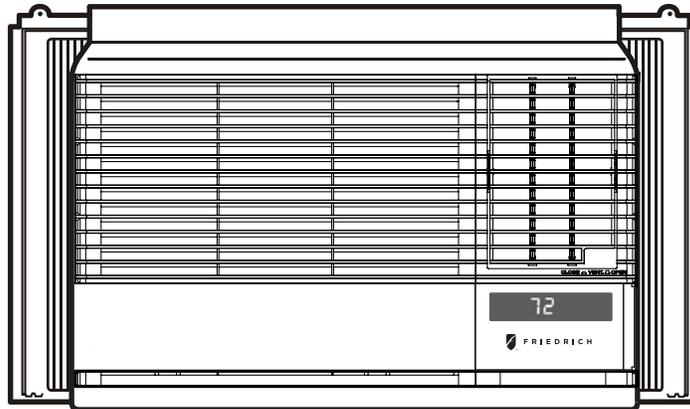




F R I E D R I C H

# Room Air Conditioner Service and Parts Manual



## Chill

115 Volts • CP06 • CP08

# CONTENTS

<b>1. PREFACE</b>	
1.1 SAFETY PRECAUTIONS .....	2
1.2 INSULATION RESISTANCE TEST.....	2
1.3 PRODUCT SPECIFICATIONS .....	3
1.4 OPERATING INSTRUCTIONS.....	4
<b>2. DISASSEMBLY INSTRUCTIONS</b>	
2.1 MECHANICAL PARTS.....	5
2.1.1 FRONT GRILLE .....	5
2.1.2 CABINET.....	5
2.1.3 CONTROL BOX .....	5
2.2 AIR HANDLING PARTS.....	6
2.2.1 COVER (AT THE TOP).....	6
2.2.2 AIR GUIDE AND BLOWER.....	6
2.2.2 FAN AND SHROUD .....	6
2.2.3 MOTOR .....	7
2.3 ELECTRICAL PARTS .....	7
2.3.1 OVER LOAD PROTECTOR.....	7
2.3.2 COMPRESSOR .....	7
2.3.3 CAPACITOR .....	8
2.3.4 POWER CORD.....	8
2.4 REFRIGERATION CYCLE.....	9
2.4.1 CONDENSER .....	9
2.4.2 EVAPORATOR .....	9
2.4.3 CAPILLARY TUBE .....	9
<b>3. SCHEMATIC DIAGRAM</b>	
3.1 CIRCUIT DIAGRAM.....	12
<b>4. TROUBLESHOOTING GUIDE</b>	
4.1 PIPING SYSTEM .....	13
4.2 TROUBLESHOOTING GUIDE.....	14
<b>5. EXPLODED VIEW</b> .....	19
<b>6. REPLACEMENT PARTS LIST</b> .....	20

## 1. PREFACE

This **SERVICE MANUAL** provides various service information, including the mechanical and electrical parts etc. This room air conditioner was manufactured and assembled under a strict quality control system. The refrigerant is charged at the factory. Be sure to read the safety precautions prior to servicing the unit.

### 1.1 SAFETY PRECAUTIONS

1. When servicing the unit, turn off the air conditioner and unplug the power cord.
2. Observe the original lead dress.  
If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
3. After servicing the unit, make an insulation resistance test to protect the customer from being exposed to shock hazards.

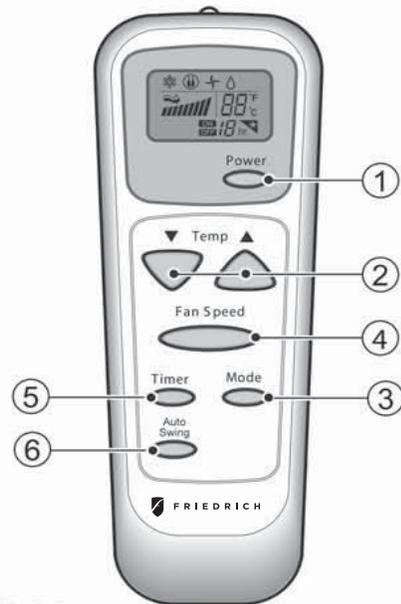
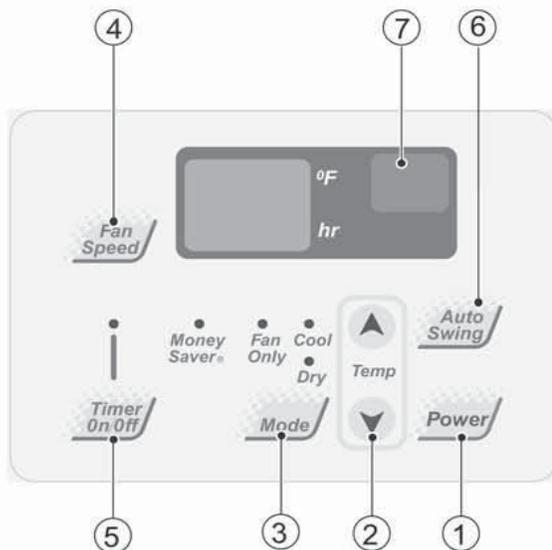
### 1.2 INSULATION RESISTANCE TEST

1. Unplug the power cord and connect a jumper between 2 pins (black and white).
2. The grounding conductor (green or green & yellow) is to be open.
3. Measure the resistance value with an ohm meter between the jumpered lead and each exposed metallic part on the equipment.
4. The value should be over 1M $\Omega$

### 1.3 PRODUCT SPECIFICATIONS

ITEMS	MODELS		CP08G10	CP06G10
	POWER SUPPLY	1Ø, 115, 60Hz		
COOLING CAPACITY	(Btu/h)	7,800	6,000	
INPUT	(W)	720	560	
RUNNING CURRENT	(A)	6.8	5.1	
E.E.R (BTU/W.h)		10.8	10.7	
OPERATING	INDOOR (C)	26.7(DB)*	19.4(WB)**	
	OUTDOOR (C)	35(DB)*	23.9(WB)**	
REFRIGERANT (R-410A) CHARGE		490g(12.4 oz)	285g(11.3 oz)	
EVAPORATOR		Ø7.0, 2ROW 14STACKS		
CONDENSER		Ø5.0, 2ROW 16STACKS		
FAN, INDOOR		TURBO FAN		
FAN, OUTDOOR		PROPELLER TYPE FAN WITH SLINGER RING		
FAN SPEEDS, FAN/COOLING		3/3		
FAN MOTOR		6 POLES		
OPERATION CONTROL		REMOTE CONTROLLER		
ROOM TEMP. CONTROL		THERMISTOR		
AIR DIRECTION CONTROL		HORIZONTAL LOUVER (UP & DOWN), VERTICAL LOUVER (RIGHT&LEFT)		
CONSTRUCTION		SLIDE IN-OUT CHASSIS		
PROTECTOR	COMPRESSOR	OVERLOAD PROTECTOR		
	FAN MOTOR	INTERNAL THERMAL PROTECTOR		
POWER CORD		3 WIRE WITH GROUNDING		
		ATTACHMENT PLUG (CORD-CONNECTED TYPE)		
DRAIN SYSTEM		DRAIN PIPE OR SPLASHED BY FAN SLINGER		
OUTSIDE DIMENSION (W x H x D)	(inch)	18 1/2 x 13 7/8 x 20 11/16		
	(mm)	469 x 353 x 526		

## 1.4 OPERATING INSTRUCTIONS



### Control and Remote Control Operations

#### 1. POWER

Operation begins when this button is pressed and stops when you press the button again.

#### 2. TEMPERATURE CONTROL

The thermostat monitors room temperature to maintain the desired temperature. The thermostat can be set between 60°F~86°F (16°C~30°C).

#### 3. OPERATION MODE SELECTOR

Select cooling mode to cool the room. Select Money Saver® mode for energy saving operation. Select fan mode for basic ventilating fan operation. Select dry mode for dry operation. (dehumidify operation)

#### 4. FAN SPEED SELECTOR

For increased power while cooling, select a higher fan speed.  
3 speeds: Low; Med; High

#### 5. ON/OFF TIMER

ON: If the unit is off, use Timer to set number of hours before unit starts.

- Push Timer button to advance setting from 1hr - 2hrs - ...24hrs maximum.

OFF: You will usually use shut-off time while you sleep.

- If unit is running, use Timer to set number of hours until shut-off.

- For your sleeping comfort, once Time is set, the temperature setting will rise 2°F after 30min, and once again after 30min.

- Push Timer button to advance setting from 1hr 2hrs....24hrs maximum.

#### 6. AUTO SWING

This button can automatically control the air flow direction.

#### 7. REMOTE CONTROL SENSOR

To receive the signal from remote controller.

### Inserting the Remote Control Batteries

1. Push out the cover on the back of the remote control with your thumb
2. Pay attention to polarity and insert two new AAA 1.5V batteries.
3. Reattach the cover.



**NOTE:** Do not use rechargeable batteries. Make sure that both batteries are new.

- In order to prevent discharge, remove the batteries from the remote control if the air conditioner is not going to be used for an extended period of time
- Keep the remote control away from extremely hot or humid places.

To maintain optimal operation of the remote control, the remote sensor should not be exposed to direct sunlight.

## 2. DISASSEMBLY INSTRUCTIONS

— Before the following disassembly, POWER SWITCH is set to OFF and disconnected the power cord.

### 2.1 MECHANICAL STRUCTURE

#### 2.1.1 FRONT GRILLE

1. Open the Inlet grille upward or downward.
2. Remove the screw which fastens the front grille.
3. Pull the front grille from the right side.
4. Remove the front grille.
5. Re-install the component by referring to the removal procedure, above.(See Figure 17)

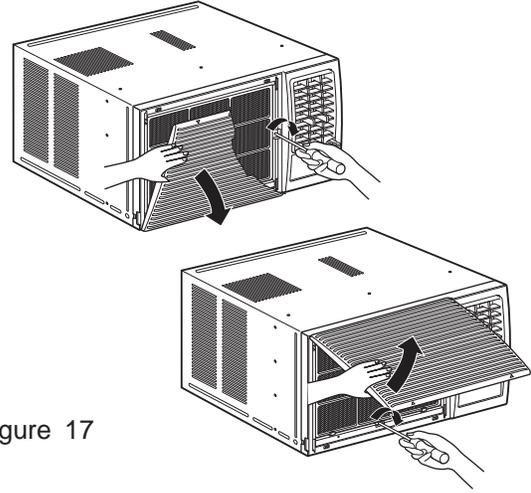


Figure 17

#### 2.1.2 CABINET

1. After disassembling the FRONT GRILLE, remove the 2 screws which fasten the cabinet at both sides.
2. Remove the 2 screws which fasten the cabinet at back.
3. Pull the base pan forward. (See Figure 18)
4. Remove the cabinet.
5. Re-install the component by referring to the removal procedure, above.

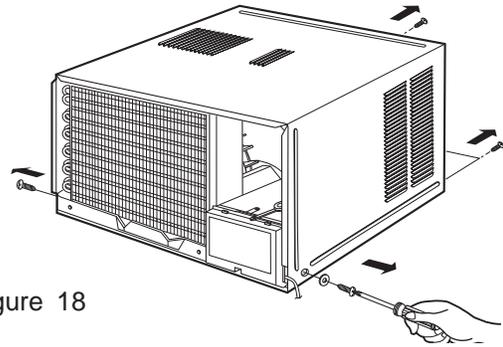


Figure 18

#### 2.1.3 CONTROL BOX

1. Disconnect the unit from the power source.
2. Remove the front grille.
3. Remove the cabinet.
4. Remove the screw which fastens the contrc cover.
5. Remove the housing which connects motor in the control box.
6. Remove the 3 leads from the compressor.
7. Discharge the capacitor by placing a 20,000 ohm resistor across the capacitor terminals.
8. Remove the 2 screws which fasten the control box.(See Figure 19)
9. Pull the control box forward completely.
10. Re-install the components by referring to the removal procedure, above. (See Figure 19)

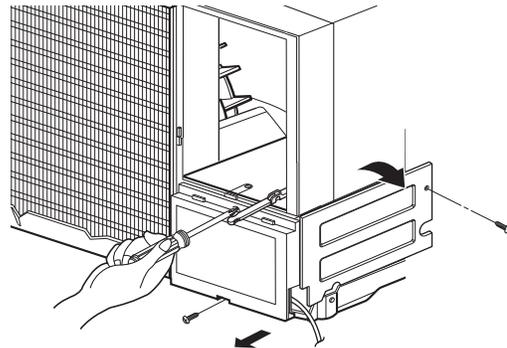


Figure 19

## 2.2 AIR HANDLING PARTS

### 2.2.1. AIR GUIDE AND BLOWER

1. Remove the front grille.
2. Remove the cabinet.
3. Remove the control box.
4. Remove the 3 screws which fasten the brace.
5. Remove the brace.
6. Remove the 2 screws which fasten the evaporator.
7. Move the evaporator forward and pulling it upward slightly. (See Figure 20)
8. Move the evaporator to the left carefully.
9. Pull out the hook of orifice by pushing the tabs and remove it. (See Figure 21)
10. Remove the clamp with a hand plier which secures the blower.
11. Remove the blower.
12. Remove the 4 screws which fasten the air guide from the barrier.
13. Move the air guide backward, pulling out from the base pan.
14. Re-install the components by referring to the removal procedure, above.

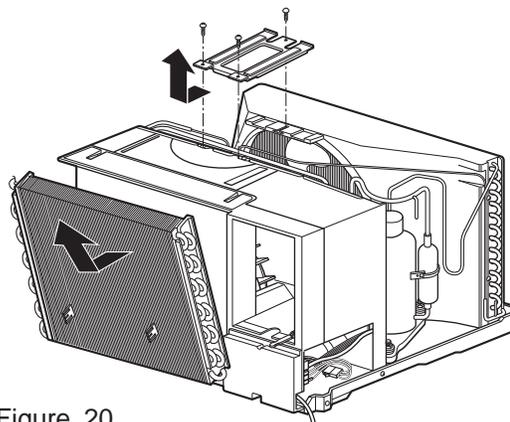


Figure 20

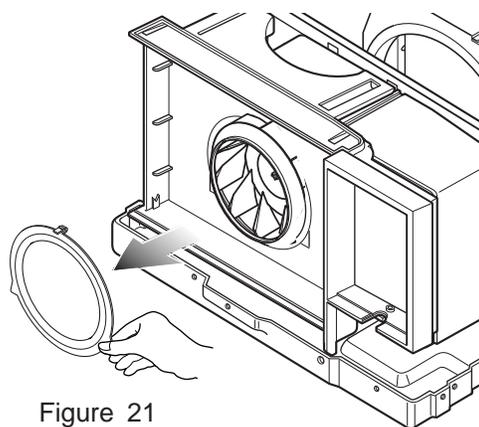


Figure 21

### 2.2.2 FAN AND SHROUD

1. Remove the cabinet.
2. Remove the brace.
3. Remove the 3 screws which fasten the condenser.
4. Move the condenser to the left carefully.
5. Remove the clamp which secures the fan.
6. Remove the fan and then pull out the shroud. (See Figure 22)
7. Re-install by referring to the removal procedure.

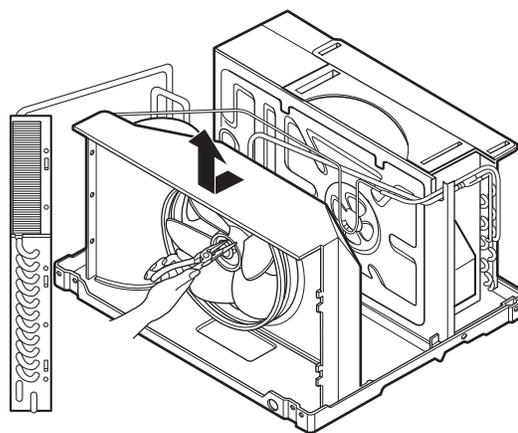


Figure 22

### 2.2.3. MOTOR

1. Remove the cabinet.
2. Remove the evaporator.
3. Remove the orifice.
4. Remove the blower.
5. Remove the fan.
6. Remove the control box cover and housing of the motor in the control box.
7. Remove the 2 screws which fasten the motor from the mount motor. (See Figure 23)
8. Remove the motor.
9. Re-install the components by referring to the removal procedure, above.(See Figure 23)

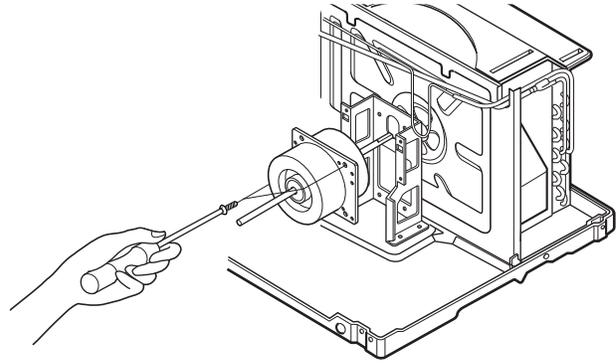


Figure 23

## 2.3 ELECTRICAL PARTS

### 2.3.1. OVERLOAD PROTECTOR

1. Remove the cabinet.
2. Remove the nut which fastens the terminal cover.
3. Remove the terminal cover. (See Figure 24)
4. Remove all the leads from the overload protector.
5. Remove the overload protector.
6. Re-install the component by referring to the removal procedure, above.

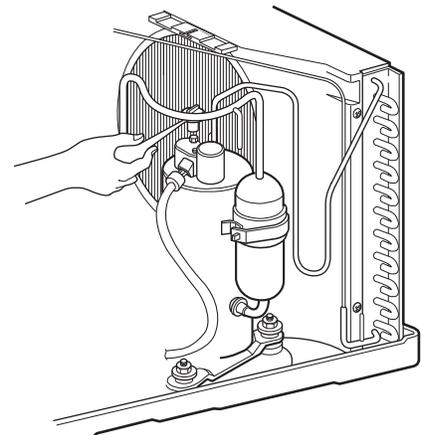


Figure 24

### 2.3.2. COMPRESSOR

1. Remove the cabinet.
2. Discharge the refrigerant system using a Freon™ Recovery System.  
If there is no valve to attach the recovery system, install one (such as a WATCO A-1) before venting the Freon™. Leave the valve in place after servicing the system.
3. Remove the overload protector.
4. After purging the unit completely, unbraid the suction and discharge tubes at the compressor connections.
5. Remove the 3 nuts and the 3 washers which fasten the compressor.
6. Remove the compressor. (See Figure 25)
7. Re-install the components by referring to the removal procedure, above.

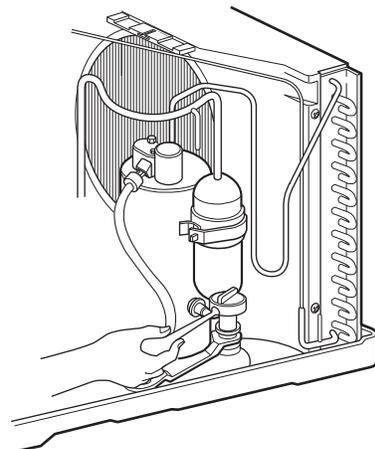


Figure 25

### 2.3.3. CAPACITOR

1. Remove the control box.
2. Remove the screw which fasten control panel from control box.
3. Remove the screw which located in the front.
4. Open the bottom side of control box.
5. Remove the screw and the clamp which fastens the capacitor.
6. Disconnect all the leads of capacitor terminals.
7. Re-install the components by referring to the removal procedure, above. (See Figure 27)

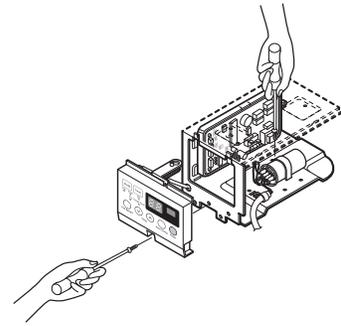


Figure 27

### 2.3.4. POWER CORD

1. Remove the control box.
2. Open the control box.
3. Disconnect the grounding screw from the control box.
4. Disconnect the 2 receptacles.
5. Remove a screw which fastens the clip cord. (See Figure 30)
6. Remove the power cord.
7. Re-install the component by referring to the above removal procedure, above. (Use only one ground-marked hole  $\oplus$  for ground connection.)
8. If the supply cord of this appliance is damaged, it must be replaced by the special cord. (The special cord means the cord which has the same specification marked on the supply cord attached at the unit.)

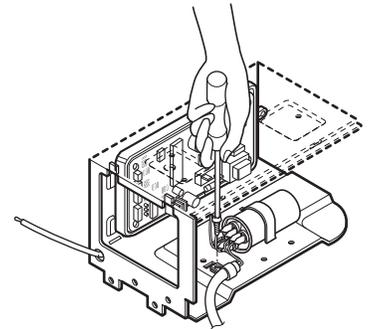


Figure 30

## 2.4 REFRIGERATION CYCLE



**CAUTION:** Discharge the refrigerant system using Freon™ Recovery System. If there is no valve to attach the recovery system, install one (such as a WATCO A-1) before venting the Freon™. Leave the valve in place after servicing the system.

### 2.4.1 CONDENSER

1. Remove the cabinet.
2. Remove the 3 screws which fasten the brace.
3. Remove the 3 screws which fasten the condenser and shroud.
4. After discharging the refrigerant completely, unbrazed the interconnecting tube at the condenser connections.
5. Remove the condenser carefully.
6. Re-install the component by referring to notes. (See Figure 31)

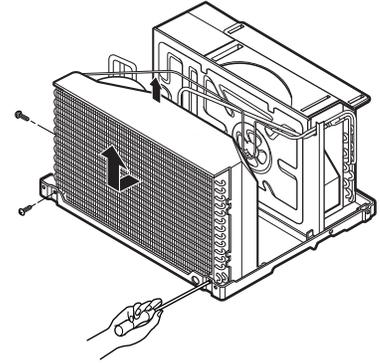


Figure 31

### 2.4.2 EVAPORATOR

1. Remove the cabinet.
2. Remove the 2 screws which fasten the evaporator.
3. Move the evaporator sideways carefully.
4. After discharging the refrigerant completely, unbrazed the interconnecting tube at the evaporator connections.
5. Remove the evaporator carefully.
6. Re-install the component by referring to notes. (See Figure 32)

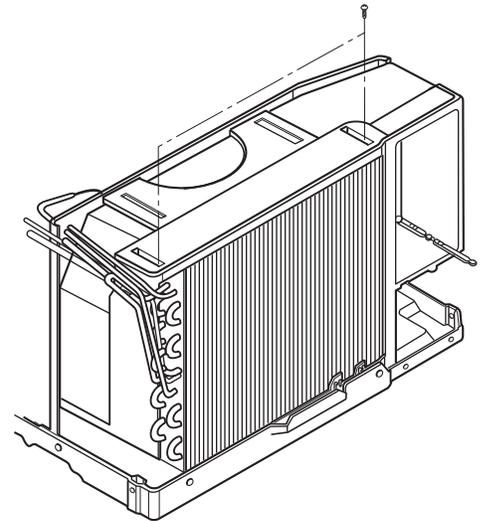


Figure 32

### 2.4.3 CAPILLARY TUBE

1. Remove the cabinet.
2. After discharging the refrigerant completely, unbrazed the interconnecting tube at the capillary tube.
3. Remove the capillary tube.
4. Re-install the component by referring to notes.

**NOTICE**

— Replacement of the refrigeration cycle.

1. When replacing the refrigeration cycle, be sure to discharge the refrigerant system using a Freon™ recovery System.  
If there is no valve to attach the recovery system, install one (such as a WATCO A-1) before venting the Freon™. Leave the valve in place after servicing the system.
2. After discharging the unit completely, remove the desired component, and unbrazed the pinch-off tubes.
3. Solder service valves into the pinch-off tube ports, leaving the valves open.
4. Solder the pinch-off tubes with Service valves.
5. Evacuate as follows.
  - 1) Connect the vacuum pump, as illustrated figure 33A.
  - 2) Start the vacuum pump, slowly open manifold valves A and B with two full turns counterclockwise and leave the valves open.  
The vacuum pump is now pulling through valves A and B up to valve C by means of the manifold and entire system.



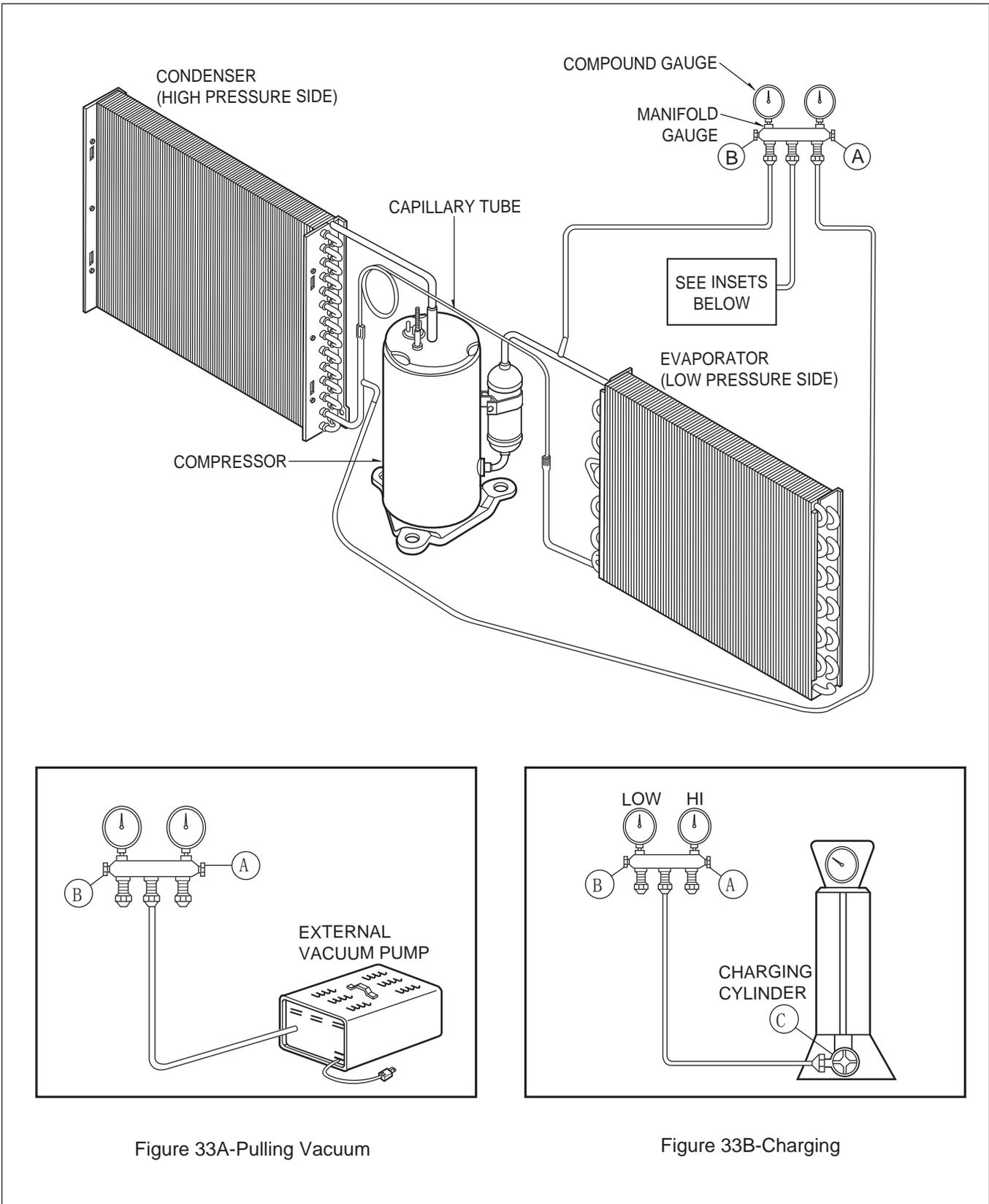
**CAUTION:** If high vacuum equipment is used, just crack valves A and B for a few minutes, then open slowly with the two full turns counterclockwise. This will keep oil from foaming and being drawn into the vacuum pump.

- 3) Operate the vacuum pump vacuum for 20 to 30 minutes, until 600 microns of vacuum is obtained. Close valves A and B, and observe vacuum gauge for a few minutes. A rise in pressure would indicate a possible leak or moisture

remaining in the system. With valves A and B closed, stop the vacuum pump.

- 4) Remove the hose from the vacuum pump and place it on the charging cylinder. See figure 37B. Open valve C.  
Discharge the line at the manifold connection.
  - 5) The system is now ready for final charging.
6. Recharge as follows :
- 1) Refrigeration cycle systems are charged from the High-side. If the total charge cannot be put in the High-side, the balance will be put in the suction line through the access valve which you installed as the system was opened.
  - 2) Connect the charging cylinder as shown in figure 33B.  
With valve C open, discharge the hose at the manifold connection.
  - 3) Open valve A and allow the proper charge to enter the system. Valve B is still closed.
  - 4) If more charge is required, the high-side will not take it. Close valve A.
  - 5) With the unit running, open valve B and add the balance of the charge.
    - a. Do not add the liquid refrigerant to the Low-side.
    - b. Watch the Low-side gauge; allow pressure to rise to 30 lbs.
    - c. Turn off valve B and allow pressure to drop.
    - d. Repeat steps b. and c. until the balance of the charge is in the system.
  - 6) When satisfied the unit is operating correctly, use the pinch-off tool with the unit still running and clamp on to the pinch-off tube. Using a tube cutter, cut the pinch-off tube about 2 inches from the pinch-off tool. Use sil-fos braze and braze pinch-off tube closed. Turn off the unit, allow it to set for a while, and then test the leakage of the pinch-off connection.

Equipment needed: Vacuum pump, Charging cylinder, Manifold gauge, Brazing equipment. Pin-off tool capable of making a vapor-proof seal, Leak detector, Tubing cutter, Hand Tools to remove components, Service valve.





# 4. TROUBLESHOOTING GUIDE

## 4.1 PIPING SYSTEM

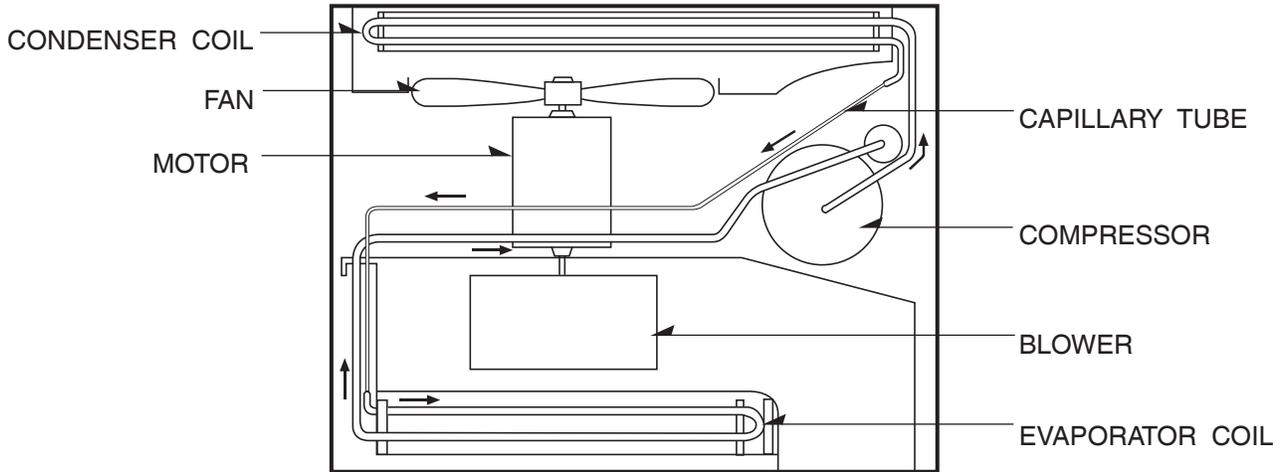
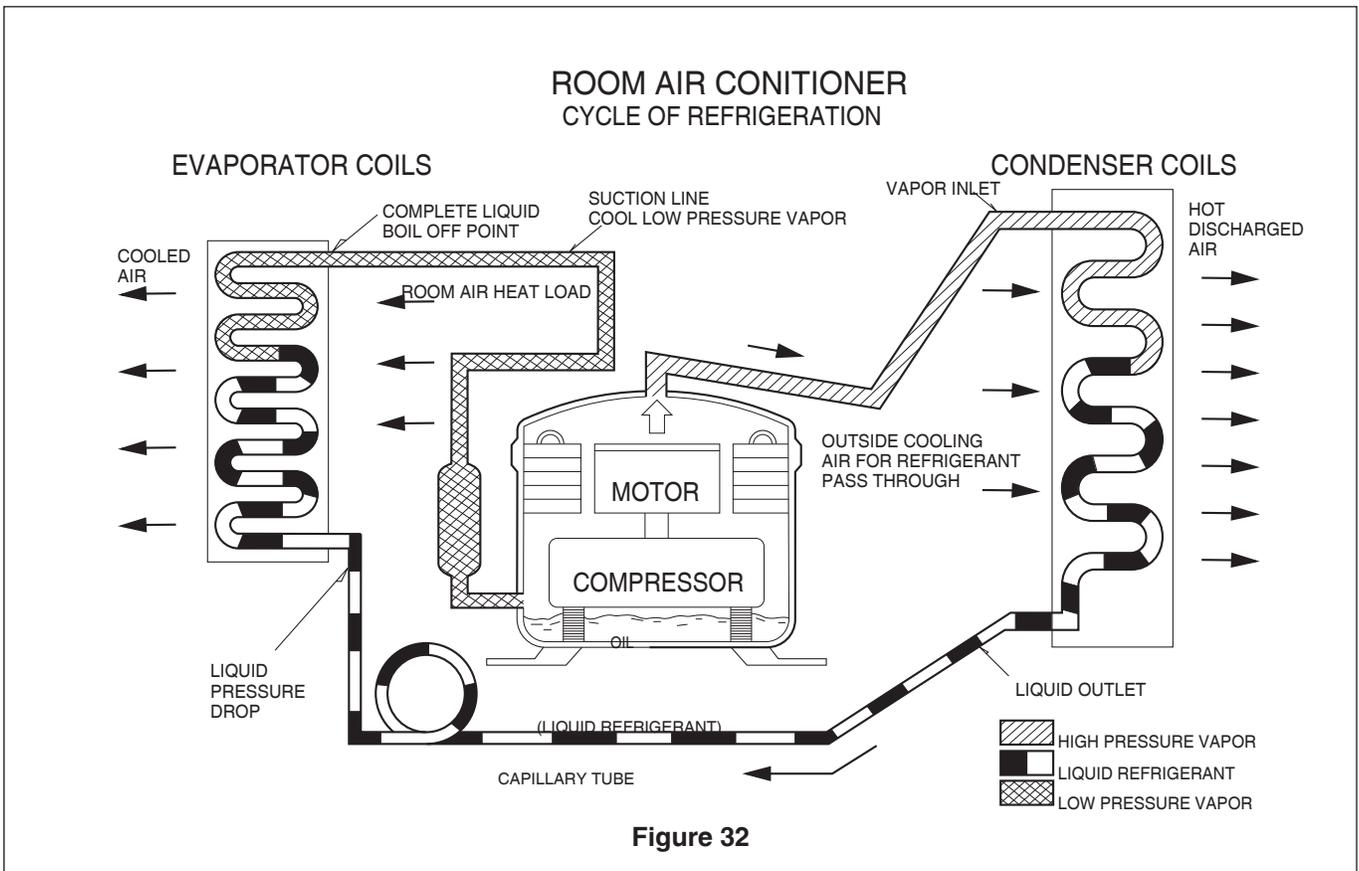


Figure 32 is a brief description of the important components and their function in what is called the refrigeration system. This will help you to understand the refrigeration cycle and the flow of the refrigerant in the cooling cycle.

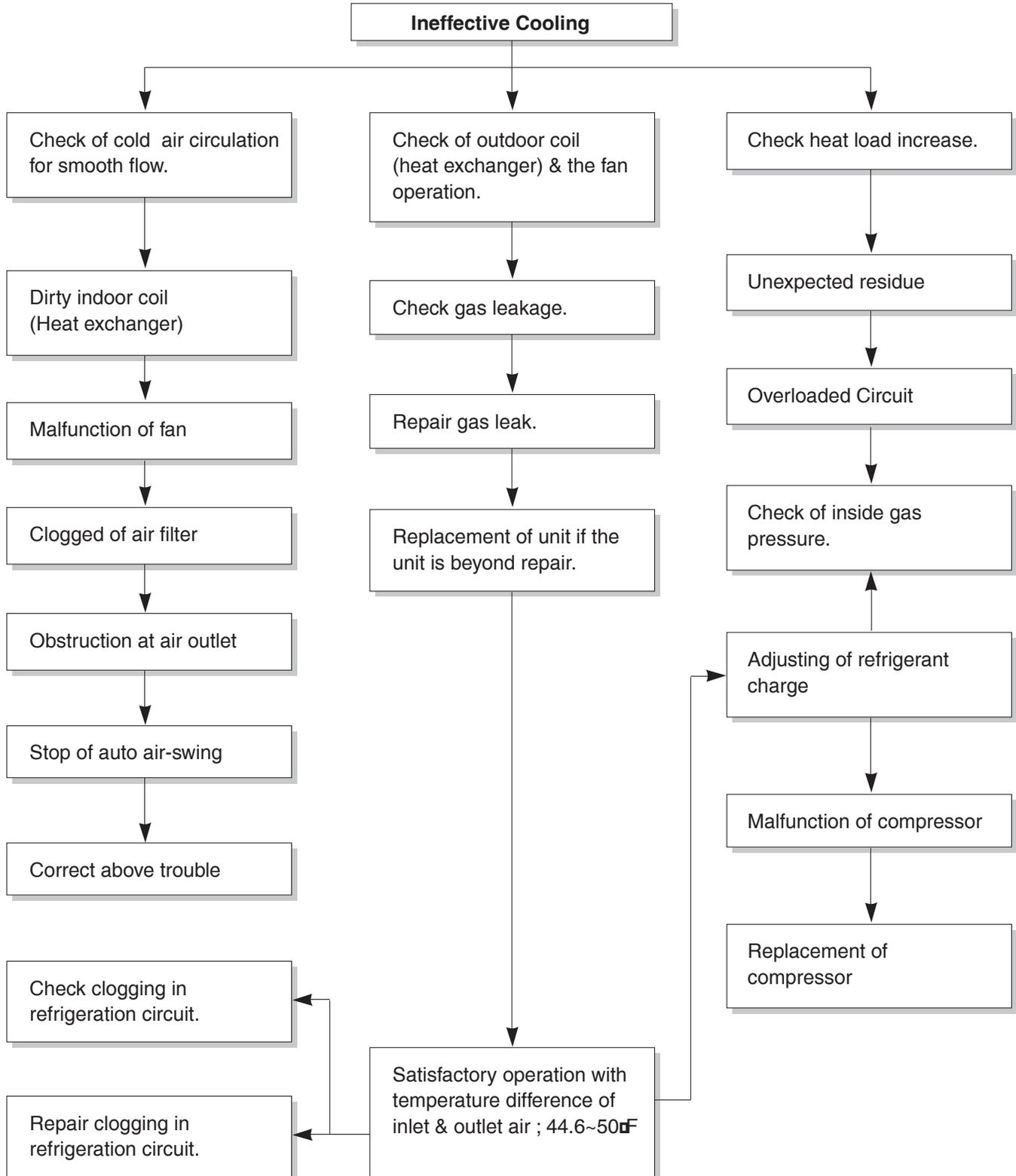


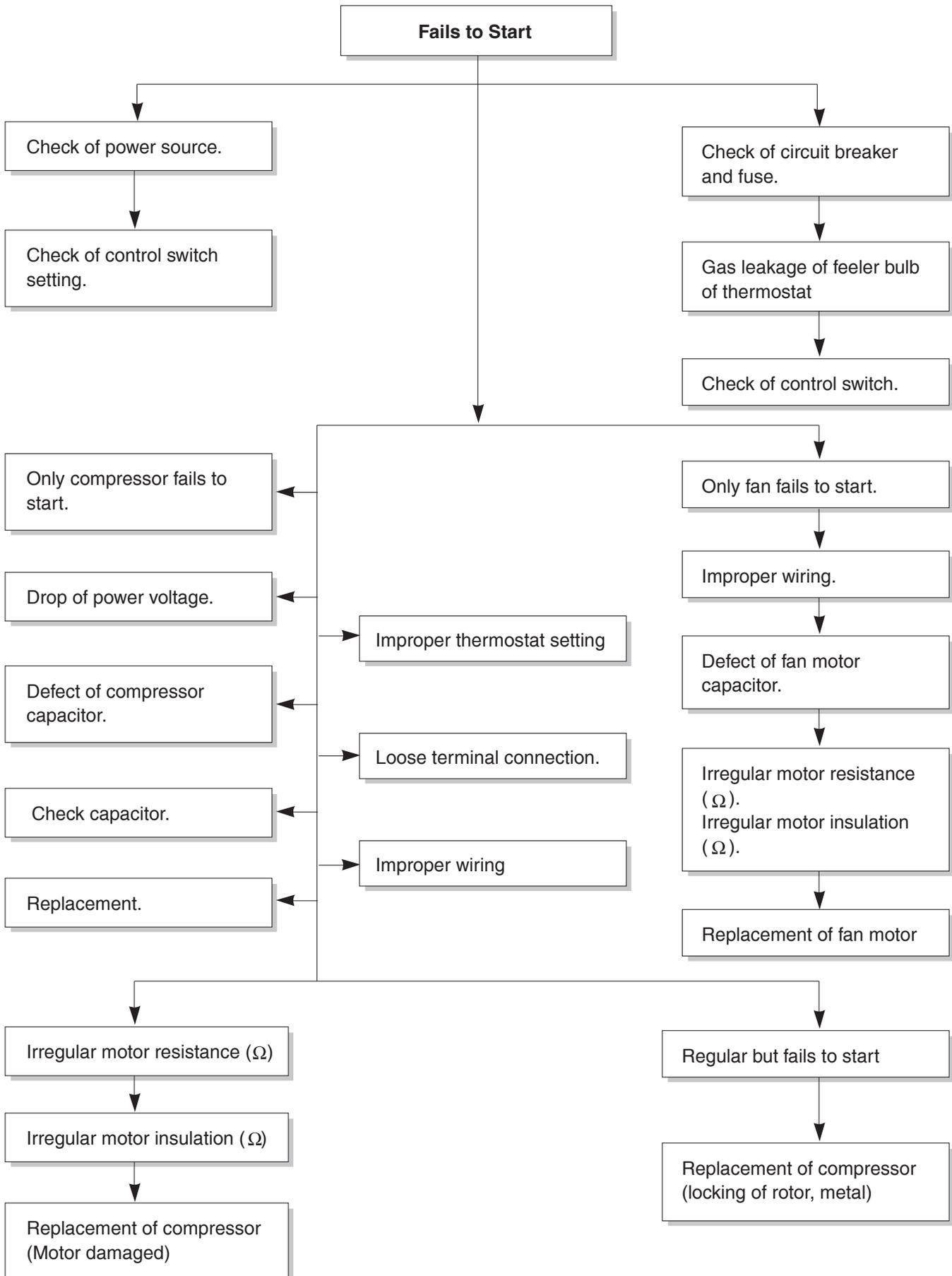
## 4.2 TROUBLESHOOTING GUIDE

In general, possible trouble is classified in two causes.

The one is called Starting Failure which is caused from an electrical defect, and the other is Ineffective Air Conditioning caused by a defect in the refrigeration circuit and improper application.

### Unit is running but cooling is ineffective





COMPLAINT	CAUSE	REMEDY
Fan motor will not run.	No power	Check voltage at outlet. Correct if none.
	Power supply cord	Check voltage to rotary switch. If none, check power supply cord. Replace cord if circuit is open.
	Rotary switch	Check switch continuity. Refer to wiring diagram for terminal identification. Replace switch if defective.
	Wire disconnected or connection loose	Connect wire. Refer to wiring diagram for terminal identification. Repair or replace loose terminal.
	Capacitor (Discharge capacitor before testing.)	Test capacitor. Replace if not within $\pm 10\%$ of manufacturer's rating. Replace if shorted, open, or damaged.
	Will not rotate	Fan blade hitting shroud or blower wheel hitting scroll. Realign assembly.  Units using slinger ring condenser fans must have $\frac{1}{4}$ to $\frac{5}{16}$ inch clearance to the base. If it is hitting the base, shim up the bottom of the fan motor with mounting screw(s).  Check fan motor bearings; if motor shaft will not rotate, replace the motor.
Fan motor runs intermittently	Revolves on overload.	Check voltage. See limits on this page. If not within limits, call an electrician.  Test capacitor. Check bearings. Does the fan blade rotate freely? If not, replace fan motor.  Pay attention to any change from high speed to low speed. If the speed does not change, replace the motor.
Fan motor noise.	Grommets	Check grommets; if worn or missing, replace them.
	Fan	If cracked, out of balance, or partially missing, replace it.
	Turbo fan	If cracked, out of balance, or partially missing, replace it.
	Loose set screw	Tighten it.
	Worn bearings	If knocking sounds continue when running or loose, replace the motor. If the motor hums or noise appears to be internal while running, replace motor.

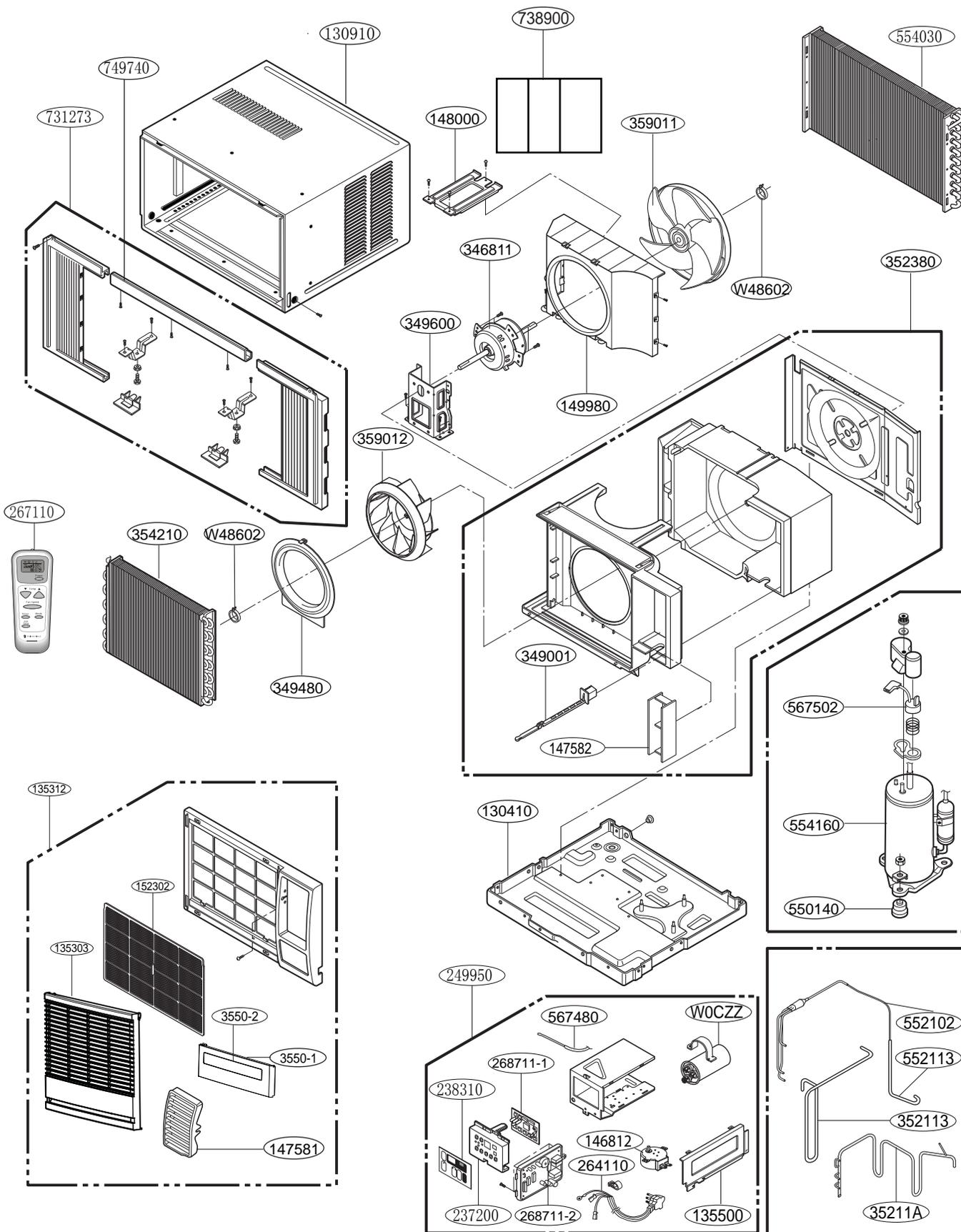
COMPLAINT	CAUSE	REMEDY
Compressor will not run, but fan motor runs.	Voltage	Check voltage. See the limits on the preceding page. If not within limits, call an electrician.
	Wiring	Check the wire connections, if loose, repair or replace the terminal. If wires are off, refer to wiring diagram for identification, and replace. Check wire locations. If not per wiring diagram, correct.
	Rotary	Check for continuity, refer to the wiring diagram for terminal identification. Replace the switch if circuit is open.
	Thermostat	Check the position of knob. If not at the coldest setting, advance the knob to this setting and restart unit. Check continuity of the thermostat. Replace thermostat if circuit is open.
	Capacitor (Discharge capacitor before servicing.)	Check the capacitor. Replace if not within $\pm 10\%$ of manufacturer's rating. Replace if shorted, open, or damaged.
	Compressor	Check the compressor for open circuit or ground. If open or grounded, replace the compressor.
	Overload	Check the compressor overload, if externally mounted. Replace if open. (If the compressor temperature is high, remove the overload, cool it, and retest.)

## ROOM AIR CONDITIONER VOLTAGE LIMITS

NAME PLATE RATING	MINIMUM	MAXIMUM
115V	103.5V	126.5V
208/230V	187V	253V

COMPLAINT	CAUSE	REMEDY
Compressor cycles on overload.	Voltage	Check the voltage. See the limits on the preceding page. If not within limits, call an electrician.
	Overload	Check overload, if externally mounted. Replace if open. (If the compressor temperature is high, remove the overload, cool, and retest.)
	Fan motor	If not running, determine the cause. Replace if required.
	Condenser air flow restriction	Remove the cabinet. inspect the interior surface of the condenser; if restricted, clean carefully with a vacuum cleaner (do not damage fins) or brush. Clean the interior base before reassembling.
	Condenser fins (damaged)	If condenser fins are closed over a large area on the coil surface, head pressures will increase, causing the compressor to cycle. Straighten the fins or replace the coil.
	Capacitor	Test capacitor.
	Wiring	Check the terminals. If loose, repair or replace.
	Refrigerating system	Check the system for a restriction.
Insufficient cooling or heating	Air filter	If restricted, clean or replace.
	Exhaust damper door	Close if open.
	Unit undersized	Determine if the unit is properly sized for the area to be cooled.
Excessive noise.	Blower or fan	Check the set screw or clamp. If loose or missing, correct. If the blower or fan is hitting air guide, rearrange the air handling parts.
	Copper tubing	Remove the cabinet and carefully rearrange tubing not to contact cabinet, compressor, shroud, and barrier.

# 5.Exploded Vie w



## 6. REPLACEMENT PARTS LIST

Location	Description	CP06G10	CP08G10
3550	Cover	67305565	67305565
130410	Base Assembly, Single	67302932	67302933
130910	Cabinet Assembly, Single	67305535	67305535
135303	Grille, Inlet	67304803	67304803
135312	Grille Assembly, Front(Indoor)	67302745	67302745
146812	Motor Assembly, AC, Single	67300902	67300902
147581	Louver, Horizontal	67305536	67305536
147582	Louver, Vertical	67306264	67306264
149980	Shroud	67303117	67305564
152302	Filter Assembly, Air Cleaner	67304310	67304310
237200	Panel, Control	67305512	67305512
238310	Escutcheon	67304804	67304804
264110	Power Cord Assembly	67300020	67300020
267110	Remote Controller Assembly	67302246	67302246
346811	Motor Assembly, AC, Single	67303013	67303013
349001	Damper Assembly	67303502	67303502
349480	Orifice	67303412	67303412
349600	Bracket, Motor	67303604	67303604
352380	Duct Assembly	67302736	67302736
359011	Fan, Axial	67303203	67303203
359012	Fan, Turbo	67302609	67302609
550140	Isolator, Compressor	67301900	67301900
567480	Thermistor, NTC	67307806	67307806
731273	Install Part Assembly, Single	67306315	67306315
749740	Guide	67304012	67304012
268711-1	PCB Assembly, Main	67307621	67307621
268711-2	PCB Assembly, Main	67307659	67307659
W0CZZ	Capacitor, Film Box	67300718	67300718
W48602	Clamp Spring	67302500	67302500



**F R I E D R I C H**

**FRIEDRICH AIR CONDITIONING CO.**

Visit our web site at [www.friedrich.com](http://www.friedrich.com)

10001 Reunion Place, Suite 500 • San Antonio, TX 78216  
(800)541-6645

