



A D I R O N D A C K ▲ A I R E

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Water Cooled Console Air Conditioner

Installation Operation and Maintenance



Thank You for choosing *Adirondack-Aire* products. Our goal is to make sure you remain pleased with your decision to purchase a *Adirondack-Aire* product. If you are in need of assistance that is not available or provided by your local installer/contractor feel free to give us a call, write us, Fax, or e-mail us at:

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PRODUCT DESCRIPTION:

MODEL WC CONSOLE WATER COOLED AIR CONDITIONER with HOT WATER HEATING

Adirondack-Aire 'WC' series units directly replace old *Slant-Fin* 'WC' perimeter console type water source

air conditioners. These units can be supplied as chassis only or complete with a heavy-duty, powder coated room cabinet. Heat section, 3-way valve, and mono-flow tube assemblies are available.

Construction throughout is rugged and heavy gauge just like the original and the chassis features unit-mounted controls and two-speed fans. These high quality units use proven technology and components and offer the latest in efficiency and reliability advances. WC-06 & -09 are housed in a 45" Room Cabinet. The WC-12 & -16 are housed in a 55" cabinet.

COMPATIBILITY:

These *Adirondack-Aire* console water source air conditioners are designed as direct replacements for old *Slant-Fin* 'WC' consoles. Complete units replace the cabinet, chassis, heat coil, 3-way valve, and mono-flow tube. Chassis only will slide into the existing cabinet without modification. Either approach

eliminates the need for room repairs or redecorating. These units are designed to be compatible in flow sensitive mono-flow installations.

Installer - General Information

We have designed and manufactured this unit to be safe and trouble free. As the installer of this unit, you play a major role in assuring it's intended performance and customer satisfaction. The important information provided here will help you install the unit correctly and eliminate call backs.

ATTENTION: Please read these instructions carefully and completely before attempting installation. Qualified service personnel should install this unit. To prevent personal injury and/or death, ensure that all power is disconnected before servicing.

IMPORTANT! Alterations and replacement parts: Altering the product or replacing parts with non authorized factory parts will void the factory warranty and may result in adverse operational performance and/or a possible hazardous safety condition to service personnel and occupants. If you are in doubt as to how to service this unit or where to find factory replacement parts, call Adirondack-Aire at 315.339.2331 for assistance

These instructions give information relative to *Adirondack-Aire* WC replacement water source console unit. Local codes, if different from these instructions, must be followed and supplement or supersede these instructions.

Unpacking and Inspection:

WC chassis are shipped in one package. The heat section and 3-way valve assembly are shipped separately. All goods are inspected at the factory and released to the Freight Company in good condition. When received at the site, a visual inspection of all packages should be made immediately. Any evidence of rough handling or apparent damage should be noted on the delivery receipt and the material inspected in the presence of the carrier's representative. If damage is found a claim should be filed with the freight company immediately.

Job Site Storage:

The chassis must be kept upright in it's normal position at all times. **DO NOT STORE CHASSIS ON END.** These units are intended for indoor use only. To protect the unit from damage due to the elements and prevent it from possibly becoming a

contaminant source for IAQ problems, the unit should be stored indoors. If indoor storage is not possible, the following provisions must be met:

- 1). Place the unit on a dry surface or raise off the ground to assure adequate air circulation beneath the unit and to assure that no portion of the unit contact standing water at any time.
- 2). Cover the unit with a water repellent tarp to protect them from the elements.
- 3). Make provisions for continuous venting of the covered unit to prevent moisture from condensing on the unit surfaces.

Removal of Old Chassis:

Two persons or one person and a properly designed cart best facilitate chassis removal.

- 1). Shut off all power first! Failure to shut off power supplies can result in electric shock and death! **WARNING** some units have more than one power supply. Be sure all power is disconnected before proceeding!
- 2). Remove the cabinet panel that provides access to the WC chassis.
- 3). Disconnect the chassis power supply plug & cord from the receptacle.
- 4) Disconnect the 3-way valve power supply 'molex' from the chassis.
- 5). Shut off water valves to isolate the unit from the water loop and disconnect the water connections at the mono-flow & 3-Way valve connection points. Disconnect the drain hose connection from the header.
- 6). Remove the thermostat sensing bulb from its mount in the cabinet base and pull up and out of the way so as not to interfere with chassis removal.
- 7). Carefully slide the chassis forward and remove from the cabinet. The chassis contains R-22 refrigerant. Be sure to dispose of properly.

Removal of Old Heat Section & 3-Way Valve:

After the old chassis has been removed proceed with removal of the old heat section and 3-way valve assemblies

- 1). Be sure the water valves are shut off to isolate the heat coil and 3-way valve from the mono-flow headers.

2). Disconnect the heating coil and 3-way valve at the unions. Remove both halves of the old unions as new unions are supplied with the new heat coil and valve.

3). Remove the coil mounting plate and screws.

4). Remove the assembly from the cabinet.

Before Installing the New Chassis Install the new heating coil and 3-way valve assemblies.

1). Clean dust, dirt, and debris from the cabinet and base

2). Check the condition of the mono-flow headers and drain line. Repair or replace as necessary.

3). The new heat coil and 3-way valve assemblies are provided with new unions. Be sure to properly clean and flux the tubing before soldering/brazing in the new unions. BE SURE to use a soldering/brazing alloy rated to withstand the pressure and temperature typically found in commercial heating systems. High temperature braze is recommended. Separate the union halves for brazing to the existing water lines/headers. Complete the braze and inspect the joint for full coverage.

4). After the half-union has completely cooled, proceed with installing the heating coil and 3-way valve. Slide the coil onto its mount in the base of the cabinet. Be sure to support the fixed side of the union with a wrench to avoid leaks and/or damaging the tubing. Carefully torque the fitting for a leak free joint.

5). Carefully route the 3-way valve power cord for connection to the chassis once it is in position. BE SURE the cord is clear of, and is not pinched by, the chassis as it is slid into the cabinet.

Water Loop:

The performance and reliability of the new *Adirondack-Aire* unit depends on proper water flow rate and water quality. Inadequate water flow rate and/or poor water quality or contamination will result in poor performance and may shorten unit life. Failure to provide adequate flow and properly maintained water quality may void the new unit Limited Warranty.

Installing the New Chassis:

1). Locate and hold the thermostat sensing bulb up and out of the way as the chassis installation proceeds.

2). Guide the drain hose into position for connection

to the drain header as the chassis is slid into the cabinet.

3). Carefully move the new chassis into position in the front of the cabinet. Rest the back of the chassis on the cabinet slide rails then carefully slide the chassis to the back of the cabinet. Be careful not to pinch the chassis line cord(s), drain hose, and water valve cord as the chassis is slid into place.

4). Connect the chassis half-unions to the half-unions on the header and 3-way valve connections. Carefully support both halves of the union and tighten with sufficient torque to assure a leak free connection. Open the water valves to the water loop and check for leaks. Tighten or repair any leaks.

5) Connect the drain hose to the header located in the cabinet base. Carefully route the hose so as not to cause a kink.

6). Connect the 3-way valve power supply 'molex' to the mating connector in the end of the chassis.

7). Plug the power supply cord(s) into the receptacle(s) located within the chassis.

8). Locate the thermostat label on the front of the heat coil cover panel. Carefully route the thermostat-sensing bulb down under the heating coil and into the clamps adjacent to the label. Be sure not to kink the tubing attached to the sensing bulb.

9). Install the new air filter in the track under the heating coil.

10). Replace the cabinet front panel.

11). Turn on the power at the source(s).

Pre-Start Quick Check List:

Before proceeding with the start-up of individual units, the following should be verified:

_Has the water loop system been flushed and cleaned of construction debris?

_Is the water flow established and circulating through all units?

_Has the water loop system been balanced to design flow rates?

_Is the water temperature within normal operation range?

_Has heat transfer fluid been added in the proper mix to

prevent freezing in closed systems that could, under any condition, fall below the freezing point.

_Is the filter in place.

_Is the wiring properly sized and run in according with the unit wiring diagram?

_Has the unit been properly grounded and fused with the recommended fuse size?

_Has all work been done in accordance with applicable local and national codes?

_Are all covers and access panels in place to prevent air loss and safety hazards?

Warning: Bodily injury can result from high voltage electrical components. If operating checks must be performed with the unit operating, it is the technician's responsibility to recognize these hazards and proceed safely. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.

To Operate:

Operation of the unit is automatic and will provide cooling and heating depending on the settings of the Cool Heat selector switch, Fan 'HI' 'LO' switch, and thermostat.

WC Models - Cooling Operation:

The compressor operation is locked out when the water loop temperature reaches approximately 120°F. If loop temperature is at or above this temperature the unit will not run in cooling operation.

1). Open the cabinet control door. Locate the "COOL", 'OFF', 'HEAT' and the 'FAN' 'HI' 'LO' push button switches. Push the switch on the unit control panel to the 'COOL' position. Select either FAN 'HI' or 'LO' as desired.

2). Set the desired temperature you want to maintain by moving the thermostat dial to the 'WARMER' or 'COOLER' position. If the room is warmer than the setting, the unit will turn on and begin to blow cool air after a few minutes. Note that a warm humid room or building may take several hours of continuous operation to cool to the thermostat set point the first time. Once the set temperature is reached the unit will cycle on and off normally.

3). Check unit operation. The compressor and blower should be running supplying cool air through the

supply air grille located on the top of the cabinet. Compressor and blower operation should be smooth and quiet.

4). For energy conservation reasons you may want to set your thermostat at a higher temperature when you are away. Do not raise the temperature setting by more than 5 degrees. Changing the temperature by more than 5 degrees or shutting the unit 'off' can actually cost more than leaving the setting at a constant temperature.

5). **IMPORTANT!** Wait at least 3 minutes after turning the air conditioner off before trying to restart it. This gives the unit the time needed to stabilize before restarting. Failure to do so may cause unit damage and failure.

6). A properly installed and sized unit will not cycle more than 10 times per hour. If you notice more frequent starts call your service contractor.

WC Models - Heating Operation:

NOTE: WC series units provide heating via a hot water heating coil. The water supplied to the coil must be warm enough to provide heating, (at least 100° F). This is a function of the main building system and cannot be controlled at the unit. If the unit fails to provide heating check the building water loop temperature. Setting the switch and thermostat on the control panel to the 'Heat' position and setting the desired temperature activates heating operation. When heating, the 'LO' fan position is recommended. Adjust the temperature set point above room temperature. Warm air should blow from the cabinet supply air grille. The unit will activate the heating coil automatically to maintain the set room temperature. As in cooling turn the thermostat knob to 'WARMER' or 'COOLER' as desired

Final Inspection:

Do a final visual inspection of the entire installation and complete any final details and clean up.

Chassis Removal:

If it is necessary to remove the chassis for major service or cleaning follow the procedure outlined in the "Removal of Old Chassis" section above.

Maintenance:

Unit performance is maintained at optimum level and maintenance of the unit simplified by implementing the following preventive measures.

1). The unit is furnished with a permanent, cleanable type air filter. The unit should not be operated without

this filter installed.

- 2). Filters should be inspected at least every three months and cleaned when dirty. Unit operation becomes very inefficient with dirty filters. Unit warranty is void if filters are not maintained properly.
- 3). Condensate drains can pick up lint and dirt, especially with dirty filters. Inspect, and if dirty, clean the condensate drain pan twice a year to avoid the possibility of overflow (see section "Inspecting and Cleaning Drain Pans).
- 4). Microbial growth can occur in water source heat pumps anywhere in the air stream where moisture exists. ASHRAE standard 62-89 recommends that these surfaces be inspected and cleaned to limit contamination. This typically includes surfaces beginning at the finned coil, drain pan, insulation, and fan/blowers.
- 5). It is important to check the cleanliness of the water-to-refrigerant heat exchanger. Should it become contaminated with dirt and scaling as a result of poor water quality treatment. The heat exchanger will have to be back-flushed and cleaned with a chemical that will remove the scale. An experienced service technician should perform this service.
- 6). A strainer (20 mesh or greater) may be used to keep debris from entering the system and to help ensure a clean system. This is highly recommended on open tower systems.
- 7). Check the tightness of the various wiring connections within the control panel.
- 8). The direct-drive blower motor has permanently sealed lubricated bearings and do not require periodic oiling. Life of the bearings may however be extended by adding a few drops of 20W non-detergent oil through the oil ports twice a year. Do NOT over oil.

Inspecting and Cleaning Drain Pans:

Note: Standing water in drain pans can promote microbial growth (mold), which may cause unpleasant odors, and serious health related indoor air quality problems. If microbial growth is found, it must be removed immediately and the unit must be properly cleaned and sanitized.

The condensate drain pan and drain line must be checked to ensure that the condensate is draining freely. This inspection should occur a minimum of every six months or more often if necessary.

If evidence of standing water or condensate overflow is found steps should be taken to identify and repair the cause immediately. Refer to the troubleshooting section of this manual for possible cause and solutions. If microbial growth in the drain pan is observed, it should be cleaned and removed immediately. Drain pans should be cleaned using the following procedure:

- 1). Disconnect all electrical power to the unit.

- 2). Wear the appropriate personal protective equipment.
- 3). Remove all standing water.
- 4). Use a scraper or other tool to remove any solid matter. Remove solid matter with a vacuum device that utilizes High Efficiency Particulate Arrestance (HEPA) filters.
- 5). Thoroughly clean the contaminated areas with a mild bleach and water solution or an EPA approved sanitizer specifically designed for HVAC use. Carefully follow the sanitizer manufacturers instructions regarding this product.
- 6). Immediately rinse the drain pan thoroughly with fresh water to prevent potential corrosion from the cleaning solution, the drain pan and drain line components.
- 7). Determine and correct the cause of the microbial contamination.
- 8). Be careful that the contaminated material does not come into contact with other areas of the unit or building. Properly dispose of all contaminated materials and used cleaning solution. Store unused solutions according to solution manufacture's directions.
- 9). Allow the unit to dry thoroughly before putting the system back into service.

Inspecting and Cleaning Finned Coils:

Coils become externally fouled as a result of normal operation. Dirt on the surface of the coil reduces its ability to transfer heat, which can result in comfort problems, increased resistance to airflow and result in increased operating energy costs. If the dirt on the surface of the coil becomes wet, such as commonly occurs with cooling coils, microbial growth can result which may cause unpleasant odors and serious health related indoor air quality problems.

Coils should be inspected at least every six months or more often as necessary. The frequency of the required inspection/cleaning is dependent on the operating hours of the system, filter maintenance and efficiency, and dirt load. The following is the suggested method of cleaning coils:

- 1). Disconnect all electrical power to the unit.
- 2). Wear the appropriate personal protective equipment.
- 3). Gain access to the coil section of the unit (both sides).
- 4). Using a soft brush, remove loose debris from both sides of the coil.
- 5). Mix a high quality coil cleaning detergent with water according to the manufacturers instructions. If the detergent is strongly alkaline after mixing (8.5 pH or higher), it must contain a corrosion inhibitor. Carefully follow the cleaning solution manufacturers instructions regarding the use of the product.
- 6). Placed the mixed solution in a pump sprayer or high pressure sprayer. If a high pressure sprayer is used, note the following:

- A. Maintain a minimum nozzle spray angle of 15 degrees.
- B. Spray perpendicular to the coil face.
- C. Protect other areas of the air handler and internal controls from contact with moisture or the cleaning solution.
- D. Keep the nozzle at least 6 inches from the coil.
- E. Do NOT exceed 600psi.
- 7). Spray the leaving air side of the coil first, then the entering air side. Use a block-off to prevent spray from going through the coil and into a dry section of the unit. Carefully follow the cleaning solution manufacturers usage instructions.
- 8). Thoroughly rinse both sides of the coil and the drain pan with cool, clean water.
- 9). Repeat steps 7 and 8 as necessary.
- 10). Straighten any coil fins that may have been damaged during the cleaning process. Use a fin comb.
- 11). Confirm that the drain line remains open following the cleaning process.
- 12). Replace all panels and parts. Restore electrical power to the unit.
- 13). Allow the unit to dry before putting unit back in service.
- 14). Be careful that the contaminated material does not come into contact with other areas of her unit or building. Properly dispose of all contaminated materials and used cleaning solution. Store unused solutions according to solution manufacturer's directions.

Before Calling for Factory Assistance:

A call to the factory is sometimes necessary for technical support or service/troubleshooting. We are happy to help! Before calling please gather and record the following information so that we are best able to help.

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- ___ Unit Model No
- ___ Unit Serial number
- ___ Name of Job or Installation
- ___ Your Name
- ___ Your Company's Name
- ___ Your Company's Address
- ___ Your Company's Phone, Fax, and e-mail
- ___ Room Temperature -DB/WB
- ___ Entering Water Temperature
- ___ Leaving Water Temperature
- ___ Suction Pressure
- ___ Discharge pressure
- ___ Suction Superheat
- ___ Voltage @ contactor
- ___ Amp Reading (clamp-on)
- ___ Your Diagnosis or Question

Records:

Date of Installation _____

Model number _____

Serial number _____

Installing Contractor _____

Address _____

Phone No. _____

Service/Maintenance

Date	Work Performed	BY
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Notes: _____



TROUBLESHOOTING CHART

The troubleshooting chart that follows is provided to serve as an aid for identifying malfunctions that may occur. Within the chart are three columns.

1. The **Problems** column describes what the unit is doing.
2. The **Cause** column identifies the most likely sources of the problem.
3. The **Correction** column describes what should be done to correct the problem.

Problem	Heating	Cooling	Possible Cause	Correction
No response to any thermostat setting	X	X	Main power off	Check fuses/ breakers
	X	X	Defective control transformer	Replace
	X	X	Broken or loose connection	Repair
	X	X	Defective thermostat	Replace
Unit short cycles	X	X	Thermostat or sensor improperly located	Relocate
Blower runs but compressor does not		X	Defective compressor overload	Replace (if external)
		X	Defective compressor contactor	Replace
		X	Supply voltage too low	Correct
		X	Defective compressor capacitor	Replace
		X	Defective windings	Replace
		X	Limit switches open	Check cause/replace or repair
Inadequate cooling or heating		X	Water temperature 120° F or above	Lower water temperature
	X	X	Dirty Filter	Replace/clean
	X	X	Blower RPM too low	Correct
		X	Introduction of excessively hot return air	Correct/ Check 3-way valve
		X	Low on refrigerant charge	Locate leak, repair & recharge
		X	Restricted capillary tube	Replace
	X	X	Unit undersized	Recalculate heat gains/losses
	X	X	Thermostat improperly located	Relocate
High head pressure	X	X	Building water loop temp. below 100° F	Increase water temperature
		X	Overcharge of refrigerant	Decrease charge
		X	Non-condensable in system	Evacuate and recharge
		X	Low water flow	Correct/ check 3-way valve
		X	Dirty clogged coil	Clean/replace
		X	Inadequate air flow	Check, clean blower and coil
Low suction pressure		X	Water temperature 120° F or above	Replace compr. lock-out T'stat
		X	Undercharged	Locate leak, repair & recharge
		X	Restricted metering device	Repair/replace
		X	Inadequate air flow	Check, clean blower and coil
No Heat		X	Dirty filter	Clean/replace
	X		Building water loop temp. below 100° F	Increase loop temp.
	X		3- way valve connection loose or broken	Connect/ repair
	X		Defective heat relay	Replace

