

COMPU-MATE

AIR COOLED • WATER COOLED • CHILLED WATER

-INSTALLATION AND OPERATION MANUAL-



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SAFETY INFORMATION





IMPORTANT: PLEASE READ!

PLEASE CAREFULLY READ THE FOLLOWING SAFETY INFORMATION BEFORE PROCEEDING FURTHER

This installation and operation manual (IOM) contains important safety information that should be followed during installation or servicing of a Compu-Aire Compu-Mate system. Below are general safety information as well as descriptions of safety and accident prevention symbols that will be utilized throughout this document. In addition to safety information provided by this manual, all warnings, cautions, and safety instructions located on the unit should be adhered to at all times. If applicable, local codes or ordinances and any other safety requirements must also be taken into consideration when installing or servicing the unit.

This IOM should be stored in a safe and accessible location for service personnel during installation or servicing operations. When no longer needed, this IOM should be returned to its original location for future reference.

DESCRIPTION OF IMPORTANT ACCIDENT PREVENTION SAFETY SYMBOLS

SYMBOL	DEFINITION ¹
	Indicates an extremely hazardous situation which, if not avoided, will result in death or serious injury. Use of this symbol is limited to the most extreme situations
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. Caution may be also be used to alert against unsafe practices
	Indicates a statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property

¹Accident prevention definitions per ANSI Z535.2- 2011.

DANGER



HIGH VOLTAGE!

Unit utilizes high voltage power supply. There is a high risk of arc flash and electric shock. Always proceed with caution and wear protective equipment per NFPA 70E specifications at all times before working on the electrical control panel. Failure to comply can cause serious injury or death. The required unit power supply can be found on the nameplate located on the unit.

Service personnel should ensure that the main power supply to the unit is disconnected from the feeder when installation or servicing operations are being performed and when power is not needed.

Compu-Aire's Compu-Mate equipment requires a permanent power connection from an isolated circuit breaker. The customer must provide earth ground to the unit per NEC, CEC, and local codes when applicable.

WARNING

INSTALLATION AND SERVICING PERSONNEL TRAINING & QUALIFICATIONS REQUIREMENTS

Installation and service of this equipment should be done only by qualified personnel who have been specially trained and qualified in the installation or servicing of HVAC equipment. Improper installation may result in unaccountable loss or damage.

WARNING

EQUIPMENT TRANSPORTATION, PROPER BRACING, & HIGH-SPEED MOVING PARTS

Every precaution should be taken before the time of transportation of the equipment that all transportation equipment such as forklifts are properly rated to transport the equipment. Not doing so may cause equipment damage, injury, or death. Please refer to the shipping slip or contact the factory to determine the weight of the unit.

High-speed moving parts can cause serious injury or death. Ensure that all unit panels are installed before any functional testing is done.

CAUTION

SHARP EDGES, SPLINTERS, EXPOSED FASTENERS, AND HOT SURFACES

property damage and loss of critical data center equipment. Suitable leak detection system should be installed inside or around the proximity of the unit to minimize any type of property damage.

NOTICE

REFRIGERANT LEAKAGE DUE TO FREEZING TEMPERATURES AND/OR CORROSION

Refrigerant leaking from the unit coil or piping due to freezing and/or corrosion can cause serious equipment and building damage. Use of proper antifreeze and inhibitors can prevent freezing and premature coil corrosion. To ensure proper unit normal operation, it is highly recommended that the water or water/glycol solution used on the system be analyzed every six months to determine the pattern of inhibitor depletion.

CONTACTING COMPU-AIRE FOR TECHNICAL ASSISTANCE

Compu-Aire, Inc. uses the latest in electronic and software technologies to develop some of the most reliable and cost efficient air conditioning systems in the world. Since many of our customer installations are sensitive to down time, we stock nearly all components for your system ready for same day shipment. In addition, our service departments can usually diagnose and repair the electronic components and return them to you within a few days.

Our customer support staff is available should you require assistance in diagnosing a problem or in setting up your air conditioning system. During usual business hour, you may call at (562) 945-8971 between 8:00am and 04:30pm, Pacific time, Monday through Friday except holidays, or you may send a facsimile message at (562) 696-0724 anytime. Finally, you may write us at Compu-Aire, Inc., 8167 Byron Road, Whittier, CA 90606.

Please do not return system components without prior authorization from Compu-Aire. Whether repair or replacement is required for in warranty or out of warranty parts, Compu-Aire must know what is being returned to keep proper records of returned parts. Call Compu-Aire's service center for a returned merchandise authorization number (RMA) and clearly mark all packages on the outside with the number before sending them to us.

When contacting the factory, please have information ready as to the model and size of the air conditioner system and most important, the job number. Compu-Aire keeps a file on all equipment sold detailing system components using this latter number. All such information can be found on the Warranty Plate attached to each unit.

RECEIPT OF UNIT AND TRANSPORTATION

Upon receipt of the unit, a visual inspection is required. The unit packaging should be entirely intact and the crate should not be damaged. Transport the unit to the desired location in the upright position to avoid damaging to any external panels or internal components. Once the unit is uncrated and in the desired location, inspection of the unit for any external damage is crucial as this may be indicative of internal damage. Any signs of damage to the packaging or system panels or incomplete shipments require a claim to be filed with the shipping company. Freight damage claims are the responsibility of the receiver.

Any items designated as field installed shall be packaged inside of the unit and must be removed and installed prior to startup of the equipment.

Optional articles such as jack-stand parts, condensate pump, and remote control panel are packaged separately.

REPORT ANY DAMAGE TO THE CARRIER. COMPU-AIRE IS NOT RESPONSIBLE FOR FILING OF ANY CLAIMS. ALL NEEDED INSPECTION AND CLAIM FILING IS THE RESPONSIBILITY OF THE RECEIVER.

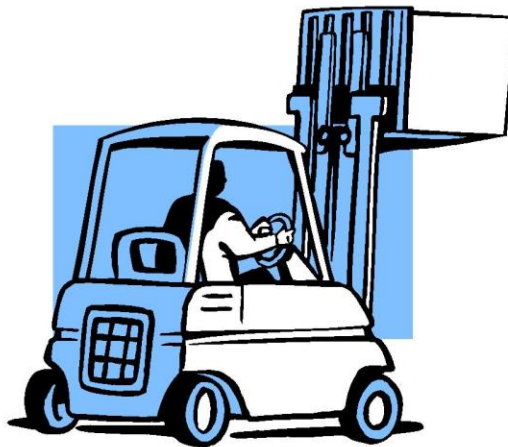


Figure 1: LOADING UNITS

INSPECTION

Upon receipt of equipment, inspect for any visible or concealed damage and promptly report the same to the carrier and file a damage claim. **IT IS THE RESPONSIBILITY OF THE RECEIVER; COMPU-AIRE IS NOT RESPONSIBLE.**

Then verify the exact voltage of the unit and compare with the voltage source. In case there is any disagreement, contact the factory.

COMPUTER ROOM PREPARATION

The room should be well insulated and have a sealed vapor barrier. The vapor barrier in the ceiling can be a polyethylene film type. Use a rubber or plastic base paint on concrete walls or floors. Doors should not be undercut or have grill in them. Outside or fresh air should be kept to an absolute minimum as it adds to the heating, cooling humidification needs of the site. It is recommended that outside air be kept below 5% of the total air circulated in the computer room.

GENERAL DESCRIPTION

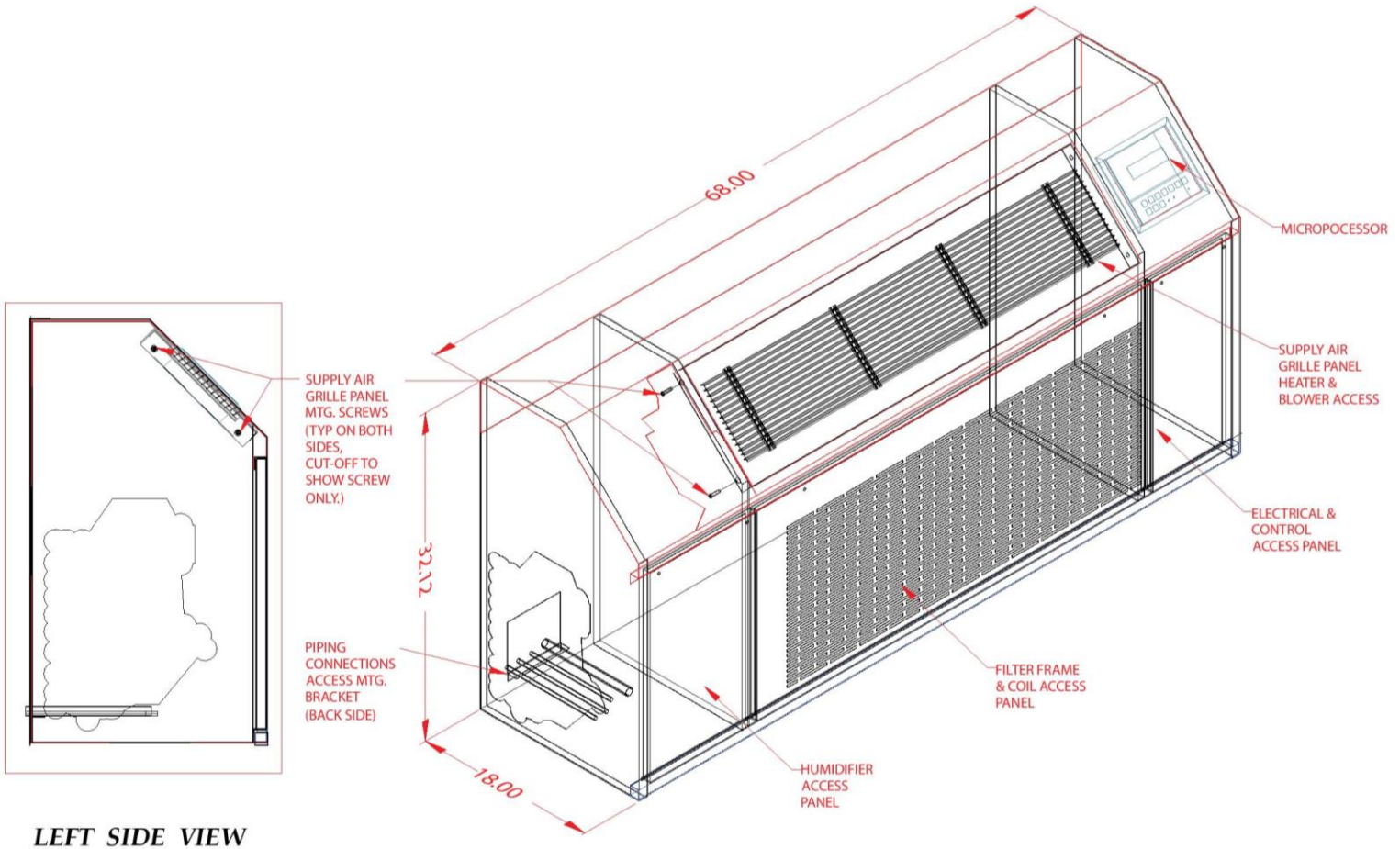
The **Compu-Mate** is split air conditioning system that consists of two components: An indoor module containing the evaporator coil, fan, *reheat, *humidifier and the control system.

A condensing module that contains the refrigeration system: compressor, condenser fan and coil, electrical controls and low ambient controls. The condensing module may be one of three types:

- 1) OUTDOOR AIR COOLED CONDENSING MODULE
- 2) CENTRIFUGAL INDOOR AIR COOLED CONDENSING MODULE
- 3) WATER COOLED CONDENSING MODULE

* optional

GENERAL DIMENSIONAL LAYOUT DATA



COMPU-MATE AIR COOL
AIR COOLED 1.5, 2, 3, 4 & 5 TON

SELECTION OF INSTALLATION SITE

Prior to installing the unit, check the structure thoroughly. Ascertain the location of wiring, condensate disposal, ease of access to the unit for maintenance and service 32" minimum clearance must be provided on the front.

UNIT MOUNTING

The COMPU-MATE Indoor Module is designed to installed against a wall inside the room. Its low height and depth allow for easy installation and access for service.

CONDENSING SECTION

1) OUTDOOR CONDENSING MODULE

LOCATION CONSIDERATIONS

To assure an adequate air supply, it is recommended that condensers be located in a clean air area, away from loose dirt and foreign matter that may clog the coil. Condensers must not be located in the vicinity of steam, hot air or fume exhausts or closer than 18" from a wall, obstruction or adjacent unit.

A solid base, capable of supporting the weight of the condenser and at least 2" higher than the surrounding grade and 2" larger than the condenser base dimensions, should be installed at the pre-determined location.

The condenser should be located for maximum security and maintenance accessibility. Avoid ground-level sites with public access or areas that will contribute to heavy snow accumulations.

2) CENTRIFUGAL AIR COOLED CONDENSING MODULE

LOCATION

The air cooled condensing unit is suitable for indoor installation only. The unit may be separated from the indoor module to simplify ductwork, minimize sound levels or for ease of service. Avoid areas that will contribute to heavy snow accumulation at air inlet and discharge locations.

DUCTING

Total external static pressure for inlet and outlet duct, including grille, must not exceed .5 inches of water. If the condenser is located close to the outside of building, rain hoods must be installed. hood intake dimensions should be the same as condenser duct dimensions. In addition, install a triple layer bird screen over rain hood openings to eliminate possibility of insects, birds, water or debris from entering unit. Use flexible ductwork or nonflammable cloth collars to attach duct to unit and to help control transmission of vibrations to building structures. Attach ductwork to the unit using the flanges provided. Precautions should be taken to locate the unit and ductwork so that condenser air inlets are not in the vicinity of steam, hot air or fume exhausts and to prevent supply air from short circuiting to return air. Avoid directing hot condenser exhaust air towards adjacent unconditioned buildings that may have open doors or windows facing the unit. Normal operating sound may be objectionable if the condensing unit is placed directly over quiet work areas. Insulation of ductwork is a must where it runs through a

conditioned space or is exposed to conditions where condensation may occur. When possible, ductwork should be suspended using flexible hangers and not fastened directly to the building's structure. In applications where the ceiling plenum is used for rejecting the heat of the unit, the discharge air must be directed away from the condenser air inlet and a screen added to the end of discharge duct for the protection of service personnel.

3) WATER COOLED CONDENSING MODULE

LOCATION

The water cooled condensing module may be separated from the indoor module to reduce sound levels and simplify service.

PIPING CONSIDERATIONS

Its recommended that manual service shut-off valves be installed at the supply and return line to each unit. This will provide for routine service or emergency isolation of the unit. When the water source for the condenser is of poor quality it is good practice to provide cleanable filters in the supply line. These filters will trap the particles in the water supply and extend the service life of the water cooled condenser.

The Condenser Water Inlet(FPT) is 3/4" and the Condenser Water Outlet(FPT) is 3/4".

WATER REGULATING VALVE

Water valves are factory installed on Compu-Aire water cooled units. Valves automatically open on refrigerant pressure increases, close on pressure decreases. To adjust the head pressure: attach refrigeration gauges to the compressor discharge and suction. raise the head pressure by turning the adjusting screw counterclockwise. Lower the head pressure by turning the adjusting screw clockwise. Allow enough time between changes for the system to settle out.

TESTING FUNCTION OF VALVE

When the refrigeration system has been off for approximately 10 to 15 minutes, the water flow should stop. Should the water continue to flow, the valve is either improperly adjusted with too low of head pressure or the pressure sensing capillary is not connected properly to the condenser.

MANUAL FLUSHING

The valve may be flushed by inserting a screw driver or similarly tool under the two sides of the main spring and lifting. This action will open the valve seat and flush any dirt particles from the seat.

CONDENSER WATER REQUIREMENTS

Maximum water pressure 150 psig. For applications above this pressure, consult the factory.

INSTALLATION AND PREPARATION

1. Position unit in desired location in the room.
2. Check to see that nothing obstructs the flow of air to or from evaporator fan inlet and outlet.
3. Open access panels and inspect air conditioner thoroughly for broken controls or other damage, such as loose pipes, etc.
4. Remove caps from the compressor discharge and suction valves. Using wrenches, check to see that these valve stems are backseated as far as they will go. Replace valve caps.
5. Electrically ground unit.
6. Turn disconnect switches to OFF position. Connect unit to source of electric power. Must be 208v, 1 PH, 60 Hz. Power tolerances are at $\pm 10\%$.
7. Tighten access panel fully to prevent leakage of conditioned air from the cabinet.
8. Prime condensate drain.

ELECTRICAL

Units are completely wired at the factory. Prior to any electrical hook up, check the following:

1. Verify the unit voltage.
2. Check all connections for tightness.
3. Consult and comply with all applicable local and national codes.
4. Provide fused disconnects or HVAC approved circuit breaker for the unit.
5. Low voltage wiring must be 18 gauge minimum up to 50 feet run. Factory wiring terminates in the control box.
6. Locate outdoor unit and run the control wiring from outdoor unit to indoor unit.

PIPING CONNECTIONS

Three sets of piping connections need to be made in order to put the Compu-Mate into operation. They are:

- . Refrigeration connections between the indoor unit and the outdoor condensing unit.
- . A drain line from the evaporator-coil drain pan.
- . A supply and drain line to the steam humidifier (optional).

EVAPORATOR COIL DRAIN LINE

A drain outlet is provided at the right end of the evaporator coil. It is essential that the unit be installed in a level position to permit proper drainage. Pitch and trap the drain line as local codes require.

Drain Connection 5/8" OD Copper

STEAM HUMIDIFIER SUPPLY AND DRAIN (OPTIONAL)

Supply Connection 1/4" NPT Male

Drain Connection 1/2" NPT Fem.

CONDENSATE DRAINS

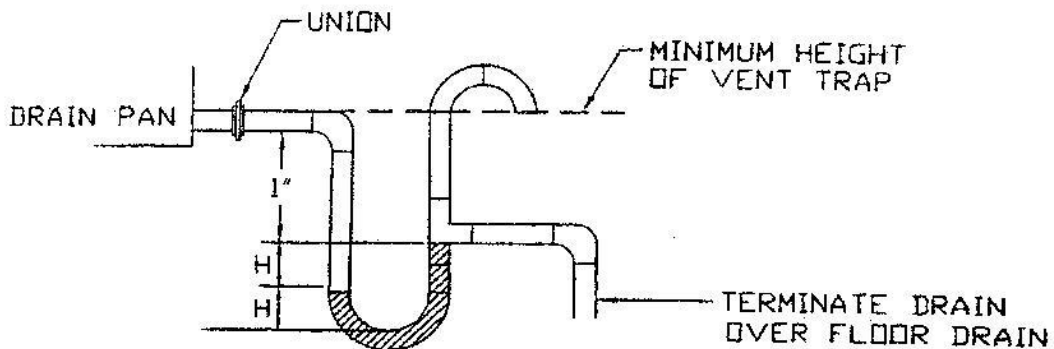
3/4 condensate drain is provided. **THIS DRAIN IS CONNECTED TO THE FIELD DRAIN WITH A MINIMUM SLOPE OF 1/4" PER 10 FEET OF RUNS TOWARDS THE DRAIN.**

AIR FLOW

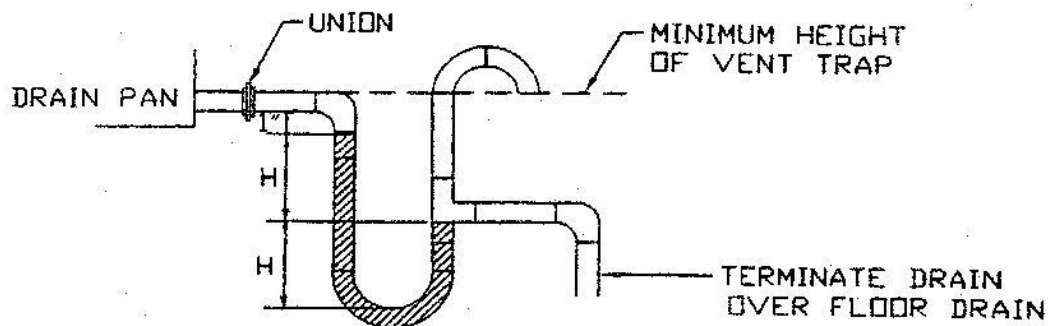
The evaporator is provided with direct drive three speed motor. Refer to the specification data for the air flow data. In case field adjustments are made, check to verify the motor full load amps. The evaporator is provided with direct drive motor and the three speed switch is located in the control panel.

CONDENSATE DRAIN

Evaporator and the condensing sections (air cooled only) are provided with individual condensate drains, 3/4" stub. Hook both drains with "P" traps. Provide 1/4" slope per 10 feet.



BLOW-THRU UNIT



DRAW-THRU UNIT

NOTE: 'H' EQUALS THE NEGATIVE ESP ON DRAW-THRU UNITS
'H' EQUALS THE TSP ON BLOW-THRU UNITS

CAUTION: Drain line contains boiling water from humidifier. Use copper or other suitable material for the drain.

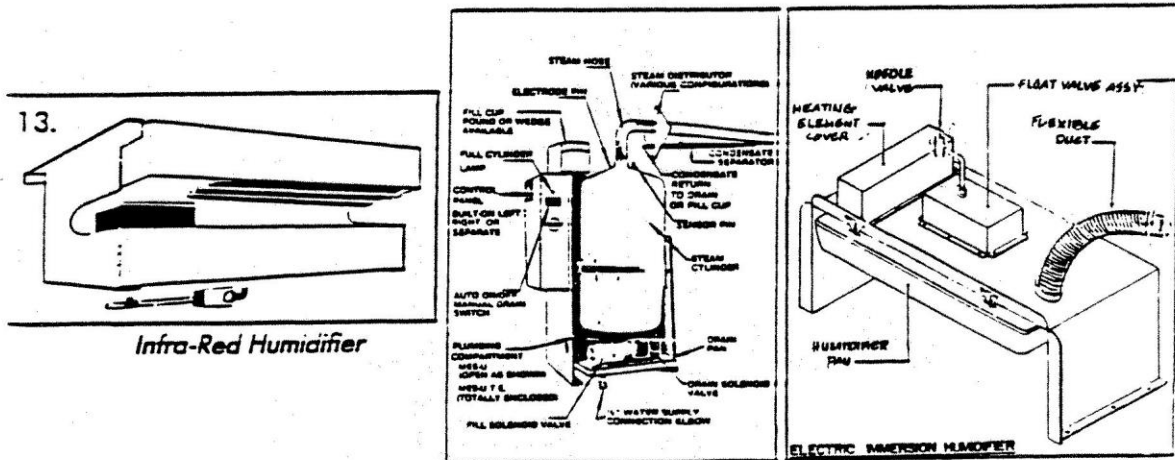
HUMIDIFIER PIPING CONNECTION

The standard humidifier supplied with COMPU-AIRE units is a disposable generator type humidifier. A 1/4" compression fitting is provided for the water supply, a 1/4" O.D. copper tubing should be used for make-up water.

For the optional infra-red humidifier or the electric immersion, piping connections are identical to the standard humidifier. All require a 1/4" tubing.

A water line shut off valve **MUST** be provided outside the air conditioner for future disconnection and service. In addition, an in line water pressure regulator and a strainer should be installed in the make-up water line. Water pressure should be set between 30 and 50 psig.

For infra-red and electric immersion the float is factory adjusted to maintain minimum water in the humidifier where the elements are just submersed in water. For field adjustment, loosen the float arm, or slightly bend.



LEAK TESTING

No installation is complete until the entire system has been thoroughly checked for leaks. This includes water tubing, humidifier make-up water and condensate drain lines and refrigeration lines.

STEAM GENERATOR TYPE HUMIDIFIER

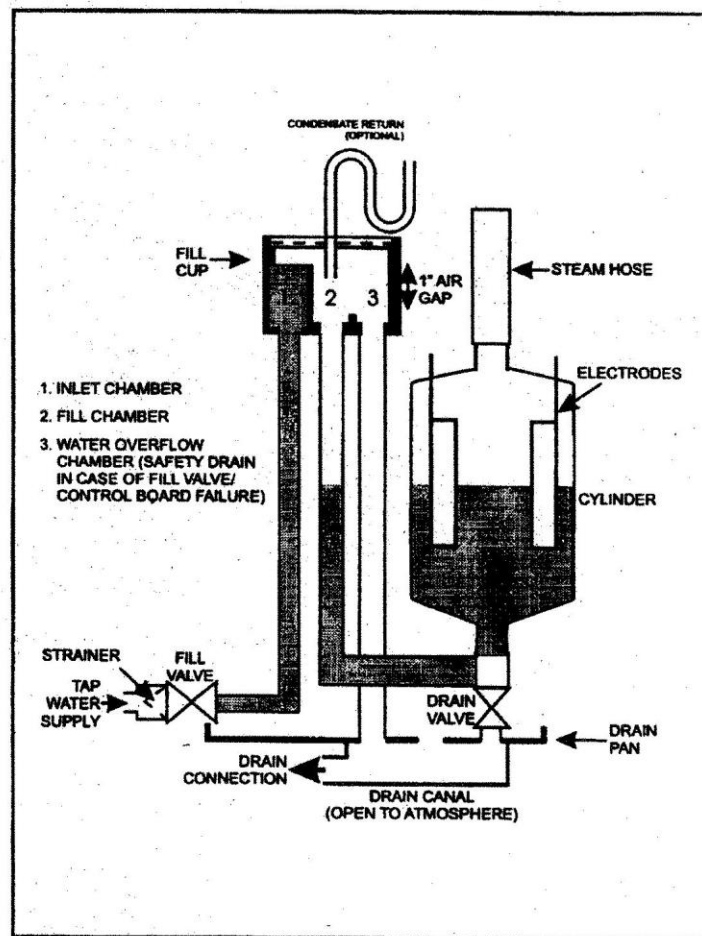
PRINCIPLE OF OPERATION:

When the humidistat calls, the cylinder fills to 110% of the Full Load Amperage (F.L.A.) or to the top of the cylinder, whichever comes first.

If it reaches 110% F.L.A. the water heats and boils away to a level giving only 90% F.L.A.

An electronic timer uses the rate of fall to determine the water level. The objective is to concentrate current-carrying minerals in the cylinder so that a smaller volume of water is required to produce the rated steam output.

This achieve the longest life for the disposable cylinder because of minimum electrode coverage and uses less energy because the high concentration allows minimal drain rate.



When it reaches 90% F.L.A. the fill valve will open refilling cylinder to 110% FLA. On occasion, the drain valve will also come on if water level is too high a concentration and the requirement for a dilution of the water in the cylinder.

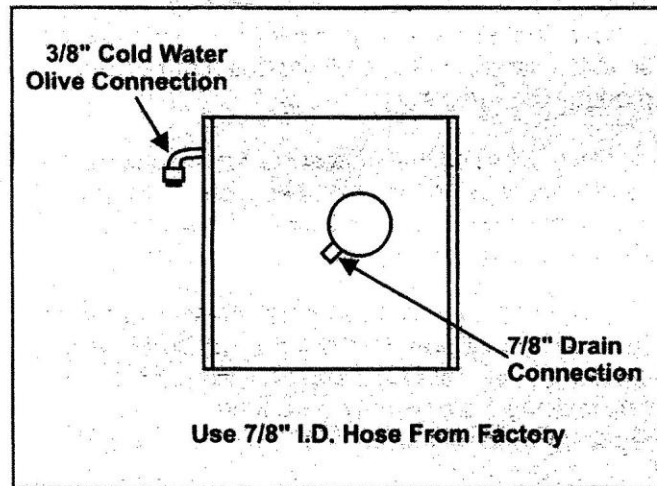
If the water reaches top of cylinder before 110% F.L.A. the fill valve shuts off via the sensor and fill-boil-fill-boil cycle continues, cycling off the red full cylinder light until the concentration becomes high enough to reach 100% F.L.A. Then the following described control process takes over.

WATER SUPPLY AND PLUMBING

- 1) The orifice in the fill valve(s) is sized for an extended water pressure range of 30 to 85 psi.
- 2) For water pressure between 15 and 30 psi, notify the factory and the next larger size of fill valve will be supplied.
- 3) For cases below 15 psi, notify the factory and fill valve with largely oversized orifice will be supplied.
- 4) For cases above 85 psi, install a pressure reducing valve in the water feed line to the unit. Otherwise insufficient cylinder water will drain when fill and drain mix during the automatic dilution cycle.
- 5) With extremely dirty or muddy water sources, e.g. some well sources, ensure proper filtration by adding an external filter to the water line entering the unit. (Consult factory for accessories such as filters).
- 6) DO NOT soften water with this humidifier unit because it is much too conductive.
- 7) DO NOT use completely demineralized water with this humidifier unit as it is the minerals that allow the electrode principle to work.
- 8) DO NOT use a hot water source as it will cause deposits to eventually block the fill valve orifice.

Water Connection

- 1) A copper compression olive type coupling for 1/4" soft copper tubing is provided with unit and requires no soldering for the water connection to the unit.
- 2) An isolating gate valve should ALWAYS be placed in feed water line allowing service of the fill valve.



Bottom view of MES-U unit

- 3) Each unit is fitted with a fill solenoid valve located on the base drain pan. Flow orifices are designed for water pressures from 30-85 psi and are protected by the built-in strainer.
- 4) For inlet water pressure outside this range, the factory should be contacted. (See also water supply section)

HUMIDIFIER START-UP:

Check to see that the unit is securely mounted on a level surface with the proper drain and water supply. Check for correct voltage with appropriately sized service. Check that the steam distributor, steam supply hose and condensate line are correctly installed and routed back to the unit. Ensure that the external control humidistat is located in an area to properly sense the relative humidity to be maintained by the humidifier, and that the inter-connecting low voltage wires between the humidistat and unit's control terminal strip are in accordance with the wiring diagram.

Check **all electrical connections** for wires which may have become **loose in shipping**. Components burnt due to loose connection are NOT under warranty.

Check electrode plugs to ensure they are pressed firmly onto the electrode pins.

Important: Loose connections will cause overheating of the cylinder plugs and probably melting of the plugs and/or cylinder.

Open the isolating gate valve in the feed water line to the unit.

Make sure the humidistat is set high enough to call for humidification.

Turn on the main disconnect in the primary service feeding the unit and check that unit has power at the primary terminal block.

“PUSH THE AUTO ON/OFF/DRAIN SWITCH TO “ON”.

Water will start to enter the cylinder through its bottom port and rise in the cylinder to a point determined by the solid state control circuitry.

It is not unusual upon initial start-up for the water to fill the cylinder an cycle on the red high water sensor light.

The red light simply acts as a safety to shut off the fill valve and prevent over fitting. With the red light on, the water in the cylinder will continue to heat and after a few minutes start to boil. After the boiling action of the water has lowered the water level below the sensor at the top of the cylinder, the red light will go out and the fill solenoid will again open until the cylinder is again full.

This cycling of the red light and fill valve will continue until the unit's full output capacity is reached after which the water level will automatically lower itself in the cylinder. (The increased concentration allows for lower electrode coverage while maintaining the same output). When a stabilized condition is reached the water will be boiling close to the cylinder seam level. The solid state circuitry will maintain the proper concentration in the cylinder by introducing short drains only when necessary.

If the cylinder is manually drained, the above process will repeat itself.

LOW WATER CONDUCTIVITY

Should normalization of the unit be required immediately after start-up, the installer may speed up the process by artificially increasing water conductivity. The installer should dissolve half a teaspoon of table salt (no more) in a cup of water and add it to the cylinder by means of the fill cup attached to the plumbing section.

Open the plumbing compartment and add salt solution through cylinder outlet. Excessive amounts of salt will result in erratic operation of the unit, however, normalization of the unit will occur automatically through the solid-state control sequence.

CAPACITY ADJUSTMENT

The M.E.S. series of humidifiers are factory set to cover most normal conditions. If an extreme situation is encountered notify the factory for instructions.

CYLINDER REPLACEMENT

After an extended period of operation in accordance with life expectancy information, the cylinder is completely used as indicated by a red light illuminated on the face of the cabinet. When this condition is reached, a new replacement cylinder is to be installed.

NOTE: Red light may come on during initial start-up but does not mean cylinder replacement.
See "Humidifier Start-up" Section

Consult factory or agent for replacement. Quote the cylinder model from the white 3-digit label on the cylinder or quote model, voltage and serial number from unit specification label.

When to replace the stem cylinder:

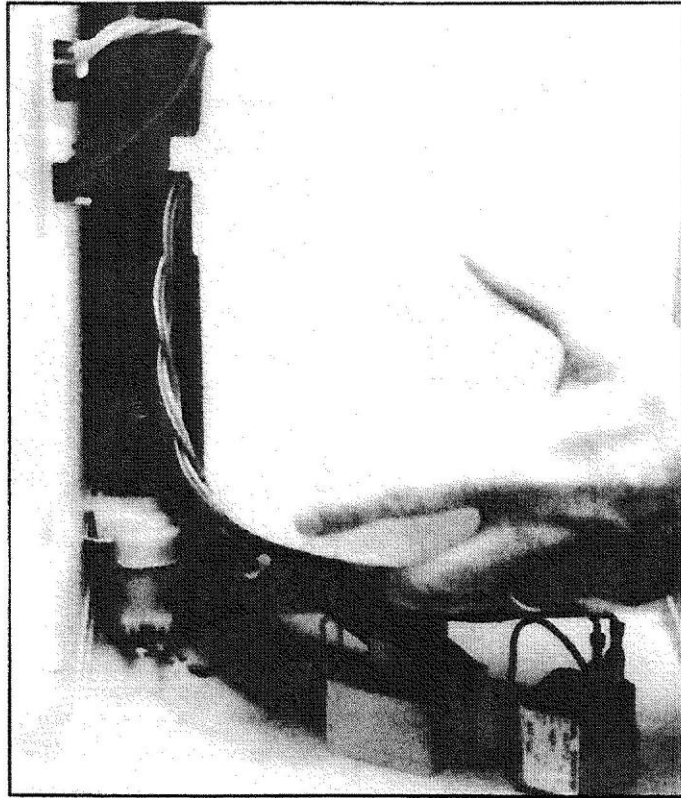
The steam cylinder is disposable and must be replaced at the end of cylinder life. Cylinder life is dependent on water supply conditions and humidifier usage. Failure to replace the cylinder at the end of cylinder life may result in unit damage.

Extended Shutdown:

Any time that the unit is going to be shut down for an extended period of time, including summer shutdown, **ALWAYS drain** down the cylinder before disconnecting power. Otherwise, the electrodes are subject to harmful corrosion which drastically shortens the cylinder life. Do not leave the switch in the DRAIN position indefinitely as the drain coil could burn out. Leave the switch in the OFF position and

REMOVING THE CYLINDER

- 1) Turn off the water supply to the unit
- 2) The old cylinder must be drained completely before removing. This is done by pushing the auto on/off drain switch to the "drain" position.
- 3) When completely drained, push the auto/on/off drain switch to the "off" position.
- 4) Open the main disconnect during the entire cylinder change operation.
- 5) The power wires to the cylinder are attached by cylinder plugs to the electrode pins on top of the cylinder. Pull these plugs vertically off the pins.
- 6) Using slot screw driver, loosen the steam hose clamp(s) and pull steam hose off vertically.

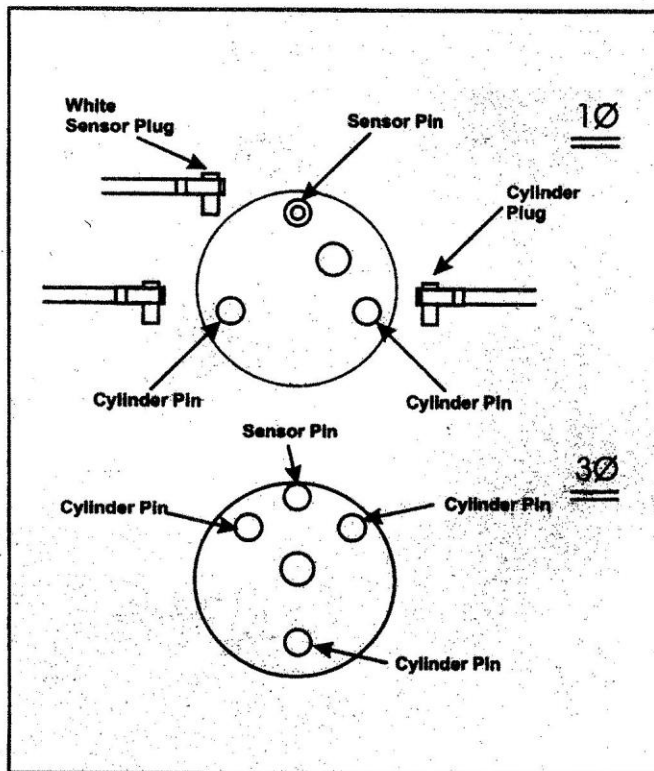


Cylinder Removal

- 7) The cylinder is now ready to be lifted out of the unit.

INSTALLING THE NEW CYLINDER

- 1) The reverse procedure should be followed to install a new cylinder. The main disconnect is to be left open until the cylinder is completely installed and reconnected.
- 2) Ensure that the cylinder mounting stubs are seated properly in the allotted side mounting slots within the unit.
- 3) The white cylinder plug on all units is for the sensor electrode which always goes on the single pin offset from the others.
- 4) Ensure that cylinder plugs are very snug on the pins.



Cylinder Plugs

- 5) For loose fitting plugs, a temporary solution is to squeeze plugs with a pair of pliers before installing. Since loose plugs may generate enough heat to melt and destroy the plug and cylinder new plugs must be ordered.

TROUBLE-SHOOTING HUMIDIFIER

Auto on/off/drain switch in "on" position-unit will not fill:

When the on/off control circuit is made and the "auto on/off/drain" switch is pushed to "on", the 24 volt holding coil of the primary contactor should energize. The resulting magnetic pull closes the high voltage contacts with a distinct and audible "clunk". If the contactor will not make, then inspect the following while referring to the wiring diagram.

- 1) Check for 24VAC across pins 18 and 26.
- 2) Jumper the humidistat on external control terminal strip. If contactor operates then control system is at fault.
- 3) The low voltage 3 amp fuse located in the control box could be blown.

- 4) The contactor holding coil could be open or shorted.
- 5) The switch could be defective.

Recheck that the "auto/on/off drain" switch is still at "on". If it is, then shut off the main disconnect and check fuses or breaker of the main disconnect. If they are serviceable, turn power back on.

To test for a defective "auto/on/off drain" switch, connect a wire from the fuse directly to terminal 6 on the external control strip. If the contactor activates, the "on" side of the switch is defective. If the contactor does not activate, then the basic unit p.c. board could be defective.

If the 3 amp control fuse blows when the wire from the fuse touches terminal 6 on the external controls strip, contactor holding coil could be shorted. Replace the contactor if necessary.

Return wires to normal.

After the necessary components have been replaced and the contactors pull in, there is high voltage to the cylinder and the control sequence can begin.

Approximately 30 seconds after the contactor pulls in, the fill valve coil should energize. There is also a visible fill relay on the basic printed circuit board. It is the one located farthest from the C.T. core. The points on this relay must be touching in order for the fill valve coil to be energized.

If the points will not touch after the built-in time delay, then the sensor input may be interfering. To confirm, remove the red and black sensor wires from the terminal 6 and 10 on the PC board. Wait 30 seconds and if the fill relay point now touches, then the sensor should be replaced. If they do not touch, then the PC board could be faulty. To confirm, disconnect the red wire from terminal 18 and touch it to terminal 14. If the fill valve coil activates then the basic PC board should be replaced. If it still does not activate then the fill valve coil should be replaced.

Having changed the necessary components, water starts filling the cylinder and begins to submerge the electrodes. Because of the high voltage across the electrodes, the water can now conduct electricity.

Red "Change Cylinder" light on - Water at top of cylinder:

- Common occurrence on start-up - See "Humidifier start up and Operation" section.
- If cylinder is old, it indicates replacement time (can be ordered from factory). See "When to replace steam cylinder" section..

Red “Change Cylinder” light on - water NOT at top of cylinder:

- Water foaming to top of cylinder to activate red light, also may be accompanied by arcing (flashing) inside cylinder

Water remains at high level and won't concentrate:

- Normal on cold start-up, can be accelerated by adding maximum 1 tsp. of salt to the cylinder (thorough the plastic fill cup) on fill cycle. “See Low Water Conductivity” section.
- If the unit has been operating extensively, observe for normal fill-boil-fill-boil cycle; no drain should be occurring. Check for leaking drain valve or back pressure.

Water beyond top of cylinder up into spout:

- Red light not on and fill still activated; jumper across connection of sensor on basic unit PC board, if fill remains on when connection is jumped, then basic PC board is faulty.
- If fill shuts off, then verify primary voltage to cylinder (contactor energized). If primary voltage is present, the high water sensor PCB is defective.

Unit drains continually:

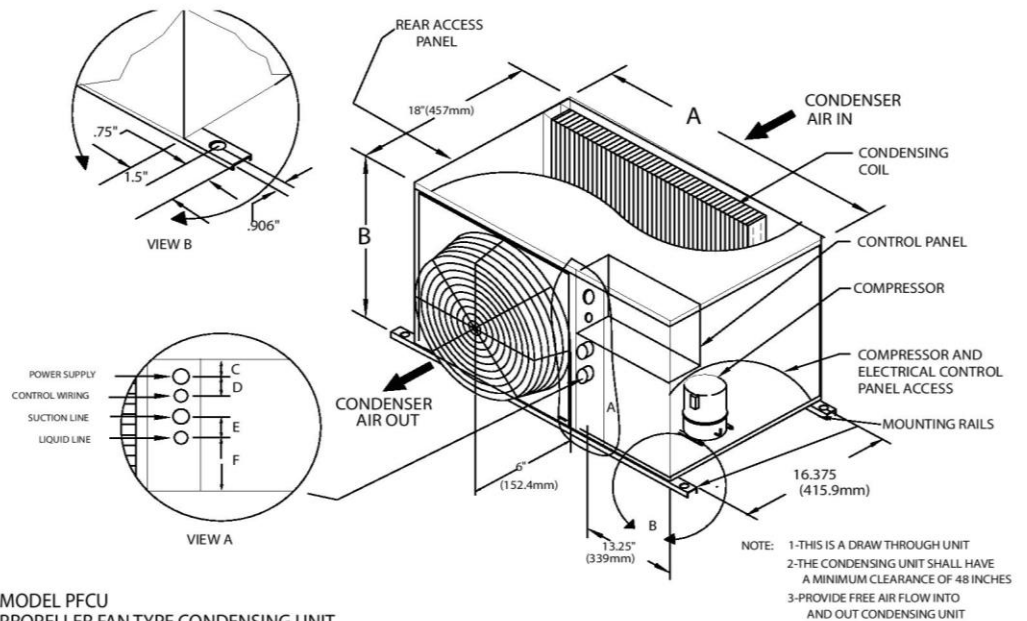
- May be caused by foaming and/or back pressure, or leaking drain valve.
- Cylinder is almost empty, check for magnetic pull on drain solenoid indicating miswiring. If no pull, drain actuator is blocked open, remove, disassemble and clean.
- If drain is occurring through activated drain valve, valve is miswired or electronics are faulty – consult factory.
- If drain is occurring through the overflow on the fill cup, this is due to abnormal restriction on the steam line and back pressure forces water out of the cylinder, therefore, water cannot concentrate and level must stay high, review installation of steam line to ensure no blockages or excessive static pressure in air system.

TECHNICAL DATA

Model & Nominal Tonnage	CME-1.5	CME-2	CME-3	CME-5
80°F DB 67°F WB 50% RH Entering Air				
Total BTU/HR (kw)	18,200	26,500	36,300	68,301
Total Sensible BTU/HR (kw)	15,800	23,800	31,000	48,783
75°F DB 62.5°F WB 50% RH Entering Air				
Total BTU/HR (kw)	16,700	24,200	34,100	47,736
Total Sensible (kw)	15,200	22,800	29,800	41,736
72°F 60°F WB 50% RH Entering Air				
Total BTU/HR (kw)	16,200	23,400	32,200	44,665
Total Sensible (kw)	14,300	22,800	29,700	40,432
Fan Data				
Motor HP	1	1	1	1
CFM	660	1320	1550	2000
ESP inch WC	0.25"	0.25"	0.25"	0.25"
Evaporator Coil Data- high efficiency "Slab" configuration, copper tube- aluminum fin				
Face Area Ft.	4.06	4.06	4.06	3.96
Rows/FPI	3/12	3/12	3/12	4/12
Electric Reheat (optional)				
kw	5	5	5	10
BTU/HR (includes motor heat)	8,225	17,500	20,460	40,650
Stages	1	1	1	1
Humidifier- Electronic self generating modulating steam type with disposable cylinder (optional)				
kw	1.7	1.7	1.7	3.4
Lbs./HR	5	5	5	10
Filter Data 30%				
Filter size	1"	1"	1"	1"
Piping-all connections are copper O.D.				
Liquid Line Size	3/8"	3/8"	1/2"	1/2"
Suction Line Size	5/8"	3/4"	7/8"	1 1/8"
Humidifier Water Supply	1/4"	1/4"	1/4"	1/4"
Condensate Drain	3/4"	3/4"	3/4"	3/4"
Unit Weight (Lbs.)	235	235	375	675

Model & Nominal Tonnage	PFCU-1.5	PFCU-2	PFCU-3	PFCU-4	PFCU-5
Design Ambient Temperature 95°F					
Fan Data					
CFM	1420	1600	2400	3200	4000
Fan Size	16"	20"	24"	24"	24"
Motor HP	1/5	1/3	1/3	3/4	3/4
Condenser Coil Data					
Face Area Ft.	3.8	5.0	7.7	10.5	10.5
Rows	2	2	2	3	3
High Efficiency Scroll Compressor					
Refrigerant	R-407C	R-407C	R-407C	R-407C	R-407C
Size	1.5	2	3	4	5
Quantity	1	1	1	1	1
EER	11.0	13.8	13.7	13.8	14.0
Electrical Data @ 208V/1Ph/60Hz					
Full Load Amps (FLA)	15.3	13.2	16.6	21.0	23.9
Min Circuit Ampacity (MCA)	19.1	15.4	20.0	25.1	28.7
Max. Recommended Fuse Size (MFS)	30A	25A	30A	45A	50A
Piping Connection Data					
Liquid Line	1/2"	1/2"	1/2"	5/8"	5/8"
Suction Line	3/4"	3/4"	3/4"	7/8"	7/8"
Physical Data					
Length	38"	43"	50"	54"	54"
Width	18"	18"	18"	18"	18"
Height	24"	24"	31"	37"	37"
Unit Weight (Lbs.)	275	310	325	335	340

Propeller Fan Condensing Unit

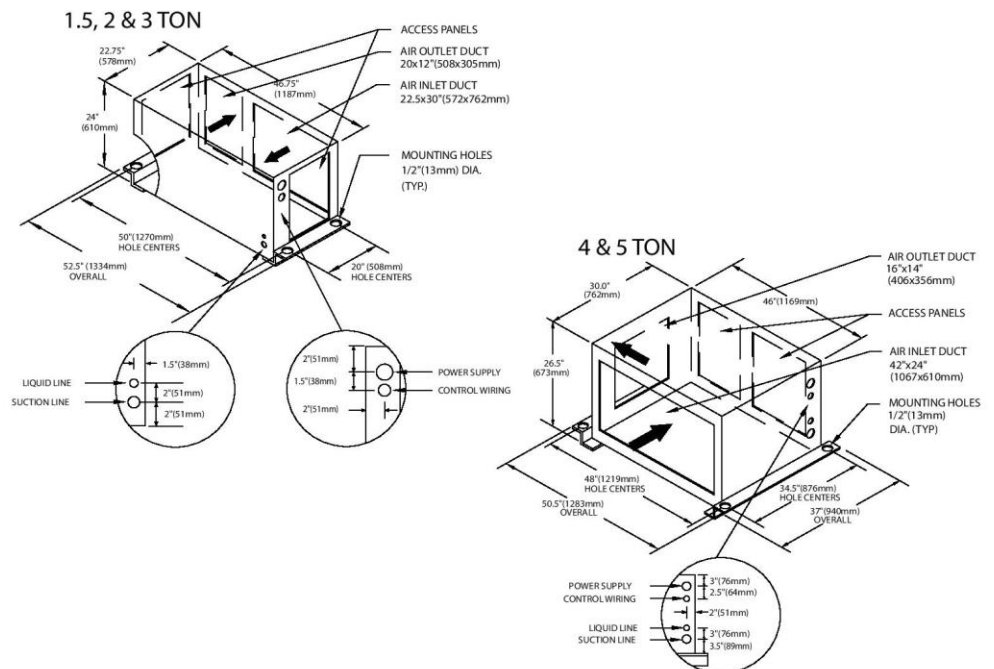


MODEL PFCU
PROPELLER FAN TYPE CONDENSING UNIT

PFCU MODEL	NOMINAL TONNAGE	A In. (mm)	B In. (mm)	C In. (mm)	D In. (mm)	E In. (mm)	F In. (mm)	WEIGHT LBS. (kg.)
01.5	1 & 1.5	38"(965)	24"(610)	1.75"(44.4)	2.00"(50.8)	3.00"(76.2)	13.00"(330.2)	240 (108)
02	2	43"(1092)	24"(610)	1.75"(44.4)	2.00"(50.8)	3.00"(76.2)	13.00"(330.2)	300 (135)
03	3	50"(1270)	31"(787)	2.00"(50.8)	2.00"(50.8)	3.00"(76.2)	21"(533.4)	325 (146)
05	4 & 5	54"(1372)	37"(940)	3.00"(76.2)	2.00"(50.8)	3.00"(76.2)	21"(533.4)	340 (153)

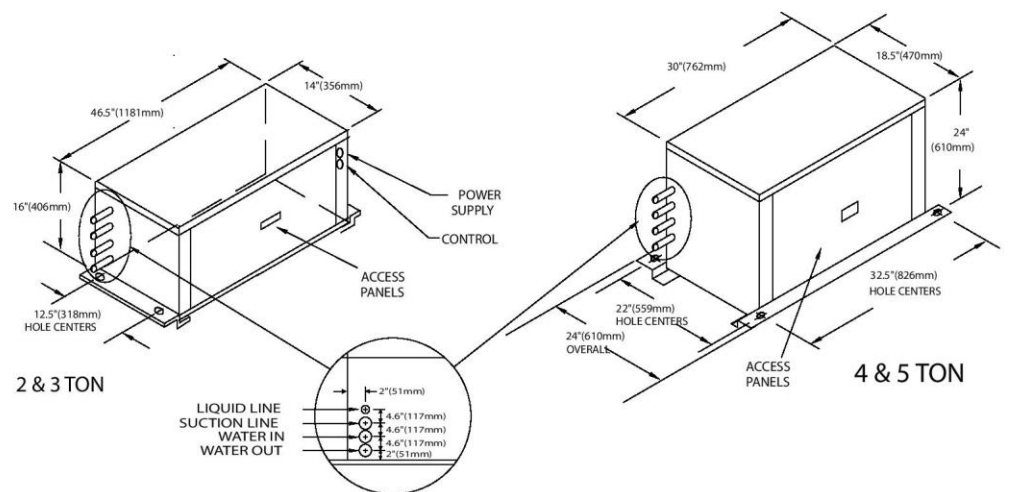
Model & Nominal Tonnage	CFCU-1.5	CFCU-2	CFCU-3	CFCU-4	CFCU-5
Design Ambient Temperature 95°F					
Fan Data					
CFM	1020	1020	1670	2320	3580
Fan Size	16"	20"	24"	24"	24"
Motor HP	3/4	3/4	3/4	1 1/2	1 1/2
Condenser Coil Data					
Face Area Ft.	1.75	1.75	4.6	7.6	7.6
Rows	4	4	3	4	4
High Efficiency Scroll Compressor					
Refrigerant	R-407C	R-407C	R-407C	R-407C	R-407C
Size	1.5	2	3	4	5
Quantity	1	1	1	1	1
EER	11.0	13.8	13.7	13.8	14.0
Electrical Data @ 208V/1Ph/60Hz					
Full Load Amps (FLA)					
Min Circuit Ampacity (MCA)					
Max. Recommended Fuse Size (MFS)					
Piping Connection Data					
Liquid Line	3/8"	3/8"	3/8"	1/2"	1/2"
Suction Line	5/8"	7/8"	7/8"	1 1/8"	1 1/8"
Physical Data					
Length	38"	43"	50"	54"	54"
Width	18"	18"	18"	18"	18"
Height	24"	24"	31"	37"	37"
Unit Weight (Lbs.)	285	310	340	370	390

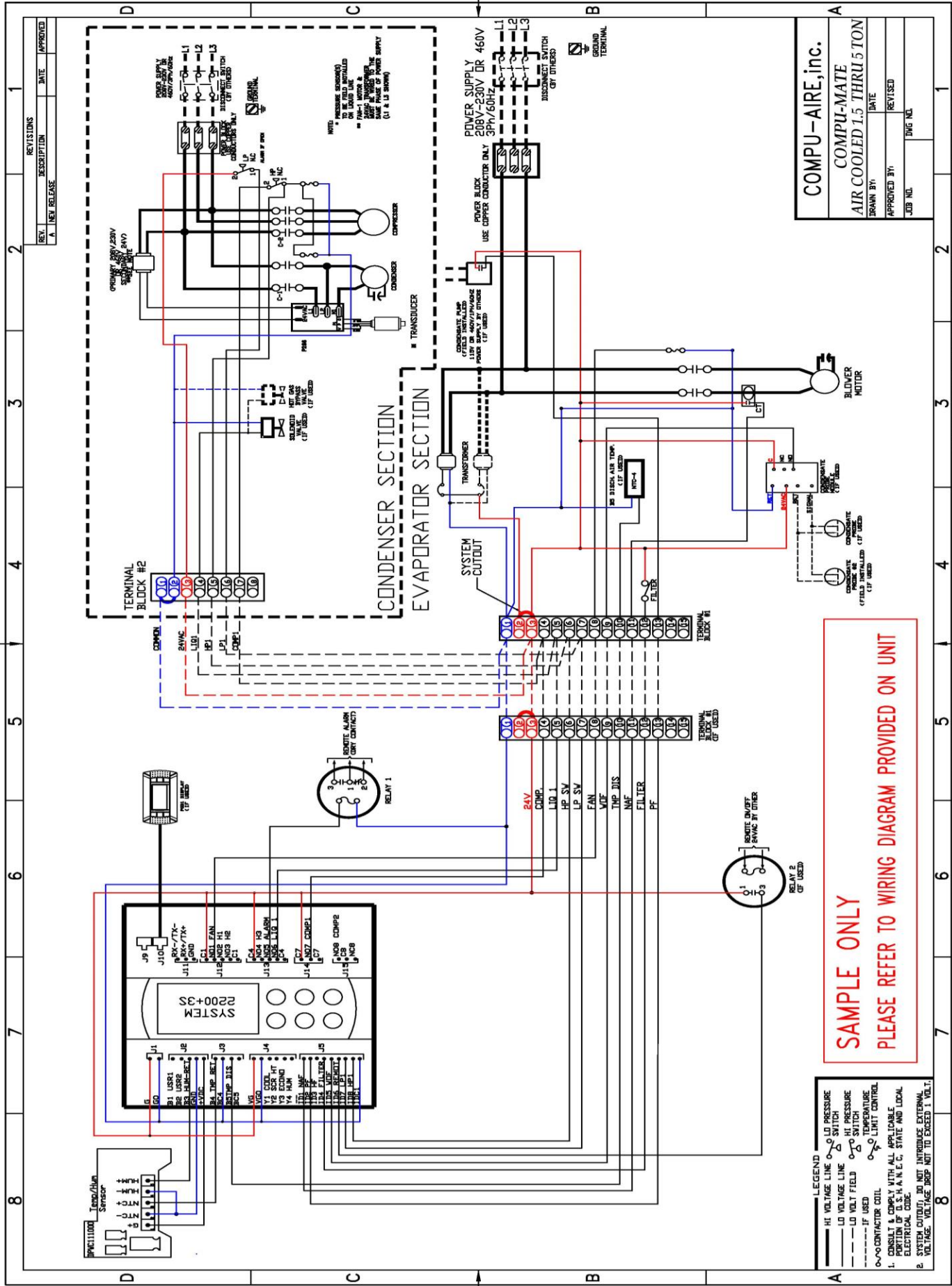
Centrifugal Fan Condensing Unit



Model & Nominal Tonnage	WCCU-1.5	WCCU-2	WCCU-3	WCCU-4	WCCU-5
Design Ambient Temperature 95°F					
Fan Data					
CFM	1020	1020	1670		3580
Fan Size	16"	20"	24"		24"
Motor HP	3/4	3/4	3/4		1 1/2
Water Cooled Condenser Data					
Face Area Ft.	1.75	1.75	4.6		7.6
Rows	4	4	3		4
High Efficiency Scroll Compressor					
Refrigerant	R-407C	R-407C	R-407C		R-407C
Size	1.5	2	3		5
Quantity	1	1	1		1
EER	9.9	10.2	10.3		10.0
Electrical Data @ 208V/1Ph/60Hz					
Full Load Amps (FLA)					
Min Circuit Ampacity (MCA)					
Max. Recommended Fuse Size (MFS)					
Piping Connection Data					
Liquid Line	3/8"	3/8"	3/8"		1/2"
Suction Line	5/8"	7/8"	7/8"		1 1/8"
Physical Data					
Length	46.5"	46.5"	46.5"		30"
Width	14"	14"	14"		18.50"
Height	16"	16"	16"		37"
Unit Weight (Lbs.)	275	275	290		390

Water Cooled Condensing Unit





MAINTENANCE PROCEDURES

AIR DISTRIBUTION SYSTEM

Periodic checks of the blower package would include: motor mounts and fan housings and impellers are tightly mounted on the fan shaft, and do not rub against the fan housing. The entire fan area should be free of debris.

FILTERS

Filters are usually the most neglected items in an air conditioning system. To maintain efficient operation, they should be checked monthly and cleaned or replaced as required. Filters are located behind the access door on the lower front of the unit.

HUMIDIFICATION SYSTEM

The Compu-Mate employs a steam generating humidifier with an automatic flush cycle to prolong humidifier life. The humidifier system consists of a water cylinder with an internal set of electrodes that generate the steam used for humidification. The steam is introduced into the room air through a discharge plenum separate from the conditioned air discharge.

System Operation

When there is a call for humidification, the fill solenoid valve opens and water flows into the cylinder. On initial start-up, with the cylinder empty, this requires 15 - 20 minutes. As water is evaporated, the fill valve will maintain the correct water level.

As water is evaporated from the cylinder, the mineral concentration of the water (and its electrical conductivity) increases. This will open the drain valve and lower the water level in the cylinder. The fill valve then opens, refilling the cylinder with fresh water. This drain-refill cycle continues until the mineral concentration requires changing the cylinder.

Changing Cylinder

Because water characteristics vary, it is difficult to establish cylinder changing intervals. Individual maintenance schedules must be determined for each location based upon periodic examination of the humidifier.

To change the cylinder, first drain water from the cylinder. A switch is provided that manually opens the humidifier drain and empties the humidifier. The switch is located on the underside of the control panel. The unit and the humidification system must be ON. If necessary, INCREASE the setting of the humidistat. Depress the drain switch until water is completely drained.

Disconnect all power to the unit. Remove the electrode wires from the top of the cylinder. Loosen the hose clamp holding the flexible steam hose and remove hose. Disconnect fill and drain line connections. Pull cylinder up and out of its socket. Reverse procedure to install new cylinder.

REFRIGERATION SYSTEM

The refrigeration system is split between an indoor and an outdoor module. The indoor module contains the evaporator coil and the outdoor module contains the remainder of the refrigeration components: the compressor, the condenser and the winter control system. Service to the refrigeration system should be performed only by qualified refrigeration personnel.

Winter Control System

All air cooled systems use a fan speed controller that varies the voltage to specially designed fan motors. This provides an infinite number of speed variations to match outdoor conditions.

Crankcase Heaters

All models are equipped with crankcase heaters installed on the compressor sump. This prevents refrigeration migration to the compressor during the off cycle and permits smoother start-up.

General Maintenance

Clean the condenser coil of all debris that will inhibit air flow. this can be done with compressed air or a commercial coil cleaner. Check for bent or damaged coil fins and repair as necessary. In winter, do not permit snow to accumulate around the condenser. Check all refrigerant lines and capillaries for vibration isolation and support as necessary. Visually inspect all refrigerant lines for signs of oil leaks.

High Pressure Cut-Out

A manual-reset high pressure cut-out is supplied and factory pre-set at 360 psi. The reset protrudes through the front of the condenser cabinet next to the fan inlet.



MAINTENANCE CHECKLIST

Inspection Date _____
Job Name _____
Unit Model # _____
Unit Serial Number # _____
Room Temperature _____ ° Humidity _____ %
Ambient Temperature _____ °

Filters

- ___ 1. Check/replace filters
- ___ 2. Grille area unrestricted
- ___ 3. Wipe section clean
- ___ 4. Coil clean

Blower Section

- ___ 1. Blower wheel(s) free of debris
- ___ 2. Check belt tension and condition (replace if needed)
- ___ 3. Check bearings
- ___ 4. Check sheave/pulley (replace if worn)
- ___ 5. Check motor mount
- ___ 6. Motor amp draw L1 _____ L2 _____ L3 _____
- ___ Compare measured amp draw to nameplate rating

Reheat

- ___ 1. Inspect elements
- ___ 2. Check wire connections (inside reheat box)
- ___ 3. Reheat amp draw _____ #1 _____ #2 _____ #3

Steam Generating Humidifier

- ___ 1. Check drain valve/drain lines/trap for clogs
- ___ 2. Check water make-up valve and all hoses for leaks
- ___ 3. Clean strainer
- ___ 4. Replace humidifier bottle if necessary

EVZ ___ 5. Check operation of humidifier
 ___ 6. Humidifier amp draw L1 _____ L2 _____ L3 _____

PAI **Condensate Pump** 3

REI ___ 1. Check for debris in sump
 ___ 2. Check operation of float(s) (free movement)

215 **Electrical Panel**

215 ___ 1. Check fuses
 215 ___ 2. Check contactors for pitting 1
 AII ___ 3. Check all wire connections

Controls 3

___ 1. Check/Verify Control Operation (Sequence)
 ___ 2. Check operation of the airflow switch
 ___ 3. Check setting/operation of the clogged filter switch 1
 ___ 4. Check/test changeover device(s)
 ___ 5. Check/test water detection device(s) 1

Notes _____ 1

FII _____

_____ 2

268 _____ 1

241 _____ 1

249 _____ 3

250 _____ 2

256 _____ 1

259 _____ 1

298 _____ 1

298 _____ 1

Signature _____

Company _____

CONDENSOR SECTION:

AIR COOLED PROPELLER FAN TYPE

PART NUMBER	DESCRIPTION	1	1.5	2	3
201-010-014	COMPRESSOR 1-TON 208/1	1			
201-015-102	COMPRESSOR 1.5TON 208/1		1		
201-020-012	COMPRESSOR 2-TON 208/1			1	
201-030-012	COMPRESSOR 3-TON 208/1				1
256-040-001	HP SWITCH MG-212060	1	1	1	1
256-050-001	LP SWITCH MG-201229	1	1	1	1
229-053-040	DRIER 1/2"	1	1	1	1

AIR MOVING PARTS

	18" PROP FAN	1	1		
	20" PROP FAN			1	
	24" PROP FAN				1
	MOTOR 1/4 HP	1	1		
	MOTOR 1/3 HP			1	1
249-010-021	CONTACTOR 2 POLE/30 AMPS	1	1	1	1

CENTRIFUGAL FAN TYPE

PART NUMBER	DESCRIPTION	1	1.5	2	3
201-010-014	COMPRESSOR 1-TON 208/1	1			
201-015-102	COMPRESSOR 1.5TON 208/1		1		
201-020-012	COMPRESSOR 2-TON 208/1			1	
201-030-012	COMPRESSOR 3-TON 208/1				1
256-040-001	HP SWITCH MG-212060	1	1	1	1
256-050-001	LP SWITCH MG-201229	1	1	1	1
229-053-040	DRIER 1/2"	1	1	1	1

AIR MOVING PARTS

270-025-001	9X9 DD	1	1	1	
270-010-008	10X8				1
202-007-613	MOTOR 1/2 HP	1	1		
202-007-613	MOTOR 3/4 HP			1	1
249-010-021	CONTACTOR 2 POLE/30 AMPS	1	1	1	1

WATER COOLED TYPE

PART NUMBER	DESCRIPTION	1	1.5	2	3
201-010-014	COMPRESSOR 1-TON 208/1	1			
201-015-102	COMPRESSOR 1.5TON 208/1		1		
201-020-012	COMPRESSOR 2-TON 208/1			1	
201-030-012	COMPRESSOR 3-TON 208/1				1
256-040-001	HP SWITCH MG-212060	1	1	1	1
256-050-001	LP SWITCH MG-201229	1	1	1	1
229-053-040	DRIER 1/2"	1	1	1	1

WATER PARTS

231-010-003	CO-AXIAL CONDENSER S-2	1	1	1	
231-010-004	CO-AXIAL CONDENSER S-3				1
222-040-060	WATER REGULATING VALVE 3/8"	1	1	1	
222-040-006	WATER REGULATING VALVE 3/4"				1
249-010-021	CONTACTOR 2 POLE/30 AMPS	1	1	1	1

TROUBLE SHOOTING

SYMPTON	PROBABLE CAUSE	CHECK OR REMEDY
High head pressure	Condenser fan not operating	Check power to motor.
	Dirty condenser coil	Clean coil.
	Insufficient open area around condenser	Clear area 3 feet all around condenser air inlet and discharge duct.
	Condenser discharge air recirculation	Duct discharge air way from inlet to condenser.
	Condenser water not circulating	Check pump and water regulating valve.
Room Temperature too high	Thermostat set too high	Reset thermostat to lower setting. Check for fan and compressor symptoms.
Room Temperature too low	Thermostat set too low	Reset thermostat to higher setting.
Low air flow	Dirty air filter	Replace air filter
Compressor not operating	Thermal overloads in in compressor open	Wait 5 minutes for automatic reset. Open disconnect. Remove cover from compressor. Check with ohm meter on the control circuit leads and isolate the defective overload.
Compressor will not operate when cooling is called for	Compressor out on high head pressure	See symptom "high head pressure".
	Low head pressure, out of refrigerant, or dirty filter	Change filter or recharge after fixing leak.
	Low pressure switch defective	Check low pressure switch for continuity, by disconnecting one of the wires on the switch and using an ohm meter to read continuity.
	Water sensor in the condensate pan senses high condensate level. Entire system shuts down.	Check for restriction in condenser drain line. Adjust humidifier needle valve if water run-off too high.
Main fan not operating	Power not on	Check high voltage disconnect.
	Overload tripped on motor	Wait 5 min. for auto. reset & determine the cause.
	Water sensor in condensate pan senses water. Entire system shuts down.	check for restriction in condensate drain line. Adjust humidifier needle valve if water run off too high.
Reheat not operating	Heater safety open	Check continuity through safety.
	Defective holding coil	Check for 24 v at holding coil.
	Thermostat not operating	Check thermostat on heating.
High humidity	Compressor not operating on dehumidistat	Check compressor for operation as in previous steps. Check dehumidistat.
	Humidistat set too high	Reset humidistat lower.
	Poor vapor seal in room	If the control is functioning properly by calling for dehumidification, check the room for proper vapor seal.
High humidity	No water flowing	Turn on water. Check strainer, valve & solenoid.
	Pad not clean	Clean/replace pad.
	Humidistat set too low	Reset humidistat Higher.
	Cold water	Heat water to 140 F.

SAMPLE



COMPU-AIRE INC.

Specialized Environmental Air Conditioning Systems

8167 Byron Rd., Whittier, CA 90606
PH (562) 945-8971 FAX (562) 696-0724

STANDARD ONE YEAR WARRANTY

Job Name: _____ Job No. _____ Date: _____

We warranty this Compu-Aire, Inc. computer room unit to be free from defects in material and workmanship; our obligation being limited to repairing or replacing at our factory any part (except as noted below) within one year from the date of shipment to the original purchaser. Parts to be returned to us PREPAID. Proof of start-up date must be submitted to the factory.

This warranty is effective only if the unit has been installed in accordance with our instructions and connected to proper and adequate electric, water and drain services, correctly dehydrated and placed into operation by a competent service representative.

Fan motor compressor warranty is covered by original manufacturer's warranty and any repair or replacement should be made by the local authorized service facility as listed the telephone book.

Maintenance and service such as replacing filters, humidifier cylinder, infra-red lamps, float valve assemblies, belts, cleaning, lubrication, calibration and adjusting are NOT INCLUDED in this warranty.

Replacement or repair parts shall be shipped from the factory pre-paid and invoiced for the full amount. Upon receipt of warranted parts within 30 days with prepayment of the component and which our inspection discloses the parts are defective, and show no signs of misuse, alterations, or abuse, full credit will be issued.

Compu-Aire, Inc. does not assume any responsibility for the labor expense for changing defective parts or replacement of any refrigerant or other cooling medium such as glycol etc.

All parts and goods are thoroughly inspected and packed to meet the requirements of railroad freight classifications bureaus, and under standard shippers risk, when they leave our factory. SHOULD GOODS ARRIVE DAMAGED, call the agents attention to damage, and have same noted on freight bill. For concealed damage, demand immediate inspection from agent of the shipping company and insist on a notation being made on freight bill.

Purchaser-User

Model Number

Serial Number



Authorized by

X _____

Quality Manager

CUSTOMER SERVICE & TECHNICAL SUPPORT

Website: www.compu-air.com

Phone: (562) 945-8971

Fax: (562) 696-0724

Business Hours: 08:00 AM – 04:30 PM, PST/PDT

UNITED STATES OFFICE

Compu-Aire, Inc.

8167 Byron Rd.

Whittier, CA 90606



Made in USA

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