

EN Split Type Room Air Conditioner
CN 分體式冷氣機

User Manual page 1
用戶使用手冊 page 29



PHILCO® 

MODEL: PMSC18VC

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IMPORTANT NOTE:

重要提示:



A2L

This appliance is using R32 mildly flammable refrigerant.

此設備使用輕度易燃製冷劑R32。



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

Please check the applicable models, technical data from the nameplate pasted on the unit.

在安裝或操作新空調機組之前，請仔細閱讀本手冊。請妥善保管本手冊以備將來參考。適用的型號、技術資料見機身銘牌。

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Appliance filled with flammable gas R32.



Before use the appliance, read the owner's manual first.



Before install the appliance, read the installation manual first.



Before repair the appliance, read the service manual first.

The Refrigerant

- To realize the function of the air conditioner unit, a special refrigerant circulates in the system. The used refrigerant is the fluoride R32, which is specially cleaned. The refrigerant is flammable and inodorous. Furthermore, it can leads to explosion under certain conditions. But the flammability of the refrigerant is very low. It can be ignited only by fire.
- Compared to common refrigerants, R32 is a nonpolluting refrigerant with no harm to the ozonosphere. The influence upon the greenhouse effect is also lower. R32 has got very good thermodynamic features which lead to a really high energy efficiency. The units therefore need a less filling.

WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer. Should repair be necessary, contact your nearest authorized Service Centre. Any repairs carried out by unqualified personnel may be dangerous.
- 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.)
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- Spaces where refrigerant pipes shall be compliance with local gas regulations.
- Servicing shall be performed only as recommended by the manufacturer.
- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- All working procedure that affects safety means shall only be carried by competent persons.
- This appliance contains a grounding connection used solely for functional purposes.

This appliance is not intended for use by persons (including children) reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

If it needs to install, move or maintain the air conditioner, please contact dealer or local service center to conduct it at first. Air conditioner must be installed, moved or maintained by appointed unit. Otherwise, it may cause serious damage or personal injury or death.

WARNING

Please read this manual carefully before using and operating correctly as instructed in this manual .

User Notice

- This appliance can be used by children aged of 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.
- The total capacity of the indoor units which runs at the same time can not exceed 150% of that of the outdoor units, otherwise, the cooling (heating) effect of each indoor unit would be poor.
- Switch the main power on 8 hours before starting the unit, helpful for a successful startup.
- It is a normal phenomenon that the indoor unit fan will still run for 20~70 seconds after the indoor unit receives the "stop" signal so as to make full use of after-heat for the next operation.
- When the running modes of the indoor and outdoor units conflict, it will be indicated on the display of the wired controller in five seconds and then the indoor unit will stop. In this case, they can back to the normal condition by harmonizing their running modes: the cooling mode is compatible with the dehumidifying mode and the fan mode can go with any other mode except the heating mode. If the supply power fails when the unit is running, then the indoor unit will send the "start" signal to the outdoor unit three minutes later after power recovery.
- Do not frequently power on/off the unit, otherwise it would cause the compressor, fan, mainboard, electrostatic expansion valve, or other important component damaged, and then make the unit fail.
- During installation, the communication cable and the power cord must not be twisted together but instead separated with an interval of at least 2cm, otherwise the unit is likely to run abnormally.
- Cautions for the Debugging and Maintenance Personnel:
During debugging and maintenance, prior to the startup of the compressor make sure the heating belt of the compressor has been energized for at least eight hours!
Once the compressor is started, it must be guaranteed that it works continuously for at least 30 minutes, otherwise it would be damaged!
- The appliance shall be installed in accordance with local wiring regulations.
- 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.

⚠ WARNING It indicates improper operation which will lead to human casualty or severe injury.

- The installation should be committed to the appointed service center, otherwise it will cause water leakage, electric shock or fire etc..
- Please install the unit in a place where is strong enough to withstand the weight of the unit, otherwise, the unit would fall down and cause injury or death.
- The drain pipe should be installed as instructed in the manual to guarantee the proper drainage, meanwhile it should be insulated to prevent condensing. Otherwise the improper installation would cause water leakage and then wet the household wares in the room.
- Do not use or place any inflammable, combustible or any noxious substance next to the unit.
- Under the occurrence of an error (like burning smell etc.), please cut off the main power supply of the unit.
- Keep good ventilation in the room to avoid oxygen deficit.
- Never insert your finger or any other object into the air outlet/inlet grille.
- Please take notice of the supporting frame of the unit to see if it is damaged over the long time period of use.
- Never refit the unit and contact the sales agent or the professional installation personnel for the repair or relocation of the unit.
- Non-professional personnel are prohibited to dismantle of the electric box owing to the high voltage of the outdoor unit.
- An all-pole disconnection switch having a contact separation of at least 3mm in all poles should be connected in fixed wiring.

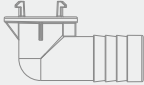
⚠ CAUTION It indicates improper operation which will lead to injury or property damage.

- Before installation, please check if the power supply corresponds with the requirement specified on the nameplate and also check its security.
- Before using the unit, please check if the piping and wiring are correct to avoid water leakage, refrigerant leakage, electric shock, or fire etc..
- The main power supply must be earthed to avoid the hazard of electric shock and never connect this earth wire to the gas pipe, running water pipe, lightning rod or phone cable's earth lead.
- Turn off the unit after it runs at least five minutes, otherwise its service life will be shortened.
- Do not allow children operate this unit.
- Do not operate this unit wet hands.
- Cut off the main power supply prior to the cleaning of the unit or the replacement of the air filter.
- When the unit is not to be used for a long time, please cut off the main power supply of the unit.
- Do not expose the unit to the moist or corrosive circumstances.
- Never step on the unit or place any object on it.
- It is suggested to have a power-on test annually.

Models	Fuse Size
PMSC18VC	T25AH/250V

Standard Accessory Parts

The standard accessory parts listed below are furnished and should be used as required.

Name	Appearance	Q'ty	Usage
Drainage Connector		1	To connect with the hard PVC drain pipe
Sealing Gasket		1	For use with drain connectors to ensure a watertight seal
Drip Tray		1	Collects condensate from the connecting pipeline and channels it into the interior of the unit.
Others	Instructions , bar code		

Installation Location and Matters Needing Attention

The installation of the unit must comply with the local safety regulations.

The installation quality directly affects the normal use, so the user should not carry out the installation personally, instead, the installation and debugging should be done by technician according to this manual. Only after that, can the unit be energized.

How to select the installation location for the indoor unit

1. Where there is no direct sunlight.
2. Where the top hanger, ceiling and the building structure are strong enough to withstand the weight of the unit.
3. Where the drain pipe can be easily connected to outside.
4. Where the flow of the air inlet/outlet is not blocked.
5. Where the refrigerant pipe of the indoor unit can be easily led to outside.
6. Where there is no inflammable, explosive substances or their leakage.
7. Where there is no corrosive gas, heavy dust, salt mist, smog or moisture.

How to select the installation location for the outdoor unit

1. The outdoor unit must be installed where the bearing surface is stable and secure enough.
2. The outdoor unit and indoor unit should be placed as close as possible to minimize the length and bends of the refrigerant pipe.
3. Do not install the outdoor unit under the window or between the buildings to prevent the normal running noise entering the room.
4. Where the flow of the air inlet/outlet is not blocked.
5. The outside unit should be installed where ventilation is in good condition so that the unit can take in and discharge enough air.
6. Do not install the unit where there are inflammable and explosive substances and where there is heavy dust, salt fog and other severely polluted air.

No air guiding pipe is allowed to be installed at the air inlet/outlet of the outdoor unit. Under the heating mode, the condensate water would drip down from the base frame and would be frozen when the outdoor ambient temperature is lower than 0°C (32°F). Besides, the installation of the outdoor unit should not affect the heat radiation of the unit.



CAUTION

The unit installed in the following places is likely to run abnormally. If unavoidable, please contact the professional personnel at the appointed service center.

- Where is full of oil.
- Alkaline soil off the sea.
- Where there is sulfur gas (like sulfur hot spring).
- Where there are devices with high frequency (like wireless devices, electric welding devices, or medical equipment).
- Special circumstances.

Electric wiring

- 1. The installation must be done in accordance with the local wiring regulations.
- 2. Only the power cord with the rated voltage and exclusive circuit for the air conditioning can be used.
- 3. Do not pull power cord by force.
- 4. The electric installation should be carried out by the professional personnel as instructed by the local laws, regulations and also this manual.
- 5. The diameter of the power cord should be large enough and once it is damaged it must be replaced by dedicated one.
- 6. The earthing should be reliable and the earth wire should be connected to the dedicated device of the building by the professional personnel. Besides, the air switch coupled with the leakage current protection switch must be equipped, which is of enough capacity and of both magnetic and thermal tripping functions in case of the short circuit and overload.
Must be equipped with a residual current device (RCD) suitable for variable frequency equipment.

Models	Power Supply	Residual current device (RCD) type	Capacity of the Air Switch	Recommended Cord (pieces × sectional area)
PMSC18VC	220-240V~, 50Hz	Type F	16A	3×1.5mm ²

Notes

- 1. The specifications of the breaker and power cable listed in the table above are determined based on the maximum power (maximum amps) of the unit.
- 2. The specifications of the power cable listed in the table above are applied to the conduit-guarded multi-wire copper cable (like, YJV copper cable, consisting of PE insulated wires and a PVC cable jacket) used at 40°C and resistible to 90°C (see IEC 60364-5-54). If the working condition changes, they should be modified according to the related local standard.
- 3. The specifications of the breaker listed in the table above are applied to the breaker with the working temperature at 40°C. If the working condition changes, they should be modified according to the related local standard.

Earthing Requirements

- 1. The air conditioner is classified into the class I appliances, so its earthing must be reliable.
- 2. The yellow-green line of the air conditioner is the earth line and cannot be used for other purpose, cut off or fixed by the tapping screw, otherwise it would cause the hazard of the electric shock.
- 3. The reliable earth terminal should be provided and the earth wire cannot be connected to any of the following places.
 - (1)Running water pipe
 - (2)Coal gas pipe
 - (3)Sewage pipe
 - (4)Other places where the professional personnel think unreliable.

Noise precautions

- 1. The air conditioning unit should be installed where ventilation is in good condition, otherwise the working capability of the unit would be reduced or working noise would be increased.
- 2. The air conditioning unit should be installed on the base frame which is stable and secure enough to withstand the weight of the unit, otherwise it would incur vibration and noise.

3. During the installation, a consideration should be taken that the produced hot air or noise should not affect neighbors or surroundings.
4. Do not stack obstacles near the air outlet of the outdoor unit, otherwise it would reduce the working capability of the unit or increase the working noise.
5. In the event of the occurrence of abnormal noise, please contact the sales agent as soon as possible.
6. Accessories for installation.

Refer to the packing list for the accessories of the indoor and outdoor units respectively.

Installation of the Outdoor Unit

Precautions for the installation of the outdoor unit

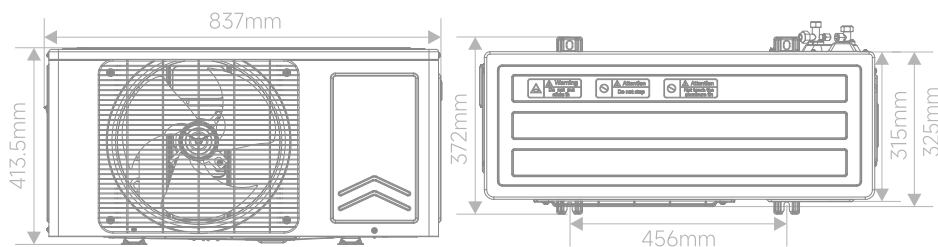
The following rules should be followed when the installation location is being considered so as to let the unit run well enough.

1. The discharged air from the outdoor unit won't return back and enough space should be left for maintenance around the unit.
2. The installation location should be in good condition so that the unit is able to take in and discharge enough air. Besides, make sure there is no obstacle at the air inlet/outlet of the unit. If there is, remove it.
3. The unit must be installed where it is secure enough to support the weight of the unit and capable of reducing to some extent noise and vibration to make sure they do not bother your neighbors.
4. The designated lifting hole must be used for lifting the unit and protect the unit carefully during lifting to prevent damaging the metal sheet which would result in rusting in future.
5. The unit should be installed where there is as little as direct sunlight.
6. The unit must be installed where the rain water and defrosting water can be drained.
7. The unit must be installed where the unit won't be covered by the snow and won't be affected by rubbish and oil fog.
8. Rubber or spring shock absorbers should be used during the installation of the outdoor unit to meet the noise and vibration requirements.
9. The installation dimensions should meet the requirement covered in this manual and the outdoor unit must be fixed securely.
10. The installation should be carried out by the professionally skilled personnel.

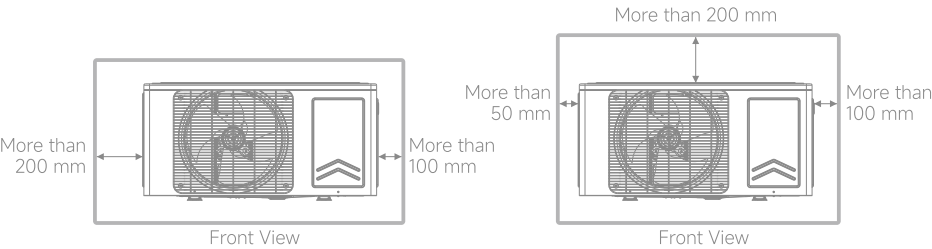
Installation of the Outdoor Unit

1. Outline dimension of the outdoor unit. Units: mm

PMSC18VC



- During the transportation of the outdoor unit, two lifting ropes long enough must be used in four directions and the separation included angle must be less than 40° prevent the center of unit deviating.
- During the installation, M10 screws should be used to fix the support leg and base frame of the unit.
- The unit should be installed on a concrete base frame with a height of 10cm.
- The installation space for the unit should meet the following requirements
It is recommended to have no more than two obstructions for better ventilation performance, If there are three walls in the installation environment(top, left, right),make sure the distance from the left side or top of the unit is at least 200mm.



Connection between Indoor and Outdoor Units

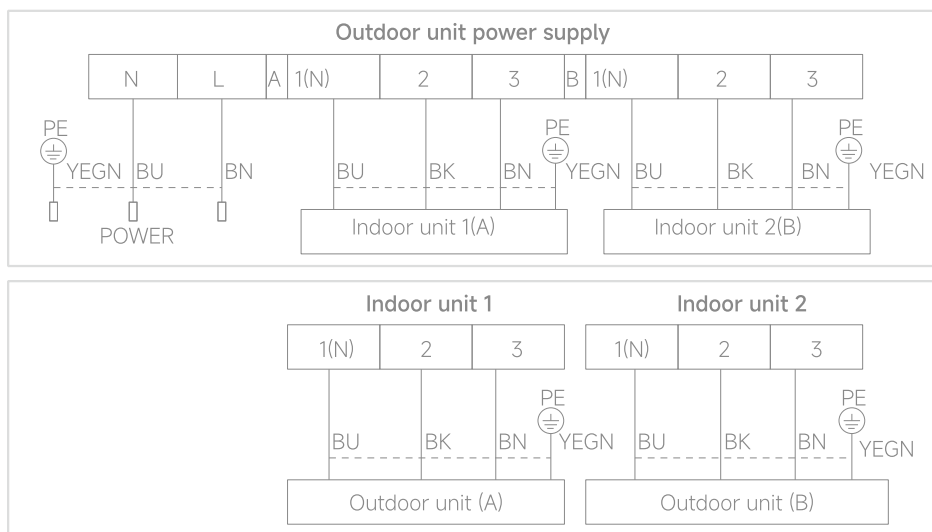
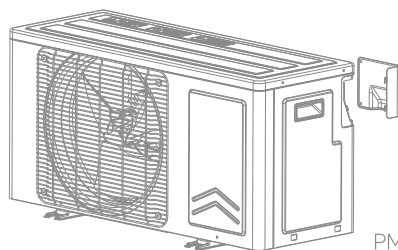
The indoor unit combination should meet the requirements of the following table. If need to use a combination not listed, please contact the product design manufacturer.

UNITS COMBINATIONS		
Outdoor units	Indoor units combination	
	1	2
18-2units	9K	9K+9K
	12K	9K+12K

Wiring of the Power Cord

⚠ CAUTION A breaker must be installed, capable of cutting off the power supply for the whole system.

- Remove the handle of the outdoor.
- Remove the wire clip; connect the power connection wire and signal control wire (only for cooling and heating unit) to the wiring terminal according to the color, fix them with screws.
- Fix the power connection wire and signal control wire with wire clip (only for cooling and heating unit).
- Reinstall the handle.



Allowable Length and Height Fall of the Refrigerant Pipe

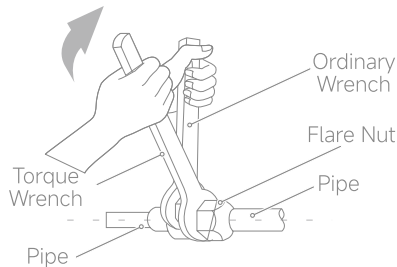
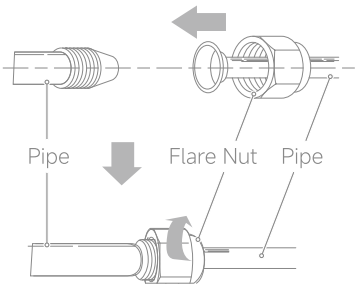
		Allowable Length	Refrigerant Pipe
		18K	18K
Total Length(m)		20	L1+L2
Max. Length for Single Unit(m)		10	LX
Max. installation altitude	Outdoor unit and indoor unit	5	H1
	Indoor unit and indoor unit	5	H2

Dimension of the Refrigerant Pipe of the Indoor Unit

Capacity Level of the Indoor Unit	Gas Pipe (mm)	Liquid pipe (mm)
09, 12	Φ9.52	Φ6.35

Piping between the Indoor and Outdoor units

- 1. Refer to the table for the moments of torque for tightening screws.
- 2. Let the flare end of the copper pipe point at the screw and then tighten the screw by hand.
- 3. After that, tighten the screw by the torque wrench until it clatters (as shown in the figure).
- 4. The bending degree of the pipe cannot be too small, otherwise it will crack. And please use a pipe tube bender to bend the pipe.
- 5. Wrap the exposed refrigerant pipe and the joints by sponge and then tighten them with the plastic tape.



Moments of Torque for Tightening Screws

Diameter (mm)	Wall Thickness (mm)	Moment of Torque (Nm)
Φ6.35	≥0.5	15-30
Φ9.52	≥0.71	30-40
Φ12.7	≥1	45-50
Φ15.9	≥1	60-65

CAUTION

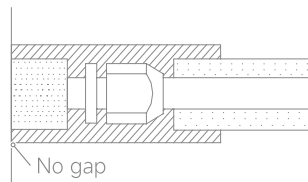
- 1. During the connection of the indoor unit and the refrigerant pipe, never pull any joints of the indoor unit by force, otherwise the capillary pipe or other pipe may crack, which then would result in leakage.
- 2. The refrigerant pipe should be supported by brackets, that is, don't let the unit withstand the weight of it.

CAUTION

For the Multi Split inverter air conditioner unit, each pipe should be labeled to tell which system it belongs to avoid mistaken inaccurate piping. Lower connector needs to be placed outside.

Installation of the Protection Layer of the Refrigerant Pipe

- 1. The refrigerant pipe should be insulated by the insulating material and plastic tape in order to prevent condensation and water leakage.
- 2. The joints of the indoor unit should be wrapped with the insulating material and no gap is allowed on the joint of the indoor unit, as shown in the figure.



CAUTION

After the pipe is protected well enough, never bend it to form a small angle, otherwise it would crack or break.

Wrap the Pipe with Tape

1. Bundle the refrigerant pipe and electric wire together with tape, and separate them from the drain pipe to prevent the condensate water overflowing.
2. Wrap the pipe from the bottom of the outdoor unit to the top of the pipe where it enters the wall. During the wrapping, the later circle should cover half the former one.
3. Fix the wrapped pipe on the wall with clamps.

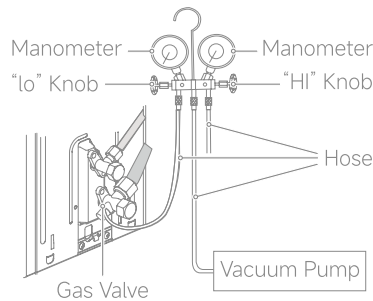
CAUTION

1. Do not wrap the pipe too tightly, otherwise the insulation effect would be weakened. Additionally, make sure the drain hose is separated from the pipe.
2. After that, fill the hole on the wall with sealing material to prevent wind and rain coming into the room.

Refrigerant Charging and Trial Running

Refrigerant Charging

1. The refrigerant has been charged into the outdoor unit before shipment, while additional refrigerant still need be charged into the refrigerant pipe during the field installation.
2. Check if the liquid valve and the gas valve of the outdoor unit are closed fully.
3. As shown in the following figure, expel the gas inside the indoor unit and refrigerant pipe out by the vacuum pump.
4. When the compressor is not running, charge the R32 refrigerant into the refrigerant pipe from the liquid valve of the outdoor unit (do not do it from the gas valve)



Calculation of the Additional Refrigerant Charging

1. Refrigerant Charge in the Outdoor Unit before Shipment

Model	Refrigerant Charge (kg)
PMSC18VC	0.8

Notes:

- (1) The refrigerant charge mentioned in the table above is not include those charged additionally in the indoor unit and the refrigerant pipe.
- (2) The amount of the additional refrigerant charge is dependent on the diameter and length of the liquid refrigerant pipe which is decided by the actual yield installation requirement.
- (3) Record the additional refrigerant charge for future maintenance

2. Calculation of the Additional Refrigerant Charge

If the total refrigerant pipe length (liquid pipe) is smaller than listed in the table below, no additional refrigerant will be charged.

Model	Total Liquid Pipe Length (a+b)
PMSC18VC	≤15m

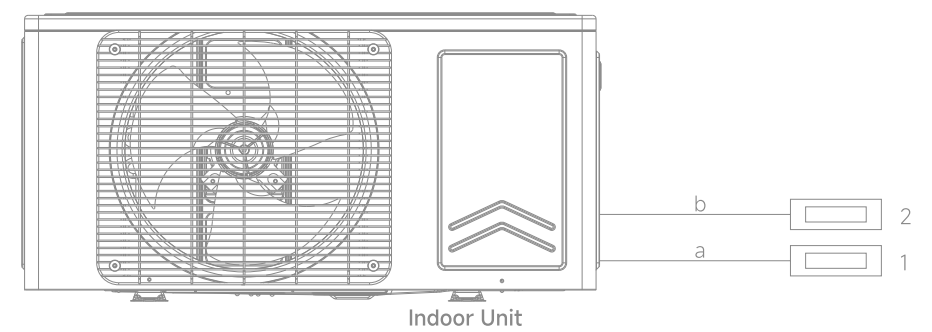
Additional refrigerant charge= ΣExtra Liquid Pipe Length × 17g/m (liquid pipe Φ6.35mm)

Notes:

If the total refrigerant pipe length is larger than that listed in the table above, the additional refrigerant for the extra length of the pipe needs to be charged as per 17g/m.

The total length of the refrigerant pipes shall not exceed 20 meters.

3.Example: PMSC18VC



Serial No.	Model
Indoor Unit 1	PMSC09VE
Indoor Unit 2	PMSC12VE

Improper pipe expanding is the main cause of refrigerant leakage. Please expand the pipe according to the following steps:

Liquid Refrigerant Pipe

Serial No.	Diameter	Length
a	Φ6.35	10
b	Φ6.35	10

The total length of each liquid refrigerant pipe is: a+b=20m
Thus, the minimum additional refrigerant charge=(20-15)*0.017=0.085 That means an additional 0.085 kg of refrigerant needs to be added.
(Note: no additional refrigerant is needed for the liquid pipe within 15m)

Items to be checked after the installation

Items to be Checked	Possible Errors	Check Results
Has each part and component of the unit been installed securely?	The unit may fall off ,vibrate or generate noise.	
Has the gas leakage test been taken?	The cooling (heating) capacity may be poor.	
Is the thermal insulation sufficient?	Dews and water drops may be generated.	
Does the drainage go well?	Dews and water drops may be generated.	
Is the actual power voltage in line with the value marked on the nameplate?	The unit may break down or some components may be burnt out.	
Are the wiring and piping correct?	The unit may break down or some components may be burnt out.	
Has the unit been earthed reliably?	There may be a danger of electric shock.	
Does the wire meet the regulated requirement?	The unit may break down or the components may be burnt out.	
Is there any obstacle at the air inlet/outlet of the indoor/outdoor unit?	The cooling (heating) capacity may be poor.	
Have the length of the refrigerant pipe and the refrigerant charge been recorded?	It may be hard to know the exact refrigerant charge.	

Trial Running

1. Check before the Trial Running

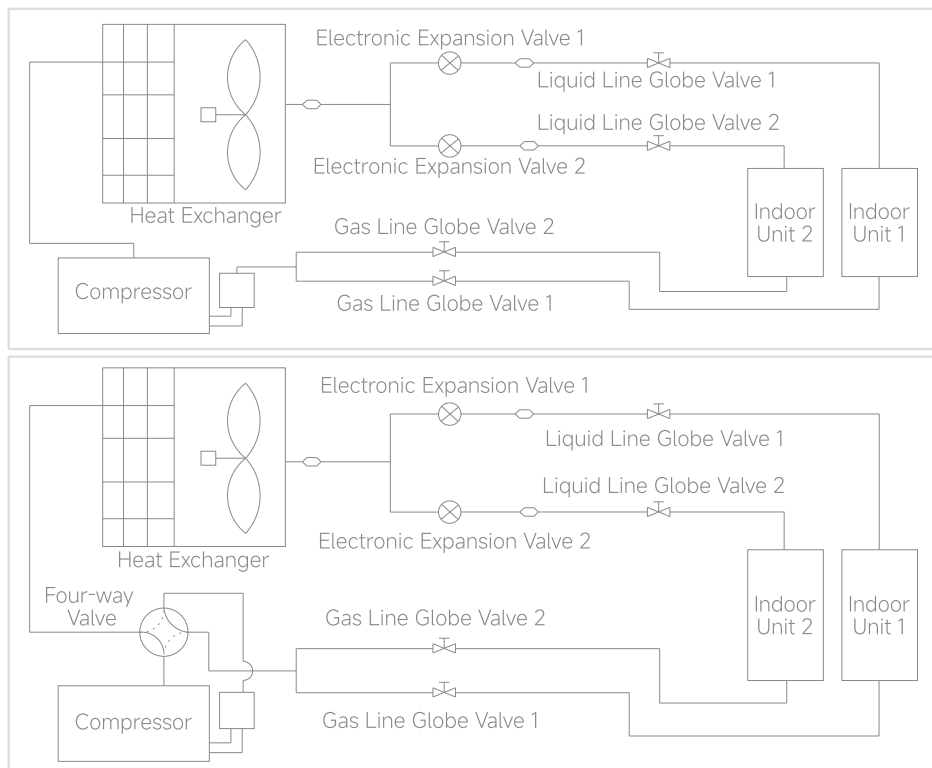
- (1) Check if the appearance of the unit and the piping system are damaged during the transportation.
- (2) Check if the wiring terminals of the electronic component are secure.
- (3) Check if the rotation direction of the fan motor is right.
- (4) Check if all valves in the system are fully opened.

2. Trial Running

- (1) The trial running should be carried out by the professionally skilled personnel on the premise that all items above are in normal conditions.

- (2) Let the unit energized and switch the wired controller or the remote controller to "ON".
- (3) The fan motor and compressor of the outdoor unit will run automatically in one minute.
- (4) If there is some unusual sound after the compressor is started, turn off the unit for an immediate check.

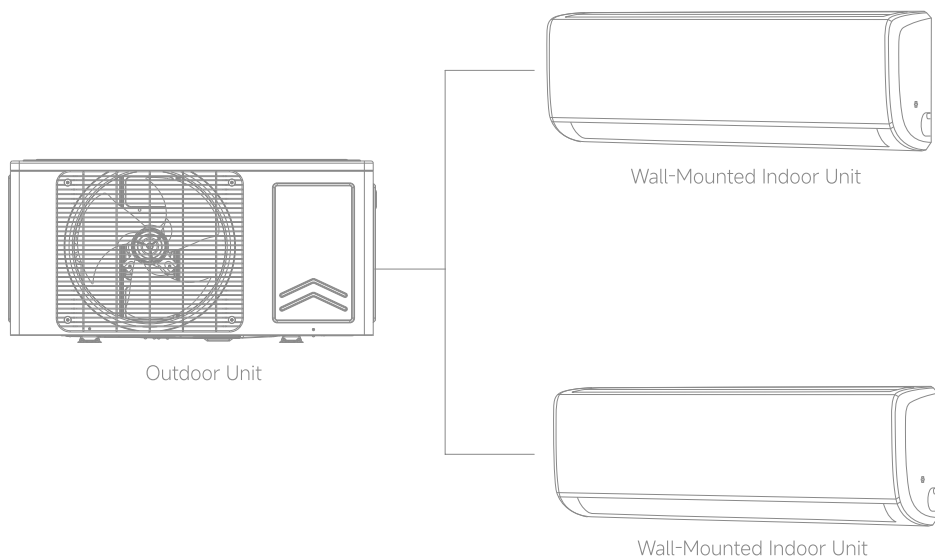
Schematic Diagram of Multi Split Inverter Air Conditioner Unit's System



The outdoor and indoor units start to work once the power is switched on. During the cooling operation, the low temperature, low pressure refrigerant gas from the heat exchanger of each indoor unit gets together and then is taken into the compressor to be compressed into high temperature, high pressure gas, which will soon go to the heat exchanger of the outdoor unit to exchange heat with the outdoor air and then is turned into refrigerant liquid.

After passing through the throttling device, the temperature and pressure of the refrigerant liquid will further decrease and then go to the main valve. After that, it will be divided and go to the heat exchanger of each indoor unit to exchange heat with the air which needs to be conditioned. Consequently, the refrigerant liquid becomes low temperature, low pressure refrigerant gas again. Such a refrigerant cycle goes round and round to achieve the desired cooling purpose. During the heating operation, the four-way valve is involved to make the refrigerant cycle reverse. The refrigerant radiates heat in the heat exchanger of the indoor unit (so do the electric heating devices) and absorbs heat in the heat exchanger of the outdoor unit for a heat pump heating cycle so as to achieve the desired heating purpose.

System Structure



For the Multi Split Inverter air conditioner unit, one outdoor unit is able to drive up two indoor units. Among them, the wall-mounted indoor units should be controlled by the remote controller. The outdoor unit will run as long as any one indoor unit receives the running command, and all indoor units stop once the outdoor unit is turned off.

WARNING

1. The unit can only be cleaned after the unit is turned off and the main power is cut off, otherwise it would cause an electric shock hazard.
2. Do not dampen the air conditioner, as it would cause an electric shock hazard and never rinse the unit with water in any event.

CAUTION

1. Volatile liquid, like thinner, gasoline etc. would damage the appearance of the air conditioning unit. (Only use the soft dry cloth or the wet cloth with neutral detergent clean the shell of the air conditioning unit)
2. Do not clean the outer shell of the air conditioning unit with more than 45°C hot water to prevent discoloration or deformation.
3. Do not dry the air filter screen of the indoor unit on the fire to prevent combustion or deformation.

Check before the Seasonal Use

1. Check if the inlet/outlet of the indoor/outdoor unit is clogged.
2. Check if the earth lead is earthed reliably.
3. Check if the batteries of the remote controller are replaced.
4. Check if the air filter screen is installed properly.
5. Check if the installation of the outdoor is secure. If there is something abnormal, please contact the appointed service center.
6. When restarting the unit which is not used for a long time, switch on the main power supply eight hours ahead, helpful for a successful startup.

Check after the Seasonal Use

1. Clean the filter screen and body of the indoor and outdoor units.
2. Cut off the main power supply of the air conditioning system.
3. Remove the dust and the foreign matters of the outdoor unit.
4. In the event of the rusting, use the anti-rust paint to stop spreading of rust.

Refer to the installation and operation manual of each indoor unit respectively for detailed maintenance.

⚠ WARNING

1. In the event of abnormal conditions(like, stinky smell), please shut off the main power supply immediately and then contact the appointed service center, otherwise the continuous abnormal running would damage the air conditioning unit and also would cause electric shock or fire hazard etc..
2. Do not repair the air conditioning personally but instead contact the professionally skilled personnel at the appointed service center, as the incorrect repair would cause electric shock or fire hazard etc..

Note: Check before Contacting Service Center

Please check the following items before contacting the maintenance serviceman.

Conditions	Causes	Corrective Actions
The unit does not run	Broken fuse or opened breaker	Change the fuse or close the breaker
	Power off	Restart the unit when power on
	Power supply plug is loose	Plug the power supply properly
	Insufficient batteries voltage of the remote controller	Change new batteries
	Remote controller out of the control scope	Keep the control distance within 8 meters
The unit stops soon after it starts	Clogged inlet/outlet of the indoor/outdoor unit	Clear the obstacle
Cooling/Heating is abnormal	Clogged inlet/outlet of the indoor/outdoor unit	Clear the obstacle
	Improperly set temperature	Adjust the setting of the remote or wired controller
	Too low set fan speed	Adjust the setting of the remote or wired controller
	Improper airflow direction	Adjust the setting of the remote or wired controller
	Opened door and window	Close the door and window
	Direct sunlight	Hang a curtain or blinds over the window
	Too much people in the room	
	Too much heat sources in the room	Reduce the heat sources
	Dirty filter screen	Clean the filter screen

Notes:

If the air conditioner still runs abnormally after the above check and handling, please contact the maintenance serviceman at the local appointed service center and also give a description of the error occurred as well as the model of the unit.

Problem handling

The conditions listed below are not classified into errors.

	Conditions	Causes
The unit does not run	When restart the unit soon after it is stopped	The overload protection switch of the unit let the startup delayed for three minutes
	As soon as power is on	The unit will stand by for approximate one minute
The unit blows out mist	When the cooling operation starts	The hi-humidity air indoor is cooled quickly
The unit generates noise	The unit "clatters" as soon as it starts running	It is the sound generated during the initialization of the electronic expansion valve
	The unit "swishes" during the cooling operation	It is the sound when the refrigerant gas runs inside the unit
	The unit "swishes" when it is started or stopped	It is the sound when the refrigerant gas stops running
	The unit "swishes" when it is in and after the running	It is the sound when the draining system is operating
	The unit "squeaks" when it is in and after the running	It is the sound of friction generated by the skin plate etc which swells due to the temperature change
The unit blows out dust	When the unit restarts after it is not used for a long time	The dust inside the unit is blown out again
The unit emits odors	When the unit is running	The odors absorbed in are blown out again

Error Description

If some error occurs when the unit is running, the error code will be displayed on the wired controller or the display board of the indoor unit. Check for more details about the meaning of each error, as shown in the table.

No.	Error Item	Display Board	Wired Controller Display	Error Type
1	Oil return for cooling	A1	A1	Outdoor
2	Anti-cold air mode	A2	A2	Outdoor
3	Refrigerant recovery mode	A3	A3	Outdoor
4	Filter cleaning reminder	CL	CL	Indoor
5	Trail running	o5	o5	Indoor
6	Compressor rms phase current limit down	F0	F0	Outdoor
7	Rms machine current limit down	F1	F1	Outdoor
8	Exhaustgas temperature limit down	F2	F2	Outdoor
9	Anti-freeze limit down	F3	F3	Outdoor
10	Overload limit down	F4	F4	Outdoor
11	IPM temp limit down	F5	F5	Outdoor
12	Oil return for heating or defrosting	FF	FF	Outdoor
13	High discharge temp protection	H0	H0	Outdoor
14	Overload protection	H1	H1	Outdoor
15	Shutdown for whole unit anti-freeze protection	H3	H3	Outdoor
16	Outdoor amibient temp abnormal protection	H8	H8	Outdoor
17	Compressor stalling	L0	L0	Outdoor
18	Startup failure	L1	L1	Outdoor
19	Compressor phase current peak protection	L2	L2	Outdoor
20	Compressor phase current RMS protection	L3	L3	Outdoor
21	IPM protection	L4	L4	Outdoor
22	IPM overheat protection	L5	L5	Outdoor
23	Compressor phase circuit detection error	L6	L6	Outdoor
24	Phase loss	L7	L7	Outdoor
25	Outdoor DC fan motor error	L8	L8	Outdoor
26	Outdoor DC fan phase current detection circuit error	L9	L9	Outdoor
27	Jumper error	C0	C0	Indoor

No.	Error Item	Display Board	Wired Controller Display	Error Type
28	Zero detection circuit error	C1	C1	Indoor
29	Indoor display communication error between the indoor unit and outdoor unit	C3	C3	Indoor
30	Select the port level abnormal error	C4	C4	Indoor
31	Indoor EEPROM error	C5	C5	Indoor
32	Outdoor display communication error between the indoor unit and outdoor unit	C6	C6	Outdoor
33	Charging circuit error	U1	U1	Outdoor
34	Feedforward voltage protection	U2	U2	Outdoor
35	Over voltage protection	U3	U3	Outdoor
36	Low voltage protection	U4	U4	Outdoor
37	DC link voltage drop error	U5	U5	Outdoor
38	Machine current detection circuit error	U6	U6	Outdoor
39	Over-current protection	U7	U7	Outdoor
40	PFC error	U8	U8	Outdoor
41	PFC protection	U9	U9	Outdoor
42	Indoor and outdoor mismatch	UA	UA	Outdoor
43	Mode conflict	Ub	Ub	Outdoor
44	Select the outdoor port level abnormal error	UC	UC	Outdoor
45	Indoor ambient Temp Sensor short/open-circuit	E0	E0	Indoor
46	Indoor pipe midway temp sensor error	E1	E1	Indoor
47	Outdoor ambient temp sensor error	E2	E2	Outdoor
48	Outdoor mid-coil temp sensor error	E3	E3	Outdoor
49	Outdoor discharge temp sensor error	E4	E4	Outdoor
50	IPM temp sensor short/open-circuit	E5	E5	Outdoor
51	Pipe outlet temp sensor short/open-circuit	E6	E6	Outdoor
52	Pipe inlet temp sensor short/open-circuit	E7	E7	Outdoor
53	Discharge temp sensor error	E8	E8	Outdoor

Once errors are displayed on the controller or display board, please shut off the air conditioning unit and contact the professionally skilled personnel for troubleshooting.

After-Sales Service

If there is any quality or other issue, please contact the after-sales service center.

Rated working conditions of the air conditioning unit**Working Temperature Range**

	Indoor side DB/WB(°C)	Outdoor side DB/WB(°C)
Maximum cooling	32/23	52/-
Maximum heating	27/-	24/18

Notes:

The operating temperature range (outdoor temperature) for cooling is 15°C~52°C Heating temperature range for the model without electric heating belt for chassis is -15°C~24°C ; Heating temperature range for the model with electric heating belt for chassis is -20°C~24°C.

 WARNING**Annex CC (informative)****Transportation, marking and storage for units that employ flammable refrigerants**

· The following information is provided for units that employ flammable refrigerants.

CC.1 Transport of equipment containing flammable refrigerants

Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment, permitted to be transported together will be determined by the applicable transport regulations.

CC.2 Marking of equipment using signs

Signs for similar appliances used in a work area generally are addressed by local regulations and give the minimum requirements for the provision of safety and/or health signs for a work location.

All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs.

The effectiveness of signs should not be diminished by too many signs being placed together. Any pictograms used should be as simple as possible and contain only essential details.

CC.3 Disposal of equipment using flammable refrigerants

See local regulations.

CC.4 Storage of equipment/appliances

The storage of equipment should be in accordance with the manufacturer's instructions.

CC.5 Storage of packed (unsold) equipment

Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.

The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

Information on servicing

• 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 minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

• Work procedure

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

• 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.

• 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.

• 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 CO₂ fire extinguisher adjacent to the charging area.

• 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.

• 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.

• 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:

- The charge size is in accordance with the room size within which the refrigerant containing parts are installed;

- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- 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.

· 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:

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

Repairs to sealed components

- 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.
- 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.

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.

Cablling

Check that cablling 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 aging or continual vibration from sources such as compressors or fans.

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.

Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

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:

- Remove refrigerant;
- Purge the circuit with inert gas;
- Evacuate;
- Purge again with inert gas;
- 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 pipe-work are to take place.

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

Charging procedures

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

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
 - Cylinders shall be kept upright.
 - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
 - Label the system when charging is complete (if not already).
 - Extreme care shall be taken not to overfill the refrigeration system.
- 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.

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.

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) Before attempting the procedure ensure that:
 - * Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - * All personal protective equipment is available and being used correctly;
 - * The recovery process is supervised at all times by a competent person;
 - * Recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with manufacturer's instructions.
- h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) 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.
- k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

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.

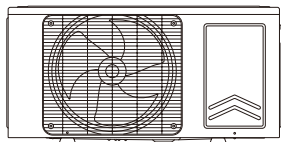
Recovery

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 is 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 Note 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.



EN Split Type Room Air Conditioner
CN 分體式冷氣機

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PHILCO® 

MODEL: PMSC18VC

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IMPORTANT NOTE:

重要提示:



A2L

This appliance is using R32 mildly flammable refrigerant.

此設備使用輕度易燃製冷劑R32。



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

Please check the applicable models, technical data from the nameplate pasted on the unit.

在安裝或操作新空調機組之前，請仔細閱讀本手冊。請妥善保管本手冊以備將來參考。
適用的型號、技術資料見機身銘牌。

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設備內充注易燃氣體 R32。



使用設備前，請先閱讀使用說明書。



安裝設備前，請先閱讀安裝說明書。



維修設備前，請先閱讀維修說明書。

製冷劑

- 為確保冷氣機正常運作，系統內會循環使用專用製冷劑。所使用的製冷劑為氟化物 R32，已經過專門清潔處理。製冷劑易燃且無氣味。此外，在某些條件下可能導致爆炸。但製冷劑的可燃性很低。只有明火才能點燃。
- 與常見製冷劑相比，R32 是一種無污染製冷劑，不會危害臭氧層。其對溫室效應的影響也較低。R32 具有非常良好的熱力學特性，可帶來相當高的能源效率。因此，機組所需的充注量較少。

⚠ 警告

- 請勿使用製造商建議以外的方法來加速除霜過程或進行清潔。如需維修，請聯絡就近的授權服務中心。非合資格人員進行維修都可能存在危險。
- 設備應存放於沒有持續運作點火源的房間內。（例如：明火、運作中的燃氣設備或運作中的電暖器。）
- 請勿刺穿或焚燒。
- 請注意，製冷劑可能沒有氣味。
- 製冷劑管道所在空間應符合當地燃氣法規。
- 維修保養僅應按製造商建議進行。
- 設備應存放於通風良好的區域，且房間面積大小應符合運作規定。
- 所有影響安全措施的工作程序僅應由具備能力的人員執行。
- 本器具含有僅用於實現功能用途的接地連接

本設備不適合身體、感官或精神能力降低，或缺乏經驗與知識的人員（包括兒童）使用，除非其已由負責其安全的人員就設備使用給予監督或指導。應監督兒童，確保其不玩弄本設備。如需安裝、移動或保養冷氣機，請先聯絡經銷商或當地服務中心處理。冷氣機必須由指定單位進行安裝、移動或保養。否則，可能造成嚴重損壞、人身傷害或死亡。

警告

使用前請仔細閱讀本說明書，並按本說明書指示正確操作。

使用者須知

- 本設備可供 8 歲及以上兒童，以及身體、感官或精神能力降低，或缺乏經驗與知識的人員使用，前提是他們已獲得有關安全使用本設備的監督或指導，並了解相關危險。
- 兒童不得玩弄本設備。
- 未經監督，兒童不得進行清潔和使用者保養。
- 同時運作的室內機總容量不得超過室外機容量的 150%，否則各室內機的製冷（暖氣）效果會較差。
- 啟動機組前 8 小時開啟主電源，有助於順利啟動。
- 室內機收到「停止」信號後，室內機風扇仍會運作 20~70 秒，以便充分利用餘熱供下次運作使用，這是正常現象。
- 當室內機與室外機的運作模式發生衝突時，將在五秒內於線控器顯示屏上顯示，隨後室內機將停止。在此情況下，可透過協調其運作模式恢復正常狀態：製冷模式與除濕模式相容，送風模式可與暖氣模式以外的任何其他模式配合。如果機組運作時供電中斷，則電源恢復三分鐘後，室內機將向室外機發送「啟動」信號。
- 請勿頻繁開關機組電源，否則可能導致壓縮機、風扇、主板、電子膨脹閥或其他重要部件損壞，進而使機組故障。
- 安裝期間，通訊電纜和電源線不得纏繞在一起，而應保持至少 2cm 的間距，否則機組可能運作異常。
- 調試與保養人員注意事項：
調試與保養期間，在啟動壓縮機之前，務必確保壓縮機加熱帶已通電至少八小時！壓縮機一經啟動，必須連續運作至少 30 分鐘，否則可能導致損壞！
- 本機必須按照當地電器安裝規例進行安裝。
- 如果電源線損壞，必須由製造商、其服務代理或合資格技術人員更換，以避免危險。

⚠ 警告 表示錯誤操作可能導致人身傷亡或嚴重傷害。

- 安裝必須由指定服務中心進行，否則會造成漏水、觸電或火災等。
- 請將機組安裝在強度足以承受機組重量的位置，否則機組可能墜落並造成人員受傷或死亡。
- 排水管應按說明書指示安裝，以確保正常排水，同時應進行保溫以防止冷凝，否則不當安裝會造成漏水，進而弄濕室內家居用品。
- 請勿在機組旁使用或放置任何易燃、可燃或有害物質。
- 如出現異常（如燒焦氣味等），請立即關閉主電源。
- 保持室內通風良好，以避免缺氧。
- 切勿將手指或任何其他物體插入出風口或進風口。
- 請注意檢查機組支撐架，確認其在長期使用後是否損壞。
- 切勿改裝機組，如需維修或移機，請聯絡銷售代理或專業安裝人員。
- 由於室外機具有高電壓，非合資格人員不得拆卸電器箱。
- 固定佈線中應連接一個全極斷開開關，且所有極的觸點間距至少為 3 毫米。

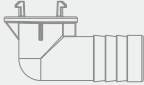
⚠ 注意 表示操作不當將導致傷害或財產損失。

- 安裝前，請確認電源符合銘牌所列規格，並確保供電安全。
- 使用機組前，請檢查管道及電線接駁是否正確，以避免漏水、製冷劑洩漏、觸電或火災等。
- 主電源必須妥善接地，以避免觸電危險，且切勿將此接地線連接到燃氣管、自來水管、避雷針或電話線的接地導線。
- 機組啟動後應運作至少5分鐘才關閉，否則其使用壽命將會縮短。
- 請勿讓兒童操作本機。
- 請勿用濕手操作本機。
- 清潔機組或更換空氣過濾網前，請切斷主電源。
- 當機組長時間不使用時，請切斷機組主電源。
- 請勿將機組暴露於潮濕或腐蝕性環境中。
- 切勿踩踏機組或在其上放置任何物品。
- 建議每年進行一次通電測試。

型號	保險絲規格
PMSC18VC	T25AH/250V

標準附件

下列標準附件隨機提供，應按需使用。

名稱	外觀	數量	用途
排水接頭		1	用於連接硬質 PVC 排水管
密封膠圈		1	配合排水接頭密封使用
滴水盤		1	收集連接管路產生的冷凝水，並將其導入機組內部。
其他	說明書、條碼		

安裝位置及注意事項

機組的安裝必須符合當地安全法規。安裝品質會直接影響正常使用，使用者不應自行安裝，而必須由技術人員依照本說明書進行安裝和調試。只有在完成上述工作後，機組才可通電。

如何選擇室內機的安裝位置

1. 無陽光直射的位置。
2. 頂部吊架、天花板和建築結構足夠牢固，能承受機組重量的位置。
3. 排水管可方便連接至室外的位置。
4. 進風口/出風口氣流流通無阻。
5. 室內機製冷劑管可方便引至室外的位置。
6. 無易燃、易爆物質或其洩漏的位置。
7. 無腐蝕性氣體、重塵、鹽霧、煙霧或潮氣的位置。

如何選擇室外機的安裝位置

1. 室外機必須安裝在穩固且具足夠承重能力的表面。
 2. 室外機與室內機應盡可能靠近放置，以最大限度減少製冷劑管的長度和彎曲。
 3. 請勿將室外機安裝在窗戶下方或建築物之間，以免正常運轉噪音傳入室內。
 4. 進風口/出風口氣流流通無阻。
 5. 室外機應安裝在通風良好的位置，以便機組能吸入並排出足夠的空氣。
 6. 請勿將機組安裝在有易燃易爆物質、重塵、鹽霧及其他嚴重污染空氣的位置。
- 室外機的進風口/出風口不得安裝導風管。在暖氣模式下，冷凝水會從底架滴落，當室外環境溫度低於 0 °C (32 °F) 時會結冰。此外，室外機的安裝不應影響機組散熱。

 **注意** 機組安裝在以下位置時，可能會運轉異常。如無法避免，請聯絡指定服務中心的專業人員。

- 充滿油污的位置。
- 海邊鹼性土壤區域。
- 有硫磺氣體的位置（如硫磺溫泉）。
- 有高頻設備的位置（如無線設備、電焊設備或醫療設備）。
- 特殊情況。

電器接線

- 1.安裝必須依照當地接線規範進行。
- 2.只能使用具有額定電壓且供冷氣機專用迴路使用的電源線。
- 3.請勿用力拉扯電源線。
- 4.電器安裝應由專業人員依照當地法律、法規及本說明書的指示進行。
- 5.電源線的線徑應足夠大，一旦損壞，必須更換為專用電源線。
- 6.接地應可靠，接地線應由專業人員連接至建築物的專用接地裝置。此外，必須配備與漏電保護開關配套的空氣開關，其容量應足夠，並具備磁脫扣和熱脫扣功能，以應對短路和過載情況。
必須配備符合變頻設備的漏電保護

型號	電源	漏電保護開關類型	空氣開關容量	建議電線 (芯數× 截面積)
PMSC18VC	220-240V~, 50Hz	F型	16A	3×1.5mm ²

注意

- 1.上表所列斷路器和電源電纜的規格，是根據機組的最大功率（最大電流）確定的。
- 2.上表所列電源電纜的規格，適用於在 40 °C 下使用且可耐受 90 °C 的導管保護多芯銅電纜（例如 YJV 銅電纜，由 PE 絕緣導線和 PVC 電纜護套組成）（參見 IEC 60364-5-54）。如果工作條件發生變化，應依照當地相關標準進行修改。
- 3.上表所列斷路器的規格，適用於工作溫度為 40 °C 的斷路器。如果工作條件發生變化，應依照相關當地標準進行修改。

接地要求

- 1.冷氣機屬於 I 類電器，因此其接地必須可靠。
- 2.冷氣機的黃綠線為接地線，不得作其他用途、剪斷或用自攻螺釘固定，否則可能造成觸電危險。
- 3.應提供可靠的接地端子，且接地線不得連接至以下任何位置。(1)自來水管 (2)煤氣管 (3)污水管 (4)專業人員認為不可靠的其他位置。

噪音注意事項

- 1.冷氣機組應安裝在通風良好的位置，否則機組的工作能力會降低或運轉噪音會增加。
- 2.冷氣機組應安裝在穩定且牢固、足以承受機組重量的底架上，否則會產生振動和噪音。
- 3.安裝時應考慮所產生的熱風或噪音不應影響鄰居或周圍環境。
- 4.請勿在室外機出風口附近堆放障礙物，否則會降低機組的工作能力或增加運轉噪音。
- 5.若出現異常噪音，請盡快聯絡銷售代理商。
- 6.安裝附件。
室內機和室外機的附件請分別參閱裝箱單。

室外機安裝

室外機安裝注意事項

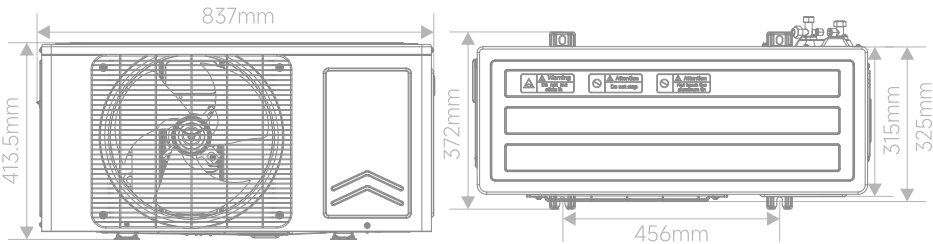
考慮安裝位置時應遵循以下規則，以確保機組良好運轉。

- 1.室外機排出的空氣不應回流，且機組周圍應留有足夠的保養空間。
- 2.安裝位置應條件良好，使機組能吸入並排出足夠的空氣。此外，請確保機組進風口/出風口無障礙物。如有障礙物，請將其移除。
- 3.機組必須安裝在足夠牢固、能支撐機組重量的位置，並能在一定程度上降低噪音和振動，以確保不打擾鄰居。
- 4.吊裝機組時必須使用指定吊孔，並在吊裝過程中小心保護機組，以防損壞金屬板，導致日後生鏽。
- 5.機組應安裝在盡可能少受陽光直射的位置。
- 6.機組必須安裝在雨水和化霜水能夠排出的地方。
- 7.機組必須安裝在不會被積雪覆蓋，且不受垃圾和油霧影響的位置。
- 8.室外機安裝時應使用橡膠或彈簧減震器，以滿足噪音和振動要求。
- 9.安裝尺寸應符合本說明書中的要求，且室外機必須固定牢靠。
- 10.安裝應由具備專業技能的人員進行。

室外機安裝

- 1.室外機外形尺寸。 單位：mm

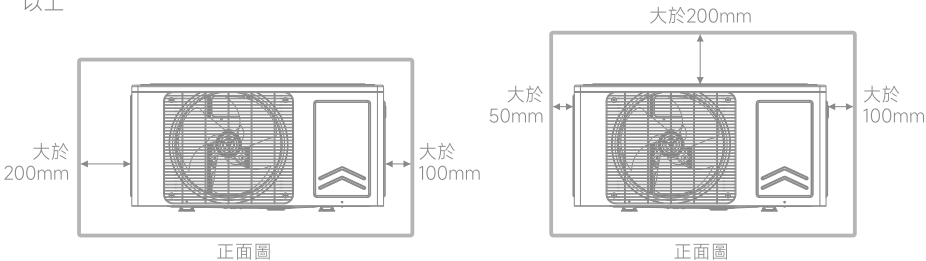
PMSC18VC



- 2.室外機運輸過程中，必須在四個方向使用兩條足夠長的吊繩，且分離夾角必須小於 40°，以防機組重心偏移。
- 3.安裝時，應使用 M10 螺釘固定機組的支撐腳和底架。
- 4.機組應安裝在高度為 10cm 的混凝土底架上。
- 5.機組的安裝空間應符合以下要求

為實現良好通風，最好不要多於兩個障礙

安裝環境若有三處牆壁（頂部、左邊、右邊），請確保機身的左邊或者頂部距離必須是 200mm 以上



室內機與室外機之間的連接

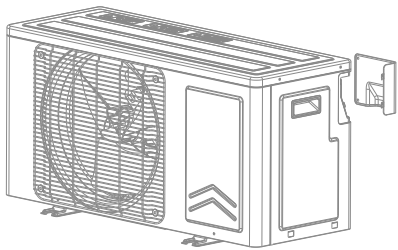
室內機組合應符合下表要求。如需使用未列出的組合，請聯絡產品設計製造商。

機組組合		
室外機	室內機組合	
	1	2
	9K 12K	9K+9K 9K+12K

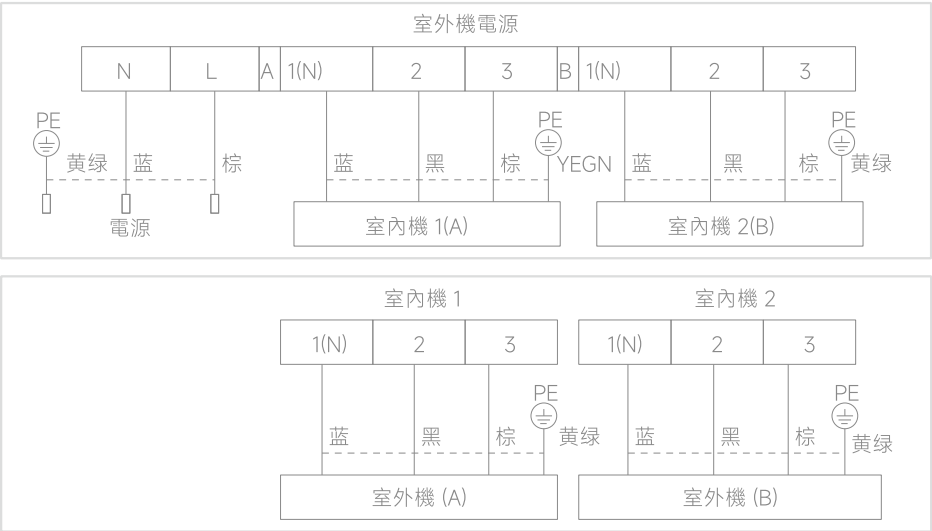
電源線接線

⚠ 注意 必須安裝斷路器，且能切斷整個系統的電源。

- 拆下室外機的把手。
- 拆下線夾；依照顏色將電源連接線和信號控制線（僅適用於冷暖機組）連接到接線端子，並用螺釘固定。
- 用線夾固定電源連接線和信號控制線（僅適用於冷暖機組）。
- 重新安裝把手。



PMSC18VC



製冷劑管允許高度和高度落差

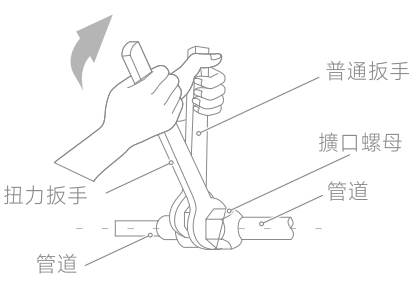
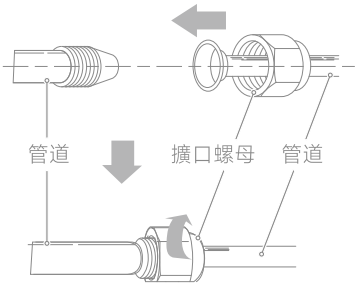
		允許長度	製冷劑管
		18K	18K
總長度(m)		20	L1+L2
單台機最大長度(m)		10	LX
最大安裝高度	室外機與室內機	5	H1
	室內機與室內機	5	H2

室內機製冷劑管尺寸

室內機容量等級	氣管 (mm)	液管 (mm)
09, 12	Φ9.52	Φ6.35

室內機與室外機之間的配管

- 1. 鎖緊螺釘的扭矩請參照表格。
- 2. 將銅管的擴口端對準螺釘，然後用手鎖緊螺釘。
- 3. 之後，用扭力扳手鎖緊螺釘，直到發出喀嗒聲（如圖所示）。
- 4. 管道的彎曲角度不可過小，否則會破裂。並請使用彎管器彎曲管道。
- 5. 用海綿包覆外露的製冷劑管和接頭，然後用塑膠膠帶將其纏緊。



鎖緊螺釘的扭矩

直徑 (mm)	壁厚 (mm)	扭矩 (Nm)
Φ6.35	≥0.5	15-30
Φ9.52	≥0.71	30-40
Φ12.7	≥1	45-50
Φ15.9	≥1	60-65

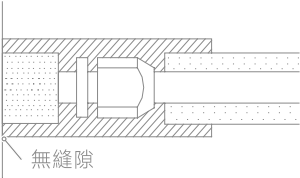
⚠ 注意

- 1. 連接室內機與製冷劑管時，切勿用力拉扯室內機的任何接頭，否則毛細管或其他管道可能破裂，進而導致洩漏。
- 2. 製冷劑管應由支架支撐，也就是說，不要讓機組承受其重量。

⚠ 注意 對於 Multi Split 變頻冷氣機組，每根管道都應貼上標籤，以標明其所屬系統，避免配管錯誤或不準確。下部接頭需置於外側。

製冷劑管保護層安裝

- 1. 製冷劑管應使用隔熱材料和塑膠膠帶進行保溫，以防止凝露和漏水。
- 2. 室內機的接頭應使用隔熱材料包覆，且室內機接頭處不得留有縫隙，如圖所示。



⚠ 注意 管道妥善保護後，切勿將其彎成小角度，否則可能破裂或折斷。

用膠帶包覆管道

- 1. 用膠帶將製冷劑管和電線紮在一起，並將其與排水管分開，以防冷凝水溢出。
- 2. 從室外機底部到管道進入牆體處的管道頂端進行包覆。包覆時，後一圈應覆蓋前一圈的一半。
- 3. 用管夾將包覆好的管道固定在牆上。

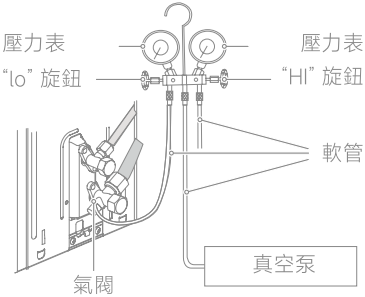
⚠ 注意

- 1. 不要將管道包得太緊，否則保溫效果會降低。
此外，請確保排水軟管與管道分開。
- 2. 之後，用密封材料填充牆上的孔洞，以防風雨進入室內。

製冷劑充注與試運轉

製冷劑充注

- 1. 製冷劑在出廠前已充注到室外機中，而現場安裝時仍需向製冷劑管中追加充注製冷劑。
- 2. 檢查室外機的液閥和氣閥是否完全關閉。
- 3. 如以下圖所示，使用真空泵將室內機和製冷劑管內的氣體抽出。
- 4. 當壓縮機未運轉時，從室外機的液閥將 R32 製冷劑充注到製冷劑管中（不要從氣閥充注）



額外製冷劑充填量的計算

- 1. 出貨前室外機內的製冷劑充填量

型號	製冷劑充填量 (kg)
PMSC18VC	0.8

注意：

- (1) 上表所述的製冷劑充填量不包括室內機和製冷劑管中額外充填的製冷劑。
- (2) 額外製冷劑充填量取決於液態製冷劑管的直徑和長度，而其由實際現場安裝要求決定。
- (3) 記錄額外製冷劑充填量，以供日後保養使用

2.額外製冷劑充填量的計算

如果製冷劑管總長度（液管）小於下表所列值，則無需額外充填製冷劑。

型號	液管總長度（a+b）
PMSC18VC	≤15m

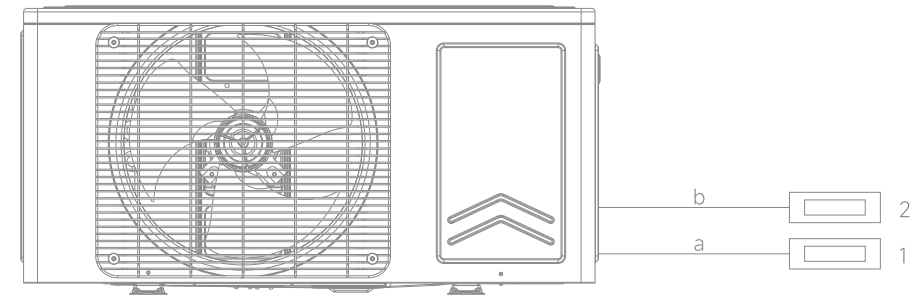
額外製冷劑充填量=Σ額外液管長度× 17g/m（液管 Φ6.35mm）

注意事項：

如果製冷劑管總長度大於上表所列值，則需按 17g/m 為管路超出長度額外充填製冷劑。

製冷劑管總長度不可超過 20m。

3. 範例：PMSC18VC



室內機

序號	型號
室內機 1	PMSC09VE
室內機 2	PMSC12VE

擴管不當是製冷劑洩漏的主要原因。請依照以下步驟進行擴管：

液態製冷劑管

序號	直徑	長度
a	Φ6.35	10
b	Φ6.35	10

每條液態製冷劑管的總長度為：a+b=20m

因此，最小額外製冷劑充填量=(20-15)*0.017=0.085 即需要額外補充 0.085kg 製冷劑。

（注意：15m 以內的液管無需額外製冷劑）

安裝後需檢查的項目

需檢查的項目	可能的錯誤	檢查結果
機組的各部件和元件是否已牢固安裝？	機組可能會掉落、振動或產生噪音。	
是否已進行漏氣測試？	製冷（暖氣）能力可能不佳。	
隔熱是否充分？	可能會產生凝露和水滴。	
排水是否順暢？	可能會產生凝露和水滴。	
實際電源電壓是否與銘牌上標示的值一致？	機組可能會故障，或某些元件可能會燒毀。	
接線和配管是否正確？	機組可能會故障，或某些元件可能會燒毀。	
機組是否已可靠接地？	可能有觸電危險。	
電線是否符合規定要求？	機組可能會故障，或元件可能會燒毀。	
室內機／室外機的進風口／出風口是否有任何障礙物？	製冷（暖氣）能力可能不佳。	
是否已記錄製冷劑管長度和製冷劑充填量？	可能難以得知準確的製冷劑充填量。	

試運轉

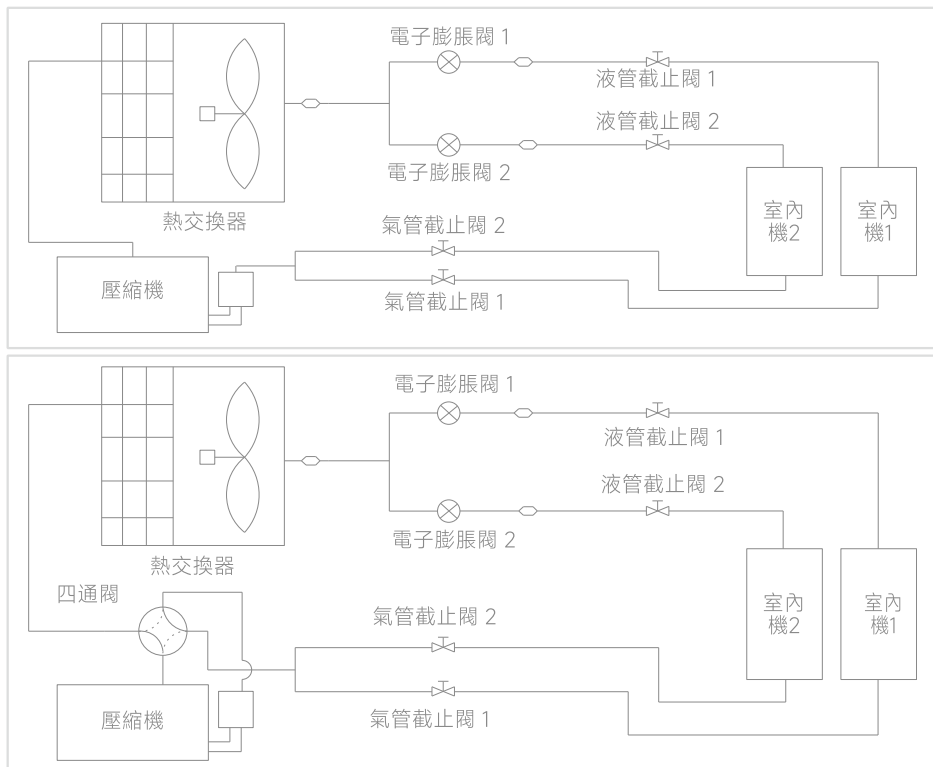
1.試運轉前檢查

- (1) 檢查機組外觀和配管系統是否在運輸過程中受損。
- (2) 檢查電子元件的接線端子是否牢固。
- (3) 檢查風扇馬達的旋轉方向是否正確。
- (4) 檢查系統中的所有閥門是否已完全打開。

2.試運轉

- (1) 試運轉應由具備專業技能的人員在上述所有項目均處於正常情況的前提下進行。
- (2) 使機組通電，並將線控器或遙控器切換至“ON”。
- (3) 室外機的風扇馬達和壓縮機將在一分鐘內自動運轉。
- (4) 壓縮機啟動後如有異常聲音，請關閉機組並立即檢查。

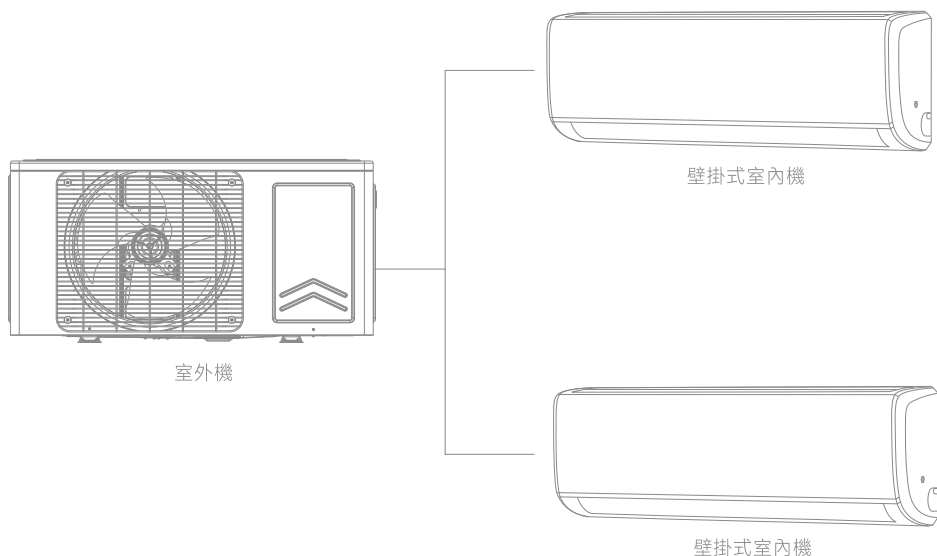
Multi Split 變頻冷氣機組系統示意圖



電源接通後，室外機和室內機即開始工作。在製冷運轉期間，來自各室內機熱交換器的低溫、低壓製冷劑氣體匯合後被吸入壓縮機，壓縮成高溫、高壓氣體，隨即進入室外機熱交換器與室外空氣進行熱交換，然後轉變為製冷劑液體。通過節流裝置後，製冷劑液體的溫度和壓力將進一步降低，然後進入主閥。

之後，製冷劑將被分流並進入各室內機的熱交換器，與需要調節的空氣進行熱交換。因此，製冷劑液體再次變成低溫、低壓製冷劑氣體。這樣的製冷劑循環周而復始，以達到所需的製冷目的。在暖氣運轉期間，四通閥會參與工作，使製冷劑循環反向進行。製冷劑在室內機的熱交換器中放熱（電加熱裝置也是如此），並在室外機熱交換器中吸熱，形成熱泵暖氣循環，以達到所需的暖氣目的。

系統結構



對於 Multi Split 變頻冷氣機組，一台室外機可驅動最多兩台室內機。其中，壁掛式室內機應由遙控器控制。只要任一室內機收到運轉指令，室外機就會運轉；而室外機關閉後，所有室內機都會停止。

⚠ 警告

1. 只有在機組關閉且主電源切斷後，才可清潔機組，否則可能造成觸電危險。
2. 請勿弄濕冷氣機，否則可能造成觸電危險；在任何情況下都不得用水沖洗機組。

⚠ 注意

1. 揮發性液體，如稀釋劑、汽油等，會損壞冷氣機組的外觀。（僅可使用柔軟乾布或沾有中性清潔劑的濕布清潔冷氣機組外殼）
2. 請勿使用超過 45 °C 的熱水清潔冷氣機組外殼，以防止變色或變形。
3. 請勿在火上烘乾室內機的空氣濾網，以防止燃燒或變形。

季節性使用前檢查

1. 檢查室內/室外機的進風口/出風口是否堵塞。
2. 檢查接地線是否可靠接地。
3. 檢查遙控器的電池是否已更換。
4. 檢查空氣濾網是否安裝妥當。
5. 檢查室外機的安裝是否牢固。如有異常，請聯絡指定服務中心。
6. 長時間未使用的機組重新啟動時，請提前八小時接通主電源，以利順利啟動。

季節性使用後的檢查

1. 清潔室內機和室外機的濾網及機身。
2. 切斷冷氣機系統的主電源。
3. 清除室外機上的灰塵和異物。
4. 如有生鏽，請使用防鏽漆防止鏽蝕擴散。
詳細保養請分別參閱各室內機的安裝和操作說明書。

⚠ 警告

1. 如出現異常情況（如異味），請立即關閉主電源，然後聯絡指定服務中心，否則持續異常運轉會損壞冷氣機組，並可能導致觸電或火災等危險。
2. 請勿自行維修冷氣機，應聯絡指定服務中心的專業技術人員，因為不正確的維修可能導致觸電或火災等危險。

注意：聯絡服務中心前的檢查

聯絡維修人員前，請檢查以下項目。

情況	原因	處理方法
機組不運轉	保險絲熔斷或斷路器斷開	更換保險絲或閉合斷路器
	斷電	通電後重新啟動機組
	電源插頭鬆動	正確插好電源插頭
	遙控器電池電壓不足	更換新電池
	遙控器超出控制範圍	將控制距離保持在 8 米以內
機組啟動後很快停止	室內/室外機進風口/出風口堵塞	清除障礙物
製冷/製熱異常	室內/室外機進風口/出風口堵塞	清除障礙物
	設定溫度不當	調整遙控器或線控器的設定
	設定風速過低	調整遙控器或線控器的設定
	氣流方向不當	調整遙控器或線控器的設定
	門窗開啟	關閉門窗
	陽光直射	在窗戶上掛上窗簾或百葉窗
	室內人員過多	
	室內熱源過多	減少熱源
	濾網髒污	清潔濾網

注意：

如果經過上述檢查和處理後冷氣機仍運轉異常，請聯絡當地指定服務中心的維修人員，並說明所發生的故障以及機組型號。

問題處理

下列情況不歸類為故障。

	情況	原因
機組不運轉	機組停止後很快重新啟動時	機組的過載保護開關會使啟動延遲三分鐘
	一通電時	機組將待機約一分鐘
機組吹出霧氣	製冷運轉開始時	室內高濕度空氣被快速冷卻
機組產生噪音	機組一開始運轉即發出「喀嗒」聲	這是電子膨脹閥初始化期間產生的聲音
	機組在製冷運轉期間發出「嗖嗖」聲	這是製冷劑氣體在機組內流動時的聲音
	機組啟動或停止時發出「嗖嗖」聲	這是製冷劑氣體停止流動時的聲音
	機組在運轉中及運轉後發出「嗖嗖」聲	這是排水系統運作時的聲音
	機組在運轉中及運轉後發出「吱吱」聲	這是面板等因溫度變化而膨脹所產生的摩擦聲
機組吹出灰塵	機組長時間未使用後重新啟動時	機組內部的灰塵再次被吹出
機組散發異味	機組運轉時	吸入的異味再次被吹出

故障說明

如果機組運轉時發生某些故障，故障代碼將顯示在線控器或室內機顯示板上。請查看表格以了解每個故障含義的更多詳情。

編號	故障項目	顯示板	線控器顯示	故障類型
1	製冷回油	A1	A1	室外
2	防冷風模式	A2	A2	室外
3	製冷劑回收模式	A3	A3	室外
4	濾網清潔提醒	CL	CL	室內
5	試運轉	o5	o5	室內
6	壓縮機相電流下限值	F0	F0	室外
7	整機電流下限值	F1	F1	室外
8	排氣溫度下限值	F2	F2	室外
9	防凍下限值	F3	F3	室外
10	過載下限值	F4	F4	室外
11	IPM 溫度下限值	F5	F5	室外
12	製熱或除霜回油	FF	FF	室外
13	高排氣溫度保護	H0	H0	室外
14	過載保護	H1	H1	室外
15	整機防凍保護停機	H3	H3	室外
16	室外環境溫度異常保護	H8	H8	室外
17	壓縮機堵轉	L0	L0	室外
18	啟動失敗	L1	L1	室外
19	壓縮機相電流峰值保護	L2	L2	室外
20	壓縮機相電流有效值保護	L3	L3	室外
21	IPM 保護	L4	L4	室外
22	IPM 過熱保護	L5	L5	室外
23	壓縮機相電路檢測錯誤	L6	L6	室外
24	缺相	L7	L7	室外
25	室外直流風扇馬達錯誤	L8	L8	室外
26	室外直流風扇相電流檢測電路錯誤	L9	L9	室外
27	跳線錯誤	C0	C0	室內

編號	故障項目	顯示板	線控器顯示	故障類型
28	過零檢測電路錯誤	C1	C1	室內
29	室內顯示板與室外機之間通訊錯誤	C3	C3	室內
30	選擇端口電平異常錯誤	C4	C4	室內
31	室內 EEPROM 錯誤	C5	C5	室內
32	室外顯示板與室內機之間通訊錯誤	C6	C6	室外
33	充電電路錯誤	U1	U1	室外
34	前饋電壓保護	U2	U2	室外
35	過電壓保護	U3	U3	室外
36	低電壓保護	U4	U4	室外
37	直流母線電壓下降錯誤	U5	U5	室外
38	整機電流檢測電路錯誤	U6	U6	室外
39	過電流保護	U7	U7	室外
40	PFC 錯誤	U8	U8	室外
41	PFC 保護	U9	U9	室外
42	室內機與室外機不匹配	UA	UA	室外
43	模式衝突	Ub	Ub	室外
44	選擇室外端口電平異常錯誤	UC	UC	室外
45	室內環境溫度感測器短路/開路	E0	E0	室內
46	室內管路中段溫度感測器錯誤	E1	E1	室內
47	室外環境溫度感應器錯誤	E2	E2	室外
48	室外中部盤管溫度感應器錯誤	E3	E3	室外
49	室外排氣溫度感應器錯誤	E4	E4	室外
50	IPM 溫度感應短路/開路	E5	E5	室外
51	管路出口溫度感應器短路/開路	E6	E6	室外
52	管路入口溫度感應器短路/開路	E7	E7	室外
53	排氣溫度感應器錯誤	E8	E8	室外

如控制器或顯示板顯示錯誤，請關閉冷氣機組並聯絡專業技術人員進行故障排除。

售後服務

若有任何品質或其他問題，請聯絡售後服務中心。

冷氣機組的允許工作條件

工作溫度範圍

	室內側 DB/WB(°C)	室外側 DB/WB(°C)
最高製冷	32/23	52/-
最高製熱	27/-	24/18

注意：

製冷的運轉溫度範圍（室外溫度）為 15°C~52°C；

不帶底盤電加熱帶機型的暖氣溫度範圍為 -15°C~24°C；

帶底盤電加熱帶機型的暖氣溫度範圍為 -20°C~24°C。

 警告**附錄 CC（資料性）****使用可燃性製冷劑之機組的運輸、標示和儲存**

· 以下資訊適用於使用可燃性製冷劑的機組。

CC.1 含有可燃性製冷劑之設備的運輸

請注意，對於含有可燃性氣體的設備，可能存在額外的運輸法規。允許一起運輸的設備最大件數或設備配置，將由適用的運輸法規決定。

CC.2 使用標誌進行設備標示

工作區域內類似器具所使用的標誌通常由當地法規規定，並給出工作場所提供安全和 / 或健康標誌的最低要求。

所有必要標誌均應維持完好，雇主應確保員工就適當安全標誌的含義以及與這些標誌相關需採取的措施，接受適當且充分的指導與培訓。

不應因過多標誌放置在一起而削弱標誌的有效性。

所使用的任何圖示應盡可能簡單，且僅包含必要細節。

CC.3 使用可燃性製冷劑之設備的處置

參見當地法規。

CC.4 設備 / 器具的儲存

設備的儲存應符合製造商的說明。

CC.5 已包裝（未售出）設備的儲存

儲存包裝的防護結構應確保包裝內設備的機械損壞不會導致製冷劑充注量洩漏。

允許一起儲存的設備最大件數將由當地法規決定。

維修資訊

· 區域檢查

在開始對含有可燃性製冷劑的系統進行工作之前，必須進行安全檢查，以確保將點燃風險降至最低。在對冷凍系統進行修理時，應在對系統進行工作之前遵守以下注意事項。

· 工作程序

工作應依照受控程序進行，以便在工作執行期間將可燃性氣體或蒸氣存在的風險降至最低。

· 一般工作區域

所有保養人員及在當地區域工作的其他人員，均應被告知正在進行工作的性質。應避免在密閉空間內工作。工作空間周圍區域應予以隔離。確保已透過控制可燃物，使該區域內的條件達到安全狀態。

· 檢查製冷劑是否存在

在工作前及工作期間，應使用適當的製冷劑偵測器檢查該區域，以確保技術人員知悉潛在的可燃性氣氛。確保所使用的洩漏偵測設備適合用於可燃性製冷劑，即無火花、充分密封或本質安全。

· 滅火器的存在

如需對冷凍設備或任何相關部件進行任何熱工作，應備有合適的滅火設備可隨手使用。在充注區附近配置乾粉或 CO₂ 滅火器。

· 嚴禁火源

任何從事與冷凍系統相關工作的人員，如該工作涉及暴露任何含有或曾含有可燃性製冷劑的管路，均不得以可能導致火災或爆炸風險的方式使用任何點火源。所有可能的點火源，包括吸煙，均應與安裝、修理、拆除和處置現場保持足夠距離，在這些過程中可燃性製冷劑可能釋放到周圍空間。在開始工作之前，應檢查設備周圍區域，以確保不存在可燃性危害或點火風險。應張貼「禁止吸煙」標誌。

· 通風區域

在打開系統或進行任何發熱工作之前，確保該區域處於開放環境，或已充分通風。在工作進行期間，應持續保持一定程度的通風。通風應安全地驅散任何釋放的製冷劑，並最好將其排至外部大氣中。

· 冷凍設備檢查

更換電器元件時，元件應符合用途並符合正確規格。應始終遵循製造商的保養和維修指南。如有疑問，請諮詢製造商的技術部門以獲得協助。以下檢查應適用於使用可燃性製冷劑的裝置：

- 充注量應符合安裝含製冷劑部件之房間的大小；
- 通風機械和出口運作正常且未受阻；
- 如使用間接冷凍迴路，應檢查二次迴路中是否存在製冷劑；
- 設備上的標示仍保持可見且清晰可讀。無法辨識的標示和標誌應予以修正；
- 冷凍管路或元件應安裝在不太可能暴露於任何可能腐蝕含製冷劑元件之物質的位置，除非該元件由本身耐腐蝕的材料製成，或已適當防護以避免此類腐蝕。

· 電器裝置檢查

電器元件的修理和保養應包括初始安全檢查和元件檢查程序。如存在可能危及安全的故障，則在故障得到令人滿意的處理之前，不得將任何電源連接至該電路。如故障無法立即修正但必須繼續運轉，應採用適當的臨時解決方案。此情況應向設備所有者報告，以便通知所有相關方。初始安全檢查應包括：

- 電容器已放電：此操作應以安全方式進行，以避免產生火花的可能性；
- 在對系統進行充注、回收或吹掃時，沒有帶電電器元件和配線外露；
- 接地連接具有連續性。

密封元件的修理

在修理密封元件期間，在拆除任何密封蓋等之前，應斷開正在工作之設備的所有電源。如在維修期間絕對有必要向設備供電，則應在最關鍵點設置一種持續運作的洩漏偵測形式，以警告潛在危險情況。

應特別注意以下事項，以確保在處理電器元件時，不會以影響防護等級的方式改變外殼。這應包括電纜損壞、連接數量過多、端子未按原規格製作、密封件損壞、填料函安裝不正確等。確保裝置安裝牢固。

確保密封件或密封材料未劣化，以致其不再能達到防止可燃性氣氛進入的目的。替換部件應符合製造商的規格。

注意：

使用矽膠密封劑可能會抑制某些類型洩漏偵測設備的有效性。本質安全元件在工作前不必隔離。

本質安全元件的修理

在未確保不會超過使用中設備所允許的許可電壓和電流之前，不得向電路施加任何永久性電感或電容負載。

本質安全元件是在存在可燃性氣氛時唯一可帶電工作的類型。測試裝置應具有正確的額定值。

僅使用製造商指定的部件替換元件。其他部件可能導致大氣中洩漏出的製冷劑被點燃。

佈線

檢查佈線不會受到磨損、腐蝕、過大壓力、振動、銳邊或任何其他不利環境影響。檢查還應考慮老化或來自壓縮機或風扇等來源的持續振動所產生的影響。

可燃性製冷劑的偵測

在任何情況下，均不得使用潛在點火源來尋找或偵測製冷劑洩漏。不得使用鹵素檢漏燈（或任何其他使用明火的偵測器）。

洩漏偵測方法

以下洩漏偵測方法被認為可接受用於含有可燃性製冷劑的系統。

應使用電子洩漏偵測器偵測可燃性製冷劑，但其靈敏度可能不足，或可能需要重新校準。（偵測設備應在無製冷劑區域進行校準。）確保偵測器不是潛在點火源，並且適用於所使用的製冷劑。洩漏偵測設備應設定為製冷劑 LFL 的某一百分比，並應針對所用製冷劑進行校準，且確認適當的氣體百分比（最高 25%）。

洩漏偵測液適合與大多數製冷劑一起使用，但應避免使用含氯清潔劑，因為氯可能與製冷劑反應並腐蝕銅管路。

如懷疑有洩漏，應移除／熄滅所有明火。

如發現需要鈎焊的製冷劑洩漏，應將所有製冷劑從系統中回收，或透過截止閥隔離在系統中遠離洩漏點的部分。隨後應在鈎焊過程之前及期間，以無氧氮氣（OFN）吹掃系統。

移除與抽真空

在打開製冷劑迴路進行修理或為任何其他目的時，應使用常規程序。然而，由於可燃性是一項考量因素，因此遵循最佳實務非常重要。應遵守以下程序：

- 移除製冷劑；
- 用惰性氣體吹掃迴路；
- 抽真空；
- 再次用惰性氣體吹掃；
- 透過切割或鈎焊打開迴路。

製冷劑充注量應回收到正確的回收鋼瓶中。系統應使用 OFN 進行「沖洗」，以使機組安全。此過程可能需要重複數次。不得使用壓縮空氣或氧氣執行此任務。

沖洗應透過使用 OFN 破除系統中的真空並持續充入至達到工作壓力，然後排放至大氣，最後再抽至真空來完成。應重複此過程，直到系統內沒有製冷劑為止。使用最後一次 OFN 充注時，系統應排放至大氣壓力，以便進行工作。如需對管路進行釐焊操作，此操作絕對至關重要。確保真空泵出口不靠近任何點火源，並且有可用通風。

充注程序

除常規充注程序外，還應遵循以下要求。

- 確保在使用充注設備時，不會發生不同製冷劑的污染。軟管或管線應盡可能短，以盡量減少其中所含的製冷劑量。
- 鋼瓶應保持直立。
- 在向冷凍系統充注製冷劑之前，確保冷凍系統已接地。
- 充注完成時，為系統貼上標籤（如尚未貼上）。
- 應極其小心，避免冷凍系統過度充填。
在重新充注系統之前，應使用 OFN 進行壓力測試。系統應在充注完成後但，運行前進行洩漏測試。離開現場前，應進行後續洩漏測試。

停用

在執行此程序之前，技術人員必須完全熟悉設備及其所有細節。建議的良好實務是安全回收所有製冷劑。在執行任務之前，應採集油和製冷劑樣品，以備在再使用回收製冷劑前需要進行分析。在開始任務之前，必須確保有電源可用。

- a) 熟悉設備及其操作。
- b) 將系統電器隔離。
- c) 在嘗試該程序之前，確保：
 - * 如有需要，備有用於搬運製冷劑鋼瓶的機械搬運設備；
 - * 所有個人防護設備均可用且正確使用；
 - * 回收過程始終由合格人員監督；
 - * 回收設備和鋼瓶符合適用標準。
- d) 如可能，抽空製冷劑系統。
- e) 如無法抽真空，則製作歧管，以便可從系統各部分移除製冷劑。
- f) 在回收開始前，確保鋼瓶放置在磅秤上。
- g) 啟動回收機，並按照製造商的說明操作。
- h) 不得過度充填鋼瓶。（液體充注量不得超過 80% 容積）。
- i) 即使是暫時的，也不得超過鋼瓶的最大工作壓力。
- j) 鋼瓶正確充填且過程完成後，確保鋼瓶和設備迅速從現場移除，並關閉設備上的所有隔離閥。
- k) 回收的製冷劑除非已經清潔和檢查，否則不得充注到另一個冷凍系統中。

標籤

設備應貼上標籤，說明其已停用並已清空製冷劑。標籤應註明日期並簽名。確保設備上有標籤，說明設備含有可燃性製冷劑。

回收

從系統中移除製冷劑時，無論是為維修還是停用，建議的良好實務是安全移除所有製冷劑。

將製冷劑轉移到鋼瓶中時，確保僅使用適當的製冷劑回收鋼瓶。確保有正確數量的鋼瓶可容納系統總充注量。所有將使用的鋼瓶均應指定用於回收的製冷劑，並為該製冷劑貼上標籤（即用於回收製冷劑的專用鋼瓶）。鋼瓶應配備完整的洩壓閥及相關截止閥，並處於良好工作狀態。空的回收鋼瓶應進行抽真空，並在可能時於回收前冷卻。

回收設備應處於良好工作狀態，並備有一套關於該設備且可隨手取得的操作說明，且應適用於可燃性製冷劑的回收。此外，應備有一套經校準的秤，且處於良好工作狀態。軟管應配備完整且無洩漏的斷開接頭，並保持良好狀態。在使用回收機前，請檢查其是否處於令人滿意的工作狀態、已得到適當保養，且任何相關電器部件均已密封，以防在製冷劑釋放時引發點燃。如有疑問，請諮詢製造商。

回收的製冷劑應裝入正確的回收鋼瓶中退還給製冷劑供應商，並辦妥相關的廢棄物轉移單。請勿在回收裝置中混合製冷劑，尤其不得在鋼瓶中混合。

如果要拆除壓縮機或壓縮機油，請確保其已抽真空至可接受程度，以確保可燃性製冷劑不會殘留在潤滑劑中。抽真空程序應在將壓縮機退還給供應商之前執行。僅可對壓縮機本體採用電加熱以加速此過程。從系統排放油時，應以安全方式進行。

請記錄下列產品資料

- 型號 MODEL No.: _____
- 機身編號 SERIAL No.: _____
- 經銷商名稱 DEALER.: _____
- 購買日期 DATE OF PURCHASE.: _____
- 單據編號 INVOICE No.: _____

本產品不斷改進中，如功能有所更改，恕不另行通知，如有疑問，
請與客戶服務中心聯絡，不便之處，敬請原諒。

The product specifications may be changed without prior notice.
Please contact customer service for details if necessary.

說明書內容以英文版本為準

If there is any inconsistency or ambiguity
between the English version and the Chinese version,
the English version shall prevail.

請即上網登記

Please register now at : www.dchtoolbox.com



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