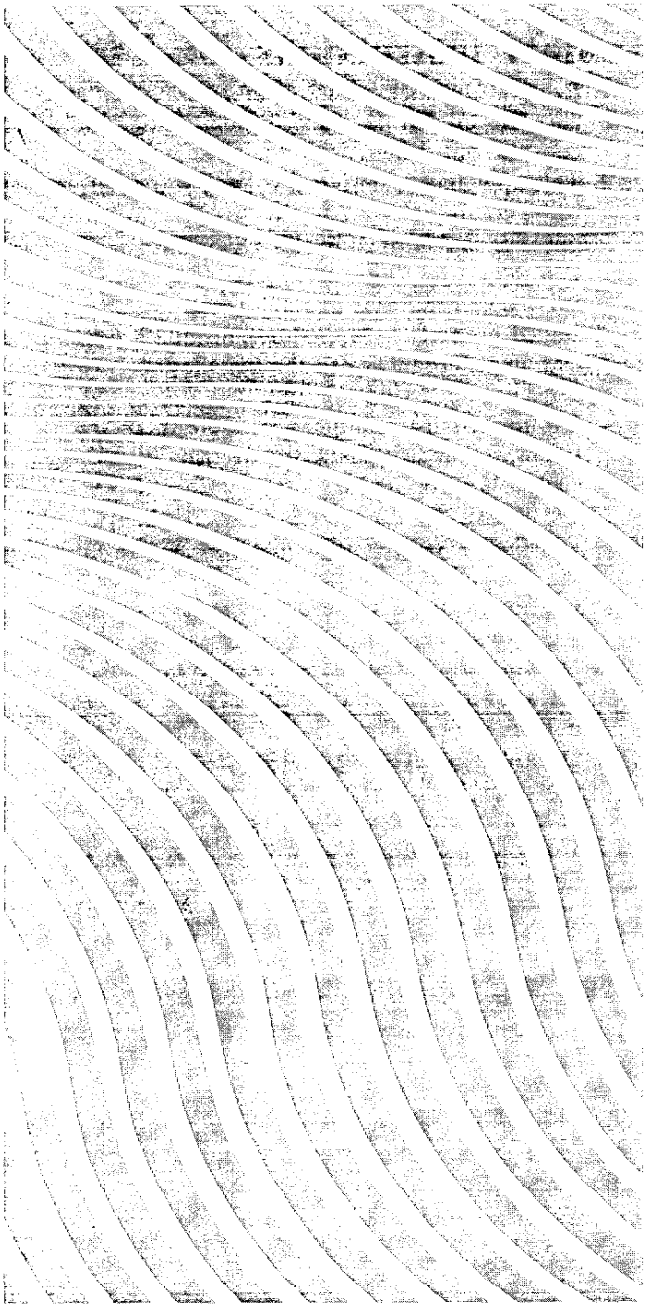
SPLIT SYSTEM HEAT PUMP



OPERATING INSTRUCTIONS

09KH11W 09KH11X
09KH12W 09KH12X
12KH12W 12KH12X
18KH12W 18KH12X
24KH12W

Contents

Pub. OI-85464119526000

SANYO

Useful Information for the Customer

Find the nameplate at the bottom of the indoor unit and fill in these spaces:

Model No. _____

Serial No. _____

Date of purchase _____

Dealer's Address:

Phone number:

Tips for Energy Saving

Do:

- Always try to keep the air filter clean. (Refer to "Care and Cleaning"). A clogged filter will impair the performance of the unit.
- To prevent conditioned air from escaping, keep windows, doors and any other openings closed.

Do not:

- Block the air intake and outlet of the unit. If it is obstructed, the unit will not work well, and may be damaged.
- Let direct sunlight into the room. Use sunshades, blind or curtains. If the walls and ceiling of the room are warmed by the sun, it will take longer to cool the room.

Electrical Requirements

1. Power supply: 60 Hz, single-phase

09KH11W 09KH11X	115 VOLT
09KH12W 09KH12X 12KH12W 12KH12X 18KH12W 18KH12X 24KH12W	230/208 VOLT

2. Conformance
All wiring must conform to the National Electrical Code (NEC) and local electrical codes.

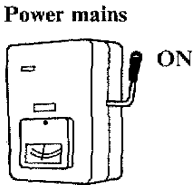
Operating Range

	Temperature	Indoor air intake	Outdoor air intake
Cooling	Maximum	95°F DB/- 71°F WB	115°F DB
	Minimum	67°F DB/- 57°F WB	67°F DB
Heating	Maximum	80°F DB/- 67°F WB	75°F DB/- 65°F WB
	Minimum	— DB/- — WB	17°F DB/- 15°F WB

IMPORTANT

For models: 18KH12W, 18KH12X and 24KH12W

To warm up the system, power mains must be turned on at least five (5) hours before operation. Leave the power mains ON unless you will not be using the air conditioner for an extended period.



Safety Instructions

1. **Read this booklet carefully before using this appliance.** If you still have any difficulties or problems, consult your dealer.
2. This appliance is designed to give you comfortable room conditions. Use this only for its intended purpose as described in this Operating Instructions.
3. We recommend that this appliance must be installed properly by a qualified installation technician in accordance with the Installation Instructions provided with the unit.
4. Do not install this appliance where there are fumes, flammable gases or extremely humid space such as a green house.
5. Check that the voltage of the electric supply in your home is the same as the voltage shown on the nameplate.
6. Do not change the internal wiring or any part of the system.
7. Do not turn this appliance on and off with power mains switch. Use the OPERATION ON/OFF button.
8. Do not stick anything into the air outlet of the unit. This is dangerous because the fan is rotating at high speed.
9. Do not let children play with this appliance.
10. Do not cool or heat the room too much if babies or invalids are present.

SAVE THESE INSTRUCTIONS

Naming of Parts

This heat pump consists of an indoor unit and an outdoor unit.

Air Intake
The return air in the room is drawn into this section and passes through air filters which remove dust and foreign particles.

Air Outlet
By moving the flap and vertical vanes at the air outlet grille, the air flow direction can be adjusted as desired.

Remote Control Unit
The remote control unit contains controls for power ON/OFF, operation mode selection, temperature adjustment, fan speed, and timer setting.

Refrigerant Tubes
The indoor and outdoor units are connected by copper tubes through which refrigerant gas flows.

Drain Hose
Moisture in the room is condensed and drained off by means of this hose.

Outdoor (Condensing) Unit
The outdoor unit contains the compressor, fan motor, heat exchanger coil, and other electrical components.

Menu for Easy Reading

1. "Carefree" course

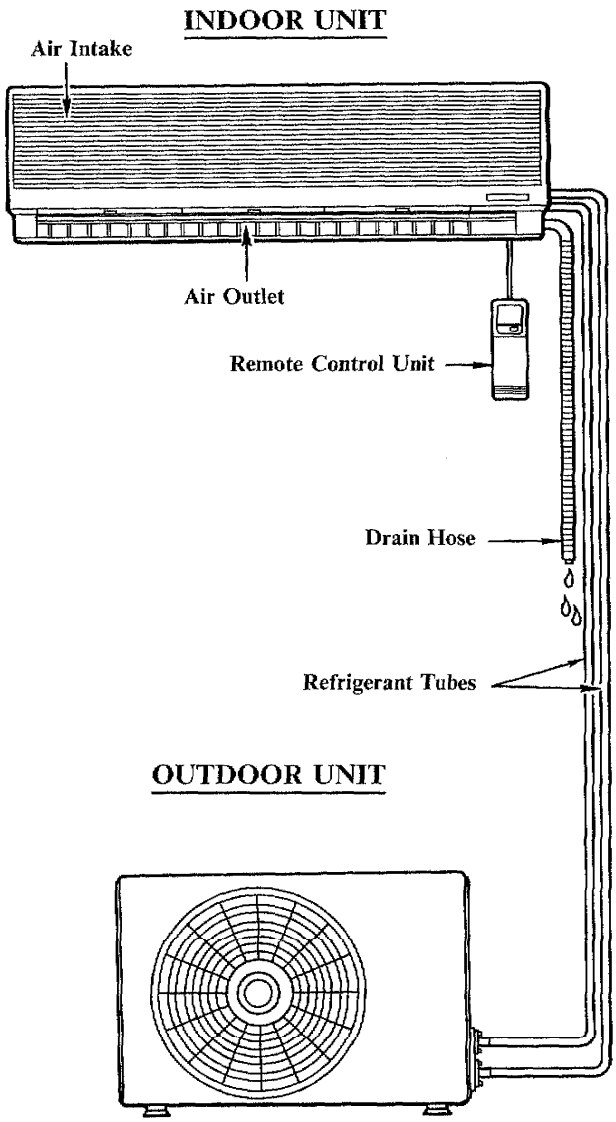
Must read sections

- Control and Indicators
- Operation Thumbnails
- Operation
  1. "Carefree" Operation
- Care and Cleaning

2. Do-it-yourself course

Read

Read the sections describing the functions you wish to try out and the "Care and Cleaning" section. Or, if you wish, read the entire booklet.



NOTE

This illustration is based on the external view of the model 18KH12W. Consequently, the shape and dimensions may differ from those of the heat pump which you have selected.

Controls and Indicators

A. OPERATION BUTTON
This button is used to turn the heat pump ON/OFF.

B1. COOLING OPERATION LAMP
This lamp lights when the "COOL" mode is selected.

B2. HEATING OPERATION LAMP
This lamp lights when the "HEAT" mode is selected.

C. TIMER LAMP
This lamp lights when the system is operating on the timer.

D. SAVING MODE LAMP
This lamp lights when the NIGHT SETBACK or ENERGY SAVER mode is selected.

E. ROOM TEMPERATURE INDICATOR LAMPS
These lamps indicate the approximate room temperature at the location of the remote control unit.

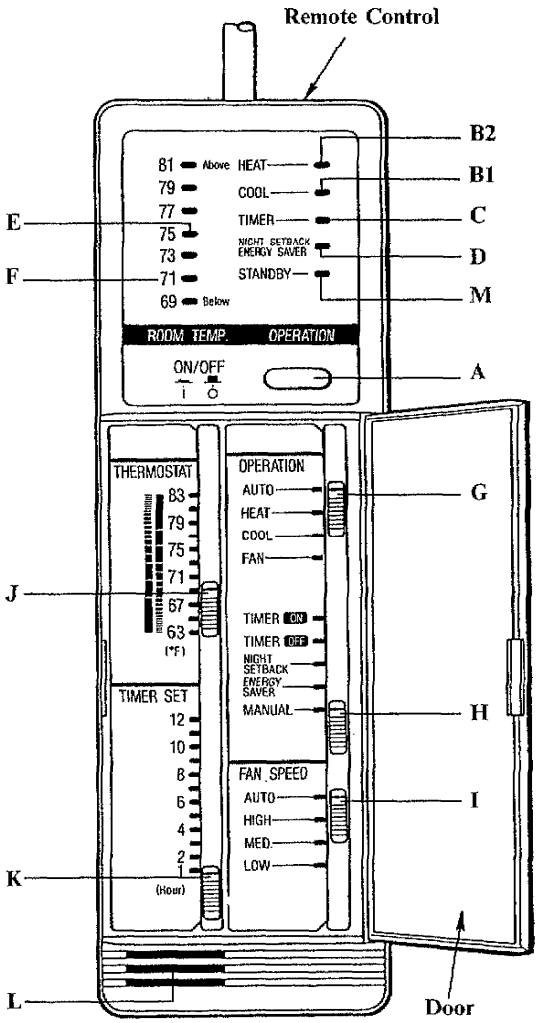
F. TEMPERATURE SCALE
The numbers constitute the temperature scale (°F).

G. MODE SELECTOR
This has four options:

AUTO:	When this setting is selected, the heat pump calculates the difference between the thermostat setting and the room temperature and automatically switches to the "cool" or "heat" mode as appropriate.
HEAT:	Used for normal heating operation.
COOL:	Used for normal cooling operation.
FAN:	Choose this setting to run the fan only, without the heating or cooling function.

H. OPERATION SELECTOR
This has five options:

TIMER ON:	Used to start the system at the set time.
TIMER OFF:	Used to stop the system at the set time.
NIGHT SETBACK:	Used for programmed energy saving operation at night.
ENERGY SAVER:	Used for programmed energy saving operation during the day.
MANUAL:	Used for conventional temperature control operation using the thermostat.



I. FAN SPEED SELECTOR

AUTO:	In this mode the fan speed is set automatically.
HIGH MED.: LOW	You can manually select the desired fan speed.

J. THERMOSTAT KNOB
You can regulate the room temperature as desired by adjusting this knob.

K. TIMER SET KNOB
This control is used to set the time at which you wish the heat pump to go on or off. Each number on the scale shows setting hour.

L. SENSOR
The sensor detects any change in the room temperature.

M. STANDBY LAMP
This lamp lights at the beginning of heating and when the system is in defrosting.

Operation Thumbnails

By setting this heat pump once to the desired temperature, it will automatically regulate the room temperature to that value. Thus you can operate the heat pump or stop it by simply pressing the OPERATION ON/OFF button.

First, open the door of the remote control unit to gain access to the control panel. Next, carry out the following steps while referring to the sub-section "Controls and Indicators" on the previous page.

What you wish to do	How to do it	What will happen
• Start the heat pump to get the desired room temperature very easily.	1. Set the "G" knob to AUTO. 2. Set the "H" knob to MANUAL. 3. Set the "I" knob to AUTO. 4. Set the "J" knob to the desired temperature. 5. Press the "A" OPERATION ON/OFF button.	First, the "E" lamp will light to indicate the room temperature. If the room temperature is higher than the thermostat setting, the "B1" lamp will light and after a few minutes cooling will begin. If, on the other hand, the room temperature is lower than the thermostat setting, the "B2" lamp will light and heating will begin.
• To stop the heat pump immediately while it is operating	1. Press the "A" OPERATION ON/OFF button.	The heat pump will stop immediately, and all indicator lamps will go out.
• To use the TIMER to stop the heat pump after several hours	1. Set the "K" knob to the time at which you wish to stop the heat pump. 2. Set the "H" knob to the TIMER OFF position.	The "C" lamp will light and after the set time has elapsed the heat pump will stop automatically.
• To switch the heat pump to the ENERGY SAVING mode during manual cooling (or heating)	Set the "H" knob from the MANUAL to the NIGHT SETBACK or ENERGY SAVER position.	The "D" lamp will light, the set temperature will automatically change, and the heat pump will continue to operate in the ENERGY SAVING mode.
• To use the TIMER to start the heat pump after several hours	1. Set the "K" knob to the time at which you wish to start the heat pump. 2. Set the "H" knob to the TIMER ON position. 3. Press the "A" OPERATION ON/OFF button.	The "C" lamp will light and after the set time has elapsed the heat pump will start to operate automatically.
• To circulate the air in the room without air conditioning (fan-only operation)	1. Set the "G" knob to FAN. 2. Press the "A" OPERATION ON/OFF button.	The heat pump will operate as a circulation fan without changing the room temperature. In this case, only the "E" lamp will light.

The above description is intended to provide you with basic knowledge of your heat pump. For details of each function, read the relevant sections.

Operation

1. "Carefree" Operation

Once this mode is selected and the unit is preset by following the steps below, you can have the heat pump automatically bring the room to the desired temperature simply by pressing the OPERATION ON/OFF button.

STEP 1: Set the "G" MODE SELECTOR knob to AUTO.

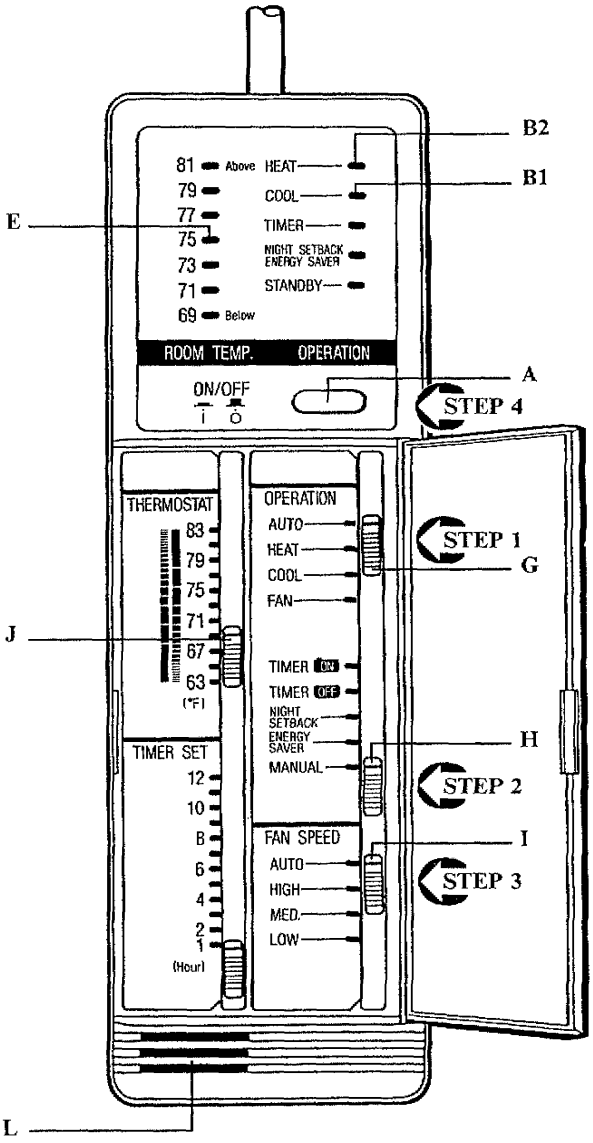
STEP 2: Set the "H" OPERATION SELECTOR knob to MANUAL.

STEP 3: Set the "I" FAN SPEED at AUTO.

STEP 4: Press the "A" OPERATION ON/OFF button.
To stop the heat pump, press the OPERATION ON/OFF button again.

Sequence of Operation

Press the "A" OPERATION ON/OFF button. The "L" sensor registers the room temperature and the "E" lamp lights to indicate the current temperature. If the room temperature is higher than temperature you set using the "J" knob, the "B1" lamp will light and after a few minutes cooling will begin. If, on the other hand, the room temperature is lower, the "B2" lamp will light and heating will begin.



Operation

2. Cooling

A. Manual Cooling

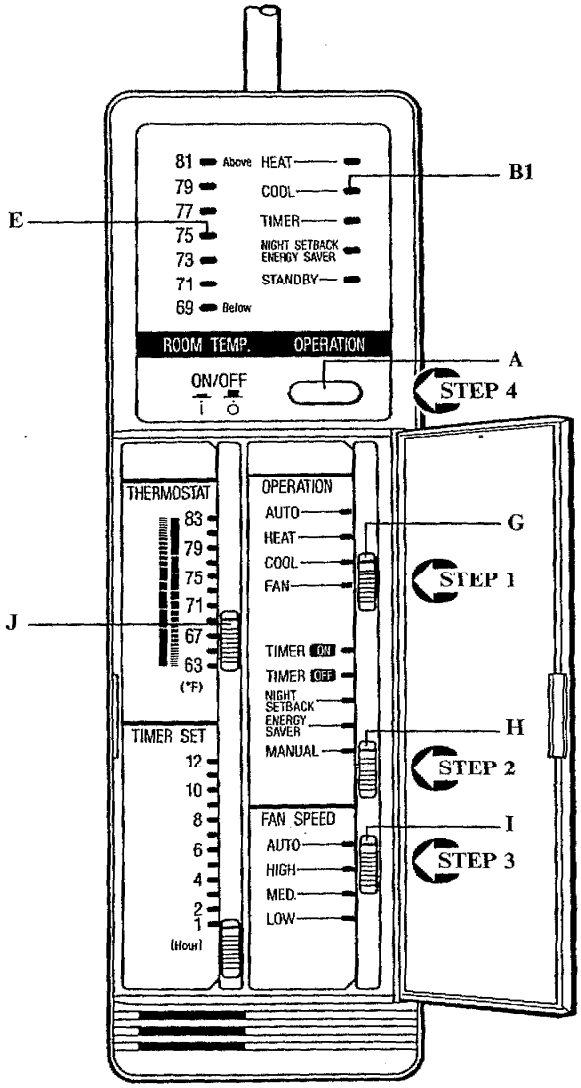
The Manual mode is used for normal cooling operation.

STEP 1: Set the "G" MODE SELECTOR knob to COOL.

STEP 2: Set the "H" OPERATION SELECTOR knob to MANUAL.

STEP 3: Set the "I" FAN SPEED as desired.

STEP 4: Press the "A" OPERATION ON/OFF button.
To stop the heat pump, press the OPERATION ON/OFF button again.



NOTE

1. This appliance has a built-in time delay circuit to ensure reliable operation. If the operation button is pressed, the compressor will start running after a few minutes.
   When power is interrupted, press the OPERATION ON/OFF button again to start the unit.
2. To prevent the appliance from malfunctioning, do not set the selector knob between the two indicated positions. Make sure that it clicks into position.

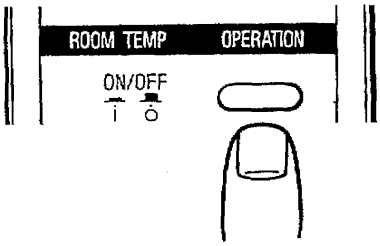
2. Cooling

B. Energy Saving Modes

B.1 Energy saver mode in cooling

STEP 1: Set the "H" OPERATION SELECTOR knob to ENERGY SAVER before turning the system on.

STEP 2: Press the "A" OPERATION ON/OFF button. The ENERGY SAVER and COOL lamps will light.

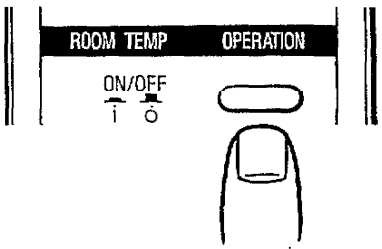


To cancel the Energy Saver mode, move the selector to MANUAL.

B.2 Night Setback mode in cooling

STEP 1: Set the "H" OPERATION SELECTOR knob to NIGHT SETBACK before turning the system on.

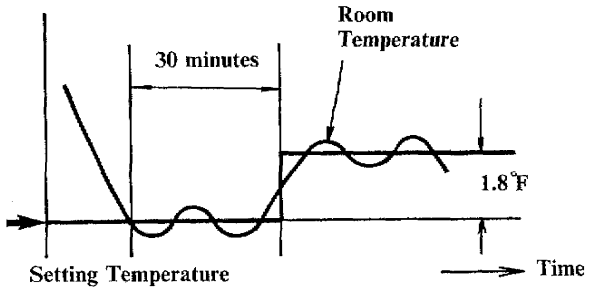
STEP2: Press the "A" OPERATION ON/OFF button. The NIGHT SETBACK and COOL lamp will light.



To cancel the Night Setback mode, move the selector to MANUAL.

■ What does the Energy Saver mode mean ?

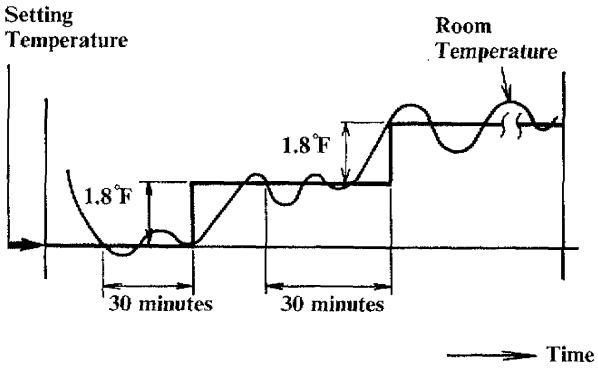
By selecting this mode then pressing the OPERATION ON/OFF button, the heat pump will perform cooling operation until the temperature in the room reaches the set value, then the thermostat will cause the unit to pause. After about 30 minutes, the heat pump will automatically raise the set temperature 1.8°F as shown in the diagram below. This enables you to save energy without sacrificing comfort. This function is convenient for when the room is vacant or soft cooling is needed in the daytime.



■ What does the Night Setback mode mean ?

By selecting this mode then pressing the OPERATION ON/OFF button, the heat pump will perform cooling operation until the temperature in the room reaches the set value, then the thermostat will cause the unit to pause.

After about 30 minutes, the heat pump will automatically raise the set temperature 1.8°F. When the room temperature reaches the newly set value, the thermostat will cause the unit to pause. After about 30 minutes the temperature is again raised by 1.8°F as shown below. This enables you to save energy. This function is convenient for when leaving the heat pump on all night or soft cooling is needed.

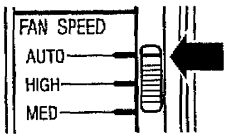


Operation

3. Adjusting the Fan Speed

A. Automatic

Simply set the "I" FAN SPEED selector to the "AUTO" position.



A microcomputer in the heat pump automatically controls the fan speed when the AUTO mode is selected. When the heat pump starts operating, the difference between the room temperature and the set temperature is detected by the microcomputer which then automatically switches the fan speed to the most suitable level.

Cooling mode:

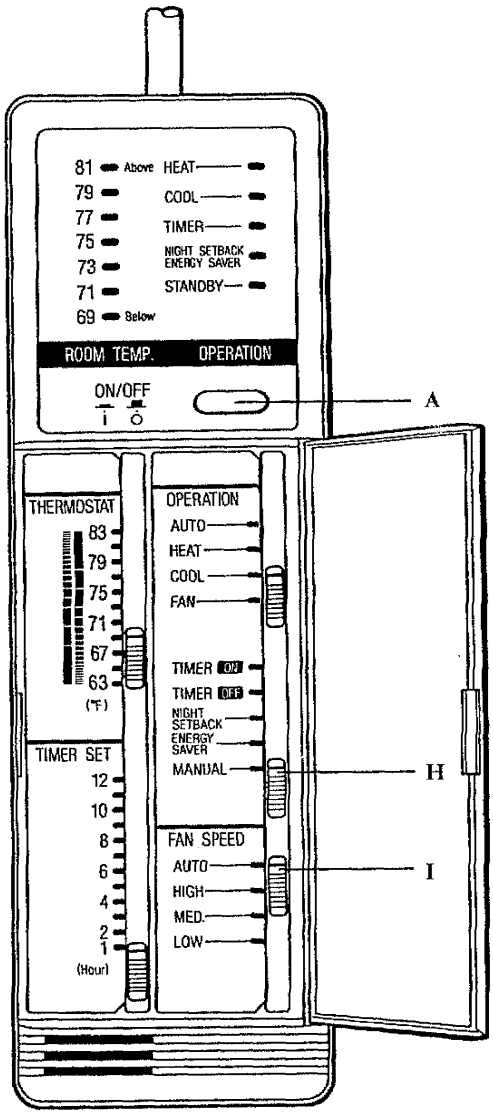
When difference between room temperature and set temperature is	FAN SPEED
3.6°F and over	High
Between 3.6 and 1.8°F	Medium
Below 1.8°F	Low

Heating mode:

When difference between room temperature and set temperature is	FAN SPEED
1.8°F and over	High
Below 1.8°F	Medium

B. Manual

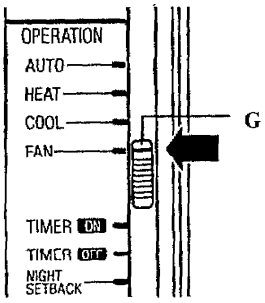
If you want to adjust fan speed manually during cooling, just set the FAN SPEED selector as desired. [HIGH, MED., or LOW]



4. Fan Only

If you want to circulate air without any temperature control, follow these steps:

STEP: 1 Set the "G" MODE SELECTOR knob to FAN.



STEP: 2 Press the "A" OPERATION ON/OFF button.

5. Using the Timer

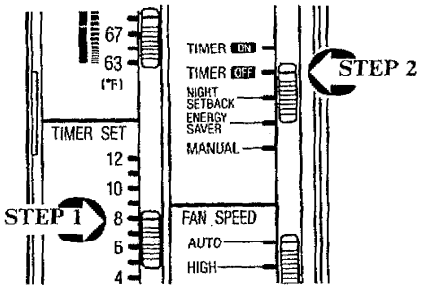
A. TIMER OFF Mode

The system stops at the set time.

STEP 1: Set the TIMER SET knob to the desired time.

When the timer is set to 8, for instance, the system stops after eight hours.

STEP 2: Set the "H" OPERATION SELECTOR knob to TIMER OFF.



The TIMER lamp will light.

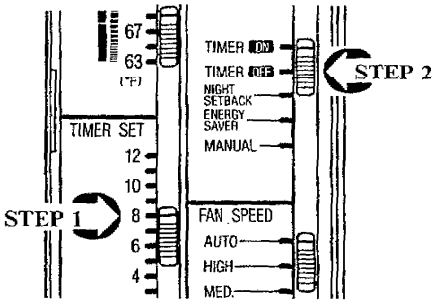
B. TIMER ON Mode

The system starts at the set time.

STEP 1: Set the TIMER SET knob to the desired time.

When the timer is set to 8, for instance, the system starts after eight hours.

STEP 2: Set the "H" OPERATION SELECTOR knob to TIMER ON.



STEP 3: Press the "A" OPERATION ON/OFF button. The TIMER lamp will light.

Operation

6. Heating

A. Manual Heating

The Manual mode is used for normal heating operation.

STEP 1: Set the "G" MODE SELECTOR knob to HEAT.

STEP 2: Set the "H" OPERATION SELECTOR knob to MANUAL.

STEP 3: Set the "I" FAN SPEED as desired.

STEP 4: Press the "A" OPERATION ON/OFF button.
To stop the heat pump, press the OPERATION ON/OFF button again.

NOTE

1. This appliance has a built-in time delay circuit to ensure reliable operation. If the operation button is pressed, the compressor will start running after a few minutes.
   When power is interrupted, press the OPERATION ON/OFF button again to start the unit.
2. To prevent the appliance from malfunctioning, do not set the selector knob between the two indicated positions. Make sure that it clicks into position.

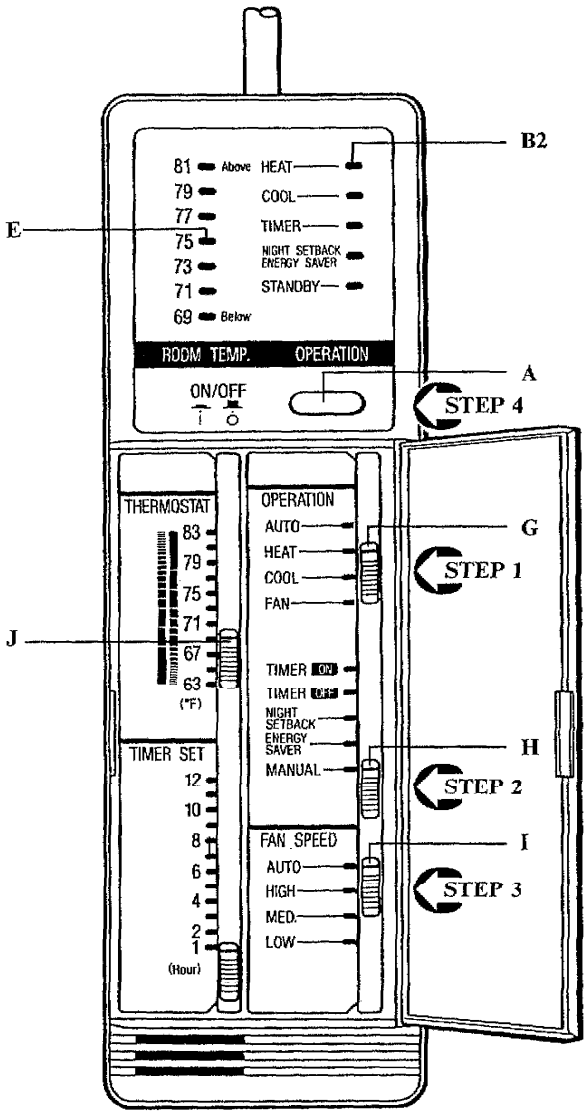
Special remarks on heating

Heating performance

- Because this heat pump heats a room by drawing in the heat of the outside air (heat pump system), the heating efficiency will fall off when the outdoor temperature is very low. If sufficient heat cannot be obtained with this heat pump, use another heating appliance in conjunction with it.

Defrosting

- When the outdoor temperature is low, frost or ice may form on the heat exchanger coil, reducing the heating performance. When this happens, a microcomputer defrosting system operates. At the same time, the fan on the indoor unit stops and the STANDBY LAMP remains lit until defrosting is completed. Heating operation restarts after several minutes. (This interval will vary slightly depending upon the outdoor temperature and the way in which frost forms).



STANDBY LAMP

- For several minutes after the start of heating operation, the indoor fan will not start running until the indoor heat exchanger coil has warmed up sufficiently. This is because the COLD DRAFT PREVENTION SYSTEM is operating. During this period, the STANDBY LAMP remains lit.
- The STANDBY lamp also remains lit during defrosting or when the compressor has been turned off by the thermostat when the system is in the heating mode.
- Upon completion of defrosting and when the compressor is turned on again, for heating operation, the STANDBY LAMP will go off automatically.

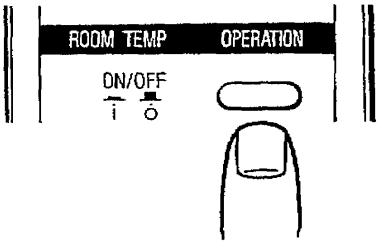
6. Heating

B. Energy Saving Modes

B.1 Energy saver mode in heating

STEP 1: Set the "H" OPERATION SELECTOR knob to ENERGY SAVER before turning the system on.

STEP 2: Press the "A" OPERATION ON/OFF button. The ENERGY SAVER and HEAT lamps will light.

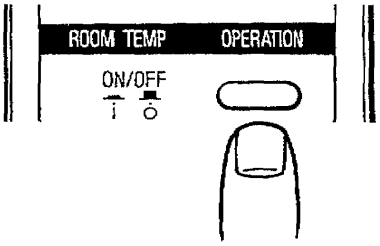


To cancel the Energy Saver mode, move the selector to MANUAL.

B.2 Night Setback mode in heating

STEP 1: Set the "H" OPERATION SELECTOR knob to NIGHT SETBACK before turning the system on.

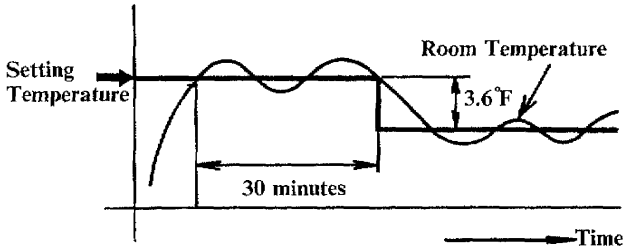
STEP 2: Press the "A" OPERATION ON/OFF button. The NIGHT SETBACK and HEAT lamps will light.



To cancel the Night Setback mode, move the selector to MANUAL.

■ What does the Energy Saver mode mean ?

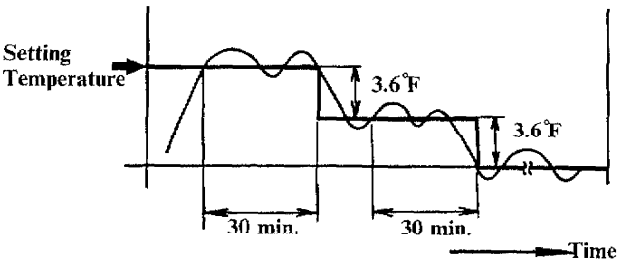
By selecting this mode then pressing the OPERATION ON/OFF button, the heat pump will perform heating operation until the temperature in the room reaches the set value, then the thermostat will cause the unit to pause. After about half an hour, the heat pump will automatically lower the set temperature 3.6°F as shown in the diagram below. This enables you to save energy without sacrificing comfort. This function is convenient for when the room is vacant or mild heating is needed in the daytime.



■ What does the Night Setback mode mean ?

By selecting this mode then pressing the OPERATION ON/OFF button, the heat pump will perform heating operation until the temperature in the room reaches the set value, then the thermostat will cause the unit to pause.

After about 30 minutes, the heat pump will automatically lower the set temperature 3.6°F. When the room temperature reaches the newly set value, the thermostat will cause the unit to pause. After about 30 minutes, the temperature is again lowered by 3.6°F as shown below. This enables you to save energy. This function is convenient for when leaving the heat pump on all night or mild heating is needed.

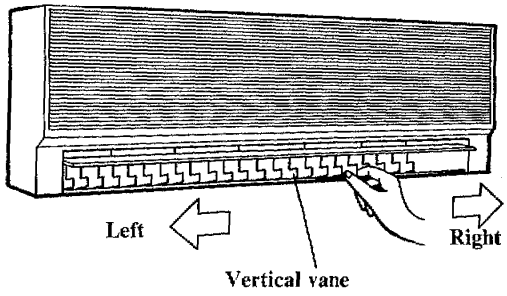


Operation

7. Adjusting the Air Flow Direction

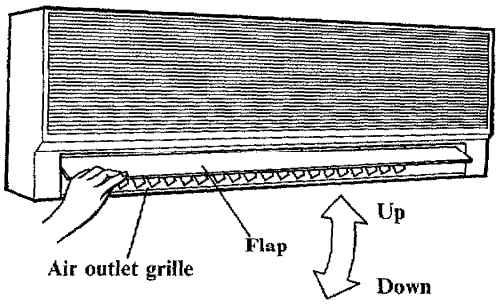
A. Horizontal

The horizontal air flow can be adjusted by moving the vertical vane to the left or right.



B. Vertical

Hold both ends of the flap and move the flap up and down to adjust the vertical air flow.



Recommended flap positions:

COOLING

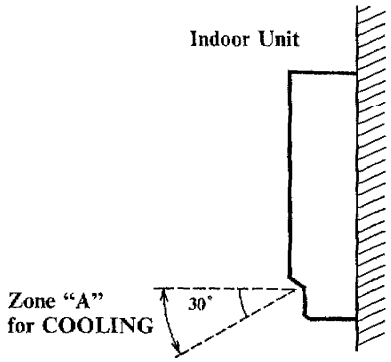
- Be sure to set the flap within zone "A".

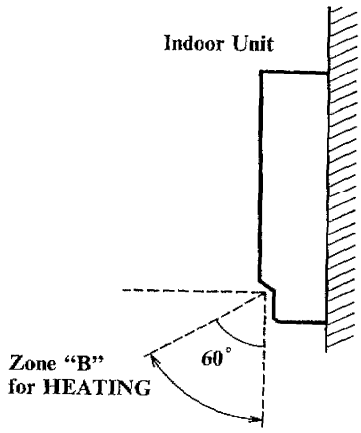
NOTE

- **If the flap is set within zone "B", condensation may form near the air outlet grille and drip onto the floor.**

HEATING

- Set the flap within zone "B" for effective heating.





Care and Cleaning

For safety's sake, be sure to turn the heat pump off and also disconnect it from the power mains before cleaning it.

Casing and Grille (Indoor Unit)

Clean the casing and grille of the indoor unit with a vacuum cleaner brush, or wipe them with a clean soft cloth.

If these parts are stained, use a clean cloth moistened with a mild liquid detergent.

When cleaning the grille, be careful so as not to force the vanes out of place.

CAUTION

1. Do not pour water on the unit to clean it. This will damage the internal components and cause an electric shock hazard.
2. Never use solvents, or harsh chemicals. Do not wipe the plastic casing using very hot water.

Outdoor Unit

CAUTION

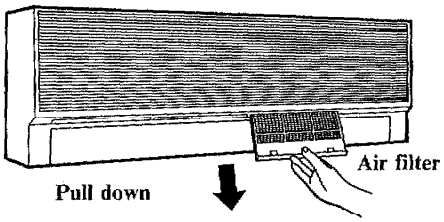
1. Certain metal edges and the condenser fins are sharp and may cause injury if handled improperly; special care should be taken when you clean these parts.
2. Periodically check the outdoor unit to see if the air outlet or air intake are clogged with dirt or soot.
3. The internal coil and other components of the outdoor unit must also be cleaned periodically. Consult your dealer or service shop.

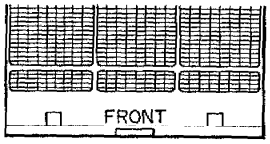
Air Filter

The air filter behind the air intake grille should be checked and cleaned at least once every two weeks.

How to remove the filter

1. Place the flap on the air outlet grille in the bottom-most position.
2. Grasp the air filter by the tab at the bottom, and pull downward.





Use a vacuum cleaner to remove light dust. If there is sticky dust on the filter, wash the filter in lukewarm, soapy water, rinse it in clean water, and dry it.

When replacing the filter, check that the FRONT mark is facing you.

Troubleshooting

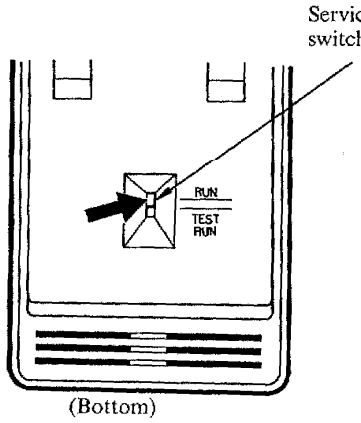
If your heat pump does not work properly, first check the following points before requesting service.
If the problem cannot be corrected, contact your dealer or service center.

Trouble	Possible Cause	Remedy
Heat pump does not run at all	1. Power failure 2. Leakage breaker tripped 3. Line voltage too low 4. OPERATION ON/OFF button is OFF	1. Restore power 2. Contact service center 3. Consult with electrician or dealer 4. Press the button again
Compressor runs but soon stops	1. Obstruction in front of condenser coil	1. Remove obstruction
Poor cooling or heating performance	1. Dirty or clogged air filter 2. Heat source or many people in room 3. Doors and/or windows are open 4. Obstacle near air intake or air discharge port 5. Thermostat is set too high for cooling (or too low for heating)	1. Clean air filter to improve air flow 2. Eliminate heat source if possible 3. Shut them to interrupt any draft 4. Remove it to ensure good air flow 5. Adjust thermostat setting if additional cooling (or heating) is required

NOTE

Service TEST RUN switch (recessed)
The Service TEST RUN switch is located at the rear bottom of the remote control unit. It is used for servicing the heat pump. Do not touch it, therefore. *During normal operation,this switch must be set in the RUN position.* If the heat pump is used with the switch in the TEST RUN position, it will not operate normally.

"HIGH" Fan Speed in heating
If the room temperature and outdoor temperature are high when the heat pump is operating in the heating mode, the indoor fan speed will switch to High, regardless of the setting of the FAN SPEED selector, and in some cases, this condition will be repeated. This is because the safety unit operates to prevent the system from overloading.



Remote control unit viewed from the rear