USER'S MANUAL

TITAN SERIES

ASH-28AT

sinclair
AIR CONDITIONING

CONTENTS

Please read this OWNERS MANUAL carefully prior to use……

For to prevent flicker impressions during the start of the compressor (technical process)following installation conditions do apply.

1 ASH-28AT will be connected only to a supply with the relevant system impedance no more than Zmax=0.267 Ω

2 The power connection for the air conditioner has to be done at the main power distribution. This distribution has to be of an low impedance. Normally the required impedance is eached at a 32A fusing point.

3 No other equipment has to be connected to this power line.

4 For detailed installation acceptance please refer to your contract with the power supplier, if restrictions do apply far products like washing machines air conditioners or electrical ovens.

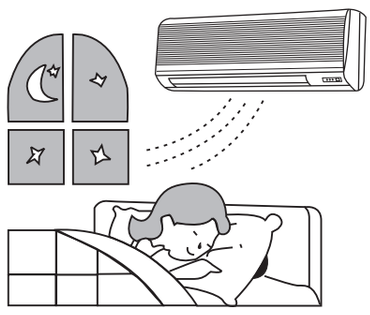
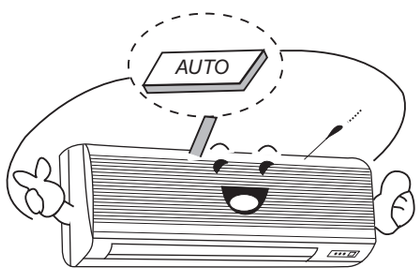
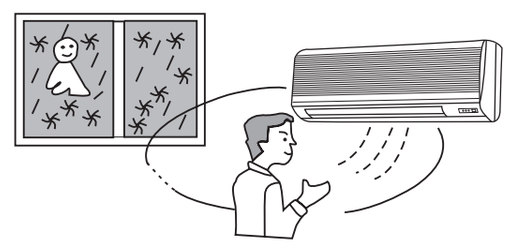
5 For power details of the air conditioner refer to the rating plate of the product.

6 For any question contact your local seller.

7 This product must not be disposed together with the domestic waste. This product has to be disposed at an authorized place for recycling of electrical and electronic appliances.

8 The fuse indoor: T5AL, AC250V, outdoor: T3.15AL, AC250V.

Functions

Cooling in summer	Dehumidifying in rainy or humid season
In hot summer,air conditioner can cool room air by transfering heat out. 	Without reducing room temp.,air conditioner can dehumidify and make room air dry and comfortable. 
Operating automatically	**Heating in winter (heat pump type)**
According to room temp. change,microcomputer can automaticlly set COOL or HEAT or FAN operation mode, so as for best effect. 	In cold winter,air conditioner can supply warm air to rise room temp. 

※ Working temperature range

	Indoor side DB/WB(℃)	Outdoor side DB/WB(℃)
Maximum cooling	32/23	43/26
Minimum cooling	21/15	—
Maximum heating	27/ —	24/18
Minimum heating	20/ —	— 5/ — 6

※Working voltage:50Hz 230V

※ Installation precaution:

① To prevent possible hazards due to insulation failure,the unit must be grounded.

② Provide a power outlet to be used exclusively for each unit,and a power supply disconnect and circuit breaker and current fuse protector should be provide in the exclusive line.

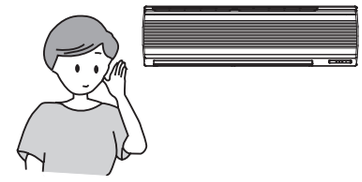
③ Each wiring connection must be done in accordance with the wiring system diagram.Wrong wiring may cause the unit to misoperate or become damage.

④ Please cut off power supply when unit will not be used for a long time.

⑤ An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.

Operation mechanism

Cooling cycle



Connected with pipes,indoor unit and outdoor unit form a refrigeration system.With power,compressor takes in low temp.and low pressure refrigerant vapour from evaporator of indoor unit,presses it into high temp.and high pressure gas,then discharges it into condenser of outdoor unit.By help of axialflow fan,heat is removed to outdoor air from the gas which then condenses into liquid.After capillary tube throtting,the liquid drops temp.and pressure, flows into evaporator.There,by help of cross-flow fan,the liquid absorbs heat from room air,evaporates and becomes low pressure vapour which then flows into compressor again,beginning next cooling cycle.Therefore, heat is transfered from indoor to outdoor,and room gets cool.

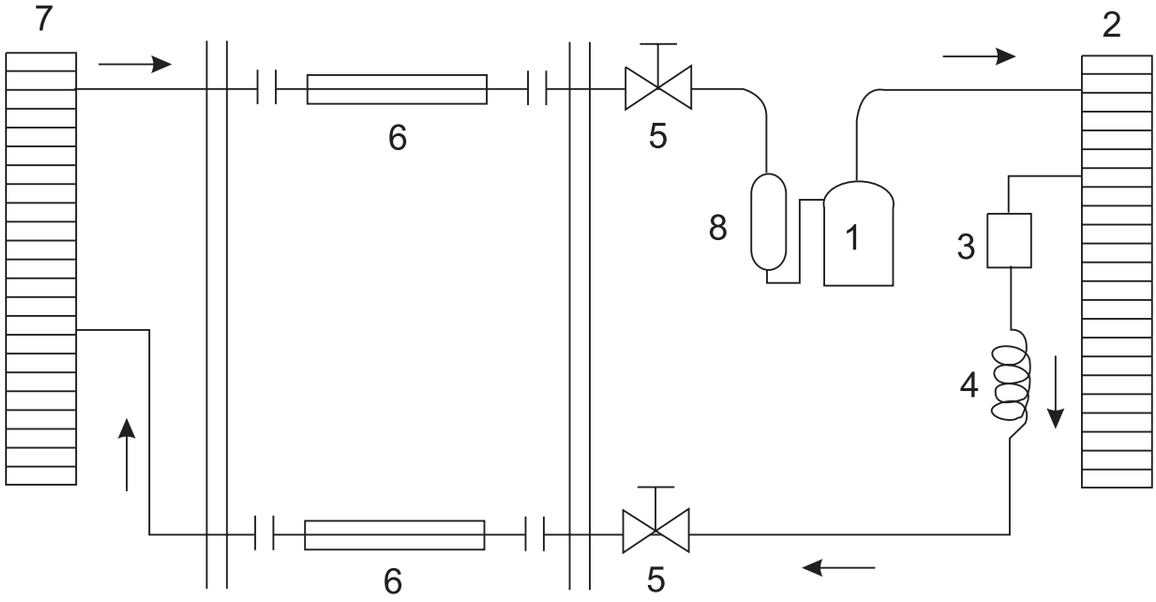
Ventilation cycle

Ventilation cycle divides into indoor and outdoor two parts.With suction of cross-flow fan,room air flows through filters,exchanges heat in evaporator,then returns to room.In this way,room air can be cool and dehumidified.At the same time,pumped by axial-flow fan,outdoor air flows through condenser and exchanges heat.

Heating cycle

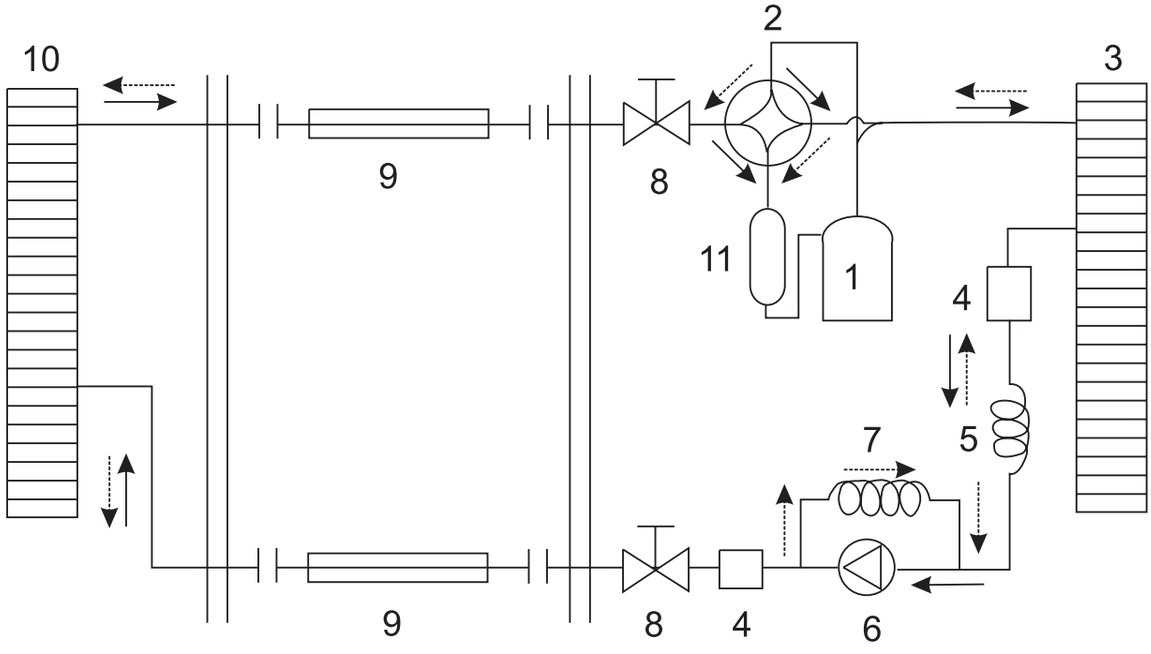
Heat pump type air conditioner uses a commutator (4-way electromagnetic valve) to change refrigerant flow direction.When heating,refrigerant firstly enters indoor heat-exchanger,releasing heat and condensing.Then it enters outdoor heat-exchanger,absorbing heat and evaporating.Because consumption power changes into heat which is discharged in room,heating efficiency is very good.

(1) Schematic diagram of cool only type



1.Compressor 2.Outdoor heat-exchanger 3.Filter 4.Capillary tube
5.Stop valve 6.Connecting pipes 7.Indoor heat-exchanger 8.Accumulator

(2) Schematic diagram of heat pump type



1.Compressor 2. 4-way electromagnetic valve 3.Outdoor heat-exchanger 4.Filter
5.Master capillary tube 6.Check valve 7.Auxiliary capillary tube 8.Stop valve
9.Connecting pipes 10.Indoor heat-exchanger 11.Accumulator

Technical specification

Model		ASH-28AT
Funcitions		Cool/Heat
Cooling capacity(W)		8000
Heating capacity(W)		8800
Power supply		230V~50Hz
Rated input	Cooling(W)	4000
	Heating(W)	3600
Input power	Cooling(W)	2800
	Heating(W)	2800
Refrigerant		R410A 2600g
Noise dB(A)	Indoor	49
	Outdoor	60
Climate type		T1
Moisture protection		IP24
Isolation		I
Dimension (mm)	Indoor unit	1178*326*227
	Outdoor unit	1006*340*847
Weight(kg)	Indoor unit	17.5
	Outdoor unit	90

All above should be changed without notice. There are latest and accurate specification on the nameplate of your air conditioner.

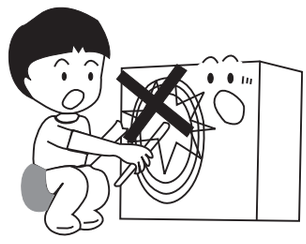
Important notices

Air Conditioner should be operated with stable voltage in range of 198-253V～1Ph, otherwise, compressor would vibrate terribly to damage refrigeration system.

230V ～

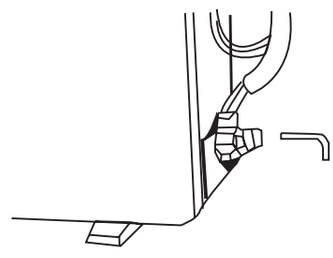
Do not cut or pull strongly power lines and connecting lines.

Do not insert any foreign materials into the air inlet or air outlet, it is very dangerous.



Close doors and windows (better using contains)while operating air conditioner,to avoid cool or heat leakage which affects air condition. If room air is quite turbid,you should open a door or window a little for a moment to get some outdoor fresh air.

It is only specific technician who can operate the stop valve of outdoor unit,otherwise it is possible to make refrigerant leak out and compressor breakdown.



Delay operation

To avoid action of overload protector or other security devices,we design a delay for 3～4 minutes before starting cooling or heating or dehumidifying cycle in following situations:

- To start again immediatelly after stopping;
- To adjust operation mode.

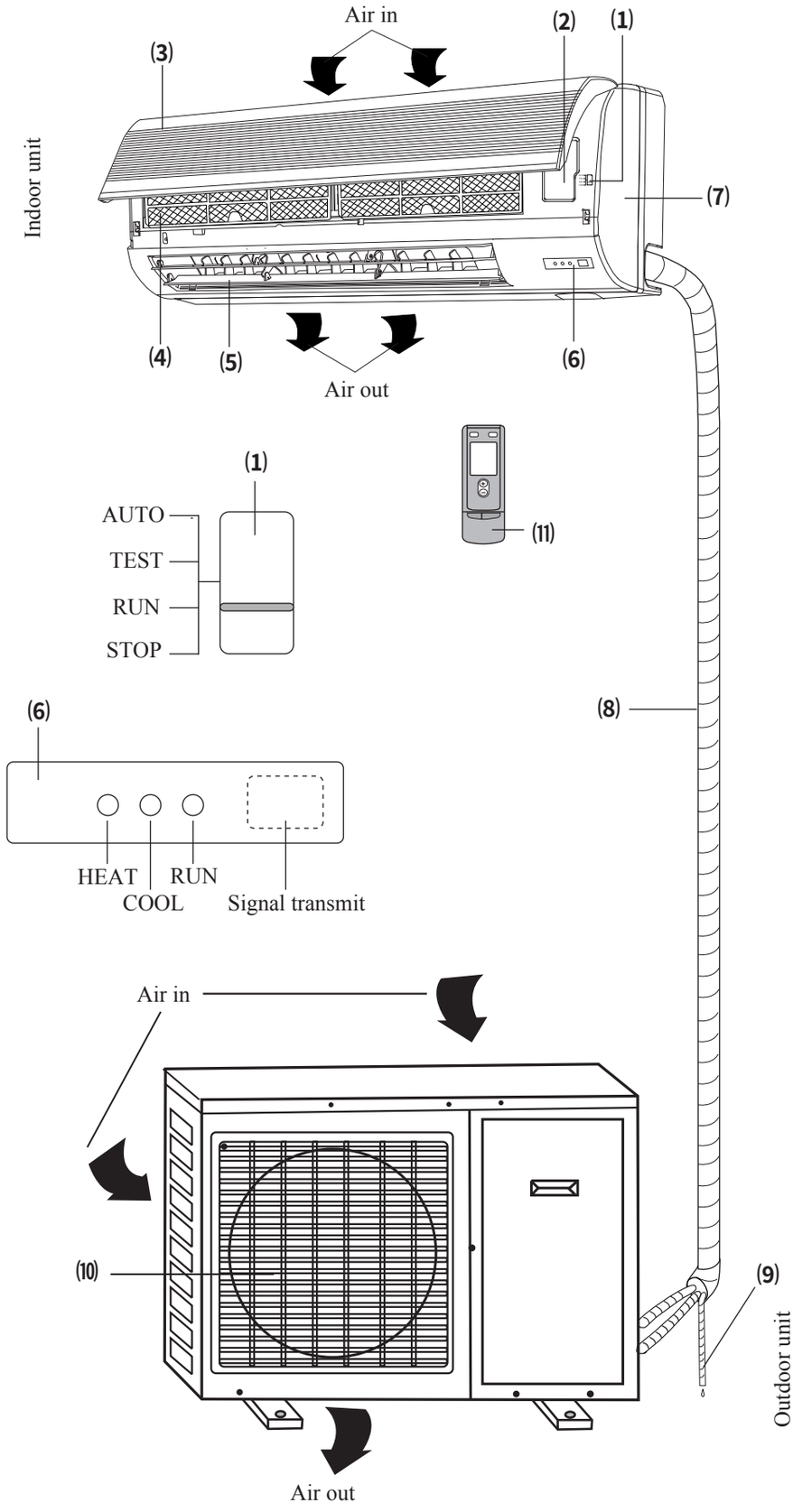
Smell

Sometimes there is some smell out of indoor unit,as does not mean any machine failure,but because of suction air mixed with smell of furniture or smoking etc.

Electric circuit

Must use special electric circuit,do not use longer power lines,do not share a same socket with other electric appliances to avoid fire etc.

Structure description



(1)Handling switch

(2)Wiring cover

(3)Surface panel

(4)Filter

(5)Deflector

(6)Singal window

(7)Front panel

(8)Piping and wiring

(9)Drain hose

(10)Air outlet net

Remote control operation procedure

Name and Function-Remote control

Note:

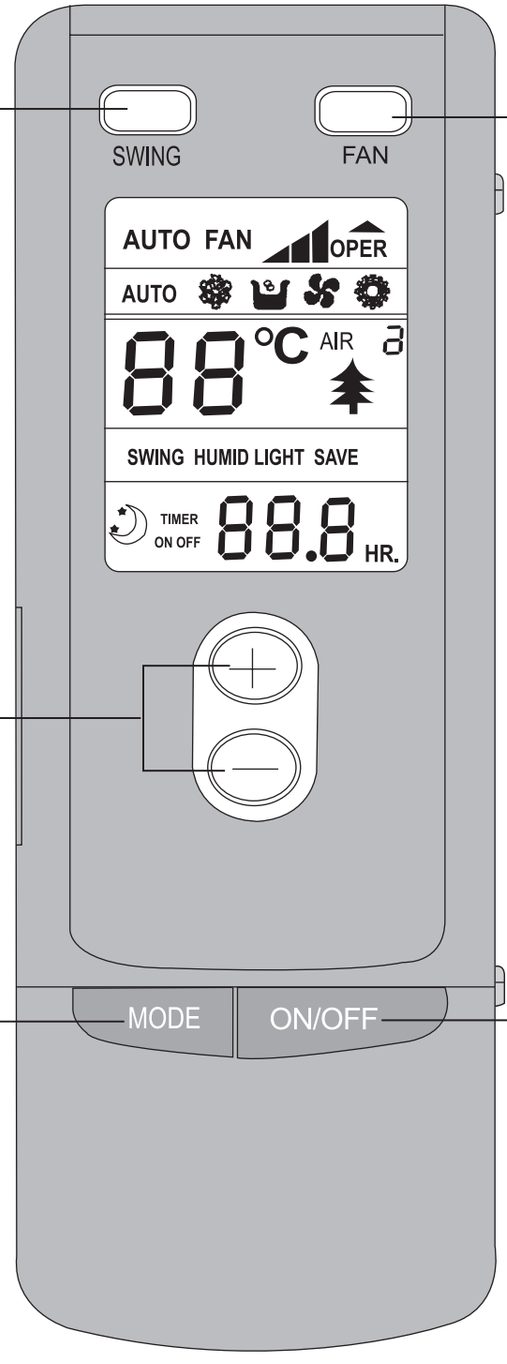
- **Be sure that there are no obstructions.**
- **The remote control signal can be received at a distance of up to about 10m.**
- **Don't drop or throw the remote control.**
- **Don't place the remote control in a location exposed to direct sunlight.**

SWING button
When it is pressed, the louvers start to rotate automatically and stop when repressed.

FAN button
Press this button to change the fan speed of:

AUTO FAN → ◢ → ◢ → ◢◢◢

TEMP. button
SET **TEMP**. increases 1℃ by pressing ⊕ button once,and decreases 1℃ by pressing ⊖ button once.
At COOL mode operation, SET TEMP. can be selected from 16℃ to 30℃.
At DRY mode operation, SET TEMP. can be selected from 16℃ to 30℃.
At HEAT mode operation, SET TEMP. can be selected from 16℃ to 30℃.



" ❄ " COOL mode
" 💧 " DRY mode
" 🌀 " FAN mode
" ⚙ " HEAT mode

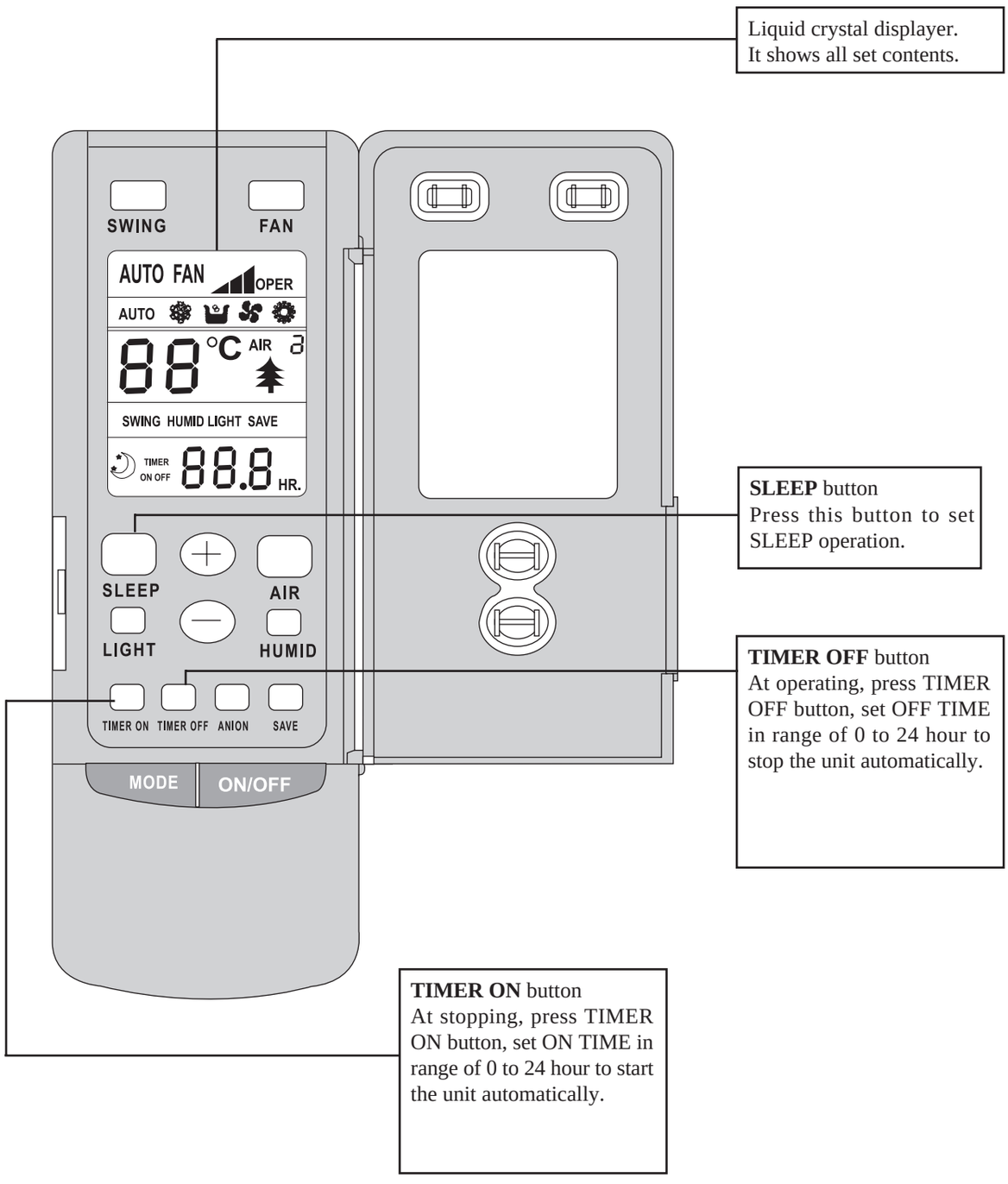
MODE button
Press this button to change the operation mode in order of mode in order of:

AUTO → ❄ → 💧 → ⚙ → 🌀 →

ON/OFF button
Press this button to turn on or turn off the unit.

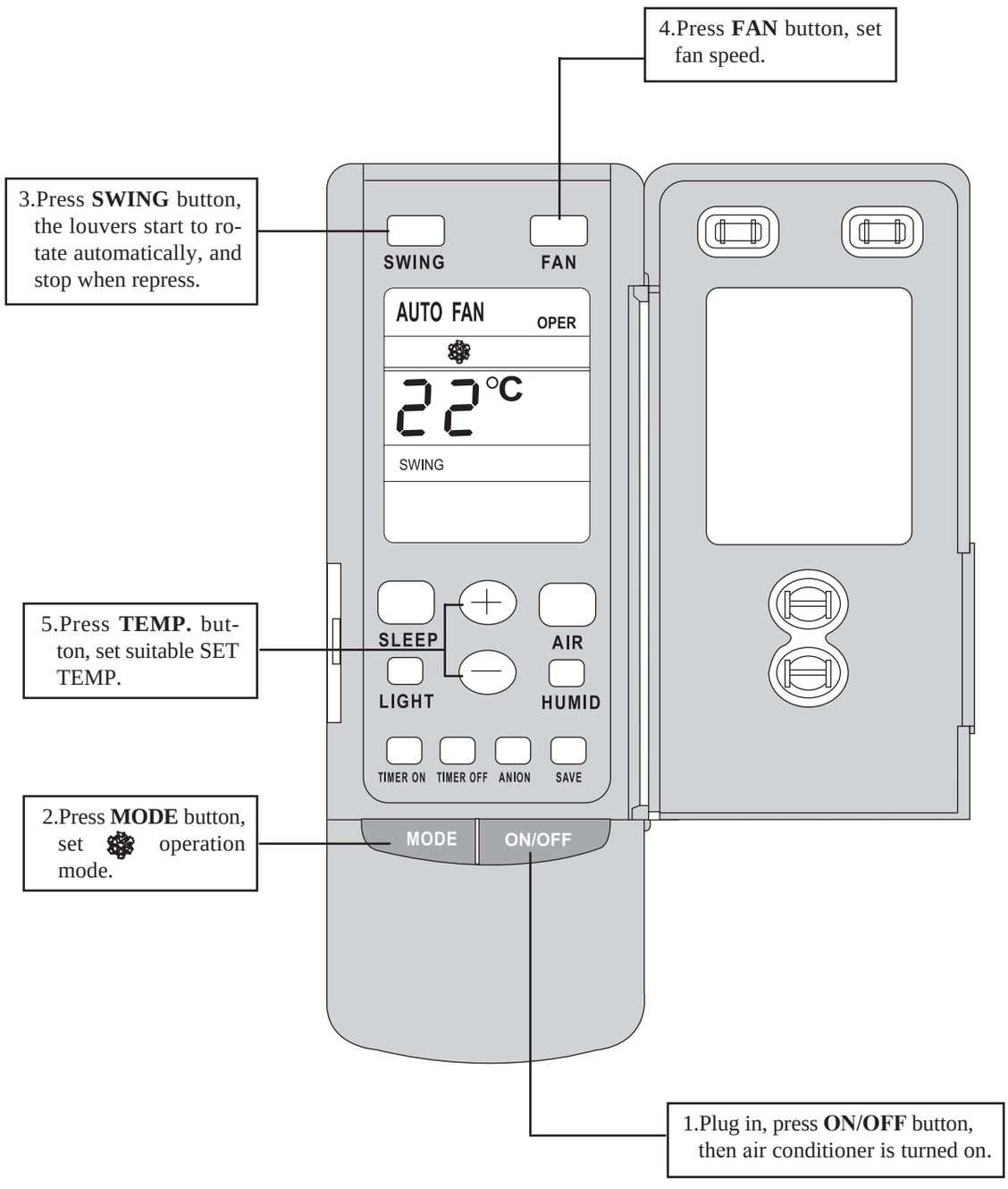
Name and Function-Remote control. (Remove the cover)

Note: **This type of remote controller is a kind of new current controller. some buttons of the controller which are not available to this Air conditioner will not be described below.**



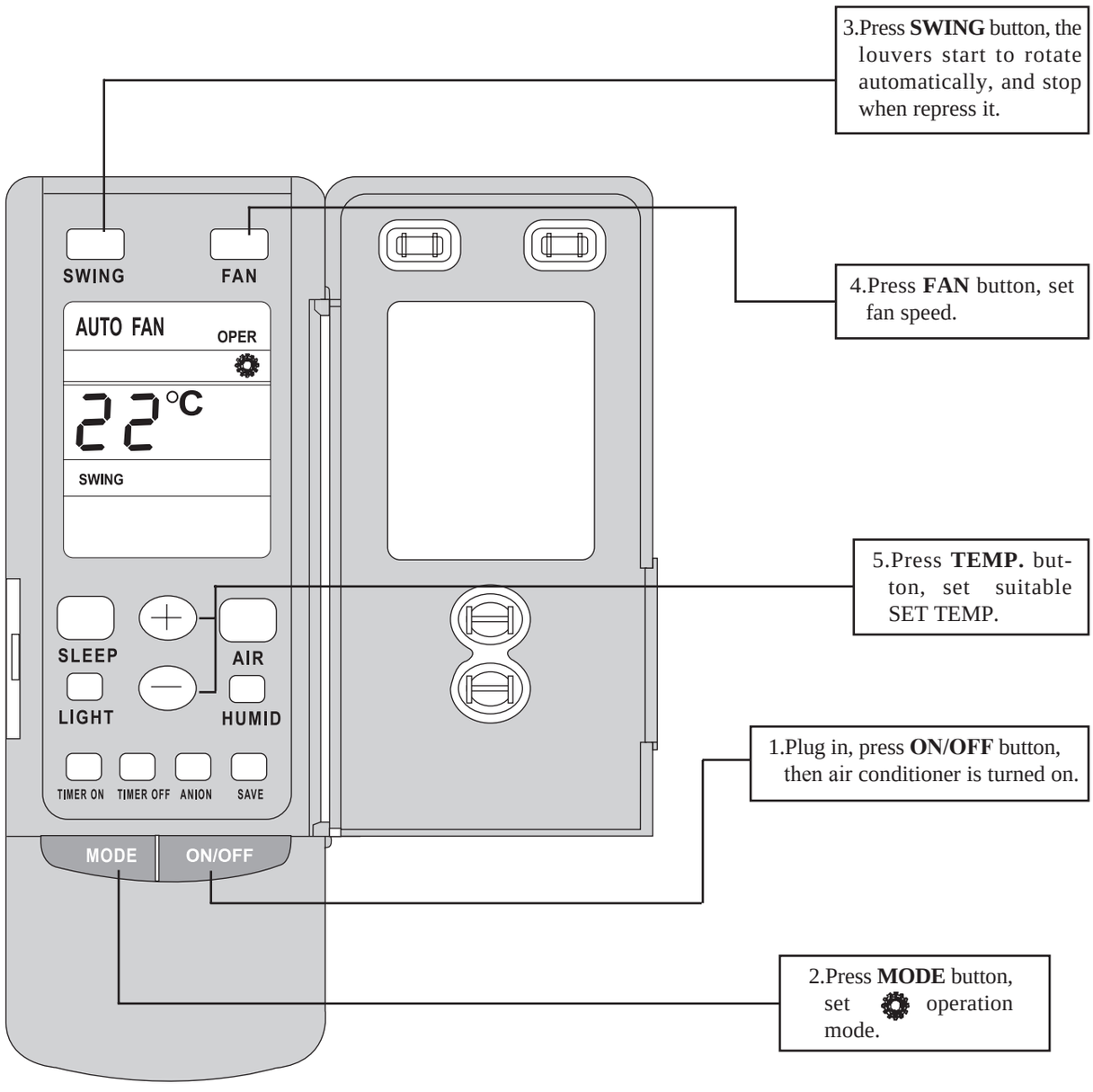
COOL mode operation procedure

- **According to difference between room temp. and set temp., microcomputer can control cooling on or not.**
- **If room temp. is higher than set temp., compressor runs at COOL mode.**
- **If room temp. is lower than set temp., compressor stops and only indoor fan motor runs.**
- **SET TEMP. should be in range of 16℃ to 30℃。**



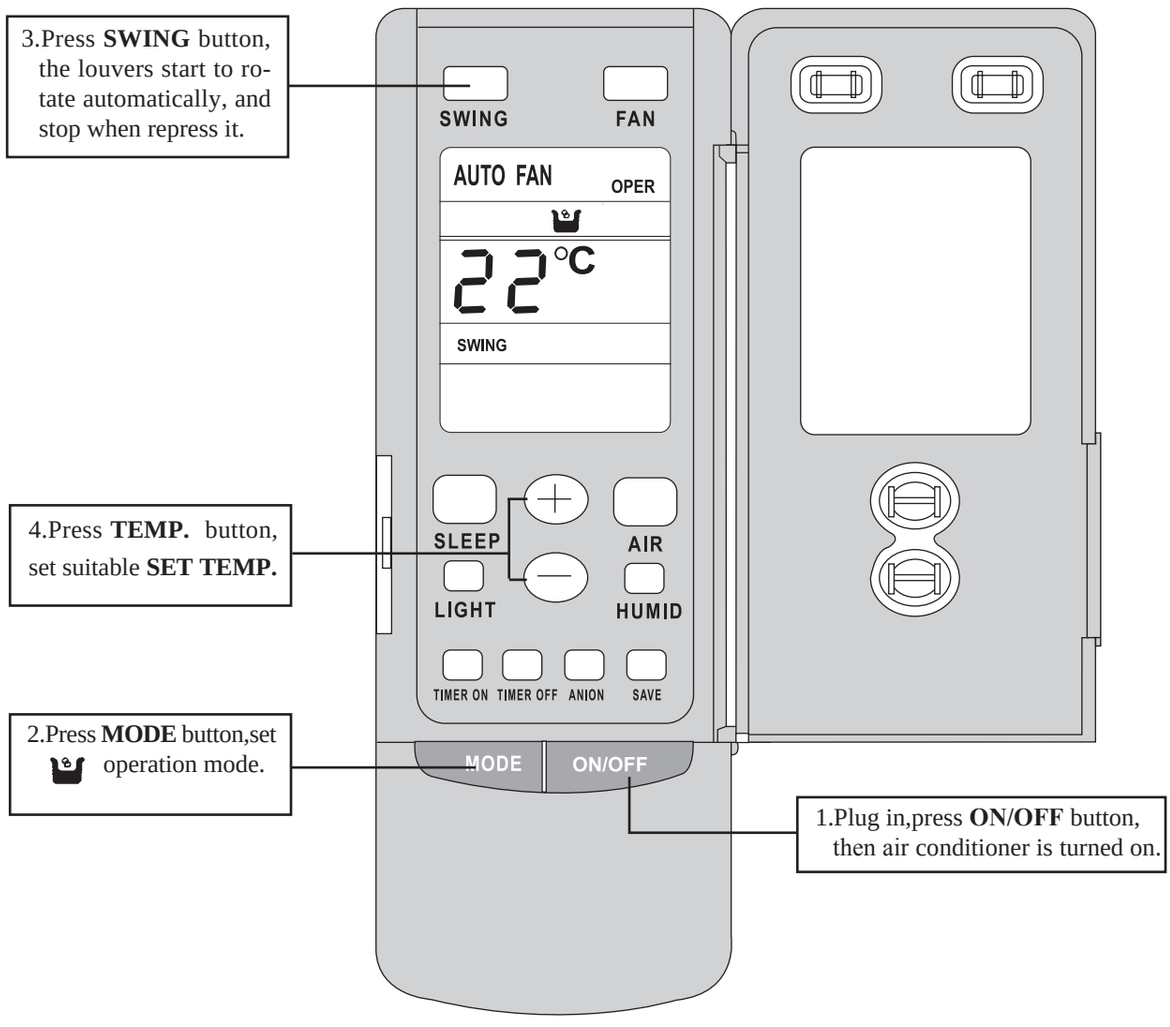
HEAT mode operation procedure

- **If room temp. is lower than set temp., compressor runs at HEAT mode;**
- **If room temp. is higher than set temp., compressor and outdoor fan motor stop, only indoor fan motor runs.**
- **SET TEMP. should be in range of 16℃ to 30℃。**



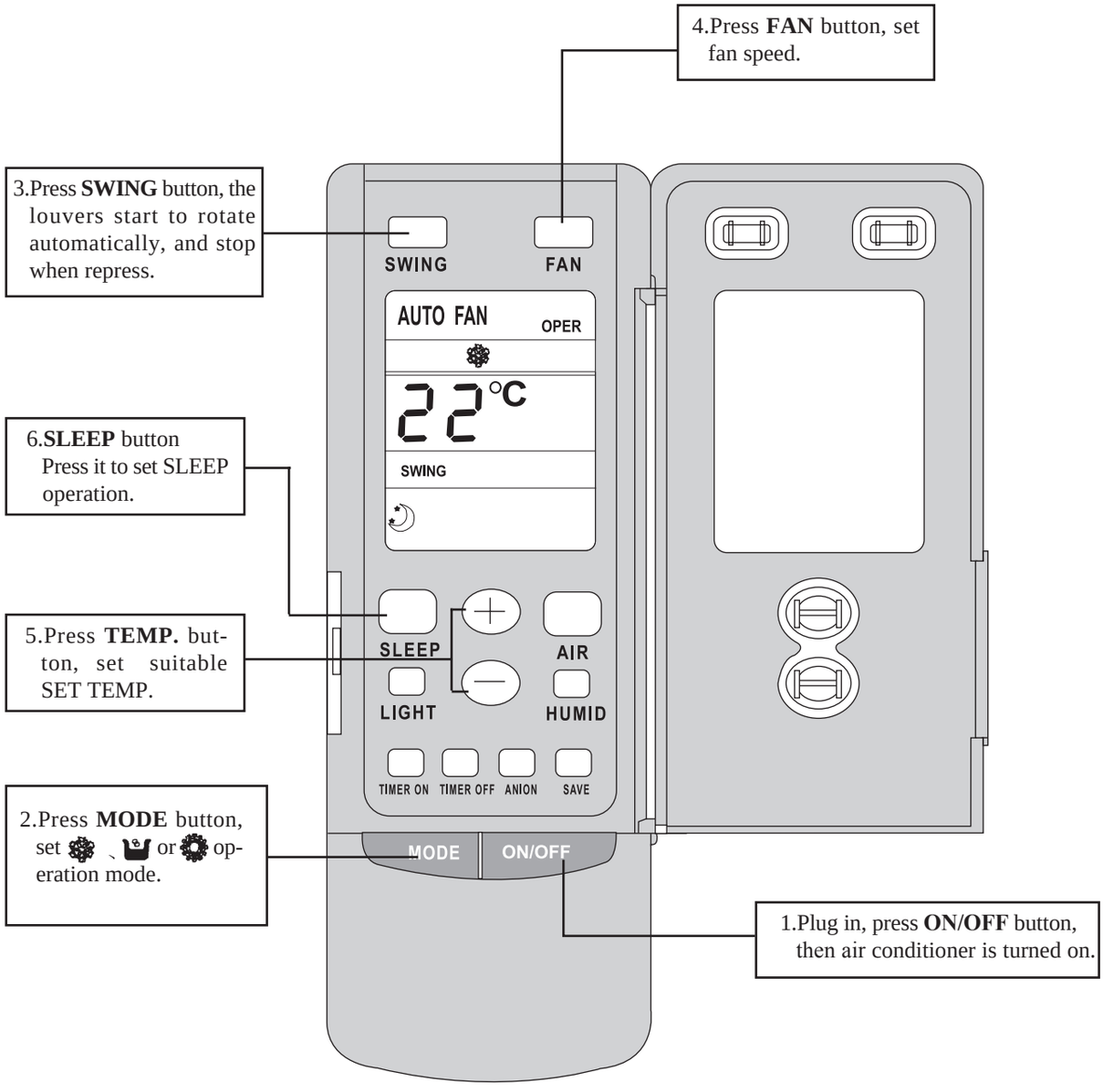
DRY mode operation procedure

- **If room temp. is lower than set temp., compressor , outdoor and indoor fan motor stop. If room temp. is between ± 2℃ of set temp., Air conditioner is drying. If room temp. is higher than set temp., it's at COOL mode.**
- **SET TEMP. should be in range of 16℃ to 30℃。**



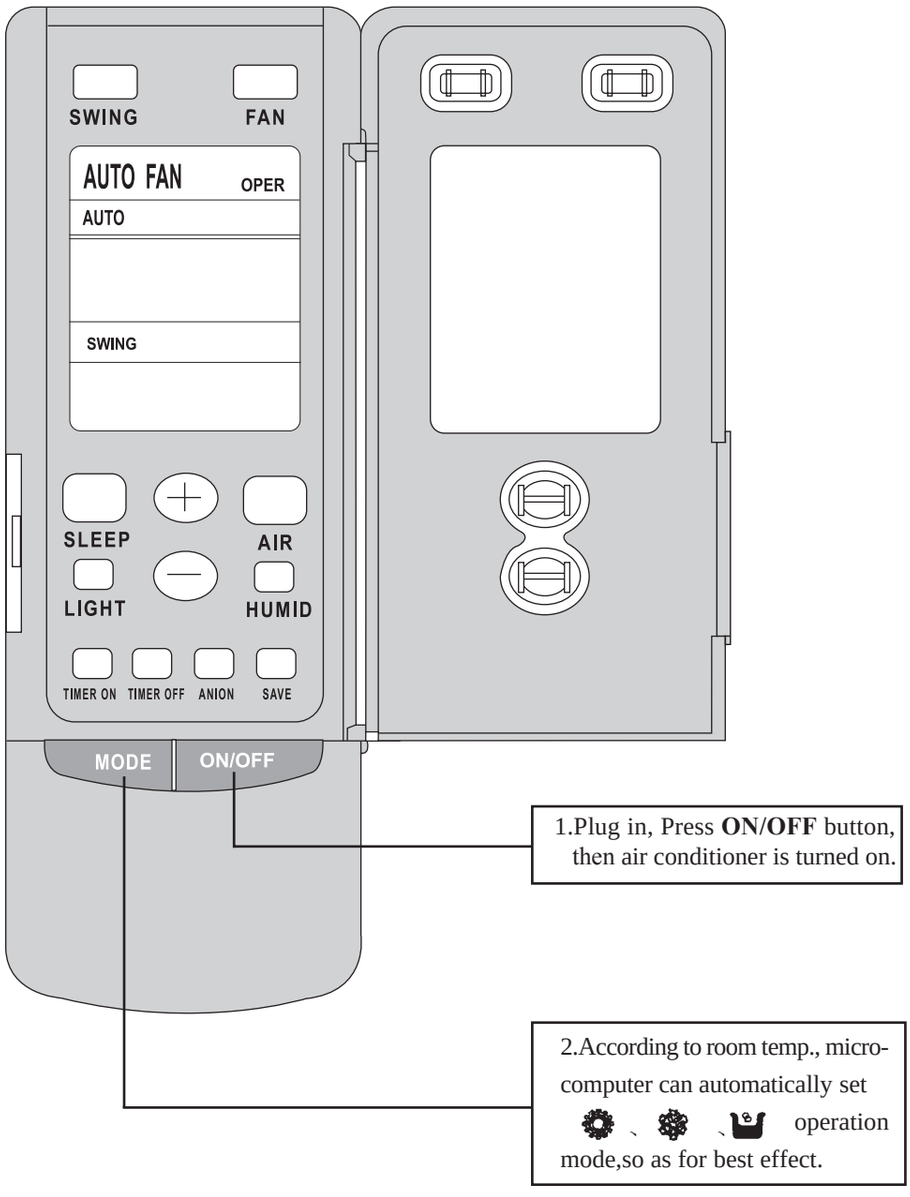
SLEEP mode operation procedure

- **When the unit is cooling or drying, if SLEEP operation is set, SET TEMP. would increase 1℃ in 1 hour and 2℃ in 2 hours. Indoor fan motor runs at low speed.**
- **When the unit is heating , if SLEEP operation is set, SET TEMP. would decrease 1℃ in 1 hour and 2℃ in 2 hours. Indoor fan motor runs at low speed.**

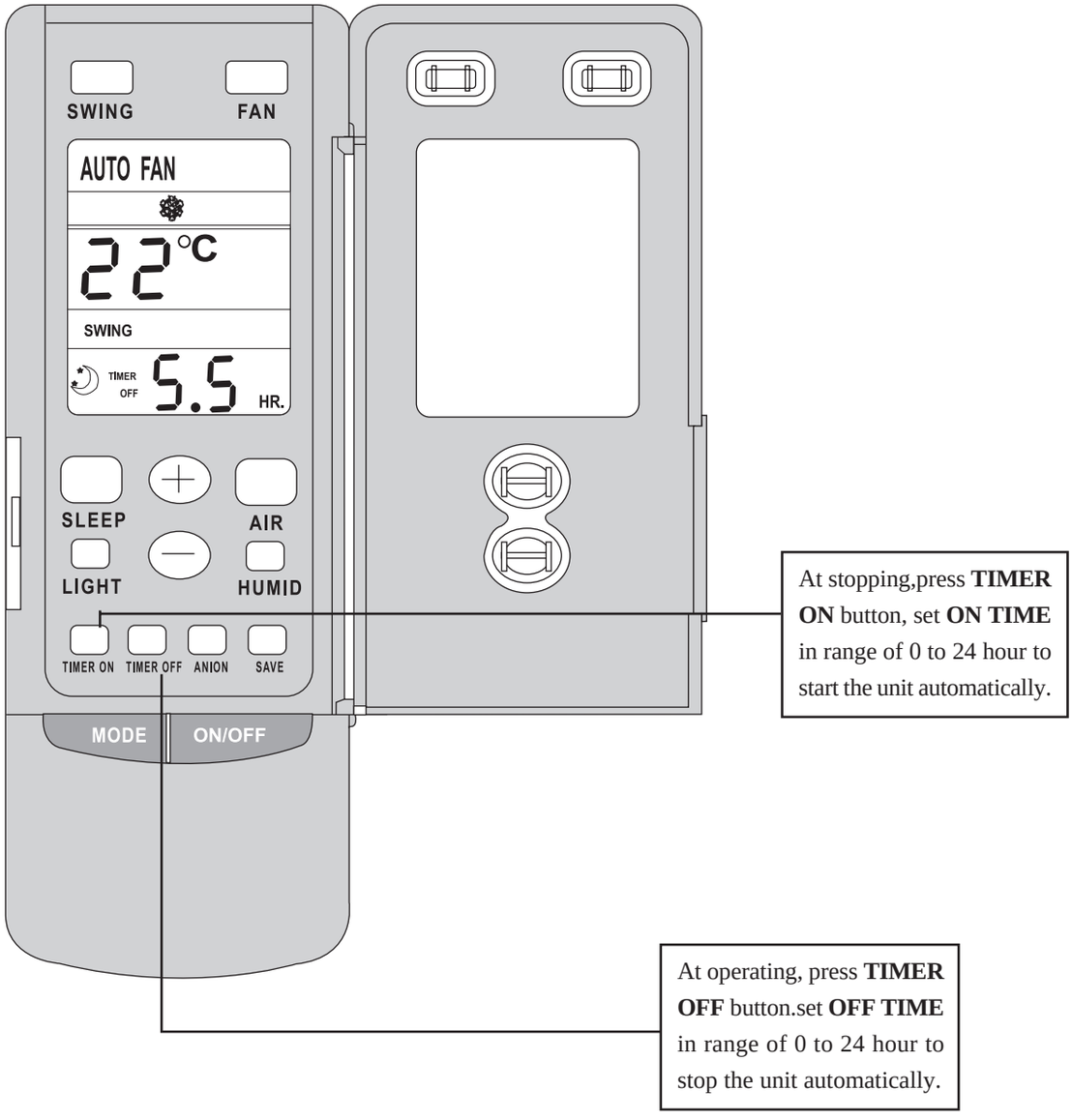


AUTO mode operation procedure

- **At AUTO mode operation, standard SET TEMP. is 25℃ for COOL mode and 20℃ for HEAT mode.**



TIMER mode operation procedure

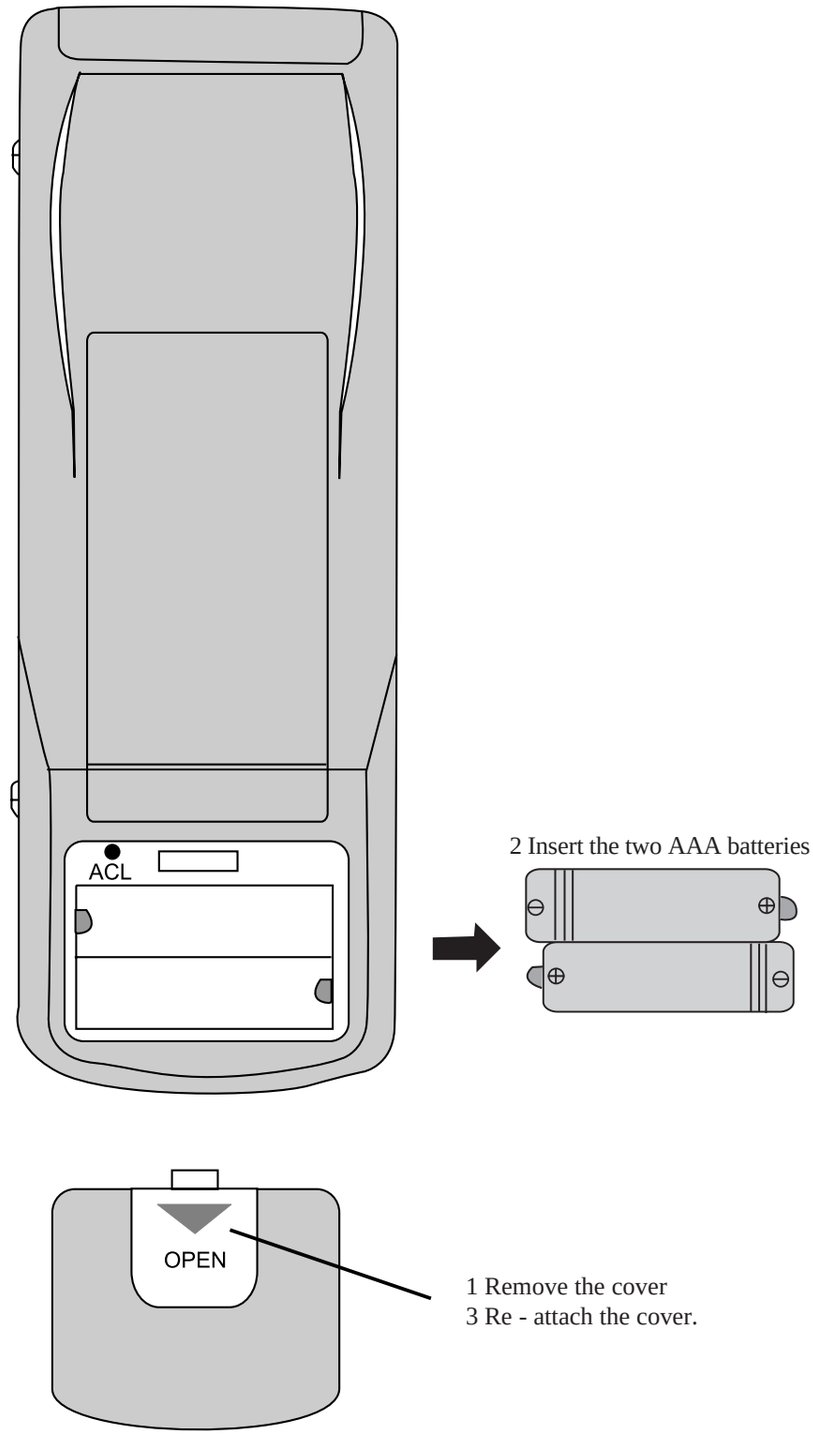


How to insert batteries

1.Remove the cover from the back of the remote control.
2.Insert the two batteries (Two AAA dry - cell batteries) and press button “ACL”.
3.Re - attach the cover.

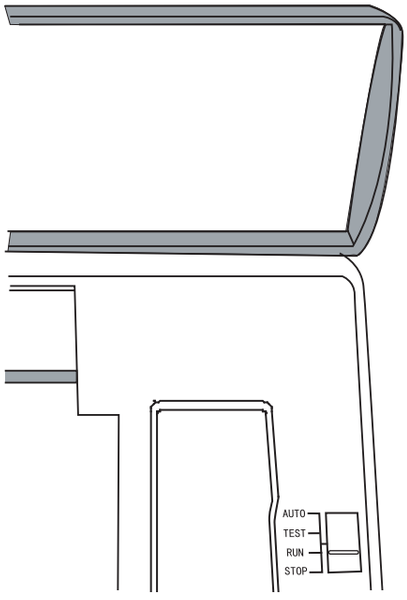
NOTE:

- **Don’t confuse the new and worn or different batteries.**
- **Remove batteries when not in use for a long time.**
- **The remote control signal can be received at a distance of up to about 10m.**



Emergency run operation procedure

If Wireless remote controller lost,open the surface panel and operate as following:



Manual switch (Auto, Test, Run, Stop)

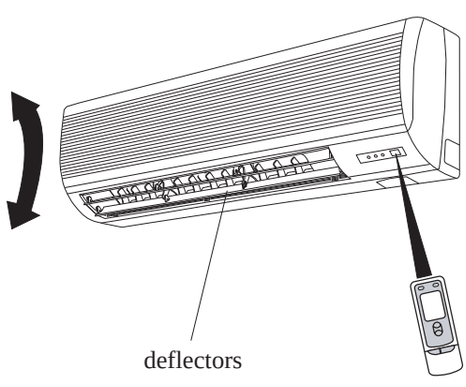
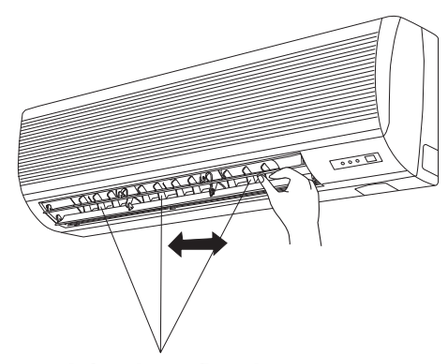
a. When turning it to Auto position, unit will run in Auto mode, if there is remote control signal, it will run at the remote control signal.

b. When turning it to Test position, the main unit will enter into Cool mode, indoor fan will run at high fan speed, if there is remote control signal, main unit will run at the remote control signal, at this time to shield the low pressure switch.

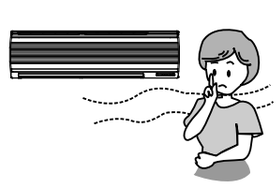
c. When turning it to Run position, the main unit will run at the received remote control order.

d. When turning it to Stop position, the unit will stop running.

Air flow direction adjustment procedure

1.Adjusting up/down air flow direction	2.Adjusting left/right air flow direction
With wireless remote controller,adjust air flow direction by rotating the UP/DOWN deflectors up and down automatically or stopping at an angle. * Press SWING button,the deflectors start to rotate and stop when repress.	As shown,move the LEFT/RIGHT deflectors by hand, adjust air flow left or right or three different directions to every corner of room so as to make everywhere temp. average.
 deflectors	 Adjusting left/right air flow direction

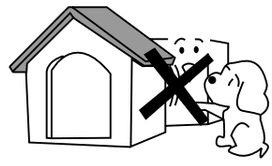
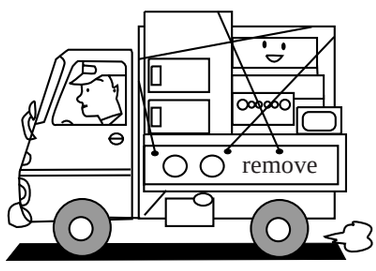
Special performance

Time delay in heating	When power is failed
* To avoid cold air,indoor fan motor does not start till compressor works for 30 seconds. * To keep heating,when room temp. reaches SET TEMP. and compressor stops,indoor fan motor works at LOW speed. 	* All operations stop. * Press ON/OFF button to restore operations. * If made mistakes in operation,plug out,then plug in well,and press ON/OFF button.

Operation conditions

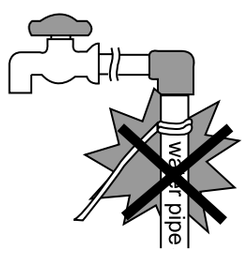
COOL mode operation	Avoiding evaporator frost
Outdoor temp. should be in range of 18℃ to 43℃, otherwise it is possible for air conditioner to breakdown. Room temp. should be in range of 16℃ to 32℃. Room humidity should be lower than 80%, otherwise it is possible to dew at air conditioner surface and even drop water.	After compressor continually working more than 6 minutes,and evaporator pipe temp. keeping no higher than 0 ℃ in 3 minutes,the compressor and outdoor fan motor stop,while indoor fan motor runs at SET SPEED. When evaporator pipe temp. is not lower than 10℃,and after 3 minutes delay,air conditioner restores previous operation.
DRY mode operation	**HEAT mode operation**
Outdoor temp. should be in range of 18 ℃ to 43 ℃,otherwise it is possible for air conditioner to breakdown. Room temp. should be in range of 16 ℃ to 32 ℃.	Outdoor temp. should be over -5℃,otherwise it is possible for protect devices inside to act and air conditioner can not start.

Installation precaution

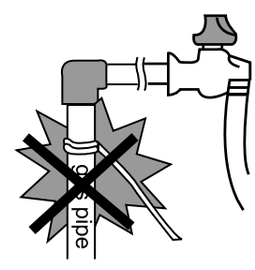
Installation position	Noise
* Drain the condensed water from indoor unit into ground pipe. * Install indoor unit far away TV set or radio etc., to avoid disturbing video or voice. * In salt and coastal area or place where is near thermal springs and polluted by sulphureous gas, or other special areas,please contact with seller before use. * Avoid place where is possible for flammable gas to leak out. * Avoid other heat sources or direct sun light. * Avoid place where is easy for children to touch.	* Install on place firmly enough to avoid transmitting or increasing noise and vibration. * Do not put objects in front of outdoor unit air outlet, to avoid increasing noise. * Be sure not to make trouble to neighbors with hot air or noise from outdoor unit. * Please contact with saler as soon as there is strange noise during operation. 
Remove	**Electric lines location**
When remove air conditioner to other place,it needs special technician,so contact with seller firstly. 	* Must connect with ground. * Must use rated voltage and electric circuit specific for air conditioner. * Avoid octopus type of multi-plug which would cause over heat. * Do not pull power lines strongly. * To fit an electrical leakage-proof switch,please contact with special eletric seller. * Chose proper fuse to meet with the current specification. * Power lines should be thick enough.

Earth wire Do not connect earth wire to following places:

Water pipe
Sometimes,there is some plastic material such as polythene used as part of water pipe,which is not available for earth.



Gas pipe
If there is electrical leakage accidently from air conditioner,it is easy to cause fire or explosion,as is very dangerous.



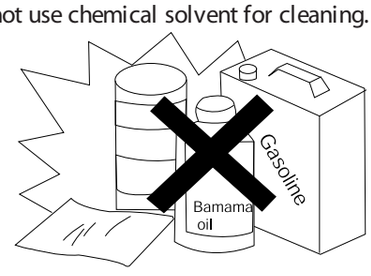
Care and maintenance

Cleaning unit

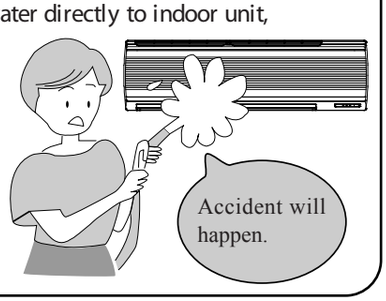
1.Switch off first before cleaning.

2.Clean surface panel with a soft and dry cloth,which is soaked warm water below 40℃

3.Do not use chemical solvent for cleaning.



4.Do not splash water directly to indoor unit, in which there are microcomputer and circuit plate, they must not be touched by water.



Cleaning filters

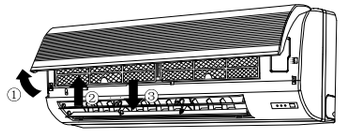
Air filters should be cleaned once every two weeks.

1.Open surface panel only after air conditioner stops at all.

① Pull here up (both sides of the surface panel);

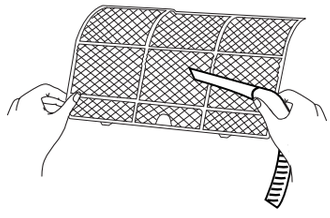
② Push filters up till hooks are free from the front panel;

③Pull down and take out filters.

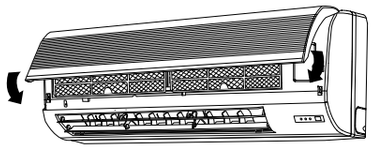


2.Clean filters with a vacuum cleaner or by typing them gently.

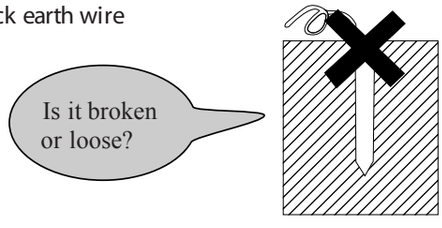
If they are very dirty,wash them in warm water below 40℃ dissolved with neutral scouring agent,then dry them in cool air.



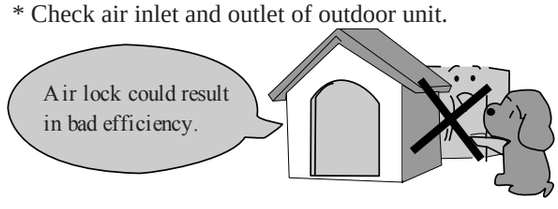
3.Insert them at original position,then push down and close surface panel.



* Check earth wire

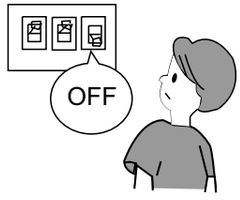
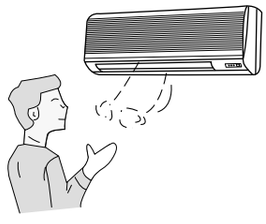


* Check air inlet and outlet of outdoor unit.



When malfunction happening

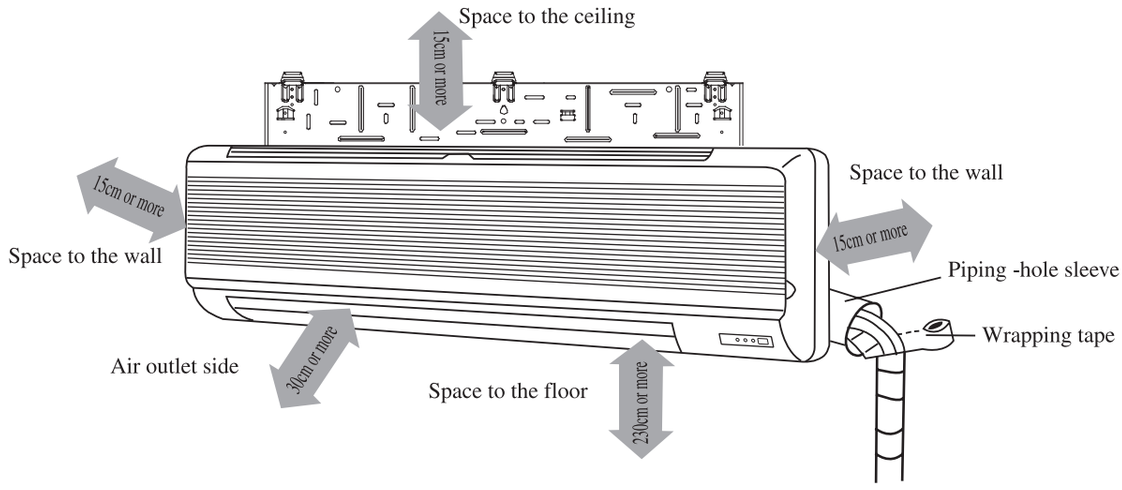
Please check the following items before ask for repair,it saves your time and money.

Fault phenomenon	Trouble shooting
Air conditioner does not operate at all. 	* Is power fail? * Is plug out? * Is power fuse or switch off? * Is voltage higher than 264V or lower than 206V? * Is SET TIME suitable?
Cooling efficiency is not good. 	* Is air inlet or outlet locking? * Is there any other heat source in room? * Are air filters dirty very much? * Is indoor fan speed set at LOW? * Is SET TEMP. suitable?
Wireless remote controller is not available. 	* If disturbed abnormally or operation modes changed too frequently,sometimes the electric controller would lose function.Please plug out and plug in again, it maybe OK. * Check batteries of wireless remote controller,if voltage is little,change batteries. * If wireless remote controller displays unclear or displays all symbols,please change batteries.
Foggy air flows out. 	* At COOL or DRY mode operation,sometimes there is foggy air flowing out of indoor unit,this is because that room humid air has been cooling rapid.

Immediately stop all operations and plug out,contact with your seller in the following situations.

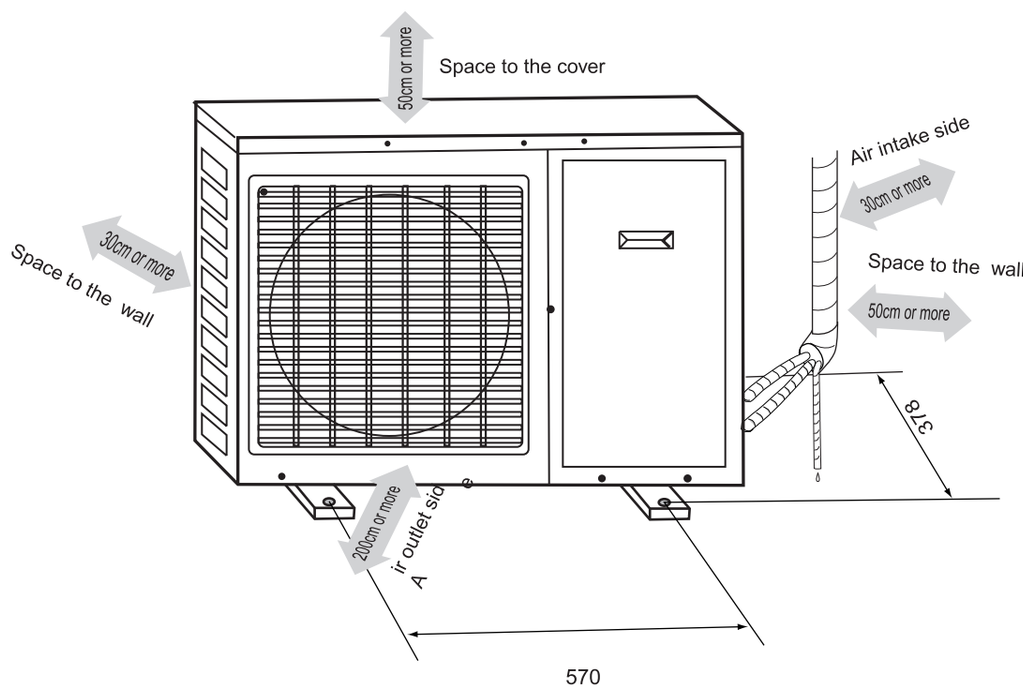
* Operation starts or stops abnormally;
* Power fuse or switch often breaks;
* Carelessly splash water or something into air conditioner;
* Electrical lines are much hot or lines cover breaks;
* Other strange situations.

Installation dimension diagram



IMPORTANT NOTES

* **The installation must be done by trained and qualified service personnel with reliability according to this manual.**
* **Contact with service center of SINCLAIR before installation to avoid the malfunction due to unprofessional installation.**
* **When picking up and moving the units, you must be guided by trained and qualified personnel.**
* **The distance between air outlet and the combustible must be over 50cm if the heater element is equipped.**



Installation location

Indoor unit

1. The inlet and outlet should not be covered so that the outflow air can reach all parts of the room.
2. Install in a location where is permitting easy connection with the outdoor unit.
3. A location from which the condensation water can be drained out conveniently.
4. Avoid a location where there is heat source, high humidity or inflammable gas.
5. Install in a location where is strong enough to withstand the full weight and vibration of the unit.
6. Be sure that the installation conforms to the installation dimension diagram.
7. Be sure to leave enough space to allow access for routine maintenance.
8. Install in a location where is lm or more away from other electric appliances such as television, audio device, etc.
9. Select location where is easy to remove and clean the filter.
10. Do not use the unit in the immediate surroundings of a laundry a bath a shower or a swimming pool.

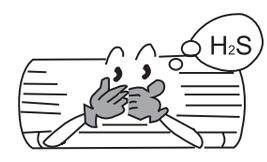
Outdoor unit

1. Select location from which noise and outflow air emitted by unit will not inconvenience neighbors.
2. Select location where there should be sufficient ventilation.
3. The inlet and outlet should not be covered.
4. The location should be able to withstand the full weight and vibration of the outdoor unit.
5. There should be no danger of flammable gas or corrosive gas leaks.
6. Be sure that the installation conforms to the installation dimension diagram.

NOTE:

Install in the following place may cause malfunction. If it is unavoidable, contact with service center of SINCLAIR please.

- Place where oil (machine oil) is used.
- The place where a lot of salinities such as coast exists.
- Place where a sulfured gas such as the hot spring zones is generated.
- Place where high - frequency waves are generated by radio equipment,welders and medical equipment.
- Other place with special circumstance.
- Wrong wiring connection will cause electrical malfunction.
- Do not pull the wire when fixing it with wire clamp.
- The appliance is not intended for use by young children or infirm persons without supervision.
- Young children should be supervised to ensure that they do not play with the appliance.



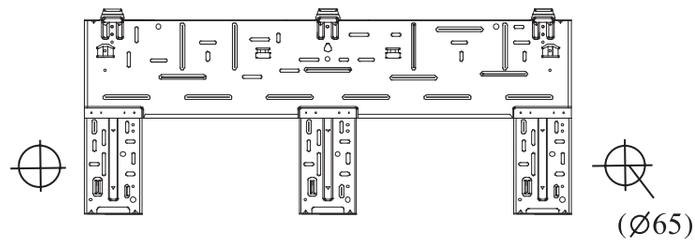
Install the indoor unit

Install the rear panel

1.Always mount the rear panel horizontally.

2.Fix the rear panel on the selected location with screws supplied with the unit.

3.Be sure that the rear panel has been fixed firmly enough to withstand the weight of an adult of 60kg, furthermore, the weight should be evenly shared by each screw.

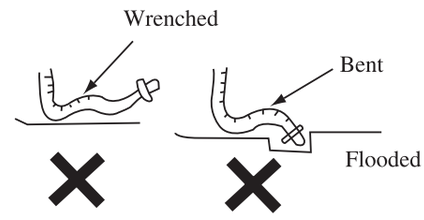


(Fig.2)

Install the drain hose

1.For well draining, the drain hose should be placed at a downward slant.

2.Do not wrench or bend the drain hose or flood its end by water.



(Fig.3)

Install the piping hole

1.Make the piping hole (∅65) in the wall at a slight downward slant to the outdoor side. The center of the hole should be determined refer to Fig.2.

2.Insert the piping-hole sleeve into the hole to prevent the connection piping and wiring from being damaged when passing through the hole.

Install the connection pipes

Connect the connection pipes with the relevant union pipes of the indoor unit (Shown in P25 “Install the connection pipes”).

NOTE:

- **Connect the connection pipes with the indoor unit firstly and the outdoor unit secondly.**
- **Be careful in bending the connection pipes, or you will damage the pipes.**
- **If the tightening torque is too great in tightening the flare nuts, leakage will happen.**

Electrical wiring

1. Open the surface panel.
2. Remove the wiring cover. (Fig.4)
3. Route the power connection cord from the back of the indoor unit and pull it toward the front through the wiring hole for connection.
4. Connect the blue wire of the power connection cord to the terminal “N(1)”, the brown one to “2”, the black one to “3”, and the yellow- green one (earth wire) to “⏚” as shown in Fig.4.

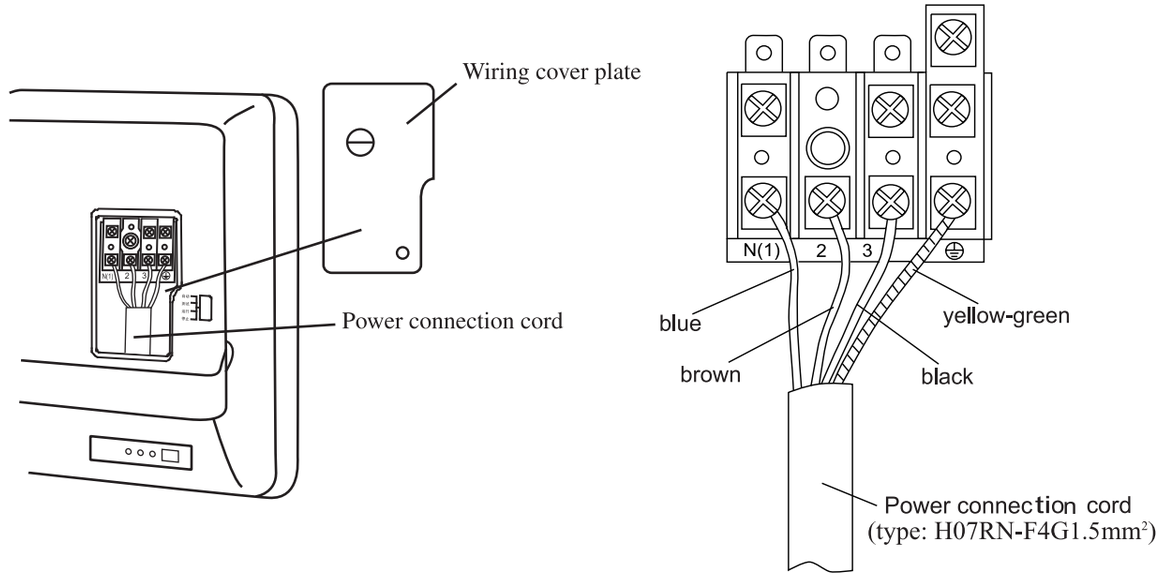


Fig.4

NOTE:

- **All the electrical work must be done by qualified personnel according to relative wiring regulation and this manual.**
- **The power supply is type Y connection. 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 rated voltage and the exclusive circuit must be used.**
- **Leakage circuit-breaker and air switch of correct capacity must be installed. The air switch of 32A should be used in these models.**

Install the indoor unit

1.When routing the piping and wiring from the left or right side of the indoor unit, cut off the tailings from the chassis in necessary(shown in Fig.5).

① Cut off tailing 1 when only power cord is routed.

② Cut off tailings 1 and 2 when connect pipe and power cord are routed.

2.Wrap the piping and wiring and pull them through the cut-off tailings hole (shown in Fig. 6).

3.Hang the 2 mounting slots of the indoor unit on the upper tabs of the rear panel and check if it is firm enough.

4.The height of the installed location should be 2.3m or more from the floor.

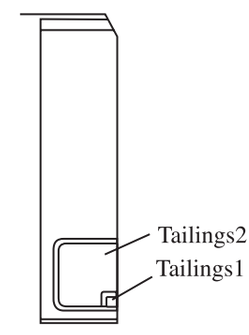


Fig.5

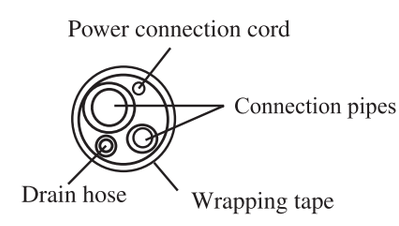


Fig.6

Install the outdoor unit

Install the connection pipe

1.Align the center of the piping flare with the relevant valve.
2.Screw in the flare nut by hand and then tighten the nut with spanner and torque wrench refer to the diagram at right.

Note: Exceeding tightening torque will damage the flare surface.

Tightening torque table

Hex nut diameter (mm)	Tightening torque(N.m)
∅ 6	15~20
∅9.5	31~35
∅12	50~55
∅16	60~65

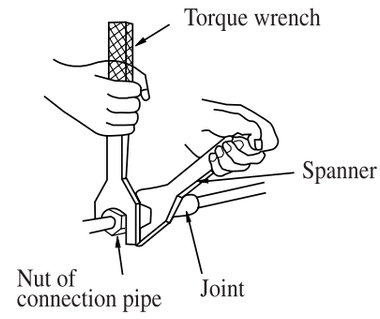


Fig.7

Electric wiring connection

1.Remove the front side plate (Fig.8).
2.Break through the hole for wires and put on rubber bush.
3.Pull all wires throught the rubber bush.
4.Remove the wire clamp and connect the end of the power connection cord with screws to the wiring terminal board according to the "WIRING DIAGRAM" of outdoor unit.
5.Make sure that the wiring has been connected firmly.
6.Tighten the wire with clamp and clasp.

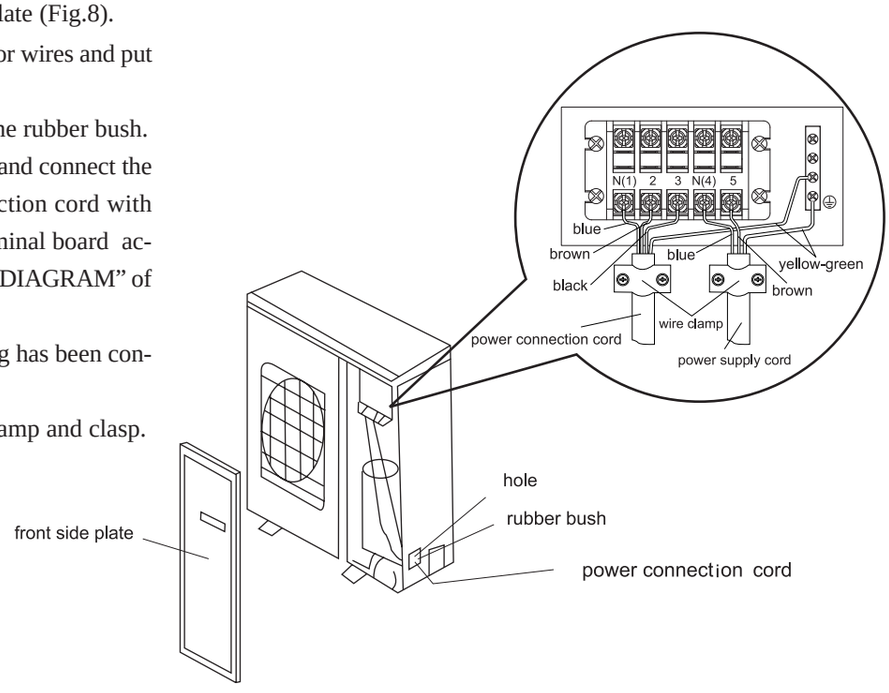
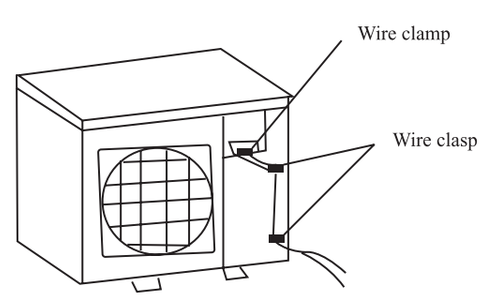


Fig.8

NOTE:

Wrong wiring connection will cause electrical malfunction.
Do not pull the wire when fixing it with wire clamp.
Do not let the wire too loose in the outdoor unit.



Install the outdoor unit

Connecting the pipe

1.Remove the flare nuts from the cut - off valves of the outdoor unit.

2.Align the center of the piping flare with the relevant valve, and screw in the flare nut about 3~4 turns by hand.

3.Tighten the flare nut with spanner and torque wrench.

4.Remove the valve caps of the gas valve and liquid valve and the service port nut.

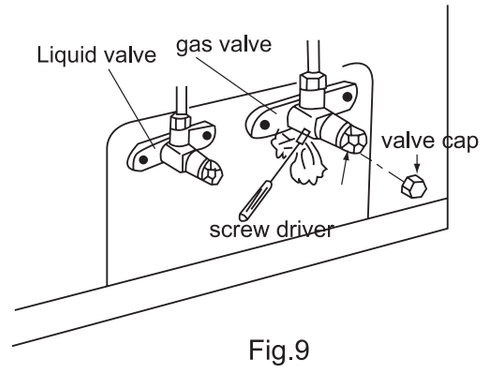


Fig.9

Air purging and leakage test

For the air conditioners with R22 refrigerant, as the below step:

1.Loosen the valve stem of the liquid valve with a hex wrench.

2.Push the check valve core of the gas valve to discharge air and moisture remaining in the refrigerant system.

3.Stop pushing the valve core as soon as the refrigerant starts to be discharged, and reinstall the service port nut.

4.Open the liquid valve and gas valve entirely (shown in Fig.9).

5.Tighten the valve caps and test leakage at all joints of the piping (both indoor and outdoor) with liquid soap or leak detector.

6.If possible, discharge air and moisture remaining in the refrigerant system with a vacuum pump. (shown in Fig.10)

1.Remove the nuts of one-way valve.

2.Evacuate from the one-way valve with a vacuum pump until the vacuum meter is 5 Torr, and keep up evacuating 1 hour or more.

3.Turn off the valve and fighten the nuts.

4.Fully open valves.(Fig.9)

5.Tighten the nuts, then check whether there is gas leaking out.

*Moisture inside pipeline must be less 200 PPm.

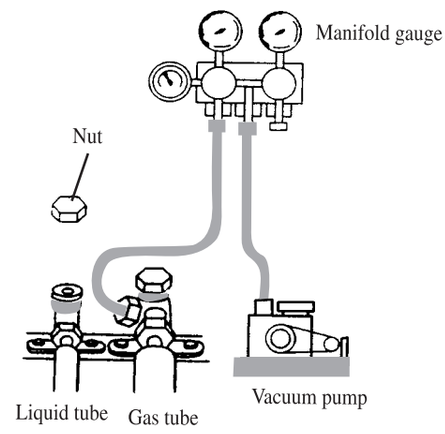


Fig.10

Outdoor condensation drainage (Heat pump type only)

When the unit is heating or defrosting,the waste water formed in the outdoor unit can be drained out reliably through the drain hose.

Installation:

Install the outdoor drain elbow in the ϕ 25 hole on the base plate as shown in Fig.11, and joint the drain hose to the elbow, so that the waste water formed in the outdoor unit can be drained out to a proper place.

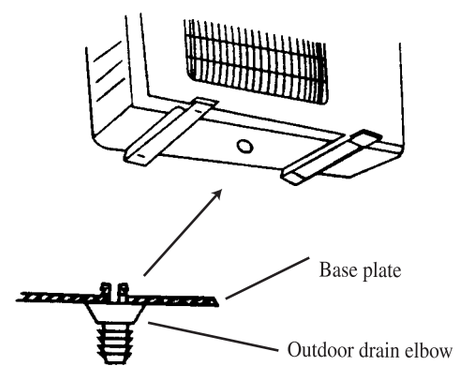


Fig.11

Routine check after installation

Check after installation

Items to be checked	Possible malfunction	Situation
Has the air conditioner been fixed firmly?	The unit may drop, shake or emit noise.	
Have you done the refrigerant leakage test?	It may cause insufficient refrigerating capacity.	
Is heat insulation sufficient?	It may cause condensation and dripping.	
Does the unit drain well?	It may cause condensation and dripping.	
Is the voltage in accordance with the rated voltage marked on the nameplate?	It may cause electric malfunction or damage the part.	
Is the electrical wiring and piping connection installed correctly and securely?	It may cause electric malfunction or damage the part.	
Has the unit been connected to a secure earth connection?	It may cause electrical leakage.	
Is the power cord specified?	It may cause electric malfunction or damage the part.	
Has the inlet and outlet been covered?	It may cause insufficient refrigerating capacity.	
Has the length of connection pipes and the refrigerant capacity been recorded?	The refrigerant capacity is not accurate.	

ENVIRONMENTAL INFORMATION

This unit contains fluorinated gases with greenhouse effect covered by the Kyoto Protocol.
Maintenance and disposal must be carried out by qualified persons only.
Refrigerant gas R410A, GWP = 1730

EXTRA REFRIGERANT CHARGE

Pursuant to Regulation EC 842/2006 on certain fluorinated greenhouse gases, in case of extra refrigerant charge, it is compulsory to:

- Fill in the label accompanying the unit inserting the factory quantity of refrigerant charge (see the technical label), the extra refrigerant charge and the total charge.
- Apply the label next to the technical label applied on the unit. For the split-type air conditioner apply on the outdoor unit.