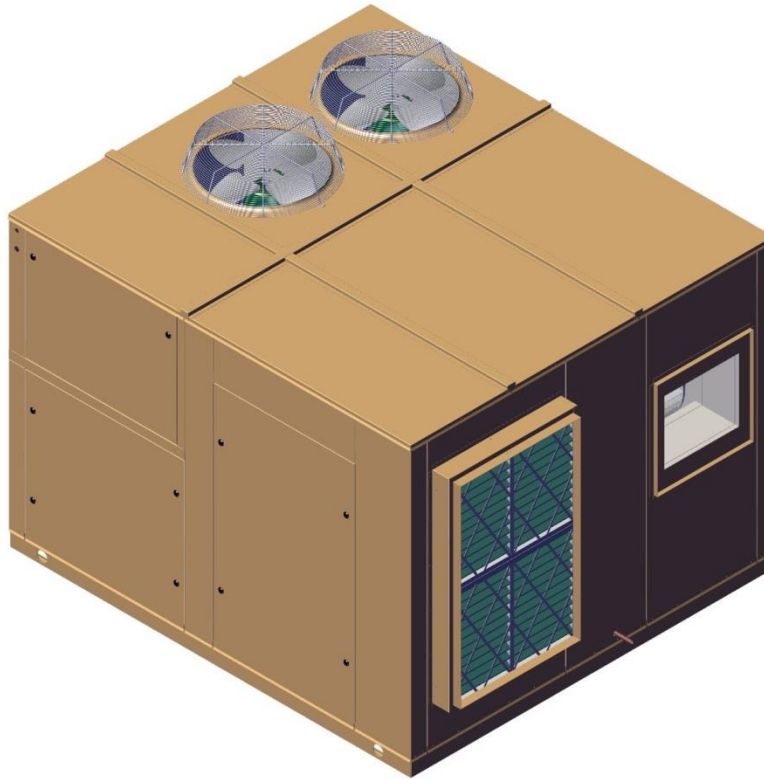




**MAXI KOOL ROOFTOP
-INSTALLATION AND OPERATION MANUAL-**

MKA-15 & 20 TON RTU



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ADDENDUM

CORRECT PHASING OF SCROLL COMPRESSORS:

The scroll compressor is a unidirectional compressor and will only compress refrigerant in one rotation direction. Therefore, the proper rotation of the scroll compressor must be checked. The scroll compressor will run in the reverse direction but it will not pump refrigerant and will draw substantially reduced current as compared to listed values, and will result in elevated sound levels. Scroll compressor will trip on internal protection after running for some time in the reverse direction.

Verification of the proper rotation of the scroll compressor is done by observing that suction pressure drops and discharge pressure rises when the compressor is energized.

WARNING:

EXTENDED IMPROPER OPERATION MAY ALSO VOID COMPRESSOR WARRANTY.

1 SAFETY INFORMATION

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 Maxi Kool Rooftop system. Below is 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.

General guidelines:

- a) Installation and maintenance are to be performed by qualified personnel only.
- b) Assure all field wiring conforms to the requirements of the equipment and all applicable national and local codes. Assure the voltage on the unit name-plate agrees with the power supply available.
- c) Avoid contact with any sharp edges. It may cause serious injury.
- d) Make sure all power sources are disconnected before any service work is performed on the equipment

DESCRIPTION OF IMPORTANT ACCIDENT PREVENTION SAFETY SYMBOLS

SYMBOL

DEFINITION¹



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.



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 and locked out from the feeder when installation or servicing operations are being performed and when power is not needed.

Compu-Aire Maxi Kool roof top series 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.



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.



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 is 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.

Once installation of the equipment is complete, the equipment should also be properly braced or anchored to the floor or wall if necessitated by local codes and ordinances. Up-flow units are especially at risk of falling over due to the fact that EC plug fans are installed at a higher distance from the unit's base, causing the center of gravity to be higher from the base compared to down-flow units.

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



SHARP EDGES, SPLINTERS, EXPOSED FASTENERS, AND HOT SURFACES

While every precaution has been made to ensure sharp edges, splinters, and exposed fasteners have been minimized internally and externally on the unit to prevent personal injury, it is highly recommended that all personnel installing or servicing the unit wear safety headgear, glasses, gloves, and shoes at all times. In addition, precaution should be taken to ensure the unit is sufficiently cool to perform any type of servicing operations.

A first aid kit should be readily available and accessible at all times when needed.

NOTICE

EQUIPMENT STORAGE POSITION AND LOCATION

Improper storage of unit may cause unintentional damage. If possible, keep unit in the upright position and stored in the units original shipping package. In addition, steps should be taken to ensure that the unit is protected from contact damage.

NOTICE

EQUIPMENT TRANSPORTATION

Prior to transporting unit to final installation location, ensure that there are no risks of overhead interference. Relevant measurements of the unit and all doorways should be taken to determine if unit will be able to be transported to its final location without causing damage to the building and to the unit itself. Required unit clearances at installation site should also be confirmed prior to unit transportation for safe and proper installation operations.

NOTICE

LOCATION OF DRAIN AND WATER SUPPLY LINES-Drains and water supply and return lines should not be located above any equipment that could sustain water damage.

NOTICE

CLOGGED OR LEAKING DRAIN LINES

Any clogged or leaking drain lines must be inspected and maintained to ensure that drain water runs freely through the drain system. Proper installation, application, and service practices should be used at all times to minimize the possibility of water leakage from the unit. Water leakage can cause severe 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.

2 CONTACTING COMPU-AIRE FOR TECHNICAL ASSISTANCE

Compu-Aire 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, 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.

3 PRODUCT MODEL INFORMATION

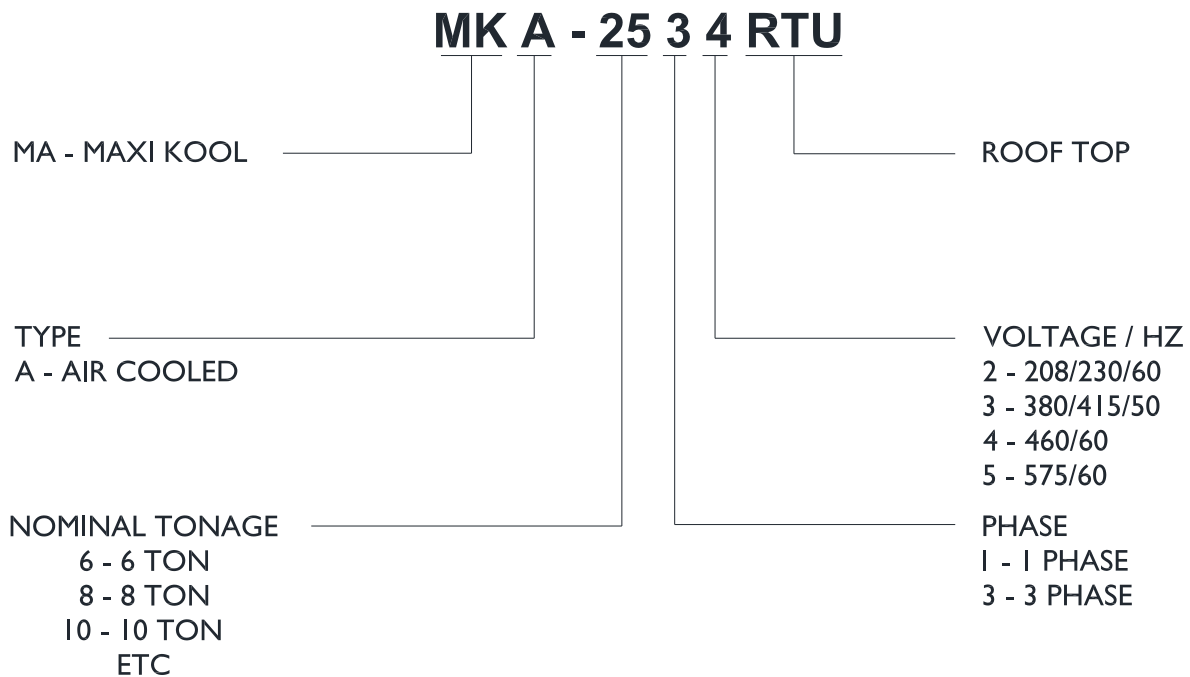


Figure 1 Unit Model Designation

4 GENERAL EQUIPMENT DESCRIPTION

The Compu-Aire Inc. Maxi-Kool roof top is an air conditioner specifically engineered for mini-computer environments and its usefulness extends to spot cooling for any application, however big or small the need may be. The Maxi-Kool roof top ceiling mounting allows the user to position the unit where it is needed the most, thereby reducing cost of long runs of duct work and other related expenses. The Maxi-Kool roof top provides complete control of temperature and humidity requirements practically anywhere, simply and economically.

The Maxi-Kool Roof top is usable in:

- a) Mini-computer rooms
- b) Any hot spot application such as hospitals, laboratories, banks, communication rooms, libraries, foyers, and many other special applications.

The Maxi-Kool roof top is designed to be serviceable in place without any rigging devices or service winches, thereby eliminating the necessity of undoing electrical and refrigerant connections.

The Maxi-Kool roof top utilizes a variable drive package for the evaporator and condenser sections for ease of field adjustment ability to match specific external static pressure requirements. Ceiling

duct-work can easily be moved without relocating the air conditioner which allows easy moving of air distribution devices such as ceiling diffusers and grilles.

The cabinet is constructed of heavy gauge galvanized steel. The frame of the unit is constructed of steel channels for floor mounting or ceiling mounting with hanger rods. The evaporator and condenser sections of the air cooled units are constructed so they can easily be field separated for ease of installation in tight spaces; or for installation in different parts of the building.

5 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. If any damage is found, make note of the damage on the shipping bill of landing prior to signing. Transport the unit to the desired location in the upright position to avoid damage 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.

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

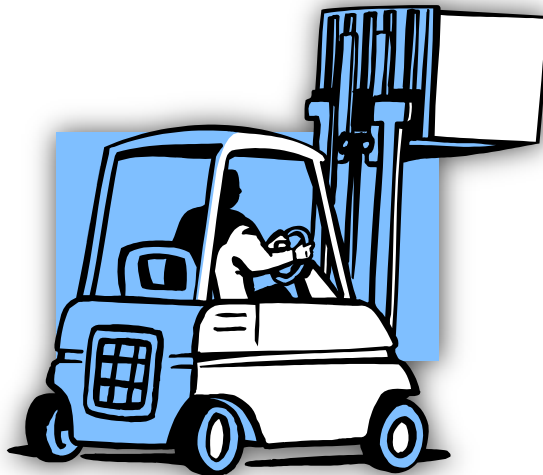


Figure 2 Transportation

5.1 TRANSPORTATION MODE

Visual inspection of the outer casing provides a simple indication of possible internal damage to the equipment. Move the unit to the installation site in the upright position.

FILE A CLAIM WITH THE SHIPPING COMPANY IF THE SHIPMENT IS DAMAGED OR INCOMPLETE. FREIGHT DAMAGE CLAIMS ARE THE RESPONSIBILITY OF THE RECEIVER.

5.2 IMPORTANT – READ BEFORE INSTALLING



Check the power supply. Voltage, frequency and phase must correspond to that specified on the unit nameplate. The power supply must be able to handle the additional load imposed by this equipment.

6 LOCATING THE UNIT

Consult local building codes and National Code for special installation requirements. When installing the unit, allow sufficient space for air flow clearance, wiring and servicing the unit. Left side, right side and front should have a minimum clearance of 36 inches for servicing. Rear clearance should be at least 1 inch to allow for out-of-square walls.

The location of the unit shall be selected based on air distribution in the room and service access requirement. Proper clearance is important for the unit function and access to various components for service.

Front clearance: 36"-Access to electrical component panel

Left clearance: 48"- Access to condenser air intake expanded metal grille

Rear clearance: 48" - Access to condenser air intake , humidifier, & blower motor

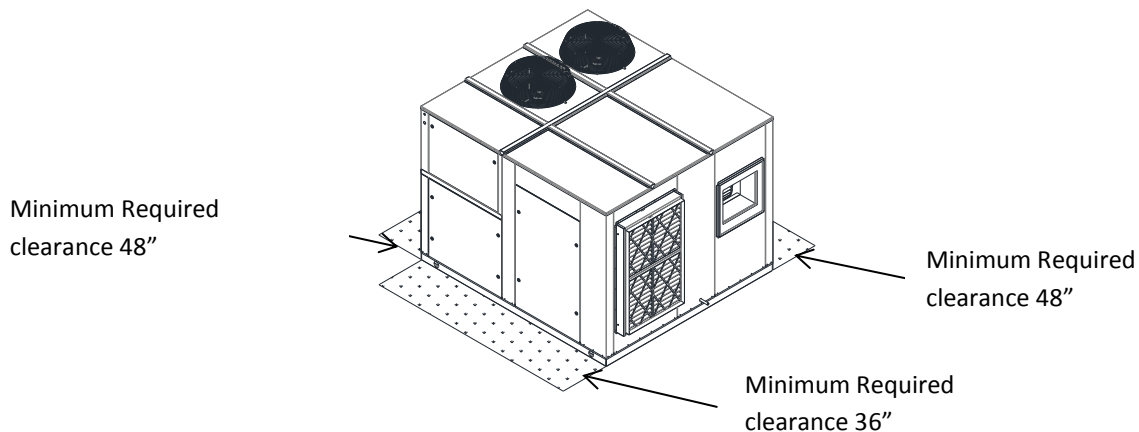


Figure 3 Roof Floor Clearance Requirement

Air distribution is very important for proper unit operation. Air balancing is required to obtain design CFM at site. Fan speed can be adjusted from the controller as needed (if applicable).

The unit is designed with draw-thru air pattern with negative pressure inside. The condensate drain connection with a proper p-trap will be installed at field to prevent the water is drawn back by the fans. The evaporator and condenser fans are double width, double inlet, and centrifugal type. Each fan assembly is dynamically and statically balanced and both use a heavy duty stainless steel shaft with permanently lubricated bearings. The fan motors are internally protected and 1750 rpm. The drive set is of the variable pitch type. Both fans are located on the downstream side of the coils for proper air flow over the cooling surface for maximum heat transfer.

6.1 CONNECTIONS

In connecting the unit, several items must be addressed. They are:

6.1.1 Structural Support

The unit can be installed directly on the roof top with roof curb. The curb should be level. Gasket material should be placed between the bottom perimeter of the unit and the curb to seal and to prevent water penetration.

6.1.2 Unit Mounting

The Maxi-Kool roof top is shipped as a complete package with the evaporator and condensing sections attached together. If the unit is to be ceiling hung, use 3/8" minimum diameter hanging rods for 2 thru 5 ton units and 5/8" minimum diameter hanging rods for 8 thru 12 ton units with washers, locknuts, and vibration isolators. Larger unit will be also provided with roof mounting clearance holes as specified. Hanger hardware is to be field supplied. The Maxi-Kool roof top must be level in order to drain condensate properly.

NOTE: Loading limitations of walls, ceilings, and/or floors must be paid particular attention to. Be sure to securely anchor the top ends of the suspension rods if the unit is to be ceiling hung. Make sure all nuts are tight. Be sure to follow all applicable codes.

6.1.3 Electrical Support

A fused disconnects or a HVAC approved circuit breaker must be field provided and install per the National Electric Code (NEC). There is access to the unit for electrical connection through the unit next to the electrical control box. Be sure unit is properly grounded.



Figure 4 Unit Components Access

6.1.4 Electrical Connection

The unit is completely factory wired with self-contained controls.

IMPORTANT - Before proceeding with the electrical connections, make certain that the volts, hertz and phase correspond to that specified on the unit rating plate. Also, check to be sure that service provided by the utility is sufficient to handle the additional load imposed by this equipment. Refer to the unit rating plate for equipment electrical requirements. The attached wiring diagram shows the proper high and low voltage field wiring.

Make all electrical connections in accordance with National Electrical Code and any local code ordinances that may apply. **USE COPPER CONDUCTORS ONLY.**

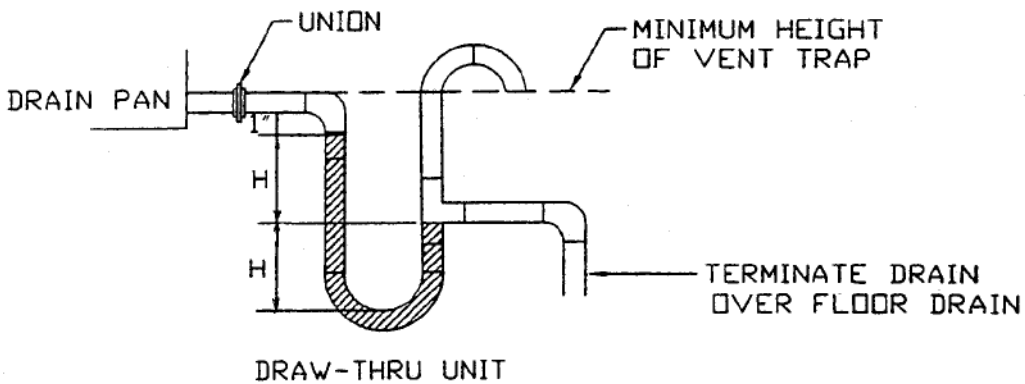
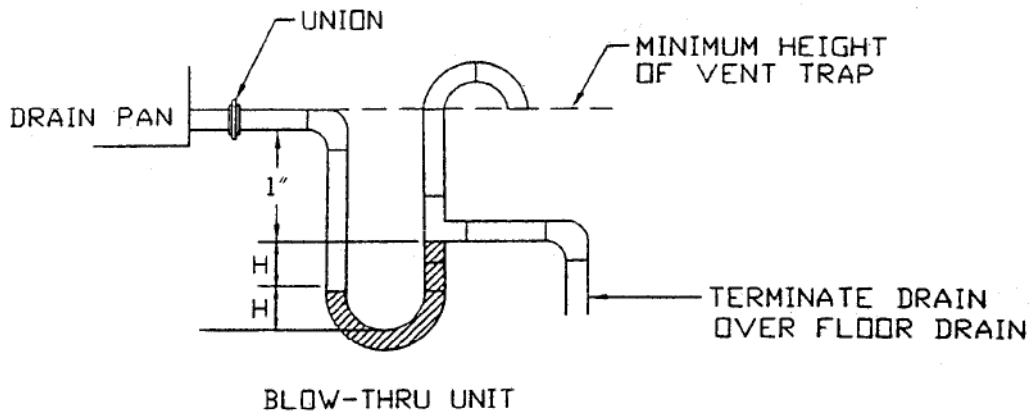
WARNING -- The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. It is important that an electrical ground wire of adequate size can be connected to the ground lug provided inside the control box.

Supply voltage at the unit must be within $\pm 10\%$ of the voltage indicated on the nameplate for a dual voltage rating, supply voltage must be within 5% from the lower nameplate rating and within 10% from the higher rating. Phase to phase imbalance must not exceed 3%. Contact your local utility company for correction of improper line voltage. Improper electrical power supply may cause premature failures and void unit warranties

6.1.5 Condensate Drain Connection

This must be equipped with 3/4" O.D. drain line. The contractor must provide and install a P-trap in this line at the lowest point in the unit or below the unit. A minimum slope of 1/4" per foot must be provided on the horizontal run.

The evaporator and 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.



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 the humidifier. Use copper or other suitable material for the drain.

6.1.6 Humidifier Connection

The humidifier is to be provided with a 1/4" O.D. feed line and shut off valve. To connect the humidifier, bring in a 1/4" O.D. copper line and connect to the humidifier shut off valve with the compression fitting. Access to this line is on top panel of the unit for the upflow model and is on the bottom of unit for the down-flow model.

Suggested pipe sizes are: Refer to the ASHRAE guide for proper sizing and layout. **A CHECK VALVE MUST BE INSTALLED IN THE DISCHARGE LINE.**

7 REFRIGERANTS

7.1 REFRIGERANT OIL CHARGE

DO NOT MIX DIFFERENT TYPE OF REFRIGERANT ON THE SAME SYSTEM.

For adding refrigerant oil please follows compressor manufacturer for the proper type of refrigerant oil used for the system. **DO NOT MIX DIFERRENT TYPE REFRIGERANT OIL IN THE SAME SYSTEM OR COMPONENT FAILURE AND SYSTEM MALFUNCTION MAY OCCUR.**

The Maxi Kool air-cooled system unit is shipped with factory pre-charged refrigerant or nitrogen. System must be charged enough with correct type of refrigerant and refrigerant oil. Generally, the oil charge should be 2 to 3% of the liquid line charge. **USE ONLY POLYOL ESTER (POE-32) OIL FOR ALL THE COMPRESSORS.** See the compressor name plate for original oil charge. Manufacturer recommends compressor should be charged 4 fluid ounces (118 ml) less than the name plate value for a full complete recharge on the compressor.

It is recommended if the system contains more than 20 lbs (9 kg) of refrigerant; add one fluid ounce for every additional 5 pounds (15ml/kg) of refrigerant over this amount.

7.1.1 Evacuation Procedures

CAUTION: PULL ALL FUSES EXCEPT MAIN FAN AND TRANSFORMER FUSES. To reduce the possibility of non-condensables in the refrigerant system during charging, the solenoid valves must be open and a vacuum must be pulled on both the suction side and the discharge side of the compressor.

PROCEDURE FOR DEHYDRATION - METHOD #1

- 1) Open all disconnects switches.
- 2) Pull all fuses except main fan and transformer fuses.
- 3) Turn disconnect ON
- 4) Start the main fan by pushing the main fan switch.
- 5) Check amperage on main fan and make sure it does not exceed FLA (full load amps).
- 6) Check fan rotation and correct if necessary.
- 7) Set thermostat at 40°F.
- 8) Proceed with paragraph #4 in procedure #2.

PROCEDURE FOR DEHYDRATION - METHOD #2

By using a separate control voltage transformer having an output of 24 volts at 40 VA, the solenoid can be energized without starting the unit.

- 1) Turn all power OFF to the unit.

-
- 2) Remove all fuses including main fan and transformer fuses.
 - 3) Connect the external transformer to the solenoid valves.
 - 4) Evacuate the system in accordance with the following procedure:

Connect the refrigeration gauges on circuits #1 & #2 at both the suction and discharge service valves.

Start with circuit #1 and open all service valves. Place in circuit #1, 150 psig of DRY NITROGEN with a tracer of Freon for the purpose of leak checking. With pressure in circuit #1, open the discharge and suction valve on compressor #2. If pressure increases in #2, the system is cross circuited and must be re-checked for proper piping. If there is no pressure increase, place 150 psig of DRY NITROGEN with a tracer of Freon in circuit #2 and leak test.

After completion of leak testing, release test pressure & pull a vacuum on the system. Leave this pulled down for approximately 4 hours and re-check the gauge reading. If it has not changed purge with Freon, pull another vacuum of 250 microns, leave on for 2 hours and re-check the gauge readings. Purge with Freon and re-pull the vacuum of 250 microns (9.842 in. hg.) or less. After the completion of this step, fill the system with Freon vapor until pressures have equalized in the liquid and discharge lines.

7.1.2 Liquid Charge

After the final vacuum has been pulled on the systems, liquid refrigerant may be placed in the receivers. This is accomplished by the following procedure:

- 1) Make sure the unit is off and that the solenoids are closed.
- 2) Connect a set of manifold gauges to the refrigerant drum and to the receiver at the rotalock adapter.
- 3) Purge the refrigerant hoses so that no non-condensable will enter the systems.
- 4) Open the refrigerant drum so that the liquid will flow from the drum to receiver.
- 5) Open the rotalock valve and allow the refrigerant to flow into the receiver.
- 6) Close the rotalock valve and disconnect gauges.
- 7) Start the compressor.

7.1.3 Vapor Charge

- 1) After the dehydration procedures have been followed, replace the fuses in the condenser fan compressors and transformer circuits.
- 2) Connect hose from drum to suction port of the compressor, purge hose so that no non-condensables are in the hose.

3) Start the compressors check the level in the sight glass. If the level has lowered, add additional Freon to maintain the sight clear. After charging is complete, reset the high pressure switch.

Approximate charge required per circuit:

As recommended by ASHRAE MANUAL.

Total Charge = Basic Charge + Liquid Line Based on Hermetic and scroll Compressor Line and Refrigerated Liquid at 100F

7.1.4 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 lines (if provided)

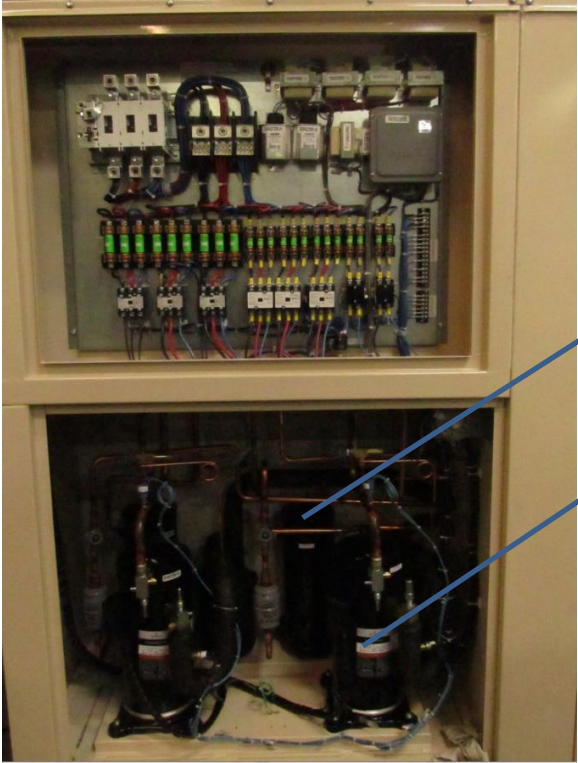
7.2 HOW TO SAVE REFRIGERANT

The process of opening a refrigerant circuit of the Maxi Kool and saving the refrigerant charge of the system to be opened requires only a few more minutes than does blowing the refrigerant charge.

Intentionally blowing the charge is illegal.

The procedure for saving the refrigerant charge is as follows:

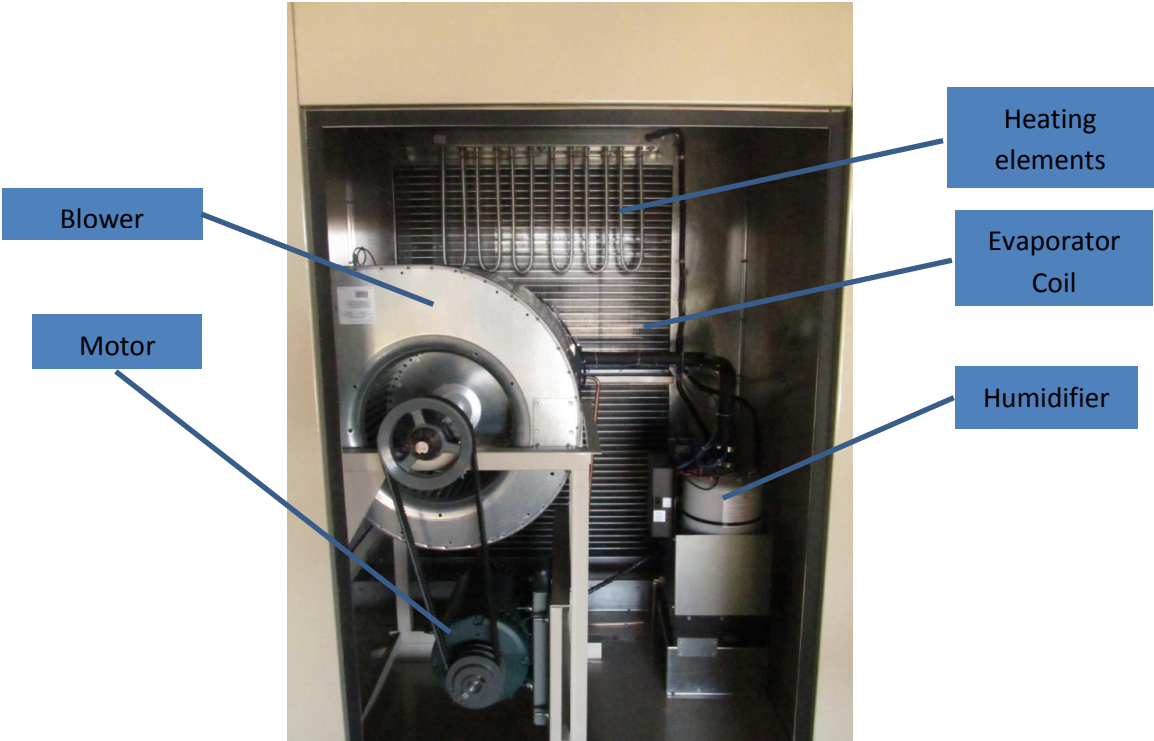
- 1) Open disconnect switch.
- 2) Pull fuses on system not to be opened.
- 3) Install manifold on the receiver at each rotalock valve, using the high pressure gauge and the charging hose.
- 4) Purge the hoses to remove any condensables.
- 5) Start the unit and set the thermostat at 40 degrees F; this will start the compressor.
- 6) Return to the receivers.
- 7) Backseat the rotalock valves on the system being pumped down. Open gauge and rotalock valve on the other system.
- 8) During this procedure, watch the gauge pressure to prevent the receiver from over-filling. If the gauge pressure starts to rise, do not let the pressure exceed setting on pressure relief device located on the receiver.
- 9) Open the rotalock valve of the system, release vapor pressure present and make necessary repairs.
- 10) Evacuate the system. After evacuation is complete, the liquid can be transferred back into the proper system, through the manifold gauge.



Liquid Receiver

Compressor

Figure 5 Compressor Compartment



Blower

Motor

Heating elements

Evaporator Coil

Humidifier

Figure 6 Evaporator supply air access

8 LOW AMBIENT CONTROL OPTIONS

8.1 FAN CYCLING CONTROL

A standard Maxi-Kool roof top air Cooled unit is provided with a fan cycling (On/Off) control on the condenser fan. The fan cycling control provides mild ambient down to 50F.

8.2 LOW AMBIENT CONTROL DAMPER

For locations where the Maxi-Kool roof top is needed to operate below 50°F, a low ambient damper control is provided at condenser fan discharge. The damper control can be effective down to 0 F.

8.3 HEAD PRESSURE CONTROL (-20 F)

This type of low ambient control includes head pressure control valves and the receiver package. The head pressure control valve is factory installed on the condensing coil. The receivers are also mounted inside the unit.

8.3.1 Operation of Head Pressure Control Valve:

During periods of low ambient temperatures the condensing temperature falls until it approaches the setting of the head pressure control valve, which throttles towards a closed setting, thus restricting the flow of the liquid from the condenser. This causes the refrigerant to back up in the condenser and reduces the effective condenser surface. The check valve opens after the head pressure control has offered enough restriction and then causes the differential between the condensing pressure and the receiver pressure to exceed 20 PSIG. The hot gas flowing through the check valve serves to heat the cold liquid being passed by the limitizer valve. Thus, the liquid reaches the receiver warm and with sufficient pressure to assure proper expansion valve operation. The check valve and limitizer valves modulate the flow automatically to maintain proper condensing pressures. Receivers are installed inside the compressor compartment.

8.3.2 Electrical Connection

The unit is completely factory wired with self-contained controls.

IMPORTANT - Before proceeding with the electrical connections, make certain that the volts, hertz and phase correspond to that specified on the unit rating plate. Also, check to be sure that service provided by the utility is sufficient to handle the additional load imposed by this equipment. Refer to the unit rating plate for equipment electrical requirements. The attached wiring diagram shows the proper high and low voltage field wiring.

Make all electrical connections in accordance with National Electrical Code and any local code ordinances that may apply. USE COPPER CONDUCTORS ONLY.

WARNING -- The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. It is important that an electrical ground wire of adequate size can be connected to the ground lug provided inside the control box.

Supply voltage at the unit must be within $\pm 10\%$ of the voltage indicated on the nameplate for a dual voltage rating, supply voltage must be within 5% from the lower nameplate rating and within 10% from the higher rating. Phase to phase imbalance must not exceed 3%. Contact your local utility company for correction of improper line voltage. Improper electrical power supply may cause premature failures and void unit warranties

The system cutout terminals on the terminal strip are for connection to a "panic button" or remote shut-off if required. This should only be connected to a switch and NO EXTERNAL SOURCE OF POWER SHOULD BE INTRODUCED AT THIS POINT. The conductors should be sized depending on the length of run and the number of control transformers used in the unit. **Maximum voltage drop must not exceed 1 volt.** Each control transformer draws approximately 3 amps @ 24 V. For long runs where the conductor size becomes too large, an interlocking relay (field provided) should be used.

A dry contact (24 volts rating) is provided for terminals for a remote alarm connection.

If the control panel includes a condensate probe, make sure it is mounted below the unit against the floor area where water may collect. To check the operation of the probe, submerge it in a cup of water. The condensate alarm should energize.

9 GENERAL WIRING DIAGRAM

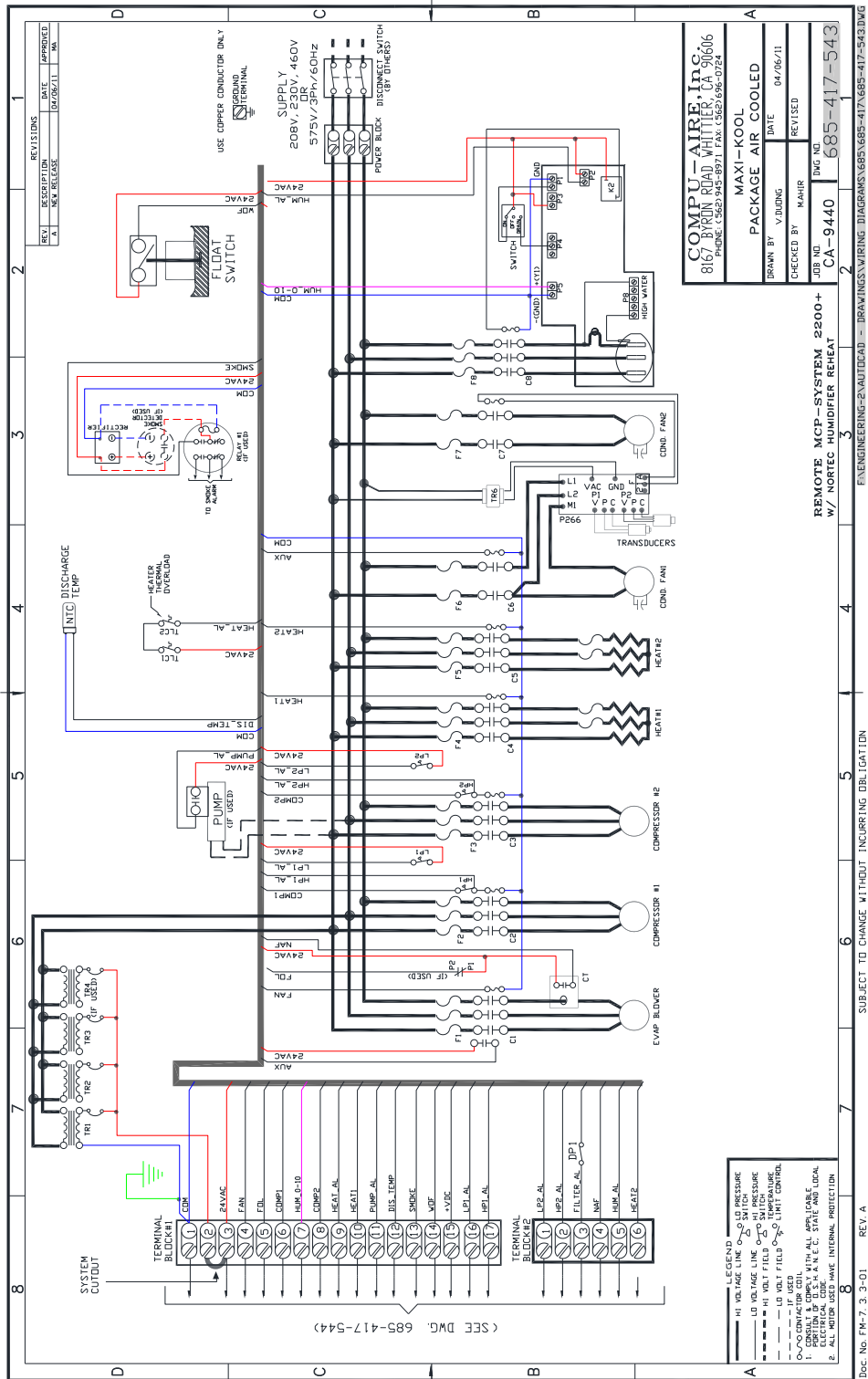


Figure 7 Unit Wiring Schematic

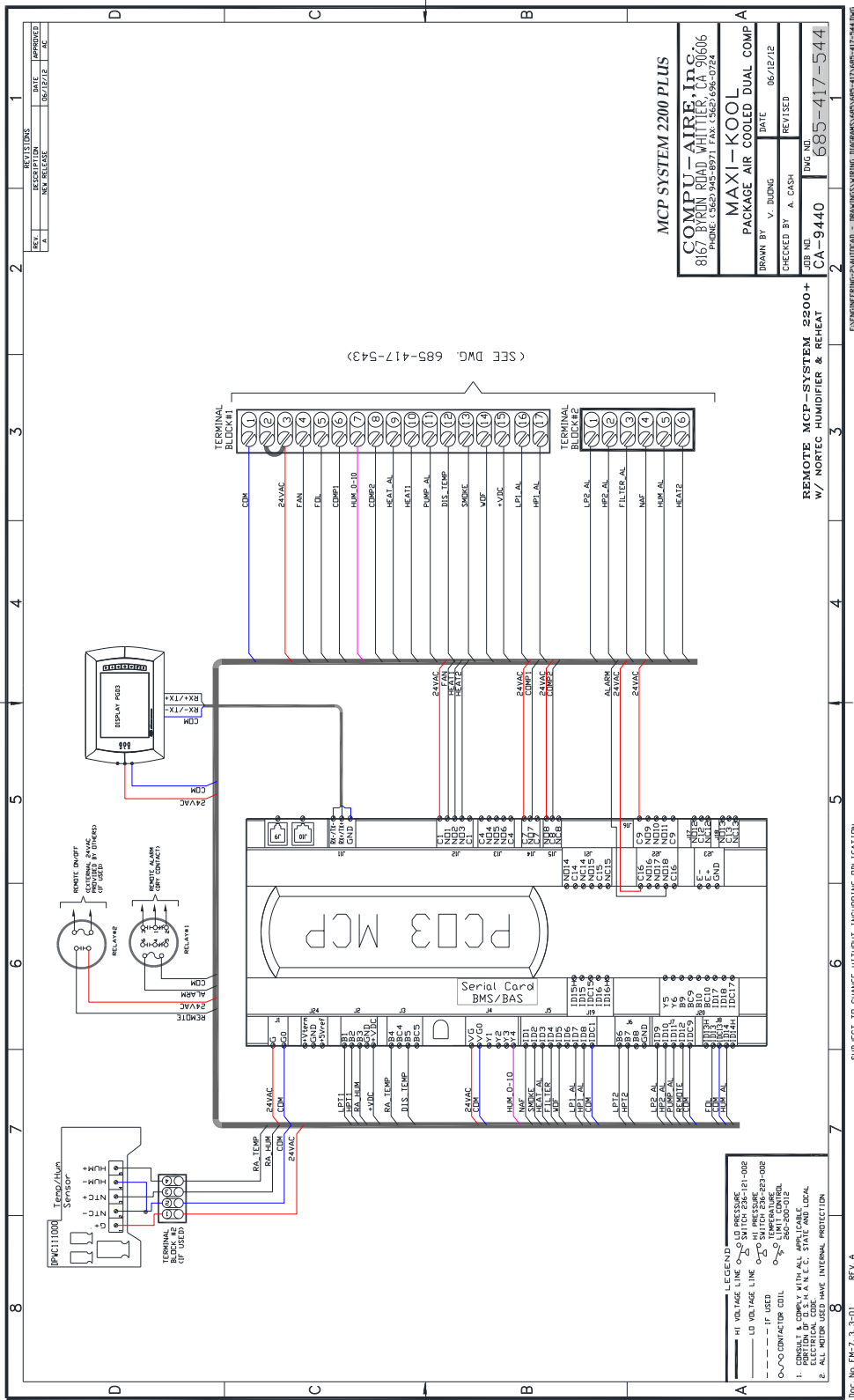


Figure 8 MCP Panel Wiring Schematic

10 COMPONENTS OPERATION GUIDE AND MAINTENANCE



HIGH-SPEED MOVING PARTS

Risk of high-speed moving parts can cause injury or death. Disconnect all local and remote electric power supplies and make sure blowers have stopped rotating before performing service operations.

Do not operate up-flow units without installing a supply air plenum, ductwork or protective guard over the blower openings.

The unit you have received is very special. It is specifically designed for Computer Room applications. Please read the following INSTRUCTIONS prior to working on the equipment.

ELECTRICAL DATA: 208v, 3 phase, 60 h, 460v, 3 phase, 60 hz, 208v, 1 phase, 60 hz, 575v, 3 phase, 60 hz, 3 phase, 60 hz, or 415/380v, 3 phase, 50 hz.

Please check the voltage.

NAMEPLATE DATA: Refer to the unit name plate. It indicates all the electrical data for the unit.

LOCAL ELECTRICAL CODES OR ANY OTHER APPLICABLE CODES MUST BE COMPLIED WITH PRIOR TO WORKING IN THE UNIT.

10.1 SYSTEM TESTING

The performance of all control circuits can be tested by actuating each of the main functions. This is done by temporarily changing the set points.

10.1.1 Cooling

To test the cooling function, set the setpoint for a temperature of 10°F (5°C) below room temperature. A call for cooling should be seen and the equipment should begin to cool. A high temperature alarm may come On. Disregard it. Return setpoint to the desired temperature.

10.1.2 Heating

Reheat may be tested by setting the setpoint for 10°F (5°C) above room temperature. A call for heating should be seen and the heating coils should begin to heat. Disregard the temperature alarm and return the setpoint to the desired temperature.

10.1.3 Humidification

To check humidification, set the humidity setpoint for an RH 10% above the room humidity reading. For infrared humidifiers, the infrared element should come On. Steam generating humidifiers should click immediately as it energizes. After a short delay, the canister will fill with water. The water will heat and steam will be produced. Return the humidity setpoint to the desired humidity.

10.1.4 Dehumidification

Dehumidification can be checked by setting the humidity setpoint for an RH 10% below room relative humidity. The compressor should come On. Return humidity setpoint to the desired humidity.

10.1.5 Electric Panel

The electric panel should be inspected for any loose electrical connections

10.2 HUMIDIFIER

The steam humidifier on COMPU KOOL III system is the most advanced OEM steam humidifier and provides steady and reliable humidification using the same proven cylinder technology as Nortec's commercial NHTC. Depending on the unit configuration, the steam humidifier capacity can be range from 5 to 30 lb/hr. Each steam humidifier has different size of mounting cabinet and replaceable canister. Please refer to Table 2. Part List for the correct part number of the humidifier. **Refer to supplied installation and operation manual of the steam generator humidifier for a complete guidance.**

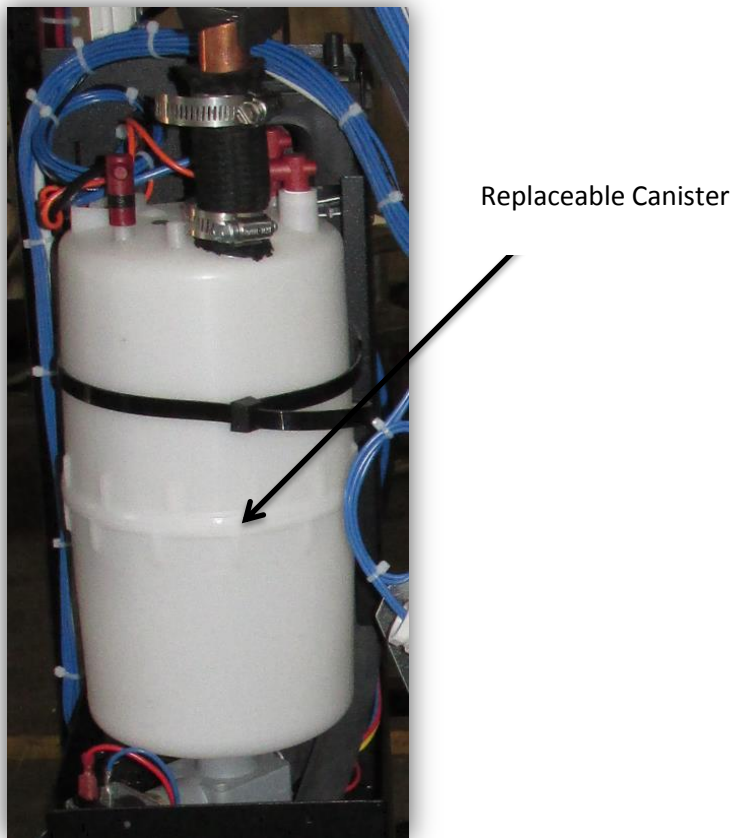


Figure 9 Steam Humidifier

10.3 REHEAT

Unit is equipped with one of the following reheats:

- Electrical heating elements
- Hot Gas
- Hot Water
- Steam
- No reheat

Check your unit for the kind of reheat it has. For type hot water and steam piping connections are required. Make sure shut off valves are provided external to the unit.

The most common type of reheat used in Compu Kool III unit is the electrical heating elements. The number of the stages and elements depend on heating required for dehumidification.

Temperature Limit
Switch capillary tube



Figure 10 Reheat Elements

10.4 CONDENSATE DRAIN

One condensate drain is provided on the Compu Kool III systems. The drain connection is trapped externally. Refer to Table 1 Piping Connection Data for drain piping connection size of the unit.

10.5 CONDENSATE PUMP (optional):

When provided it is mounted in the unit or shipped separately. If the condensate pump mounted on the floor stand, field install requires providing piping connection from the unit to the condensate pump and piping from the pump to dump the condensate water. Wiring and connector for high voltage for electrical power to the pump and low voltage wiring for pump failure alarm are provided by factory. Field install must connect all wirings properly for pump to function. To avoid any flooding problems provide a separate power source. WIRE THE PUMP TO SHUT THE SYSTEM OFF IN CASE OF OVERFLOW OR PUMP FAILURE. A SYSTEM CUT OFF TERMINAL IS PROVIDED IN THE UNIT.

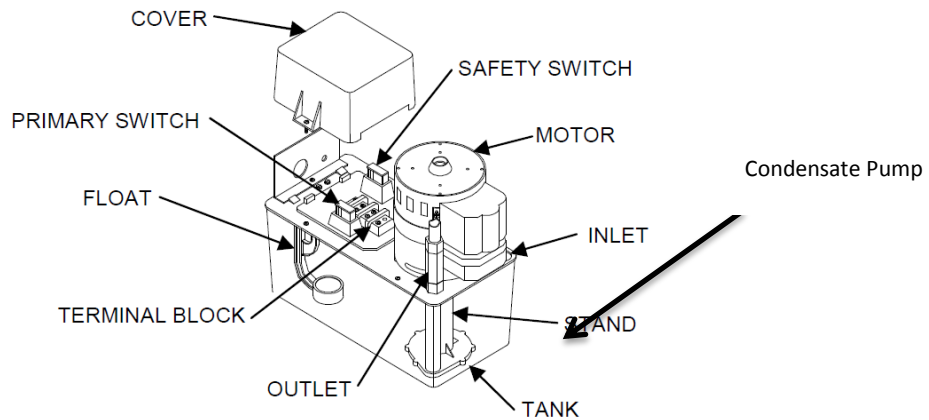


Figure 11 Condensate Pump Schematic

Refer to the provided owner’s manual for a complete installation guide of the condensate pump.

COMPRESSOR: Standard units are provided with scroll compressors. Each compressor is provided with a safety high pressure switch. It is manual resettable and is factory set to open at 400 psig. A low pressure switch is also provided which is automatic reset.

CONTROL PANEL: This control panel is to be installed and wired in the field. **MAKE SURE TO PROPERLY HOOK UP THE SENSOR CONNECTION TO THE SCR CONTROLLER WHICH ARE TO BE MADE IN THE FIELD**

ALL REFRIGERATION PIPING SHALL BE INSTALLED PER ASHRAE STANDARDS.

CONTROL PANEL: This control panel is to be field mounted, wired and provide a fused disconnect switch for the power.

IMPORTANT SUGGESTION

In order to have trouble free operation please maintain the humidifiers, regularly check the unit operation and change filters when they are dirty.

For assistance, please call COMPU-AIRE, INC. at (562)945-8971

11 UNIT DIMENSIONS AND GENERAL COMPONENT LAYOUT

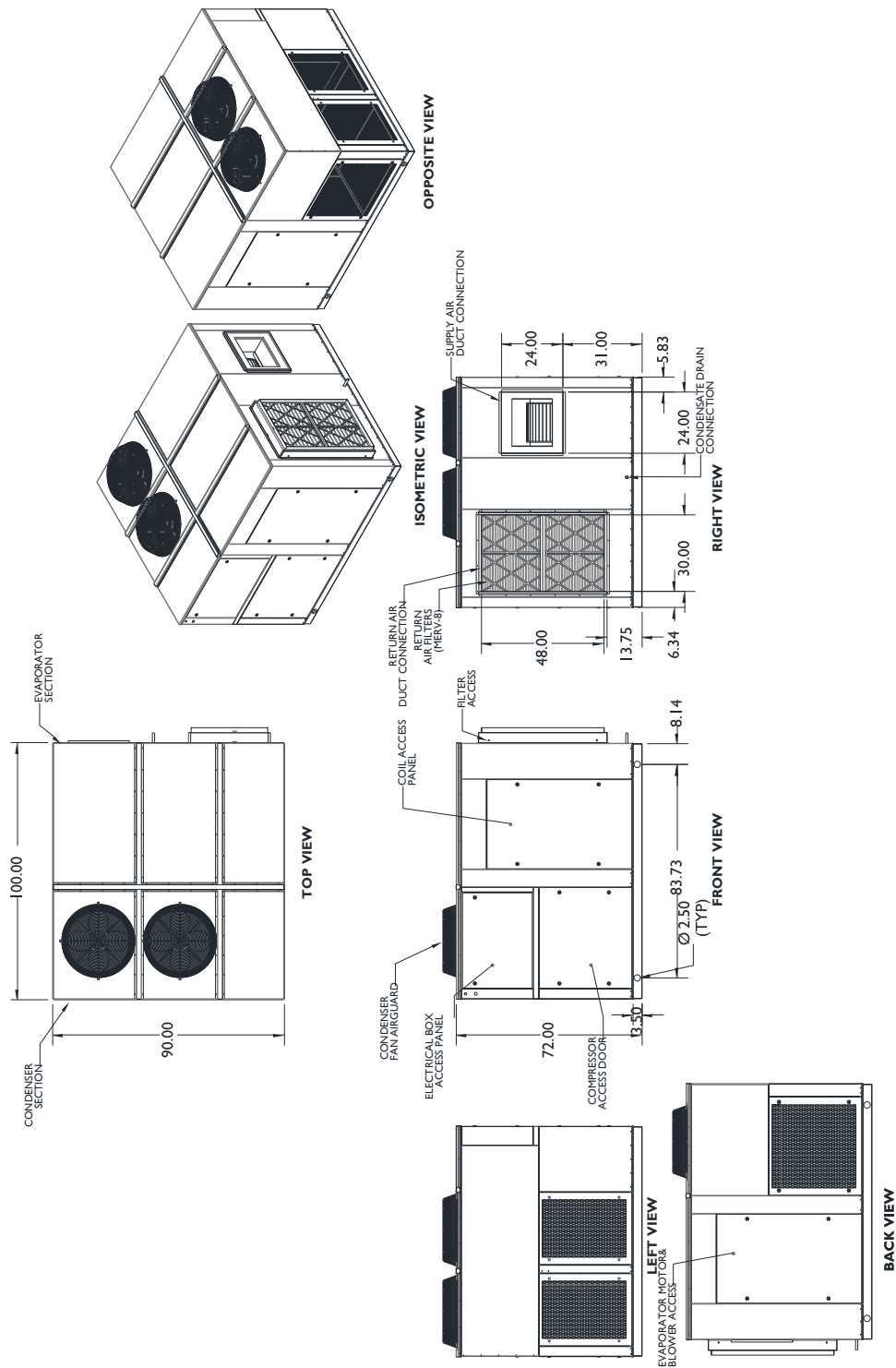


Figure 12 Unit Dimension Uflow Unit Shown

PIPING CONNECTION DATA-ALL SIZE IN COPPER OD*

LIQUID LINE	1/2	1/2	5/8	5/8
SUCTION LINE	3/4	3/4	7/8	7/8
HUMIDIFIER WATER SUPPLY	1/4	1/4	1/4	1/4
CONDENSATE DRAIN	3/4	3/4	3/4	3/4
WATER SUPPLY	3/4	3/4	1 1/8	1 1/8
WATER RETURN	3/4	3/4	1 1/8	1 1/8

*ALL DIMENSIONS ARE IN INCH

Table 1 Piping Connection Data

12 COMPONENTS IDENTIFICATION

12.1 ELECTRICAL PANEL LAYOUT

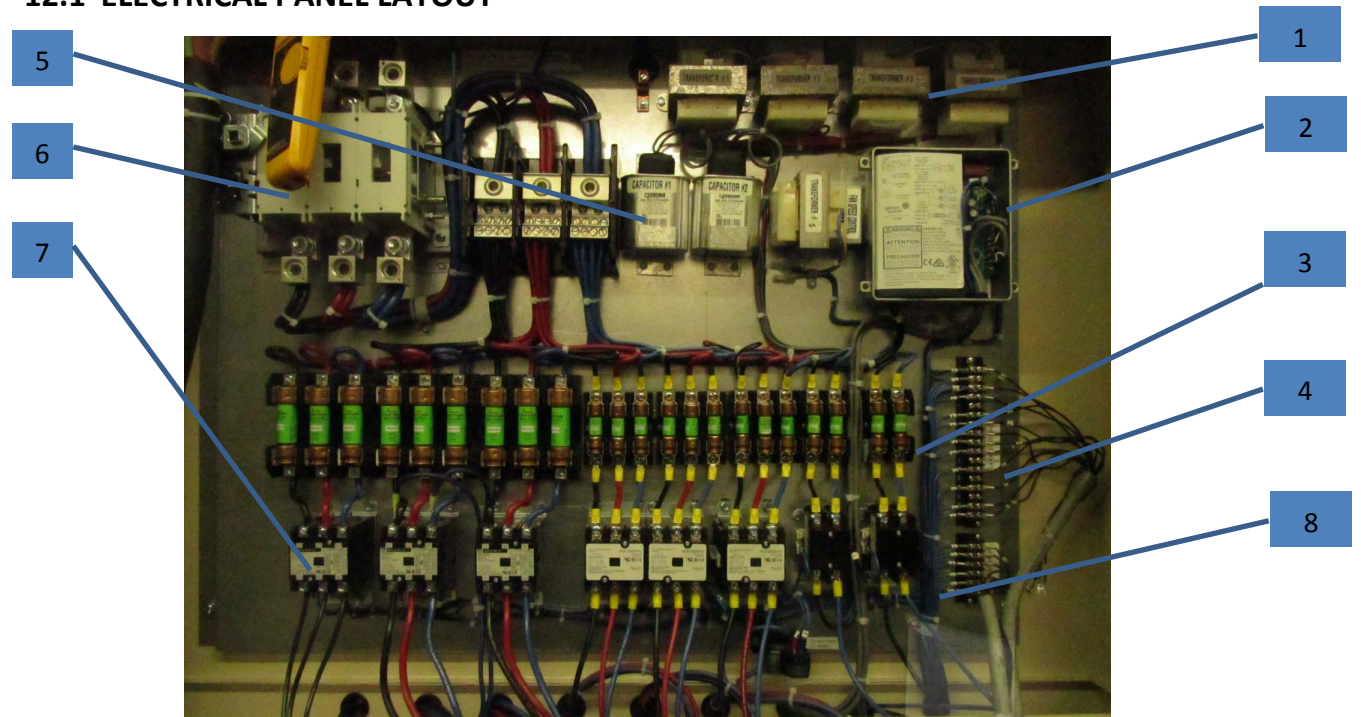


Figure 13 Electrical Components

NUMBER	NAME
1	TRANSFORMER
2	RELAYS
3	FUSE BLOCKS AND FUSES
4	TERMINAL BLOCK CONNECTIONS
5	CONDENSER MOTOR CAPACITOR
6	DISCONNECT SWITCH
7	CONTACTOR
8	RELAY

13 SYSTEM CUT-OUT JUMPER FOR EMERGENCY SHUT-DOWN

The unit is completely factory wired with self-contained controls to run without using external system cut-out. When external system cut-out is used, remove the jumper between terminal 5 and 6 and use NC dry contact of field provided system cut-out relay.

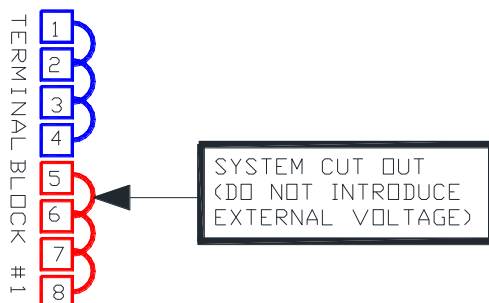


Figure 14 Terminal Block with System Cut-Out

The system cut-out terminal on the terminals strip is for connection to a “panic button” or EPO Switch when emergency shut-down is required. The system cut-out jumper shall only be replaced by separate dry contact for each unit and **NO EXTERNAL SOURCE OF POWER SHOULD BE INTRODUCED AT THIS POINT**. The EPO relay must be installed in the unit control panel to minimize voltage drop in control circuit.

Remote ON/OFF relay shall not be used for emergency shut-down purpose. This relay is design to provide systematic shut down by the controller programming. Remote ON/OFF relays can be disabled from controller programming and unit may not shut-down in case of emergency.

14 REMOTE ALARMS

One Alarm Relay with a set of dry contact is provided for remote connection whenever the unit alarm is energized. Default setting for this alarm relay is programmed to be energized for global alarm however; it can be changed to selectable alarm to customize for specific alarms only. See controller guide for more detail on how to program this relay for selectable alarms.

If unit is provided with extra relays, see unit wiring diagram and submittal for detail.

If the unit is provided with condensate overflow sensor, the unit mounted control panel includes a condensate probe module. The condensate probe sensor shall be shipped loose for field installation. Condensate probe sensor shall be located underneath the unit where water may collect to sense any condensate overflow. To check the operation of the probe, submerge it in a cup of water. The condensate alarm should energize.

If the unit is provided with sensing cable type leak detection system, use specific manual provided by the manufacturer to install the complete system. Alarm relay dry contact from sensing cable type leak detection system can be connected to the digital input for condensate alarm of unit controller. Use 24VAC power from the unit terminal block for this alarm input

15 START-UP AND TEST PROCEDURE

15.1 CHECK THAT ALL WIRING IS CORRECT

To perform this test the unit must be turn OFF. Check that properly sized fuses are installed in the disconnect switch. Correct fuse size and minimum circuit ampacity are listed on the unit nameplate. Now, check the wiring connections in the Main Control Panel to see if they are tight. It is best that this be checked prior to operating the machine. After checking, close the Main Control Panel cover and proceed as follows:

Microprocessor Control Panel – With the system switch in the “OFF” position, apply power to the unit. The “Power ON” light should illuminate.

15.2 CHECK FOR CORRECT PHASING

The equipment should now be checked for correct phasing required to make the blower motor turn in the correct directions. For this test it is necessary to open the right side doors of the unit to observe the blower and blower motor. Now, momentarily switch the system switch to the “ON” position and then back to “OFF”. The blower motor will have started and it is therefore possible to determine rotation. On Compu-Aire units, the blower should be rotating in a CLOCKWISE direction in downflow units and COUNTERCLOCKWISE direction in upflow units, looking in the right side of the unit. Heaters and humidifiers are not affected by phasing.

15.3 BLOWER SPEED ADJUSTMENT

Adjustment of the air flow maybe desired. The air flow can be readily adjusted on the microprocessor controller (See microprocessor controller for instructions). After the unit has been started and the air flow properly adjusted, check the blower motor current to ensure is increased; the blower motor current should be checked. If a field adjustment is made, the motor should run for at least one hour at maximum design room temperature to see if motor trips on internal overload. For proper motors amps refer to the name plate.

15.4 NO AIRFLOW & CLOGGED FILTER ADJUSTMENT

The "No Air Flow" light and alarm should be checked prior to the completion of the installation. Although the control adjusted at the factory, varying local conditions make it impossible to provide accurate pressure adjustments.

To check the filter pressure switch, let the unit operate on cooling for about 30 minutes. This will allow the evaporator coil surface to become wet. The air pressure differential switch is

provided with adjustable knob. Set the knob to desire pressure drop for dirty filter and verify the Dirty Filter alarm. With the unit cooling and filters in place, block off approximately 75% of the air intake. If the sensing device is correctly adjusted, the "Clogged Filter" alarm should energize; the sensing device should have just turned on the alarm at the 75% blocked inlet condition. An Air Flow Sail switch is also provided at the discharge side of the blower and will activate the No Air Flow malfunction light and alarm.

Similar to the clogged filter switch, adjustment may be necessary for the no air flow switch(s). The loss of airflow switch is wired in the normally closed position to open on airflow and the dirty filter switch is wired to the normally open position and set to close with dirty filter. Adjustment can be made by removing the top cover and turning the dial to the proper pressure. See Figure 9 below.



Figure 15 Air Pressure Differential Switch

16 GENERAL MAINTENANCE

General maintenance must be performed in regular intervals to provide continued operation of the entire unit. The maintenance intervals must be determined site specifically. Use the maintenance checklist at the end of this manual when performing maintenance. Typically, air filters should be replaced no less than two times per year.

The filters should be checked and changed periodically. When they become dirty, an alarm is activated the filter pressure switch. If the filters are dirty, they must be changed for efficient operation of your system. To check the alarm indicator, cover approximately 75% of the return air opening; the alarm should energize. If the alarm energizes prematurely or does not energize when it should, adjust the filter switch. All doors to machine should remain closed before determining whether an adjustment is necessary. Spare filters should be kept in stock. Filters should be checked monthly and replaced if necessary.

The maintenance intervals must be determined site specifically. Use the maintenance checklist at the end of this manual when performing maintenance. In order to ensure that the refrigeration system runs trouble free for many years, a follow-up maintenance program (consisting of a minimum of two inspections per year) should be set up. A qualified refrigeration service mechanic should carry out this semi-annual inspection. The main power supply **must be disconnected and locked off** to avoid accidental startup of the equipment.

- (1) Check electrical components and tighten any loose connections.
- (2) Check all wiring and electrical insulators.
- (3) Check contactors to ensure proper operation and contact point for wear.
- (4) Check that fan motors (if applicable) are operational, ensure fan blades are tight and all mounting bolts are tight.
- (5) Check oil and refrigerant levels in the system.
- (6) Ensure that the condenser surface (if applicable) is cleaned and free of dirt and debris.
- (7) Check the operation of the control system. Make certain that all of the safety controls are operational and functioning properly.
- (8) Check all refrigeration piping. Make sure that all mechanical joints and flare nuts are tight.

Service Parts Availability

Genuine replacement service parts should be used whenever possible. Parts may be obtained by contacting your local sales representative or authorized distributor. Contact us 562.945.8971

17 REFERENCE DOCUMENTS



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

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

Condensate Pump

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

Electrical Panel

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

Controls

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

Notes _____

Signature _____
Company _____

18 TROUBLESHOOTING GUIDE

Complaint	Problem	Symptom	Action
1. System does not run.	No 24VAC supply voltage.	Power LED is not on.	Check circuit breaker in system 24VAC circuit and reset if necessary. Check System cutout switch. Test for 24VAC at pins 1 and 2 of MCP. If no voltage check machine wiring. Otherwise, if voltage replaces MCP.
	System is not turned on.	Power LED is on but, System LED is off.	Press the On button on the MCP. If the system does not start and the display is blank, replace the MCP.
	Bad or locked up MCP.	Display is blank, shows erroneous characters or does not change messages.	Press Off button on MCP then press On button. If the system does not start or if the display still shows erroneous information, replace the MCP.
Complaint	Problem	Symptom	Action
2. Nothing is visible on the display or is barely visible.	Display contrast is adjusted too low.	Power is on and system is running okay. But, nothing is visible or is barely visible on display.	Refer to the section MCP Circuit Adjustments, in this guide. Adjust display contrast for best visibility. The display will not be visible unless light is directed into it (it does not have its own light source).
3. Temperature or humidity displayed is wrong.	Sensor circuits are out of calibration.	Displayed value(s) are wrong by a few increments.	If the value is wrong by a few degrees or percent when compared to an accurate measuring instrument, then try

			recalibrating the sensor circuits (see the section MCP Circuit Adjustment, in this guide).
	Wiring to sensor circuit board(s) are loose or broken.	Display shows very high or low values or values that change erratically.	Check all wiring between the sensor circuit board and the MCP for loose connections. If the values
Complaint	Problem	Symptom	Action
			don't change and they seem to be at an extreme high or low, test for 24-VAC at the sensor board. Test for continuity between Temp and Hum on the sensor board and pins 9, 14, and 16 on the MCP. If tests fail repair or replace wiring to sensor boards. If tests are okay, swap connections between pins 14 and 16 and observe whether display tracks each okay. If it does, replace the sensor. If it doesn't, replace the MCP.
Complaint	Problem	Symptom	Action
4. Sensor(s) do not adjust into range.	Circuits on MCP are out of calibration.	Displayed values change but, adjustments to the sensor circuit board do not bring the temperature or humidity displayed to the actual value.	See the section, Adjusting MCP Circuits in this guide. If those adjustments fail and instructions for item 3 above have been followed, contact Compu-Aire for further assistance.
5. System does not cool or does not cool sufficiently.	Control parameters are not set correctly or are	System seems to function okay otherwise.	Refer to the section in this guide, Environment Control Settings, and

	not set as expected.		check that all parameters are set correctly.
	Compressor is not running because of high or low pressure failure.	Display shows compressor failure alarm. Alarm LED is on.	Determine cause of high or low pressure failure and remedy. Press Reset button on MCP.
Complaint	Problem	Symptom	Action
	Compressor is not running because of loose or broken wiring.	Display shows DX cooling is on and there are no compressor failure alarms.	Test for 24VAC at pin 17 and 27 of MCP terminal block while shows DX cooling. If voltage, check wiring back to compressor contactor. If no voltage at pin 27, check wiring back to 24VAC transformers in system. If voltage at pin 27 but not at 17, replace MCP.
Complaint	Problem	Symptom	Action
	Chilled water valve is not opening because of loose or broken wiring.	Display shows chilled water cooling is on or economy cooling is on but, the valve is closed.	Test for 24VAC at valve motor. Check continuity between pins 3 and 12 of MCP and valve motor. If continuity, test for 5VDC to 10VDC between pin 1 and 12 of MCP. If no voltage, replace MCP.
	DIP switches on MCP are set incorrectly.	After setting a temperature set point sufficiently lower than room air, and waiting one minute, the display never indicates cooling is on or shows the wrong type cooling.	Refer to the section in this guide, DIP Switch Settings, and check that the compressors are enabled for DX systems or disabled for chilled water systems.
6. System does not heat or does not heat sufficiently.	Control parameters are not set correctly or are not set as expected.	System seems to function okay otherwise.	Refer to the section in this guide, Environment Control Settings, and check that all control parameters are set

			correctly.
	Humidifier is on.	Display shows the humidifier is operating.	The heaters don't operate while the humidifier is on. Refer to the section, Environment Control Settings, and check that all control parameters are set correctly.
	DIP switches on MCP are not set correctly.	After setting a temperature set point sufficiently higher than room air, and waiting one minute, the display never shows any stage of heating.	Refer to the section in this guide, DIP Switch Settings, and check that the heaters are enabled.
	Heaters are not on because of loose or broken wiring.	Display shows stage one or stage two heating but the heaters are not on.	Test for 24VAC at pin 27 of the MCP terminal connector. Test at pin 30 only if stage two is off. Test at both 30 and 33 if stage two is on. If no voltage at pin 27 or if voltage at each, check back to system terminal block and heater contactors. If voltage at pin 27 but, no voltage at pin 30
Complaint	Problem	Symptom	Action
			Or pin 33 if stage two is on, replace the MCP.
7. System does not humidify or does not do so sufficiently.	Control parameters are not set correctly or set as expected.	System seems to function okay otherwise.	Refer to the section, Environment Control Settings, and check that all control parameters are set correctly.
	Loose or broken wiring in low voltage circuits or bad MCP.	Display shows humidification operating but, the humidifier is not on.	Test for 24VAC at pins 4 and 5 of the MCP. If no voltage, check wiring back to system. If voltage at pin 4 but not 5 or vice-versa, replace the

			MCP.
8. System does not dehumidify or does not do so sufficiently.	Control parameters are not set correctly or are not set as expected.	System seems to function okay otherwise.	Refer to the section, Environment Control Settings, and check that all control settings are correct.
	Compressors or chilled water valve (depending on type system) is not operating.	Display shows dehumidification but, compressors are not running or, for chilled water systems, the valve is not open.	Check all items under 5 above.
Complaint	Problem	Symptom	Action
9. Display shows messages that don't make sense for this machine.	DIP switches on MCP are set incorrectly.	Display shows function messages for equipment not installed.	Refer to the section in this guide, DIP Switch Settings, and make sure the switches are set correctly.
10. System occasionally forgets control settings.	Battery is dead.	If the system is turned off for a few minutes and then turned on again, the set points are not as they were.	The battery on the MCP has an expected life of at least 5 years. Contact Compu-Aire for assistance in replacing the battery.
	Excessive noise on the power supply.	There has been a thunder storm in the area or there was a power outage or brown-out.	Random problems could be attributed to noise on the power source caused by machinery being switched on and off, power outages or thunder storms. These kinds of problems can be very difficult to identify. Make sure all wiring
Complaint	Problem	Symptom	Action
			connections are secure and that contactors do not chatter when switch-ed. Check that the sys-tem ground is properly connected to

			an earth ground.
11. System is on but, no-thing is operating. The blower is off.	No air flow, fire stat, water on floor or smoke detector alarm is activated.	The display shows one or more of these alarms and the Alarm LED is on.	The system is automatic-ally shut down if any of these conditions occur. Determine what the cause is and remedy. Then, press the Reset button on the MCP.

18 PART LIST

Sub-Components	Components	Voltage/Ph/Hz	TON	Part Number	
			15		
REFRIGERATION PARTS	R410A, Scroll Compressor	208/3/60		201-075-026	
	HP Switch, Manual Reset			236-132-001	
	Expansion Valve			239-080-401	
	LP Switch			236-101-002	
	Filter Drier			233-150-001	
	Sight Glass			232-005-001	
Air Moving Parts	Motor	208/3/60		206-050-003	
	Airflow Switch	ALL		222-100-202	
	Filters(30%-merv-8) Qty-4			220-116-252	
Electrical Parts	Humidifier (Capacity-lbs)				
	30.0	208-230/3/60		262-130-231	
	Contactor			274-030-243	
				274-030-336	
	Aux Switch	208/3/60		274-100-034	
	Fuse	15 A			271-160-515
		20 A			271-160-520
		25 A			271-160-525
	Transformer	208/3/60		275-675-012	
Reheat Element (KW)					
2.5	220/1/60		259-252-001		
Microprocessor Controller	Controller Board				
	MCP-SYS 2200+3S	ALL		254-743-102	
	MCP-SYS 2200+3M			254-743-202	
	MCP-SYS 2200+3L			254-743-302	
	Touch Screen Display				
	Temp/Hum Sensor	ALL		254-744-302	
	Connector Kit			254-743-302	
	NTC Sensor			254-445-002	
	Communication Card				
	pCOnet BACnet OVER MS/TP	ALL		254-549-004	
pCOWEB ETHERNET INTERFACE			254-549-003		
LONWORKS ECHELON			254-649-010		

Table 2. Part List



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
		Serial Number
		Serial Number
		Serial Number

Technical Support/ Service

Website

www.compu-aire.com

Location

Compu-Aire, Inc.
8167 Byron Road
Whittier, California 90606
United States of America
+1 (562) 945-8971 (Phone)
+1 (562) 696-0724 (Fax)

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