

Comfort Guide For Your New Home

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Introduction

This booklet has been designed to help you better understand how your new air conditioning equipment operates. This booklet also provides helpful maintenance information that will help keep your unit operating at top efficiency.

Your architect, builder and **CMi Air Conditioning & Electrical** have selected the most suitable type of equipment for your application. A load calculation was prepared to select the size of the system(s) for your new home. This process is outlined by Air Conditioning Contractors of America (ACCA) Manual J; when properly sized and functioning your home will maintain 75°F and 50% RH inside when its 91° outside.

Three-Way Responsibility

You have a right to expect your Heating Ventilation and Air Conditioning (HVAC) system to serve you well for many years to come. For this to happen there must be a three-way responsibility.

- 1. The **manufacturer** must design and manufacture reliable equipment to rigid quality standards; the capacity and efficiency claimed by the manufacturer is verified by AHRI to validate the performance.
- 2. **CMi** must plan and install the HVAC system so that the equipment's full comfort potential is realized.
- 3. The **end user** must operate and maintain the equipment properly; as would be expected with any sophisticated machinery. The purpose of this booklet is to inform you of simple procedures that will help assure peak performance and the long life of your comfort equipment.

Energy Savings Agreement

Preventive Maintenance is critical to a properly functioning A/C unit

Congratulations on the purchase of your new home. You may already be aware that your A/C system requires regular maintenance. CMi A/C & Electrical's Energy Savings Agreement (ESA) offers many benefits such as:

- Increases the service life of your air conditioning system.
- Lowers utility costs to condition your home or office.
- Reduces the risk of property damage.

Filters: Your air filters need to be replaced or cleaned at different intervals based on the type of filter. Remember the better the filter, the more particles it can capture, the faster it "fills up." Typically filters are inspected every 3 months. Replacing filters is critical to a clean system because the air filters capture airborne pollutants such as molds, skin cells, and allergens. Dirty filters restrict airflow and, left unattended, will cause harm to the coil, blower, compressor, and property.

Coils/Refrigerant: This is the area of your system where the heat transfer takes place. If these components are not clean they cannot properly remove the heat from the air. Subsequently, your system will run longer to meet the thermostat set point. Additionally, the refrigerant must be at the correct level for your system to function as designed.

Drains: Drain maintenance is one of the most important aspects of your system. Blocked drains cause equipment failures and property damage. Because we live in a high humidity area, drains must be cleared regularly. During the installation, various safety components are installed to minimize the potential for problems; however, over time glue can dry out from the heat, algae forms in the drain lines/pans and the pitch of the PVC drain can change due to building settling and heat. Each of these items can cause the drain system to malfunction. The drain system must be properly maintained to reduce the potential of a failure.

Ducts: Inspect for air leaks in the duct attachment at the air handler as well as ensuring the air handler is properly sealed. During our "extended" summer months, hot, humid air can enter the air conditioning system causing your system to work harder. A brief math example: the air <u>returning</u> to your air handler is approximately $75^{\circ} - 78^{\circ}$; in the summer months the air surrounding your air handler and ducts can be up to 120° . A small duct leak could drive up the temperature of the returning air to 82° ; this directly effects the supply air temp. Typically there is about an $18^{\circ} - 20^{\circ}$ separation between the returning air and the supply air.

Motors and Electrical Components: Check the electrical components (motors, relays, capacitors) to make sure they are operating properly. Power supplied to your air conditioning system is provided by your local utility (i.e. FPL or Lake Worth Utilities). Technicians will verify voltage is within the correct range for your system. Voltage above or below the accepted range will cause wear on your electrical components. Technicians can identify those components prior to failure. Some electric motors require annual lubrication. Technicians will provide the correct amount of oil for those motors. Other motors are permanently lubricated and only need to be checked for cleanliness and correct operation.

Energy Savings Agreement		tioning & Electrical	(56	CONDITIONING & ELECTRICAL 202 OLD DIXIE HWY LAKE PARK, FL. 33403 61)844-1004 (561)844-1074 FAX Email: <u>info@cmiac.com</u> ate Lic # CAC1817971/EC0002042				
Residential	Name/Address/City/State/Zip:			Location of equipment:				
We agree to provide you with a complete tune-up & professional cleaning semi-annually, or as								
described below for your air conditioning equipment during the term indicated.	Phone:			Phone:				
BENEFITS	Email:							
	EOUIP.	BRAND AGE	Μ	ODEL #	SERL	AL # ON FIL	LE	
 Lower Utility Bills Extended Equipment Life Fewer Repairs 								
 15% discount on repairs Priority customer 								
 Inflation protection 24-Hr. emergency service 								
\cdot Never an overtime charge								
• Agreement is transferable (Stays with equipment)								
Precision Tune-								
Up Procedures								
Include:	□ New ESA	1 st visit	2 nd visi	it	3 rd visit	(renewal due	;)	
Monitor refrigerant pressure	□ Renewal ESA	A 1 st visit		2 nd visi	it (1	renewal due)	e)	
 Test starting capabilities Test safety controls 	CONTRACT Done Year			□ Two Years □ Three		Three Years		
Clean & adjust blower components	OPTIONS:	Investment: \$ Number of		stment: \$ nber of		tment: \$ ber of	_	
Measure for proper airflow		Tune Ups:		e Ups:		Ups:	_	
 Tighten electrical 		(Per Unit)		(Per Unit)		(Per Unit)		
connectionsMeasure volts/amps on	PAYMENT METHOD:							
motorsLubricate all moving	□ Mastercard □ Visa □ Am. Exp □ Discover □ Check Payment:\$							
parts • Verify thermostat					-		-	
operation • Clean evaporator coil (in place) • Rinse condenser coil	This prepaid agreement covers your drain line for blockages; although, this does not guarantee that the drain line will never back up. This agreement allows for one follow up drain clear; if additional drain clears are required an analysis will be done to determine the corrective action. This ESA does not cover any water damaged that was caused by the blockage. Maintenance's are scheduled between hours of 8am-5pm, Mon-Fri. Mold is a natural occurring event in Florida. Please understand that we do not carry insurance for, or assume liability for damage caused by mold.							
 Treat condensate drain Measure temperature 								
difference • Clean or replace (1"	Company App	proval:			Date:			
poly) filters. • Clean drain system • Test Electric Heater	Customer App	proval:		Date:				
L	White Copy-Cus	stomer	Yellow Coj	py-Service Dept.				

Warranties

YOUR WARRANTY RECORDS ARE ON FILE AT CMi Air Conditioning & Electrical

Limited Manufacturer Warranty:

Your new air conditioning system is covered by the manufacturer's limited warranty. The standard warranty is provided from the equipment manufacturer. Most offer 10 year limited warranty on all functional parts while CMi offers a 1 year warranty for our labor and workmanship. Some manufacturers offer a 12 year limited warranty on functional parts. In both instances your equipment must be registered with the equipment manufacturer to start the limited warranty period. Accessory equipment such as wine room units and dehumidifiers have separate warranty not associated with the A/C equipment. Unregistered equipment, accessory equipment and equipment installed on commercial properties has between a 1 and 5 year limited warranty period. YOUR EQUIPMENT WAS REGISTERED BY CMI WITHIN 60 DAYS OF INSTALLATION TO OUALIFY FOR THE 10 OR 12 YEAR WARRANTY. Please refer to inside pocket of folder for your specific registration paperwork.

Optional Extended Warranty:

We offer a beneficial program that you may consider. An extended warranty protects your equipment for the term. Both parts and labor are covered for a period of 10 years. The extended warranty works in conjunction with our ESA as the underwriters of the policy require that the covered equipment is regularly maintained. Very simply, the cost of parts and labor associated with any repair will be covered by the extended warranty underwriter. The investment for the extended warranty varies per system based on proximity to salt water and the manufacturer's limited warranty. We can provide specific information on extended warranties for your HVAC system upon your request.

If you are interested in purchasing an extended warranty or, if you would like more information on the extended warranty please feel free to call at anytime.

INDOOR AIR QUALITY

UV Lights & APCO:

- Destroys airborne toxic gases, germs & allergens.
- Destroys odors, freshens air.
- A/C units up to 50% more energy efficient.
- Prevents mold growth on evaporator coils.
- Visit <u>www.freshaireuv.com</u> for detailed information.

Upgraded Filters:

Filters are an important part of your new air conditioning system. Initially filters were developed to keep dirt and other airborne items off of the evaporator coil. We have now learned that higher efficiency filters can keep the air in your home clean. To do this we offer several types of filtration systems.

*1" filter to fit directly in the grille or at the air handler

• Pleated Filters provide more surface area and dust spot efficiency. These filters are disposable and last up to 90 days.

*Electronic Air Cleaners

 These filters use electronic attraction (+/-) which allows for more surface and highly effective air cleaning. These are the most effective filters on the market.



CAUTION: TURN OFF POWER TO UNIT BEFORE PERFORMING ANY MAINTENANCE.



Before Calling For Service (Cooling)

Cooling System Fails To Operate:

If your cooling system fails to operate, there are some steps homeowners can take:

- 1. Check that your room thermostat temperature selector is set below the room temperature and the system switch is in the "COOL" position.
- 2. Check your thermostat for batteries; if present, are they good?
- 3. Check the main breaker panel. If you find a "tripped" breaker (in the middle position) turn to off then back to on. Are all the breakers in the "ON" position (both CU and AHU-HEAT breakers)?
- 4. If the unit still does not operate, give us a call for 24/7 emergency service.

(Heating)

Heating System Fails To Operate:

If your heater fails to operate, follow these step-by-step instructions:

- 1. Check that your room thermostat temperature selector is set above the room temperature and the system switch is in the "HEAT" position.
- 2. Check your thermostat for batteries; if present, are they good?
- 3. Check the main breaker panel for the house for a tripped circuit breaker. If you find a "tripped" breaker (in the middle position) turn to off then back to on. Are all the breakers in the "ON" position (both CU and AHU-HEAT breakers)?
- 4. If the unit still does not operate, give us a call.

Insufficient Air Flow:

If you sense a change in air flow, a dirty air filter is the most likely cause. Inspect the air filter, change as needed.

Another common cause of insufficient air flow is a blocked air-return or air-supply grille. Be sure all of these grilles are not blocked by furniture or other items.

Systems with belt drives require adjustment of the blower motor pulley regularly to set blower speed for proper air flow. This is not an area for the novice, call us to adjust or change belts and pulleys.

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Humidistats and Thermostats

Operating Instructions While "In Residence":

Turn the humidistat to "OFF" position. Set the thermostat at desired temperature and turn to "COOL" and "AUTO" or "HEAT" and "AUTO".

Operating Instructions When You Are Away:

This set of directions are dependent upon the type of thermostat installed in your home. If you have a standard digital thermostat: Place the Mode to "COOL" position and the fan on "AUTO". Set the temperature to 78° - 80° . If your thermostat has a Humidistat feature: Set your thermostat to the "COOL" position and the fan on "AUTO". The thermostat setting should be 80° and the humidistat to 50-55%relative humidity. This setting should keep the level of humidity in your home at a consistent level. All closet doors should be left open in either scenario.

General Maintenance (Filter Location)







Air Handler Bottom Mount Ceiling or Wall Mount

Air Handler Front Mount

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General Maintenance

Your heating/cooling equipment should be inspected regularly by a trained **CMi** Technician. We do offer an ESA that will keep all your equipment operating at peak efficiency year after year.

Outdoor Equipment:

- Check that shrubs, grass, leaves, dirt, etc. do not obstruct airflow to the outdoor coil. The coil fins may be cleared by flushing with a water hose. If your home is near salt water you may consider flushing the coils monthly to rinse off the salt. Be sure to shut off power to unit before flushing to avoid damage or shock. Do not flatten or bend coil fins as this will harm the unit efficiency and could create a leak in the coil.
- The outdoor unit should be sitting level with proper slope and graded so there is no buildup of water around unit. If there is a water drainage problem, call **CMi.** Do not attempt to move the unit yourself, as this may damage the unit's piping connections resulting in refrigerant leaks and an inoperative system.
- 3. Your condensing unit has been designed for minimum care and is completely weatherproof. An occasional coat of wax on the metal portion of the cabinet will help to prevent deterioration of the finish and enhance its durability.



Indoor Equipment:

Condensation is a byproduct of the cooling process and is piped to a suitable drain outside the home. These drains require regular cleaning (*especially in our humid climate*). Untreated drains will become blocked and stop the unit and/or cause property damage. Check the condensation drain for a free flowing condition. If water does not run freely, the drain pipe must be cleared. CMi installs an auxiliary drain/pan and a safety switch to reduce the risk of an overflow into your home or office. The drain is usually piped to an outside location where it can be observed. If you notice sludge or debris accumulating near the drain termination you can clear it with a wet/dry vac or a hose. Your **CMi** technician is properly trained to remedy drain problems and should be consulted in the event of this poor drainage condition.

FILTERS:

Air filters should be checked regularly. A dirty filter should be replaced or cleaned immediately as it will cause your equipment to work harder than necessary, resulting in wasted energy and possible equipment/property damage.

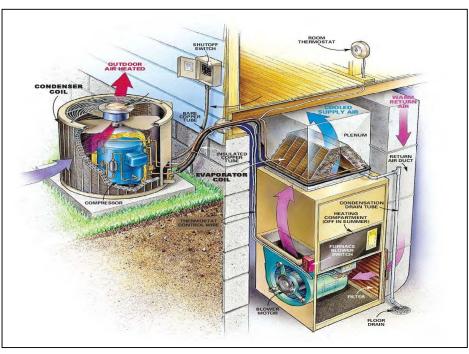
CAUTION: TURN OFF POWER TO UNIT BEFORE PERFORMING ANY MAINTENANCE.

How a Cooling System Operates

Residential air conditioning uses a sealed refrigerant system to lower the home's air temperature and humidity to a comfortable level of 75° and 50% R.H. A typical system consists of an evaporator coil (indoor located in the air handler) connected by copper tubing to the condensing unit (located outdoors). The illustration below shows an evaporator coil mounted on an air handler, using the filter below in the air handler. The oversimplified description of air conditioning is the principle: "*heat moves to cool*".

Cooling Cycle:

- 1. Refrigerant (Freon) is pumped by the compressor in vapor form to the condensing coil.
- 2. The outdoor fan pulls air over the condensing coil, cooling the refrigerant and changes state to a liquid.
- 3. The liquid refrigerant flows from the outdoor coil to the air handler/evaporator coil via copper tubing.
- 4. At the evaporator coil the refrigerant changes state to a vapor, during this change heat and moisture are removed from the air passing over the coil; condensation forms. This additional benefit of removing water from the air is known as dehumidification. This water is disposed of through a condensate drain.
- 5. The refrigerant vapor, now warmer after picking up heat from the house, is pulled back to the outdoor condensing unit by the compressor where the cycle starts over.



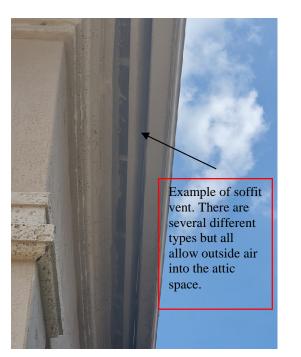
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Cold Attic Syndrome

Residential air conditioning uses a sealed refrigerant system to lower the home's air temperature and humidity to a comfortable level of 75° and 50% R.H. A typical system consists of ductwork located in the attic to distribute conditioned air. When the ductwork / air handler is located in the attic the potential for condensation to form on the surface exists. This is more prevalent when the attic is vented to the outdoors via soffit vents and in the summer months. In this situation the attic is cooler (relatively speaking) than the dew point and condensation forms; very similar to a cold glass of water. This is a common occurrence in South Florida. While we take steps to avoid any damage, in this situation it is possible for the drywall ceiling to become stained by condensation dripping off the surface.

Remedies:

- 1. Keep the home at the design temperature of 75°. Keeping the home at a colder temperature, especially for long periods of time, causes the ducts to get colder.
- 2. Keeping doors and windows closed when the A/C is on.
- 3. If soffit vents are present, seal them with an elastomeric paint.
- 4. Add a dehumidifier to those attics with Icynene (spray foam type) insulation.





CAUTION: TURN OFF POWER TO UNIT BEFORE PERFORMING ANY MAINTENANCE

Balancing Your System

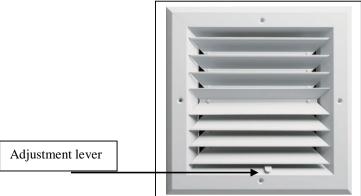
CMi has made the basic adjustments to the air distribution system in your home. But you and your family are the only ones who know best what is comfortable in the various rooms. For that reason, you are the most likely person to "balance" your system. If you prefer to have a professional make these adjustments feel free to give us a call.

There are 4 easy steps in balancing your system:

- 1. Pick a day when the temperature of the outside air is typical for the time of year. Leave the thermostat on one setting for an hour before proceeding to Step 2. All dampers, ducts and registers should be open.
- 2. If you find some of the rooms are too cool (cooling mode) or too warm (heating mode), partially close dampers to outlets in these rooms. Make adjustments in one room at a time. It is best to start with the room that contains the thermostat.

Caution: Only move dampers a very small amount at any one time. Never make a large adjustment in the damper position or close dampers completely as this will reduce system air flow and can cause system damage.

- 3. As air flow is reduced from some outlets, it automatically increases at others. After air has been reduced to rooms that need less conditioning, allow system to run for 30 minutes or more.
- 4. Continue to make very slight adjustments to the dampers until rooms reach the temperature balance you want. Be sure to allow enough time for the temperatures to stabilize after you make each adjustment.



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Cooling System Operation



To Begin Operation:

Check that the power supply is on. Set the room thermostat to the cooling mode and set the temperature selector switch to the desired temperature. Remember your system was designed to reach 75° when its 91° outside. Excessive cooling below this temperature may be problematic. The cooling system should cycle on and off according to the temperature setting. **NOTE: Do not move the thermostat setting excessively as this may cause damage or trip a circuit breaker.**

Allow at least five minutes after unit shuts off before readjusting thermostat to restart cooling unit. This allows time for pressures in the system to equalize for proper compressor startup. Best operation is obtained by setting the thermostat at the desired temperature and leaving it there, allowing the thermostat to cycle the equipment rather than readjusting the setting manually to turn cooling on and off. If the temperature is not even and comfortable in all rooms, refer to "Balancing Your System".

Many models of condensing units incorporate a compressor crankcase heater. Crankcase heaters are useful during cool weather conditions. During cool weather, refrigerant in the system can migrate to the compressor crankcase condensed in a liquid state, mixed with the compressor oil. Should the compressor be started under these conditions, it would be forced to pump liquid refrigerant and oil, this would **DAMAGE THE COMPRESSOR.** Compressors are only designed to compress refrigerant as a gas. It would also cause lubrication problems because the compressor oil would be flushed out of the crankcase with the liquid refrigerant.

This is where the crankcase heater comes into play as a protective device for the compressor. At cooler temperatures, this heater is on; raising the temperature of the crankcase enough to prevent condensing the refrigerant in the compressor.

If you do not plan to use your cooling system for long periods of time, such as November through March; you can turn the power off to the unit *(it is not recommended due to the humidity in our area)*. This will save energy, as crankcase heaters can use between 30-65 watts of power. When the weather changes and cooling is needed again; the power **MUST** be turned <u>on</u> for **AT LEAST 24 HOURS** prior to setting your room thermostat to cooling to run the unit.

Some cooling systems have a timed interlock control that will prevent the compressor from operating for up to five minutes between cycles. The unit will restart automatically on thermostat demand, when this internal timing cycle is completed. This delay may be noticed when setting thermostat for a cooler temperature and the cooling unit does not start immediately, this is normal.

Two-Speed units have both a timed interlock control and a built–in delay between low and high speed. It is normal for these units to shut off for a few seconds between speeds.

To Shut Off Cooling Unit:

- 1. Set thermostat to the "System Off" switch.
- 2. Turn off the power supply to the unit.

CAUTION: TURN OFF POWER TO UNIT BEFORE PERFORMING ANY MAINTENANCE.

Electric Heat Operation

Power Supply:

Normally, the disconnect switch is mounted on the element panel of the unit. (If these switches are not used as the disconnect switch, the disconnect switch will be located near the air handler.)

Start Up:

Check that the power supply is on. Set the thermostat above room temperature. The air handler should cycle according to the thermostat setting.

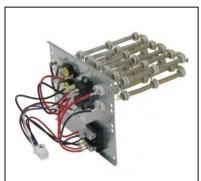
To Shut Off Heater:

- 1. Set thermostat to the lowest setting.
- 2. Move heat off cool selector to "off".



How the Heating System Operates

Our little slice of paradise is considered a *cooling zone*. This definition means that the size of the cooling equipment takes precedence and the heater size is secondary. For this reason we install electric heaters located in the air handler. The heat section of an air handler consists of one or more electric heating elements. The element is much like that in an electric toaster, only larger. When the room thermostat calls for heat, current is sent through the heating coil and the resistance produces heat. The air is heated and forced through the ducts to the different rooms in the home. It is important to remember that lack of airflow will prevent the heater from working. Make sure to keep filters clean. It is also important to remember that when using the heat for the first time each heating season, *it is normal to have a slight odor when the heat comes on. This is just "dust" burning off of the heater*. Long periods (4 - 5 days) of cold weather will cause the electric heater to become less effective...fortunately we don't have many of those periods.



CAUTION: TURN OFF POWER TO UNIT BEFORE PERFORMING ANY MAINTENANCE.

Notes on Operating Costs for Heating and Cooling Systems

- 1. Keep windows and doors closed as much as possible. Unconditioned air, noise and dust belong outside.
- Fireplaces provide a nice setting and pleasant atmosphere; however, fireplaces require a great deal of air for combustion and create a strong updraft through the chimney. Be sure fireplace dampers are closed when fire is completely extinguished and the fireplace is not in use.
- 3. Kitchen, bath and utility exhaust fans are a necessity; however, keep in mind that they also remove conditioned air from the house. Their use should be kept at a minimum in order to reduce cooling/heating costs.
- 4. Keep in mind that washers, dryers, ovens and other home appliances can add heat and humidity to your home. For example, you might consider washing and drying clothes in the morning or evening in the summer months to avoid adding heat to your home during peak cooling hours. Keeping your dryer vents clean will keep from adding heat to the home and dry your clothes faster.
- 5. Your digital thermostat is a precision instrument, designed to automatically control your heating and cooling system. For best results, select a comfortable setting and do not change the thermostat except when absolutely necessary.

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OPTIONAL ACCESSORIES

We are a full service Air Conditioning and Electrical contractor. We do offer many items to enhance your home's air conditioning and electrical performance. Below is a sample of some of the items we offer:

- UV Lights
- Electronic Air Cleaners
- Whole House Air Purifiers
- Filtration
- Condensate Pumps
- Wi-Fi or "Smart" Thermostats
- Equipment Surge Protection
- Variable Speed Motor Surge Protection
- Upgraded Lighting options (under-cabinet, accent, chandeliers, wall sconces, recessed lighting, landscape etc...)
- Ductless "Mini Split" A/C systems for garages or workshops.

YOUR EQUIPMENT

From time to time you may need the model and serial numbers of your equipment. Below is a list of the equipment installed in your home:

	BRAND	MODEL#	SERIAL#	START UP DATE
AIR HANDLER:				
HEATER:				
CONDENSER:				
THERMOSTAT:				
ACCESSORY:				
AIR HANDLER:				
HEATER:				
CONDENSER:				
THERMOSTAT:				
ACCESSORY:				
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