

Ver.

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„ORIGINAL INSTRUCTIONS“

**IMPORTANT NOTE:**

Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

**EN**

For downloading manual for this product, please enter the model name at this link:

**SK**

Pre stiahnutie manuálu k tomuto produktu zadajte modelové označenie do nasledujúceho odkazu:

**HR**

Za preuzimanje priručnika za ovaj proizvod unesite naziv modela na ovu vezu:

**SL**

Za prenos navodil za uporabo tega izdelka, vnesite ime modela na tej povezavi:

**IT**

Per scaricare il manuale di questo prodotto, inserisci il nome del modello a questo link:

**CZ**

Pro stažení manuálu k tomuto produktu zadejte modelové označení do následujícího odkazu:

**DE**

Um das Handbuch für dieses Produkt herunterzuladen, geben Sie bitte den Modellnamen für diesen Link ein:

**HU**

Termék kézikönyvének letöltéséhez írja be a modell megnevezését az alábbi linkre:

**RU**

Чтобы загрузить руководство для этого продукта, введите обозначение модели по следующей ссылке:

**ES**

Para descargar el manual de este producto, ingrese la designación del modelo en el siguiente enlace:



## To Users

Thank you for selecting Sinclair product. Please read this instruction manual carefully before installing and using the product, so as to master and correctly use the product. In order to guide you to correctly install and use our product and achieve expected operating effect, we hereby instruct as below:

- (1) This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- (2) In order to ensure reliability of product, the product may consume some power under stand-by status for maintaining normal communication of system and preheating refrigerant and lubricant. If the product is not to be used for long, cut off the power supply; please energize and preheat the unit in advance before reusing it.
- (3) Please properly select the model according to actual using environment, otherwise it may impact the using convenience.
- (4) If the product needs to be installed, moved or maintained, please contact our designated dealer or local service center for professional support. Users should not disassemble or maintain the unit by themselves, otherwise it may cause relative damage, and our company will bear no responsibilities.
- (5) All the illustrations and information in the instruction manual are only for reference. In order to make the product better, we will continuously conduct improvement and innovation. If there is adjustment in the product, please subject to actual product.
- (6) If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

# Exception Clauses

Manufacturer will bear no responsibilities when personal injury or property loss is caused by the following reasons:

- (1) Damage the product due to improper use or misuse of the product.
- (2) Alter, change, maintain or use the product with other equipment without abiding by the instruction manual of manufacturer.
- (3) After verification, the defect of product is directly caused by corrosive gas.
- (4) After verification, defects are due to improper operation during transportation of product.
- (5) Operate, repair, maintain the unit without abiding by instruction manual or related regulations.
- (6) After verification, the problem or dispute is caused by the quality specification or performance of parts and components that produced by other manufacturers.
- (7) The damage is caused by natural calamities, bad using environment or force majeure.

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This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

# 1 Safety Notices (Please be sure to abide them)

## **SPECIAL WARNING:**

- (1) Be sure to comply with national gas regulations.
- (2) Do not pierce or burn.
- (3) Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- (4) Be aware that refrigerants may not contain an odor.
- (5) Appliance shall be installed, operated and stored in a room with a floor area larger than "X"m<sup>2</sup> ("X" see section 3.1.1).
- (6) The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).



**PROHIBITED:** This sign indicates that the items must be prohibited. Improper operation may cause severe damage or death to people.



**WARNING:** If not abide them strictly, it may cause severe damage to the unit or the people.



**NOTE:** If not abide them strictly, it may cause slight or medium damage to the unit or the people.



**OBSERVED:** This sign indicates that the items must be observed. Improper operation may cause damage to people or property.



## **WARNING:**

This product can't be installed at corrosive, inflammable or explosive environment or the place with special requirements, such as kitchen. Otherwise, it will affect the normal operation or shorten the service life of the unit, or even cause fire hazard or serious injury. As for the above special places, please adopt special air conditioner with anti-corrosive or anti-explosion function.

Please read this operating manual carefully before operating the unit.



The air conditioner is charged with inflammable refrigerant R32 (GWP: 675).



Before using the air conditioner, please read the instruction manual.



Before installing the air conditioner, please read the instruction manual.

Before repairing the air conditioner, please read the instruction manual.



The figures in this manual may be different with the material objects, please refer to the material objects for reference.



**PROHIBITED!**

- (1) The air conditioner should be grounded to avoid electric shock. Do not connect the ground wire to gas pipe, water pipe, lightning arrester or telephone wire.
- (2) The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- (3) The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).
- (4) According to federal/state/local laws and regulations, all packages and transportation materials, including nails, metal or wooden parts, and plastic packing material, must be treated in a safe way.



**WARNING!**

- (1) Please install according to this instruction manual. Installation must be performed in accordance with the requirement of NEC and CEC by authorized personnel only.
- (2) Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- (3) Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- (4) The appliance shall be installed in accordance with national wiring regulations.
- (5) The fixed wires connecting to the appliance must be configured with all-pole disconnection device under voltage grade III according to wiring rules.
- (6) Air conditioner should be stored with protective measures against mechanical damage caused by accident.





**WARNING!**

- |      |  |
|------|--|
| (7)  | If the installation space for air conditioner pipe is too small, adopt a protective measure to prevent the pipe from physical damage.  |
| (8)  | During installation, use the specialized accessories and components, otherwise water leakage, electric shock or fire hazard may occur.   |
| (9)  | Please install the air conditioner in a secure place that can withstand the weight of air conditioner. Insecure installation may cause the air conditioner falling down and lead to injury.  |
| (10) | Be sure to adopt independent power circuit. If the power cord is damaged, it must be repaired by the manufacturer, service agent or other professional agents.   |
| (11) | The air conditioner can be cleaned only after it is turned off and power-disconnected, otherwise electric shock may occur.   |
| (12) | The air conditioner is not intended to be cleaned or maintained by children without supervision.   |
| (13) | Do not alter the setting of pressure sensor or other protective devices. If the protective devices are short-circuited or changed against rules, fire hazard or even explosion may occur.  |
| (14) | Do not operate the air conditioner with wet hands. Do not wash or sprinkle water on the air conditioner, otherwise malfunction or electric shock will occur.   |
| (15) | Do not dry the filter with naked flame or an air blower; otherwise the filter will be out of shape.  |
| (16) | If the unit is to be installed in a small space, please adopt protective measures to prevent the concentration of refrigerant from exceeding the allowable safety limit; Excessive refrigerant leakage may lead to explosion.  |
| (17) | When installing or re-installing the air conditioner, please keep the refrigerant circuit away from substances other than the specified refrigerant, such as air. Any presence of foreign substances will cause abnormal pressure change or even explosion, resulting in injury. |
| (18) | Only professionals are allowed to carry on daily maintenance.  |
| (19) | Before contacting any wire, make sure power is cut off.  |
| (20) | Do not let any inflammable objects near the unit.  |
| (21) | Do not use organic solvent to clean the air conditioner.   |
| (22) | If you need to replace a component, please ask a professional to repair with a component supplied by the original manufacturer so as to ensure the unit's quality.   |
| (23) | Improper operation may get the unit broken, hit by electric shock or cause fire.   |
| (24) | Do not make the air conditioner wet or electric shock may be lead, ensure that the air conditioner will not be cleaned by water rinsing under any circumstance.  |

**NOTES!**

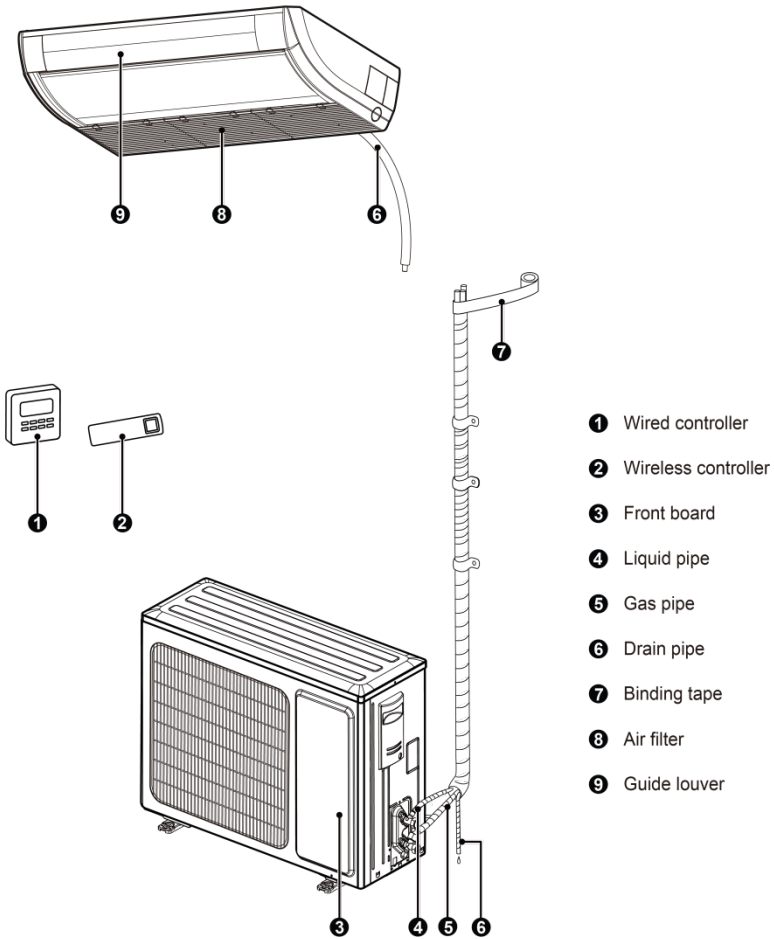
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|-----|--|
| (1) | Do not put a finger or other objects into the air inlet or air return grill.   |
| (2) | Please adopt safety protection measures before touching the refrigerant pipe, otherwise your hands may be hurt.  |
| (3) | Please arrange the drain pipe according to the instruction manual.   |
| (4) | Never stop the air conditioner by directly cutting off the power.  |
| (5) | Please select the proper copper pipe according to the requirement for pipe thickness.  |
| (6) | Indoor unit can only be installed indoors while outdoor unit can be installed either indoors or outdoors. Never install the air conditioner in the following places: <ol style="list-style-type: none"> <li>1) Places with oil smoke or volatile liquid: plastic parts may deteriorate and fall off or even cause water leakage.</li> <li>2) Places with corrosive gas: copper pipe or the welding parts may be corroded and cause refrigerant leakage.</li> </ol> |
| (7) | Adopt proper measures to protect the outdoor unit from small animals because they may damage the electric components and cause malfunction of the air conditioner.   |

**OBSERVED!**

- |     |  |
|-----|--|
| (1) | If wired controller is to be used, it should be connected first before powering up the unit, otherwise the wired controller may not be able to use.  |
| (2) | When installing the indoor unit, keep it away from television, wireless waves, and fluorescent.  |
| (3) | Only use soft dry cloth or slightly wet cloth with neutral detergent to clean the casing of the air conditioner.   |
| (4) | Before operating the unit under low temperature, connect it to power for 8 hours. If it is stopped for a short time, for example, one night, do not cut off the power (This is to protect the compressor). |

## 2 Product Introduction


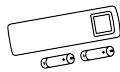



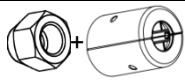
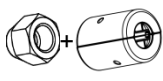
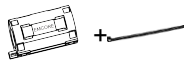
### 2.1 Overall Layout





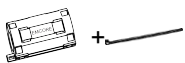


**NOTE:**

The connection pipe, drain pipe, power cord for this unit should be prepared by the user.

## 2.2 Standard Accessories

Indoor Unit Accessories				
No.	Name	Appearance	Q'ty	Usage
1	Nut with Washer		8	To fix the hook on the cabinet of the unit
2	Wireless Controller + Battery		1+2	To control the indoor unit
3	Insulation		1	To insulate the gas pipe
4	Insulation		1	To insulate the liquid pipe
5	Fastener		4	To fasten the sponge
6	Ordinary Nut+ Tamperproof box		1	To prevent the removal of the gas pipe connecting nut
7	Ordinary Nut+ Tamperproof box		1	To prevent the removal of the liquid pipe connecting nut
8	Buckle magnetic ring+ Cable tie		1+2	For engineering installation. (only ASF-48BI2)

Outdoor Unit Accessories				
No.	Name	Appearance	Q'ty	Usage
1	Drain Plug	 or 	0 or 3 or 4 or 5	To plug the unused drain hole
2	Drainage Connector	 or 	1	To connect with the hard PVC drain pipe
3	Buckle magnetic ring+ Cable tie		1+2	For engineering installation. (only ASGE-48BI2-3)

## 3 Maintenance

### 3.1 Failures Not Caused by Faults of the AC

- (1) If your air conditioner fails to function normally, please first check the following items before maintenance:

Problem	Cause	Corrective measure
The air conditioner can't run.	If you turn off the unit and then immediately turn it on, in order to protect the compressor and avoid system overload, compressor will delay running for 3min.	Please wait for a while.
	Wire connection is wrong.	Connect wires according to the wiring diagram.
	Fuse or circuit breaker is broken.	Replace the fuse or switch on the circuit breaker.
	Power failure.	Restart after power is resumed.
	Power plug is loose.	Re-insert the power plug.
	Remote controller has low battery.	Replace the batteries.
Bad cooling or heating effect.	Air inlet and outlet of indoor or outdoor units have been blocked.	Clear the obstacles and keep the room for indoor and outdoor units well ventilated.
	Improper temperature setting	Reset a proper temperature.
	Fan speed is too low.	Reset a proper fan speed.
	Air flow direction is not right.	Change the direction of air louvers.
	Doors or windows are open.	Close them.
	Exposed under direct sunshine	Put on curtains or louvers in front of the windows.
	Too many heat sources in the room.	Remove unnecessary heat sources.
	Filter is blocked or dirty.	Send for a professional to clean the filter.
Air inlets or outlets of the units are blocked.	Clear away obstacles that are blocking the air inlets and outlets of indoor and outdoor units.	

(2) The following situations are not operation failures.

Problem	Time of Occurrence	Cause
Mist comes from the air conditioner.	During operation.	If the unit is running under high humidity, the wet air in the room will be quickly cooled down.
The air conditioner generates some noise.	System switches to heating mode after defrosting.	Defrosting process will generate some water, which will turn to water vapor.
	The air conditioner is buzzing at the beginning of operation.	Some components will be buzzing when it starts working. The noise will become weak 1min later.
	When the unit is turned on, it purrs.	When the system is just started, the refrigerant is not stable. About 30s later, the purr of the unit becomes low.
	About 20s after the unit first enables the heating mode or there is refrigerant brushing sound when defrosting under heating.	It's the sound of 4-way valve switching direction. The sound will disappear after the valve changes its direction.
	There is hissing sound when the unit is started or stopped and a slight hissing sound during and after operation.	It's the sound of gaseous refrigerant that stops flowing and the sound of drainage system.
	There is a sound of crunching during and after operation.	Because of temperature change, front panel and other components may be swelled up and cause abrasion sound.
	There is a hissing sound when the unit is turned on or suddenly stopped during operation or after defrosting.	Because refrigerant suddenly stops flowing or changes the flow direction.
Dust comes from the air conditioner.	The unit starts operation after being unused for a long time.	Dust inside the indoor unit comes out together with the air.
The air conditioner generates some smell.	During operation.	The room smell or the smell of cigarette comes out through the indoor unit.



**NOTE:** Check the above items and adopt the corresponding corrective measures. If the air conditioner continues to function poorly, please stop the air conditioner immediately and contact Sinclair's authorized local service center. Ask our professional service staff to check and repair the unit.

### 3.2 Error Code



**WARNING!**

- (1) If abnormal things (for example, awful smell) occur, please stop the unit immediately and disconnect power. Then contact Sinclair's authorized servicecenter. If the unit continues to run in abnormal situations, it may get damagedand cause electric shock or fire hazard.
- (2) Do not repair the air conditioner by yourself. Improper maintenance will cause electric shock or fire hazard. Please contact Sinclair's authorized service centerand send for professional service staff to repair.

If the display panel or wired controller displays an error code, please refer to the error code meaning stated in the following table.

Error code	Error	Error code	Error
A1	Outdoor fan IPM module protection	LE	Compressor overspeed
Ac	Outdoor fan startup failure	LF	Power protection
Ad	Outdoor fan Phase-loss protection	LP	IDU and ODU unmatched
AE	Outdoor fan current detection circuit error	oE	ODU error, for specific error please see the status of ODU main board indicator
AJ	Outdoor fan out-of-step protection	P0	Driver reset protection
C0	Wired controller and indoor unit communication failure	P5	Compressor phase over-current protection
C1	Indoor ambient temperature sensor error	P6	Master control and driver communication error
C2	Evaporator temperature sensor error	P7	Module temperature sensor circuit failure
C3	Condenser temperature sensor error	P8	Driver module temperature protection
C4	ODU jumper cap error	P9	AC contractor protection

Error code	Error	Error code	Error
CJ	IDU jumper cap error	PA	ODU AC current protection
C6	Discharge temperature sensor error	PE	Temperature drift protection
C7	Condenser meso-temperature sensor error	PF	Driveboard ambient temperature sensor error
C8	Compressor dial code or jumper cap abnormal	PH	Bus high-voltage protection
C9	Compressor driver memory chip failure	PL	Bus low-voltage protection
CE	Wired controller temperature sensor error	PP	Input AC voltage error
CP	Multi-main wired controller failure	PU	Capacitor charging failure
dc	Compressor suction temperature sensor error	q0	DC indoor fan driver bus low-voltage protection
dH	Wired controller circuit board abnormal	q1	DC indoor fan driver bus high-voltage protection
dJ	AC sequence protection (phase loss or anti-phase protection)	q2	DC indoor fan AC current protection
E0	Indoor fan error	q3	DC indoor fan driver IPM module protection
E1	Compressor high pressure protection	q4	DC indoor fan driver PFC protection
E2	Indoor anti-freeze protection	q5	DC indoor fan startup failure
E3	Refrigerant lack protection or compressor low pressure protection	q6	DC indoor fan Phase-loss protection
E4	Compressor air discharge high-temperature protection	q7	DC indoor fan driver reset protection
E6	ODU and IDU communication error	q8	DC indoor fan over-current protection
E7	Mode conflict	q9	DC indoor fan power protection
E9	Water-full protection	qA	DC indoor fan driver current detection circuit error
EE	Memory chip reading and writing failure	qb	DC indoor fan out-of-step protection
EL	Emergency stop (fire alarm)	qC	Master control and DC indoor fan driver communication error
F3	Outdoor ambient temperature sensor error	qd	DC indoor fan driver module high temperature protection



DC Inverter UNI SPLIT Series Floor Ceiling Type Unit

Error code	Error	Error code	Error
Fo	Recycling refrigerant mode	qE	DC indoor fan driver module temperature sensor error
H1	Ordinary defrosting state	qF	DC indoor fan driver memory chip error
H4	Overload protection	qH	DC indoor fan driver charge loop error
H5	IPM module current protection	qL	DC indoor fan driver input AC voltage error protection
H7	Compressor out-of-step protection	qo	DC indoor fan driver electrical box temperature sensor error
HC	PFC overcurrent protection	qp	DC indoor fan driver AC input zero-crossing protection
HE	Compressor demagnetize protection	U1	Compressor phase current circuit detection error
L3	Outdoor fan 1 error	U2	Compressor phase-loss and anti-phase protection
L4	Wired controller power supply circuit poor	U3	DC bus voltage drop error
L5	Wired controller power supply overcurrent protection	U5	Overall current detection failure
L6	One control multi-machine endor quantity is inconsistent	U7	4-way valve switch-over error
L7	One control multi-machine endor series is inconsistent	U8	Zero-crossing protection
LA	Outdoor fan 2 error	UL	Outdoor fan overcurrent protection
Lc	Compressor startup failure	Uo	Outdoor ambient temperature abnormal(Temperature high opening heat mode or temperature over low open refrigeration mode)

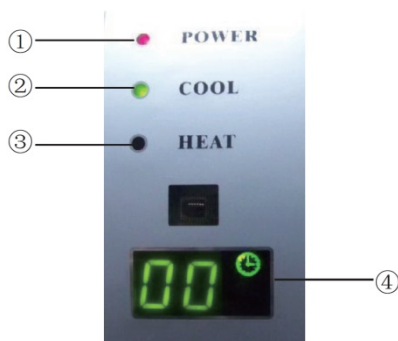


**NOTE:** When the unit is connected with the wired controller, the error code will be simultaneously shown on it.

Instructions to the Error Indicating Lamps on the Panel of the Floor Ceiling Type Unit.

**States of the Indicating Lamps:**

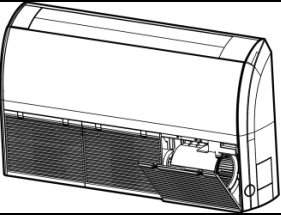
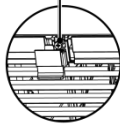
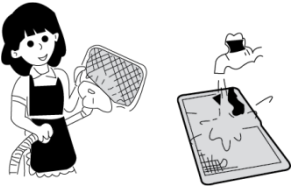
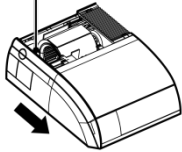
- ① Indicating Lamp of “POWER”: The indicating lamp will shine when power on, while it will go out when power off.
- ② Indicating Lamp of “COOL”: The indicating lamp will shine when “COOL” is activated, while it will go out when “COOL” is deactivated.
- ③ Indicating Lamp of “HEAT”: The indicating lamp will shine when “HEAT” is activated, while it will go out when “HEAT” is deactivated.
- ④ Indicating Lamp of “TIMER”: The indicating lamp will shine when “TIMER” is activated, while it will go out when “TIMER” is deactivated or the set.

**3.3 Unit Maintenance****NOTES!**

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| (1) Before cleaning, please make sure the unit is stopped. Cut the circuit breaker and remove the power socket, otherwise, electric shock may occur. |
| (2) Do not wash the air conditioner with water, otherwise fire hazard or electric shock may occur.   |
| (3) When cleaning the filter, please be careful of your steps. If you need to work high above the ground, please be extremely careful.               |

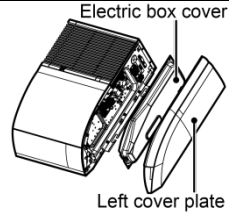
### 3.3.1 Clean Air Filter

(1) Disassembly method of filter screen and electric box cover.

How to clean the air filter	
<p>1) Open the air inlet grille.</p> <p>A. Firstly unfix two buckles on the grille as shown on the picture.</p> <p>B. Remove the screws under the buckles by a screwdriver and then open the inlet grille.</p>	 <p style="text-align: center;">Remove the screw</p> 
<p>2) Clean the filter screen.</p> <p>Clean the filter screen by a vacuum cleaner or wash it by flashing water. If the oil stain on the filter cannot be removed or cleaned up, wash it by warm water mixed with the detergent. Dry the filter in the shadow.</p> <p><b>NOTES:</b></p> <p>A. Never use hot water over 45°C in case of color fading or turning yellow.</p> <p>B. Never dry it by fire so as to prevent the filter caught fire or deformation.</p>	
<p>3) Disassemble the left and right side board.</p> <p>A. After the grille is removed, use a screwdriver to remove the screws shown on the picture.</p> <p>B. Push the side plate as per the arrowed direction and take it down.</p>	<p style="text-align: center;">Remove the screw</p> 
<p>4) Disassemble the right side board.</p>	<p>Disassembly method of right side board Step 3.</p>

## How to clean the air filter

- 5) Disassemble the electric box cover  
After the right side board is removed, the electric box cover will be shown up and disassemble the fixed screws on it.



## (2) At the Start of the Seasonal Use.

- 1) Check if there is blockage at the inlet or outlet vent of air conditioner.
- 2) Check if the earth wire has been attached reliably by the skilled serviceman.
- 3) Check if the exhausted batteries of the wireless controller have been replaced.
- 4) Check if the air filter had been installed well by professional.

Keep the power switch "On" 8 hours before the startup of the unit which has not been used for a long period.



**NOTE:** all above should be operated by the skilled serviceman.

## (3) At the End of the Seasonal Use.

- 1) Cut off the power supply main switch.
- 2) Clean the air filters and other parts by the skilled serviceman.
- 3) Leave the fan running for 2-3 hours to dry the inside of the unit.



**NOTE:** all above should be operated by the skilled serviceman.

## 3.3.2 Heat Exchanger of Outdoor Unit

Conduct cleaning for the heat exchanger of outdoor unit periodically, clean it once at least in every two months. Clean the dust and sundries on the surface of the heat exchanger with dust collector and nylon brush, if there's compressed air source; Use the compressed air to blow the dust on the surface of the heat exchanger. Don't use tap water for cleaning.

## 3.3.3 Drainage Pipe

Periodically check if the drainage pipe is blocked to smooth the condensate water.

### 3.3.4 Notices at the Beginning of the Using Season

- (1) Check if the air inlet/outlet of indoor/outdoor unit is blocked.
- (2) Check if the ground connection is reliable.
- (3) Check if the battery of remote controller is replaced.
- (4) Check if the air filter screen is properly installed.
- (5) If starting up again after long-term shut down, preset the power switch of air conditioner to "ON" status before 8h of operation, to preheat the crankcase of outdoor compressor.
- (6) Check if the installation of outdoor unit is firm, if not, please contact with Sinclair appointed maintenance center.

### 3.3.5 Maintenance at the end of the Using Season

- (1) Cut off the main power of air conditioner.
- (2) Clean the filter screen, indoor and outdoor unit.
- (3) Clean the dust and sundries in indoor and outdoor unit.
- (4) If the outdoor unit is rusty, coat the rusty location with paint to prevent it from expanding.

### 3.3.6 Components Replacement

Components are available in Sinclair agency or Sinclair distributors nearby.

## 3.4 Notice on Maintenance

### 3.4.1 Information on Servicing

The manual shall contain specific information for service personnel who shall be instructed to undertake the following when servicing an appliance that employs a flammable refrigerant.

#### 3.4.1.1 Checks to the Area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

#### 3.4.1.2 Work Procedure

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapour being present while the work is being performed.

### 3.4.1.3 General Work Area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

### 3.4.1.4 Checking for Presence of Refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

### 3.4.1.5 Presence of Fire Extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO<sub>2</sub> fire extinguisher adjacent to the charging area.

### 3.4.1.6 No Ignition Sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

### 3.4.1.7 Ventilated Area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

### 3.4.1.8 Checks to the Refrigeration Equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants:

- (1) The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
- (2) The ventilation machinery and outlets are operating adequately and are not obstructed.
- (3) If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
- (4) Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
- (5) Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

### 3.4.1.9 Checks to Electrical Devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- (1) Those capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
- (2) That no live electrical components and wiring are exposed while charging, recovering or purging the system.
- (3) That there is continuity of earth bonding.

### 3.4.2 Repairs to Sealed Components

- (1) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- (2) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.



**NOTE:** The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

### 3.4.3 Repair to Intrinsically Safe Components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.



### 3.4.4 Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of ageing or continual vibration from sources such as compressors or fans.

### 3.4.5 Detection of Flammable Refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

### 3.4.6 Removal and Evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose –conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- (1) Remove refrigerant.
- (2) Purge the circuit with inert gas.
- (3) Evacuate.
- (4) Purge again with inert gas.
- (5) Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be “flushed” with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipework are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

### 3.4.7 Charging Procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- (1) Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- (2) Cylinders shall be kept upright.
- (3) Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- (4) Label the system when charging is complete (if not already).
- (5) Extreme care shall be taken not to overfill the refrigeration system.
- (6) Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

### 3.4.8 Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced:

- (1) Become familiar with the equipment and its operation.
- (2) Isolate system electrically.
- (3) Before attempting the procedure ensure that:
  - 1) Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
  - 2) All personal protective equipment is available and being used correctly.
  - 3) The recovery process is supervised at all times by a competent person.
  - 4) Recovery equipment and cylinders conform to the appropriate standards.

- (4) Pump down refrigerant system, if possible.
- (5) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- (6) Make sure that cylinder is situated on the scales before recovery takes place.
- (7) Start the recovery machine and operate in accordance with manufacturer's instructions.
- (8) Do not overfill cylinders (No more than 80 % volume liquid charge).
- (9) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- (10) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- (11) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

### 3.4.9 Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

### 3.4.10 Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).

Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Notice arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

### 3.5 After-Sales Services

Any quality or other issues encountered in the purchased air conditioner, please contact the local Sinclair after-sales service department.

## NOTE CONCERNING PROTECTION OF ENVIRONMENT



This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

## INFORMATION CONCERNING USED REFRIGERANT MEDIUM

This unit is containing fluorinated gases included in the Kyoto protocol. The maintenance and the liquidation must be carried out by qualified personnel.

Type of refrigerant: R32

The quantity of the refrigerant: Please see the unit label.

The value GWP: 675 (1 kg R32 = 0,675 t CO<sub>2</sub> eq)

GWP = Global Warming Potential



Appliance filled with flammable gas R32.

In case of quality problem or other please contact your local supplier or authorized service center.

**Emergency number: 112**

## PRODUCER

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This product was manufactured in China (Made in China).

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AIR CONDITIONING