

AMW / AMC SERIES

Installation, Operation And Maintenance Manual



Please read this manual before installing and operating the unit

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INSTALLATION INSTRUCTIONS

TOOLS AND SUPPLIES

The following tools are needed for installation.

1. Level
2. Hole Saw
3. Core bits
4. Hammer
5. Drill
6. Torque wrench
7. Adjustable wrench
8. Flat head screwdriver
9. Philips head screwdriver
10. Wire stripper
11. Measuring tape
12. Ratchet set
13. Flaring tools
14. Tube cutter

The following materials are required:

1. Correct size copper tubing
2. Correct size drain pipe
3. Sleeve and bush
4. Vinyl tape
5. Saddle & Clamps to support refrigerant piping
6. Power supply cable
7. Insulation material
8. Putty or similar sealant

SAFETY CONSIDERATIONS

Installation and servicing of air conditioner can be hazardous due to high refrigerant pressure and electrical components inside the unit. Only fully trained, qualified and certified service personnel should install, repair and service the air conditioner.

While working on the air conditioner, all precautions in the literature, tags and labels attached to the unit and all other general safety precautions should be carefully observed. Please follow all safety codes, wear safety glasses and work gloves. Also use quenching cloth for brazing operations.

It is highly recommended that this manual be read completely before installing and operating the system.

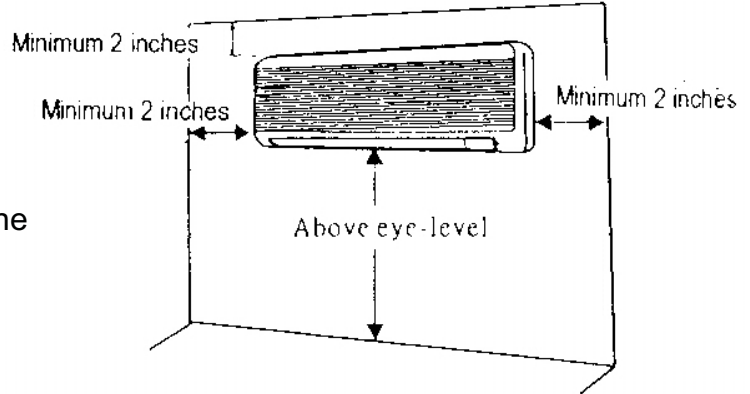
WARNING: The main power breakers to the unit , including its accessory or parts, should be turned off before performing service or maintenance operations on the unit. Dangerous high voltage can cause electric shock, serious personal injury or even death.

SELECTION OF LOCATION

Select a convenient location where:

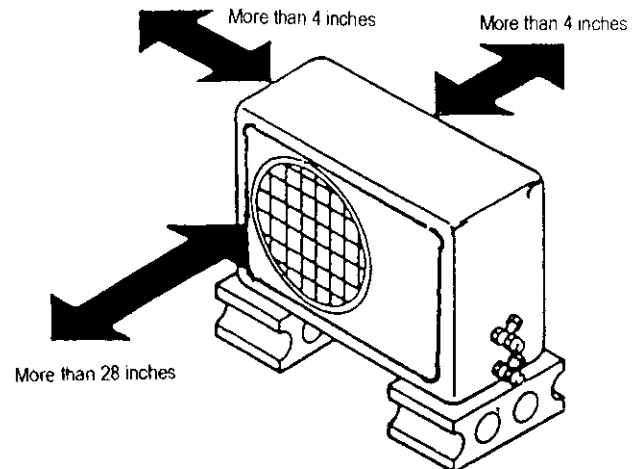
INDOOR UNIT

- The cool air can reach every corner of the area to be cooled.
- The unit is away from any direct heat source
- Easy and short routing of the refrigerant and drain pipes to the exterior.
- There are no flammable gas, alkaline or acid present in the air.
- Air circulation is not obstructed, preventing good air circulation.
- The structure where the unit is installed should be strong enough to support the weight of the unit and also prevent any vibration during operation of the unit.
- Figure on the right shows the spacing to the nearest wall.



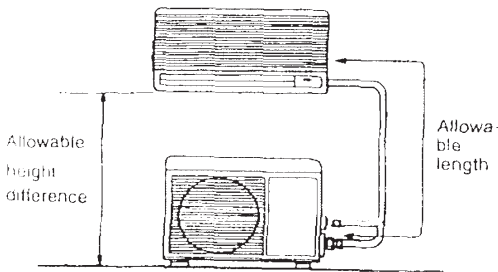
OUTDOOR UNIT:

- The condensing unit should be located as close as possible to the fan coil.
- The air inlet shall be located at least 4" from the wall or other obstruction for unrestricted airflow.
- The air outlet shall be located so as to direct discharged warm air away from the building. (Avoid low overhanging roofs to avoid re-circulation of condenser discharge air on vertical discharge models.)
- Mount the unit on a sturdy base.
- Figure on the right shows the spacing to be provided.



RECOMMENDED HEIGHT AND LENGTH

If the refrigerant piping is longer than the recommended length, or if the height difference between the indoor and outdoor unit is greater than recommended, the capacity will drop and the compressor could malfunction. Select an installation location that is within the recommended parameters.



(MAXIMUM PIPING LENGTH & HEIGHT RECOMMENDED)

Piping length (feet)					Notes
▼23		▼50			
Cooling capacity 7,500 to 9,000 Btuh	Add charge	Not needed	Needed (1)	Installation not recommended	Unit Piping Diameter 1/4" and 3/8"

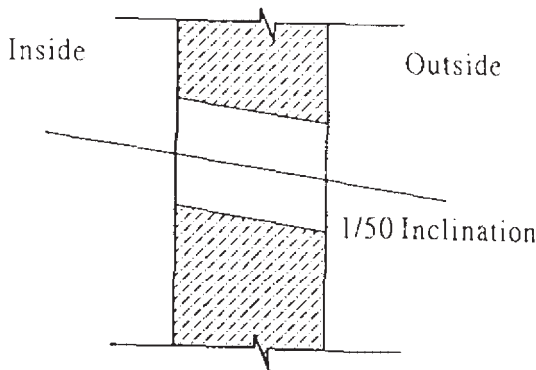
Recommended height difference is 23 ft or less
*Evacuate refrigerant lines

- (1) An installation with a piping length of 23 ft. or less is desirable. If this is not possible, the maximum piping length can be extended to 50 ft. by charging the system with additional refrigerant. However, cooling and heating capacity will be reduced.

- Additional charge volume = (piping length - 23 ft.) x 0.2 oz.

INSTALLATION METHOD

HOLE DRILLING: After deciding the method your unit will be installed, a hole to route the connecting tubes and wires to the outdoor unit is to be drilled on the wall. The hole must be lower than the point where the drainpipe attaches to the drain pan of the unit. It should also be slightly declined towards the outside.



Piping length (feet)					Notes
▼33		▼55			
Cooling capacity 18,500 to 36,000 Btuh	Add charge	Not needed	Needed (2)	Installation not recommended	Unit Piping Diameter

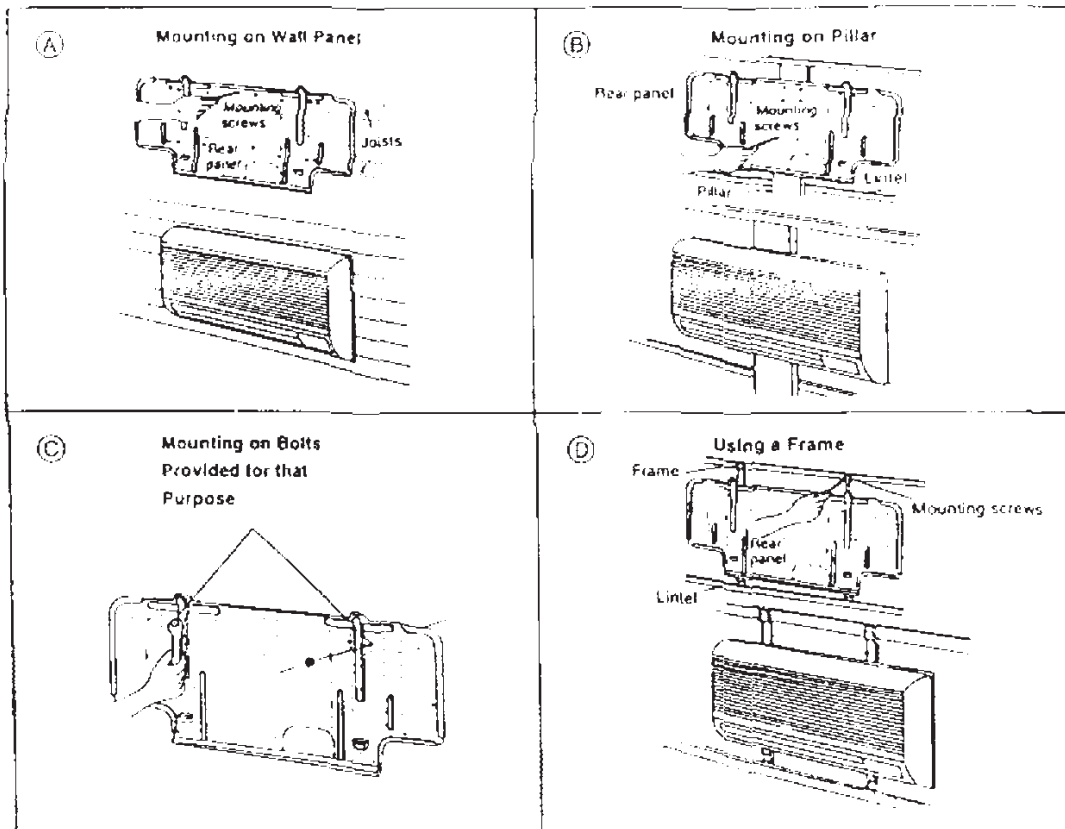
Recommended height difference is 23 ft or less
*Evacuate refrigerant lines

- (2) An installation with a piping length of 33 ft. or less is desirable. If this is not possible, the maximum piping length can be extended to 55 ft. by charging the system with additional refrigerant. However, cooling and heating capacity will be reduced.

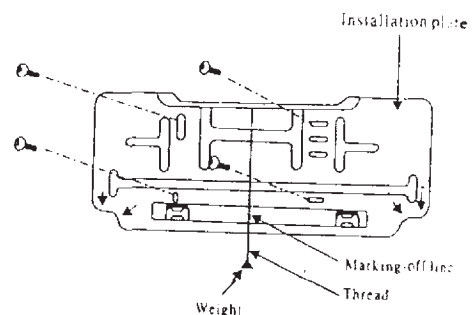
- Additional charge volume = (piping length - 33 ft.) x 0.2 oz.

MOUNTING INSTALLATION PLATE:

The fan coil can be installed using any of the four methods described below. Determine which is the most suitable method.



Position the installation plate on the wall making sure that it is parallel to the ground. This can be done by aligning the marking-off line with a thread and weight as shown in figure on the right. This is to ensure that the condensate water does not overflow from the drain pan.



Mount the installation plate with the 4 screws provided. (If the unit is to be mounted on a concrete wall, consider using anchor bolts instead of the screws provided.)

INSTALLATION OF FAN COIL:

The extended liquid and suction pipes and drain hose are hidden inside a slot at the back of the fan coil. This allows the hole on the wall to be either on the right or left side of the fan coil.

RIGHT SIDE HOLE POSITION: The piping and drain hose are routed straight through the hole.

LEFT SIDE HOLE POSITION: The piping and drain hose run from the right side to the left side of the unit, hidden in the slot at the back of the unit before routing through the hole on the left side of the unit.

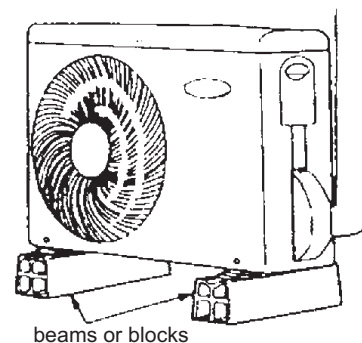
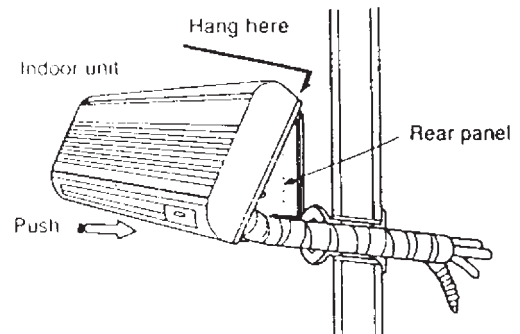
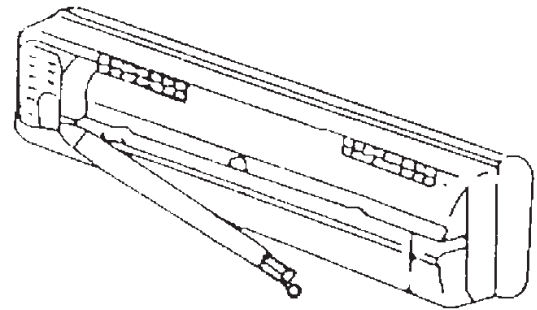
MOUNTING FAN COIL UNIT:

Hook the fan coil onto the upper portion of the installation plate ensuring that it sits securely on the installation plate.

Press the lower portion of the unit against the installation plate until the hooks at the back of the unit are securely engaged with the installation plate.

MOUNTING CONDENSING UNIT:

Do not place the condensing unit directly on the ground. It should preferably be placed on a slightly raised platform to prevent rain water from splashing into it. Also ensure that it is level. Avoid installing the unit in places where flammable gases may be present.



If necessary, due to the placement conditions, rubber cushions can be placed underneath the outdoor unit.

REFRIGERATION PIPING & DRAINAGE

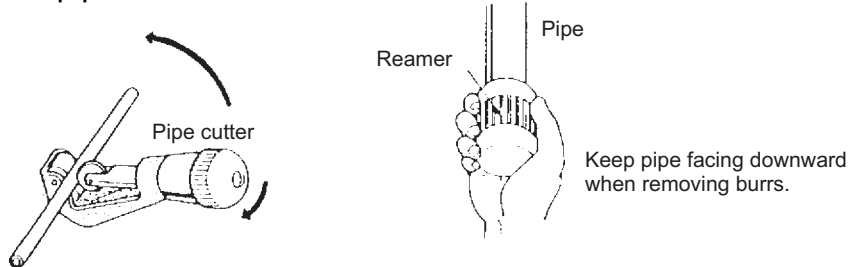
PREPARATION OF PIPING

Fan coil and side discharge condensing units are equipped with flare connections. Improper flaring and brazing may cause refrigerant to leak out of the system. Follow these instructions carefully in preparing the refrigerant piping.

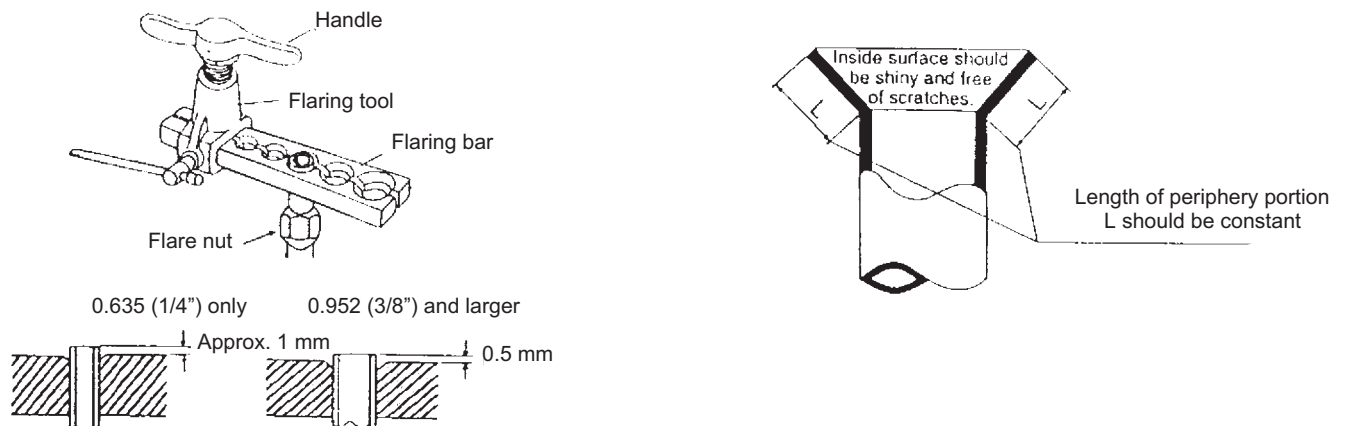
- Ensure that all piping is of the correct size.
- Measure the distance between the indoor and outdoor units' refrigerant connections, together with all the curves necessary. Add a few inches as slack.
- Lay the piping as straight as possible on a flat surface and with a pipe cutter, cut the piping according to the measured length.; Do not tighten the cutter excessively during cutting as this may cause the pipe to deform. Do not use hacksaw or similar tools to cut the pipe, as it results in metal shavings getting inside the pipe. This also makes proper flaring impossible.
- Use a reamer to remove burrs from cut edges. Hold the pipe ends upside down to prevent metal powder from getting into the pipe.

Note:

As the pipe is round, cutting should be performed on a straight section. Also, do not apply too much force with the blade of the pipe cutter.

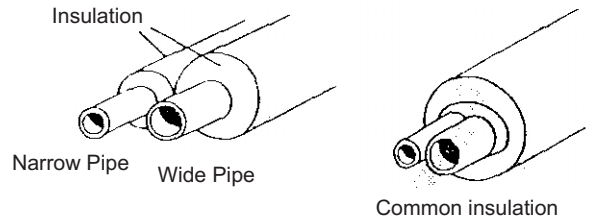


- For connection to flare settings, the pipe has to be flared. Remove the flare nut from the unit and insert it onto the piping.
- Fit the pipe into the bar of the flare tool, about 0.5 mm higher than the surface of the bar.
- Center the flare punch carefully on the pipe and turn gradually to widen the pipe. Check the finish of the flare to ensure even flaring.
- Cover the flared ends with tape to prevent dust from entering.



PIPING INSULATION

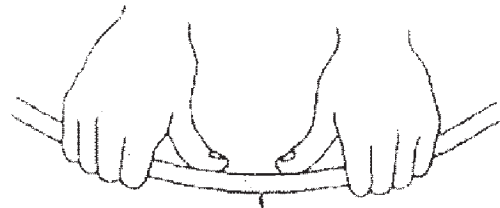
Liquid and suction lines must be insulated separately. In a cooling only type air conditioner, both pipes become cold during operation. This can cause moisture to condense on the surface of the pipes, resulting in heat loss.



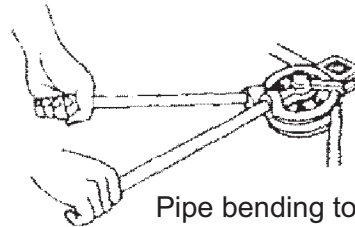
Separate insulation is essential

PRECAUTIONS WHEN BENDING PIPES

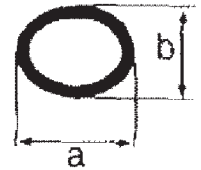
- The air conditioner's performance will suffer if the piping is crushed.
- Bend pipes using the pads of your thumbs to prevent them from collapsing (See picture on the right.)
- Use a pipe bending tool to bend pipe wider than 1/2" in diameter.



Bend with pads of thumbs



Pipe bending tool

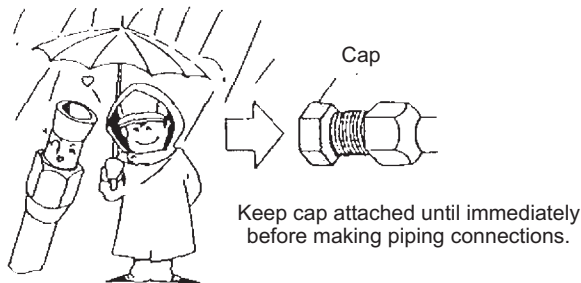


$$b/a = 0.7 \text{ or more}$$

FLARE FITTING CONNECTION. There are 3 piping rules:

(a) **DRY:** Never allow any water to get inside the piping.

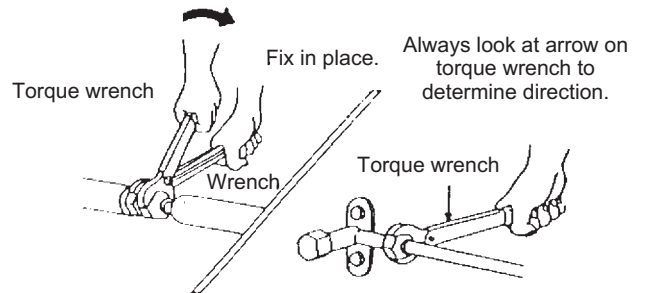
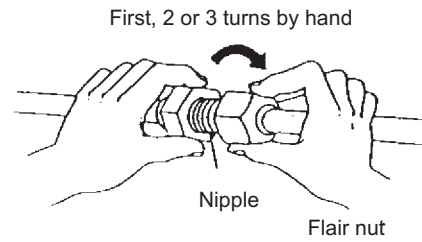
(b) **CLEAN:** Never allow dirt, sand or other foreign particles to get inside the piping.



(c) PRECAUTIONS WHEN CONNECTING PIPES:

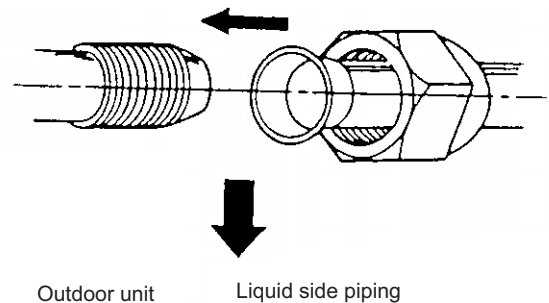
Connections will go more smoothly if the large pipe is connected first, followed by the small pipe. Hold the nipple and the flare nut straight and lightly turn the nut two or three turns by hand to ensure that the threads are aligned.

Then tighten to the specified torque using a wrench. In particular, when tightening 1/4" diameter flare nuts, use the specified torque wrench



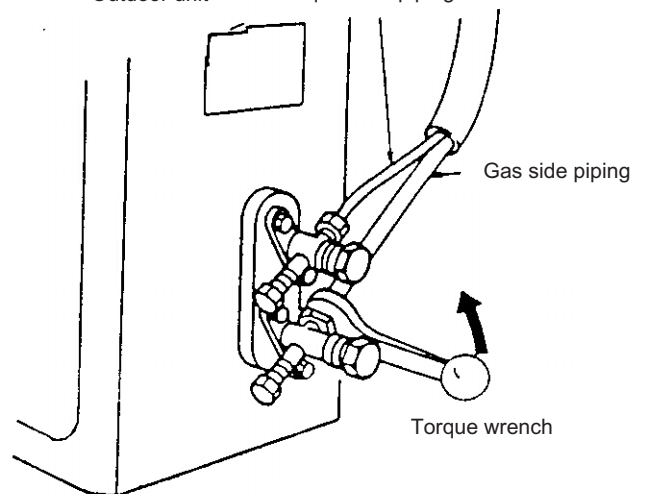
Fan Coil

- Align the center of both flare fittings and tighten the flare nut with your hand.
- With a torque wrench tighten the flare nut fully.



Condensing Units

- Align the center of the flare nut of the liquid line to the liquid valve. Tighten the flare nut, first with your hand and then fully tighten with the torque wrench.
- Align the center of the flare nut of the gas line to the gas valve. Tighten the flare nut with your hand. After purging, tighten it fully with a torque wrench and check all connections for leaks with soap solution.

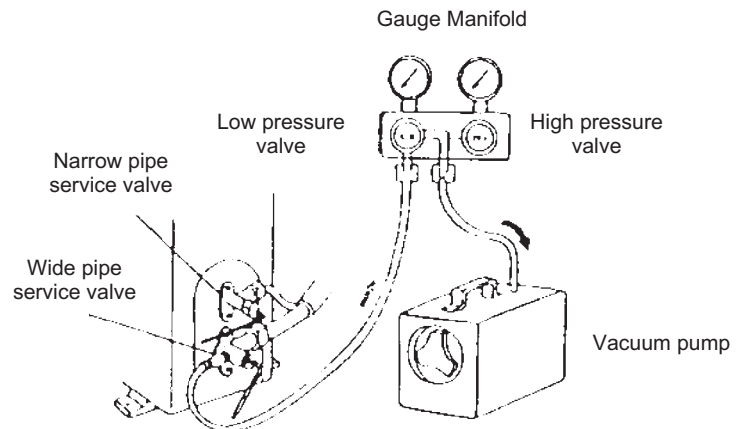


AIR PURGING

This procedure is used to remove air from inside the piping connecting the indoor and outdoor units, as well as the air inside the indoor unit. If air purging is not carried out, air will become mixed into the refrigerant cycle, causing the pressure to rise to abnormally high levels, increasing power consumption and reducing the capacity of the unit. Also, moisture in the air can cause insulation failure in the compressor motor and deterioration of the refrigerant oil, resulting in a significant reduction in the air conditioner life.

The procedure is as follows:

- Confirm that all piping connections have been completed correctly.
- Connect a gauge manifold and a vacuum pump as shown in the diagram.
- Completely open the low-pressure valve of the gauge manifold and completely close the high-pressure valve.
- Start the vacuum pump and allow it to operate until the pressure is at 29" of vacuum. This will take about 15 minutes or more.
- With the low-pressure valve completely open, switch off the vacuum pump.
- Completely open both the suction and liquid service valves.
- Disconnect the manifold.
- Tighten the caps on the service valves and the flange nut on the charging port.



DRAIN PIPE CONNECTION

The fan coil is equipped with a drain hose. It is tied together with the refrigerant piping. During installation, it is important to observe the following instructions to prevent water overflowing from the drain pan.

- Insure that the indoor unit is level and not tilted forwards or backwards.
- Insure that the drain hose does not rise above the drain pan. It should be sloping towards the hole.
- Route the drain hose through the same hole as the refrigerant pipes.
- If the drain pipe extends horizontally a long way, use PVC tubing to provide heat insulation.
- Outside insert the drain hose into a PVC drainpipe and not the other way around and glue them together.
- Run the PVC drainpipe straight down the wall. There should be no traps and avoid putting the end of the pipe into water.
- Ensure that all sections of the PVC pipes are glued securely together.
- Ensure that the entire indoor part of the drain hose is insulated to avoid condensation from dripping.
- Drain pipe may be required for heat pump unit and should be connected if necessary.

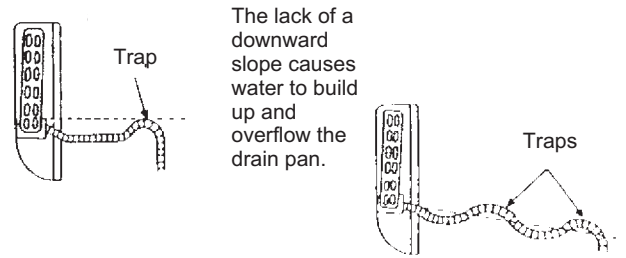
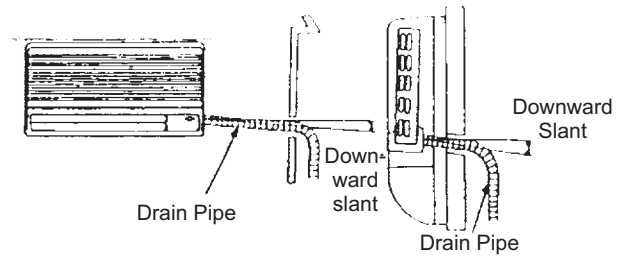
SLIME

Water leakage due to a clogged drain hose can be caused by accumulated dirt in the drain pan or by a buildup of slime inside the drain hose.

Slime is caused by the following factors:

- Temperature : 25°C (77°F) to 30°C(86°F)
- Accumulated water
- Nutrients (components of perspiration and dust in the air)
- A combination of certain types of mold and bacteria.

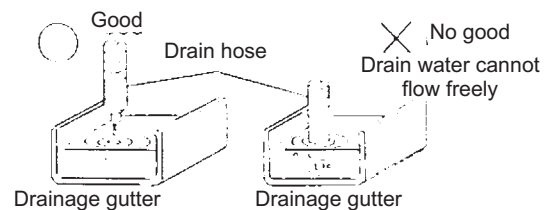
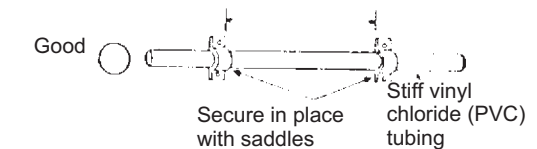
To reduce the chance of clogging, it is very important to ensure that the drain hose has a downward slant to prevent water from accumulating and a clean and a well ventilated environment.



Even if there is a downward slope overall, there must not be any "double traps" formed

• Long Horizontal Extensions

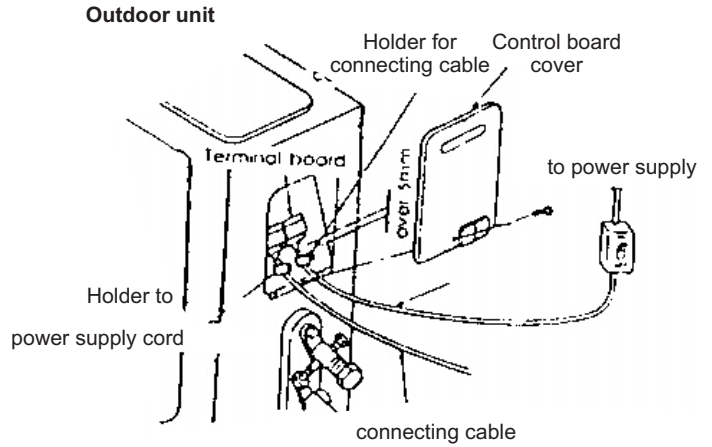
Gap of approximately 50 cm



ELECTRICAL WIRING

LOCATION OF TERMINAL BLOCK:

The terminal block on the indoor unit is located next to the PCB. Cable access is through the back of the unit. For the condensing unit, the terminal block is located behind the control panel.

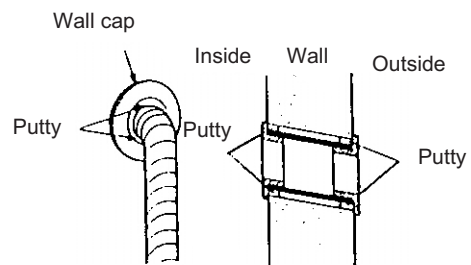
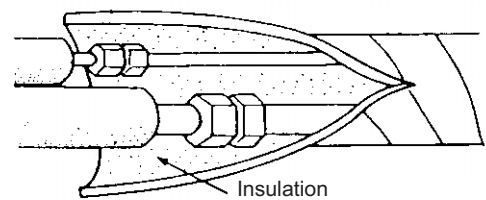
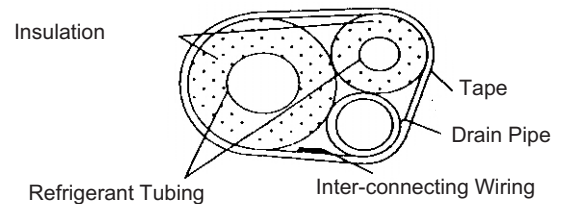


WIRING CONNECTION:

- All wiring and grounding must comply with the local Electric Codes.
- See the unit nameplate for electrical rating and use correct wire size to handle the minimum circuit ampacity required for the unit. Refer to Local Electric Codes for wire sizing.
- Always use a separate power line with circuit breaker for each air conditioner.
- Always ground the unit.
- Ensure that no wiring touches the tubing, motors or any other moving parts.
- Depending on the outdoor unit type, the number of inter-connecting wires between indoor and outdoor unit varies. Please refer to the wiring diagram on the unit to determine the number of wires required and correct connection.
- Finally inspect all the electrical connections, including the factory wiring to ensure that all connections are tight.

EXTERNAL FINISHING OF PIPING

- After completing the installation of the refrigerant piping, drain pipe and wiring, bind them together into a bundle with tape at 4 inches to 8 inches (100 to 200 mm) intervals. Start from the bottom and work to the top. Keep the drainpipe at the bottom of the bundle.
- Do not fail to apply insulation to the joints and wrap them with tape. If the joints are not insulated, condensation could form on them, resulting in water leakage.
- Use saddles to secure piping in place so that it does not sway back and forth.
- Plug any open portions of the pass through hole with putty to ensure that no rain or wind can get inside.
- Finally, tidy up both the inside and outside and the installation process is complete.



OPERATING INSTRUCTIONS

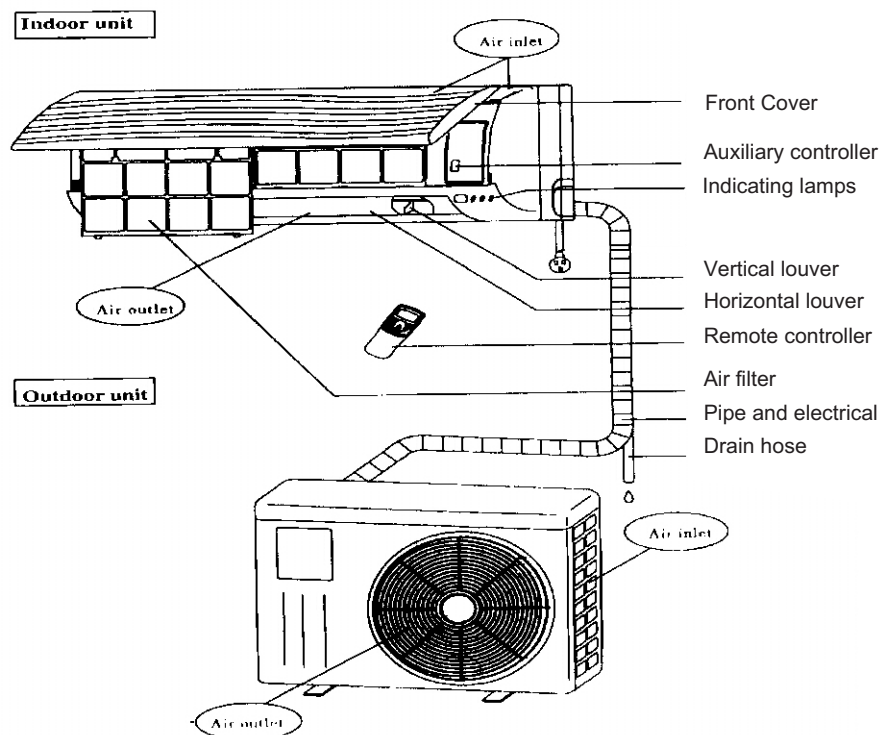
OPERATING TIPS:

Observe the following points for economical and safe operation:

- Keep the room temperature at a comfortable level. Too much cooling is unhealthy and results in excessive consumption of electricity. A temperature setting of 75°F (24°C) is usually sufficient during the day. During the night, set the temperature a few degrees higher as the body temperature is reduced when a person is asleep.
- Adjust the vertical and horizontal louvers to provide uniform distribution of air in the room.
- Clean the filter at least twice a month. A clogged air filter reduces performance and increases power consumption.
- Keep the indoor and outdoor coils clean to maintain high heat transfer capability. Periodically, inspect the coils and call a professional serviceman to clean the coils with special cleaning chemicals if necessary.
- Reduce heat gain through windows by stopping direct sunlight with curtains or blinds. Awnings are also helpful by creating shade around the windows. Keep windows and doors closed except when ventilating the room.
- It is good practice to ventilate the room occasionally to rid the room of stale air.

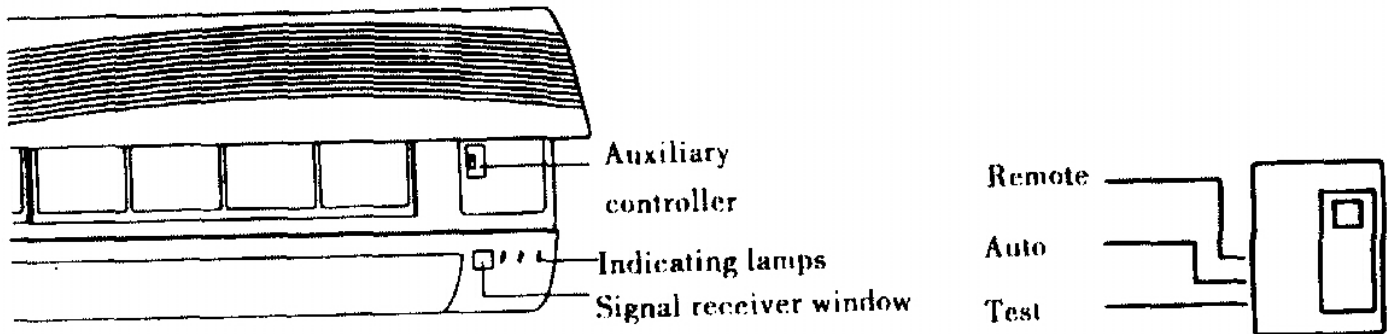
PRODUCT DESCRIPTION

Figure below illustrates the important components of the air conditioning unit.



AUXILIARY CONTROL

Figure below illustrates the auxiliary control on the fan coil. This can be used to operate / control the air conditioner when the remote controller is not available or lost.



Test

Use to operate the air conditioner under "COOL" mode. All other functions will not be effective. The air conditioner will automatically stop operating after 30 minutes. This is to test if the air conditioner is in working condition.

Remote

In this position, the air conditioner is controlled by the remote controller.

Auto

Use to by-pass the remote controller. The air conditioner will operate automatically when power is supplied. The remote controller is ineffective in this position.

Red indicating lamp

Red light will be lit when electrical power is supplied to the air conditioner.

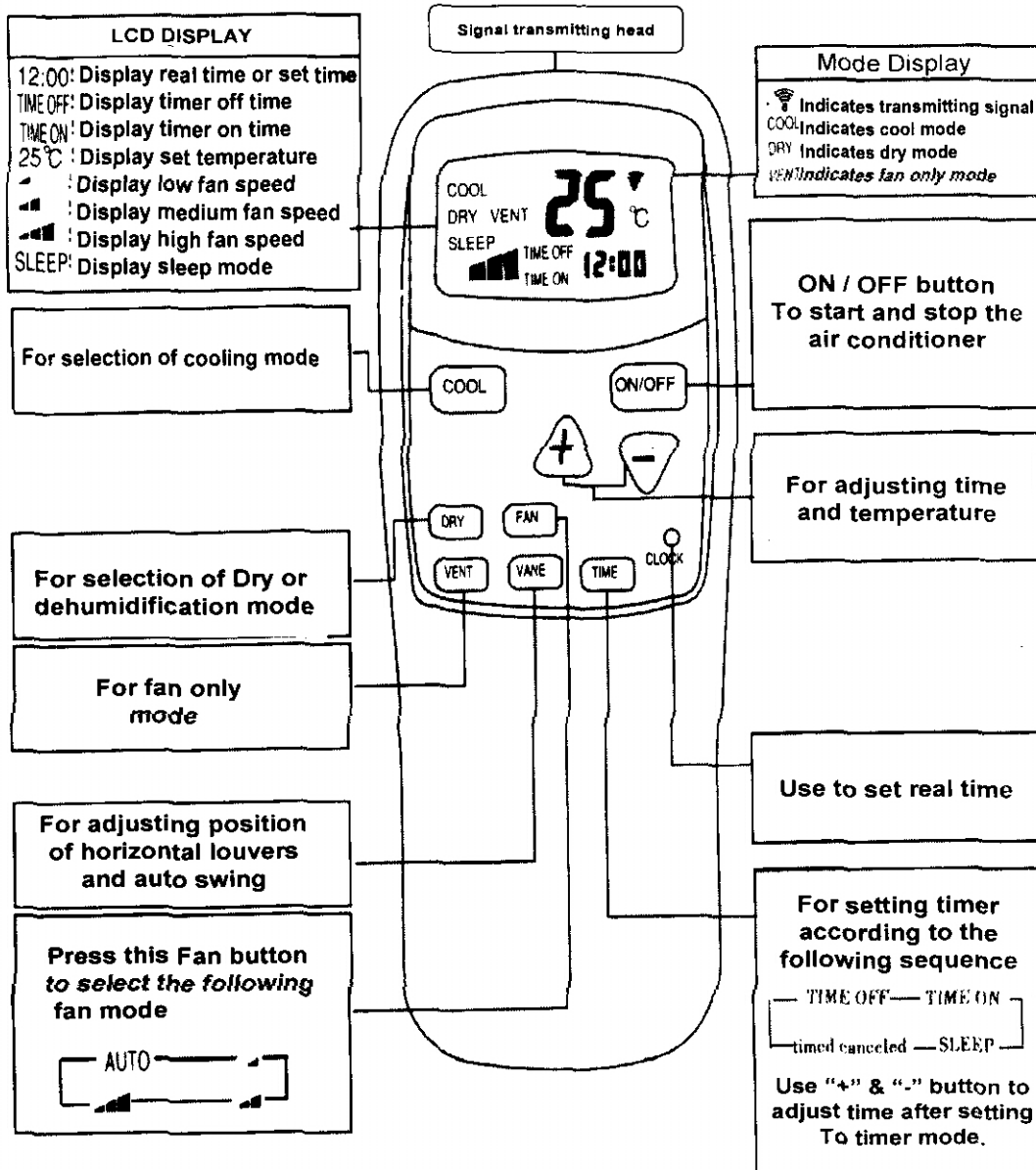
Green indicating lamp

This green lamp will be lit when the compressor starts operating. It indicates cooling operation is in progress. It will blink if the operating temperature is abnormal.

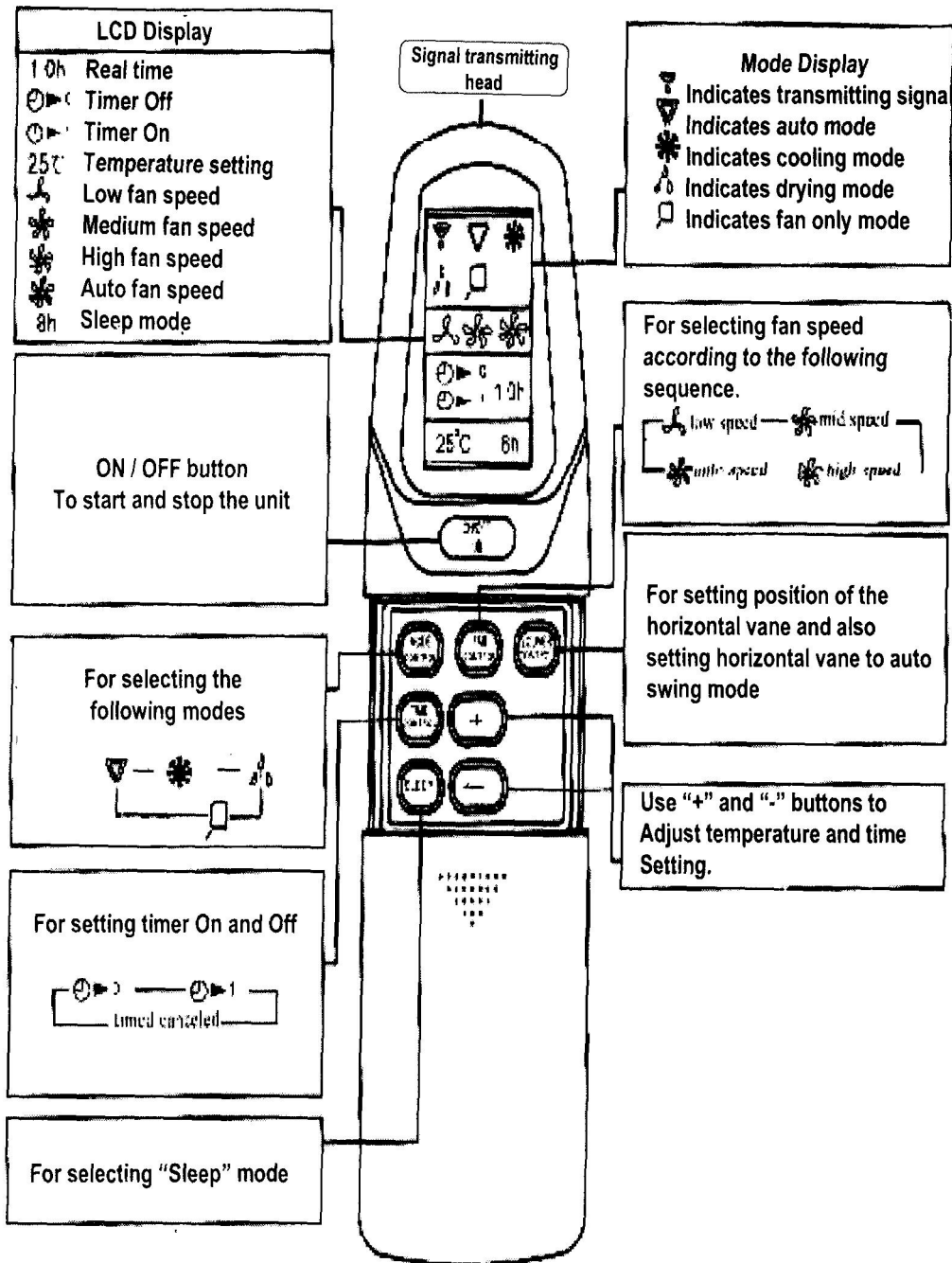
REMOTE CONTROL OPERATION

CONTROLS AND INDICATORS

Figure below illustrates the various controls and indicators of the LCD wireless remote control.



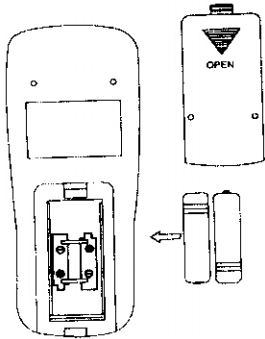
MODEL: AMW 25, 30



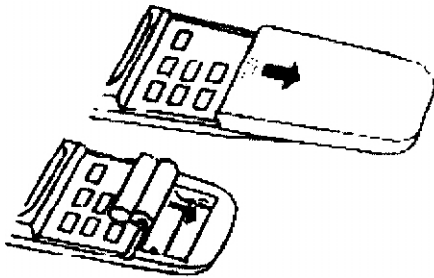
MODEL: AMW 45, 60

OPERATING INSTRUCTIONS

Before operating the unit for the first time, it is necessary to install the batteries in the remote controller.



Model: AMW25,30



- Batteries are located at the back of the remote controller (Model AMW25, 30) and at the front of the remote controller (Model AMW45, 60).
- Open the battery holder by simultaneously pushing downwards and inwards at the area marked "OPEN"
- Use only "AAA" alkaline batteries
- Dispose of used batteries correctly, in a manner not causing pollution or harm to the environment.

OPERATING GUIDE MODEL: AMW 25, 30

- **Start air conditioner.** Point the remote controller at the fan coil and press ON/OFF button.
- **Select the operational mode.** Press either "Cool", "Dry" or "Vent" button to select the desired mode.
- **Set temperature.** Press "+" or "-" button to set desired temperature.
- **Select fan speed.** Press "Fan" button to select desired fan speed.
- **Set airflow position.** Press "Vane" button to adjust airflow direction or to set vane to auto swing.
- **Set Timer.** If required, press "Time" button to set timer On or Off. After pressing "Time" button, the Time display on the LCD will start to flash. Press "+" or "-" to set the time before flashing stops.
- **Sleep mode.** Select sleep mode by pressing "Time:" button until "Sleep" appears on the LCD display. Sleep mode allows the air conditioner to raise the room temperature by up to 2°F from set temperature while you sleep to save power.

MODEL: AMW 45, 60

- **Start air conditioner.** Point the remote controller at the fan coil and press "ON/OFF" button.
- **Select operation mode.** Press "Mode" button to select any of the following modes: "Cool", "Dry" or "Vent".
- **Temperature setting.** Press "+" or "-" button to set desired temperature.
- **Select fan speed.** Press "Fan control" button to select desired fan speed.
- **Select airflow direction.** Press "Louver control" button to set position of horizontal vane or set it to auto swing.
- **Set Timer.** If desired, set timer on or off by pressing "Time Control" button, followed by "+" or "-" button to select time before air conditioner starts or stops operating.
- **Sleep mode.** Press "Sleep" button to select sleep mode. As the name suggests, it is used during sleeping. The room temperature would be adjusted by 2°F up from set temperature to save power.

2) FUNCTIONS

AUTO

This allows the air conditioner to operate automatically at a pre-set temperature. Cooling will be affected when room temperature is above 82°F (28°C).

COOLING

When activated, the fan will automatically operate at high speed for 5 minutes before operating at the set speed. During cooling if the humidity in the room is very high (RH above 80 %), condensation may occur at the air discharge louver. It is advisable to operate the fan at high speed under this condition.

DRYING

When activated, the air conditioner will operate on and off intermittently. The fan will automatically operate at low speed. Fan speed, temperature settings and sleep mode will be by-passed. This function will not operate if the room temperature is lower than 59°F (15°C).

FAN ONLY

The following speed can be selected. Low mid high auto. At auto, the fan speed will be automatically selected by the micro-processor, depending on the difference between factory pre-set and room temperature.

TIMER

This feature allows the air conditioner to be automatically SWITCH ON or SWITCH OFF after a pre-determined time.

CLOCK

This is for setting the real time to facilitate the operation of the timer.

CARE AND MAINTENANCE

- The air conditioner requires proper care and maintenance for efficient operation. A periodic inspection and cleaning may be available from your dealer or distributor. Be sure to ask about this service at the time of installation. The user can also perform some of the care and maintenance. Please follow these instructions.
- Be sure to disconnect the power supply before undertaking any inspection.
- Open the RETURN AIR GRILLE and remove the air filters. Clean by washing or with a vacuum cleaner. Dry the filters before putting them back on the unit.
- Do not operate the air conditioner without the air filters in it. Remember that the filters protect the coil from getting dirty. A dirty coil is more difficult to clean than a dirty filter. Clean the filters at least twice a month and more if the environment is dusty.
- **CLEAN THE UNIT:** Clean with a wet soft cloth. Do not wash the air conditioner. **Never use the following** to clean the air conditioner.
 - Hot water above 104°F (40°C).
 - Volatile substances like benzene, gasoline, thinner and other solvents.

END OF SEASON:

- When the air conditioner is to stop operating for prolonged periods, for example, at the end of the season, please follow these instructions before shut down.

Operate the unit at the following setting for 2 to 3 hours.

- Type of Operation: Cool
- Temperature setting: 86°F (30°C).
- This will dry up any residual water in the unit.
- Remove the batteries from the Remote Controller.
- Use car wax on the painted surface of the outdoor unit.

START UP: Operation after prolonged period

- Clean the unit and the filter as described above.
- Operate the FAN ONLY for half a day to remove any moisture that may have accumulated inside the unit.

TROUBLE SHOOTING

The following are normal and should not be treated as defects.

- Hissing sound, like flow of water from the unit. This is the sound of the refrigerant at the expansion device, which can be heard from time to time depending on the indoor and outdoor ambient conditions.
- The unit does not cool for a few minutes after it restarts. This is because a time delay mechanism built into the unit prevents the compressor from starting for a few minutes. This is to protect the compressor from breakdown.
- Smell from the supply air: The coil and filters absorb the smell from the environment and the supply air may also have the same smell. This usually happens in places where heavy cigarette smoke exists in the air.

BEFORE CALLING FOR SERVICE, PLEASE CHECK THE FOLLOWING:

Air conditioner does not operate:

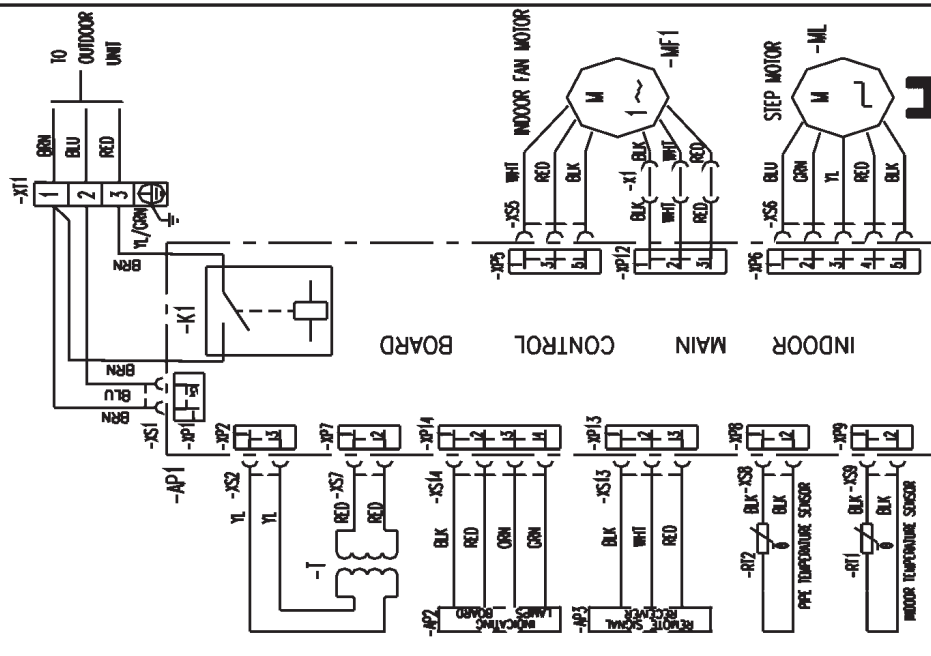
- Check the thermostat setting to ensure that it is not set above the room temperature.
- Check the circuit breaker.
- Check the power supply to ensure that it is not interrupted.

Cooling is insufficient:

- Check and clean the filters if necessary.
- Check that the thermostat setting is not above room temperature for cooling.
- Check that all windows and doors are closed.
- Check if there are sources of heat present in the room, like stove burners.
- Check that the fan speed is set to the HIGH setting
- If the system still does not operate or does not provide sufficient cooling, call for a professional serviceman.

MODEL: AMW 25

ELECTRIC CIRCUIT DIAGRAM FOR INDOOR UNIT



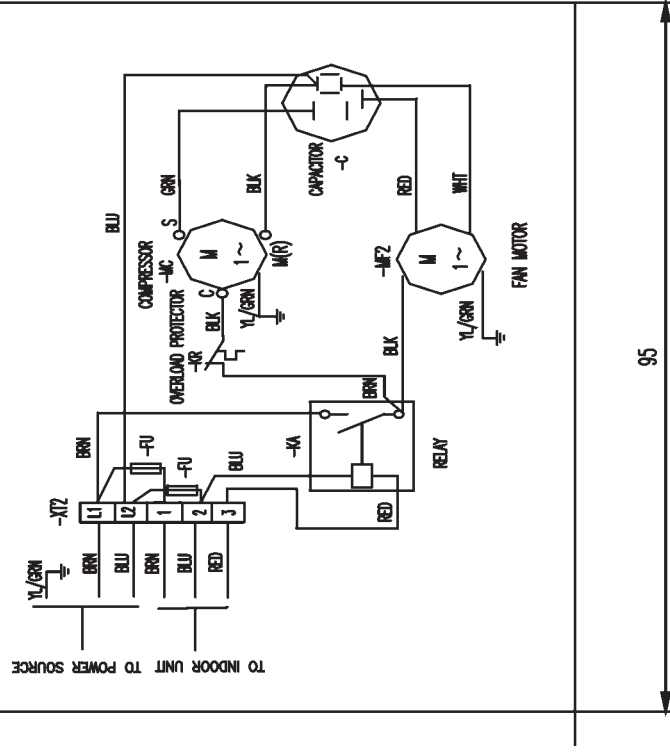
TROUBLE ANALYSIS

- RED LAMP IS NOT ON:
ANALYSE: THERE IS SOMETHING WRONG WITH THE MAIN POWER SOURCE, TRANSFORMER OR RECTIFICATION CIRCUIT
- GREEN LAMP TWINKLES:
ANALYSE: PIPE IS FOUND ABNORMAL IN TEMPERATURE AND CHECK PROTECTION BY THE SENSOR RTZ.
- BOTH GREEN LAMP AND YELLOW LAMP TWINKLE:
ANALYSE: PROTECTION IS FOR ABNORMAL IN ROOM'S SPEED OF INDOOR FAN MOTOR.

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MODEL : AMC 25

ELECTRIC CIRCUIT DIAGRAM FOR OUTDOOR UNIT

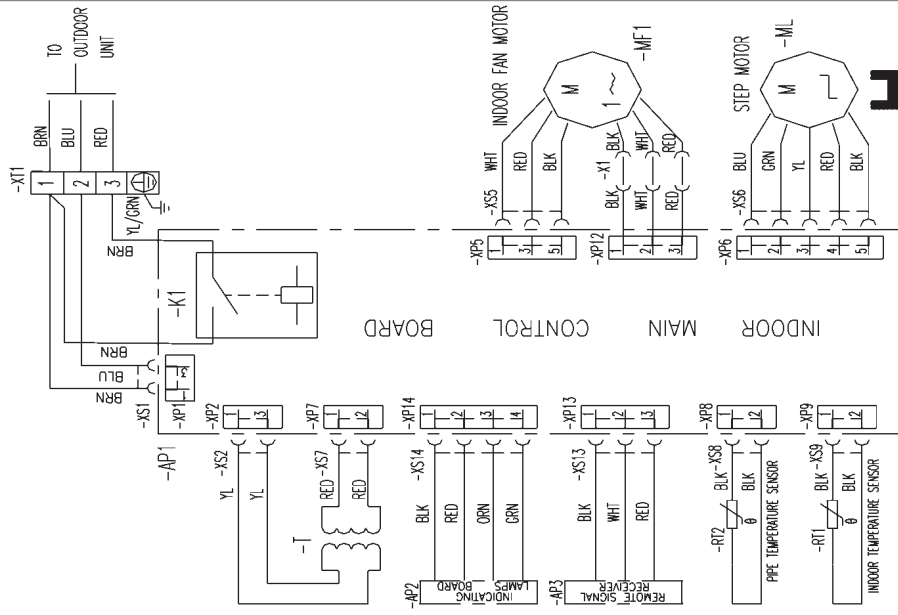


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AMW/AMC 25

MODEL: AMW30

ELECTRIC CIRCUIT DIAGRAM FOR INDOOR UNIT



TROUBLE ANALYSIS

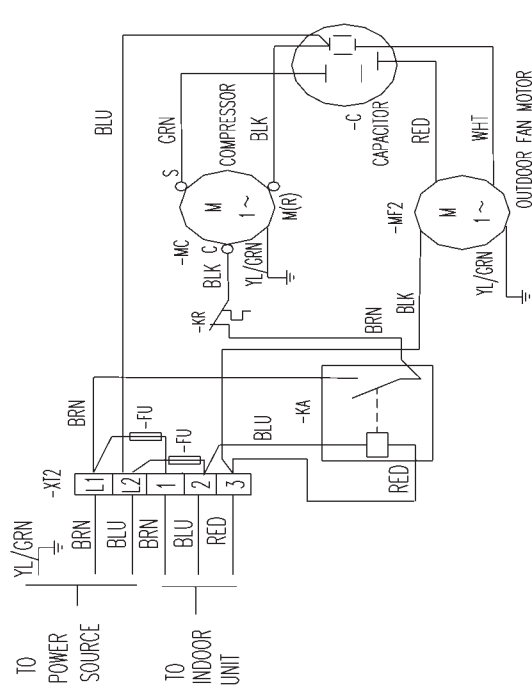
- RED LAMP IS NOT ON:
ANALYSIS: THERE IS SOMETHING WRONG WITH THE MAIN POWER SOURCE, TRANSFORMER OR RECTIFICATION CIRCUIT.
- GREEN LAMP TWINKLES:
ANALYSIS: THE PPE IS FOUND ABNORMAL IN TEMPERATURE AND OPEN PROTECTION BY THE SENSOR RT2.
- BOTH GREEN LAMP AND YELLOW LAMP TWINKLE:
ANALYSIS: THE PROTECTION IS FOR ABNORMAL IN ROTATE SPEED OF INDOOR FAN MOTOR.

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AMW/AMC 30

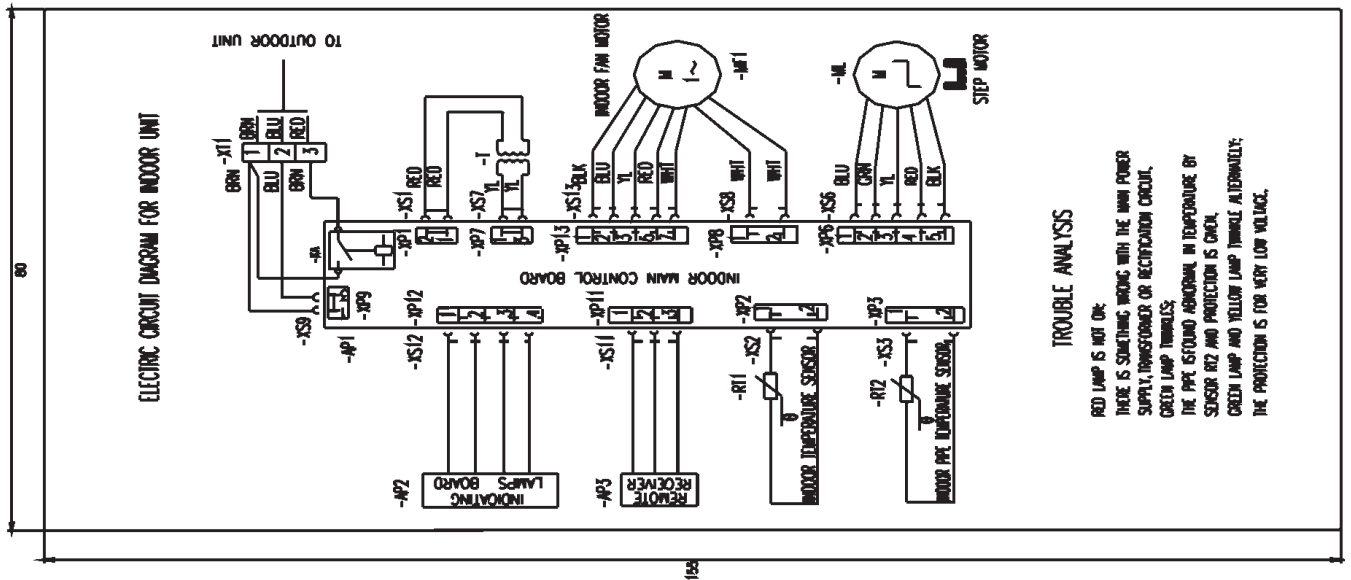
MODEL: AMC 30

ELECTRIC CIRCUIT DIAGRAM FOR OUTDOOR UNIT



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MODEL: AMW 45 & 60



TROUBLE ANALYSIS

- RED LAMP IS NOT ON:
THERE IS SOMETHING WRONG WITH THE MAIN POWER SUPPLY, TRANSFORMER OR RECTIFICATION CIRCUIT.
- GREEN LAMP FLASHES:
THE PPE IS FOUND ABNORMAL IN TEMPERATURE BY SENSOR RT2 AND PROTECTION IS ON.
- GREEN LAMP AND YELLOW LAMP FLASH ALTERNATELY:
THE PROTECTION IS FOR VERY LOW VOLTAGE.

AMW/AMC 45 & 60

MODEL: AMC 45 & 60

