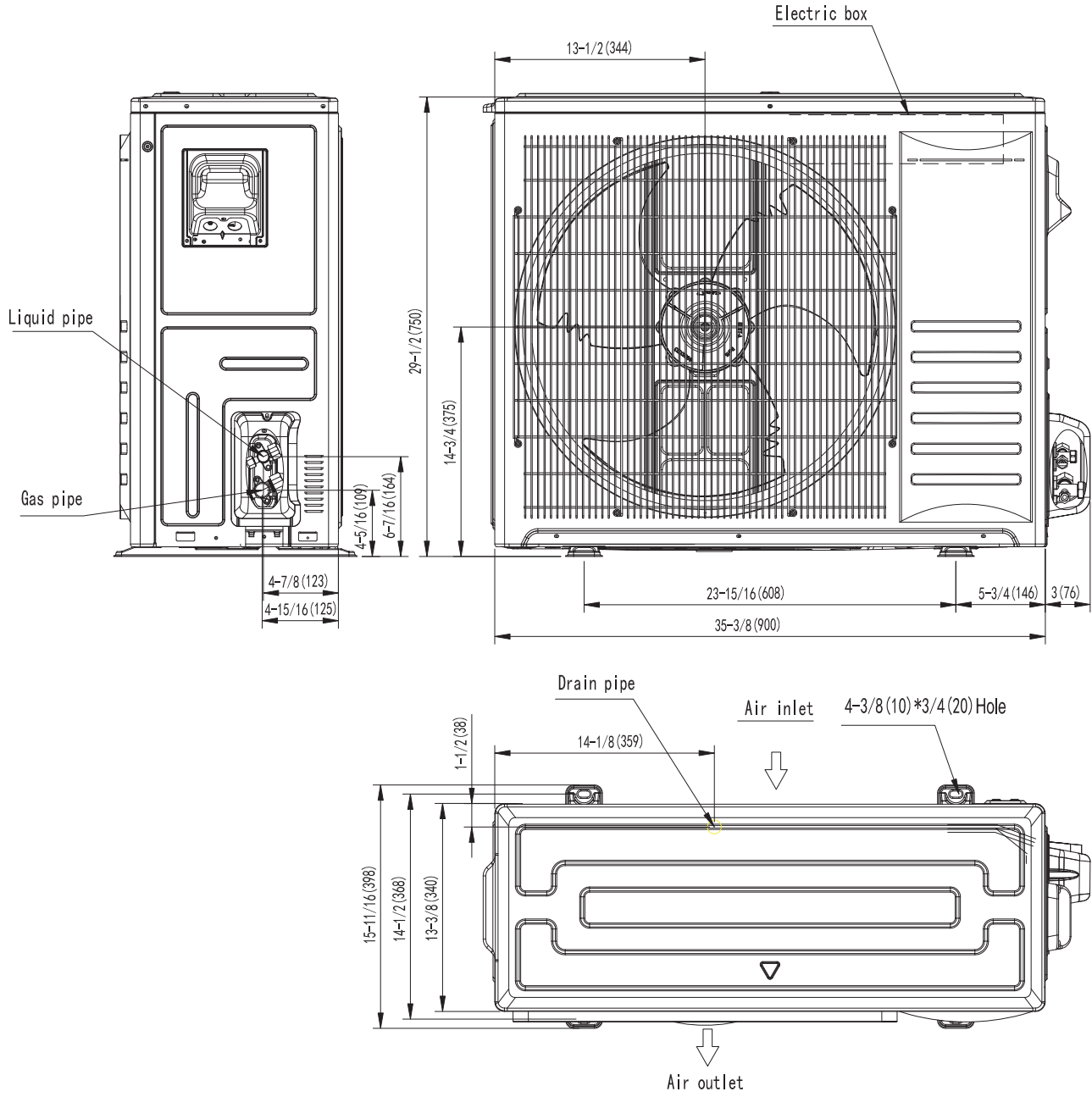
## 1.6 Product appearance

	36K	48K/60K
<b>View</b>		

## 2. Outlines and dimensions

36K

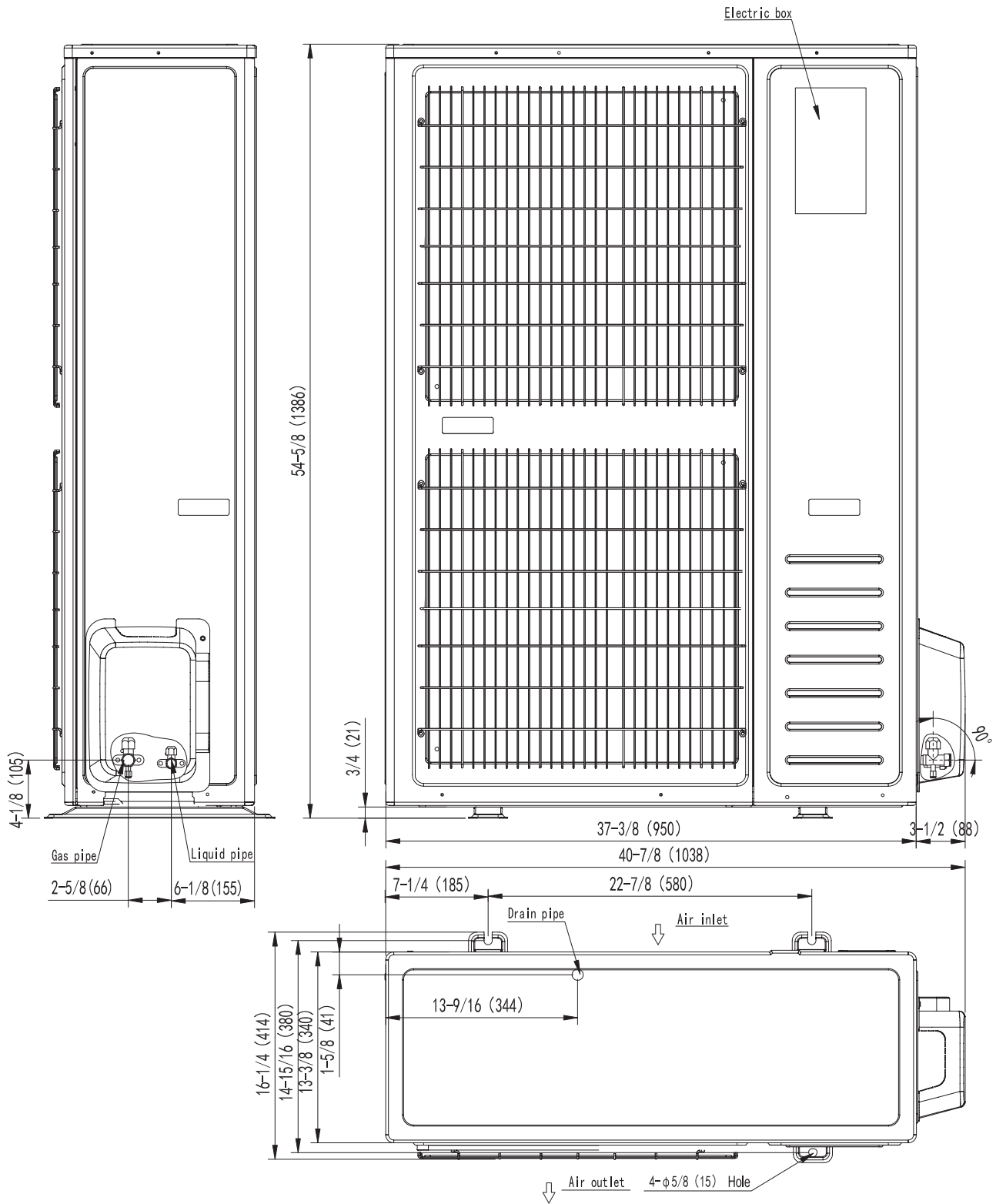
Unit : in.(mm)



## 2. Outlines and dimensions

48k/60k

Unit : in.(mm)







### 3. Electrical data

Indoor Unit	Power Supply			Applicable voltage		ELB	
	Voltage (V)	PH	Frequency (Hz)	Umin (V)	Umax (V)	Nominal Current (A)	Nominal Sensitive Current (mA)
36K	208/230	1	60	176	253	35	30
48K/60K	208/230	1	60	176	253	50	30

**Note:**

1. The above compressor data is based on 100% capacity combination of indoor units at the rated operating frequency.
2. This data is based on the same conditions as the nominal cooling capacities.
3. The compressor is started by an inverter, resulting in extremely low starting current.

## 4. Capacities and selection data

### 4.1 Capacity characteristic charts

The following charts show the characteristics of outdoor unit capacity, which corresponds with the operating ambient temperature of outdoor unit. Conditions:

- ① Pipe length / height difference: 25 ft. (7.6m) / 0 ft. (0m)
- ② Compressor at rated inverter frequency
- ③ Indoor fan speed at high fan speed

**Remarks:**

TC: Total Cooling Capacity (Gross) kBtu/h

S/T: Sensible Capacity Ratio

PI: Power Input (including the compressor, cond. fan motor) kW

DB: Dry Bulb Temperature

WB: Wet Bulb Temperature



### 3. Electrical data

Performance data (Cooling operation at rated frequency)

36K outdoor unit matches 30K indoor unit

Airflow (CMF)	Outdoor DB (iF/°C)	IWB (iF/°C)	59/15				63/17.2				67/19.4				71/21.6			
			IWB (iF/°C)	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7
800	65	TC	25.6	25.8	26.3	26.7	26.3	26.7	27.0	27.2	28.2	28.4	28.7	28.9	\	34.3	34.6	34.9
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.55	1.57	1.58	1.58	1.58	1.60	1.61	1.63	1.63	1.64	1.66	1.68	\	2.05	2.07	2.10
	75	TC	25.6	25.9	26.4	26.7	26.4	26.7	27.0	27.3	28.3	28.5	28.8	29.0	\	34.0	34.3	34.5
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	1.72	1.74	1.76	1.76	1.76	1.78	1.80	1.81	1.80	1.83	1.85	1.87	\	2.26	2.28	2.30
	85	TC	25.2	25.5	26.0	26.3	26.0	26.3	26.6	26.9	27.8	28.1	28.3	28.5	\	33.4	33.7	33.8
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	1.94	1.96	1.98	1.98	1.98	2.00	2.02	2.04	2.04	2.06	2.08	2.10	\	2.56	2.59	2.61
	95	TC	24.8	25.0	25.6	25.9	25.6	25.9	26.2	26.4	27.4	27.7	27.8	28.1	\	32.6	32.9	33.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	2.33	2.35	2.38	2.38	2.38	2.40	2.43	2.45	2.46	2.48	2.50	2.53	\	3.05	3.07	3.10
	105	TC	24.3	24.6	25.1	25.4	25.1	25.4	25.7	25.9	26.9	27.1	27.3	27.5	\	31.5	31.6	31.7
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	2.77	2.80	2.83	2.83	2.83	2.86	2.89	2.92	2.92	2.95	2.97	3.00	\	3.53	3.54	3.55
	115	TC	21.7	22.0	22.5	22.7	22.5	22.7	23.0	23.2	24.2	24.3	24.4	24.6	\	26.2	26.3	26.4
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	2.82	2.85	2.88	2.88	2.88	2.92	2.95	2.98	3.00	3.02	3.04	3.05	\	3.14	3.16	3.17
1000	65	TC	27.5	27.7	28.4	28.7	28.4	28.7	29.0	29.3	30.4	30.6	30.9	31.1	\	36.7	37.0	37.2
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.81	1.83	1.85	1.85	1.85	1.87	1.89	1.91	1.90	1.93	1.95	1.97	\	2.35	2.38	2.40
	75	TC	27.5	27.8	28.4	28.7	28.4	28.7	29.0	29.4	30.4	30.7	30.9	31.1	\	36.4	36.7	37.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	1.98	2.00	2.02	2.02	2.02	2.04	2.06	2.08	2.08	2.10	2.13	2.15	\	2.47	2.50	2.52
	85	TC	27.0	27.3	27.9	28.3	27.9	28.3	28.5	28.9	29.9	30.2	30.3	30.6	\	35.5	35.7	36.0
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	2.18	2.20	2.23	2.23	2.23	2.25	2.27	2.30	2.30	2.32	2.34	2.37	\	2.85	2.87	2.90
	95	TC	26.7	27.0	27.7	27.9	27.7	27.9	28.2	28.5	29.3	29.7	30.0	30.2	\	34.6	34.8	35.0
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	2.59	2.62	2.65	2.65	2.65	2.67	2.70	2.73	2.74	2.76	2.79	2.81	\	3.35	3.38	3.40
	105	TC	26.0	26.3	27.0	27.2	27.0	27.2	27.5	27.8	28.7	29.0	29.2	29.5	\	32.1	32.1	32.3
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	3.06	3.09	3.12	3.12	3.12	3.16	3.19	3.22	3.23	3.26	3.29	3.31	\	3.62	3.60	3.62
	115	TC	21.6	21.8	22.3	22.5	22.3	22.5	22.8	23.0	24.5	24.6	24.3	24.3	\	25.3	25.4	25.5
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	2.87	2.90	2.93	2.93	2.93	2.96	2.99	3.02	3.07	3.09	3.08	3.10	\	3.13	3.14	3.15
1200	65	TC	29.2	29.6	30.2	30.5	30.2	30.5	30.9	31.2	32.3	32.6	32.8	33.0	\	38.7	39.0	39.6
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	2.12	2.14	2.16	2.16	2.16	2.19	2.21	2.23	2.23	2.25	2.28	2.30	\	2.69	2.71	2.57
	75	TC	29.3	29.7	30.3	30.6	30.3	30.6	31.0	31.3	32.5	32.7	33.0	33.2	\	39.7	39.8	39.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	2.18	2.20	2.23	2.23	2.23	2.25	2.27	2.30	2.30	2.32	2.34	2.37	\	2.96	2.97	2.97
	85	TC	28.7	29.0	29.7	30.0	29.7	30.0	30.3	30.6	31.8	32.0	32.3	32.4	\	37.4	37.6	37.8
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	2.46	2.48	2.51	2.51	2.51	2.54	2.56	2.59	2.60	2.62	2.64	2.66	\	3.16	3.19	3.21
	95	TC	28.0	28.3	28.9	29.2	28.9	29.2	29.6	29.8	31.0	31.2	31.4	31.7	\	35.6	35.7	35.7
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	2.89	2.92	2.95	2.95	2.95	2.98	3.01	3.04	3.06	3.08	3.10	3.12	\	3.57	3.58	3.58
	105	TC	27.2	27.5	28.1	28.4	28.1	28.4	28.7	29.0	30.2	30.3	30.5	30.8	\	32.5	32.7	32.5
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	3.37	3.40	3.44	3.44	3.44	3.48	3.51	3.55	3.57	3.60	3.62	3.65	\	3.75	3.77	3.71
	115	TC	21.7	21.9	22.4	22.7	22.4	22.7	23.0	23.1	24.2	24.3	24.3	24.5	\	25.9	26.0	26.1
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	2.98	3.01	3.05	3.05	3.05	3.08	3.11	3.14	3.18	3.19	3.21	3.22	\	3.32	3.33	3.34

### 3. Electrical data

Performance data (Cooling operation at rated frequency)  
 36K outdoor unit matches 36K indoor unit

Airflow (CMF)	Outdoor DB (iF/°C)	IWB (iF/°C)	59/15				63/17.2				67/19.4				71/21.6			
			IWB (iF/°C)	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7
950	65	TC	29.8	30.1	30.7	31.1	30.7	31.1	31.4	31.8	32.9	33.2	33.5	33.7	\	40.1	40.4	40.7
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	1.92	1.94	1.96	1.96	1.96	1.98	1.99	2.02	2.02	2.03	2.06	2.08	\	2.54	2.57	2.60
	75	TC	29.8	30.2	30.8	31.1	30.8	31.1	31.6	31.9	33.0	33.3	33.6	33.8	\	39.7	40.0	40.3
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	2.13	2.16	2.18	2.18	2.18	2.21	2.23	2.24	2.23	2.27	2.29	2.32	\	2.80	2.83	2.85
	85	TC	29.4	29.7	30.3	30.7	30.3	30.7	31.0	31.3	32.5	32.8	33.1	33.3	\	39.0	39.3	39.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	2.41	2.43	2.46	2.46	2.46	2.48	2.51	2.53	2.53	2.56	2.58	2.60	\	3.18	3.22	3.24
	95	TC	28.9	29.2	29.8	30.2	29.8	30.2	30.5	30.8	32.0	32.3	32.5	32.8	\	38.0	38.3	38.6
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	2.89	2.92	2.95	2.95	2.95	2.98	3.02	3.04	3.05	3.08	3.10	3.14	\	3.79	3.81	3.85
	105	TC	28.3	28.7	29.3	29.6	29.3	29.6	29.9	30.2	31.3	31.7	31.9	32.1	\	36.7	36.8	37.0
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	3.44	3.48	3.51	3.51	3.51	3.55	3.59	3.63	3.63	3.66	3.69	3.73	\	4.39	4.40	4.41
	115	TC	25.4	25.7	26.3	26.5	26.3	26.5	26.8	27.1	28.2	28.4	28.5	28.7	\	30.5	30.7	30.8
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.50	3.54	3.58	3.58	3.58	3.63	3.66	3.70	3.73	3.75	3.78	3.79	\	3.90	3.93	3.94
1150	65	TC	32.1	32.4	33.2	33.5	33.2	33.5	33.9	34.2	35.5	35.7	36.0	36.3	\	42.8	43.1	43.4
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.24	2.27	2.29	2.29	2.29	2.32	2.34	2.37	2.36	2.39	2.42	2.44	\	2.92	2.95	2.98
	75	TC	32.1	32.5	33.2	33.5	33.2	33.5	33.9	34.3	35.5	35.8	36.0	36.3	\	42.5	42.8	43.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.46	2.48	2.51	2.51	2.51	2.53	2.56	2.58	2.58	2.60	2.64	2.67	\	3.07	3.10	3.13
	85	TC	31.6	31.9	32.6	33.0	32.6	33.0	33.3	33.7	34.9	35.2	35.4	35.7	\	41.4	41.7	42.0
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	2.70	2.73	2.77	2.77	2.77	2.79	2.82	2.85	2.85	2.88	2.90	2.94	\	3.54	3.56	3.60
	95	TC	31.1	31.6	32.3	32.6	32.3	32.6	32.9	33.3	34.2	34.7	35.0	35.2	\	40.4	40.6	40.8
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	3.22	3.25	3.29	3.29	3.29	3.32	3.35	3.39	3.40	3.43	3.47	3.49	\	4.16	4.20	4.23
	105	TC	30.3	30.7	31.4	31.8	31.4	31.8	32.1	32.5	33.5	33.9	34.1	34.4	\	37.4	37.4	37.6
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	3.80	3.84	3.88	3.88	3.88	3.93	3.96	4.00	4.01	4.05	4.09	4.11	\	4.50	4.47	4.50
	115	TC	25.2	25.5	26.0	26.3	26.0	26.3	26.6	26.9	28.6	28.7	28.3	28.4	\	29.5	29.6	29.7
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	3.56	3.60	3.64	3.64	3.64	3.68	3.71	3.75	3.81	3.84	3.83	3.85	\	3.89	3.90	3.91
1350	65	TC	34.1	34.5	35.2	35.6	35.2	35.6	36.0	36.4	37.7	38.0	38.2	38.6	\	45.1	45.4	46.2
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	2.63	2.65	2.68	2.68	2.68	2.72	2.74	2.77	2.77	2.79	2.83	2.85	\	3.34	3.37	3.19
	75	TC	34.2	34.6	35.4	35.7	35.4	35.7	36.1	36.5	37.9	38.1	38.4	38.8	\	46.3	46.5	46.6
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	2.70	2.73	2.77	2.77	2.77	2.79	2.82	2.85	2.85	2.88	2.90	2.94	\	3.68	3.69	3.69
	85	TC	33.5	33.9	34.6	35.0	34.6	35.0	35.3	35.7	37.1	37.3	37.6	37.8	\	43.6	43.8	44.1
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	3.05	3.08	3.12	3.12	3.12	3.15	3.18	3.22	3.23	3.25	3.28	3.30	\	3.93	3.96	3.99
	95	TC	32.7	33.0	33.7	34.1	33.7	34.1	34.5	34.8	36.2	36.4	36.6	36.9	\	41.5	41.7	41.7
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	3.59	3.63	3.66	3.66	3.66	3.70	3.74	3.78	3.80	3.83	3.85	3.88	\	4.44	4.45	4.45
	105	TC	31.8	32.1	32.8	33.2	32.8	33.2	33.5	33.9	35.2	35.4	35.6	35.9	\	37.9	38.1	37.9
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	4.19	4.23	4.28	4.28	4.28	4.33	4.36	4.41	4.44	4.47	4.50	4.54	\	4.66	4.69	4.61
	115	TC	25.4	25.6	26.2	26.5	26.2	26.5	26.8	27.0	28.2	28.3	28.4	28.6	\	30.2	30.3	30.4
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	3.70	3.74	3.79	3.79	3.79	3.83	3.86	3.90	3.95	3.96	3.99	4.00	\	4.13	4.14	4.15



### 3. Electrical data

Performance data (Cooling operation at rated frequency)  
48K outdoor unit matches 42K indoor unit

Airflow (CMF)	Outdoor DB (İF/°C)	IWB (İF/°C)	59/15				63/17.2				67/19.4				71/21.6			
			70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4
1150	65	TC	35.8	36.2	36.9	37.4	36.9	37.4	37.7	38.1	39.4	39.8	40.2	40.4	\	48.1	48.5	48.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.07	2.09	2.11	2.11	2.11	2.13	2.15	2.17	2.17	2.19	2.21	2.24	\	2.74	2.76	2.80
	75	TC	35.8	36.3	37.0	37.4	37.0	37.4	37.9	38.2	39.6	39.9	40.3	40.5	\	47.6	48.0	48.3
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	2.29	2.32	2.35	2.35	2.35	2.37	2.40	2.42	2.40	2.44	2.47	2.50	\	3.02	3.05	3.07
	85	TC	35.3	35.7	36.4	36.9	36.4	36.9	37.3	37.6	39.0	39.3	39.7	39.9	\	46.7	47.1	47.4
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	2.59	2.62	2.64	2.64	2.64	2.67	2.70	2.72	2.72	2.75	2.78	2.80	\	3.42	3.46	3.49
	95	TC	34.7	35.1	35.8	36.3	35.8	36.3	36.6	37.0	38.3	38.7	39.0	39.3	\	45.7	46.0	46.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	3.11	3.14	3.18	3.18	3.18	3.21	3.25	3.27	3.29	3.31	3.34	3.38	\	4.08	4.11	4.15
	105	TC	34.0	34.5	35.2	35.5	35.2	35.5	35.9	36.3	37.6	38.0	38.2	38.5	\	44.1	44.2	44.4
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	3.70	3.74	3.78	3.78	3.78	3.82	3.86	3.90	3.90	3.94	3.97	4.01	\	4.72	4.74	4.75
	115	TC	30.4	30.8	31.5	31.8	31.5	31.8	32.1	32.5	33.8	34.1	34.2	34.5	\	36.6	36.9	37.0
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	3.77	3.81	3.85	3.85	3.85	3.90	3.94	3.98	4.01	4.04	4.07	4.08	\	4.20	4.23	4.24
1350	65	TC	38.5	38.8	39.8	40.2	39.8	40.2	40.7	41.0	42.6	42.9	43.2	43.6	\	51.4	51.7	52.1
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.42	2.44	2.47	2.47	2.47	2.50	2.52	2.55	2.54	2.58	2.60	2.63	\	3.14	3.18	3.21
	75	TC	38.5	39.0	39.8	40.2	39.8	40.2	40.7	41.1	42.6	43.0	43.2	43.6	\	51.0	51.4	51.7
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.64	2.67	2.70	2.70	2.70	2.72	2.75	2.78	2.78	2.80	2.84	2.87	\	3.30	3.34	3.37
	85	TC	37.9	38.2	39.1	39.6	39.1	39.6	39.9	40.4	41.9	42.2	42.5	42.9	\	49.7	50.0	50.4
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	2.91	2.94	2.98	2.98	2.98	3.01	3.03	3.07	3.07	3.10	3.13	3.17	\	3.81	3.84	3.88
	95	TC	37.4	37.9	38.7	39.1	38.7	39.1	39.4	39.9	41.0	41.6	42.0	42.2	\	48.5	48.7	48.9
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	3.46	3.50	3.54	3.54	3.54	3.57	3.61	3.65	3.66	3.69	3.73	3.76	\	4.48	4.52	4.55
	105	TC	36.4	36.9	37.7	38.1	37.7	38.1	38.5	39.0	40.2	40.7	40.9	41.3	\	44.9	44.9	45.2
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	4.09	4.13	4.17	4.17	4.17	4.23	4.27	4.31	4.32	4.36	4.40	4.43	\	4.84	4.82	4.84
	115	TC	30.2	30.6	31.2	31.5	31.2	31.5	31.9	32.3	34.3	34.5	34.0	34.1	\	35.4	35.5	35.7
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	3.84	3.88	3.92	3.92	3.92	3.96	4.00	4.04	4.11	4.13	4.12	4.15	\	4.19	4.20	4.21
1550	65	TC	40.9	41.4	42.2	42.7	42.2	42.7	43.2	43.7	45.3	45.7	45.9	46.3	\	54.2	54.5	55.4
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	2.83	2.86	2.88	2.88	2.88	2.92	2.95	2.98	2.98	3.01	3.05	3.07	\	3.60	3.62	3.43
	75	TC	41.0	41.5	42.5	42.9	42.5	42.9	43.3	43.8	45.5	45.8	46.1	46.5	\	55.5	55.8	55.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	2.91	2.94	2.98	2.98	2.98	3.01	3.03	3.07	3.07	3.10	3.13	3.17	\	3.96	3.97	3.97
	85	TC	40.2	40.7	41.5	42.0	41.5	42.0	42.4	42.9	44.6	44.8	45.2	45.4	\	52.3	52.6	53.0
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	3.29	3.31	3.35	3.35	3.35	3.39	3.42	3.46	3.48	3.50	3.53	3.56	\	4.23	4.27	4.29
	95	TC	39.2	39.6	40.4	40.9	40.4	40.9	41.4	41.8	43.5	43.7	43.9	44.3	\	49.8	50.0	50.0
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	3.86	3.90	3.94	3.94	3.94	3.98	4.03	4.07	4.09	4.12	4.15	4.17	\	4.78	4.79	4.79
	105	TC	38.1	38.5	39.3	39.8	39.3	39.8	40.2	40.7	42.2	42.5	42.7	43.1	\	45.5	45.8	45.5
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	4.51	4.55	4.60	4.60	4.60	4.66	4.70	4.75	4.78	4.82	4.84	4.88	\	5.02	5.04	4.96
	115	TC	30.4	30.7	31.4	31.8	31.4	31.8	32.1	32.4	33.8	34.0	34.1	34.3	\	36.3	36.4	36.5
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	3.98	4.03	4.08	4.08	4.08	4.12	4.16	4.20	4.25	4.27	4.29	4.31	\	4.44	4.45	4.47

### 3. Electrical data

Performance data (Cooling operation at rated frequency)  
48K outdoor unit matches 48K indoor unit

Airflow (CMF)	Outdoor DB (iF/°C)	IWB (iF/°C)	59/15				63/17.2				67/19.4				71/21.6			
			70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4
1360	65	TC	40.9	41.3	42.2	42.7	42.2	42.7	43.1	43.5	45.1	45.5	45.9	46.2	\	55.0	55.4	55.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.47	2.50	2.51	2.51	2.51	2.55	2.56	2.59	2.59	2.61	2.64	2.67	\	3.27	3.30	3.35
	75	TC	40.9	41.5	42.3	42.7	42.3	42.7	43.3	43.7	45.2	45.6	46.1	46.3	\	54.4	54.8	55.2
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	2.74	2.77	2.80	2.80	2.80	2.83	2.87	2.88	2.87	2.91	2.95	2.98	\	3.60	3.63	3.67
	85	TC	40.3	40.8	41.6	42.2	41.6	42.2	42.6	43.0	44.5	44.9	45.4	45.6	\	53.4	53.8	54.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	3.09	3.12	3.15	3.15	3.15	3.19	3.22	3.25	3.25	3.28	3.31	3.35	\	4.08	4.13	4.16
	95	TC	39.7	40.1	40.9	41.5	40.9	41.5	41.9	42.3	43.8	44.2	44.5	44.9	\	52.2	52.6	52.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	3.71	3.75	3.79	3.79	3.79	3.83	3.87	3.91	3.92	3.95	3.99	4.03	\	4.87	4.90	4.95
	105	TC	38.8	39.4	40.2	40.6	40.2	40.6	41.0	41.5	43.0	43.4	43.7	44.0	\	50.4	50.5	50.8
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	4.42	4.47	4.51	4.51	4.51	4.56	4.61	4.66	4.66	4.71	4.74	4.79	\	5.63	5.65	5.67
	115	TC	34.8	35.2	36.0	36.3	36.0	36.3	36.7	37.1	38.7	39.0	39.1	39.4	\	41.9	42.2	42.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.50	4.55	4.59	4.59	4.59	4.66	4.71	4.75	4.79	4.82	4.85	4.87	\	5.01	5.04	5.06
1560	65	TC	44.0	44.4	45.5	45.9	45.5	45.9	46.5	46.9	48.7	49.0	49.4	49.8	\	58.7	59.1	59.5
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.88	2.91	2.95	2.95	2.95	2.98	3.01	3.04	3.03	3.07	3.11	3.14	\	3.75	3.79	3.83
	75	TC	44.0	44.5	45.5	45.9	45.5	45.9	46.5	47.0	48.7	49.1	49.4	49.8	\	58.3	58.7	59.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	3.15	3.19	3.22	3.22	3.22	3.25	3.28	3.31	3.31	3.35	3.39	3.43	\	3.94	3.99	4.02
	85	TC	43.3	43.7	44.7	45.2	44.7	45.2	45.6	46.2	47.9	48.3	48.6	49.0	\	56.8	57.2	57.6
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	3.47	3.51	3.55	3.55	3.55	3.59	3.62	3.67	3.67	3.70	3.73	3.78	\	4.55	4.58	4.63
	95	TC	42.7	43.3	44.2	44.7	44.2	44.7	45.1	45.6	46.9	47.6	48.0	48.3	\	55.4	55.7	55.9
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	4.13	4.18	4.23	4.23	4.23	4.26	4.31	4.35	4.37	4.40	4.45	4.48	\	5.35	5.39	5.43
	105	TC	41.6	42.2	43.1	43.5	43.1	43.5	44.0	44.5	45.9	46.5	46.7	47.2	\	51.3	51.3	51.6
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	4.88	4.93	4.98	4.98	4.98	5.04	5.09	5.14	5.15	5.20	5.25	5.28	\	5.78	5.75	5.78
	115	TC	34.5	34.9	35.6	36.0	35.6	36.0	36.5	36.9	39.2	39.4	38.8	39.0	\	40.5	40.6	40.8
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	4.58	4.63	4.67	4.67	4.67	4.72	4.77	4.82	4.90	4.93	4.91	4.95	\	4.99	5.01	5.03
1760	65	TC	46.7	47.3	48.3	48.8	48.3	48.8	49.4	49.9	51.8	52.2	52.5	52.9	\	61.9	62.3	63.3
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	3.38	3.41	3.44	3.44	3.44	3.49	3.52	3.55	3.55	3.59	3.63	3.67	\	4.29	4.32	4.40
	75	TC	46.9	47.4	48.6	49.0	48.6	49.0	49.5	50.1	52.0	52.3	52.7	53.1	\	63.4	63.7	63.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	3.47	3.51	3.55	3.55	3.55	3.59	3.62	3.67	3.67	3.70	3.73	3.78	\	4.72	4.74	4.74
	85	TC	45.9	46.5	47.4	48.0	47.4	48.0	48.4	49.0	50.9	51.2	51.6	51.9	\	59.8	60.1	60.5
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	3.92	3.95	4.00	4.00	4.00	4.05	4.08	4.13	4.15	4.18	4.21	4.24	\	5.04	5.09	5.12
	95	TC	44.8	45.2	46.2	46.7	46.2	46.7	47.3	47.7	49.7	49.9	50.2	50.6	\	56.9	57.2	57.2
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	4.61	4.66	4.71	4.71	4.71	4.75	4.80	4.85	4.88	4.91	4.95	4.98	\	5.70	5.71	5.71
	105	TC	43.5	44.0	44.9	45.5	44.9	45.5	45.9	46.5	48.3	48.6	48.8	49.3	\	52.0	52.3	52.0
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	5.38	5.43	5.49	5.49	5.49	5.55	5.60	5.67	5.70	5.75	5.78	5.83	\	5.99	6.02	5.92
	115	TC	34.8	35.1	35.9	36.3	35.9	36.3	36.7	37.0	38.7	38.8	39.0	39.2	\	41.5	41.6	41.7
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	4.75	4.80	4.87	4.87	4.87	4.91	4.96	5.01	5.07	5.09	5.12	5.14	\	5.30	5.31	5.33



### 3. Electrical data

Performance data (Cooling operation at rated frequency)  
60K outdoor unit matches 48K indoor unit

Airflow (CMF)	Outdoor DB (İF/°C)	IWB (İF/°C)	59/15				63/17.2				67/19.4				71/21.6			
			70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4
1360	65	TC	40.9	41.3	42.2	42.7	42.2	42.7	43.1	43.5	45.1	45.5	45.9	46.2	\	55.0	55.4	55.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.48	2.51	2.52	2.52	2.52	2.56	2.57	2.60	2.60	2.62	2.65	2.69	\	3.28	3.31	3.36
	75	TC	40.9	41.5	42.3	42.7	42.3	42.7	43.3	43.7	45.2	45.6	46.1	46.3	\	54.4	54.8	55.2
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	2.75	2.78	2.81	2.81	2.81	2.85	2.88	2.89	2.88	2.93	2.96	2.99	\	3.62	3.65	3.68
	85	TC	40.3	40.8	41.6	42.2	41.6	42.2	42.6	43.0	44.5	44.9	45.4	45.6	\	53.4	53.8	54.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	3.10	3.14	3.17	3.17	3.17	3.20	3.23	3.26	3.26	3.30	3.33	3.36	\	4.10	4.15	4.18
	95	TC	39.7	40.1	40.9	41.5	40.9	41.5	41.9	42.3	43.8	44.2	44.5	44.9	\	52.2	52.6	52.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	3.73	3.76	3.81	3.81	3.81	3.84	3.89	3.92	3.94	3.97	4.00	4.05	\	4.89	4.92	4.97
	105	TC	38.8	39.4	40.2	40.6	40.2	40.6	41.0	41.5	43.0	43.4	43.7	44.0	\	50.4	50.5	50.8
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	4.44	4.49	4.53	4.53	4.53	4.58	4.63	4.68	4.68	4.73	4.76	4.81	\	5.66	5.68	5.69
	115	TC	34.8	35.2	36.0	36.3	36.0	36.3	36.7	37.1	38.7	39.0	39.1	39.4	\	41.9	42.2	42.3
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	4.52	4.57	4.61	4.61	4.61	4.68	4.73	4.78	4.81	4.84	4.87	4.89	\	5.03	5.06	5.08
1560	65	TC	44.0	44.4	45.5	45.9	45.5	45.9	46.5	46.9	48.7	49.0	49.4	49.8	\	58.7	59.1	59.5
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	2.89	2.93	2.96	2.96	2.96	2.99	3.02	3.06	3.04	3.09	3.12	3.15	\	3.76	3.81	3.84
	75	TC	44.0	44.5	45.5	45.9	45.5	45.9	46.5	47.0	48.7	49.1	49.4	49.8	\	58.3	58.7	59.1
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	3.17	3.20	3.23	3.23	3.23	3.26	3.30	3.33	3.33	3.36	3.41	3.44	\	3.96	4.00	4.04
	85	TC	43.3	43.7	44.7	45.2	44.7	45.2	45.6	46.2	47.9	48.3	48.6	49.0	\	56.8	57.2	57.6
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	3.49	3.52	3.57	3.57	3.57	3.60	3.63	3.68	3.68	3.71	3.75	3.79	\	4.57	4.60	4.65
	95	TC	42.7	43.3	44.2	44.7	44.2	44.7	45.1	45.6	46.9	47.6	48.0	48.3	\	55.4	55.7	55.9
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	4.15	4.20	4.24	4.24	4.24	4.28	4.33	4.37	4.39	4.42	4.47	4.50	\	5.37	5.42	5.45
	105	TC	41.6	42.2	43.1	43.5	43.1	43.5	44.0	44.5	45.9	46.5	46.7	47.2	\	51.3	51.3	51.6
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	4.90	4.95	5.00	5.00	5.00	5.06	5.11	5.16	5.18	5.23	5.27	5.31	\	5.80	5.77	5.80
	115	TC	34.5	34.9	35.6	36.0	35.6	36.0	36.5	36.9	39.2	39.4	38.8	39.0	\	40.5	40.6	40.8
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	4.60	4.65	4.70	4.70	4.70	4.74	4.79	4.84	4.92	4.95	4.94	4.97	\	5.02	5.03	5.05
1760	65	TC	46.7	47.3	48.3	48.8	48.3	48.8	49.4	49.9	51.8	52.2	52.5	52.9	\	61.9	62.3	63.3
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	3.39	3.42	3.46	3.46	3.46	3.51	3.54	3.57	3.57	3.60	3.65	3.68	\	4.31	4.34	4.12
	75	TC	46.9	47.4	48.6	49.0	48.6	49.0	49.5	50.1	52.0	52.3	52.7	53.1	\	63.4	63.7	63.9
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	3.49	3.52	3.57	3.57	3.57	3.60	3.63	3.68	3.68	3.71	3.75	3.79	\	4.74	4.76	4.76
	85	TC	45.9	46.5	47.4	48.0	47.4	48.0	48.4	49.0	50.9	51.2	51.6	51.9	\	59.8	60.1	60.5
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	3.94	3.97	4.02	4.02	4.02	4.07	4.10	4.15	4.16	4.20	4.23	4.26	\	5.06	5.11	5.15
	95	TC	44.8	45.2	46.2	46.7	46.2	46.7	47.3	47.7	49.7	49.9	50.2	50.6	\	56.9	57.2	57.2
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	4.63	4.68	4.73	4.73	4.73	4.78	4.82	4.87	4.90	4.94	4.97	5.00	\	5.72	5.74	5.74
	105	TC	43.5	44.0	44.9	45.5	44.9	45.5	45.9	46.5	48.3	48.6	48.8	49.3	\	52.0	52.3	52.0
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	5.40	5.45	5.52	5.52	5.52	5.58	5.63	5.69	5.72	5.77	5.80	5.85	\	6.01	6.05	5.95
	115	TC	34.8	35.1	35.9	36.3	35.9	36.3	36.7	37.0	38.7	38.8	39.0	39.2	\	41.5	41.6	41.7
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	4.78	4.82	4.89	4.89	4.89	4.94	4.98	5.03	5.10	5.11	5.15	5.16	\	5.32	5.34	5.35



### 3. Electrical data

Performance data (Cooling operation at rated frequency)

60K outdoor unit matches 60K indoor unit

Airflow (CMF)	Outdoor DB (İF/°C)	IWB (İF/°C)	59/15				63/17.2				67/19.4				71/21.6			
			IDB (İF/°C)	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7	85/ 29.4	70/ 21.1	75/ 23.9	80/ 26.7
1500	65	TC	46.0	46.5	47.4	48.1	47.4	48.1	48.5	49.0	50.7	51.2	51.7	52.0	\	61.8	62.3	62.8
		S/T	0.99	1.00	1.00	1.00	0.61	0.83	1.00	1.00	0.39	0.57	0.73	0.90	\	0.39	0.53	0.67
		kW	2.99	3.03	3.05	3.05	3.05	3.09	3.11	3.15	3.15	3.17	3.21	3.24	\	3.96	4.00	4.06
	75	TC	46.0	46.6	47.6	48.1	47.6	48.1	48.7	49.1	50.9	51.3	51.8	52.1	\	61.2	61.7	62.1
		S/T	1.00	1.00	0.99	1.00	0.62	0.83	1.00	1.00	0.39	0.56	0.73	0.90	\	0.39	0.53	0.67
		kW	3.32	3.36	3.40	3.40	3.40	3.44	3.48	3.50	3.48	3.54	3.57	3.61	\	4.37	4.41	4.45
	85	TC	45.4	45.9	46.8	47.4	46.8	47.4	47.9	48.4	50.1	50.6	51.0	51.3	\	60.1	60.6	60.9
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.91	\	0.39	0.53	0.67
		kW	3.75	3.79	3.83	3.83	3.83	3.87	3.90	3.94	3.94	3.98	4.02	4.06	\	4.95	5.01	5.05
	95	TC	44.6	45.1	46.0	46.6	46.0	46.6	47.1	47.6	49.3	49.8	50.1	50.6	\	58.7	59.2	59.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.74	0.92	\	0.39	0.53	0.68
		kW	4.51	4.55	4.60	4.60	4.60	4.64	4.70	4.74	4.76	4.80	4.84	4.89	\	5.91	5.94	6.00
	105	TC	43.7	44.3	45.2	45.7	45.2	45.7	46.2	46.6	48.4	48.8	49.1	49.5	\	56.7	56.8	57.1
		S/T	0.99	1.00	1.00	1.00	0.62	0.84	1.00	1.00	0.39	0.57	0.75	0.93	\	0.39	0.54	0.69
		kW	5.36	5.42	5.48	5.48	5.48	5.54	5.59	5.65	5.65	5.71	5.75	5.81	\	6.84	6.86	6.88
	115	TC	39.1	39.6	40.5	40.9	40.5	40.9	41.3	41.8	43.5	43.8	44.0	44.3	\	47.1	47.4	47.6
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.40	0.60	0.79	0.99	\	0.39	0.58	0.76
		kW	5.46	5.52	5.57	5.57	5.57	5.65	5.71	5.77	5.81	5.85	5.89	5.91	\	6.08	6.12	6.14
1700	65	TC	49.5	49.9	51.2	51.7	51.2	51.7	52.3	52.7	54.8	55.1	55.6	56.0	\	66.1	66.5	67.0
		S/T	0.99	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	3.50	3.54	3.57	3.57	3.57	3.61	3.65	3.69	3.67	3.73	3.77	3.81	\	4.55	4.60	4.64
	75	TC	49.5	50.1	51.2	51.7	51.2	51.7	52.3	52.9	54.8	55.3	55.6	56.0	\	65.6	66.1	66.5
		S/T	1.00	1.00	1.00	1.00	0.62	0.85	1.00	1.00	0.39	0.58	0.76	0.94	\	0.39	0.54	0.69
		kW	3.83	3.87	3.90	3.90	3.90	3.94	3.98	4.02	4.02	4.06	4.12	4.16	\	4.78	4.84	4.88
	85	TC	48.7	49.1	50.2	50.9	50.2	50.9	51.3	52.0	53.8	54.3	54.6	55.1	\	63.9	64.3	64.8
		S/T	1.00	1.00	1.00	1.00	0.63	0.86	1.00	1.00	0.39	0.58	0.76	0.95	\	0.39	0.54	0.70
		kW	4.22	4.25	4.31	4.31	4.31	4.35	4.39	4.45	4.45	4.49	4.53	4.58	\	5.52	5.56	5.61
	95	TC	48.1	48.7	49.8	50.2	49.8	50.2	50.7	51.3	52.7	53.5	54.0	54.3	\	62.3	62.6	62.9
		S/T	1.00	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.58	0.76	1.00	\	0.39	0.55	0.71
		kW	5.01	5.07	5.13	5.13	5.13	5.17	5.23	5.28	5.30	5.34	5.40	5.44	\	6.49	6.55	6.58
	105	TC	46.8	47.4	48.5	49.0	48.5	49.0	49.5	50.1	51.7	52.3	52.6	53.1	\	57.8	57.8	58.1
		S/T	0.99	1.00	0.99	1.00	0.63	0.87	1.00	1.00	0.39	0.59	0.78	1.00	\	0.39	0.57	0.74
		kW	5.92	5.98	6.04	6.04	6.04	6.12	6.18	6.24	6.25	6.31	6.37	6.41	\	7.01	6.97	7.01
	115	TC	38.8	39.3	40.1	40.5	40.1	40.5	41.0	41.5	44.1	44.3	43.7	43.8	\	45.5	45.7	45.9
		S/T	1.00	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.40	0.62	0.86	1.00	\	0.40	0.62	0.84
		kW	5.56	5.61	5.67	5.67	5.67	5.73	5.79	5.85	5.94	5.98	5.96	6.00	\	6.06	6.08	6.10
1900	65	TC	52.6	53.2	54.3	54.9	54.3	54.9	55.6	56.2	58.2	58.7	59.0	59.5	\	69.7	70.1	71.2
		S/T	0.99	1.00	1.00	1.00	0.64	0.88	1.00	1.00	0.39	0.59	0.78	0.99	\	0.38	0.55	0.71
		kW	4.10	4.14	4.18	4.18	4.18	4.23	4.27	4.31	4.31	4.35	4.41	4.45	\	5.21	5.24	4.97
	75	TC	52.7	53.4	54.6	55.1	54.6	55.1	55.7	56.3	58.5	58.9	59.3	59.8	\	71.4	71.7	71.8
		S/T	0.99	1.00	1.00	1.00	0.63	0.88	1.00	1.00	0.39	0.59	0.78	1.00	\	0.38	0.55	0.71
		kW	4.22	4.25	4.31	4.31	4.31	4.35	4.39	4.45	4.45	4.49	4.53	4.58	\	5.73	5.75	5.75
	85	TC	51.7	52.3	53.4	54.0	53.4	54.0	54.5	55.1	57.3	57.6	58.1	58.4	\	67.3	67.6	68.1
		S/T	0.99	1.00	1.00	1.00	0.64	0.89	1.00	1.00	0.39	0.59	0.79	1.00	\	0.39	0.56	0.73
		kW	4.76	4.80	4.86	4.86	4.86	4.91	4.95	5.01	5.03	5.07	5.11	5.15	\	6.12	6.18	6.22
	95	TC	50.4	50.9	52.0	52.6	52.0	52.6	53.2	53.7	55.9	56.2	56.5	57.0	\	64.0	64.3	64.3
		S/T	1.00	1.00	1.00	1.00	0.64	0.90	1.00	1.00	0.39	0.60	0.80	1.00	\	0.39	0.57	0.75
		kW	5.59	5.65	5.71	5.71	5.71	5.77	5.83	5.89	5.92	5.96	6.00	6.04	\	6.92	6.93	6.93
	105	TC	49.0	49.5	50.6	51.2	50.6	51.2	51.7	52.3	54.3	54.6	54.9	55.4	\	58.5	58.9	58.5
		S/T	1.00	1.00	1.00	1.00	0.65	0.90	1.00	1.00	0.39	0.60	0.81	1.00	\	0.39	0.59	0.79
		kW	6.53	6.58	6.66	6.66	6.66	6.74	6.80	6.88	6.92	6.97	7.01	7.07	\	7.26	7.30	7.19
	115	TC	39.1	39.4	40.4	40.9	40.4	40.9	41.3	41.6	43.5	43.7	43.8	44.1	\	46.6	46.8	47.0
		S/T	1.00	1.00	1.00	1.00	0.66	1.00	1.00	1.00	0.40	0.66	0.93	1.00	\	0.40	0.65	0.90
		kW	5.77	5.83	5.91	5.91	5.91	5.96	6.02	6.08	6.16	6.18	6.22	6.24	\	6.43	6.45	6.47



### 3. Electrical data

## 4.2 Piping length correction factor

The correction factor is based on the equivalent piping length in meters (EL) and the height difference between outdoor and indoor units in meters (H).

H:

Height difference between indoor unit and outdoor unit (m).

- H>0: Position of outdoor unit is higher than that of the indoor unit (m).
- H<0: Position of outdoor unit is lower than that of the indoor unit (m).

L:

Actual one-way piping length between indoor unit and outdoor unit (m).

EL: Equivalent one-way piping length between indoor unit and outdoor unit (m).

Gas Pipe Diameter (mm/inch)	9.52 (3/8')	12.7 (1/2')	15.88 (5/8')	19.05 (3/4')	22.22 (7/8')
90° Elbow (m)	0.15	0.20	0.25	0.35	0.40

**Note:**

If the size of indoor gas pipe valve is different from the outdoor's gas pipe valve, a pipe adaptor will be needed for connecting the pipe.

Cooling:

Model \ EL [ft(m)]	25(7.6)	30(10)	50(15)	75(23)	100(30)	131(40)	150(45)	164(50)
36K	1.00	0.99	0.94	0.88	0.83	0.78	--	--
48K	1.00	0.99	0.95	0.91	0.90	0.87	0.82	0.82
60K	1.00	0.99	0.96	0.93	0.90	0.87	0.82	0.85

The correction factor of height between indoor unit and outdoor unit

Height difference	16ft (5m)	33ft (10m)	108ft (30m)
Factor	0.010	0.020	0.025

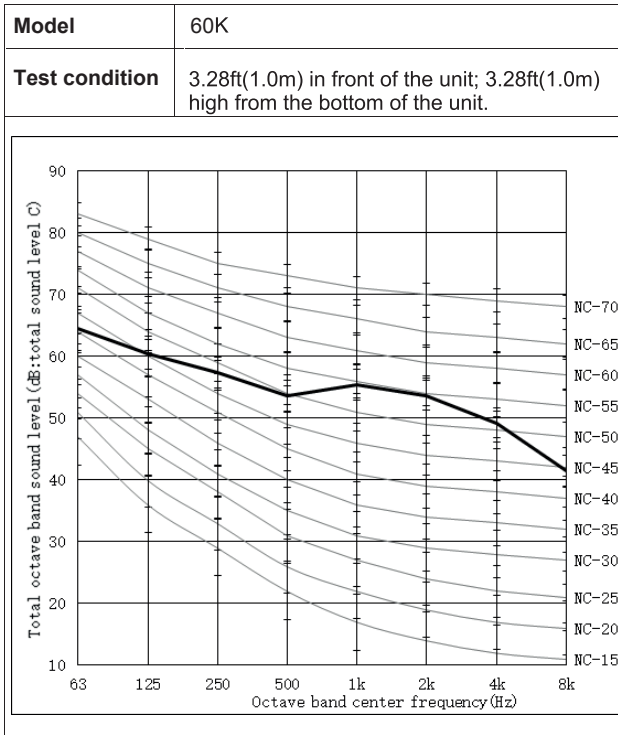
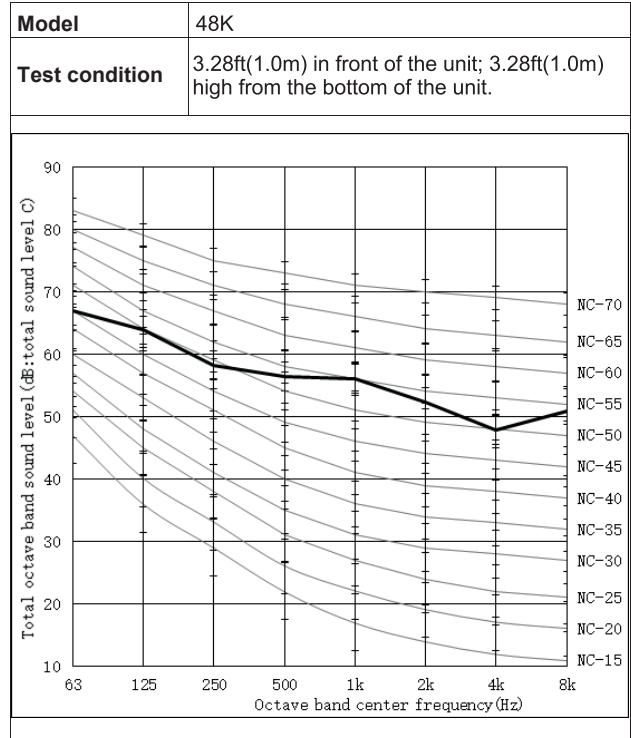
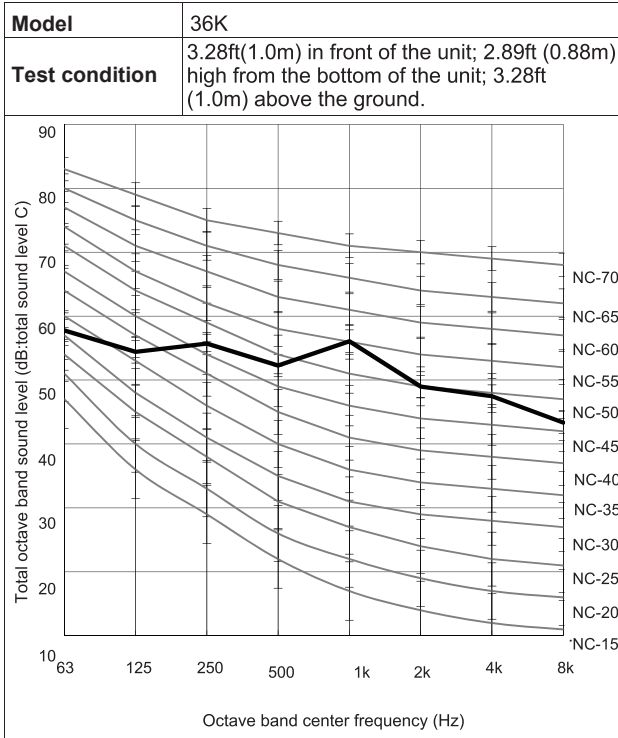
To ensure correct unit selection, consider the farthest indoor unit.

**Note:**

1. Above data is assuming that the height difference between indoor unit and outdoor unit is 0m.
2. Be sure to minimize length of connection pipes to optimize performance. If the outdoor unit is installed higher or lower than the indoor unit, it is necessary to apply height correction factor additionally to length correction factor to calculate cooling. If outdoor unit is higher, correction should be applied to cooling capacity.

# 5. Sound pressure data

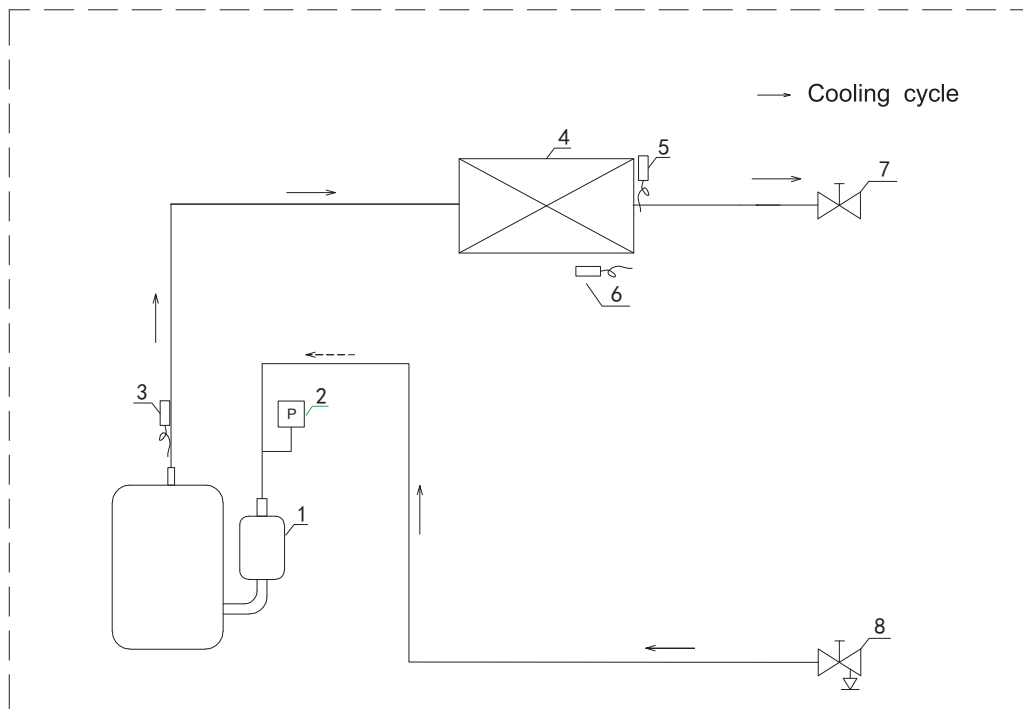
Outdoor



## 6. Refrigerant cycle

Outdoor unit

36K

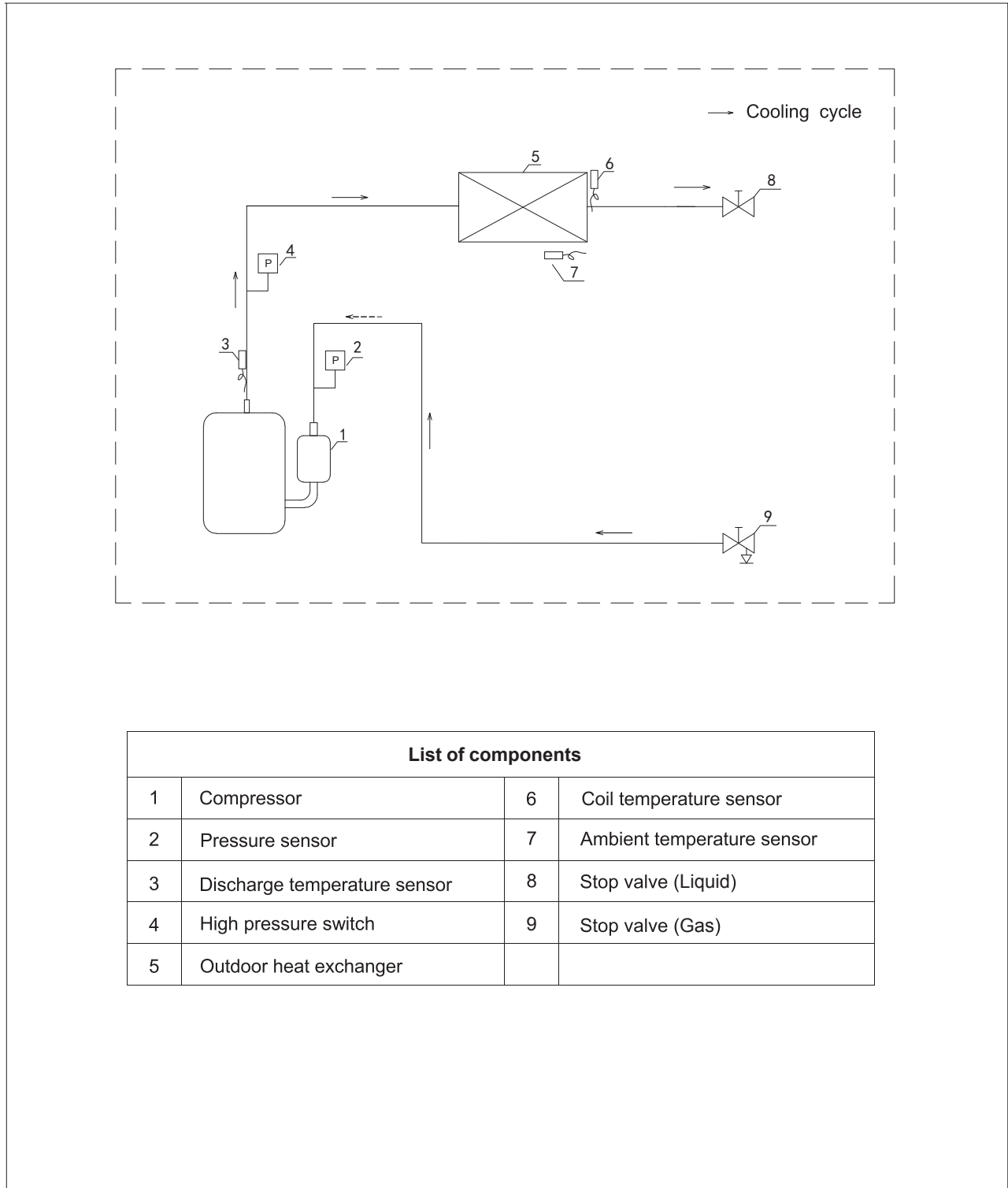


**List of components**

1	Compressor	5	Coil temperature sensor
2	Pressure sensor	6	Ambient temperature sensor
3	Discharge temperature sensor	7	Stop valve (Liquid)
4	Outdoor heat exchanger	8	Stop valve (Gas)

## 6. Refrigerant cycle

48K/60K

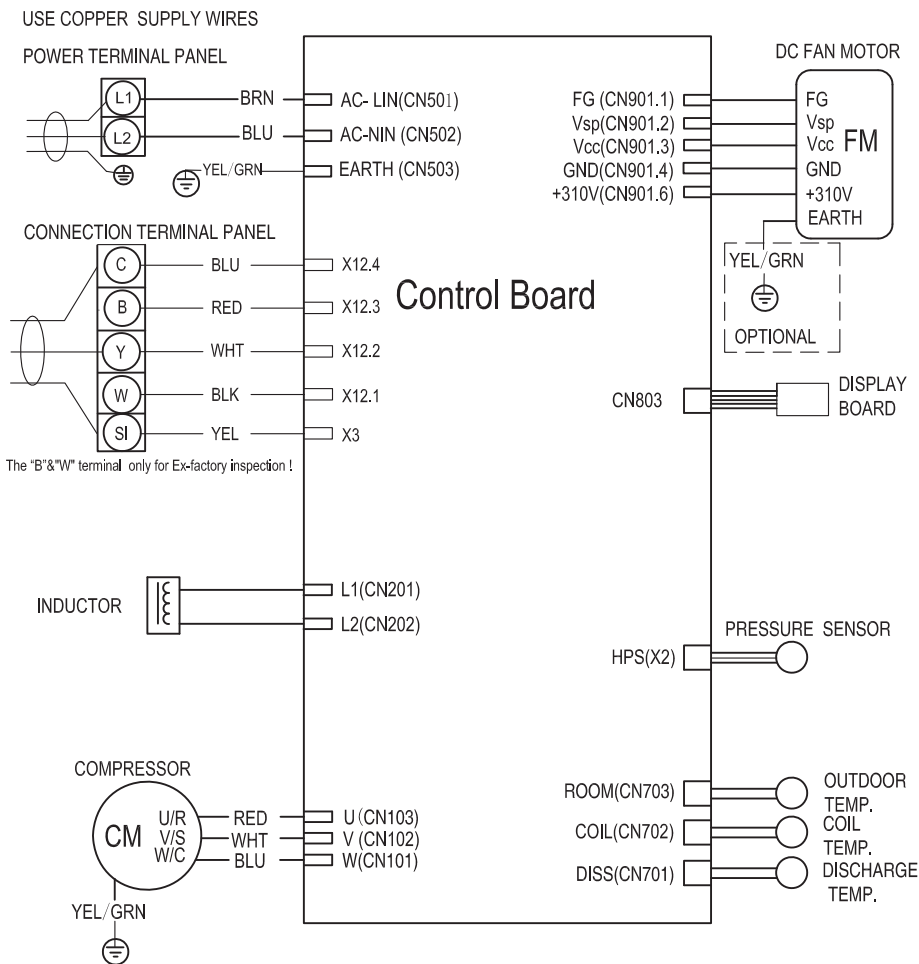


# 7. Wiring diagram

## 7.1 Electrical wiring diagram

36K

**Electric wiring diagram 2247669.B**



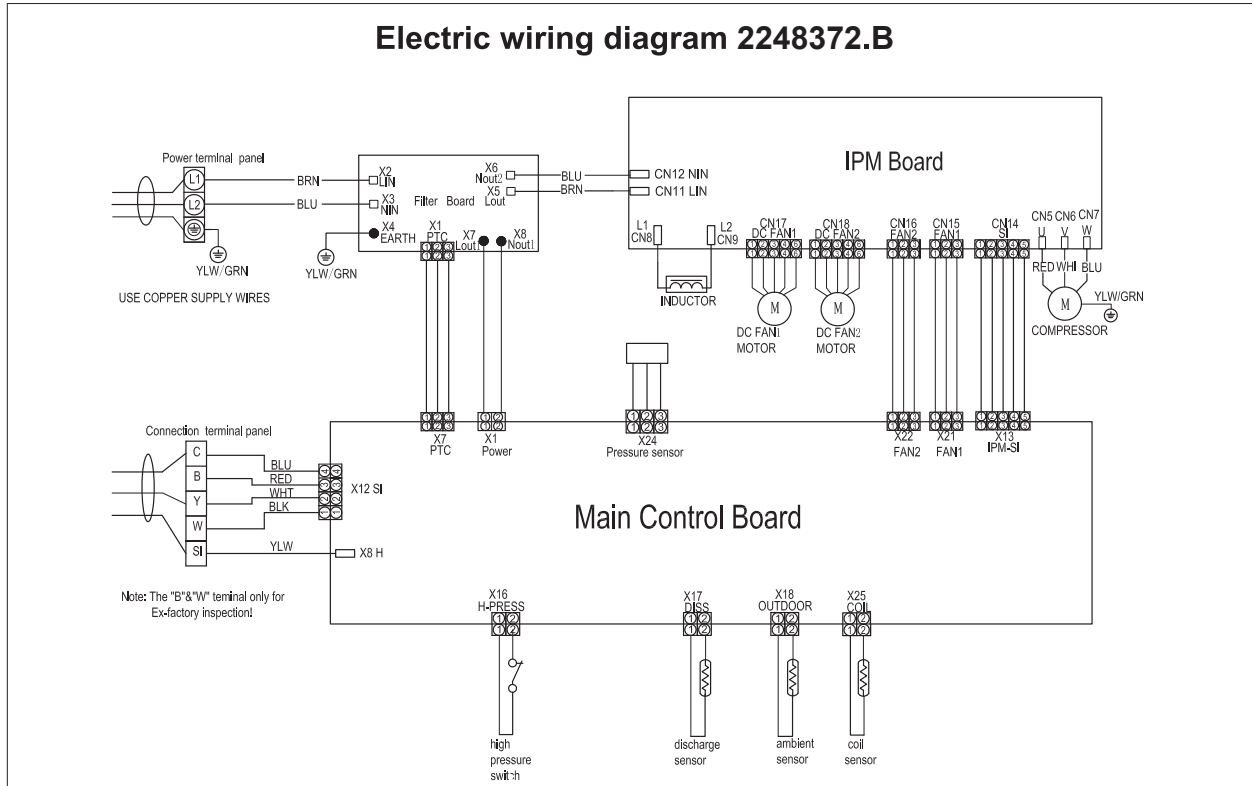
**WARNING**  
 High voltage danger,  
 Outdoor power supply  
 must be disconnected  
 Before  
 maintenance, Until the  
 LED power  
 indicator on the  
 outdoor control board  
 is power off, It can be  
 operated.  
 Be sure to cut off the  
 electricity before  
 operating!

### DIP Switch Setting of Outdoor Unit

Turn on the power before setting the DIP switch. Without turning on, the switches do not work and the content of the setting are invalid. Mark of "■" indicates the position of DIP switches.

S4 DIP switch setting		S5 DIP switch setting	
Factory setting		Factory setting	
Pump Down Switch		Capacity Hi → Low	

48K/60K



### DIP Switch Setting of Outdoor Unit

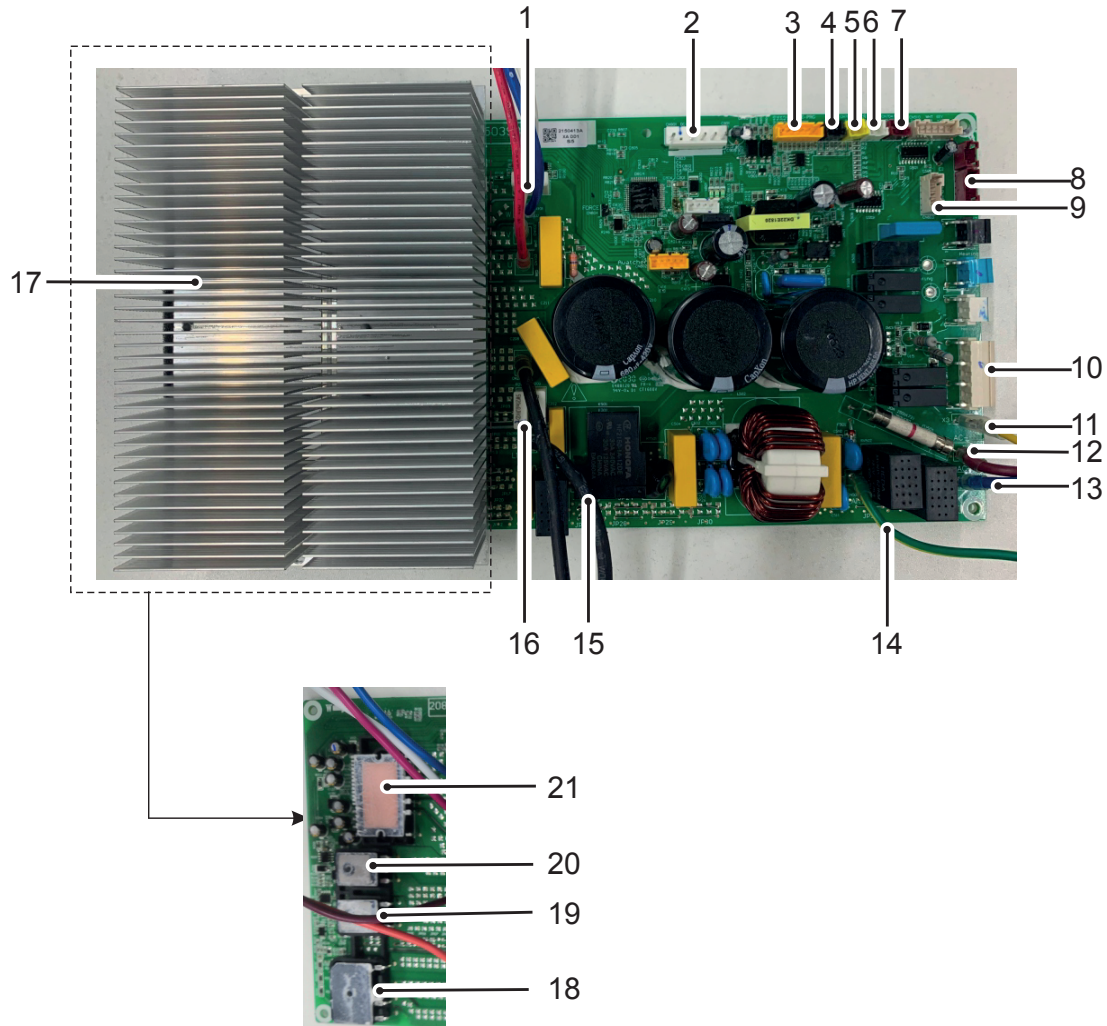
Turn off all power sources before setting.  
 Without turning off, the switches do not work  
 and the content of the setting are invalid.  
 Mark of "■" indicates the position of DIP switches.

S4 DIP switch setting	S5 DIP switch setting								
select setting	select setting								
<table border="1"> <tr> <td>Factory setting</td> <td> </td> </tr> <tr> <td>Pump Down Switch</td> <td> </td> </tr> </table>	Factory setting		Pump Down Switch		<table border="1"> <tr> <td>Factory setting</td> <td> </td> </tr> <tr> <td>Capacity Hi—Low</td> <td> </td> </tr> </table>	Factory setting		Capacity Hi—Low	
Factory setting									
Pump Down Switch									
Factory setting									
Capacity Hi—Low									

## 7. Wiring diagram

### 7.2 Control board picture

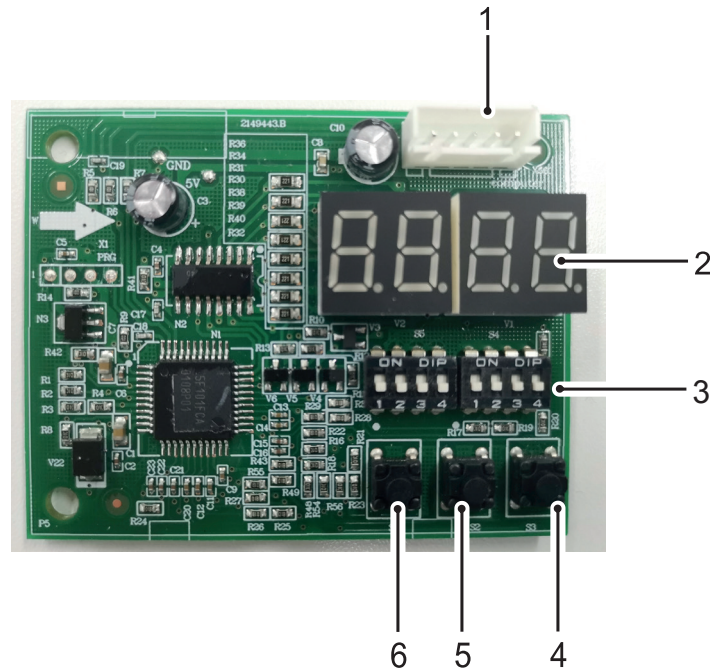
36K  
Main control board



No.	Description	No.	Description
1	Compressor	12	AC Power Lin
2	DC Fan	13	AC Power Nin
3	EE	14	GND
4	Coil Temperature Sensor	15	Reactor L2
5	Ambient Temperature Sensor	16	Reactor L1
6	Discharge Temperature Sensor	17	Rectifier Bridge
7	Overheat Protector	18	IGBT
8	SW	19	Diode
9	Computer/Checker	20	IPM
10	Communication Signal	21	Radiator
11	SI		

## 7. Wiring diagram

### 7-Segment display board



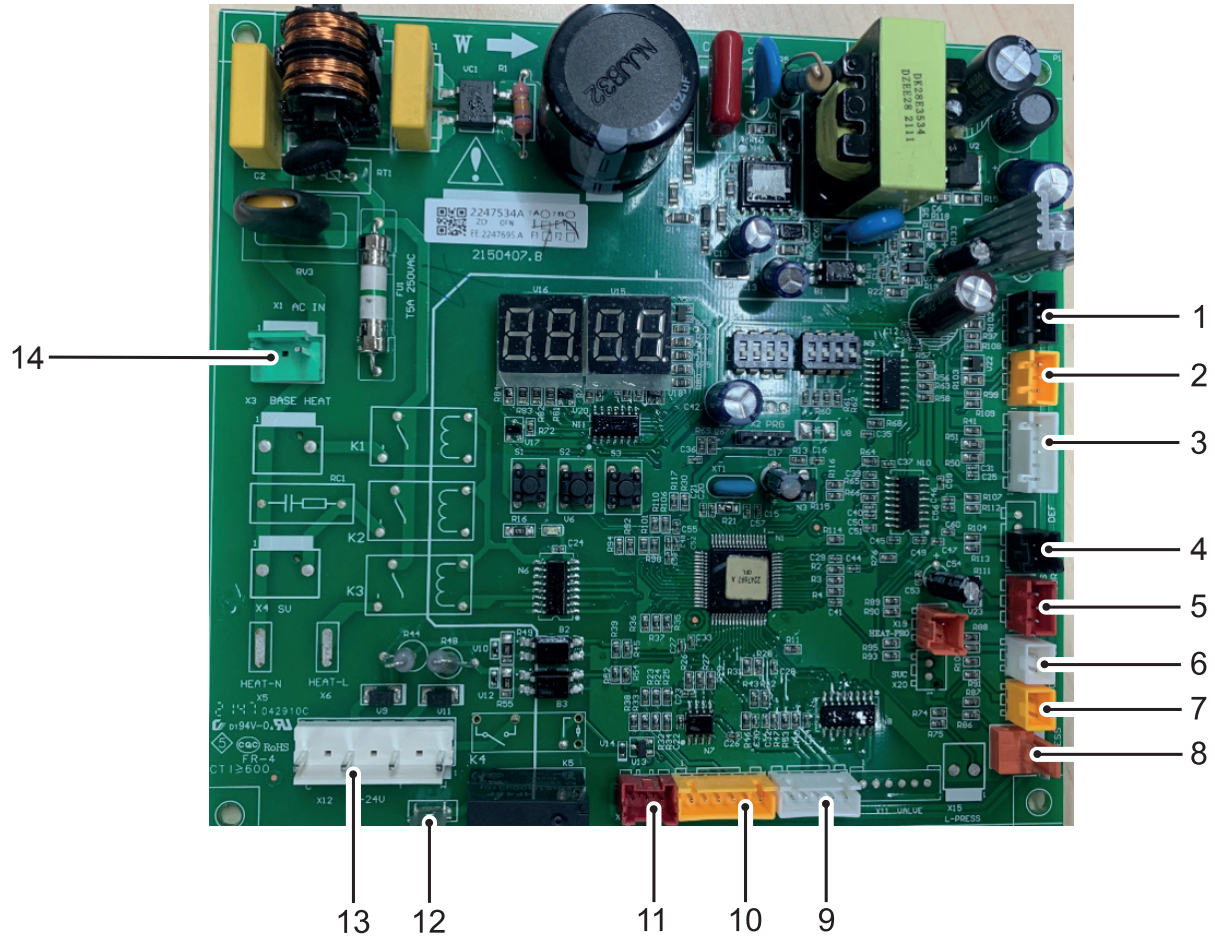
No.	Description	No.	Description
1	Computer/Checker to Outdoor Control Board	4	S3-Decrease Button
2	7-Segment Display	5	S2-Select Button
3	DIP Switch	6	S1-Increase Button



## 7. Wiring diagram

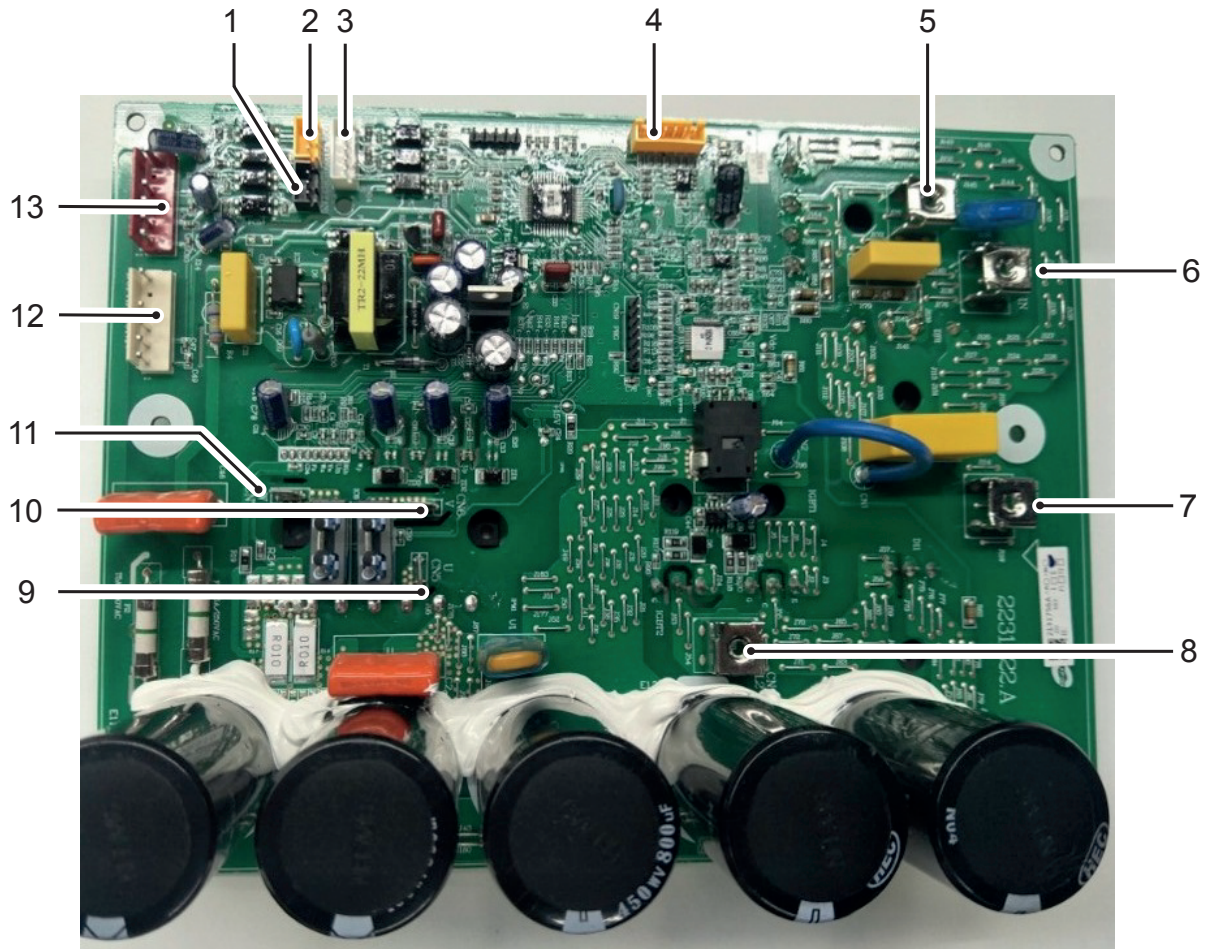
48K/60K

Main control board



No.	Description	No.	Description
1	DC Fan Driver1	8	High Pressure Switch
2	DC Fan Driver2	9	Checker
3	IPM-SI	10	EEPROM
4	Coil Temperature Sensor	11	PTC Control Signal
5	Pressure Sensor	12	SI Signal
6	Discharge Temperature Sensor	13	Communication Signal
7	Ambient Temperature Sensor	14	AC Power

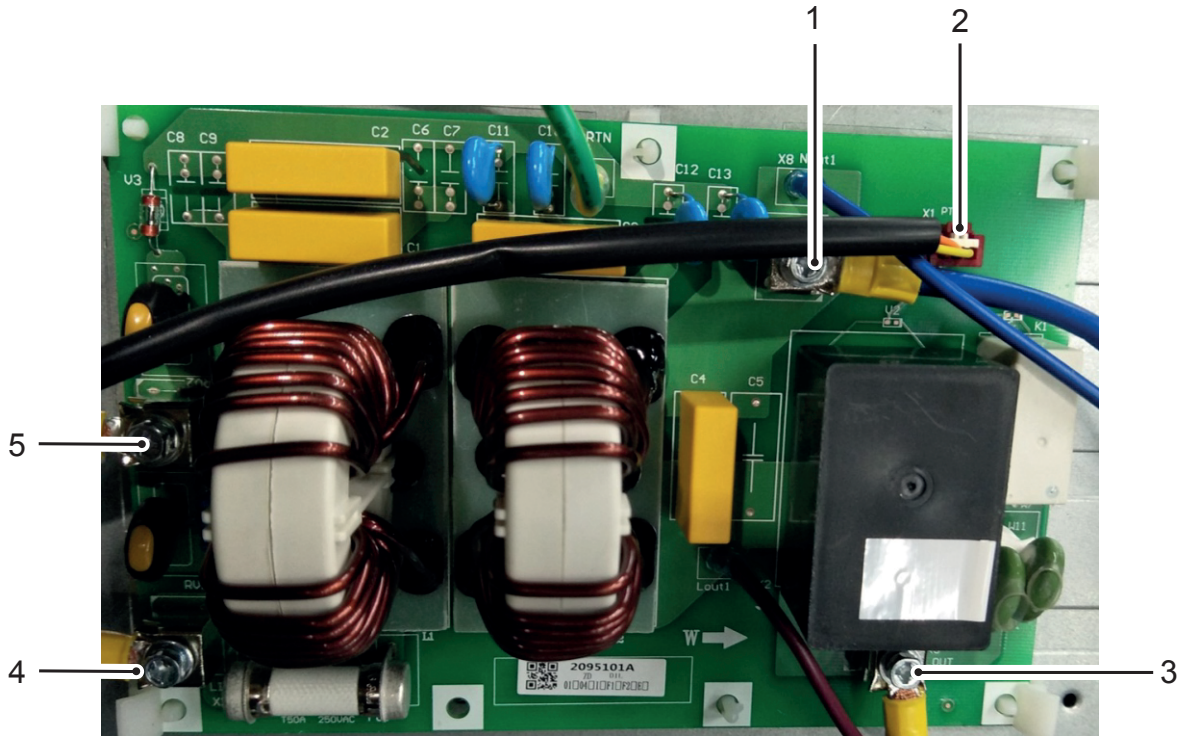
### Drive board



No.	Description	No.	Description
1	DC Fan Signal	8	Reactor L2
2	DC Fan Signal	9	Compressor U
3	IPM-SI	10	Compressor V
4	EEPROM	11	Compressor W
5	NIN	12	DC Fan 1
6	LIN	13	DC Fan 2
7	Reactor L1		

## 7. Wiring diagram

Drive board



No.	Description	No.	Description
1	N Out	4	LIN
2	PTC Control Signal	5	NIN
3	L Out		

## 7.2 Control board picture

Model (Btu/h)	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size	Fuse or Circuit Breaker (A)
		Rated Current (A)	Nominal Sensitive Current (mA)			
36K	208/230V ~/60Hz	35	30	3×10AWG	3×16AWG	35
48K / 60K	208/230V ~/60Hz	50	30	3×8AWG	3×16AWG	50

Max. Running Current (A): REFER TO NAMEPLATE

**Note:**

1. Follow local codes and regulations when selecting field wires, and all the above are the minimum wire size.
2. When transmitting cable is longer than 262ft. (80m), a larger wire size should be selected.
3. Install main switch and ELB for each system separately. Select the high response type ELB that is acted within 0.1 second.







## 8. Filed setting

### 8.1 Outdoor unit DIP switch

DIP Switch Setting of Outdoor Unit (Optional setting)

1. Turn on all power sources before setting. Without turning on, the switches settings are not refreshed and might be invalid. (36K)
2. Turn off all power sources before setting. Without turning off, the switches settings are not refreshed and might be invalid.(48K/60K)
3. Mark of "■" indicates the position of DIP switches.

S4 DIP switch setting		S5 DIP switch setting	
Factory Setting		Factory Setting	
Pump Down Switch		Capacity Hi → Low	

#### Capacity set

Dial it when the indoor units matched are in the following conditions.

Outdoor unit model	Indoor unit connect
36K	30K
48K	42K
60K	48K

#### Pump down mode

##### Actions:

The compressor runs with the target frequency, and without any protection when frequency rises; The EEV runs with setting opening; Outdoor unit fan will run with the set fan speed.

##### Operation procedures:

Step 1:

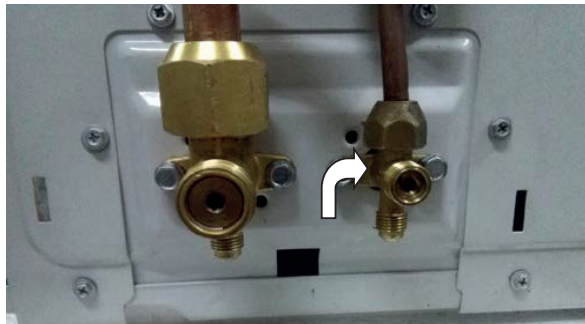
Press the ON/OFF button to power off the appliance.

Step 2:

Disconnect the machine power.

Step 3:

Close the stop valve of the liquid piping with an Allen wrench in a clockwise direction.



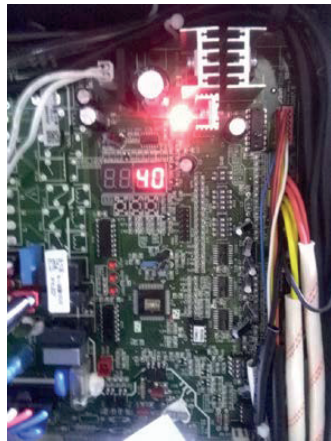
## 8. Filed setting

Step 4:  
Open the maintenance panel.

Step 5:  
Switch the dial code (referring to outdoor wiring diagram ) ON position on the main control board.

Step 6:  
Switch on the machine power.

Step 7:  
Check if "40" is displayed on the LED digital tube of the main control board.



Step 8:  
When the numerals on the LED digital tube of outdoor unit count down to 0 (40 → 39 → 38 ...0), and "0" begins to blink, close the shut-off valve of the gas piping with an Allen wrench in a clockwise direction.



Step 9:  
Cut off machine power and the procedure for recovering refrigerant is finished.

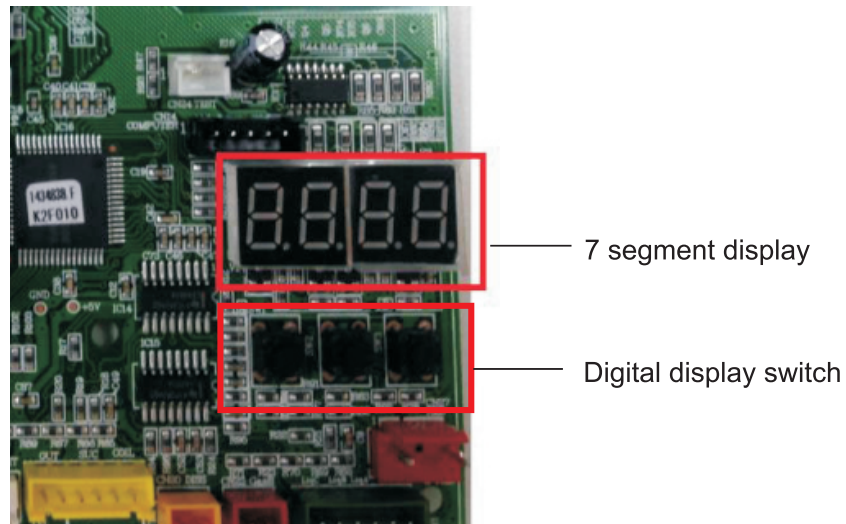
**Note:**

Be sure to switch back the dial after refrigerant recovery operation. If not, it will enter refrigerant recovery mode again after power ON. But if the power is not off, it will not enter refrigerant recovery mode and will run normally.

## 8. Filed setting

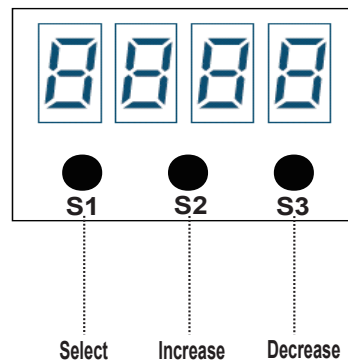
### 8.2 Running parameter check

Query by 7 segment display



7-segment display Introduction

36K



There are 3 buttons on the digital display board:

1) Select button: Select to display outdoor/indoor unit parameter.

“ P. ” -- Parameter of outdoor unit

2) INCREASE button: Each time it is pressed, the number rises by 1.

3) DECREASE button: Each time it is pressed, the number lowers by 1.

The parameter content will be automatically displayed after the parameter code is selected for 3s.

Parameters can be checked in the following table below.

Parameter code	Descriptions
P.0	Fault codes
P.1	Compressor actual frequency
P.2	Compressor driving frequency
P.4	Compressor target frequency
P.5	Compressor exhaust temperature
P.6	Outdoor suction temperature
P.7	Outdoor ambient temperature
P.8	Outdoor coil temperature
P.9	Outdoor defrosting temperature
P.10	IPM module temperature
P.11	Outdoor capacity requirement
P.13	Outdoor DC Motor target speed
P.14	AC input current
P.15	AC input voltage
P.16	DC bus voltage
P.17	Compressor phase current
P.18	Frequency limit code
P.20	Target suction overheating
P.21	Target exhaust overheating

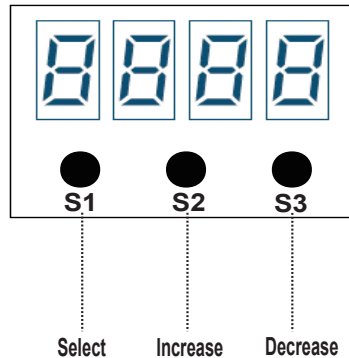
**Note:**

The right is therefore reserved to EE changing without notice.



## 8. Filed setting

48K/60K



There are 3 buttons on the digital display board:

1. SWITCH button:

Indoor parameters and outdoor parameters can be selected in turn by pressing it. "P"/"H"- outdoor unit parameter

2. INCREASE button:

Each time it is pressed, the number rises by 1, hold down it, the number will be rapidly increased;

3. DECREASE button:

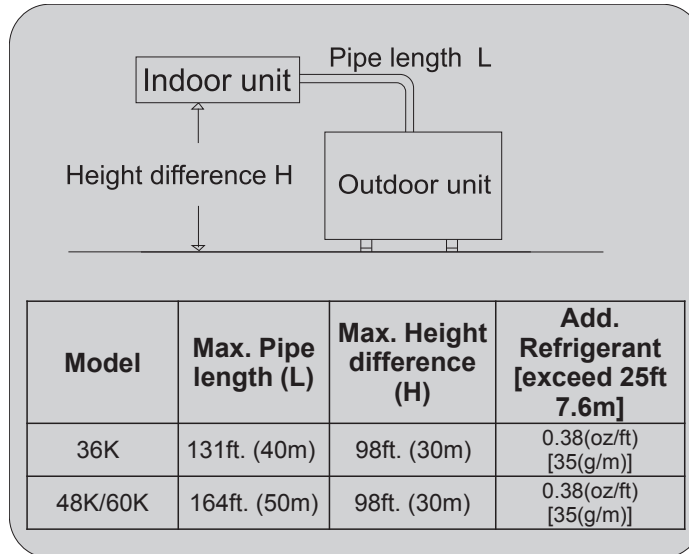
Each time it is pressed, the number lowers by 1, hold down it, the number will be rapidly decreased.

Parameters can be checked in the following table below.

Parameter code	Descriptions
0	Protection code or fault code
P.1	Target frequency
P.2	Driving frequency
P.4	Outdoor EEV opening
P.5	Outdoor EEV target opening
P.6	Upper DC motor revolving speed
P.8	AC Input voltage
P.9	Current
P.10	Modular temper
P.11	Capacity needed
P.12	Modular fault
P.20	Outdoor ambient temperature
P.21	Outdoor coil temperature
P.22	Outdoor defrost temperature
P.23	Suction temperature
P.24	Discharge temperature
H.1	DSH actual value
H.2	DSH target value
H.3	Target pressure in cooling mode (Actual pressure= the displayed value/100)
H.4	Target pressure in heating mode (Actual pressure= the displayed value/100)
H.5	Actual pressure (Actual pressure=the displayed value/100)

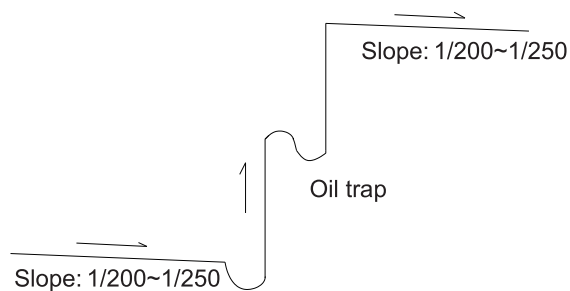
## 9. Piping work and refrigerant charge

### 9.1 MAX. length allowed



### 9.2 Oil trap

When the indoor unit is lower than outdoor unit and height difference is larger than 16.4ft.(5m), set an oil trap every 16.4ft.(5m) (height difference) on suction piping.



**Note:**

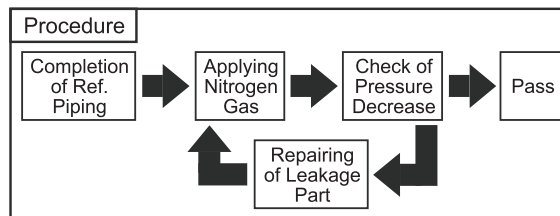
1. To avoid storing too much oil in the oil trap, the oil trap should be as short as possible.
2. The horizontal piping should slope down along the refrigerant flow direction, to bring the oil back to compressor, the slope is about 1/200 to 1/250.
3. In order to ensure better cooling/heating performance, the refrigerant piping should be as short and straight as possible.

## 9. Piping work and refrigerant charge

### 9.3 Air tight test

Do use nitrogen when performing air-tight test.

Connect the gauge manifold using charging hoses with a nitrogen cylinder to the check joints of the liquid line and the gas line stop valves. Perform the air-tight test. Don't open the gas line stop valves. Apply nitrogen gas pressure of 550 psig (3.8MPa). Check for any gas leakage at the flare nut connections, or brazed parts by gas leak detector or foaming agent. It is OK if gas pressure does not decrease. After the air tight test, release nitrogen gas.



Air tight procedure

### 9.4 Additional refrigerant charge

Although refrigerant has been charged into this unit, additional refrigerant charge is required according to the piping length.

- The additional refrigerant precharge quantity should be determined and charged into the system according to the following procedure.
- Record the additional refrigerant quantity in order to facilitate maintenance and servicing activities.

Refrigerant charge before shipment (W0 (oz.))

W0 is the outdoor unit refrigerant charge before shipment;

Xg is additional refrigerant outdoor unit needed to charge according to piping length during installation.

Model	Refrigerant precharged before shipment (oz.)	Total refrigerant pipe length	
		0ft.~25ft.	Longer than 25ft.
36K	98.7	0	Xg = 0.38oz/ft x (Total pipe length(ft.) -25)
48K	141.1	0	
60K	152.7	0	

## 10. Installation tools and installation flow chart

### 10.1 Necessary tools and instrument list for installation

Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool	No.	Tool	No.	Tool
1	Handsaw	6	Copper Pipe Bender	11	Spanner	16	Leveler
2	Phillips Screwdriver	7	Manual Water Pump	12	Charging Cylinder	17	Clamper for Solderless Terminals
3	Vacuum Pump	8	Pipe Cutter	13	Gauge Manifold	18	Hoist (for Indoor Unit)
4	Refrigerant Gas Hose	9	Brazing Kit	14	Cutter for Wires	19	Ammeter
5	Megohmmeter	10	Hexagon Wrench	15	Gas Leak Detector	20	Voltage Meter

## 10. Installation tools and installation flow chart

Use tools and measuring instruments only for the new refrigerant which is direct contact with to refrigerant.

◇ : Interchangeability is available with R410A

● : Only for Refrigerant R32

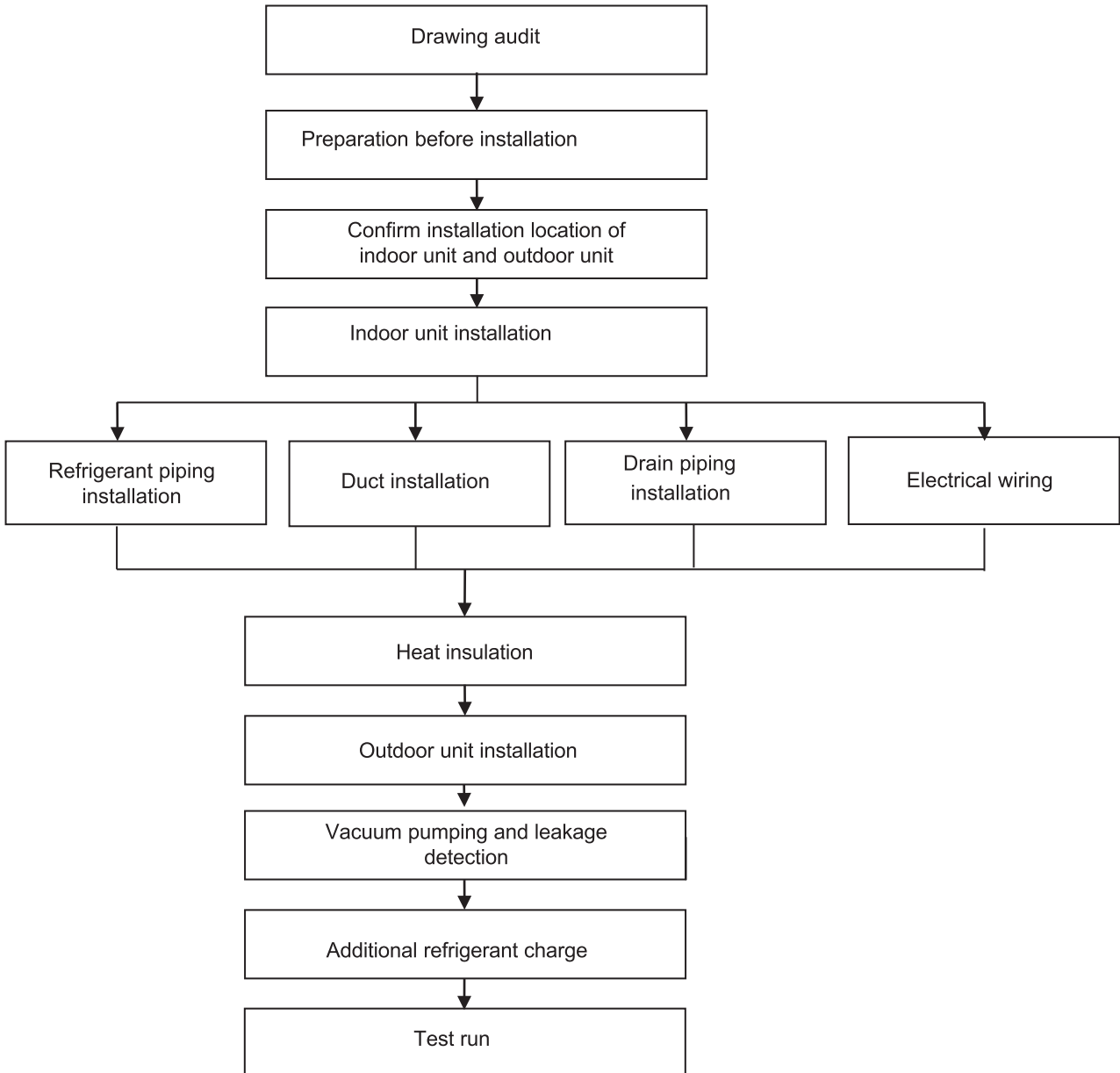
× : Prohibited

◆ : Only for Refrigerant R22

Measuring Instrument and Tool for R410A		R32	R22	Reason of Non-Interchangeability and Attention (*: Strictly Required)	Use
Refrigerant Pipe	Pipe Cutter Chamfering Reamer	◇	◇	-	Cutting Pipe Removing Burrs
	Flaring Tool	◇	◇	* The flaring tools for R32 are applicable to R22/R410A. * If using flaring tube, make dimension of tube larger for R410A. * In case of material 1/2H, flaring is not available.	Flaring for Tubes
	Pipe Bender	◇	◇	* In case of material 1/2H, bending is not available. Use elbow for bend and braze.	Bending
	Expanding Tool	◇	◇	* In case of material 1/2H, expanding of tube is not available. Use socket for connecting tube.	Expanding Tubes
	Torque Wrench	◇	××	* For φ1/2, φ5/8, spanner size is up 2mm.	Connection of Flare Nut
		◇	◇	* For φ1/4, φ3/8, φ3/4, spanner size is the same.	
	Brazing Tool	◇	◇	* Perform correct brazing work.	Brazing for Tubes
	Nitrogen Gas	◇	◇	* Strict Control against Contamin (Blow nitrogen during brazing.)	Prevention from Oxidation during Brazing
	Lubrication Oil (for Flare Surface)	●	◆	* Use a synthetic oil which is equivalent to the oil used in the refrigeration cycle. * Synthetic oil absorbs moisture quickly.	Applying Oil to the Flared Surface
Vacuum Drying & Refrigerant Charge	Refrigerant Cylinder	×	×	* Check refrigerant cylinder color. * Liquid refrigerant charging is required regarding zeotropic refrigerant. * Use the weight scale.	Refrigerant Charging
	Vacuum Pump	◇	◇	* The current ones are applicable. However, it is required to mount a vacuum pump adapter which can prevent from reverse flow when a vacuum pump stops, resulting in no reverse oil flow.	Vacuum Pumping
	Adapter for Vacuum Pump	◇	◆		
	Manifold Valve	◇	◆	* No interchangeability is available due to higher pressures when compared with R22. * Do not use current ones to the different refrigerant. If used, mineral oil will flow into the cycle and cause sludges, resulting in clogging or compressor failure. * Connection diameter is different; R32/R410A: UNF1/2, R22: UNF7/16.	Vacuum Pumping, Vacuum Holding, Refrigerant Charging and Check of Pressures
	Charging Hose	◇	×		
	Weight Scale	◇	◇		Measuring Instrument for Refrigerant Charging
	Refrigerant Gas Leakage Detector	×	×	* The current gas leakage detector (R22) is not applicable due to different detecting method.	Gas Leakage Check

## 10. Installation tools and installation flow chart

### 10.2 Installation flow chart



**Note:**

This flow is only for reference; for details please see installation manual section.



## 11. Control mode

### Control function

#### 1. Cooling Anti-Freeze Protection

The outdoor pressure sensor functions as real time temperature detector of evaporator. It prevents the indoor unit evaporator temperature becoming too low. If the indoor coil temperature is too low, the compressor will automatically start protection mode.

#### 2. Overload Protection

To prevent system overload caused by excessive pressure, the machine will implement real-time detection when outdoor coil temperature is too high during cooling mode.

#### 3. Exhaust temperature protection

To prevent deterioration due to high exhaust temperature of compressor, the machine will realize the real-time detection of the exhaust gas temperature. If the temperature is too high compressor provides automatic protection.

#### 4. Oil-return Control

When the compressor runs at low frequencies for a long time, control system will start the oil-return mechanism. The oil in the system returns to the compressor.

#### 5. Start-up Protection

To prevent compressor from restarting frequently when the system pressure has not been completely balanced, it cannot be restarted within 3 minutes.

#### 6. Pressure Protection

When the pressure increases to a preset value, the pressure switch will automatically come to protection mode. The compressor will stop and report the fault code protection.

## 12. Sensor parameter

### 1. THE PARAMETER OF OUTDOOR COMPRESSOR DISCHARGE TEMPERATURE SENSOR:

( $R_0=187.25K\pm 6.3\%$ ;  $R_{100}=3.77K\pm 2.5K$ ;  $B0/100=3979K\pm 1\%$ )

DR: Deviation Rate

$DR(MIN)\% = (R_{min} - R_{nom}) / R_{nom} * 100\%$

$DR(MAX)\% = (R_{max} - R_{nom}) / R_{nom} * 100\%$

T [ °C ]	Rmin [ KΩ ]	Rnom [ KΩ ]	Rmax [ KΩ ]	DR(MIN)%	DR(MAX)%
-30	908.2603	985.5274	1065.1210	-7.84	7.47
-29	855.3955	927.6043	1001.9150	-7.78	7.42
-28	805.9244	873.4324	924.8368	-7.73	5.56
-27	759.6097	822.7471	887.5944	-7.67	7.31
-26	716.2320	775.3041	835.9165	-7.62	7.25
-25	675.5881	730.8775	787.5529	-7.56	7.20
-24	637.4902	689.2583	742.2720	-7.51	7.14
-23	601.7645	650.2533	699.8601	-7.46	7.09
-22	568.2499	613.6835	660.1191	-7.40	7.03
-21	536.7970	579.3832	622.8658	-7.35	6.98
-20	507.2676	547.1989	587.9307	-7.30	6.93
-19	497.5332	516.9882	555.1565	-3.76	6.88
-18	453.4748	488.6192	524.3977	-7.19	6.82
-17	428.9819	461.9693	495.5191	-7.14	6.77
-16	405.9517	436.9251	486.3954	-7.09	10.17
-15	384.2888	413.3808	442.9105	-7.04	6.67
-14	363.9047	391.2386	418.9563	-6.99	6.62
-13	344.7169	370.4072	396.4325	-6.94	6.56
-12	326.6497	350.8019	375.2461	-6.88	6.51
-11	309.6286	332.3441	355.3104	-6.83	6.46
-10	293.5903	314.9620	336.5448	-6.79	6.41
-9	278.4719	298.5822	318.3744	-6.74	6.22
-8	264.2156	283.1464	302.2294	-6.69	6.31
-7	250.7678	268.5936	286.5448	-6.64	6.26
-6	238.0783	254.8686	271.7603	-6.59	6.22
-5	226.1003	241.9200	257.8193	-6.54	6.17
-4	214.7903	229.6997	244.6593	-6.49	6.11
-3	204.1073	218.1630	232.2612	-6.44	6.07
-2	194.0135	207.2681	220.5495	-6.39	6.02
-1	184.4732	196.9759	209.4913	-6.35	5.97
0	175.4533	187.2500	199.0468	-6.30	5.93
1	166.8952	178.0255	189.1529	-6.25	5.88
2	158.8023	169.3067	179.8058	-6.20	5.84
3	151.1467	161.0633	170.9724	-6.16	5.80
4	143.9026	153.2667	162.6216	-6.11	5.75
5	137.0455	145.8905	154.7246	-6.06	5.71
6	130.5528	138.9097	147.2544	-6.02	5.67
7	124.4033	132.3011	140.1856	-5.97	5.62
8	118.5769	126.0429	133.4946	-5.92	5.58
9	113.0550	120.1146	127.1591	-5.88	5.54
10	107.8202	114.4973	121.1586	-5.83	5.50
11	102.8560	109.1728	115.4734	-5.79	5.46
12	98.1470	104.1246	110.0855	-5.74	5.41
13	93.6787	99.3367	104.9778	-5.70	5.37
14	89.4378	94.7946	100.1342	-5.65	5.33
15	85.4114	90.4842	95.5398	-5.61	5.29
16	81.5875	86.3926	91.1805	-5.56	5.25
17	77.9551	82.5076	87.0430	-5.52	5.21
18	74.5034	78.8177	83.1150	-5.47	5.17



## 11. Control mode

T [ °C ]	Rmin [ KΩ ]	Rnom [ KΩ ]	Rmax [ KΩ ]	DR(MIN)%	DR(MAX)%
19	71.2227	75.3122	79.3848	-5.43	5.13
20	68.1036	71.9808	75.8414	-5.39	5.09
21	65.1373	68.8141	72.4746	-5.34	5.05
22	62.3155	65.8032	69.2746	-5.30	5.01
23	59.6306	62.9395	66.2324	-5.26	4.97
24	57.0752	60.2152	63.3395	-5.21	4.93
25	54.6424	57.6227	60.5877	-5.17	4.89
26	52.3258	55.1551	57.9695	-5.13	4.85
27	50.1192	52.8058	55.4778	-5.09	4.82
28	48.0168	50.5684	53.1058	-5.05	4.78
29	46.0133	48.4371	50.8472	-5.00	4.74
30	44.1034	46.4046	48.6960	-4.96	4.71
31	42.2825	44.4711	46.6466	-4.92	4.66
32	40.5458	42.6261	44.6937	-4.88	4.63
33	38.8891	40.8668	42.8323	-4.84	4.59
34	37.3084	39.1890	41.0576	-4.80	4.55
35	35.7998	37.5883	39.3653	-4.76	4.51
36	34.3596	36.0609	37.7511	-4.72	4.48
37	32.9844	34.6030	36.2109	-4.68	4.44
38	31.6710	33.2113	34.7412	-4.64	4.40
39	30.4164	31.8823	33.3383	-4.60	4.37
40	29.2176	30.6130	31.9988	-4.56	4.33
41	28.0718	29.4004	30.7197	-4.52	4.29
42	26.9765	28.2417	29.4979	-4.48	4.26
43	25.9293	27.1342	28.3306	-4.44	4.22
44	24.9277	26.0755	27.2150	-4.40	4.19
45	23.9697	25.0632	26.1488	-4.36	4.15
46	23.0530	24.0950	25.1293	-4.32	4.12
47	22.1757	23.1688	24.1545	-4.29	4.08
48	21.3360	22.2826	23.2221	-4.25	4.05
49	20.5321	21.4345	22.3301	-4.21	4.01
50	19.7623	20.6226	21.4766	-4.17	3.98
51	19.0261	19.8468	20.6612	-4.14	3.94
52	18.3211	19.1040	19.8808	-4.10	3.91
53	17.6458	18.3926	19.1338	-4.06	3.87
54	16.9986	17.7113	18.4185	-4.02	3.84
55	16.3784	17.0537	17.7335	-3.96	3.83
56	15.7839	16.4332	17.0774	-3.95	3.77
57	15.2139	15.8338	16.4488	-3.92	3.74
58	14.6673	15.2592	15.8464	-3.88	3.71
59	14.1430	14.7083	15.2690	-3.84	3.67
60	13.6400	14.1799	14.7154	-3.81	3.64
61	13.1573	13.6730	14.1846	-3.77	3.61
62	12.6941	13.1868	13.6756	-3.74	3.57
63	12.2494	12.7202	13.1872	-3.70	3.54
64	11.8224	12.2723	12.7186	-3.67	3.51
65	11.4124	11.8424	12.2690	-3.63	3.48
66	11.0185	11.4295	11.8373	-3.60	3.45
67	10.6401	11.0331	11.4230	-3.56	3.41
68	10.2765	10.6522	11.0251	-3.53	3.38
69	9.9271	10.2863	10.6429	-3.49	3.35
70	9.5912	9.9348	10.2756	-3.46	3.32
71	9.2682	9.5968	9.9231	-3.42	3.29
72	8.9576	9.2720	9.5841	-3.39	3.26
73	8.6589	8.9597	9.2583	-3.36	3.23
74	8.3716	8.6594	8.9451	-3.32	3.19

## 11. Control mode

T [ °C ]	Rmin [ KΩ ]	Rnom [ KΩ ]	Rmax [ KΩ ]	DR(MIN)%	DR(MAX)%
75	8.0951	8.3705	8.6440	-3.29	3.16
76	7.8290	8.0926	8.3544	-3.26	3.13
77	7.5730	7.8252	8.0758	-3.22	3.10
78	7.3264	7.5679	7.8078	-3.19	3.07
79	7.0891	7.3202	7.5499	-3.16	3.04
80	6.8605	7.0818	7.3018	-3.12	3.01
81	6.6403	6.8522	7.0629	-3.09	2.98
82	6.4282	6.6311	6.8329	-3.06	2.95
83	6.2239	6.4182	6.6115	-3.03	2.92
84	6.0269	6.2131	6.3982	-3.00	2.89
85	5.8371	6.0154	6.1928	-2.96	2.86
86	5.6542	5.8249	5.9949	-2.93	2.84
87	5.4777	5.6413	5.8042	-2.90	2.81
88	5.3076	5.4644	5.6205	-2.87	2.78
89	5.1435	5.2937	5.4433	-2.84	2.75
90	4.9853	5.1292	5.2726	-2.81	2.72
91	4.8326	4.9705	5.1079	-2.77	2.69
92	4.6852	4.8174	4.9492	-2.74	2.66
93	4.5430	4.6697	4.7960	-2.71	2.63
94	4.4058	4.5272	4.6483	-2.68	2.61
95	4.2733	4.3896	4.5058	-2.65	2.58
96	4.1453	4.2568	4.3683	-2.62	2.55
97	4.0218	4.1287	4.2355	-2.59	2.52
98	3.9024	4.0049	4.1074	-2.56	2.50
99	3.7872	3.8854	3.9837	-2.53	2.47
100	3.6758	3.7700	3.8643	-2.50	2.44
101	3.5661	3.6585	3.7512	-2.53	2.47
102	3.4601	3.5509	3.6419	-2.56	2.50
103	3.3577	3.4468	3.5362	-2.59	2.53
104	3.2588	3.3463	3.4341	-2.61	2.56
105	3.1632	3.2491	3.3353	-2.64	2.58
106	3.0708	3.1551	3.2398	-2.67	2.61
107	2.9816	3.0643	3.1475	-2.70	2.64
108	2.8953	2.9765	3.0582	-2.73	2.67
109	2.8118	2.8915	2.9717	-2.76	2.70
110	2.7311	2.8093	2.8881	-2.78	2.73
111	2.6531	2.7299	2.8072	-2.81	2.75
112	2.5776	2.6530	2.7289	-2.84	2.78
113	2.5046	2.5785	2.6531	-2.87	2.81
114	2.4340	2.5065	2.5798	-2.89	2.84
115	2.3656	2.4368	2.5087	-2.92	2.87
116	2.2995	2.3693	2.4400	-2.95	2.90
117	2.2354	2.3040	2.3733	-2.98	2.92
118	2.1734	2.2407	2.3088	-3.00	2.95
119	2.1134	2.1795	2.2463	-3.03	2.97
120	2.0553	2.1201	2.1858	-3.06	3.01
121	1.9991	2.0626	2.1271	-3.08	3.03
122	1.9446	2.0070	2.0702	-3.11	3.05
123	1.8918	1.9530	2.0151	-3.13	3.08
124	1.8406	1.9007	1.9617	-3.16	3.11
125	1.7911	1.8500	1.9099	-3.18	3.14
126	1.7430	1.8009	1.8597	-3.22	3.16
127	1.6965	1.7533	1.8110	-3.24	3.19
128	1.6514	1.7071	1.7638	-3.26	3.21
129	1.6076	1.6623	1.7180	-3.29	3.24
130	1.5652	1.6189	1.6736	-3.32	3.27

## 11. Control mode

### 2. THE PARAMETER OF THE OTHER SENSOR: ( $R_0=15K\pm 2\%$ ; $B0/100=3450K\pm 2\%$ )

DR: Deviation Rate

$$DR(MIN)\% = (R_{min} - R_{nom}) / R_{nom} * 100\%$$

$$DR(MAX)\% = (R_{max} - R_{nom}) / R_{nom} * 100\%$$

T [°C]	Rmin [ KΩ ]	Rnom [ KΩ ]	Rmax [ KΩ ]	DR(MIN)%	DR(MAX)%
-30	60.78	64.77	68.99	-6.16	6.12
-29	57.75	61.36	65.16	-5.88	5.83
-28	54.89	58.15	61.58	-5.61	5.57
-27	52.19	55.14	58.23	-5.35	5.31
-26	49.63	52.30	55.08	-5.11	5.05
-25	47.21	49.62	52.13	-4.86	4.81
-24	44.92	47.10	49.37	-4.63	4.60
-23	42.76	44.73	46.78	-4.40	4.38
-22	40.71	42.49	44.34	-4.19	4.17
-21	38.77	40.38	42.05	-3.99	3.97
-20	36.93	38.39	39.90	-3.80	3.78
-19	35.18	36.51	37.87	-3.64	3.59
-18	33.53	34.74	35.97	-3.48	3.42
-17	31.96	33.06	34.17	-3.33	3.25
-16	30.48	31.47	32.49	-3.15	3.14
-15	29.07	29.97	30.89	-3.00	2.98
-14	27.73	28.56	29.39	-2.91	2.82
-13	26.46	27.22	27.98	-2.79	2.72
-12	25.26	25.95	26.64	-2.66	2.59
-11	24.11	24.75	25.38	-2.59	2.48
-10	23.03	23.61	24.19	-2.46	2.40
-9	21.99	22.53	23.06	-2.40	2.30
-8	21.01	21.51	22.00	-2.32	2.23
-7	20.08	20.54	20.99	-2.24	2.14
-6	19.19	19.62	20.04	-2.19	2.10
-5	18.35	18.74	19.14	-2.08	2.09
-4	17.55	17.92	18.29	-2.06	2.02
-3	16.78	17.13	17.48	-2.04	2.00
-2	16.06	16.38	16.71	-1.95	1.97
	15.36	15.67	15.98	-1.98	1.94
0	14.70	15.00	15.29	-2.00	1.90
1	14.08	14.36	14.64	-1.95	1.91
2	13.48	13.75	14.02	-1.96	1.93
3	12.91	13.17	13.43	-1.97	1.94
4	12.36	12.62	12.87	-2.06	1.94
5	11.85	12.09	12.34	-1.99	2.03
6	11.35	11.59	11.83	-2.07	2.03
7	10.88	11.11	11.35	-2.07	2.11
8	10.43	10.66	10.89	-2.16	2.11
9	9999	10230	10450	-2.26	2.11
10	9590	9816	10040	-2.30	2.23
11	9199	9422	9647	-2.37	2.33
12	8826	9047	9269	-2.44	2.40
13	8470	8689	8910	-2.52	2.48
14	8129	8347	8567	-2.61	2.57
15	7804	8021	8240	-2.71	2.66
16	7493	7709	7928	-2.80	2.76
17	7196	7412	7630	-2.91	2.86
18	6912	7127	7346	-3.02	2.98
19	6640	6855	7074	-3.14	3.10
20	6381	6595	6815	-3.24	3.23
21	6132	6347	6567	-3.39	3.35
22	5894	6109	6330	-3.52	3.49

## 11. Control mode

T [°C]	Rmin [ KΩ ]	Rnom [ KΩ ]	Rmax [ KΩ ]	DR(MIN)%	DR(MAX)%
23	5667	5882	6103	-3.66	3.62
24	5449	5664	5886	-3.80	3.77
25	5240	5456	5678	-3.96	3.91
26	5048	5260	5478	-4.03	3.98
27	4864	5072	5286	-4.10	4.05
28	4687	4891	5101	-4.17	4.12
29	4517	4717	4924	-4.24	4.20
30	4355	4550	4753	-4.29	4.27
31	4198	4390	4589	-4.37	4.34
32	4048	4236	4431	-4.44	4.40
33	3904	4089	4280	-4.52	4.46
34	3766	3946	4134	-4.56	4.55
35	3663	3810	3994	-3.86	4.61
36	3506	3679	3859	-4.70	4.66
37	3383	3552	3729	-4.76	4.75
38	3265	3431	3604	-4.84	4.80
39	3152	3314	3484	-4.89	4.88
40	3043	3202	3368	-4.97	4.93
41	2938	3094	3257	-5.04	5.00
42	2838	2990	3149	-5.08	5.05
43	2741	2890	3046	-5.16	5.12
44	2648	2793	2946	-5.19	5.19
45	2558	2701	2850	-5.29	5.23
46	2472	2611	2758	-5.32	5.33
47	2389	2525	2669	-5.39	5.40
48	2309	2443	2583	-5.49	5.42
49	2232	2363	2500	-5.54	5.48
50	2158	2286	2421	-5.60	5.58
51	2087	2212	2344	-5.65	5.63
52	2018	2140	2269	-5.70	5.69
53	1952	2072	2198	-5.79	5.73
54	1888	2005	2129	-5.84	5.82
55	1827	1941	2062	-5.87	5.87
56	1767	1880	1998	-6.01	5.91
57	1710	1820	1936	-6.04	5.99
58	1655	1763	1876	-6.13	6.02
59	1602	1707	1818	-6.15	6.11
60	1551	1654	1762	-6.23	6.13
61	1502	1602	1709	-6.24	6.26
62	1452	1553	1657	-6.50	6.28
63	1409	1505	1606	-6.38	6.29
64	1364	1458	1558	-6.45	6.42
65	1322	1413	1511	-6.44	6.49
66	1280	1370	1466	-6.57	6.55
67	1241	1328	1422	-6.55	6.61
68	1202	1288	1379	-6.68	6.60
69	1165	1249	1339	-6.73	6.72
70	1129	1211	1299	-6.77	6.77
71	1095	1175	1261	-6.81	6.82
72	1061	1140	1224	-6.93	6.86
73	1029	1106	1188	-6.96	6.90
74	0.9977	1073	1153	-7.02	6.94
75	0.9676	1041	1120	-7.05	7.05
76	0.9385	1011	1088	-7.17	7.08
77	0.9104	0.9810	1056	-7.20	7.10
78	0.8833	0.9523	1026	-7.25	7.18

## 11. Control mode

T [°C]	Rmin [ KΩ ]	Rnom [ KΩ ]	Rmax [ KΩ ]	DR(MIN)%	DR(MAX)%
79	0.8570	0.9246	0.9971	-7.31	7.27
80	0.8316	0.8977	0.9687	-7.36	7.33
81	0.8071	0.8717	0.9412	-7.41	7.38
82	0.7834	0.8466	0.9146	-7.47	7.43
83	0.7604	0.8223	0.8888	-7.53	7.48
84	0.7382	0.7987	0.8639	-7.57	7.55
85	0.7167	0.7759	0.8397	-7.63	7.60
86	0.6958	0.7537	0.8161	-7.68	7.65
87	0.6755	0.7322	0.7933	-7.74	7.70
88	0.6560	0.7114	0.7712	-7.79	7.75
89	0.6371	0.6913	0.7498	-7.84	7.80
90	0.6188	0.6718	0.7291	-7.89	7.86
91	0.6011	0.6530	0.7051	-7.95	7.39
92	0.5840	0.6348	0.6897	-8.00	7.96
93	0.5674	0.6171	0.6709	-8.05	8.02
94	0.5514	0.6000	0.6527	-8.10	8.07
95	0.5359	0.5835	0.6350	-8.16	8.11
96	0.5209	0.5675	0.6179	-8.21	8.16
97	0.5064	0.5519	0.6014	-8.24	8.23
98	0.4923	0.5369	0.5853	-8.31	8.27
99	0.4787	0.5224	0.5698	-8.37	8.32
100	0.4655	0.5083	0.5547	-8.42	8.36
101	0.4528	0.4946	0.5401	-8.45	8.42
102	0.4404	0.4814	0.5259	-8.52	8.46
103	0.4284	0.4685	0.5121	-8.56	8.51
104	0.4168	0.4561	0.4988	-8.62	8.56
105	0.4056	0.4440	0.4859	-8.65	8.62
106	0.3947	0.4323	0.4733	-8.70	8.66
107	0.3841	0.4210	0.4611	-8.76	8.70
108	0.3739	0.4100	0.4493	-8.80	8.75
109	0.3640	0.3993	0.4379	-8.84	8.81
110	0.3544	0.3890	0.4267	-8.89	8.84
111	0.3450	0.3789	0.4159	-8.95	8.90
112	0.3360	0.3692	0.4055	-8.99	8.95
113	0.3272	0.3597	0.3953	-9.04	9.01
114	0.3187	0.3505	0.3854	-9.07	9.06
115	0.3104	0.3416	0.3758	-9.13	9.10
116	0.3024	0.3330	0.3665	-9.19	9.14
117	0.2947	0.3246	0.3574	-9.21	9.18
118	0.2871	0.3164	0.3468	-9.26	8.77
119	0.2798	0.3085	0.3401	-9.30	9.29
120	0.2727	0.3008	0.33	-9.34	9.34

# 13. Troubleshooting

## 13.1 Trouble guide

Troubleshooting for normal malfunction

Troubleshooting	Possible Reasons of Abnormality	How to Deal With
Air conditioner can not start up	<ol style="list-style-type: none"> <li>1. Power supply failure;</li> <li>2. Trip of breaker or blow of fuse;</li> <li>3. Power voltage is too low;</li> <li>4. Improper setting of remote controller;</li> <li>5. Remote controller is short of power.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check power supply circuit;</li> <li>2. Measure insulation resistance to ground to see if there is any leakage;</li> <li>3. Check if there is a defective contact or leak current in the power supply circuit;</li> <li>4. Check and set remote controller again;</li> <li>5. Change batteries.</li> </ol>
The compressor starts or stops frequently	The air inlet and outlet have been blocked.	Remove obstacles.
Poor cooling	<ol style="list-style-type: none"> <li>1. The outdoor heat exchanger is dirty, such as condenser;</li> <li>2. There are heating devices indoors;</li> <li>3. The air tightness is not enough, and people come in and out too frequently;</li> <li>4. Block of outdoor heat exchanger;</li> <li>5. Improper setting of temperature.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean the heat exchanger of the outdoor unit, such as condenser ;</li> <li>2. Remove heating devices;</li> <li>3. Keep certain air tightness indoors;</li> <li>4. Remove block obstacles;</li> <li>5. Check and try to set temperature again.</li> </ol>
Sound from deforming parts	During system starting or stopping, a sound might be heard. However, this is due to the normal deformation of plastic parts.	It is not abnormal, and the sound will disappear soon.
Water leakage	<ol style="list-style-type: none"> <li>1. Drainage pipe is blocked or broken;</li> <li>2. Wrap of refrigerant pipe joint is not closed completely.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change drainage pipe;</li> <li>2. Re-wrap and make it tight.</li> </ol>

## 13. Troubleshooting

### Outdoor unit

#### 36K

#### DC-Inverter unitary (Main control board upside-down)

1) Fault code displayed by LED lamps on outdoor main control board.

There are 3 LED lamps on control board, LED1, LED2 and LED3.

LED1 indicates the ten's place of the fault code, LED2 indicates the unit's place of the fault code and LED3 indicates outdoor drive control fault.

When LED3 is off, LED1 and LED 2 indicate main control fault code.

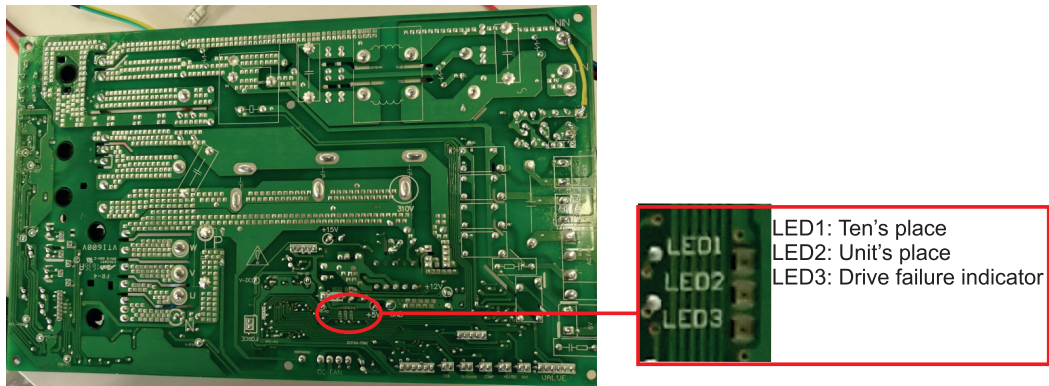
When LED3 is on, LED1 and LED 2 indicate drive control fault code.

When LED3 is flickering and LED1, LED 2 are all off, it indicates the compressor is preheating.

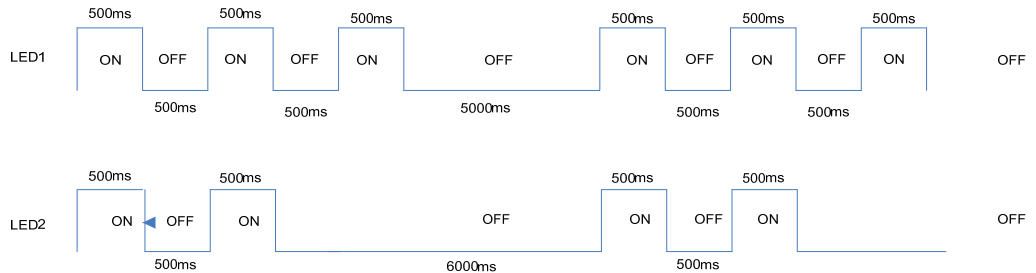
Failures display with 5s interval. It means LED will be off for 5s to report the next fault code.

System protection codes display method is the same with main control fault code.

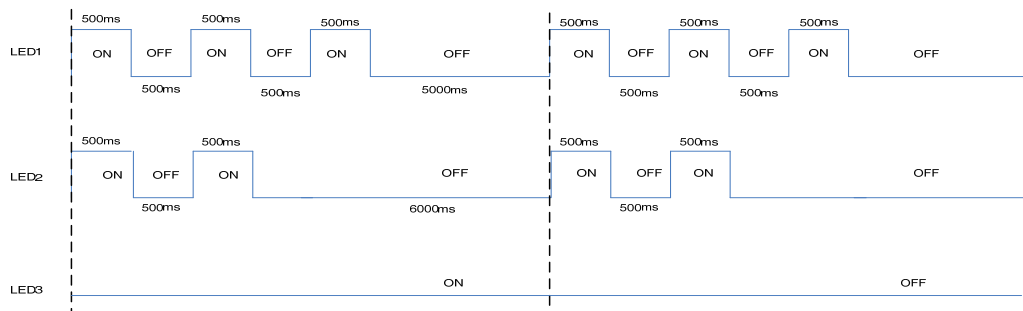
LED lamps will be off when there is no failure, protection or preheating.



For example, outdoor main control fault 32:



For example, outdoor drive fault 32:





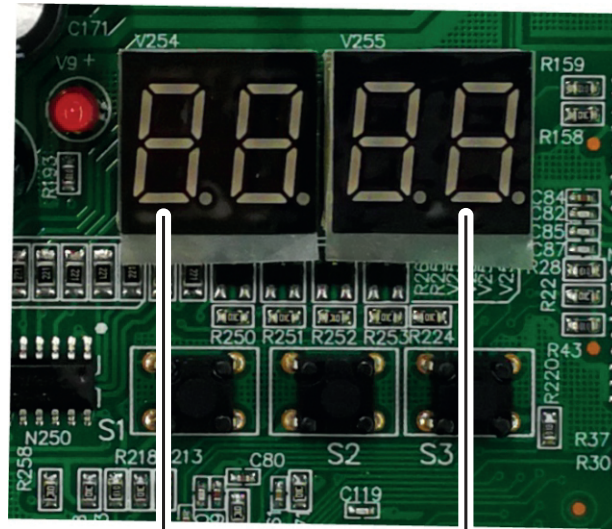
2) Display by 7 segment display board.

Fault code will be displayed directly on 7 segment display board.

#### 48K/60K

##### Main control fault display

Fault code will be displayed by 7 segment display on main control board.



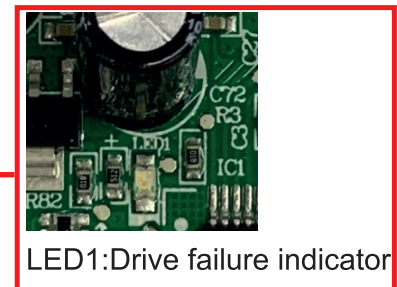
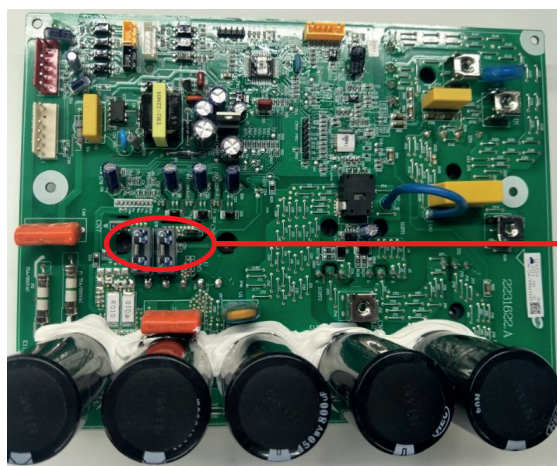
⊗ : Show failure occur.

Display ERROR code.

##### Drive fault code display

The lamp of drive board flashing shows failure occurs.

How many times the drive failure lamp flicker will show the failure code.





## 13. Troubleshooting

### 13.2 Fault codes

The following is the fault code table of outdoor units.

**Table 1 Outdoor fault code**

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
1	Outdoor ambient temperature sensor fault	<ol style="list-style-type: none"> <li>1. The outdoor ambient temperature sensor is connected loosely;</li> <li>2. The outdoor ambient temperature sensor fails to work;</li> <li>3. The sampling circuit fails.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the outdoor ambient temperature sensor;</li> <li>2. Replace the outdoor ambient temperature sensor components;</li> <li>3. Replace the outdoor control board components.</li> </ol>	
2	Outdoor coil temperature sensor fault	<ol style="list-style-type: none"> <li>1. The outdoor coil temperature sensor is connected loosely;</li> <li>2. The outdoor coil temperature sensor fails to work;</li> <li>3. The sampling circuit fails.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the outdoor coil temperature sensor;</li> <li>2. Replace the outdoor coil temperature sensor components;</li> <li>3. Replace the outdoor control board components.</li> </ol>	
3	The unit over-current turn off fault	<ol style="list-style-type: none"> <li>1. Control board current sampling circuit fails;</li> <li>2. The current is over high because the supply voltage is too low;</li> <li>3. The compressor is blocked;</li> <li>4. Overload in cooling mode.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the electrical control board components;</li> <li>2. Normal protection;</li> <li>3. Replace the compressor;</li> <li>4. Please see Table 2.</li> </ol>	
4	EEProm Data error	<ol style="list-style-type: none"> <li>1. EE components fails;</li> <li>2. EE components control circuit fails;</li> <li>3. EE components are inserted incorrectly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the EE components;</li> <li>2. Replace the outdoor control board components;</li> <li>3. Reassemble the EE components.</li> </ol>	
5	Cooling freezing protection (the indoor coil temperature is too low)	<ol style="list-style-type: none"> <li>1. The indoor unit can not blow air normally;</li> <li>2. The room temperature is too low in cooling mode or the room temperature is too high in heating;</li> <li>3. The filter is dirty;</li> <li>4. The duct resistance is too high to resulting in low air flow;</li> <li>5. The setting fan speed is too low;</li> <li>6. The indoor unit is not installed in accordance with the installation standards, and the air inlet is too close to the air outlet .</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the indoor fan, indoor fan motor and evaporator work normally;</li> <li>2. Normal protection;</li> <li>3. Clean the filter;</li> <li>4. Check the volume control valve, duct length etc.;</li> <li>5. Set the speed with high speed;</li> <li>6. Reinstall the indoor unit referring to the user manual to change the distance between the indoor unit and the wall or ceiling.</li> </ol>	
7	The communication fault between the indoor unit and outdoor unit	<ol style="list-style-type: none"> <li>1. The connection cable is connected improperly between the indoor unit and outdoor unit;</li> <li>2. The communication cable is connected loosely;</li> <li>3. The communication cable fails;</li> <li>4. The indoor control board fails;</li> <li>5. The outdoor control board fails;</li> <li>6. Communication circuit fuse open;</li> <li>7. The specification of communication cable is incorrect.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the connection cable referring to the wiring diagram;</li> <li>2. Reconnect the communication cable;</li> <li>3. Replace the communication cable;</li> <li>4. Replace the indoor control board;</li> <li>5. Replace the outdoor control board;</li> <li>6. Check the communication circuit, adjust the DIP switch and the short-circuit fuse;</li> <li>7. Choose suitable communication cable referring to the user manual.</li> </ol>	

### 13. Troubleshooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
13	Compressor overheat protector device	<ol style="list-style-type: none"> <li>1. The wiring of the overload protector is connected loosely.</li> <li>2. The overload protector fails .</li> <li>3. The refrigerant is not enough;</li> <li>4. The installation pipe is much longer than the normal one, but extra refrigerant is not added ;</li> <li>5. The expansion valve fails;</li> <li>6. The outdoor control board fails.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the wiring of the overload protector;</li> <li>2. Replace the overload protector;</li> <li>3. Check the welding point of the unit to confirm whether it is leakage, and then recharge the refrigerant;</li> <li>4. Add the refrigerant;</li> <li>5. Replace expansion valve;</li> <li>6. Replace the outdoor control board.</li> </ol>	
14	The high pressure switch operation or the unit is turned off for high pressure protection	<ol style="list-style-type: none"> <li>1. The wiring of the high pressure protector is connected loosely;</li> <li>2. The high pressure protector fails;</li> <li>3. The outdoor control board is abnormal;</li> <li>4. Overload in cooling.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the wiring of the high pressure protector;</li> <li>2. Replace the high pressure protector;</li> <li>3. Replace the outdoor control board;</li> <li>4. Please refer to Table 2.</li> </ol>	Applied to models with high pressure switch or pressure sensor
16	Overload protection in cooling mode	System overload	Please refer to Table 2.	
17	Discharge temperature sensor fault	<ol style="list-style-type: none"> <li>1. The wiring of the discharge temperature sensor is connected loosely;</li> <li>2. The discharge temperature sensor fails;</li> <li>3. The sampling circuit is abnormal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the wiring of the discharge temperature sensor;</li> <li>2. Replace the discharge temperature sensor;</li> <li>3. Replace the outdoor control board.</li> </ol>	
18	AC voltage is abnormal	<ol style="list-style-type: none"> <li>1. The AC voltage &gt;275V or &lt;160V;</li> <li>2. The AC voltage of sampling circuit on the driver board is abnormal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Normal protection, please check the supply power;</li> <li>2. Replace the driver board.</li> </ol>	
43	High Pressure sensor fault	<ol style="list-style-type: none"> <li>1. The wiring of the high-pressure pressure sensor connect is loose;</li> <li>2. The high-pressure pressure sensor fails;</li> <li>3. The sampling circuit of the highpressure pressure sensor fails.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the wiring of the high-pressure pressure sensor;</li> <li>2. Replace the high-pressure pressure sensor;</li> <li>3. Replace the outdoor control board.</li> </ol>	
45	IPM fault	There are many reasons for this failure. You can check the driver board fault LED to further analyze the fault code of the drive board and to learn about what leads to the fault and how to operate it. Specific information can be seen in table 3, table 4.	See attached "analysis of the driving board fault".	

## 13. Troubleshooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
46	IPM and control board communication fault	<ol style="list-style-type: none"> <li>1. The cable between the control board and the driver board is connected loosely;</li> <li>2. The cable between the control board and the driver board fails;</li> <li>3. The driver board fails;</li> <li>4. The control board fails.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the cable between the control board and the driver board;</li> <li>2. Replace the communication cable between the control board and the driver board;</li> <li>3. Replace the driver board;</li> <li>4. Replace the control board.</li> </ol>	
47	Too high discharge temperature fault	<ol style="list-style-type: none"> <li>1. The refrigerant of the unit is not enough;</li> <li>2. The refrigerant of the unit is not enough due to that the installation pipe is longer;</li> <li>3. Throttling service fails;</li> <li>4. The outdoor ambient temperature is too high.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the welding point to confirm whether the unit has leakage point, and then add some refrigerant;</li> <li>2. Add some refrigerant referring to the installation user manual;</li> <li>3. Replace the throttling service (such as capillary, expansion valve);</li> <li>4. Normal protection.</li> </ol>	
48	The outdoor DC fan motor fault (upper fan motor)	<ol style="list-style-type: none"> <li>1. The connecting wiring of the up DC fan motor is loose;</li> <li>2. The cord of the upper DC fan motor fails;</li> <li>3. The upper DC fan motor fails;</li> <li>4. The drive circuit of the upper DC fan motor fails;</li> <li>5. The outdoor fan has been blocked.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the wiring of the up DC fan motor;</li> <li>2. Replace the upper DC fan motor;</li> <li>3. Replace the upper DC fan motor;</li> <li>4. Replace the driver board of the fan motor;</li> <li>5. Check the outdoor fan and ensure the outdoor fan can run normally.</li> </ol>	
49	The outdoor DC fan motor fault (down fan motor)	<ol style="list-style-type: none"> <li>1. The connecting wiring of the down DC fan motor is loose;</li> <li>2. The cord of the down DC fan motor fails;</li> <li>3. The down DC fan motor fails;</li> <li>4. The drive circuit of the down DC fan motor fails;</li> <li>5. The outdoor fan has been blocked.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reconnect the wiring of the down DC fan motor;</li> <li>2. Replace the down DC fan motor;</li> <li>3. Replace the down DC fan motor;</li> <li>4. Replace the driver board of the fan motor;</li> <li>5. Check the outdoor fan and ensure the outdoor fan can run normally.</li> </ol>	
91	The unit turn off due to the IPM board over heating fault	<ol style="list-style-type: none"> <li>1. The outdoor ambient temp. is too high;</li> <li>2. The speed of the out fan motor is too low if the fan motor is AC fan motor;</li> <li>3. The outdoor unit is not installed in accordance with the standard;</li> <li>4. The supply power is too low.</li> </ol>	<ol style="list-style-type: none"> <li>1. Normal protection;</li> <li>2. Check the fan capacitor, and replace the fan capacitor if it is a failure;</li> <li>3. Reinstalled the outdoor unit referring to the installation user manual;</li> <li>4. Normal protection.</li> </ol>	
96	Lacking of refrigerant	The refrigerant of the unit is not enough.	Discharge the refrigerant and charge the refrigerant referring to the rating label.	

**Note:**

Overload in cooling mode

Table 2 Overload in cooling mode

sr.	The root cause	Corrective measure
1	The refrigerant is excessive.	Discharge the refrigerant, and recharge the refrigerant referring to the rating label.
2	The outdoor ambient temperature is too high.	Please use it within allowable temperature range
3	Short-circuit occurs in the air outlet and air inlet of the outdoor unit.	Adjust the installation of the outdoor unit referring to the user manual.
4	The outdoor heat exchanger is dirty, such as condenser.	Clean the heat exchanger of the outdoor unit, such as condenser.
5	The speed of the outdoor fan motor is too low.	Check the outdoor fan motor and fan capacitor.
6	The outdoor fan is broken or the outdoor fan is blocked.	Check the outdoor fan.
7	The air inlet and outlet have been blocked.	Remove the obstructions.
8	The expansion valve or the capillary fails.	Replace the expansion valve or the capillary.

### 13. Troubleshooting

Table 3 Drive fault code (/36K)

Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Inverter DC voltage overload fault	1. Power supply input is too high or too low; 2. Driver board fault.	1. Check power supply; 2. Change driver board.
2	Inverter DC low voltage fault		
3	Inverter AC current overload fault		
4	Out-of-step detection	1. Compressor phase lost; 2. Bad driver board components; 3. The compressor insulation fault.	1. Check compressor wire connection; 2. Change the driver board; 3. Change compressor.
5	Loss phase detection fault (speed pulsation)		
6	Loss phase detection fault (current imbalance)		
7	Inverter IPM fault (edge)	1. System overload or current over load; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft ; 4. The compressor insulation fault.	1. Check the system. 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
8	Inverter IPM fault (level)		
9	PFC_IPM fault (edge)		
10	PFC_IPM fault (level)		
11	PFC power detection of failure	1. The power supply is not stable; 2. Instantaneous power off; 3. Driver board failure.	1. Check the power supply. 2. No need to deal with. 3. Change the driver board.
12	PFC overload current detection of failure.	1. System overload, current is too high; 2. Driver board fails; 3. PFC fails.	1. Check the system; 2. Change the driver board; 3. Change the PFC.
13	DC voltage detected abnormal .	1. Input voltage is too high or too low; 2. Driver board fails.	1. Check the power supply; 2. Change the driver board.
14	PFC LOW voltage detected failure.		
15	AD offset abnormal detected failure.	Driver board fails.	Change the driver board.
16	Inverter PWM logic set fault.		
17	Inverter PWM initialization failure		
18	PFC_PWM logic set fault.		
19	PFC_PWM initialization fault.		
20	Temperature abnormal.		
21	Shunt resistance unbalance adjustment fault		
22	Communication failure.	1. Communication wire connection is not proper; 2. Driver board fails; 3. Control board fails.	1. Check the wiring; 2. Change the driver board; 3. Change the control board.
23	Motor parameters setting of failure	Initialization is abnormal.	Reset the power supply.
26	DC voltage mutation error	1. Power input changes suddenly 2. Driver board fails.	1. Check power supply, to provide stable power supply; 2. Change driver board.
27	D axis current control error	1. System overload, phase current is too high; 2. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
28	Q axis current control error	1. System overloads, phase current is too high; 2. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
29	Saturation error of d axis current control integral	1. System overload suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
30	Saturation error of q axis current control integral	1. System overload suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
35	EE data abnormal	Driver board EEPROM is abnormal	1. Change EEPROM; 2. Change the driver board.

### 13. Troubleshooting

Table 4 Drive fault code (48K/60K)

Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Q axis current detection, failure in drive control	1. Compressor wire is not connected properly; 2. Bad driver board components; 3. Compressor start load is too large; 4. Compressor demagnetization; 5. Compress or oil shortage serious wear of crankshaft; 6. The compressor insulation fails.	1. Check the wire of the compressor; 2. Change the driver board ; 3. Turn on the machine after the pressure is balanced again; 4. Change the compressor; 5. Change the compressor; 6. Change the compressor.
2	Phase current detection failure in drive control	1. Compressor voltage default phase; 2. Bad driver board components; 3. The compressor insulation fault.	1. Check compressor wire connection; 2. Change the driver board; 3. Change the compressor.
3	Initialization, phase current imbalance	Bad driver board components.	Change the driver board .
4	Speed estimation, failure in drive control	1. Bad driver board components; 2. Compressor shaft clamping; 3. The compressor insulation fails.	1. Change the driver board ; 2. Change the compressor ; 3. Change the compressor .
5	IPM FO output fault	1. System overload or current overload. 2. Driver board fails; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the air conditioner system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
6	Communication between driver board and control board fault	1. Communication wire is not connected well; 2. Driver board fault; 3. Control board fault;	1. Check compressor wire connection. 2. Change the driver board; 3. Change the control board ;
7	AC voltage, overload voltage	1. Supply voltage input is too high or too low; 2. Driver board fails;	1. Check power supply; 2. Change the driver board;
8	DC voltage, overload voltage	1. Supply voltage input is too high ; 2. Driver board fault;	1. Check power supply; 2. Change the driver board;
9	AC voltage imbalance	Driver board fails;	Change the driver board;
10	The PFC current detection circuit fault before compressor is ON	Bad driver board components;	Change the driver board
11	AC voltage supply in outrange	1. Power supply abnormal, power frequency out of range; 2. Driver board fails;	1. Check the system; 2. Change the driver board;
12	Products of single-phase PFC over-current, FO output low level	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Inverter over current (3-phase power supply air conditioners)	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
13	Inverter over current	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
14	PFC over current(single-phase air-conditioner)	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Phase imbalance or phase lacks or the instantaneous power failure (only for 3-phase power supply air conditioners)	1. 3-Phase voltage imbalance; 2. The 3-phase power supply phase lost; 3. Power supply wiring is wrong; 4. Driver board fault.	1, Check the power supply; 2. Check the power supply; 3. Check the power supply wiring connection; 4. Change the driver board.

### 13. Troubleshooting

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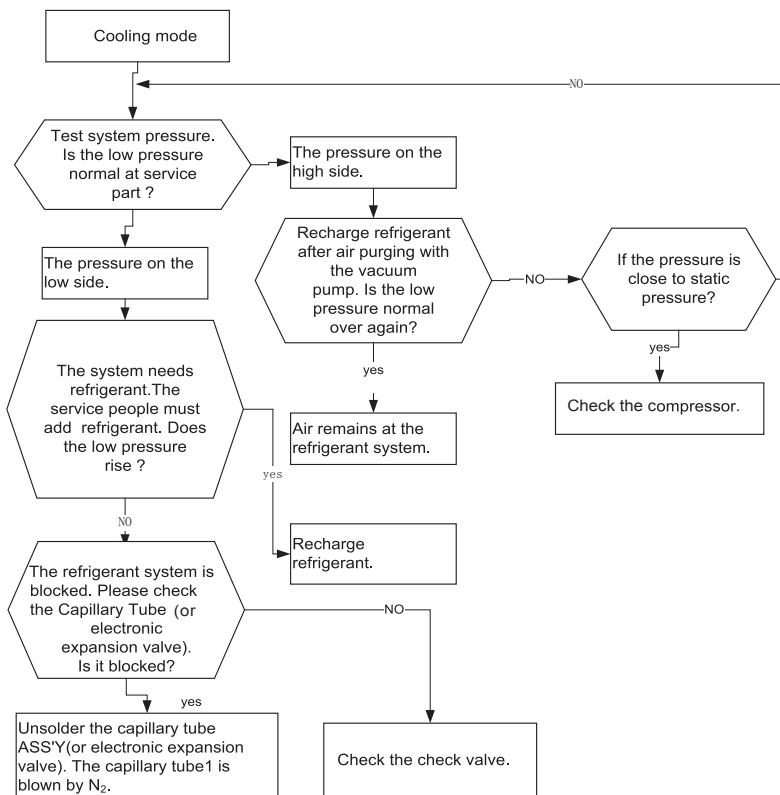
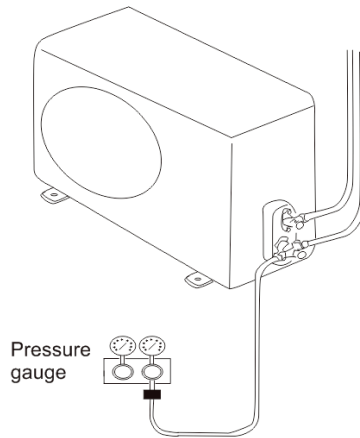
Fault code	Fault description	Possible reasons for abnormality	How to deal with
15	The instantaneous power off detection	1.The power supply is not stable ; 2.The instantaneous power failure; 3.Driver board fault;	1. Check the power supply; 2. Not fault; 3. Change the driver board.
16	Low DC voltage 200V	1. Voltage input is too low; 2. Drive board fault.	1. Check the power supply. 2. Change the driver board.
18	Driver board read EE data error	1. EEPROM has no data or data error; 2. EEPROM circuit fault.	1. Change EEPROM component; 2. Change the driver board.
19	PFC chip receives data fault	Abnormal communication loop.	Change the drive board.
20	PFC soft start abnormally	Abnormal PFC drive loop.	Change the drive board.
21	The compressor drive chip could not receive data from PFC chip.	Communication loop fault.	Change the drive board

# 14. Checking components

## 14.1 Check refrigerant system

TEST SYSTEM FLOW:

- Conditions: ① Compressor is running.  
 The air condition should be installed in good ventilation.
- Tool: Pressure Gauge Technique: ① see ② feel ③ test  
 See ----- Tube defrost.  
 Feel ----- The difference between tube's temperature.  
 Test ----- Test pressure.





## 14. Checking components

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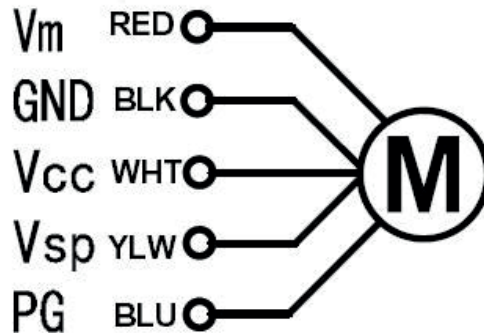
### 14.2 Check parts unit

#### 1. Outdoor unit fan motor

DC motor

36K: ZWK511B51102

48K/60K: SIC-71FW-F8121-1

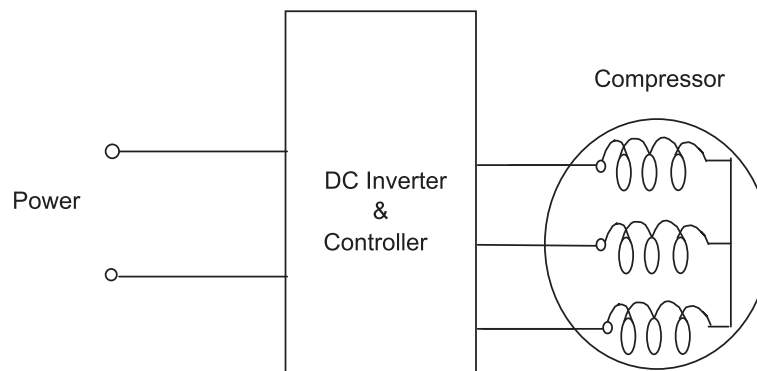


#### 2. Compressor

Compressor examination and repairing

36K: KTM310D85UMT

48K/60K: ATF400D64UMT



Test in resistance.

TOOL: Multi-meter.

Test the resistance of the winding. The compressor fails if the resistance of winding is 0 (short circuit) or  $\infty$  (open circuit).

Familiar error:

- 1) Compressor motor lock.
- 2) Discharge pressure value approaches static pressure value.
- 3) Compressor motor winding abnormality.

## 14. Checking components

### Note:

- 1) Don't put a compressor on its side or turn over.
- 2) Please assemble the compressor in your air conditioner rapidly after removing the plugs. Don't place the comp. in air for a long time.
- 3) Avoid compressor running in reverse caused by connecting electrical wire incorrectly.
- 4) Warning! In case AC voltage is impressed to compressor, the compressor performance will decrease because of its rotor magnetic force decreasing.

### 3. Inductance

Familiar error:

- 1) Sound abnormality
- 2) Insulation resistance disqualification.

### 4. Fuse



Check for continuity of fuse on PCB ASS'Y.

Remove the PCB ASS'Y from the electrical component box. Then pull out the fuse from the PCB ASS'Y. Check for continuity by a multimeter as shown below.



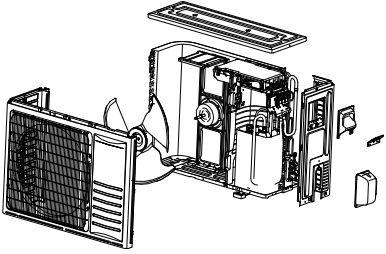
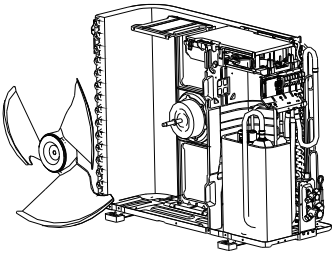
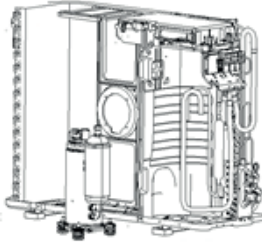
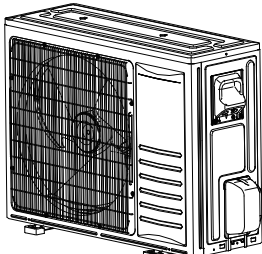
# 15. Disassembly and assembly for compressor and motor

The special tools for compressor & motor disassembly and assembly:

Tool	
1	Hexagon Screwdriver 
2	Hexagon Socket 

## Outdoor unit 36K

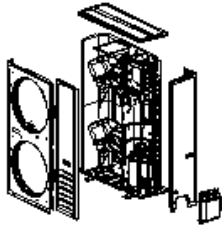
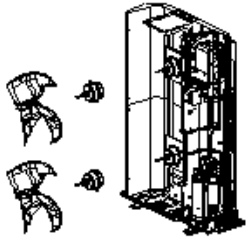
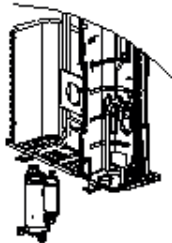

Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.

Step	Illustration	Handling Instruction
1. Remove external casing		<ol style="list-style-type: none"> <li>1. Remove the top cover, handle and valve cover;</li> <li>2. Remove the outer case and right side plate.</li> </ol>
2. Remove motor		<ol style="list-style-type: none"> <li>1. Remove the blade nut and then remove the blade;</li> <li>2. Remove the motor from motor supporter.</li> </ol>
3. Remove compressor		<ol style="list-style-type: none"> <li>1. Reclaim the refrigerant from the entire system;</li> <li>2. Remove the compressor mounting bolts;</li> <li>3. Carefully remove the compressor from chassis.</li> </ol>
4. Assemble unit		Assemble the unit in the reverse order of disassembly.

### Outdoor unit

48K/60K

Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.

Step	Illustration	Handling Instruction
1. Remove external casing		<ol style="list-style-type: none"> <li>1. Remove the top cover, handle and valve cover;</li> <li>2. Remove the outer case and right side plate.</li> </ol>
2. Remove motor		<ol style="list-style-type: none"> <li>1. Remove the blade nut and then remove the blade;</li> <li>2. Remove the motor from motor supporter.</li> </ol>
3. Remove compressor		<ol style="list-style-type: none"> <li>1. Reclaim the refrigerant from the entire system;</li> <li>2. Remove the compressor mounting bolts;</li> <li>3. Carefully remove the compressor from chassis.</li> </ol>
4. Assemble unit		<p>Assemble the unit in the reverse order of disassembly.</p>

## 16. Control logic description

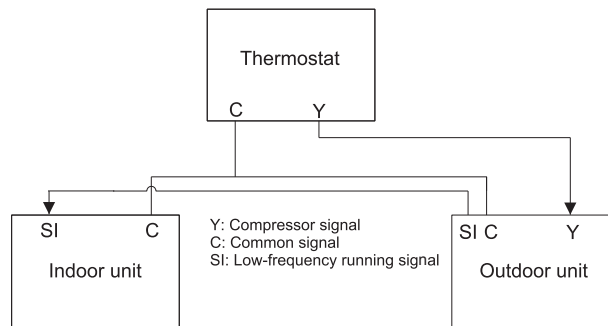
### 16.1 An illustration to outdoor unit signal

(1) Communication between indoor and outdoor units:

The communication between the outdoor unit, thermostat and the indoor unit is achieved through 24V alternating current, as shown in figure below.

The thermostat controls the signal output of Y, if Y-C is high level, the outdoor unit starts in cooling mode.

W-SI signal is send when outdoor unit runs with low-frequency mode.



### 16.2 Cooling Mode

(1) Start conditions:

When high level compressor signal is received from the thermostat, that is Y-C is high level.

(2) Stopping operating:

① Stopping conditions:

When low level compressor signal is received from the thermostat, that is Y-C is low level.

② Actions:

The compressor keeps operating with its current frequency, and detects its system pressure at the same time.

(a) If the pressure changes more than 0.04MPa **【e2】** in 10 seconds, the compressor stops operating.

(b) If the pressure changes less than 0.04MPa **【e2】** in 10 seconds, the compressor keeps operating and the target pressure is set to increase by 0.2MPa **【e2】** based on the current system pressure. The motor and electronic expansion valve are controlled as usual, the protection function and oil-return control are valid.

③ Stopping conditions:

When the compressor signal received from the thermostat is high level, that is Y-C is high level, the unit restores the normal target pressure to operate or when the compressor has operated for 30min **【e2】** with the increased target pressure, it is taken as it has stopped operating.

## 16. Control logic description

### Compressor running rules:

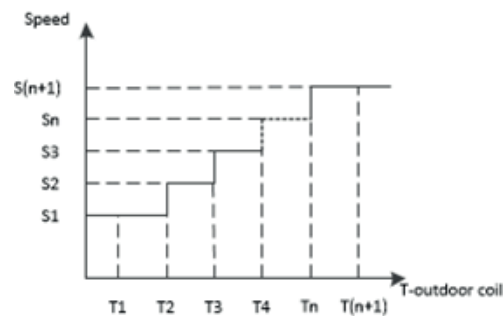
When the unit starts up in cooling mode, the compressor starts to work, and adjust its operating frequency according to the system target pressure and the actual pressure. If the actual pressure is higher than the target pressure, the compressor frequency will rise; if the actual pressure is lower than the target pressure, the compressor frequency decreases; when the target pressure is reached, the compressor frequency will keep stable.

### Outdoor fan running rules:

Once the outdoor fan starts up, it will follow the rules below:

Single outdoor fan: First, it will run in an invariable speed for a short time; Then it will regulate the speed by the outdoor-coil temperature.

Double outdoor fan: If it has two outdoor fans, the upper fan regulates the speed by the rules, and the downer fan speed is lower than the upper fan speed for 30rpm~60rpm.

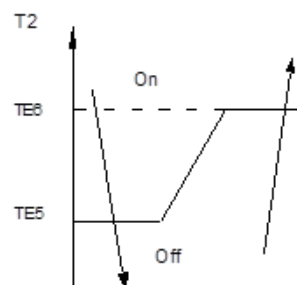


## 16.3 Evaporator Low-temperature Protection

### DC-Inverter

AC will enter T2 protection if any of the following condition is satisfied.

Condition:



Cooling mode: When the saturation temperature (which is got from low pressure cycling) T2 keeps lower than TE5 for 120 seconds, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

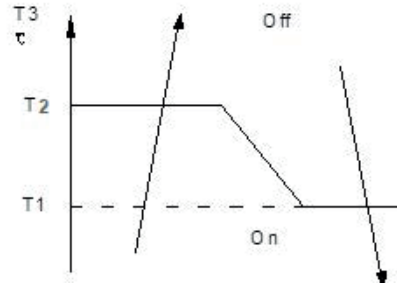
## 16. Control logic description

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### 16.5 Condenser High-temperature Protection

DC-Inverter outdoor unit

AC will enter T3 protection if any of the following conditions is satisfied.



Cooling mode: When the saturation temperature (which is got from low pressure cycling) T2 keeps lower than TE5 for 120 seconds, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

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