Service Manual

Air Conditioner





CS/CU-EH935K CS/CU-EH1235K





⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-techical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

Page	Pa	age
1 Features 2	11 Disassembly of The Parts	-44
2 Functions 3	12 Troubleshooting Guide	- 47
3 Product Specifications 6	13 Technical Data	- 49
4 Dimensions10	14 Exploded View	- 51
5 Refrigeration Cycle Diagram12	15 Replacement Parts List	- 52
6 Block Diagram13	16 Exploded View	- 53
7 Wiring Diagram14	17 Replacement Parts List	- 54
8 Operation Details15	18 Exploded View	- 55
9 Installation27	19 Replacement Parts List	- 56
10 2-way,3-way Valve37	20 Electronic Circuit Diagram	- 57

Panasonic[®]

1 Features

- High Efficiency
- Air Quality Indicator
- 3-direction Vertical Airflow Wide Control Spot Control
- Auto Restart Control

 Automatically restart after power failure

- Quiet Mode

 To provide quiet operation.
- Comfort Environment

 Wide range of horizontal discharge air
- 12-hour Timer Setting

2 Functions

Remote Control



TEMP OFF/ON Room Temperature Setting Operation START/STOP Cooling, Soft Dry, Air Circulation Operation • Turn on/off the air conditioner Temperature Setting(16℃ to 30℃) • When stop the operation by pressing **Automatic Operation** OFF/ON button, the cursor key points ▲ Operation with 2°C higher than to OFF. standard temperature. MODE Operation with standard temperature. **Operation Mode Selection** ▼ Operation with 2°C lower than AUTO---- Automatic Mode Operation standard temperature. COOL---- Cooling Mode Operation **TIMER** OFF/ON • DRY ---- Soft Dry Mode Operation **Timer Operation Selection** • FAN ---- Air Circulation Mode Operation Stop/Start Operation Control FAN **SPEED** (set the ON/OFF Timer hourly later) Indoor Fan Speed Selection TIMER SFT/ CANCEL Low Speed Timer Operation Set / Cancel Medium Speed • ON-Timer and OFF-Timer setting confirm High Speed and cancellation • By pressing SET button for 5seconds AUTO **Automatic Speed** continuously to switch to set the sensor AIR sensitivity. **SWING Vertical Airflow Direction Control** QUIET Quiet Mode Operation OFF/ON · -Wide Control -Spot Control RESET -Manual Control Remote Control reset point (Five stages of adjustment)

Indoor Unit



Auto Switch Button

Power Switch ON/OFF

 When the remote control cannot be used or for repairing and testing ,please use this button.

Demonstration Mode

 Keep pressing this button for 15seconds to start or end the Demonstration Mode.

Signal Receiving Sound Control

 Keep pressing this button for 10seconds to turn on or turn off the signal receiving sound.

Operation Indication Lamps

- Power (green) ——Lights up in operation;
 Blinks during Test
 Run operation and
 determining Auto
 Operation mode
- Timer(orange) Timer in operation
- Quiet (Orange)——Lights up in Quiet Mode Operation
- Air quality Green Orange Red

Operation Mode

• Cooling/Soft Dry /Auto Operation/ Air circulation

Time Delay Safety Control

• The unit restarts operation in 3-4 minutes after each pause.

7-Minutes Time Save Control

 7-minutes automatic restarting at Cooling Operation

Anti-freezing Control for the Evaporator

• Cooling or Soft Dry Operation

Indoor Fan Speed Control

- High, Med, Low
- Auto Fan Speed

Airflow Direction Control

- Wide airflow direction, Spot airflow direction and manual adjusted by remote control for Vertical airflow.
- Manually adjusted by hand for horizontal.

Delayed On-timer Control

 For cooling or soft dry mode, the unit starts 15 minutes before the set time with the remote control.

Random Auto Restart Control

 Operation is restarted randomly after power failure at previous setting mode.

Outdoor Unit



(CU-EH935K)



(CU-EH1235K)

Anti-reverse Protection

• To protect the compressor from reverse rotation when power off suddenly.

Overload Protector

- The 2-step Overload Protector is to protect the compressor when

 - 2)High temperature or current enters into the compressor

60-seconds Test Operation Control

 Once the compressor is activated, it does not stop for 60 seconds. It stops immediately with remote control ON/OFF button.

3 Product Specifications

		Unit	CS-EH935K	CU-EH935K
Cooling Capa	city	kW	2.50	
Moisture Rem	ioval	L/h	-	
Power Source	;	Phase V Cycle	Singl 220 50	
Airflow Metho	d	OUTLET	SIDE VIEW	TOP VIEW
		INTAKE		* * *
Air Circulation	Indoor Air (low)	m³/min	5.8	-
	Indoor Air (medium)	m³/min	6.8	-
	Indoor Air (high)	m³/min	7.6	-
	Outdoor Air	m³/min	-	-
Noise Level		dB(A)	High37,Low30	High47
Electrical	Input	W	800	
Data	Running Current	A	3.70	
	EER	W/W	3.13	
	Starting Current	A	17	
Piping Connec	tion Port(Flare piping)	Inch inch	G:half union3/8" L:half union1/4"	G:3-way valve3/8" L:2-way valve1/4"
Piping Size(Fla	are piping)	Inch inch	G:gas side3/8" L:liquid side1/4"	G:gas side3/8" L:liquid side1/4"
Drain Hose	Inner Diameter	mm	14	-
	Length	m	0.6	-
Power Supply (Number of cor	Cord Length re-wire)	m	1.3 3 core-wire/1.0mm ²	-
Dimensions	Height	mm	280	530
Difficitsions	Width	mm	799	650
	Depth	mm	183	230
Net Weight	I	kg	8.5	24
Compressor	Type		-	Rotary(1 cylinder) Rolling piston type
	Motor Type	307	-	Induction(2 pole)
Air Circulation	Rated Output Type	W	- Cross-flow fan	700 Propeller fan
	Motor Type		Induction(4 pole)	Induction(6pole)
	Input	W	38.4	-
	Rated Output	W	13	20
	Low	rpm	960±60	-
	Speed Med	rpm	1120±60	-
	High	rpm	1200±60	800±60

		Unit	CS-EH935K	CU-EH935K
11 (Description	Onic	Evaporator	Condenser
Heat	Tube Material		copper	copper
Exchanger	Fin Type		slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,for 2 x 15	ced draft) 1 x 24
	FPI		18	17
	Dimensions	mm	610x252x25.4	575.8x504x12.7
Refrigerant C	ontrol Device		-	Capillary Tube
Refrigeration	Oil	(c.c)	-	SUNISO 4GDID or ATMOS M60(M56)
Refrigerant (I	R-22)	g	- 530*	
Thermostat			Electronic Control	-
Protection De	evice		-	O.L.P.(37A/230V)
	Length	mm	_	645±10
Capillary	Circulation	L/min	-	8.0±0.2
	Inner Diameter	mm	-	1.3
Air Filter			P.P Honeycomb	-
Refrigerant C	irculation Control Device		Capillary	
Compressor		μFV	- 30μF 370V	
Fan Motor Ca	pacitor	μ F V	1.5µF 400V 2.0µF 400V	

[•] Specifications are subject to change without notice for further improvement.

^{*60}g for air purging is not included.

Piping Size(Flare piping) Inch			Unit	CS-EH1235K	CU-EH1235K
Phase	Cooling Capa	city	kW	3.55	
Power Source	Moisture Rem	oval	L/h	-	
Air Circulation Indoor Air (low) m³/min 7.4	Power Source		V	220	
Air Circulation	Airflow Metho	d	OUTLET	SIDE VIEW	TOP VIEW
Indoor Air (low) Indoor Air (medium) Indoor Air (medium) Indoor Air (medium) Indoor Air (high) Indoor Air Indoor Air (high) Indoor (high) Indoor Air (high) Indoor Air (high) Indoor (hi			INTAKE		**************************************
Indoor Air (high)	Air Circulation	Indoor Air (low)	m³/min	7.4	-
Noise Level Industrial In		Indoor Air (medium)	m³/min	8.0	-
Noise Level Input		Indoor Air (high)	m³/min	9.4	-
Electrical Data		Outdoor Air	m³/min	-	-
Running Current A	Noise Level		dB(A)	High39,Low32	High48
Running Current		Input	W	1020	
Starting Current A Starting Current A Starting Current A Starting Current Inch Induction(4 pole) Inch Inch	Data	Running Current	А	4.80	
Piping Connection Port(Flare piping)		EER	W/W	3.43	
Piping Connection Port(Flare piping) inch L:half union1/4" L:2-way valve1/4		Starting Current			0.0
Drain Hose	Piping Connec	tion Port(Flare piping)	inch	L:half union1/4"	L:2-way valve1/4"
Length	Piping Size(Fla	are piping)		G:gas side1/2" L:liquid side1/4"	G:gas side1/2" L:liquid side1/4"
Power Supply Cord Length (Number of core-wire)	Drain Hose		mm		-
Number of core-wire State State		_			-
Dimensions	(Number of cor	Cord Length e-wire)	m	1.3 3 core-wire/1.0mm²	-
Net Weight Net	,	Height		280	
Net Weight kg 9 32 Compressor Type - Rotary(1 cylinder Rolling piston type Polling piston type Induction(2 pole) Motor Type - Induction(2 pole) Air Circulation Type Cross-flow fan Propeller fan Motor Type Induction(4 pole) Induction(4pole) Input W 37.4 - Rated Output W 17 20 Fan Low rpm 1010±60 -	Difficitionia		_		
Compressor Type - Rotary(1 cylinder Rolling piston type Motor Type - Induction(2 pole) Rated Output W - 900 Air Circulation Type Cross-flow fan Propeller fan Motor Type Induction(4 pole) Induction(4pole) Input W 37.4 - Rated Output W 17 20 Fan Low rpm 1010±60 -	Net Weight	Depth			
Motor Type - Induction(2 pole) Rated Output W - 900 Air Circulation Type Cross-flow fan Propeller fan Motor Type Induction(4 pole) Induction(4pole) Input W 37.4 - Rated Output W 17 20 Fan Low rpm 1010±60 -		Type	'\9		
Rated Output W	Compressor	• •			
Motor Type Cross-flow fan Propeller fan Input W 37.4 - Rated Output W 17 20 Fan Low rpm 1010±60 -			\\/	<u>-</u>	
Motor Type Induction(4 pole) Induction(4pole) Input W 37.4 - Rated Output W 17 20 Fan Low rpm 1010±60 -	Air Circulation		V V	Cross-flow fan	
Input W 37.4 -		Motor Type			•
Rated Output W 17 20 Fan Low rpm 1010±60 -				37.4	- ` '
Fall A L L L L L L L L L L L L L L L L L L			W	17	20
$ Speed $ Med $ rpm $ $ 1090\pm60 $ -		raii 💮 🔭			-
High rpm 1280±60 765±50		Speed Med			- 765±50

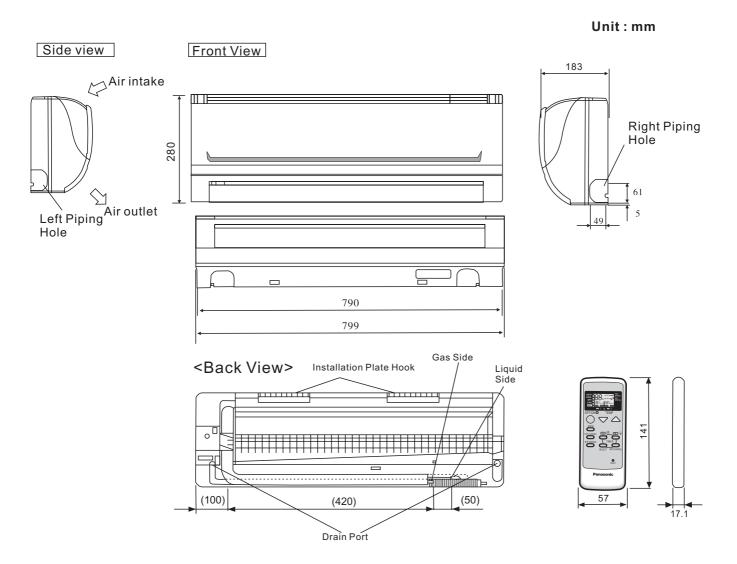
		Unit	CS-EH1235K	CU-EH1235K
Heat	Description		Evaporator	Condenser
Exchanger	Tube Material	copper		copper
Excitatiget	Fin Type		slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,for 2 x 15	ced draft) 2 x 24
	FPI		21	21
	Dimensions	mm	610x252x25.4	735.8 715.1 X462x12.7
Refrigerant C	ontrol Device		-	Capillary Tube
Refrigeration	Oil	(c.c)	-	SUNISO 4GDID or ATMOS M60(M56)
Refrigerant (I	R-22)	g	-	880*
Thermostat			Electronic Control	-
Protection De	evice		-	O.L.P(30A,230V)
Capillary	Length Circulation	mm L/min	- -	545±10 12.5±0.2
' '	Inner Diameter	mm	-	1.5
Air Filter			P.P Honeycomb	-
	Lefrigerant Circulation Control Device Capillary		lary	
Compressor		μFV	-	30 µF 370 V
Fan Motor Ca	Fan Motor Capacitor µF V 1.5µF400V 1.8µF		1.8µF400V	

[•] Specifications are subject to change without notice for further improvement.

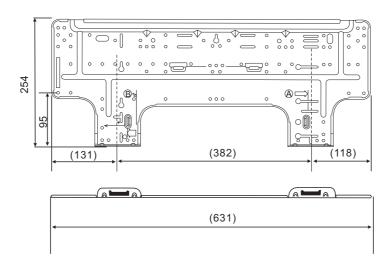
^{*60}g for air purging is not included.

4 Dimensions

Indoor Unit CS-EH935K CS-EH1235K



Installation plate (Front View)



61.6

Unit: mm

Outdoor Unit CU-EH935K

Required space for installation

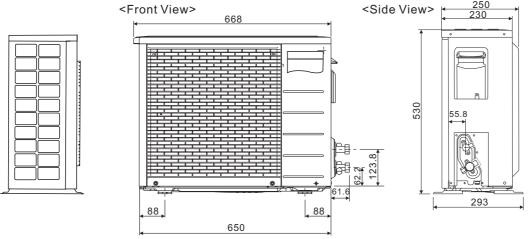
Air intake

Air outlet

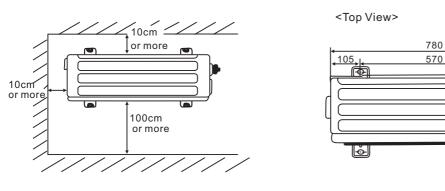
Side View>

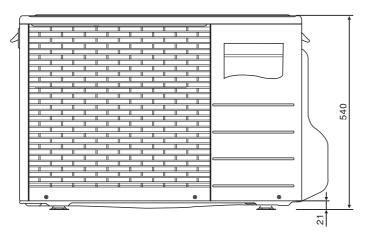
Case Side View>

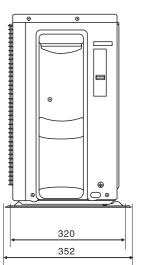
Case



CU-EH1235K





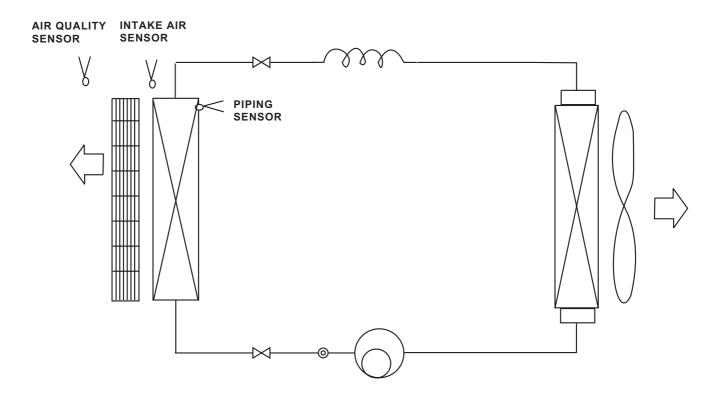


48

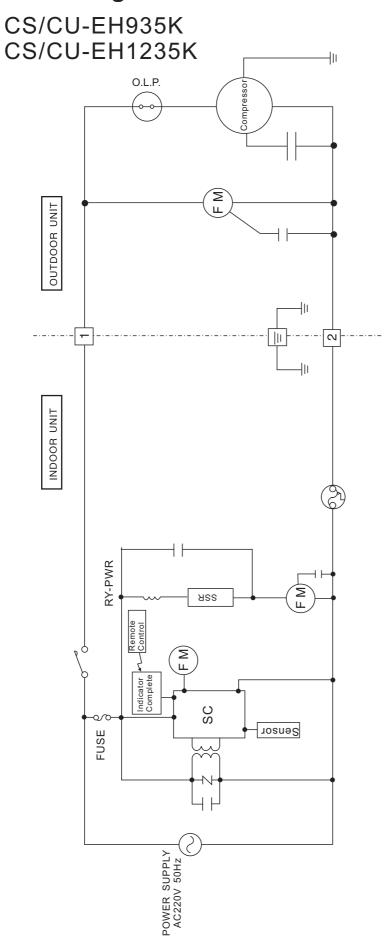
Ď

5 Refrigeration Cycle Diagram

CS/CU-EH935K CS/CU-EH1235K

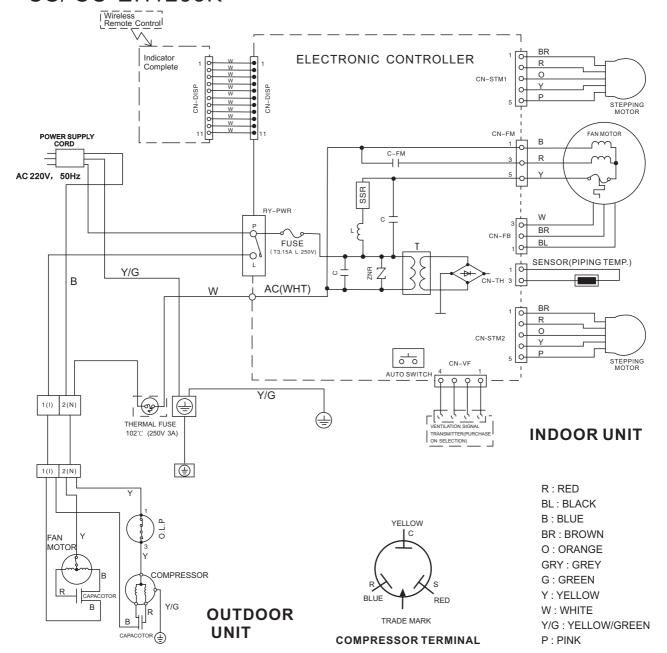


6 Block Diagram



7 Wiring Diagram

CS/CU-EH935K CS/CU-EH1235K



INDOOR FAN MOTOR RESISTANCE(Ω)

	CS-EH935K	CS-EH1235K
CONNECTING	CWA921308	CWA921116
Y-B (M)	395	331
Y-R (A)	325	312

COMPRESSOR RESISTANCE(Ω)

_		
	CU-EH935K	CU-EH935K
CONNECTING	CWB092291	CWB092281
C-R	3.863	2.803
C-S	3.309	4.420

OUTDOOR FAN MOTOR RESISTANCE(Ω)

	CU-EH935K	CU-EH1235K
CONNECTING	CWA951427	CWA951423
Y-B	275	272
Y-R	260	248

8 Operation Details

8.1 Cooling Mode Operation.

When selecting the Cooling Mode Operation, the unit will operate according to the setting by the Remote Controller or the control panel on the indoor unit and the operation is as the following.

Time Delay Safety Control(3 minutes)

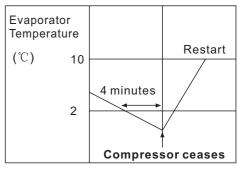
- When the compressor is stopped by Remote Control or power failed, it restarts after 3 minutes when turn on the conditioner using Remote Control.
- When the room temperature reach the setting during cooling operation, the compressor stops and it will not start within 3 minutes.

7 Minutes Time Save Control

• 7 min.----The unit will automatically operate in 7 minutes even if the room temperature is not reached. (Prevention of raising the humidity)

Anti-Freezing Control

- If temperature of evaporator is lower than 2°C continuously for 4 minutes, the compressor will cease to prevent the evaporator from freezing. Fan speed setting will not be changed.
- When temperature of evaporator reaches 10℃, compressor will restart.
- W During Cooling Mode Operation, the Time Delay Safety Control is available.

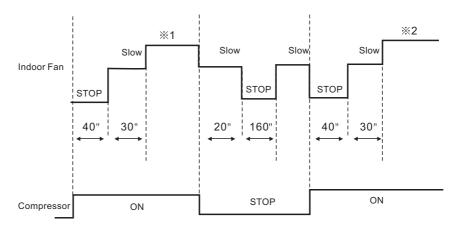


→ Time

Automatic Fan Speed Mode

During Cooling Mode Operation, use remote controller to select Automatic Fan Speed.

- Fan speed will be at the point between "High" and "super low" speed.
- Deodorization control.



- * 1 Fan speed will be at "Hi" till the compressor ceases (set temperature reached).
- * 2 Fan speed will be at "Me" when the compressor restarts.

Quiet Operation Control

(For Cooling Mode or cooling region of Soft Dry Mode)

Purpose of this operation is to provide quite cooling operation compare to normal operation.

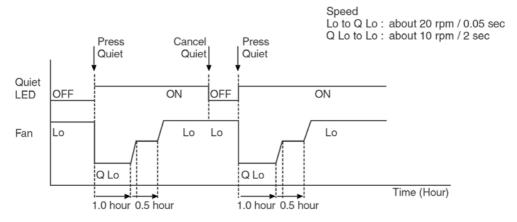
When the Quiet Mode is set at the remote control, Quiet Mode LED illuminates, the sound level will be automatically decreased 2 dB (Lo), decreased 3 dB (Hi, Me), against the present sound level operation.

Quiet setting of fan speed rpm refer to Indoor Fan Speed Control.

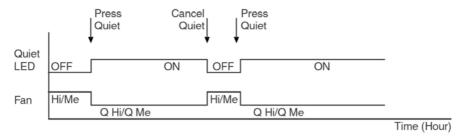
Dew formation become severe at Quiet Lo cool, therefore Quiet Lo cool is operated only 1h 30 min (1h QLo, 30 min QLo + 50). After that, it goes back to Lo cool (However Quiet LED remains on).

Manual Airflow Direction:-

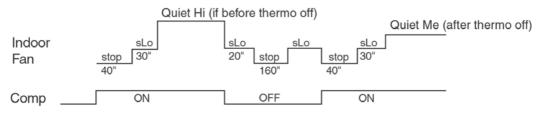
RPM control during Lo cool



RPM control during Hi & Me cool



Auto Airflow Direction:-



Quiet Mode Operation will stop if:-

Quiet mode button is pressed again.

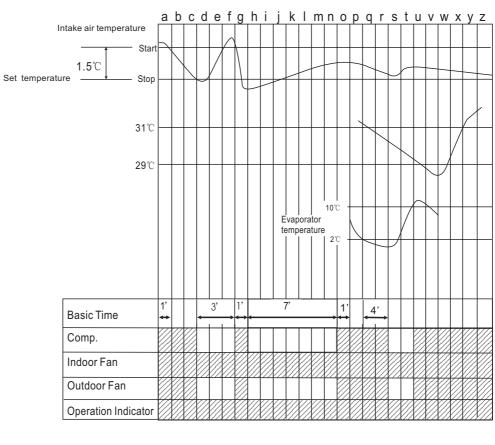
Stopped by ON/OFF switch.

Timer OFF activates.

Powerful mode button is pressed.

When change mode to Air Circulation mode.

Time Graph for Cooling Operation



(Operation status)

→ Time

d-g : Time delay safety control g-h : Compressor Test control

h-o : 7 minutes Time Save Control

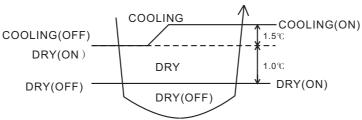
q-t : Anti-freezing Control

Stop

Operate

8.2. Soft Dry Mode Operation

Operation area



- When selecting Soft Dry mode operation, the operation will be cooling until the room temperature reaches the set temp on remote control, and then Soft Dry will be activated. (During Soft Dry Mode the fan of indoor unit will operate at super low speed. The soft dry mode will run for less than 10 minutes.)
- Once Soft Dry mode operation is turned off, indoor fan, compressor and outdoor fan will stop for 6 minutes.

Time Delay Safety Protection

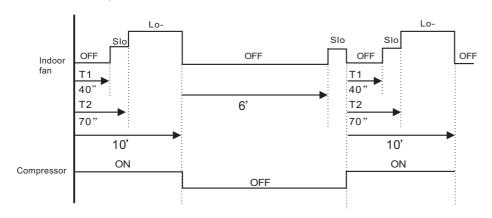
During cooling mode operation, if the compressor ceased, it will not restart within 3 minutes.

Anti Freezing Control

Same as the denotation in Cooling Operation.(P15)
 (During Soft Dry Mode Operation, compressor will stop for at least 6 min.)

Automatic Fan Speed

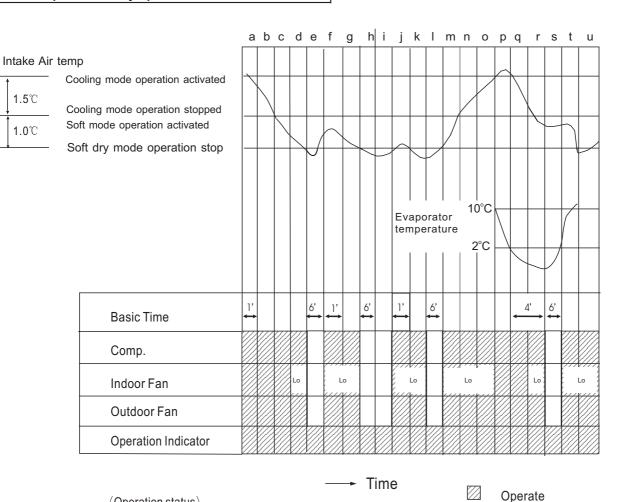
• During Soft Dry Operation, use remote controller to select Auto Fan Speed mode. Indoor Fan Speed is at "Lo-"



Time Graph for soft dry operation

1.5℃

1.0℃



⟨Operation status⟩

: Cooling Mode Operation a-c,p-r Soft Dry Mode Operation c-p,r-u

: Soft Dry Mode Operation Stopped Compressor Test Operation Control j - I

: Anti Freezing Control q - t

Stop

8.3. Automatic Mode Operation

Standard for Determining Operation Mode

First Determination:

Intake Air temperature 23°C Cooling mode Soft Dry mode

	Setting Temperature (Standard)
Cooling mode	25℃
Soft Dry mode	22℃

Second Determination:

One hour after the above determination, the unit will operate according to the table below.

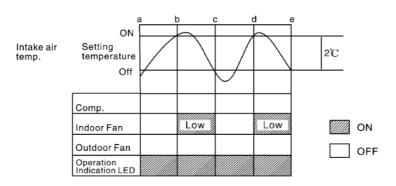
		Second Determination	
		Cooling	Dry
First	Cooling	23℃ or above	
determination	Dry		20°C or above

- A) Indoor fan operates at super low speed for 20 seconds.
- B) After judging indoor air temperature, the operation is determined and operation continued at the mode determined.
- C) After the operation mode has been determined, the mode does not change. However, Soft Dry mode operation includes cooling mode operation.
- D) If automatic mode operation is started while the unit is operating, operation will continue.
- E) If current operation is in cooling mode (including the cooling mode operation when is a part of Soft Dry mode operation) it will be maintained, and if current operation is not cooling mode, the appropriate operation mode is determined for 25seconds at super slow fan speed. Then the selected mode will continue.
- F) The setting temperature for all the operations can be changed one level up or one level down from the standard temperature as shown below by pressing the temperature up or down button at remote control.

			Cooling	Soft Dry
Higher	\rightarrow	+2℃	27℃	24 °C
Standard	\rightarrow	±0°C	25℃	22℃
Lower	\rightarrow	-2℃	23℃	20℃

8.4. Air Circulation Mode Operation

■ When the temperature near the ceiling reaches the setting temperature, Air Circulation Mode Operation commences at low airflow volume. It stops when the temperature drops to 2°C below the setting temperature.



8.5 Air Quality Sensor Control

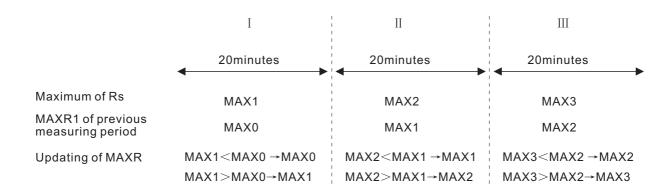
• Resistance of air quality sensor: Rs(air)= $10k \Omega \sim 50k \Omega$ (The worse the air quality, the smaller the resistance.)

Basic Operation

- Detecting and indicating of the air quality will not stop during the operation of the air conditioner.
- The power of the air quality sensor is always on during the operation of the air conditioner. When the air conditioner stops (The air conditioner is on standby.), the air conditioner will provide power to the air quality sensor intermittently (It will be on for 3 minutes after each 109 minutes.) for the purpose of air quality detecting.
- Within 2 minutes after the air conditioner starts to operate, the air quality sensor is in the process of preheating and the air quality indicator is red.

Resistance Reference

- Detecting of air quality(During the operation of the air conditioner):
 - (a) The measuring period is 20 minutes; The air conditioner will measure the resistance (Rs) of the air quality sensor once each 2 seconds and record the data. The maximum Rs within the 20 minutes will be selected as Rs(MAX) for this measuring period.
 - (b) Suppose the current Rs(MAX) as MAX and the resistance reference of the previous measuring period is as MAXR1.; If MAX>MAXR1, the resistance reference of the current measuring period is MAXR=MAX; If MAX<MAXR1, MAXR=MAXR1;</p>
 - (c) Within 2 minutes after the power of the air quality sensor is turned on, the resistance reference of this measuring period is the maximum resistance of the sensor during this period.



The following conditions should be fulfilled

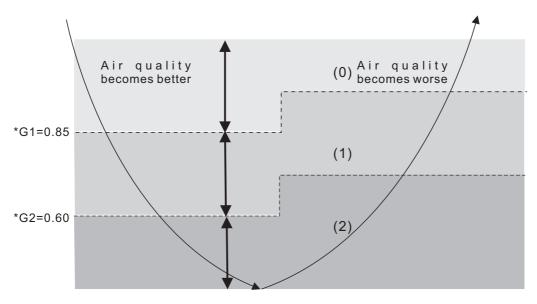
- (d) The initial MAXR after the preheating of the air quality sensor when the air conditioner is turned on:
 - The air conditioner will compare the maximum value of the current measuring period (MAX) with the resistance reference 109 minutes before (MAXRO) and select the bigger one as the current resistance
- (e) reference(MAXR).
 - When the air conditioner determines the air quality is getting worse: Air quality level 1 Air quality level 2, MAXR will not be updated; When the air quality gets better (air quality level 0), Rs detected at this time will be
- (f) MAX and MAXR.
 - The air conditioner will not detect the air quality during deicing operation. The indication prior to the deicing operation will be held during the deicing operation.

- Detecting of air quality(When the air conditioner is on standby.)
 - (a) After the air conditioner stops operation, it will provides power to the air quality sensor intermittently to detect the air quality and update the resistance reference (MAXR). The power of the air quality sensor will be on for 3 minutes after each 109 minutes.
 - (b) During these 3 minutes, the air quality sensor will be in preheating process for 2 minutes and the other time is for measuring the resistance. The air conditioner will compare the maximum resistance measured in this period with the maximum value in the previous 109 minutes and the bigger one will be selected as resistance

Air Quality Control

Detecting of air quality(When the air conditioner is on standby.)
 Rs/MAXR will be calculated automatically every 2 seconds and the air quality level will be determined in accordance with the value below,

	Signal of Air Quality Sensor	Air Quality Level
Air Quality	Rs/MAXR≤G1	(0)→ (1)
Getting Worse	Rs/MAXR≪G2	(1)→(2)
Air Quality	Rs/MAXR≥G3	(2)→ (1)
Getting Better	Rs/MAXR≽G4	(1)→ (0)



X Set the sensitivity number of the air quality sensor as 2 (Standard)

Air Quality Level and Indicator

- During preheating of the air quality sensor the air quality indicator is red.
- The color of the air quality indicator varies with the air quality level:

Air Pollution Level 0: Green

Air Pollution Level 1:Orange

Air Pollution Level 2:Red

Forced Resetting

• Forced Resetting Time (The added operation time mentioned later not included.)

(a) Air Pollution Level 2: Red: 5 minutes Orange: 8 minutes Green
(B) Air Pollution Level 1: Red: 5 minutes Orange: 8 minutes Green

Timer Resetting

When the forced resetting mode is determined and the following conditions are fulfilled, the timer is reset.

- 1) The air quality changes which results in the changing of the color of the air quality indicator.
- 2) Compare Rs detected in current 2 seconds with R1 detected in previous 2 seconds and Rs/R1<0.95.
- 3) Suppose Rs detected in previous 3 minutes is R2 and Rs/R2≤0.87.

Added Operation of Air Quality Sensor

When the air quality getting worse

If the air pollution level changes from 0 to 2, the color of the air quality indicator changes as below, Green → Orange (2 Sec.) → Red

• When the air quality getting better (added operation)

If the air pollution level changes from 2 to o, the color of the air quality indicator changes as below,

Judgment during added operation

During added operation, if the air quality sensor judges that the air quality is getting worse, the added operation will be stopped immediately and the air quality indicator will shift to normal indication. If the air quality getting better, the air conditioner will judge the air quality until the added operation is finished.

Sensitivity Control of Air Quality Sensor

- The sensitivity number can be changed through the following procedure
 - <Setting Sensitivity Number>
 - 1. Keep the SET button on the remote control depressed continuously for 5 seconds to select sensitivity control mode.
 - 2. The previous sensitivity setting will be displayed in the temperature display.

"0"=Turn off the air quality indicator

"1"= Low Sensitivity.......G1=0.70, G2=0.45, G3=0.48, G4=0.73

"2"=Standard Sensitivity.......G1=0.85, G2=0.60, G3=0.63, G4=0.88

"3"=High Sensitivity......G1=0.90, G2=0.65, G3=0.68, G4=0.93

3. Press ∇ or \triangle button on the remote control to change the sensitivity

 Within 10 seconds after the sensitivity setting is finished, other settings are not available. The display of the remote control will change back to normal without pressing any button.

8.6 Demo Mode (Outdoor unit not needed)

Activate the demo mode:

Keep the AUTO button on the indoor unit depressed continuously for 15 seconds until 3 beeps are heard and the demo mode is activated.

Turn off the air conditioner

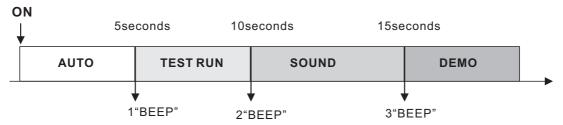
Turn off the air conditioner

Turn off the air conditioner

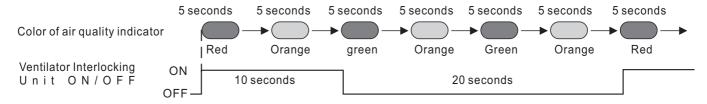
• In demo mode, the air conditioner can be operated(if the outdoor unit is connected to the indoor unit); Whenever you turned off the air conditioner, it will restart automatically into demo mode operation.

Cancel the demo mode:

• Keep the AUTO button on the indoor unit depressed continuously for 15 seconds until 3 beeps are heard.



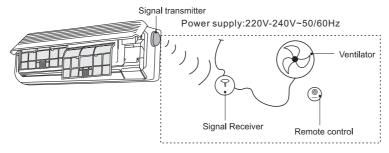
• Demo operation control(Air quality indicator and Ventilator Interlocking Unit signal)



8.7 Ventilator Interlocking Unit Control (Optional)

- Purpose: The air conditioner will control the operation of the ventilator (optional) according to the signal of the air quality sensor when displaying the air quality.
- Devices: Ventilator, Ventilator Interlocking Unit (wireless)

**To use this function, a ventilator and a ventilator interlocking unit should be purchased.



Control Specification:

Air quality getting worse
Air quality getting better



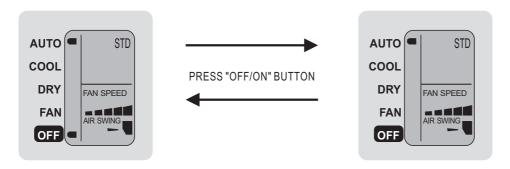
15 minutes after the air conditioner is Turned on:

- Ventilator ON: Air quality indicator is red or
- Ventilator OFF: Air quality indicator is green or the air conditioner is turned off.

*Within 15 minutes after the air conditioner is turned on, the ventilator will not operate even though the air quality indicator is red.

8.8 About Cursor Key Which Points To "OFF" On Remote Control

• When the ON/OFF button on the remote control is pressed, the cursor key which points to "OFF" will appear or disappear to indicate the ON/OFF status of the air conditioner.



- For some reason (Ex. The signal of the remote control does not reach the signal receiver of the indoor unit.), the display of the remote control will not correspond with the actual ON/OFF status of the indoor unit:
 - 1. The air conditioner is running but the cursor key which points to "OFF" appears. The air conditioner can be stopped with any button (Except for "ON/OFF", "TIMER SET", "TIMER ON") pressed.
 - 2. The air conditioner is on standby, but the cursor key which points to "OFF" disappears. The air conditioner can be started with any button(Except for "ON/OFF", "TIMER SET", "TIMER OFF") pressed.

8.9 Indoor Fan Motor Control

- Automatic fan speed control
 When automatic fan speed set, the available range for fan speed is from Hi to Slo.
- Manual Fan Speed Control
 Basic fan speed can be manually adjusted (Lo, Med, Hi) by pressing the fan speed selection button at the Remote Control.
- Basic Fan Speed

Category		Hi	Me	Lo	Lo-	Q	SLo
Cooling Mode	Auto	0	0				0
Operation	Manual	0	0	0			
	Quiet					0	
Soft Dry	Auto				0		0
Operation	Manual				0		0
	Quiet					0	
Fan mode Operation	Auto			0	0	0	
	Manual	0	0	0			
	Quiet					0	

Category		Hi	Me	Lo	Lo-	Q	SLo
	Cool, Dry	1260	1120	960	-	860	600
EH935K	Dry	_	_		900	860	600
	Fan	1260	1120	960	900	860	_
	Cool, Dry	1280	1090	1010	_	930	600
EH1235K	Dry	_	_	_	980	930	600
	Fan	1280	1090	1010	980	930	_

8.10 Airflow Direction Control

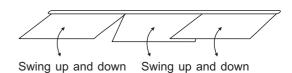
Horizontal Airflow Direction

- Adjust airflow direction louver manually.
- Handhold the adjust pole to move, and the horizontal airflow direction louver moves left and right.



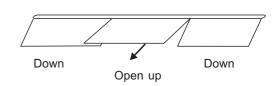
Vertical Airflow Direction Control

- Operation Mode (Cool, Fan, Dry)
 Angles setting of vanes (central vane, right and left vanes) Make level position as norm angle.
 - 1) Automatic airflow direction(Wide)
 The vertical vanes swing vertically.

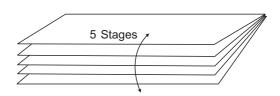


2)Automatic airflow direction(spot)

The left and right vertical vanes adown, the central vane open up



3)Airflow direction adjusted manually. Set 5 stages from the top down



Angles Of Airflow Direction Louver

Opera	ting Mode	1	2	3	4	5		
Cooling	Manual	9°, 9°	17°, 17°	25°, 25°	32°, 32°	36°, 36°		
Soft dry	Auto	32°, 60°						
		9° , 9° ~ 42° , 42°						
Determining mode	g operation	Operate as the remote control set						
		9°, 9°						

 When the AIR SWING button is pressed, the manually airflow direction is released, set the vane angle as shown in the table above. Vertical Airflow Direction Auto-Contol (wide /spot angle)

Wide angle: The central vane and the right and left vanes swing up and down between 12° and 42° at different speeds.

Spot angle: Central vane is at 17 $^\circ\,$, the right and left vanes is at 54 $^\circ\,$,immovablely.

In addition

- 1)When the supply power is on, the unit will adjust the vane stage automatically, make it get back to the turn-off state.

 After the power is on, when startup the unit with pressing the automatic operate button, it will start with previous airflow direction.
- 2) When the operation is stopped by pressing OFF/ON Button in the remote control, the wanes move to closed stage.

8.11 Random Auto restart control

- If there is a power failure during air conditioner operation, operation will be automatically restarted after 3 to 4 minutes when the power is resumed.
- It will start with previous operation mode and airflow direction.
- Auto Restart Control is not available when Timer is set.

9 Installation Instructions

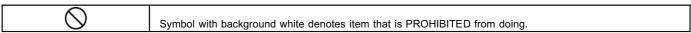
	Required tools for Installation Works							
1.	Philips screw driver	5.	Spanner	9.	Gas leak detector	13. Multimeter		
2.	Level gauge	6.	Pipe cutter	10.	Measuring tape	14. Torque wrench 18 N.m (1.8 kgf.m) 42 N.m (4.2 kgf.m) 55 N.m (5.5 kgf.m)		
3.	Electric drill, hole core drill (ø70 mm)	7.	Reamer	11.	Thermometer	15. Vacuum pump		
4.	Hexagonal wrench (4 mm)	8.	Knife	12.	Megameter	16. Gauge manifold		

9.1. Safety Precautions

- Read the following "SAFETY PRECAUTIONS" carefully before installation.
- Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit
 for the model to be installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each
 indication used is as below. Incorrect installation due to ignoring of the instruction will cause harm or damage, and the
 seriousness is classified by the following indications.

<u> </u>	This indication shows the possibility of causing death or serious injury.			
⚠ CAUTION	This indication shows the possibility of causing injury or damage to properties only.			

The items to be followed are classified by the symbols:



• Carry out test running to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

MARNING

- 1. Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.
- 2. Install according to this installation instruction strictly. If installation is defective, it will cause water leakage, electrical shock or fire.
- 3. Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.
- 4. Install at a strong and firm location which is able to withstand the set• sweight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
- 5. For electrical work, follow the local national wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.
- 6. Use the specified cable (1.5 mm²) and connect tightly for indoor/outdoor connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.
- 7. Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.
- 8. When carrying out piping connection, take care not to let air substances other than the specified refrigerant go into refrigeration cycle. Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury.
- 9. When connecting the piping, do not allow air or any substances other than the specified refrigerant (R22) to enter the refrigeration cycle. Otherwise, this may lower the capacity, cause abnormally high pressure in the refrigeration cycle, and possibly result in explosion and injury.
- 10. Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock. if the power supply cord is damaged, engage an authorized dealer to replace it.

CAUTION

- 1. The equipment must be earthed. It may cause electrical shock if grounding is not perfect.
- Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.



3. Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture

ATTENTION

1. Selection of the installation location.

Select a installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.

2. Power supply connection to the room air conditioner.

Connect the power supply cord of the room air conditioner to the mains using one of the following method.

Power supply point shall be the place where there is ease for access for the power disconnection in case of emergency.

In some countries, permanent connection of this room air conditioner to the power supply is prohibited.

1. Power supply connection to the receptacle using a power plug.

Use an approved 10A power plug with earth pin for the connection to the socket.

- 2. Power supply connection to a circuit breaker for the permanent connection. Use an approved 10A circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3 mm contact gap.
- 3. Do not release refrigerant.
 - Do not release refrigerant during piping work for installation, reinstallation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
- 4. Installation work.
 - It may need two people to carry out the installation work.
- 5. Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.

Attached accessories.

No.	Accessories part		Qty.	
1	Installation plate		1	
2	Installation plate fixing screw		5	
3	Remote control		1	
4	Battery	⊚ ⊕ ⊖)	2	
5	Catechin Air Filter		1	
6	Optical Deodorising Filter			

SELECT THE BEST LOCATION

INDOOR UNIT

- There should not be any heat source or steam near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- Recommended installation height for indoor unit shall be at least 2.5 m.

OUTDOOR UNIT

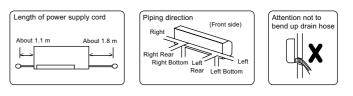
- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharge air.
- If piping length is over the common length, additional refrigerant should be added as shown in the table.

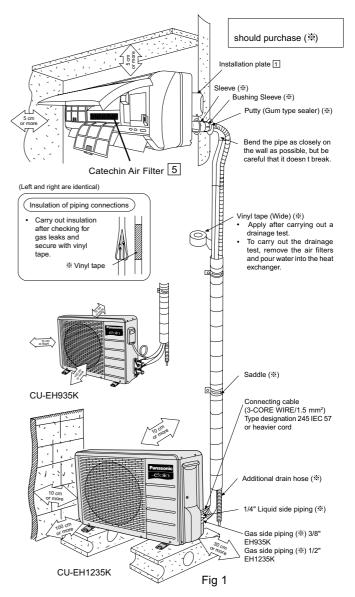
NA- del	Piping size		Max.	Max. Piping	Additional
Model	Gas	Liquid	Elevation (m)	Length (m)	Refrigerant (g/m)
EH935K	3/8"	1/4"	5	7	-
EH1235K	1/2"	1/4"	5	7	-

9.2. INDOOR UNIT

9.2.1. SELECT THE BEST LOCATION (Refer to "Select the best location" section)

Indoor/Outdoor Unit Installation Diagram





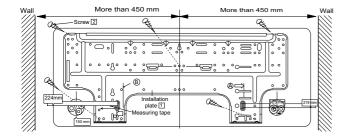
This illustration is for explanation purposes only.
 The indoor unit will actually face a different way.

9.2. INDOOR UNIT

9.2.1. SELECT THE BEST LOCATION (Refer to "Select the best location" section)

9.2.2. HOW TO FIX INSTALLATION PLATE

The mounting wall is strong and solid enough to prevent it from the vibration.



The centre of installation plate should be at more than 450 mm at right and left of the wall.

The distance from installation plate edge to ceiling should more than 75 mm.

From installation plate left edge to unit's left side is 74 mm. From installation plate right edge to unit's right is 94 mm.

- ⑤ : For left side piping, piping connection for liquid should be about 10 mm from this line.
 - : For left side piping, piping connection for gas should be about 45 mm from this line.
 - : For left side piping, piping connecting cable should be about 800 mm from this line.
- Mount the installation plate on the wall with 5 screws or more.

(If mounting the unit on the concrete wall consider using anchor bolts.)

Always mount the installation plate horizontally by aligning the marking-off line with the thread and using a level gauge.

2. Drill the piping plate hole with ø70 mm hole-core drill.

Line according to the arrows marked on the lower left and right side of the installation plate. The meeting point of the extended line is the centre of the hole. Another method is by putting measuring tape at position as shown in the diagram above. The hole centre is obtained by measuring the distance namely 105 mm and 145 mm for left and right hole respectively.

Drill the piping hole at either the right or the left and the hole should be slightly slanted to the outdoor side.

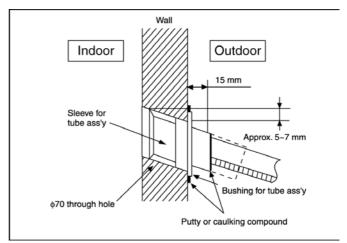
9.2.3. TO DRILL A HOLE IN THE WALL AND INSTALL A SLEEVE OF PIPING

- 1. Insert the piping sleeve to the hole.
- 2. Fix the bushing to the sleeve.
- 3. Cut the sleeve until it extrudes about 15 mm from the wall.

Cautio r

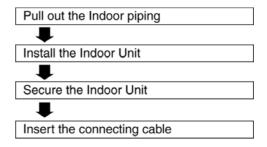
When the wall is hollow, please be sure to use the sleeve for tube ass'y to prevent dangers caused by mice biting the connecting cable.

4. Finish by sealing the sleeve with putty or caulking compound at the final stage.

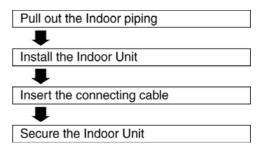


9.2.4. INDOOR UNIT INSTALLATION

1. For the right rear piping



2. For the right and right bottom piping



3. For the embed ded piping

Replace the drain hose



Bend the embedded piping



Use a spring bender or equivalent to bend the piping so that the piping is not crushed.

Install the Indoor Unit



Cut and flare the embedded piping



 When determing the dimension of the piping, slide the unit all the way to the left on the installation plate. Refer to the section "Cutting and flaring the

Pull the connecting cable into Indoor Unit



• The inside and outside connecting cable can be connected without removing the front grille

Connect the piping



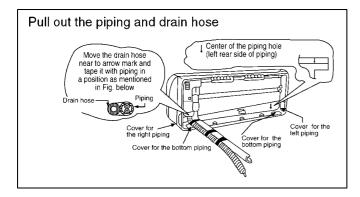
 Please refer to "Connecting the piping" column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

Insulate and finish the piping

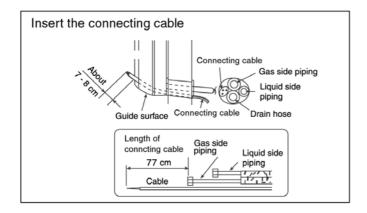


Please refer to "Piping and finishing" column of outdoor section and "Insulation of piping connections" column as mentioned in Indoor/ Outdoor Unit Installation.

Secure the Indoor Unit

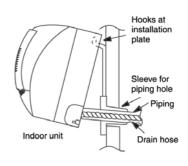


Cover for piping How to keep the cover In case of the cover is cut, keep the cover at the rear of chassis as shown in the illustration for future reinstallation. (Left, right and 2 bottom covers for piping)



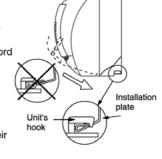
Install the Indoor Unit

Hook the indoor unit onto the upper portion of installation plate (Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving in left and right.

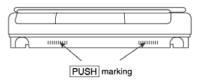


Secure the Indoor Unit

- 1. Tape the extra power supply cord in a bundle and keep it behind the chassis.
 - Ensure that the power supply cord is not clamped in between the unit's hook (2 positions) and installation plate.
- 2. Press the lower left and right side of the unit against the installation plate until hooks engages with their slots (sound click).



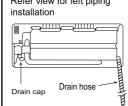
To take out the unit, push the PUSH marking at the bottom unit, and pull it slightly towards you to disengage the hooks from the unit.

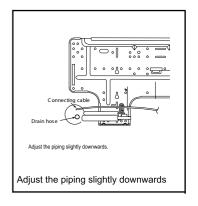


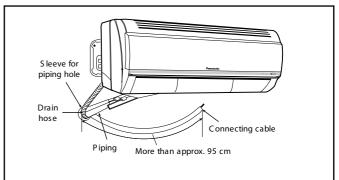
(This can be used for left rear piping & left bottom piping also.)

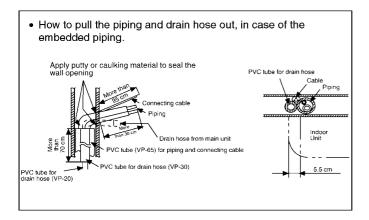
Exchange the drain hose and the cap

Refer view for left piping









In case of left piping how to insert the connecting cable and drain hose.

Drain hose

Cable

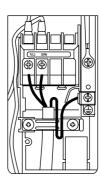
(For the right piping, follow the same procedure)

9.2.5. CONNECT THE CABLE TO THE INDOOR UNIT

- 1. The inside and outside connecting cable can be connected without removing the front grille.
- Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 x1.5 mm² flexible cord, type designation 245 IEC 57 or heavier cord.
 - Ensure the color of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
 - Earth lead wire shall be longer than the other lead wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the anchorage.

Terminals on the indoor unit	1(L)	2(N)	(1)
Color of wires			
Terminals on the outdoor unit	1(L)	2(N)	(1)

■ Secure the cable onto the control board with the holder (clamper).

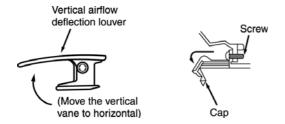


HOW TO TAKE OUT FRONT GRILE

Please follow the steps below to take out front grille if necessary such as when servicing.

- 1. Set the vertical airflow direction louver to the horizontal position.
- Slide down the two caps on the front grille as shown in the illustration at right, and then remove the two mounting screws
- 3. Pull the lower section of the front grille towards you to remove the front grille.

When reinstalling the front grille, first set the vertical airflow direction louvre to the horizontal position and then carry out above steps 2 - 3 in the reverse order.



AUTO SWITCH OPERATION

The below operations will be performed by pressing the "AUTO" switch.

1. AUTO OPERATION MODE

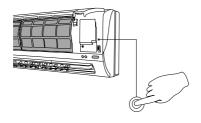
The Auto operation will be activated immediately once the Auto Switch is pressed.

2. TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)

The Test Run operation will be activated if the Auto Switch is pressed continuously for more than 5 sec. to below 10 sec. A "pep" sound will occur at the fifth sec., in order to identify the starting of Test Run operation

3. REMOTE CONTROLLER RECEIVING SOUND ON/OFF

The ON/OFF of Remote Controller receiving sound can be changed over by pressing the "AUTO" Switch continuously for 10 sec. and above. A "pep", "pep" sound will occur at the tenth sec., in order to indicate the "ON/OFF" changed over of remote control receiving sound.

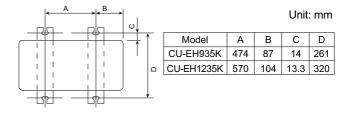


9.3. OUTDOOR UNIT

9.3.1. SELECT THE BEST LOCATION (Refer to "Select the best location" section)

9.3.2. INSTALL THE OUTDOOR UNIT

- After selecting the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.
- 1. Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut. (ø10 mm).
- 2. When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.



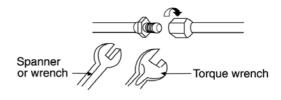
9.3.3. CONNECTING THE PIPING

Connecting The Piping To Indoor Unit

Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.



Model	Piping size (Torque)			
Model	Gas	Liquid		
EH935K	3/8" [42 N · m]	1/4" [18 N · m]		
EH1235K	1/2" [55 N · m]	1/4" [18 N · m]		

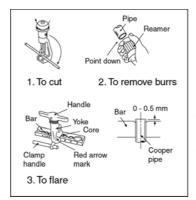
Connecting The Piping To Outdoor Unit

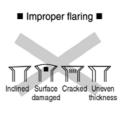
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (located at valve) onto the copper pipe.

Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

CUTTING AND FLARING THE PIPING

- 1. Please cut using pipe cutter and then remove the burrs.
- 2. Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused.
 - Turn the piping end down to avoid the metal powder entering the pipe.
- 3. Please make flare after inserting the flare nut onto the copper pipes.

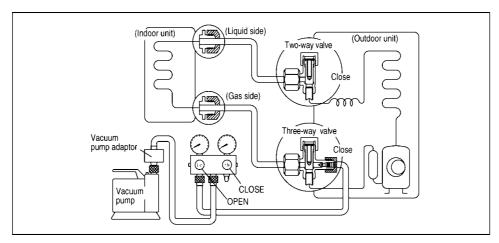




When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

9.3.4. (a) EVACUATION OF THE EQUIPMENT (FOR EUROPE & OCEANIA DESTINATION)

WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.



- 1. Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
 - Be sure to connect the end of the charging hose with the push pin to the service port.
- 2. Connect the center hose of the charging set to a vacuum pump with check valve, or vacuum pump and vacuum pump adaptor.
- 3. Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.
- 4. Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.

Note: BE SURE TO FOLLOW THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.

- 5. Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
- 6. Tighten the service port caps of the 3-way valve at torque of 18 N.m with a torque wrench.
- 7. Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to "OPEN" using a hexagonal wrench (4 mm).
- 8. Mount valve caps onto the 2-way valve and the 3-way valve.
 - "Be sure to check for gas leakage.

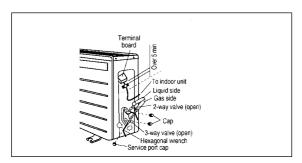
CAUTION

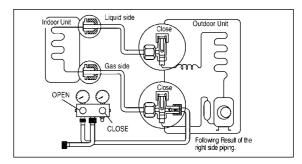
- If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa), in step 3 above take the following measure:
- If the leak stops when the piping connections are tightened further, continue working from step 3.
- If the leak does not stop when the connections are retightened, repair the location of leak.
- "Do not release refrigerant during piping work for installation and reinstallation. Take care of the liquid refrigerant, it may cause frostbite.

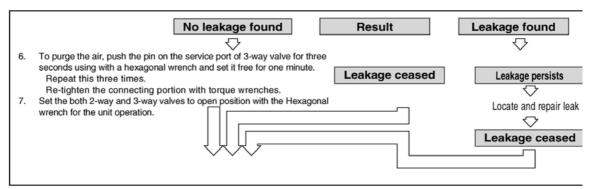
9.3.5. (b) AIR PURGING OF THE PIPING AND INDOOR UNIT

The remaining air in the Refrigeration cycle which contains moisture may cause malfunction on the compressor.

- 1. Remove the caps from the 2-way and 3-way valves.
- 2. Remove the service-port cap from the 3-way valves.
- 3. To open the valve, turn the valve stem of 2-way valve counter-clockwise approx. 90° and hold it there for ten seconds, then close it.
- 4. Check gas-leakage of the connecting portion of the pipings.
 - For the left pipings, refer to item 4(A).
- 5. To open 2-way valve again, turn the valve stem counter-clockwise until it stops.



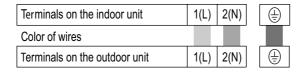




- 4(A). Checking gas leakage for the left piping.
 - * Connect the manifold gauge to the service port of 3-way valve.
 Measure the pressure.
- (2) * Keep it for 5-10 minutes.Ensure that the pressure indicated on the gauge is the* same as that of measured during the first time.

9.3.6. CONNECT THE CABLE TO THE OUTDOOR UNIT

- 1. Remove the control board cover from the unit by loosening the screw.
- 2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 x 1.5 mm² flexible cord, type designation 245 IEC 57 or heavier cord.



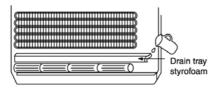
- 3. Secure the cable onto the control board with the holder (clamper).
- 4. Attach the control board cover back to the original position with the screw.

9.3.7. PIPE INSULATION

- 1. Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
- 2. If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

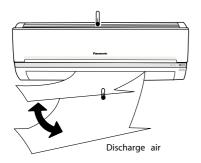
CHECK THE DRAINAGE

- Open front panel and remove air filters.
 (Drainage checking can be carried out without removing the front grille.)
- Pour a glass of water into the drain tray-styrofoam.
- Ensure that water flows out from drain hose of the indoor unit.



EVALUATION OF THE PERFORMANCE

- Operate the unit for fifteen minutes or more.
- Measure the temperature of the intake and discharge air.
- Ensure the difference between the intake temperature and the discharge is more than 8°C.



CHECK ITEMS Is there any gas leakage at flare nut connections? Has the heat insulation been carried out at flare nut connection? Is the connecting cable being fixed to terminal board firmly? Is the connecting cable being clamped firmly? Is the drainage OK? (Refer to "Check the drainage" section) Is the earth wire connection properly done? Is the indoor unit properly hooked to the installation plate? Is the power supply voltage complied with rated value? Is there any abnormal sound? Is the cooling operation normal?

Is the air purifying filter installed?

NOTE:

These equipment shall be connected to a suitable mains network with a main impendance less than: EH935K:0.38ohm, EH1235K:0.27ohm

10 2-way, 3-way Valve

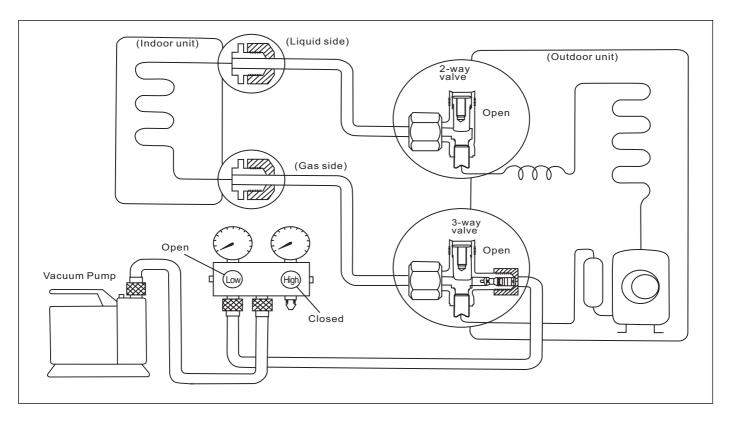
	2-way Valve (Liquid Side)	3-way Valve	(Gas Side)
	To piping To outdoor unit	To piping To out	Open position Close position Pin Service-port
Works	Shaft Position	Shaft Position	Service Port
Shipping	Close (With valve cap)	Closed (With valve cap)	Closed (With cap)
Air purging(Installation and Re- installation)	Open (Counter-clockwise)	Closed (clockwise)	Open (Push-pin)
Operation	Open (Counter-clockwise)	Open (With valve cap)`	Closed (With cap)
Pumping down (Transferring)	Closed (Clockwise)	Open (Counter-clockwise)	Open (Connected manifold gauge)
Evacuation (Servicing)	Open	Open	Open (With vacuum pump)
Charging (Servicing)	Open	Open	Open (With charging cylinder)
Pressure check (Servicing)	Open	Open	Open (Connected manifold gauge)
Gas releasing (Servicing)	Open	Open	Open (Connected manifold gauge)

10.1. Evacuation of Installation

When installing an air conditioner, be sure to evacuate the air inside the indoor unit and pipes in the following procedure. Required tools:

Hexagonal wrench, adjustable wrench, torque wrench, wrench to hold the joints, gas leak detector, charging set and vacuum pump.

The air in the indoor unit and in the piping must be purged. If air remains in the refrigeration piping, it will affect the compressor, reduce cooling capacity, and could lead to a malfunction.



Service port cap

Be sure, using a torque wrench to tighten the service port cap(after using the service port), so that it prevents the gas leakage from the refrigeration cycle.

Procedure:

- 1.Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
- Be sure to connect the end of the charging hose with the push pin to the service port.
- 2.Connect the centre hose of the charging set to a vacuum pump.
- 3.Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 Mpa) to -76 cmHg (-0.1 Mpa). Then evacuate the air for approximately 10 minutes.
- 4.Close the valve of the Low side of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately 5 minutes.
 - BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID GAS REFRIGERANT LEAKAGE.
- 5.Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.

- 6. Tighten the service port caps of both the 3-way valve and the 2-way valve at a torque of 18 N.m with a torque wrench.
- 7.Remove the valve caps of both the 3-way and the 2-way valves.
 - Position both of the valves to "open" using a hexagonal wrench (4 mm).
- 8. Mount valve caps onto both of the 3-way valve and the 2-way valve.

Be sure to check for gas leakage.

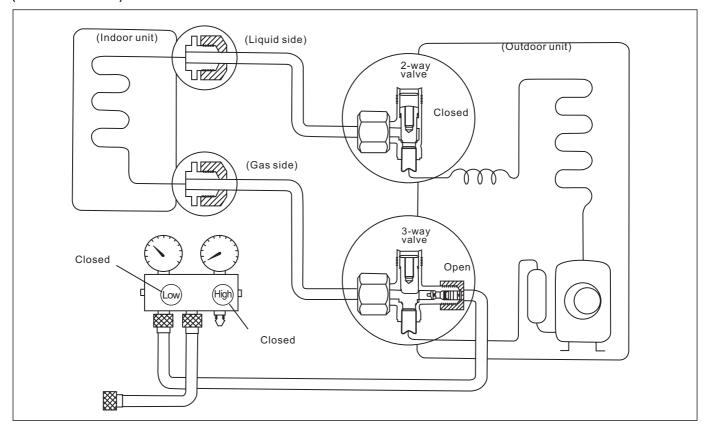
Caution

If gauge needle does not move from 0 cmHg(0 Mpa) to -76cmHg (-0.1MPa) in step (3) above, take the following measures: If the leaks stop when the piping connections are tightened further, continue working from step (3).

If the leaks do not stop when the connections are retightened, repair the location of the leak.

10.2. Pumping down

(For Re-Installation)



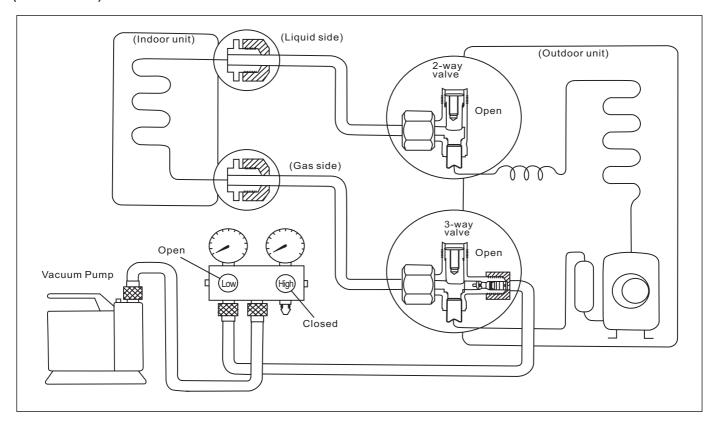
Procedure

- 1.Confirm that both 2-way and 3-way valves are set to open positions.
 - Remove the valve stem cap and confirm that the valve stems are in the open position.
 - Be sure using a hexagonal wrench to operate the valve stems.
- 2. Operate the unit for 10-15 minutes.
- 3.Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.
 - Connect the charge hose with the push pin to the service port.
- 4. Air purging of the charge hose.
 - Open the low-pressure valve of the charge set slightly to purge air from the charge hose.
- 5.Set the 2-way valve to the close position.

- 6. Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 2 kg/cm²G (0.1Mpa).
 - If the unit cannot be operated at the cooling mode operation (weather is rather cold), short the Pumping Down pins on the Main Control P.C.B.
- 7. Immediately set 3-way valve to the closed position.
 - Do this quickly so that the gauge ends up indicating 1 to 3kg/cm²G (0.1 to 0.3 Mpa).
- 8. Use refrigerant reclaiming equipment to collect refrigerant from indoor unit and pipes.
- 9. Disconnect the charge set, and mount the 2-way and 3-way valve stem's nuts and service port cap.
 - Use torque wrench to tighten the service port cap to a torque 1.8kgf.m (18N.m).
 - Be sure to check for gas leakage.
- 10. Disconnect pipes from indoor unit and outdoor unit.

10.3.Re-air Purging

(Re-installation)



1.Connect a charging hose with a push pin to the Low side of a charging set and the service port of a 3-way valves.

Be sure to connect the end of the charging hose with the push pin to the service port.

- 2. Connect the centre hose of the charging set to a vacuum pump.
- 3.Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 Mpa) to -76 cmHg (-0.1 Mpa). Then evacuate the air for approximately 10 minutes.
- 4.Close the valve of the Low side of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately 5 minutes.

BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID GAS REFRIGERANT LEAKAGE.

- 5.Disconnect the charging hose from the vacuum pump
- 6. Charge the pipes and indoor unit with gas refrigerant from 3-way valve service port, and then discharge the refrigerant until low side (gas side) gauge needle indicates 0.3 Mpa (3 kg/cm²).

- 7.Tighten the service port caps of both the 3-way valve and the 2-way valve at a torque of 18 N.m with a torque wrench.
- 8.Remove the valve caps of both the valves. Position both of the valves to "open" using a hexagonal wrench (4 mm).
- 9. Mount valve caps onto both the valves.
 - BE SURE TO USE REFRIGERANT RECLAIMING EQUIPMENT WHILE DISCHARGING THE REFRIGERANT.
 - Purge the air from charge set's centre hose.
 - Be sure to check for gas leakage.

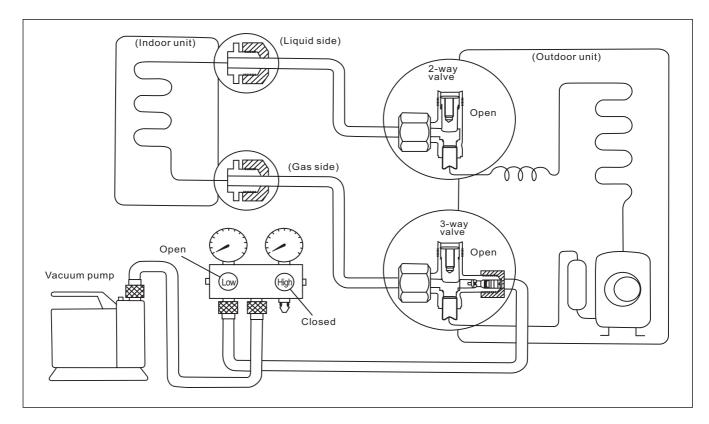
Caution

If gauge needle does not move from 0 cmHg(0 Mpa) to -76cmHg (-0.1MPa) in step (3) above, take the following measures: If the leaks stop when the piping connections are tightened further, continue working from step (3).

If the leaks do not stop when the connections are retightened, repair the location of the leak.

10.4. Balance refrigerant of the 2-way, 3-way walves

(Gas leakage)



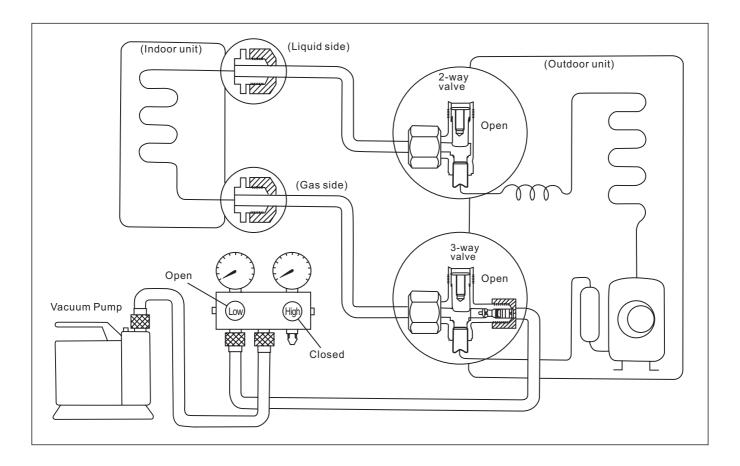
Procedure

- 1.Confirm that both the 3-way valve and 2-way valve are set to the open position.
- 2.Connect the charge set to the 3-way valve's service port.
 - Leave the valve on the charge set closed.
 - Connect the charge hose with the push-pin to the service port.
 - Confirm whether the pressure indicates more than 1 kg/cm²G (0.1MPa).
- 3.Connect the charge set's centre hose to refrigerant reclaiming equipment.

- 4.Open the valve (Low side) on the charge set and discharge the refrigerant until the gauge indicates 0.05 MPa (0.5 kg/cm²G) to 0.1 MPa (1 kg/cm²G).
- If there is no air in the refrigeration cycle (the pressure when the air conditioner is not running is higher than 0.1 MPa (1 kg/cm²G), discharge the refrigerant until the gauge indicates 0.05 MPa (0.5 km/cm²G) to 0.1 MPa (1 kg/cm²G). If this is the case, it will not be necessary to apply a evacuation.
- Discharge the refrigerant gradually; if it is discharged too suddenly, the refrigeration oil will also be discharged.
- 5. Turn on refrigerant reclaiming equipment to collect the refrigerant until the needle indicates 0 (no refrigerant is remaining).

10.5. Evacuation (Installation)

(No refrigerant in the refrigeration cycle)



Procedure

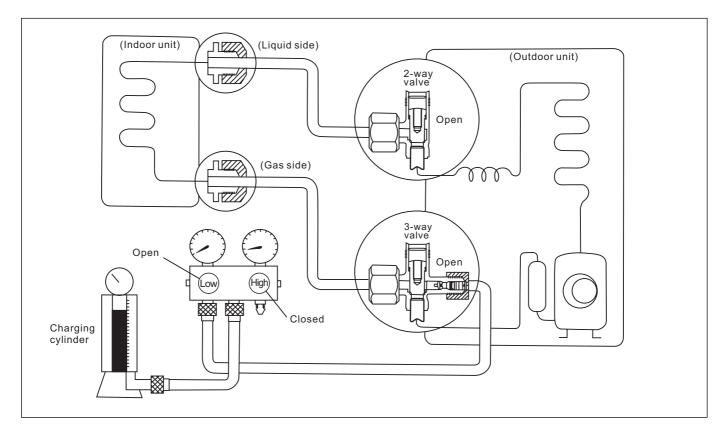
1. Connect the vacuum pump to the charge set's centre hose.

2. Evacuation for approximately 1 hour.

- Confirm that the gauge needle has moved toward -76cmHg (-0.1MPa) [vacuum of 4 mmHg or less].
- 3.Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- 4. Disconnect the charge hose from the vacuum.
 - Vacuum oil
 If the vacuum pump oil becomes dirty or depleted, replenish as needed.

10.6. Gas charging

(After Evacuation)



Procedure

1.Connect the charge hose to the charging cylinder.

- Connect the charge hose which was disconnected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder also use a scale and reverse the cylinder so that the system can be charged with liquid.

2.Purge the air from the charge hose.

- Open the valve at the bottom of the cylinder and use a screwdriver to press the check valve on the charge set to purge the air.(Be careful of the liquid refrigerant.)
- The procedure is the same if using a gas cylinder.

3. Open the valve (Low side) on the charge set and charge the system with liquid refrigerant.

 If the system cannot be charged with the specified amount of refrigerant, it can be charge with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle.

However, one time is not sufficient, wait approximately 1 minute and then repeat the procedure. (Pumping down pin)

This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do no attempt to charge with large amount of liquid refrigerant while operating the air conditioner.

4.Immediately disconnect the charge hose from the 3-way valve's service port.

- Stopping part-way will allow the refrigerant to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

5. Mount the valve stem nuts and the service port.

- Use a torque wrench to tighten the service port cap to a torque of 1.8kgf.m (18 N.m)
- Be sure to check for gas leakage.

11 Disassembly of the parts

Removal Procedure For Intake Grille

1. Open the intake grille and pull it to the horizontal position. (Fig. 1)



Fig. 1

2. Pull up the intake grille until it falls off.(Fig. 2)



Fig. 2

Removal Procedure For Front Grille

1.Remove the two caps at the discharge port (right and left) (Fig. 3)



Fig. 3

2. Release the two screws under the both caps. (Fig. 4)



Fixing Screw



3.Pull out the front grille from the unit body. (Fig.5)

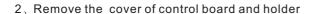


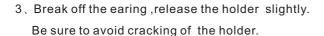
Fig. 5

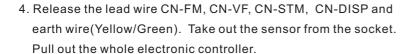
Removal Procedure For Electronic Controller

1. Remove indicador complete

Afer removing the front grille, loose the screw behind the indicator, the whole indicator can be released.







Remove the whole control board
 Loose the screw s of control board, earings slightly, then the whole control board can be pulled out.



Fig 6 Indicator Complete

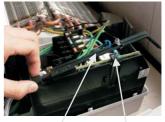


Fig 7 Holder Earing



Fig 8

Fig 9

Removal Procedure For the Discharge Grille

1. Separate the drain hose and the drain plate(Fig.10)





Fig 10



Fig. 11

Removal Procedure For Cross Flow Fan

 Release the two fixing screws, disassembly the fixing board from evaporator on the left side of the evaporator and pull out the whole evaporator. (Fig. 12)



Fig. 12

2.Loose the fixing screw of the cross flow fan. (Fig. 13)



Fixing Screw

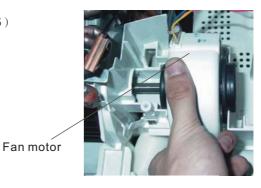
Fig. 13

3. After removing the bearing (refer to fig14), indoor fan can be taken out from the left side.



Fig 14

4. Lift up the indoor fan slightly, and then pull the fan motor out. (Fig15)



Remote control reset

If the display is chaotic or can not be adjusted, Use a pin to press RESET button to reset the remote control to the original set by manufacture.



12 Troubleshooting Guide

12.1. Refrigeration cycle system

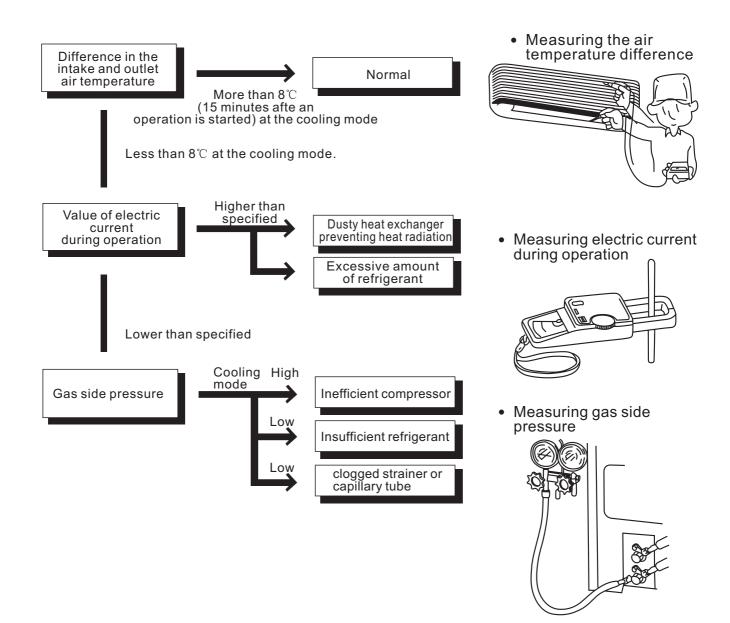
In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of compressor or fan.

The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table to the right.

Normal pressure and outlet air temperature(standard)

	Gas side pressure	Outlet air
	Мра	temperature
	(kg/cm ² G)	(℃)
Cooling mode	0.4~0.6(4~6)	12~16

★ Condition: indoor fan speed: high outdoor temperature: 35°C (Cooling mode)



12.2. Relationship between the condition of air conditioner and pressrue and electric current

	Cooling mode			
Condition of the air conditioner	Low pressure	High pressure	Electric current during operation	
Insufficient refrigerant (gas leakage)	¥	7	`\	
Clogged capillary tube	¥	¥	¥	
Short circuit in the indoor unit	¥	¥	¥	
Heat radiation deficiency of the outdoor unit	1	1	1	
Insufficient compression	1	¥	7	

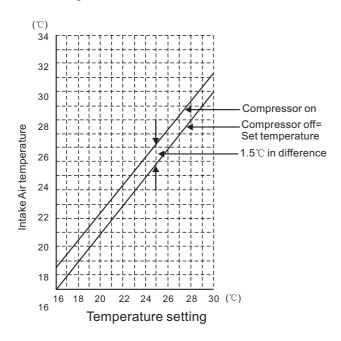
12.3. Diagnosis methods of a malfunction of a compressor .

Nature of fault	Symptom
Insufficient compressing of a compressor	 Electric current during operation becomes approximately 80% lower than the normal level. The discharge tube of the compressor becomes abnormally hot (normally 70~90℃). The difference between high pressure and low pressure becomes almost zero.
Locked compressor	 Electric current reaches a high level abnormally, and the value exceeds the limit of an ammeter. In some cases, a breaker turns off. The compressor has a humming sound.

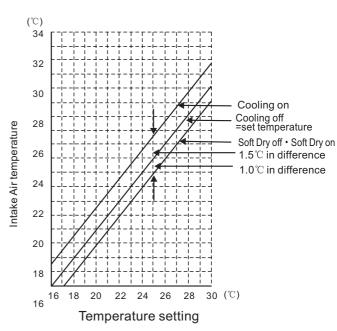
13 Technical Data

■ Thermostat characteristics

• Cooling mode

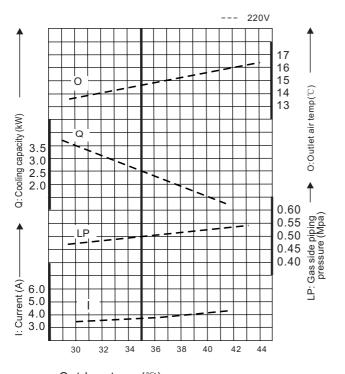


• Soft dry mode



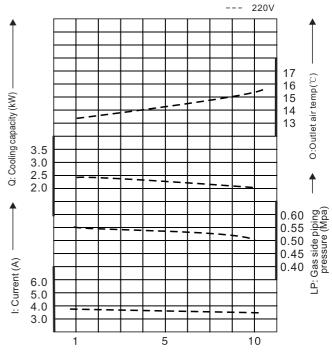
• CS/CU-EH935K

■ Cooling characteristics



Outdoor temp($^{\circ}$) [Condition] Room temp: 27/19 $^{\circ}$ Cooling operation:at high speed Piping length:5m

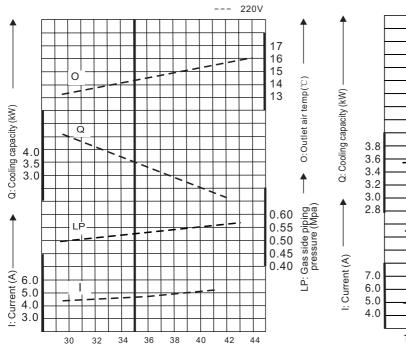
■ Piping Length Characteristic



Piping Length(m) [Condition] Room temp: 27/19°C Outdoor Temperature :35/24°C Cooling operation :at high speed

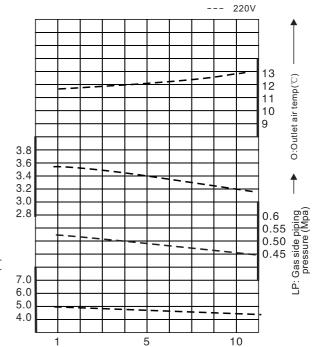
• CS/CU-EH1235K

■ Cooling characteristics



Outdoor temp($^{\circ}$ C) [Condition] Room temp: 27/19 $^{\circ}$ C Cooling operation:at high speed Piping length:5m

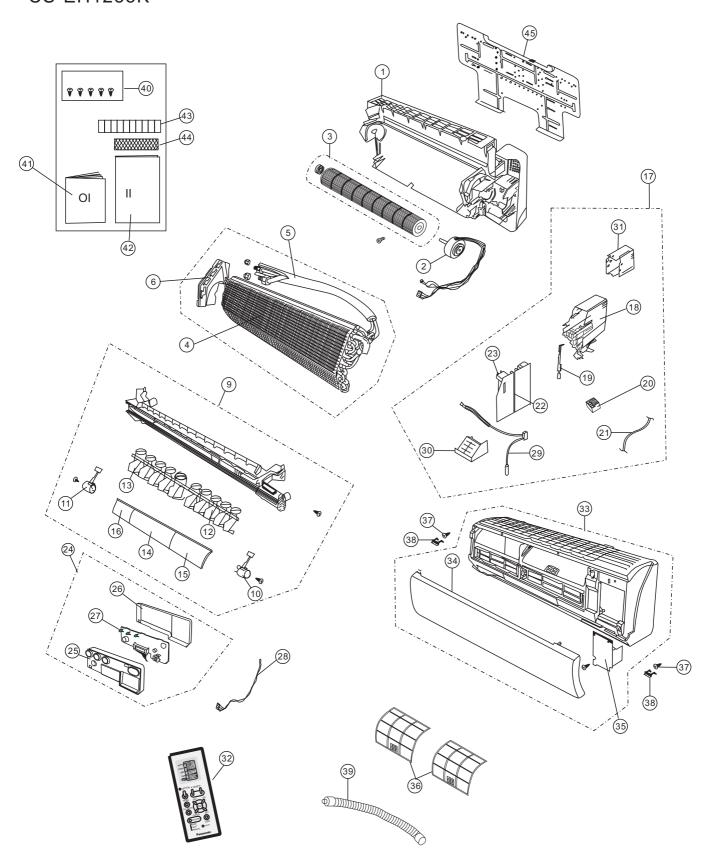
■ Piping Length Characteristic



Piping Length(m) [Condition] Room temp: 27/19℃ Outdoor Temperature :35/24℃ Cooling operation :at high speed

14 Exploded View

CS-EH935K CS-EH1235K



15 Replacement Parts List

CS-EH935K CS-EH1235K

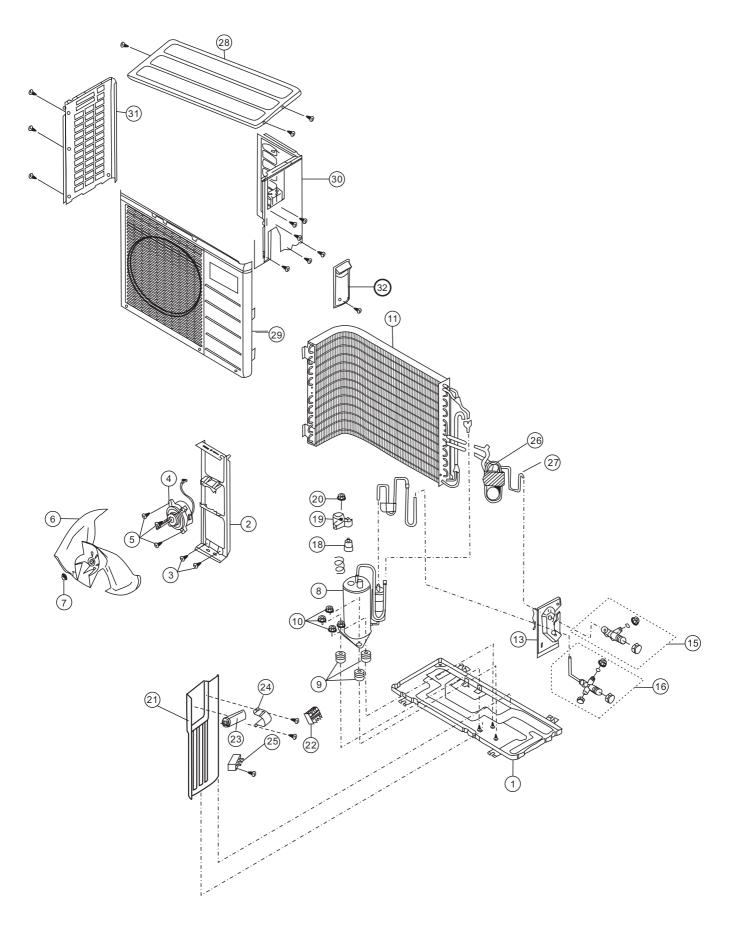
No.	DESCRIPTION&NAME	Q'ty	CS-EH935K	CS-EH1235K	RE
1	CHASSIS COMPLETE	1	CWD50C1426	CWD50C1426	
2	FAN MOTOR	1	CWA921308	CWA921116	
3	CROSS FLOW FAN COMPLETE	1	CWH02C1036	CWH02C1036	
4	EVAPORATOR	1	CWB30C1712	CWB30C1714	
5	TUBE ASS'Y	1	CWT01C3476	CWT01C3425	
6	FIXING BOARD	1	CWD661044	CWD661043	
9	DISCHARGE GRILLE COMPLETE	1	CWE20C2427	CWE20C2427	
10	AIR SWING MOTOR(LEFT)	1	CWA981135J	CWA981135J	
11	AIR SWING MOTOR (RIGHT)	1	CWA981131	CWA981131	
12	VERTICAL VANE(RIGHT)	1	CWE24C1092	CWE24C1092	
13	VERTICAL VANE(LEFT)	1	CWE24C1093	CWE24C1093	
14	HORIZONTAL VANE(MIDDLE)	1	CWE241164A	CWE241164A	
15	HORIZONTAL VANE(RIGHT)	1	CWE241165A	CWE241165A	
16	HORIZONTAL VANE(LEFT)	1	CWE241166A	CWE241166A	
17	C-BOX	1	CWH14C4667	CWH14C4668	
18	CONTROL BOARD	1	CWH102265	CWH102265	
19	HOLDER	1	CWD932493	CWD932493	
20	TERMINAL BOARD	1	CWA28C2085	CWA28C2087	
21	POWER SUPPLY CORD COMPLETE	1	CWA20C2362	CWA20C2362	
22	MAIN PCB	1	CWA743879	CWA743880	
24	INDICATOR COMPLETE	1	CWE39C1129	CWE39C1129	
25	INDICATOR HOLDER-FRONT	1	CWD932491	CWD932491	
26	INDICATOR HOLDER-BACK	1	CWD932492	CWD932492	
27	INDICATOR PCB	1	CWA743700	CWA743700	
28	LEAD WIRE(INDICATOR)	1	CWA67C5500	CWA67C5500	
29	SENSOR COMPLETE	1	CWA50C2271J	CWA50C2271J	
30	CONTROL BOARD FRONT COVER	1	CWH131235	CWH131235	
31	CONTROL BOARD TOP COVER	1	CWH131237	CWH131237	
32	REMOTE CONTROL	1	CWA75C2696	CWA75C2696	
33	FRONT GRILLE COMPLETE	1	CWE11C3237	CWE11C3237	
34	INTAKE GRILLE	1	CWE221135	CWE221135	
35	GRILLE DOOR	1	CWE141073	CWE141073	
36	AIR FILTER	2	CWD001153	CWD001153	
37	SCREW-FRONT GRILLE	2	XTT4+16CFJ	XTT4+16CFJ	
38	CAP-FRONT GRILLE	2	CWH521109	CWH521109	
39	DRAIN HOSE	1	CWH851074	CWH851074	
40	BAG COMPLETE	1	CWH82C1214	CWH82C1214	
41	OPERATING INSTRUCTIONS	1	CWF564724	CWF564724	
42	INSTALLATION INSTRUCTIONS	1	CWF612767	CWF612767	
43	CATECHIN AIR FILTER	1	CWMD00C0001	CWMD00C0001	
44	OPTICAL DEODORISING FILTER	1	CWD00C1150	CWD00C1150	
45	INSTALLATION PLATE	1	CWH361069	CWH361069	

Note:

All parts are supplied from GMAC, P.R. China.

16 Exploded View

CU-EH935K



17 Replacement Parts List

CU-EH935K

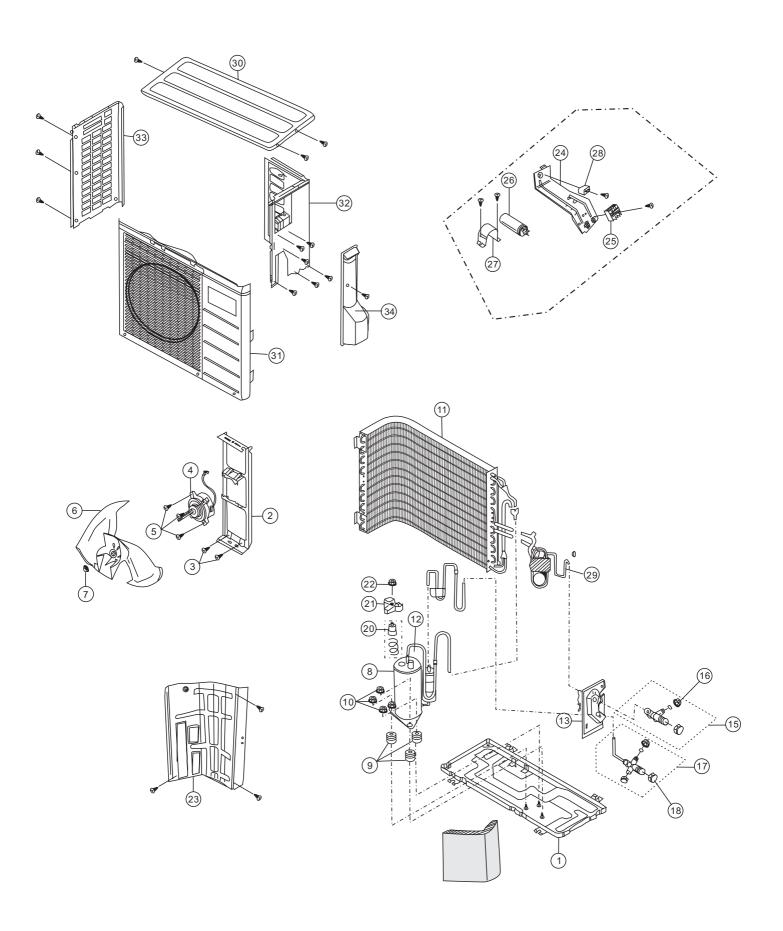
No.	DESCRIPTION&NAME	Q'ty	CU-EH935K	RE
1	BASE ASS'Y	1	CWD52K1106A	
2	HOLDER-FAN MOTOR	1	CWD541072	
3	SCREW-F.M. HOLDER	2	XTT4D10CFJ	
4	FAN MOTOR	1	CWA951427	
5	FIXING SCREW-FAN MOTOR	3	CWH55406J	
6	PROPELLER FAN	1	CWH03K1025	
7	NUT-P.FAN	1	CWH561036J	
8	COMPRESSOR	1	CWB092291	
9	MOUNT RUBBER(COMP.)	3	CWH501022	
10	NUT-COMP.MOUNT	3	CWH561047A	
11	CONDENSER	1	CWB32C1483P	
13	HOLDER-COUPLING	1	CWH351049A	
15	2-WAY VALVE	1	CWB021260	
16	3-WAY VALVE	1	CWB011322	
18	OVER LOAD PROTECTOR	1	CWA121220	
19	TERMINAL COVER	1	CWH17006	
20	NUT-TERMINAL COVER	1	7080300J	
21	SOUND PROOF PANEL	1	CWH151080	
22	TERMINAL BOARD ASS'Y	1	CWA28K1105	
23	CAPACITOR-COMPRESSOR	1	DS371306CPXC	
24	HOLDER-CAPACITOR	1	CWH301037	
25	CAPACITOR-FAN MOTOR	1	F0DAH2050001	
26	TUBE ASS'Y(CAPILLARY)	1	CWT01C3512	
27	CAPILLARY	1	CWB15211	
28	SURFACE COVER	1	CWE031044A	
29	CABINET FRONT PLATE	1	CWE06K1049	
30	CABINET SIDE PLATE(R)	1	CWE041125A	
31	CABINET SIDE PLATE(L)	1	CWE041124A	
32	CONTROL BOARD COVER	1	CWH131223	

Note:

All parts are supplied from GMAC, P.R. China.

18 Exploded View

CU-EH1235K



19 Replacement Parts List

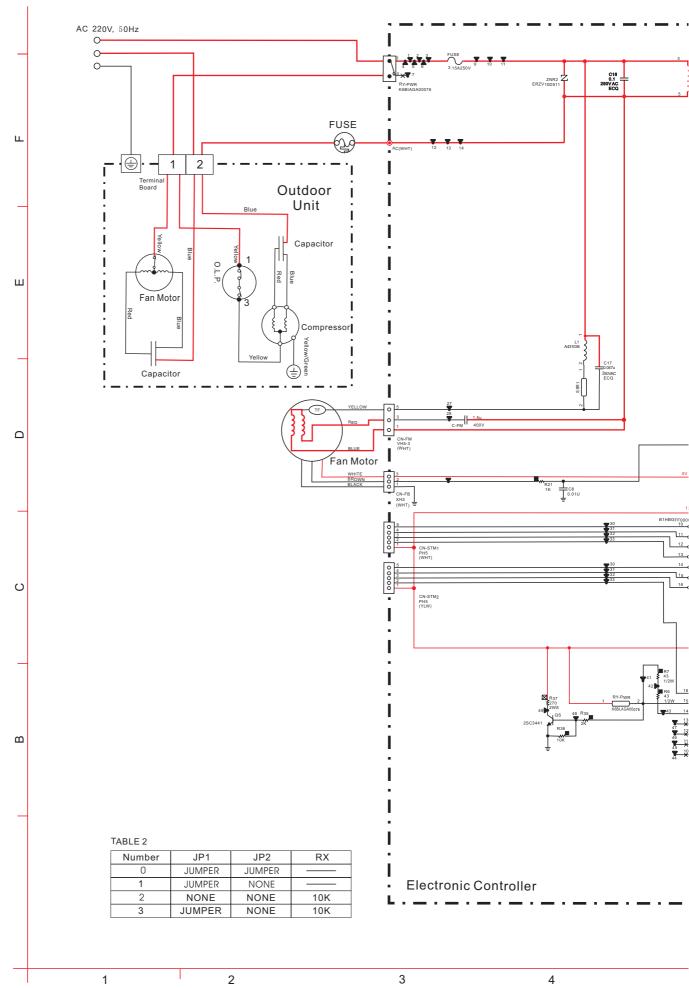
CU-EH1235K

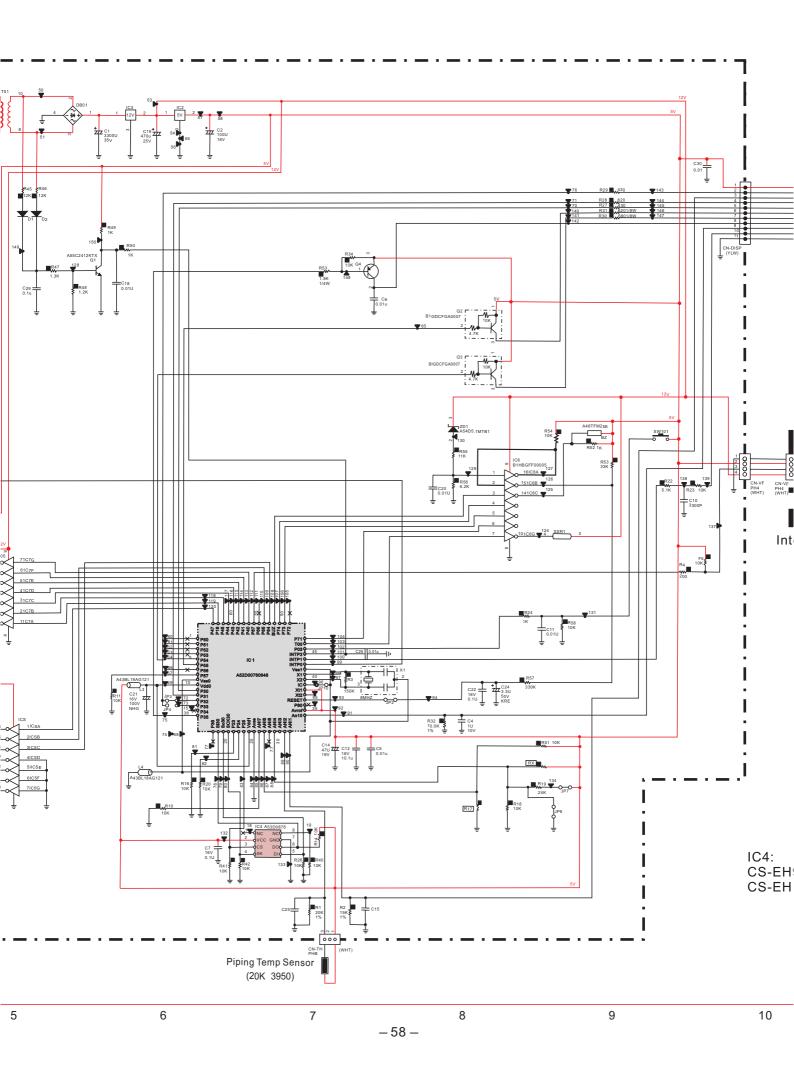
No.	DESCRIPTION&NAME	Q'ty	CU-EH1235K	RE
1	BASE ASS'Y	1	CWD50K2122A	
2	HOLDER-FAN MOTOR	1	CWD541020	
3	SCREW-F.M. HOLDER	2	CWH551060J	
4	FAN MOTOR	1	CWA951423	
5	FIXING SCREW-FAN MOTOR	4	CWH55406J	
6	PROPELLER FAN	1	CWH03K1010	
7	NUT-P.FAN	1	CWH561036J	
8	COMPRESSOR	1	CWB092281	
9	MOUNT RUBBER(COMP.)	3	H50077	
10	NUT-COMP.MOUNT	3	CWH561047A	
11	CONDENSER	1	CWB32C1556P	
12	TUBE ASS'Y(RECEIVER)	1	CWT01C3513	
13	HOLDER-COUPLING	1	CWH351017	
15	2-WAY VALVE	1	CWB021260	
17	3-WAY VALVE	1	CWB011323	
19	OVER LOAD PROTECTOR	1	CWA121218	
21	TERMINAL COVER	1	CWH17006	
22	NUT-TERMINAL COVER	1	CW7080300J	
23	SOUND PROOF PANEL	1	CWH151113	
24	CONTROL BOARD	1	CWH102270	
25	TERMINAL BOARD ASS'Y	1	CWA28K1105	
26	CAPACITOR-COMPRESSOR	1	DS371306CPXC	
27	HOLDER-CAPACITOR	1	CWH30165	
28	CAPACITOR-FAN MOTOR	1	CWA312150	
29	TUBE ASS'Y(CAPILLARY)	1	CWT01C3513	
30	SURFACE COVER	1	CWE031054	
31	CABINET FRONT PLATE	1	CWE06C1116	
32	CABINET SIDE PLATE(R)	1	CWE041116A	
33	CABINET SIDE PLATE(L)	1	CWE041118A	
34	CONTROL BOARD COVER	1	CWH13C1119	

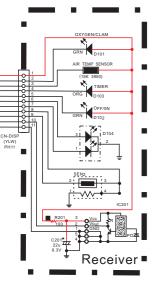
Note:

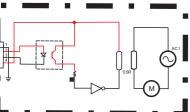
All parts are supplied from GMAC, P.R. China.

20.1 CS/CU-EH935K CS/CU-EH1235K









erlocking Ventilator Unit(Optional)

935K:A53D0964 1235K:A53D0965

12

11

20.2 How to use electronic circuit diagram.

Before using the circuit diagram, read the following carefully.

• Voltage measurement

Voltage has been measured with a digital tester when the indoor fan is set at high Fan Speed under the following conditions without setting the timer.

Use them for servicing.

Voltage indication is in red.

Measurement point

• Indication for capacitor

Type:

Electrolytic Capacitor: Not indicated...NHG series aluminium electrolytic capacitor

FC.....FC series aluminium electrolytic capacitor T.....Ta series aluminium electrolytic capacitor

Ceramic capacitor: Not indicated.....KB series aluminium electrolytic capacitor

NB.....NB series ceramic capacitor

• Indication for resistance

 $\mathbf{K}.....\mathbf{K}\,\Omega$ $M....M\Omega$ W.....Watt

Not indication.....1/10 W

☐Refer to the Form

20.3 Remote Control Electronic Diagram

