

OPERATION AND INSTALLATION MANUAL



TABLE OF CONTENTS

Introduction	2
Basic Unit Operation	2
Unpacking And Storage	3
Pre-Installation Test	3
Preparing The Enclosure	5
Mechanical Installation Instruction	5
Electrical Installation Instruction	6
Programming The Standard Controller	7
Standard Controller Alarm Operation.....	10
Alarm Output Installation Instruction (Optional).....	10
Operating The System	11
Maintenance	12
Troubleshooting	13
Electrical Schematics	14

PLEASE READ this manual and follow the instructions for safe and satisfactory installation and operation of this system. Keep this manual for future reference. Some information may not apply to all systems.

INTRODUCTION

ICEqube's Thermal Management Systems are designed to cool, dehumidify, or heat the internal environment of modern electrical enclosures. ICEqube offers efficient and aesthetically appealing packages that can be mounted on top or on the side of your enclosure. Our closed-loop circulation design protects your equipment from airborne dust and contaminants which may hinder equipment operations, causing unnecessary down time. ICEqube offers various models of cooling systems, ranging in cooling capacity from 1,000 to 27,000 BTU per hour to provide air conditioning systems for many of your environmental needs, including hazardous locations.

BASIC UNIT OPERATION

The ICEqube Thermal Management System (TMS) is a combination of three systems which function simultaneously to maintain environmentally friendly conditions for various types of electronic equipment enclosures. These three thermal related systems are the closed-loop enclosure air system, the ambient air system, and the vapor-compression refrigeration system (Refer to Figure 1).

The closed-loop enclosure air system circulates cold air from the ICEqube TMS to the electronics enclosure. This air returns to the ICEqube TMS bringing with it unwanted heat and humidity from inside the enclosure. Heat and humidity are then removed by an evaporator (a type of heat exchanger) located within the ICEqube TMS. This evaporator is part of the vapor-compression refrigeration system. If the unit is equipped with a heater, during heating operation cool air from the electronics enclosure will circulate across a heater, located within the closed-loop air system, and back to the enclosure. Heating and cooling operation will never operate simultaneously.

At the heart of the vapor-compression refrigeration system is a quiet, energy efficient rotary compressor which circulates environmentally friendly NON-CFC refrigerant. The main purpose of this compressor is to transfer heat laden refrigerant from the evaporator, located within the closed-loop enclosure air system, to the condenser, located within the ambient air system. In the ambient air system, air is circulated from the ambient air surrounding the enclosure, through a filter, and across the condenser (a type of heat exchanger). Here, heat from the enclosure is transferred to the ambient air.

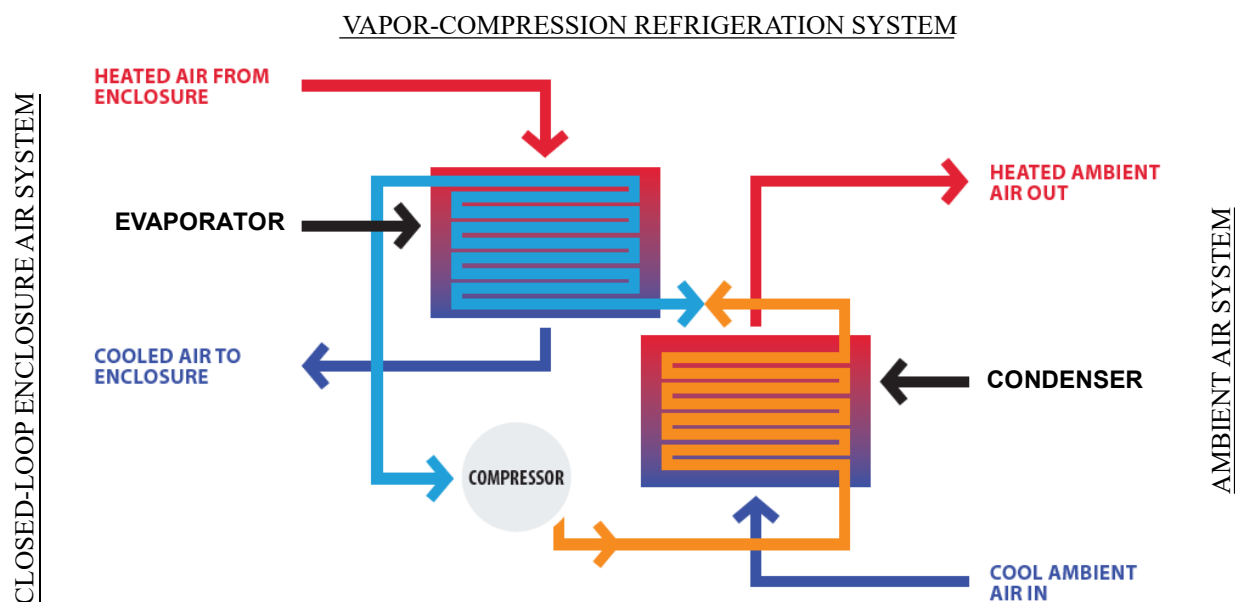


Figure 1: Flow Diagram

UNPACKING AND STORAGE

CAUTION: *It is recommended to use gloves and protective eyewear when unpacking.*

Verify product is as identified on the packing list. The ICEqube TMS should arrive banded to a pallet in the proper upright position. See arrows on packaging for verification. Any evidence of damage should be noted on the freight bill. The freight carriers claim procedure should be followed. ICEqube cannot accept responsibility for damages that occur during shipping. If the shipping container was damaged or marred in any way, check for scratches, dents, loose hardware, presence of oil or any other irregularities with the ICEqube TMS. When applicable, if the supply cord is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified persons in order to avoid a hazard.

Use a utility blade to cut along the dotted line on the bottom of the box. Avoid cutting too deep as this may result in scratches to the TMS. Once cut, lift the outer box off the TMS.

Note: *Operating the unit before maintaining an upright position for 24 hours will void all warranties.*

Package Contents

Included in the standard shipment of the TMS:

1. Operation and Installation Manual
2. Gasket kit which includes the Gasket Installation Instructions (Some units come with the gasket kit installed)
3. Mounting hardware
4. Condensate Management Kit (Only for Top Mount units)

Handling and Storage

Always keep the unit in the proper upright position, as indicated on the shipping container. Failure to keep the unit in the proper upright position may cause internal damage and shorten the lifespan of the TMS. The unit must remain upright for a minimum of 24 hours before initial operation to ensure oil has returned to the compressor. The storage space temperature should be in the range of -40°C to 85°C (-40°F to 185°F) in a non-condensing environment.

PRE-INSTALLATION TEST

Before installing the ICEqube TMS on the enclosure, ICEqube recommends operating the unit. Although the ICEqube TMS has been tested at the factory, internal damage may have occurred during shipping which may have not been apparent during the unpacking inspection.

Note: *The standard controller interface is described here. For instructions on interfacing with our other controllers (such as the qubeLINK® controller) see the respective manual located on our website: www.iceqube.com*

1. Verify whether the TMS is a Top or a Vertical Mount unit. Place the system on a solid base such as a workbench or table in the proper upright position. Be sure to allow adequate space for airflow. There are two air systems that must not be restricted, the closed-loop enclosure air system and the ambient air system. Top mount units must be elevated to provide adequate airflow for the cool air stream located on the bottom of the system.

Note: *All ICEqube TMS containing an MM, B, V, or EV as part of the model number are designed to operate in a vertical position only (See Figure 3). All ICEqube TMS containing a T in the model number are designed to operate in a horizontal position only (See Figure 2).*



Figure 2: Top Mounted Unit



Figure 3: Side Mounted Unit

2. Check that the ambient air system filter is in place, location varies with model type.

Note: Models with the optional rain or wash down hood do not have an ambient air filter and will require routine condenser maintenance.

3. Check the data tag for proper electrical requirements. The data tag lists the design voltage and amperage requirements of the system. Verify that the electrical supply to which the system will be connected has the proper capacity. After noting the above, connect the ICEqube TMS to a properly grounded electrical connection. The use of an extension cord is not recommended. See **Electrical Installation Instruction** for wiring details (Page 6).

Note: If any unusual noise or vibration is present during the testing procedure, immediately disconnect from power and inspect the unit for the cause of the noise or vibration. If necessary, contact ICEqube immediately to determine the cause of the noise/vibration.

4. As soon as power is supplied to the system, the evaporator blower will begin to operate (excluding Top Mount models – see following note). The compressor and condenser blower will not operate if the room air temperature is below 80°F (the factory setpoint). The digital display on the face of the controller displays the room temperature. If the display is indicating 80°F (27°C) or warmer, the “COOL” LED will flash for 3½, 4, 5, or 7 minutes* before the compressor and the condenser blower will operate.

Note: Top Mount unit evaporator blowers are electrically connected to cycle with the compressor and condenser blower.

Note: If the display is indicating a temperature less than 80°F (27°C), adjust the setpoint to a temperature lower than the room temperature in order for the compressor and condenser blower to operate. Refer to Programming The Standard Controller (Page 7) to change the factory setpoints.

5. With the compressor and both blowers functioning, operate the unit for up to 7 minutes to ensure cool air is exhausted from the enclosure side of the TMS (closed-loop enclosure air system).
6. After completing the above check point, the ICEqube TMS is ready to be mounted to your enclosure.

*All units below 14,000BTU per hour are factory set to 3 ½ minutes and all units with a capacity of 14,000-20,000 BTU per hour may be factory set to 3 ½, 4, or 7 minutes depending on manufacture date. Units with a capacity of 27,000 BTU per hour are factory set to 5 minutes.

PREPARING THE ENCLOSURE

Please read this entire section before beginning installation. The ICEqube TMS has been designed to be lightweight for easy installation. A few modifications must be made to the enclosure to provide proper airflow, to maintain enclosure integrity, and to ensure a secure installation. Required modifications will vary with each ICEqube TMS model.

1. Ensure the mounting surface of the enclosure will support the weight of the ICEqube TMS and will not become unstable causing bodily harm or equipment damage. For units mounted on enclosure doors, confirm hinges will support the weight. Refer to specifications for model weights. All current specifications can be found on our website: www.iceqube.com
2. Using the specification drawing, determine the ideal location to install the ICEqube TMS on your enclosure.
3. Upon deciding the location of the ICEqube TMS on the enclosure, use the cutout drawing to determine the necessary modifications required for mounting. All current cutout drawings can be found on our website: www.iceqube.com
4. Ensure the ICEqube TMS will be mounted level and plumb. Top mount units can only be mounted on a flat horizontal surface. Side mount units can only be mounted on a flat vertical surface.
5. Ensure the inlet and outlet of the closed-loop enclosure air system will not be restricted by equipment or shelving within your enclosure.
6. Ensure the air flow of the ambient air system will not be affected or restricted.

MECHANICAL INSTALLATION INSTRUCTION

1. Ensure the surface on the ICEqube TMS that the gasket is to be installed on is clean, free of debris, dirt, and oil.
2. If the gasket kit did not come installed, follow the Gasket Installation Instructions for gasket placement and apply the gasket to the TMS. This ensures a proper seal will be created between the TMS and the enclosure.

CAUTION: Be careful while removing the backing on the gasket material. The material may stretch and the holes will not align.

3. After the gasket material has been installed, mount the ICEqube TMS onto the enclosure and secure by hand tightening the supplied hardware. Check to see if the power cord (when applicable) and all optional cables are in place and not obstructed.
4. With everything aligned, securely fasten with appropriate tools to compress the gasket to half of its thickness with no visible gaps.

Note: Only use supplied hardware to secure unit to enclosure, using non-supplied hardware may cause internal damage.

5. For some EV/EV pro Series units, an external cabinet ground stud may be installed on the unit to secure earth ground (nut and wire terminal are provided).
6. EV/EV pro Series units come with a removable air diverter plate attached to the ambient exhaust below the filter. The air diverter plate can remain as installed, moved to either of the other two sides, or removed entirely for air flow.
7. On the bottom or on the side of the ICEqube TMS is a drain nipple for condensate overflow. Although all vertically mounted ICEqube TMS have built-in condensate management systems, it may be necessary to attach a drain hose to this drain nipple on enclosures which are in extremely humid conditions.

Note: Top mount models do not have a built-in condensate evaporation system. In order for the drainage system to operate properly, the factory supplied drain kit with a "Tee" must be installed per factory instructions. ICEqube cannot be held responsible for improper installation.

Note: If the enclosure is not airtight or the ICEqube TMS operates with the enclosure door(s) open, moisture will condensate inside the TMS system and may cause the condensate management system to overflow. The TMS system is designed to be closed-loop, meaning no mixing of the ambient air with the enclosure air.

ELECTRICAL INSTALLATION INSTRUCTION

Please read this entire section before beginning the electrical installation of the ICEqube TMS. ICEqube units have been designed for easy electrical power connection at one specific location on the enclosure side of the ICEqube TMS. Each ICEqube TMS has been designed to operate at a range of voltages and frequencies. See unit label(s) for correct voltage and frequency for your model(s).

****WARNING: ELECTRICAL SHOCK****

Electrical connections should only be completed by a qualified technician. Compliance with all national wiring regulations, safety and electrical codes is required. Contact local authority having jurisdiction as required. Do not connect while the circuit is energized. Turn off circuit breaker and install lock out. Means for disconnection must be incorporated for permanently connected appliances.

Pre-Installation Checks

1. Check the unit label for power and overcurrent circuit protection requirements. A time delay fuse or time delay circuit breaker is recommended.
2. Check the designated unit power supply for adequate and proper electrical power requirements.
3. Check that the wire routing to the ICEqube TMS will not interfere with or become damaged by other components.

Electrical Installation

1. Check that the units designated power supply is de-energized and locked out.
2. Locate the terminal box and remove the terminal box cover screws or locate the power cord on the enclosure side of the unit (model dependent).
3. For conductor sizes in units without a power cord, refer to the unit label to determine the proper conductor size based on electrical codes (i.e. NEC or IEC). The usage of an agency approved (i.e. NEC or IEC) strain relief is also recommended to secure the wires when applicable.
4. Ensure circuit protection requirements listed on the unit label are installed.
5. For the EV/EV pro Series units use an agency approved (i.e. NEC or IEC) strain relief to secure the wires, route the power cable through the 7/8" hole.
6. For units with a terminal block connect Line 1, Line 2, and Ground. Once securely connected, reinstall the terminal box cover and screws.

PROGRAMMING THE STANDARD CONTROLLER

The digital standard controller has many features that may or may not be required for all applications. The standard controller has been programmed at the factory with default settings for immediate system operation. (For the programming of our other controllers (such as the qubeLINK® controller) see the respective manual located on our website: www.iceqube.com)

Please review the following default settings:

- | | |
|--------------------------------------|---------------------------------|
| 1. Cooling system on temperature | 80°F (27°C) |
| 2. Heating system on temperature | 50°F (10°C); (Optional) |
| 3. High enclosure temperature alarm | 131°F (55°C) |
| 4. Low enclosure temperature alarm | -20°F (-28.8°C) |
| 5. Audible and Visual alarm | ON |
| 6. Power off alarm (POA) | ON |
| 7. Digital display in degrees | Fahrenheit |
| 8. Filter maintenance alarm | 0 days |
| 9. Heat installed | On/Off; (Optional) |
| 10. Power on relay (Por) | On |
| 11. High condenser temperature alarm | 170°F (76°C) (No adjustability) |

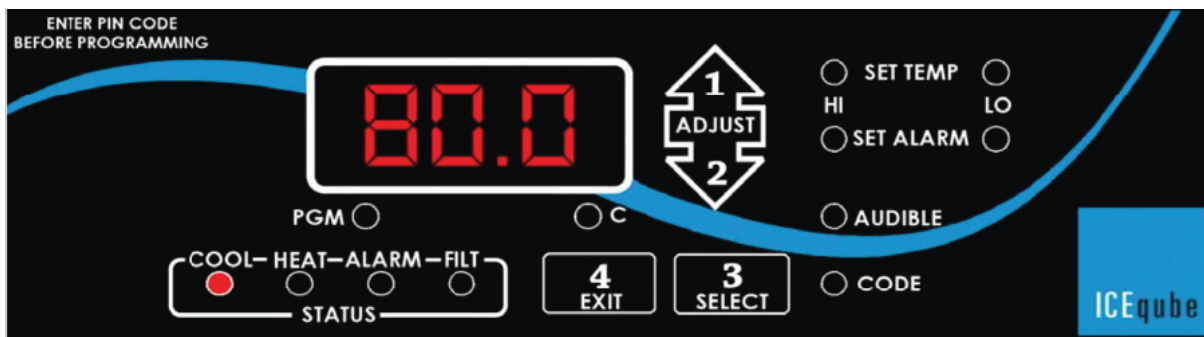


Figure 4: Standard Controller

To change the factory default settings, enter the programming code sequence below:

- "1 Adjust-up" arrow
- "2 Adjust-down" arrow
- "3 Select"
- "4 Exit"

- After pressing the above sequence the "PGM" LED illuminates and the display shows three alternating boxes, indicating the code was accepted. If no selection is made within 1 minute, the controller returns to the normal operating mode.

Note: Pressing the "4 Exit" button at any time while in the programming mode saves the changes and returns to normal operating mode.

- Press the "3 Select" button to continue programming. The set temperature "HI" LED illuminates and the "COOL" LED will flash indicating the 'cooling on' setpoint. The compressor and condenser blower/fan will begin operation at this temperature and will remain operating until the enclosure temperature decreases approximately 7°F (4°C). Press the "1 Adjust-up" or "2 Adjust-down" arrow until the desired setpoint is displayed. The range for this adjustment is 70°F to 124°F (21°C to 51°C).

3. Press the **"3 Select"** button to continue. If the unit does not have heat go to step 4. The set temperature "LO" LED illuminates and the "HEAT" LED will flash indicating the 'heating on' setpoint (heat is not applicable to all units). The heating system will begin operation at this temperature and remain operating until the enclosure temperature increases approximately 7°F (4°C). Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow until the desired setpoint is displayed within a range of -4°F to 63°F (-20°C to 17°C).

Note: There is a dead band programmed into the controller that prevents heating and cooling from operating simultaneously. However, if set to the minimum Cool Temperature (70°F (21.11°C)) and the maximum Heat Temperature (63°F (17.22°C)) inefficiencies can occur.

4. Press the **"3 Select"** button to continue. The set alarm "HI" LED illuminates and the "ALARM" LED will flash with the display indicating the high temperature alarm setpoint, which is factory set to 131°F (55°C). The alarm will activate at this temperature and will automatically reset at 2°F (1°C) below this temperature. Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow to change the high temperature alarm setpoint, which should be at least 20°F (11°C) above the 'cooling on' setpoint when applicable. Always set the high temperature alarm to a value greater than the 'cooling on' setpoint to avoid false alarms. The range of adjustability is 87°F -131°F (31°C to 55°C).
5. Press the **"3 Select"** button to continue. The set alarm "LO" LED illuminates and the "ALARM" LED will flash with the display indicating the low temperature alarm setpoint, which is factory set to -20°F (-29°C). The alarm will activate at this temperature and will automatically reset at 2°F (1°C) above this temperature. Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow to change the low temperature alarm setpoint, if heat is installed the low temperature alarm setpoint should be at least 10°F (5°C) less than the 'heating on' setpoint. The range of adjustability is -20°F to 44°F (-29°C to 7°C).
6. Press the **"3 Select"** button to continue. The "Alarm" LED will flash, and the display will show "ALL" indicating the "ALL" alarm on/off status. Press **"3 Select"** button and the display will show either "ON" or "OFF", indicating current alarm status. Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow to toggle to the mode desired. If the "OFF" mode is selected, no alarms will activate and the audible on/off select and POA (Power Off Alarm) functions are disabled, move to step 9.
7. Press the **"3 Select"** button to continue. The "AUDIBLE" LED will flash, and the display will show "Aud", indicating the audible alarm on/off status. Press **"3 Select"** button and the display shows "ON" or "OFF" indicating the current audible alarm status. Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow to toggle to the mode desired.
8. Press the **"3 Select"** button to continue. The "ALARM" LED will flash, and the display will show "POA", indicating the Power Off Alarm status. This alarm is activated when the power on relay (Por), which serves as a manual shutoff, is turned off. Press **"3 Select"** button and the display shows "ON" or "OFF" indicating the current alarm status. Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow to toggle to the mode desired.
9. Press **"3 Select"** button to continue. The "C" LED will flash, and the display will show either "-F-" for degrees Fahrenheit or "-C-" for degrees Celsius. Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow to toggle to the mode desired.
10. Press the **"3 Select"** button to continue. The "CODE" LED will flash, and the display will show "PIN". To set a new user PIN code, press the **"1 Adjust-up"** arrow. The display will flash "4", prompting an entry of a four-button/arrow sequence using the **"1 Adjust-up"**, **"2 Adjust-down"**, **3 Select**, and/or **"4 Exit"** buttons/arrows. Any sequence of the four buttons/arrows may be programmed as the code. As the buttons/arrows are pressed, the display will show the number that was pressed.

Note: After pressing a button/arrow, there will only be 5 seconds to press the next button/arrow. If the next button/arrow is not pressed within the allotted time, the system will default to no PIN code, indicated by "0" on the display. Once the sequence is entered the display will no longer flash and will show "4".

To program the no PIN code mode, press **"2 Adjust-down"** arrow and the display will show "0", indicating no PIN code. With no PIN code, pressing any button will permit access to the program.

CAUTION: Always record the selection sequence (pin code) and store in a secure place.

11. Press the **"3 Select"** button to continue. The "FILT" LED flashes and the display will show "FIL", indicating the filter alarm day quantity selection. Press **"3 Select"** button and the display will show the number of days that the alarm is set to which are in half day increments. Note that the alarm is based on compressor run time. (Example: 10.5 indicates that the alarm will activate every ten and a half days or 252 hours of compressor run time.) Press the **"1 Adjust-up"** or **"2 Adjust-down"** arrow to vary the desired number of days. Programming "0" days will disable the alarm.

Note: The required number of days to set this alarm will be determined by the ambient air conditions. If rain or wash down hoods are installed on the system, no filter is supplied, and the filter alarm should be set to "0". This will disable the filter alarm.

12. Press the **"3 Select"** button to continue. The "HEAT" LED will flash, and the display will show "HEA", indicating the optional heating function. Press the **"3 Select"** button and the display shows "ON" or "OFF", indicating the current on/off status. Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow to toggle the mode desired.
13. Press the **"3 Select"** button to continue. The "COOL", "HEAT", "ALARM", and "FILT" LEDs will flash, and the display will show "Por", indicating the power on relay status, which serves as a manual shutoff. Press the **"3 Select"** button and the display shows "ON" or "OFF", indicating the current power on relay status. Press **"1 Adjust-up"** or **"2 Adjust-down"** arrow to toggle the mode desired. This should almost always be set to "ON".

Note: Some fans may remain functioning for some time after this setting is off and the crankcase heater can remain operational (if equipped).

CAUTION: In this mode certain parts of the system may still be energized. This does not replace disconnecting the unit from power during service. If servicing the unit, de-energize the power supply and lock out.

14. Programming of the controller is now complete. Press the **"3 Select"** button to review all the settings. The display will show three alternating boxes. Press the **"3 Select"** button to review each setting. Press **"4 Exit"** button to use the selected settings and return to the normal operating mode. The "PGM" LED will now turn off.

STANDARD CONTROLLER ALARM OPERATION

1. The enclosure temperature is above or below the alarm setpoint:

The "ALARM" LED will illuminate, the display will flash the "HI" or the "LO" LED, and the audible alarm sounds (if activated). The enclosure temperature must rise or fall 2°F (1°C) before the alarm resets.

2. The condenser temperature is above the condenser alarm setpoint:

The "ALARM" LED illuminates, the display flashes the condenser temperature, and the audible alarm sounds (if activated). The condenser temperature must fall 4°F (2°C) before the alarm resets.

3. The filter day timer has expired:

The "ALARM" LED illuminates, the display flashes "FIL", the "FILT" LED flashes, and the audible alarm sounds (if activated). The "4 Exit" button silences the alarm. Press the pin code to the clear and restart the timer.

4. The power on relay (Por) is turned off:

The "ALARM" LED lights, and the display flashes "OFF", indicating interrupted power to the units' electrical circuits. This alarm will be reset when the power on relay (Por) has been programmed to "ON", see step 13 in the **Programming The Standard Controller** section.

5. Sensor malfunctions:

E-O:	Evaporator sensor open
E-C:	Evaporator sensor shorted
C-O:	Condenser sensor open
C-C:	Condenser sensor shorted
Alternating E-O and C-O:	Sensor connector disconnected

6. Incorrect voltage supply:

A continual flashing value of the program version ("3.xx" where x indicates current program version) on the display screen indicates an incorrect power was supplied to the controller.

ALARM OUTPUT INSTALLATION INSTRUCTION (OPTIONAL)

ICEqube offers an optional dry contact alarm output (XO3) that provides both a normally open (close on alarm) and a normally closed (open on alarm) set of contacts. This alarm signal is provided from a relay through a 3 conductor cable (*Black/Common, White/Normally Open, and Red/Normally Closed*).

Pre-Installation Checks

1. Ensure that the power connected to the alarm wires is from a circuit that follows the appropriate electrical codes (NEC approved Class 2 circuit or equivalent).
2. Check that alarm wire routing from the unit will not interfere with or become damaged by other components.

Alarm Installation

1. Check that both the TMS designated power supply and the alarm power supply is de-energized and locked out.
2. Route alarm wire cable to the desired location.

OPERATING THE SYSTEM

CAUTION: *This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.*

Note: *The standard controller interface is described here. For instructions on interfacing with our other controllers (such as the qubeLINK® controller) see the respective manual located on our website: www.iceqube.com*

Once the ICEqube TMS has been installed onto the enclosure and a properly grounded electrical connection with adequate voltage and current supply have been established, the unit is ready for operation. As soon as electrical power is supplied to the ICEqube TMS, the evaporator blower will start to operate, (except for top mount units). The blower will run continuously so that the controller can monitor the enclosure's internal temperature. The enclosure temperature will be displayed on the face of the digital standard controller.

If the enclosure temperature is greater than the cooling setpoint the "COOL" LED will flash. This indicates that the compressor's automatic off cycle timer is working. The off cycle timer is factory set at 3½, 4, 5, or 7 minutes*. At the end of the timer, the compressor and the condenser blower will begin to operate, and the "COOL" LED will be steady. This signifies that the cooling system has begun operation to remove heat and humidity from the enclosure. The unit may take 20 to 30 minutes before it reaches full capacity.

When the temperature inside the enclosure decreases 7°F (4°C) below the cooling setpoint, the compressor and the condenser blower will cycle off. The evaporator blower will continue to operate, circulating air within the enclosure. The digital standard controller has a factory programmed temperature differential of 7°F (4°C). Example: "Cooling On" @ 80°F (27°C); "Cooling Off" @ 73°F (23°C).

ICEqube offers optional heat: External Heat Output (EHO) which provides power output to an external heater (optional) typically located within the equipment enclosure; and an Internal Heat Output (IHO) which provides a heater located within the TMS. If the enclosure temperature is below the heating setpoint the "HEAT" LED will illuminate. This indicates power is being supplied to the heater. There is no time delay before heating begins. When the temperature of the enclosure rises 7°F (4°C) above the setpoint, the standard controller will cycle the heater off.

Note: *There is a dead band programmed into the controller that prevents heating and cooling from operating simultaneously.*

Note: *See the label of the TMS for maximum wattage of the heater.*

* All units below 14,000BTU per hour are factory set to 3 ½ minutes and all units with a capacity of 14,000-20,000 BTU per hour may be factory set to 3 ½, 4, or 7 minutes depending on manufacture date. Units with a capacity of 27,000BTU per hour are factory set to 5 minutes.

MAINTENANCE

****PRECAUTIONS TO AVOID ELECTRICAL SHOCK****

- A. Do not clean while the electrical circuit is energized.**
- B. Surfaces are to be cleaned only with a damp cloth to avoid build-up of electrostatic charge.**

The ICEqube TMS is designed to provide many years of trouble free operation with minimal amounts of maintenance. Primary maintenance consists of checking the condition of the ambient air filter and the condensate management system

Ambient Air Filter

It is recommended that the ambient air filter be inspected and cleaned regularly; frequency will depend upon ambient conditions. To check the condition of the air filter, it is recommended to first remove electrical power from the ICEqube system. Next, locate the filter cover and filter (location will vary by model). Slide the filter from the filter rack through the end slot. If cleaning is required, soak the filter in warm, soapy water. Rinse with clean water. Use a shop-vac to remove excess water from the filter before returning it to the system. Replace the filter if it shows signs of deterioration. See website for air filter cleaning demonstration at <http://www.iceqube.com/ice-qube-tv/>

Note: If rain or wash down hoods have been installed, a filter would not have been supplied, therefore no filter maintenance is required. However, systems equipped with rain or wash down hoods will require regular condensing section maintenance by qualified personnel. For systems equipped with filters, it is recommended to have a spare clean filter in stock to prevent prolonged cooling system downtime. The dirty filter may be cleaned at a more convenient time.

Condensate Management System

The condensate management system should be checked periodically for scale, sludge and debris that may cause the system to fail. The type of environment will determine the frequency of required maintenance. For all units (except for the EV/EV pro Series, see below) maintenance of the condensate management system will require removal of electrical power from the ICEqube system and removal of the cover. Please contact ICEqube before removing the cover during the warranty period.

CAUTION: Electrical wires are connected from the cover to the base.

Removing the cover will allow access to the primary condensate management pan, which is located below the evaporator. Inspect the condensate pan and the drain nipple for signs of scale, sludge or debris that may prevent water flow through the nipple. To clean the debris from the pan, use a clean absorbent cloth or shop-vac. Nipples may be cleaned using a soft tube/pipe brush, then flush with clean water. Also inspect any tubing that is attached to the nipples on the condensate management system. Replace the tubing if it appears to have internal buildup or has become brittle. After all debris has been removed from the system, place the cover back onto the unit-being careful not to damage the wiring connecting the cover to the base.

Note: If there is a secondary condensate management pan, maintenance will need to be performed in the same manner as explained above.

For the EV/EV pro Series, do not remove the cover. These units only require access to the bottom of the TMS. If tubing was installed onto the drain nipple, removal is necessary. Replacement of the tubing is recommended if it appears to have internal buildup or has become brittle. Using a soft tube/pipe brush, insert into the drain nipple and move in a circular motion to clear anything that may cause failure. Only insert brush to a maximum depth of .625"(15.88mm); if the brush is inserted further, damage may occur to the drain float.

Current documentation and cut out templates can be found on our website at www.iceqube.com.

TROUBLESHOOTING

If an operating problem occurs, please review the items outlined on this page. If the problem persists, obtain the model and serial number before contacting ICEqube for technical assistance. DO NOT remove the cover without first notifying customer service.

Troubleshooting Checklist

Model No:		Serial Number:	
Voltage Rating:	Amps:	Phase:	Frequency:

Options:

Is proper electrical power available at the power supply?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is the power cord or conductors from the terminal block connected to the power supply?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is the controller cooling setpoint below the enclosure temperature?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is the evaporator (closed-loop enclosure air system) blower operating?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is the compressor and condenser (ambient air system) blower operating?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is the enclosure door closed tightly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are the ICEqube TMS gaskets in place?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has the condenser (ambient air system) filter been cleaned or changed recently?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is the system mounted level and plumb on the enclosure?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is there adequate space within the enclosure for air flow?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is there adequate space around the ICEqube TMS for airflow?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has the enclosure population remained the same?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

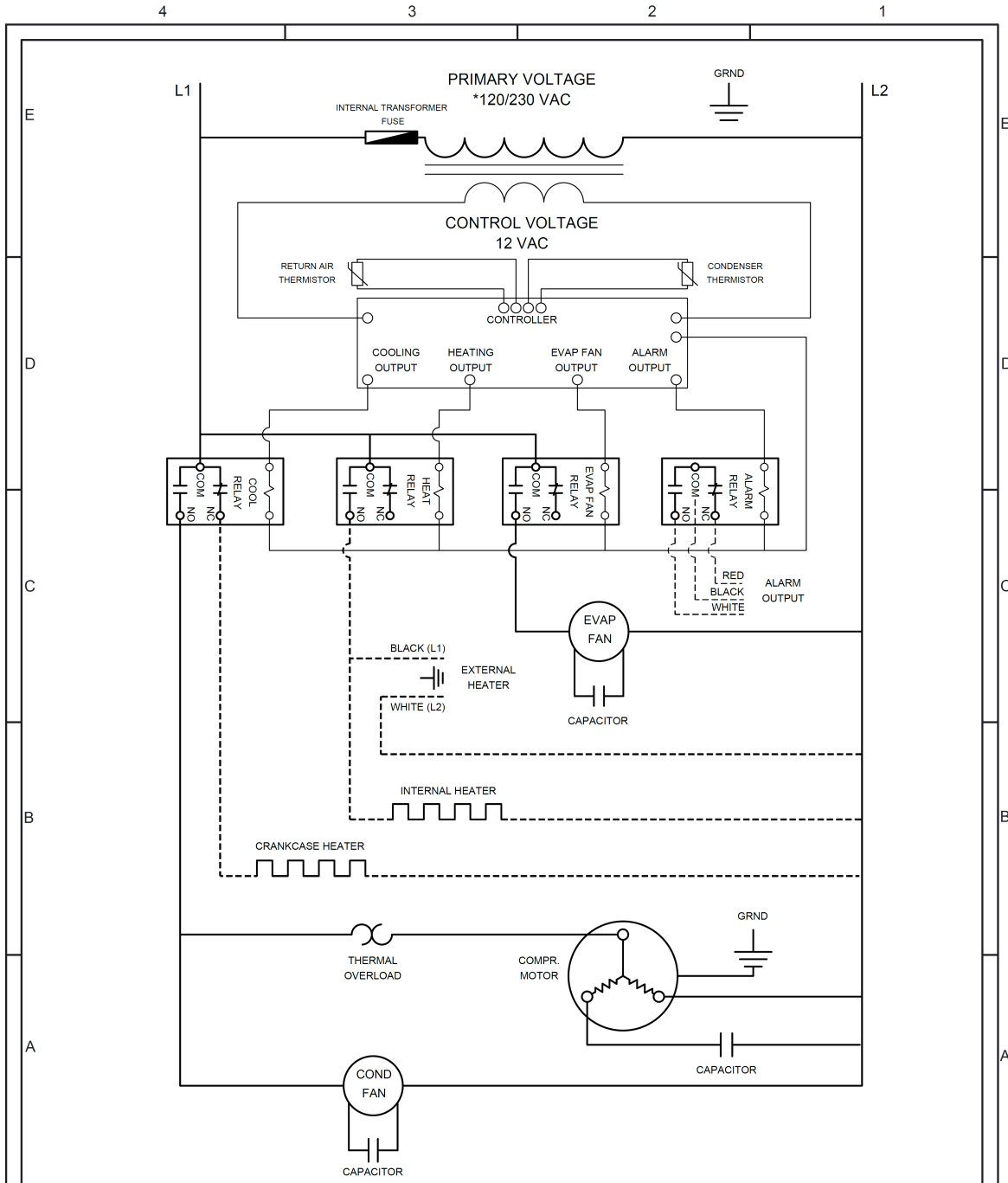
Notes:

For additional support, call ICEqube at **1-724-837-7600** or **1-888-867-8234**.

Please have the above checklist completed before you call.

ELECTRICAL SCHEMATICS

120-230V VERTICAL MOUNT UNITS



——— LINE VOLTAGE
 ——— CONTROL VOLTAGE (LOW)
 - - - - - OPTIONAL

*120V NOT AVAILABLE IN 14-17-20000V/EV / IQ20EV pro UNITS. ALWAYS FOLLOW VOLTAGE ON UNIT LABEL.

ICE QUBE, INC.

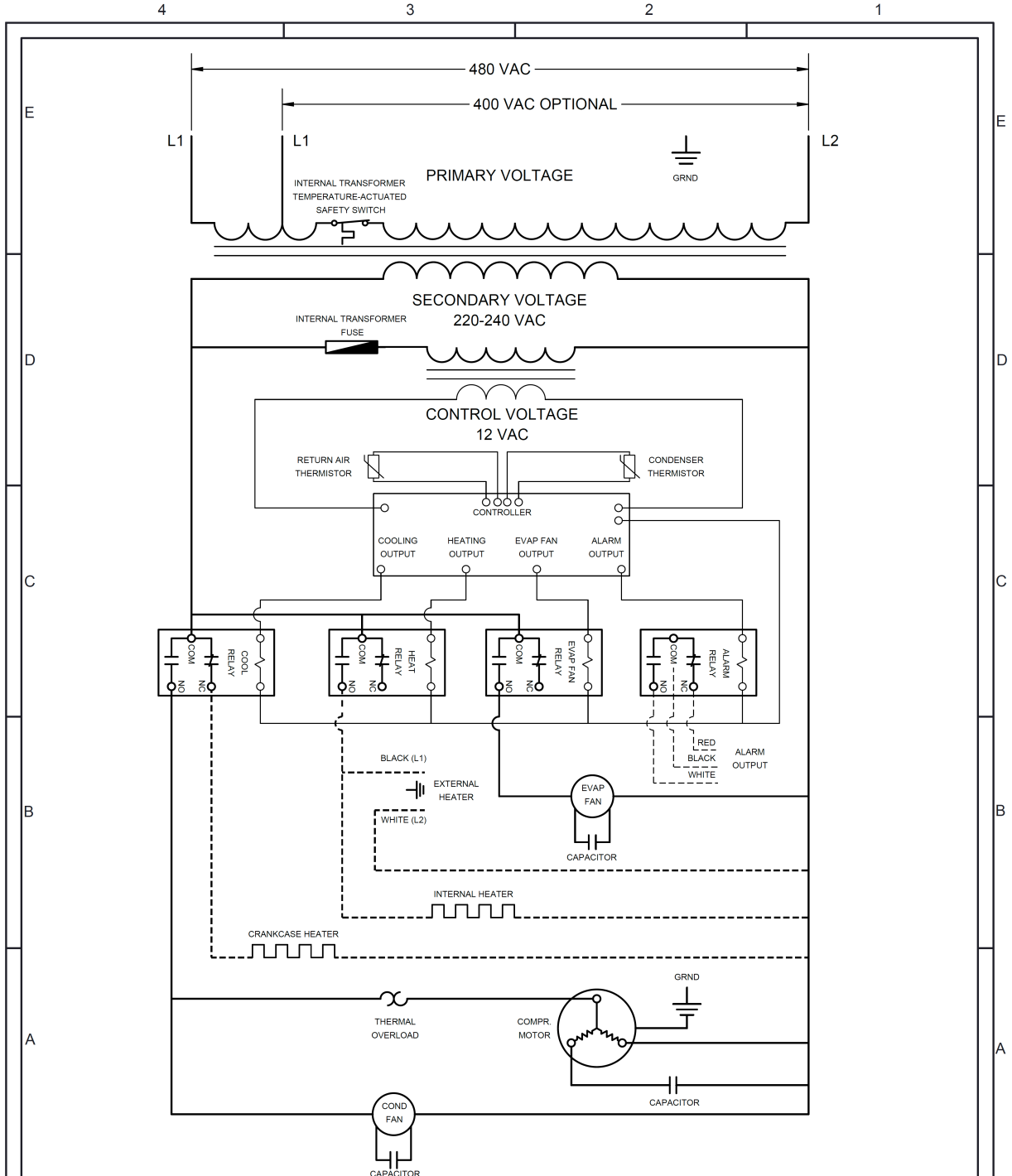
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DESCRIPTION
 120-230V VERTICAL MOUNT AIR
 CONDITIONER WIRING SCHEMATIC

DRAWING NUMBER
IQ350942

REV
D

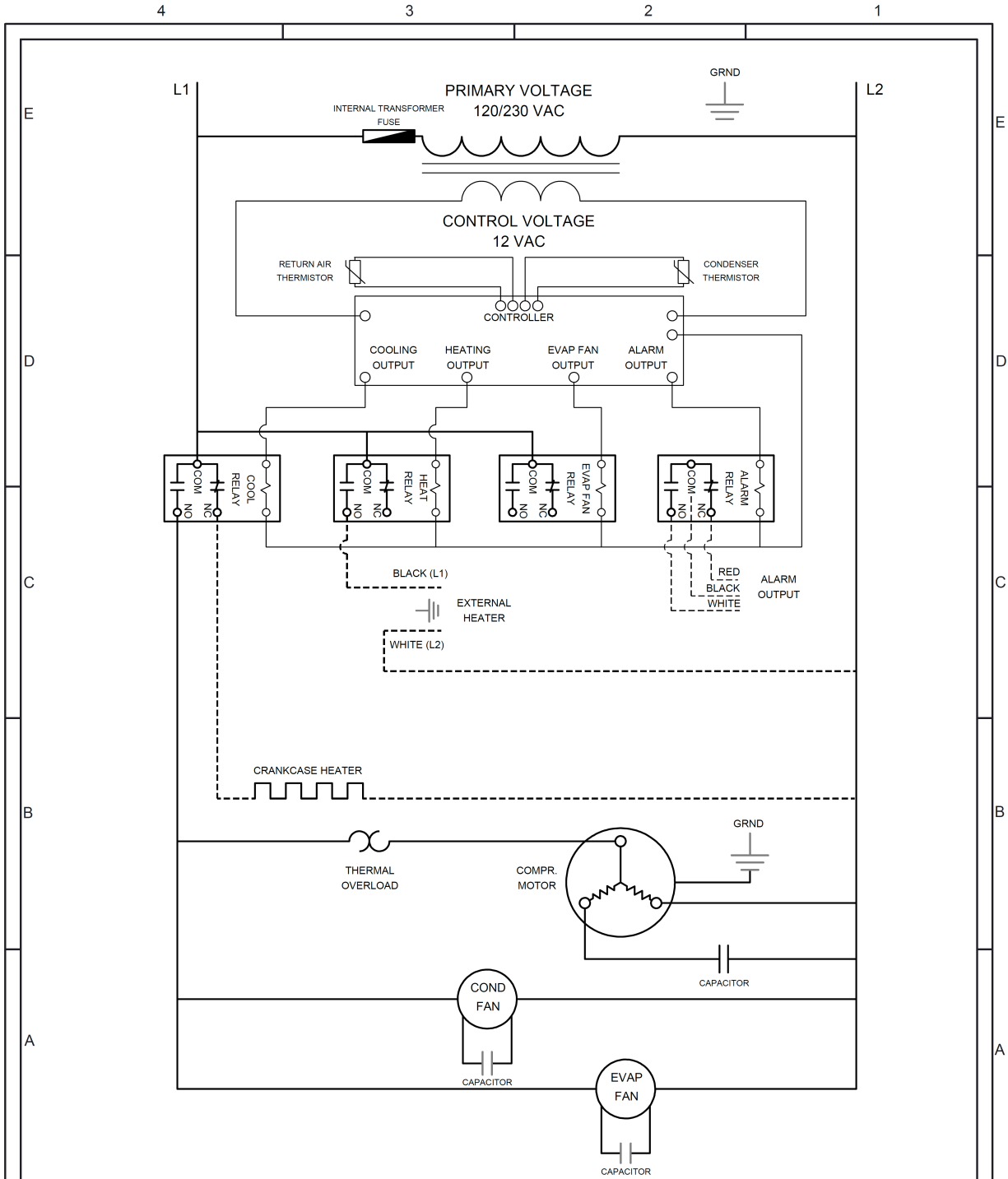
400-480V VERTICAL MOUNT UNITS



— LINE VOLTAGE
 — CONTROL VOLTAGE (LOW)
 - - - - - OPTIONAL

ICE QUBE, INC.	
<small>THIS IS A PROPRIETARY DOCUMENT. DO NOT REPRODUCE OR DISCLOSE WITHOUT THE EXPRESS WRITTEN PERMISSION OF ICE QUBE, INC.</small>	
DESCRIPTION 400-480V VERTICAL MOUNT AIR CONDITIONER WIRING SCHEMATIC	
DRAWING NUMBER	REV
IQ350943	C

120-230V TOP MOUNT UNITS



——— LINE VOLTAGE
 ——— CONTROL VOLTAGE (LOW)
 - - - - - OPTIONAL

ICE QUBE, INC.
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 DESCRIPTION
120-230V TOP MOUNT AIR CONDITIONER WIRING SCHEMATIC
 DRAWING NUMBER
IQ354358
 REV
B