



## OPERATING & MAINTENANCE MANUAL

# HORIZONTAL WATER SOURCE HEAT PUMP



*World Class Comfort.*



## OPERATING & MAINTENANCE MANUAL – HORIZONTAL WATER SOURCE HEAT PUMP

### WELCOME

**Congratulations on your selection of ICE AIR Water Source Heat Pumps (WSHPs)** for your comfort conditioning requirements. WSHP units are combination cooling and heating units that which provide an efficient, room-by-room source for the 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 the 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 on the back 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!

### 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.

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- 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 airflow areas must be maintained. Failure to do so will decrease unit function and efficiency, and may void your Warranty.

**We recommend that you record the following information about your ICE AIR WSHP products:**

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

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### CONTROLS (OPTIONAL)

ICE AIR WSHP Horizontal 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 following features:

#### 1. 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.

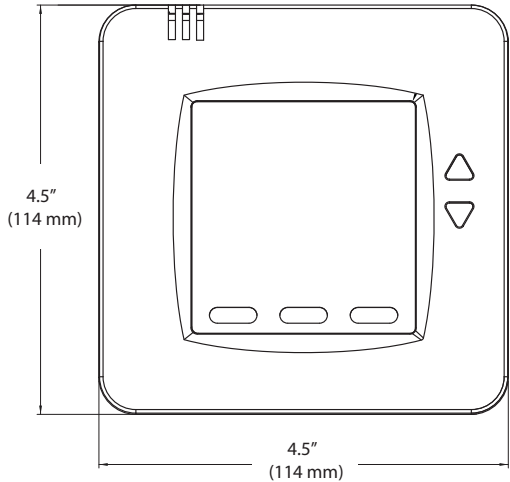
#### 2. Two-Stage Digital Auto or Manual Changeover

This thermostat is a two-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. Thermostat to be remotely mounted on wall within reasonable proximity to unit, but not in direct airflow of the vent.

#### 3. Two-Stage Manual Changeover Programmable (5/2 Day or 7 Day)

This thermostat is 5 day/7 day programmable (with up to 4 set-points per day), two-stage (2H/2C), 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).

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### INSTALLATION

#### When Installing This Product:

1. Read these instructions carefully. Failure to follow the instruction can damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After completing installation, use these instructions to check out the product operation.

#### Selecting Location

Install the thermostat about 5 ft. (1.5m) above the floor in an area with good air circulation at average temperature.

Do not install the thermostat where it can be affected by:

- Drafts or dead spots behind doors and in corners
- Hot or cold air from ducts
- Radiant heat from sun or appliances
- Concealed pipes and chimneys

- Unheated (uncooled) areas such as an outside wall behind the thermostat
- Thermostat to be remotely mounted on wall within reasonable proximity to unit, but not in direct airflow of the vent.

### INSTALLING WALLPLATE

**CAUTION. Electrical Hazard. Can cause electrical shock or equipment damage. Disconnect power before wiring.**

1. Position and level the wallplate (for appearance only).
2. Use a pencil to mark the mounting holes.
3. Remove the wallplate from the wall and, if drywall, drill two 3/16-in. holes in the wall, as marked. For firmer material such as plaster, drill two 7/32-in. holes. Gently tap anchors (provided) into the drilled holes until flush with the wall.
4. Position the wallplate over the holes, pulling wires through the wiring opening.
5. Insert the mounting screws into the holes and tighten.

**NOTE:** Strain relief is not included. It should be provided by installer.

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### LCD PROGRAMMABLE THERMOSTAT



#### FEATURE LIST

- Operates on 2 stage Heat and 2 stage Cool
- 7 programs (Mo, Tu, We, Th, Fr, Sa, Su) or 5-2 programs (Mo-Fr, Sa-Su)
- 4 Separate Time and Temperature Settings for each program
- Heat and Cool set-points for each program
- EPROM stores heat and cool program settings
- Temporary Program Override
- Permanent Program Override
- Compressor Short Cycle Protection
- LCD Backlighting
- Low Temperature Protection

#### USER INTERFACE

##### PUSH BUTTONS

SYMBOL	PRESS	HOLD
▲	UP/Override mode	UP/Permanent Override mode
▼	Down/Override mode	Down/Permanent override mode
ON/OFF	ON/OFF	-----
MODE	Set operation mode	Internal Setting
FAN	Set fan speed/Confirm	-----

#### Operation

##### Normal Mode

1. Press [ON/OFF] to turn on thermostat.
2. Press [Mode] to change the system mode.
3. There are three operation modes for Cool Mode, Heat Mode, Auto Mode.

##### Cool Mode

- To activate cooling mode, 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.

##### Heat Mode

- To activate heating mode, 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.

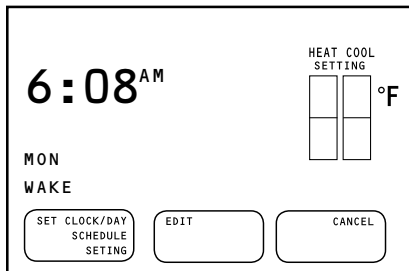
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### Auto Mode

- To activate auto mode, press the mode button until AUTO displays.
- Press up/down arrow keys to set desired heat temperature.
- Wait 5 seconds for cool to appear.
- Press up/down arrow keys to set desired cool temperature.
- The unit will automatically cycle between heat and cool modes if unit exceeds desired set points. The temperature reading that is on constant display is the ambient room temperature.

### Internal Setting

Enter internal setting mode by pressing and holding [Mode] key for 5 seconds



### Time Setting

Set Clock/Day is flashing

- Press [Mode] key to select Edit "Clock/Day".
- Use [Up] and [Down] keys to adjust hours (12 hr).
- Press [Mode] to select minutes.
- Use [Up] and [Down] keys to adjust minutes.
- Press [Mode] to select days.
- Use [Up] and [Down] keys to adjust days  
Press [Fan] when complete.

### Daily Programming

Press [On/Off] to select Schedule (Schedule is flashing)

- Press [Mode] key to select Edit "Set Schedule."
- Use [Up] and [Down] to select Day.
- Press [Mode] to edit time.
- Use [Up] and [Down] to select Time. (Adjustable in 10 minute increments)
- Press [Mode] to edit heat setting.
- Use [Up] and [Down] to select temperature.
- Press [Mode] to edit cool setting.
- Use [Up] and [Down] to select temperature.
- Press [Mode] to set next time frame.
- Follow the screen, and repeat steps 2 through 9 to adjust 7 day schedule programming.
- Press [Fan] when complete.

Below is the default program:

The default selection is 5-2 day program.

	EVENT	TIME	HEAT	COOL
MON-FRI	WAKE	6:00 AM	70° F (21° C)	78° F (26° C)
	LEAVE	8:00 AM	62° F (17° C)	85° F (29.5° C)
	RETURN	6:00 PM	70° F (21° C)	78° F (26° C)
	SLEEP	10:00 PM	62° F (17° C)	82° F (28° C)
SAT-SUN	WAKE	6:00 AM	70° F (21° C)	78° F (28° C)
	LEAVE	10:00 AM	62° F (17° C)	85° F (29.5° C)
	RETURN	6:00 PM	70° F (21° C)	78° F (26° C)
	SLEEP	11:00 PM	62° F (17° C)	82° F (28° C)

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### **Changing Program Schedule and Temperature Limits**

Press [On/Off] twice to select Settings  
(Settings is flashing)

1. Press [Mode] key to select Edit “Settings.”
2. Use [Up] and [Down] to select 7 Day or 5-2 Day.
3. Press [Mode] to edit Heat Temperature Limit.
4. Use [Up] and [Down] to set temperature.  
Default internal setting: Heat limit 90°F
5. Press [Mode] to edit Cool Temperature Limit.
6. Use [Up] and [Down] to set temperature.  
Default internal setting: Cool limit 60°F
7. Press [Fan] when complete. The cool limit setting should be at least 4°F higher than the heat limit setting.

The cool limit setting is 55°F to 95°F

The heat limit setting is 51°F to 91°F

### **Exit Internal Setting and Return to Normal Mode**

1. Press [Fan] to confirm and return to normal mode
2. If no key is pressed for 15 seconds, it will return to normal mode automatically

### **Temporary Program Override**

1. When thermostat is ON, the program set-point can be temporarily overrode by pressing [UP] or [DOWN]. “OVERRIDE” icon will turn on.  
Press [UP] or [Down] to select the set-point
2. In Heat mode, Heat set-point can be adjusted
3. In Cool mode, Cool set-point can be adjusted
4. In Auto mode, Heat set-point will be set first and press [UP] or [DOWN] to set the Heat set-point.  
Press [Fan] to confirm the Heat set point. Cool set-point will be set second and press [UP] or [DOWN] to set the Cool set-point. Press [Fan] to confirm the Cool set-point.
5. Temporary Override will be cancelled if user changes the operation mode or the unit enters the next program time session.

### **Permanent Override**

1. Holding [UP] and [Down] key for 2 seconds to enter Permanent Override mode.  
Permanent Override icon will turn on.
2. In Heat mode, Heat set-point can be adjusted
3. In Cool mode, Cool set-point can be adjusted
4. In Auto mode, Heat set-point will be set first and press [UP] or [DOWN] to set the Heat set-point.  
Press [Fan] to confirm the Heat set-point. Cool set-point will be set second and press [UP] or [DOWN] to set the Cool set-point.
5. Permanent Override will be cancelled if user changes the operation mode or turns off the unit.
6. Hold [Fan] key 5 seconds to cancel the permanent override mode.

### **Operating Specifications**

- Temperature measurement  
°C ~ 40°C / 32°F ~ 99°F
- Accuracy: ±0.5°C/ 1°F
- Voltage: 18-30VAC
- Temperature Controllable range:  
5°C~35°C / 55°F ~ 95°F
- Resolution: 0.5°C /1°F
- Operating temperature:  
0 – 50°C / 32 – 122°F
- Storage temperature:  
5 – 50°C/ 23 – 122°F



## **OPERATING & MAINTENANCE MANUAL – HORIZONTAL WATER SOURCE HEAT PUMP**

### **ELECTRICAL DATA**

- Ensure 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 airflow into and out of the unit  
Therefore:
  - Do not place any object in front of the discharge area
  - Do not place objects near the air return
  - Have the unit filter properly cleaned and serviced to prevent air blockage from dirt and dust with in the filter media

#### **Proper installation and operating environment must be maintained.**

Therefore:

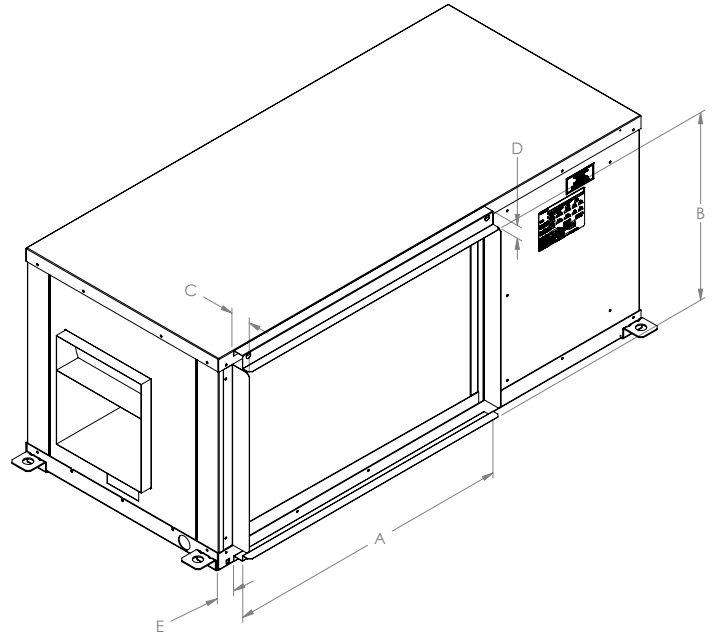
- Do not operate the unit in corrosive environments such as chemical plants, refineries or salt spray areas
- Operate only with proper electrical service and protective circuit breakers or fuses in place
- Operate only with all components in place and properly installed
- In areas of high concentrations 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.

## OPERATING INSTRUCTIONS & SEQUENCE OF OPERATIONS

### 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



### 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**.

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### LOCKOUT SAFETY

All ICE AIR WSHP units have their 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 WSHP 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 WSHP 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.

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### 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.

### 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).

### 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.



## OPERATING & MAINTENANCE MANUAL – HORIZONTAL WATER SOURCE HEAT PUMP

### 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.

### 1. TROUBLESHOOTING

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 does 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



### **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

