ActronAir®

Aurora

Service Manual 2014

CONTENTS

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 servicing the 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.**
- **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.**
- **Install the panel and the cover of control box securely.**
- **Improper wiring or installation may cause fire or electric shock.**
- **Do not install, remove, or reinstall the unit by yourself (customer).**
- **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.**
- **Do not install the product on a defective installation stand.**
- **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.**
- **Take care to ensure that power cable could not be pulled out or damaged during operation.**
- **Do not place anything on the power cable.**
- **Do not touch the product with wet hands.**
- **Do not place a heater or other appliance near the power cable.**
- **Do not allow water to run into electrical parts.**
- **Do not store or use flammable gas or combustible near the product.**
- **Do not use the product in a tightly closed space for a long time.**
- **If strange sounds or smoke comes from product, turn the breaker off or disconnect the power supply cable.**

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

- **Do not open the inlet grill of the product during operation.**

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

- **When the product is soaked, contact an authorized service centre.**

There is risk of fire or electric shock.

- CAUTION: **water should not enter the product.**

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 or water leakage.

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

- **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 time. (Do not sit in the draft).**
- **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.**
- **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.**
- **Do not step on or put anything on the product. (outdoor units)**
- **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 objects through air inlet or outlet while the product is operated.**
- **Do not drink the water drained from the product.**
- **Use a firm ladder when cleaning or maintaining the product.**

Be careful and avoid personal injury.

- **Replace 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.**

On/Off Function – Labelled On/Off 1 & On/Off 2 on the DR Control Box Terminals

This is a “Normally Closed” switch operation. i.e. Turning Switch “On” will Turn the Unit “OFF”, Turning the Switch “Off” will turn the Unit “On”.

Operations:

If the Unit is OFF: Turning OFF the Switch will Power On the Unit, Mode will be Auto / Set Temp is 24 DegC.(This is regardless of what was last set on the Remote Control)
If Unit is ON: Turning ON the Switch will Power Off the Unit.

If Unit is OFF: Turning OFF the Switch will Power On the Unit – Auto Mode / 24 DegC. Pressing any button on the Remote Control (except On/Off) will update the Unit settings to whatever is set on the Remote Control. (ie: Cool Mode, 20 DegC etc)

If Unit was turned ON via the Remote Control: Turning OFF the Switch will Power on the Unit in “On/Off Mode” – so Unit will go to Auto Mode / 24 Deg C (Regardless of what was the last set on the Remote Control)

If Unit was turned OFF via the Remote Control: Turning ON the Switch will leave the Unit in OFF Mode.

If the Unit was ON via the Remote Control: Turning switch ON will Power Off the Unit. Remote Control will still be in “ON” Mode. Pressing “On/Off” Button on Remote Control results in Unit ON with Settings as currently set on Remote Control (ie: Cool Mode, 20 DegC Etc)

Switch Function – Labelled Switch 1 & Switch 2 on the DR Control Box Terminals

Must have a Loop Wire Installed on Unit between Switch1 & Switch2 Terminals or Unit will Not Operate & CP will be displayed on LCD Screen.

If Loop Wire is removed & Switch installed:

Operates like a “Stand-By” Mode:

If Unit is ON: Turning Switch OFF will put the Unit in “Stand-By” Mode – Unit stops running & CP is displayed on LCD. All button presses on Remote are ignored except On/Off Button.

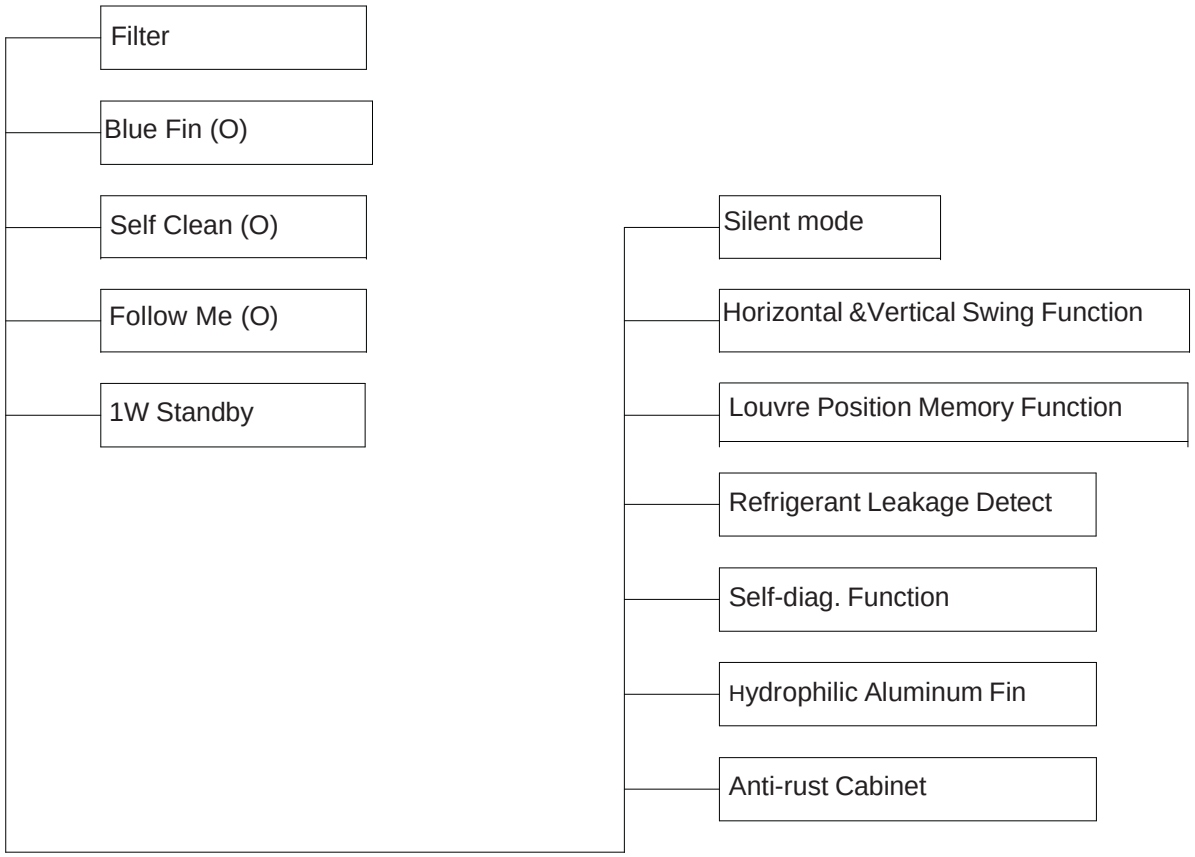
If Unit is ON: Turning Switch ON will allow Unit to resume normal Operation via Remote Control – all Remote Settings are recalled & Unit runs as per last Remote inputs.

If Switch is OFF: Unit is in Stand-by Mode – CP displayed on LCD. Pressing Remote Control On/Off button to “OFF” will Power OFF Unit completely. If Remote On/Off Button pressed again to “ON” – Unit will go back into “Stand-by Mode” & CP will be displayed on LCD.

2. Function

Model Names of Indoor/Outdoor Units

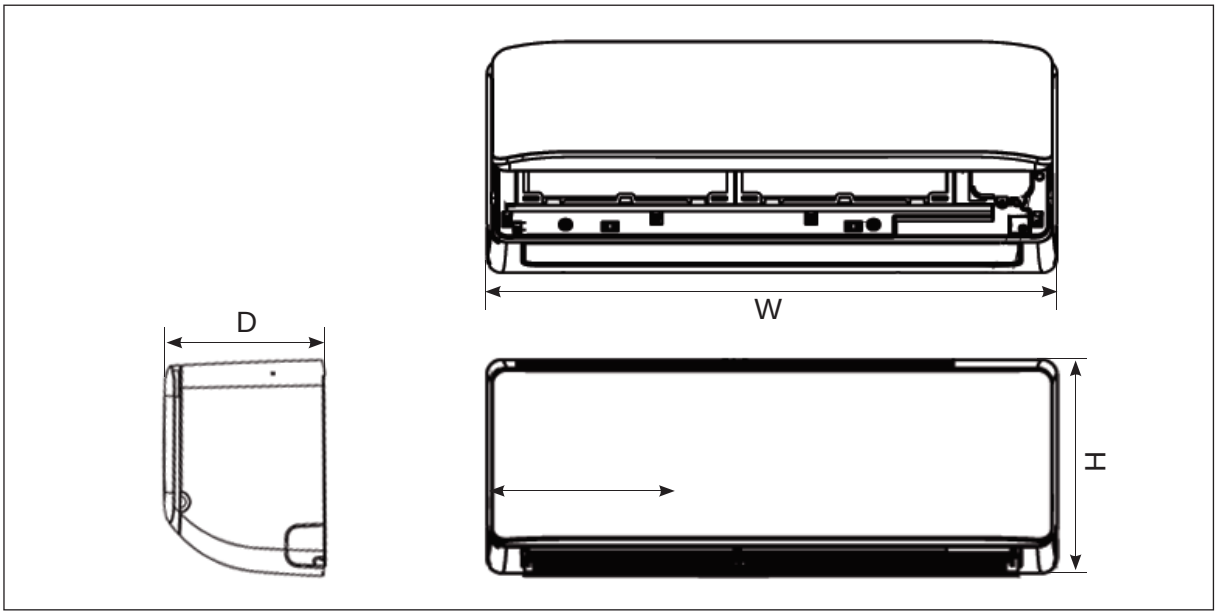
Capacity	Indoor units	Outdoor units
2.6kW	SWB26E	SWB26C
3.6kW	SWB36E	SWB36C
5.2kW	SWB52E	SWB52C
7.0kW	SWB70E	SWB70C
8.2kW	SWB82E	SWB82C



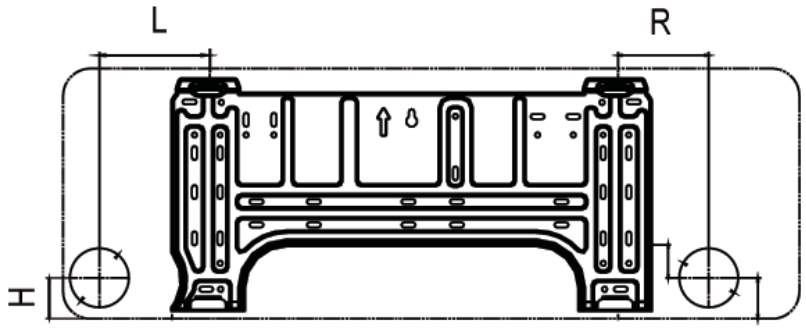
O: optional function

3. Dimension

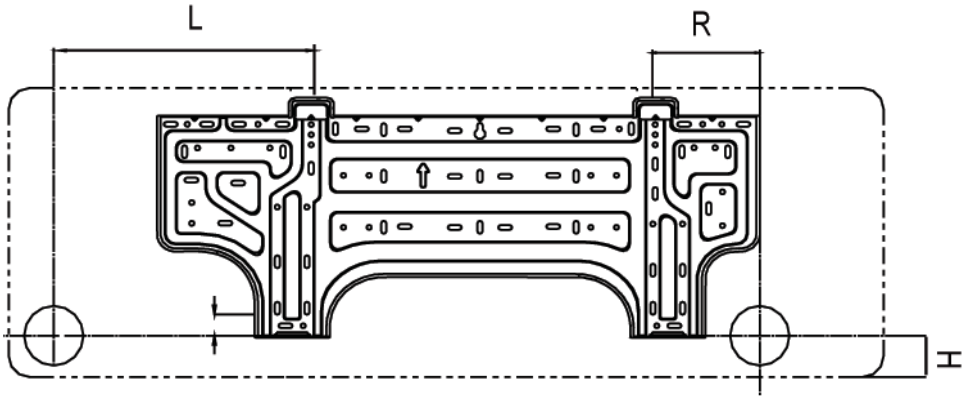
3.1 Indoor Unit / Mounting Plate Dimensions



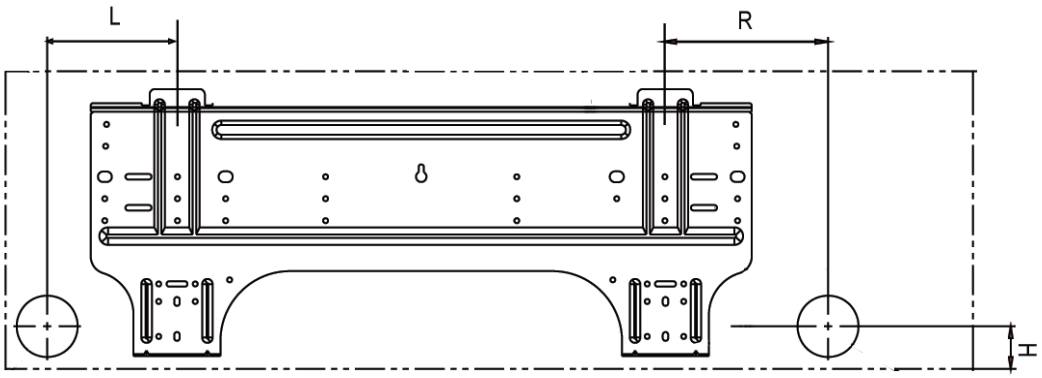
Model	W (mm)	D (mm)	H (mm)
SWB26E	750	198	280
SWB36E	835	198	280
SWB52E	990	218	315
SWB70E	1186	258	340
SWB82E	1186	258	340



Model	L(mm)	R(mm)	H(mm)	Dimension of installation hole(mm)
SWB26E	180	110	45	¢ 65
SWB36E	140	110	45	

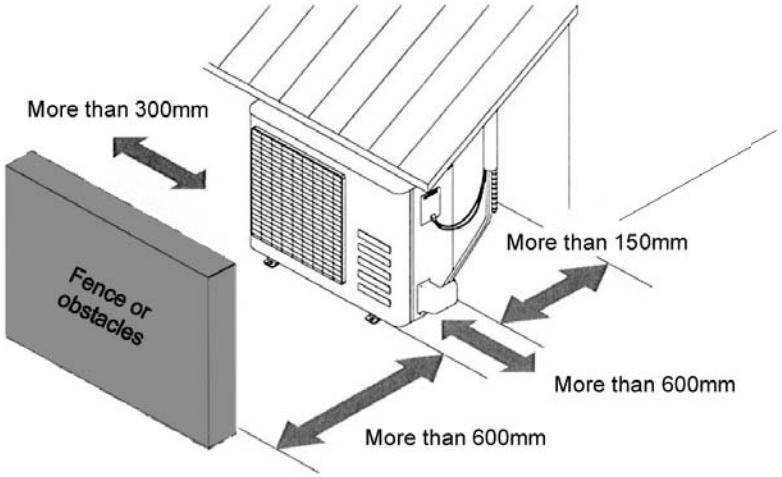


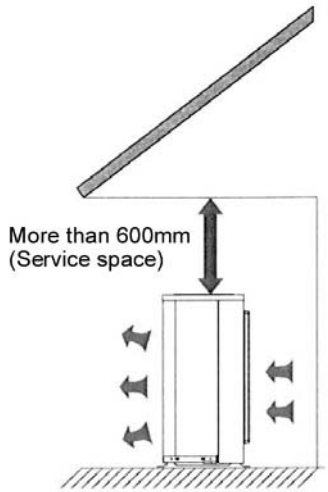
Model	L(mm)	R(mm)	H(mm)	Dimension of installation hole(mm)
SWB52E	260	135	45	¢ 65

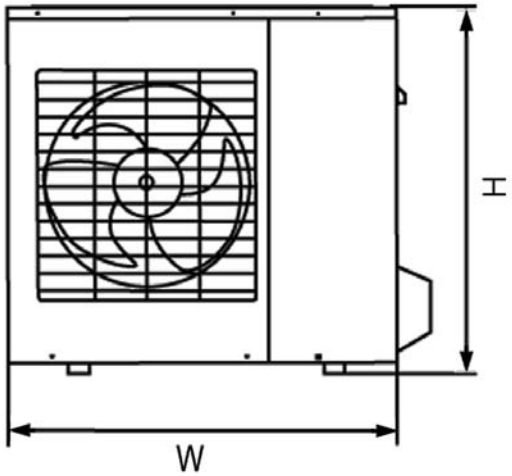


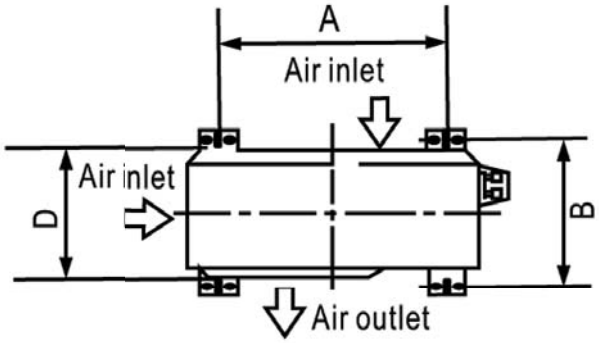
Model	L(mm)	R(mm)	H(mm)	Dimension of installation hole (mm)
SWB70E	275	275	45	¢ 65
SWB82E				

3.2 Outdoor Unit



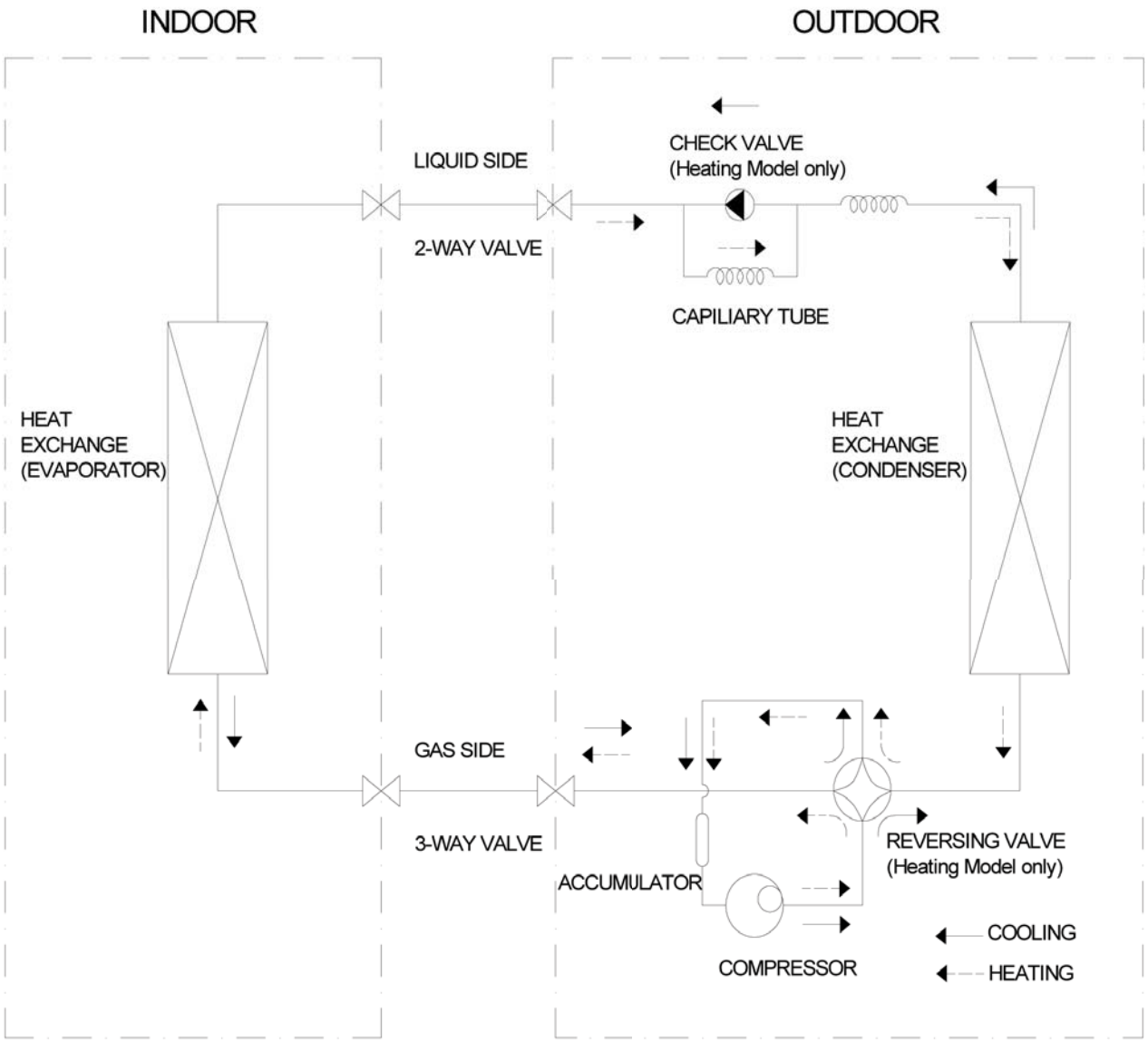






Model	W (mm)	D (mm)	H (mm)	A (mm)	B (mm)
SWB26C	760	285	590	530	290
SWB36C	760	285	590	530	290
SWB52C	845	320	700	560	335
SWB70C	900	315	860	590	333
SWB82C	900	315	860	590	333

4. Refrigerant Cycle Diagram

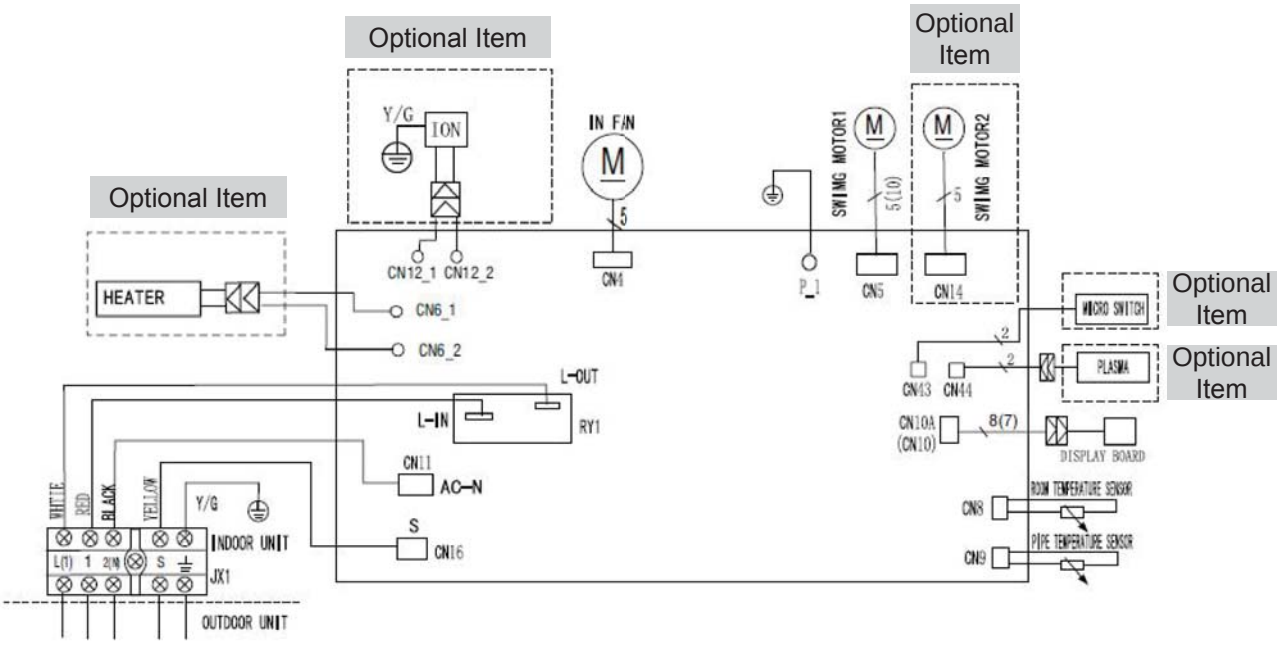


5. Wiring Diagram

5.1 Outdoor Unit / Indoor Unit

All Models SWB26E / SWB36E / SWB52E / SWB70E / SWB82E

Note: The cross section area of cable connected to L(1), 1, 2(N) must be sufficient for the maximum system current.



IMPORTANT NOTE

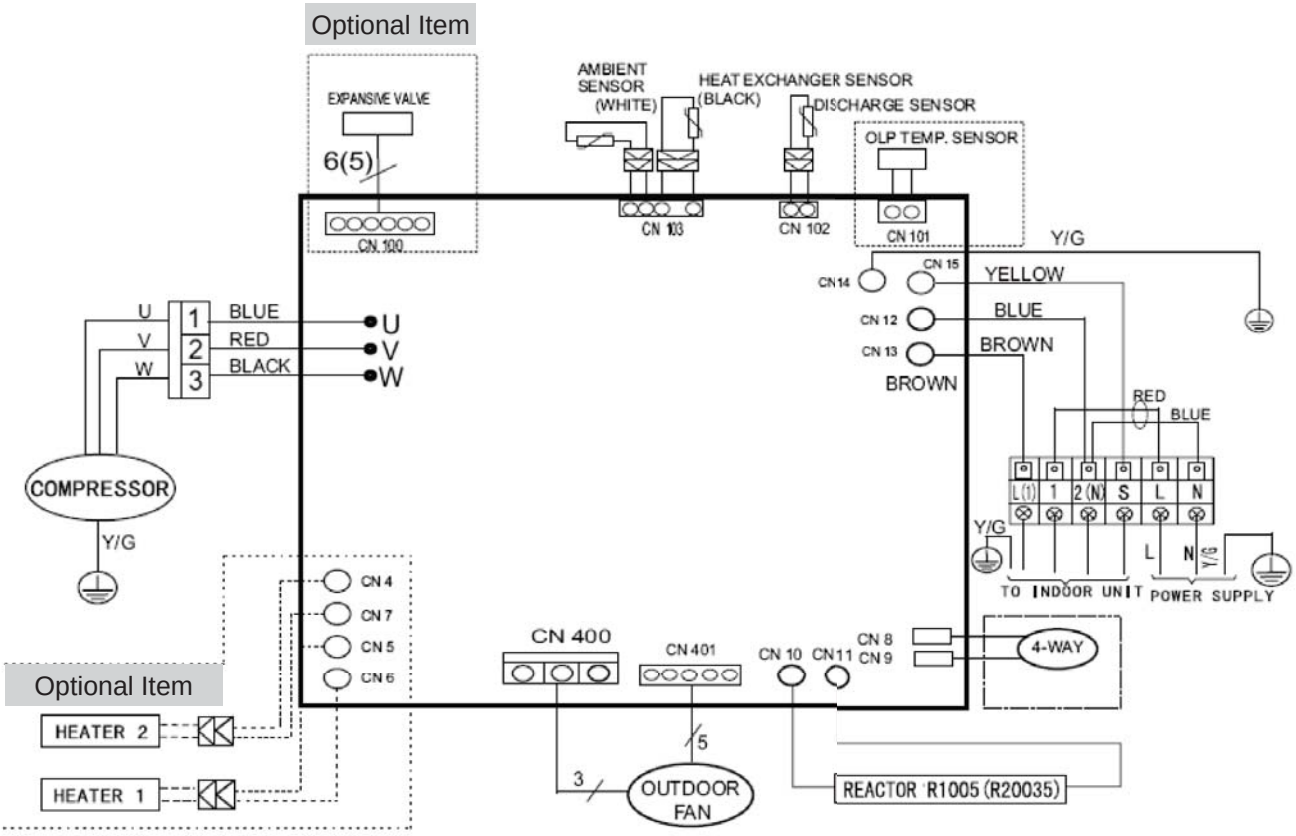
Optional Items:

Only selected 'optional items' are offered. If you require an optional item, please contact ActronAir regarding its availability.

Email: technicalsupport@actronair.com.au

5.2 Outdoor Unit

Models SWB26C / SWB36C



IMPORTANT NOTE

Optional Items:

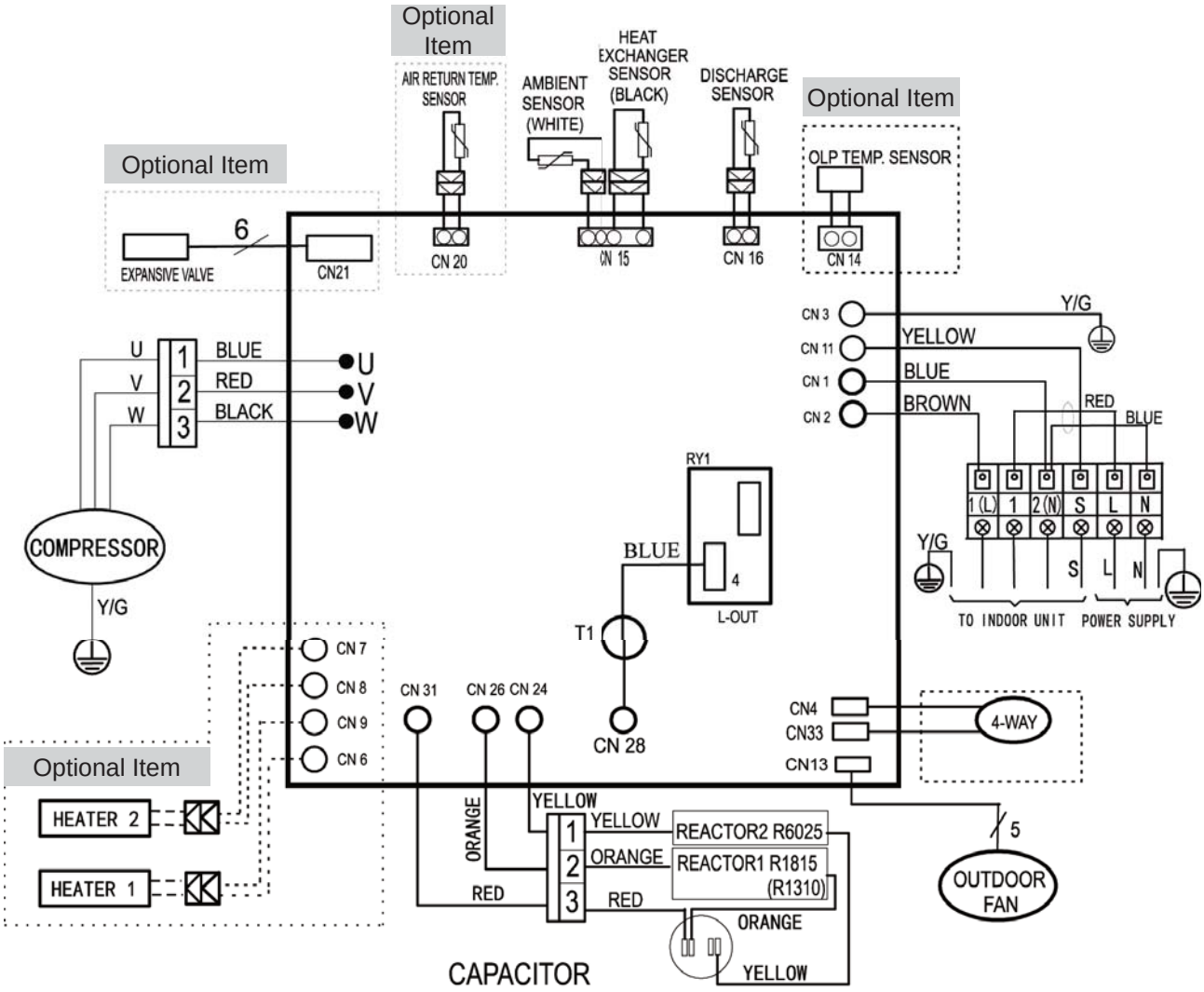
Only selected 'optional items' are offered. If you require an optional item, please contact ActronAir regarding its availability.

Email: technicalsupport@actronair.com.au

5.2 Outdoor Unit (continued)

Model SWB52C

Note: The cross section area of cable connected to L(1), 1, 2(N) must be sufficient for the maximum system current.



IMPORTANT NOTE

Optional Items:

Only selected 'optional items' are offered. If you require an optional item, please contact ActronAir regarding its availability.

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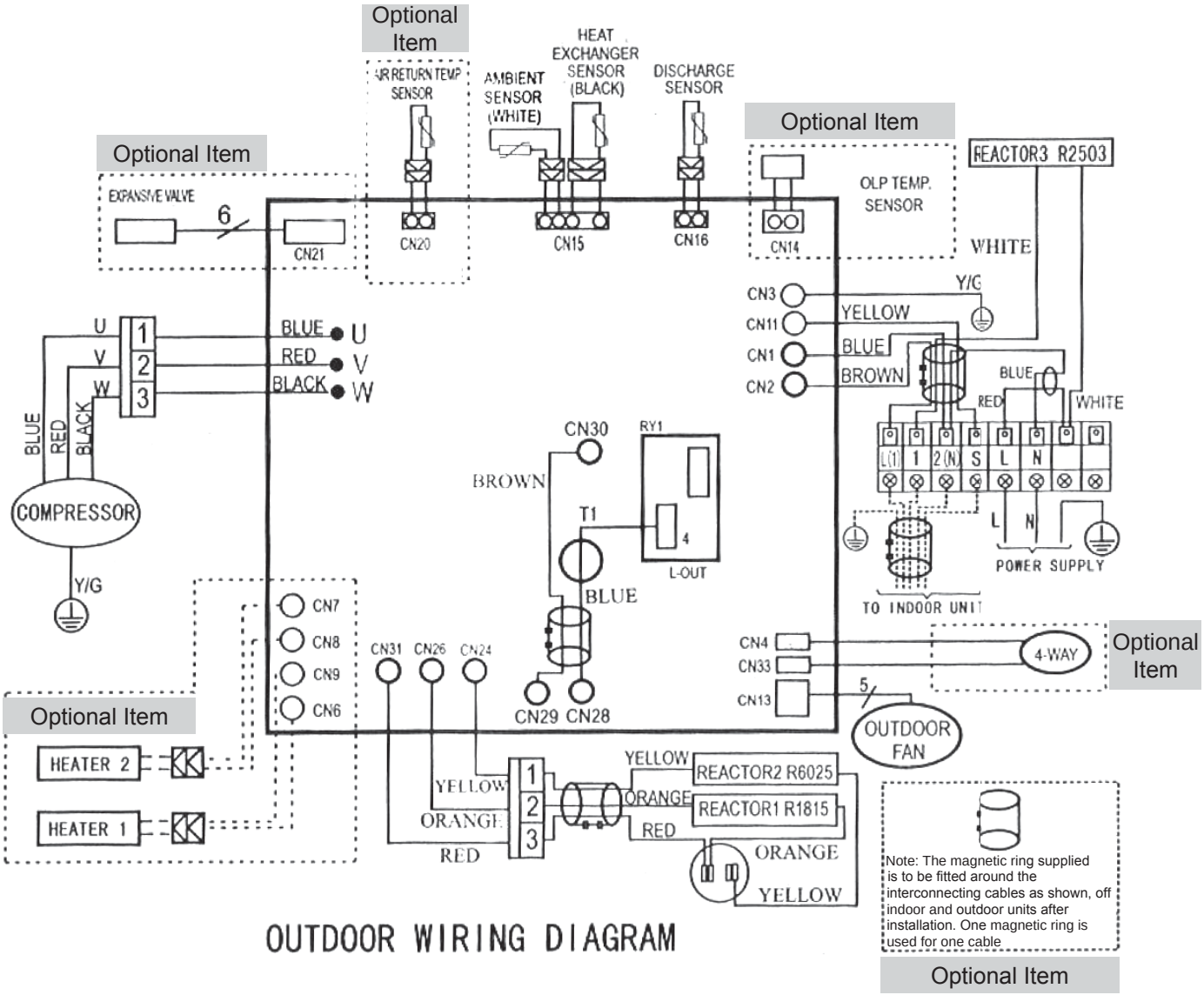
5.2 Outdoor Unit (continued)

Model SWB70C



OUTDOOR WIRING DIAGRAM

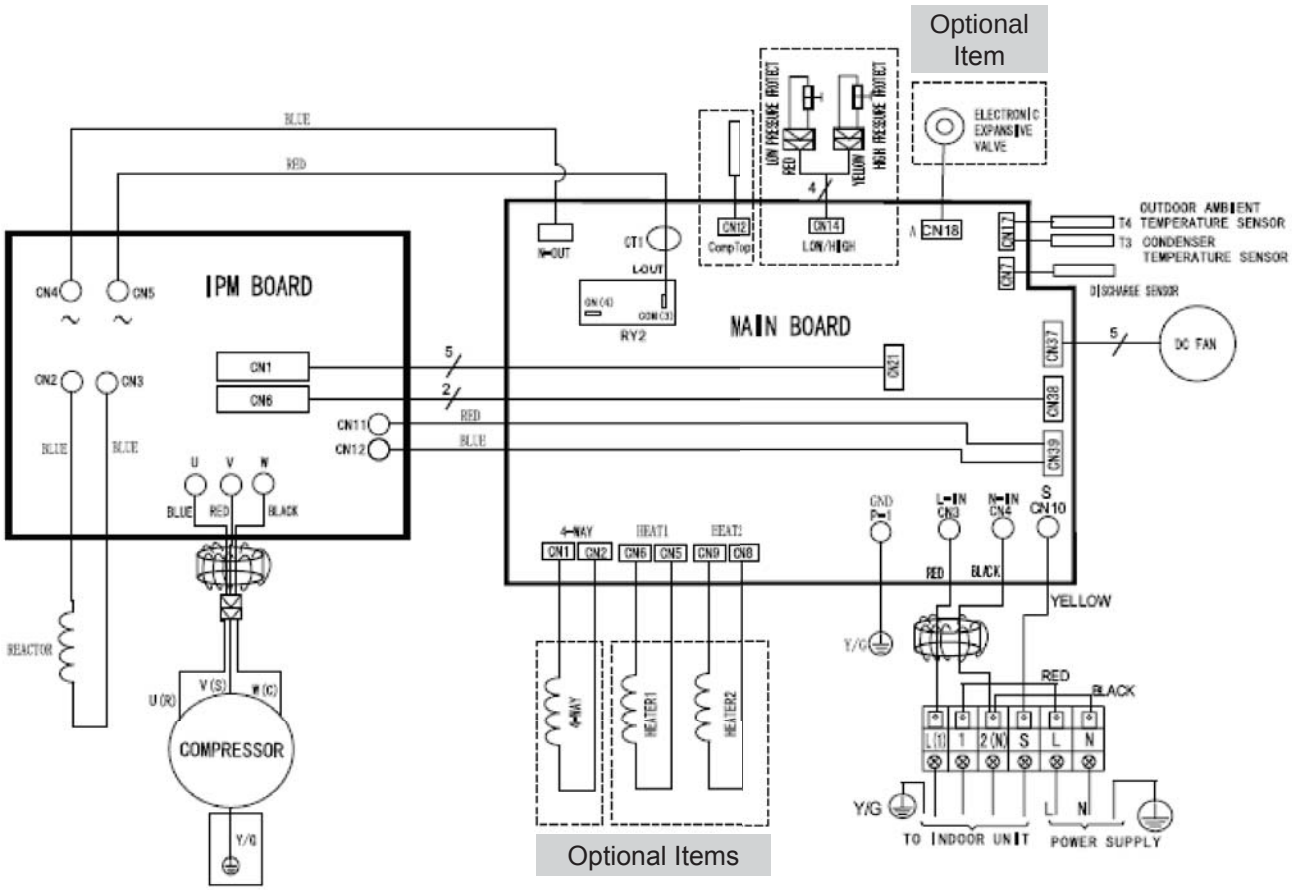
IMPORTANT NOTE

Optional Items:
Only selected 'optional items' are offered. If you require an optional item, please contact ActronAir regarding its availability.

Email: technicalsupport@actronair.com.au

5.2 Outdoor Unit (continued)

Model SWB82C



IMPORTANT NOTE

Optional Items:

Only selected 'optional items' are offered. If you require an optional item, please contact ActronAir regarding its availability.

Email: technicalsupport@actronair.com.au

6. Installation Details

6.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening torque
mm	inch	N.cm	N.cm
ϕ 6.35	1/4	1500 (153kgf.cm)	1600 (163kgf.cm)
ϕ 9.52	3/8	2500 (255kgf.cm)	2600 (265kgf.cm)
ϕ 12.7	1/2	3500 (357kgf.cm)	3600 (367kgf.cm)
ϕ 15.9	5/8	4500 (459kgf.cm)	4700 (479kgf.cm)
ϕ 19	3/4	6500 (663kgf.cm)	6700 (683kgf.cm)

6.2 Connecting the cables

Electrical Work to the ***INDOOR Unit***

Electrical safety regulations for the initial installation

1. Power voltage should be in the range of 90%~110% of rated voltage.
2. Ensure the air conditioner is grounded well.
3. See Electrical Connection Diagram located on the panel of the outdoor unit to connect the wire.
4. All wiring must comply with local and national electrical codes and be installed by qualified and skilled electricians
5. An individual branch circuit and single receptable used only for this air conditioner must be available. See the following table for suggested wire sizes and fuse specifications

Suggested minimum cross sectional area of conductors

Model	Wiring Method (Mains connected to Outdoor or Indoor unit)	FLA for Unit	Main Circuit Breaker Rating	Suggested Minimum Mains **Cable Size*1**	Suggested Minimum Indoor to Outdoor **Cable Size*1**
SWB26C/E	Hardwired to Outdoor unit	9.5A	16.0A	2.5mm²	1.0mm²
SWB36C/E	Hardwired to Outdoor unit	12.0A	16.0A	2.5mm²	1.0mm²
SWB52C/E	Hardwired to Outdoor unit	13.0A	16.0A	2.5mm²	1.0mm²
SWB70C/E	Hardwired to Outdoor unit	13.5A	20.0A	2.5mm²	1.0mm²
SWB82C/E	Hardwired to Outdoor unit	15.0A	20.0A	2.5mm²	1.0mm²

* 1 Suggested Minimum Cable Sizes should be used as a guide only - refer to AS/NZS3000 “Australia and New Zealand Wiring Rules” for full details.

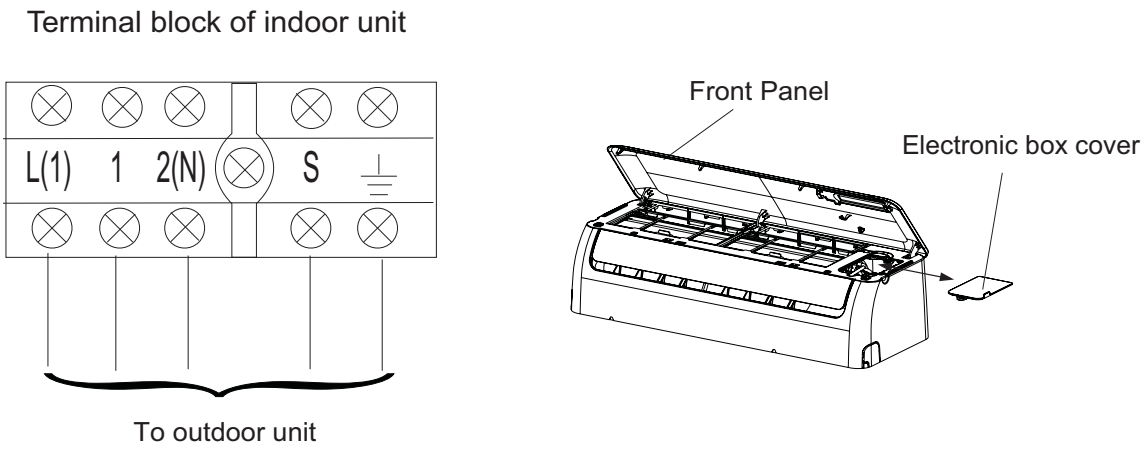
6.2 Connecting the cables (continued)

Connecting the cables to the ***INDOOR Unit*** and ***OUTDOOR Unit***

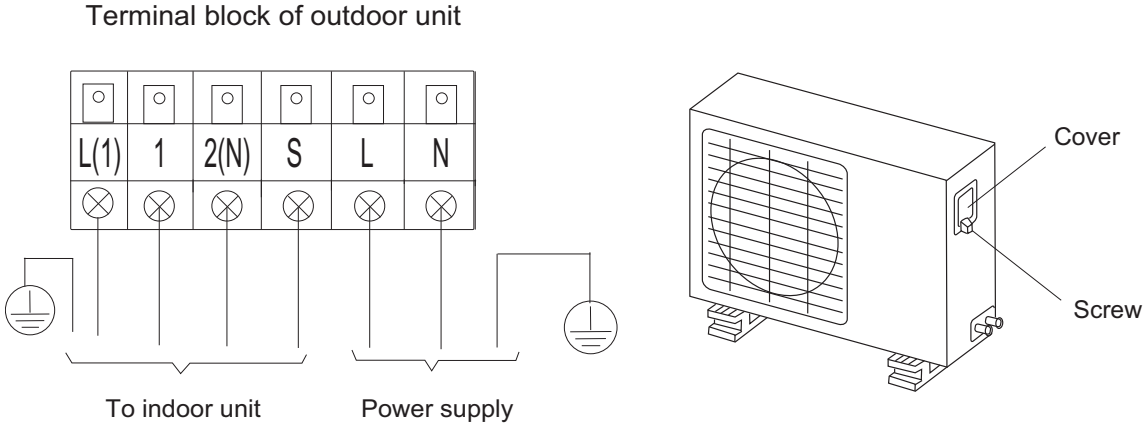
NOTE: Before performing any electrical work, **turn off the main power to the system**

1. The inside and outside connecting cable can be connected without removing the front grille.
2. Use appropriate connection cables to connect indoor to outdoor unit
3. Lift the indoor unit panel up, remove the electrical box cover by loosening the screw.
4. Ensure the colour of wires of outdoor unit and the terminal numbers are the same to the indoor's respectively.
5. Wrap those cables not connected with terminals with insulation tape, so that they will not touch any electrical components. Secure the cable onto the control board with the cord clamp.

Wiring Diagram (Indoor Unit):



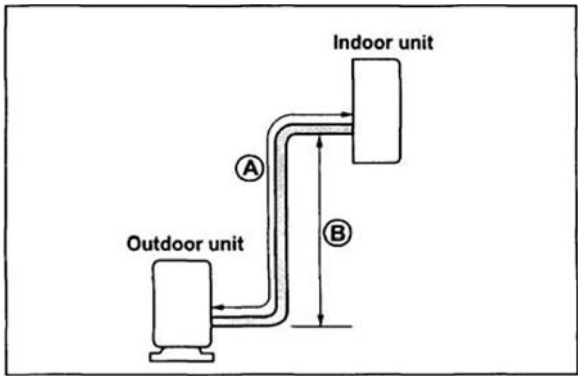
Wiring Diagram (Outdoor Unit):



6.3 pipe length and the elevation

The pipe length and refrigerant amount

Model	Pipe Size		Pre Charged Length (m)	Max. Elevation B (mm)	Max. Length S (mm)	Additional Refrigerant (g/m)
	Gas	Liquid				
SWB26C/E	3/8” (ϕ9.52)	1/4” (ϕ6.35)	5	8	20	20
SWB36C/E	1/2” (ϕ12.7)	1/4” (ϕ6.35)	5	8	20	20
SWB52C/E	1/2” (ϕ12.7)	1/4” (ϕ6.35)	5	10	25	20
SWB70C/E	5/8” (ϕ15.9)	3/8” (ϕ9.52)	5	10	25	40
SWB82C/E	5/8” (ϕ15.9)	3/8” (ϕ9.52)	5	10	25	40



6.4 Installation for the first time

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

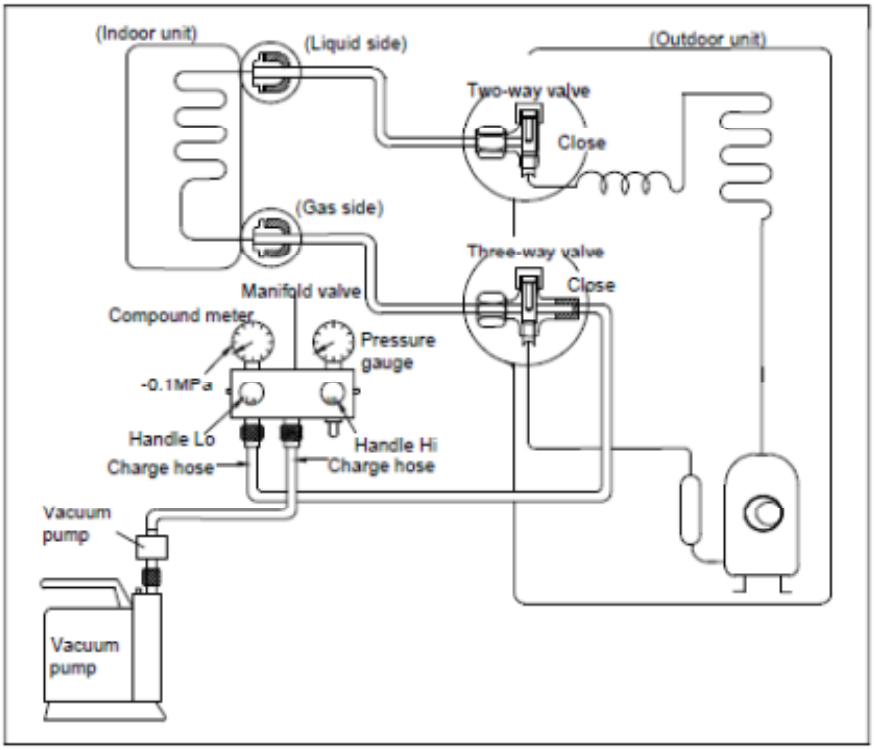
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

  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

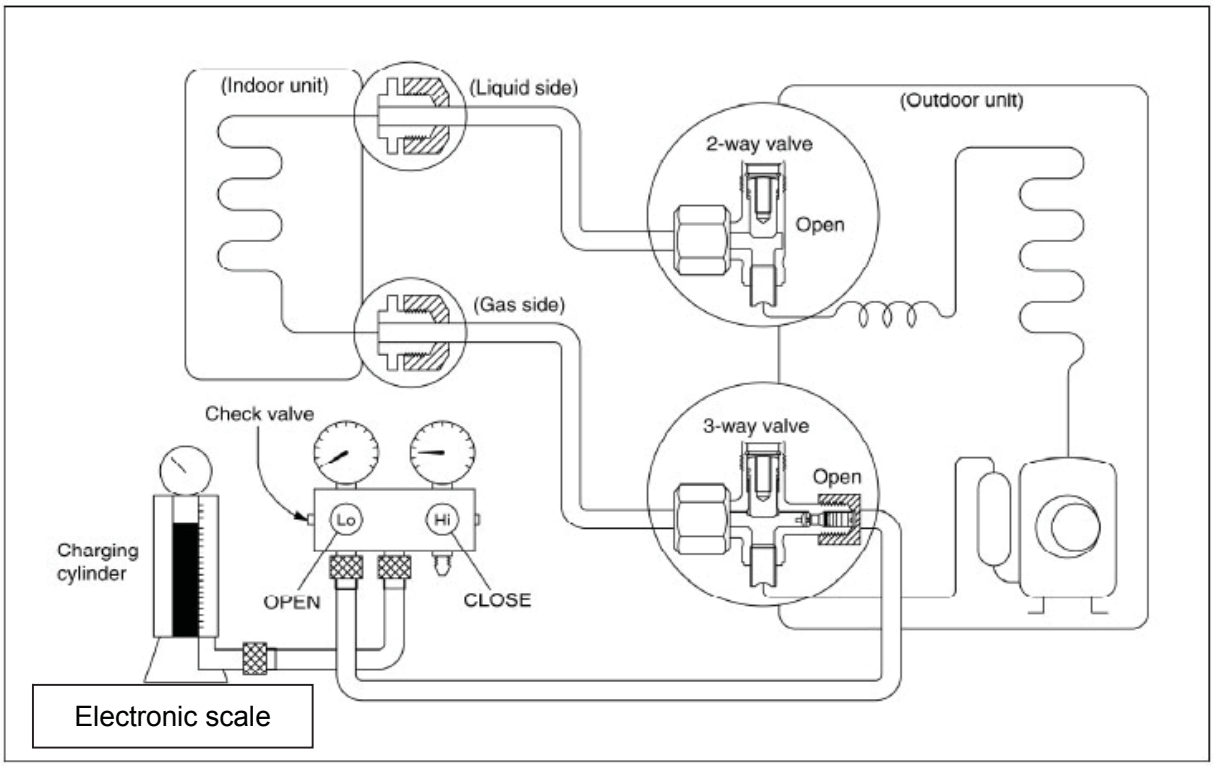


1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
2) Connect the charge hose with the push pin of handle low to the 3-way valves gas service port.
3) Connect the charge hose of handle hi connection to the vacuum pump.
4) Fully open the handle Low of the manifold valve.
5) Operate the vacuum pump to evacuate.
6) Evacuate to 500 microns.

Notes:

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.

2). Ensure lines are free of air / moisture.

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

4) Operate the air conditioner at the cooling mode.

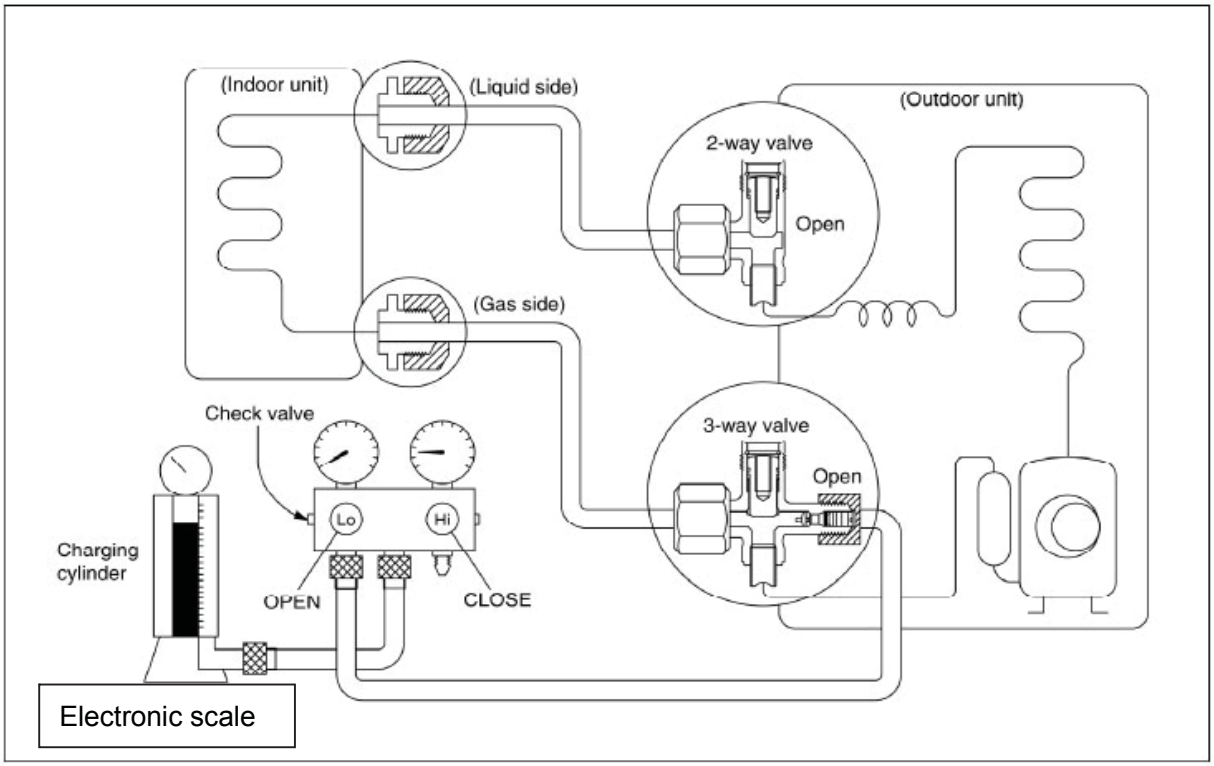
5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

6). When the electronic scale displays the proper weight (refer to the table), close valves 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.

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.

2). Ensure lines are free of air / moisture.

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.

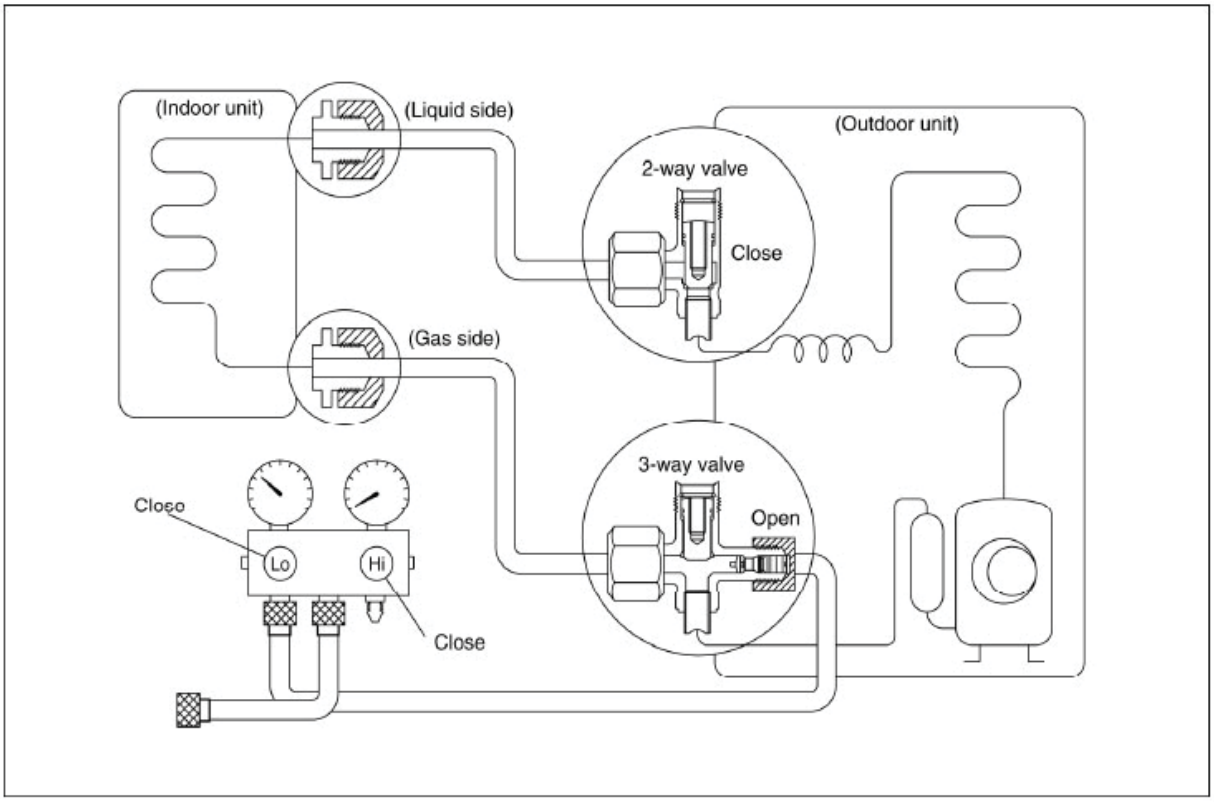
7). Mount the valve stem caps and the service port

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 needs to be repaired

1. Collecting the refrigerant into the Outdoor Unit / Pump Down



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 low to the 3-way valves gas service port.

3). Ensure lines are free of air / moisture.

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.

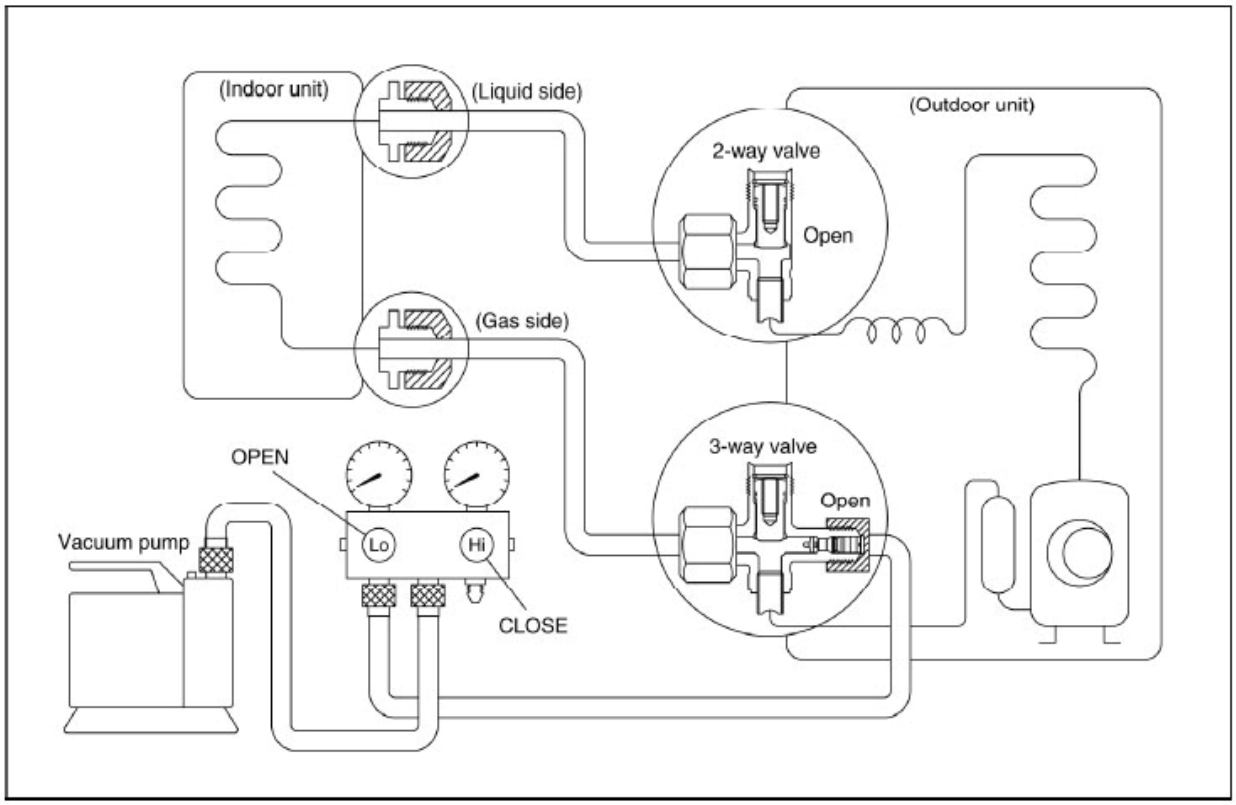
Use a torque wrench to tighten the 3-way valves service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

Notes:

6.7 Re-installation while the outdoor unit needs 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.

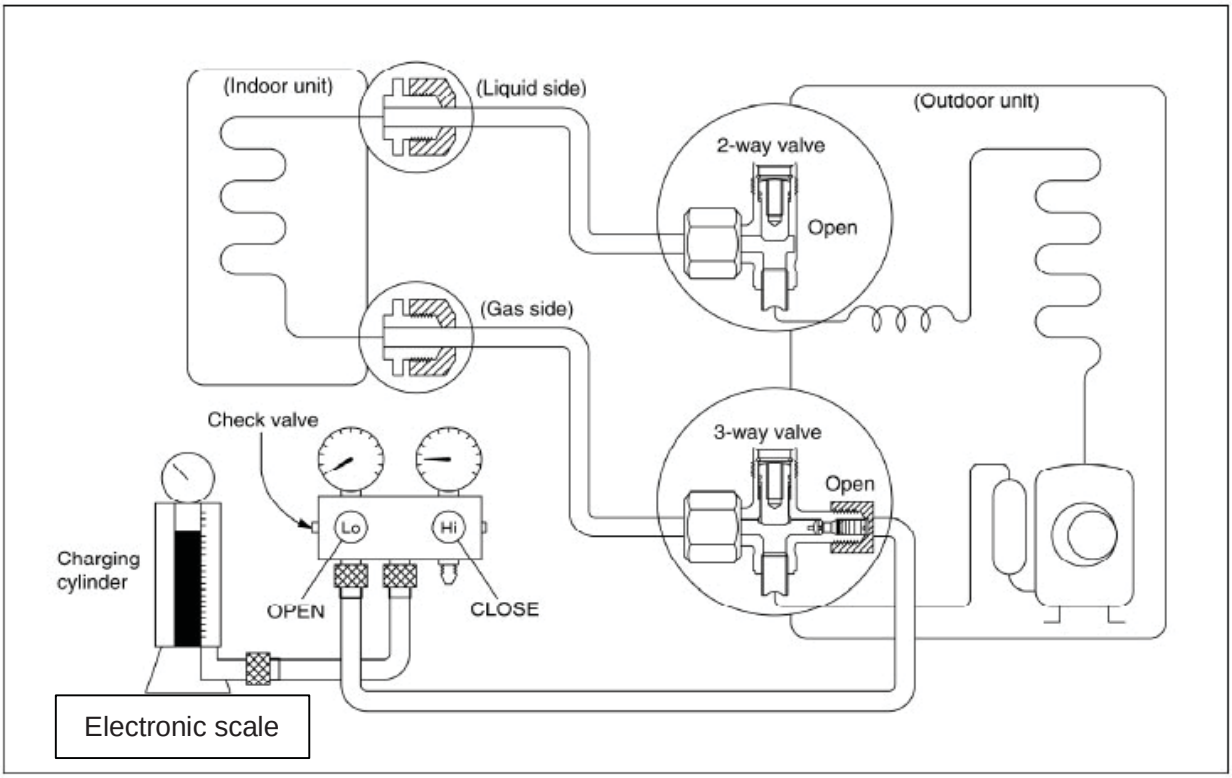
2). Connect the vacuum pump to 3-way valve's service port.

3). Evacuation for approximately one hour. Confirm that the vacuum gauge indicates 500 microns.

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). Ensure lines are free of air / moisture. 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), operate the air conditioner in the cooling cycle.

5).When the electronic scale displays the proper weight, close valves, 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). 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

Notes:

7. Operation Characteristics

Temperature / Mode	Cooling operation	Heating operation	Drying operation
Room temperature	≥17℃	≤30℃	＞10℃
Outdoor temperature	- 0℃～50℃	-15℃～30℃	0℃～50℃

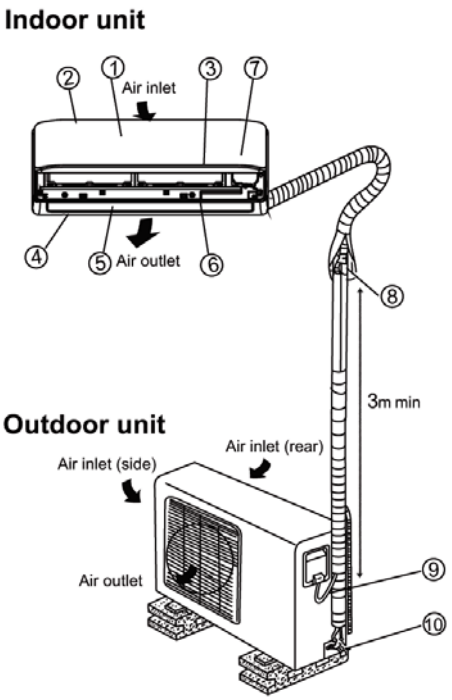
CAUTION:

1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.

2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louvre to its maximum angle (vertically to the floor), and set HIGH fan mode.

3. The optimum performance will be achieved during this operating temperature zone.

8. Installation Details



8.1 Abbreviation

Names of parts ***INDOOR Unit***

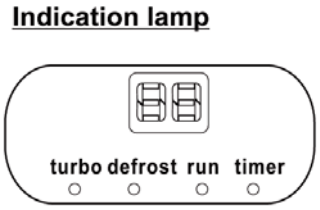
1. Front panel
2. Air inlet
3. Air filter
4. Air outlet
5. Horizontal air flow grille
6. Vertical air flow louvre (inside)
7. Display panel

Names of parts ***OUTDOOR Unit***

8. Connecting pipe
9. Connecting cable
10. Stop valve

NOTE: Pipe length needs to be a minimum of 3 metres to reduce noise and vibration.

8.2 Display function



TURBO indication lamp
This lamp illuminates when TURBO feature is activated.

DEFROST indication lamp
Lights up when the air conditioner starts defrosting automatically or when the warm air pre-heat control feature is activated in heating operation.

RUN indication lamp
This lamp illuminates when the air conditioner is in operation.

TIMER indication lamp
Lights up during Timer operation.

TEMPERATURE indication lamp
- Displays the temperature settings when the air conditioner is operational.
- Displays the malfunction / error code.

IMPORTANT NOTE
All the pictures in the manual are for explaination purposes only. The actual shape of the indoor unit you purchased may be slightly different on front panel and display window. The actual shape shall prevail.

8.3 Main Protection

8.3.1 Time delay at restart for compressor

1 minute delay for the 1st time start-up and 3 minutes delay for others.

8.3.2 Temperature protection of compressor.

The unit will stop working when the compressor top temperature protector cuts off, and will restart after the compressor top temperature protectors reset

8.3.3 Temperature protection of compressor discharge

When the compressor discharge temp. is getting higher, the running frequency will be limited as below rules:

---Compressor discharge temp. T5>115℃ for 5s, compressor stops and restarts up till T5<90℃

---110<T5<115℃, decrease the frequency to the lower level every 2 minutes.

---105<T5<110℃, keep running at the current frequency.

----T5<105℃, no limit for frequency.

8.3.4 Fan Speed is out of control

When Indoor Fan Speed remains at less than (300RPM) for an extended amount time, the unit will stop and the LED will display the failure

8.3.5 Inverter module protection

The Inverter module has a protection function about current, voltage and temperature. If these protections happen, the corresponding code will display on indoor unit and the unit will stop working.

8.3.6 Indoor fan delayed open function

When the unit starts up, the louver will be active immediately and the indoor fan will start 10s later.

If the unit runs in heating mode, the indoor fan will be also controlled by anti-cold wind function.

8.4.7 Refrigerant leakage detection

This function is only active in cooling mode. It can better prevent the compressor being damaged by refrigerant leakage or compressor overload.

Open condition:

Define the evaporator coil temp.T2 of the compressor just starts running as Tcool.

In the beginning 5 minutes after the compressor starts up, if T2 ＜Tcool－2℃ does not keep continuous 4 seconds and this situation happens 3 times, the display area will show “EC” and AC will turn off.

8.4 Operation Modes and Functions

8.4.1 Fan mode

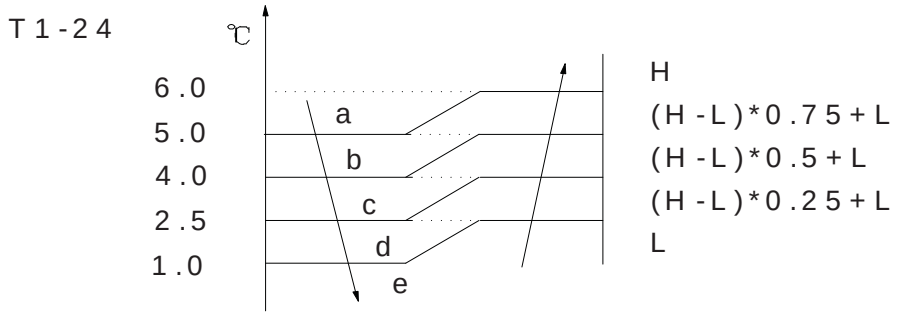
(1) Outdoor fan and compressor stop.

(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 louvre operates same as in cooling mode.

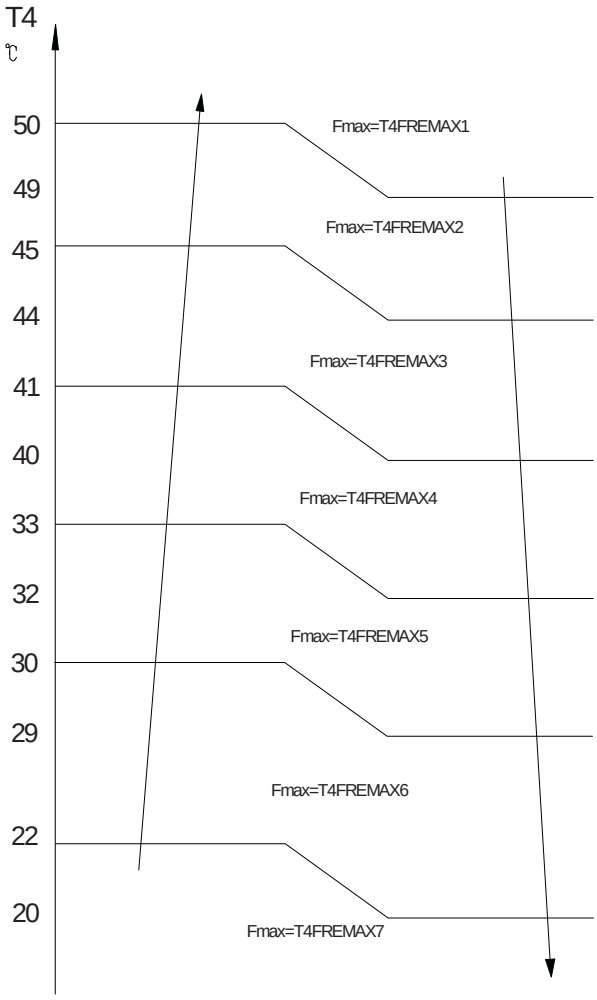
(5) Auto fan:



8.4.2 Cooling Mode

8.4.2.1 Compressor running rules

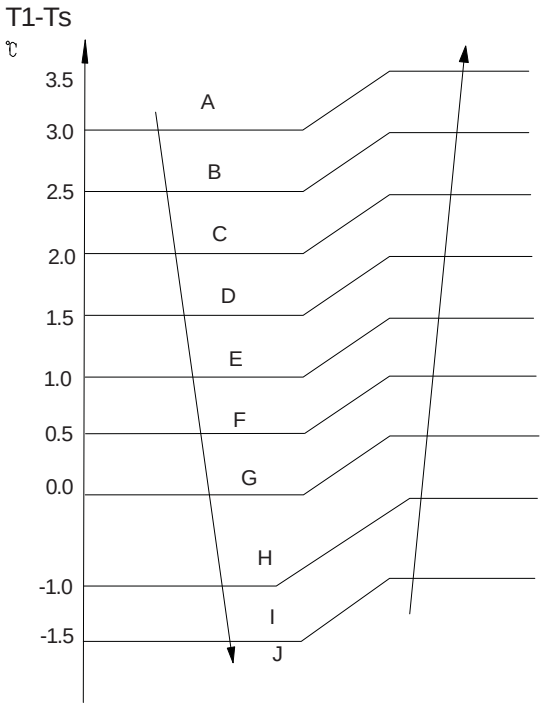
The maximum operation frequency of compressor after starting submits to following rule.



Meanwhile, the maximum frequency is limited by the indoor fan speed.

Indoor fan speed	Maximum frequency
High speed / turbo function	No limit
Silent mode	Fixed at F3

If users switch on AC by remote controller, the compressor will run at the Fmax frequency for 7 minutes according to the outdoor ambient temp. During the 7 minutes, the frequency limitation is active. 7 minutes later, the compressor running frequency will be controlled as below:



While the zones of A,B,C... are corresponding to different compressor running frequency.

Note:

When T1-Ts keeps in the same temp. zone for 3 minutes, the compressor will run as the below rules:

A:Increase the frequency to 3 grade higher until to FREMAX.

B~E: Increase the frequency to 2 grade higher until to FREMAX.

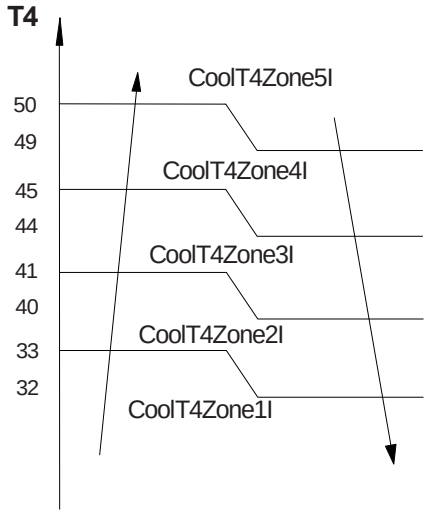
F~G: Increase the frequency to 1 grade higher until to FREMAX.

H: Keep the current frequency. :

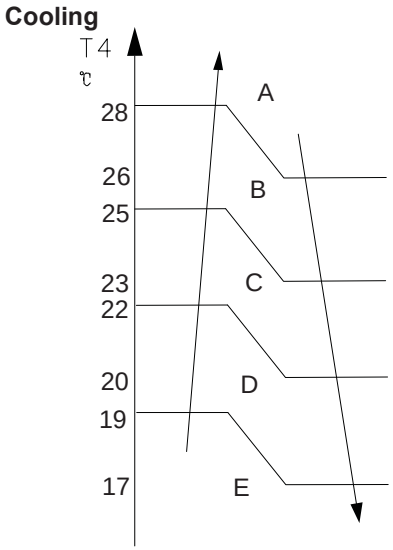
I: Decrease the frequency to 1 grade lower until to F1.

J: Run at F1 for 1h.(if T1-Ts<-2℃, the compressor will stop)

Meanwhile, the compressor running frequency is limited by the current.



8.4.2.2 Outdoor fan running rules



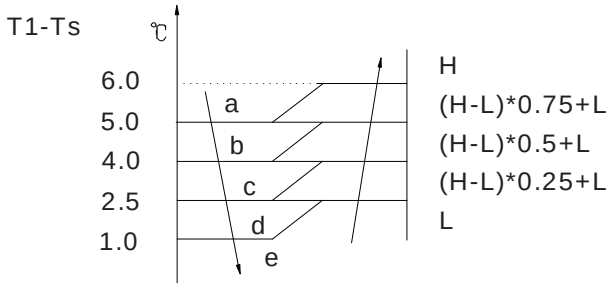
While A,B,C…means different fan speed of outdoor unit.

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, auto and silent. When the compressor is running, the indoor fan is controlled as below:

Setting Fan speed	T1-Ts		Actual fan speed
H	4.5		H+(H+=H+G)
	3.0	A	H（=H）
	1.5	B	H-（H-=H-G）
		C	
M	4.5		M+(M+=M+Z)
	3.0	D	M(M=M)
	1.5	E	M-(M-=M-Z)
		F	
L	4.5		L+(L+=L+D)
	3.0	G	L(L=L)
	1.5	H	L-(L-=L-D)
		I	

The auto fan acts as below rules:



8.4.2.4 Condenser temperature protection

---55℃<T3<60℃, the compressor frequency will decrease to the lower level until to F1 and then runs at F1.If T3<54℃, the compressor will keep running at the current frequency.

---T3<52℃, the compressor will not limit the frequency and resume to the former frequency.

---T3>60℃ for 5 seconds, the compressor will stop until T3<52℃.

8.4.2.5 Evaporator temperature protection

---T2<0℃, the compressor will stop and restart when T2>=5℃.

---0℃≦T2<4℃, the compressor frequency will be limited and decreased to the lower level

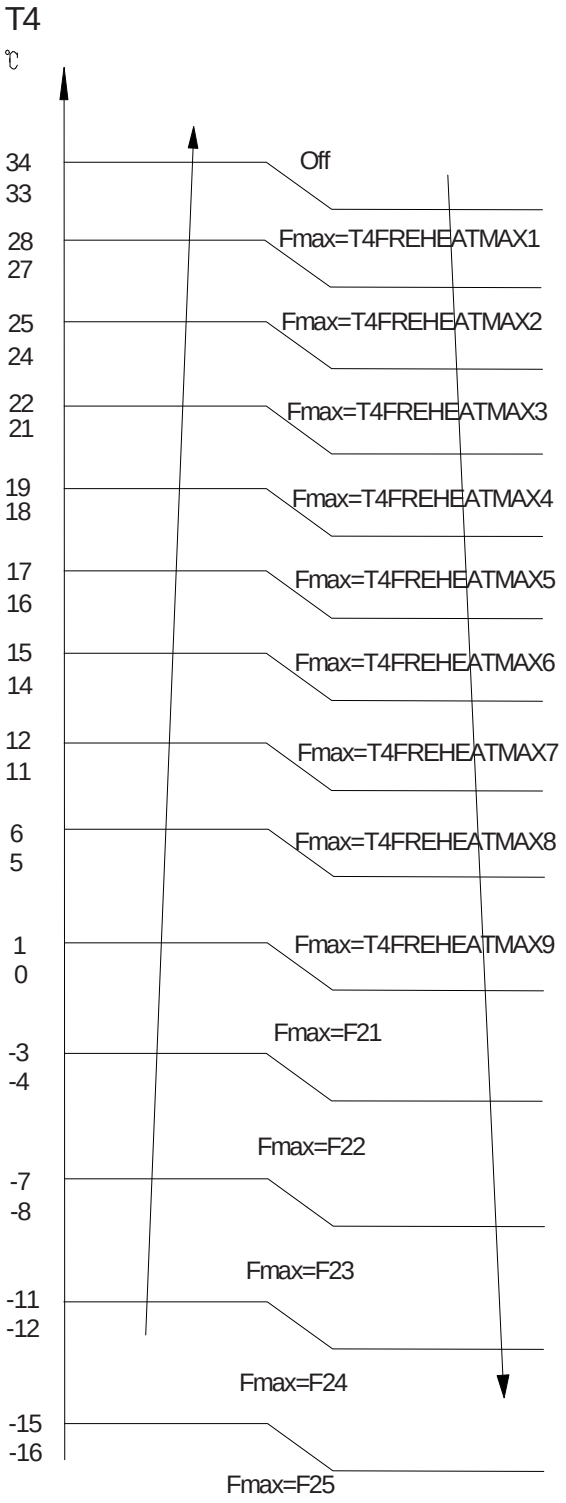
---4℃≤T2≤7℃, the compressor will keep the current frequency.

---T2>7℃, the compressor frequency will not be limited.

8.4.3 Heating Mode

8.4.3.1 Compressor running rules

The maximum operation frequency of the compressor after starting submits to the following rule.

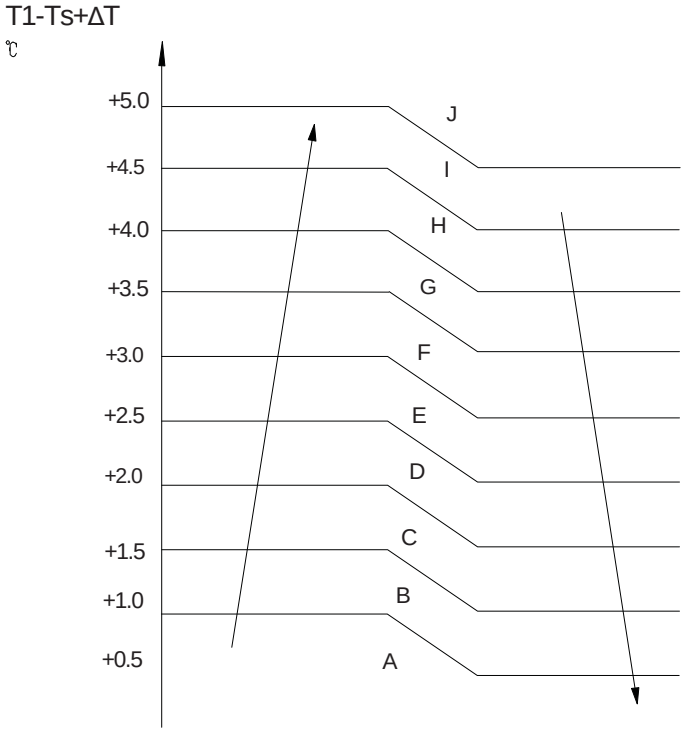


Meanwhile, the maximum frequency is limited by the indoor fan speed.

Indoor fan speed	Maximum frequency
High speed/8 degree heating/ turbo function	No limit
Medium speed	FHeatMaxMidFan
Low speed/sleep mode	FHeatMaxLowFan
Silent mode	Fixed at F3

If users switch on AC by remote controller, the compressor will run at the Fmax frequency for 7 minutes according to outdoor ambient temp. During the 7 minutes, the frequency limitation is active.

7 minutes later, the compressor running frequency will be controlled as below:



While the zones of A,B,C... are corresponding to different compressor running frequency.

ΔT=0℃ as default.

Note:

When T1-Ts keeps in the same temp. zone for 3 minutes, the compressor will run as the below rules:

A: Increase the frequency to 3 grade higher until to FREMAX.

B~E: Increase the frequency to 2 grade higher until to FREMAX.

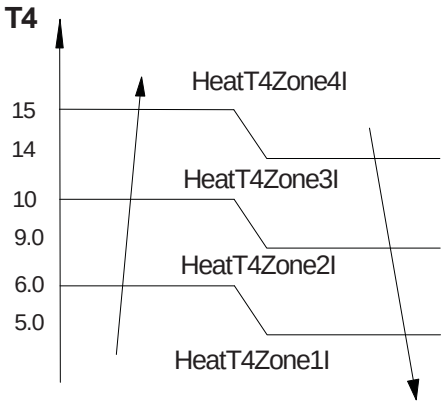
F~G: Increase the frequency to 1 grade higher until to FREMAX.

H: Keep the current frequency.

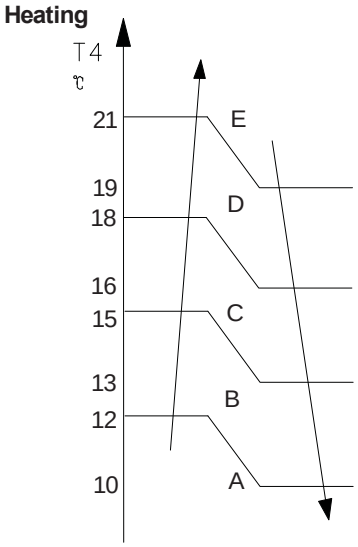
I: Decrease the frequency to the 1 grade lower until to F1.

J: Run at F1 for 1h.(if T1-Ts-ΔT >6℃, the compressor will stop)

Meanwhile, the compressor running frequency is limited by the current.



8.4.3.2 Outdoor fan running rules



8.4.3.3 Indoor fan running rules

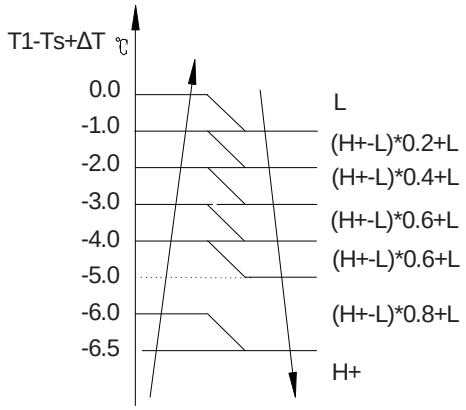
In heating mode, indoor fan can be selected as high, medium, low, auto and silent. The anti-cold- wind function is preferential. The running rules of anti-cold-wind function depend on both T1 and T2 that is more comfortable control.

When the compressor is running, the indoor fan is controlled as below:

Setting fan speed	T1-Ts	Actual fan speed
H	-1.5 -3.0 -4.5	H-（H-=H-G） H（=H） H+(H+=H+G)
M	-1.5 -3.0 -4.5	M-(M-=M-Z) M(M=M) M+(M+=M+Z)
L	-1.5 -3.0 -4.5	L-(L-=L-D) L(L=L) L+(L+=L+D)

If the compressor stops caused by the room temperature rising, the indoor fan will be forced to run 127 seconds with breeze. During this period, the anti-cold-wind is disabled.

Auto fan action in heating mode:



8.4.3.4 Defrosting mode

Condition of defrosting:

----T4＞0℃,

When the units are running, if the following two items are satisfied, the units start defrosting:

The units run with T3＜3℃ for 40 minutes and T3 keeps lower than TCDI℃ for more than 3 minutes.

The units run with T3＜3℃ for 80 minutes and T3 keeps lower than TCDI+2℃ for more than 3 minutes.

----T4＜0℃,

If the 1st condition and 2nd condition items are satisfied, then the program judges if T2 has decreased more than 5℃.When T2 has decreased more than 5℃, enter the defrosting mode.

----No matter what value of the T4 is and whether the T2 drops more than 5℃ or not, if the machine runs with T3＜3℃ for more than 120 minutes and T3 keeps lower than TCDI+4℃ for more than 3 minutes, the machine will enter defrosting mode.

Condition of ending defrosting:

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

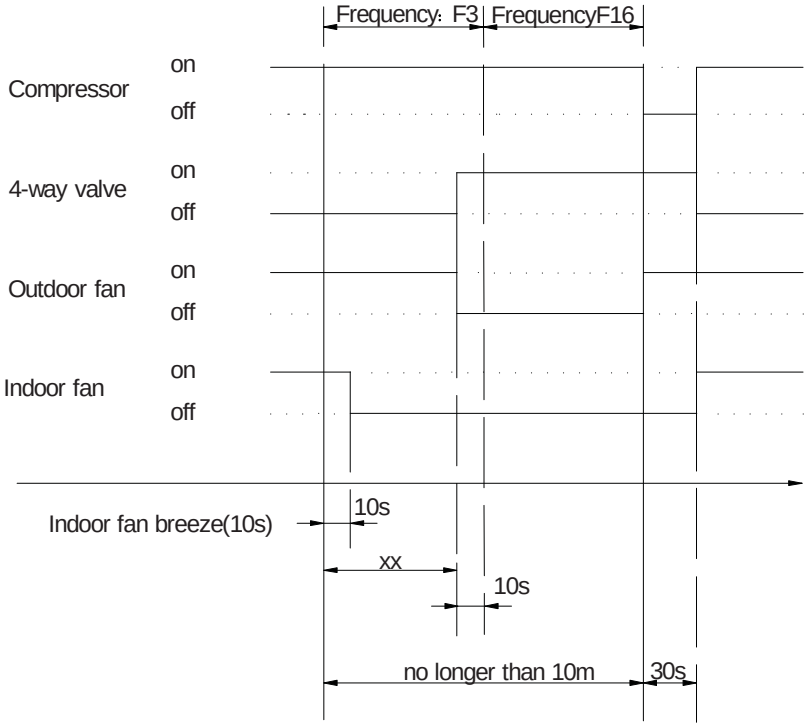
----T3 rises to be higher than TCDE1℃.

----T3 keeps to be higher than TCDE2℃ for 80 seconds.

----The machine has run for 10 minutes in defrosting mode.

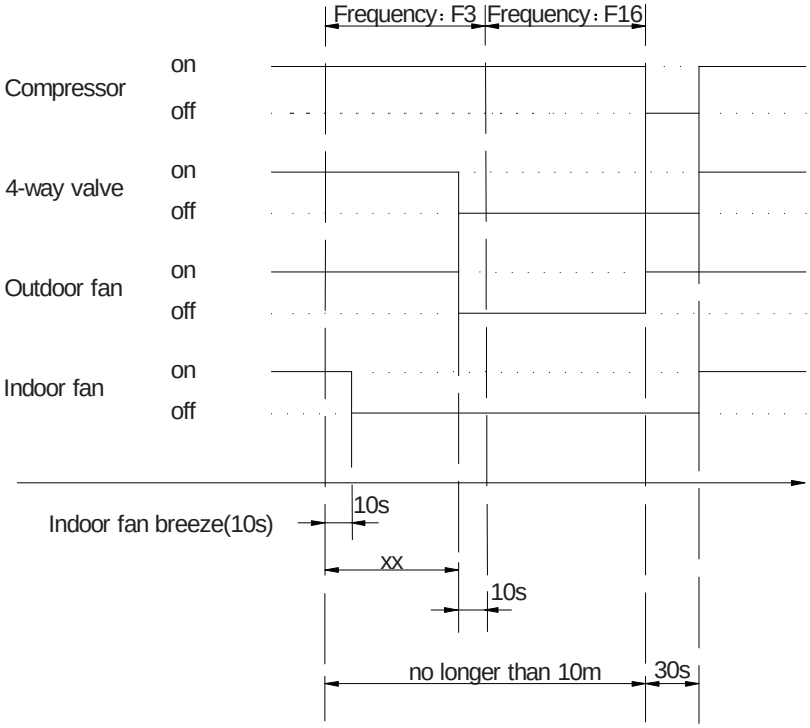
Defrosting action：

SWB26 & SWB36



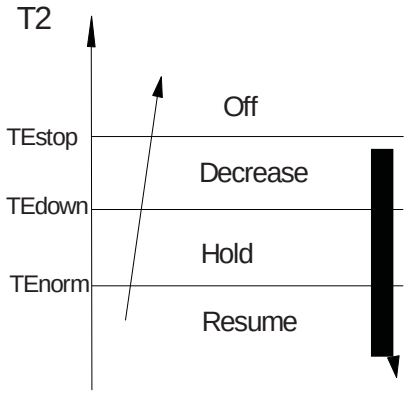
xx=60 for SWB26 & SWB36

For SWB52, SWB70 & SWB82



xx=90.

8.4.3.5 Evaporator coil temperature protection



Off: Compressor stops.

Decrease: Decrease the running frequency to the lower level.

Hold: Keep the current frequency.

Resume: No limitation for frequency.

8.4.4 Auto-mode

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30℃.

In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT (ΔT =T1-Ts).

ΔT=T1-Ts	Running mode
ΔT＞1℃	Cooling
-1<ΔT≤1℃	Fan-only
ΔT≤-1℃	Heating

Indoor fan will run at auto fan of the relevant mode.

The louver operates same as in relevant mode.

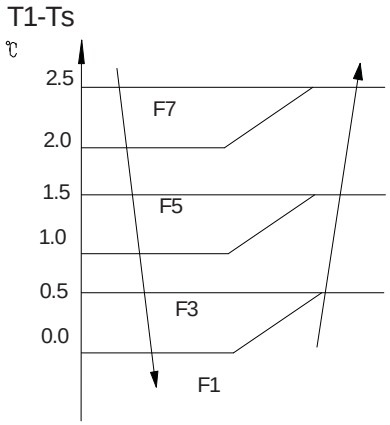
If the machine switches mode between heating and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts.

If the setting temperature is modified, the machine will choose running function again.

8.4.5 Drying mode

8.4.5.1 Indoor fan speed is fixed at breeze (Low) and can't be changed. The louvre angle is the same as in cooling mode.

8.4.5.2 Compressor running rules



8.4.5.3 Low indoor room temperature protection

In drying mode, if room temperature is lower than 10℃, the compressor will stop and not resume until room temperature exceeds 12℃.

8.4.5.4 Evaporator anti-freezing protection, condenser high temperature protection and outdoor unit frequency limit are active and the same as that in cooling mode.

8.4.5.5 The outdoor fan operates the same as in cooling mode.

8.4.6 Forced operation function

8.4.6.1 Enter forced operation function:

When the machine is off, pressing the touch button will carry the machine to forced auto mode. If pressing the button once again within 5 seconds, the machine will turn into forced cooling mode.

In forced auto, forced cooling or any other operation mode, pressing touch button will turn off the machine.

8.4.6.2 In forced operation mode, all general protections and remote control are available.

8.4.6.3 Operation rules:

Forced cooling mode:

The compressor runs at F2 frequency and indoor fan runs as breeze. After running for 30 minutes. The machine will turn to auto mode as 24℃ setting temperature.

Forced auto mode:

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

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 set time.

8.4.7.3 Timer off. The machine will turn off automatically when reaching the set 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 The timer function will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer LED will be off and the AC running mode has not been changed.

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:

When cooling, the setting temperature rises 1℃ (be lower than 30℃) 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℃ (be higher than 17℃) 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 turn to auto mode as 24℃ setting temp.

If AC is off before power off and AC is required to start up now, the compressor will have 1 minute delay when power on. Other conditions, the compressor will have 3 minutes delay when restarts.

8.4.11 Follow me

1) If the indoor PCB receives the signal which results from pressing the FOLLOW ME button on remote controller, the buzzer will emit a sound and this indicates the follow me function is initiated. But when the indoor PCB receives signal which sent from remote controller every 3 minutes, the buzzer will not respond. When the unit is running with follow me function, the PCB will control the unit according to the temperature from follow me signal, and the temperature collection function of room temperature sensor will be shielded, but the error detective function of room temperature sensor will be still valid.

2) When the follow me function is available, the PCB will control the unit according to the room temperature from the remote controller and the setting temperature.

3) The PCB will take action to the mode change information from remote controller signal, but it will be affected by the setting temperature.

4) When the unit is running with follow me function, if the PCB doesn't receive any signal from remote controller for 7 minutes or pressing FOLLOW ME button again, the follow me function will be turned off automatically, and the temperature collection function of room temperature sensor will be available, the PCB will control the unit according to the room temperature detected from its own room temperature sensor and setting temperature.

8.4.12 Self clean(optional)

For heat pump models which are provided with this function, after running in cooling or drying mode, if the user press "Self Clean" button on remote controller, firstly, indoor unit runs in fan only mode for a while, then low heat operation and finally runs in fan only again. This function can keep the inside of indoor unit dry and prevent breeding of mold.

8.4.13 Refrigerant Leakage Detection

With this new technology, the display area will show "EC" when the outdoor unit detects refrigerant leakage

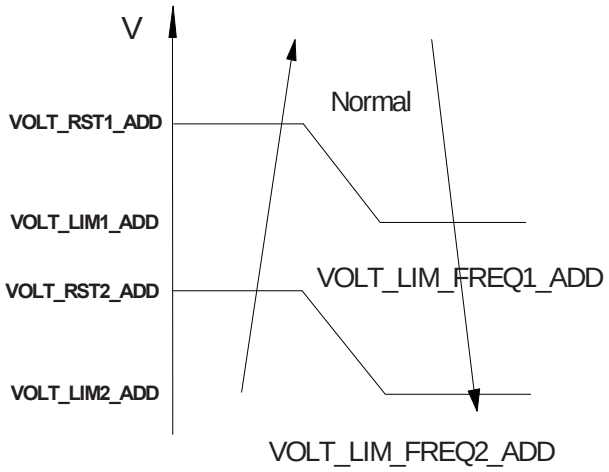
8.4.14 Louvre Position Memory Function

When starting the unit again after shutting down, its louver will restore to the angle originally set by the user, but the precondition is that the angle must be within the allowable range, if it exceeds, it will memorize the maximum angle of the louvre. During operation, if the power fails or the end user shuts down the unit in the turbo mode, the louvre will restore to the default angle.

8.4.15 Silence operation (optional)

Press the “silence” button on remote controller to initiate SILENCE function. When the Silence function is activated, the compressor running frequency will keep lower than F2 and the indoor unit will bring faint breeze, which will reduce the noise to the lowest level and create a quiet and comfortable room for you.

8.4.16 Frequency limitation protection



The PCB will detect the voltage of power supply and adjust the compressor running frequency to protect the system.
In the first 10 seconds after power on, this protection is inactive.
When this protection happens, it will last 3 minutes and then the PCB will detect the power supply voltage again.

8.41 7 DR mode

- **Control logic description**

DR Mode	Description of operation in this mode
DR1	Compressor off.
DR2	The air conditioner continues to cool or heat during the demand response event, but the electrical energy consumed by the air conditioner in a half hour period is not more than 50% of the total electrical energy that would be consumed if operating at the rated capacity in a half hour period.
DR3	The air conditioner continues to cool or heat during the demand response event, but the electrical energy consumed by the air conditioner in a half hour period is not more than 75% of the total electrical energy that would be consumed if operating at the rated capacity in a half hour period.

Cooling mode:

Compressor frequency		DR mode	Compressor on time(minutes)	Compressor off time(minutes)	Outdoor ambient temperature(T4)
Model SWB26/36	Model SWB52/70/82				
F2	F2	DR2	COOLDR21	15-COOLDR21	T4<35℃
		DR3	COOLDR31	15-COOLDR31	
F1	F2	DR2	COOLDR22	15-COOLDR22	43℃>T4≥35℃
		DR3	COOLDR32	15-COOLDR32	
F1	F1	DR2	COOLDR23	15-COOLDR23	T4≥43℃
		DR3	COOLDR33	15-COOLDR33	

Heating mode:

Compressor frequency		DR mode	Compressor on time (minutes)	Compressor off time (minutes)	Outdoor ambient temperature (T4)
Model SWB26/36	Model SWB52/70/82				
F1	F3	DR2	HEATDR21	30-HEATDR21	T4≥8℃
		DR3	HEATDR31	30-HEATDR31	
F2	F4	DR2	HEATDR22	30-HEATDR22	8℃>T4≥3℃
		DR3	HEATDR32	30-HEATDR32	
F3	F5	DR2	HEATDR23	30-HEATDR23	3℃>T4≥-5℃
		DR3	HEATDR33	30-HEATDR33	
F4	F6	DR2	HEATDR24	30-HEATDR24	T4<-5℃
		DR3	HEATDR34	30-HEATDR34	

Key points of DR mode:

- When the unit is on and receives the signal of DR1,DR2 or DR3, the indoor unit display area will show d1, d2 or d3. And while DR signal input malfunction occurs, it will display dE.
- DR mode has the priority. AC will change to DR mode immediately once receiving the signal and return to original mode when DR mode is over.
- DR signal is inactive in self clean mode.
- The refrigerant leakage detection, Ionizer, super Ionizer and PTC heater function will be reserved firstly and get resumed when DR mode is over.
- If the running mode(cooling, heating) is changed by controller in DR mode, the timing will not get cleared.
- The timing gets cleared when DR mode is changed in DR1, DR2, DR3.
- If AC receives DR signal in defrosting mode, the frequency will not be limited and will keep at defrosting frequency. Only the running time will follow DR mode time zone.

9. Troubleshooting

9.1 Indoor Unit Error Display

Operation lamp	Timer lamp	Display	LED Status
☆ 1 time	X	E0	Indoor unit EEPROM parameter error
☆ 2 times	X	E1	Indoor / Outddor units communication error
☆ 4 times	X	E3	Indoor fan speed has been out of control
☆ 5 times	X	E4	Indoor room temperature sensor T1 open circuit or short circuit
☆ 6 times	X	E5	Evaporator coil temperature sensor T2 open circuit or short circuit
☆ 7 times	X	EC	Refrigerant Leakage Detection
☆ 2 times	O	F1	Outdoor ambient temperature sensor T4 open circuit or short circuit
☆ 3 times	O	F2	Condensor coil temperature sensor T3 open circuit or short circuit
☆ 4 times	O	F3	Compresser discharge temperature sensor T4 open circuit or short circuit
☆ 5 times	O	F4	Outdoor unit EEPROM parameter error
☆ 6 times	O	F5	Outdoor fan speed has been out of control
☆ 1 time	☆	P0	IMP malfunction or IGBT over-strong current protection
☆ 2 times	☆	P1	Over voltage or over low voltage protection
☆ 3 times	☆	P2	High temperature protection of compressor top diagnosis and solution (only SWB52C, SWB70C)
☆ 5 times	☆	P4	Inverter compressor drive error
-	-	CP	Remote On/Off terminal is open circuit

The following symbols mean:

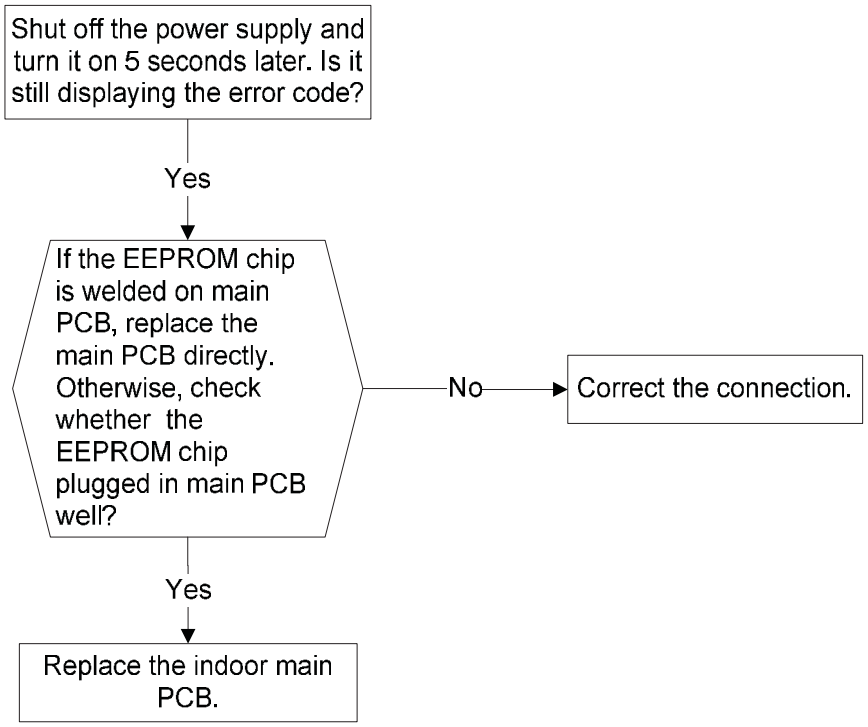
O = (on)

X = (off)

☆ = (flash)

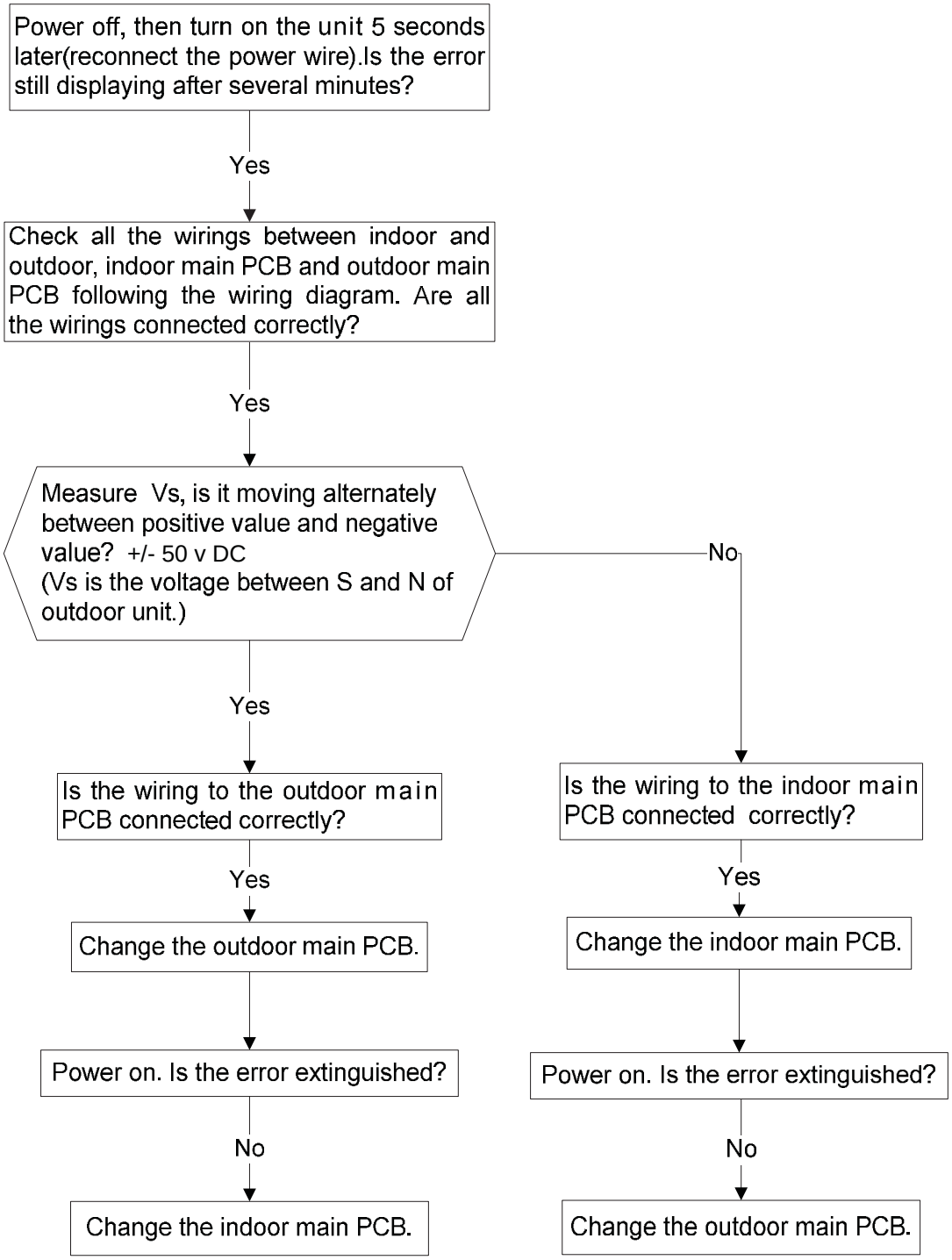
9.2 Diagnosis and Solution

9.2.1 EEPROM parameter error diagnosis and solution (E0)

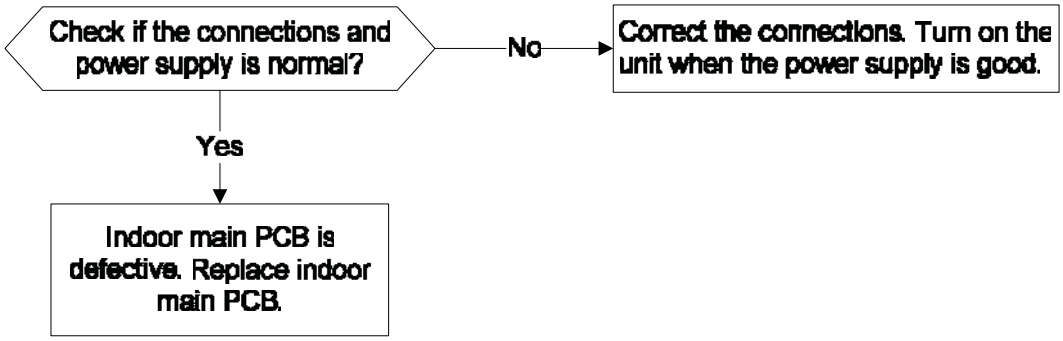


EEPROM: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.

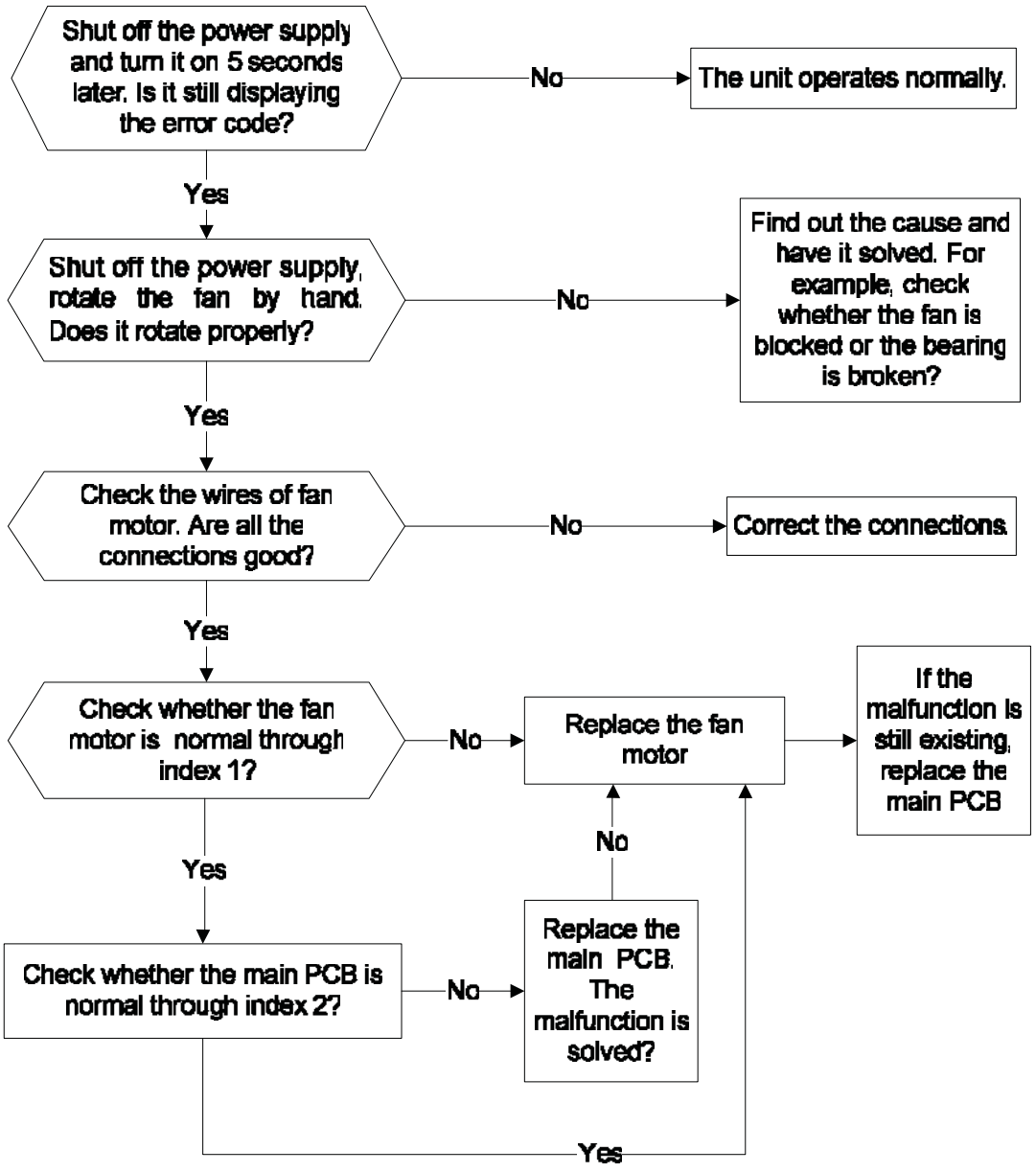
9.2.2 Indoor unit and outdoor unit communication protection error diagnosis and solution(E1)



9.2.3 Zero crossing detection error diagnosis and solution (E2)



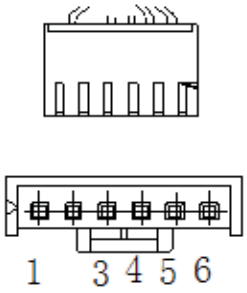
9.2.4 Fan speed has been out of control diagnosis and solution (E3/F5)



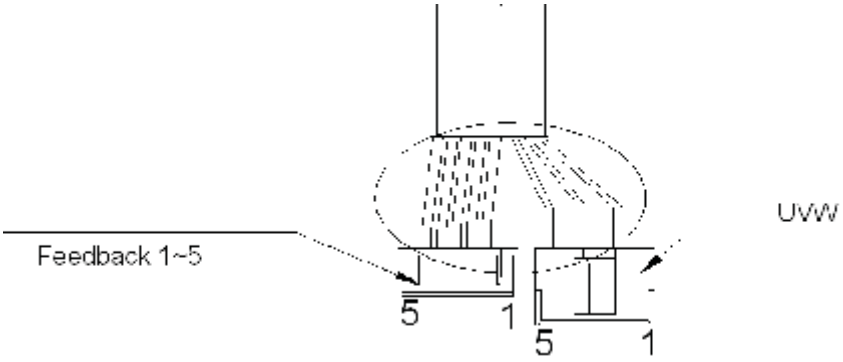
Index 1:

1.Indoor or Outdoor DC Fan Motor(control chip is in fan motor)

Measure the resistance value of each winding by using the tester. If any resistance 'value is zero' the fan motor has problems and needs to be replaced.



3.Outdoor DC Fan Motor(control chip is in outdoor PCB)



NO.	1	2	3	4	5
Color	Orange	Grey	White	Pink	Black
Signal	Hu	Hv	Hw	Vcc	GND

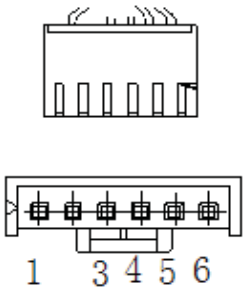
Color	Red	Blue	Yellow
Signal	W	V	U

1) Release the UVW connector. Measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other, the fan motor must has problems and need to be replaced. Otherwise, go to step 2.
2) Power on and when the unit is in standby, measure the voltage of pin4-5 in feedback signal connector. If the value is not 5V, change the PCB. Otherwise, go to step 3.
3) Rotate the fan by hand, measure the voltage of pin1-5, pin 2-5 and pin 3-5 in feedback signal connector. If any voltage is not positive voltage fluctuation, the fan motor must has problems and need to be replaced.

Index2:

1: Indoor or Outdoor DC Fan Motor(control chip is in fan motor)

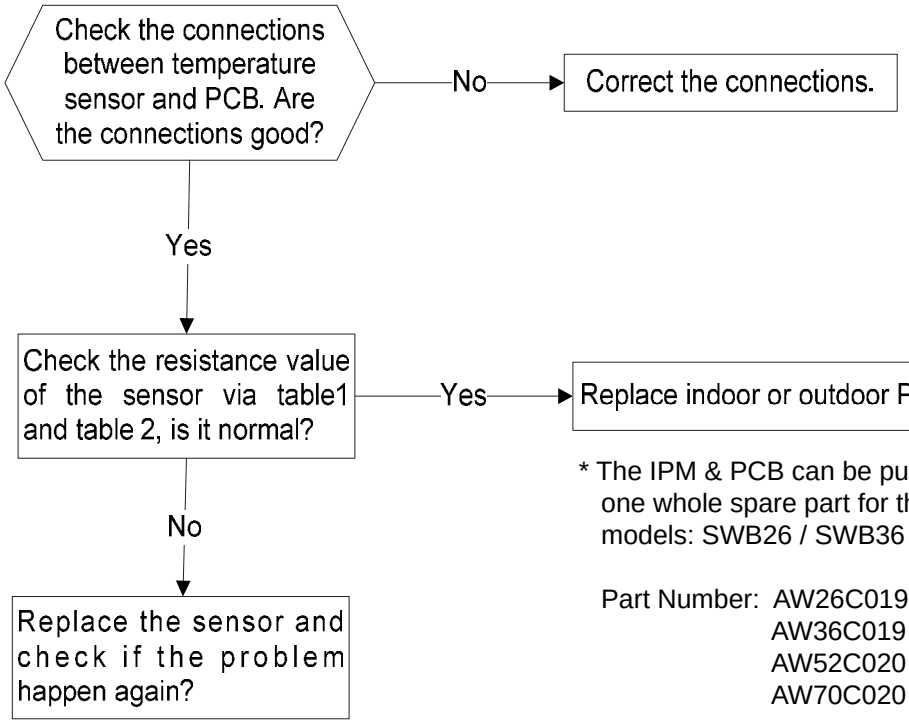
Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must has problems and need to be replaced.



DC motor voltage input and output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	280V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V

9.2.4 Open circuit or short circuit of temperature sensor diagnosis and solution (E4/E5/F1/F2/F3)



* The IPM & PCB can be purchased one whole spare part for the following models: SWB26 / SWB36 / SWB52 & SWB70

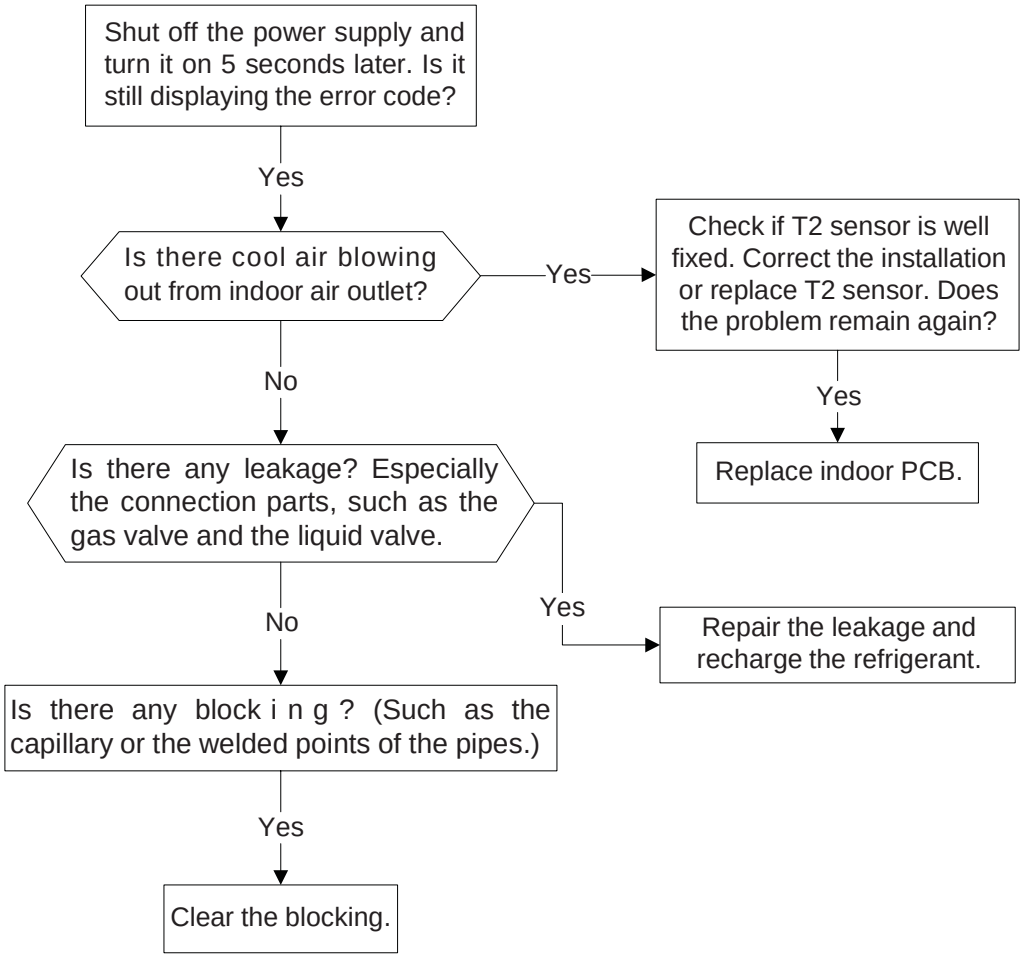
Part Number: AW26C019 (for SWB26 model)
AW36C019 (for SWB36 model)
AW52C020 (for SWB52 model)
AW70C020 (for SWB70 model)

* For the SWB82 Model, the IPM & PCB can be purchased as separate parts

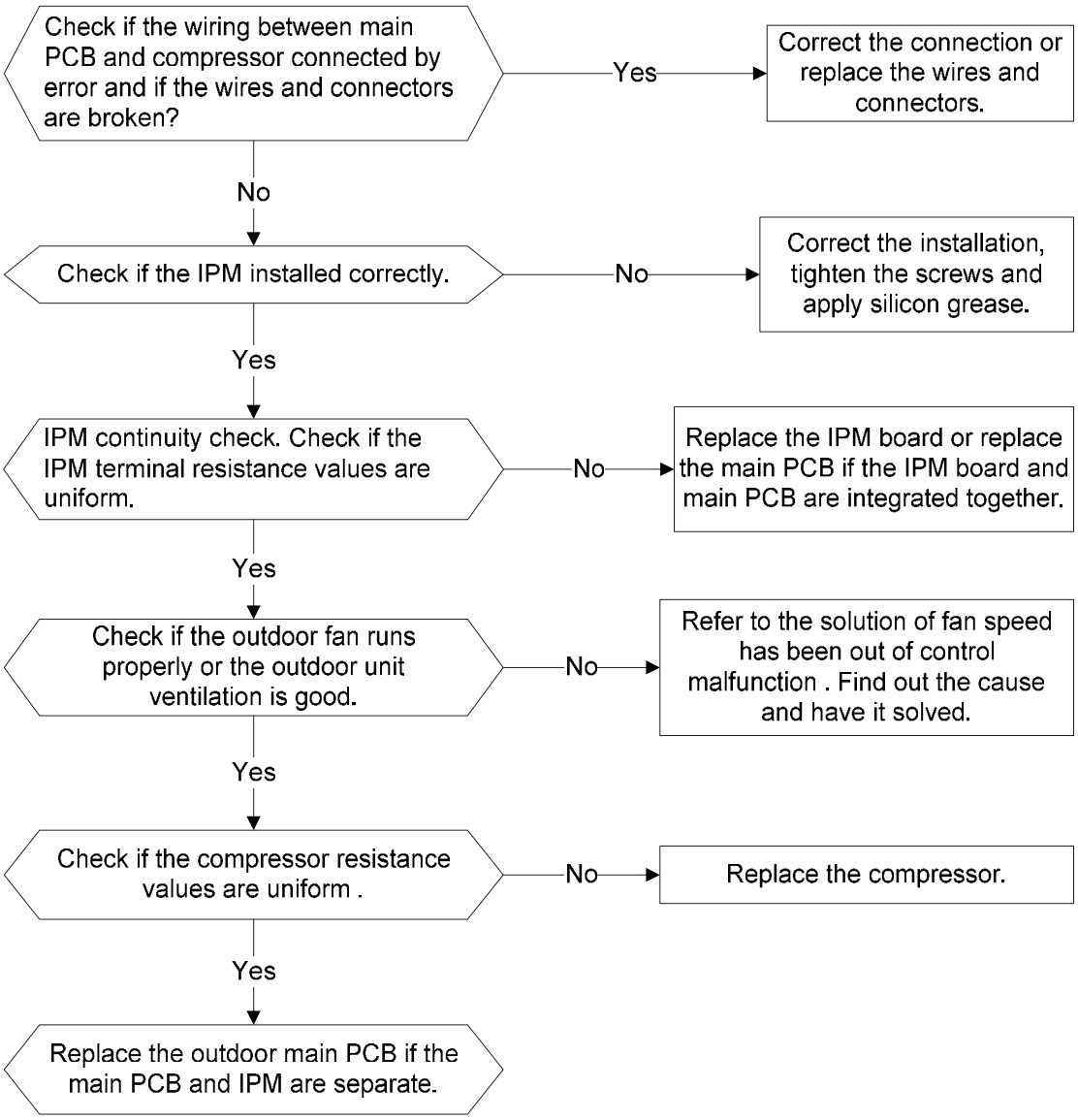
IPM Part Number: AW82C020C

PCB Part Number: AW82C020B

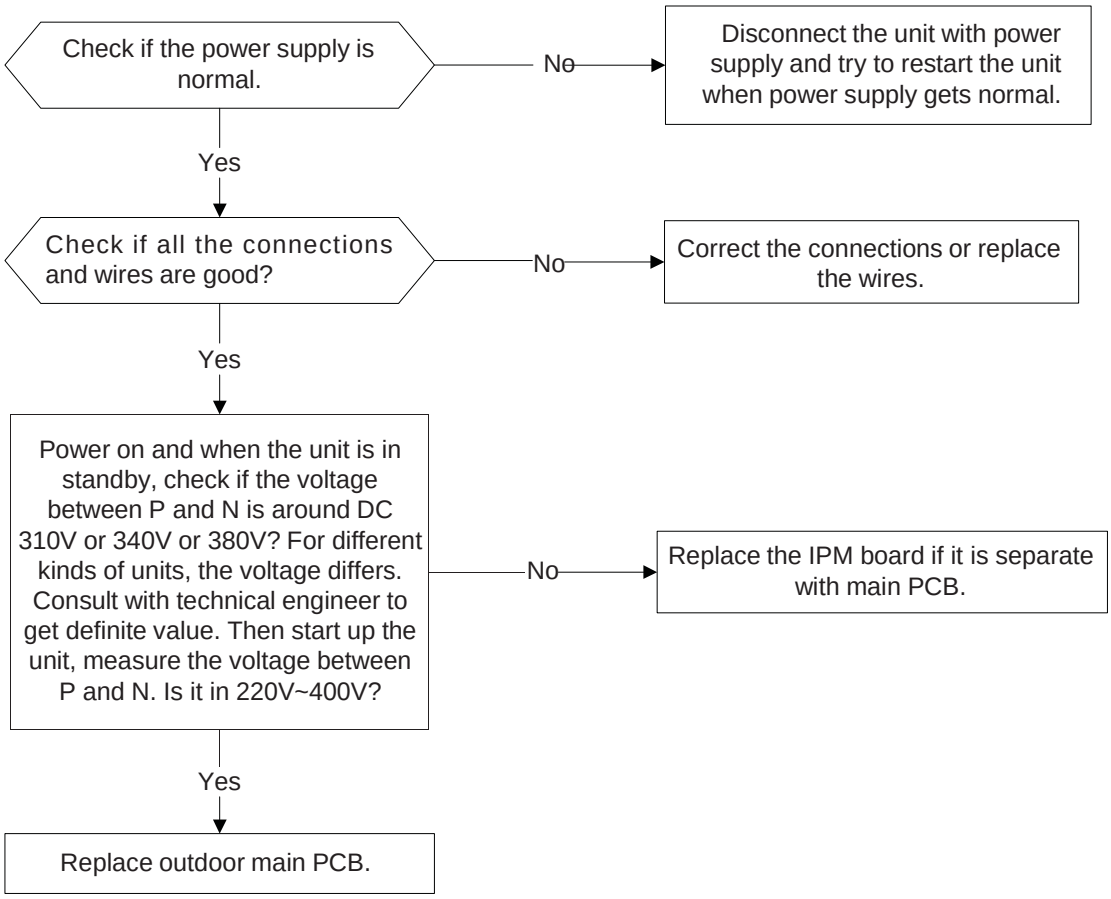
9.2.5 Refrigerant Leakage Detection diagnosis and solution(EC)



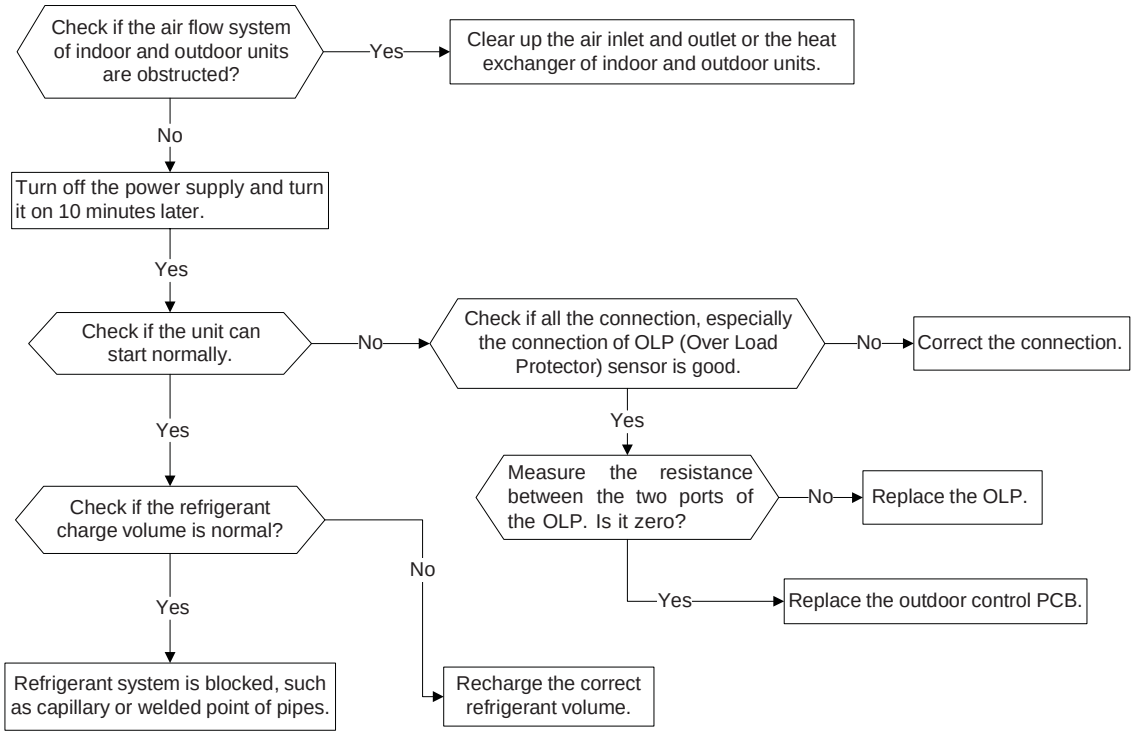
9.2.6 IPM malfunction or IGBT over-strong current protection diagnosis and solution(P0)



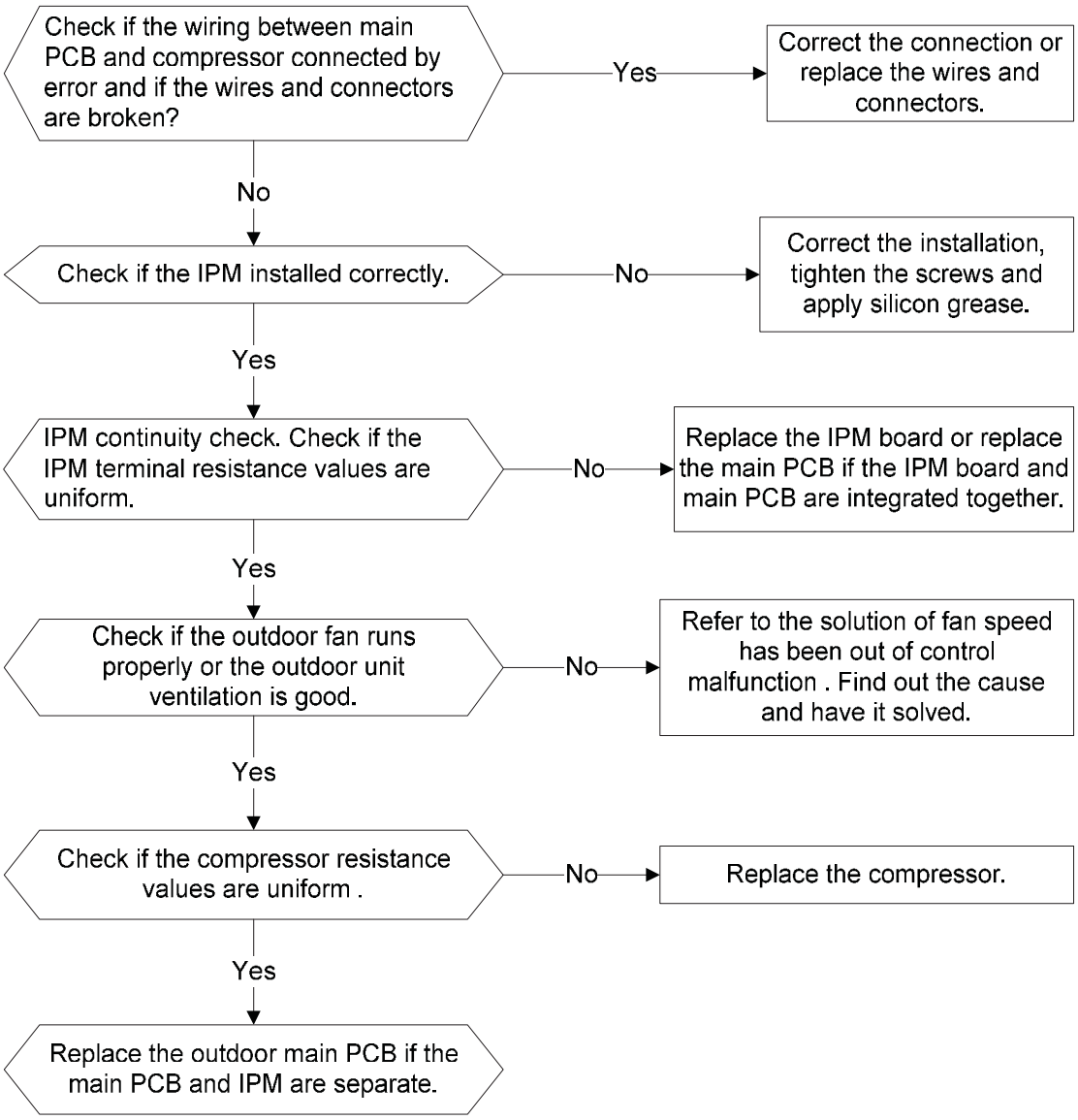
9.2.8 Over voltage or too low voltage protection diagnosis and solution(P1)



9.2.9 High temperature protection of compressor top diagnosis and solution(P2)

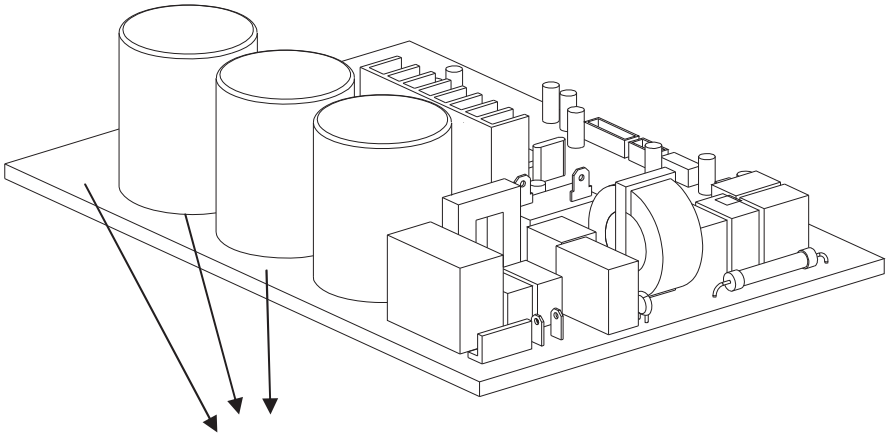


9.2.10 Inverter compressor drive error diagnosis and solution(P4)



Safety

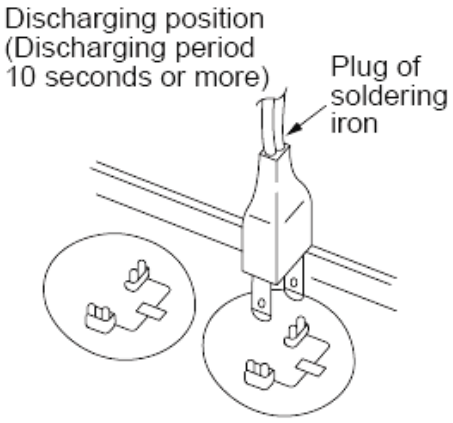
Electricity power is still kept in capacitors even the power supply is shut off. Do not forget to discharge the electricity power in capacitor.



Electrolytic Capacitors

(HIGH VOLTAGE! CAUTION!)

Connect discharge resistance (approx.100Ω 40W) or soldering iron (plug) between +, - terminals of the electrolytic capacitor on the contrary side of the outdoor PCB.

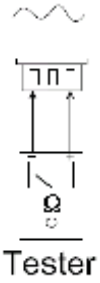


Note: The picture above is only for reference. The plug of your side may be different.

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.

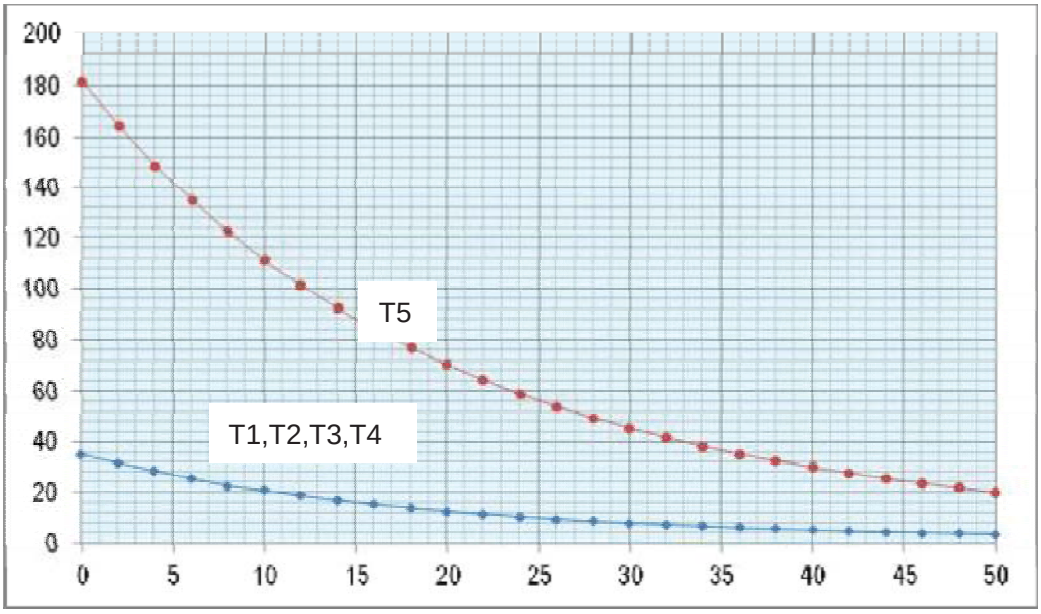
Table 1:Some frequently-used R-T data for T1,T2,T3 and T4 sensor:

Temperature (℃)	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 (℃)	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)



Specification

Part Name	SWB26C	SWB36C	SWB52C
Compressor	AW09C032 (DA108X1C-20FZ3)	AW36C023 (DA130M1C-31FZ)	AW18C032 (DA150SIC-20FZ)
Indoor fan motor	AW26E011 (WZDK20-38G) ☆	AW26E011 (WZDK20-38G) ☆	AW52E014 (WZDK58-38G) ☆
Outdoor fan motor	AW26C014 (WZDK35-38G) ★	AW26C014 (WZDK35-38G) ★	AW52C014 (WZDK50-38G) ☆

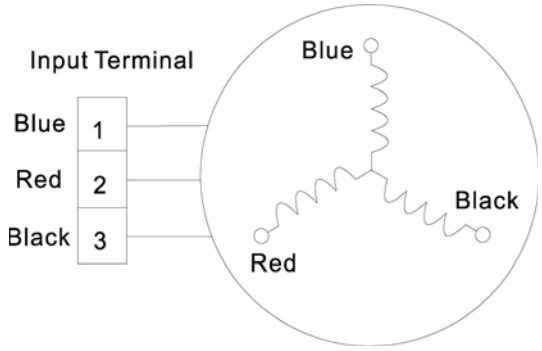
Part Name	SWB70C	SWB82C
Compressor	AW18C032 (DA150SIC-20FZ)	AW18C032 (DA250S2C-30MT)
Indoor fan motor	AW70E014 (WZDK60-38G) ☆	AW52E014 (WZDK60-38G) ☆
Outdoor fan motor	AW70C014 (WZDK72-38G) ☆	AW52C014 (WZDK72-38G) ☆

IMPORTANT NOTE

The motor marked "★" means DC fan motor with control chip in the PCB while the ones marked "☆" means DC fan motor with control chip in the fan motor.

2. Compressor Checking

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



Position	Resistance Value			
	DA108X1C-20FZ3	DA130M1C-31FZ	DA150S1C-20FZ	DA250S2C-30MT
Blue - Red	0.71 Ω (20°C)	1.77 Ω (20°C)	0.95 Ω (20°C)	0.55 Ω (20°C)
Blue - Black				
Red - Blue				

3. IPM continuity check

Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

<table>
<tr><th colspan="2">Digital tester</th><th>Normal resistance value</th><th colspan="2">Digital tester</th><th>Normal resistance value</th></tr>
<tr><td>(+)Red</td><td>(-)Black</td><td rowspan="5">∞
(Several MΩ)</td><td>(+)Red</td><td>(-)Black</td><td rowspan="5">∞
(Several MΩ)</td></tr>
<tr><td rowspan="4">P</td><td>N</td><td>U</td><td rowspan="4">N</td></tr>
<tr><td>U</td><td>V</td></tr>
<tr><td>V</td><td>W</td></tr>
<tr><td>W</td><td>(+)Red</td></tr>
</table>