

# SERVICE MANUAL

SPLIT WALL-MOUNTED TYPE  
R ON-OFF SERIES(MDSR/MDOR)

# 1. Precaution

## 1.1 Safety Precaution

- **To prevent injury to the user or other people and property damage, the following instructions must be followed.**
- **Incorrect operation due to ignoring instruction will cause harm or damage.**
- **Before service unit, be sure to read this service manual at first.**

## 1.2 Warning

### ➤ Installation

- **Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.**

There is risk of fire or electric shock.

- **For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized service center.**

Do not disassemble or repair the product, there is risk of fire or electric shock.

- **Always ground the product.**

There is risk of fire or electric shock.

- **Install the panel and the cover of control box securely.**

There is risk of fire of electric shock.

- **Always install a dedicated circuit and breaker.**

Improper wiring or installation may cause fire or electric shock.

- **Use the correctly rated breaker or fuse.**

There is risk of fire or electric shock.

- **Do not modify or extend the power cable.**

There is risk of fire or electric shock.

- **Do not install, remove, or reinstall the unit by yourself(customer).**

There is risk of fire, electric shock, explosion, or injury.

- **Be caution when unpacking and installing the product.**

Sharp edges could cause injury, be especially careful of the case edges and the fins on the

condenser and evaporator.

- **For installation, always contact the dealer or an Authorized service center.**

There is risk of fire, electric shock, explosion, or injury.

- **Do not install the product on a defective installation stand.**

It may cause injury, accident, or damage to the product.

- **Be sure the installation area does not deteriorate with age.**

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

- **Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.**

Moisture may condense and wet or damage furniture.

- **Take care to ensure that power cable could not be pulled out or damaged during operation.**

There is risk of fire or electric shock.

- **Do not place anything on the power cable.**

There is risk of fire or electric shock.

- **Do not plug or unplug the power supply plug during operation.**

There is risk of fire or electric shock.

- **Do not touch (operation) the product with wet hands.**

There is risk of fire or electric shock.

- **Do not place a heater or other appliance near the power cable.**

There is risk of fire and electric shock.

- **Do not allow water to run into electric parts.**

It may cause fire, failure of the product, or electric shock.

- **Do not store or use flammable gas or combustible near the product.**

There is risk of fire or failure of product.

- **Do not use the product in a tightly closed space for a long time.**

Oxygen deficiency could occur.

- **When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.**

Do not use the telephone or turn switches on or off.

There is risk of explosion or fire.

- **If strange sounds, or small or smoke comes from product. Turn the breaker off or disconnect the power supply cable.**

There is risk of electric shock or fire.

- **Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.**

There is risk of property damage, failure of product, or electric shock.

- **Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)**

There is risk of physical injury, electric shock, or product failure.

- **When the product is soaked (flooded or submerged), contact an Authorized service center.**

There is risk of fire or electric shock.

- **Be caution that water could not enter the product.**

There is risk of fire, electric shock, or product damage.

- **Ventilate the product from time to time when operating it together with a stove, etc.**

There is risk of fire or electric shock.

- **Turn the main power off when cleaning or maintaining the product.**

There is risk of electric shock.

- **When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.**

There is risk of product damage or failure, or unintended operation.

- **Take care to ensure that nobody could step on or fall onto the outdoor unit.**

This could result in personal injury and product damage.

## ➤ CAUTION

- **Always check for gas (refrigerant) leakage after installation or repair of product.**

Low refrigerant levels may cause failure of product.

- **Install the drain hose to ensure that water is drained away properly.**

A bad connection may cause water leakage.

- **Keep level even when installing the product.**

It can avoid vibration of water leakage.

- **Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.**

It may cause a problem for your neighbors.

- **Use two or more people to lift and transport the product.**

Avoid personal injury.

- **Do not install the product where it will be exposed to sea wind (salt spray) directly.**

It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

### ➤ **Operational**

- **Do not expose the skin directly to cool air for long periods of time. (Do not sit in the draft).**

This could harm to your health.

- **Do not use the product for special purposes, such as preserving foods, works of art, etc.**

**It is a consumer air conditioner, not a precision refrigerant system.**

There is risk of damage or loss of property.

- **Do not block the inlet or outlet of air flow.**

It may cause product failure.

- **Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.**

There is risk of fire, electric shock, or damage to the plastic parts of the product.

- **Do not touch the metal parts of the product when removing the air filter. They are very sharp.**

There is risk of personal injury.

- **Do not step on or put anything on the product. (outdoor units)**

There is risk of personal injury and failure of product.

- **Always insert the filter securely. Clean the filter every two weeks or more often if necessary.**

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

- **Do not insert hands or other object through air inlet or outlet while the product is**

**operated.**

There are sharp and moving parts that could cause personal injury.

- **Do not drink the water drained from the product.**

It is not sanitary could cause serious health issues.

- **Use a firm stool or ladder when cleaning or maintaining the product.**

Be careful and avoid personal injury.

- **Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.**

There is risk of fire or explosion.

- **Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.**

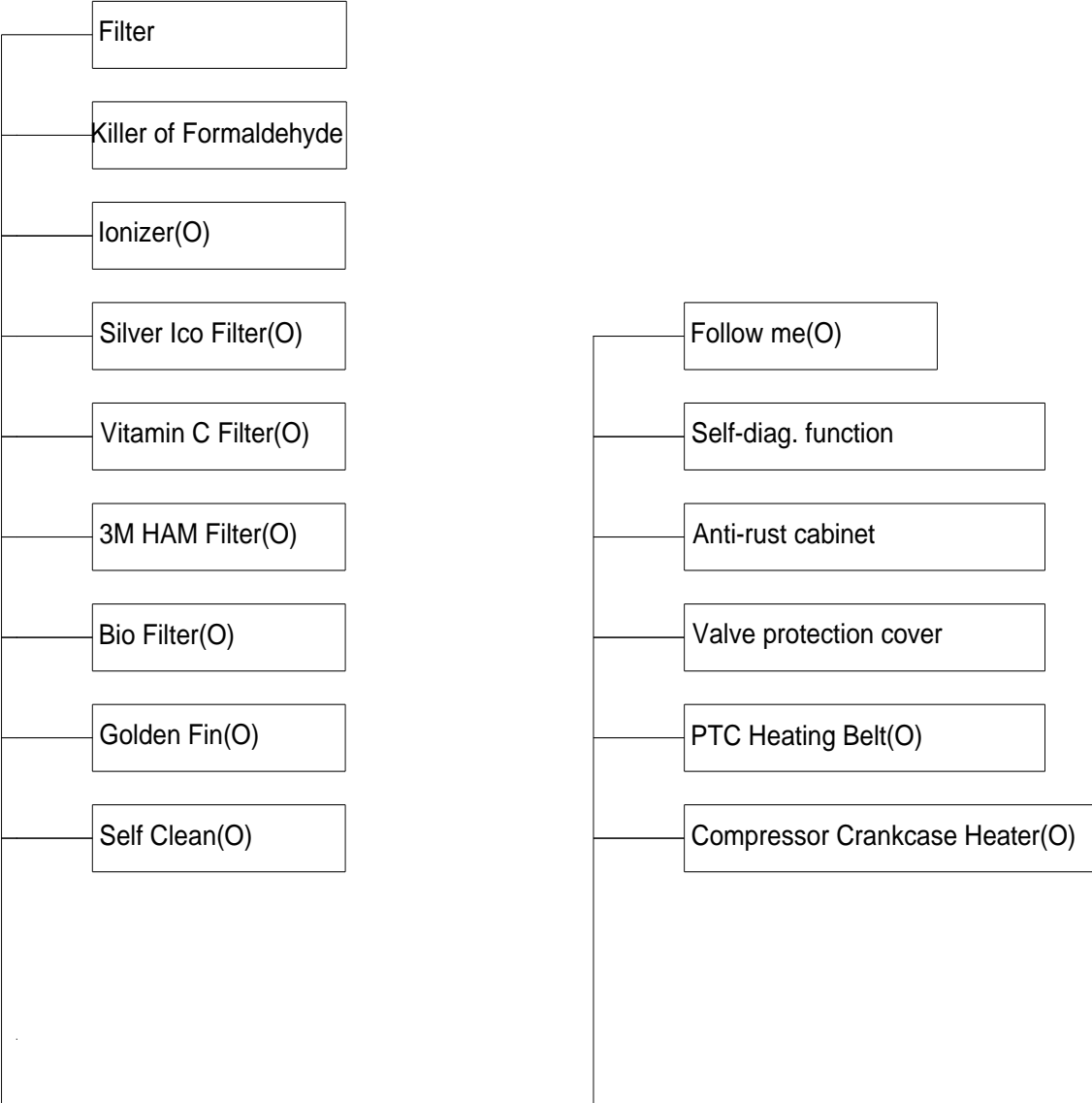
They may burn or explode.

- **If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote if the batteries have leaked.**

The chemical in batteries could cause burns or other health hazards

The designs, and information in this book are subject to change without notice for product improvement.

## 2. Function



### 3. Dimension

#### 3.1 Indoor Units

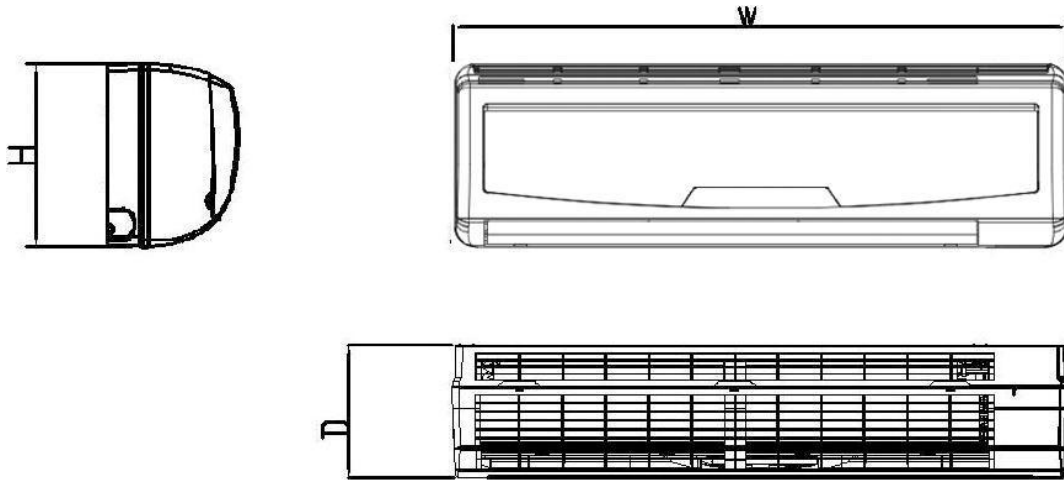
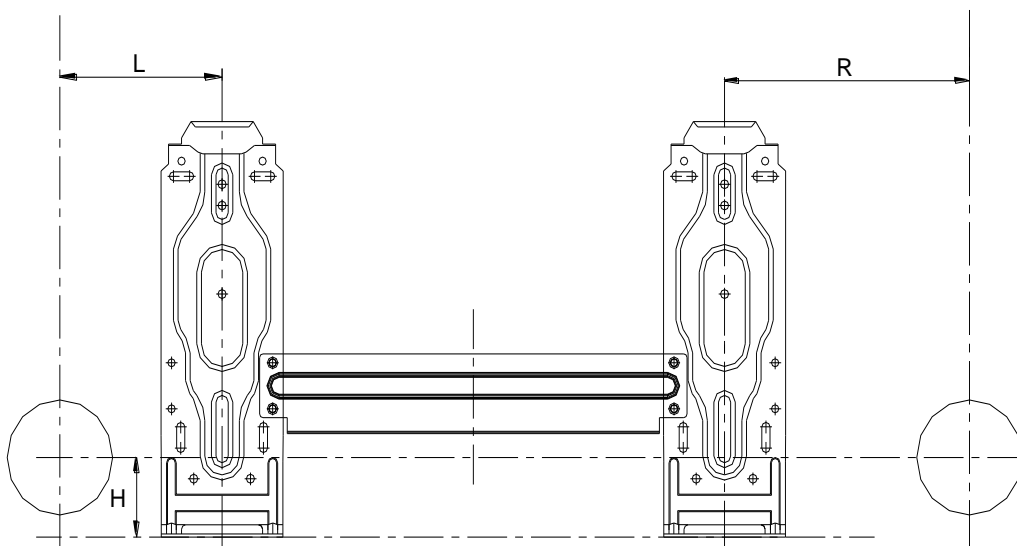


Figure	Models	W	H	D
Figure 1	MDSR-07HRN1 MDSR-09HRN1	710	250	189
Figure 2	MDSR-12HRN1	790	275	196
Figure 3	MDSR-18HRN1	930	275	198
Figure 4	MDSR-24HRN1 MDSR-28HRN1	1036	315	230

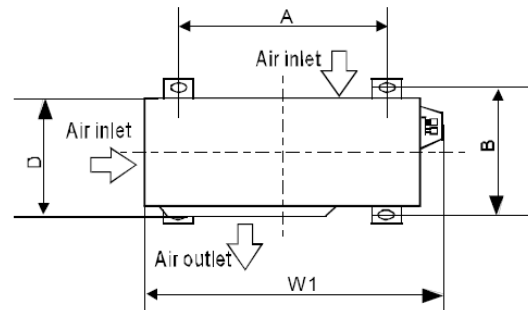
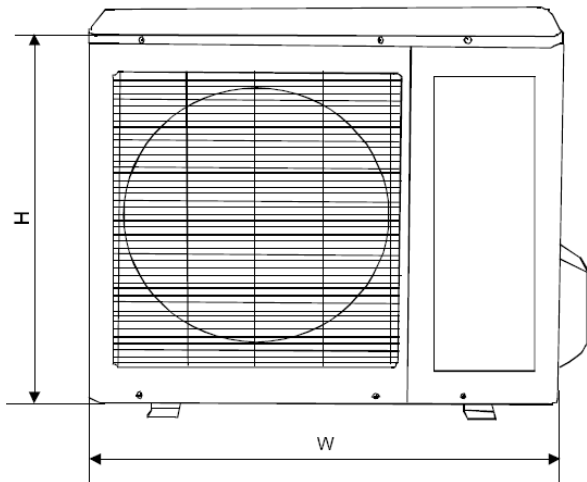
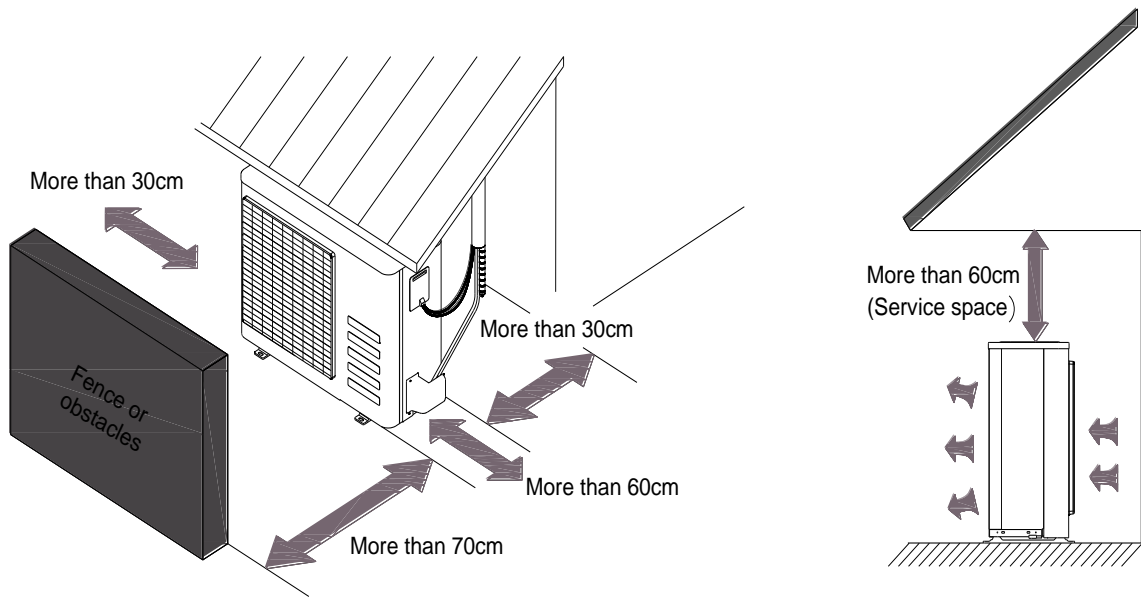


Model	R(mm)	L(mm)	H(mm)	Dimension of installation hole(mm)
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MDSR-07HRN1	111.5	100	45	Φ65
MDSR-09HRN1	83.5	100	45	Φ65
MDSR-12HRN1	207	150	45	Φ65
MDSR-24HRN1 MDSR-28HRN1	139	100	45	Φ65
MDSR-09HRN1	136	60	45	Φ65

### 3.2 Outdoor Units

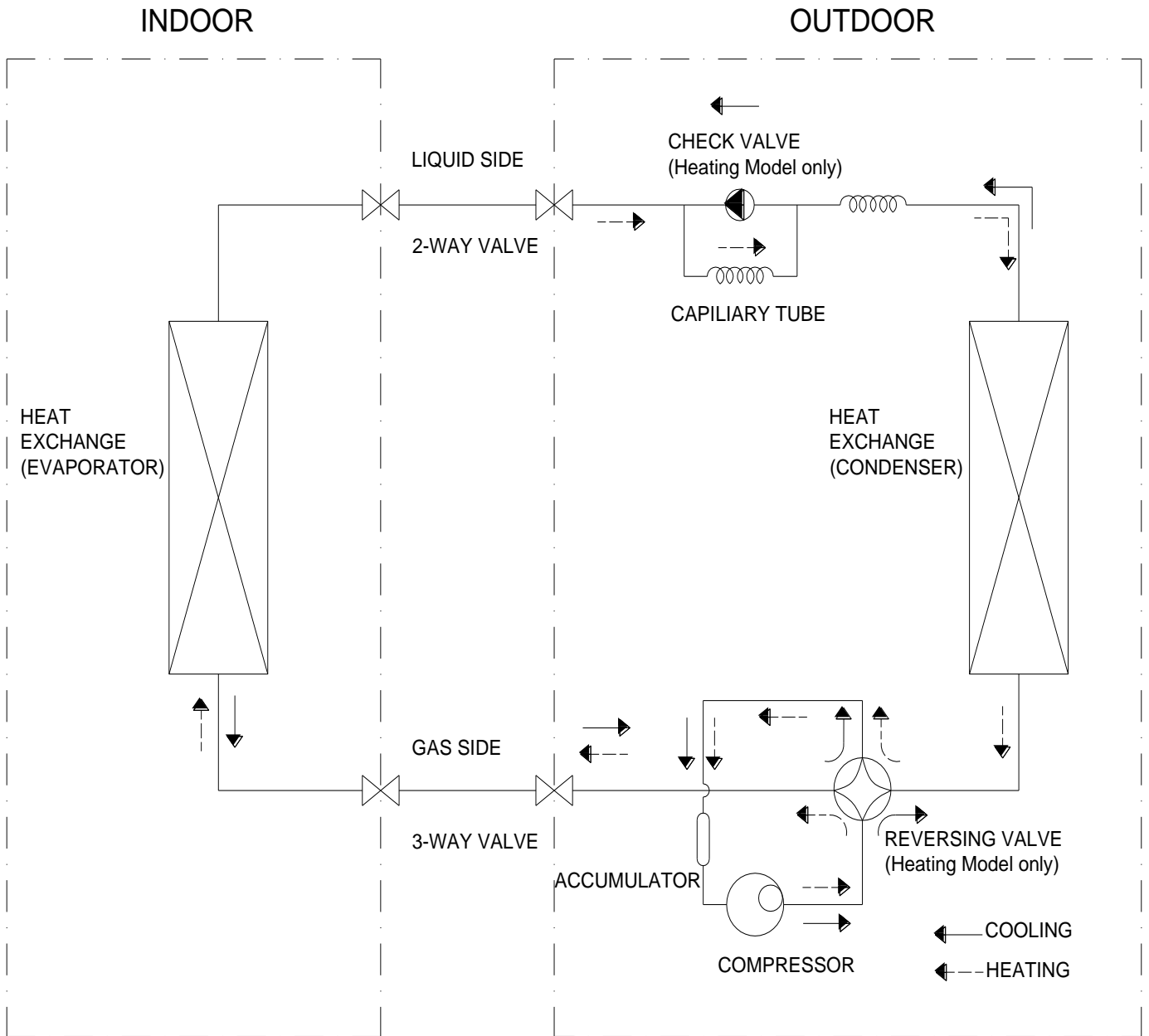


Model	W	D	H	W1	A	B
MDOR-07HN1	685	260	430	742	460	276
MDOR-09HN1	700	240	540	757	458	250

MDOR-12HN1	780	250	540	843	549	276
MDOR-18HN1	760	285	590	823	530	290
MDOR-24HN1	820	330	595	870	523	340
MDOR-28HN1	845	320	700	908	560	335

# 4. Refrigerant Cycle Diagram

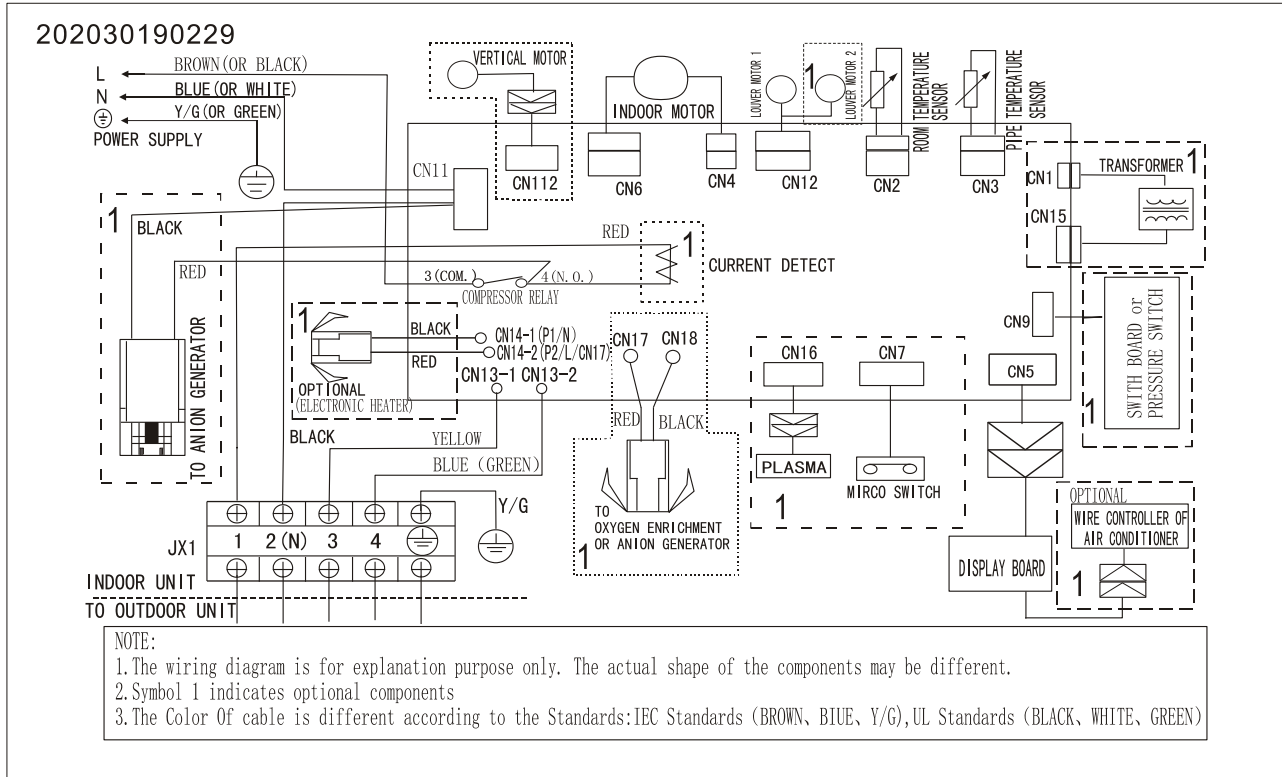
For heat pump models:



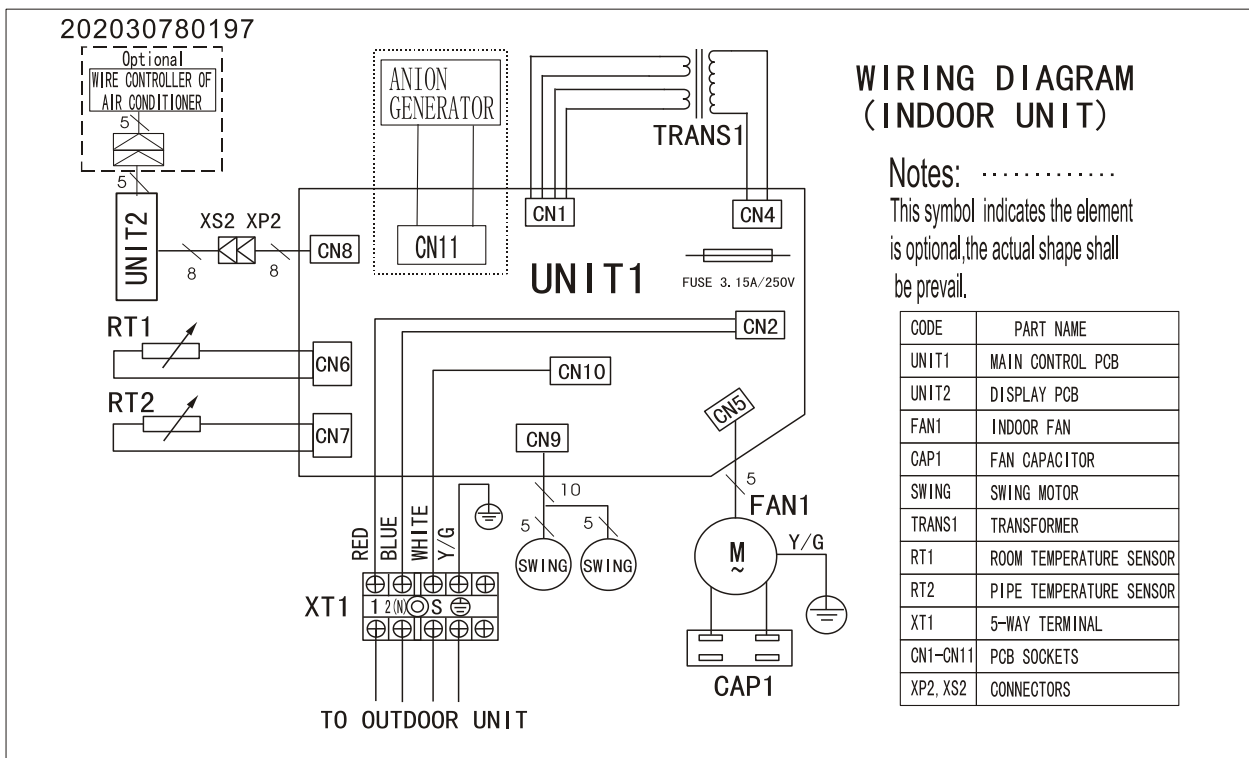
# 5. Wiring Diagram

## 5.1 Indoor Units

### MSDR-07(09; 12; 18)HN1

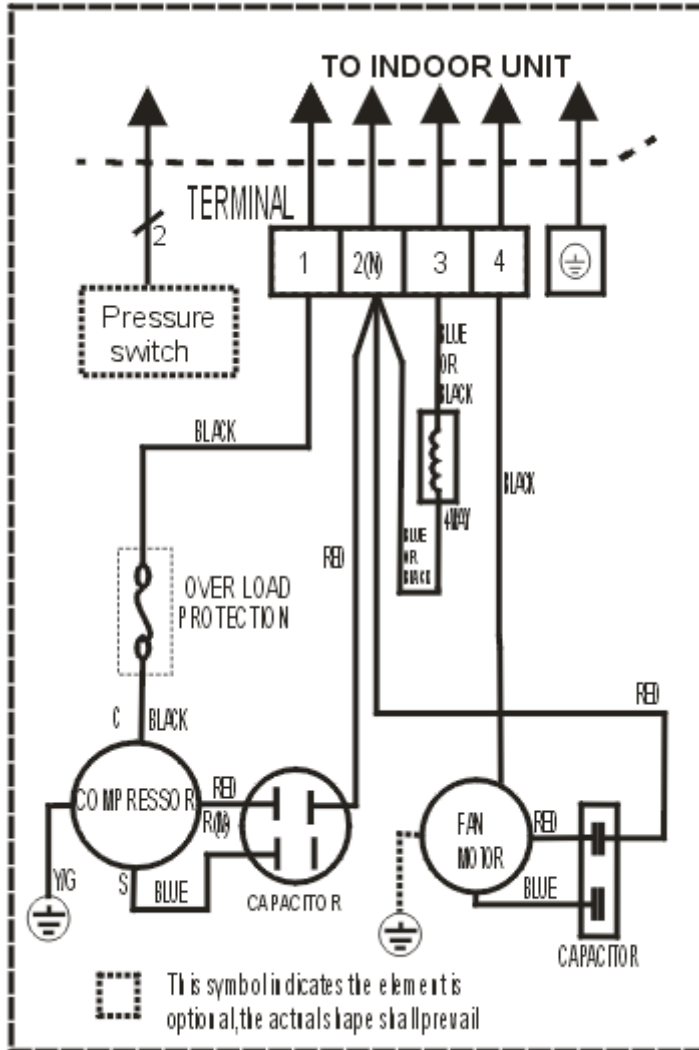


### MDSR-24(28)HN1

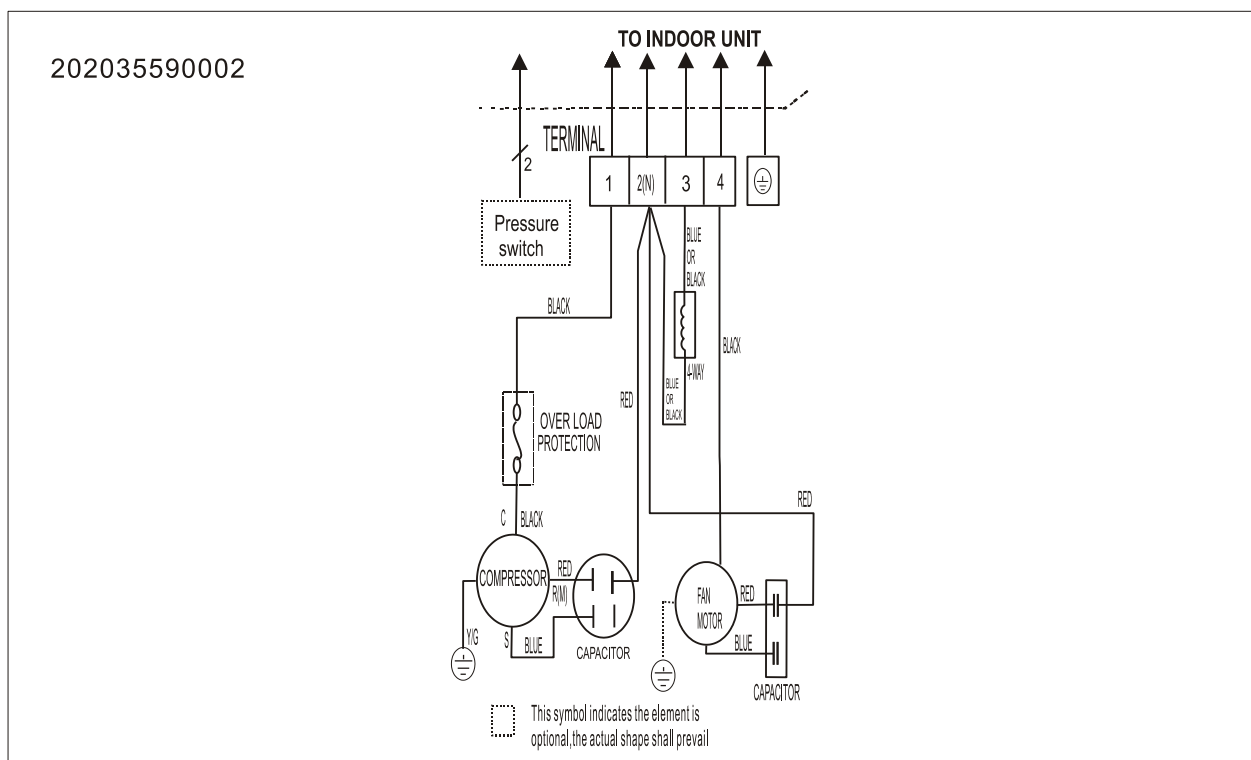


## 5.2 Outdoor Units

### MDOR-07(09)HN1

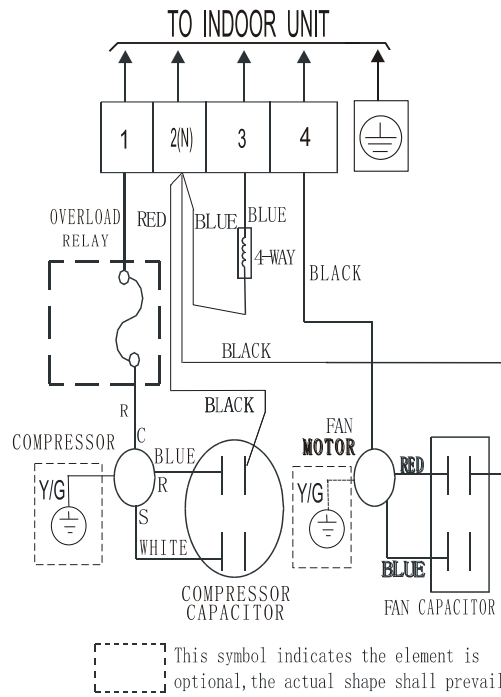


### MDOR-12HN1



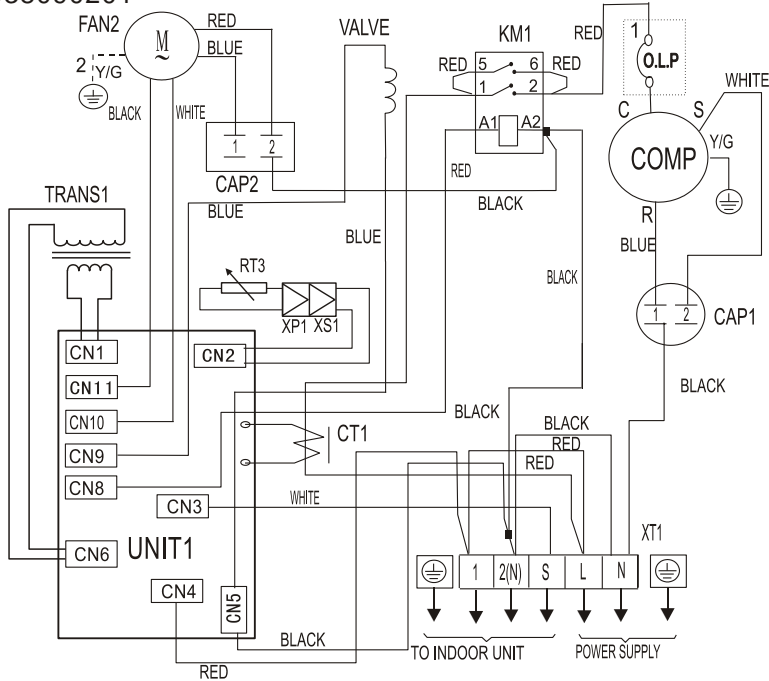
# MDOR-18HN1

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# MDOR-24HN1

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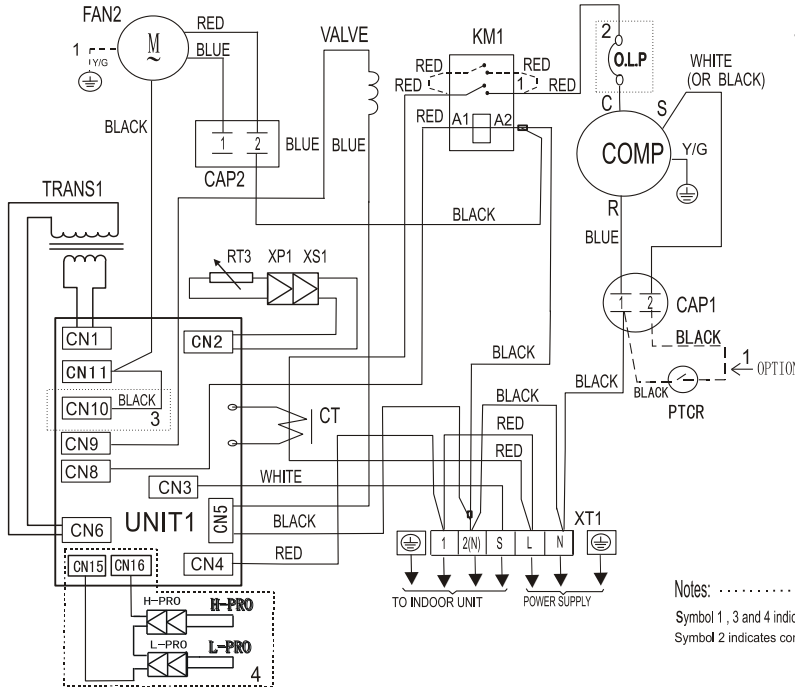


## WIRING DIAGRAM (OUTDOOR UNIT)

CODE	PART NAME
UNIT1	OUTDOOR CONTROL PCB
COMP	COMPRESSOR
CAP1	COMPRESSOR RUN CAPACITOR
CAP2	OUTDOOR FAN CAPACITOR
FAN2	OUTDOOR FAN
XT1	5-WAY TERMINAL
XT2	MIDDLE TERMINAL
XP1, XS1	CONNECTORS
RT3	PIPE TEMPERATURE SENSOR
KM1	AC CONTACTOR
CT1	CURRENT INDUCTOR
TRANS1	TRANSFORMER
CN1-CN11	PCB SOCKETS
VALVE	REVERSING VALVE

NOTE: Symbol 1 indicates compressor internal or external components.  
Symbol 2 indicates the element is optional, the actual shape shall be prevail.

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## WIRING DIAGRAM (OUTDOOR UNIT)

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CAP1	COMPRESSOR RUN CAPACITOR
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FAN2	OUTDOOR FAN
XT1	TERMINAL
XT2	MIDDLE TERMINAL
XP1, XS1	CONNECTORS
RT3	PIPE TEMPERATURE SENSOR
KM1	AC CONTACTOR
CT	CURRENT INDUCTOR
TRANS1	TRANSFORMER
CN1-CN11	PCB SOCKETS
VALVE	REVERSING VALVE

Notes: .....

Symbol 1, 3 and 4 indicates the element is optional, the actual shape shall be prevail.  
Symbol 2 indicates compressor internal or external components.



## 6. Installation details

### 6.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening torque
mm	inch	N.cm	N.cm
Φ6.35	1/4	1500 (153kgf.cm)	1600 (163kgf.cm)
Φ9.52	3/8	2500 (255kgf.cm)	2600 (265kgf.cm)
Φ12.7	1/2	3500 (357kgf.cm)	3600 (367kgf.cm)
Φ15.9	5/8	4500 (459kgf.cm)	4700 (479kgf.cm)

### 6.2 Connecting the cables

The power cord of connect should be selected according to the following specifications sheet.

Rated current of appliance	Nominal cross-sectional area (mm <sup>2</sup> )
>3 and ≤6	0.75
>6 and ≤10	1.0
>10 and ≤16	1.5
>16 and ≤25	2.5

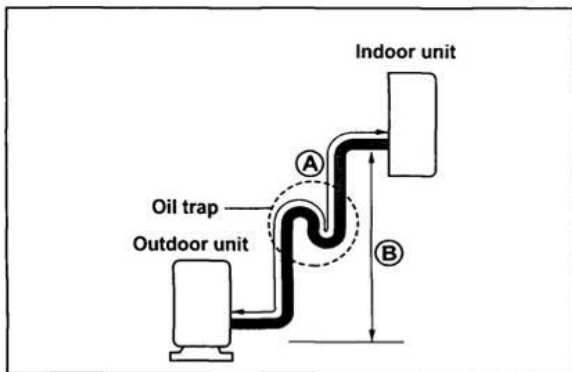
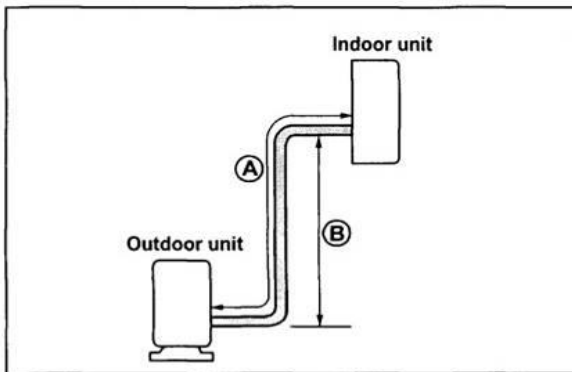
The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

### 6.3 Pipe length and the elevation

The pipe length and refrigerant amount:

Model	Connective pipe length	Air purging	Additional amount of refrigerant
All	Less than 5m	Use vacuum pump	-----
7k,9k,12k,16k,17k,18k	More than 5m	Use vacuum pump	(Pipe length – 5) × 20g/m
24k,28k	More than 5m	Use vacuum pump	(Pipe length – 5) × 40g/m

Model	Standard length (m)	Max. Elevation B (m)	Max. Length A (m)
7k,9k,12k,16k,17k	5	8	20
18k,24k,28k	5	10	25



**Caution:**

The capacity test is based on the standard length and the maximum permissible length is based on the system reliability.

The oil trap should be installed per 5-7 meters.

## 6.4 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

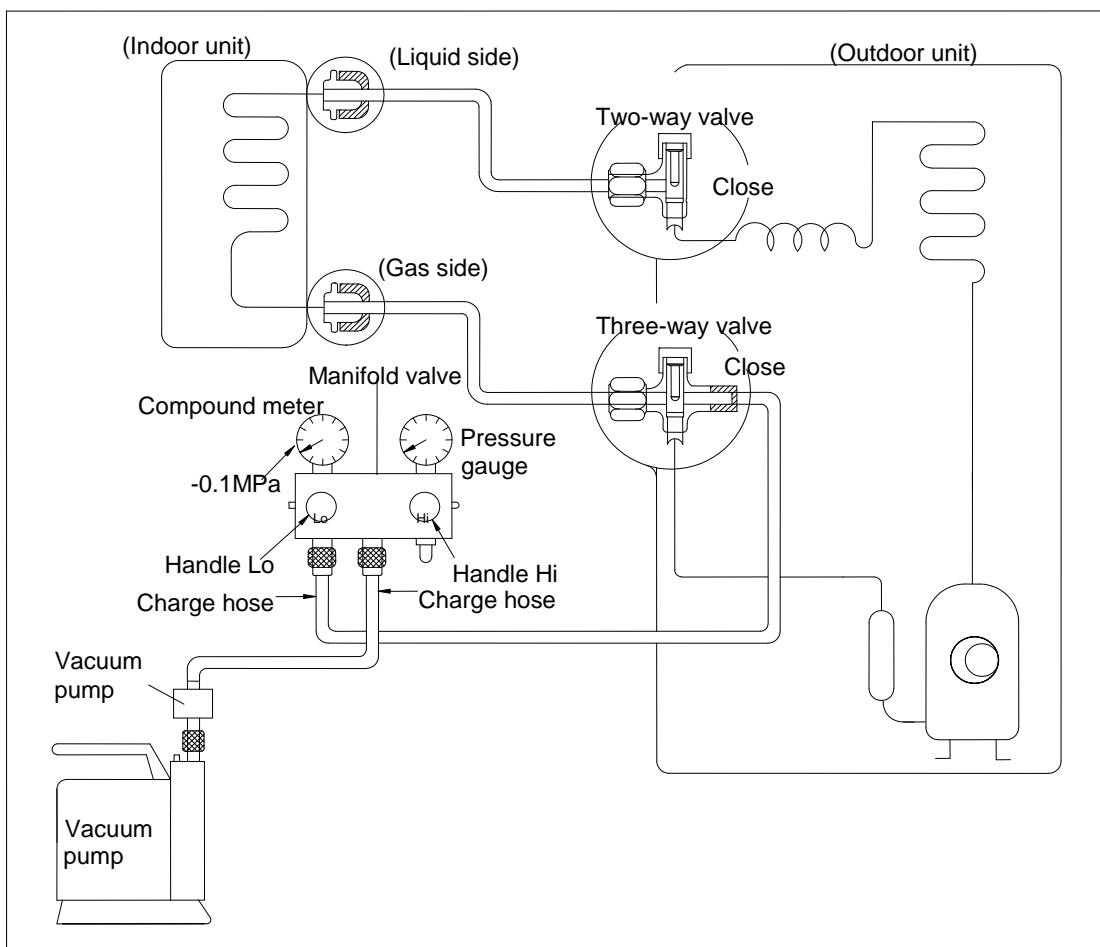
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

### 1. Air purging with vacuum pump



- 1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position
- 2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
- 3) Connect the charge hose of handle hi connection to the vacuum pump.
- 4) Fully open the handle Lo of the manifold valve.
- 5) Operate the vacuum pump to evacuate.
- 6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If

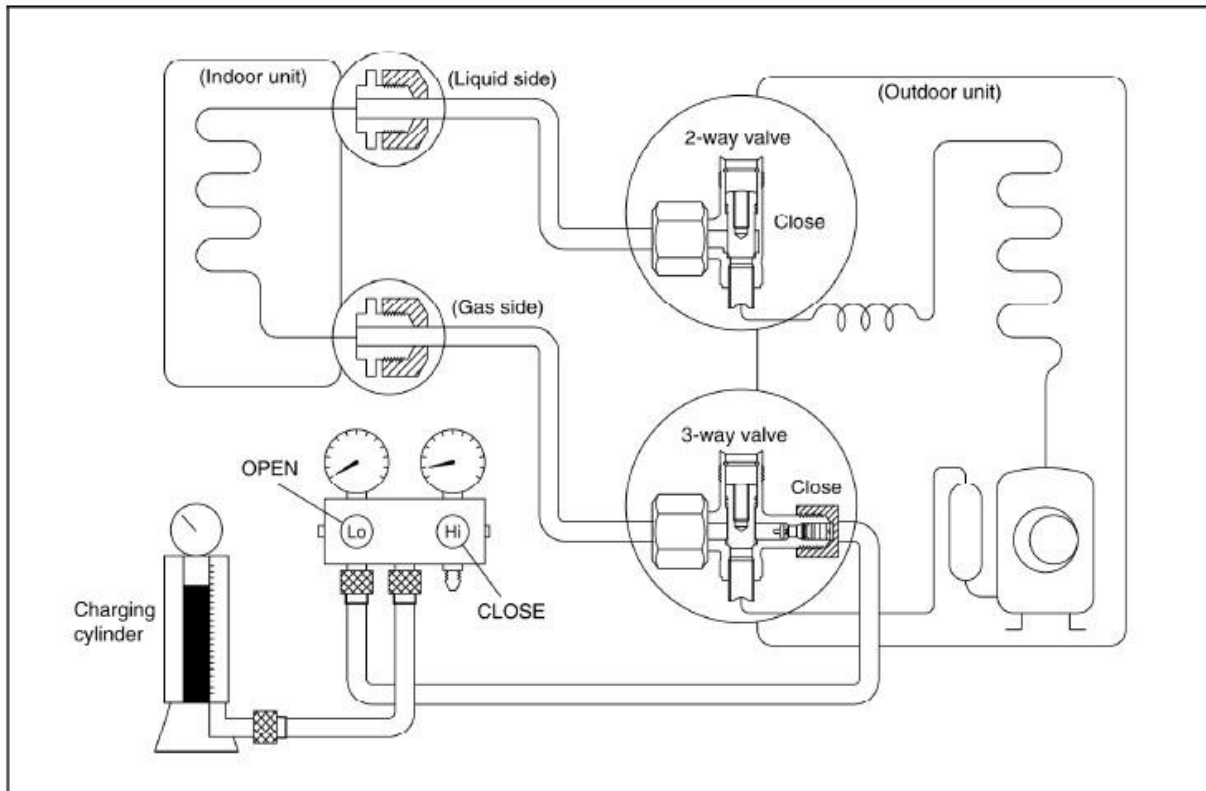
the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points.

Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.

8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

## 2. Air purging by refrigerant



### Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.

3). Air purging

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45° until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

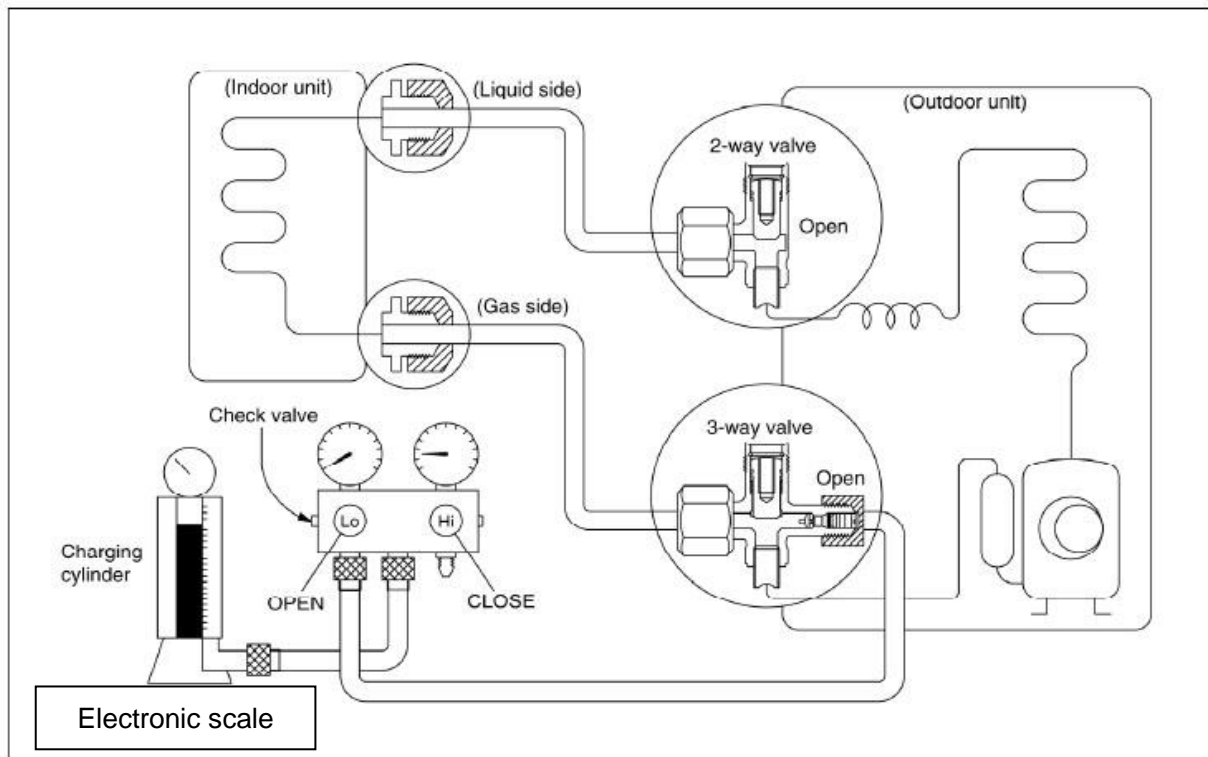
Be sure to use a hexagonal wrench to operate the valve stems.

7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakage.

### 3. Adding the refrigerant if the pipe length >5m



#### Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure the liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

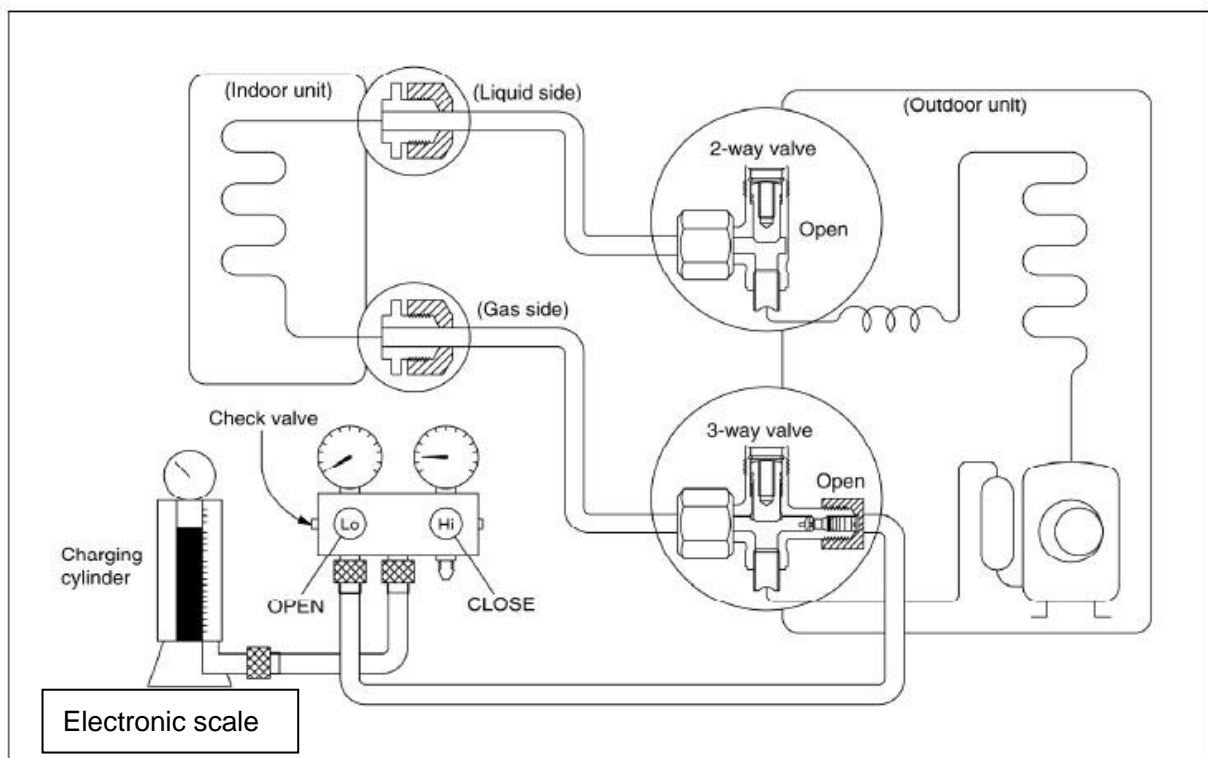
6).When the electronic scale displays the proper weight (refer to the table), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

## 6.5 Adding the refrigerant after running the system for many years



### Procedure:

1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve.

Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

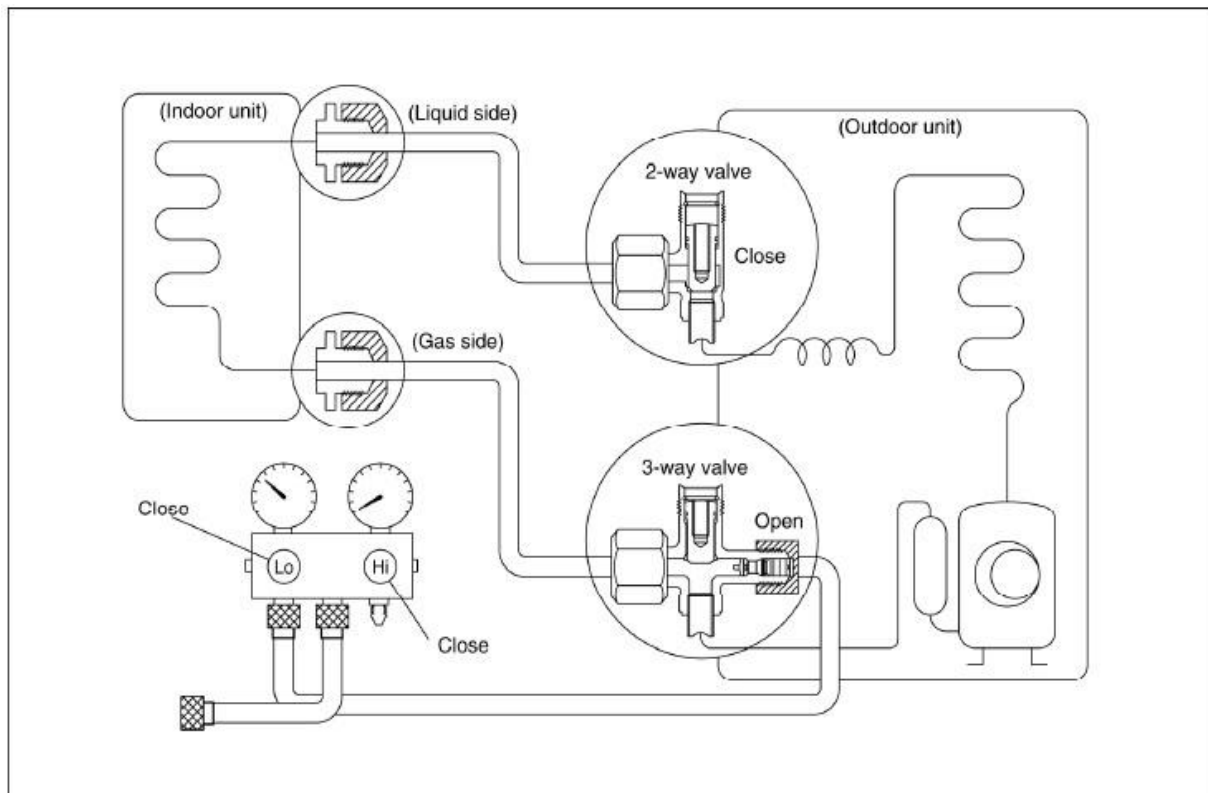
7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

## 6.6 Re-installation while the indoor unit need to be repaired

### 1. Collecting the refrigerant into the outdoor unit



#### Procedure

1). Confirm that both the 2-way and 3-way valves are set to the opened position.

Remove the valve stem caps and confirm that the valve stems are in the opened position.

Be sure to use a hexagonal wrench to operate the valve stems.

2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.

3). Air purging of the charge hose

Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.

4). Set the 2-way valve to the close position.

5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.

6). Set the 3-way valve to the closed position immediately

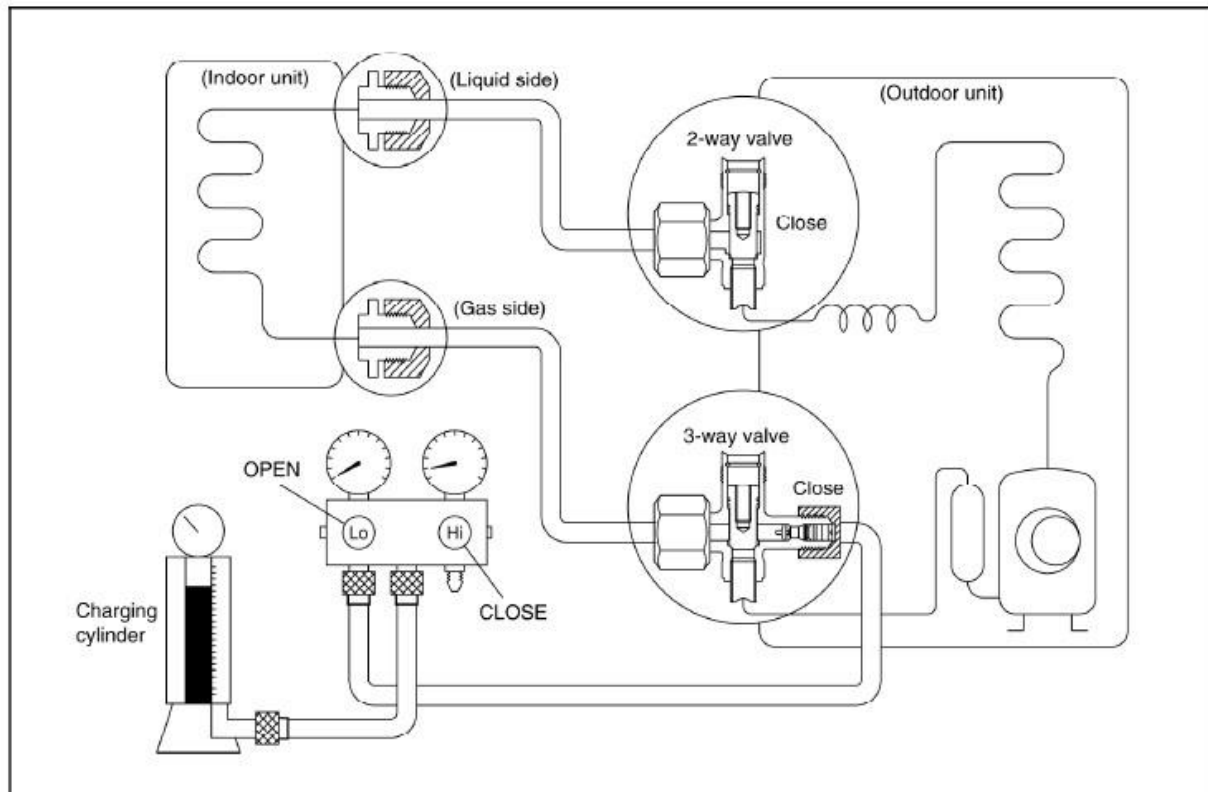
Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.

Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

## 2. Air purging by the refrigerant



### Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.

Leave the valve on the charging cylinder closed.

3). Air purging

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant



Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

Be sure to use a hexagonal wrench to operate the valve stems.

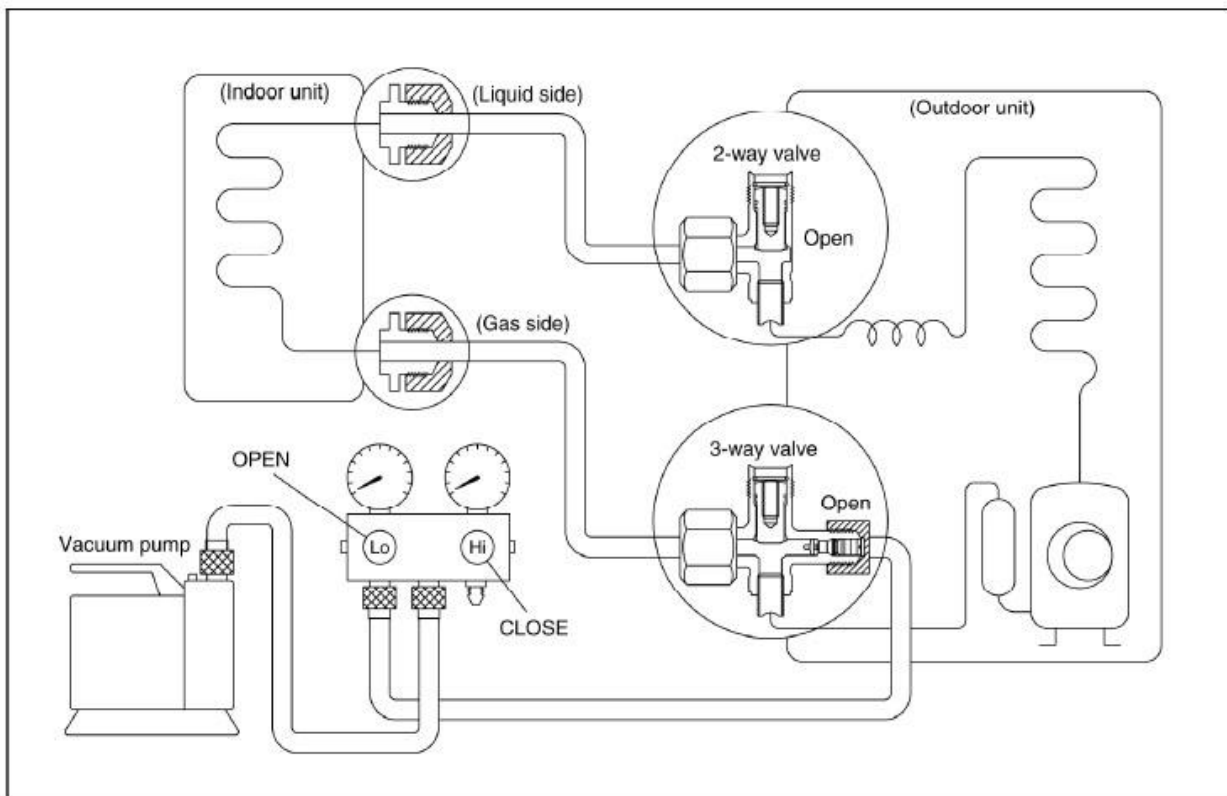
7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check the gas leakage.

## 6.7 Re-installation while the outdoor unit need to be repaired

### 1. Evacuation for the whole system



#### Procedure:

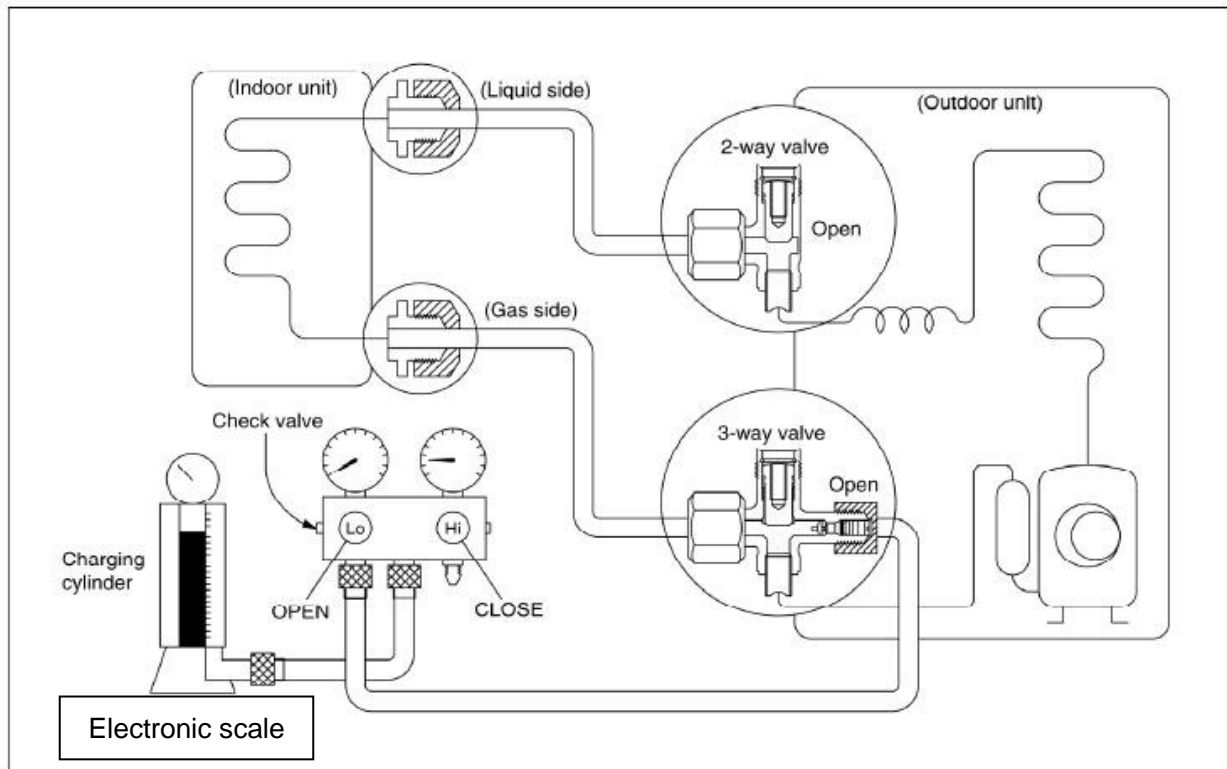
- 1). Confirm that both the 2-way and 3-way valves are set to the opened position.
- 2). Connect the vacuum pump to 3-way valve's service port.
- 3). Evacuation for approximately one hour

Confirm that the compound meter indicates -0.1Mpa.

- 4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

5). Disconnect the charge hose from the vacuum pump.

## 2. Refrigerant charging



### Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately.

If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

6). Mounted the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

## 7. Operation characteristics

Mode Temperature	Cooling operation	Heating operation	Drying operation
Room temperature	17°C ~ 32°C	0°C ~ 30°C	10°C ~ 32°C
			17°C ~ 32°C
Outdoor temperature	18°C ~ 43°C	-7°C ~ 24°C	11°C ~ 43°C
			18°C ~ 43°C
	-25°C ~ 43°C with Low Ambient Kit (-v)		18°C ~ 43°C

### CAUTION:

1. If air conditioner is used beyond the above conditions, the certain protections may action.
2. Room relative humidity should be less than 80%. If the air conditioner operates in excess of this value, the surface of the air conditioner may attract condensation water. In this case, please set the vertical air louver to its maximum angle (vertically to the floor), and set the fan to high speed.

## 8. Electronic function

### 8.1 Abbreviation

T1: Indoor ambient temperature

T2: Coil temperature of indoor heat exchanger

T3: Coil temperature of outdoor heat exchanger

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

### 8.2 Display function

8.2.1 Icon explanation on indoor display board.

Auto indicator: This indicator illuminates when the air conditioner is in AUTO operation.
PRE.-DEF. Indicator(only for heat pump models) This indicator illuminates when the air conditioner starts defrosting automatically or when the warm air control feature is activated in heating mode.
OPERATION indicator: This indicator illuminates when the air conditioner is running.
Timer indicator: This indicator illuminates when TIMER is set ON/OFF

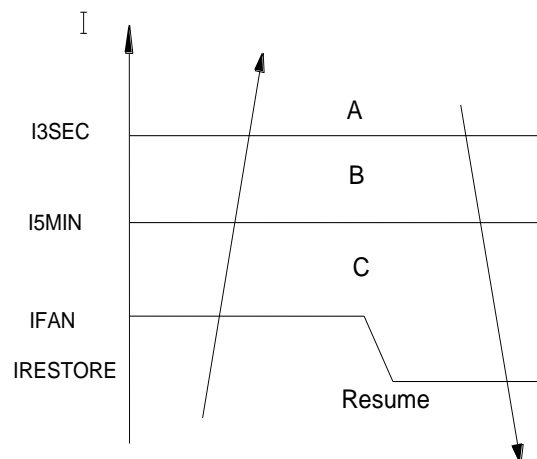
### 8.3 Main Protection

8.3.1 Time delay at restart for compressor.

8.3.2 Fan Speed is out of control. (only for 7k,9k,12 models)

---When Indoor Fan Speed keeps too low or too high for certain time, the unit will stop and the LED will display the failure

8.3.3 Current protection



A zone: The current exceeds  $I_{3SEC}$  for 5 seconds(3 seconds for 21k model), the compressor and outdoor fan will shut off.

B zone: The current exceeds  $I_{5min}$  for 5 minutes, the compressor and outdoor fan will shut off.

C zone: The current exceeds  $I_{FAN}$ , the outdoor fan will shut off if AC is in heating mode. If AC is in cooling mode, the indoor fan will run at low speed.

### 8.3.4 Zero crossing detection error protection (only for 7k, 9k, 12k models)

If AC can not detect zero crossing signal for 4 minutes or the zero crossing signal time interval is not correct, the unit will stop and the LED will display the failure. The correct zero crossing signal time interval should be between 6-13ms.

### 8.3.5 Indoor / outdoor units communication protection(only for 24, 28k models)

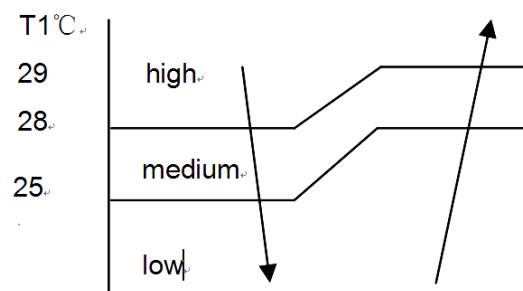
If the indoor units can not receive the feedback signal from the outdoor units for 2 minutes, the AC will stop and display the failure.

## 8.4 Operation Modes and Functions

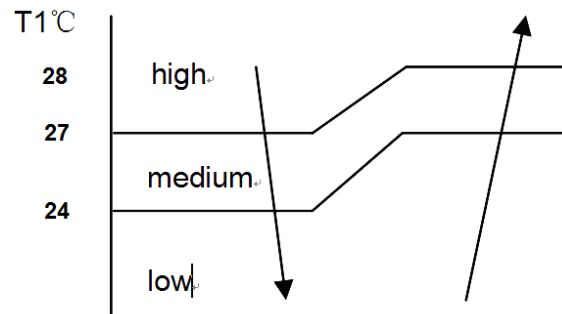
### 8.4.1 Fan mode

- (1) Outdoor fan and compressor stop.
- (2) Temperature setting function is disabled, and no setting temperature is displayed.
- (3) Indoor fan can be set to high/med/low/auto.
- (4) The louver operates same as in cooling mode.
- (5) Auto fan:

For 7k,9k,12k models:



For 24, 28k models:

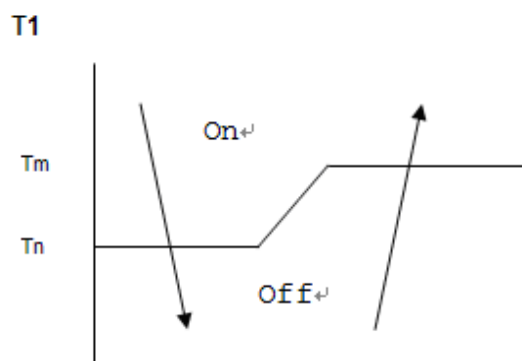


## 8.4.2 Cooling Mode

### 8.4.2.1 Compressor running rules:

Once the compressor starts up, it will follow the below rules:

When indoor room temp.  $T_1$  is lower than  $T_n$ , the compressor and outdoor fan will shut off. When  $T_1$  is higher than  $T_m$ , the compressor and outdoor fan will start up.



$$T_m = T_s + 1, T_n = T_s.$$

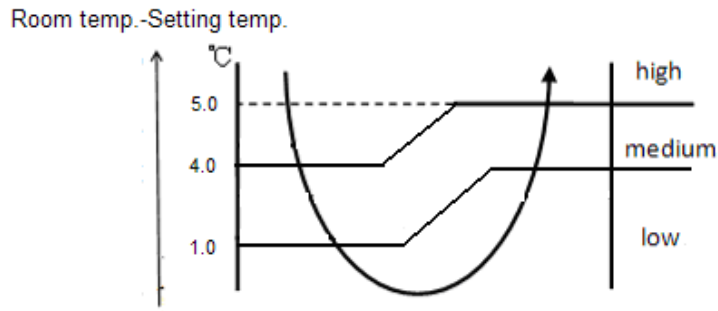
### 8.4.2.2 Outdoor fan running rules:

The On-off outdoor units have single fan speed. The outdoor fan will run following the compressor except when AC is in evaporator high temp. protection in heating mode, condenser high temp. protection in cooling mode, defrosting mode and the current protection.

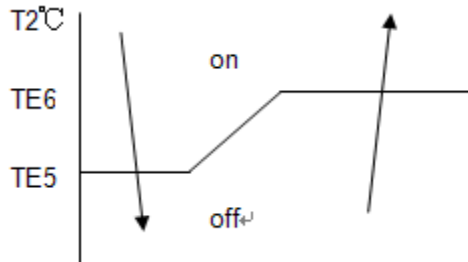
### 8.4.2.3 Indoor fan running rules

In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and auto.

The auto fan:



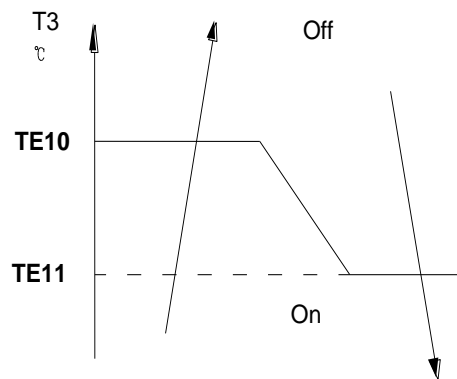
#### 8.4.2.4 Evaporator low temperature T2 protection.



When the evaporator coil temp. T2 keeps lower than TE5 for 5 minutes (4 minutes for 21k model), the compressor and outdoor fan will shut off.

When T2 is higher than TE6, the compressor and outdoor fan will restart up.

#### 8.4.2.5 Condenser high temperature T3 protection (only for 21k, 24k heat pump models)



When  $T3 \geq TE10$ , the compressor will shut off. When  $T3 < TE11$ , the compressor will restart.

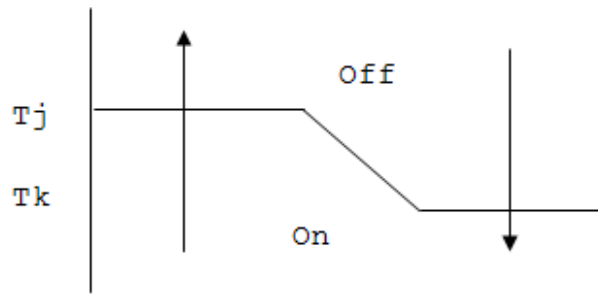
### 8.4.3 Heating Mode

#### 8.4.3.1 Compressor running rules:

For 21k, 24k models, every time the compressors start up, they will keep running for  $\Delta t$  minutes (protections are active) and then follow the below rules. (While  $\Delta t = 4$ .)

For other models, they will follow the below rules once the compressors start up:

When indoor room temp.  $T_1$  is higher than  $T_j$ , the compressor and outdoor fan will shut off. When  $T_1$  is lower than  $T_k$ , the compressor and outdoor fan will start up.



$$T_j = T_s + T_c$$

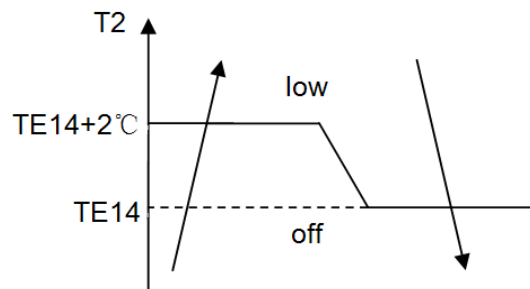
$$T_k = T_s + T_c - 1$$

#### 8.4.3.2 Outdoor fan running rules:

The outdoor units have single fan speed. The outdoor fan will run following the compressor except when AC is in evaporator high temp. protection in heating mode, condenser high temp. protection in cooling mode, defrosting mode and the current protection.

#### 8.4.3.3 Indoor fan running rules:

For 24k, 28k models, when the compressor is off because of the room temperature rising or the protection, the indoor fan will run as below rule:



While  $TE_{14} = 32^\circ\text{C}$

For all the models, when the compressor is on, the indoor fan can be set to high/med/low/auto. And the anti-cold wind function has the priority.

#### Anti-cold wind function:

When the evaporator coil temp.  $T_2$  is getting higher,

$T_2 > TE_2$ , the indoor fan will run at setting speed.

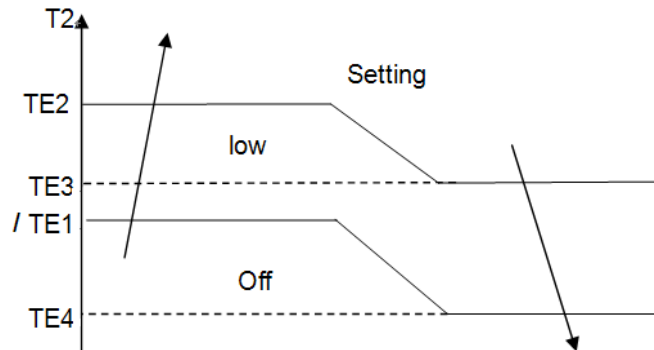
$TE_1 < T_2 < TE_2$ , the indoor fan will run at low speed.



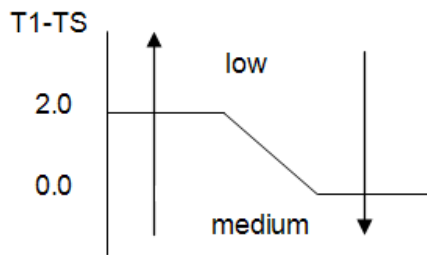
When T2 is getting lower,

$TE4 < T2 < TE3$ , the indoor fan will run at low speed.

$T2 < TE4$ , the indoor fan will shut off.



**Auto fan action:**

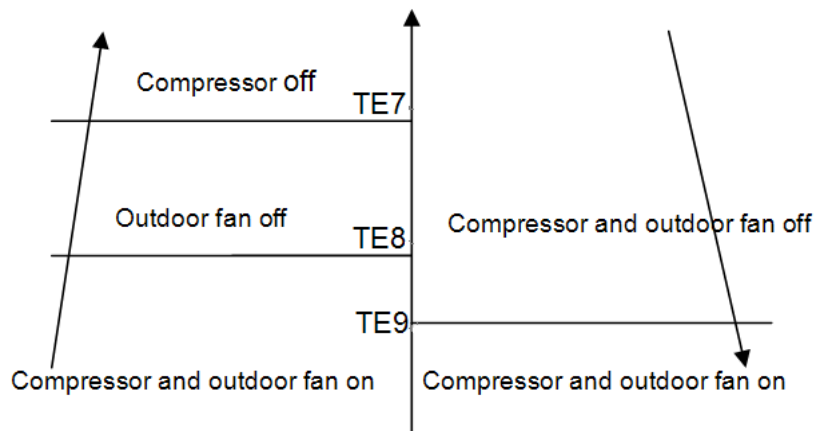


When  $T_1 - T_s > 2^\circ\text{C}$ , the indoor fan will run at low speed.

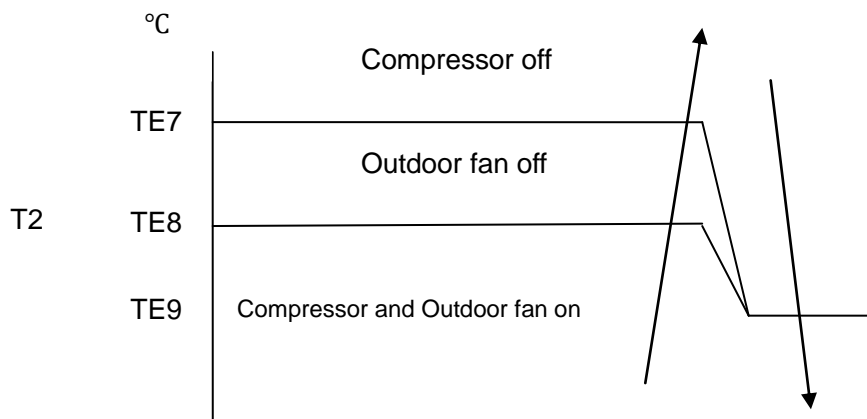
When  $T_1 - T_s \leq 0^\circ\text{C}$ , the indoor fan will run at medium speed.

**8.4.3.4 High evaporator coil temp. T2 protection:**

For 24k, 28k models:



**For other models:**



**8.4.3.5 Defrosting mode:**

**For 7k,9k,12k, models:**

- **Condition of defrosting:**

AC will enter defrosting mode if any of the following items is satisfied.

(1) Both A and B are satisfied

A: The compressor keeps running for 40 minutes.

B: The evaporator coil temp. T2-Indoor room temp. T1 meets the below table.

°C	T2 – T1
High speed	$< TH_{DEFROST}$
Medium speed	$< TM_{DEFROST}$
Low speed	$< TL_{DEFROST}$
Breeze/off	No need to compare the T2 and T1

(2) After the last defrosting, the time that the outdoor fan is off but the compressor is on in high T2 protection cumulates up to 90 minutes.

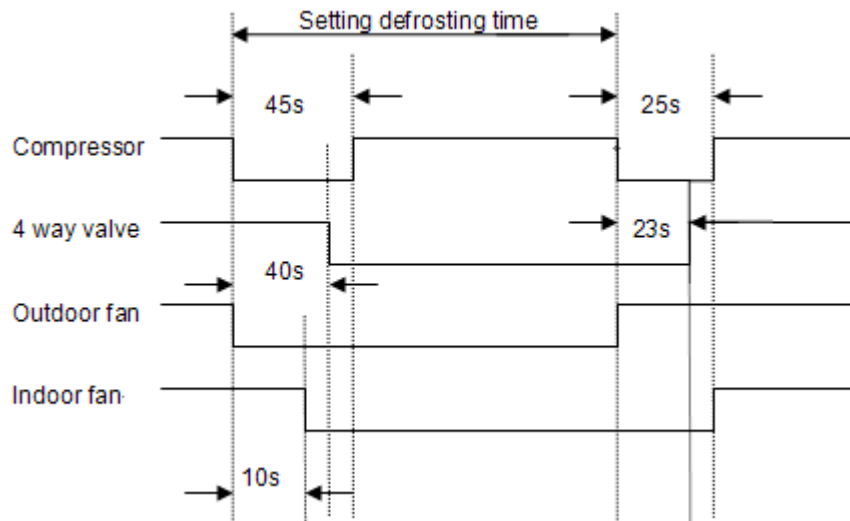
- **Condition of ending defrosting:**

If any one of the following items is satisfied, the defrosting will terminate and the machine will turn to normal heating mode.

(1) The defrosting time is reached to the setting value.

(2) The compressor current reaches or exceeds  $I_{DEFROST}$  for 7 seconds.

- **Defrosting action:**



### About the setting defrosting time:

(1) Condition 1 of defrosting;

If case B happens before case A and lasts till case A happens, the setting defrosting time is 10 minutes.

Otherwise the defrosting time is 7.5 minutes.

(2) Condition 2 of defrosting.

The defrosting time is 10 minutes.

(3) No matter what condition of defrosting is, if the defrosting time keeps 7.5 minutes for 3 times, it will be 10 minutes in the 4<sup>th</sup> defrosting.

### For 24k,28k models:

#### 1) Defrosting condition:

AC will enter defrosting mode if any of the following items is satisfied.

(1) When  $T3 < TC1^{\circ}C$ , if the compressor keeps running over 40 minutes and  $T3 < TC3^{\circ}C$  for 3 minutes.

(2) After the last defrosting, the time that the outdoor fan is off but the compressor is on in high T2 protection cumulates up to 90 minutes.

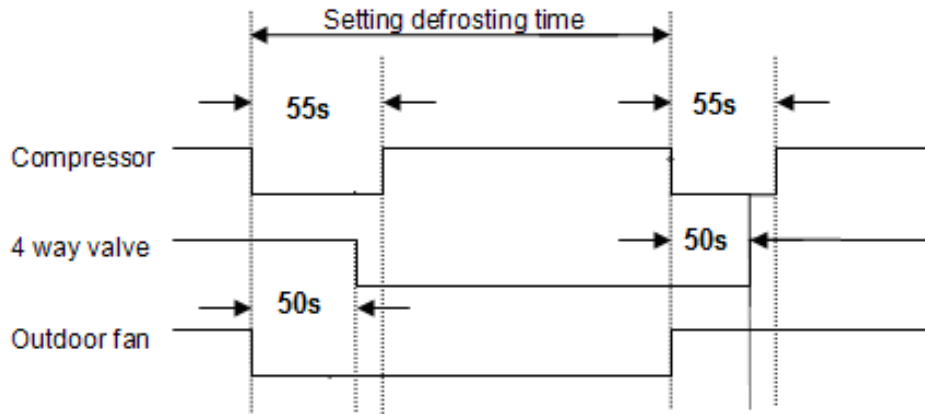
#### 2) Condition of ending defrosting:

If any one of the following items is satisfied, the defrosting will terminate and the machine will turn to normal heating mode.

(1)  $T3$  rises to be higher than  $TC2$ .

(2) The machine has run for 10 minutes in defrosting.

#### 3) Defrosting action:



**For 18k models:**

**Condition of defrosting:**

If any one of following items is satisfied, defrosting will start.

Condition 1: Both the following conditions are satisfied:

A: If the working time of the compressor accumulates to 42 min and one continuous working time is more than 330s.

B: Check the temperature difference between T2 and T1

Fan speed / °C	T2-T1	Note
High	$< TH_{DEFROST}$	If indoor fan is in high speed and $T2-T1 < TH_{DEFROST}$ , start defrosting
Medium	$< TM_{DEFROST}$	If indoor fan is in medium speed and $T2-T1 < TM_{DEFROST}$ , start defrosting
Low	$< TL_{DEFROST}$	If indoor fan is in low speed and $T2-T1 < TL_{DEFROST}$ , start defrosting
Breeze or stop	/	If indoor fan is breezing or stopped, start defrosting

Condition 2: If the accumulated time of outdoor fan stopped but the compressor keep working due to evaporator high temperature protection mode reaches 90 min from the end of last defrosting mode.

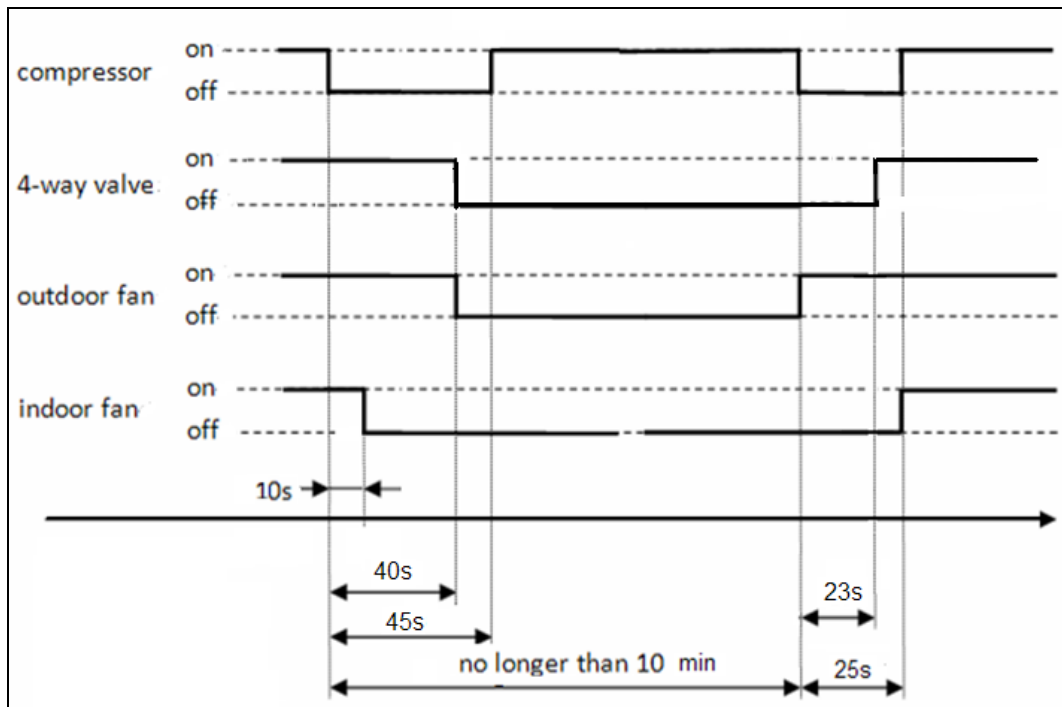
**Condition of defrosting stop:**

If any one of following conditions occurs, the defrosting will finish and the machine will turn to normal heating mode.

Condition 1: Reached the defrosting time.

Condition 2: The current of compressor is more than  $I_{defrost}$  continuously more than 7s. The value of  $I_{defrost}$  is depending on the exactly machine.

**Defrosting actions:**



During the defrosting mode, if the machine stopped or transferred to other mode, the defrosting mode will stop, and all the defrosting conditions will be cleared.

#### 8.4.4 Auto-mode

The machine will choose cooling, heating or fan-only mode according to  $\Delta T$  ( $\Delta T = T1 - Ts$ ).

For 7, 9, 12, 18k models:

$\Delta T = T1 - Ts$	Running mode
$\Delta T > 2^\circ\text{C}$	Cooling
$-1 \leq \Delta T \leq 2^\circ\text{C}$	Fan-only
$\Delta T < -1^\circ\text{C}$	Heating (for cooling only models, they will run at fan-only mode)

For 24 and 28k models:

$\Delta T = T1 - Ts$	Running mode
$\Delta T > 2^{\circ}\text{C}$	Cooling
$-1 < \Delta T \leq 2^{\circ}\text{C}$	Fan-only
$\Delta T \leq -1^{\circ}\text{C}$	Heating(for cooling only models, they will run at fan-only mode)

AC will run in auto mode in the below cases:

- (1) Press the forced auto button.
- (2) If AC is off, it will run in auto mode when timer on function is active.
- (3) After setting the mode, AC will run in auto mode if the compressor keeps not running for 15 minutes

#### 8.4.5 Drying mode

**For 7k,9k,12k,18k models:**

8.4.5.1 The indoor fan will run following the compressor .If the compressor is on, the indoor fan will run at low speed .If the compressor is off, the indoor fan will run at breeze.

Running rules:

No	Condition	Indoor fan	Compressor and outdoor fan
1	$T1 \geq Ts+2$	Low Breeze	ON 6 minutes OFF 4 minutes
2	$Ts \leq T1 < Ts+2$	Low Breeze	ON 5 minutes OFF 5 minutes
3	$T1 < Ts$	Low Breeze	ON 4 minutes OFF 6 minutes

8.4.5.2 In drying mode, if room temperature is lower than 10°C, the indoor fan will run at breeze while the compressor and outdoor fan will stop and not resume until room temperature exceeds 13°C.

8.4.5.3 System protection is active in this mode.

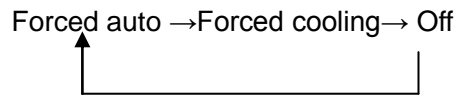
**For 24k,28k models:**

8.4.5.4 The indoor fan will keep running at low speed.

8.4.5.5 The outdoor fan, compressor and all the protections are the same with cooling mode.

#### 8.4.6 Forced operation function

Press the touch button continually, the AC will run as below sequence:



Forced cooling mode:

The compressor and outdoor fan keep running and the indoor fan runs at low speed. After running for 30 minutes, AC will turn to drying mode(AC will turn to auto mode for 21k,24k models) with 24°C setting temperature.

Forced auto mode:

The action of forced auto mode is the same as normal auto mode with 24°C setting temperature.

- When AC receives signals, such as switch on, switch off, timer on, timer off, mode setting, fan speed setting ,sleeping mode setting, follow me setting, it will quit the forced operation.
- The forced operation function can not be memorized if power off.

## 8.4.7 Timer function

8.4.7.1 Timing range is 24 hours.

8.4.7.2 Timer on. The machine will turn on automatically when reaching the setting time.

8.4.7.3 Timer off. The machine will turn off automatically when reaching the setting time.

8.4.7.4 Timer on/off. The machine will turn on automatically when reaching the setting “on” time, and then turn off automatically when reaching the setting “off” time.

8.4.7.5 Timer off/on. The machine will turn off automatically when reaching the setting “off” time, and then turn on automatically when reaching the setting “on” time.

8.4.7.6 For 7k,9k,12k,16k,17k,18k models, the timer function will not change the AC current operation mode. Suppose users set the “timer off” function and AC is off now, the AC will keep the current running mode and then turn off when reaching the setting time. For 21k,24k models, the timer function will change the AC current operation mode. Suppose users set the “timer off” function and AC is off now, the AC will turn on firstly and then turn off when reaching the setting time.

8.4.7.7 The setting time is relative time.

## 8.4.8 Sleep function mode

8.4.8.1 Operation time in sleep mode is 7 hours. After 7 hours, the AC quits this mode and turns off.

8.4.8.2.Operation process in sleep mode is as follow:

After pressing ECONOMIC or SLEEP button on controller, the machine will turn into sleep mode.

When cooling, the setting temperature rises 1°C (be lower than 30°C) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed as low speed.

When heating, the setting temperature decreases 1°C (be higher than 17°C) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed as low speed. (Anti-cold wind function has the priority).

8.4.8.3 Timer setting is available.

8.4.8.4 When user uses timer off function in sleep mode (or sleep function in timer off mode), if the timing is less than 7 hours, sleep function will be cancelled when reaching the setting time. If the timing is more than 7 hours, the machine will not stop until reaches the setting time in sleep mode.

### 8.4.9 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including Swing function) automatically after 3 minutes when power returns.

If the memorization condition is forced cooling mode, the unit will run in cooling mode for 30 minutes and then turn to drying mode (auto mode for 21k, 24k models) as 24°C setting temp.

## 9. Troubleshooting

### 9.1 Indoor unit error display

For 24 and 28k models:

Operation lamp	Timer lamp	Defrosting lamp	Auto lamp	Failure
☆	☆	☆	X	Over current protection occurs 4 times.
☆	X	X	X	The T2 sensor is open circuit or short circuit
X	☆	X	X	The T1 sensor is open circuit or short circuit
X	X	☆	X	The T3 sensor is open circuit or short circuit
☆	☆	X	X	EEPROM error
X	X	X	☆	Indoor / outdoor units communication error

O (light)    X (off)    ☆ (flash)



**For some 18k models:**

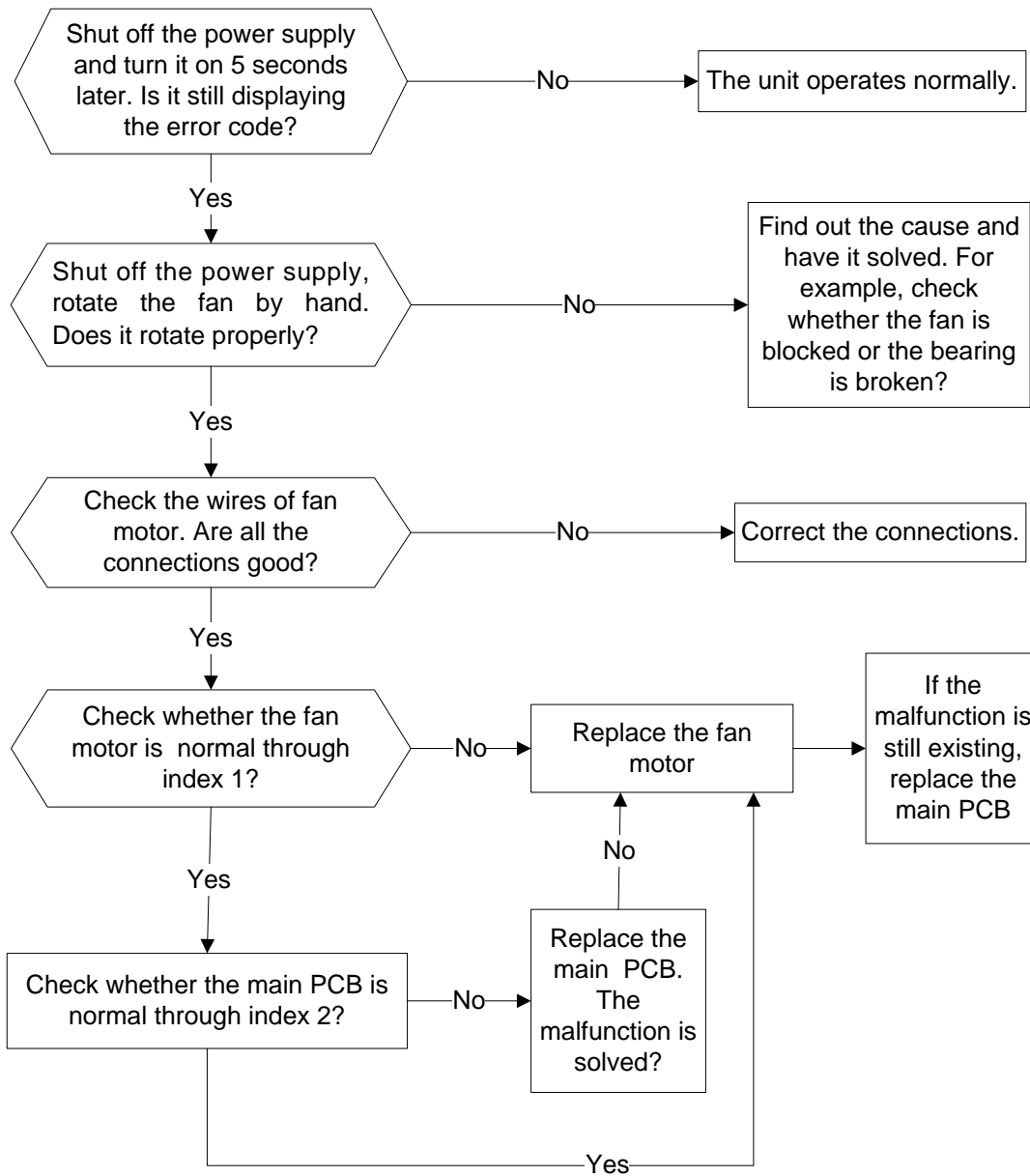
Display	LED STATUS
E1	EEPROM error
E2	Zero crossing signal detection error
E3	Indoor fan speed has been out of control
E4	Over current protection of the compressor occurs 4 times
E5	Open circuit or short circuit of room temperature sensor
E6	Evaporator temperature sensor open circuit or short circuit

**For other models:**

Operation lamp	Timer lamp	Failure
☆	X	Indoor fan speed has been out of control
☆	O	The T1 or T2 sensor is open circuit or short circuit
X	☆	Over current protection occurs 4 times
O	☆	EEPROM error
☆	☆	Zero crossing signal detection error

## 9.2 Diagnosis and Solution

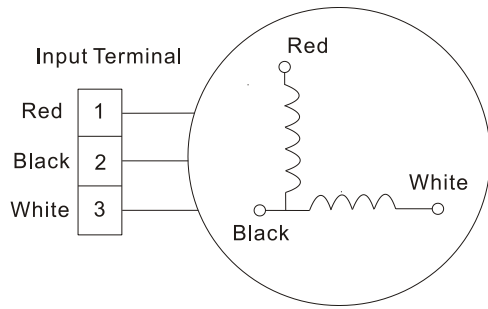
### 9.2.1 Indoor fan speed out of control diagnosis and solution



Index 1:

1. Indoor AC Fan Motor

Measure the resistance value of each winding by using the tester.

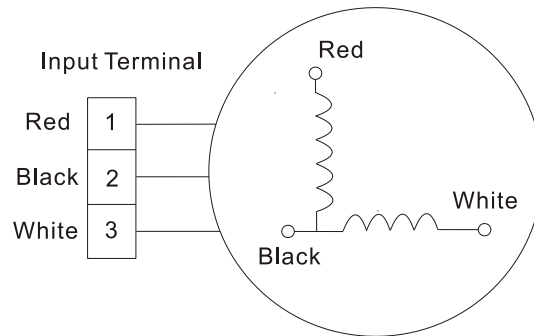


For the definite resistance value of the motor, please contact the technical engineer.

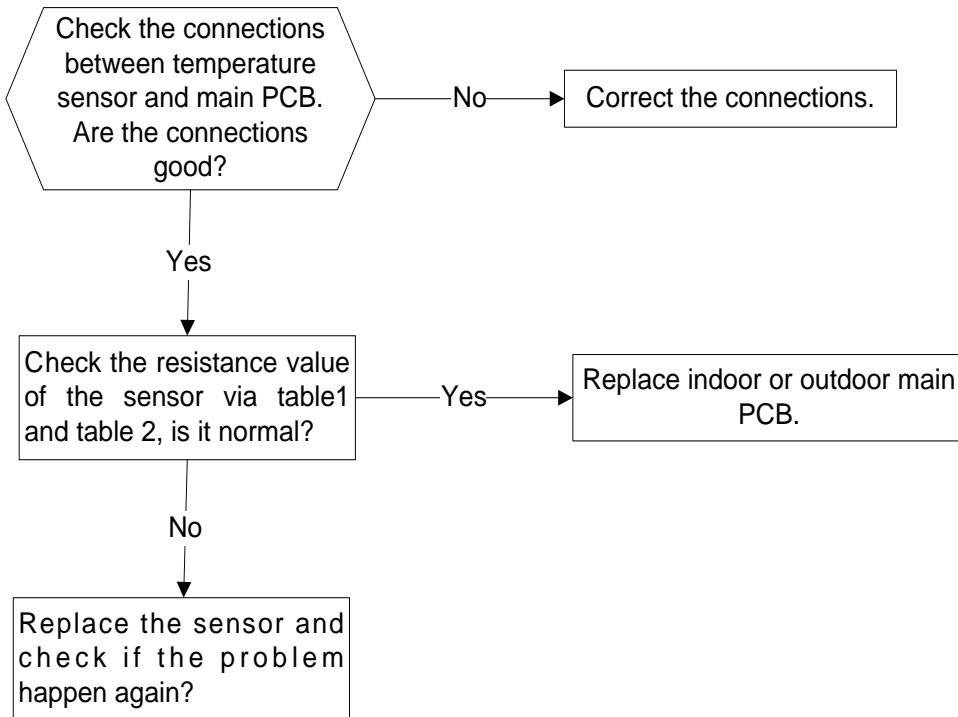
Index2:

1: Indoor AC Fan Motor

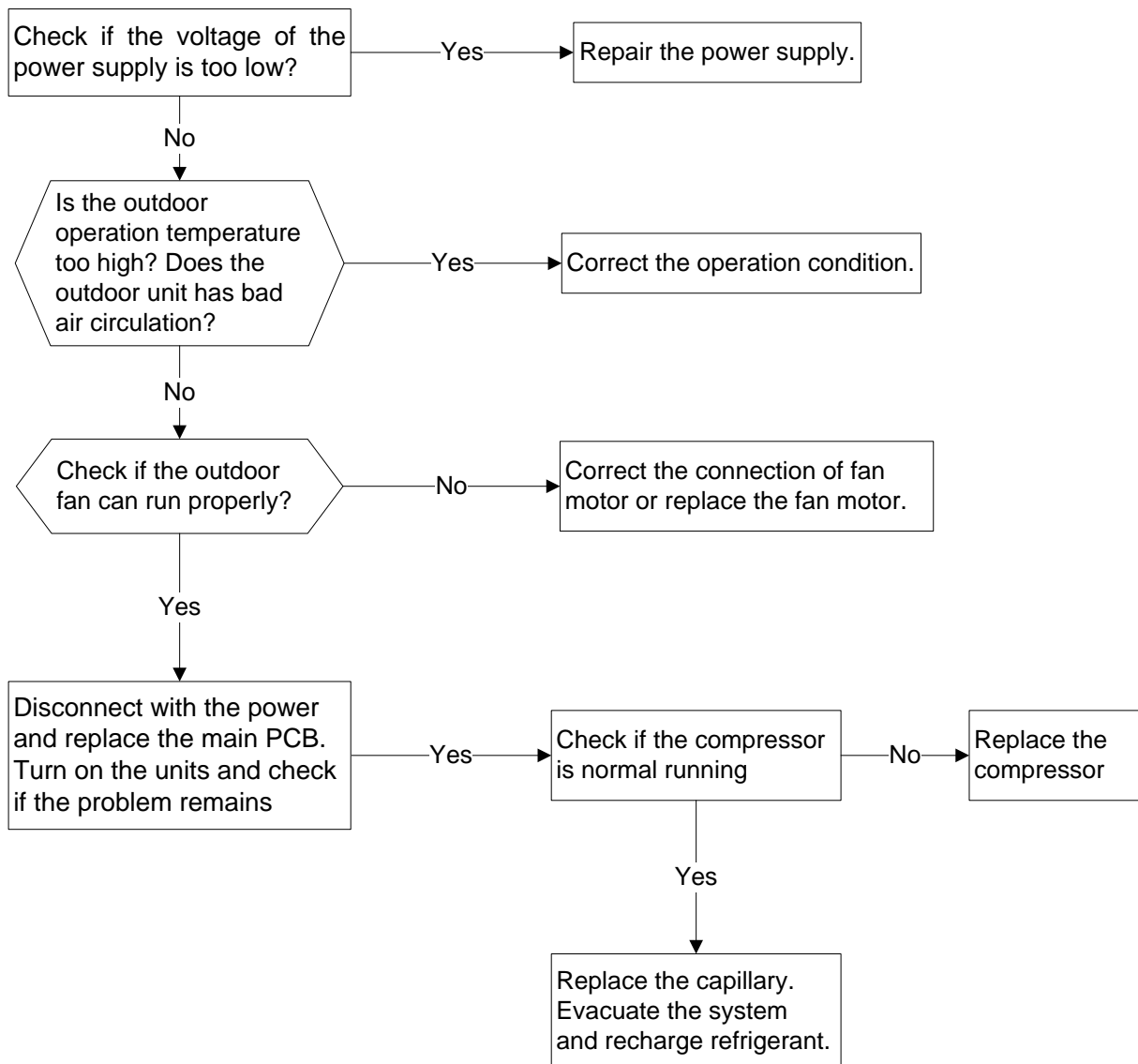
Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of pin1 and pin2. If the value of the voltage is less than 100V(208~240V power supply)or 50V(115V power supply), the PCB must has problems and need to be replaced.



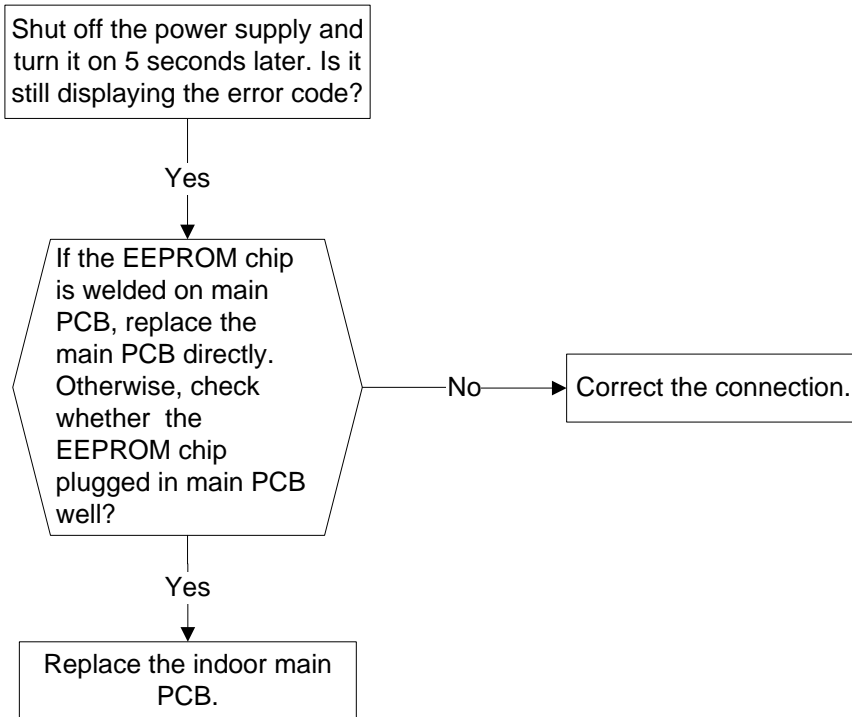
### 9.2.2 The temp. sensor is open circuit or short circuit diagnosis and solution



### 9.2.3 Over current protection occurs 4 times diagnosis and solution

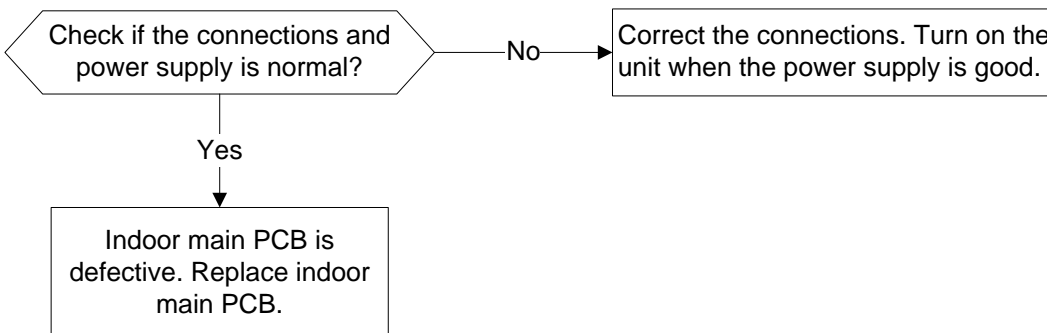


### 9.2.4 EEPROM parameter error diagnosis and solution

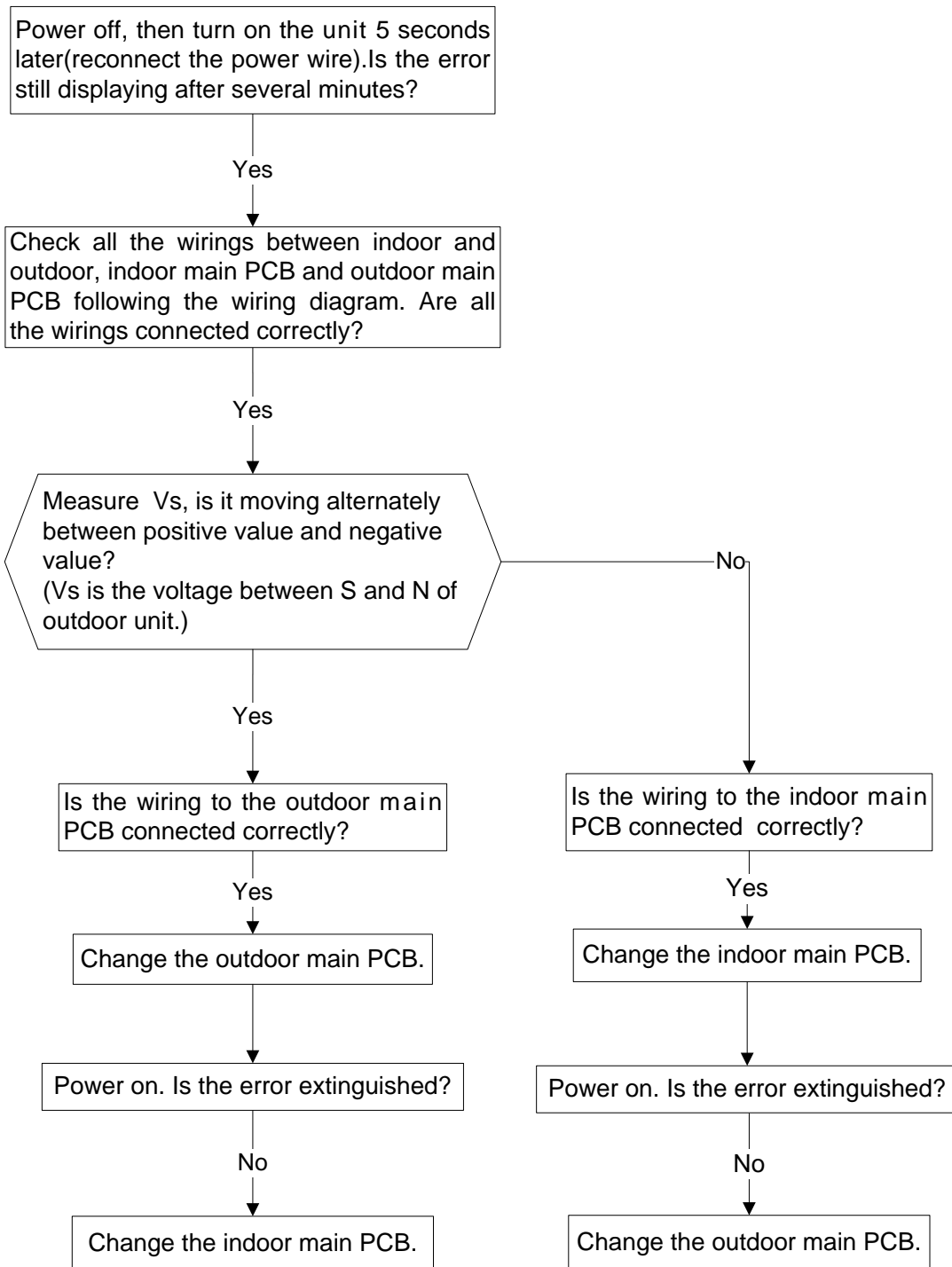


EEPROM: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

### 9.2.5 Zero crossing detection error diagnosis and solution



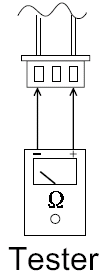
### 9.2.6 Indoor / outdoor units communication error diagnosis and solution



Main parts check

1. Temperature sensor checking

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.



Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

Measure the resistance value of each winding by using the multi-meter.

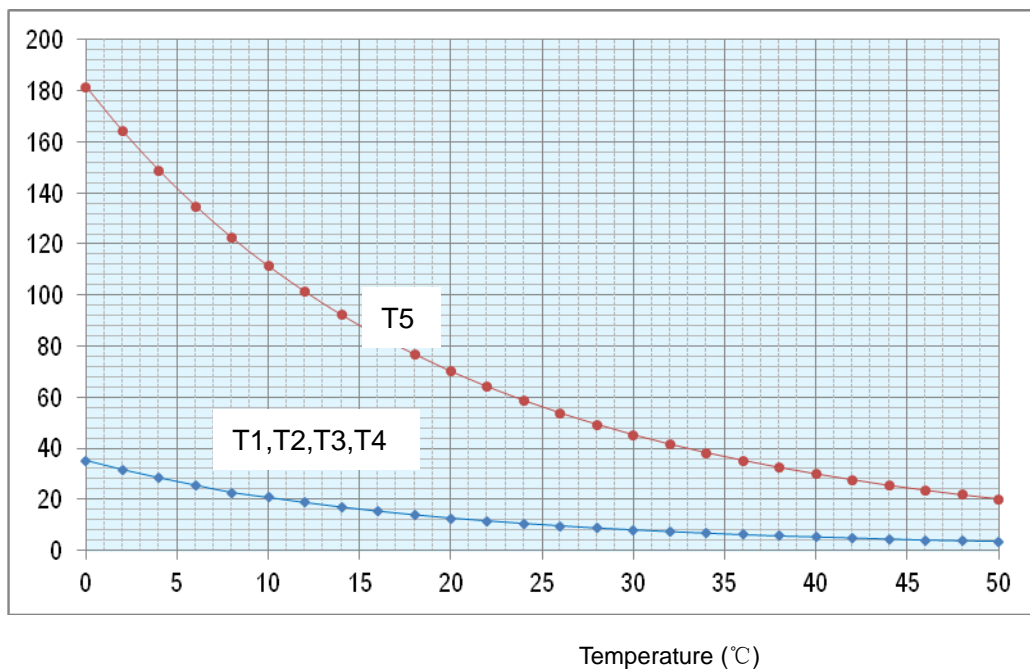
Table 1:Some frequently-used R-T data for T1,T2,T3 and T4 sensor:

Temperature (°C)	5	10	15	20	25	30	40	50	60
Resistance Value (KΩ)	26.9	20.7	16.1	12.6	10	8	5.2	3.5	2.4

Table 2:Some frequently-used R-T data for T5 sensor:

Temperature (°C)	5	15	25	35	60	70	80	90	100
Resistance Value (KΩ)	141.6	88	56.1	36.6	13.8	9.7	6.9	5	3.7

Resistance value (KΩ)





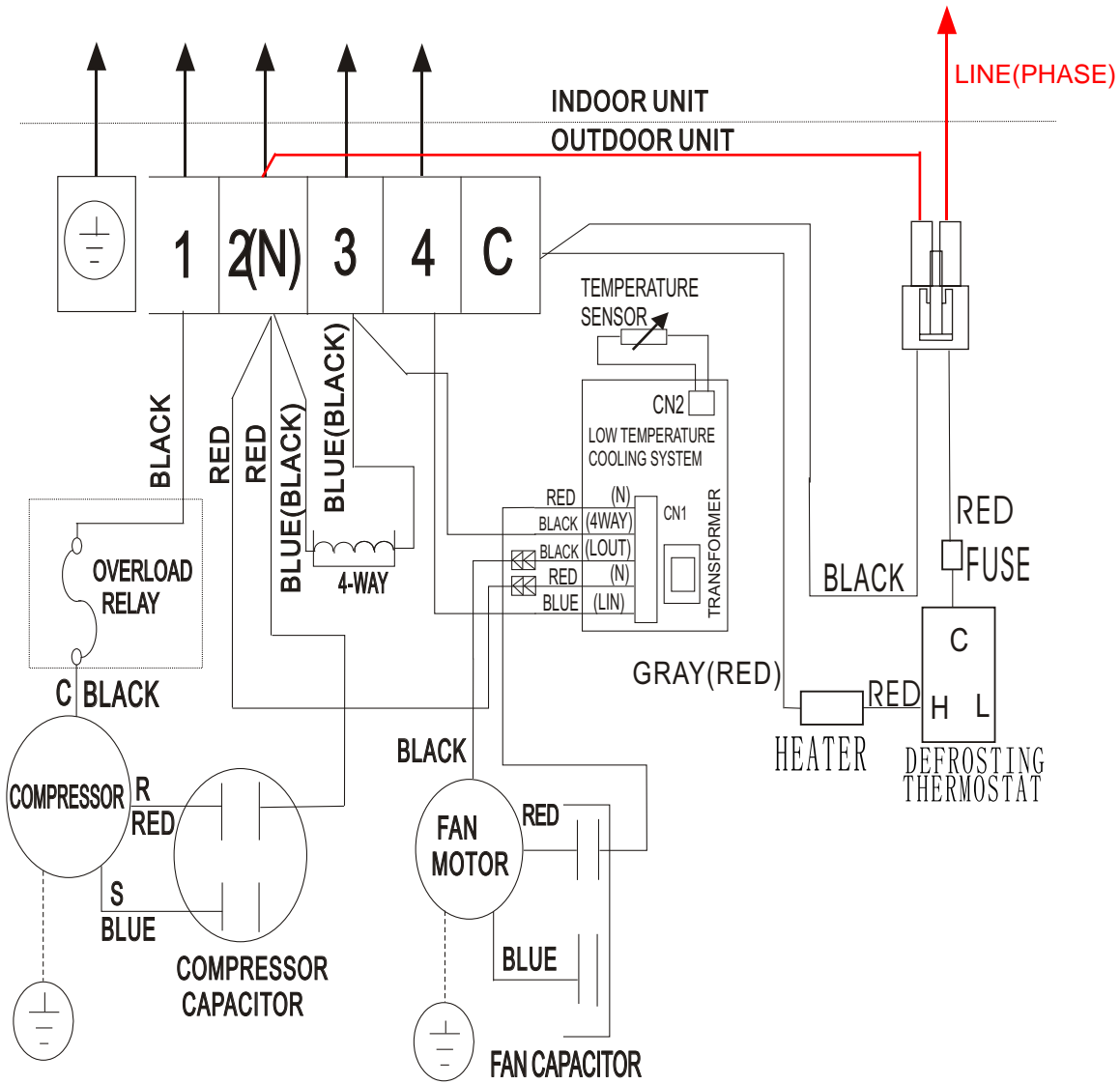
Model			MDSR-07HRN1	MDSR-09HRN1
Indoor			MDSR-07HRN1	MDSR-09HRN1
Outdoor			MDOR-07HN1	MDOR-09HN1
Power supply		Ph-V-Hz	220-240V~ 50Hz, 1Ph	
Cooling	Capacity	Btu/h	7500	9000
	Input	W	680	820
	Rated current	A	3.1	3.7
	EER	W/W	3.21	3.21
Heating	Capacity	Btu/h	8000	9500
	Input	W	650	770
	Rated current	A	3.0	3.4
	COP	W/W	3.61	3.61
Moisture Removal		L/h	0.8	1.0
Max. input consumption		W	1050	1100
Max. current		A	5.5	5.5
Starting current		A	19	21.7
Compressor	Model		PA89M1C-4DZDE	PA103M1C-4DZDE2
	Type		ROTARY	ROTARY
	Brand		GMCC	GMCC
	Capacity	Btu/h	7302/7404	8428/8530
	Input	W	720/735	830/860
	Rated current(RLA)	A	3.30/3.10	3.85/3.73
	Locked rotor Amp(LRA)	A	19	21.7
	Thermal protector		B140-135-241E or BF670-MA	B160-135-241E
	Thermal protector position		EXTERNAL	EXTERNAL
	Capacitor	uF	25	25
	Refrigerant oil/oil charge	ml	ESTER OIL VG74/350CC	ESTER OIL VG74 350cc
Indoor fan motor	Model		RPG13H	RPG13H
	Brand		Welling	Welling
	Input	W	34	34
	Capacitor	uF	1.2	1.2
	Speed(Hi/Mi/Lo)	r/min	1150/950/850	1220 / 1000 / 850
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	20x11.28	20x11.28
	c.Fin spacing	mm	1.3	1.3
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	Φ6,innergroove tube	Φ6,innergroove tube
	f.Coil length x height x width	mm	540x240x22.56	540x240x22.56
	g.Number of circuits		2	2
Indoor air flow (Hi/Mi/Lo)		m3/h	400/330/300	480/370/300
Indoor noise level (Hi/Mi/Lo)		dB(A)	36/31/27	38/33/29
Indoor unit	Dimension(W*D*H)	mm	710x189x250	710x189x250
	Packing (W*D*H)	mm	775x260x324	775x260x324
	Net/Gross weight	Kg	7 / 8.5	7 / 9.5
Outdoor fan motor	Model		YDK25-4(B)	YDK24-6T(B)
	Brand		Welling	Welling
	Input	W	61	70
	Capacitor	uF	2	3.0
	Speed	r/min	965 / -- / --	815 / -- / --
Outdoor coil	a.Number of rows		1	1
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1.3	1.4
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	Φ7,innergroove tube	Φ7,innergroove tube

	f.Coil length x height x width	mm	676x399x13.37	694*504*13.37
	g.Number of circuits		2	1
Outdoor air flow		m3/h	1300	1650
Outdoor noise level		dB(A)	55	54
Outdoor unit	Dimension(W*D*H)	mm	685x260x430	700x240x540
	Packing (W*D*H)	mm	795x345x495	815x325x580
	Net/Gross weight	Kg	23 / 25	24.5 / 26.5
Refrigerant type		g	R410A/550g	R410A/620g
Design pressure		MPa	4.2/1.5	4.2/1.5
Refrigerant piping	Liquid side/ Gas side	mm(inch)	Φ6.35/Φ9.52(1/4"/3/8")	Φ6.35/Φ9.52(1/4"/3/8")
	Max. refrigerant pipe length	m	20	20
	Max. difference in level	m	8	8
Thermostat type		°C	Remote Control	Remote Control
Operation temperature	Indoor(cooling/ heating)	°C	17~32/0~30	17~32/0~30
	Outdoor(cooling/heating)		18~43/-7~24	18~43/-7~24
<b>Model</b>			MDSR-12HRN1	MDSR-18HRN1
<b>Indoor</b>			MDSR-12HRN1	MDSR-18HRN1
<b>Outdoor</b>			MDOR-12HN1	MDOR-18HN1
Power supply		Ph-V-Hz	220-240V~ 50Hz, 1Ph	
Cooling	Capacity	Btu/h	12000	18000
	Input	W	1090	1640
	Rated current	A	4.8	7.5
	EER	W/W	3.21	3.21
Heating	Capacity	Btu/h	12000	18000
	Input	W	970	1460
	Rated current	A	4.4	7.3
	COP	W/W	3.63	3.61
Moisture Removal		L/h	1.2	1.8
Max. input consumption		W	1490	2200
Max. current		A	7.4	12.0
Starting current		A	19,2	31.8
Compressor	Model		PA118M1C-4FZ2	PA200M2CS-4KU2
	Type		ROTARY	ROTARY
	Brand		GMCC	GMCC
	Capacity	Btu/h	9495/9605	16581
	Input	W	955/995	1605
	Rated current(RLA)	A	4.5/4.4	7.45
	Locked rotor Amp(LRA)	A	19,2	31.8
	Thermal protector		-----	-----
	Thermal protector position		INTERNAL	INTERNAL
	Capacitor	uF	25	45
	Refrigerant oil/oil charge	ml	ESTER OIL VG74/350	ESTER OIL VG74 750cc
Indoor fan motor	Model		RPG20E	RPG28R
	Brand		Welling	Welling
	Input	W	45	71
	Capacitor	uF	1.5	1.5
	Speed(Hi/Mi/Lo)	r/min	1200/1100/800	1250/1050/850
Indoor coil	a.Number of rows		1/2	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1.2/1.3	1.3
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	Φ7,innergroove tube	Φ7,innergroove tube
	f.Coil length x height x width	mm	637x84x13.37+637x189x26.74	769x273x26.74

	g.Number of circuits		2	3
Indoor air flow (Hi/Mi/Lo)		m3/h	580/500/400	750/630/510
Indoor noise level (Hi/Mi/Lo)		dB(A)	41/38/35	46/41/35
Indoor unit	Dimension(W*D*H)	mm	790x196x275	930x198x275
	Packing (W*D*H)	mm	865x265x350	1015x265x350
	Net/Gross weight	Kg	8/10	10 / 12.5
Outdoor fan motor	Model		YDK24-6F(B)	YDK48-6H(A)
	Brand		Welling	Welling
	Input	W	63	110
	Capacitor	uF	2.5	3.0
	Speed	r/min	800	890 / -- / --
Outdoor coil	a.Number of rows		1	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1.4	1.4
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	Φ7, innergroove tube	Φ7,innergroove tube
	f.Coil length x height x width	mm	755x504x13.37	655x546x26.74
	g.Number of circuits		2	3
Outdoor air flow		m3/h	1800	2300
Outdoor noise level		dB(A)	54	60
Outdoor unit	Dimension(W*D*H)	mm	780x250x540	760x285x590
	Packing (W*D*H)	mm	910x335x585	887x355x645
	Net/Gross weight	Kg	26/28	37.5 / 39.5
Refrigerant type		g	R410A/750g	R410A/1150g
Design pressure		MPa	4.2/1.5	4.2/1.5
Refrigerant piping	Liquid side/ Gas side	mm(inch)	Φ6.35 / Φ12.7(1/4"/1/2")	Φ6.35/Φ12.7(1/4"/1/2")
	Max. refrigerant pipe length	m	20	25
	Max. difference in level	m	8	10
Thermostat type		°C	Remote control	Remote Control
Operation temperature	Indoor(cooling/ heating)	°C	17~32/0~30	17~32/0~30
	Outdoor(cooling/heating)		18~43/-7~24	18~43/-7~24
<b>Model</b>			MDSR-24HRN1	MDSR-28HRN1
<b>Indoor</b>			MDSR-24HRN1	MDSR-28HRN1
<b>Outdoor</b>			MDOR-24HN1	MDOR-28HN1
Power supply		Ph-V-Hz	220-240V~ 50Hz, 1Ph	
Cooling	Capacity	Btu/h	24000	28000
	Input	W	2502	2928
	Rated current	A	11.2	13.4
	EER	W/W	2,81	2.81
Heating	Capacity	Btu/h	25000	28000
	Input	W	2283	2554
	Rated current	A	10.2	11.6
	COP	W/W	3,21	3.21
Moisture Removal		L/h	2.4	2.8
Max. input consumption		W	3312	3418
Max. current		A	17.4	16.9
Starting current		A	36,8	60
Compressor	Model		PA240X2CS-4KU1	PA270G2CS-4MU1
	Type		ROTARY	ROTARY
	Brand		GMCC	GMCC
	Capacity	Btu/h	19789/19960	23287/23458
	Input	W	1985/2060	2235/2385
	Rated current(RLA)	A	9.2/9.3	10.55/11.15

	Locked rotor Amp(LRA)	A	36,8	60
	Thermal protector		UP3SE0391-T39	---
	Thermal protector position		INTERNAL	INTERNAL
	Capacitor	uF	50	60
	Refrigerant oil/oil charge	ml	ESTER OIL VG74/750	ESTER OIL VG74/850 CC
Indoor fan motor	Model		YDK36-4C(A)	YDK36-4C(A)
	Brand		Welling	Welling
	Input	W	67/58/50	70/54/50
	Capacitor	uF	2	3.0
	Speed(Hi/Mi/Lo)	r/min	1210/1120/1020	1210/1020/950
Indoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1,4	1.2
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	Φ7,innergroove tube	Φ7,innergroove tube
	f.Coil length x height x width	mm	799x357x26.74	799x357x26.74
	g.Number of circuits		4	4
Indoor air flow (Hi/Mi/Lo)		m3/h	920/850/780	1050/890/820
Indoor noise level (Hi/Mi/Lo)		dB(A)	44/42/39	48/44/42
Indoor unit	Dimension(W*D*H)	mm	1036x230x315	1036x230x315
	Packing (W*D*H)	mm	1135x435x315	1135x435x315
	Net/Gross weight	Kg	13 / 20	13 / 17.5
Outdoor fan motor	Model		YDK75-6D(B)	YDK53-6C
	Brand		Welling	Welling
	Input	W	170	136
	Capacitor	uF	5.0	3
	Speed	r/min	875	800
Outdoor coil	a.Number of rows		2	2
	b.Tube pitch(a)x row pitch(b)	mm	21x13.37	21x13.37
	c.Fin spacing	mm	1,4	1.4
	d.Fin type (code)		Hydrophilic aluminium	Hydrophilic aluminium
	e.Tube outside dia.and type	mm	Φ7,innergroove tube	Φ7,innergroove tube
	f.Coil length x height x width	mm	760*546*26.74	785x651x26.74
	g.Number of circuits		4	4
Outdoor air flow		m3/h	2500	2700
Outdoor noise level		dB(A)	61	59
Outdoor unit	Dimension(W*D*H)	mm	820x330x595	845x320x700
	Packing (W*D*H)	mm	940x415x645	965x395x755
	Net/Gross weight	Kg	44 / 48	49 / 52.5
Refrigerant type		g	R410A/1600g	R410A/1690g
Design pressure		MPa	4.2/1.5	4.2/1.5
Refrigerant piping	Liquid side/ Gas side	mm(inch)	Φ9.52/Φ15.9(3/8"/5/8")	Φ9.52/Φ15.9(3/8"/5/8")
	Max. refrigerant pipe length	m	25	25
	Max. difference in level	m	10	10
Thermostat type		°C	Remote Control	Remote Control
Operation temperature	Indoor(cooling/ heating)	°C	17~32/0~30	17~32/0~30
	Outdoor(cooling/heating)		18~43/-7~24	18~43/-7~24

# 9 / 12 / 18kBTU



# 28kBTU

