

HIGH WALL COOLING ONLY AND HEAT PUMP DUCTLESS SPLIT SYSTEMS

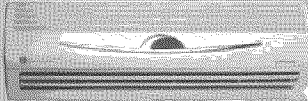
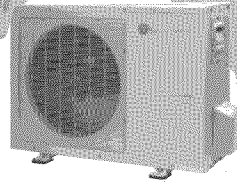
STRAIGHT COOL/HEAT PUMP

Nominal Circuit Capacities:

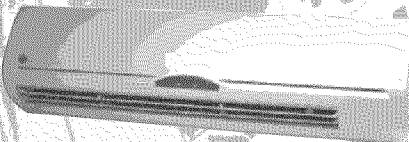
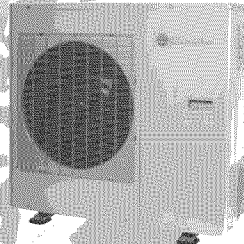
9,000, 12,000, 18,000, 24,000 Btuh units.



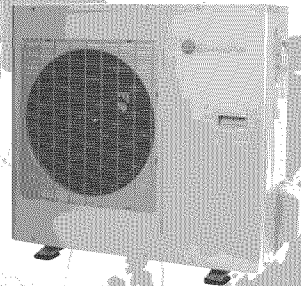
9,000 & 12,000



18,000



24,000



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An **ECR International Brand**
An ISO 9001-2000 Certified Company



P/N# 240006537 Rev. A [04/08]

ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

P/N 240006537 , Rev. 1.0 [01/07]

This manual is intended as an aid to a qualified service personnel for proper installation, operation, and maintenance of EMI EnviroAir high efficiency R-410A Ductless Split Systems. Carefully read these instructions before attempting installation or operation. Failure to follow these instructions may result in improper installation, operation, or maintenance, possibly resulting in fire, electrical shock, property damage, personal injury, or death.

**Shipping Damage MUST be Reported to the Carrier IMMEDIATELY!!!
Examine the carton for signs of damage if any is evident open packaging and check the unit for shipping damage.**

TO THE INSTALLER

- (1) Retain this manual for future reference.
- (2) Before leaving the premises, review this manual to be sure the unit has been installed correctly and run the unit for one complete cycle to make sure it functions properly.

To obtain technical service or warranty assistance during or after the installation of this unit, check our website @ www.enviromaster.com or call your installing contractor or distributor. Our technical service department may be contacted at 1-800-228-9364.

When calling for assistance, please have the following information ready:

- Indoor Unit
Model Number _____
- Indoor Unit
Serial Number _____
- Outdoor Unit
Model Number _____
- Outdoor Unit
Serial Number _____
- Date of installation _____

SAFETY INSTRUCTIONS

- ▲ Read all instructions before using the EMI EnviroAir high efficiency system. Install or locate this system only in accordance with these instructions. Use this system only for its intended use as described in this manual.
- ▲ Check rating plate for correct system voltage before installing. Installation and operation of a system with the incorrect voltage may result in malfunction or other issues and **will void the warranty**.
- ▲ The EMI EnviroAir system must be connected only to a properly grounded electrical supply. Do not fail to properly ground this unit.
- ▲ Turn off the electrical supply before servicing the EMI EnviroAir system.
- ▲ Do not use the EMI EnviroAir system if it has damaged wiring, is not working properly, or has been damaged or dropped.

[Save These Instructions]



This symbol is an indication of Important Safety Information.



ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

⚠ DANGER ⚠

Tampering with the EMI EnviroAir cooling system is dangerous and may result in serious injury or death. Tampering voids all warranties. Do not attempt to modify or change these units in any way.

PRODUCT DESCRIPTION

The EnviroAir system is an efficient ductless split air conditioning system with cooling capacities from 9,000-24,000 Btuh and heat pump capacity of 9,000-24,000 Btuh. Designed for quiet operation and boasting compact dimensions, the EnviroAir system includes advanced features like auto-restart, full feature remote control.

Comprised of three standard components the indoor high wall evaporator, the outdoor condensing unit, and an infrared handheld remote control. The EnviroAir system is engineered to the highest performance and reliability standards. The evaporator is equipped with permanent washable air filters as well as motorized air sweep for enhanced air circulation, and the condensing unit is equipped as standard with a high efficiency rotary compressor.

EMI recommends the EnviroAir system for residential and light commercial cooling applications. The EnviroAir system will operate in standard cooling mode down to 60°F outdoor temperature.

The EnviroAir system is backed with the standard limited warranty that applies to all EMI equipment. For a copy of this limited warranty, please contact EMI customer service or refer to the website at www.enviromaster.com.

INSTALLER SUPPLIED ITEMS

- **Main System Breaker:** Sized per unit requirements, to be mounted adjacent to outdoor unit.
 - **Mounting Hardware:** Wall anchors, condenser pad.
 - **Vacuum Pump**
 - **Gauge Set :** R-410 specific.
 - **High Voltage Interconnect Wiring:** 14 AWG wiring from outdoor unit to indoor unit for power and control. *
 - **Refrigerant :** R-410A required for additional line sets beyond 16 ft.
- * Can be purchased through the factory as an accessory, (part of the **Tube Set Kit** below)

ACCESSORY

Tube-Set Kit consisting of:

- **Refrigerant Line Set** - 25 feet of suction and liquid line, both fully insulated, and flare fittings supplied on both ends.
- **Interconnecting High Voltage Wiring** - 25 feet supplied.
- **Additional Condensate Tubing** - 6 feet extra supplied.

FACTORY SUPPLIED ITEM

- **Matched System Consisting Of:** Evaporator section and condenser section with remote control.

ITEMS FOR CONSIDERATION

Application:

Check the application of the unit prior to installation, certain applications require additional components or installation parameters, such as the need for external condensate pump or if the system will need to perform low ambient cooling at outdoor temperatures below 60°F.

ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

CHOOSING UNIT MODEL

MODELS OFFERED

Indoor Model #	Outdoor Model #	Duty	Capacity Btuh	Voltage
KWCA09A0	K1CA9000A00	Cooling Only	9,000	115-1-60
KWCA12A0	K1CA2000A00	Cooling Only	12,000	115-1-60
KWCA18D0	K1CA8000D00	Cooling Only	18,000	208/230-1-60
KWCA24D0	K1CA4000D00	Cooling Only	24,000	208/230-1-60
KWHA09A0	K1HA9000A00	Heat Pump	9,000	115-1-60
KWHA12A0	K1HA2000A00	Heat Pump	12,000	115-1-60
KWHA18D0	K1HA8000D00	Heat Pump	18,000	208/230-1-60
KWHA24D0	K1HA4000D00	Heat Pump	24,000	208/230-1-60

EnviroAir Indoor Unit Nomenclature								
Position	1	2	3	4	5,6	7	8	
Example	K	W	C	A	09	A	0	
EnviroAir Unit	↑	↑	↑	↑	↑	↑	↑	
Unit Style <i>W = High Wall Unit</i>		↑						
Duty <i>C = Cooling Only H = Heat Pump</i>			↑					
Design Revision <i>A = R-410A</i>				↑				
Capacity <i>09 = 9,000 Btuh 12 = 12,000 Btuh 18 = 18,000 Btuh 24 = 24,000 Btuh</i>					↑			
Voltage <i>A = 115-1-60 (09 and 12 only) D = 208/230-1-60 (18 and 24 only)</i>						↑		
Not Used							↑	

EnviroAir Outdoor Unit Nomenclature											
Position	1	2	3	4	5	6	7	8	9	10	11
Example	K	1	C	A	9	0	0	0	A	0	0
EnviroAir Unit	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Number of Zones <i>1 = Single Zone</i>		↑									
Duty <i>C = Cooling Only H = Heat Pump</i>			↑								
Design Revision <i>A = R-410A</i>				↑							
Zone 1 Capacity <i>9 = 9,000 Btuh 2 = 12,000 Btuh 8 = 18,000 Btuh 4 = 24,000 Btuh</i>					↑						
Not Used						↑					
Not Used							↑				
Not Used								↑			
Voltage <i>A = 115-1-60 (9 and 2 only) D = 208/230-1-60 (8 and 4 only)</i>									↑		
Controls <i>0 = Standard</i>										↑	
Condenser Coil <i>0 = Standard Al/Cu</i>											↑

ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

PRE INSTALLATION

Determine the best location for mounting the indoor unit, it must be located a minimum of 4 ft (6 ft or more recommended) from the floor and no less than 6" from ceiling.

Pay attention to the air circulation in the room, 9,000 & 12,000 Btuh units throw air 15ft, 18,000 & 24,000 Btuh units throw air 25ft, ensure no obstacles to airflow exist.

Locate the indoor and outdoor units as close together as possible, maximum line set run and lift **MUST NOT BE EXCEEDED**. Determine how the interconnect piping, wiring and condensate hose are to be run.

Unit	Max Line Set Run	Max Vertical Lift
KWCA/K1CA 09/12	35 Feet	17 Feet
KWCA/K1CA 18/24	50 Feet	17 Feet
KWHA/K1HA 09/12	35 Feet	17 Feet
KWHA/K1HA 18/24	50 Feet	17 Feet

Ensure that all panels can be removed for service as required.

Certification:

All EnviroAir Ductless Splits are certified by UL under UL Standard 1995. Performance is verified by CSA under ARI 210/240 test standard.

CONTROLS AND COMPONENTS

Units are supplied with a wireless remote control, which communicates with the unit microprocessor control. The return air temperature sensor mounted in the indoor unit provides input to the control for system operation.

Several modes of operation are available to the end user depending on the type of comfort required. All unit operating functions are controlled via the remote control. Refer to "System Operation" section of this manual.

OPTIONAL CONTROLS AND COMPONENTS

Low Ambient Control:

Please consult the factory for availability of approved method of low ambient cooling operation.

Condensate Pump:

It is recommended to use the supplied condensate drain hose in a gravity fed method whenever possible. If this can not be done then a field installed pump that is external to the evaporator would be required.

ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

INDOOR UNIT INSTALLATION

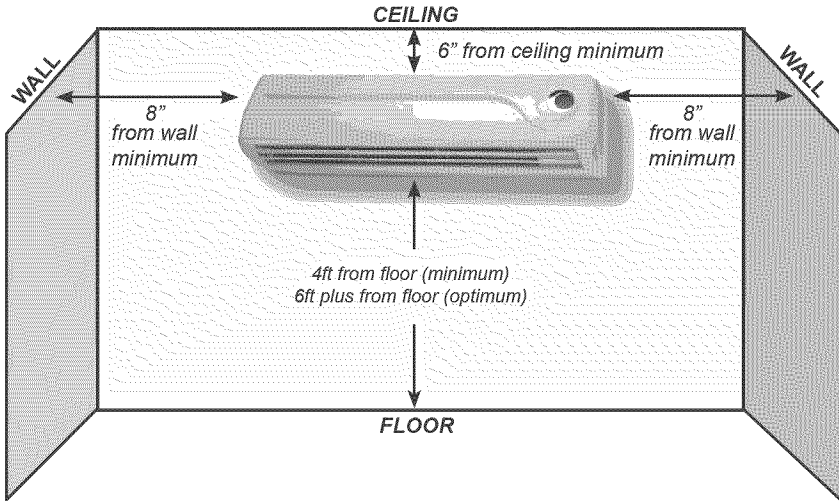
⚠ CAUTION ⚠

Follow Instructions, failure to follow instructions may cause possible malfunction and void any warranty.

Remove indoor and outdoor units from the carton/box. Indoor unit carton contains, remote control and batteries, ensure these are kept in a safe place during installation.

Locate area to install indoor unit the unit should be located a minimum of 6 ft. from the floor and 6" from the ceiling.

Choose an area where the wall is plumb and determine how to best to run the unit interconnects.



Ensure no obstacles to airflow are directly in front of the unit, for a minimum of 12 ft for 9,000/12,000 Btuh units and 16 ft for 18,000/24,000 Btuh units.

Do not install the Indoor unit units in areas exposed to high humidity (*Relative Humidity of 80% or more*), direct sunlight and direct heat from stoves or other devices.

ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

INDOOR UNIT INSTALLATION

Prepare the evaporator for mounting

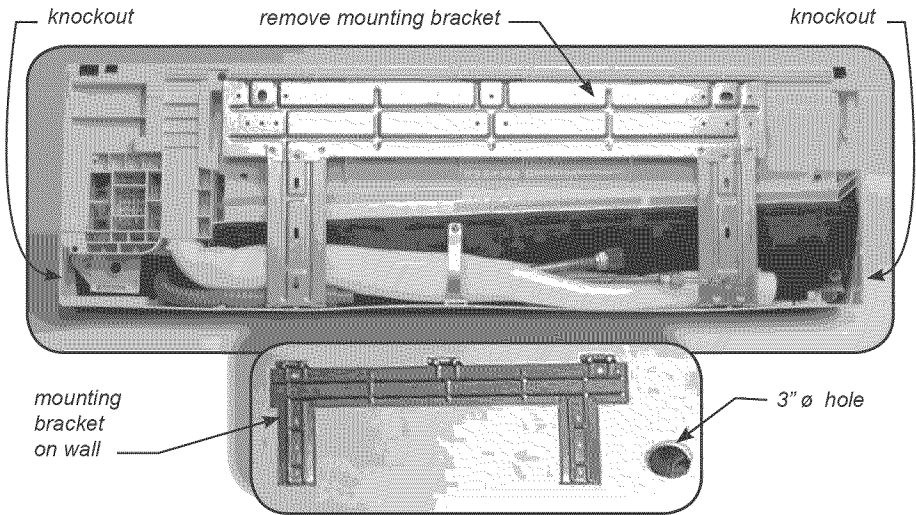
by removing the mounting bracket from the rear of the indoor unit. Use a Phillips head screwdriver to remove the unit pipe strap. If the unit is a heat pump the defrost sensor also must be undone from its retainer.

If mounting the unit on an outside wall measure from the edges of the unit to the center of the line set 90° bend to locate the center of the wall penetration. Drill a 3" \varnothing hole through the wall. Angle the wall penetration slightly down towards the outside to assist in draining the condensate away from the unit.

If mounting the unit on an inside wall, use the knockouts provided on the left and right sides of the unit to route the piping and wiring connections through.

The indoor unit weighs a maximum of 20 Lbs. Use wall anchors to secure the mounting bracket to a wall stud and ensure that the wall is capable of holding the weight of the unit.

Be sure mounting bracket is level, so that the condensate can drain properly.



Note: Prepare all wiring and piping connections before hanging the unit on the mounting bracket.

ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

INDOOR UNIT INSTALLATION

Prepare unit line set connections

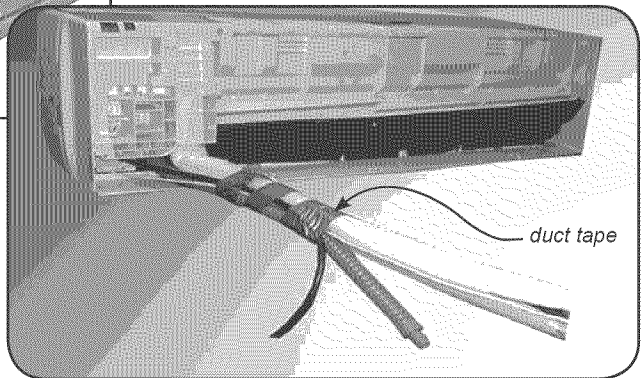
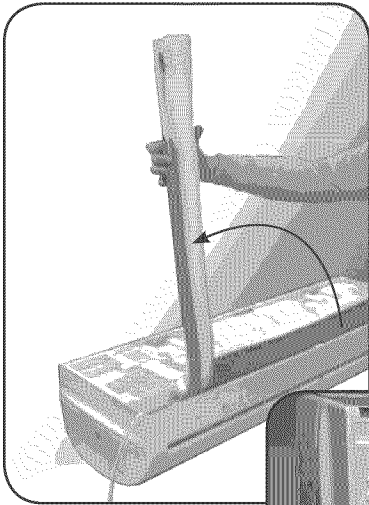
Rotate refrigerant line stubs gently to 90° (if mounting on an outside wall). For other line set configurations align the stubs as required.

Tip: Use Duct tape to tape the Condensate hose (make sure it is below the Line set stubs) and the defrost sensor (heat pump only). This makes it easier to guide them through the hole in the wall.

Feed the 14 AWG interconnect wiring between indoor and outdoor through the unit electrical connection (maximum number of 6 wires is required) (if required by local codes an electrical connector can be attached to the rear of the unit). Tape the loose wire to the line set stubs. (See *Electrical Wiring Install* section.) These two tips save time and prevent damage to the stubs when mounting the indoor unit.

HEAT PUMP SYSTEMS

Very Important! Make sure the defrost sensor wire is run and connected between the indoor and outdoor units, or the heat pump system will not operate in heat mode. Refer to "Heat Pump Wiring" section of this manual.



ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

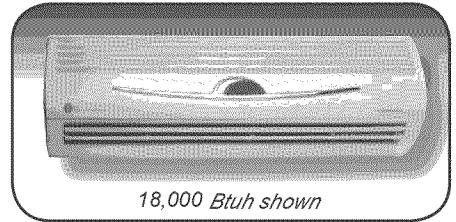
INDOOR UNIT INSTALLATION

Install unit on mounting bracket

Feed the line set stubs/condensate hose/wiring connections through a \varnothing 3" hole in the wall.

Position the evaporator so that the "key" slots on the back of the unit slide onto the tabs on top of the mounting bracket. Then push the lower portion of the evaporator against the bracket until it latches into the mounting bracket.

Indoor unit is now installed, it should be plumb, level and flush with the wall. Insure that the line set stubs are completely



through the wall penetration, also check that the wall is plumb. The unit must be level and plumb for proper condensate removal.

OUTDOOR UNIT INSTALLATION

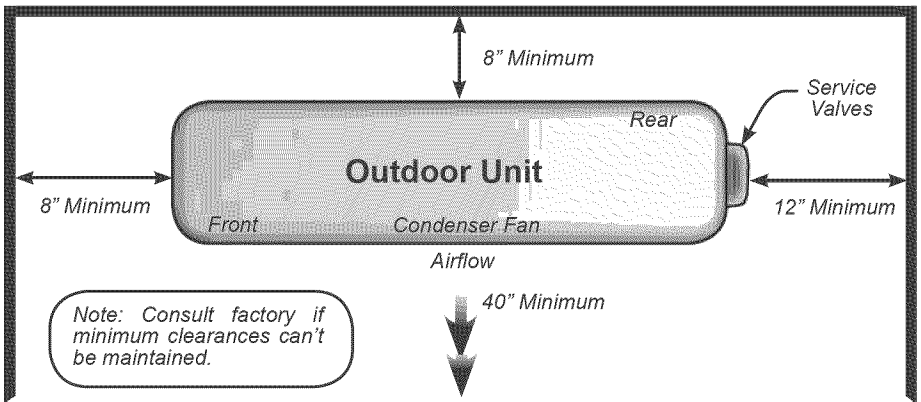
Locate Outdoor unit

Select a location with proper ventilation, minimizing recirculation possibility. Do not install the outdoor unit in a location exposed to high winds (*field fabricated and installed wind baffle may be required*).

Ensure location does not impede access around unit and pose a disturbance to neighboring areas.

Install the outdoor unit on a condenser service pad. If unit is a heat pump extend feet to raise 6" to allow for defrost to drain away.

Clearances for the Outdoor unit:



ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

OUTDOOR UNIT INSTALLATION

Refrigerant Line Set Piping

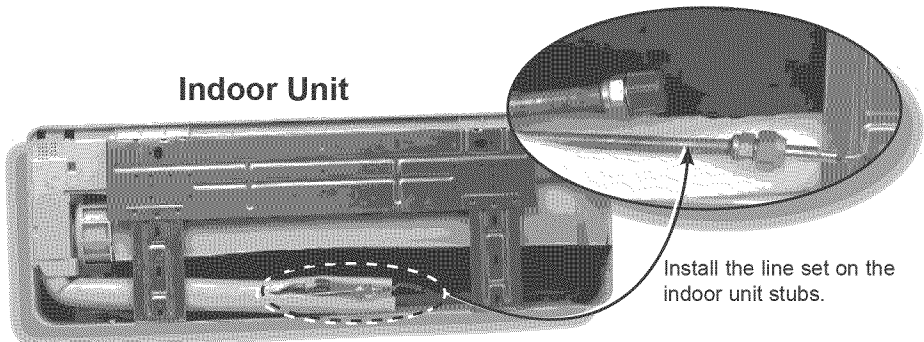
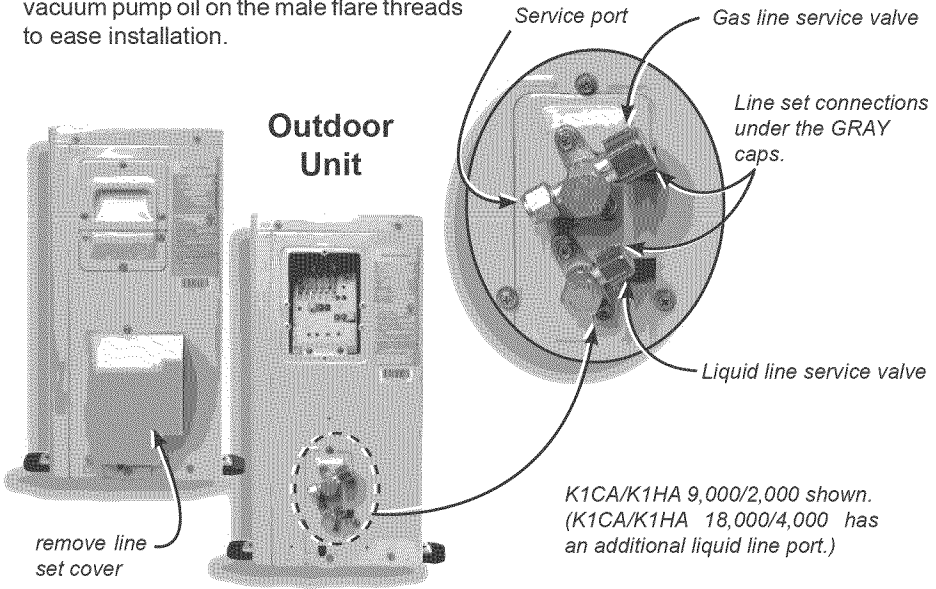
Interconnecting line set between the outdoor unit and the indoor unit, must have both refrigerant lines insulated as the expansion device is located in the outdoor unit.

Gently bend the line set stubs from the indoor unit to the desired location. Using 2 x 10"/12" Crescent wrenches remove the flare nuts from the indoor unit line stubs.

The indoor unit is filled with a dry gas, check for release of this to ensure that no leaks are present. Use a small amount of vacuum pump oil on the male flare threads to ease installation.

Connect the line set to the stubs. Using the 2 wrenches, 1 on the male and 1 on the female tighten the flare nuts. Run the line set to the outdoor unit, avoid tight bends and kinking the lines.

If line set length is in excess of that required, cut line set and re-flare or coil excess vertically to facilitate oil return to the compressor



ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

OUTDOOR UNIT INSTALLATION

Evacuation

Gauges can now be attached to the service ports - **SERVICE PORTS HAVE A 5/16" CONNECTION TO GAUGES**, which is different from the norm for R-22. You will need specific hoses or an adaptor for the 5/16" connection.

Once the gauges are attached the line set can be leak checked using Nitrogen at 300 psig. Evacuate the unit and interconnect down to a minimum of 400-500 Microns, break vacuum with Nitrogen to further leak check.

Re-evacuate the system down to 300-400 Microns or lower for a period of one hour. This is an R-410A System it is essential that a deep vacuum be pulled on the sys-

tem to remove all traces of moisture. See "System Start-Up" section to fine-tune the refrigerant charge.

Main Power Wiring

Electrical wiring should be done in accordance with all National Electrical Code (NEC) and local state/city building codes.

Note: A small screwdriver is required for unit terminals.

Breaker size and wiring must be sized for the rating plate amperage, MCA and HACR. Use only HACR type breakers, each system installed must have a separate branch circuit with an individual breaker/fuse.

Electrical Specifications

Nominal Capacity Btuh	Volts/Hz/Ph	Compressor		Cond Fan		Indoor Fan		Total FLA	MCA	HACR Max Fuse
		RLA	LRA	Watts	RLA	Watts	RLA			
KWCA/K1CA 09, 12, 18 & 24 Cooling Only										
9,000	115/60/1	7.5	47	35	0.81	16	0.35	7.2	10.6	15.0
12,000	115/60/1	9.9	53	45	0.80	16	0.35	9.6	14.0	20.0
18,000	208/230/60/1	6.6	42	60	0.85	40	0.40	6.4	9.5	15.0
24,000	208/230/60/1	10.0	46	60	0.90	40	0.40	8.1	13.8	23.8
KWHA/K1HA 09, 12, 18 & 24 Heat Pump										
9,000	115/60/1	7.5	47	35	0.81	16	0.35	7.2	10.6	15.0
12,000	115/60/1	9.9	53	45	0.80	16	0.35	9.6	14.0	20.0
18,000	220/60/1	6.6	42	60	0.85	40	0.40	6.4	9.5	15.0
24,000	208/230/60/1	10.0	46	60	0.90	40	0.40	8.1	13.8	23.8

A local disconnect should be installed adjacent to the outdoor unit in accordance with National and Local Codes. The outdoor unit provides power for the indoor unit, no disconnect is required between the outdoor and indoor units.

Line voltage from the disconnect should be wired to:

- N - L (115V Unit), + G
- L1 - L2 (208/230V Unit), + G

Remove right side knockout on the terminal access panel for whip/wiring connec-

tion. Ground connection must be made to the terminal plate.

Heat Pump (208/230 V) unit terminals:

- L1 - L2 : Power from breaker + G
- L3 - L4 : Power to indoor unit + G
- 1 - 2 - 3 : Control signals

These are just examples of typical wiring connections. **Always refer to Wire Diagram on unit for actual wiring connections.**

Tip: For easier access to the terminals in the outdoor unit remove the lower access panel to install whip and sealite connectors for conduit.

ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

OUTDOOR UNIT INSTALLATION

Electrical Wiring Installation



Electrical Wiring should be done by a certified electrician in accordance with all National Electrical Code (NEC) and local state/city building codes.

ALL CONTROLS WIRING BETWEEN INDOOR AND OUTDOOR UNIT IS HIGH VOLTAGE MINIMUM 14 AWG WIRE MUST BE USED.

Remove terminal covers from indoor unit and wire to the terminals, (*small screwdriver required*). Control wiring from the

outdoor unit must be a point to point i.e. the terminal that the wire is attached to on the outdoor unit must be the same terminal it is wired to in on the indoor unit.

THIS IS EXTREMELY IMPORTANT:

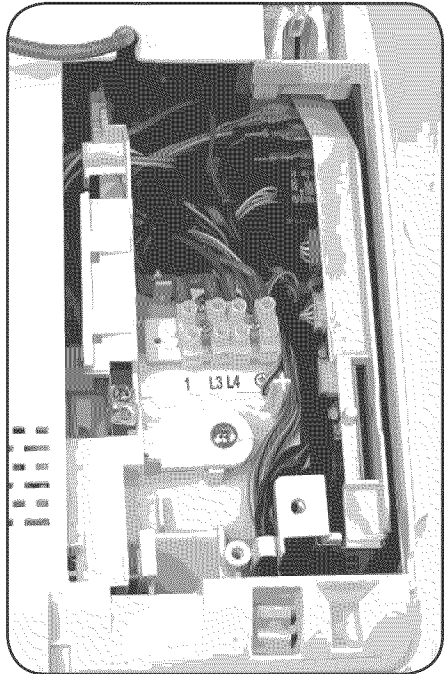
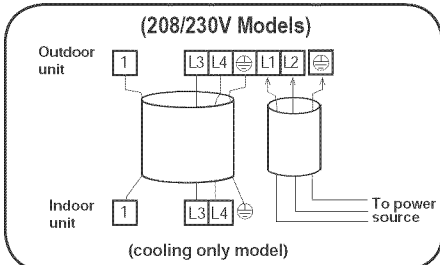
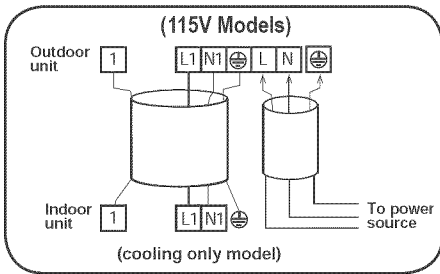
Switching the L3 - L4 or N1 - L1 wires will allow the indoor unit to operate but it will not provide controls signals for the outdoor unit so that the compressor will not operate. Ground connection should be made to ground screw marked in indoor unit.

COOLING ONLY WIRING

Control wiring at outdoor unit (*cooling only*).

Ground wires connected to the terminal plate indoor and outdoor units must be grounded.

Connection of wires for outdoor unit and indoor unit



ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

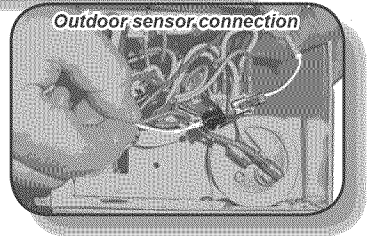
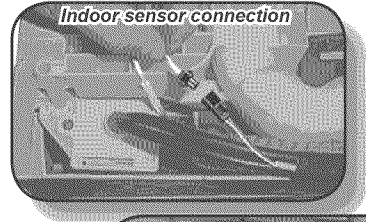
OUTDOOR UNIT INSTALLATION

HEAT PUMP WIRING

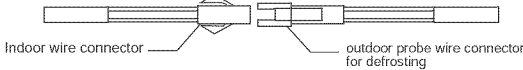
If the system is a heat pump the defrost sensor must be connected from the indoor unit to the defrost sensor in the outdoor unit. Standard lead length is 25 ft, if a longer length is required then cut the lead and extend using thermostat wire.

The heat pump defrost sensor interconnect wire comes bundled up with the indoor units. It then should be "un-bundled" and connected to the molex connection at the indoor unit and run to the outdoor unit molex connection, typically with the interconnecting wiring and/or interconnecting tubing.

Note: use of colored wire (supplied with line set) and defrost sensor connected (heat pump only).



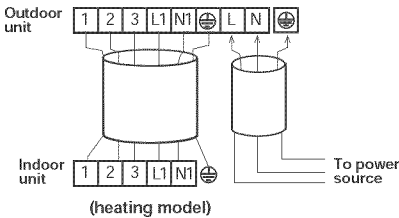
Defrost Sensor



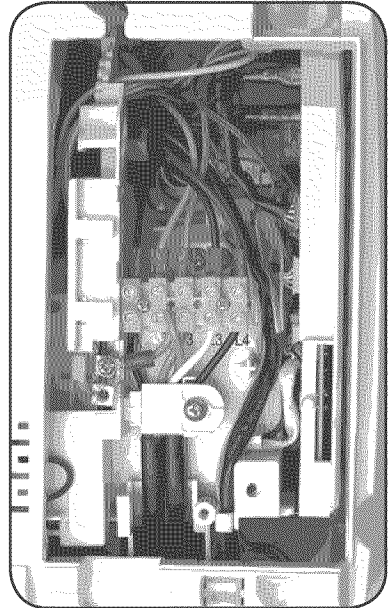
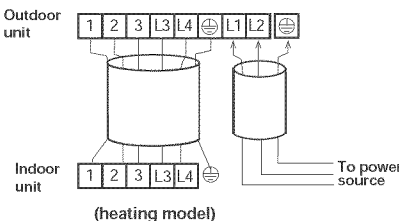
Ground wires connected to the terminal plate on indoor and outdoor units must be grounded.

Connection of wires for outdoor unit and indoor unit

(115V Models)



(208/230V Models)



ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

OUTDOOR UNIT INSTALLATION

12) Condensate Hose:

The unit is provided with approximately 18" of condensate hose connected. Hose connection is sized to accept a 3/4" OD or 5/8" ID clear plastic hose to then extend to building drain.

There is approximately 6' of additional drain hose supplied with the (accessory) line set.

All condensate hose extensions should be in accordance with local building codes. Remember water only flows downhill to ensure positive draining from the unit. Check using water for a positive flow of condensate.

The basic system installation is now complete. The unit is now ready for start up.

SYSTEM START UP

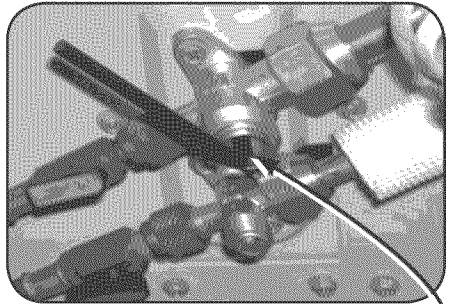
With the evaporator and line set completely evacuated the system can now be opened to allow the refrigerant charge in the outdoor unit to be released into the line set.

The condenser is charged with enough R410A refrigerant for 16 feet of interconnect. For longer line set lengths additional charge must be added in per the following table.

UNIT	LINE SET AND ADDED CHARGE REQUIRED								CHARGE
	Charge oz. per ft.	20 ft.	25 ft.	30 ft.	35 ft.	40 ft.	45 ft.	50 ft.	
KWCA/K1CA09/12	.3oz./ft.	1.2 oz.	2.7 oz.	4.2 oz.	5.7 oz.	N/A	N/A	N/A	
KWCA/KICA18/24	.6oz./ft.	2.4 oz.	5.4 oz.	8.4 oz.	11.4 oz.	14.4 oz.	17.4 oz.	20.4 oz.	
KWHA/K1HA09/12	.3oz./ft.	1.2 oz.	2.7 oz.	4.2 oz.	5.7 oz.	N/A	N/A	N/A	
KWHA/KIHA18/24	.6oz./ft.	2.4 oz.	5.4 oz.	8.4 oz.	11.4 oz.	14.4 oz.	17.4 oz.	20.4 oz.	

The service valves require a 6mm and a 5mm Allen wrench respectively to undo the valve stems. Remove the brass caps from the service valves. **Open the suction line valve first** to prevent any possible oil logging of the capillary tube expansion device that can occur if the liquid line valve is opened first with the rest of the system in a deep vacuum. Then open the "Liquid or Expanded Gas" line.

Unscrew both valve stems until they come to a stop against the valve body, replace the brass caps, then tighten the caps to prevent leaks. Energize the breaker to allow system to be powered.



Open the suction line valve first

Continued next page.

ENVIROAIR HIGH WALL DUCTLESS SPLIT SYSTEMS

Note: If interconnect is less than 16 feet a small amount of refrigerant may need to be reclaimed to achieve the proper charge for optimal operation. EnviroAir recommends fine tuning using the "Superheat" method.

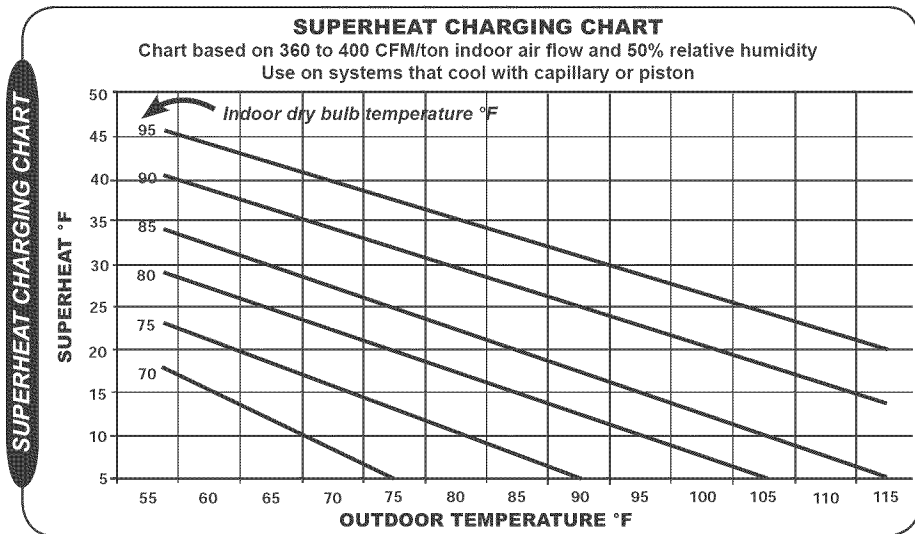
Start the indoor unit, cooling mode is only allowed when the outside ambient temperature is above 60° F to prevent damage to the compressor. Unit has a 3 minute time delay before the compressor start up operation.

FIELD CHARGING

The use of the superheat method is highly recommended for field charging or checking the existing refrigerant charge in a system that is in the cooling cycle. Because each installation is different in terms of indoor air flow, refrigerant line length, etc., the factory charge may not be correct for every application. To assure the best performance from the air-conditioner, the refrigerant charge should be checked and adjusted, if need be, on each installation.

Note: Refrigerant superheat is the temperature above the suction pressure at its saturation temperature.

For proper superheat readings, a standard low-side refrigerant gauge and an accurate thermometer is needed. A mercury or stem-type thermometer is not adequate for suction-line temperatures. We recommend electric thermocouple thermometers (available at most refrigeration wholesalers); however an accurate remote-bulb thermometer can be used. When measuring the line temperature, be sure the thermometer is securely attached to assure accurate measurements. The chart below gives superheat values at various outdoor temperatures. Allow at least 5 minutes running time between charge adjustments for the unit to stabilize.



Note: If operating superheat is more than 5° F above the chart value, add refrigerant. If below the chart value remove refrigerant. If below the limit line, remove refrigerant.

FIELD CHARGING

Instructions:

1. Measure suction pressure and determine evaporator-refrigerant temperature on R410A scale of low-side gauge.
2. Measure suction-line temperature on suction line of the unit.
3. Measure outdoor and indoor temperatures.
4. Determine from the table what the superheat should be for the indoor and outdoor temperatures.
5. Adjust charge if needed. Be sure unit is running at stabilized condition.

Example of typical system operations:

Cooling Cycle	
Conditions	80°F DB/50% RH Indoors
	82°F DB Outdoors
Return Gas Psig	140 (49° F Saturated Temperature)
Superheat	Refer to supplied superheat chart (16° F)
Heat Cycle	
Conditions	70° F Indoors
	47° F Outdoors
High Side Gas Psig	350/375 (107/112° F Saturated Temperature)
Sub-Cooling	10 - 15° F

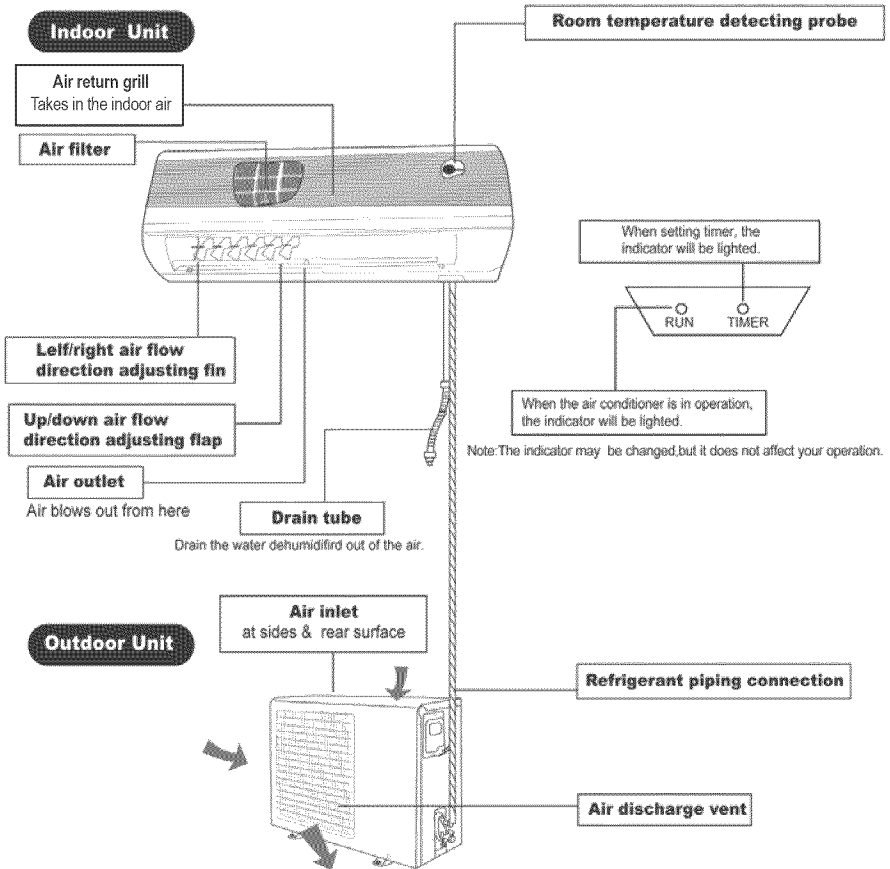
Note: When the system is in heat cycle, the refrigerant charge is checked by using the liquid sub-cool method. Liquid sub-cool is the temperature below the high side pressure at its saturation temperature.

OPERATION SECTION FOR KWCA/K1CA09/12 & KWAH/K1HA09/12

OPERATION AND MAINTENANCE SECTION FOR KWCA/ K1CA18/24 & KWAH/K1HA18/24 model follows this section.

Guide to features and their function

There are many models, features and appearance will vary. The figure shown is representative of the operation of 9,000/12,000 Btuh systems.



Unit operation section

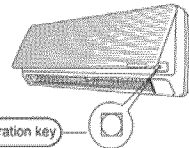
How to open



Lightly push both sides of the air inlet grille at the bottom and pull it to this side till a resistance is felt.

How to close

Push down the air inlet grille and the push both sides of air inlet grille at the bottom.



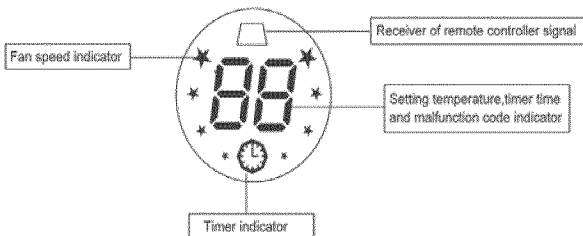
Emergency operation key

This button can be used as an emergency measure to turn on/off unit when remote controller is not available.

Note: Do not open the grille at an angle over 60 degrees.

OPERATION SECTION FOR KWCA/K1CA09/12 & KWAH/K1HA09/12

Remote Control Operation



OPERATION MODE indicator

Indicates selected operation mode

TEMPERATURE indicator

Indicates the set temperature. (It doesn't indicate temperature when operation mode is AUTO select.)

Fan speed indicator

Indicates the selected air rate.

AIR FLOW indicator

Indicates selected flap mode.

TIME indicator

During TIMER operation indicator TIMER
During normal operation indicator PRESENT TIME

ON/OFF button

This button, when pressed, starts operation and stops when pressed again.

SET TEMPERATURE button

This button sets the room temperature.

VANE CONTROL button

This button changes the flap mode.

SLEEP button

This button changes to SLEEP operation.

OPERATION MODE select button

This button, whenever pressed, changes the mode in the following order.

☁ (AUTO) → ❄ (COOL) → ☀ (DRY) → 🔥 (HEAT) → 🌀 (FAN)

AUTOSTART button

This button used for selecting timed starting

FAN SPEED button

This button set air rate.

AUTO STOP button

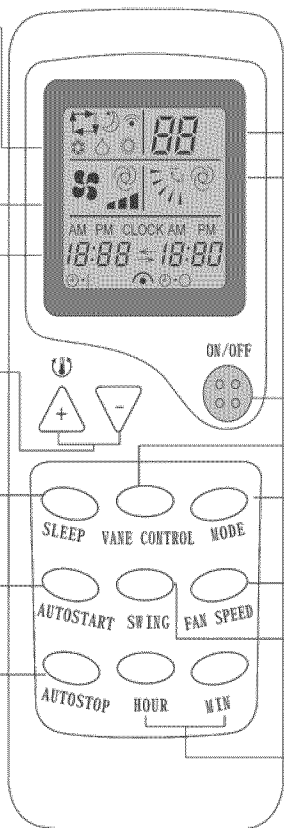
This button used for selecting timed stopping.

SWING button

This button adjust the air swinging direction.

TIME SET button

The two button used for setting present time and auto start or auto stop.






Remote Control Operation


Note: Wait 3 minutes before restarting the unit.


Selecting MODE of OPERATION


To select operating mode, point the remote control toward the indoor air conditioning unit:

- 1) Press the ON/OFF  button to **START**.
- 2) Press the MODE  button to step through the operating modes:

 **AUTO MODE** – automatically operates the system in DRY, COOL, or HEAT mode depending on the indoor temperature and setting.

 **COOL MODE** – operates the system in COOL mode depending on the indoor temperature and set point.

 **DRY MODE** – operates the system in DEHUMIDIFICATION mode.

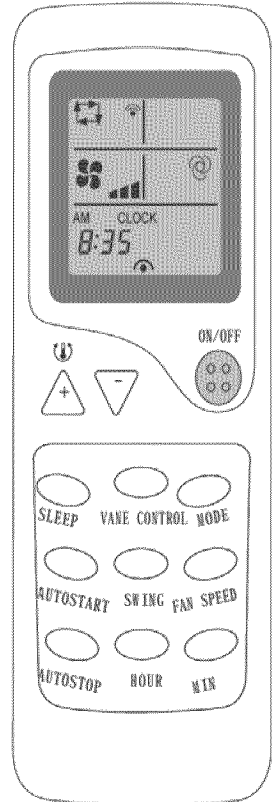
 **HEAT MODE** – operates the system in HEAT mode depending on the indoor temperature and set point.

Important:

Heating operation will cease at approximately 15° F outdoor temperature due to a sensor located in the outdoor unit. This product **does not** contain supplemental electric heat, therefore other means of heat need to be used when this system ceases operation at low outdoor ambients.

 **FAN MODE** – runs the FAN to circulate the air.



- 3) Press the ON/OFF button again to **STOP**.



Remote Control Operation





Temperature adjustment in AUTO SELECT mode

To adjust the air temperature during AUTO SELECT mode, point the remote control toward the indoor air conditioning unit:



- 1) Press the  button once. To raise the set point temperature 1°C or 1°F.
- 2) Press the  button once, to reduce the set point temperature 1°C or 1°F.

COOL/HEAT & FAN/DRY mode

Point the remote control toward the indoor air conditioning unit:

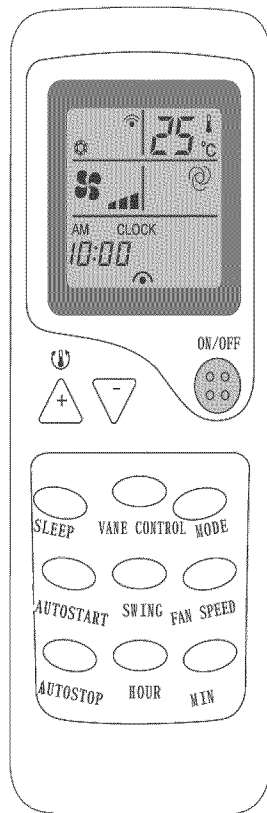
- 1) Press the ON/OFF  button.
- 2) Press the MODE  button, select the mode of operation; COOL, DRY, HEAT/FAN or AUTO.
- 3) Press the  or  to set the desired temperature.

Heat	Cool
64°F- 88°F (16°C-31°C)	64°F- 88°F (16°C-31°C)

Once minimum or maximum setting is reached operation will be continued by pressing  or .

- 4) Press the FAN SPEED  button to set the desired air flow rate.

Press the ON/OFF  button again to stop.



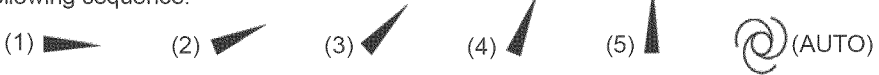
Notes:

- In the COOLING-ONLY operation, the HEAT mode will disable, and it will go to FAN mode.
- The settings can be changed even while the air conditioner is off.

Remote Control Operation

Up/down air flow direction adjustment

The up/down air flow direction can be adjusted by pressing the VANE CONTROL button on the remote control, each time this button is pressed, the vane angle changes in the following sequence:



- (1) through (5) are fixed positions.
- AUTO oscillates up and down automatically.

Air flow velocity adjustment

To change the vane control velocity press the FAN SPEED button. Each time the button is pressed, fan speed is changed in sequence,



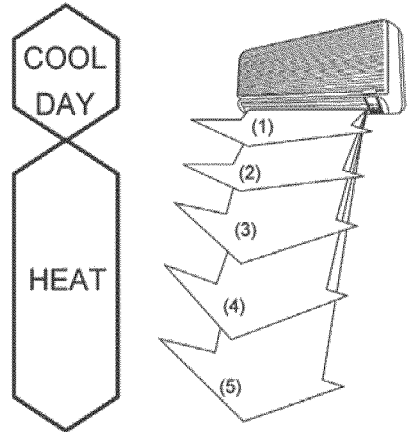
To cool the whole room, use the ■■■ [HI] setting in COOL MODE. If the sound of the air conditioner operating disturbs your sleep, use the SLEEP mode. (See next page)

Recommended horizontal VANE range

In (AUTO) mode the VANE positions are adjusted automatically.

In (COOL) or (DRY) mode VANE positions (1) or (2) are recommended.

In (HEAT) mode VANE positions (3) or (4) or (5) are recommended.



Left/right air flow direction adjustment

Adjust the air flow direction by hand, move the air flow direction fins left/right to direct the air as desired.

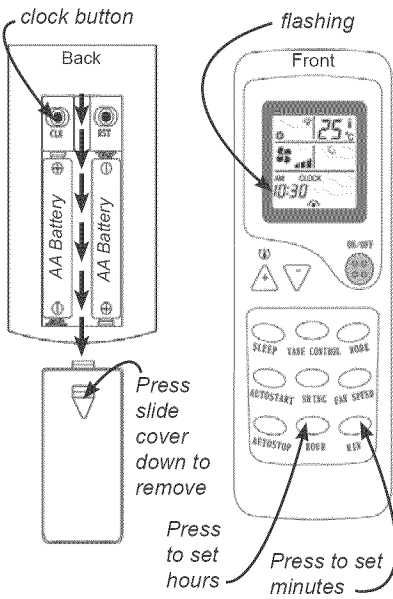
Swing adjustment (auto oscillation)

Press the SWING button, to adjust the air swinging direction. Press the button again to exit the SWING mode.

Note:

- In the cooling operation, when the air conditioner is operated with VANE CONTROL blowing down (4) or (5) for 1 hour, the VANE CONTROL direction is automatically set to level to prevent condensed water from dropping.
- Adjust the vertical VANE CONTROL direction using the remote control.
- In heating operation, if the output air temperature is too low or when defrosting is done, the horizontal vane position is set to (1).

Remote Control Operation

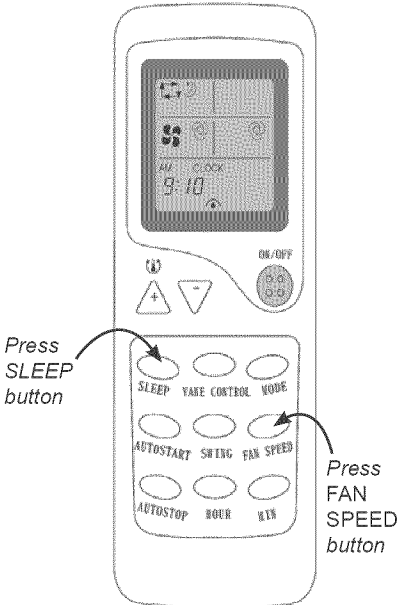


Setting the time

When batteries are inserted, the time will automatically be set to 12:00 AM.

- 1) With the back cover off, press the CLK button with the tip of a ball pen, etc. The time indicator will flash, the time can now be set.
- 2) Press the HOUR button to change the hour. **Example:** (Set to 10:AM) see front view.
- 3) Press the MIN button to change the minutes. **Example:** (Set to 30) see front view.
- 4) When time is set press the CLK button again. Slide the cover back, be sure it's clicked securely into place.

Note: The timer is set on basis of the time on the clock. Be sure to set the clock correctly.



Sleep mode

Sleep mode will reduce operation sound when sleeping.

- 1) Press the SLEEP button to activate this feature (air flow sound from the indoor unit is decreased).
- 2) Press the SLEEP button again to release the sleep mode or press the FAN SPEED button during the SLEEP mode, and the SLEEP mode is released

Note: Use the sleep mode when you are going to bed. If this mode is used during the day, the capacity is reduced since the ambient temperature is higher. (COOL mode is recommended for day use)

Remote Control Operation

How to set the ON timer

- 1) Press the AUTO START button to set the ON timer mode during operation. Each time the button is pressed, the ON timer mode alternates between ON and OFF.
- 2) Set the time on the timer using the HOUR and MIN buttons.
 - Each time the HOUR button is pressed, the timer hours are increased by 1 hour.
 - Each time the "MIN" button is pressed, the timer minutes are increased by 10 minutes.
- 3) To release the ON timer, press the AUTO START button again.

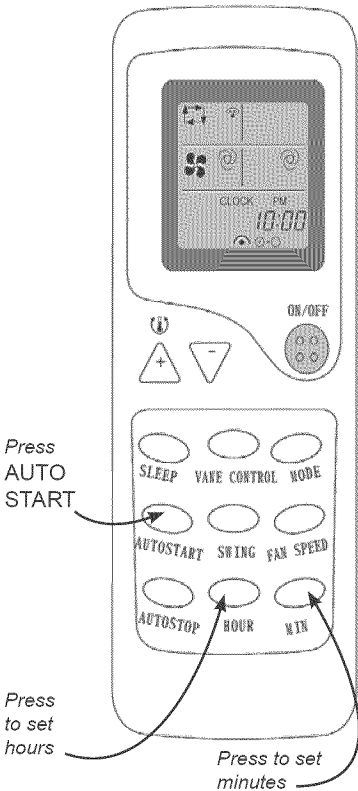
How to set the OFF timer

- 1) Press the AUTO STOP button to set the OFF timer mode during operation. Each time the button is pressed, the OFF timer mode alternates between ON and OFF.
- 2) Set the time on the timer using the HOUR and MIN buttons.
 - Each time the HOUR button is pressed, the set time is increased by 1 hour.
 - Each time the "MIN" button is pressed, the set time minutes are increased by 10 minutes.
- 3) To release the OFF timer, press the AUTO STOP button again.

Programming timer operation

The ON timer and OFF timer can be used in combination. The set time which is reached first will operate first (↔ mark indicates the order of timer operations.)

Note: If the current time has not been set, the timer operation cannot be accomplished.



Features of Heating Operations

Important:

Heating operation will cease at approximately 15° F outdoor temperature due to a sensor located in the outdoor unit. This product ***does not*** contain supplemental electric heat, therefore other means of heat need to be used when this system ceases operation at low outdoor ambients.

Defrosting

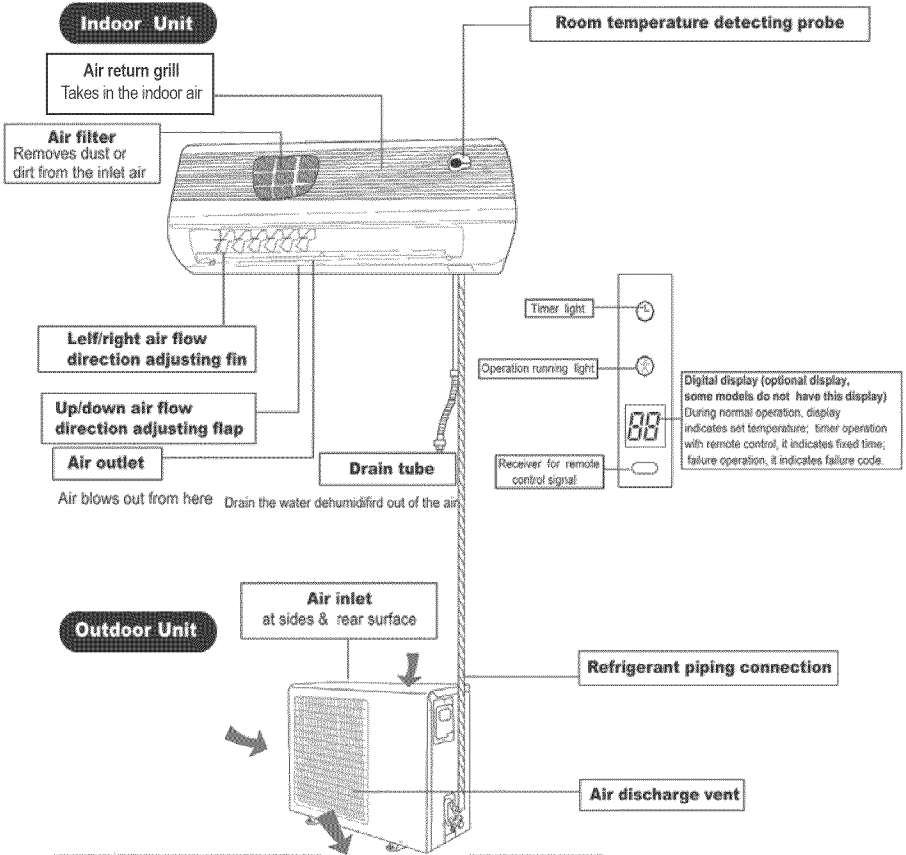
When the outdoor air temperature is very low and humidity is very high, frosting will occur in the heat exchanger of the outdoor unit, which has negative impacts upon the efficiency of the heating performance. In this case, the automatic defrosting function will come into play. The heating operation will be stopped for 5-10 minutes to do the defrosting.

Basic principles and performances

- The Heat Pumps absorb heat from the outdoor air and transfer it indoors to heat the indoor air. The heating capabilities through this principle go up/down with the increase/decrease of the temperature of the outdoor air.
- When the outdoor air temperature is very low, the system can be used together with other heating devices. Good ventilation should be maintained to ensure safety and prevent accidents.
- The fans of both the outdoor and indoor units are stopped. During the defrosting operation, the run light will flash slowly.
- During defrosting, the outdoor unit might generate some steam. It is caused by fast defrosting, which is not a performance failure.
- Upon the completion of the defrosting process, the heating operation is resumed.

OPERATION SECTION FOR KWCA/K1CA18/24 & KWAH/K1HA18/24

Guide to features and their function



Unit operation section

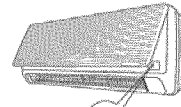
How to open



Lightly push both sides of the air inlet grille at the bottom and pull it to this side till a resistance is felt.

How to close

Push down the air inlet grille and the push both sides of air inlet grille at the bottom.



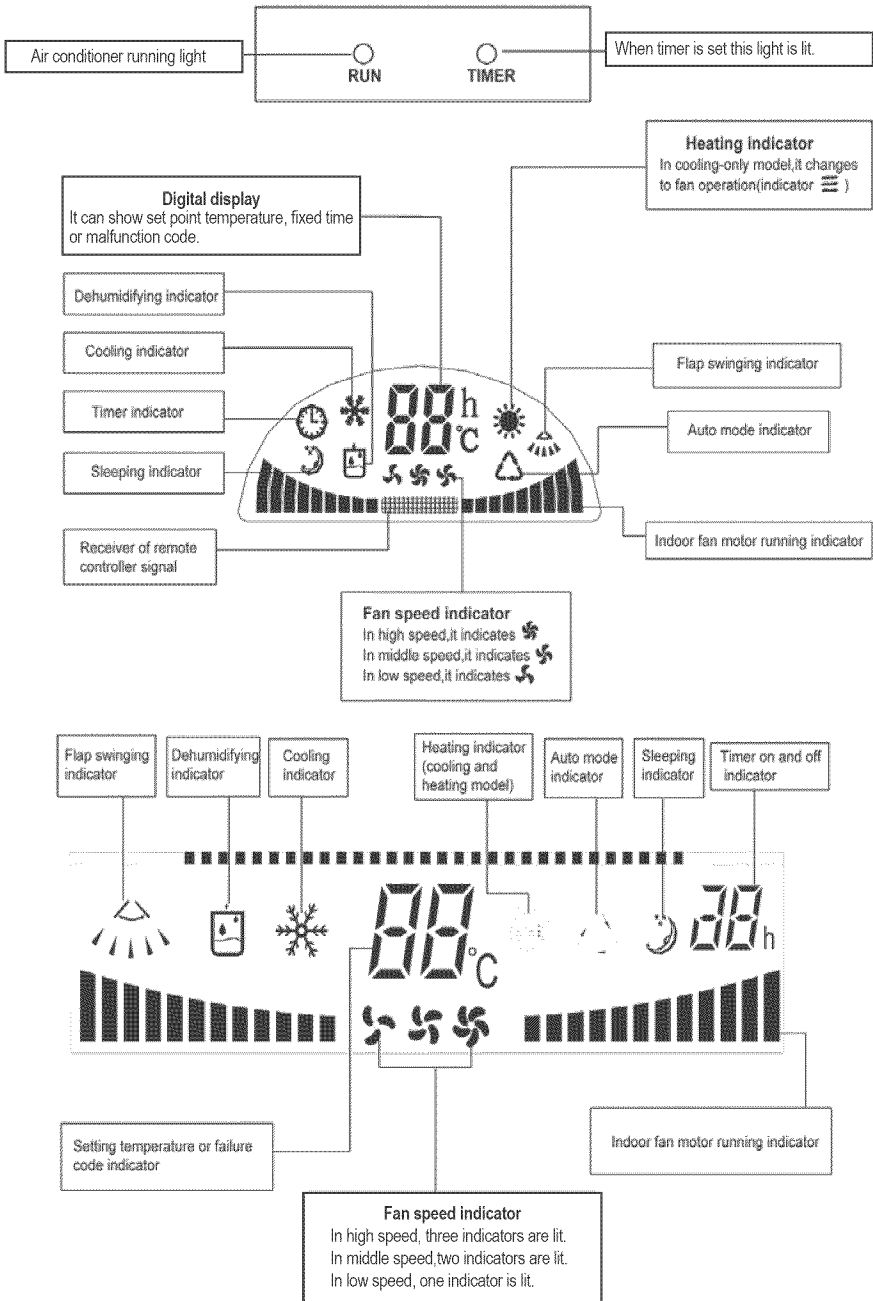
Emergency operation key

This button can be used as an emergency measure to turn on/off unit when remote controller is not available.

Note: Do not open the grille at an angle over 60 degrees.

OPERATION SECTION FOR KWCA/K1CA18/24 & KWAH/K1HA18/24

Remote Control Operation





Note: The indicator may change, this does not affect the operation.


Remote Control Operation


Note: Wait 3 minutes before restarting the unit.


Selecting MODE of OPERATION


To select operating mode, point the remote control toward the indoor air conditioning unit:

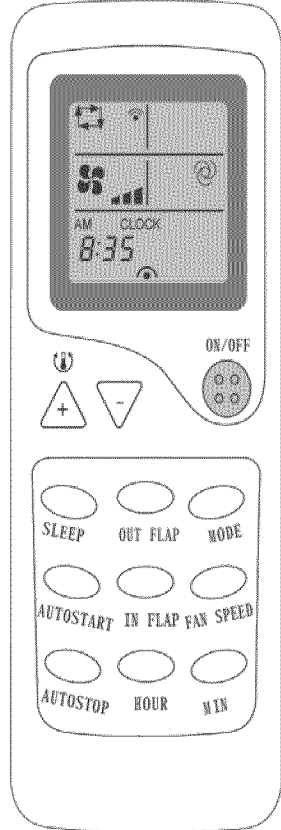
- 1) Press the ON/OFF  button to **START**.
- 2) Press the MODE  button to step through the operating modes:

 **AUTO MODE** – automatically operates the system in DRY, COOL, or HEAT mode depending on the indoor temperature and setting.

 **COOL MODE** – operates the system in COOL mode depending on the indoor temperature and set point.


 **DRY MODE** – operates the system in DEHUMIDIFICATION mode.

 **HEAT MODE** – operates the system in HEAT mode depending on the indoor temperature and set point.



Important:

Heating operation will cease at approximately 15° F outdoor temperature due to a sensor located in the outdoor unit. This product **does not** contain supplemental electric heat, therefore other means of heat need to be used when this system ceases operation at low outdoor ambients.



 **FAN MODE** – runs the FAN to circulate the air.

- 3) Press the ON/OFF button again to **STOP**.

Remote Control Operation




Temperature adjustment in AUTO SELECT mode

To adjust the air temperature during AUTO SELECT mode, point the remote control toward the indoor air conditioning unit:



- 1) Press the  button once, to raise the set point 1°C or 1°F.
- 2) Press the  button once, to reduce the set point temperature 1°C or 1°F.

COOL/HEAT & FAN/DRY mode

Point the remote control toward the indoor air conditioning unit:

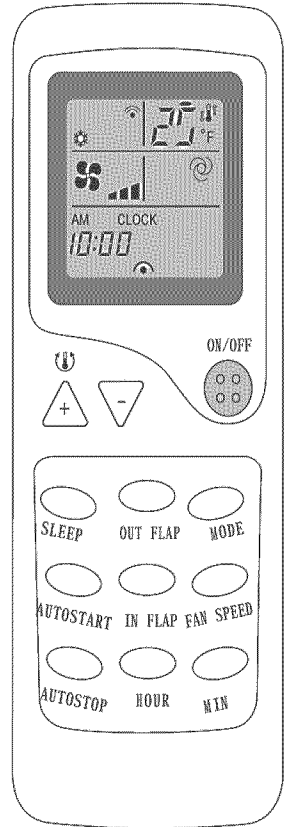
- 1) Press the ON/OFF  button.
- 2) Press the MODE  button, select the mode of operation; COOL, DRY, HEAT/FAN or AUTO.
- 3) Press the  or  to set the desired temperature.

Heat	Cool
64°F- 88°F (16°C-31°C)	64°F- 88°F (16°C-31°C)

Once minimum or maximum setting is reached operation will be continued by pressing  or 

- 4) Press the FAN SPEED  button to set the desired air flow rate.

Press the ON/OFF  button again to stop.



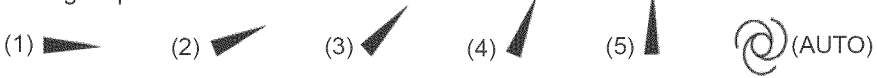
Notes:

- In the COOLING-ONLY operation, the HEAT mode will disable, and it will go to FAN mode.
- The settings can be changed even while the air conditioner is off.

Remote Control Operation

Up & down air flow direction adjustment

The up/down air flow direction can be adjusted by pressing the OUT FLAP button on the remote control, each time this button is pressed, the vane angle changes in the following sequence:



- (1) through (5) are fixed positions.
- AUTO oscillates up and down automatically.

Air flow velocity adjustment

To change the vane control velocity press the FAN SPEED button. Each time the button is pressed, fan speed is changed in sequence,



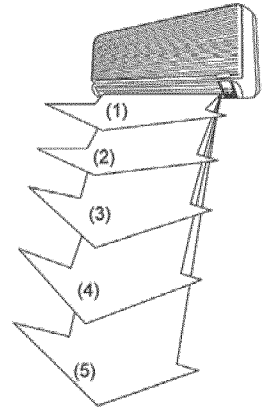
To cool the whole room, use the [HI] setting in COOL MODE. If the sound of the air conditioner operating disturbs your sleep, use the SLEEP mode.

Recommended horizontal VANE range

In AUTO mode the VANE positions are adjusted automatically.

In COOL or DRY mode VANE positions (1) or (2) are recommended.

In HEAT mode VANE positions (3) (4) or (5) are recommended.



Horizontal & vertical auto swing adjustment

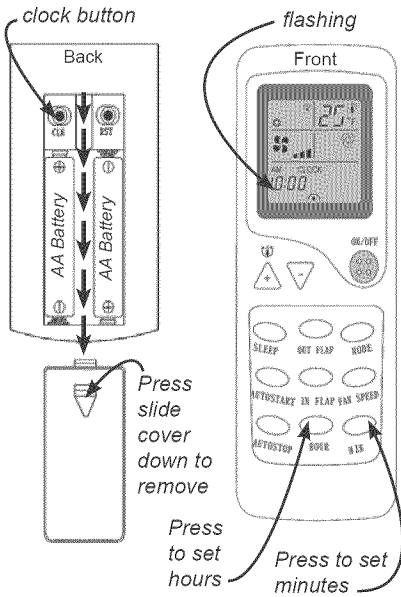
Adjust the left to right air flow direction with the remote control:

- Press the IN FLAP button, the air swing fins will continually oscillate left to right.
- Step through the different fins positions using the IN FLAP button (fins can also be set in a fixed position).

Note:

- In the cooling operation, when the air conditioner is operated with OUT FLAP blowing down (4) or (5) for 1 hour, the OUT FLAP direction is automatically set to level to prevent condensed water from dropping.
- Adjust the vertical OUT FLAP direction using the remote control.
- In heating operation, if the output air temperature is too low or when defrosting is done, the horizontal vane position is set to (1).

Remote Control Operation

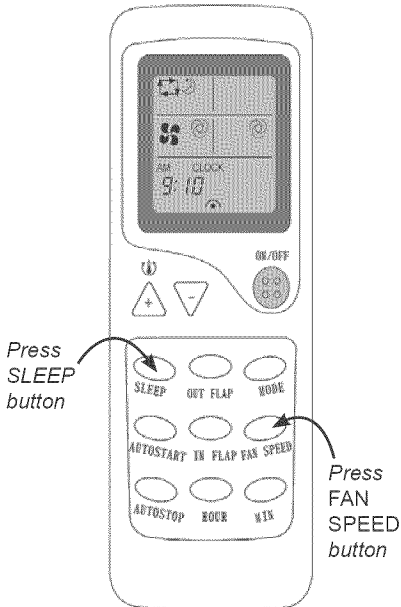


Setting the time

When batteries are inserted, the time will automatically be set to 12:00 AM.

- 1) With the back cover off, press the CLK button with the tip of a ball pen, etc. The time indicator will flash, the time can now be set.
- 2) Press the HOUR button to change the hour. **Example:** (Set to 10:AM) see front view.
- 3) Press the MIN button to change the minutes.
- 4) When time is set press the CLK button again. Slide the cover back, be sure it's clicked securely into place.

Note: The timer is set on basis of the time on the clock. Be sure to set the clock correctly.



Sleep mode

Sleep mode will reduce operation sounds when sleeping.

- 1) Press the SLEEP button to activate this feature (air flow sound from the indoor unit is decreased).
- 2) Press the SLEEP button again to release the sleep mode or press the FAN SPEED button during the SLEEP mode, and the SLEEP mode is released

Note: Use the sleep mode when you are going to bed. If this mode is used during the day, the capacity is reduced since the ambient temperature is higher. (COOL mode is recommended for day use)

Remote Control Operation

How to set the ON timer

- 1) Press the AUTO START button to set the ON timer mode during operation. Each time the button is pressed, the ON timer mode alternates between ON and OFF.
- 2) Set the time on the timer using the HOUR and MIN buttons.
 - Each time the HOUR button is pressed, the timer hours are increased by 1 hour.
 - Each time the "MIN" button is pressed, the timer minutes are increased by 10 minutes.
- 3) To release the ON timer, press the AUTO START button again.

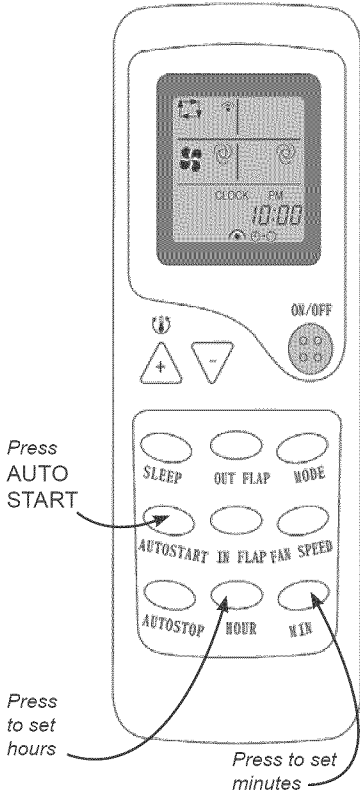
How to set the OFF timer

- 1) Press the AUTO STOP button to set the OFF timer mode during operation. Each time the button is pressed, the OFF timer mode alternates between ON and OFF.
- 2) Set the time on the timer using the HOUR and MIN buttons.
 - Each time the HOUR button is pressed, the set time is increased by 1 hour.
 - Each time the "MIN" button is pressed, the set time minutes are increased by 10 minutes.
- 3) To release the OFF timer, press the AUTO STOP button again.

Programming timer operation

The ON timer and OFF timer can be used in combination. The set time which is reached first will operate first (↔ mark indicates the order of timer operations.)

Note: *If the current time has not been set, the timer operation cannot be accomplished.*



Features of Heating Operations

Important: Heating operation will cease at approximately 15° F outdoor temperature due to a sensor located in the outdoor unit. This product **does not** contain supplemental electric heat, therefore other means of heat need to be used when this system ceases operation at low outdoor ambients.

Basic principles and performances

- The Heat Pumps absorb heat from the outdoor air and transfers it indoors to heat the indoor air. The heating capabilities through this principle go up/down with the increase/decrease of the temperature of the outdoor air.
- When the outdoor air temperature is very low, the system can be used together with other heating devices. Good ventilation should be maintained to ensure safety and prevent accidents.

Defrosting

When the outdoor air temperature is very low and humidity is very high, frosting will occur in the heat exchanger of the outdoor unit, which has negative impacts upon the efficiency of the heating performance. In this case, the automatic defrosting function will come into play. The heating operation will be stopped for 5-10 minutes to do the defrosting.

- The fans of both the outdoor and indoor units are stopped. During the defrosting operation, the run light will flash slowly.
- During defrosting, the outdoor unit might generate some steam. It is caused by fast defrosting, which is not a performance failure.
- Upon the completion of the defrosting process, the heating operation is resumed.

Maintenance

The air conditioner must be turned off before the maintenance is to be carried out.

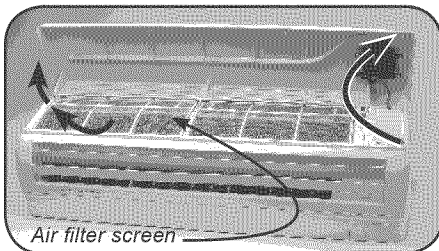
Before the operating season

- 1) Check if there are any materials blocking the intake and outlet vents of the indoor and outdoor units.
 - 2) Check if the installation stand is corroded or rusty.
 - 3) Check if the unit is properly grounded.
 - 4) Check if the air filter is clean.
 - 5) Connect to the power source.
 - 6) Put batteries in the remote controller.
- 1) To remove the air filter screen from the unit.
 - Gently press the two lower ends of the grille and open it.
 - Carefully lift the air filter screen up and out pulling it toward you.
 - 2) To Clean the air filter screen vacuum it with a brush attachment (do not lift the front cover more than 60°). If the screen is very dirty, use lukewarm water (about 86°F or 30°C) to wash it. Air dry after washing.
 - Do not use boiling water to clean the screen.
 - Do not use excess heat or an open fire to dry the screen.
 - Do not exert too much force pulling or stretching the screen.

During the operating season

Check the air filter periodically during the season and clean it if it is dirty.

Note: Do not open the grille to an angle over 60 degrees.



- 3) Replace the air filter screen.

Do not operate the air conditioner without the air filter screen. To do so will cause dirt to collect on the interior of the unit which may lead to poor performance and damage the unit.

Maintenance

To clean the surface of the air conditioner:

- Use a soft and dry cloth to wipe the air conditioner off, or use a vacuum cleaner to clean it.
- If the air conditioner is very dirty, use a damp soft cloth with a neutral household detergent to clean the surface of the unit.

Note: If the air filter screen is blocked by dust or dirt, the performance of cooling and heating will be affected, and the operation noise and power consumption will increase. Therefore, the air filter screen should be cleaned regularly.

After the operating season

- 1) Set the temperature at 86°F or 30°C and operate in the fan status for about half a day, to dry out the interior of the units.
- 2) Stop the operation of the system and turn OFF the power switch. The air conditioner will consume about 5W of electric power after the unit is turned off. For energy saving and safety, it is advisable to disconnect the power in the off season.
- 3) Clean and reinstall the air filter screen.
- 4) Clean the surface of both the indoor and outdoor units.
- 5) Take the batteries out of the remote control.

Troubleshooting

Check the following before requesting after-sale service from your dealer.

If the air conditioner does not operate at all

- Check if the main power is on.
- Is the time set to "ON" position? (If using the timer function.)
- Check for a blown fuse or a power failure.
- Check the batteries in the remote control.

Poor cooling or heating performance

- Room temperature can't be controlled (*Too cold or too hot*). Check if the room temperature setting too low or too high.
- Are the air filters clean (Not clogged)?
- Are the window (s) and door (s) opened?

Poor cooling performance

- Check if direct sunlight is entering the room.
- Check if there is a heat source in the room (i.e. - hot plate, oven, stove, etc).
- Are there too many people in the room?

If the air conditioner does not operate properly ever after conducting the above checks, if there is still doubt even after consulting the **Basic Operation Characteristics** section on following page of this manual, or in case of such phenomena as described below, turn off the power and contact your distributor.

Cases requiring immediate contact with the installer

Disconnect the power immediately, inform your installer in the following situations:

- Fuse or breaker often trips off (repeatedly).
- Remote does not initiate operation.
- Abnormal noise is heard during operation.
- If faulty operation is observed when the RUN button is pressed and even after restarting the operation after 3 minutes, faulty operation does not disappear.

Basic Operation Characteristics

Problem	Cause
The unit can not be restarted just after shut down. (<i>RUN light is on</i>)	Restart is delayed for 3 minutes after shut down to protect the unit. <i>Three-minute protection timer incorporated in the microcomputer actuates automatically. Except when power is connected, this function does not actuate.</i>
Air does not blow out at starting of heating operation.	<i>Air circulation is stopped to prevent blowing cold air into the room until heat exchanger warms up. (2 to 5 min)</i>
Heat pump system ceases operation in heating mode.	<i>Check to see if outdoor temperature is below 15° F. If so, operation will not resume until the outdoor temperature rises above 17° F.</i>
Air is not blown out for 6 to 12 min, at heating operation.	When outdoor temperature is low and humidity is high, the unit sometimes performs defrosting automatically. <i>Please wait. During defrosting, water or steam may be seen coming from the outdoor unit.</i>
Air is not blown out at DRY operation.	<i>Indoor fan is sometimes stopped to prevent vapor of dehumidified moisture and save energy .</i>
Mist is blown out at COOL operation.	This phenomenon sometimes occurs when the temperature and humidity of the room are very high. It will disappear with the lowering of the temperature and humidity.
Noise or cracking sound.	<i>This is caused by the refrigerant that is circulating inside the unit.</i>
Noise is heard (cracking sound). After a power outage or after disconnecting the power supply plug.	<i>This is caused by heat expansion or contraction of plastics.</i>
Operation can not be restarted even if the power is restored.	<i>The memory circuit of the microcomputer is cleared. Operate the remote controller again to restart the operation.</i>
Remote control signals are not received.	Remote control signals may not be received when signal receiver on the air conditioner body is exposed to direct sunlight or strong lighting. Interrupt the sunlight or dim the lighting.
Moisture may form on the air outlet grilles.	If the unit is operated for a long period of time with the high humidity, moisture may form on the air outlet grilles and drip down .

