

# WALLMOUNTEDTYPE

**AS12SGGE** 

AS09S8GE

SH12ZSG

**AQ12SGGE** 

**SH09ZS8** 

AQ09S8GE

**SH07ZS8** 

AQ07S8GE

# TRAINING Manual

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# **Model Line-Up**

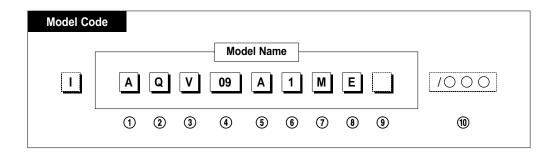
- 1-1. Model Identification
- 1-2. Model Line-Up

### **Model Identification**

#### 1-1. Model Identification

#### **Wall Mounted Type Air Conditioner**

#### Standard type



Sub_Set		3 Tech	
Set	None	General	
Indoor	ı	Tropical	Т
Outdoor	Х	INV+R22	٧
0	. 1	R22+BLDC	D
① Set Initi	al	Low Temp.	L
Set	Α	R407c	С
Indoor	Α	R410a	Α
Outdoor	U	R410a+BLDC	В
			_
② Mode			
H/P	Q		

C/O

	Х	INV+R22	V		
		R22+BLDC	D	⑤ Design o	
tia	ıl	Low Temp.	L	Grille typ	е
	Α	R407c	С	S/S Stand	Α
	Α	R410a	A	Smile	В
	U	R410a+BLDC	В	C&C	С
		1141001BLBO		V-Lip	D
е				G Advanced Model	Р
	Q			G Standard Model	S
	S			G Standard Model (KL Grille)	K
				Interior	ı
				GE	Е
				KLIMAT	Υ

"30"

Capacity		6 Used		
Btu		PD('00R)	1	
'30"	HP M	1ark	PD_MR('00R)	2
		_	MD('00R)	3
-	esign o		MD_MR('00R)	4
Grille type			PD2	5
S/S St	and	Α	PD2_MR	6
Smi	le	В	MD2	7
C&(	0	С	MD2 MR	8
V-Li	р	D	PD3	9
Advance	d Model	Р	PD3MR	0
Standar	d Model	S	PD3IVIR	U

⑥ Option		7 P/J Nam	е
(Outdoor unit sash)		V2	М
Active	Α	R	R
Active + MR	В	T2	Т
INV	С	Fashion	F
C Specification+MR	D	V3	С
Active2	Е	В	В
G Mold	G	G	G
		Used	Q
		Used	V
		Used	Α

® Rating Volt	age
115V, 60Hz	Α
220V, 60Hz	В
208~230V, 60Hz	С
200~220V, 50Hz	D
220~240V, 50Hz	Е
@ 0 1 V	

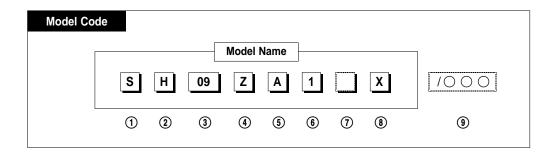
9 Serial Vers	ion
Basic	None
M/R	R
Specification change	:
į.	- 1



# Model Identification (cont.)

#### **Wall Mounted Type Air Conditioner**

• Separated type of export model for EU in private



① Products	S
Separated type	S
Separated type	3

② Function	1
H/P	Н
C/O	С

③ Сара	
Btu	

4 Tech	
Normal	Z
Tropical	Т
INV+R22	٧
R22+BLDC	D
Lower temperature model	L
R407c	С
R410a	Α
R410a+BLDC	В

⑤ Design of Grille type		
S/S Standard	Α	
Smile	В	
C&C	С	
V-Lip	D	
G Advanced Model	Р	
G Standard Model	S	
G Standard Model (KL Grille)	K	
Interior	I	
Fashion	F	
GE	Е	
KI IMAT	γ	

6 Option (Outdoor unit sash)		
PD	1	
PD_MR	2	
MD	3	
MD_MR	4	
PD2	5	
PD2_MR	6	
MD2	7	
MD2_MR	8	
PD3	9	
PD3_MR	0	
Active	Α	
A Specification+MR	В	
INV(VSash)	С	
C Specification+MR	D	
G Mold	G	

Active2

Ε

① Half finished products		
Indoor	None	
Outdoor	Х	
Serial Version		

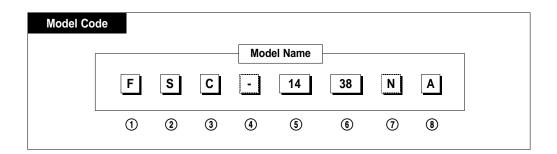
Serial Version		
Basic	None	
Specification change	Α	
:	- :	

Secondary specification division			
Model for Western	NONE(EU)		
Not used	XZE		
Model for Australia	XSA		



# Model Identification (Cont.)

#### Piping(Parts Box)



① Piping division		
Initial	F	

② Products		
Export	RAC	S
Domestic	RAC	R
Common	PAC	Р
	Cassette	В
	Duct	D
	Sealing	F
	DPM	М

③ Function		
Export	H/P	Н
	C/O	С
Domestic	H/P	Н
	C/O	С
	Oil	G
	Multi	М

	4 Division	
Н	Export	No
С	Domestic	-
Н		
С	⑤ High press Outer diamet	
G	Outer diame	lei
N.4	1/4"	14

6 Low pressure Outer diameter		
1/4"	12	
3/4"	34	
3/8"	38	
5/8"	58	

3/4"

38

⑦ Voltage type		
Export	NONE	
Domestic	Indoor	N
	Outdoor	Χ

8 Version		
Basic	Α	
New1	В	
'01R Standard	Z	

MODEL LINE-UP

# Model Line-Up

# 1-2. Model Line-Up (2003R)

			Indoor Unit	Outdoor Unit	nit Piping Unit		
		7K	AS07SBGE AS07PBGE	US07SBGE US07PBGE	FRC1438Z		
	A (STEEL)	9K	AS09SBGE AS09PBGE	US09SBGE US09PBGE	FRC1438Z		
		12K	AS12PBGE AS12SBGE	US12PBGE US12SBGE	FRC1412Z		
COOLING ONLY		7K	AS07S8GB AS07S8GD AS07S8GE	US07S8GB US07S8GD US07S8GE	FRC1438Z		
	B (MOLD)	9K	AS09S8GB AS09S8GD AS09S8GE	US09S8GB US09S8GD US09S8GE	FRC1438Z		
		12K	AS12SGGB AS12SGGD AS12SGGE	US12SGGB US12SGGD US12SGGE	FRC1412Z		
		7K	AQ07SBGE AQ07PBGE	UQ07SBGE UQ07PBGE	FSH1438Z		
	C (STEEL)	9K	AQ09SBGE AQ09PBGE	UQ09SBGE UQ09PBGE	FSH1438Z		
		12K	AQ12SBGE	UQ12SBGE	FSH1412Z		
HEAT PUMP		7K	SH07ZS8 AQ07S8GE SH07ZPG AQ07P8GE	SH07ZS8X UQ07S8GE SH07ZPGX UQ07P8GE	FSH1438Z		
	D (MOLD)	9K	SH09ZPG AQ09P8GE SH09ZS8 AQ09S8GE	SH09ZPGX UQ09P8GE SH09ZS8X UQ09S8GE	FSH1438Z		
		12K	SH12ZSG AQ12SGGE	SH12ZSGX UQ12SGGE	FSH1412Z		



# **Specifications**

2-1. Heat Pump

2-2. Cooling Only

# Heat Pump

# 2-1. Heat Pump

				Model		2ZSG SGGE		9ZS8 9S8GE		7ZS8 'S8GE	
Item					Indoor unit	ndoor unit Outdoor unit		Indoor unit Outdoor unit		Indoor unit Outdoor unit	
Туре					Wall-mounting		Wall-m	nounting	Wall-m	ounting	
	Cooling			kW	3	.5	2.7		2.2		
	Heating			kW	3	.8	2.9		2.3		
	Dehumidifying			I/h	1	.9	1	.4	C	).9	
	A.'		Cooling	2/	7.9	24	6.4	19	5.8	19	
Perfor- mance	Air volume		Heating	- m³/min	8.6	24	7.0	19	6.2	19	
mance			Cooling		40	50	38	48	36	47	
	Noise		Heating	- dB	40	50	38	48	36	47	
			Cooling		2.	97	2	.81	2	.86	
	Energy efficier	icy ratio	Heating	- W/W	3.	25	3	.22	3	.29	
	Power			V-Hz	1-220 /	240-50	1-220	/ 240-50	1-220	240-50	
			Cooling		11	80	9	60	7	70	
	Power Consun	nption	Heating	W	11	70	9	00	7	00	
			Cooling		5	.3	4	l.4	3	3.3	
	Operating Curr	rent	Heating	- A	5	i.1	4	1.0	3	3.1	
	Power factor		Cooling		96.8		94.9		99.9		
Power			Heating	- %	99	9.7	97.8		98.2		
	Starting curren	ıt		A	32	2.0	2	1.0	1	8.0	
			Length	m		-		-		-	
	Power cord		Number of core	wire		-		-		-	
			Capacity	А	250V-1	0 / 16A	250V-1	10 / 16A	250V-10 / 16A		
	Outer	"		mm	890 x 285 x 179	695 x 530 x 280	795 x 258 x 179	660 x 475 x 242	795 x 258 x 179	660 x 475 x 242	
	Dimension			inch	35.0 x 11.2 x 7.0	27.4x20.9x11.0	31.3 x 10.2 x 7.0	26.0 x 18.7 x 9.5	31.3 x 10.2 x 7.0	26.0x18.7x9.5	
	Weight		'	kg	8.5	33.0	7.5	26.3	7.5	25.6	
			Liquid	mm x L(MT)	ø6.3	5 x 5	ø6.35 x 5		ø6.35 x 5		
	Refrigerant pip	е	GAS	mm x L(MT)	ø12.	7 x 5	ø9.5	52 x 5	ø9.5	52 x 5	
	Drain hose			D x L(mm)	ø18 x	2000	ø18 :	x 2000	ø18 :	< 2000	
Size		Туре			Ro	tary	Ro	tary	Ro	tary	
	Compressor	Motor	Туре		-	-	-	-	-	-	
			Rated output		-	-	-	-	-	-	
		Туре			Cross-flow	Propeller	Cross-flow	Propeller	Cross-flow	Propeller	
	Blower	Motor	Туре		steel	steel	steel	steel	steel	steel	
			Rated output	W	15	25	11	20	11	20	
Heat ex	changer		1	1	2ROW 12STEP	1ROW 20STEP	2ROW 10STEP	1ROW 18STEP	2ROW 10STEP	1ROW 18STEP	
	rant control unit					RY TUBE		ARY TUBE		RY TUBE	
Freezer	r oil capacity			CC	60	00	3	60	3	60	
	rant to change(F	R-22)		g	8:	20	6	60	620		
	ion device	•			RAC 120	074-9622	RAC 12	054-9622	RAC 12144-9622		
Cooling	test Condition					UNIT : DB27°C			R UNIT : DB35°		
	ım operation Co	ndition				UNIT : DB32°C			R UNIT : DB43		
	.,										

# **Cooling Only**

# 2-2. Cooling Only

				Model	AS12	SGGE	AS09	S8GE	
Item					Indoor unit	Outdoor unit	Indoor unit	Outdoor unit	
Туре					Wall-m	ounting	\Wall-n	nounting	
	Cooling			BTU/h	12,	500	9,200		
	Dehumidifying			I/h	1	.9	1	1.4	
Perfor-	Air volume		Cooling	m³/min	7.9	24	6.4	19	
mance	Noise		Cooling	dB	40	50	38	48	
	Energy efficier	ncy ratio	Cooling	W/W	2.	97	2	.81	
	Power			V-Hz	1-220 /	240-50	1-220	/ 240-50	
	Power Consur	mption	Cooling	W	11	80	9	60	
	Operating Cur	rent	Cooling	Α	5	.3	4	1.4	
	Power factor Cooling		%	96	5.8	9	4.9		
Power	Starting currer	nt		Α	32	2.0	2	1.0	
			Length	m		-		-	
	Power cord Number of			wire		-	-		
	Capacity A				250V-1	0 / 16A	250V-	10 / 16A	
	Outer		Width x Height	mm	890 x 285 x 179	695 x 530 x 280	795 x 258 x 179	660 x 475 x 242	
	Dimension		x Depth	inch	35.0 x 11.2 x 7.0	27.4x20.9x11.0	31.3 x 10.2 x 7.0 26.0 x 18.7 x		
	Weight		·	kg	8.5	32.5	7.5	24.5	
	Refrigerant pip	ре	Liquid	mm x L(MT)	ø6.35 x 5		ø6.35 x 5		
			GAS	mm x L(MT)	ø12.	7 x 5	ø9.52 x 5		
Size	Drain hose		•	D x L(mm)	ø18 x	2000	ø18 x 2000 Rotary		
Size		Туре			Ro	tary			
	Compressor	Motor	Туре		-	-	-	-	
			Rated output		-	-	-	-	
		Туре			Cross-flow	Propeller	Cross-flow	Propeller	
	Blower	Motor	Туре		steel	steel	steel	steel	
			Rated output	W	15	25	11	20	
Heat ex	xchanger				2ROW 12STEP	1ROW 20STEP	2ROW 10STEP	1ROW 18STEP	
Refrige	rant control unit				CAPILLA	RY TUBE	CAPILLA	ARY TUBE	
Freeze	r oil capacity			СС	60	00	3	60	
Refrige	rant to change(I	R-22)		g	82	20	6	60	
Protect	ion device				RAC 120	074-9622	RAC 12054-9622		
Cooling	test Condition				INDOOR UNIT :	DB27°C WB19°C	OUTDOOR UNIT	: DB35°C WB24°C	
Maxim	um operation Co	ndition			INDOOR UNIT :	DB32°C WB23°C	OUTDOOR UNIT	: DB43°C WB26°C	



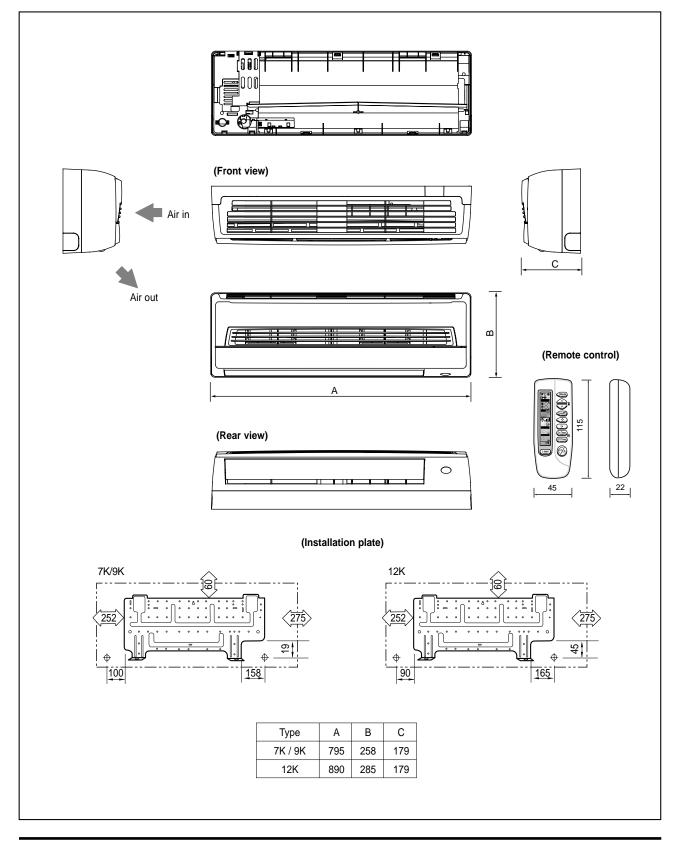
# **Outline & Dimension**

3-1. Indoor Unit

3-2. Outdoor Unit

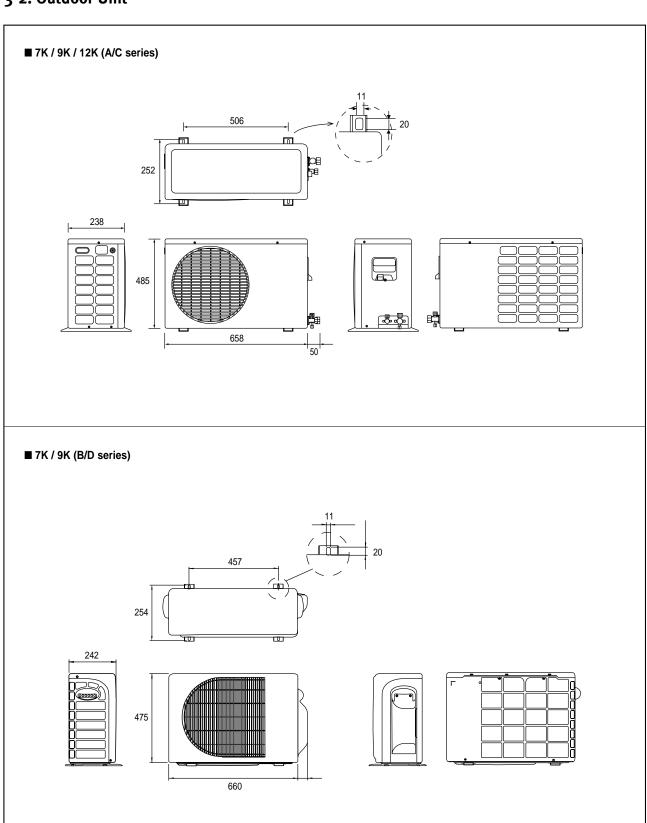
# **Indoor Unit**

#### 3-1. Indoor Unit

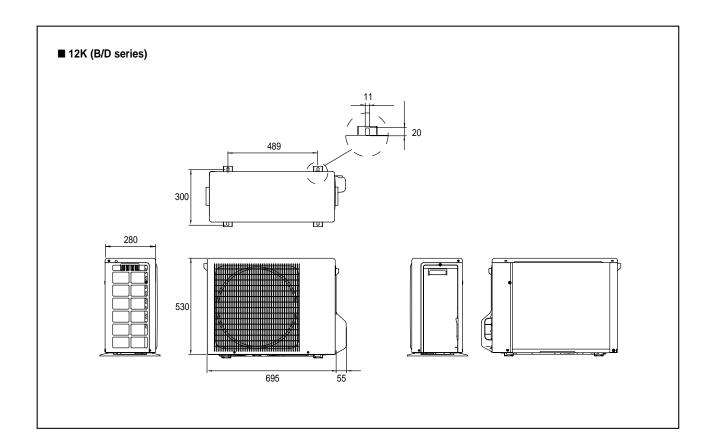


# **Outdoor Unit**

#### 3-2. Outdoor Unit



# Outdoor Unit (Cont.)



# **MEMO**



# **Performance Data**

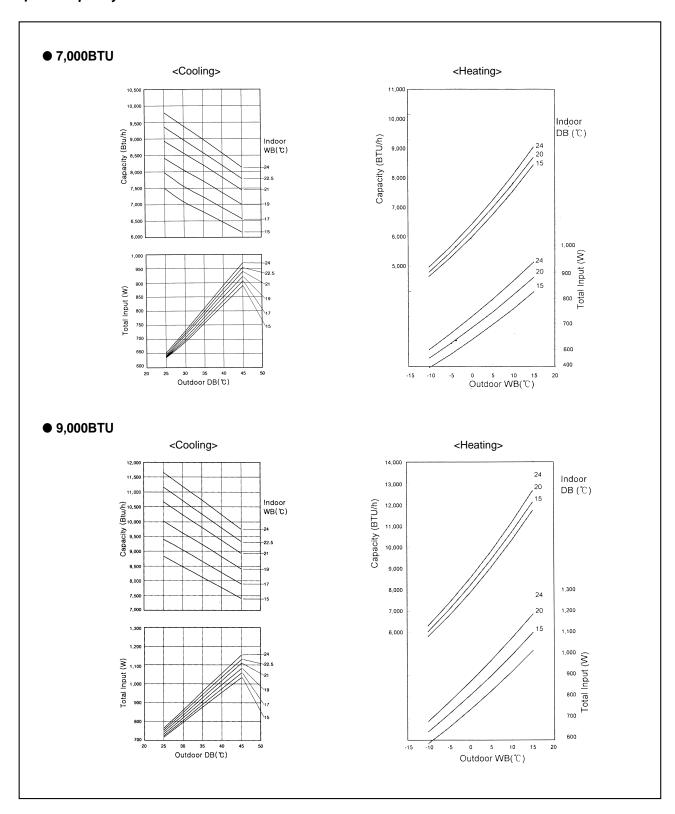
4-1. Performance Data

4-2. Noise Level Measurement

### **Performance Data**

#### 4-1. Performance Data

#### 4-1-1. Capacity

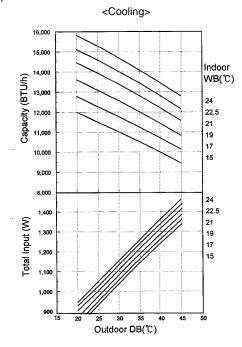


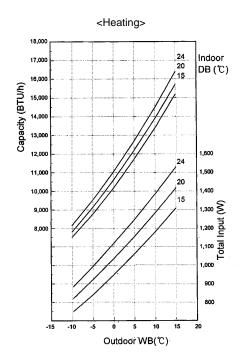


#### Performance Data (Cont.)

#### 4-1-1. Capacity (Cont.)



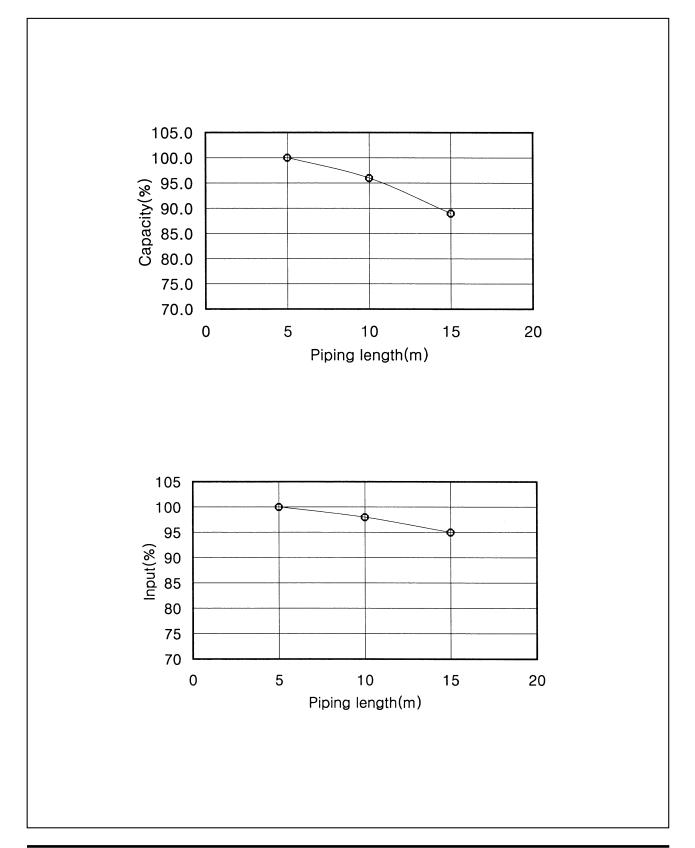




PERFORMANCE DATA

# Performance Data (Cont.)

#### 4-1-2. Cooling Capacity Correction Factors



# **MEMO**



# **Installation**

- 5-1. Selecting Area for Installation
- 5-2. Installation Diagram of Indoor Unit and Outdoor Unit
- 5-3. Performing Leak Tests
- 5-4. Placing the Indoor Unit in Position
- 5-5. Checking and Testing Oeprations

**INSTALLATION** 

#### **Selecting Area for Installation**

Select an area for installation that is suitable to customer's needs.

#### 5-1. Selecting Area for Installation

#### 5-1-1. Indoor Unit

- 1. Make sure that you install the indoor unit in an area providing good ventilation. It must not be blocked by an obstacle affecting the airflow near the air inlet and the air outlet.
- 2. Make sure that you install the indoor unit in an area allowing good air handling and endurance of vibration of the indoor unit.
- 3. Make sure that you install the indoor unit in an area where there is no source of heat or vapor nearby.
- 4. Make sure that you install the indoor unit in an area from which hot or cool air is spread evenly in a room.
- 5. Make sure that you install the indoor unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).
- 6. Make sure that you install the indoor unit in an area which provides easy pipe connection with the outdoor unit, and easy drainage for condensed water.
- 7. Make sure that you install the indoor unit in an area which is large enough to accomodate the measurements shown in figure on the next page.



• It is harmful to the air conditioner if it is used in the following environments: greasy areas (including areas near machines), salty areas such as coast areas, areas where sulfuric gas is present such as hot spring areas. Contact your dealer for advice.



#### Selecting Area for Installation (Cont.)

#### 5-1-2. Outdoor Unit

- 1. Make sure that you install the outdoor unit in area not exposed to the rain or direct sun light. (Install a separate sunblind if exposed to direct sun light.)
- 2. Make sure that you install the outdoor unit in area allowing the good air moment, not amplifying noise or vibration, especially to avoid disturbing neighbours. (Fix the unit firmly if it is mounted in a high place.)
- 3. Make sure that you install the outdoor unit in area providing the good ventilation and which is not dusty. It must not be blocked by any obstacle affecting the airflow near the air inlet and the air outlet.
- 4. Make sure that you install the outdoor unit in area free from animals or plants.
- 5. Make sure that you install the outdoor unit in area not blocking the traffic.
- 6. Make sure that you install the outdoor unit in area easy to drain condensed water from the indoor unit.
- 7. Make sure that you install the outdoor unit in area which provides easy connection within the maximum allowable length of a coolant pipe.

<b>&amp;</b>	If you have used	Then					
	More than "A" metres of piping	"B"g of refrigerant (R-22) must be added for each extra metre.					
	Less than "A" metres of piping	The purge time is normal.					

Model	Α	В
**07/09**	7.5	20
**12**	5.0	30

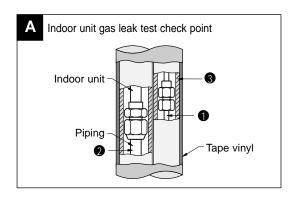
8. Make sure that you install the outdoor unit in an area which is large enough to accommodate the measurements shown in figure on the next page.

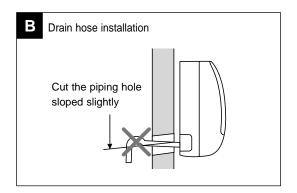
#### 5-1-3. Remote Control Unit

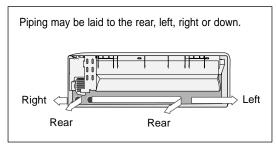
- 1. Make sure that you install the remote control unit in an area free from obstacles such as curtains etc, which may block signals from the remote control unit.
- 2. Make sure that you install the remote control unit in an area not exposed to direct sunlight, and where there is no source of heat.
- 3. Make sure that you install the remote control unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).

### **Installation Diagram of Indoor Unit and Outdoor Unit**

#### 5-2. Installation Diagram of Indoor Unit and Outdoor Unit





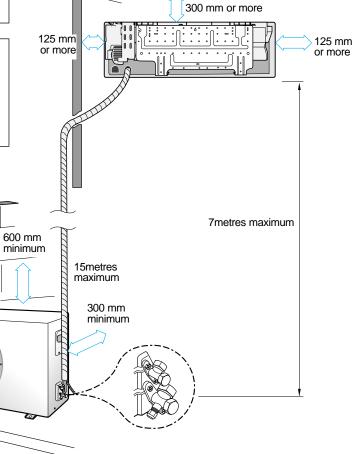


- Wrap the refrigerant pipes and the drain hose up in the abgorbent pad and the vinyl thape.
- Triply wind the pipes and hose to the end of the indoor unit with the absorbent pad (make intervals of 20mm)

300 mm

minimum

600 mm minimum



# >>

#### Installation Diagram of Indoor Unit and Outdoor Unit (cont.)

#### 5-2-1. Fixing the Installing plate.

 Determine the position of the pipe and drain hose hole refering to the right figure and drill the hole with an inner diameter of 65mm so that it slants slightly downwards.

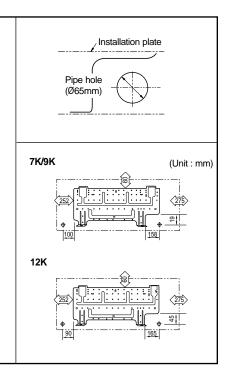
2. If you are fixing the indoor unit to a... Then follow Steps...

Wall 3.
Window frame 4 to 6.

3. Fix the installation plate to the wall in a manner appropriate to the weight of the indoor unit.

If you are mounting the plate on a concrete wall with anchor bolts, anchor bolts must not be projected by more than 20mm.

- Determine the position of the wooden uprights to be attached to the window frame.
- Attach the wooden upright to the window frame in a manner appropriate to the weight of the indoor unit.
- Using tapped screws, attach the installation plate to the wooden upright, as illustrated in the last figure opposite.

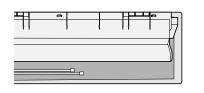


#### 5-2-2. Purging the Unit

On delivery, the indoor unit is loaded with an inert gas. All this gas must therefore be purged before connecting the assembly piping. To purge the inert gas, proceed as follows.

Unscrew the cap at the end of each pipe.

- Result All inert gas escapes from the indoor unit.
- To prevent dirt or foreign objects from getting into the pipes during installation, do NOT remove caps completely until you are ready to connect the piping.



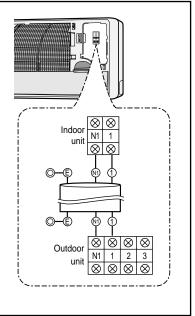


#### Installation Diagram of Indoor Unit and Outdoor Unit (cont.)

#### 5-2-3. Connecting the Assembly Cable (Cooling Oly)

The outdoor unit is powered from the indoor unit via the assembly cable. (7K/9K/12K)

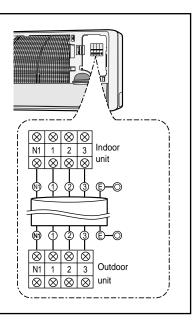
- 1. Extend the assembly cable if necessary.
- 2. Open the front grille by pulling on the tab on the lower right and left sides of the indoor unit.
- 3. Remove the screw securing the connector cover.
- 4. Pass the assembly cable through the rear of the indoor unit and connect the assembly cable to terminals.
  - ◆ Each wire is labelled with the corresponding terminal number.
- 5. Firmly fix the ass'y cable with clamp wire holder.
- 6. Pass the other end of the cable through the 65mm hole in the wall.
- 7. Replace the connector cover, carefully tightening the screw.
- 8. Close the front grille.
- 9. For further details on how to plug the other end of the assembly cable into the outdoor unit.



#### 5-2-4. Connecting the Assembly Cable (Heat Pump)

The outdoor unit is powered from the indoor unit via the assembly cable. (7K/9K/12K)

- 1. Extend the assembly cable if necessary.
- 2. Open the front grille by pulling on the tabs on the lower right and left sides of the
- 3. Remove the screw securing the connector cover.
- 4. Pass the assembly cable through the rear of the indoor unit and connect the assembly cable to terminals
  - > Each wire is labelled with the corresponding terminal number.
- 5. Pass the other end of the cable through the 65 mm hole in the wall.
- 6. Replace the connector cover, carefully tightening the screw.
- 7. Close the front grille.
- 8. For further details on how to plug the other end of the assembly cable into the





#### Installation Diagram of Indoor Unit and Outdoor Unit (cont.)

#### 5-2-5. Installing and Connecting the Indoor Unit Drain Hose

Care must be taken when installing the drain hose for the indoor unit to ensure that any condensed water is correctly drained outside. When passing the drain hose through the 65mm hole drilled in the wall, check that none of the following situation occur.



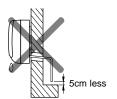
The hose must NOT slope upwards.



The end of the drain hose must NOT be placed in water.



Do NOT bend the hose in different directions.



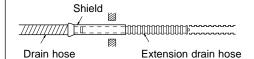
Keep a clearance of at least 5cm between the end of the hose and the ground.



Do NOT place the end of the drain hose in a hollow.

#### To install the drain hose, proceed as follows

- 1. If necessary, connect the 2-meter extension to the drain hose.
- 2. If you are using the extension, insulate the inside part of the extension drain hose with a shield.
- 3. Pass the drain hose under the refrigerant piping, taking care to keep the drain hose tight.
- 4. Pass the drain hose through the hole in the wall, making sure that it is sloping downwards, as shown in the illustrations above.



The hose will be fixed permanently into position once the whole installation has been tested for gas leaks.

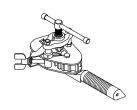


# Installation Diagram of Indoor Unit and Outdoor Unit (Cont.)

#### 5-2-6. Flare Modification

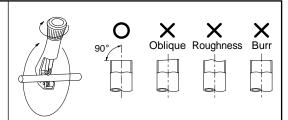
#### **TOOLS USED**





#### FLARE MODIFICATION PROCEDURE

1.	Cut the	pipe	using	а	pipe	cutter.
----	---------	------	-------	---	------	---------

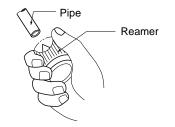


2. Remove burrs at the tip of the pipe cut.

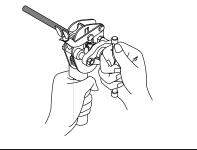


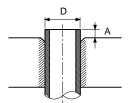
• Burrs not removed may result in leakage of gas.

 		 		 	_						



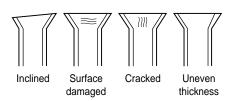
3. Insert a flare nut into the pipe and modify flare.





Outer diameter	A(mm)
ø6.35mm	1.3
ø9.52mm	1.8
ø12.7mm	2.0

#### \* Unproper flaring





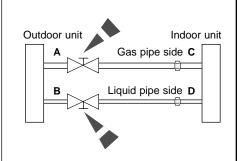
#### Installation Diagram of Indoor Unit and Outdoor Unit (cont.)

#### 5-2-7. Air-Purge Procedure

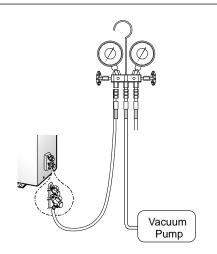
The outdoor unit is loaded with sufficient R-22 refrigerant for 5 metres of piping. The air in the indoor unit and in the pipe must be purged. If air remains in the refrigeration pipes, it will affect the compressor, reduce to cooling/heating capacity and could lead to a malfunction. Refrigerant for air purging is not charged in the outdoor unit. Use Vacuum Pump as shown at the figure.

- Connect each assembly pipe to the appropriate valve on the outdoor unit and tighten the flare nut.
- 2. Referring to the illustration opposite, tighten the flare nut first manually and then with a wrench, applying the following torque.

Outer Diameter	Torque(kg·cm)
6.35mm	144~176
9.52mm	333~407
12.70mm	504~616



- 3. Connect the charging hose of low pressure side of manifold gauge to the packed valve having a service port as shown at the figure.
- 4. Open the valve of the low pressure side of manifold gauge counterclockwise.
- 5. Purge the air from the system using vacuum pump for about 10 minutes.
  - Close the valve of the low pressure side of manifold gauge clockwise.
  - Make sure that pressure gauge show -0.1MPa(-76cmHg) after about 10minutes.
    - This procedure is very important in order to avoid gas leak.
  - ◆ Turn off the vacuum pump
  - ◆ Remove the hose of the low pressure side of manifold gauge.



\* The designs and shape are subject to change according to the model.

#### Adding Refrigerant

Refrigerant must be added if the piping measures more than 5 metres in length. This operation can only be performed by a qualified refrigeration specialist.

	<b>◆</b>
If yo <del>u have used</del>	Then
More than "A" metres of piping	"B" of refrigerant (R-22) must be added for each extra metre.
Less than "A" metres	The purge time is normal.

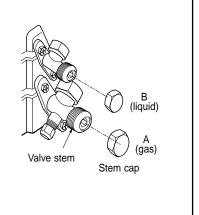
Refer to the Service Manual for more details on this operation.

MODEL	Α	В
**07/09**	7.5	20
**12**	5.0	30



# Installation Diagram of Indoor Unit and Outdoor Unit (cont.)

- 6. Set valve cork of both liquid side and gas side of packed valve to the open position.
- 7. Mount the valve stem nuts and the service port cap to the valve, and tighten them at the torque of 18N·m with a torque wrench.
- 8. Check for gas leakage.
  - ◆ At this time, especially check for gas leakage from 3-way valve's stem nuts, and from the service port cap.

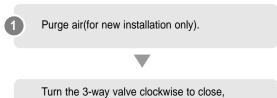


# **>>**

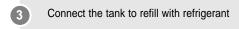
#### Installation Diagram of Indoor Unit and Outdoor Unit (cont.)

#### 5-2-8. Refrigerant Refill

Refill an air-conditioner with refrigerant when refrigerant has been leaked at installing or using.



connect the pressure gauge (low pressure side) to the service valve, and open the 3-way valve again.



Set the unit to cool operation mode.

Check the pressure indicated by the pressure gauge(low pressure side).

\* Standard pressure is should be 4.5~5.5kg/cm² in a regular, high operation mode.

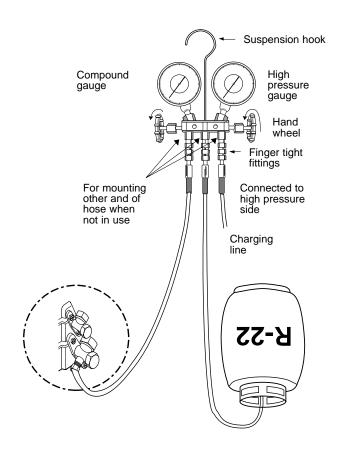
Open the refrigerant tank and fill with refrigerant until the rated pressure is reached.

\* It is recommended not to pour the refrigerant in too quickly, but gradually while operating a pressure valve.

Stop operation of the air conditioner.

Close the 3-way valve, disconnect the pressure gauge, and open the 3-way valve again.

9 Close the cap of each valve.





#### Installation Diagram of Indoor Unit and Outdoor Unit (cont.)

#### 5-2-9. Refrigerant Adjustment

Class	At ins	tallation	At s	ervice
Connection Pipe Length	Air-Purge Method	Refrigerant Adjustment	Air-Purge Method	Refrigerant Quantity
Standard 5m	Refer to the detailed Air-Purge Procedure	Unnecessary	Purge air using a vacuum pump or an additional refrigerant cylinder.	refer to specification sheet
Max. ~15m		Add "A" of refrigerant (R-22) for every 1m.	Tomgorant dymiadi.	Add "A" of refrigerant (R-22) for every 1m.

It would be the best choice to use the standard tube length to keep the basic quality of Room Air conditioner, for example cooling and heating capacity, sound level, vibration level, and reliability.

But, according to a certain different installation condition, the connection tube length could be changed in the recommendation length that is shown above. In this case, installer should keep the installation condition to keep the quality of Room Air conditioner.

MODEL	"A"	"B"
7K/ 9K	20(g/m)	7.5
12K/	30(g/m)	5.0

- \* Refrigerant should be charged additionally as written above according to the change of the length of the connection tube. It needs to affect the decrease in cooling and heating capacity or of the reliability of compressor that may be caused by a lack of refrigerant.
- \* Installation position difference between the indoor unit and the outdoor unit should not exceed over than "B" meters.
- \* When the connection pipe is been extended longer than 5 meters, it might need to change the diameter of the electrical wire to a larger size in order to keep a voltage drop for starting room air conditioner is not less than 85% of the rated voltage. And then, a voltage meter will be useful to check the rate of the voltage drop.

#### 5-2-10. Flare Nut Fixing Torque

Outer diameter	Torque (kg-cm)		
Outer diameter	Fixing Torque	Final Torque	
ø 6.35 mm (Liquid Side)	160	200	
ø 9.52 mm (Gas Side)	300	350	
ø 12.7 mm (Gas Side)	500	550	

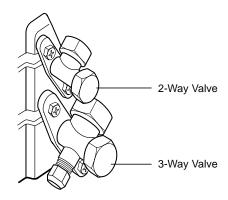


## Installation Diagram of Indoor Unit and Outdoor Unit (cont.)

### 5-2-11. "Pump down" Procedure

Pump down will be carried out when an evaporator is replaced or when the unit is relocated in another area.

- Remove the caps from the 2-way valve and the 3-way valve.
- Turn the 3-way valve clockwise to close and connect a pressure gauge (low pressure side) to the service valve, and open the 3-way valve again.
- Set the unit to cool operation mode. (Check if the compressor is operating.)
- Turn the 2-way valve clockwise to close.
- When the pressure gauge indicates "0" turn the 3-way valve clockwise to close.
- Stop operation of the air conditioner.
- Close the cap of each valve.



#### **Relocation of the Air Conditioner**

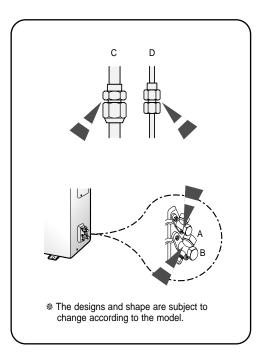
- Refer to this procedure when the unit is relocated.
- 1. Carry out the pump down procedure (refer to the details of 'pump down').
- 2. Remove the power cord.
- 3. Disconnect the assembly cable from the indoor and outdoor units.
- 4. Remove the flare nut connecting the indoor unit and the pipe. At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- 5. Disconnect the pipe connected to the outdoor unit. At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Make sure you do not bend the connection pipes in the middle and store together with
- 7. Move the indoor and outdoor units to a new location.
- 8. Remove the mounting plate for the indoor unit and move it to a new location.

# **Performing Leak Tests**

# **5-3. Performing Leak Tests**

Before completing the installation (insulation of the cable, hose and piping and fixing of the indoor unit to the installation plate), you must check that there are no gas leaks.

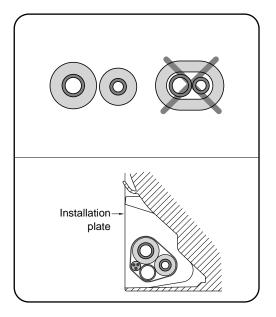
To check for gas leaks on the	Then, using a leak detector, check the
Indoor unit	Flare nuts at the end of sections C and D.
Outdoor unit	Valves on sections A and B.



## **Placing the Indoor Unit in Position**

### 5-4. Placing the Indoor Unit in Position

- Once you have checked that there are no leaks in the system, you can insulate the piping, hose and cables and place the indoor unit on the installation plate.
- 1. To avoid condensation problems, place heat-resistant polyethylene foam separately around each refrigerant pipe in the lower part of the indoor unit.
- 2. Wind insulating tape around the pipe, assembly cable and drain hose.
- 3. Place the resulting bundle carefully in the lower part of the indoor unit, making sure that it does not jut out from the rear of the indoor unit.
- **4.** Hook the indoor unit up to the installation plate and move the unit to the right and left until you are sure that it is securely to place in.
- 5. Finish wrapping insulating tape around the rest of the piping leading to the outdoor unit.
- 6. Using clamps (optionally supplied), attach the piping to the wall wherever possible.



**INSTALLATION** 

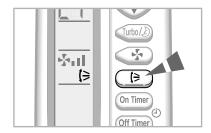
# **Checking and Testing Operations**

### 5-5. Checking and Testing Operations

- To complete the installation, perform the following checks and tests to ensure that the air conditioner is operating correctly.
- 1. Review all the following elements in the installation:
  - ◆ Installation site strength
  - Piping connection tightness to detect any gas leakages
  - ◆ Connection wiring
  - ◆ Heat-resistant insulation of the piping
  - ◆ Drainage
  - ◆ Earthing wire connection
  - ◆ Correct operations (follow the steps below)
- 2. Press the On/Off button.

  - Result 

    The indicator lights on the indoor unit flash at half-second intervals.
    - ♦ While the indoor unit opens, the indoor unit fan runs to start.
- 3. Press the who button.
  - Result
- ◆ The outdoor unit operates in cooling or heating mode as following the room temperature.
- 4. Air flow direction



# **MEMO**



# **Features & Operation**

- 6-1. The Feature of key in Remote Control
- 6-2. Details for Operation Property
- 6-3. Operating Recommendations
- 6-4. Temperature and Humidity Ranges
- 6-5. Pressure Graph

# The Feature of key in Remote Control

# 6-1. The Feature of key in Remote Control

NO	NAMED OF KEY	FUNCTION OF KEY	
1	(Agent)	Power On/Off button to start and stop air conditioner or timer set up.	
2	(UP)	Temp. up button. To increase the temperature by the pressing the temperature button.	
	(DOWN)	Temp. down button. To decrease the temperature by the pressing the temperature button.	
3	Mode	Each time you press this button Mode is changed in the following order  ► In case of Heat pump model  ♣ : Cool Mode  ♣ : Fan Only  ★ : Cool Mode  ♣ : Dry Mode  ► In case of Cooling only model  ♣ In case of Cooling only model	
4	Turbo/2	Press the button one or more times until appears. The air conditioner cools or heats the room as quickly as possible. After 30minutes, the air conditioner is reset automatically to the previous mode.  Press the button one or more times until appears. The sleep timer can be used when you are cooling or heating your room to switch the air conditioner off automatically after a period of six hours.	
5	<b>\frac{1}{2}</b>	Each time you press this button,  FAN SPEED is changed in the following order.  ***********************************	
6	( <del> </del>	Adjust air flow vertically.	
7	On Timer	The On Timer enables you to <b>switch on</b> the air conditioner automatically after a given period of time that is from 30 minutes to 24 hours.  To cancel, press the (Set/Cancel) button.	
8	Off Timer	The Off Timer enables you to <b>switch off</b> the air conditioner automatically after a given period of time that is from 30 minutes to 24 hours.  To cancel, press the (Set/Cancel) button.	
9	Energy Saving	If you wish to save energy when using your air conditioner, select the Energy saving mode with the Energy saving button.	

### **Details for Operation Property**

### 6-2. Details for Operation Property

AUTO MODE: In this mode, operation mode(COOL, HEAT)
is selected automatically by the room temperature of initial
operation.

#### ▶ In case of Heat pump model.

Room Temp	Operation Type
Tr≥ 21°C+∆T	Cool Operation (Set Temp:24°C+∆T)
21°C +ΔT>Tr	Heat Operation (Set Temp:22°C+ΔT)

#### ▶ In case of Cooling only model.

Operation Type	Room Temp.	
Cool Operation	Tr≥ 25°C+ΔT	Compressor ON
	Tr≥ 24°C+∆T	Compressor OFF

 $\Delta T$ = -1°C, -2°C, 0°C+1°C+2°C

 $\Delta T$  is controlled by setting temperature up/down key of remote control

- 2. COOL MODE: The unit operates according to the difference between the setting and room temperature. (18°C~30°C)
- 3. HEAT MODE(In case of Heat pump model):

The unit operates according to the difference between the setting and room temperature.(16°C~30°C)

\*Prevention against cold wind: In order to prevent the cool air from flowing out at the heat mode, the indoor fan does not operate or operates very slowly in the following cases.

At this time, the indoor heat exchanger will be preheating.

- For 3~5 minutes after the initial operation
- For deicing operation
- The operation of an indoor fan in accordance with the temperature of an indoor heat exchanger

The temperature of indoor heat exchanger	Indoor fan speed
below 28°C	off
28°C~below 34°C	LL Speed
34°C~below 40°C	L Speed
above 40°C	Setting Speed

\*High temperature release function: It is a function to detect an outdoor overload by the sensor of an indoor heat exchanger and to turn the outdoor fan or the compressor ON/OFF for safety. \*Deice: Deicing operation is controlled by indoor unit's heat exchanger temperature and accumulating time of compressor's operation.

Deice ends by sensing of the processing time by deice condition.

4. DRY MODE : Has 3 states, each determined by room temperature.

The unit operates in DRY mode.

\*Compressor ON/OFF Time is controlled compulsorily(can not set up the fan speed, always breeze).

\*Protective function: Low temperature release. (Prevention against freeze)

TURBO MODE: This mode is available in AUTO, COOL, HEAT, DRY, FAN MODE.

When this button is pressed at first, the air conditioner is operated "powerful" state for 30 minutes regardless of the set temperature, room temperature.

When this button is pressed again, or when the operating time is 30 minutes, turbo operation mode is canceled and returned to the previous mode.

\*But, if you press the TURBO button in DRY or FAN mode that is changed with AUTO mode automatically.

 SLEEP MODE: Sleep mode is available only in COOL or HEAT mode.

The operation will stop after 6 hours.

\*In COOL mode: The setting temperature is automatically raised by 1°C each 1hourWhen the temperature has been raised by total of 2°C, that temperature is maintained.

\*In HEAT mode: The setting temperature is automatically dropped by 1°C each 1hour.

When the temperature has been dropped by total of 2°C, that temperature is maintained.

# **Details for Operation Property** (Cont.)

- 7. FAN SPEED: Manual (3 step), Auto (4 step) Fan speed automatically varies depending on both the difference between setting and the room temperature.
- COMPULSORY OPERATION:

For operating the air conditioner without the remote control. \*The operating is the same function that AUTO MODE in the remote controller.

9. SWING: BLADE-H is rotated vertically by the stepping motor.

\*Swing Set : Press the 🕒 button under the remote control is displayed on LCD the 🕒 and the blades move up and down. If the one more time press the 🕒 button, blades location is stop.

#### 10. SETTING THE ON/OFF TIMER.:

\*ON TIMER: The On Timer enables you to switch on the air conditioner automatically after a given period of time. You can set the period of time from 30 minutes to 24 hours. \*OFF TIMER: The Off Timer enables you to switch off the air conditioner automatically after a given period of time. You can set the period of time from 30 minutes to 24 hours.

#### 11. SELF DIAGNOSIS

	LAMP of Display Monitor			
Description	TURBO	OPERATION	TIMER	ENERGY SAVING
	TURBO	<b>\$</b>	$\widehat{\mathbf{+}}$	₽₽₽
Indoor unit room temperature sensor error(open or short)	0	0	•	0
Indoor unit heat exchanger temperature sensor error(open or short)	0	•	•	0
Indoor fan motor malfunction	0	0	0	•
EEPROM error	0	•	•	•
Option error(option wasn't set up or option data error)	•	•	•	•

: Lamp off : Lamp flickering

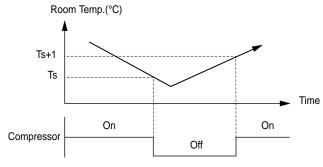
12. BUZZER SOUND: Whenever the ON/OFF button is pressed or whenever change occurs to the condition which is set up or select, the compulsory operation mode, buzzer is sounded "beep".



### **Details for Operation Property (Cont.)**

### 6-2-1. Cooling Mode Operating

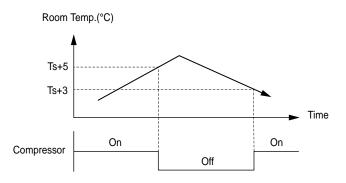
When selecting the Cooling Mode Operation, the unit will operate according to the setting by the remote controller and the operation is as well as the following. Room temperature can be set in 1°C steps in the range of 18 to 30°C.



• Ts means Remote Controller setting Temperature

### 6-2-2. Heating Mode Operation(In case of Heat pump model)

When selecting the Heating Mode Operation, the unit will operate according to the setting by the remote controller and the operation is as well as the following. Room temperature can be set in 1°C steps in the range of 16 to 30°C.



### 6-2-3. Automatic Operation

When Automatic operation is set by the remote controller, the air conditioner senses the room temperature then automatically selects the operation mode and setting temperature.

#### 1. In case of Heat pump model.

	Operating Mode	Setting Temp.	Remarks
Room Temp ≥ 21°C + ∆T	Cooling	Tsp = 24°C + ΔT	ΔT = -2, -1, 0, 1, 2°C
Room Temp < 21°C + ΔT	Heating	Tsp = 22°C + ΔT	

- ♦ In case that Room Temp.  $\geq 21^{\circ}\text{C} + \Delta \text{T}$ , the unit is operated in the Cool Mode.
- ♦ In case that Room Temp. <  $21^{\circ}$ C +  $\Delta$ T, the unit is operated in the Heat Mode.
- $\blacklozenge$   $\Delta T$  means that user is able to change setting temperature within ±2°C.

#### 2. In case of Cooling only model.

Operating Type	Room Temp.		Remarks
Cool Operation	Tr≥ 25°C + ΔT	Compressor ON	AT 2 4 0 4 2°C
Cool Operation	Tr≤ 24°C + ΔT	Compressor OFF	$\Delta T = -2, -1, 0, 1, 2^{\circ}C$

- ♦ In case the Room Temp.  $\geq$  25°C +  $\Delta$ T, the unit is operated Compressor.
- ♦ In case the Room Temp.  $\leq 24^{\circ}\text{C} + \Delta \text{T}$ , the unit is not operated Compressor.
- ♦ ΔT means that user is able to change setting temperature within ±2°C.



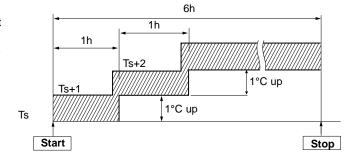
# Details for Operation Property (cont.)

### 6-2-4. Sleeping Operation

#### AT COOLING MODE

When you set the sleep mode, the following movement will start to avoid over cooling.

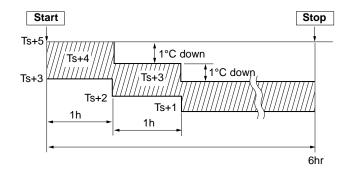
- ◆ The indoor fan speed is fixed by setting the remote controller.
- ◆ The setting temperature will rise by 1°C at the starting of operation and by 1°C one hour later.
- ◆ The operation will stop after 6 hours.



#### AT HEATING MODE

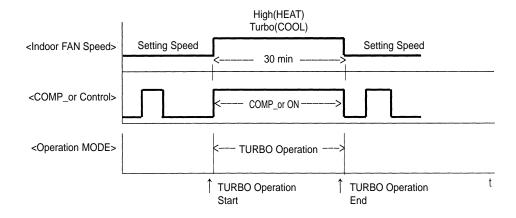
When you set the sleep mode, the following movement will start to avoid overheating.

- ◆ The indoor fan speed is fixed by setting the remote controller.
- ◆ The setting temperature will be dropped by 1°C at the starting of operation and by 1°C one hour later.
- ◆ The operation will stop after 6 hours.



### 6-2-5. Turbo Operation (Cooling or Heating Mode)

If turbo operation is selected during heating or cooling mode, compressor is operated for 30minutes regardless of room temperature. After 30minutes of turbo operation the unit will operate in normal state





# **Details for Operation Property** (Cont.)

### 6-2-6. Indoor fan control in the Heating Mode

Indoor fan is controlled depending on the temperature of indoor heat exchanger in the heating mode.

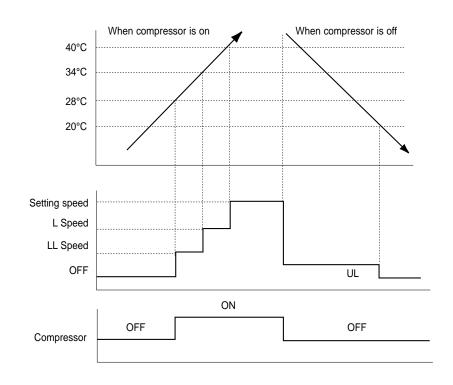
#### INDOOR FAN CONTROL

#### ♦ When compressor begins operating

The temperature of indoor heat exchanger	Indoor fan speed	
below 28°C	off	
28°C ~ below 34°C	LL speed	
34°C ~ below 40°C	L speed	
above 40°C	setting speed	

#### ♦ When compressor stops operating

The temperature of indoor heat exchanger	Indoor fan speed
above 20°C	UL speed
below 20°C off	
after 10 minutes when compressor stops operating	off





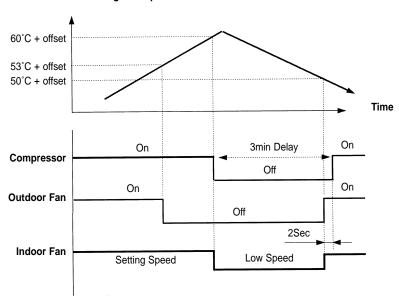
# **Details for Operation Property** (cont.)

## 6-2-7. Overload protection control

#### AT HEATING MODE

- ♦ If indoor heat exchanger temp. is over 53°C, outdoor fan turns off.
- ♦ If indoor heat exchanger temp. is over 60°C, outdoor compressor stops and Indoor fan speed is low.
- ♦ After compressor and fan are off if indoor heat exchanger temp. is below 50°C, indoor fan and outdoor compressor and outdoor fan operate normally.

#### Indoor Heat Exchanger Temp.



\*offset = 0, 1, 2, 3°C



# **Details for Operation Property (Cont.)**

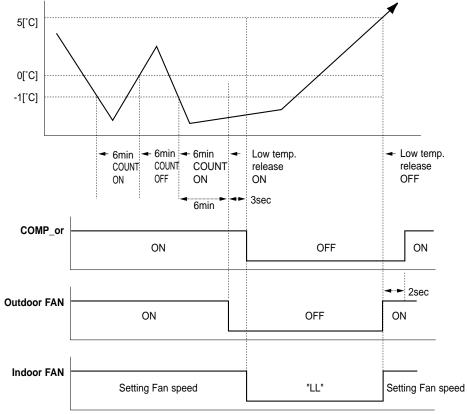
### 6-2-8. Low Temp Release

#### AT COOLING MODE

- ◆ If the temperature of indoor heat exchanger is below -1°C for over 6minutes, the outdoor fan turns off.
- ♦ If the temperature of indoor heat exchanger increase over 5°C during the first protection function, the first freezing protection function is released and the outdoor fan turns on.
- ◆ If the temperature of indoor heat exchanger increase over 0°C during 6 minutes counting, 6 minutes counter is cleared.
- ◆ If the temperature of indoor heat exchanger maintains for a minute at -4°C during the 6 minutes counting, switch off the compressor.
- ♦ If the compressor is off by Low Temp. Release, 5 minutes release is impossible.

#### **♦** Operating Pattern

# Indoor Heat exchanger Temp.(°C)



\*LL = Low FAN speed - 35rpm



# **Details for Operation Property** (Cont.)

### 6-2-9. Defrost control

Defrost operation is controlled by sensing the temperature of indoor heat exchanger

#### ♦ How to sense defrost conditions

#### A condition

The temperature of indoor heat exchanger is checked in intervals of 1 minute. In case the temperature of indoor heat exchanger drops more than 0.5°C for 6 minutes, it is considered as one cycle. If it happens 3 times continuously, It is said that "A condition" is satisfied.

#### **B** condition

If the temperature of indoor heat exchanger is below about 40±3°C when the compressor is on, it is considered as defrost "B condition"

#### C condition

When the accumulating time of compressor ON is over 20 minutes.

#### **D** condition

When the accumulating time of compressor ON is over 3Hr.

#### E condition

When operating time of compressor without stopping is over 6 minutes.

#### F condition

If the compressor is off(thermo off) when the temperature of indoor heat exchanger is below about 46°C, it is considered as one cycle. If it happens 2 times continuously, It is said that "F condition" is satisfied.

#### **G** condition

When the accumulating time of compressor ON is over 90 minutes.

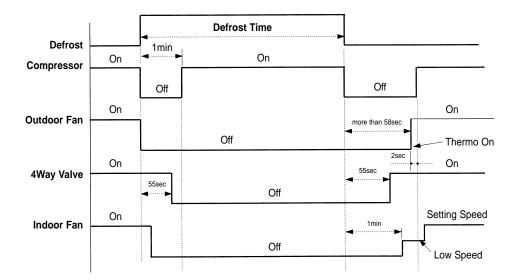
#### ◆ Defrost operation conditions

AXBXC condition or **BXDXE** condition FXG condition

Defrost time: 5~8 minutes

# **Details for Operation Property (Cont.)**

#### **♦** Operation pattern



# **Operating Recommendations**

# 6-3. Operating Recommendations

• Here are a few recommendations that you should follow when using your air conditioner.

Topic	Recommendation
Heating performances	The heat pump absorbs heat from outside air and brings it indoors.
	If the temperature of the outside air drops, the air conditioner will heat less. If you find
	that the room is not warm enough, use an additional heating appliance.
Warm air circulation	The air conditioner circulates warm air to heat your room; as a result, some time will be
	required after starting the air conditioner to warm the entire room. If necessary, set the air
	conditioner going a short time before you wish to use the room.
Frost	When outside temperatures are low and humidity is high, frost may form in the outdoor
	unit when heating with your air conditioner.
	If this happens:
	◆ The heating operation is stopped.
	◆ The Deice mode is triggered automatically for about seven minutes
	◆ The OPERATION indicator on the indoor unit lights up red.
	No intervention is required from you; after about seven minutes, the air conditioner
	starts operating again normally.
High indoor and outdoor	If both the indoor and outdoor temperatures are high and you select the
temperatures	the Heat mode, the outdoor unit's fan and compressor may stop.
	This is normal; simply wait until the air conditioner switches on again.
Power failure	If a power failure occurs when the air conditioner is operating, the unit is switched off.
	When the power returns, you must press (On/Off) to restart it.

# **Temperature and Humidity Ranges**

# 6-4. Temperature and Humidity Ranges

• The following table indicates the temperature and humidity ranges within which the air conditioner can be used.

oner is used at	Then			
res	The automatic protection feature may be triggered and the air conditioner stopped.  A water leakage or some other malfunction may happen if the heat exchanger freezes.			
es				
evels	Water may condense on and drip from the surface of the indoor unit if it is used for long periods.			
Outdoor Temperature	Indoor Temperature	Indoor Humidity		
0°C to 24°C approx.	27°C or less	-		
21°C to 43°C approx	18°C to 32°C approx.	80% or less		
18°C to 43°C approx.	18°C to 32°C approx.	-		
r	Outdoor Temperature  0°C to 24°C approx. 21°C to 43°C approx	The automatic protection feature stopped.  A water leakage or some other heat exchanger freezes.  Water may condense on and of if it is used for long periods.  Outdoor Temperature  O°C to 24°C approx. 21°C to 43°C approx. 18°C to 32°C approx.		

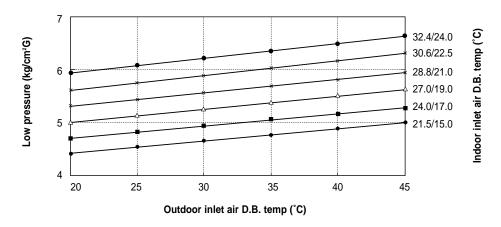
<sup>\*</sup> If the heating operation is used at below 0°C(outdoor temperature) then, does not have a full capacity.

If the cooling operation is used at over 33°C(indoor temperature) then, does not have a full capacity.

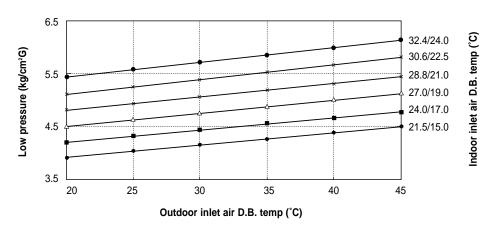
# **Pressure Graph**

## 6-5. Pressure Graph

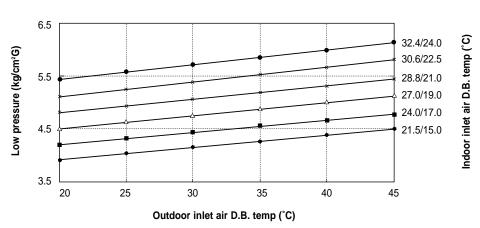
#### □ 7K BTU



#### □ 9K BTU



#### ☐ 12K BTU



# **MEMO**



# Diagram

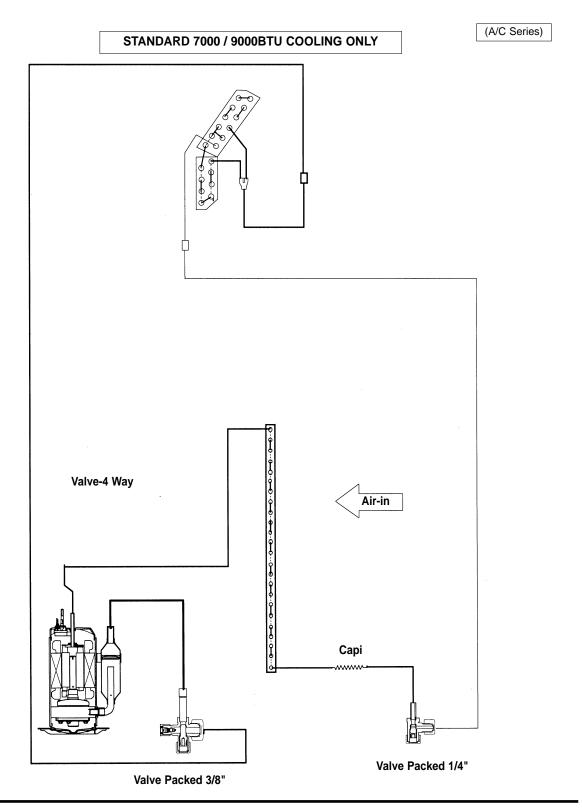
- 7-1. Refrigerating Cycle Block Diagram
- 7-2. Circuit Diagram

# Refrigerating Cycle Block Diagram

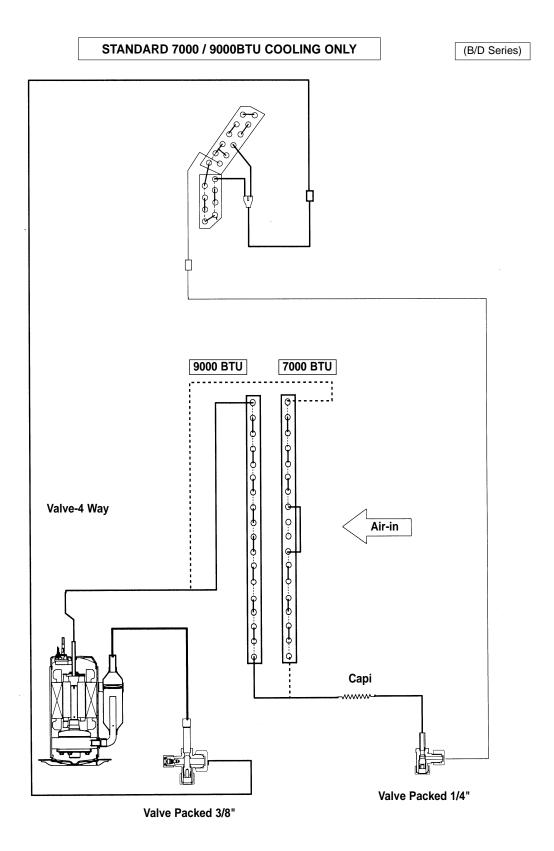
# 7-1. Refrigerating Cycle Block Diagram

## 7-1-1. Cooling Only

□ 7K / 9K



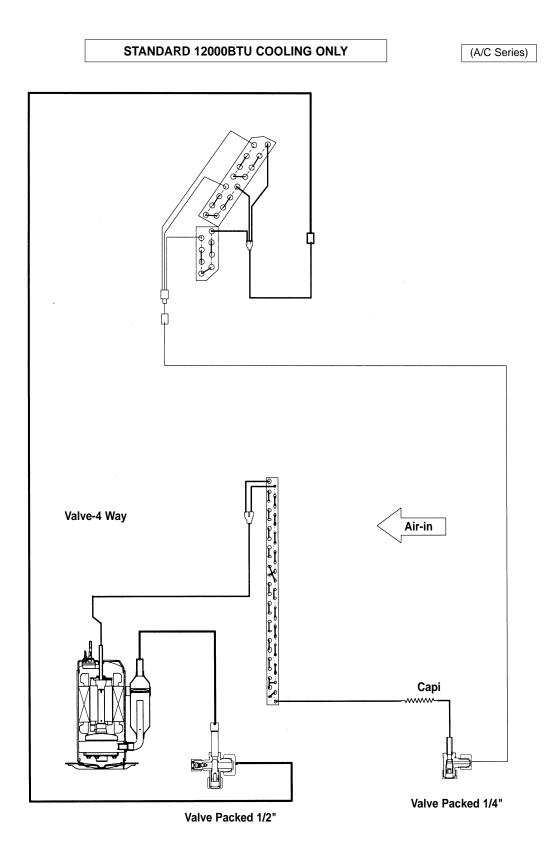
# Refrigerating Cycle Block Diagram (Cont.)



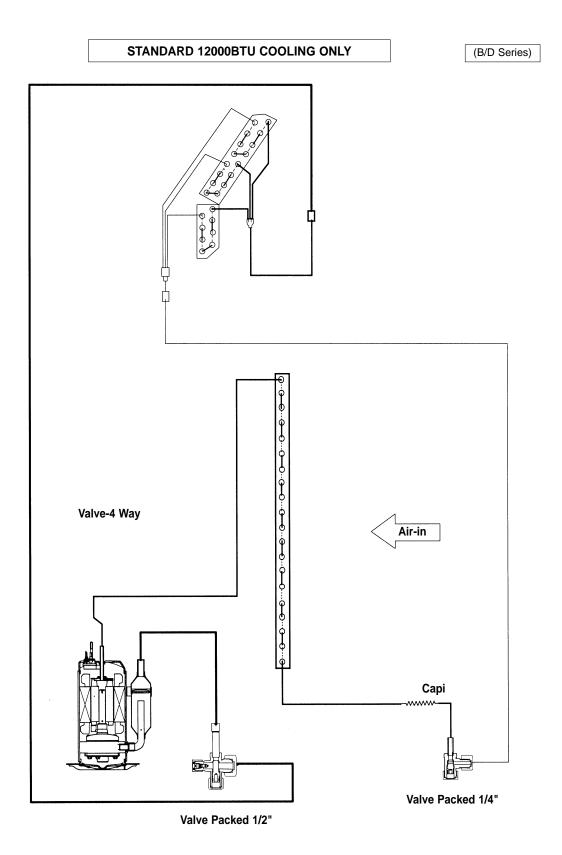


# Refrigerating Cycle Block Diagram (Cont.)

□ 12K



# Refrigerating Cycle Block Diagram (Cont.)

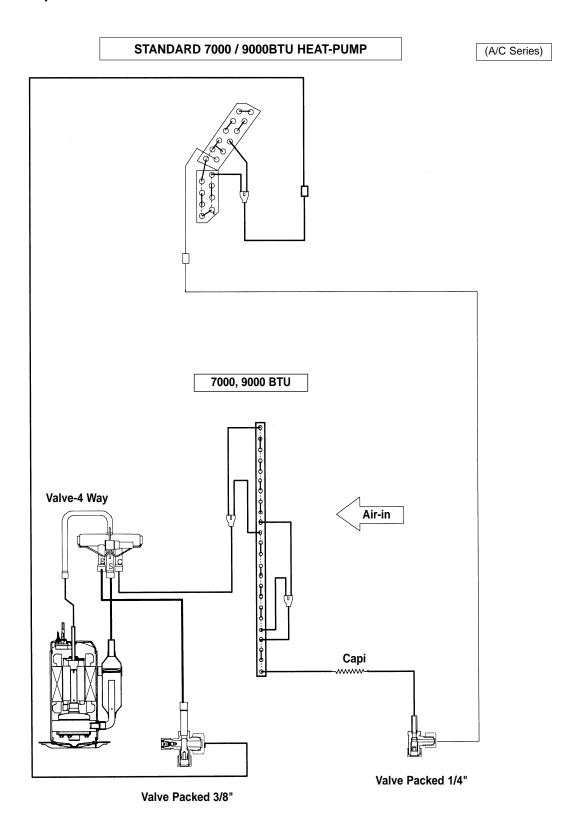




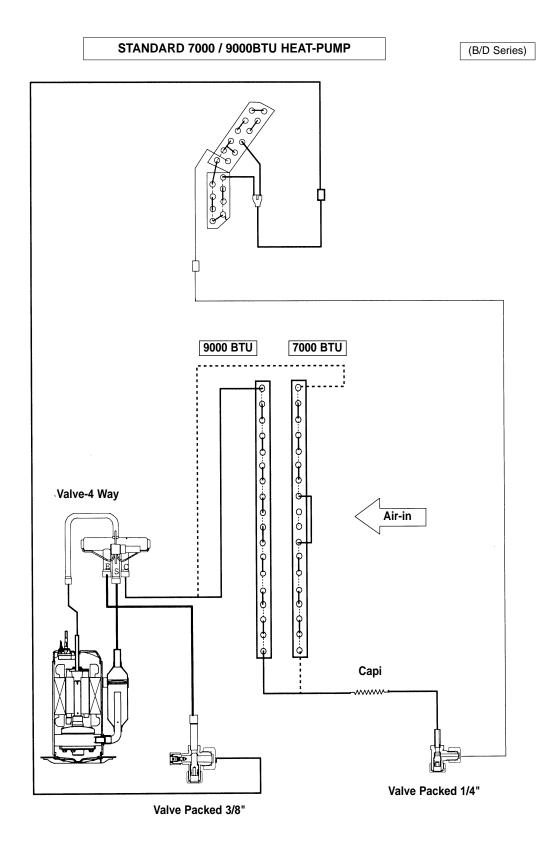
# Refrigerating Cycle Block Diagram (Cont.)

## 7-1-2. Heat Pump

□ 7K / 9K



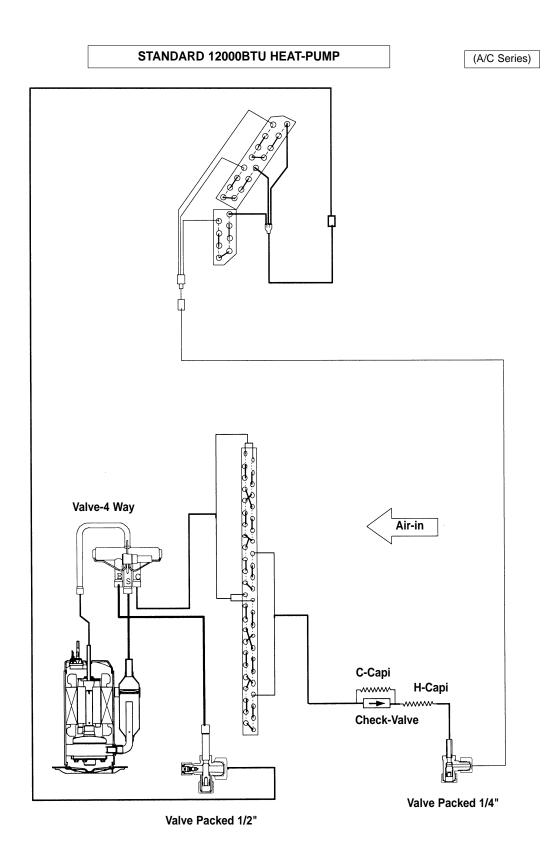
# Refrigerating Cycle Block Diagram (Cont.)



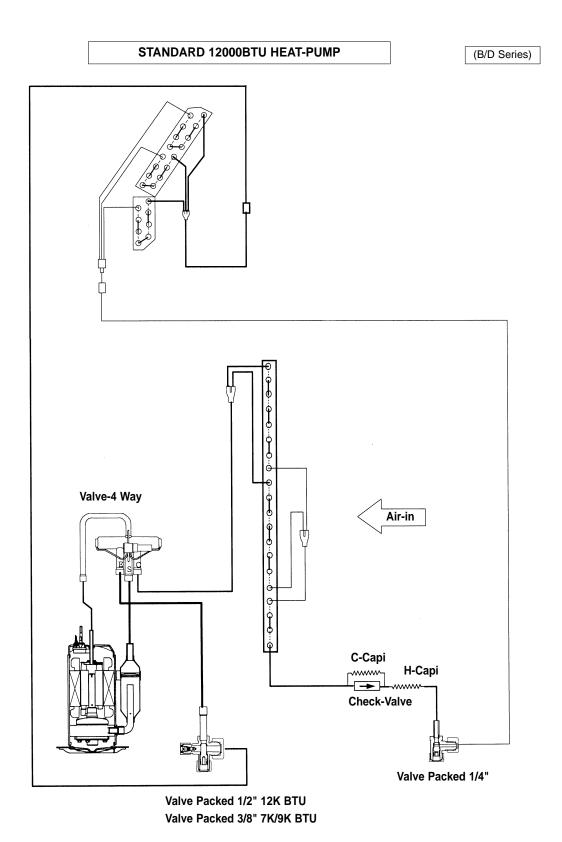


# Refrigerating Cycle Block Diagram (Cont.)

□ 12K



# Refrigerating Cycle Block Diagram (Cont.)

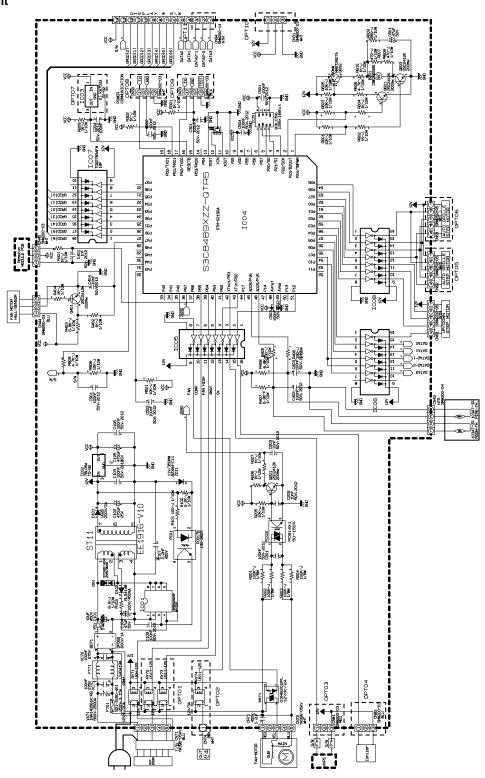


# Circuit Diagram

## 7-2. Circuit Diagram

## 7-2-1. 7K / 9K

Indoor Unit

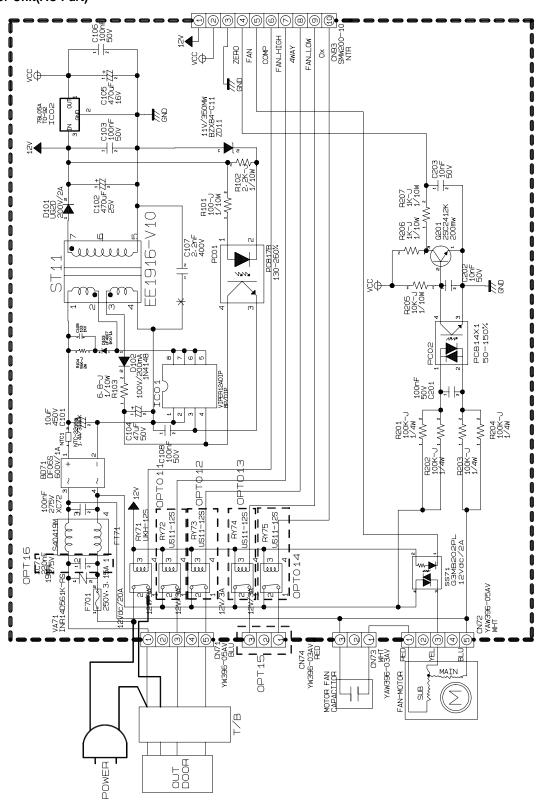




## Circuit Diagram (Cont.)

### 7-2-2. 12K

### Indoor Unit(AC Part)

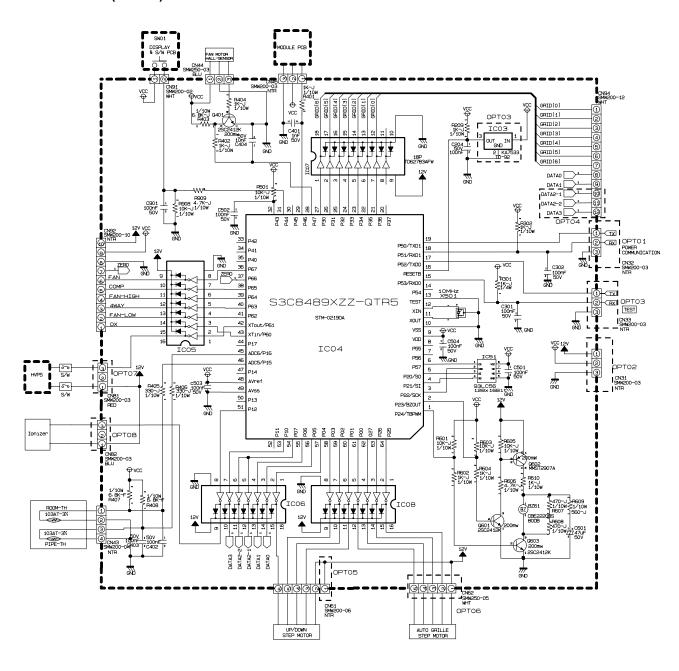




# Circuit Diagram (Cont.)

### 7-2-3. 12K

Indoor Unit(DC Part)

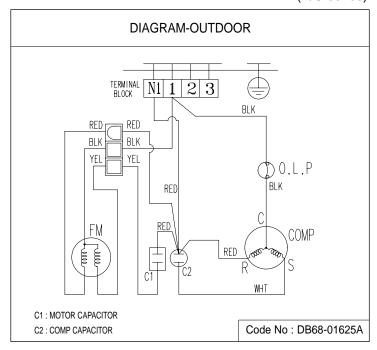


# Circuit Diagram (Cont.)

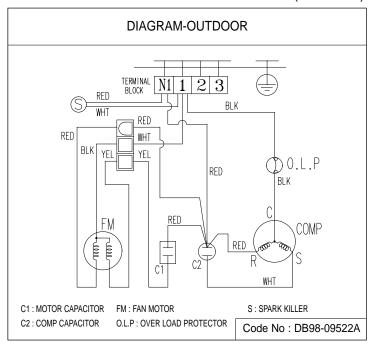
#### OUTDOOR UNIT

### □ 7K / 9K / 12K(Cooling only model)

(A/C series)



#### (B/D series)

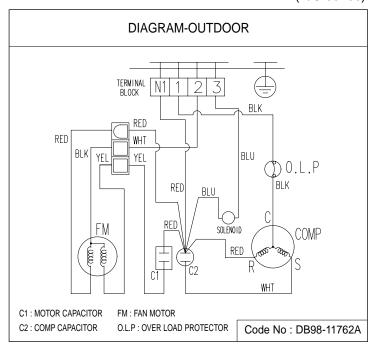




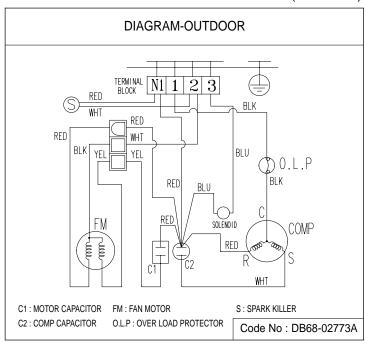
#### **OUTDOOR UNIT**

#### ☐ 7K / 9K / 12K(Heat pump model)

(A/C series)



#### (B/D series)





# **Troubleshooting**

- 8-1. Troubleshooting for Non Inverter Cooling Only (7K/9K)
- 8-2. Troubleshooting for Non Inverter Heat Pump (7K/9K)
- 8-3. Troubleshooting for Non Inverter Cooling Only (12K)
- 8-4. Troubleshooting for Non Inverter Heat Pump ( $_{12}$ K)
- 8-5. Set up the Model Option

### Troubleshooting for Non Inverter Cooling Only (7K/9K)

### 8-1. Troubleshooting for Non Inverter Coolin Only (7K/9K)

#### 8-1-1. Items to be checked first

- The input voltage should be rating voltage ±10% range. The airconditioner may not operate properly if the voltage is out of this range.
- Is the link cable linking the indoor unit and the outdoor unit linked properly? The indoor unit and the outdoor unit shall be linked by 3 cables. Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables. Otherwise the airconditioner may not operate properly.
- 3) When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

NO	Operation of air conditioner	Explanation
1	The OPERATION indication LED blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the INDOOR FAN should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Timer LED of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
6	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

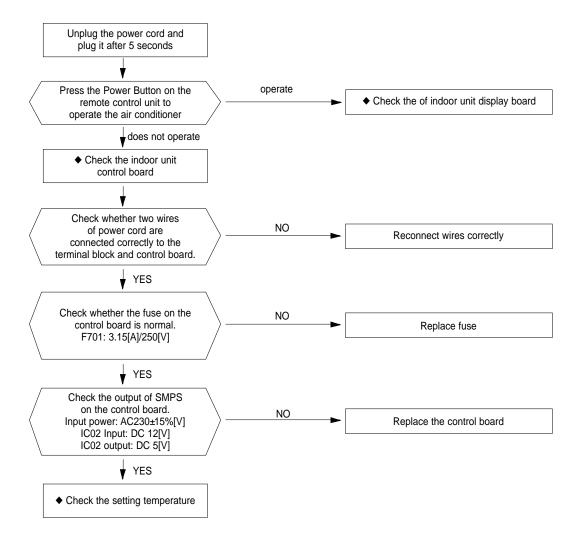
	LAMP of Display Monitor				
Description	TURBO	OPERATION	TIMER	SAVING	
	TURBO	<b>\$</b>	Ð	<del>1</del> ⊅\$	
Indoor unit room temperature sensor error(open or short)	0	0	•	0	
Indoor unit heat exchanger temperature sensor error(open or short)	0	•	•	0	
Indoor fan motor malfunction	0	0	0	•	
EEPROM error	0	•	•	•	
Option error(option wasn't set up or option data error)	•	•	•	•	

)	: Lamp off	: Lan
ノ	. Lamp on	. Lai



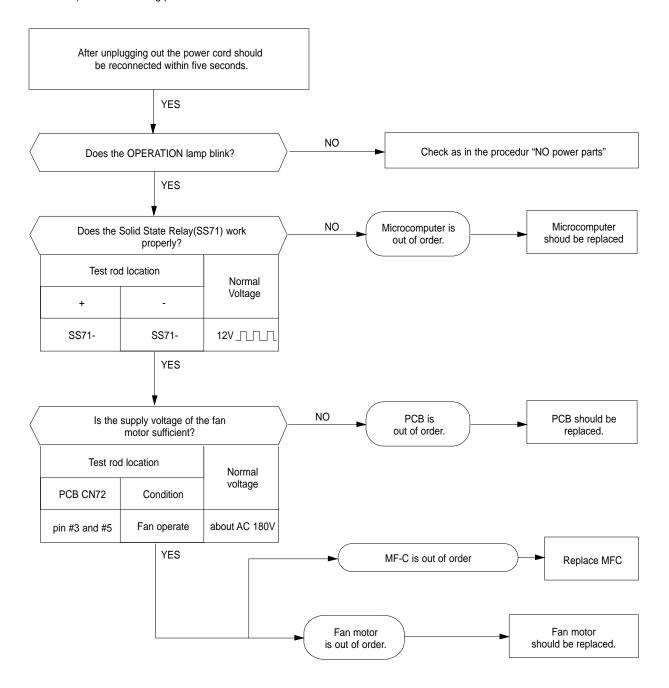
#### 8-1-2. Fault Diagnosis by Symptom

- ♦ No Power (completely dead)-Initial diagnosis
  - 1) Checklist:
    - (1) Is input voltage normal?
    - (2) Is AC power linked correctly?
    - (3) Is input voltoge of DC regulator IC KA7805 (IC02) normal? (11VDC-12.5VDC)
    - (4) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)
  - 2) Troubleshooting procedure



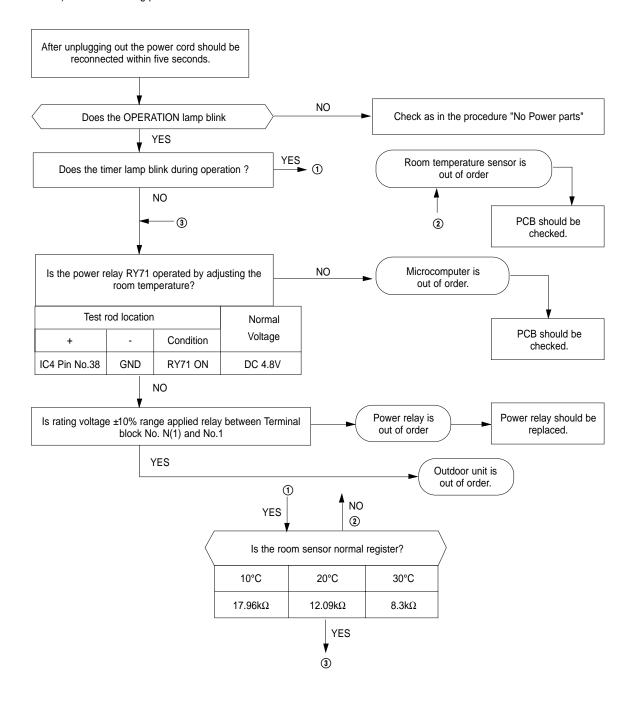
#### ♦ When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

- 1) Checklist:
  - (1) Is the indoor unit fan motor properly connected with the connector (CN72)?
  - (2) Is the AC voltage correct?
  - (3) Is HALL IC in indoor fan motor properly connected with the connector (CN44)?
  - (4) Is the running capacitor (CR71) properly connected with PCB board?
- 2) Troubleshooting procedure

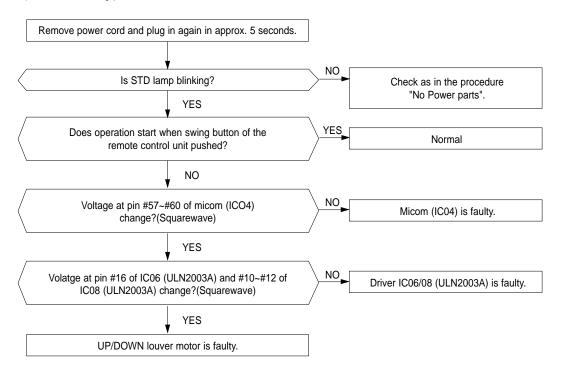


#### ♦ When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

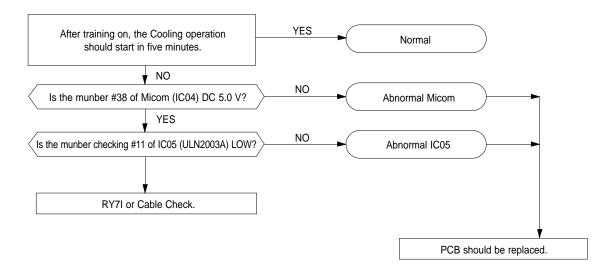
- 1) Checklist:
  - (1) Is input voltage normal?
  - (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
  - (3) Is the POWER IN connector (CN71) linked correctly?
  - (4) Is the outdoor unit properly connected with the TERMINAL BLOCK connector(N(1), 1)?
- 2) Troubleshooting procedure



- ♦ When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)
  - 1) Checklist:
    - (1) Is input voltage normal?
    - (2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?
  - 2) Troubleshooting procedure



- ♦ In the mode, When there is no cool air current. Check this first;
  - (1) Is the set temperature of Remote Control lower than room temperature in Cool mode?
  - (2) Is the Indoor PCB properly connected with the CN71 connector?



TROUBLESHOOTING

# Troubleshooting for Non Inverter Heat Pump (7K/9K)

### 8-2. Troubleshooting for Non Inverter Heat Pump (7K/9K)

#### 8-2-1. Items to be checked first

- The input voltage should be rating voltage ±10% range.
   The airconditioner may not operate properly if the voltage is out of this range.
- Is the link cable linking the indoor unit and the outdoor unit linked properly?
   The indoor unit and the outdoor unit shall be linked by 5 cables.
   Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
   Otherwise the airconditioner may not operate properly.
- 3) When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

NO	Operation of air conditioner	Explanation
1	The STD OPERATION indication LED blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the IN DOOR FAN should operate.  In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO( (Auto ) or DRY( (3/2) ) mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY( 🏈 ) mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the compressor continues operation for up to 9 minutes (maximum) until the deice is completed.
6	Timer LED of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
7	The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room temperature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
8	Indoor fan and outdoor fan stop operation intermittently in a HEAT mode.	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermittently for within 20% of the total heater operation
9	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

4) Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

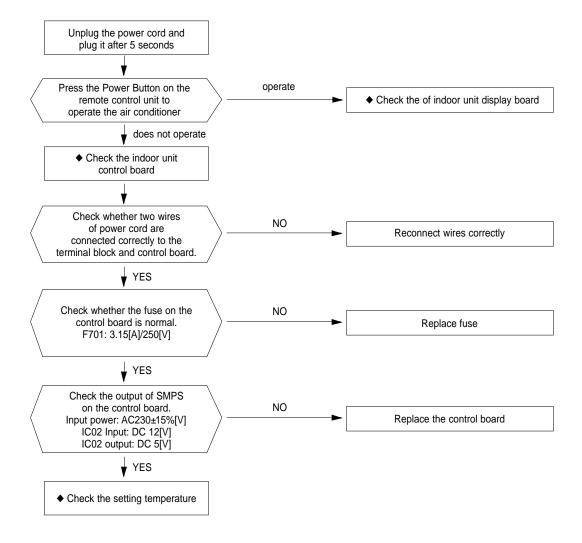
	LAMP of Display Monitor				
Description	TURBO	OPERATION	TIMER	SAVING	
	TURBO	<b>%</b>	<b>①</b>	<del>:</del> D-¥	
Indoor unit room temperature sensor error(open or short)	0	0	•	0	
Indoor unit heat exchanger temperature sensor error(open or short)	0	•	•	0	
Indoor fan motor malfunction	0	0	0	•	
EEPROM error	0	•	•	•	
Option error(option wasn't set up or option data error)	•	•	•	•	

•	: Lamp off		Lam	p flickerin	(
$\overline{}$	. Lamp on	$\vee$	Lam	p mckemi	ļ



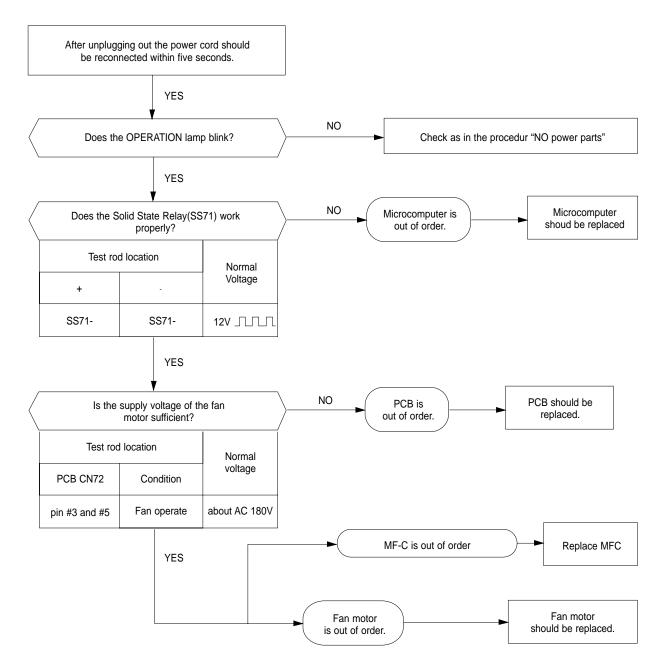
#### 8-2-2. Fault Diagnosis by Symptom

- ♦ No Power (completely dead)-Initial diagnosis
  - 1) Checklist:
    - (1) Is input voltage normal?
    - (2) Is AC power linked correctly?
    - (3) Is input voltage of DC regulator IC KA7805 (IC02) normal? (11VDC-12.5VDC)
    - (4) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)
  - 2) Troubleshooting procedure



#### ♦ When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

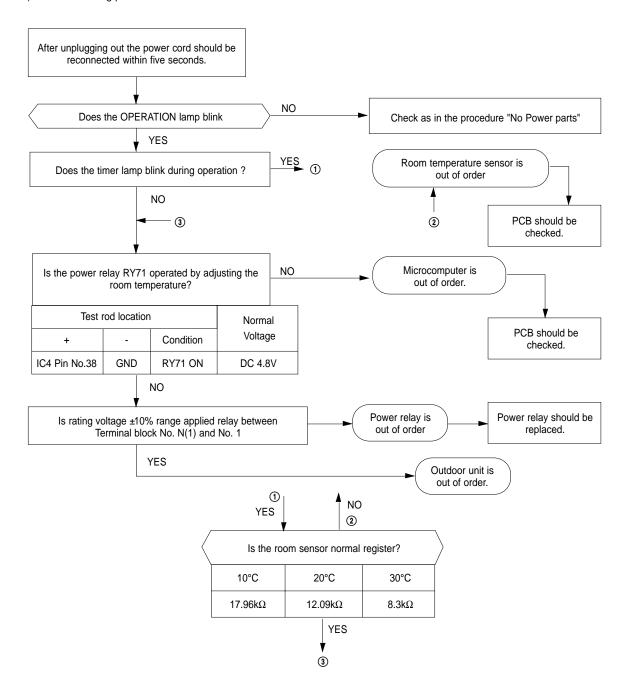
- 1) Checklist:
  - (1) Is the indoor unit fan motor properly connected with the connector (CN72)?
  - (2) Is the AC voltage correct?
  - (3) Is HALL IC in indoor fan motor properly connected with the connector (CN44)?
  - (4) Is the running capacitor (CR71) properly connected with PCB board?
- 2) Troubleshooting procedure



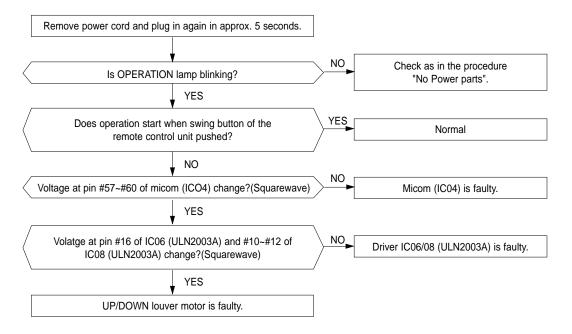
#### ◆ When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

- 1) Checklist:
  - (1) Is input voltage normal?
  - (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
  - (3) Is the set temperature of the remote control lower than room temperature in HEAT mode?
  - (4) Is the POWER IN connector (CN71) linked correctly?
  - (5) Is the outdoor unit properly connected with the TERMINAL BLOCK connector(N(1), 1, 2, 3)?

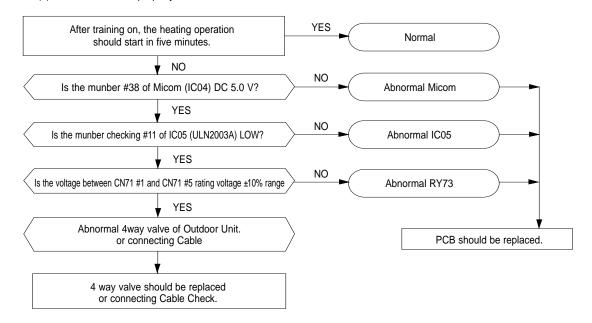
#### 2) Troubleshooting procedure



- ◆ When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)
  - 1) Checklist:
    - (1) Is input voltage normal?
    - (2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?
  - 2) Troubleshooting procedure



- ♦ In the mode, When there is no warm air current. Check this fist;
  - (1) Is the set temperature of Remote Control lower than room temperature in Heat mode?
  - (2) Is the Indoor PCB properly connected with the CN71 connector?



### 8-3. Troubleshooting for Non Inverter Cooling Only (12K)

### 8-3-1. Items to be checked first

- 1) The input voltage should be rating voltage ±10% range. The airconditioner may not operate properly if the voltage is out of this range.
- 2) Is the link cable linking the indoor unit and the outdoor unit linked properly? The indoor unit and the outdoor unit shall be linked by 3 cables. Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables. Otherwise the airconditioner may not operate properly.
- 3) When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

NO	Operation of air conditioner	Explanation
1	The OPERATION indication LED blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the INDOOR FAN should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

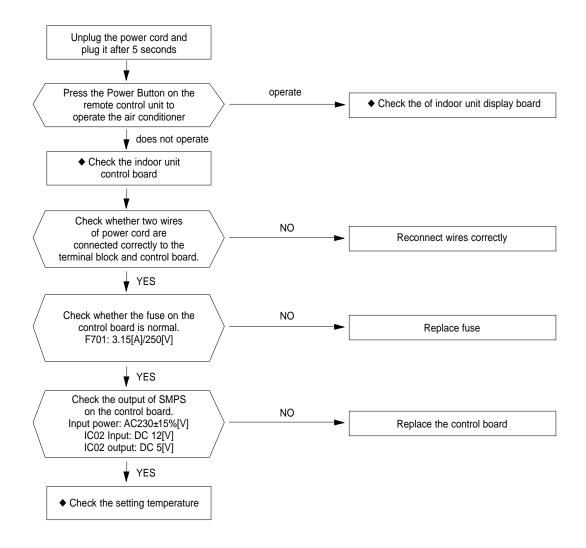
	LAMP of Display Monitor				
Description	TURBO	OPERATION	TIMER	SAVING	
	TURBO	<b>%</b>	9	₽	
Indoor unit room temperature sensor error(open or short)	0	0	•	0	
Indoor unit heat exchanger temperature sensor error(open or short)	0	•	•	0	
Indoor fan motor malfunction	0	0	0	•	
EEPROM error	0	•	•	•	
Option error(option wasn't set up or option data error)	•	•	•	•	

: Lamp off		: Lamp flickering
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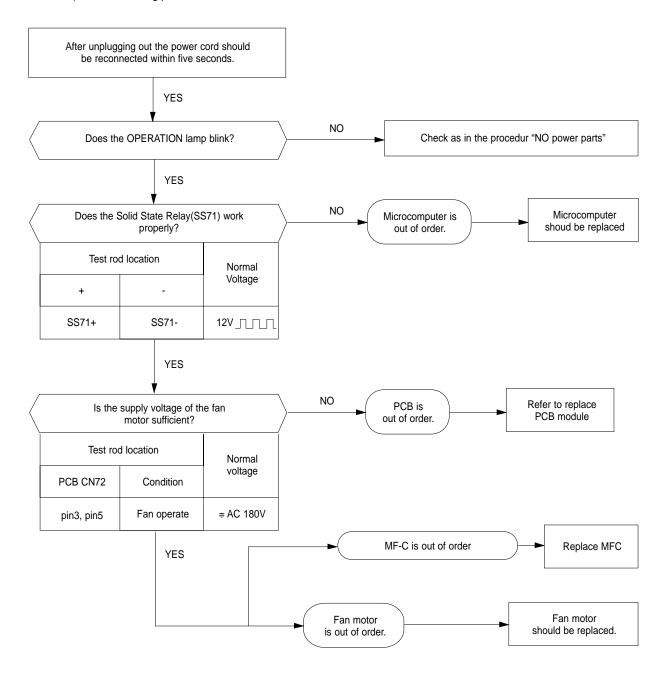
### 8-3-2. Fault Diagnosis by Symptom

- ◆ No Power (completely dead)-Initial diagnosis
  - 1) Checklist:
    - (1) Is input voltage normal? the rating voltage ±10% range.
    - (2) Is AC power linked correctly?
    - (3) Are connections between primary side, secondary side of the power transformer and PCB good.
    - (4) Is input voltage of DC regulator IC KA7805 (IC02) normal? (11VDC-12.5VDC)
    - (5) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)
  - 2) Troubleshooting procedure



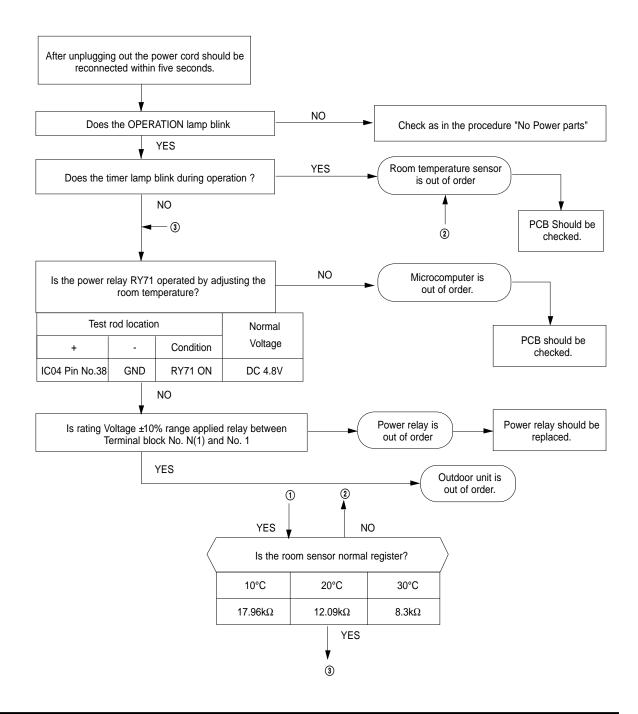
#### ♦ When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

- 1) Checklist:
  - (1) Is the indoor unit fan motor properly connected with the connector (CN72)?
  - (2) Is the AC voltage correct?
  - (3) Is HALL IC in indoor fan motor properly connected with the connector (CN44)?
  - (4) Is the running capacitor properly connected with PCB board?
- 2) Troubleshooting procedure



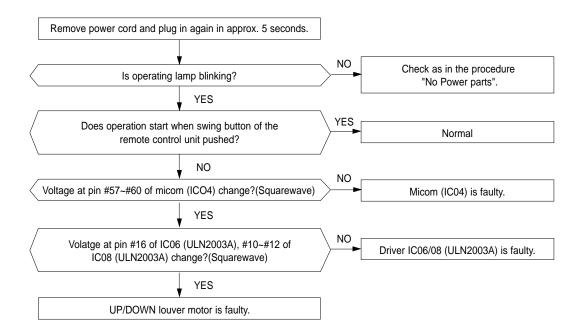
#### ◆ When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

- 1) Checklist:
  - (1) Is input voltage normal?
  - (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
  - (3) Is the POWER IN connector (CN71) linked correctly?
  - (4) Is the outdoor unit properly connected with the TERMINAL BLOCK connector(N(1), 1)?
- 2) Troubleshooting procedure



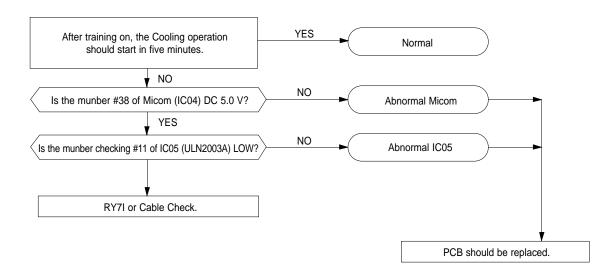
#### ♦ When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)

- 1) Checklist:
  - (1) Is input voltage normal? (input voltage ±10% range)
  - (2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?
- 2) Troubleshooting procedure



#### ♦ In the mode, When there is no cool air current. Check this first;

- (1) Is the set temperature of Remote Control lower than room temperature in Cool mode?
- (2) Is the Indoor PCB properly connected with the CN71 connector?



TROUBLESHOOTING

### Troubleshooting for Non Inverter Heat Pump (12K)

### 8-4. Troubleshooting for Non Inverter Heat Pump (12K)

### 8-4-1. Items to be checked first

- The input voltage should be rating voltage ±10% range.
   The airconditioner may not operate properly if the voltage is out of this range.
- 2) Is the link cable linking the indoor unit and the outdoor unit linked properly? The indoor unit and the outdoor unit shall be linked by 5 cables. Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables. Otherwise the airconditioner may not operate properly.
- 3) When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

NO	Operation of air conditioner	Explanation
1	The OPERATION indication LED blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the INDOOR FAN should operate.  In a HEAT operation mode, the compressor does not operate at a room temperature lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on.  As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the compressor continues operation for up to 9 minutes (maximum) until the deice is completed.
6	Timer LED of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
7	The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room temperature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
8	Indoor fan and outdoor fan stop operation intermittently in a HEAT mode.	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermittently for within 20% of the total heater operation
9	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

4) Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

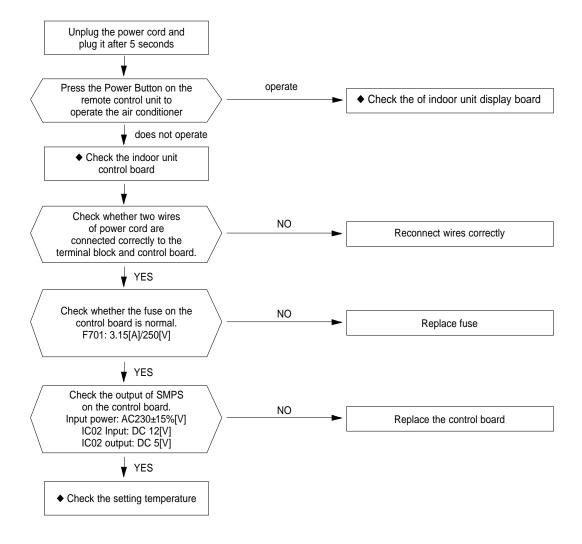
	LAMP of Display Monitor				
Description	TURBO	OPERATION	TIMER	SAVING	
	TURBO	<b>\$</b>	<b>①</b>	<del>:</del> D₽	
Indoor unit room temperature sensor error(open or short)	0	0	•	0	
Indoor unit heat exchanger temperature sensor error(open or short)	0	•	•	0	
Indoor fan motor malfunction	0	0	0	•	
EEPROM error	0	•	•	•	
Option error(option wasn't set up or option data error)	•	•	•	•	

	: Lamp off		•	l amp	flickering
$\sim$	. Lamp on	V		Lamp	IIIONOTITIO



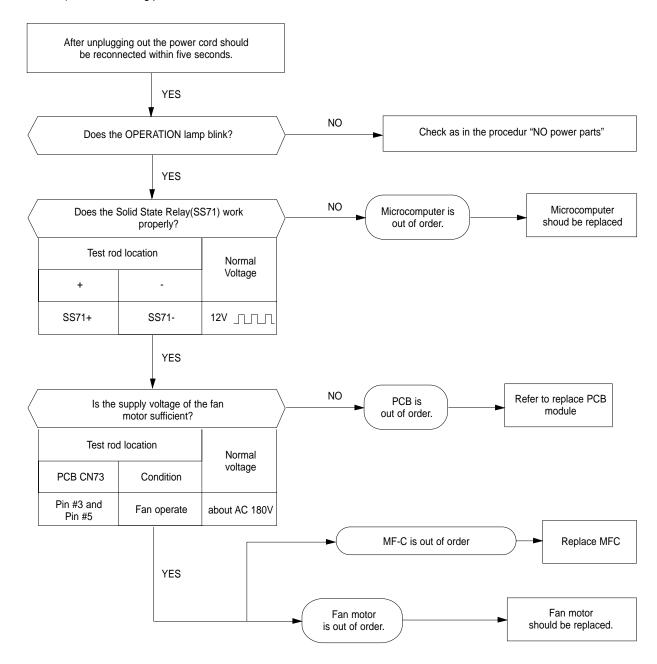
#### 8-4-2. Fault Diagnosis by Symptom

- ♦ No Power (completely dead)-Initial diagnosis
  - 1) Checklist:
    - (1) Is input voltage normal? (the rating voltage ±10% range)
    - (2) Is AC power linked correctly?
    - (3) Are connections between primary side, secondary side of the power transformer and PCB good.
    - (4) Is input voltage of DC regulator IC KA7805 (IC02) normal? (11VDC-12.5VDC)
    - (5) Is input voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)
  - 2) Troubleshooting procedure



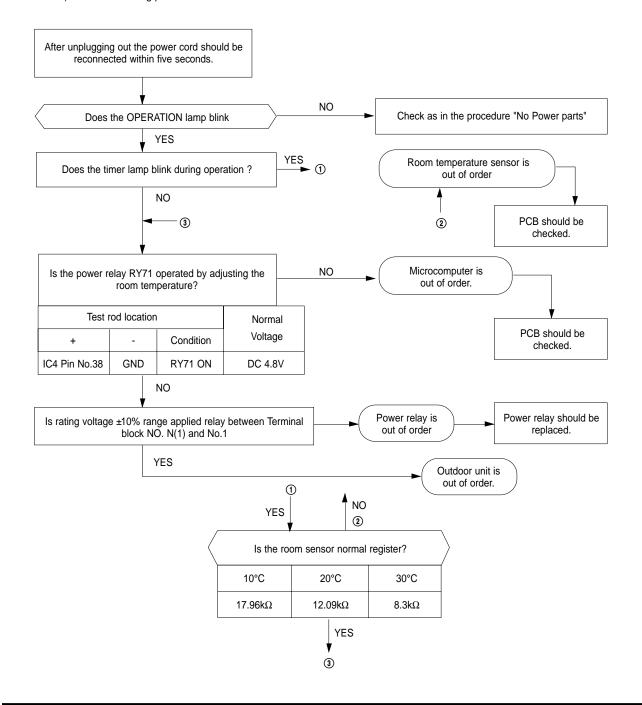
#### ♦ When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

- 1) Checklist:
  - (1) Is the indoor unit fan motor properly connected with the connector (CN72)?
  - (2) Is the AC voltage correct?
  - (3) Is HALL IC in indoor fan motor properly connected with the connector (CN44)?
  - (4) Is the running capacitor properly connected with PCB board?
- 2) Troubleshooting procedure



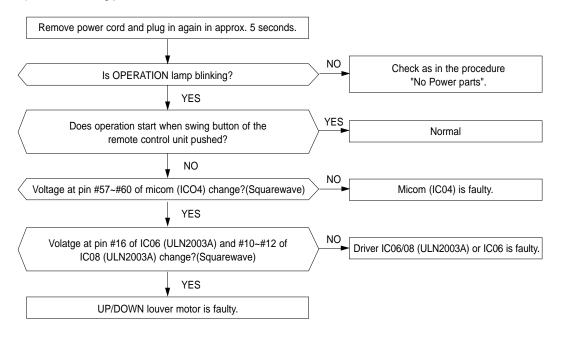
#### ◆ When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

- 1) Checklist:
  - (1) Is input voltage normal? (the rating voltage ±10% range)
  - (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
  - (3) Is the set temperature of the remote control lower than room temperature in HEAT mode?
  - (4) Is the POWER IN connector (CN71) linked correctly?
  - (5) Is the outdoor unit properly connected with the TERMINAL BLOCK connector(N(1), 1, 2, 3)?
- 2) Troubleshooting procedure



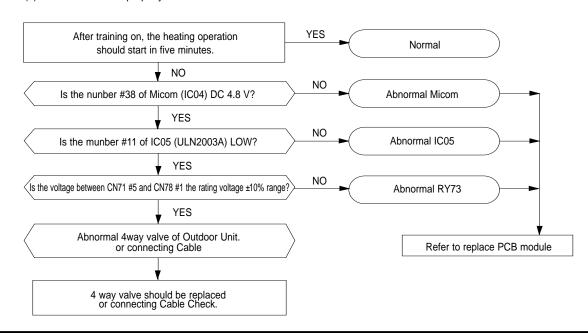
#### ♦ When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)

- 1) Checklist:
  - (1) Is input voltage normal? (the rating voltage ±10% range)
  - (2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?
- 2) Troubleshooting procedure



#### ♦ In the Heat mode, When there is no warm air current. Check this first;

- (1) Is the set temperature of Remote Control lower than room temperature in Heat mode?
- (2) Is the Indoor PCB properly connected with the CN71 and CN78 connector?



### Set up the model Option

### 8-5. Set up the Model Option

#### Step 1: Preparing the remocon to main PBA option set

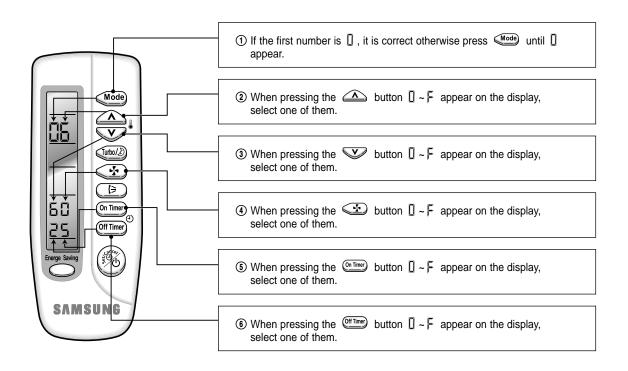
- Remove the battery from the remocon.
- Press the temperature raise/down button simultaneously and insert the battery again.  $2^{\text{nd}}$
- $3^{\text{rd}}$ Make sure the remocon display shown as  $\square$   $\square$   $\square$   $\square$   $\square$   $\square$   $\square$   $\square$ .



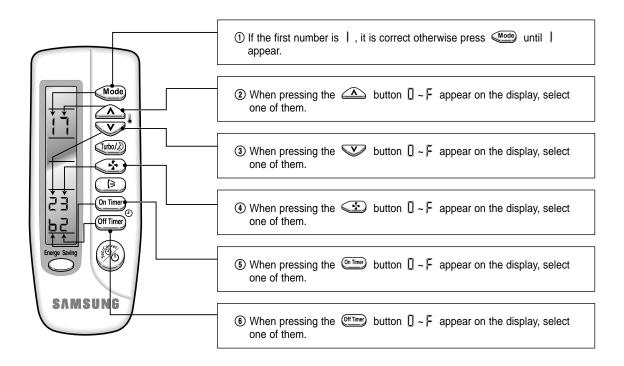
Step 2: Second stage preparation of the remocon option set.

- \* Note; In case the wrong letter has been selected, continue to press the button until the correct letter appears.
  - If the first stage number " []" appears on the display, proceed to the second stage.
  - Every time the ① and ⑦ button, " 🗓 " and " ) " each continue to appear.
  - Whenever pressing the ②, ③, ④, ⑤, ⑥, ⑥, ⑨, ⑩, ⑪, ⑫ button, the number increases from 0~9(0123456789) and A, b, C, d, E, F each time.

### ex) Option No.: 066025-172362



## Set up the Model Option (cont.)



Step 3: Reconfirming option set after completion

### (in case of ex. 066025-172362)

After pressing  $\bigcirc$  selector for the  $\square$  mode, the display shown as  $\square \subseteq \square \subseteq \square \subseteq \square$ .

After pressing Mode selector for the | mode, the display shown as 1723 62.

# Step 4 : Pressing the ON/OFF button ( )

When pressing the operation ON/OFF key with the direction of remote controller for unit, the sound "Ding" or "Diriring" is heard and the OPERATION LED lamp is flickering at the same time, then the input of option is completed. (If the diriring sound isn't heard, try again pressing the ON/OFF button.)

#### Step 5: Unit operation test-run

First, Remove the battery from the remote controller.

Second, Re-insert the battery into the remote controller.

Third, Press ON/OFF key with the direction of remote controller for set.

#### **Error Mode:**

- 1st If all lamps of indoor unit are flickering, Plug out and plug in again and pressing ON/OFF key to retry.
- 2nd If the unit is not working properly or all lamps are continuously flickering after setting the option code, see if the correct option code is set up for it's model.



# Set up the Model Option (Cont.)

### <Table of the option code>

### ♦ Non Inverter (7K/ 9K/ 12K)

MODEL	OPTION CODE
SH12ZSG	066025-172362
SH09ZS8	027064-17221d
SH07ZS8	026064-1720Fb

