



# Service Manual

# **Cassette B Series**

#### **MODELS:**

CAS12HP230V1BC CAS18HP230V1BC CAS24HP230V1BC Thank you for choosing our product. Please read this Installation & Owner's Manual carefully before operation and retain it for future reference.

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# Multi-zone Cassette B

# Installation, Service & Troubleshooting

Models:

CAS12HP230V1BC CAS18HP230V1BC CAS24HP230V1BC

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## Part | : Technical Information

## 1. Summary

**Indoor Unit** 

CAS12HP230V1BC CAS18HP230V1BC



CAS24HP230V1BC



**Remote Controller** 

YAP1FFB



## 2. Specifications

## 2.1 Specification Sheet

Paramete	r	Unit	Value			
Model			CAS12HP230V1BC CAS18HP230V1BC			
Product C	ode		CN510N0190_X20047	CN510N0210_X20047		
D	Rated Voltage	V~	208/230	208/230		
Power Supply	Rated Frequency	Hz	60	60		
Supply	Phases		1	1		
Cooling C	apacity	Btu/h	12000	14400		
Heating C	apacity	Btu/h	13000	16000		
Air flow vo	olume(H/M/L/SL)	CFM	330/306/265/-	394/347/265/-		
Dehumidif	fying Volume	Pint/h	2.96	3.80		
Fan Type			Centrifugal	Centrifugal		
Fan Diam	eter-height	inch	Ф12 11/16-5 13/16	Ф12 11/16-5 13/16		
Fan Motor	Cooling Speed(SH/H/M/L/SL)	rpm	800/700/650/560/-	900/850/750/580/-		
Fan Motor	Heating Speed(SH/H/M/L/SL)	rpm	800/700/650/580/-	900/850/750/600/-		
Fan Motor	Power Output	W	45	45		
Fan motor	running current	Α	1	1		
Fan Motor	Capacitor	μF	1	1		
Evaporato	r Material		Aluminum fin-copper tube	Aluminum fin-copper tube		
Evaporato	r Pipe Diameter	inch	Ф1/4	Ф1/4		
Evaporato	r Number of Rows-Fin Pitch		2	2		
Evaporato	or Length(L)XHeight(H)XWidth(W)	inch	52X7 1/2X1	52X7 1/2X1		
Fuse Curr	ent	Α	5	5		
Sound Pre	essure Level(SH/H/M/L/SL)	dB (A)	44/41/38/34/-	47/45/41/35/-		
Sound Po	wer Level(SH/H/M/L/SL)	dB (A)	55/52/49/45/-	58/56/52/46/-		
Dimension	n of Outline(LXWXH)	inch	23 7/16X23 7/16X9 7/16	23 7/16X23 7/16X9 7/16		
Dimension	n of Carton Box(LXWXH)	inch	30 1/2X28 15/16X11 1/4	30 1/2X28 15/16X11 1/4		
Dimension	n of Package(LXWXH)	inch	30 5/8X29 1/16X11 13/16	30 5/8X29 1/16X11 13/16		
Net Weigh	nt	lb	44.1	44.1		
Gross We	ight	lb	52.92	52.92		
Liquid pipe	e	inch	Ф1/4	Ф1/4		
Gas Pipe(	to indoor unit)	inch	Ф3/8	Ф1/2		

The above data is subject to change without notice. Please refer to the nameplate of the unit.

Parameter		Unit	Value
Model			CAS24HP230V1BC
Product C	ode		CN510N0200_X20047
Б	Rated Voltage	V~	208/230
Power	Rated Frequency	Hz	60
Supply	Phases		1
Cooling C	apacity	Btu/h	22800
Heating C	apacity	Btu/h	27400
Air flow vo	lume(H/M/L/SL)	CFM	718/647/518/-
Dehumidif	ying Volume	Pint/h	5.28
Fan Type			Centrifugal
	eter-height	inch	Ф17 11/16-5 5/8
Fan Motor	Cooling Speed(SH/H/M/L/SL)	rpm	650/620/560/450/-
Fan Motor	Heating Speed(SH/H/M/L/SL)	rpm	650/620/560/460/-
Fan Motor	Power Output	W	45
	running current	Α	I
Fan Motor	Capacitor	μF	1
Evaporato			Aluminum fin-copper tube
	r Pipe Diameter	inch	Φ1/4
Evaporato	r Number of Rows-Fin Pitch		2
Evaporato	r Length(L)XHeight(H)XWidth(W)	inch	77 3/8X6 3/4X1
Fuse Curr	ent	Α	5
Sound Pre	essure Level(SH/H/M/L/SL)	dB (A)	47/45/41/36/-
Sound Po	wer Level(SH/H/M/L/SL)	dB (A)	58/56/52/47/-
Dimension	of Outline(LXWXH)	inch	33 1/16X33 1/16X9 7/16
Dimension	of Carton Box(LXWXH)	inch	37 13/16X37 13/16X12 3/16
Dimension	of Package(LXWXH)	inch	37 15/16X37 15/16X12 13/16
Net Weigh	t	lb	57.33
Gross We	ght	lb	70.56
Liquid pipe		inch	Ф3/8
Gas Pipe(	to indoor unit)	inch	Ф5/8

The above data is subject to change without notice. Please refer to the nameplate of the unit.

Technical Information • • • • • • • • • •

Note: Nominal capacities are based on the follow conditions.

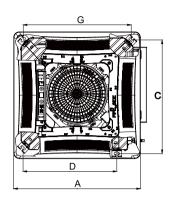
Mode	Indoor °F (°C) Outdoor °F (°C			
Cooling	DB:80.6(27)	DB:95(35)		
Cooling	WB:66.2(9)	WB:75.2(24)		
Heating	DB:68 (20)	DB:44.6(7)		
Heating	WB:()	WB:42.8(6)		
Piping Length	3/16 ir	nch		

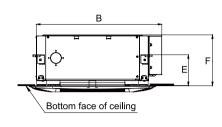
The air volume is measured at the relevant standard external static pressure.

Noise is tested in the semianechoic room, so it should be slightly higher in the actual operation due to environmental change.

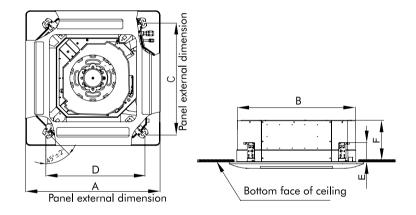
## 3. Outline Dimension Diagram

CAS12HP230V1BC CAS18HP230V1BC





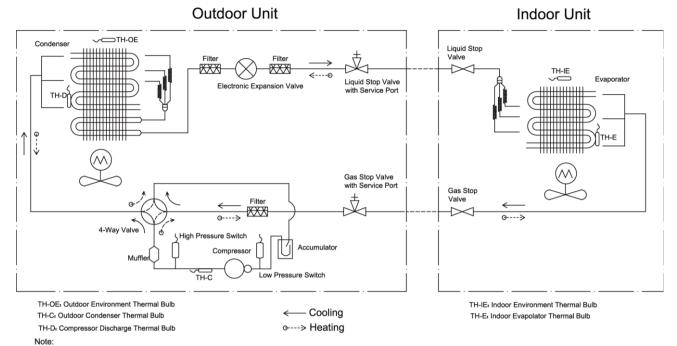
#### CAS24HP230V1BC



Unit: inch

Item Model	Α	В	С	D	E	F	G
CAS12HP230V1BC	26 3/8	26 1/4	23 5/8	19 1/2	5 11/16	9 7/16	23 7/16
CAS18HP230V1BC	20 3/0	20 1/4	23 3/0	19 1/2	3 11/10	9 1/10	23 1/10
CAS24HP230V1BC	37 3/8	33 1/16	30 11/16	26 3/4	5 11/16	9 7/16	-

## 4. Refrigerant System Diagram



1.it is just a schematic diagram and some parts may differ from the real objects inside the unit.

## 5. Electrical Part

## 5.1 Wiring Diagram

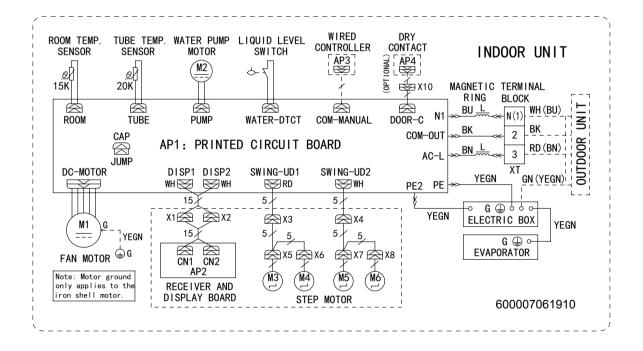
#### Instruction

Symbol	Symbol Color	Symbol	Symbol Color	Symbol	Name
WH	White	GN	Green	CAP	Jumper cap
YE	Yellow	BN	Brown	COMP	Compressor
RD	Red	BU	Blue		Grounding wire
YEGN	Yellow/Green	BK	Black	/	1
VT	Violet	OG	Orange	1	1

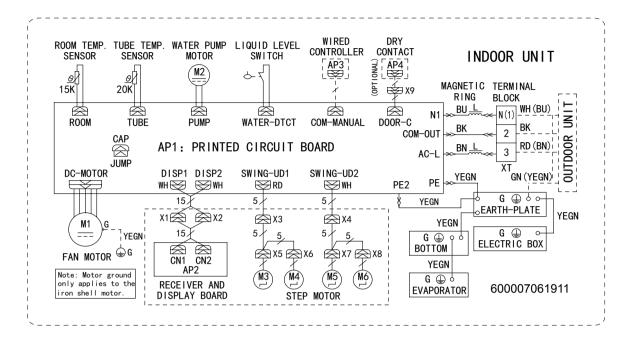
Note: Jumper cap is used to determine fan speed and the swing angle of horizontal lover for this model.

#### Indoor Unit

#### CAS12HP230V1BC CAS18HP230V1BC

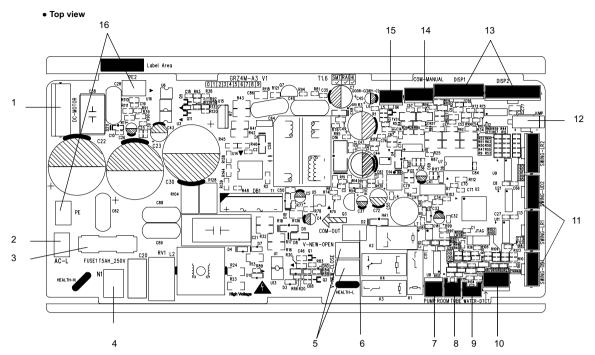


#### CAS24HP230V1BC



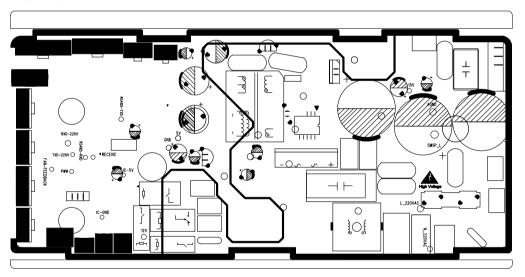
These circuit diagrams are subject to change without notice, please refer to the one supplied with the unit.

## **5.2 PCB Printed Diagram**



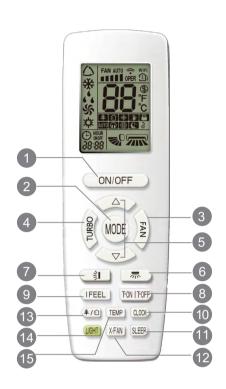
No.	Name
1	Interface of fan
2	Interface of live wire
3	Fuse
4	Interface of netural wire
5	Air terminal
6	Terminal with outdoor unit communication wire
7	Water pump control
8	Interface of ambient temperature sensor
9	Interface of tube temperature sensor
10	Water full detection terminal
11	Up&down swing motor
12	Jumper cap terminal
13	Display interface
14	Wired controller
15	Interface of gate-control detection
16	Grounding wire

• Bottom view



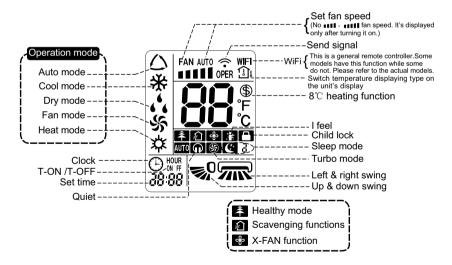
## 6. Function and Control

### 6.1 Remote Controller Introduction



- ON/OFF button
- 2 MODE button
- 3 FAN button
- 4 TURBO button
- 5 ▲/ ▼ button
- 7 🔰 button
- 8 T-ON / T-OFF button
- 9 I FEEL button
- 10 CLOCK button
- 11 SLEEP button
- 12 X-FAN button (Note: X-FAN is the same with BLOW.)
- 14 LIGHT button
- 15 TEMP button

## Introduction for icons on display screen



### Note:

- This is a general use remote controller, it could be used for the air conditioners with multifunction; For some function, which the model doesn't have, if press the corresponding button on the remote controller that the unit will keep the original running status.
- After putting through the power, the air conditioner will give out a sound. Operation indicator "(1)" is ON (red indicator, the colour is different for different models). After that, you can operate the air conditioner by using remote controller.
- Under on status, pressing the button on the remote controller, the signal icon "on the display of remote controller will blink once and the air conditioner will give out a "de" sound, which means the signal has been sent to the air conditioner.

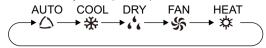
10 <u>Technical Information</u>

#### 1. ON/OFF button

Press this button to turn on the unit. Press this button again to turn off the unit.

#### 2 MODE button

Press this button to select your required operation mode.



- When selecting auto mode, air conditioner will operate automatically according to the sensed temperature. Set temperature can't be adjusted and will not be displayed as well. Press " FAN" button can adjust fan speed. Press " \( \mathre{\pi} \) " button can adjust fan blowing angle.
- After selecting cool mode, air conditioner will operate under cool mode. Cool indicator " ※" on indoor unit is ON(This indicator is not available for some models). Press "▲" or "▼" button to adjust set temperature. Press "FAN" button to adjust fan speed. Press " 漂" / " ※" button to adjust fan blowing angle.
- When selecting dry mode, the air conditioner operates at low speed under dry mode. Dry indicator " 4 " on indoor unit is ON(This indicator is not available for some models). Under dry mode, fan speed can't be adjusted. Press " 🛒 " / " 🦹 " button to adjust fan blowing angle.
- When selecting fan mode, the air conditioner will only blow fan, no cooling and no heating. All indicators are OFF,Operation indicator is ON(This indicator is not available for some models). Press "FAN" button to adjust fan speed. Press", " | "\nambda" button to adjust fan blowing angle.
- When selecting heating mode, the air conditioner operates under heat mode. Heat indicator "☆" on indoor unit is ON. Press "▲" or "▼" button to adjust set temperature. Press "FAN" button to adjust fan speed. Press ", "/"> " button to adjust fan blowing angle. (Cooling only unit won't receive heating mode signal. If setting heat mode with remote controller, press ON/OFF button can't start up the unit).

#### Note:

- For preventing cold air, after starting up heating mode, indoor unit will delay 1~5 minutes to blow air (actual delay time is depend on indoor ambient temperature).
- Set temperature range from remote controller: 61-86°F (16~30°C); Fan speed: auto, low speed, medium speed, high speed. speed, high speed.

#### 3. FAN button

Pressing this button can set fan speed circularly as: auto (AUTO), low( ■ ), medium ( ■ ■ ), high( ■ ■ ■ ).



#### Note:

- Under AUTO speed, air conditioner will select proper fan speed automatically according to ex-factory setting.
- It's Low fan speed under Dry mode.

#### 4. TURBO button

Under COOL or HEAT mode, press this button to turn to quick COOL or quick HEAT mode. " \$\mathbb{G}" icon is displayed on remote controller. Press this button again to exit turbo function and " \$\mathbb{G}" icon will disappear.

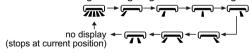
If start this function, the unit will run at super-high fan speed to cool or heat quickly so that the ambient temp. approachs the preset temp. as soon as possible.

#### 5. ▲/ ▼ button

- Press "▲" or "▼" button once increase or decrease set temperature 1°F (°C). Holding "▲" or "▼" button, 2s later, set temperature on remote controller will change quickly. On releasing button after setting is finished, temperature indicator on indoor unit will change accordingly. (Temperature can't be adjusted under auto mode)
- When setting TIMER ON, TIMER OFF or CLOCK, press "▲" or "▼ " button to adjust time. (Refer to CLOCK, TIMER ON, TIMER OFF buttons)

#### 6. $\mathbb{R}$ button

Press this button can select left & right swing angle. Fan blow angle can be selected circularly as below:

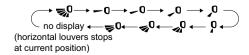


#### Note:

- Press this button continuously more than 2s, the main unit will swing back and forth from left to right, and then loosen the button, the unit will stop swinging and present position of guide louver will be kept immediately.
- Under swing left and right mode, when the status is switched from off to 🛒, if press this button again 2s later, 🛣 status will switch to off status dir ectly; if press this button again within 2s, the change of swing status will also depend on the circulation sequence stated above.
- This function is applicable to partial of models.

#### 7. 🔰 button

Press this button can select up & down swing angle. Fan blow angle can be selected circularly as below:



- When selecting " 👟 0", air conditioner is blowing fan automatically. Horizontal louver will automatically swing up & down at maximum angle.
- When selecting "-0 , -0 , 0 , 0 , o ", air conditioner is blowing fan at fixed position. Horizontal louver will stop at the fixed position.
- When selecting " = 0 . \_0 ", air conditioner is blowing fan at fixed angle. Horizontal louver will send air at the fixed angle.
- Hold "

  O" button above 2s to set your required swing angle. When reaching your required angle, release the button.

#### Note:

- " = 0, = 0, = 0 may not be available. When air conditioner receives this signal, the air conditioner will blow fan automatically
- Press this button continuously more than 2s, the main unit will swing back and forth from up to down, and then loosen the button, the unit will stop swinging and present position of guide louver will be kept immediately.
- Under swing up and down mode, when the status is switched from off to  $\sqrt{2}$ , if press this button again 2s later,  $\sqrt{2}$  status will switch to off status directly; if press this button again within 2s,the change of swing status will also depend on the circulation sequence stated above.

#### 8. T-ON / T-OFF button

#### T-ON button

"T-ON" button can set the time for timer on. After pressing this button, "⊕" icon disappears and the word "ON" on remote controller blinks.

Press "▲" or "▼" button to adjust T-ON setting. After each pressing "▲" or "▼" button, T-ON setting will increase or decrease 1min. Hold "▲" or "▼" button, 2s later, the time will change quickly until reaching your required time.

Press "T-ON" to confirm it. The word "ON" will stop blinking. " icon resumes displaying. Cancel T-ON: Under the condition that T-ON is started up,press "T-ON" button to cancel it.

#### T-OFF button

"T-OFF" button can set the time for timer off. After pressing this button, "⊕" icon disappears and the word "OFF" on remote controller blinks.

Press "▲" or "▼" button to adjust T-OFF setting. After each pressing "▲" or "▼" button, T-OFF setting will increase or decrease 1min. Hold "▲" or "▼" button, 2s later, the time will change quickly until reaching your required time.

Press "T-OFF" word "OFF" will stop blinking. " "icon resumes displaying. Cancel T-OFF. Under the condition that T-OFF is started up, press "T-OFF" button to cancel it.

#### Note:

- Under on and off status, you can set T-OFF or T-ON simultaneously.
- Before setting T-ON or T-OFF, please adjust the clock time.
- After starting up T-ON or T-OFF, set the constant circulating valid.

After that, air conditioner will be turned on or turned off according to setting time.ON/OFF button has no effect on setting. If you don't need this function, please use remote controller to cancel it.

#### 9. I FEEL button

Press this button to start I FEEL function and " will be displayed on the remote controller. After this function is set, the remote controller will send the detected ambient temperature to the controller and the unit will automatically adjust the indoor temperature according to the detected temperature. Press this button again to close I FEEL function and " will disappear.

• Please put the remote controller near user when this function is set. Do not put the remote controller near the object of high temperature or low temperature in order to avoid detecting inaccurate ambient temperature.

#### 10. CLOCK button

Press this button to set clock time. "♠" icon on remote controller will blink. Press "♠" or "▼" button within 5s to set clock time. Each pressing of "♠" or "▼" button, clock time will increase or decrease 1 min ute. If hold "♠" or "▼" button, 2s later,time will change quickly. Release this button when reaching your required time.

Press "CLOCK" button to confirm the time. "()" icon stops blinking.

#### Note

- Clock time adopts 24-hour mode.
- The interval between two operation can't exceeds 5s. Otherwise, remote controller will quit setting status. Operation for T-ON/T-OFF is the same.

#### 11. SLEEP button

Under COOL, or HEAT mode, press this button to start up sleep function." ("icon is displayed on remote controller. Press this button again to cancel sleep function and " ("icon will disappear. After powered on, Sleep Off is defaulted. After the unit is turned off, the Sleep function is canceled. In this mode, the time of time can be adjusted. Under Fan DRY and Auto modes, this function is not available.

#### 12. X-FAN button

Pressing this button in COOL or DRY mode, the icon " %" is displayed and the indoor fan will continue operation for a few minutes in order to dry the indoor unit even though you have turned off the unit. After energization, X-FAN OFF is defaulted.X-FAN is not available in AUTO, FAN or HEAT mode.

This function indicates that moisture on evaporator of indoor unit will be blowed after the unit is stopped to avoid mould.

- Having set X-FAN function on: After turning off the unit by pressing ON/OFF button indoor fan will continue running for about a few minutes. at low speed. In this period, press X-FAN button to stop indoor fan directly.
- Having set X-FAN function off: After turning off the unit by pressing ON/OFF button, the complete unit will be off directly.

#### 13. **本/**針 button

Press this button to achieve the on and off of healthy and scavenging functions in operation status. Press this button for the first time to start scavenging function; LCD displays "\(\hat{\Omega}\)". Press the button for the second time to start healthy and scavenging functions simultaneously; LCD displays "\(\hat{\Omega}\)" and "\(\hat{\R}\)".

Press this button for the third time to quit healthy and scavenging functions simultaneously.

Press the button for the fourth time to start healthy function; LCD display "\$".

Press this button again to repeat the operation above.

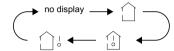
• This function is applicable to partial of models.

#### 14. LIGHT button

Press this button to turn off display light on indoor unit. " ¿ˈo̪ɛ" icon on remote controller disappears. Press this button again to turn on display light. " ¿ˈo̞ɛ" icon is displayed.

#### 15. TEMP button

By pressing this button, you can see indoor set temperature, indoor ambient temperature or outdoor ambient temperature on indoor unit's display. The setting on remote controlleris selected circularly as below:



- When selecting " Tor no display with remote controller, temperature indicator on indoor unit displays set temperature.
- When selecting " 💮 " with remote controller, temperature indicator on indoor unit displays indoor ambient temperature.
- When selecting " \( \), " with remote controller, temperature indicator on indoor unit displays outdoor ambient temperature.

#### Note

- Outdoor temperature display is not available for some models. At that time, indoor unit receives " 🔠 " signal, while it displays indoor set temperature.
- It's defaulted to display set temperature when turning on the unit. There is no display in the remote controller.
- Only for the models whose indoor unit has dual-8 display.
- When selecting displaying of indoor or outdoor ambient temperature, indoor temperature indicator displays corresponding temperature and automatically turn to display set temperature after three or five seconds.

#### **Function introduction for combination buttons**

#### **Energy-saving function**

Under cooling mode, press "TEMP" and " CLOCK" buttons simultaneously to start up or turn off energy-saving function. When energy-saving function is started up, "SE" will be shown on remote controller, and air conditioner will adjust the set temperature automatically according to ex-factory setting to reach to the best energy-saving effect. Press "TEMP" and "CLOCK" buttons simultaneously again to exit energy-saving function.

#### Noto

- Under energy-saving function, fan speed is defaulted at auto speed and it can't be adjusted.
- Under energy-saving function, set temperature can't be adjusted. Press "TURBO" button and the remote controller won't send signal.
- Sleep function and energy-saving function can't operate at the same time. If energy-saving function has been set under cooling mode, press sleep button will cancel energy-saving function. If sleep function has been set under cooling mode, start up the energy-saving function will cancel sleep function.

#### 8<sup>°</sup>C heating function

Under heating mode, press "TEMP" and "CLOCK" buttons simultaneously to start up or turn off 8 ℃ heating function.

When this function is started up, "\$" and "8  $^\circ$ C" will be shown on remote controller, and the air conditioner keep the heating status at 8  $^\circ$ C . Press "TEMP" and "CLOCK" buttons simultaneously again to exit 8  $^\circ$ C heating function.

- Under 8°C heating function, fan speed is defaulted at auto speed and it can't be adjusted.
- Under 8°C heating function, set temperature can't be adjusted. Press "TURBO" button and the remote controller won't send signal.
- Sleep function and 8°C heating function can't operate at the same time. If 8°C heating function has been set under cooling mode, press sleep button will cancel 8°C heating function. If sleep function has been set under cooling mode, start up the 8°C heating function will cancel sleep function.
- Under °F temperature display, the remote controller will display 46 °F heating.

#### **Child lock function**

Press "▲" and "▼" simultaneously to turn on or turn off child lock function. When child lock function is on, "♠" icon is displayed on remote controller. If you operate the remote controller, the "♠" icon will blink three times without sending signal to the unit.

#### Temperature display switchover function

Under OFF status, press "▼" and "MODE" buttons simultaneously to switch display between °C and °F.

#### **WIFI Function**

Press "MODE" and "TURBO" button simultaneously to turn on or turn off WIFI function. When WIFI function is turned on, the "WiFi" icon will be displayed on remote controller; Long press "MODE" and "TURBO" buttons simultaneously for 10s, remote controller will send WIFI reset code and then the WIFI function will be turned on. WIFI function is defaulted ON after energization of the remote controller.

• This function is only available for some models.

### **About Back-lighting Function**

The unit lights for 4s when energizing for the first time, and 3s for later press.

If "H1" is displayed on the remote controller while it's not operated by the professional person/after-sales person, it belongs to the misoperation.

Please operate it as below to cancel it. Under the OFF status of remote controller, hold the "MODE" button and "X-FAN" buttons simultaneously for 5s to cancel "H1" display.

Note:

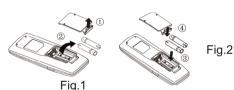
- If remote controller displays "H1", it belongs to the normal function reminder. If the unit is defrosting under heating mode, it operates according to H1 defrosting mode. "H1" won't be displayed on the panel of indoor unit;
- Once you set H1 mode, if you turn off unit by remote controller, H1 will display 3 times on the remote controller and then disappear;
- Also, when you set H1 mode, when you change to heating mode, H1 will display 3 times on the remote controller and then disappear.

### **Operation guide**

- 1. After putting through the power, press "ON/OFF" button on remote controller to turn on the air conditioner.
- 2. Press "MODE" button to select your required mode: AUTO, COOL, DRY, FAN, HEAT.
- 3. Press "▲" or "▼" button to set your required temperature. (Temperature can't be adjusted under auto mode).
- 4. Press "FAN" button to set your required fan speed: auto, low speed, low-medium speed, medium-high speed, high speed.
- 5. Press " " button to select fan blowing angle.

### Replacement of batteries in remote controller

- 1. Lift the cover along the direction of arrow (as shown in Fig 1 ①).
- 2. Take out the original batteries (as shown in Fig 1 2).
- 3. Place two 7# (AAA 1.5V) dry batteries, and make sure the position of "+" polar and "-" polar is correct (as shown in Fig 2③).
- 4. Reinstall the cover (as shown in Fig 2 4).



#### Note:

- During operation, point the remote control signal sender at the receiving window on indoor unit.
- The distance between signal sender and receiving window should be no more than 8m, and there should be no obstacles between them.
- Signal may be interfered easily in the room where there is fluorescent lamp or wireless telephone; remote controller should be close to indoor unit during operation.
- Replace new batteries of the same model when replacement is required.
- When you don't use remote controller for a long time, please take out the batteries.
- If the display on remote controller is fuzzy or there 's no display, please replace batteries.

14 <u>Technical Information</u>

### 6.2 Brief Description of Modes and Functions

#### 1.Basic function of system

#### (1)Cooling mode

- (1) Under this mode, fan and swing operates at setting status. Temperature setting range is 61-86°F(16~30°C).
- (2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.

#### (2)Drying mode

- (1) Under this mode, fan operates at low speed and swing operates at setting status. Temperature setting range is 61-86°F(16~30°C).
- (2) During malfunction of outdoor unit or the unit is stopped because of protection, indoor unit keeps original operation status.
- (3) Protection status is same as that under cooling mode.
- (4) Sleep function is not available for drying mode.

#### (3)Heating mode

- (1) Under this mode, Temperature setting range is 61-86°F(16~30°C).
- (2) Working condition and process for heating mode:

When turn on the unit under heating mode, indoor unit enters into cold air prevention status. When the unit is stopped or at OFF status, and indoor unit has been started up just now, the unit enters into residual heat-blowing status.

#### (4)Working method for AUTO mode:

- 1. Working condition and process for AUTO mode:
- a.Under AUTO mode, standard heating Tpreset=68°F(20°C) and standard cooling Tpreset=77°F(25°C.) The unit will switch mode automatically according to ambient temperature.
- 2.Protection function
- a. During cooling operation, protection function is same as that under cooling mode.
- b. During heating operation, protection function is same as that under heating mode.
- 3. Display: Set temperature is the set value under each condition. Ambient temperature is (Tamb.-Tcompensation) for heat pump unit and Tamb. for cooling only unit.
- 4. If theres I feel function, Tcompensation is 0. Others are same as above.

#### (5)Fan mode

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 61-86°F(16~30°C).

#### 2. Other control

#### (1) Buzzer

Upon energization or availably operating the unit or remote controller, the buzzer will give out a beep.

#### (2) Auto button

If press this auto button when turning off the unit, the complete unit will operate at auto mode. Indoor fan operates at auto fan speed and swing function is turned on. Press this auto button at ON status to turn off the unit.

#### (3) Auto fan

Heating mode: During auto heating mode or normal heating ode, auto fan speed will adjust the fan speed automatically according to ambient temperature and set temperature.

#### (4) Sleep

After setting sleep function for a period of time, system will adjust set temperature automatically.

#### (5) Timer function:

General timer and clock timer functions are compatible by equipping remote controller with different functions.

#### (6) Memory function

memorize compensation temperature, off-peak energization value.

Memory content: mode, up&down swing, light, set temperature, set fan speed, general timer (clock timer cant be memorized).

After power recovery, the unit will be turned on automatically according to memory content.

#### (7) Health function

During operation of indoor fan, set health function by remote controller. Turn off the unit will also turn off health function.

Turn on the unit by pressing auto button, and the health is defaulted ON.(Health function is not available for this unit)

#### (8)I feel control mode

After controller received I feel control signal and ambient temperature sent by remote controller, controller will work according to the ambient temperature sent by remote controller.

#### (9)Compulsory defrosting function

(1) Start up compulsory defrosting function

Under ON status, set heating mode with remote controller and adjust the temperature to 61(16°C). Press "+, -, +, -, +,-" button successively within 5s and the complete unit will enter into compulsory defrosting status. Meanwhile, heating indicator on indoor unit will ON 10s and OFF 0.5s successively. (Note: If complete unit has malfunction or stops operation due to protection, compulsory defrosting function can be started up after malfunction or protection is resumed.

(2) Exit compulsory defrosting mode

After compulsory defrosting is started up, the complete unit will exit defrosting operation according to the actual defrosting result, and the complete unit will resume normal heating operation.

#### (10)Refrigerant recovery function:

(1) Enter refrigerant recycling function

Within 5min after energizing (unit ON or OFF status is ok), continuously press LIGHT button for 3 times within 3s to enter refrigerant recycling mode; Fo is displayed and refrigerant recycling function is started. At this moment, the maintenance people closes liquid valve. After 5min, stick the thimble of maintenance valve with a tool. If there is no refrigerant spraying out, close the gas valve immediately and then turn off the unit to remove the connection pipe.

(2) Exit refrigerant recycling function

After entering refrigerant recycling mode, when receive any remote control signal or enter refrigerant recycling mode for 25min, the unit will exit refrigerant recycling mode automatically If the unit is in standby mode before refrigerant recycling, it will be still in standby mode after finishing refrigerant recycling; if the unit is in ON status before refrigerant recycling, it will still run in original operation mode.

#### (11)Ambient temperature display control mode

- 1. When user set the remote controller to display set temperature (corresponding remote control code: 01), current set temperature will be displayed.
- 2. Only when remote control signal is switched to indoor ambient temperature display status (corresponding remote control code: 10) from other display status (corresponding remote control code: 00, 01,11),controller will display indoor ambient temperature for 3s and then turn back to display set temperature.

Under this mode, indoor fan operates at set fan speed. Compressor, outdoor fan, 4-way valve and electric heating tube stop operation. Indoor fan can select to operate at high, medium, low or auto fan speed. Temperature setting range is 61-86°F(16~30°C).

#### (12)Off-peak energization function:

Adjust compressors minimum stop time. The original minimum stop time is 180s and then we change to:

The time interval between two start-ups of compressor cant be less than 180+T s( $0\le T\le 15$ ). T is the variable of controller. Thats to say the minimum stop time of compressor is  $180s\sim 195s$ . Read-in T into memory chip when refurbish the memory chip each time. After power recovery, compressor can only be started up after 180+T s at least.

#### (13) SE control mode

The unit operates at SE status.

#### (14) X-fan mode

When X-fan function is turned on, after turn off the unit, indoor fan will still operate at low speed for 2min and then the complete unit will be turned off. When x-fan function is turned off, after turn off the unit, the complete unit will be turned off directly.

#### (15) 8°C heating function

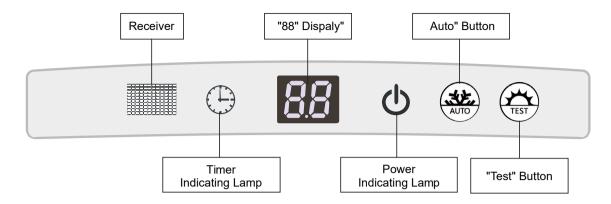
Under heating mode, you can set 46°F(8°C) heating function by remote controller. The system will operate at 46°F(8°C) set temperature.

#### (16) Turbo fan control function

Set turbo function under cooling or heating mode to enter into turbo fan speed. Press fan speed button to cancel turbo wind.

No turbo function under auto, dry or fan mode.

#### (17)Instructions to the Error Indicating Lamps on the Panel of the Cassette Type Unit.



#### Power and ON/OFF Indicating Lamp:

It goes red when the unit is powered on while it goes white when the unit is started.

#### Timer Indicating Lamp:

Timer indicator on indoor unit will be on when timer ON is set under off status and timer OFF is set under on status.

#### "88" Display:

When there is no error, the dual-8 nixie tube display the set temperature. After receiving the command of displaying indoor ambient temperature from the remote controller, the dual-8 nixie tube displays indoor temperature for 3s and then resume to display the set temperature. If there is error, error code will be displayed. If there's multiple error, error codes will be displayed in turn.

#### "Auto" button:

It's used for turning on or turning off the unit. When use this button to turn in the unit, the unit is under auto mode.

"Test" button: It's only used for the test units. This button is only valid within 3mins after the unit is energized.

#### NOTE:

- (1) If the light of indoor unit is turned off, when operating the remote controller to send command, the display will be on for 3s and then off.the remote control command.
- (2) When the wired controller is connected, the indoor unit display is invalid and the unit won't receive

## Part | : Installation and Maintenance

## 7. Notes for Installation and Maintenance

## Safety Precautions: Important!

Please read the safety precautions carefully before installation and maintenance.

The following contents are very important for installation and maintenance.

Please follow the instructions below.

- •The installation or maintenance must accord with the instructions.
- •Comply with all national electrical codes and local electrical codes.
- Pay attention to the warnings and cautions in this manual.
- •All installation and maintenance shall be performed by distributor or qualified person.
- •All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.
- •Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.



## **Warnings**

#### **Electrical Safety Precautions:**

- 1. Cut off the power supply of air conditioner before checking and maintenance.
- 2. The air condition must apply specialized circuit and prohibit share the same circuit with other appliances.
- 3. The air conditioner should be installed in suitable location and ensure the power plug is touchable.
- 4. Make sure each wiring terminal is connected firmly during installation and maintenance.
- 5. Have the unit adequately grounded. The grounding wire cant be used for other purposes.
- 6. Must apply protective accessories such as protective boards, cable-cross loop and wire clip.
- 7. The live wire, neutral wire and grounding wire of power supply must be corresponding to the live wire, neutral wire and grounding wire of the air conditioner.
- 8. The power cord and power connection wires cant be pressed by hard objects.
- 9. If power cord or connection wire is broken, it must be replaced by a qualified person.

- 10. If the power cord or connection wire is not long enough, please get the specialized power cord or connection wire from the manufacture or distributor. Prohibit prolong the wire by yourself.
- 11. For the air conditioner without plug, an air switch must be installed in the circuit. The air switch should be all-pole parting and the contact parting distance should be more than 3mm.
- 12. Make sure all wires and pipes are connected properly and the valves are opened before energizing.
- 13. Check if there is electric leakage on the unit body. If yes, please eliminate the electric leakage.
- 14. Replace the fuse with a new one of the same specification if it is burnt down; dont replace it with a cooper wire or conducting wire.
- 15. If the unit is to be installed in a humid place, the circuit breaker must be installed.

#### Installation Safety Precautions:

- 1. Select the installation location according to the requirement of this manual.(See the requirements in installation part)
- 2. Handle unit transportation with care; the unit should not be carried by only one person if it is more than 20kg.
- 3. When installing the indoor unit and outdoor unit, a sufficient fixing bolt must be installed; make sure the installation support is firm.
- 4. Ware safety belt if the height of working is above 2m.
- Use equipped components or appointed components during installation.
- 6. Make sure no foreign objects are left in the unit after finishing installation.

#### Refrigerant Safety Precautions:

- 1. Avoid contact between refrigerant and fire as it generates poisonous gas; Prohibit prolong the connection pipe by welding.
- 2. Apply specified refrigerant only. Never have it mixed with any other refrigerant. Never have air remain in the refrigerant line as it may lead to rupture or other hazards.
- 3. Make sure no refrigerant gas is leaking out when installation is completed.
- 4. If there is refrigerant leakage, please take sufficient measure to minimize the density of refrigerant.
- 5. Never touch the refrigerant piping or compressor without wearing glove to avoid scald or frostbite.

Improper installation may lead to fire hazard, explosion, electric shock or injury.

## Safety Precautions for Installing and Relocating the Unit:

To ensure safety, please be mindful of the following precautions.



## **Warnings**

1. When installing or relocating the unit, be sure to keep the refrigerant circuit free from air or substances other than the specified refrigerant.

Any presence of air or other foreign substance in the refrigerant circuit will cause system pressure rise or compressor rupture, resulting in injury.

2. When installing or moving this unit, do not charge the refrigerant which is not comply with that on the nameplate or unqualified refrigerant.

Otherwise, it may cause abnormal operation, wrong action, mechanical malfunction or even series safety accident.

3. When refrigerant needs to be recovered during relocating or repairing the unit, be sure that the unit is running in cooling mode. Then, fully close the valve at high pressure side (liquid valve). About 30-40 seconds later, fully close the valve at low pressure side (gas valve), immediately stop the unit and disconnect power. Please note that the time for refrigerant recovery should not exceed 1 minute.

If refrigerant recovery takes too much time, air may be sucked in and cause pressure rise or compressor rupture, resulting in injury.

4. During refrigerant recovery, make sure that liquid valve and gas valve are fully closed and power is disconnected before detaching the connection pipe.

If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.

**5.When installing the unit, make sure that connection pipe is securely connected before the compressor starts running.**If compressor starts running when stop valve is open and connection pipe is not yet connected, air will be sucked in and cause pressure rise or compressor rupture, resulting in injury.

6.Prohibit installing the unit at the place where there may be leaked corrosive gas or flammable gas.

If there leaked gas around the unit, it may cause explosion and other accidents.

7.Do not use extension cords for electrical connections. If the electric wire is not long enough, please contact a local service center authorized and ask for a proper electric wire.

Poor connections may lead to electric shock or fire.

8.Use the specified types of wires for electrical connections between the indoor and outdoor units. Firmly clamp the wires so that their terminals receive no external stresses.

Electric wires with insufficient capacity, wrong wire connections and insecure wire terminals may cause electric shock or fire.

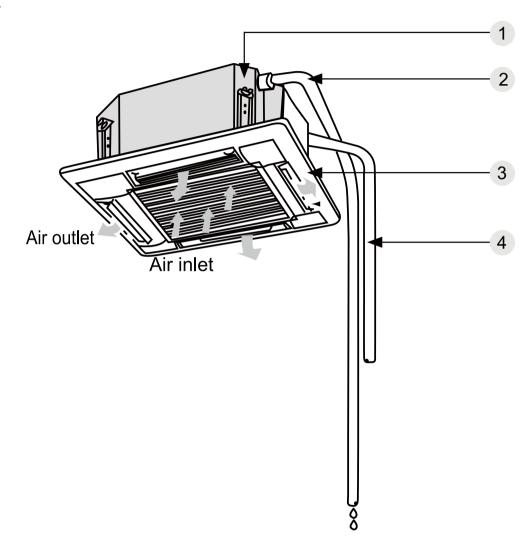
## **Main Tools for Installation and Maintenance**



## 8. Installation

## 8.1 Installation Dimension Diagram

Indoor



## 8.2 Preparative for Installation

## 8.2.1 Standard Accessory Parts

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

Table 1

	Indoor Unit Accessories						
No.	Name Appearance		Q'ty	Usage			
1	Drain Hose		1	To connect with the hard PVC drain pipe			
2	Nut with Washer		4	To fix the hook on the cabinet of the unit.			
3	Washer		10	To be used together with the hanger bolt for installing the unit.			
4	installation paperboard	$\Diamond$	1	used for ceiling drilling			
5	Gasket mounting board	B	4	Used to prevent gasket from falling off			
6	Wireless Controller +Battery		1+2	To control the indoor unit			
7	sealing plaster	The state of the s	1				
8	Fastener		4	To fasten the sponge			
9	Insulation		1	To insulate the gas pipe			
10	Insulation		1	To insulate the liquid pipe			
11	Sponge	$\bigcirc$	4	To insulate the drain pipe			
12	Nut		1	To connect gas pipe			
13	Nut		1	To connect liquid pipe			
14	Enswathement	(+)	2				

### 8.2.2 Selection of the Installation Location

## MARNING!

The unit must be installed where strong enough to withstand the weight of the unit and fixed securely, otherwise the unit would topple or fall off.

## CAUTION!

- ① . Do not install where there is the danger of combustible gas leakage.
- ②. Do not install the unit near heat source of heat, steam, or flammable gas.
- ③ . Children under 10 years old must be supervised not to operate the unit.

## 8.3 Installation of Cassette Type

#### 8.3.1. Before Installation

After receiving the machine, please check for any transport damage. If finding any surface or internal damage, please immediately report to the transport company or equipment company in writing. After receiving the machine, please check the unit and accessories in reference to the packing list. Ensure that the model is correct and the machine is in good condition. Please also check if the specification and quantity of accessory parts are correct. Determine the correct handling route and methods, thus to avoid damaging the unit or causing possible hazard. For the sake of protection and safety, it is suggested to move the unit with the packaging box. Even though it is not permitted to do like this under special occasions, do not remove the packaging box, thus to avoid loosening or falling during

handling.

Confirm if the installing foundation is solid. When this unit is to be installed on the metal section of the building, make sure that the electrical insulation must comply with applicable standards.

Ensure that the place of installation is far from the area where the inflammable or explosive substances are stored, thus to avoid possible explosion or fire due to leakage.

#### 8.3.2. Installation Site

Select an installation site where the following conditions are fulfilled and that meets your customer's approval.

- (1) Obstruct should be put away from the intake or outlet vent of the indoor unit so that the airflow can be blown through all the room.
- (2) Make sure that the installation meets the requirement of the schematic diagram of installation spaces.
- (3) Select the place where can stand 4 times of the weight of the indoor unit and would not increase the operating noise and vibration.
- (4) The horizontality of the installation place should be guaranteed.
- (5) Select the place where is easy to drain out the condensate water, and connect with outdoor unit.
- (6) Make sure that there are enough space for care and maintenance, and the height fall between the indoor unit and ground is above 1800mm.
- (7) When installing the suspension bolt, check if the installation place can stand 4 times of the weight of the unit. If not, reinforce it before installation. Note: There will be large amount of greasy dirt accumulated on the fan, heat exchanger and water pump located in the dinning room and kitchen, which would reduce the capacity of the heater exchanger, lead to leakage and abnormal operation of the water pump.

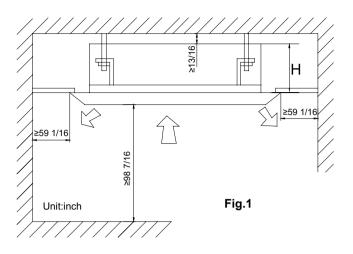


Table 2

Models	H(inch)
CAS12HP230V1BC	10 1/16
CAS18HP230V1BC	10 1/16
CAS24HP230V1BC	10 1/4

#### 8.3.3. Connection Pipe Requirement

### CAUTION!

The maximum length of the connection pipe is listed in the table below. Do not place the units between which the distance exceeds the maximum length of the connection pipe.

Table 3

Item		of Fitting Max.		Max. Height Difference between	Drainage pipe(Outer
Model	LiquidG	as	Length (inch)	Indoor Unit and Outdoor Unit (m)	Diameter × wall thickness) (mm)
CAS12HP230V1BC	1/4	3/8	787 3/8	590 9/16	
CAS18HP230V1BC	1/4	1/2	787 3/8	590 9/16	Ф1х1/16
CAS24HP230V1BC	3/8	5/8	1181 1/8	590 9/16	

The connection pipe should be insulated with proper water-proof insulating material. The pipe wall thickness shall be 0.5-1.0mm and the pipe wall shall be able to withstand the pressure of 6.0 MPa. The longer the connecting pipe, the lower the cooling and heating effect performs.

#### 8.3.4. Electrical Requirement

Electric Wire Size and Fuse Capacity.

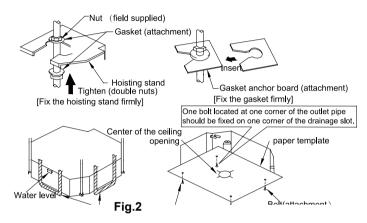
Table 4

Indoor Units	Power SupplyF	use Capacity	Min. Power Supply Cord
indoor onits	V/Ph/Hz	A	inch <sup>2</sup>
12~24k	208/230V~ 60Hz	5	AWG 18

#### Notes:

- ① . The fuse is located on the main board.
- ② . Install the disconnect device with a contact gap of at least 3mm in all poles nearby the units (Both indoor unit and outdoor unit). The appliance must be positioned so that the plug is accessible.
- ③ . The specifications of the power cable listed in the table above are determined based on the maximum power (maximum amps) of the unit.
- 4. 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 104°F(40°C) and resistible to 194°F(90°C)(see IEC 60364-5-52). If the working condition changes, they should be modified according to the related national standard

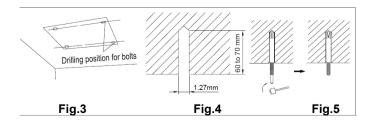
### 8.3.5 Installing the Main Body Unit



- (1). Install the hoisting stand on the hoisting screw by using nuts and gaskets at both the upper and lower sides of the hoisting stand. To prevent the gasket from breaking off, a gasket anchor board can be helpful.
- (2). Install the paper template on the unit, and fix the drain pipe at the outlet vent
- (3). Adjust the unit to the best position.
- (4). Check if the unit is installed horizontally at four directions. If not, the water pump and the float switch would function improperly and even lead to water leakage
- (5). Remove the gasket anchor board and tighten the nut remained.
- (6). Remove the paper template.

### 8.3.6 Installing the Suspension Bolts

- (1) Using the installation template, drill holes for bolts (four holes). Fig. 3
- (2) Install the bolts to the ceiling at a place strong enough to hang the unit. Mark the bolt positions from the installation template. With a concrete drill, drill for 12.7 mm (1/2") diameter holes. Fig.4
- (3) Insert the anchor bolts into the drilled holes, and drive the pins completely into the anchor bolts with a hammer. Fig. 5



#### 8.3.7. Leveling

The water level test must be done after installing the indoor unit to make the unit is horizontal, as shown below.

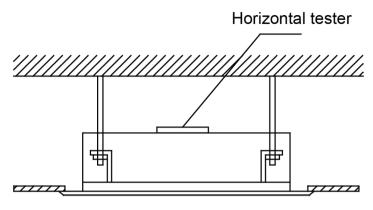


Fig.6

# 8.4 Installation of the Connection Pipe 8.4.1 Flare Processing .

- (1). Cut the connection pipe with the pipe cutter and remove the burrs.
- (2). Hold the pipe downward to prevent cuttings from entering the pipe.
- (3). R emove the flare nuts at the stop valve of the outdoor unit and inside the accessory bag of the indoor unit, then insert them to the connection pipe, after that, flare the connection pipe with a flaring tool.
- (4). Check if the flare part is spread evenly and there are no cracks (see Fig.7).

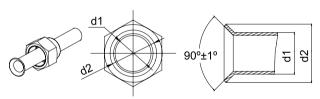
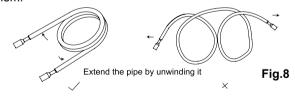


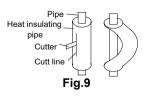
Fig.7

## 8.4.2 Bending Pipes

(1). The pipes are shaped by your hands. Be careful not to collapse them.



- (2). Do not bend the pipes in an angle more than 90°.
- (3). When pipes are repeatedly bent or stretched, the material will more. Do not bend or stretch the pipes more than three times.



(4). When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown in Fig.9, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.

## CAUTION!

- To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150mm or over.
- ② . If the pipe is bent repeatedly at the same place, it will break.

#### 8.4.3 Connecting the Pipe at the Indoor Unit Side

Detach the caps and plugs from the pipes.

### CAUTION!

- Be sure to apply the pipe against the port on the indoor unit correctly.
   If the centering is improper, the flare nut cannot be tightened smoothly.
   If the flare nut is forced to turn, the threads will be damaged.
- Do not remove the flare nut until the connection pipe is to be connected so as to prevent dust and impurities from coming into the pipe system.

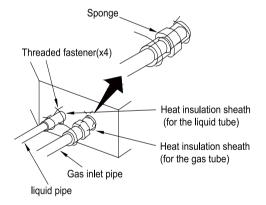
When connecting the pipe to the unit or removing it from the unit, please do use both the spanner and the torque wrench.(Fig.10)

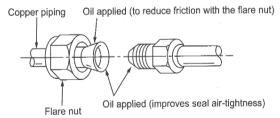
When connecting, smear both inside and outside of the flare nut with refrigeration oil, screw it hand tight and then tighten it with the spanner.

Refer to Table 6 to check if the wrench has been tightened properly (too tight would mangle the nut and lead to leakage).

Examine the connection pipe to see if it leaks, then take the treatment of heat insulation, as shown in the Fig.10.

Use the medium-sized sponge to insulate the coupler of the gas pipe.





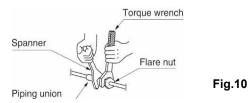


Table 4 Flare nut tightening torque

Pipe Diameter	Tightening Torque		
1/4"(Inch)	15-30 (N·m)		
3/8"(Inch)	35-40 (N·m)		
5/8"(Inch)	60-65 (N·m)		
1/2"(Inch)	45-50 (N·m)		
3/4"(Inch)	70-75 (N·m)		
7/8"(Inch)	80-85 (N·m)		

#### A CAUTION!

Be sure to connect the gas pipe after connecting the liquid pipe completely.

### 8.4.4 Connecting the Pipe at the Outdoor Side Unit

Tighten the flare nut of the connection pipe at the outdoor unit valve connector.

The tightening method is the same as that as at the indoor side.

## 8.4.5 Checking the Pipe Connections for Gas Leaking

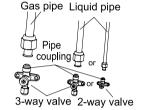
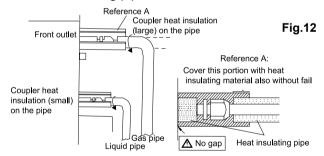


Fig.11

For both indoor and outdoor unit side, check the joints for gas leaking by the use of a gas leakage detector without fail when the pipes are connected.

## 8.4.6 Heat Insulation on the Pipe Joints (Indoor Side Only)

Stick coupler heat insulation (large and small) to the place where connecting pipes.



#### 8.4.7 Liquid Pipe and Drain Pipe

If the outdoor unit is installed lower than the indoor unit (See Fig.132) (1). A drain pipe should be above ground and the end of the pipe does not dip into water. All pipes must be restrained to the wall by saddles. (2). Taping pipes must be done from

bottom to top.(3). All pipes are bound together by tape and restrained to wall by saddles.

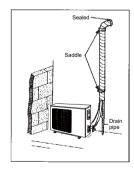


Fig.12

If the outdoor unit is installed higher than the indoor unit (See Fig.13)

- (1). Taping should be done from lower to the upper part.
- (2). All pipes are bound and taped together and also should be trapped to prevent water from returning to the room.
- (3). Restraint all pipes to the wall with saddles.

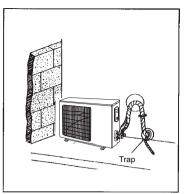


Fig.13

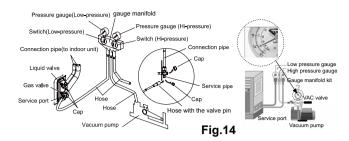
### 8.4.8 Vacuum and Gas Leakage Inspection

### CAUTION!

Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging!

#### 8.4.8.1 Vacuum

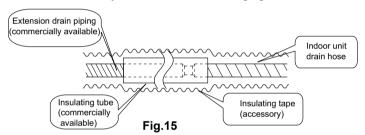
- (1). Remove the caps of the liquid valve, gas valve and also the service port.
- (2). Connect the hose at the low pressure side of the manifold valve assembly to the service port of the unit's gas valve, and meanwhile the gas and liquid valves should be kept closed in case of refrigerant leak.
- (3). Connect the hose used for evacuation to the vacuum pump.
- (4). Open the switch at the lower pressure side of the manifold valve assembly and start the vacuum pump. Meanwhile, the switch at the high pressure side of the manifold valve assembly should be kept closed, otherwise evacuation would fail.
- (5). The evacuation duration depends on the unit's capacity, generally, 15 minutes for the 12k units, 20 minutes for the 18k units, 30 minutes for the 24 units. And verify if the pressure gauge at the low pressure side of the manifold valve assembly reads -1.0Mp (-75cmHg), if not, it indicates there is leak somewhere. Then, close the switch fully and then stop the vacuum pump.
- (6). Wait for some time to see if the system pressure can remain unchanged, 3 minutes for the units less than 18k, 5 minutes for the 18K~24k units. During this time, the reading of the pressure gauge at the low pressure side can not be larger than 0.005Mp (0.38cmHg).
- (7). Slightly open the liquid valve and let some refrigerant go to the connection pipe to balance the pressure inside and outside of the connection pipe, so that air will not come into the connection pipe when removing the hose. Note that the gas and liquid valve can be opened fully only after the manifold valve assembly is removed.
- (8). Place back the caps of the liquid valve, gas valve and also the service port.



Note: For the large-sized unit, it has the service port for both the gas valve and the liquid valve. During evacuation, it is available to connect two hoses of the manifold valve assembly to two service ports to quicken the evacuating speed.

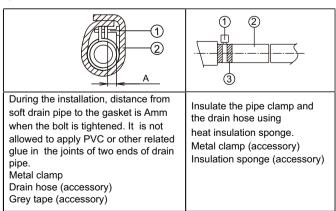
# 8.5 Installation of the Drain Hose8.5.1 Installation of Drain Piping

- (1). Keep piping as short as possible and slope it downwards at a gradient of at least 1/100 so that air may not remain trapped inside the pipe.
- (2). Keep pipe size equal to or greater than that of the connecting pipe.
- (3). Install the drain piping as shown and take measures against condensation. Improperly rigged piping could lead to leaks and eventually wet furniture and belongings.



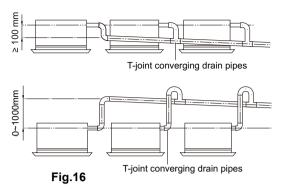
## 8.5.2 Installing the Drain Pipes

- (1). Insert the drain pipe to the drain outlet of the unit and then tighten the clamp securely with tape.
- (2). Connect the extension drain pipe to the drain pipe and then tighten the clamp with tape.

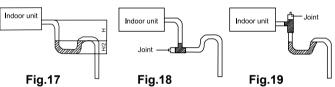


Indoor Unit	А		
GKH(12)BB-D3DNA3A/I	10±2mm(2/5±2/25inch)		
GKH(18)BB-D3DNA3A/I			
GKH(24)BC-D3DNA4A/I	15±3mm(3/5±1/10inch)		

(3). When unifying multiple drain pipes, install the pipes as Fig.16. Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.(take the cassette type unit for example)



- (4). When the drain hose cannot keep a sufficient gradient, it is necessary to fit a riser pipe (field supplied) to it.
- (5). If the air flow of indoor unit is high, this might cause negative pressure and result in return suction of outdoor air. Therefore, U-type water trap shall be designed on the drainage side of each indoor unit.(Fig.17)
- (6). Install one water trap for each unit.
- (7). Installation of water trap shall consider easy cleaning in the future.



(8). Connection of drainage branch pipe to the standpipe or horizontal pipe of drainage main pipe

The horizontal pipe cannot be connected to the vertical pipe at a same height. It can be connected in a manner as shown below:

- NO.1: Attach the 3-way connection of the drainage pipe joint as shown in Fig.20.
- NO.2: Attach the drain elbow as shown in Fig.21.
- NO.3: Attach the horizontal pipe as shown in Fig.22.

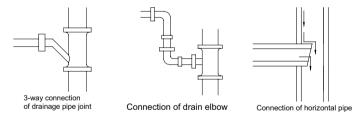
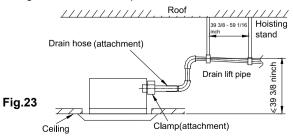


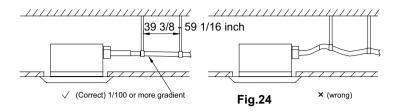
Fig.20 Fig.21 Fig.22

### 8.5.3 Precautions When Doing Riser Piping Work

- (1). Make sure that heat insulation work is executed on the following 2 spots to prevent any possible water leakage due to dew condensation.
- 1). Connect the drain hose to the drain lift pipe, and insulate them.
- 2). Connect the drain hose to the drain outlet on the indoor unit, and tighten it with the clamp.



(4). Secure a downward gradient of 1/100 or more for the drain pipe. To accomplish this, mount supporting brackets at an interval of 39 3/8 - 59 1/16 inch.



(5) The incline of attached drain hose should be 2 15/16 inch or less so that the drain outlet does not have to withstand additional force.

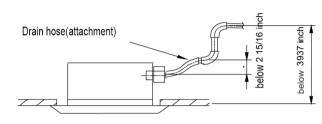
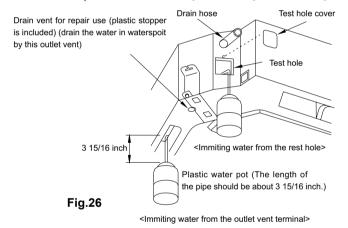


Fig.25

#### 8.5.4 Testing of Drain Piping

After piping work is finished, check if drainage flows smoothly. Shown in the Fig.26, Add approximately 1liter of water slowly into the drain pan and check drainage flow during COOL running.



#### 8.6 The Panel Installation

(1) See the figure below for the relationship of the front panel and the connecting pipe.

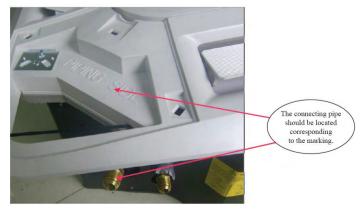


Fig.27

(2). Improper screwing of the screws may cause the troubles shown in Fig.28.

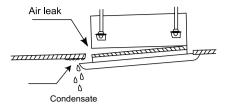
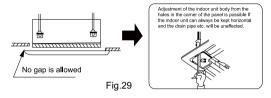
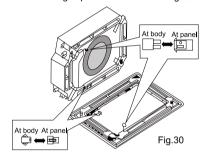


Fig.28

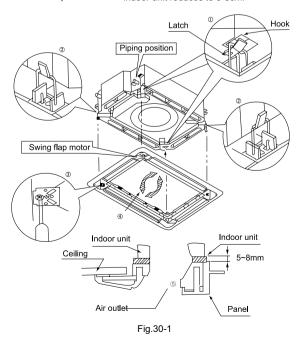
(3). If gap still exists between ceiling and decoration panel after tightening the screws, readjust the height of the indoor unit. (Fig.29)



(4). Wire the swing flap motor as shown in Fig.30.



- (1). Place the panel at the unit, and latch the hooks beside and opposite the swing flap motor.
- (2). Latch other two hooks.
- (3). Tighten four hexagonal screws under the latches about 15mm.
- (4). Adjust the panel along the direction indicated by the arrow as shown in Fig.30-1.
- (5). Tighten the screws until the thickness of the sealing material between the panel and the indoor unit reduces to 5-8cm.



## 8.7 Electrical Wiring

## 8.7.1 Wiring Precautions

#### MARNING!

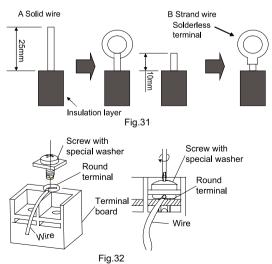
- ① . Before obtaining access to terminals, all supply circuits must be disconnected.
- ② . The rated voltage of the unit is as shown as Table 4
- ③ . Before turning on, verify that the voltage is within the 198~264V range(for single phrase unit) or 342~457V range (for three-phrase unit).
- ④ . Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.
- ⑤. The special branch circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3mm between the contacts of each pole.
- ⑥ . Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
- ⑦. Install a leakage special branch circuit breaker in accordance with the related laws and regulations and electric company standards.

### CAUTION!

- The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.
- ② . When the voltage is low and the air conditioner is difficult to start, contact the power company to raise the voltage.

### 8.7.2 Electrical Wiring

- (1). For solid core wiring (Fig.31)
- 1). Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation about 25 mm (15/16") .
- 2). Using a screwdriver, remove the terminal screw(s) on the terminal board.
- Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- 4). Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.
- (2). For strand wiring (Fig.31)
- 1). Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation about 10 mm (3/8") .
- 2). Using a screwdriver, remove the terminal screw (s) on the terminal board.
- 3). Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
- 4). Position the round terminal wire, and replace and tighten the terminal screw with a screwdriver.(Fig.32)



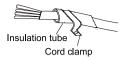
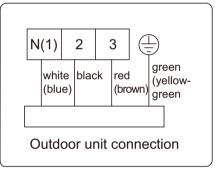


Fig.33

(5). How to fix connection cord and power cord by cord clamp After passing the connection cord fasten it with the cord c lamp.(Fig.33)

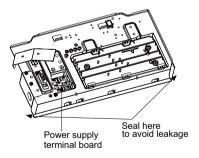
#### / WARNING! ① . Before starting work, check that power is not being supplied to the indoor unit and outdoor unit. Match the terminal block numbers and connection cord colors with those of the indoor unit side. $\ensuremath{\mathfrak{B}}$ . Erroneous wiring may cause burning of the electric parts. ④. Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire. $\ensuremath{\mathfrak{D}}$ . Always fasten the outside covering of the connection cord with cord clamps. (If the insulator is not clamped, electric leakage may occur.) ⑥ . Always connect the ground wire.

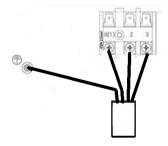
(6). Electric wiring between the indoor and outdoor units Single-phase units(12~24k)



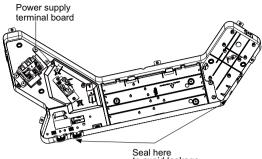
(7). Electric wiring of indoor unit side Remove the electric box cover from the electric box sub-assy and then connect the wire.

#### 12、18k:

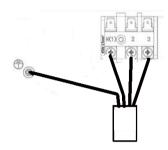




#### 24k:



Seal here to avoid leakage



### / CAUTION!

- ① . Tighten the power cord respectively on the terminal boards with screws. Faulty connection may cause a fire.
- ② . If the power supply are wired incorrectly, the air conditioner may be damaged.
- 3 . Connect the indoor unit connection cord properly based on the corresponding marks as shown in Fig.34.
- ④ . Ground both the indoor and outdoor units by attaching a ground wire.
- ⑤ . Unit shall be grounded in compliance with the applicable local and national codes.

### 8.8 Installation of Controllers

Refer to the Installation Manual of the controller for more details.

## 9. Maintenance

## 9.1 Error Code List

	Name of malfunction	Indoor unit displaying method					
NO.				display(LED blinks		AC status	Malfunctions
		8 code display	0.5s-ON/0.5s-OFF)  Running Cooling Heating		Heating	AC status	Manufictions
		uispiay	LED	LED	LED		
1	Indoor and outdoor units communication malfunction	E6	Off 3s blink 6 times			Cooling,compressor will stop,indoor fan motor works,Heating:all will stop	Please refer to troubleshooting
2	Indoor unit motor no feedback	H6	Off 3s blink 11 times			Whole unit will stop to run	1.Poor insert for GPF 2.Indoor control board AP1 malfunction 3.Indoor motor M1 malfunction
3	Jump wire cap malfunction protection	C5	Off 3s blink 15 times			Whole unit will stop to run	Indoor control board AP1 jump cap poor connected,please reinsert or replace the jump cap.
4	Indoor ambient sensor open circuit,short circuit	F1		Off 3s blink once		Cooling,dehumidifying:indoor fan motor is runing,other overloads will stop;Heating,whole unit will stop to run.	1.Room temp.sensor is not connected with the control panel AP1 2.Room temp.sensor is damaged
5	Indoor evaporator sensor ciruit open,short circuit	F2		Off 3s blink twice		Cooling,dehumidifying;indoor fan motor runing,other overload will stop;Heating,whole unit will stop.	1,Tube temp.sensor is not connected with the conrtol panel AP1 2.Tube tmep.sensor is damaged
6	In defect of refrigerant	F0				The Dual-8 Code Display will show FO and the complete unit stops.	1. In defect of refrigerant; 2. Indoor evaporator temperature sensor works abnormally; 3. The unit has been plugged up somewhere.
7	Full water protection	E9				Water level switch	If cut-off of water level switch is detected for 8s successively once energized, the system will enter full water protection. In this case, switch off the unit and then switch it on to eliminate this malfunction.

## 9.2 Troubleshooting for Main Malfunction

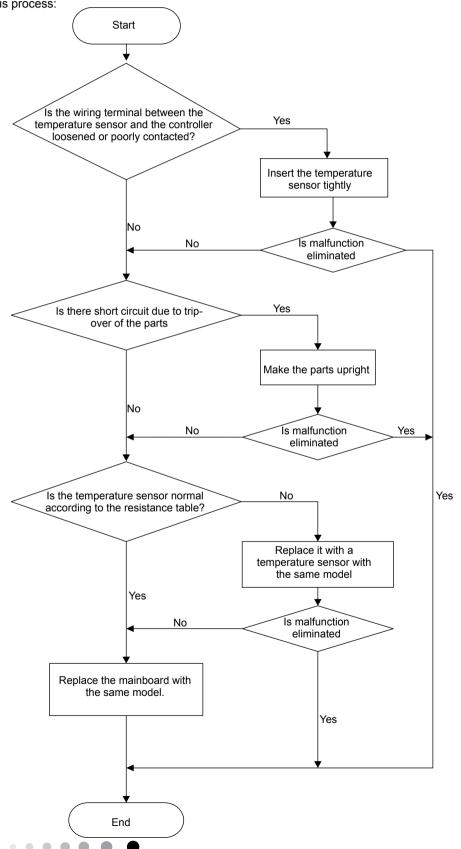
#### •Indoor unit:

#### 1. Malfunction of Temperature Sensor F1, F2

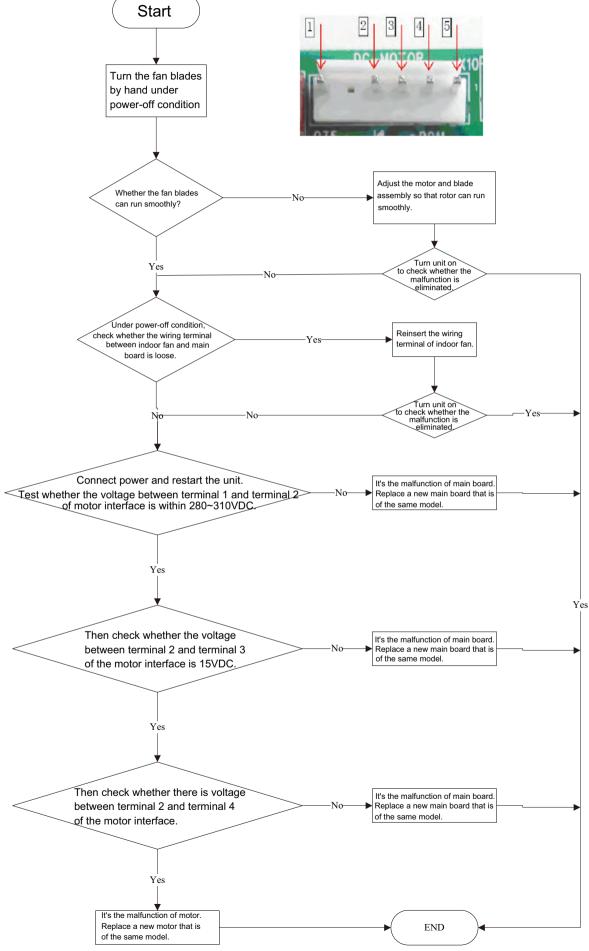
Main detection points:

- Is the wiring terminal between the temperature sensor and the controller loosened or poorly contacted?
- Is there short circuit due to trip-over of the parts?
- Is the temperature sensor broken?
- Is mainboard broken?

Malfunction diagnosis process:



#### 2. Malfunction of Blocked Protection of IDU Fan Motor H6

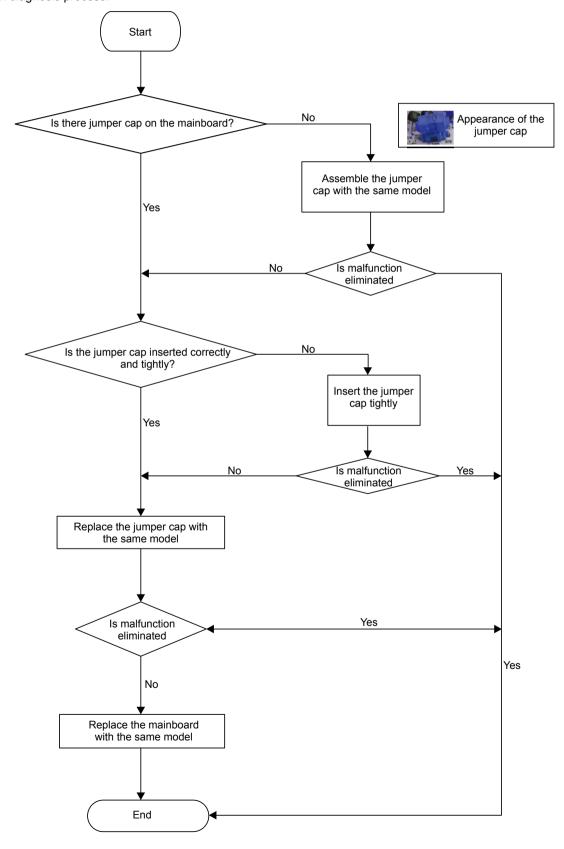


#### 3. Malfunction of Protection of Jumper Cap C5

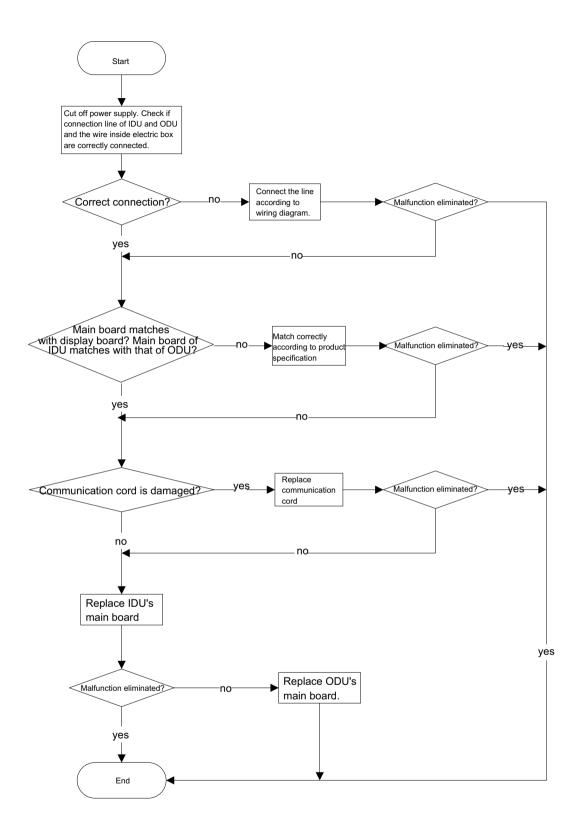
Main detection points:

- Is there jumper cap on the mainboard?
- Is the jumper cap inserted correctly and tightly?
- The jumper is broken?
- The motor is broken?
- Detection circuit of the mainboard is defined abnormal?

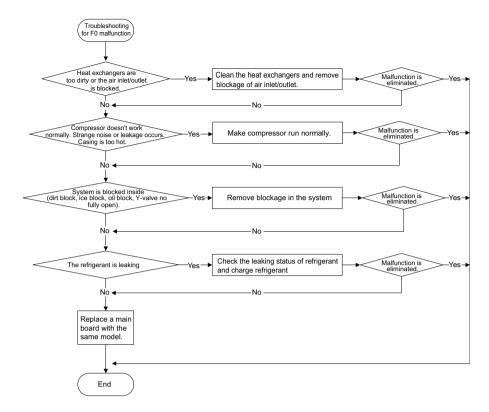
Malfunction diagnosis process:



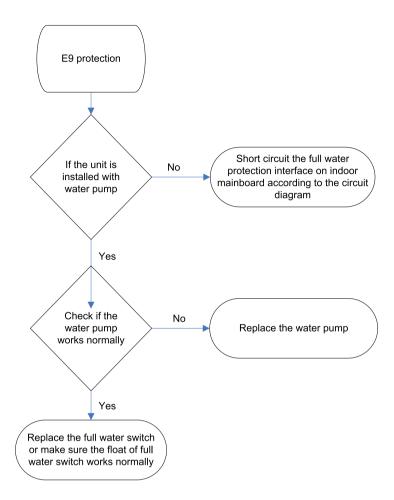
#### 4. Communication malfunction E6



#### 5. Malfunction of Insufficient fluorine protection F0



#### 6. Full Water Protection E9



### 9.3 Maintenance Method for Normal Malfunction

### 1. Air Conditioner Can't be Started Up

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting		
	After energization, operation indicator isn't bright	Confirm whether it's due to power failure. If yes wait for power recovery. If not, check power supply circuit and make sure the power plug is connected well.		
Wrong wire connection between indoor unit and outdoor unit, or poor connection for wiring terminals	onder normal power supply circumstances,	Check the circuit according to circuit diagram and connect wires correctly. Make sure all wiring terminals are connected firmly		
	After energization, room circuit breaker trips off at once	Make sure the air conditioner is grounded reliably Make sure wires of air conditioner is connected correctly Check the wiring inside air conditioner. Check whether the insulation layer of power cord is damaged; if yes, place the power cord.		
Model selection for air switch is improper	After energization, air switch trips off	Select proper air switch		
	After energization, operation indicator is bright, while no display on remote controller or buttons have no action.	Replace batteries for remote controller Repair or replace remote controller		

#### 2. Poor Cooling (Heating) for Air Conditioner

Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting		
Set temperature is improper	Observe the set temperature on remote controller	Adjust the set temperature		
Rotation speed of the IDU fan motor is set too low	Small wind blow	Set the fan speed at high or medium		
Filter of indoor unit is blocked	Check the filter to see it's blocked	Clean the filter		
Installation position for indoor unit and outdoor unit is improper	Check whether the installation postion is proper according to installation requirement for air conditioner	Adjust the installation position, and install the rainproof and sunproof for outdoor unit		
Refrigerant is leaking	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit's pressure is much lower than regulated range	Find out the leakage causes and deal with it. Add refrigerant.		
Malfunction of 4-way valve	Blow cold wind during heating	Replace the 4-way valve		
Malfunction of capillary	Discharged air temperature during cooling is higher than normal discharged wind temperature; Discharged air temperature during heating is lower than normal discharged wind temperature; Unit't pressure is much lower than regulated range. If refrigerant isn't leaking, part of capillary is blocked	Replace the capillary		
Flow volume of valve is insufficient	The pressure of valves is much lower than that stated in the specification	Open the valve completely		
Malfunction of horizontal louver	Horizontal louver can't swing	Refer to point 3 of maintenance method for details		
Malfunction of the IDU fan motor	The IDU fan motor can't operate	Refer to troubleshooting for H6 for maintenance method in details		
Malfunction of the ODU fan motor	The ODU fan motor can't operate	Refer to point 4 of maintenance method for details		
Malfunction of compressor	Compressor can't operate	Refer to point 5 of maintenance method for details		

#### 3. Horizontal Louver Can't Swing

Oli i i oli i zonitali zonitali oli i i	9			
Possible Causes	Discriminating Method (Air conditioner Status)	Troubleshooting		
Wrong wire connection, or poor connection	diagram	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly		
Stepping motor is damaged	Stepping motor can't operate	Repair or replace stepping motor		
Main board is damaged	Others are all normal, while horizontal louver can't operate	Replace the main board with the same model		

#### 4. ODU Fan Motor Can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting		
	check the winng status according to circuit	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly		
Capacity of the ODU fan motor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.			
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator		
Motor of outdoor unit is damaged		Change compressor oil and refrigerant. If no better, replace the compressor with a new one		

#### 5. Compressor Can't Operate

Possible causes	Discriminating method (air conditioner status)	Troubleshooting	
Wrong wire connection, or poor connection	check the wiring status according to circuit	Connect wires according to wiring diagram to make sure all wiring terminals are connected firmly	
Capacity of compressor is damaged	Measure the capacity of fan capacitor with an universal meter and find that the capacity is out of the deviation range indicated on the nameplate of fan capacitor.		
Power voltage is a little low or high	Use universal meter to measure the power supply voltage. The voltage is a little high or low	Suggest to equip with voltage regulator	
ICOULOT COMPRESSOR IS DURNT OUT	Use universal meter to measure the resistance between compressor terminals and it's 0	Repair or replace compressor	
Cylinder of compressor is blocked	Compressor can't operate	Repair or replace compressor	

### 6. Air Conditioner is Leaking

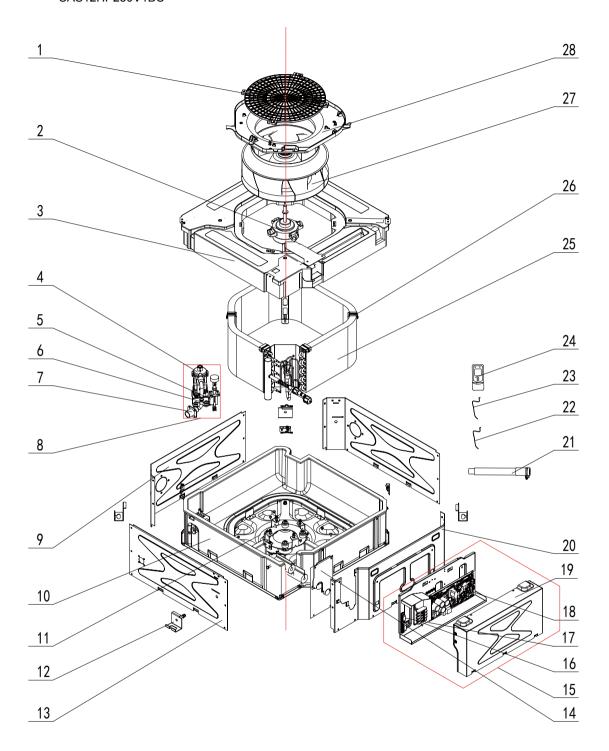
Possible causes	Discriminating method (air conditioner status)	Troubleshooting		
Drain pipe is blocked	ivvaler leaking from indoor unit	Eliminate the foreign objects inside the drain pipe		
Drain pipe is broken	Water leaking from drain pipe	Replace drain pipe		
ivvrapping is not tight	Water leaking from the pipe connection place of indoor unit	Wrap it again and bundle it tightly		

#### 7. Abnormal Sound and Vibration

Possible causes	Discriminating method (air conditioner status)	Troubleshooting		
When turn on or turn off the unit, the panel and other parts will expand and there's abnormal sound	There's the sound of "PAPA"	Normal phenomenon. Abnormal sound will disappear after a few minutes.		
When turn on or turn off the unit, there's abnormal sound due to flow of refrigerant inside air conditioner	Water-running sound can be heard	Normal phenomenon. Abnormal sound will disappear after a few minutes.		
Foreign objects inside the indoor unit or there're parts touching together inside the indoor unit	There's abnormal sound fro indoor unit	Remove foreign objects. Adjust all parts' position of indoor unit, tighten screws and stick damping plaster between connected parts		
Foreign objects inside the outdoor unit or there're parts touching together inside the outdoor unit	There's abnormal sound fro outdoor unit	Remove foreign objects. Adjust all parts' position of outdoor unit, tighten screws and stick damping plaster between connected parts		
Short circuit inside the magnetic coil	During heating, the way valve has abnormal electromagnetic sound	Replace magnetic coil		
Abnormal shake of compressor	Outdoor unit gives out abnormal sound	Adjust the support foot mat of compressor, tighten the bolts		
Abnormal sound inside the compressor	Abnormal sound inside the compressor	If add too much refrigerant during maintenance, please reduce refrigerant properly. Replace compressor for other circumstances.		

# 10. Exploded View and Parts List

CAS12HP230V1BC

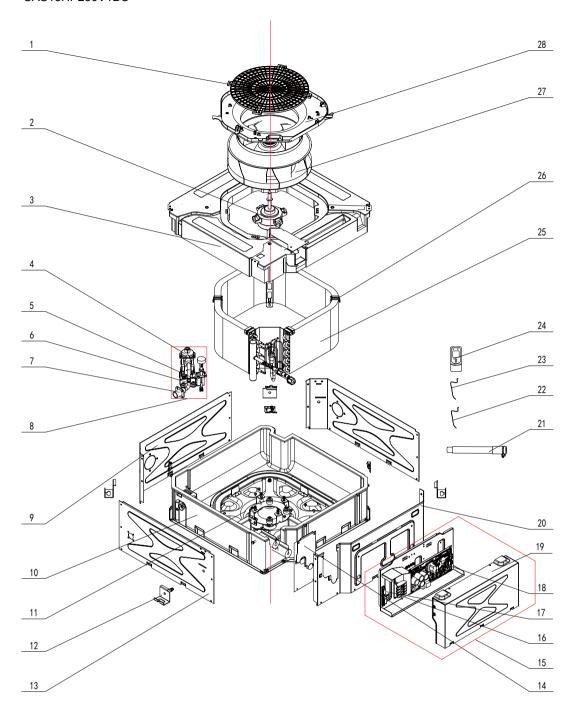


The component picture is only for reference; please refer to the actual product.

	Description	Part Code	
NO.	Description	CAS12HP230V1BC	Qty
	Product Code	CN510N0190_X20047	
1	Rear Grill	26909400007	1
2	Brushless DC Motor	1570940000401	1
3	Water Tray Assy	01289400004	1
4	Water Pump	4313800005801	1
5	Supporter	01809400007	3
6	Water Level Switch	450102013	1
7	Pump Drainpipe	26909400069	1
8	Water Pump Assy	15409400008	1
9	Right Side Plate Sub-Assy	01319400013	2
10	Bottom Foam Assy	12509400004	1
11	Base Plate Assy	02229400007	1
12	Body mounting support	01332705	4
13	Left Side Plate Sub-Assy	01319400012	1
14	Pressure Plate of Outlet Pipe	01349400004	1
15	Electric Box Assy	100002066221	1
16	Terminal Board	420001000002	1
17	Wire Clamp	0220410000501	1
18	Main Board	300002060012	1
19	Electric Box Cover	0142940000301	1
20	Front Side Plate Sub-Assy	01319400014	1
21	Drain Hose Sub-Assy	007008000001	1
22	Room Sensor	39000191	1
23	Temperature Sensor	3900012128	1
24	Remote Controller	30510599	1
25	Evaporator Assy	01029400058	1
26	Supporter	01809400007	3
27	Centrifugal Fan	10429400001	1
28	Diversion Circle	10479400001	1

Above data is subject to change without notice.

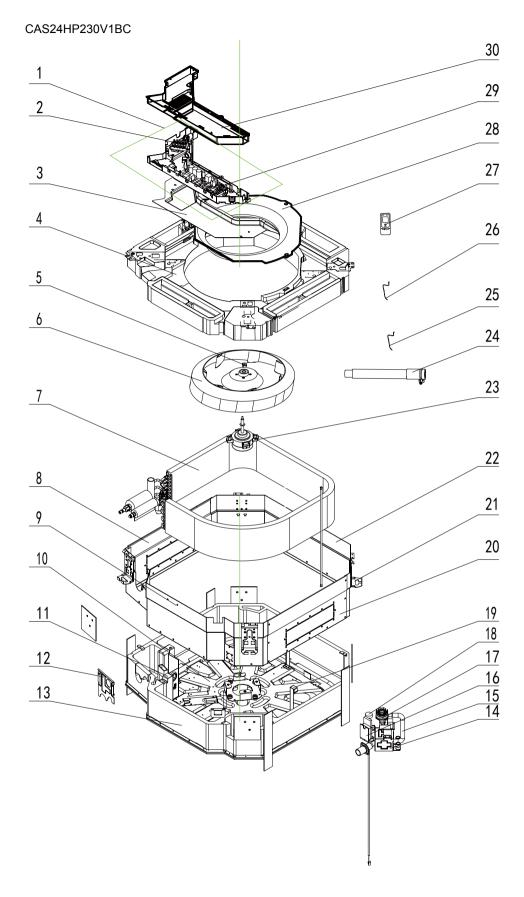
#### CAS18HP230V1BC



The component picture is only for reference; please refer to the actual product.

	Description	Part Code	
NO.	Description	CAS18HP230V1BC	Qty
	Product Code	CN510N0210_X20047	
1	Rear Grill	26909400007	1
2	Brushless DC Motor	1570940000401	1
3	Water Tray Assy	01289400004	1
4	Water Pump	4313800005801	1
5	Supporter	01809400007	3
6	Water Level Switch	450102013	1
7	Pump Drainpipe	26909400069	1
8	Water Pump Assy	15409400008	1
9	Right Side Plate Sub-Assy	01319400013	2
10	Bottom Foam Assy	12509400004	1
11	Base Plate Assy	02229400007	1
12	Body mounting support	01332705	4
13	Left Side Plate Sub-Assy	01319400012	1
14	Pressure Plate of Outlet Pipe	01349400004	1
15	Electric Box Assy	100002066222	1
16	Terminal Board	420001000002	1
17	Wire Clamp	0220410000501	1
18	Main Board	300002060012	1
19	Electric Box Cover	0142940000301	1
20	Front Side Plate Sub-Assy	01319400014	1
21	Drain Hose Sub-Assy	007008000001	1
22	Room Sensor	39000191	1
23	Temperature Sensor	3900012128	1
24	Remote Controller	30510599	1
25	Evaporator Assy	01029400013	1
26	Supporter	01809400007	3
27	Centrifugal Fan	10429400001	1
28	Diversion Circle	10479400001	1

Above data is subject to change without notice.



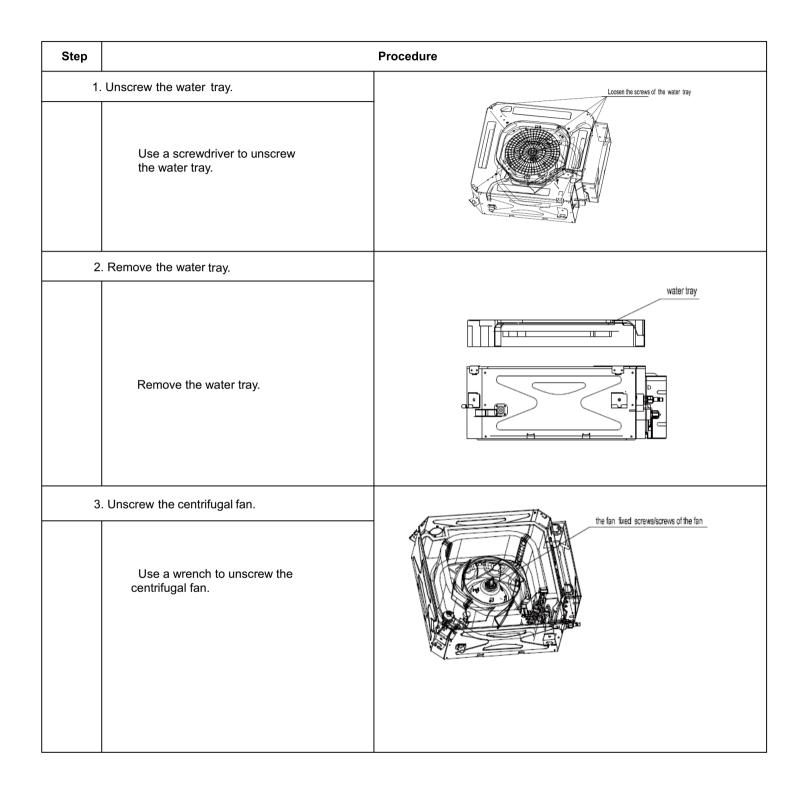
The component picture is only for reference; please refer to the actual product.

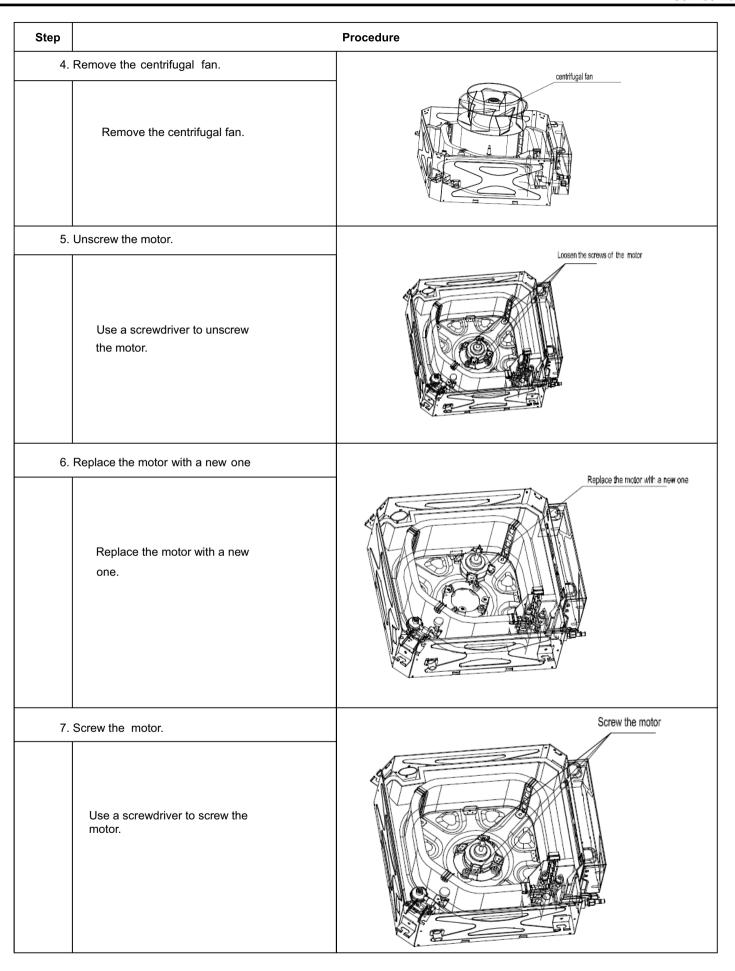
	Decement in the second	Part Code CAS24HP230V1BC				
NO.	Description					
	Product Code	CN510N0200_X20047				
1	Electric Box Assy	100002066223	1			
2	Terminal Board	420001000002	1			
3	Electric Base Plate	01412721	1			
4	Water Tray Assy	000069000104	1			
5	Fan Fixer	10312701	1			
6	Centrifugal Fan	10312705	1			
7	Evaporator Assy	011001060292	1			
8	Left Side Plate Assy	01302715	1			
9	Front Side Plate assy	01302718	1			
10	Base Plate Assy	01222701	1			
11	Connected Board Assy of Evaporator	01074042	1			
12	Tube Exit Plate Assy	0138271503	1			
13	Bottom Foam Assy	52012722	1			
14	Mounting Rack	1	1			
15	Pump Drainpipe	26909400068	1			
16	Pump Cover Board Assy	01252713	1			
17	Water Pump	43138000058	1			
18	Water Level Switch	45020216	1			
19	Evaporator Support Assy	01072703	2			
20	Right Side Plate Assy	01302716	1			
21	Body Installing Plate	01332701	4			
22	Rear Side Plate Assy	01302714	1			
23	Brushless DC Motor	1570940000401	1			
24	Drain Hose Sub-Assy	05339400001	1			
25	Room Sensor	390001921	1			
26	Temperature Sensor	390000457	1			
27	Remote Controller	30510599	1			
28	Diversion Circle	10372701	1			
29	Main Board	300002060012	1			
30	Electric Box Cover	0142410004801A	1			

Above data is subject to change without notice.

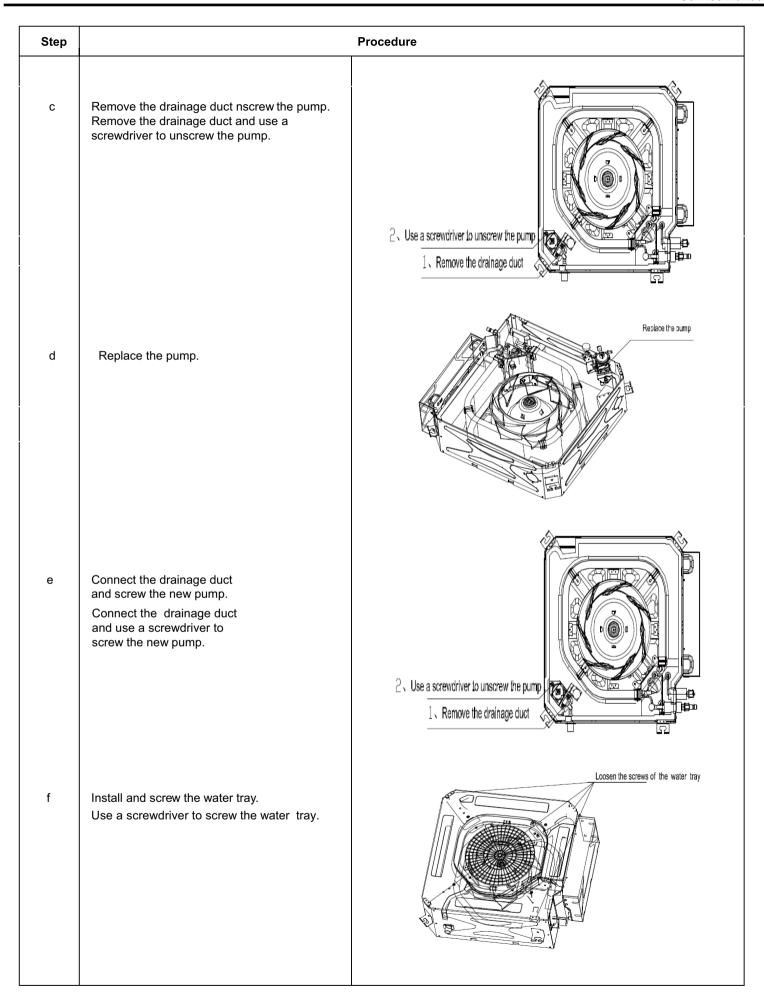
# 11. Removal Procedure

⚠ Warning: Be sure to wait for a minimum of 20 minutes after turning off all power supplies and discharge the refrigerant completely before removal.





Step		Procedure
8	Install and screw the centrifugal fan.  Install the centrifugal fan and use a wrench to screw the centrifugal fan.	centrifugal fan
9.	Install and screw the water tray.  Use a screwdriver to screw the water tray	Loosen the screws of the water tray
9. a	Unscrew the water tray. Use a screwdriver to unscrew the water tray.	Loosen the screws of the water tray
b	Remove the water tray. Replace the water tray.	water tray



# **Appendix:**

# **Appendix 1: Reference Sheet of Celsius and Fahrenheit**

Conversion formula for Fahrenheit degree and Celsius degree: Tf=Tcx1.8+32 Set temperature

Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius(°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius(°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius(°C)
61	60.8	16	69/70	69.8	21	78/79	78.8	26
62/63	62.6	17	71/72	71.6	22	80/81	80.6	27
64/65	64.4	18	73/74	73.4	23	82/83	82.4	28
66/67	66.2	19	75/76	75.2	24	84/85	84.2	29
68	68	20	77	77	25	86	86	30

#### **Ambient temperature**

Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius(°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius(°C)	Fahrenheit display temperature (°F)	Fahrenheit (°F)	Celsius(°C)
32/33	32	0	55/56	55.4	13	79/80	78.8	26
34/35	33.8	1	57/58	57.2	14	81	80.6	27
36	35.6	2	59/60	59	15	82/83	82.4	28
37/38	37.4	3	61/62	60.8	16	84/85	84.2	29
39/40	39.2	4	63	62.6	17	86/87	86	30
41/42	41	5	64/65	64.4	18	88/89	87.8	31
43/44	42.8	6	66/67	66.2	19	90	89.6	32
45	44.6	7	68/69	68	20	91/92	91.4	33
46/47	46.4	8	70/71	69.8	21	93/94	93.2	34
48/49	48.2	9	72	71.6	22	95/96	95	35
50/51	50	10	73/74	73.4	23	97/98	96.8	36
52/53	51.8	11	75/76	75.2	24	99	98.6	37
54	53.6	12	77/78	77	25			

# **Appendix 2: Configuration of Connection Pipe**

- 1.Standard length of connection pipe (More details please refer to the specifications)
- 2.Min length of connection pipeFor the unit with standard connection pipe of 5m, there is no limitation for themin length of connection pipe. For the unit with standard connection pipe of 7.5m and 8m, the min length of connection pipe is 3m.
- 3.Max length of connection pipe (More details please refer to the specifications)
- 4.The additional refrigerant oil and refrigerant charging required after prolonging connection pipe
- After the length of connection pipe is prolonged for 10m at the basis of standard length, you should add 5ml of refrigerant oil for each additional 5m of connection pipe.
- The calculation method of additional refrigerant charging amount (on the basis of liquid pipe):
- Basing on the length of standard pipe, add refrigerant according to the requirement as shown in the table. The additional refrigerant charging amount per meter is different according to the diameter of liquid pipe. See the following sheet.
- Additional refrigerant charging amount = prolonged length of liquid pipe X additional refrigerant charging amount per meter

Additional refrigerant charging amount for R22, R407C, R410A and R134a									
Diameter of o	onnection pipe	Outdoor unit throttle							
Liquid pipe(inch)	Gas pipe(inch)	Cooling only(oz/ft.)	Cooling and heating(oz/ft.)						
Ф1/4	Ф3/8or Ф1/2	0.2	0.2						
Ф1/4 ог Ф3/8	Ф5/8 or Ф3/4	0.2	0.2						
Ф1/2	Ф3/4 ог Ф7/8	0.3	1.3						
Ф5/8	Ф1 ог Ф1 1/4	0.7	1.3						
Ф3/4	1	2.7	2.7						
Ф7/8	1	3.8	3.8						

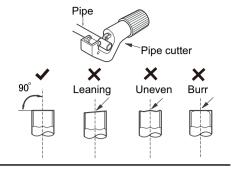
## **Appendix 3: Pipe Expanding Method**

**Note:** ∧

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

A:Cut the pip

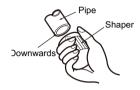
- Confirm the pipe length according to the distance of indoor unit and outdoor unit.
- Cut the required pipe with pipe cutter.



B:Remove the burrs

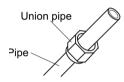
• Remove the burrs with shaper and prevent the burrs from getting into the pipe.

C:Put on suitable insulating pipe



D:Put on the union nut

• Remove the union nut on the indoor connection pipe and outdoor valve; install the union nut on the pipe.



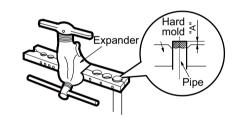
E:Expand the port

• Expand the port with expander.

**Note: Note:** 

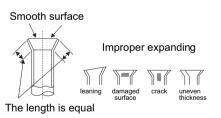
• "A" is different according to the diameter, please refer to the sheet below:

Outer diameter(mm)	A(mm)					
Outer diameter(mm)	Max	Min				
Ф6 - 6.35 (1/4")	1.3	0.7				
Ф9.52 (3/8")	1.6	1.0				
Ф12 - 12.7 (1/2")	1.8	1.0				
Ф15.8 - 16 (5/8")	2.4	2.2				



F:Inspection

• Check the quality of expanding port. If there is any blemish, expand the port again according to the steps above.



# **Appendix 4: List of Resistance for Temperature Sensor**

Resistance Table of Ambient Temperature Sensor for Indoor and Outdoor (15K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-19	138.1	20	18.75	59	3.848	98	1.071
-18	128.6	21	17.93	60	3.711	99	1.039
-17	121.6	22	17.14	61	3.579	100	1.009
-16	115	23	16.39	62	3.454	101	0.98
-15	108.7	24	15.68	63	3.333	102	0.952
-14	102.9	25	15	64	3.217	103	0.925
-13	97.4	26	14.36	65	3.105	104	0.898
-12	92.22	27	13.74	66	2.998	105	0.873
-11	87.35	28	13.16	67	2.896	106	0.848
-10	82.75	29	12.6	68	2.797	107	0.825
-9	78.43	30	12.07	69	2.702	108	0.802
-8	74.35	31	11.57	70	2.611	109	0.779
-7	70.5	32	11.09	71	2.523	110	0.758
-6	66.88	33	10.63	72	2.439	111	0.737
-5	63.46	34	10.2	73	2.358	112	0.717
-4	60.23	35	9.779	74	2.28	113	0.697
-3	57.18	36	9.382	75	2.206	114	0.678
-2	54.31	37	9.003	76	2.133	115	0.66
-1	51.59	38	8.642	77	2.064	116	0.642
0	49.02	39	8.297	78	1.997	117	0.625
1	46.6	40	7.967	79	1.933	118	0.608
2	44.31	41	7.653	80	1.871	119	0.592
3	42.14	42	7.352	81	1.811	120	0.577
4	40.09	43	7.065	82	1.754	121	0.561
5	38.15	44	6.791	83	1.699	122	0.547
6	36.32	45	6.529	84	1.645	123	0.532
7	34.58	46	6.278	85	1.594	124	0.519
8	32.94	47	6.038	86	1.544	125	0.505
9	31.38	48	5.809	87	1.497	126	0.492
10	29.9	49	5.589	88	1.451	127	0.48
11	28.51	50	5.379	89	1.408	128	0.467
12	27.18	51	5.197	90	1.363	129	0.456
13	25.92	52	4.986	91	1.322	130	0.444
14	24.73	53	4.802	92	1.282	131	0.433
15	23.6	54	4.625	93	1.244	132	0.422
16	22.53	55	4.456	94	1.207	133	0.412
17	21.51	56	4.294	95	1.171	134	0.401
18	20.54	57	4.139	96	1.136	135	0.391
19	19.63	58	3.99	97	1.103	136	0.382

### Resistance Table of Tube Temperature Sensors for Outdoor and Indoor (20K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)
-19	181.4	20	25.01	59	5.13	98	1.427
-18	171.4	21	23.9	60	4.948	99	1.386
-17	162.1	22	22.85	61	4.773	100	1.346
-16	153.3	23	21.85	62	4.605	101	1.307
-15	145	24	20.9	63	4.443	102	1.269
-14	137.2	25	20	64	4.289	103	1.233
-13	129.9	26	19.14	65	4.14	104	1.198
-12	123	27	18.13	66	3.998	105	1.164
-11	116.5	28	17.55	67	3.861	106	1.131
-10	110.3	29	16.8	68	3.729	107	1.099
-9	104.6	30	16.1	69	3.603	108	1.069
-8	99.13	31	15.43	70	3.481	109	1.039
-7	94	32	14.79	71	3.364	110	1.01
-6	89.17	33	14.18	72	3.252	111	0.983
-5	84.61	34	13.59	73	3.144	112	0.956
-4	80.31	35	13.04	74	3.04	113	0.93
-3	76.24	36	12.51	75	2.94	114	0.904
-2	72.41	37	12	76	2.844	115	0.88
-1	68.79	38	11.52	77	2.752	116	0.856
0	65.37	39	11.06	78	2.663	117	0.833
1	62.13	40	10.62	79	2.577	118	0.811
2	59.08	41	10.2	80	2.495	119	0.77
3	56.19	42	9.803	81	2.415	120	0.769
4	53.46	43	9.42	82	2.339	121	0.746
5	50.87	44	9.054	83	2.265	122	0.729
6	48.42	45	8.705	84	2.194	123	0.71
7	46.11	46	8.37	85	2.125	124	0.692
8	43.92	47	8.051	86	2.059	125	0.674
9	41.84	48	7.745	87	1.996	126	0.658
10	39.87	49	7.453	88	1.934	127	0.64
11	38.01	50	7.173	89	1.875	128	0.623
12	36.24	51	6.905	90	1.818	129	0.607
13	34.57	52	6.648	91	1.736	130	0.592
14	32.98	53	6.403	92	1.71	131	0.577
15	31.47	54	6.167	93	1.658	132	0.563
16	30.04	55	5.942	94	1.609	133	0.549
17	28.68	56	5.726	95	1.561	134	0.535
18	27.39	57	5.519	96	1.515	135	0.521
19	26.17	58	5.32	97	1.47	136	0.509

### Resistance Table of Discharge Temperature Sensor for Outdoor (50K)

Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)	Temp(°C)	Resistance(kΩ)		Temp(°C)	Resistance(kΩ)
-29	853.5	10	98	49	18.34		88	4.75
-28	799.8	11	93.42	50	17.65		89	4.61
-27	750	12	89.07	51	16.99		90	4.47
-26	703.8	13	84.95	52	16.36		91	4.33
-25	660.8	14	81.05	53	15.75		92	4.20
-24	620.8	15	77.35	54	15.17		93	4.08
-23	580.6	16	73.83	55	14.62		94	3.96
-22	548.9	17	70.5	56	14.09		95	3.84
-21	516.6	18	67.34	57	13.58		96	3.73
-20	486.5	19	64.33	58	13.09		97	3.62
-19	458.3	20	61.48	59	12.62		98	3.51
-18	432	21	58.77	60	12.17		99	3.41
-17	407.4	22	56.19	61	11.74		100	3.32
-16	384.5	23	53.74	62	11.32		101	3.22
-15	362.9	24	51.41	63	10.93		102	3.13
-14	342.8	25	49.19	64	10.54		103	3.04
-13	323.9	26	47.08	65	10.18		104	2.96
-12	306.2	27	45.07	66	9.83		105	2.87
-11	289.6	28	43.16	67	9.49		106	2.79
-10	274	29	41.34	68	9.17		107	2.72
-9	259.3	30	39.61	69	8.85		108	2.64
-8	245.6	31	37.96	70	8.56		109	2.57
-7	232.6	32	36.38	71	8.27		110	2.50
-6	220.5	33	34.88	72	7.99		111	2.43
-5	209	34	33.45	73	7.73		112	2.37
-4	198.3	35	32.09	74	7.47		113	2.30
-3	199.1	36	30.79	75	7.22		114	2.24
-2	178.5	37	29.54	76	7.00		115	2.18
-1	169.5	38	28.36	77	6.76		116	2.12
0	161	39	27.23	78	6.54		117	2.07
1	153	40	26.15	79	6.33		118	2.02
2	145.4	41	25.11	80	6.13		119	1.96
3	138.3	42	24.13	81	5.93		120	1.91
4	131.5	43	23.19	82	5.75		121	1.86
5	125.1	44	22.29	83	5.57		122	1.82
6	119.1	45	21.43	84	5.39		123	1.77
7	113.4	46	20.6	85	5.22		124	1.73
8	108	47	19.81	86	5.06		125	1.68
9	102.8	48	19.06	 87	4.90	_	126	1.64



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