



## **Service manual for Split Wall-Mounted Type Room air conditioner**

**Applied to: R410a**

**ACS-HR09LED R410A**

### **NOTE:**

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Be sure to read the manual firstly before servicing the units. Please contacts with your service center at any time if meet problem.

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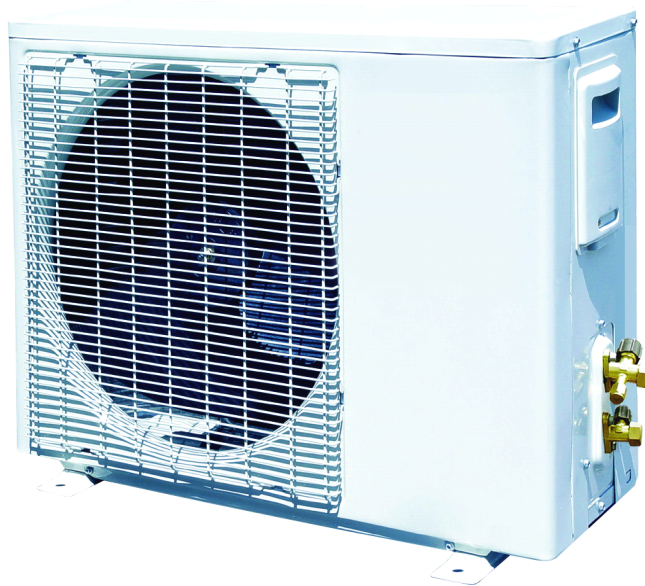
# 1. Summary

## 1.1 indoor unit



**Model 81**

## 1.2 outdoor unit

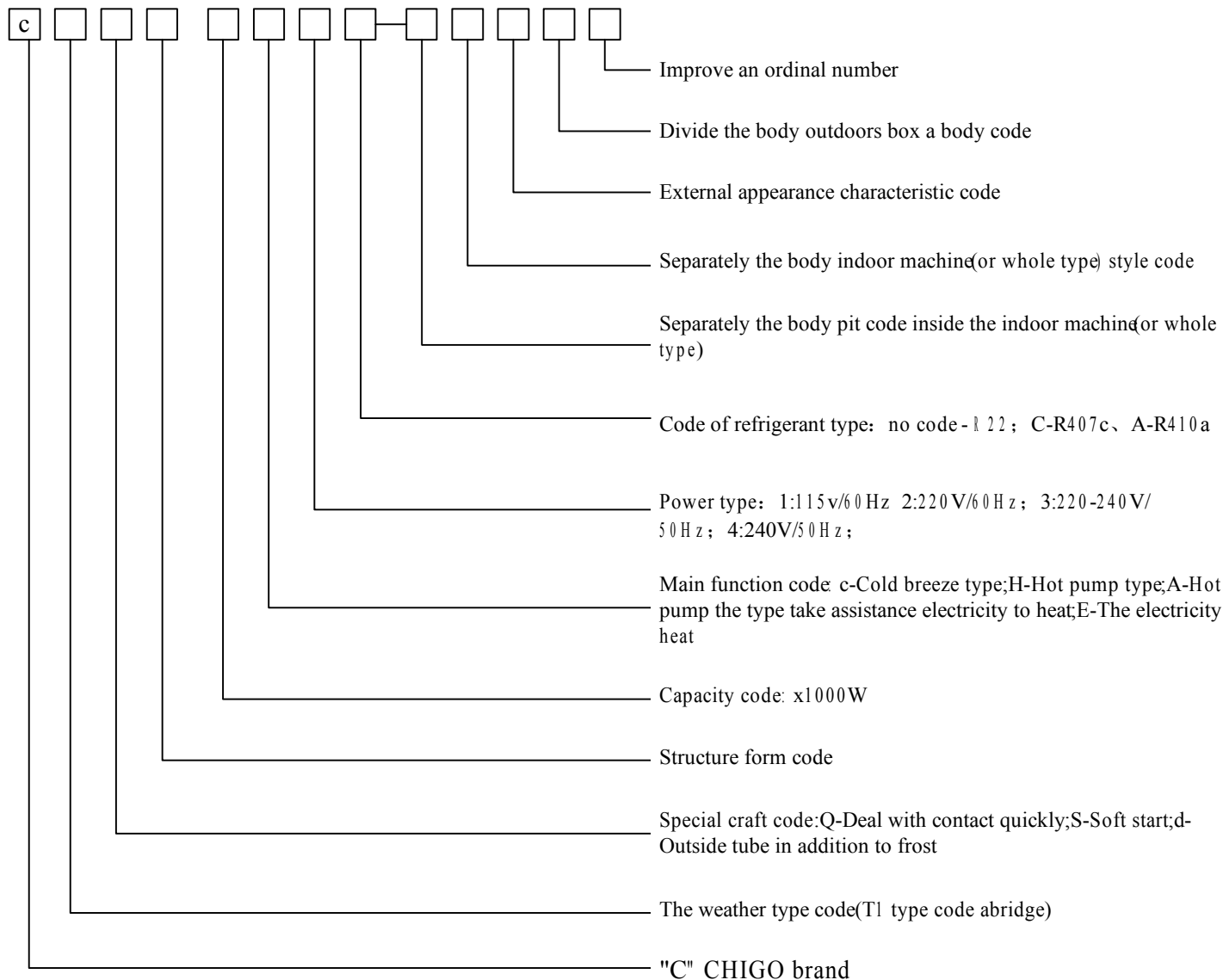


ACS-HR09LED R410A

## 1.3 remote controller



## 2、 Model explaining



**Model :** CS-25C3A-V85AY1

T1 climate type, wall split type air conditioner, cooling capacity is 2500W, power is 220V ~ /50Hz/1PH, refrigeration is R410A, the kernel of indoor unit is fresh 98, the pattern no. is 85, first time design, outdoor unit is 1HP of 2003 year.

Indoor unit model is: CS-25C3A-V85A, outdoor unit model is: CS-25C3A-Y1.

## 3. Attention of installation

### 3.1 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.

### 3.2 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 or 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 cautious 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 turning 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.

To avoid water leakage from vibration.

- 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.

## >Operation <

- 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 of the batteries have leaked.  
The chemical in batteries could cause burns or other health hazards.

### 3.3 Installation details

- Wrench torque sheet for installation

Outside diameter		Torque
mm	inch	Kg.m
φ6.35	1/4	1.8
φ9.52	3/8	4.2
φ12.7	1/2	5.5
φ15.88	5/8	6.6
φ19.05	3/4	6.6

- Connecting the cables

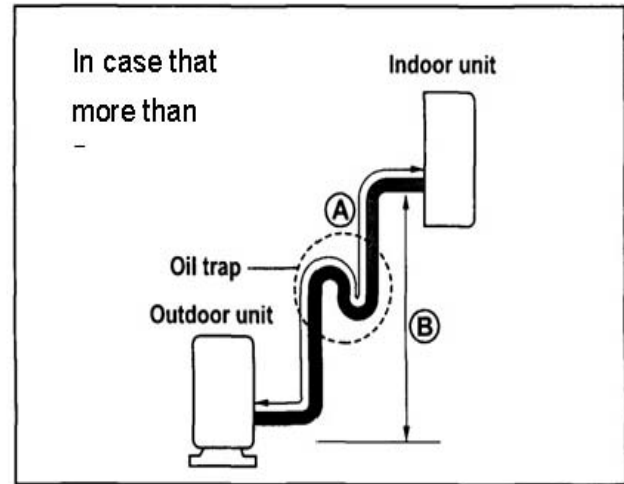
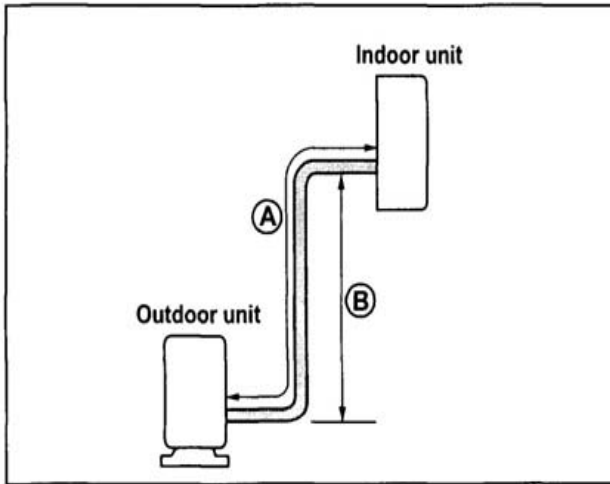
The power cord of connect should be selected according to the following specifications sheet.

Unit	Grade					
	7K	9K	12K	18K	24K	28K
mm <sup>2</sup>	1.0	1.0	1.5	2.5	2.5	2.5

- Pipe length and the elevation

Capacity	Pipe size		Standard length	Max.	Max.	Additional refrigerant
			(m)	Elevation	Elevation	
Btu/h	GAS	LIQUID		B (m)	A (m)	(g/m)

9K-12K	3/8" (φ9.52)	1/4" (φ6.35)	3.5	5	15	30
18K-22K	1/2" (φ12.7)	1/4" (φ6.35)	4	5	15	30
24K-28K	5/8" (φ15.88)	3/8" (φ9.52)	5	5	15	65



**Caution:** Capacity is base on standard length and maximum allowance length is base of reliability .Oil trap should be installed per 5-7 meters.

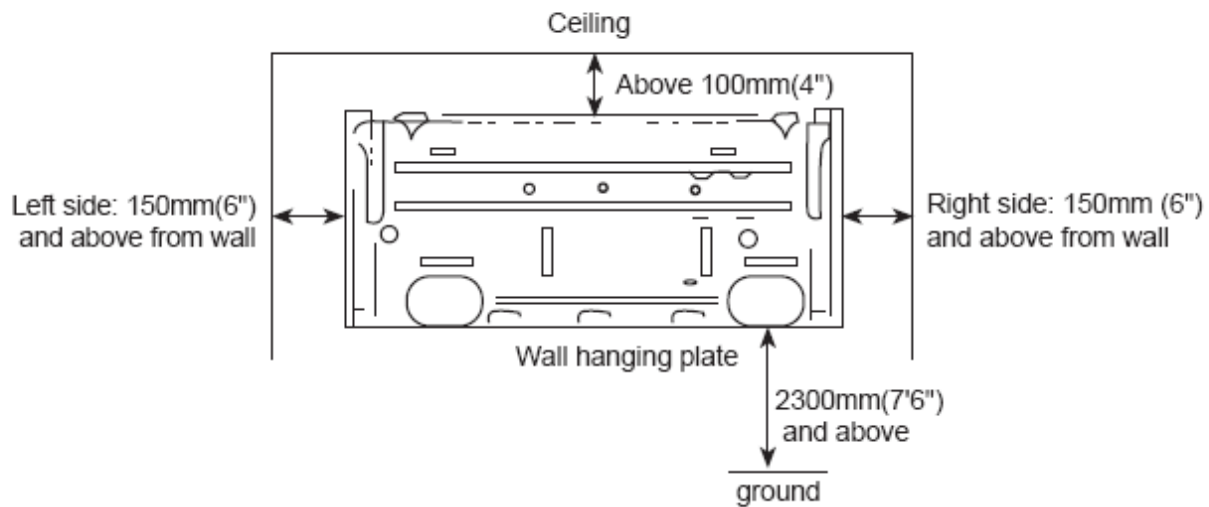
**\* Selection of installation positions for indoor unit\***

- \* To be installed at the position where the air delivered from the unit can reach every corner of the room;
- \* To avoid being affected by the outdoor air;
- \* To avoid blockage to the air inlet or outlet of the unit;
- \* To avoid too much oil smoke or steam;
- \* To avoid possible generation, inflow, lingering or leakage of flammable gases;
- \* To avoid high-frequency facilities (such as high frequency arc welders, etc.);
- \* To avoid the places where acid solutions are frequently used;
- \* To avoid the places where some special sprayers (sulfides) are frequently used.
- \* Not to install on top of the musical instruments,TV,computer etc.valuable appliance.
- \* Not to install a fire alarming device near the air outlet of the unit (during operation, the fire alarm device might be erroneously triggered by the warm air from the unit);



**\* Make sure of enough space for installation and maintenance.**

\* To take into consideration the operational convenience and safety in installation, it is recommended to ensure enough space between the unit and the walls.

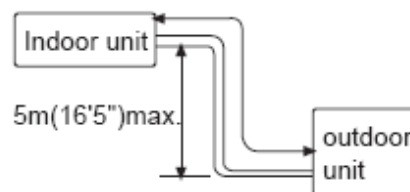


**Attention: If there are some additional function devices to install on the air conditioner, Be sure add to the installation space for the function devices.**

**\* Height limits of indoor and outdoor units.**

\* Either the indoor unit or the outdoor unit can be higher, but the height difference must comply the stated requirements.

\* Try to reduce the bending of the piping line as much as possible so as to avoid possible negative impacts upon the performances of the units.

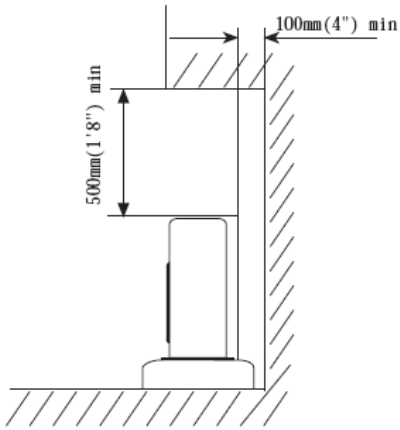


**Selection of installation positions for outdoor unit**

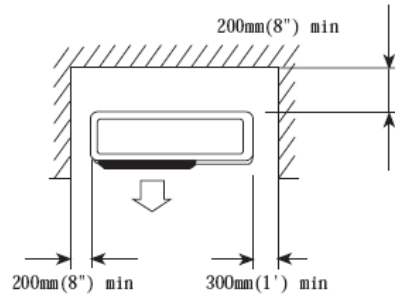
- To install the outdoor unit at the places which can stand the load of the machine weight and will not cause big vibrations and noises;
- To install the unit at the places not to be exposed to rain or direct sunshine, and the places with good ventilation;
- The noises generated from the unit will not affect the neighboring places;
- Do not install the unit on non-metal frame;
- Not to install the unit at the places where there might occur the generation, inflow, stay or leakage of inflammable gases;
- Pay attention to the drainage of the condensed water from the base plate during operations;
- To avoid the air outlet being directly against the wind.

**Detailed space requirements around the outdoor unit**

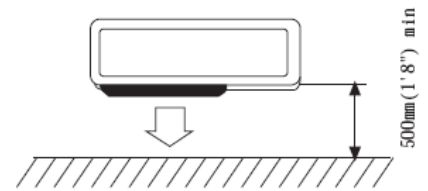
1. When there are obstacles above the unit



2. When the front (air outlet) is open

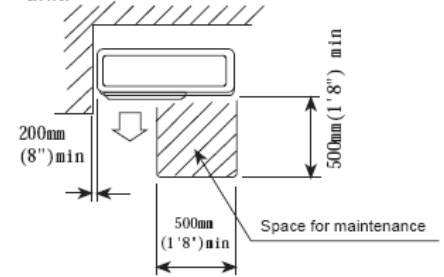


3. When there are

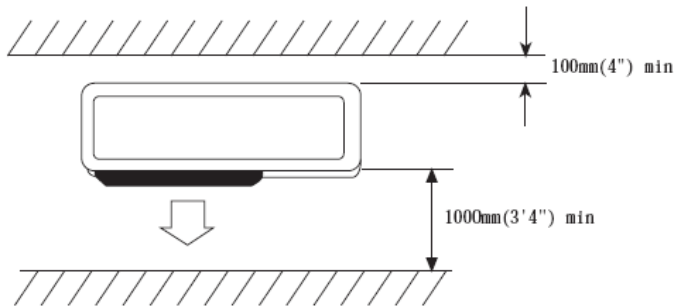


**Space for maintenance**

Shown as in the following figure. Keep the maintenance space in front of the unit.

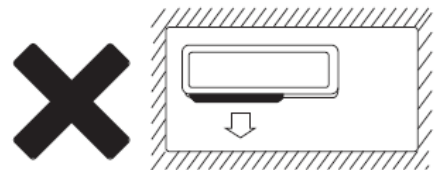


4. When there are obstacles at the front and rear sides.



5. When there are obstacles all around the unit on four sides.

Although the top side is open, the installation is not to be done if there are obstacles all around.



\* At least two sides should be kept open.

## \* Installation fixture of indoor unit \*

Pipelines can be connected in the directions of\*\*\*\*  
\*\*\*\*and\* as indicated in Fig.1. When the pipelines  
are connected to the directions of\*\*\*and\*, a groove  
for the pipes has to be opened at the proper place on  
the base stand.

### 1.Installation of wall-mounting plate

Fix the wall-mounting plate firmly on the wall with screws.  
Make sure of the leveling of the plate. Slanted wall-mounting  
plate might jeopardize the smooth discharge of the condensed  
water.

### 2.Drill holes on the wall

Drill holes at places slightly below the wall-mounting plate,  
with hole diameter of 65mm(2-3/5") and the outer edge of  
the hole 5-10mm(1/5-2/5") lower (Fig.2) so that the condensed  
water can smoothly flow out. Cut the wall penetrating pipe  
to proper length according to the thickness of the wall (3-  
5mm(1/10-1/5") longer than the wall thickness) and insert  
the pipe as indicated in Fig.2.

### 3.Installation of drain pipe

Install the pipelines of the indoor unit in accordance with  
the direction of the wall holes. Wrap tightly the drain pipe  
and the pipelines with tape. Make sure that the drain pipe  
is underneath the pipelines. (Fig.3) (When the drain pipe  
passes the room interior, some condensed water might  
occur to its surfaces if the humidity is very high).

### 4.Installation of indoor unit

Pass the connection wires, connecting pipelines and drain  
pipe through the wall hole. Hang the indoor unit on the  
hooks at the top of the wall-mounting plate so that the  
hooks at the bottom of the indoor unit match the hooks of  
the wall-mounting plate. (Fig.4)

Fig.1

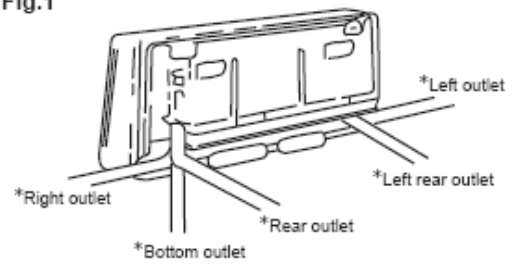


Fig.2

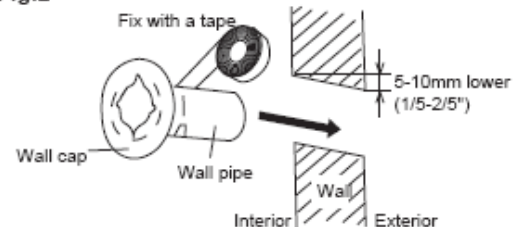


Fig.3

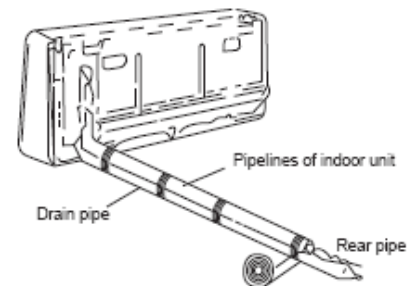
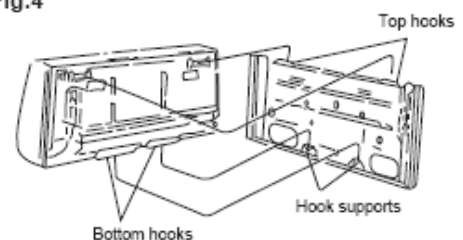
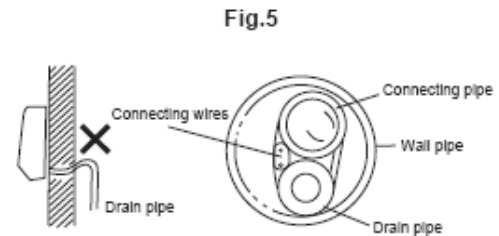


Fig.4



## Inspections:

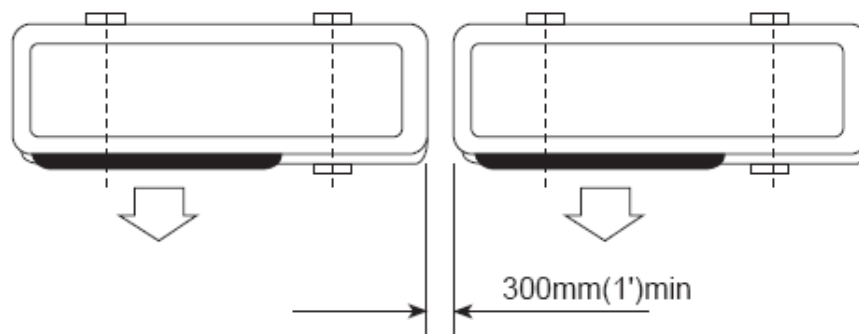
- Check if the hooks at the top and bottom are firmly fixed.
- Check if the position of the master unit is properly leveled.
- The drain pipe should not curve upward (Fig.5).
- The drain pipe should be at the lower part of the wall pipes (Fig. 5).



## \* Installation fixture of outdoor unit \*

- \* Try to ship the product to the installation location in its original package;
- \* As the gravity center of the unit is not at the installation center, special caution should be taken when using hoisting cables to lift it up;
- \* During shipping, the outdoor unit must not be slanted to over 45 degrees (Do not store the unit in a horizontal way).
- \* Use expansion bolts to fix the mounting supports on the wall;
- \* Use bolts and nuts to fix the outdoor unit firmly on the supports and keep on the same level;
- \* If the unit is installed on the wall or at the rooftop, the supports have to be firmly fixed so as to resist earthquake or strong wind.

## Dimensions for parallel units installations



## \* Ordinary pipelines connection & Air purging \*

\* The following ordinary pipelines connection and air purging procedures are just suitable for non-quick coupler model.

### \* Ordinary pipelines connection

No dust, foreign articles, air or moisture should be allowed to enter the air conditioning system. Careful attention should be paid when pipeline connection for outdoor unit is made. Try to avoid repeated curves as much as possible, otherwise hardening or cracks might be caused to the copper pipes. Suitable wrenches should be used when the pipeline connection is done so as to ensure appropriate torque (refer to following torque Table 1). Excessive torque might damage the joints while too little torque might lead to leakage.

**Table 1** Torque based upon the wrench to be used

Outer diameter of copper pipe	Tightening torque	Strengthened tightening torque
∅ 6.35(1/4")	160kgf.cm(63kgf.inch)	200kgf.cm(79kgf.inch)
∅ 9.52(3/8")	300kgf.cm(118kgf.inch)	350kgf.cm(138kgf.inch)
∅ 12.7(1/2")	500kgf.cm(197kgf.inch)	550kgf.cm(216kgf.inch)
∅ 15.88(5/8")	750kgf.cm(295kgf.inch)	800kgf.cm(315kgf.inch)
∅ 19.05(3/4")	1200kgf.cm(472kgf.inch)	1400kgf.cm(551kgf.inch)

**\* Air purging with vacuum pump**

1. Check that pipelines connection have been properly connected, remove the charging port cap, and connect the manifold gauge and the vacuum pump to the charging valve by service hoses as shown Fig.6.

2. Open the valve of the low pressure side of manifold gauge, then, run the vacuum pump. Vacuum the indoor unit and the connecting pipes until the pressure in them lowers to below 1.5mmHG (The operation time for vacuuming is about 10 minutes). When the desired vacuum is reached, close the valve of the low pressure of the manifold and stop the vacuum pump.

3. Disconnect the service hoses and fit the cap to the charging valve.

4. Remove the blank caps, and fully open the spindles of the 2-way and 3-ways valves with a service valve wrench.

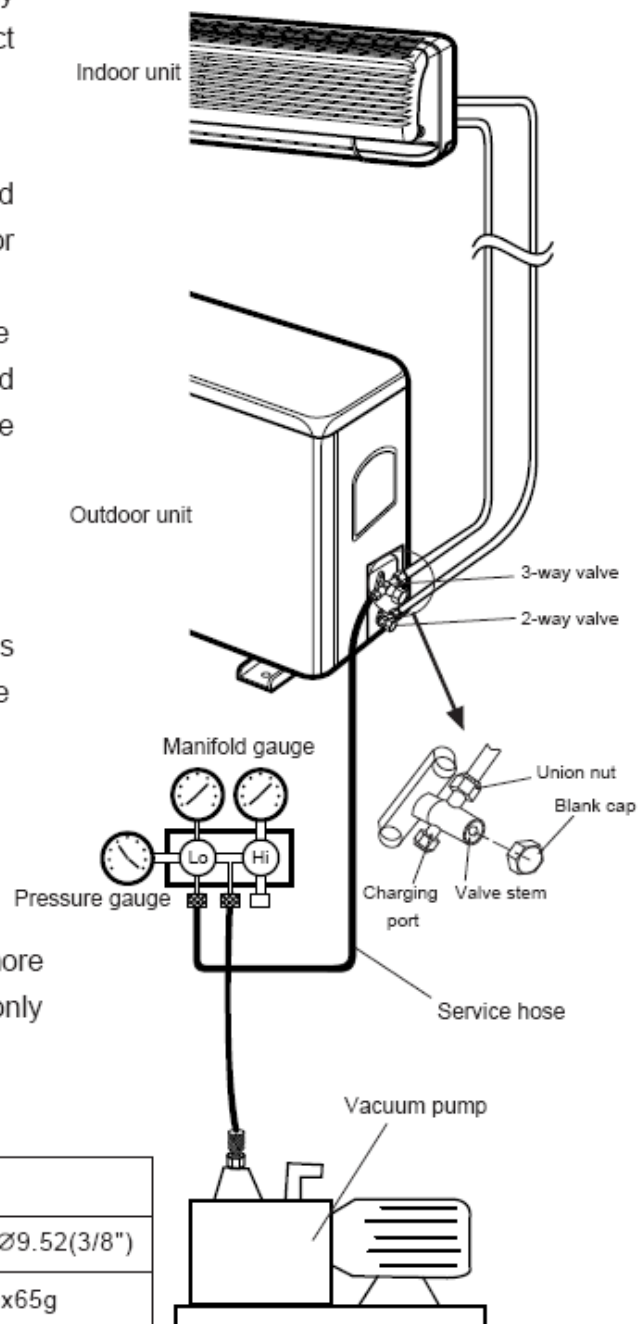
5. Tighten the blank caps of the 2-way and 3-ways valves, applying the above torque Table 1.

**\* Adding refrigerant**

Refrigerant must be added if the piping measures more than 5 metres (16'5") in length. This operation can only be performed by a professional technician, for the additional amount, see the table 2 below.

**Table 2**

Additional refrigerant amount	
Liquid pipe diameter ∅6.35(1/4")	Liquid pipe diameter: ∅9.52(3/8")
(piping length-5)m x 30g or (piping length-16)ft x 0.3oz	(piping length-5)m x 65g or (piping length-16)ft x 0.7oz



**Fig.6**

## \* Gas leakage inspection

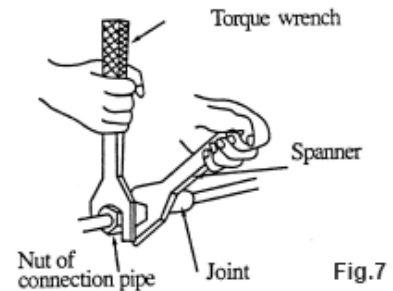
After the pipeline connection is done, use a leakage inspection device or soap suds to carefully check if there is any leakage at the joints. This is an important step to ensure the quality of installation. Once a leakage is detected, proper treatment should be taken immediately.

## \* Pipelines connection for Split type quick coupler model \*

\* If you purchase the machine for split type quick coupler model, please adopt the following pipelines connection procedures:

1. Remove the dust caps from the indoor and outdoor units, and the connecting pipe.

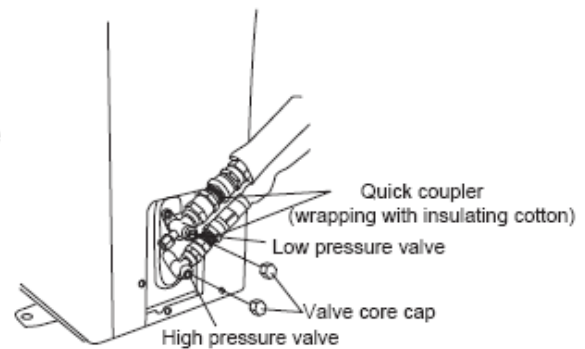
2. Align the joint counter of connecting pipe with the proper indoor and outdoor joint conic surfaces, tighten the connecting nut manually. Then, make it secure with a wrench as shown Fig.7, applying to above torque Table 1.



3. Remove the two valve core caps from the outdoor unit.

4. Turn on the high and low pressure valve cores with a socket wrench, then tighten the two valve core caps of the outdoor unit (Fig.8).

5. Finally, wrap the hot insulating cotton around the joints of indoor and outdoor units.



## \* Notes on installation of quick coupler:

1. Connecting pipe bending minimum radius parameters (Table 3)

2. Quick coupler assembly and disassembly limit: the assembly and disassembly times are inadvisably more than 7.

**Table 3** Minimum bending radius

Normal diameter(mm)	Minimum bending radius(mm)	cooling capacity
DN8(5/16")	80(3")	2100~2300W (7000~8000BTU)
DN10-12 (1/2")	100(4")	2500~5100W (9000~18000BTU)
DN14-16 (5/8")	150(6")	6100~7000W (22000~24000BTU)

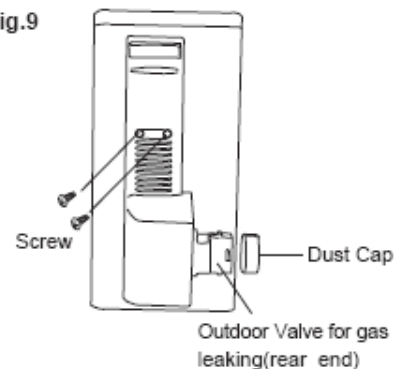
## \* Pipelines connection for Whole-Unit type quick coupler model\*

\* If you purchase the machine for Whole-Unit type quick coupler model, please adopt the following pipelines connection procedures:

### STEP 1

\* Remove two screws on the maintenance plate with a screwdriver and take off the plate, then remove the dust caps on both indoor male coupler and outdoor female coupler, See Fig.9.

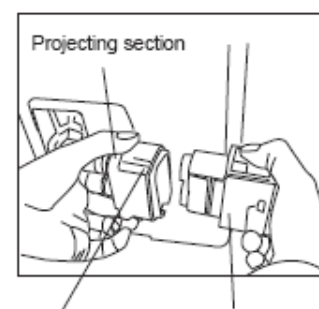
Fig.9



### STEP 2

\* Press the projecting section of outdoor female coupler backward with a little force by the thumb to make inner hooks open, and then you can easily take out the outdoor valve for gas leaking by the other hand, See Fig.10.

Fig.10

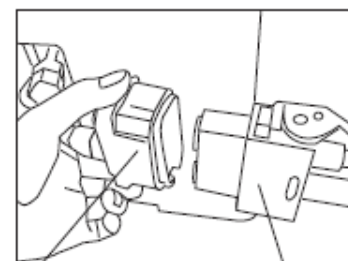


Outdoor female coupler (With movable sheath) Outdoor Valve for gas leaking

### STEP 3

\* In the same way, press the projecting section backward, then connect the indoor male coupler to the outdoor female coupler, See Fig.11.

Fig.11

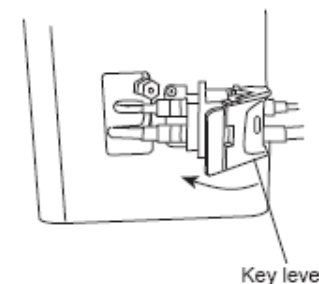


Outdoor female coupler Indoor male coupler

### STEP 4

\* Close the key lever of indoor male coupler to the horizontal position, then indoor and outdoor refrigerant will be circulating, and now you can obviously hear the sound of inner air flowing, See Fig.12.

Fig.12



### STEP 5

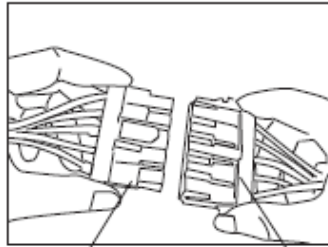
\* Connect the outdoor quick cable coupler with indoor quick cable coupler, See Fig.13.

### STEP 6

\* Finally, Re-install the maintenance plate back into its place, See Fig.14.

As for the outdoor valve for gas leaking and the dust caps, you can preserve them for future possible use on the removal of your air conditioner.

Fig.13



Outdoor quick cable coupler Indoor quick cable coupler

**\* Connection of power cable \***

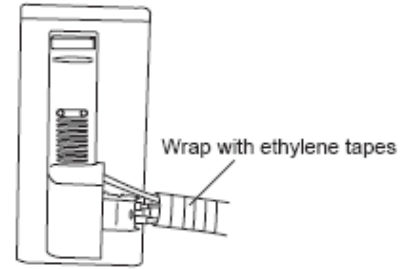
- 1.Remove the drawer of the outdoor unit.
- 2.**Non-quick coupler:**connect the indoor power and control wires with the matched outdoor wires in accordance with the electric schematic diagram and make sure that the connection is firmly done(Fig.15.)

**Quick coupler:**directly connect quick cable couplers with indoor and outdoor quick cable couplers after disassembly of the outdoor unit connecting box cover(Fig.16.)

- 3.Use a press plate to fix the wires firmly,and re-install the drawer.

- 4.Optional steps:In some cooling and heating models,you should connect the indoor wire connector with outdoor probe wire connector for defrosting,see Fig.17.

Fig.14



Wrap with ethylene tapes

Fig.15

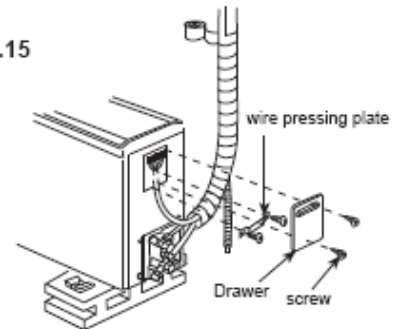


Fig.16

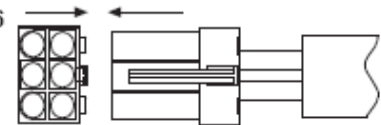
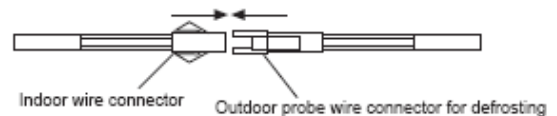


Fig.17



Note:Do not connect the wires in a wrong way,otherwise electric malfunctions will be caused and even damages to the units will occur.The appliance shall be installed in accordance with national wiring regulation.If the supply cord is damaged,it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.The plug shall be accessible after installing the appliance.If the model have not plug that a switch which have a contact separation of at least 3 mm in all poles shall be added in fixed wiring.

**\* Finishing touches \***

- \* wrap the piplines tightly with ethylene tapes.
- \* Fix the wrapped pipelines on the exterior wall with clamps.
- \* Fill in the gaps left over by the pipeline hole and wall hole to prevent rain-water from entering.

**\* Test running \***

- \* Connect to the power source,check if the function selection keys on the remote controller are working properly.
- \* Check if the room temperature adjustments and timer settings are working properly.
- \* Check if the drain is smooth.
- \* Check if there is any abnormal noise or vibration during operation.
- \* Check if there is leakage of refrigerant.



## \* **Is the unit installed correctly?** \*

### \* **Suitable Installation Position**

\*Isn't there anything which prevents ventilation or obstructs operation in front of the indoor unit ?

Do not install the unit following place .

\*Inflammable gases may leak .

\*Oil splashes a lot .

\*In case where the unit is used in such places as poisonous or sultry gases are generated or seaside district exposed to sea breezes corrosion may cause malfunction . Consult with your distributor .

\*Air conditioner body and remote controller must be 1 m(39-3/4") or more away from a TV or a radio.  
Drain the dehumidified water from the indoor unit to a place which drains well .

### \* **Pay attention to operation noise**

\*When installing the unit , choose a place which can stand the weight of the unit well and does not increase the operation noise or vibration . Especially where there is a possibility that vibration be transmitted to the house , fix the unit by inserting attached vibration -proof pads between the unit and fittings .

\*Choose the place where hot air and operation noise from the outlet of the outdoor unit do not annoy the neighborhood .

\*Things left near the outlet and inlet of the outdoor unit cause malfunction or increased operation noise . Do not leave obstacles near the outlet and inlet .

\*If irregular sound is heard during operation , consult with your distributor .

### \* **Inspection and Maintenance**

\*According to the service conditions and operating environment , the inside of the air conditioner will become dirty after several seasons (3 to 5years ) of service , resulting in decreased operating performance .Inspection and maintenance are recommended in addition to usual cleaning (The air conditioner can be used for a longer period and without anxiety .)

\*As to inspection and maintenance , consult your dealer or any one of business offices of dealing companies .(Service charge is required in this case .)

\*We recommend to perform inspection and maintenance during an off seasons.

## \* **Quick connector installation instruction** \*

This sheet only guides the requirements of the installation for stainless quick connect pipe. Other installation requirements please refer to the installation guide along with the unit.

\*To expand the connecting pipe, please hold one side then expand it following the right direction.











\*Please ensure the angles have a radius at some extent while installing the stainless soft pipe. Angles need to be around, not bended. (to the quick connecting spot and drilled point of wall).

\*Please fix the stainless soft pipe while installing because the connecting pipes are soft, so that prevent them from getting bended or stretched.

\*The minimum bending radius are as follows:

<i>Stainless soft pipe</i>	<i>Model</i>	<i>Minimum bending radius(mm)</i>
<i>*Eight</i>	Twenty-one, Twenty-five	Eighty(mm)
<i>*Ten</i>	Thirty-five	One hundred(mm)
<i>*Thirteen</i>	fifty-one	One hundred and fifteen(mm)

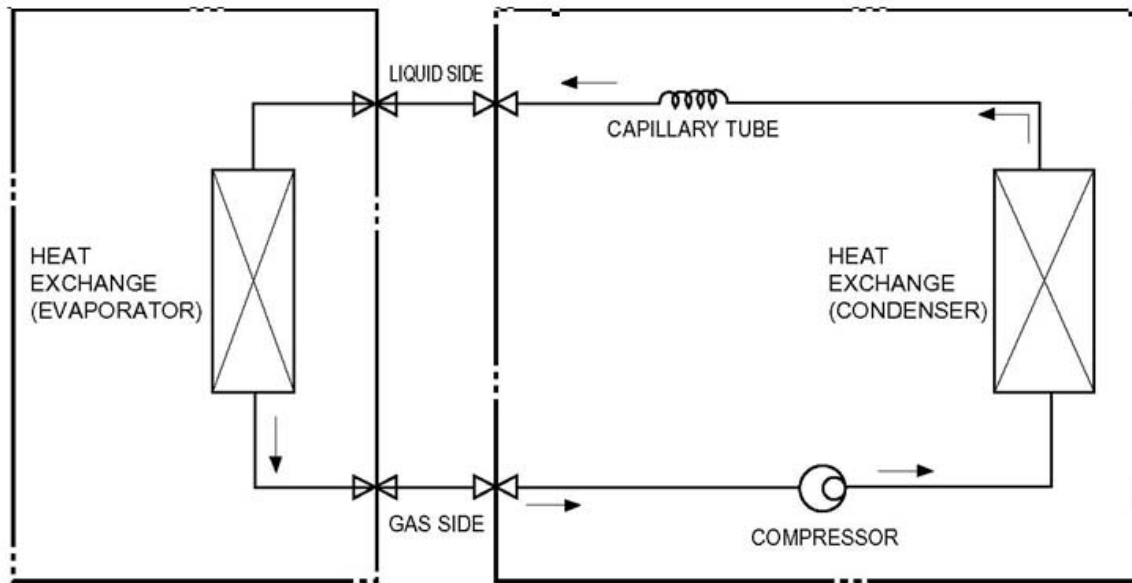
## \*Installation Guide\*

<p>To keep the allowed bending radius, please make the packed soft pipes vertical for expanding.</p>			<p>Please do not expand only one side of the packed soft pipes.</p>
<p>Please make use of semicircle pulley to keep the allowed bending radius.</p>			<p>Extremely bending could damage the pipes.</p>
<p>Please use twisting wheel to avoid improper bending.</p>			<p>Over length soft pipes will lead to irregular bending.</p>
<p>Please use rigid elbow to keep the bending radius while soft pipes operating.</p>			<p>Undersize bending will damage the soft pipe.</p>
<p>Please Keep the minimum bending radius while installing.</p>			<p>Short soft pipes will have them bending undersize, it's not allowed.</p>

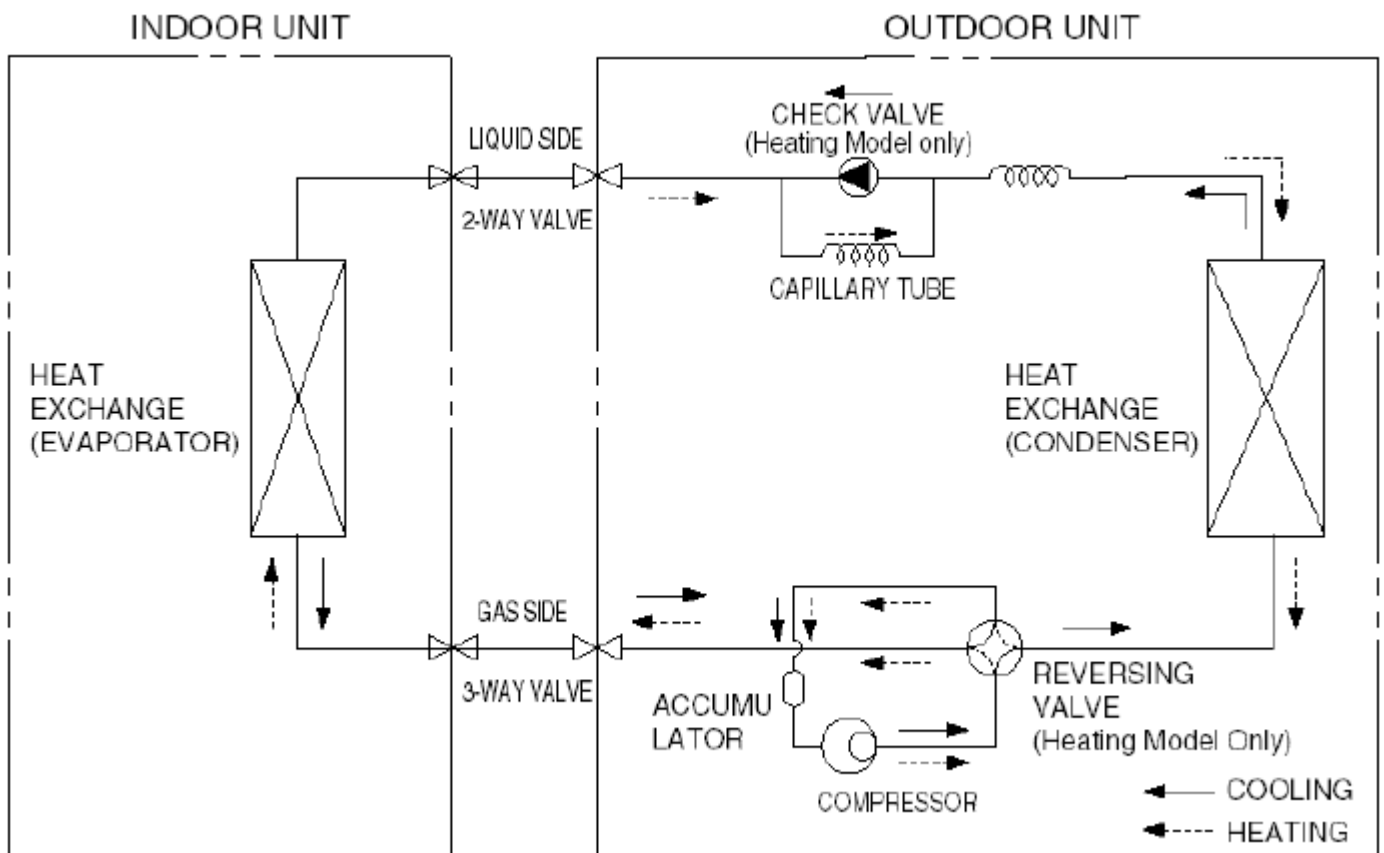
## 4、Indoor unit and outdoor unit explosion diagram and spare parts list(see explosion diagram file)

# 5. Refrigerant cycle diagram

## 5.1 Cooling only



## 5.2 Heat pump mode



## 6. Model Parameter

**Note:** Net/Gross weight ( the weight will change according to technology, configuration and customer requirements. so the data is only for reference. The actual weight comes from the product nameplate) .

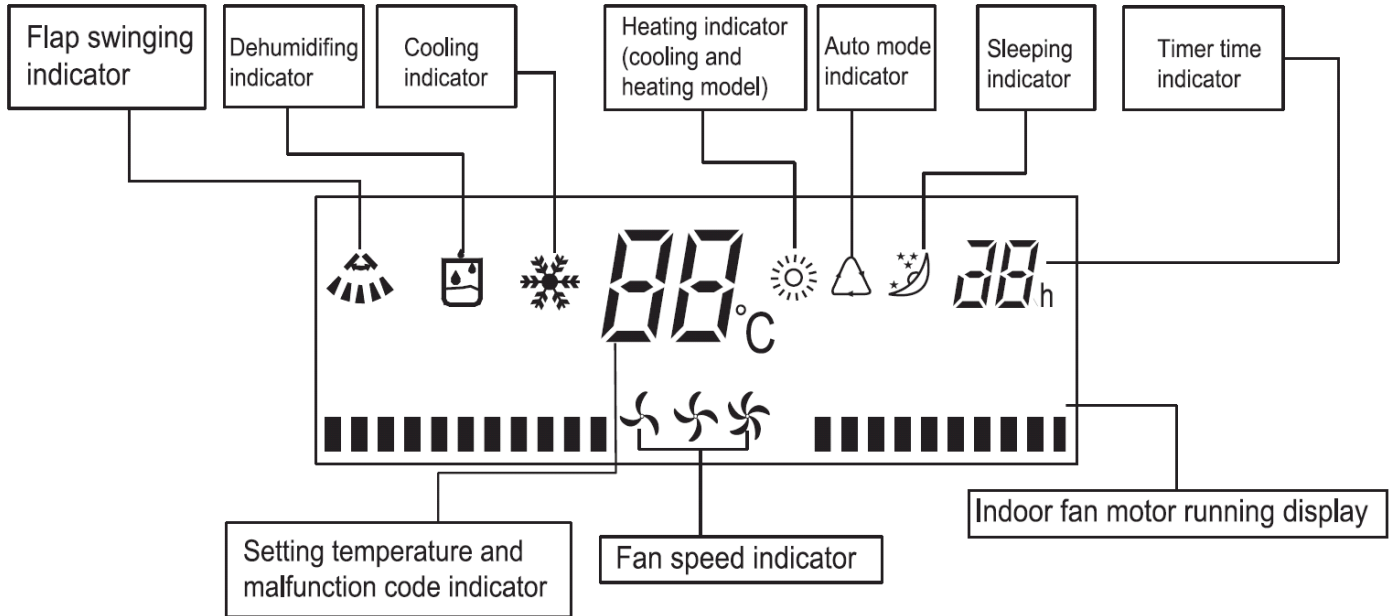
<b>Model</b>		ACS-HR09LED R410A		
Rated volt and frequency		V-Hz	220-240/50	
Cooling	Cooling capacity	W	2780	
	Cooling power input	W	860	
	Cooling current input	A	3.9	
	EER	w/w.	3.23	
Heating	Heating capacity	W	2780	
	Heating power input	W	770	
	Heating current input	A	3.4	
	COP	w/w	3.61	
Max. input consumption		W	1600	
Max. current		A	8	
Compressor	Model		PA108X1C-4DZDE	
	Type (Rotary、Piston 、 scroll)		Rotary	
	Brand		TOSHIBA	
	Capacity	W	2600	
	Power input	W	915	
	LRA	A	21.7	
	RLA	A	4.00	
	Protector		B160-135-241E	
	Capacity	uF	25/370	
	Refrigerant oil	ml	POE VG74 .350ml	
Indoor	Fan motor	Model	YDK-14-4	
		Power input	W	40
		Capacity	uF	1.2
		Speed RPM (High/Med/Low)	r/min	H:1320±20rpm M:1220±30rpm L:1120±40rpm
	Indoor fan	dia. *length	mm	φ97*583

	Evaporator	Tube pitch* row pitch*Fin spacing	mm	21*12.7*1.6
		Tube outside dia.and typ	mm	φ7/inner groove pipe
		Coil length *height* width	mm	580*167*25.4 558*82*25.4
	Airflow		m3	500
	Indoor Noise Level dB (High/Low) (actual/label)		dB(A)	29-39
	Dimension (L*W*H)		mm	745*250*195
	Packing (L*W*H)		mm	833*330*270
	Net/Gross weight		Kg	9/11
Outdoor	Fan motor	Model		YDK-30-6
		Power input	W	85
		Capacity	uF	2
		Speed RPM (High/Med/Low)	r/min	890
	Outdoor fan	dia. *length	mm	φ384×136
	Condenser	Tube pitch* row pitch*Fin spacing	mm	21*12.7*1.4
		Tube outside dia.and typ	mm	φ7/inner groove pipe
		Coil length * height * width	mm	648*462*12.7
	Outdoor Noise Level		dB(A)	51
	Dimension (L*W*H)		mm	700*225*500
	Packing (L*W*H)		mm	825*320*550
	Net/Gross weight		Kg	25/29
	Refrigerant type/weight		g	R410A/560
	Design pressure (Hi/Low)		MPa	4.2-1.2
	Refrigerant piping (Liquid side/ Gas side/Length)		mm	φ6.35+φ9.52×3500

# 7. PCB function

**NOTE:  $T_s$  is the set temperature,  $T_r$  is indoor room temperature,  $TP1$  is indoor coil pipe temperature,  $TP2$  is outdoor coil pipe temperature.**

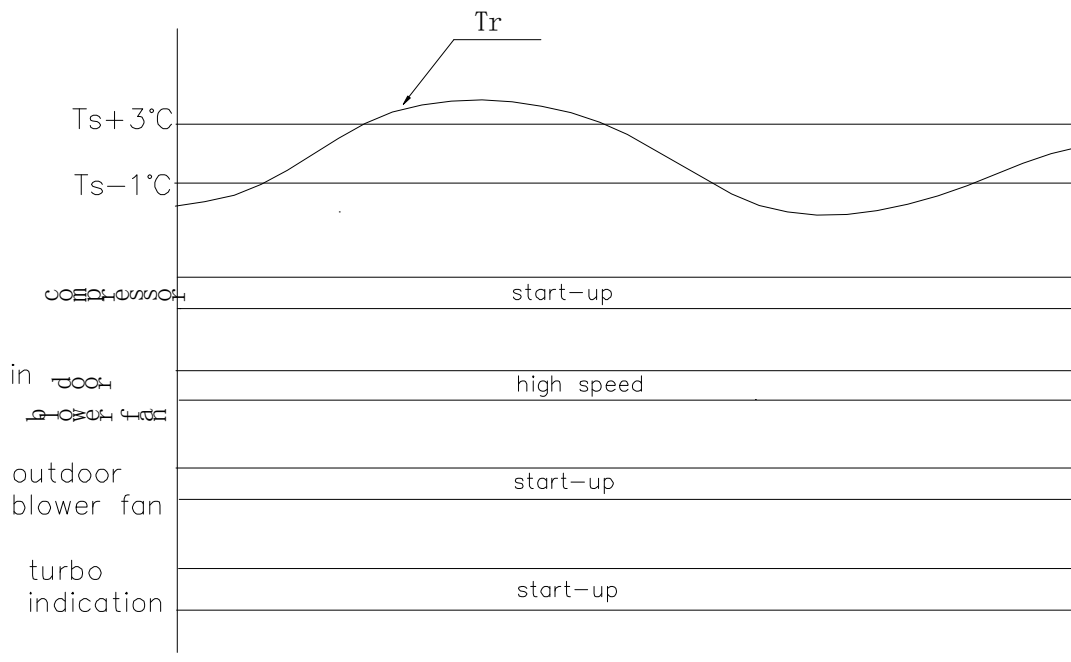
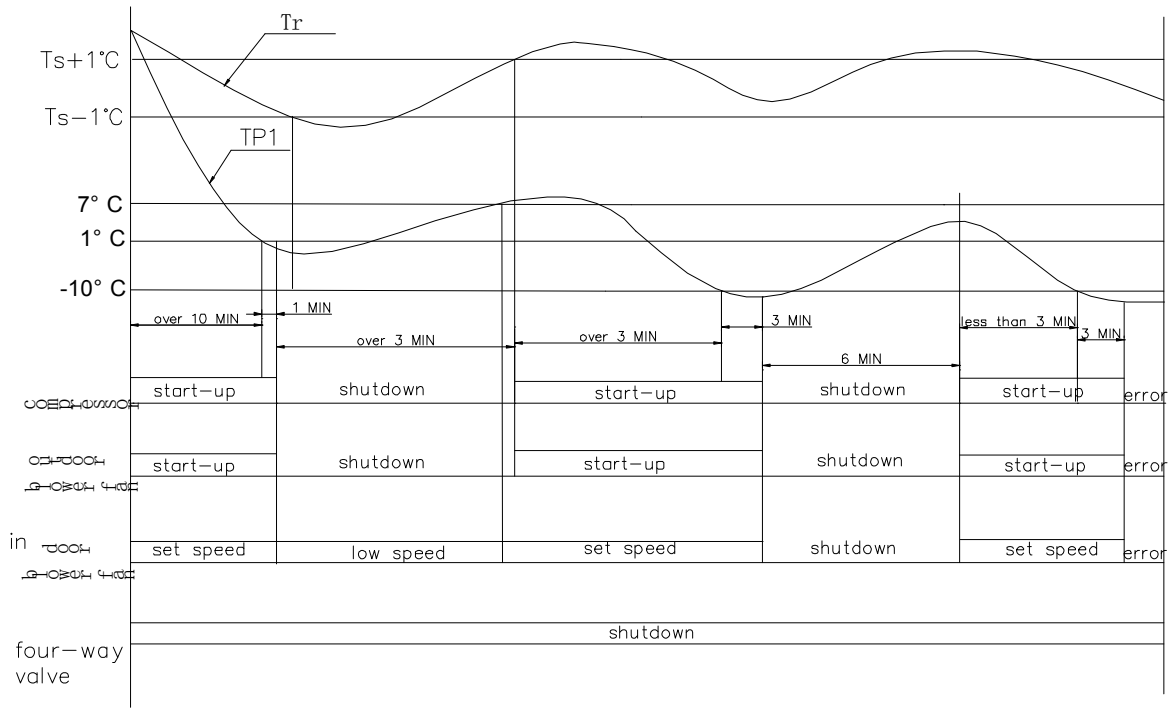
## Display panel



## Cooling

- Start up the compressor: when the room temperature is more than  $T_s+1^\circ\text{C}$ , compressor → start-up
- Shut down the compressor: when the room temperature is less than or equal to the set temperature  $T_s-1^\circ\text{C}$ , compressor → shutdown
- When the temperature of coil pipe of the indoor units is less than or equal to  $1^\circ\text{C}$  for one minute and the compressor has continuous run for more than ten minutes, the compressor and outdoor blower fan shut down through the electric control board and the indoor blower fan is running at low speed.
- When the temperature of coil pipe of the indoor units is more than or equal to  $7^\circ\text{C}$  and the compressor has shutdown for more than three minutes, the compressor and outdoor blower fan start to run and the indoor blower fan is running at set speed.
- When the temperature of coil pipe of the indoor units is equal to or less than  $-10^\circ\text{C}$  for three minutes in the compressor has continuous run for three minutes, the compressor, indoor and outdoor blower fans and swinging wind shut down. Restart up six minutes later; if the above situations appear again within six minutes, all the outputs are shut down through the electric control board and display failure.
- When you press turbo button of remote, the air conditioner enter turbo running, compressor and outdoor blower fan turn on all along, indoor blower fan run at high speed, turbo indication is light.
- After the compressor runs five minutes, the lamp flashes 4 times per six seconds or display E4 if the temperature of indoor coil pips is more than  $25^\circ\text{C}$  in the continuous 20 minutes. The controller will automatically shut down if the temperature of indoor coil pips is more than  $25^\circ\text{C}$  in another continuous 20 minutes, that is the abnormality protection of outdoor units and the indicator lamp keeps its former state of flashing. If the temperature of indoor coil pips is less than  $25^\circ\text{C}$  in the second 20 minutes or the compressor shuts down, the electric control board will

store to the normal display and the time is restarted when starting up the compressor next time.

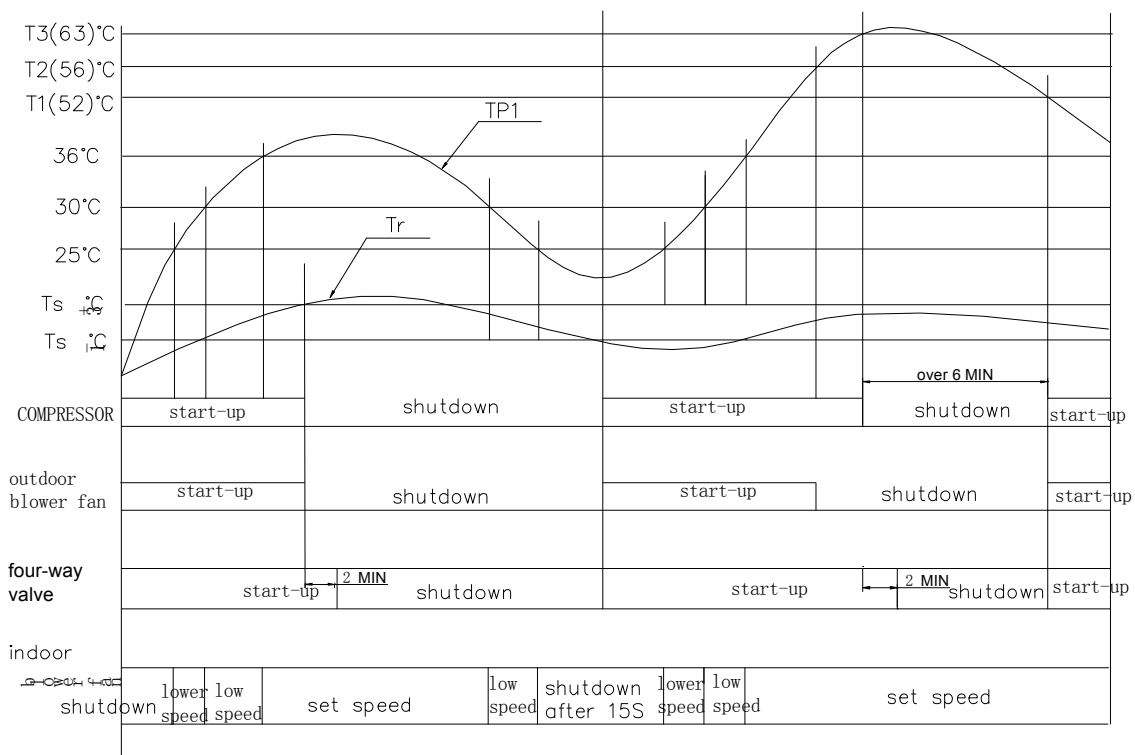


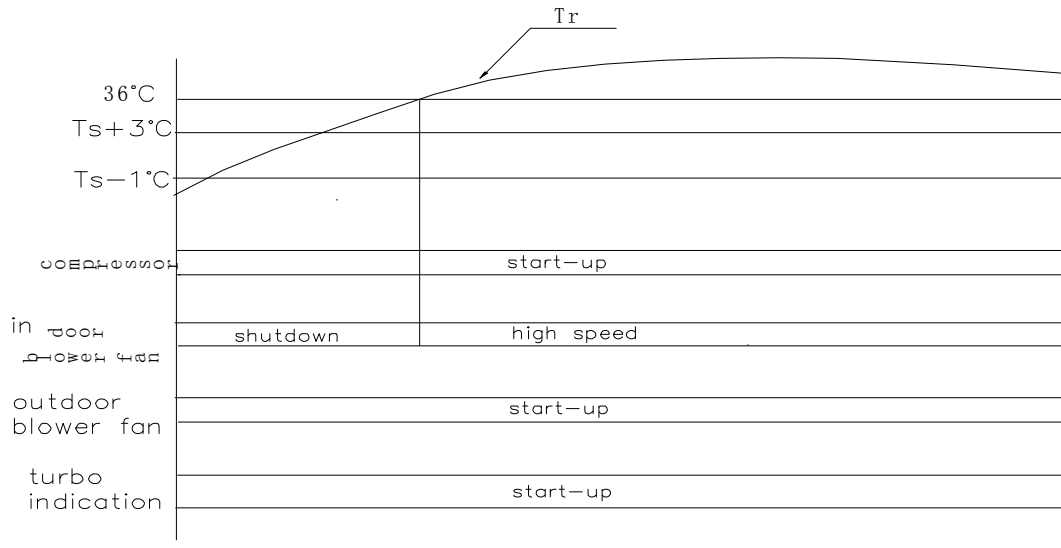
### Heating (only applicable to heat pump units)

- Start up the compressor: when the room temperature is less than  $T_s-1^\circ\text{C}$ , compressor → start-up
- Shut down the compressor: when the room temperature is more than or equal to the set temperature  $T_s+3^\circ\text{C}$ , compressor → shutdown
- The electric heating start-up in the heating mode shall meet the following conditions: ① start up the compressor and indoor blower fan ② none defrost ③  $TP1 < 49^\circ\text{C}$  ④  $Tr \leq 20^\circ\text{C}$ .
- The electric heating shutdown in the heating mode shall meet one of the following conditions: ① shutdown indoor blower fan ②  $Tr \geq 23^\circ\text{C}$  ③  $TP1 \geq 50^\circ\text{C}$ .



- In the heating mode, the indoor blower fan can be set as high/ medium/ low /automatic running mode by remote control however the anti cool air function is prior. In the heating mode, the anti cool air control function is to control shutdown of the indoor blower fan by detecting the temperature of coil pipe of evaporator so as to attain the purpose of preventing cold air from blowing.
- For the waste heat emission function in the heating mode, in principle, the indoor blower fan shall be on for fifteen seconds after the electric heating is closed.
- When the temperature of coil pipe of indoor units is more than or equal to 56°C, the outdoor blower fan shuts down and it enters the overload protection; when the temperature of coil pipe of indoor units is less than or equal to 52°C, the outdoor blower fan starts up and it exit the overload protection.
- When the temperature of coil pipe of indoor units rises to 63°C, the compressor and outdoor blower fan are closed and two minutes later, the change valve is closed. The indoor blower fan is running at the set speed. Restart up six minutes later; if the above situations appear again within ten minutes, all the outputs are shut down through the electric control board and display failure.
- When you press turbo button of remote, the air conditioner enter turbo running, compressor ,outdoor blower fan and four-way valve turn on all along, indoor blower fan run at high speed and it must meet start condition, turbo indication is light.
- After the compressor runs five minutes, the lamp flashes 4 times per six seconds or display E4 if the temperature of indoor coil pips is less than 30°C (heating) in the continuous 20 minutes. The controller will automatically shut down if the temperature of indoor coil pips is less than 30°C in another continuous 20 minutes, that is the abnormality protection of outdoor units and the indicator lamp keeps its former state of flashing.





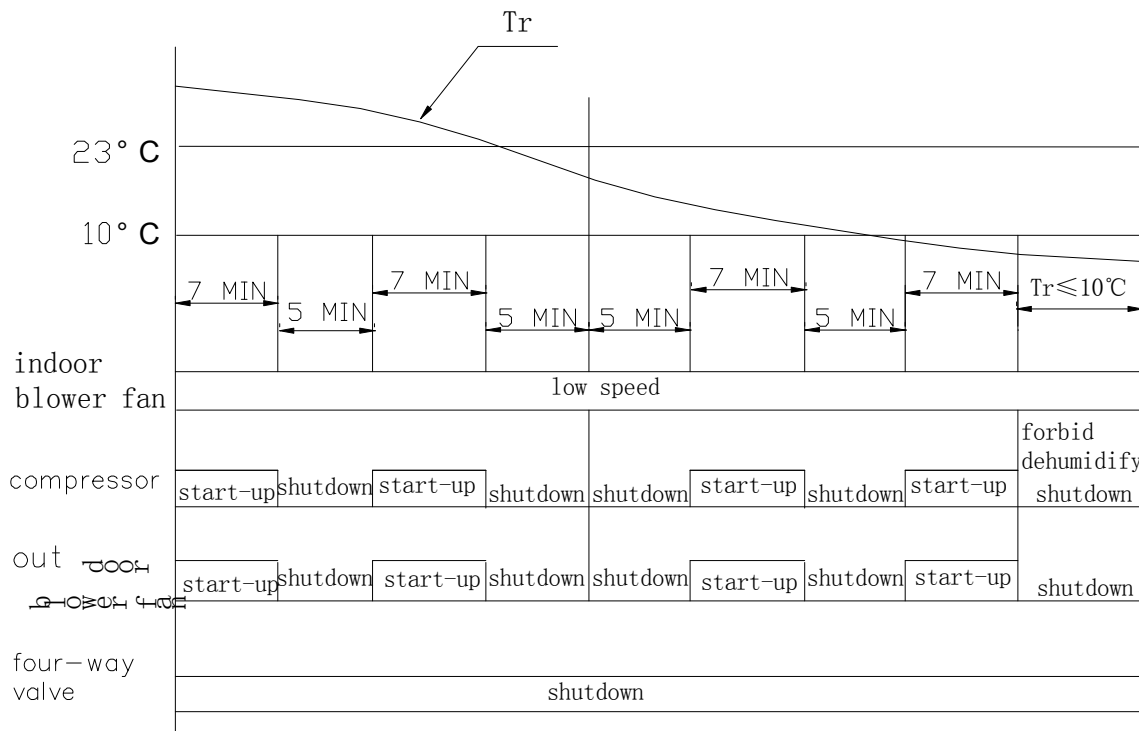
### Defrost (only applicable to the heating mode)

#### the intelligent defrost

In the heating mode, the electric control board checks and compares the temperature of indoor room and indoor coil pipe after the compressor works for a while; judge whether the outdoor heat exchanger part is frosted or not according to conditions such as the change of indoor coil pipe temperature; if it is judged as frosted, it automatically enters defrosting process. When defrosting, close the indoor and outdoor blower fan and four-way valve.

### Dehumidification

Dehumidification running is to eliminate the water vapor in the air by using the cool circulating capacity, but the dehumidification will not decrease the indoor temperature in great deal. The air conditioner automatically repeats on and off circulation according the room temperature, which is shown in the following figure.



- In the dehumidification mode, the indoor fan is running at the low speed for twenty seconds at first, then it selects working mode.

### Ventilation working mode

In the ventilation mode .When ventilating, the compressor, outdoor blower fan, four-way valve and electric heating are all closed and the indoor blower fan is running at the set speed.

### Automatic mode

- Conditions for entering the automatic running mode are: After power-up for the first time, start up and select the automatic operating mode of remote or press emergency key, the working mode depends on Tr and if the working mode had set , it doesn't change by Tr and the default set temperature is 25 °C.

### Time on and time off

When the time on or time off is used, the clock of remote controller shall be corresponding to the current clock and the timing times is less than or equal to 24 hours, when the timing time is reached, unit will start-up or shutdown.

### Sleep function

When the sleep key is press, air conditioner enter sleep state, indoor blower fan running at low speed, only sleep indication display.

### Emergency key function

There is a forcible execution key on the panel of indoor units and the air conditioner can run by pressing the key when the remote control is out of work or missing.

When pressing down the forcible execution key, then power up and enter the self-check program.

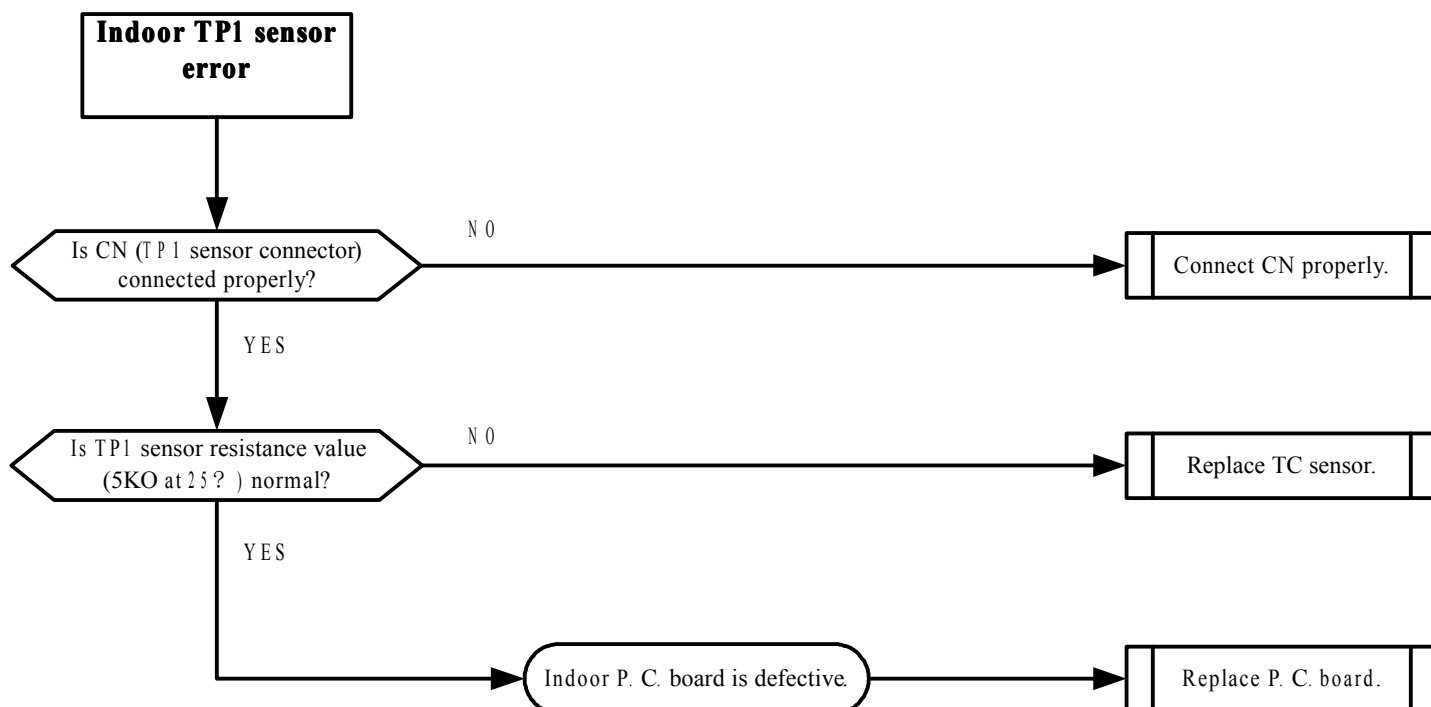
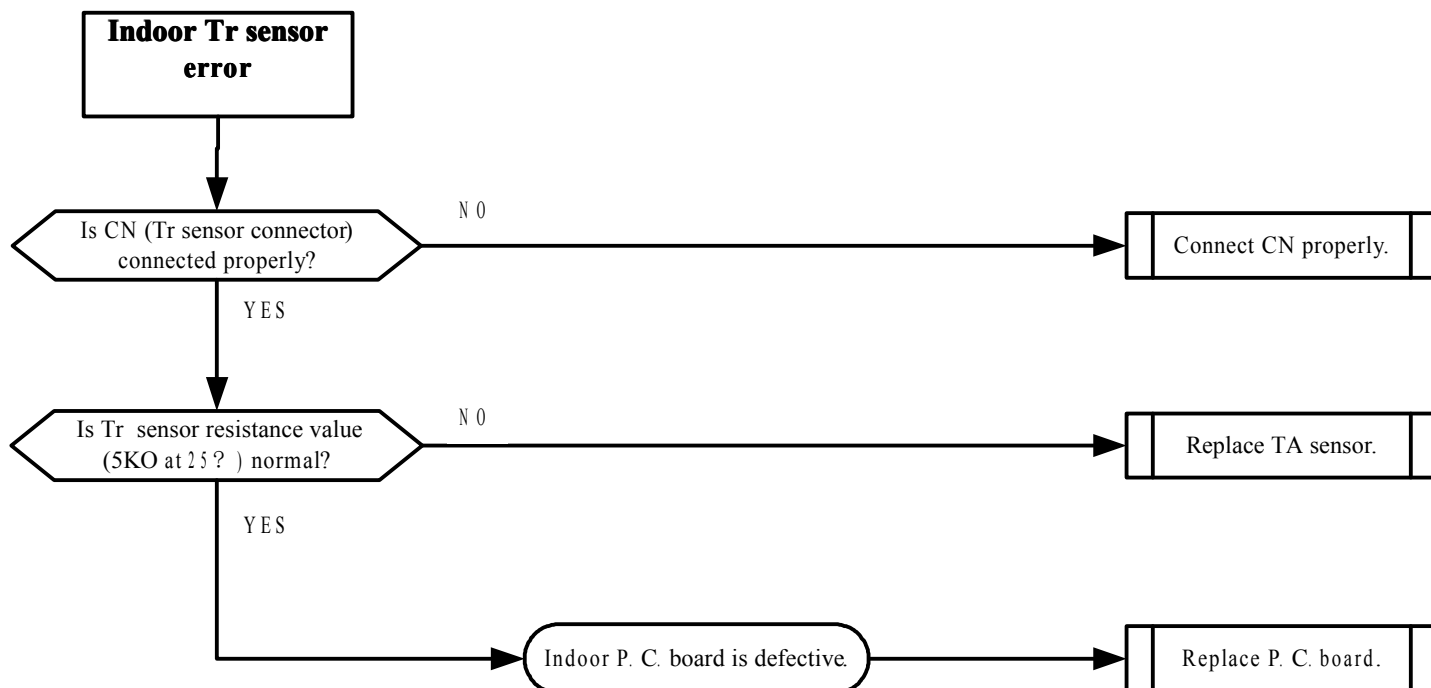
### Failure display

LED		lamp display		failure	The reason of fault and solution
code	explain	code	explain		
DF	display at on state	flicker 1/1 SEC		defrost indication	Normal, the defrost state is removed, it will return to normal condition automatically
	display at off state	flicker 1/3 SEC		anti cold wind	1、 Normal (during heating mode ) 2、 It will be removed when the coil pipe temperature sensor reaches certain temperature.
E2	display at off state	flicker 1/1 SEC	display at on/off state	room temp. sensor fault	1、 Check whether the resistance of the sensor is normal (the resistance is 5KΩ in the normal temperature 25°C), when it is abnormal the sensor should be replaced. 2、 Check whether there is short circuit or open circuit in the wire of the sensor, and whether the plug is connected well, whether there is welding off or rosin joint on the electric control board, if there is any, it should be repaired. 3、 When the 1 and 2 are both normal, then

					the components or integrated circuit is damaged, the electric control board should be replaced.
E3	display at off state	flicker 3/5 SEC	display at on/off state	coil temp. sensor fault	<ol style="list-style-type: none"> <li>1、 Check whether the resistance of the sensor is normal (the resistance is 5KΩ in the normal temperature 25℃), when it is abnormal the sensor should be replaced.</li> <li>2、 Check whether there is short circuit or open circuit in the wire of the sensor, and whether the plug is connected well, whether there is welding off or rosin joint on the electric control board, if there is any, it should be repaired.</li> <li>3、 When the 1 and 2 are both normal, then the components or integrated circuit is damaged, the electric control board should be replaced.</li> </ol>
E4	display at on/off state	flicker 4/6 SEC	display at off state	outdoor unit abnormal	<ol style="list-style-type: none"> <li>1、 Check whether the winding resistance and operation current of the compressor are normal.</li> <li>2、 Check whether the high and low pressure is normal when the unit is running.</li> <li>3、 Check (whether the coil pipe sensor is normal) whether the contact of the inserter on the circuit board is well, the coil pipe temperature sensor is fixed, the evaporation of the indoor unit is well, the key is to check the evaporator temperature detected by the coil pipe temperature sensor has reached the cooling or heating temperature.</li> <li>4、 Check whether the surface of the condenser is too dirty, it should be cleaned when it is too dirty.</li> <li>5、 Check whether the capacitance of the outdoor motor and the fan is damaged, it should be replaced when it is damaged.</li> <li>6、 If the above items are normal, the electric control board should be replaced.</li> </ol>
E5	PG motor display at off state	flicker 5/7 SEC	display at off state	no feedback signal of indoor fan	<ol style="list-style-type: none"> <li>1、 Check whether two sets of plugs on the outlet end of the motor have loosed from the socket of the electric control board, insert it firmly when loosing.</li> <li>2、 Check whether the indoor motor has damaged, the motor should be replaced when it is damaged</li> </ol>

					3、 Check whether the controllable silicon and other components on the electric control board have damaged, replace the controllable silicon or electric control board when they are damaged.
E6	PG motor display at off state	flicker 6/8 SEC	display at off state	no over zero signal	<ol style="list-style-type: none"> <li>1、 Firstly check whether the indoor fan is normal.</li> <li>2、 Check whether the signal outputting from the integrated chip of the electric control board is normal, the electric control board should be replaced when the signal is abnormal.</li> </ol>
E7	display at off state	flicker 7/9 SEC	display at off state	outdoor feedback fault	<ol style="list-style-type: none"> <li>1、 Check whether the winding resistance and operation current of the compressor are normal</li> <li>2、 Check whether the high and low pressure is normal when the unit is running.</li> <li>3、 Check whether the indoor and outdoor wiring is right; when it is wrong, connect them again according to the circuit diagram</li> <li>4、 Check whether the contact of the inserter on the circuit board and the connection are well, otherwise repair.</li> <li>5、 Check whether the signal feedback wire is disconnected, replace or connect the feedback signal wire.</li> <li>6、 Check whether the supply power is phase-lacking or phase opposition.</li> <li>7、 Check whether the AC electromagnetic contactor is well.</li> </ol>
E8	display at off state	flicker 8/10 SEC	display at off state	frost protection/over heat protection	<ol style="list-style-type: none"> <li>1、 Check whether the filter of the indoor unit is dirty or blocked, and clean if it is dirty.</li> <li>2、 Check whether the indoor fan is running normally, and replace the motor if it is abnormal.</li> <li>3、 Check whether indoor pipe temperature sensor is normal, and replace the sensor if it is abnormal.</li> <li>4、 Check whether the system pressure is normal, if abnormal, should check whether there is leakage, and fill the refrigerant again.</li> </ol>

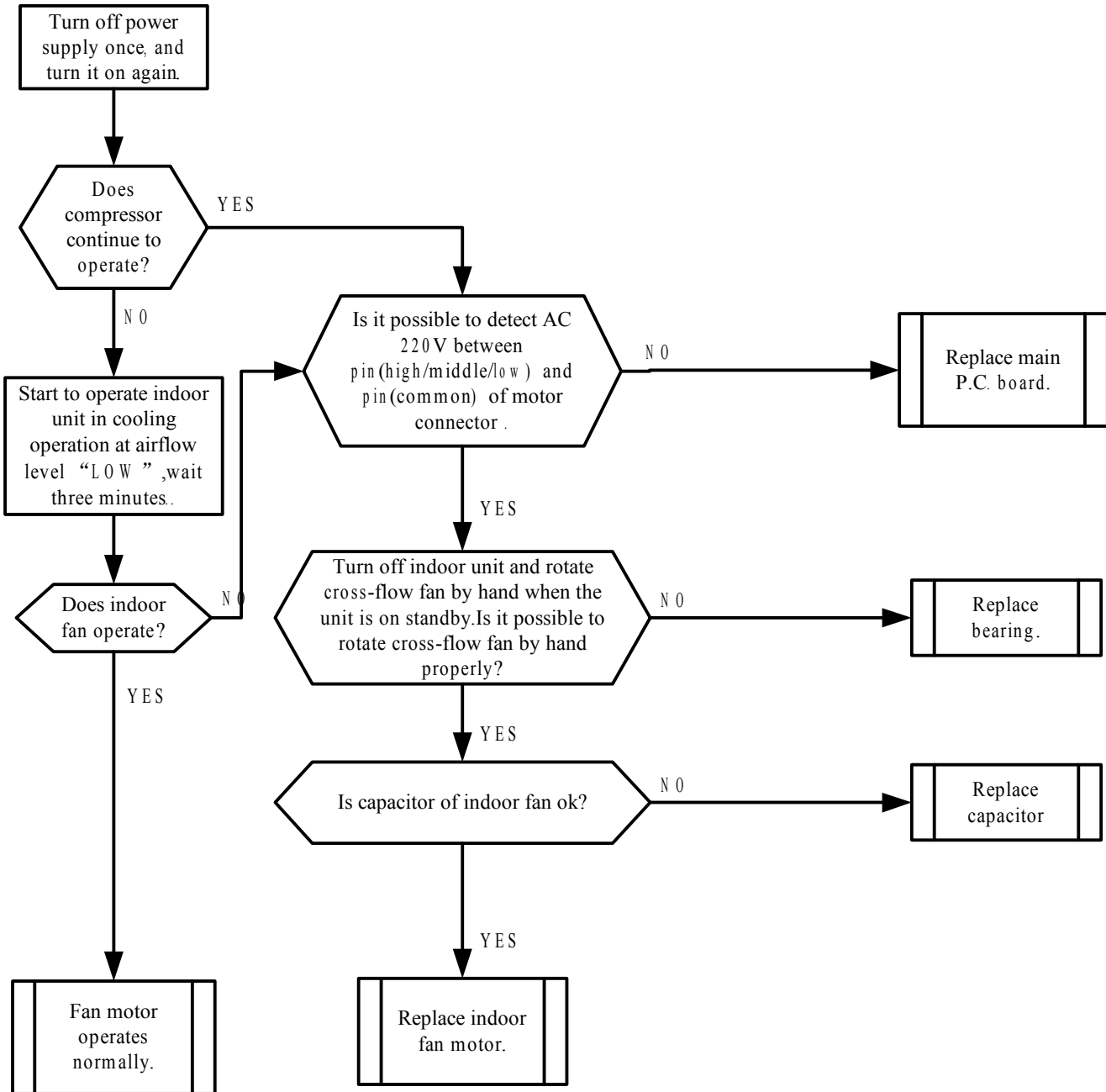
## 8. TROUBLE SHOOTING



**Only indoor fan motor does not operate.**

**<Primary check>**

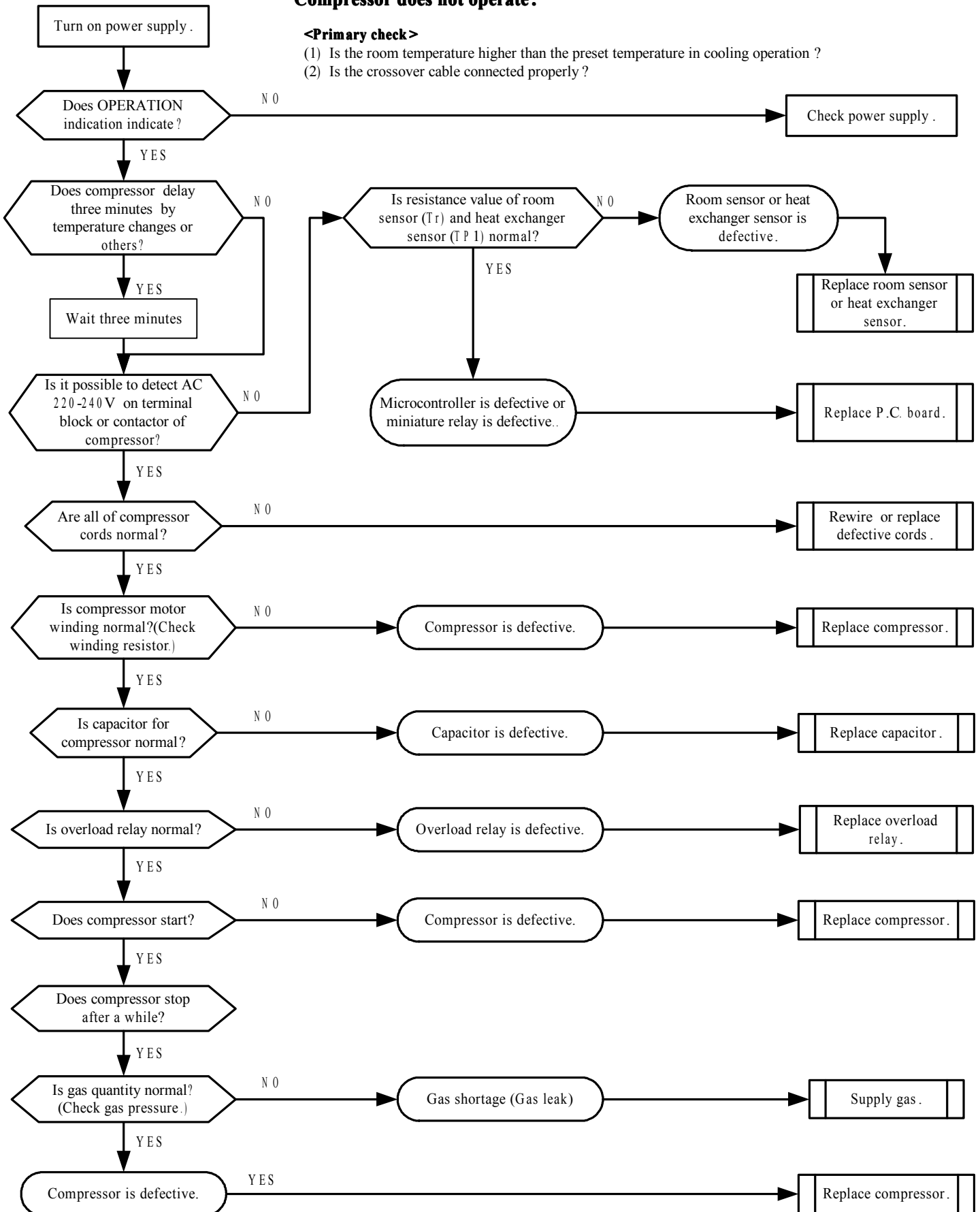
- (1) Is it possible to detect the power supply voltage (200-240 V) between L and N on the terminal block?
- (2) Does the indoor fan motor operate in cooling operation?



## Compressor does not operate.

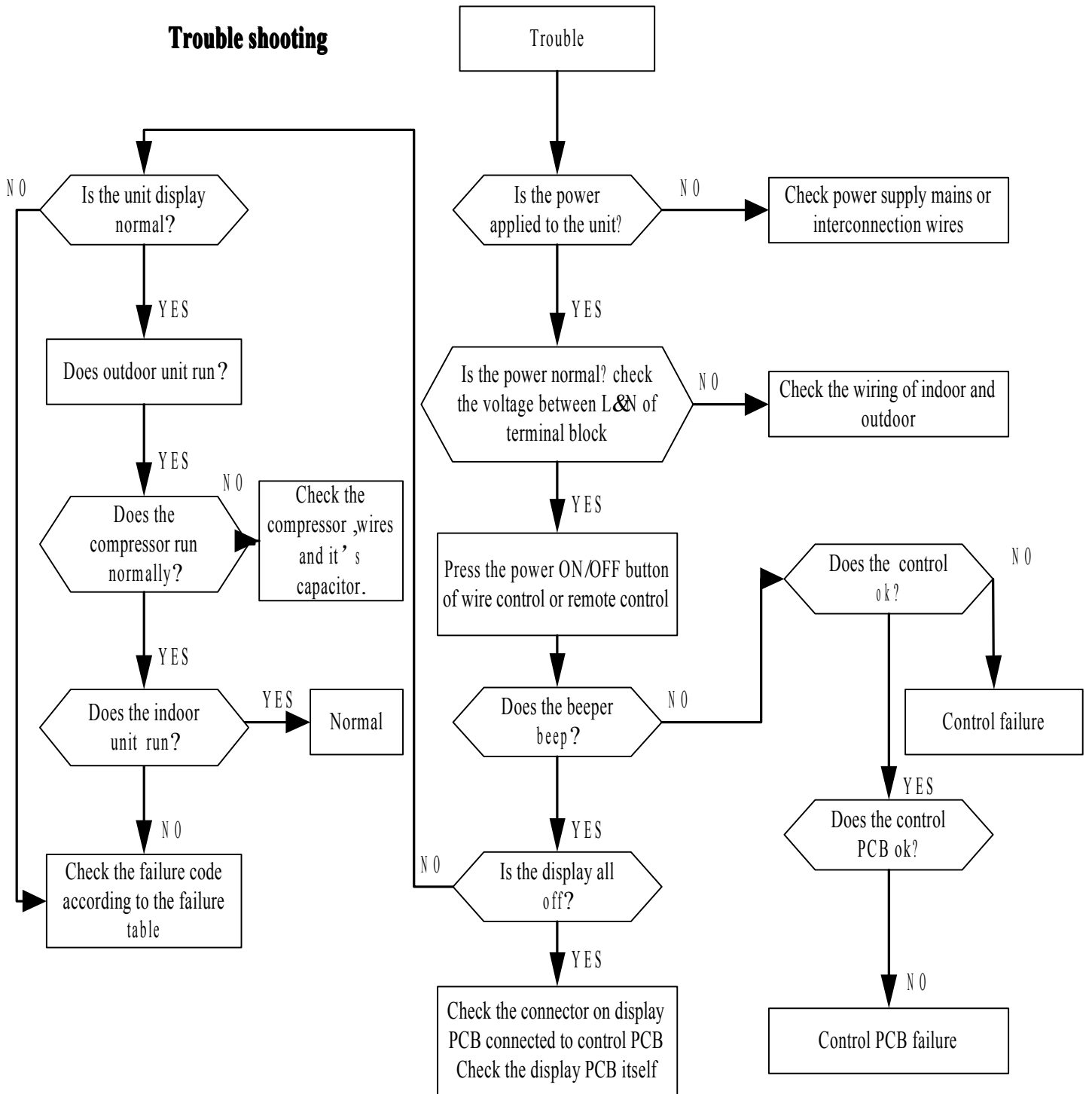
### <Primary check>

- (1) Is the room temperature higher than the preset temperature in cooling operation ?
- (2) Is the crossover cable connected properly ?





# Trouble shooting



# Indoor unit and outdoor unit don't operate

