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**ICE AIR**  
World Class Comfort®



# Vertical Stack Water Source Heat Pump (VWSHP)

**OPERATING & MAINTENANCE MANUAL**

## ***SAFETY WARNINGS***

- Must be installed by qualified, trained installation personnel
- Must be installed in accordance with Ice Air installation manual and procedures
- Must be serviced by qualified, trained personnel
- Must be operated with all chassis sheet metal parts properly in place
- Must be operated with all enclosure (cabinet) parts in place
- Intended for indoor use only
- Electric shock hazard - disconnect from live electric circuit before servicing
- Moving parts hazard – disconnect from live electric circuit before servicing
- Read this entire operations manual before operating the unit
- Must be operated on a dedicated single circuit with proper electrical overcurrent protection

### ***WELCOME***

Congratulations on your selection of Ice Air Water Source Heat Pump (WSHPs) for your comfort conditioning requirements. WSHP units are combination cooling and heating units, which provide an efficient, room-by-room source for comfort conditioning of your living environment.

Ice Air WSHP units are built to a high standard of quality and reliability, employing commercial grade components and heavy duty, galvanized sheet metal casings. With proper maintenance and usage, Ice Air WSHPs should provide many years of efficient, quiet and trouble-free comfort.

To enhance your use of your Ice Air equipment, you will want to read and carefully follow all of the instructions contained in this Operating and Maintenance Manual. We recommend that you pay special attention to the Safety and Warning Information section at the beginning of this Manual, and to the various safety advisories throughout this Manual.

Please retain this Manual for your future reference. We suggest that you retain it with other important documents and product manuals. The information contained within this Manual, unless noted herein, applies to all Ice Air WSHP models. If your unit has optional features, they will be explained in a separate instruction sheet specific to that option.

On behalf of Ice Air, and our network of distributors and dealers, we are happy to welcome you to our base of satisfied customers!

***We recommend that you record the following information about your Ice Air WSHP products:***

#### ***CONSUMER REFERENCE INFORMATION***

<b>LOCATION</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>
<b>Living Room</b>		
<b>Master Bedroom</b>		
<b>Bedroom</b>		
<b>Dining Room</b>		

## CONSUMER SAFETY AND OPERATING NOTES:

FOR SAFE AND OPTIMAL ENJOYMENT OF YOUR ICE AIR WSHP UNIT, PLEASE READ THE FOLLOWING CONSUMER SAFETY AND OPERATING NOTES CAREFULLY BEFORE OPERATING YOUR EQUIPMENT!

- This unit **MUST** be serviced only by professionally trained, qualified technicians. Do **NOT** attempt to maintain or service this unit on your own - severe injury and death can occur from electric shock, moving parts, and other hazards.
- Your Ice Air units must each be wired on an individual, dedicated electrical circuit with the correct voltage and proper amperage (capacity) to match the unit nameplate requirements.
- Each unit's electric circuit must have a proper overcurrent protection device, employing an approved circuit breaker or fuse of the proper rating under NEMA and local building codes.
- Every unit contains refrigerant within a sealed and pressurized refrigerant system. This system must not be opened or tampered with and any refrigeration system repairs **MUST** be carried out by trained technicians. Refrigerant must be properly handled and recycled per EPA regulations and guidelines.
- Your Ice Air unit must be properly installed and commissioned to operate correctly. Improper unit installation, adjustment or commissioning and / or improper condenser water system installation and connection can lead to equipment malfunction and hazardous operating conditions, and may void your Warranty. If you have any doubt about the proper installation of your WSHP unit, please contact your property manager at once to have a qualified technician inspect the equipment. Do **NOT** operate the equipment when in doubt - have it inspected first!
- Your Ice Air equipment is covered by a manufacturer's Warranty (see Warranty Information Sheet for full terms and conditions). Your unit(s) must be properly installed and kept free of obstructions. Additionally, proper cleaning of the unit filter, evaporator coil and all air flow areas must be maintained. Failure to do so will decrease unit function and efficiency, and may void your Warranty.

## ELECTRICAL DATA

- Assure that available power is the same voltage and phase as indicated on the unit serial plate. Line and voltage wiring must be executed in accordance with local codes or to the National Electrical Code or in Canada to Canadian Electrical Standards.
- Apply correct line voltage to unit. Disconnect switch near unit is required by code. Power to unit must be sized correctly and have dual element class RK5 fuses or HACR circuit breaker for branch circuit overcurrent protection. Consult the unit serial plate for current ratings.
- All 208/230V units are wired for 208V operation unless otherwise specified.

The following physical conditions must be maintained for proper unit operation:

- Unobstructed air flow into and out of the unit room enclosure (cabinet)
  - Therefore:
    - Do not place any object in front of the discharge grille (at the cabinet top)
    - Do not place plants, fabrics or objects in front of the air return access door
    - Have the unit filter properly cleaned and serviced to prevent air blockage from dirt and dust within the filter media
- Proper installation and operating environment must be maintained.
  - Therefore:
    - Do not operate the unit in corrosive environments such as chemical plants, refineries or salt spray areas
    - Operate only with proper electrical service and protective circuit breakers or fuses in place
    - Operate only with all components in place and properly installed
    - In areas of high concentrations of dirt, dust, pet dander or pollutants, clean the filter often (at least monthly).
    - Do not clean the unit with any solvents or cleaning solutions that may damage the equipment (see maintenance Instructions for proper cleaning protocols)
    - Understand and follow the unit operating instructions below before using your WSHP equipment.

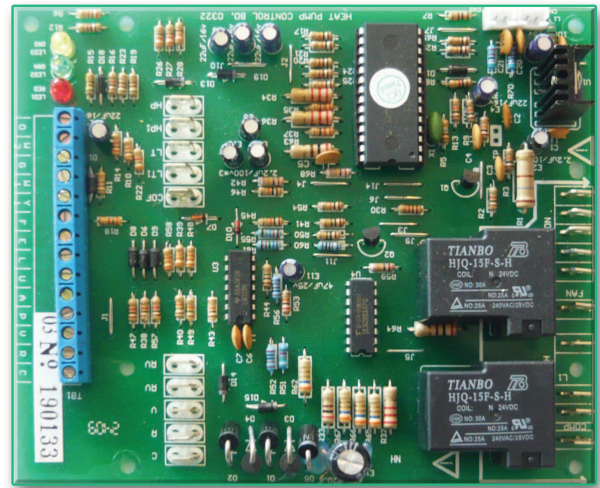
## CONTROLS

### (General Description)

Ice Air WSHP Vertical Stack units are controlled by a state of the art electronic package that is comprised of a digital control pad and an internal Power Control Board (PCB)



**Control Pad**



**PC Board**

### Thermostats:

Ice Air electronic type thermostats have the features described here:

#### a. Single Stage Standard Manual Changeover

This thermostat is a single-stage, vertical mount, manual changeover with a HEAT-OFF-COOL system switch and a fan ON-AUTO switch. The thermostat has a mechanical temperature indicator and set point indication. The thermostat only requires 4 wires for connection. Mercury bulb thermostats are not acceptable.

#### b. Single Stage Digital Auto or Manual Changeover

This thermostat is a single-stage, digital, auto or manual changeover with a HEAT-OFF-COOL-AUTO system switch and a fan ON-AUTO switch. The thermostat has an LCD display with temperature and set-point(s) in °F or °C. The Thermostat provides permanent memory of set-point(s) without batteries. A fault LED is provided to display specific fault condition. The thermostat provides temperature display offset for custom applications.

#### c. Single Stage Manual Changeover Programmable 5/2 Day

This thermostat is 5 day/2 day programmable (with up to 4 set-points per day), single stage (1H/1C), manual changeover with HEAT-OFF-COOL system settings and fan ON-AUTO settings. The thermostat has an LCD display with temperature, set-point(s), mode, and status indication. The temperature indication is selectable for °F or °C. The thermostat provides permanent memory of set-point(s) without batteries. The thermostat provides a convenient override feature to temporarily change set-point(s).

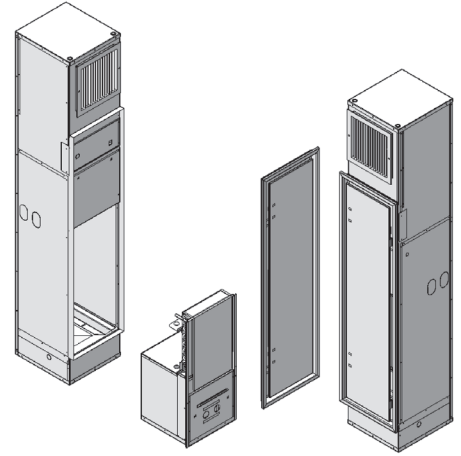
## OPERATING INSTRUCTIONS & SEQUENCE OF OPERATIONS

### OPERATION

**IMPORTANT NOTE:**

Do NOT attempt to restart the unit in Cooling mode for at least three minutes after any of these actions:

- Turning the unit OFF
- Resetting the Temperature Control to a Warmer position
- Switching from Cooling mode to any other mode



Unit components (Front exploded view)

### OPERATING INSTRUCTION - COOLING MODE

- To activate cooling, press the mode button until **COOL** displays.
- Press up/down arrow keys to your desired temperature
- Compressor will cycle when temperature reaches the set point. After compressor stops, allow at least 3 minutes before restarting (this applies only if you have manually turned the unit off or reset the thermostat - during normal running conditions, the unit will automatically allow for the required restart delay)

The temperature reading that is on constant display is the **ambient room temperature**.

### OPERATING INSTRUCTIONS

**HEAT**

- To activate heating, press the Mode button until **HEAT** displays
- Press up/down arrow keys to your desired temperature.
- The unit will cycle until the set temperature is achieved and then will continuously cycle to maintain the set temperature.

The temperature reading that is on constant display is the ambient room temperature.

### LOCKOUT SAFETY

All Ice Air WSHP units have its own lockout circuit to shut down the compressor during an abnormal condition. During unit operation the compressor will be automatically turned off due to one of these safety conditions.

- High pressure
- Low temperature
- Condensate overflow

### MAINTENANCE & SERVICE

**CAUTION:** to prevent injury or death due to electrical shock or contact with moving part, turn off the disconnect switch before servicing this unit

**IMPORTANT NOTE:** It is not the intent of this maintenance manual to correct any installation deficiencies. If you have any doubt about the proper initial installation (or reinstallation after servicing) of your WSHP unit(s)- noisy or inefficient unit operation, frayed or damaged electrical connections, improper unit appearance, etc. - please contact a trained servicer or building maintenance staff immediately.

**DO NOT OPERATE ANY EQUIPMENT THAT DOES NOT APPEAR TO BE FUNCTIONING PROPERLY!**



## Maintenance Overview

Your Ice Air WWSHP Unit is designed to provide you with many years of efficient, trouble-free comfort conditioning service. To ensure equipment longevity and efficiency, please make sure that the following simple maintenance procedures are followed.

This manual assumes that your WWSHP unit has been installed by a qualified installation professional, and is operating properly prior to maintenance service.

- Have your unit periodically inspected by a properly trained service professional or building maintenance staff person. The unit should be checked for the safe and proper functioning of all of its systems at least once a year. The following recommended maintenance procedures should be carried out only by trained personnel with strict adherence to the safety guidelines outlined at the beginning of this manual. These procedures **MUST** be followed to ensure your safety and the safety of the person maintaining the equipment.

## FILTER

Ice Air WWSHPs are equipped with a washable/reusable Filter. It is recommended that you clean the indoor air filter after every 350 to 400 hours of unit operation - more frequently if the unit is running in an environment of high dust, pet dander or other pollutants in the indoor atmosphere.

- Filter inspection: The filter is located at the bottom of your unit. To remove unit slide it out towards you.
- To reinstall place filter under the unit and slide back in to the filter rack

### Filter Cleaning:

To clean your filter use luke warm water with a biodegradable cleaner rinse and allow to dry completely before installing back to unit. (As an alternate cleaning method, the filter may be cleaned on both sides using a vacuum cleaner with a soft brush type attachment.)

**DO NOT OPERATE UNIT WITHOUT FILTERS.** This practice will damage and or seriously impair the performance of your unit and could void your Warranty.



Filter

## CHASSIS CLEANING -

### Evaporator Coil and Drain Pan / Drain Hoses:

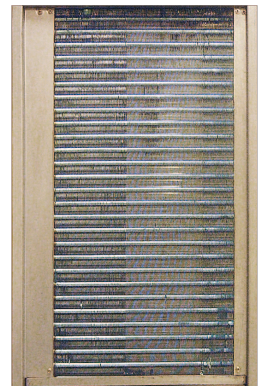
**IMPORTANT NOTE:**

The power **MUST** be disconnected before carrying out any of the following cleaning!

To access the components within the chassis of the unit, disconnect unit power and then remove the unit Access Door by unscrewing the retaining screws that hold the door in place (use a Phillips head driver). You will then have access to the unit chassis and components:

### Evaporator Coil

Check the coil for cleanliness and uniformity of fins. If the coil is dirty, vacuum clean with a soft brush attachment. This is the only form of cleaning that should be carried out within an apartment. If the coil requires additional cleaning, the unit must be removed from the wall cabinet and cleaned using compressed air and / or washed. These operations **MUST** be carried out in a facility properly equipped to handle this type of work in a safe and professional manner. Do not carry out this cleaning in a finished apartment or office area.



Evaporator Coil

### Drain Pan / Drain Hose Cleaning

The condensate pan is located under the the unit chassis. Check the visible section of the interior of the drain pan for any buildup of dirt or condensate water.

Wash annually to remove all dirt buildup. Check condensate drain pan for algae growth every 2 to 3 months. If algae growth is apparent **consult a water treatment specialist for treatment.**

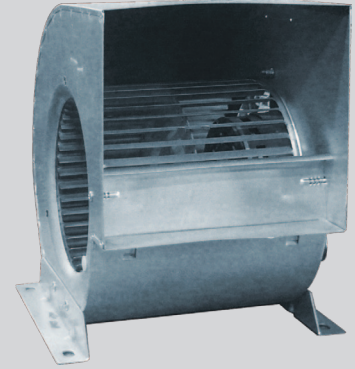
### Drain Hose

Check drain hose for leaks and blockage to eliminate potential problems.

## Evaporator Motor and Blower Assembly

If there is evidence of dirt or dust build up the evaporator motor or blowers, they should be cleaned either by vacuum cleaning (if working in an apartment) or by removing the unit to a workshop location and cleaning with compressed air. Always obey safety guidelines for using compressed air in this latter case. Your Ice Air WSHP has permanently lubricated motor bearings that do not require additional lubrication. Blowers and motor are factory assembled for quiet performance - if there is any excessive noise and vibration from this assembly, it should be serviced by a qualified technician.

**Blower Assembly**



## Compressor:

Annual check should be performed to detect potential problems.

- Amperage draw should not exceed normal full load amps indicated in the performance table. (Consult installation manual for details.)

**Compressor**



## Heat Exchanger:

Water coil maintenance is not required. If the unit installation is located in a system with water problem history it is best to establish a periodic maintenance program. It is the building's responsibility to maintain a water system that should provide your unit with treated and filtered water to keep water flowing freely thru your equipment. Generally if the water flow exceeds 3 gpm per ton the water velocities should keep your coil free of scaling and debris that could lead to coil erosion and fouling up.

**Heat Exchanger**



## GENERAL UNIT INSPECTION

Visually inspect unit at least once a month. Pay special attention to hose assemblies and connections. Repair any leaks and replace deteriorated hose immediately to avoid potential costly damage to your property due to component failure.

## TROUBLESHOOTING

1.

**If unit is not operating conduct the following checks:**

- Check the electrical connections
- Check the voltage and current against the electrical specifications on the unit nameplate
- Look for wiring errors. Check for loose screw connections in both line and low voltage terminals.
- Check the water supply piping for proper water connection.
- Check for dirty filters
- Check indoor fan for proper operation.
- Check that unit did not cycle off due to improper thermostat settings
- Check for fault codes on the control board consult the trouble shooting guide.

2.

**If checks above fail to reveal operating problem**

If the unit still do not operate after reset, contact trained service technician to conduct full unit diagnostics and repair to equipment. Record any unit that does not operate noting the unit serial number on your report

### Board Troubleshooting Table

Fault Description	Board LED Code		
	Yellow	Green	Red
Normal	OFF	ON	OFF
High Pressure Lockout	OFF	OFF	FLASH
Low Pressure Lockout	FLASH	OFF	OFF
Air Side Freeze-up Protection	FLASH	OFF	FLASH
Waterside Freeze-up Protection	OFF	FLASH	OFF
High Water Temperature Protection	FLASH	OFF	ON
Over/Under Voltage Protection	OFF	OFF	ON
Condensate Overflow Protection	ON	OFF	OFF
Low Water Temperature Protection	ON	OFF	FLASH