

Ice-O-Matic®



Ice. Pure and Simple™



ELEVATION SERIES CUBE ICE MAKER

CIM Modular Cubers



Technical Service Manual

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Energy Efficiency

Ice-O-Matic has partnered with ENERGY STAR since 2004 to ensure our customers receive the most efficient ice machines for your investment dollar. Ice-O-Matic is committed to the continuous improvement in both energy efficiency and productivity thereby delivering the best value in energy efficient ice machines money can buy.

For a detailed list of ENERGY STAR qualified Ice-O-Matic ice machines, go to:
<http://www.iceomatic.com/Products/Sales-Literature/#>

Freight Claims

Inspect Promptly

This merchandise has been carefully inspected and packed in accordance with the carrier's packing specifications. Responsibility for safe delivery has been assumed by the carrier. If loss or damage occurs, you as the consignee must file a claim with the carrier and hold the container for carrier's inspection.

Concealed Loss or Damage

If loss or damage does not appear until merchandise has been unpacked, make a written request for inspection by the carrier within 5 days of the delivery date, then file a claim on a form from the carrier.

Visible Loss or Damage

Any external evidence of loss or damage must be fully described and noted on your freight bill or express receipt and signed by the carrier's agent. The claim should be filed on a form available from the carrier.

FILE CLAIMS WITHOUT DELAY

**DO NOT RETURN DAMAGED GOODS
TO ICE-O-MATIC**

How to use this Manual

Ice-O-Matic provides this manual as an aid to the Refrigeration Service Technician in installation and maintenance of the **CIM Series** cube ice machines. Do not attempt to perform installation, start-up or maintenance unless you have read and fully understand this manual.

**Ice-O-Matic ice-makers and dispensers are not approved for outdoor installation.
CIM Cubers contain R404A Refrigerant.**

To find a Service Provider, please reference our "Find a Service Technician" tab at www.iceomatic.com
Keep this manual for future reference.

The CIM Series Service Parts Manuals are available separately.

WARNING

Always disconnect electrical power and shut off water supply whenever maintenance or repairs are performed on the ice machine and related equipment.

CAUTION

Always wear protective eye wear whenever maintenance or repairs are performed on the ice machine and related equipment.

Ice-O-Matic Warranty

Every Ice-O-Matic ice maker is backed by a warranty that provides both parts and labor coverage. To view the warranty details, register products, or check your warranty status visit the "Warranty and Water Filter Registration" page on www.iceomatic.com

Installation Guidelines

For proper operation of the ice machine, the following installation guidelines must be followed by **a qualified refrigeration technician**. Failure to do so may result in loss of production capacity, premature part failures, and may **void all warranties**.

Reference the installation parameters prior to installing the machine. Ice-O-Matic assumes no responsibility for improperly installed equipment. Excessive time required for service or time for units requiring removal for service of inaccessible equipment will be the sole responsibility of the equipment owner.

Ambient Operating Temperature

Minimum operating temperature:
50°F (10°C)

Maximum operating temperature:
100°F (38°C) (60 Hz.), 110°F (43°C) (50 Hz.).

Note: Ice-O-Matic ice-makers and dispensers are not approved for outdoor installation

Incoming Water Supply

(See Electrical and Plumbing diagrams for line sizing)

Minimum incoming water temperature:
40°F (4.5°C)

Maximum incoming water temperature:
100°F (38°C)

Minimum incoming water pressure:
20 psi (1.4 bar, 0.138MPa)

Maximum incoming water pressure:
80 psi (5.5 bar, 0.552MPa)

Note: if water pressure exceeds 80 psi (5.5 bar), a water pressure regulator must be installed

All water supply lines must be installed per local codes. Use 3/8 inch O.D. minimum on air cooled machines. On water cooled machines 3/8 inch O.D. minimum tubing must be run to the condenser. The water supply for the machine can “T” off from the condenser line using 3/8 inch O.D. minimum tubing. Make 2 coils of extra tubing so that the machine can be pulled away from the wall if service is needed.

Water Filtration/Treatment

A water filter system should be installed with the ice machine. Refer to Ice-O-Matic water filter specification sheet.

Reverse Osmosis (RO) water can be very acidic and can attack the evaporator and other metal in the ice machine. Because the RO process removes all minerals and metals from the water it can promote the faster growth of microbial mold and slime. If RO water is used, Ice-O-Matic recommends the water pH is verified to be a neutral 7.0 to minimize the corrosive effects. Incorrect cleaners, sanitizers, and RO water that does not have a neutral pH could **void the machine’s warranty**.

Drains

All drain lines must be installed per local codes. Flexible tubing is not recommended. Route bin drain, purge drain and water condenser drain individually to a floor drain. The use of condensate pumps for draining water is not recommended. Ice-O-Matic assumes no responsibility for improperly installed equipment.

Note: The Purge Drain Fitting is plastic: DO NOT apply heat to purge drain area; DO NOT over-tighten drain connection.

The purge drain should be a minimum of 3/4 inch O.D. tubing. The condenser drain on water cooled units should be 1/2 inch O.D. minimum. The drain line fittings on Ice-O-Matic bins are 3/4 FPT. The bin drain should be a minimum of 3/4 inch O.D. Cold water drains should be insulated to prevent condensation from forming.

Clearance Requirements

Self-contained air-cooled ice machines should have a minimum of 6 inches (15cm) of clearance at the rear, top and sides for proper air circulation and adequate space for serviceability.

Self-contained air-cooled ice machines exhaust air out the top and right side. There are two alternative air exhaust options. Option A (top exhaust bias): minimum of 6 inches (15cm) of clearance at the rear and top of the ice machine for proper function at maximum operating conditions. Option B (side exhaust bias): minimum of 6 inches (15cm) of clearance at the rear and right side of the ice machine with a minimum of 3 inches (7.5cm) of clearance at the top for proper function at maximum operating conditions.

Appropriate space should be allowed for proper serviceability of the machine. Excess time to gain access for serviceability is not covered under warranty.

Stacking

Ice-O-Matic does not endorse stacking ice machines.

Dispenser Application

A thermostatic bin control kit should be installed if the CIM Cube ice machine is placed on a dispenser. A bin top may or may not be required and should be secured to the dispenser.

Electrical Specifications

Refer to the serial plate at the rear of the ice machine to make sure proper voltage and circuit breaker size have been supplied. Make sure the machine is on a dedicated circuit. European installations require that the electrical supply fixed wiring must be provided with a disconnect means having a separation of at least 3mm in all poles. The ice machines are provided **without** an electrical cord set and are designed and agency approved to be permanently connected.

Units are not approved for GFI outlets.

Caution: Electrical connection must be made or a cord installed by a **qualified electrician** or there is danger of an electrical fire.

Adjustments

Level the machine within 1/8 inch in all directions. Check the water in the Water Sump for proper level.

Check the ice bridge for proper thickness and adjust on Float Switch Housing Assembly as needed.

Check the Water Regulating Valve adjustment if water cooled.

Secure the machine on top of the bin or dispenser. Attach the ice machine to the bin with the mounting straps provided with the bin or dispenser. Insure that the back of the ice machine is flush with the back of the bin. Proper functioning of the Bin Door requires the door, when it is opened, to be in a stable position.

If the ice machine is too far forward on the bin, the opened door may not be stable, resulting in an unexpected closing of the bin door. If the ice machine is to be mounted on a bin or dispenser other than an Ice-O-Matic, refer to the manufacturers instructions for machine mounting. Ice-O-Matic will not be responsible for damage or injury that results from unexpected closing of the bin door as a result of the ice machine being too far forward on the bin.

Remote Condenser Installation

For proper operation of the ice machine, the following installation guidelines must be followed. Failure to do so may result in loss of production capacity, premature part failure, and may **void all warranties**.

Use the following for planning the placement of the remote condenser relative to the ice machine

Location Limits

Remote condenser location must not exceed ANY of the following:

Maximum rise from the ice machine to the remote condenser is 35 physical feet.

Maximum drop from the ice machine to the remote condenser is 10 physical feet.

Physical line set maximum length is 75 ft.

Calculated line set length maximum is 100 ft.

Ambient operating temperatures:

-20°F (-28.9°C) to 120°F (48.9°C)

Calculation Formula

Drop = $dd \times 6.6$
(dd = drop distance (ft.))

Rise = $rd \times 1.7$
(rd = rise distance (ft.))

Horizontal Run = hd
(hd = horizontal distance (ft.))

Calculated Line Length = Drop + Rise + Horizontal Run

Configurations that do NOT meet these requirements must receive written authorization from Ice-O-Matic. This includes multi-pass or rack system remote condensers.

DO NOT: Route a line set that rises, then falls, then rises or a line set that falls, then rises, then falls.

Remote Condenser Location

Pre-charged line sets are available in 25, 40, 45, 60 or 75 foot length to connect the ice machine to the remote condenser. Select the best available location, protecting the remote condenser from extremes of dirt, dust and sun. Meet all applicable building codes. The services of a licensed electrician may be required.

Roof Attachment

Install and attach the remote condenser to the roof of the building using the methods and practices of construction that conform to the local building codes, including having a roofing contractor secure the remote condenser to the roof.

Have an electrician connect the remote condenser fan motor wires to the ice machine using the junction box at the back of the machine.

Pre-charged Line Set Routing

CAUTION: Do not connect the pre-charged tubing until all routing and forming of the tubing has been completed. See the coupling instructions for connecting information.

Each set of pre-charged tubing refrigerant lines consists of a 3/8" diameter liquid line and 1/2 inch diameter discharge line. Both ends of each line have quick connect couplings, one end of the line set has a Schrader valve connection.

Note: the openings in the building or ceiling or wall, listed in the next step, are the minimum sizes recommended for passing the refrigerant lines through.

Have a roofing contractor cut a minimum hole for the refrigerant lines of 2.50 inch. Check local codes, a separate hole may be required for the electrical power to the condenser.

CAUTION: DO NOT KINK OR CRIMP REFRIGERANT TUBING WHEN INSTALLING IT.

Route the refrigerant lines through the roof opening. Follow straight line routing whenever possible. Any excess tubing **MUST** remain inside the building. Spiral the excess length of pre-charged tubing inside the building. Use a horizontal spiral to avoid any traps in the lines. Have the roofing contractor seal the holes in the roof per local codes.

CAUTION: The couplings on the sets of pre-charged lines are self sealing when installed properly. Carefully follow the instructions in the Remote Condenser manual.

The following remote ice makers incorporate the Mixing Valve in the condenser. This configuration allows up to a 100 foot calculated remote line set run. Reference the diagram on the next page to calculate the maximum 100 ft. line set run. Maximum **actual line set run** is limited to 100 ft. Add 1/4 oz. of refrigerant for each actual foot from 75 to 100 ft. actual line set run.

| CIM Machine Model Number | Remote Condenser Model Number |
|--------------------------|-------------------------------|
| CIM0520R/530R | VRC1001B/RCA1001 |
| CIM0525R/535R | VRC1061B/RCA1061 |
| CIM0636R | VRC1061B/RCA1061 |

***Verify the CIM machine is compatible with the remote condenser.
For more information contact your Ice-O-Matic distributor.**

Equivalent Run Calculation Examples

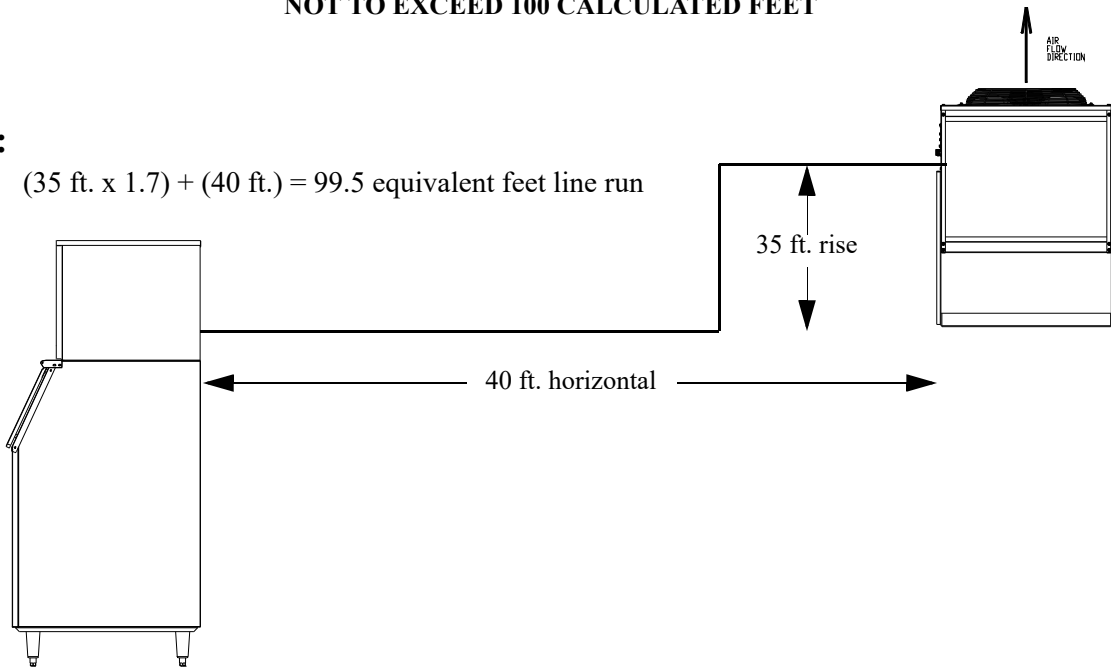
Formula for maximum equivalent run:

$$(RISE \times 1.7) + (DROP \times 6.6) + HORIZONTAL RUN = EQUIVALENT RUN$$

NOT TO EXCEED 100 CALCULATED FEET

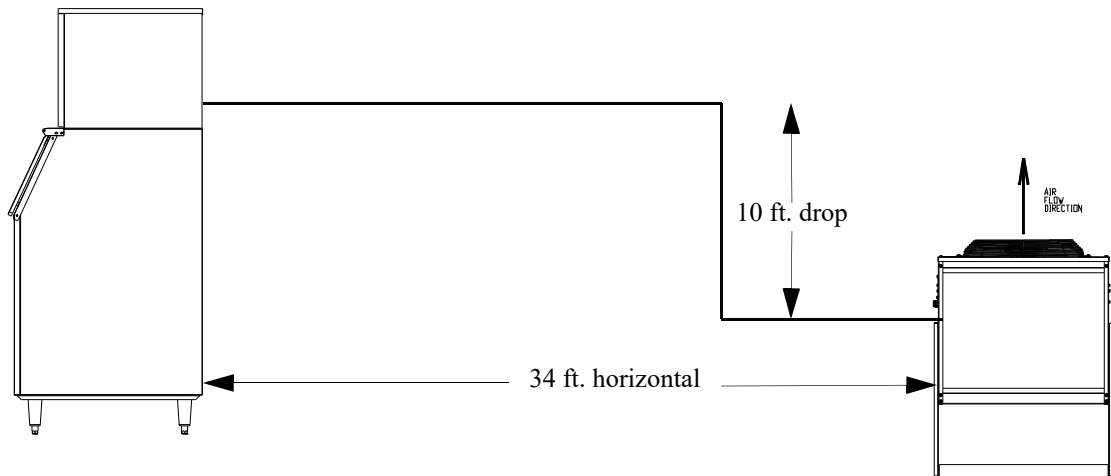
Rise:

$$(35 \text{ ft.} \times 1.7) + (40 \text{ ft.}) = 99.5 \text{ equivalent feet line run}$$



Drop:

$$(10 \text{ ft.} \times 6.6) + (34 \text{ ft.}) = 100 \text{ equivalent feet line run}$$



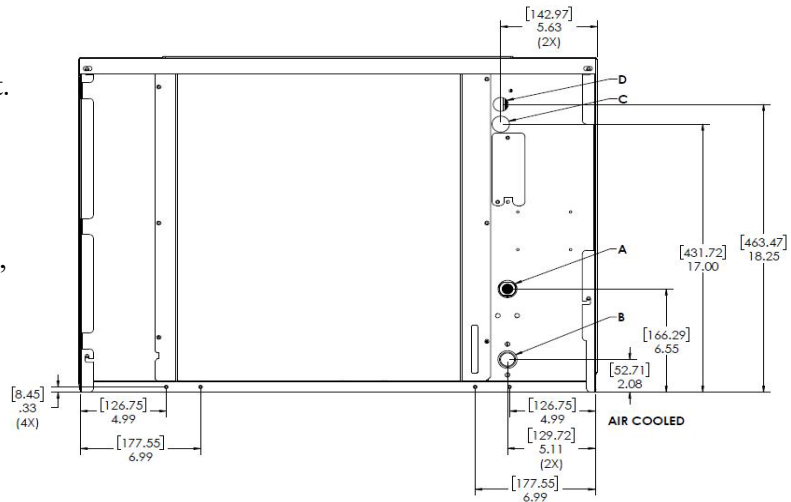
Electrical and Plumbing Requirements CIM SERIES Common Connections

CIM0330/5 A CIM0430/5/6 A CIM0635/6 A

Air Cooled

Please note: air-cooled units require 6”(152mm) for air intake and exhaust.

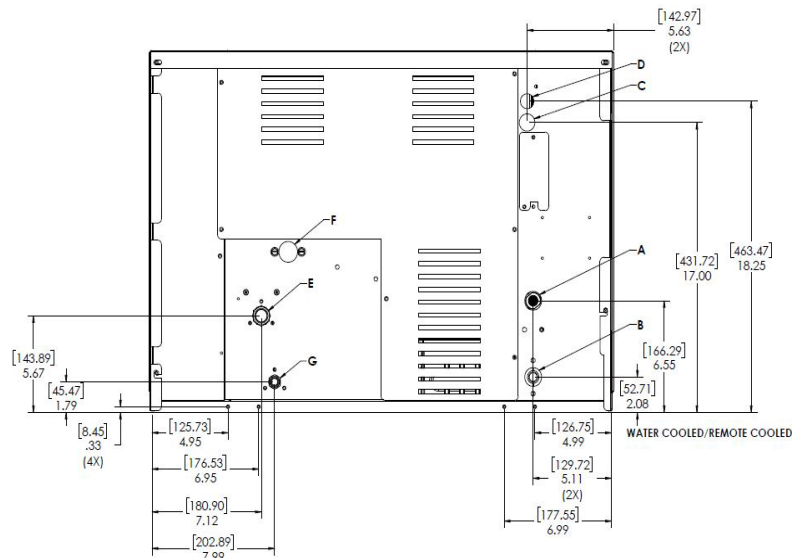
- A. Ice maker potable water in, 3/8” FPT.
- B. Ice maker water out, 3/4” FPT.
- C. Hole for electrical connections, 7/8”.
- D. Electrical junction box, 7/8”.



CIM0330 W CIM0430/5/6 W CIM0636 W/R

Water/Remote Cooled

- A. Ice maker potable water in, 3/8” FPT.
- B. Ice maker water out, 3/4” FPT.
- C. Hole for electrical connections, 7/8”.
- D. Electrical junction box, 7/8” (remote).
- E. Condenser water in, 3/8” FPT (water only)
Discharge line, 1/2” male quick connect coupling for pre-charged line set (remote only)
- F. Condenser water out, 1/2” FPT (water only).
- G. Liquid Line, 3/8” male quick connect coupling for pre-charged line set (remote only).

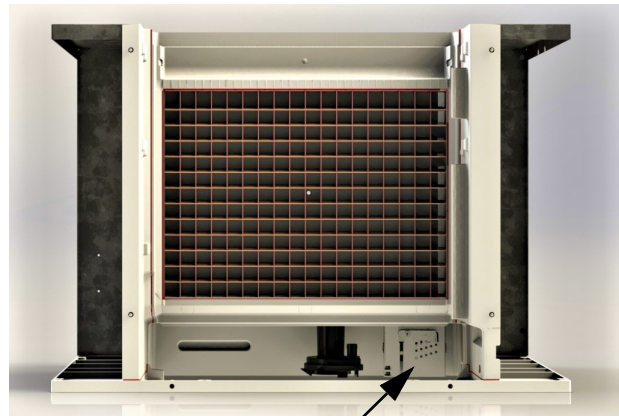


Start-Up Procedure

Note: Before starting the machine, make sure the machine is level within 1/8 inch in all directions, the bin or dispenser leg height can be adjusted by rotating the leg foot.

After verifying proper voltage, water supply, drains and breathable air space around the unit, press and quickly release the ON/OFF button behind the unit front panel. The indicator light will change from a solid red to solid blue in color.

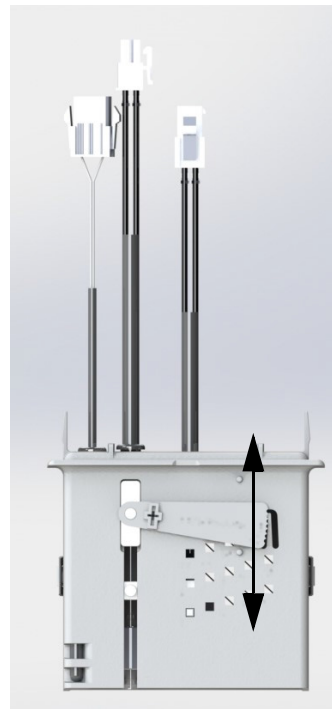
Follow the Sequence of Operation (pg.9) in this manual or the Elevation Series Service Slide Guide available from Ice-O-Matic Distributors. Check operation of each component through the cycle as explained in this section.



Access to Water Level Adjustment

Bridge Thickness Adjustment

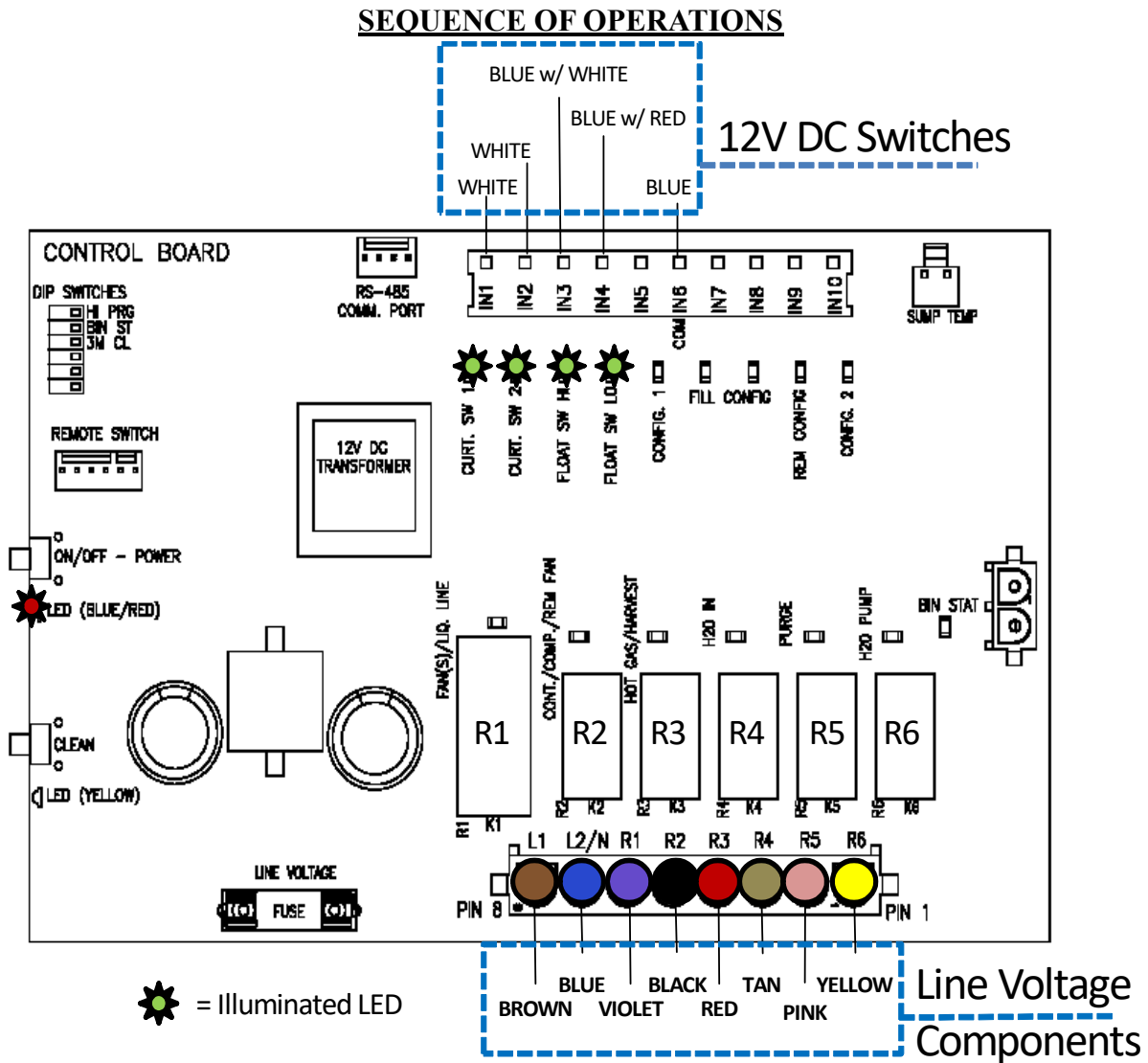
Once the unit has gone through a harvest cycle, verify the bridge thickness (3/16” thick for units less than 400 lbs. and 1/8” for 400 lbs. and above) across the middle of the ice slab on the second batch produced. The ice thickness can be changed on the Float Housing by turning the adjustment clockwise to decrease the bridge thickness and counter-clockwise to increase the bridge thickness. You will hear a “click” with each adjustment. It is recommended adjustments be made one or two “clicks” at a time.



Lowers Float; increases bridge thickness

Raises Float; decreases bridge thickness

| Model | Batch Weight | |
|------------|--------------|-----------|
| | Half Cube | Full Cube |
| CIM330/35 | 2.9-3.15 | 3.25-3.5 |
| CIM430/630 | 4.9-5.15 | 5.5-5.8 |

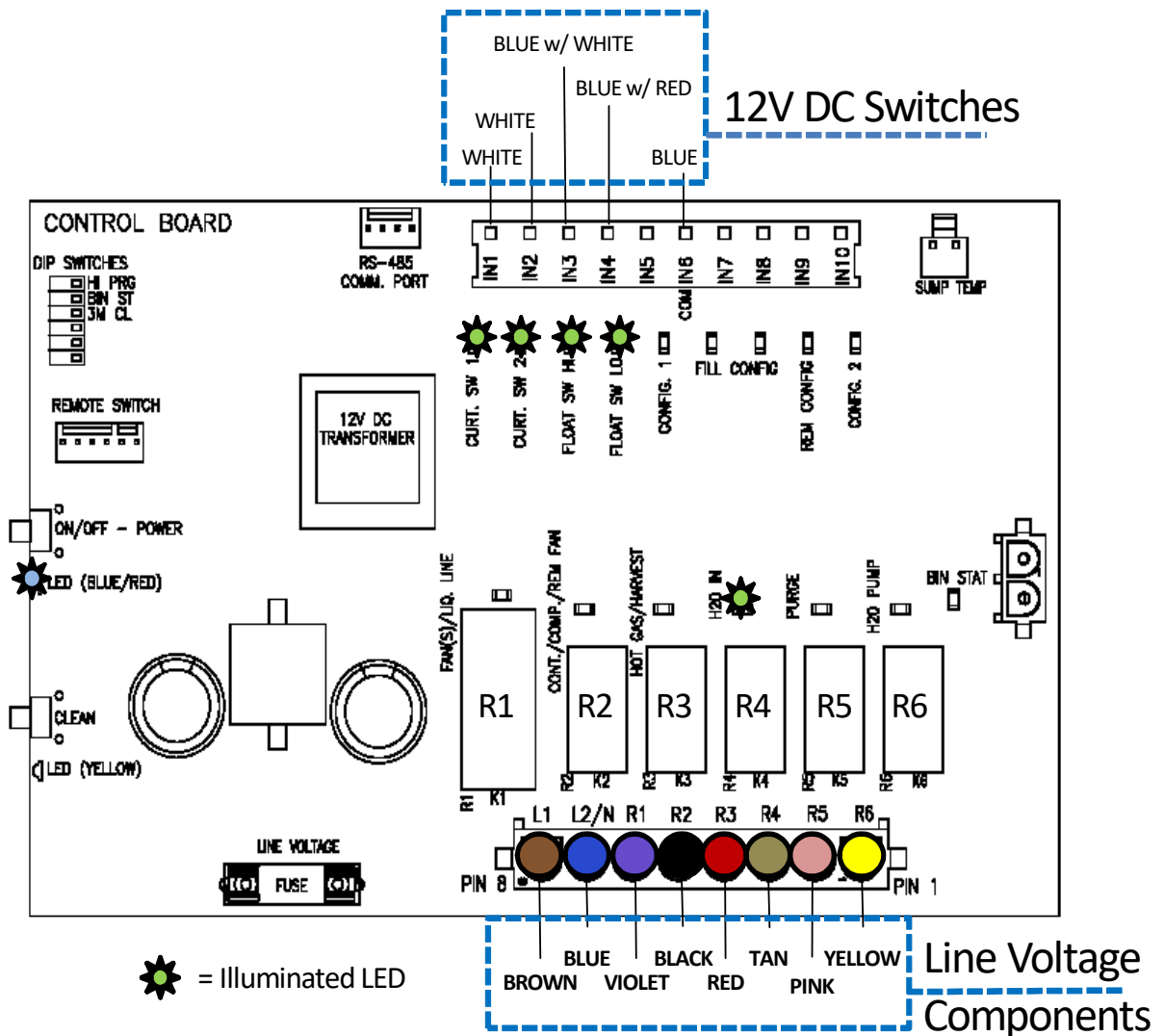


CONTROL BOARD - OFF STATUS

When power is initially applied to the unit, the LED's on both the Push Pad and the Board POWER Button will flash in sequence BLUE, then RED, then the WASH Button will flash YELLOW, followed by the POWER Button LED will turn a solid RED, indicating the unit is in the OFF status as shown above.

The LED's for the Curtain Switches (1 & 2), High Float Switch and Low Float Switch will be illuminated indicating closed circuits. Should the Curtains or Bin Thermostat (if added) be open, the unit will not start a Freeze Cycle.

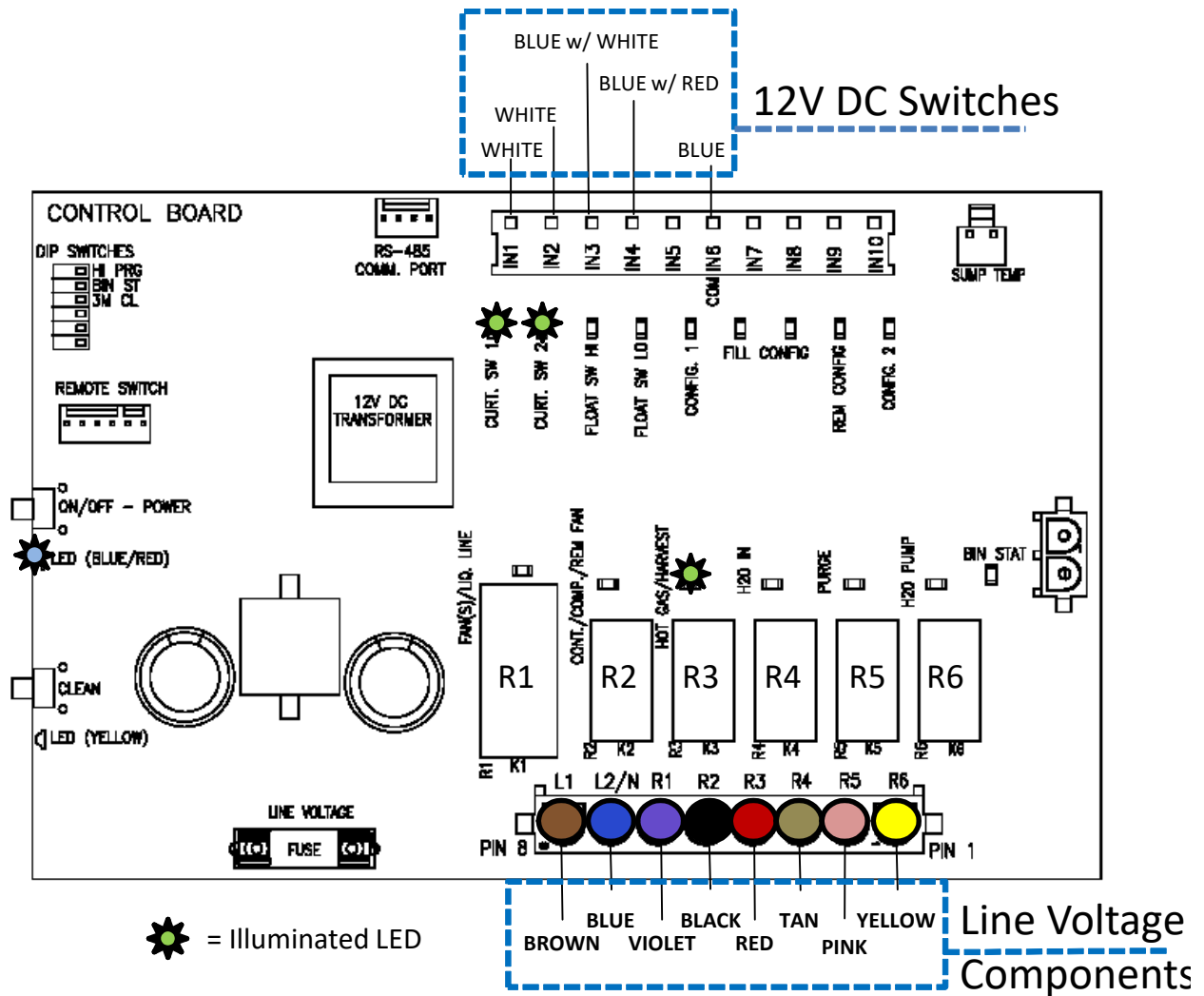
From an OFF status, the unit can start a CLEAN cycle, a FREEZE cycle or be put in the DIAGNOSTIC mode. For Cleaning Instructions, see page 56. For more on the DIAGNOSTIC mode see page 30.



CONTROL BOARD - FREEZE CYCLE

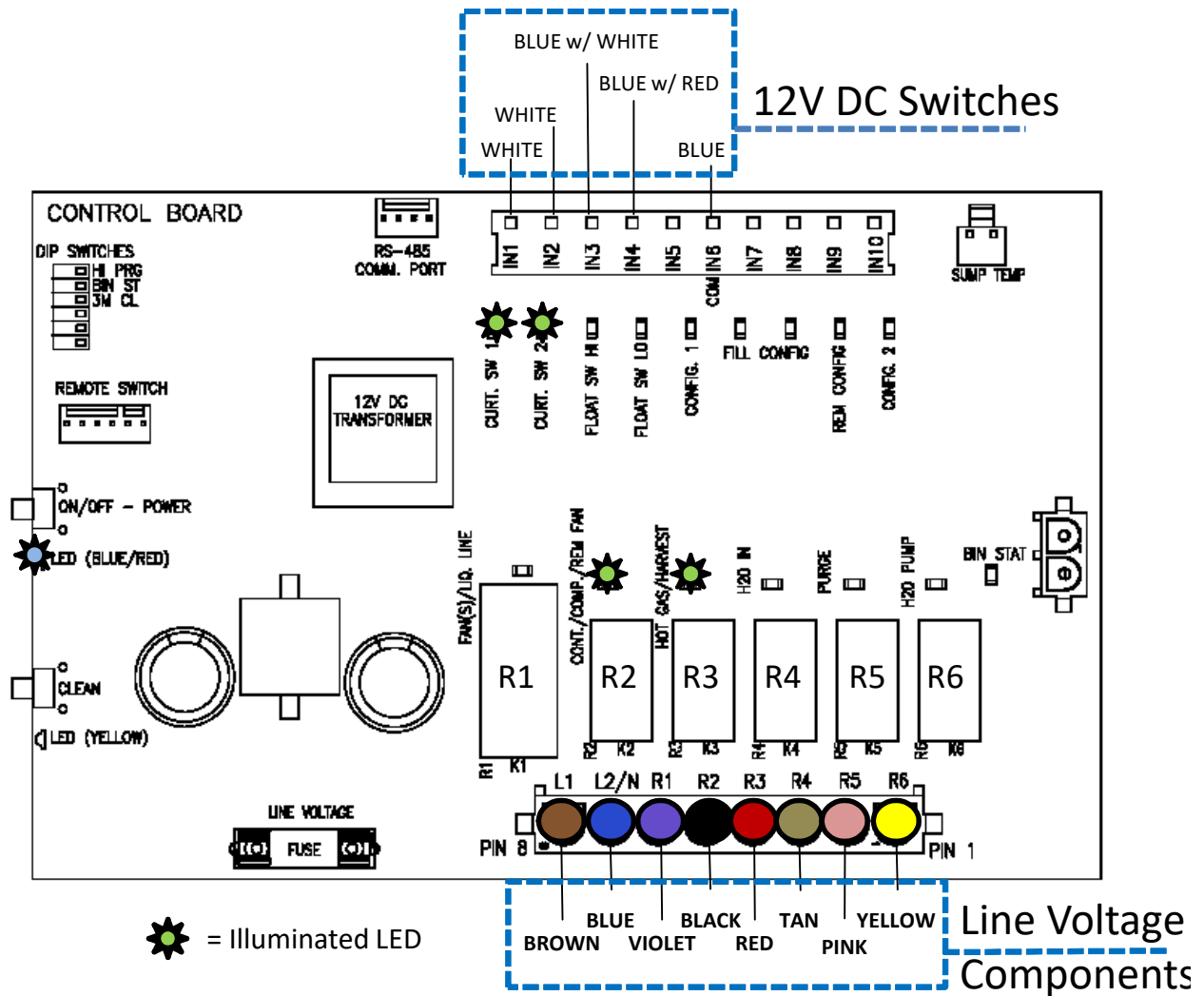
A quick press of the POWER button on the Push Pad or Board will start the Freeze cycle. The Water Inlet Valve will be energized (R4 LED on Board illuminated) and water will begin flowing into the Sump. As the water rises, the contacts in the Low Water Float will open (Switch LED off). The Water Inlet Valve will remain energized until the High Water Float contacts open (Switch LED off). The Water inlet Valve will be de-energized (R4 LED on Board off).

Note: Minimum Freeze Cycle - 5 minutes (from Compressor Start.)
 Maximum Freeze Cycle - 1 hour.



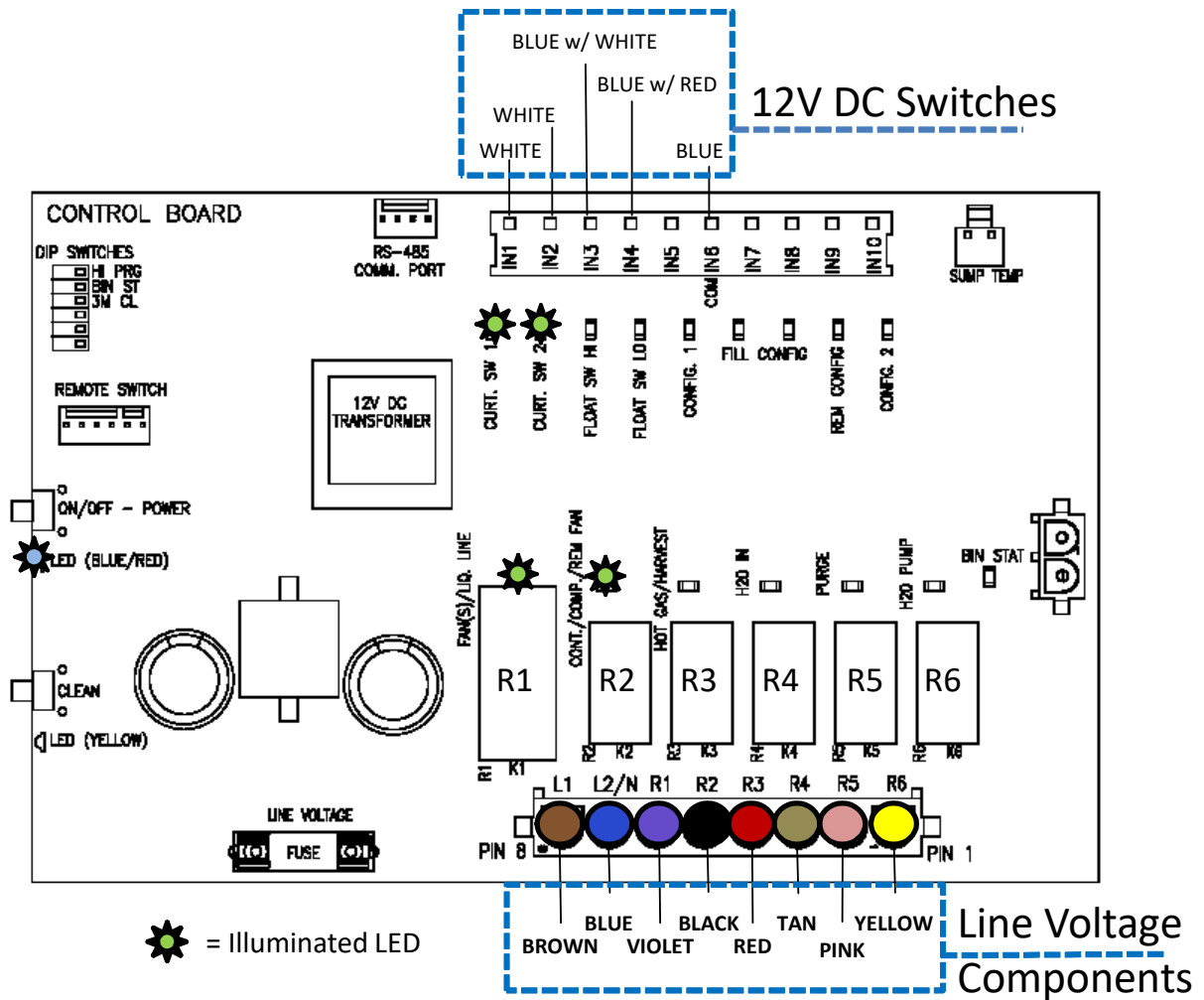
CONTROL BOARD - COMPRESSOR START

The Hot Gas Valve will be energized (R3 on Board illuminated) for 5 seconds and the system pressures will start to equalize.



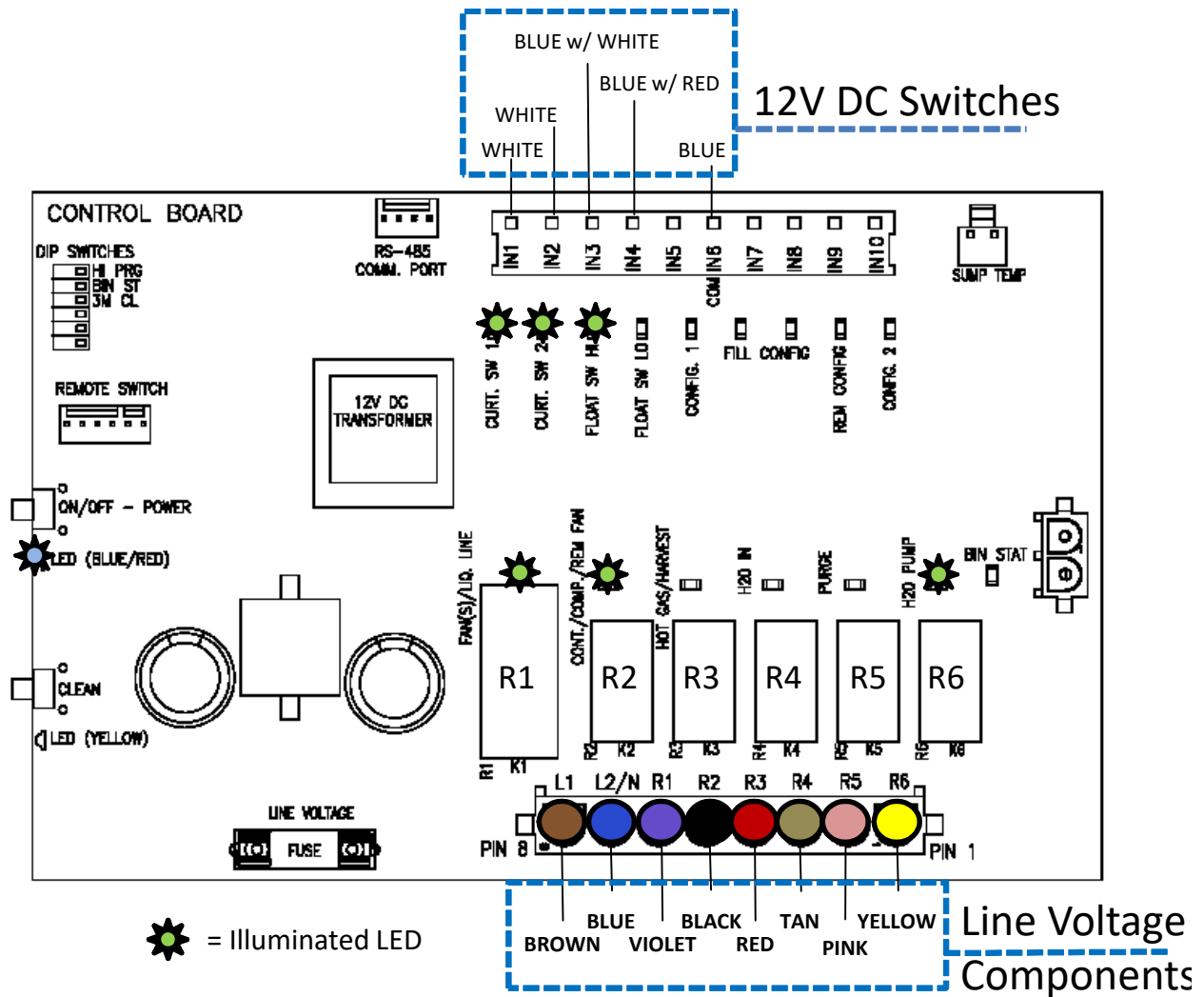
CONTROL BOARD - COMPRESSOR START

The Compressor will be energized (R2 on Board illuminated) and the Hot Gas Valve will remain open for 5 more seconds and then de-energize (R3 on Board off).



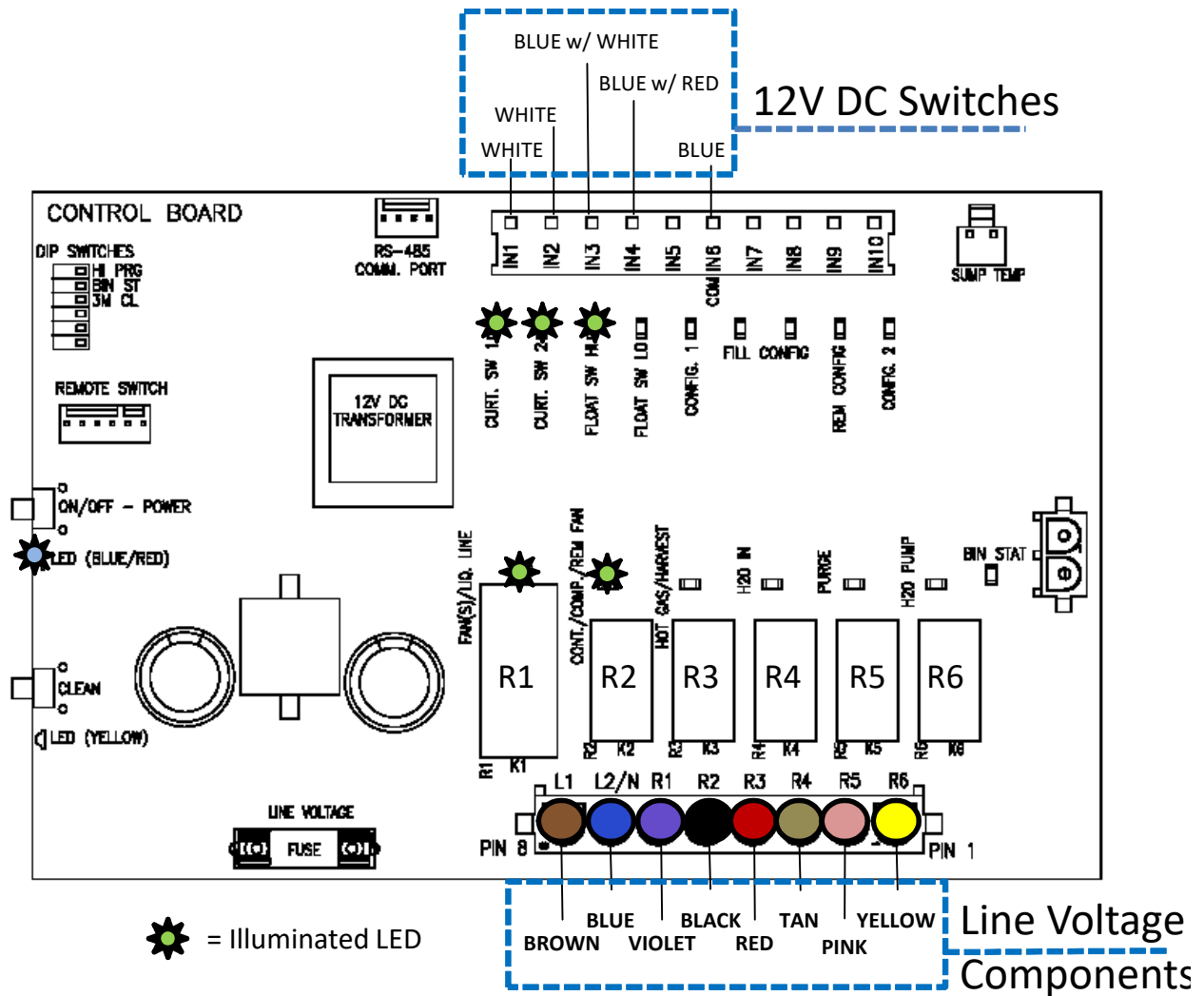
CONTROL BOARD - PRE-CHILL

The Compressor and Fan(s)/Liquid Line Solenoid (R1 and R2 LED's on Board illuminated) are energized and unit is now in a Pre-Chill for 30 seconds bringing the Evaporator temperature down. Both Curtain Switch LED's are on showing closed curtain(s). Even though (R1) is energized the Fan Motor will only come on once the Fan Cycle Switch closes at 250 psi of head pressure.



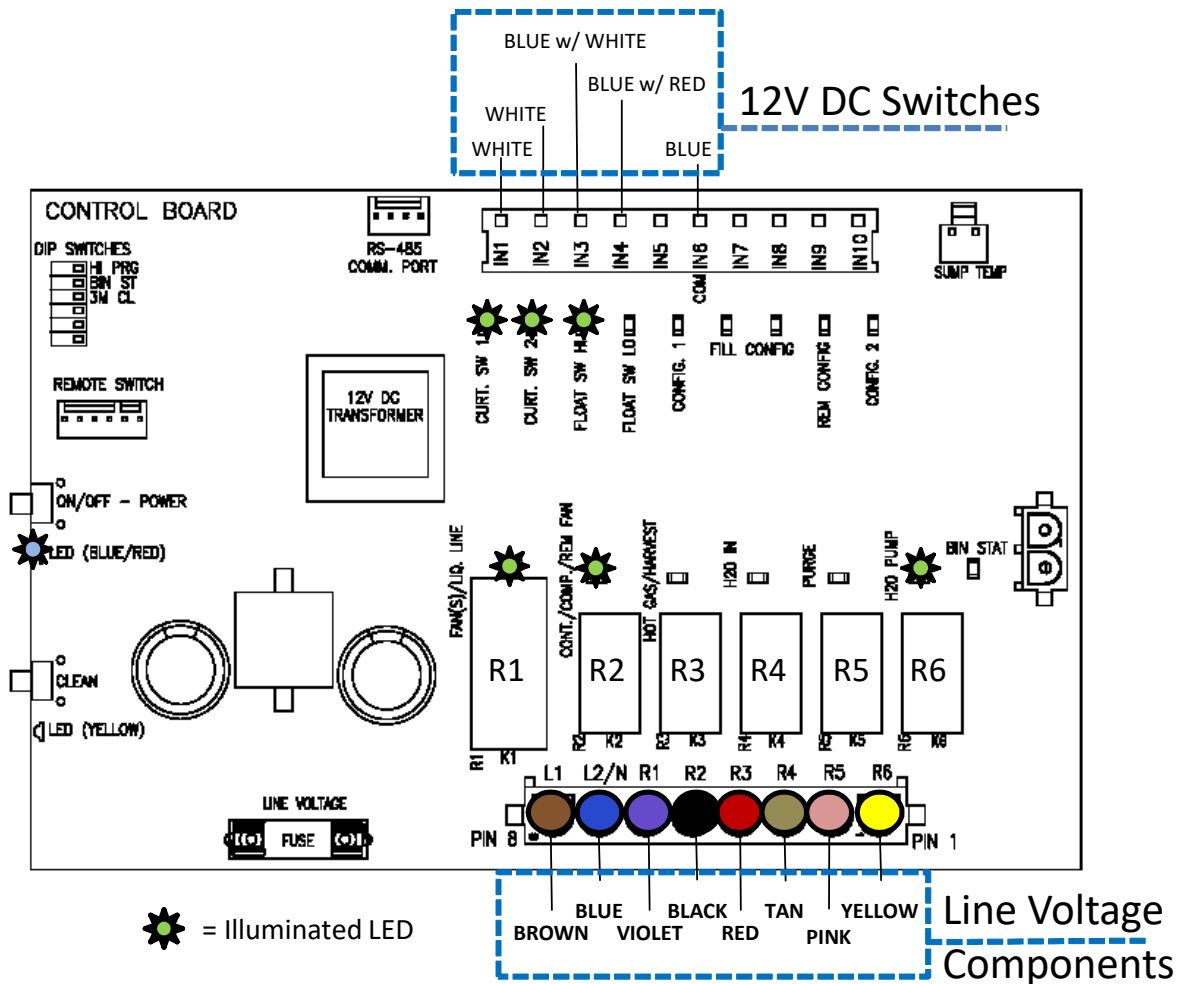
CONTROL BOARD - FREEZE

The Water Pump is energized (R6 LED on Board illuminated) and water is pushed through the Water Pump Tube and flows over the Evaporator. The High Float Switch contacts close as the water level in the Sump drops (High Float Switch LED on Board illuminates).



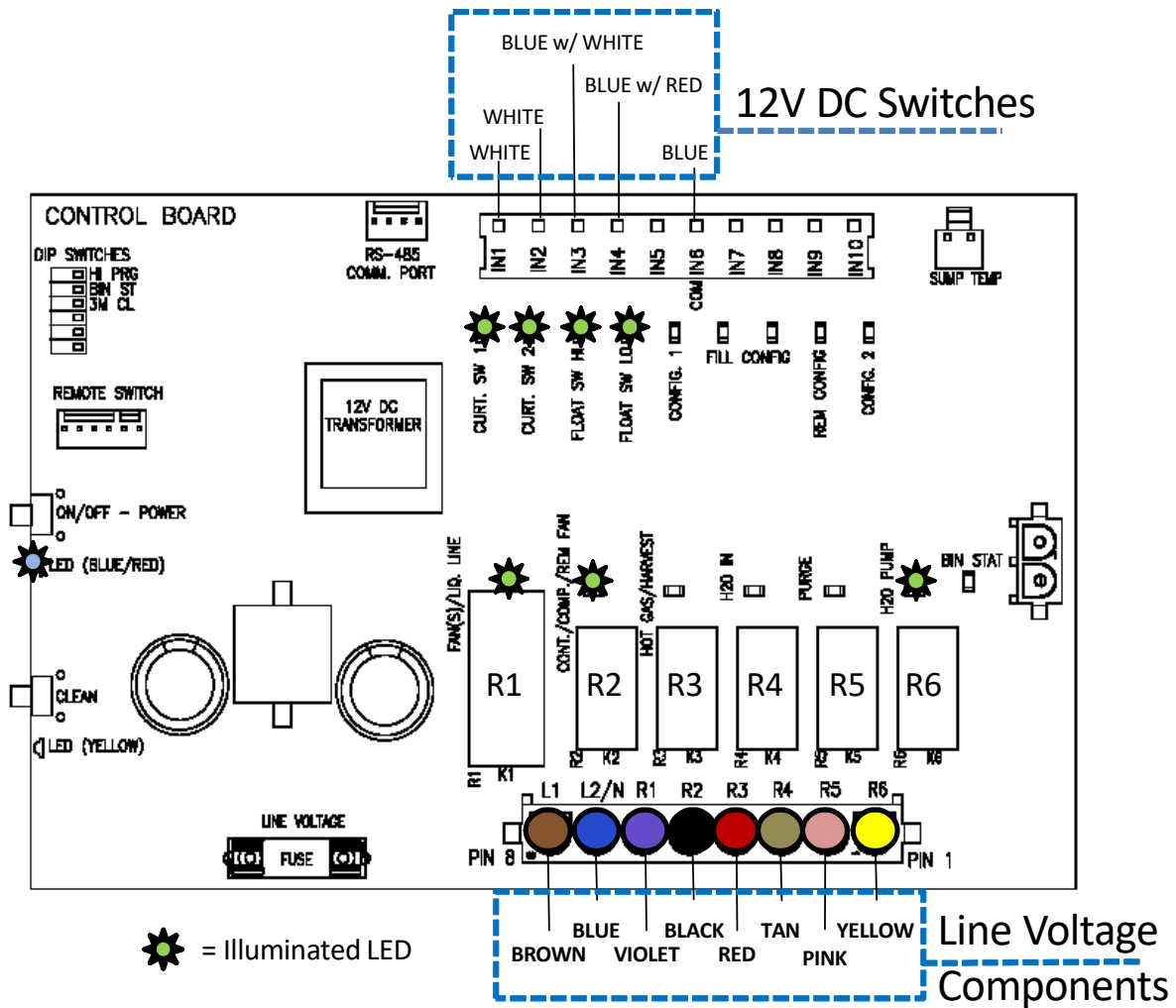
CONTROL BOARD - ANTI-SLUSH

During the first 3 cycles as the water temperature reaches 36 degrees F. the Water Pump will shut off for 20 seconds to reduce the possibility of slush developing in the Sump. After the first 3 cycles, Anti-Slush will only occur if the Sump water temperature reaches 28 degrees F.



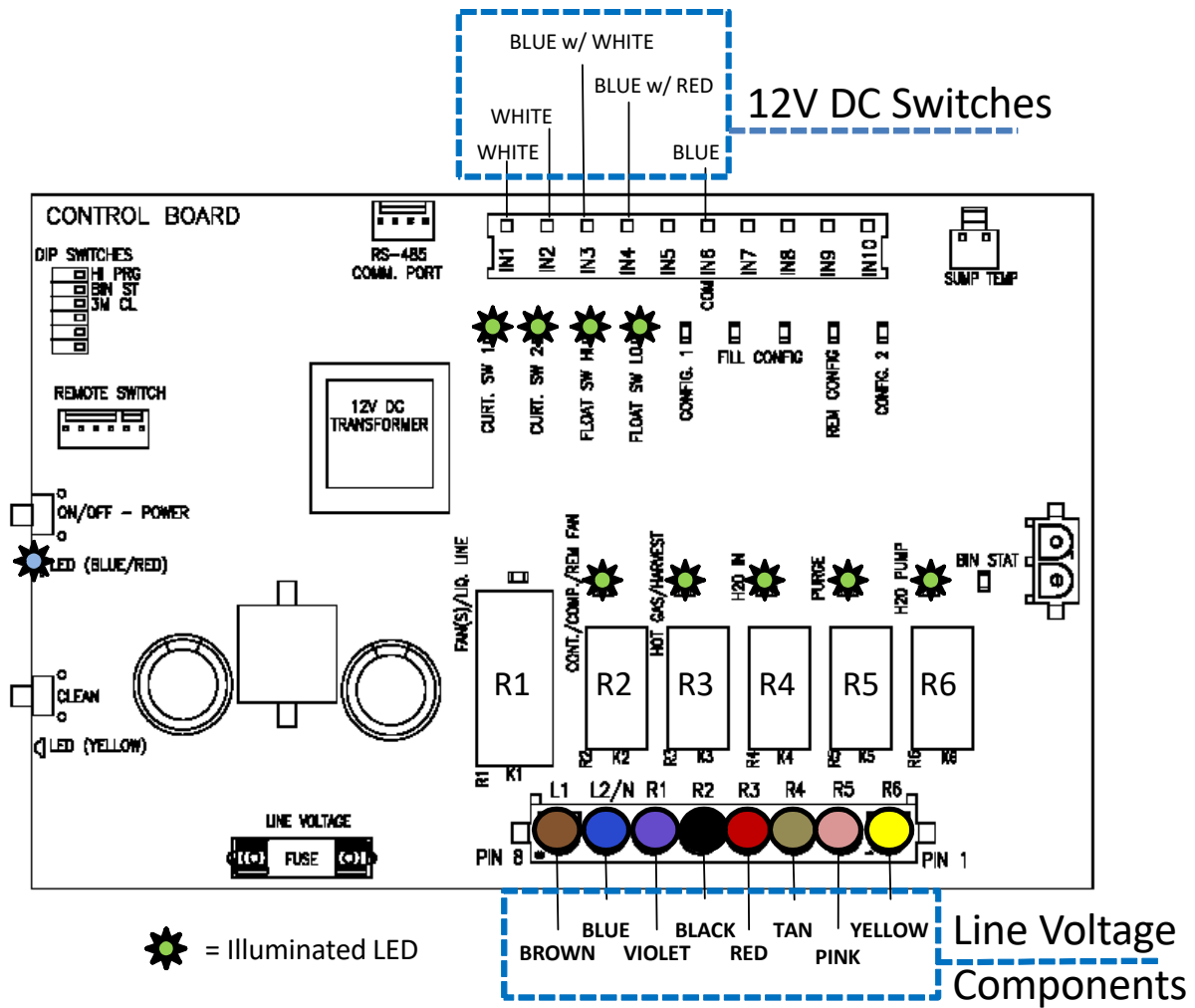
CONTROL BOARD - WATER PUMP ON

At the end of Anti-Slush the Water Pump (R6) will be re-energized and water starts flowing over the Evaporator again. The unit will stay in this mode until the Low Float Switch closes on water level drop, indicating the unit is ready to harvest.



CONTROL BOARD - INITIATING HARVEST

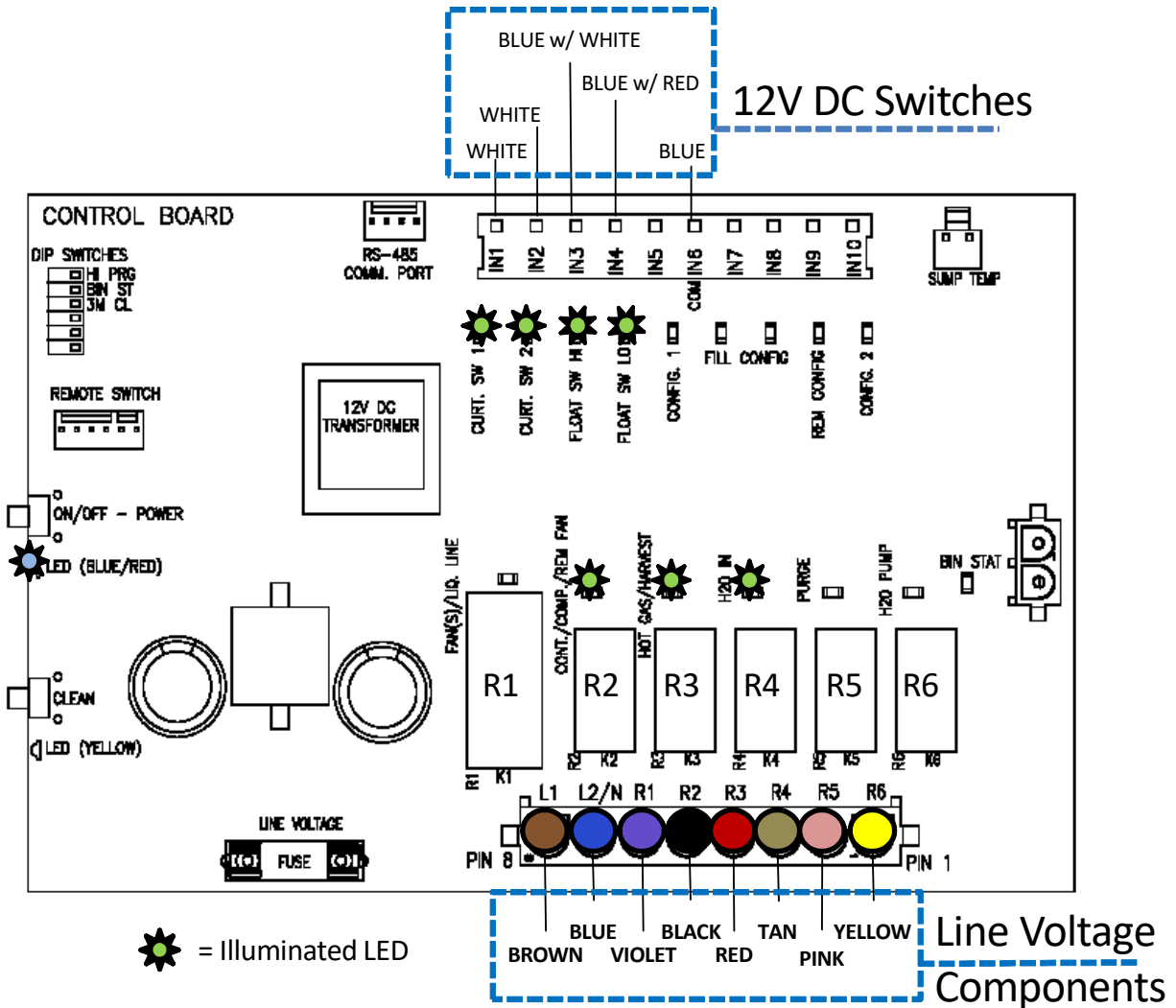
When the water level in the SUMP drops to close the contacts of the Low Float Switch (LED on Board illuminates) after a 5 second de-bounce of the switch will signal the start of the Harvest Cycle.



CONTROL BOARD - HARVEST

After the contacts of the Low Float Switch close, the Harvest Cycle starts by energizing the Hot Gas Valve, Harvest Assist, Purge Valve AND Water Inlet Valve (R2, R3, R4, R5 and R6 are illuminated on Air and Water Cooled units, ALL Relays are energized on Remotes.) The Purge Valve will close after 7 seconds.

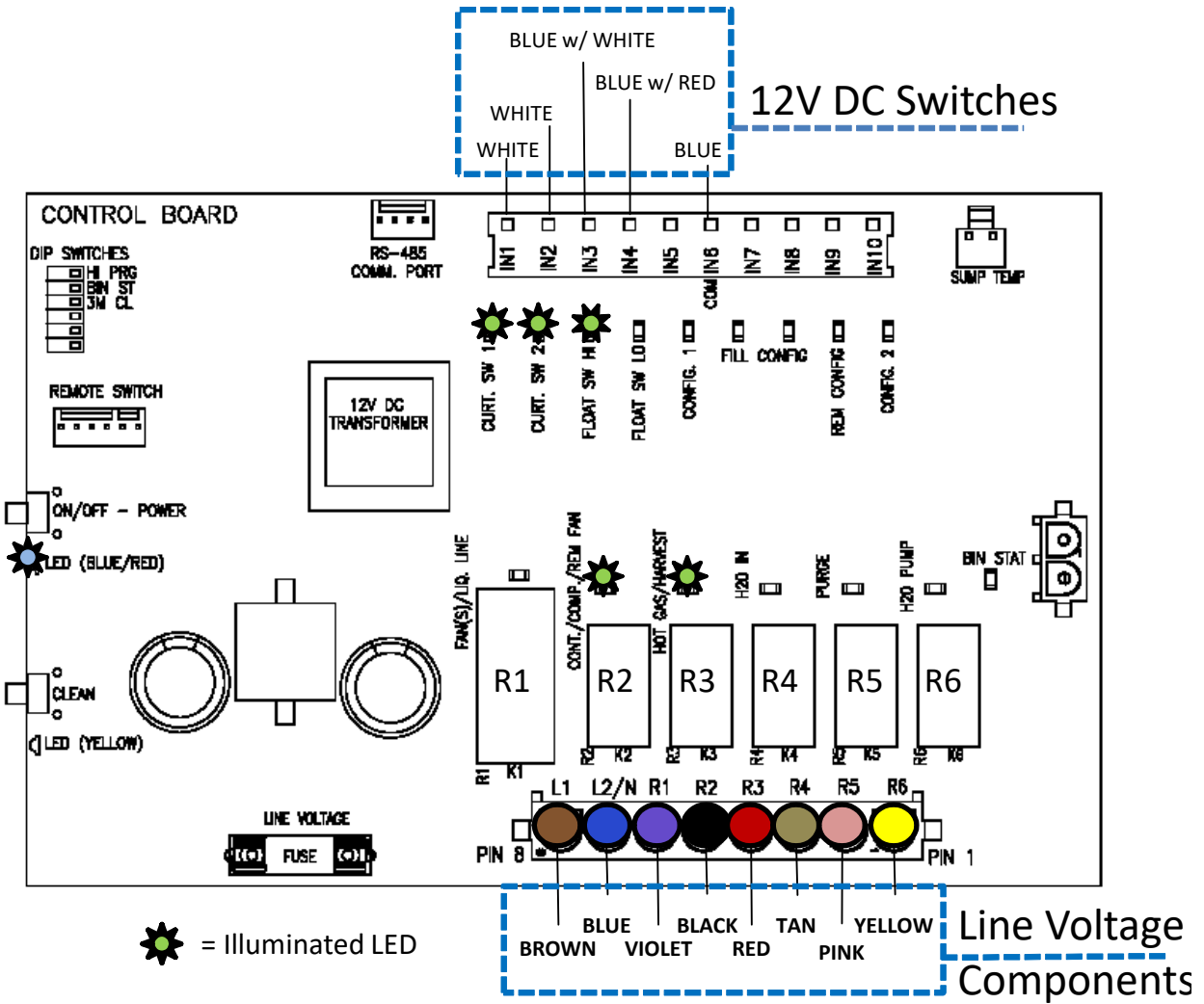
NOTE: Minimum Freeze time is 20 seconds. Maximum freeze time is 5.5 minutes.



CONTROL BOARD - HARVEST

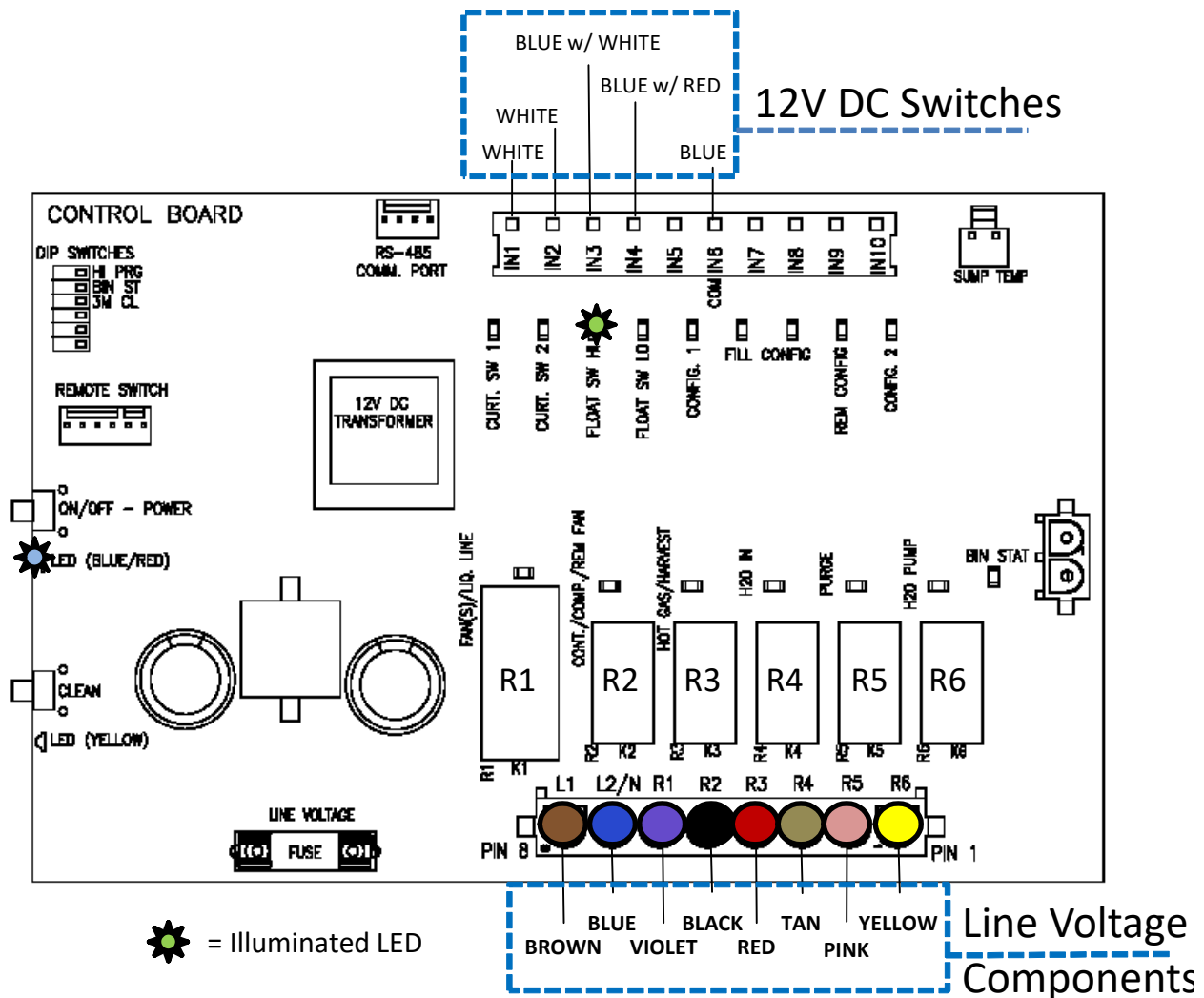
After the Purge Valve and Water Pump de-energize, the Water Inlet Valve will remain open for 20 seconds, partially filling the SUMP in preparation for the next Freeze Cycle (R2, R3, and R4, are illuminated on Air and Water Cooled units, R1 is also energized on Remotes.) The Low Float Switch will go off as the water level rises.

The Hot Gas Valve and Harvest Assist will remain energized for the remainder of the Harvest Cycle.



CONTROL BOARD - HARVEST

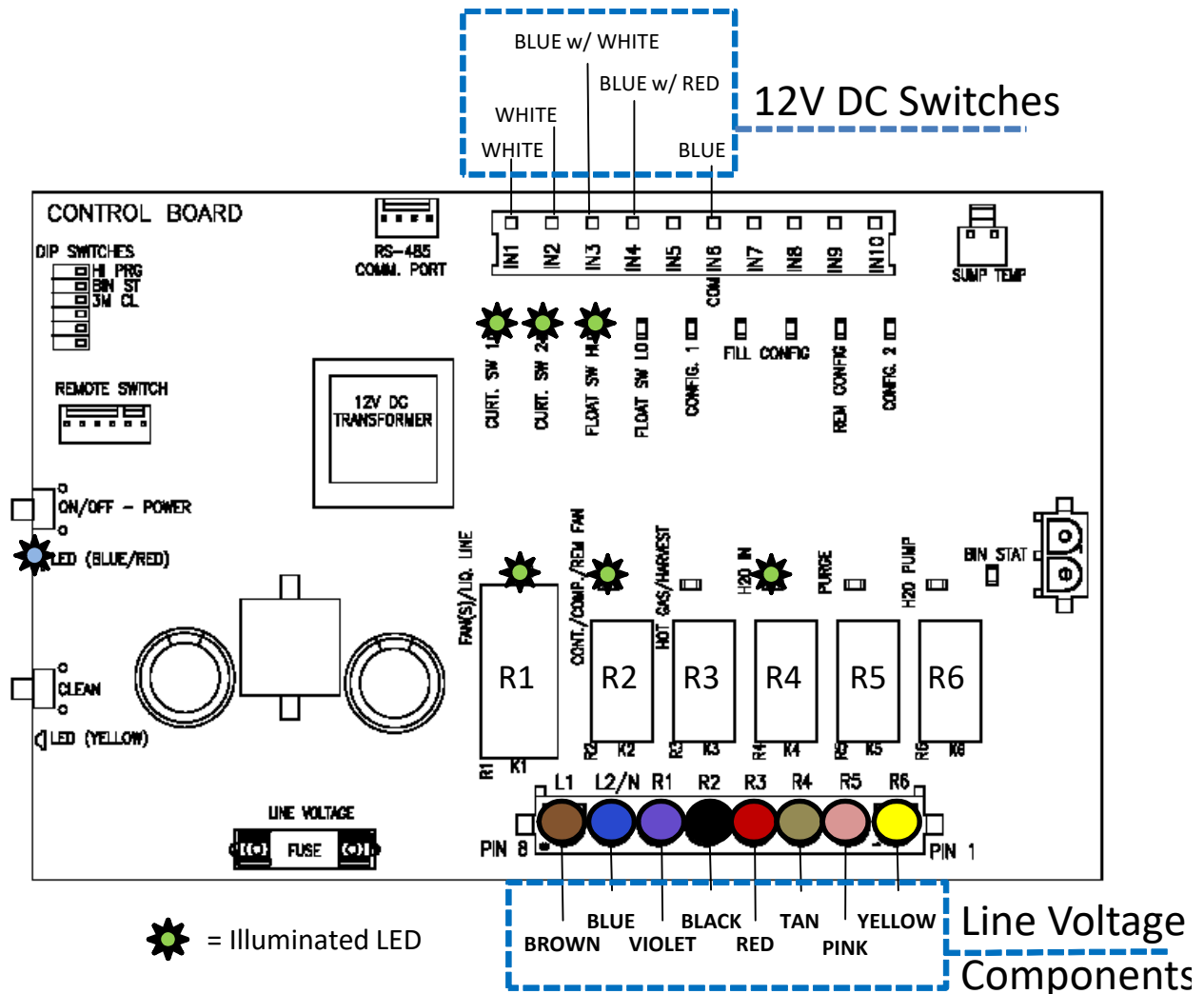
After the Water Inlet Valve closes following the 20 second time out, the Hot Gas Valve and Harvest Assist will remain energized until the ice slab is harvested from the Evaporator. At this point the unit is reading the Curtain Switch (s) and/or Bin Thermostat (if added).



CONTROL BOARD - BIN FULL

As the ice slab falls from the Evaporator, the Curtain(s) is pushed out, contacts of the Magnetic Curtain Switch(s) open as the ice slab falls. If the Curtain(s) remains open for 30 seconds, the unit will shut down on a full bin. All RELAY LED's (R1 - R6) will go off. If the storage is not full, the unit will restart the next cycle. See pg. 28.

Anytime the unit is turned off or cycles off on a full bin due to a Curtain Switch being open for 30 seconds and/or an added Bin Thermostat remaining open for 90 seconds, the unit will not restart for 3 minutes, preventing a Compressor short cycle.



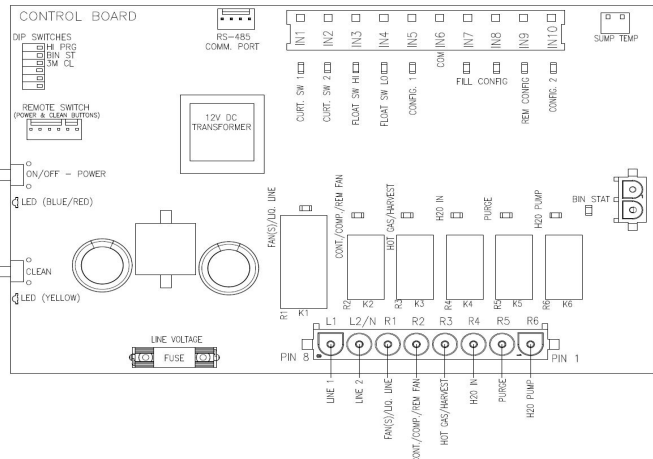
CONTROL BOARD - RETURN TO FREEZE

As the ice slab falls from the Evaporator, the Curtain(s) is pushed out and the contacts of the Curtain Switch(s) open and close, terminating the Harvest Cycle. With a closed Curtain and Bin Thermostat (if added), the unit will restart the Freeze Cycle. The Compressor (R2) and Fan(s) (R1) will continue operation as the Water Inlet Valve (R4) is energized to fill the Sump until the High Water Float opens.

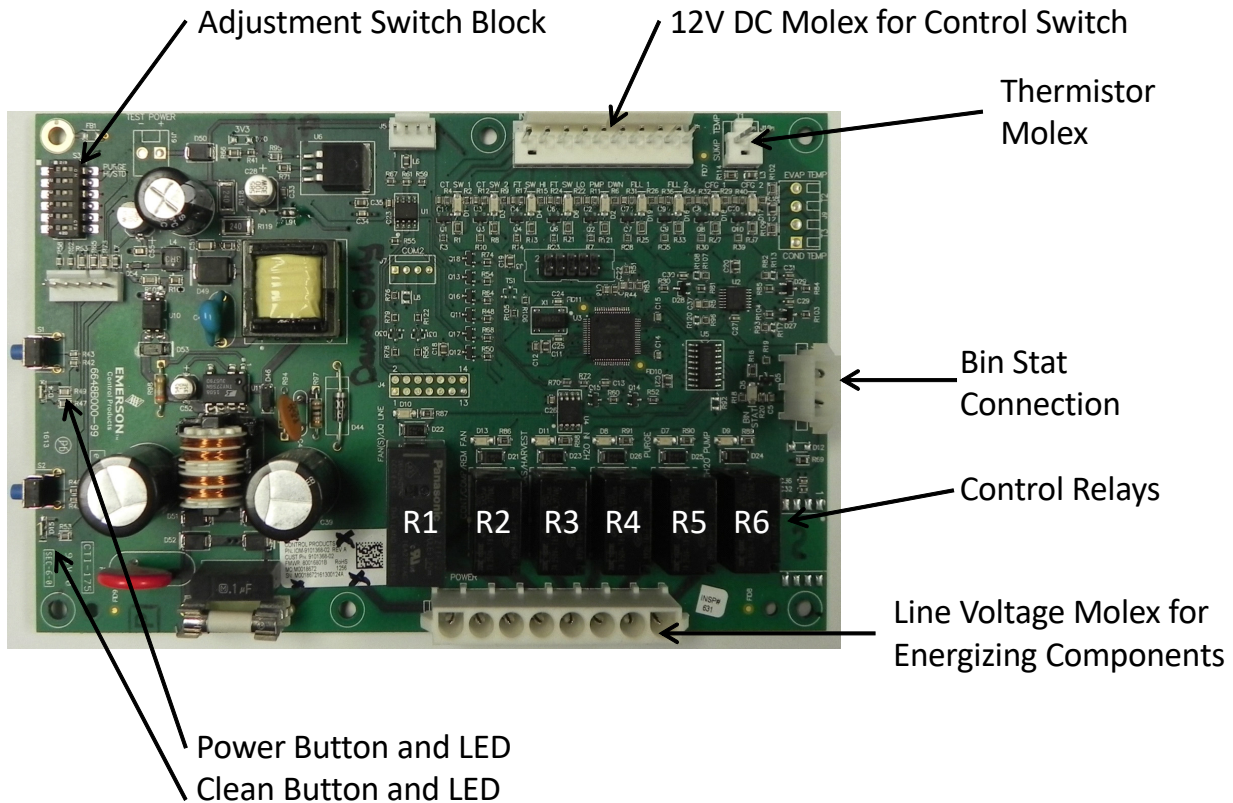
Control Board

Operation

The Board controls the operation of the unit. A series of LED lights show Switch positions and Component operation to assist the technician in understanding and troubleshooting issues that may arise. See Sequence of Operation pg. 9 for operational information.



Control Board Features



Adjustment Switch Block

Three adjustments can be made on the block. Extended Purge, Bin Thermostat Kit add-on and Cleaning Needed Reminder.

Standard Purge time during a Defrost Cycle is set at 7 seconds. To add an additional 5 seconds to the purge time, move Switch 1 to the right, to the ON position.

Should the unit be installed on top of a dispenser, a Bin Thermostat Kit is required. Following the instruction that come with the kit, Switch 2 needs to be moved to the ON position to tell the program to read the Bin Thermostat. The LED beside the Bin Stat Connection will then illuminate. The Switch 3 on the block is for the Cleaning Needed Reminder. When in the OFF position, the default setting for the reminder is 6 months. When Switch 3 is moved to the ON position, the Reminder is set for every 3 months. This is recommended should the unit be installed in a hard water location to help with production levels.

12V DC Molex for Control Switches

This Molex connects the Magnetic Curtain Switch(es), High Float Switch, Low Float Switch and Remote Configuration Switch to the Board. The LED's associated to each switch will illuminate when the contacts for each are closed. The Remote Configuration LED will be illuminated when the Smart Harness reads the unit has a Remote Condenser. The Configuration 1 and both Fill Configuration LED's are not used as of the printing of this manual.

Thermistor Molex

The Thermistor is used to gauge the water temperature in the Sump and is used to activate the Anti-Slush Cycle. When the water temperature reaches 36 degrees F during the first 3 cycles following a full bin situation, being restarted after a loss of power or turned off, the Water Pump will be turned off for 20 seconds to help prevent slushing of the water in the Sump. An Anti-Slush will also be performed any time the water temperature reaches 28 degrees F.

Control Relays

The six Control Relays send voltage out to the individual components during the operation of the unit. Relay 1 energizes the Fan(s) on self contained air cooled units or the Liquid Line Solenoid on Remotes. Relay 2 energizes the Compressor through the Contactor (and Fan Motor on Remotes). Relay 3 energizes the Hot Gas Valve and Harvest Assist Assembly during the Harvest Cycle. Relay 4 energizes Water Inlet Valve. Relay 5 energizes the Purge Valve. Relay 6 energizes the Water Pump.

Line Voltage Molex

The Line Voltage Molex connects for each component to the Board. See the wiring diagram for each unit to see the wiring colors associated with each component.

Power and Clean Buttons

These buttons are functional duplicates of the buttons on the Push Pad mounted to the front frame of the unit. See also "Button Function" chart in this manual for operation.

Power and Clean LED Flash Description

SOLID - On Constantly

SLOW - Flashes once every second

QUICK - Flashes once every half second

DOUBLE SLOW - Flashes twice then 1 second delay

DELAYED - flashes once every 3 seconds

Error Codes

Error 1 - POWER LED QUICK FLASH RED - Unit has experienced a MAX Freeze (1 hr), MAX Harvest (5.5 minutes) or BOTH.

Error 2 - POWER LED SLOW FLASH IN OFF STATE ONLY - Thermistor Failure.

Error 3 - POWER LED RED AND CLEAN LED YELLOW QUICK FLASH - Unit has experienced a MAX Fill (5 min) or MAX Purge (2 min).

Minimum / Maximum Times

Freeze - 5 Minute Minimum / 1 Hour Maximum

Standard Harvest - 20 Second Minimum / 5.5 Minute Maximum

Water Fill - No Minimum / 5 Minute Maximum

Purge - 7 Second Minimum / 2 Minute Maximum

BOARD LED SEQUENCE DURING OPERATION - INITIAL FREEZE CYCLE AT START-UP

| <u>INITIAL FREEZE AT START-UP</u> | | <u>OFF</u> | <u>FREEZE</u> | | | | | | |
|-------------------------------------|----|--|--------------------------|-------------------------------------|---|---|---------------|---|--|
| <u>COMPONENTS</u> | | <u>RELAY #</u> | <u>FILL VERIFICATION</u> | <u>PRESSURE EQUALIZE</u> | <u>PRESS. EQ. W/ COMPR.</u> | <u>PUMP DELAY</u> | <u>FREEZE</u> | <u>ANTI-SLUSH</u> | <u>FREEZE</u> |
| FAN(S) W/FAN CYCLE (A & W) | R1 | - | - | - | ON | ON | ON | ON | ON |
| LIQ. LINE VALVE (REMOTE) | R1 | | | | ON | ON | ON | ON | ON |
| CONTACTOR/COMPRESSOR/REM. COND. FAN | R2 | - | - | - | ON | ON | ON | ON | ON |
| WATER PUMP | R3 | - | - | - | - | - | ON | - | ON |
| HOT GAS VALVE(S) | R4 | - | - | ON | ON | - | - | - | - |
| HARVEST ASSIST(S) | | - | - | - | - | - | - | - | - |
| WATER INLET VALVE | R5 | - | ON | - | - | - | - | - | - |
| PURGE VALVE | R6 | - | - | - | - | - | - | - | - |
| NOTES: | | VERIFY CONFIG 1 (PUMP DOWN FOR REM ONLY) | HI-FLOAT SW. OPEN | COMPRESSOR START UP - APPROX 5 SEC. | COMP. START UP - HGV CLOSES AFTER APPROX 5 SEC. | PRE-CHILL THE EVAP PLATE - APPROX 30 SEC. | FREEZE | AT SIMPTEMP 36F, TURN OFF PUMP - APPROX 20 SEC. | CONTINUE FREEZE TO LOW FLOAT SW. CLOSE |

BOARD LED SEQUENCE DURING OPERATION - INITIAL HARVEST CYCLE AT START-UP

| INITIAL CYCLE AT START-UP (CONTINUED) | | HARVEST | | | | | |
|---|---------|--|--|---|---|----|--|
| | | PURGE ON ENTERING HARVEST | TIMED FILL | WAIT FOR HARVEST | CURT. SW. OPENS | | |
| COMPONENTS | RELAY # | | | | | | |
| FAN(S) W/FAN CYCLE (A & W) | R1 | - | - | - | - | - | |
| LIQ. LINE VALVE (REMOTE) | R1 | ON | ON | ON | ON | ON | |
| CONTACTOR/ COMPRESSOR/ REM. COND. FAN | R2 | ON | ON | ON | ON | ON | |
| WATER PUMP | R3 | ON | - | - | - | - | |
| HOT GAS VALVE(S) HARVEST ASSIST(S) | R4 | ON | ON | ON | ON | ON | |
| WATER INLET VALVE | R5 | ON | ON | ON | ON | ON | |
| PURGE VALVE | R6 | ON | - | - | - | - | |
| NOTES: | | TIMED SUMP FLUSH AND PURGE - APPROX 7 SEC. | INITIAL TIMED FILL 20 SECS. OR TO HIGH FLOAT SW. OPEN | WAITING FOR CURTAIN SW. OR BIN STAT | ICE RELEASED - HARVEST TERMINATED | | |

BOARD LED SEQUENCE DURING OPERATION - TRANSITION FROM HARVEST TO FREEZE

| TRANSITION HARVEST -> FREEZE | | CONTROLLER STATES | | | | | | | | | | | | | | | | | | |
|---|---------|---------------------------------------|--|----------------------------|---|--------------------------------|--------------------------------------|------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|
| | | HARVEST | | | | | FREEZE | | | | | | | | | | | | | |
| | | HOT GAS-HAA/ PURGE/ WATER INLET | HOT GAS- HAA/TIMED FILL | HOT GAS/HAA | CURTAIN SW (1 & 2) OPEN | CURTAIN SW (1 & 2) CLOSE | PRE-CHILL AND FILL | FREEZE | | | | | | | | | | | | |
| COMPONENTS | RELAY # | | | | | | | | | | | | | | | | | | | |
| FAN(S) W/FAN CYCLE (A & W) | R1 | - | - | - | - | - | - | - | - | - | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| LIQ. LINE VALVE (REMOTE) | R1 | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| CONTACTOR/ COMPRESSOR/ REM. COND. FAN | R2 | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| WATER PUMP | R3 | ON | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HOT GAS VALVE(S) HARVEST ASSIST(S) | R4 | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| WATER INLET VALVE | R5 | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON | ON |
| PURGE VALVE | R6 | ON | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| NOTES: | | TIMED SUMP FLUSH AND PURGE | INITIAL TIMED FILL 20 SECS. OR HIGH FLOAT SW OPENS | WAITING FOR CURTAIN SW. | CURT. SW. OPENS (MOMENT) ICE RELEASED | CURTAIN SW. CLOSES (MOMENT) | COOL THE EVAP PLATE AND FILL SUMP | 5 MINUTE MIN. FREEZE TIME | | | | | | | | | | | | |

BOARD LED SEQUENCE DURING OPERATION - BIN FULL (CURTAIN OR STAT)

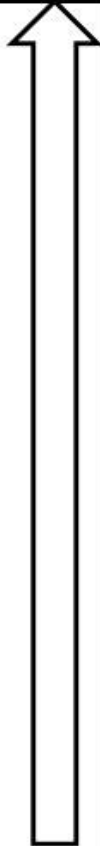
| TRANSITION TO BIN FULL SHUTDOWN | | HARVEST | | | | | BIN FULL | |
|---|-------------|--|---|---------------------------------|---|--|--------------------------------------|-------------|
| | | POWER LED SOLID BLUE | | | | | BIN FULL / PUMP DOWN (REMOTES) | SYSTEM HOLD |
| COMPONENTS | RELAY # | PURGE ON ENTERING HARVEST | TIMED FILL | WAIT FOR HARVEST | CURT SW/BIN STAT OPENS | | | |
| FAN(S) W/FAN CYCLE | R1 (A/W) | - | - | - | - | - | - | - |
| LIQ. LINE VALVE | R1 (REM) | ON | ON | ON | ON | - | - | - |
| CONTACTOR/ COMPRESSOR/ REM. COND. FAN | R2 | ON | ON | ON | ON | ON | ON | - |
| WATER PUMP | R3 | ON | - | - | - | - | - | - |
| HOT GAS VALVE(S) | R4 | ON | ON | ON | ON | ON | - | - |
| HARVEST ASSIST(S) | R5 | ON | ON | - | - | - | - | - |
| WATER INLET VALVE | R6 | ON | - | - | - | - | - | - |
| NOTES: | | TIMED SUMP FLUSH AND PURGE - APPROX 7 SEC. | INITIAL TIMED FILL 20 SECS. OR TO HIGH FLOAT SW. OPEN | WAITING FOR CURTAIN SW. OR TIME | ICE HARVESTED - CURT/BIN STAT REMAIN OPEN | CURT OR BIN STAT REMAIN OPEN - UNIT SHUT DOWN (REMOTES PUMPDOWN APPROX 30 SEC) | BIN FULL WAIT FOR CURT/STAT TO CLOSE | |

BOARD LED SEQUENCE DURING OPERATION - DIAGNOSTICS IN FREEZE CYCLE

The Diagnostic sequence is started by pressing both the Power and Clean buttons for 6 seconds.

| DIAGNOSTICS | | CONTROLLER STATES | | | | | | | |
|---|----------|--|---|---------------------------|-------------------------------|---|---|--|---|
| | | AT START-UP | | FREEZE | | | | | |
| | | FROM OFF STATE POWER LED RED SOLID | PURGE | FILL | PRES. EQUAL. | PRESS. EQ. W/ COMPR. | FREEZE | ANTI-SLUSH | FREEZE |
| COMPONENTS | RELAY # | | | | | | | | |
| FAN(S) W/FAN CYCLE | R1 (A/W) | - | - | - | - | ON | ON | ON | ON |
| LIQ. LINE VALVE | R1 (REM) | - | - | - | - | ON | ON | ON | ON |
| CONTACTOR/ COMPRESSOR/ REM. COND. FAN | R2 | - | - | - | - | ON | ON | ON | ON |
| WATER PUMP | R3 | - | ON | - | - | - | ON | - | ON |
| HOT GAS VALVE(S) | R4 | - | - | - | ON | ON | - | - | - |
| HARVEST ASSIST(S) | R5 | - | - | - | - | - | - | - | - |
| WATER INLET VALVE | R6 | - | - | ON | - | - | - | - | - |
| PURGE VALVE | R6 | - | ON | - | - | - | - | - | - |
| NOTES: | | VERIFY CONFIG 1 (PUMP DOWN FOR REM ONLY) | VERIFY EMPTY SUMP: LOW FLOAT SW: CLOSED | HI FLOAT SW. SATISFIED | HOT GAS OPEN APPROX. 5 SEC | CONTACTOR/ COMPRESSOR STARTUP - HOT GAS CLOSES AFTER 5 SEC | 5 MINUTE MIN. FREEZE TIME | AT SUMP TEMP 36F. TURN OFF WATER PUMP FOR 20 SEC | LOW FLOAT SW. CLOSE TO INITIATE HARVEST |
| | | | QUICK PRESS POWER AND CLEAN BUTTON ADVANCES TO NEXT STATE | | | | QUICK PRESS POWER AND CLEAN BUTTON ADVANCES TO NEXT STATE | | |

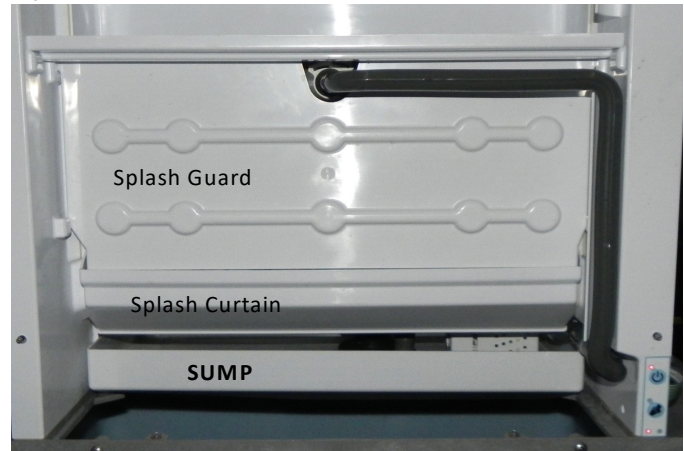
BOARD LED SEQUENCE DURING OPERATION - DIAGNOSTICS IN HARVEST CYCLE

| DIAGNOSTICS | | CONTROLLER STATES | | | | | | COMPLETE |
|---|----------|--|---------------------------------|--------------------|--|-------------------------|---|---------------------|
| | | HARVEST | | | | | | POWER LED RED SOLID |
| | | POWER LED DOUBLE SLOW FLASH RED | | | | | | |
| COMPONENTS | RELAY # | HOT GAS-HAA/ PURGE/ WATER INLET | HARVEST | CURT. SW. OPENS | HARVEST COMPLETE/ PUMP DOWN | DIAGNOSTICS COMPLETE | | |
| FAN(S) W/FAN CYCLE | R1 (A/W) | - | - | - | - | - | - | |
| LIQ. LINE VALVE | R1 (REM) | ON | ON | ON | - | - | - | |
| CONTACTOR/ COMPRESSOR/ REM. COND. FAN | R2 | ON | ON | ON | ON (REM ONLY) | - | - | |
| WATER PUMP | R3 | ON | - | - | - | - | - | |
| HOT GAS VALVE(S) | R4 | ON | ON | ON | - | - | - | |
| HARVEST ASSIST(S) | R5 | ON | - | - | - | - | - | |
| WATER INLET VALVE | R6 | ON | - | - | - | - | - | |
| PURGE VALVE | | TIMED RINSE AND PURGE APPROX 7 SEC | WAITING FOR CURTAIN SW. OR TIME | ICE RELEASED | CURT. CLOSES, VERIFY CONFIG 1 (PUMP DOWN FOR REM ONLY) | OFF STATE | | |
| NOTES: | | QUICK PRESS POWER AND CLEAN BUTTON ADVANCES TO NEXT STATE | | | | | | |
| | |  | | | | | | OFF STATE |

| BUTTON FUNCTIONS | | | |
|--|---------------|-------|--|
| INITIAL STATE | BUTTONS PRESS | | FUNCTION/NEW STATE OR MODE |
| | POWER | CLEAN | |
| OFF - POWER LED SOLID RED | QUICK | - | FREEZE |
| | 3 SEC | - | INDICATE CODE REVISION |
| | - | QUICK | CLEAN CYCLE |
| | 3 SEC | 3 SEC | CLEAR ERROR CODES AND RESET COUNTERS (Single BLUE and YELLOW light flash when reset) |
| | 6 SEC | 6 SEC | RUN DIAGNOSTICS PROGRAM |
| BIN FULL ON CURT/STAT - POWER LED SOLID BLUE | 6 SEC | - | MACHINE OFF |
| HARVEST - POWER LED SOLID BLUE | QUICK | - | MANUAL HARVEST 2 - FINISHES THEN SHUTS OFF |
| | 6 SEC | - | MACHINE OFF IMMEDIATELY |
| CLEAN IN PROCESS - POWER LED SOLID RED & CLEAN LED SLOW FLASH YELLOW | - | QUICK | ADVANCE TO PURGE AFTER MINIMUM OF 5 MIN OF WASH |
| | 6 SEC | - | MACHINE OFF - CLEAN IN PROCESS |
| CLEAN COMPLETE - POWER LED SOLID RED & CLEAN LED SOLID YELLOW | - | QUICK | MACHINE OFF |
| | QUICK | - | MACHINE OFF |
| ANY STATE | 6 SEC | - | MACHINE OFF |
| DIAGNOSTICS - POWER LED DOUBLE FLASH RED | QUICK | QUICK | ADVANCE TO NEXT STATE |
| | 6 SEC | - | MACHINE OFF |
| | 3 SEC | - | INDICATE CODE REVISION |
| ERROR 1 (MAX FREEZE/MAX HARVEST) - POWER LED QUICK FLASH RED | 3 SEC | 3 SEC | CLEAR ERROR CODES AND RESET COUNTERS (single BLUE and YELLOW light flash when reset) |
| | 6 SEC | 6 SEC | RUN DIAGNOSTICS PROGRAM |
| | 3 SEC | - | INDICATE CODE REVISION |
| ERROR 3 (WATER SYS FAILURE) - POWER LED RED & CLEAN LED YELLOW QUICK FLASH | 6 SEC | - | MACHINE OFF |
| | 3 SEC | 3 SEC | CLEAR ERROR CODES AND RESET COUNTERS Single BLUE/YELLOW flash when reset) |
| | 6 SEC | 6 SEC | RUN DIAGNOSTICS PROGRAM |
| | 3 SEC | - | INDICATE CODE REVISION |
| RINSE- POWER LED SLOW FLASH BLUE | QUICK | - | ADVANCE FREEZE |
| HARVEST VERIFICATION - POWER LED SLOW FLASH BLUE | QUICK | - | NO ACTION (CURTAIN SWITCH OPEN/CLOSE TO ADVANCE) |
| DEFAULT HARVEST - POWER LED SLOW FLASH BLUE | QUICK | - | NO ACTION (CURTAIN SWITCH OPEN/CLOSE TO ADVANCE) |
| COMPRESSOR DELAY (3 MINUTES) - POWER LED SLOW FLASH BLUE | QUICK | - | NO ACTION (COMPRESSOR WILL NOT RESTART FOR 3 MINUTES) |
| MANUAL HARVEST 1 - POWER LED QUICK FLASH BLUE | QUICK | - | CANCELS MANUAL HARVEST 1 - CONTINUES CYCLE |
| MANUAL HARVEST 2 - POWER LED QUICK FLASH BLUE | QUICK | - | CANCELS MANUAL HARVEST 2 - COMPLETES HARVEST AND CONTINUES OPERATION |

Sump

The Sump holds the potable water for the Freeze Cycle. It is located under the Evaporator and accessible from the front of the unit. The Sump must be removed to access the Water Pump and the Float Switch Housing.

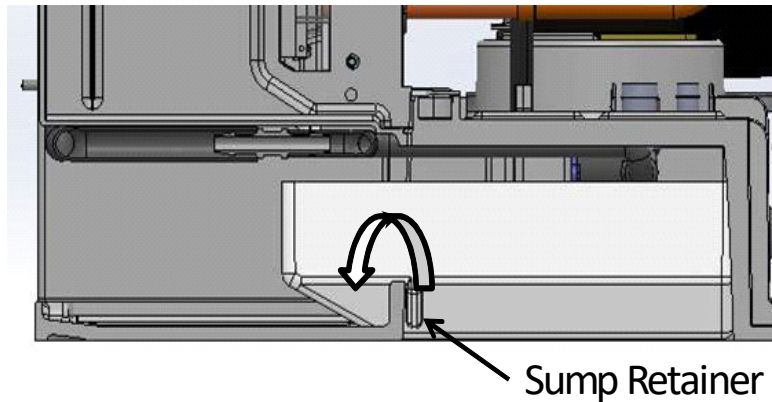


Sump Removal

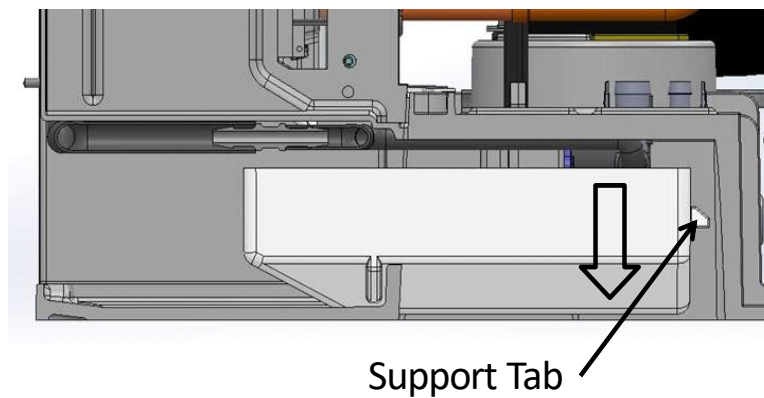
First remove the Splash Curtain and Splash Guard.



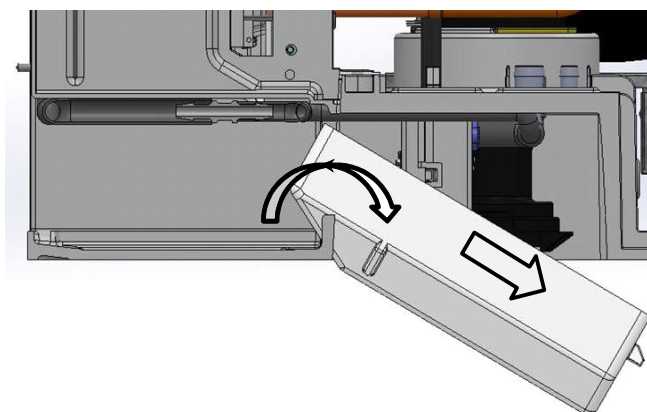
Disconnect Water Pump Tube as shown above and tuck backside of tube into the Sump.



Lift front of Sump and pull forward to clear the Sump Retainers from the frame.



With the Support Tabs now clear of the frame, allow the back of the Sump to fall clear of the frame.

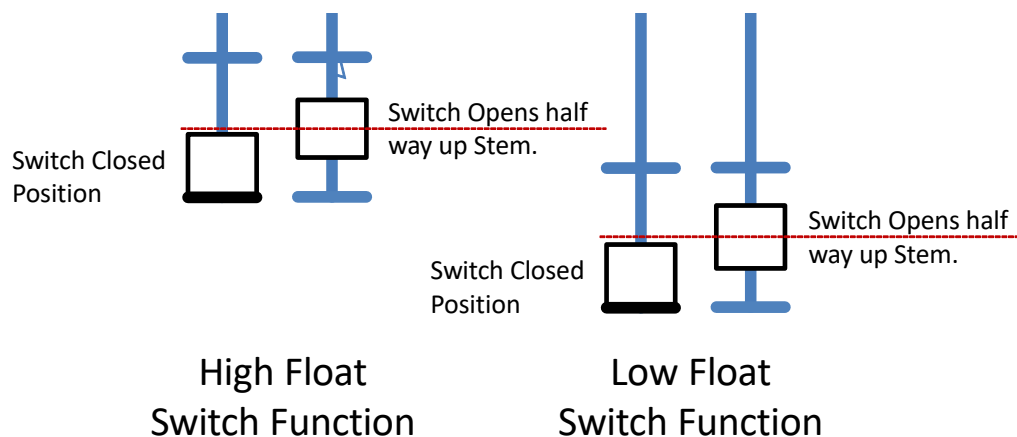
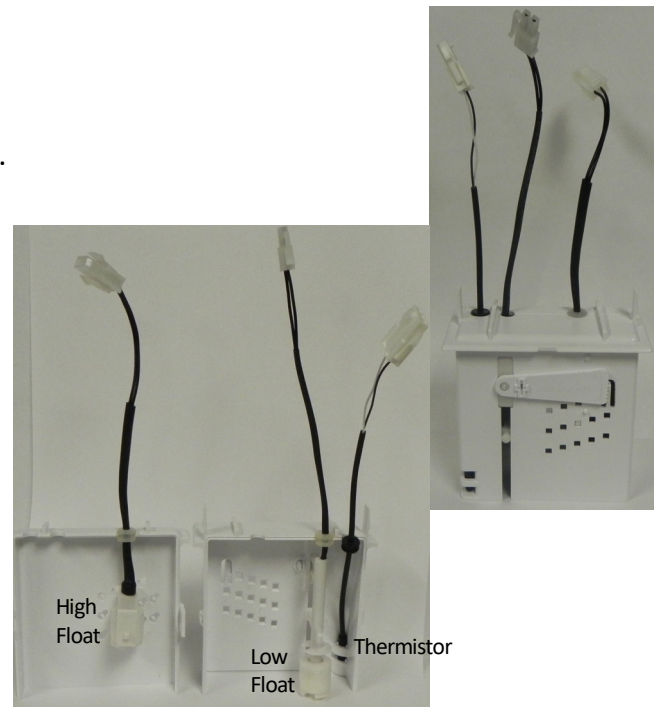


Again lift the front of the sump and push towards the back and down until Sump is clear of the frame. Turn the Sump sideways and remove through the ice drop zone.

To re-install, reverse process making sure to tuck Water Pump Tube into Sump as lift Sump into place.

Float Housing Assembly

The Float Switch Housing Assembly contains the High and Low Float Switches along with the Sump Thermistor. See below for function of each. See also Sequence of Operation pg. 9.



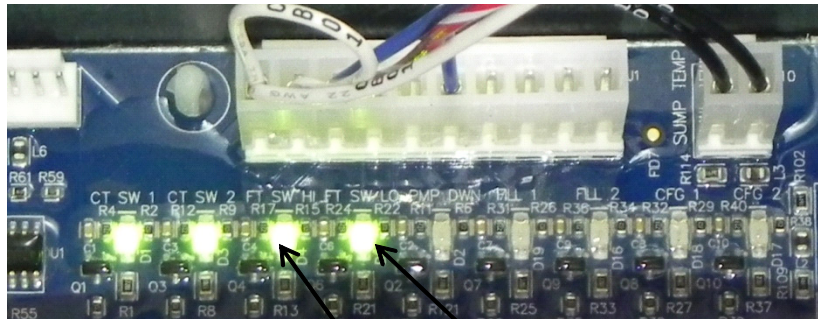
High and Low Float Switch Operation

The High Float Switch is used to control the water level for ice making, cleaning and sanitizing. The Float will rise with the water level, opening the contact of the switch and signal the Board to close the Water Inlet Valve. The LED associated with the High Float switch will be ON when the contacts of the switch are closed, and will turn OFF when the contacts open. The Low Float Switch is used to determine when the unit is ready to go into the Harvest Cycle during ice production and when the Sump has been emptied of cleaner or sanitizer during the Cleaning Cycle. The LED associated with the Low Float Switch operates the same as the LED for the High Float Switch. The LED will ILLUMINATE when the contact of the float are closed and will turn OFF when the contacts are open. The Thermistor is used to measure the temperature of the water in

the Sump during the Freeze Cycle. During the first 3 cycles following a full bin shut down or being turned on (initial start-up), the unit will perform an “Anti-slush” shutdown of the Water Pump for 20 seconds when the water temperature reaches 36 degrees F to reduce the possibility of the water in the Sump slushing. The unit will perform an anti-slush shut down of the Water Pump any time the water temp reaches 28 degrees F.

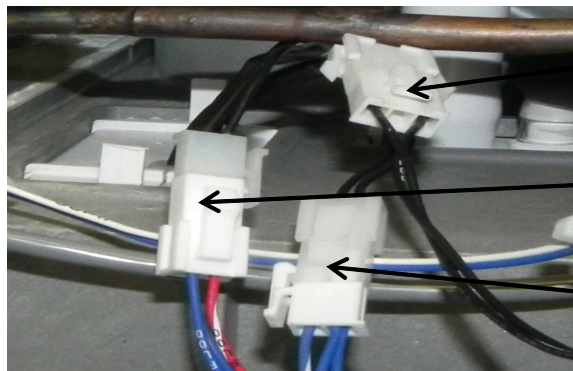
Troubleshooting

When the High and Low Floats are in the down position, the contacts for the switches are closed and the LED's on the Board should be illuminated.



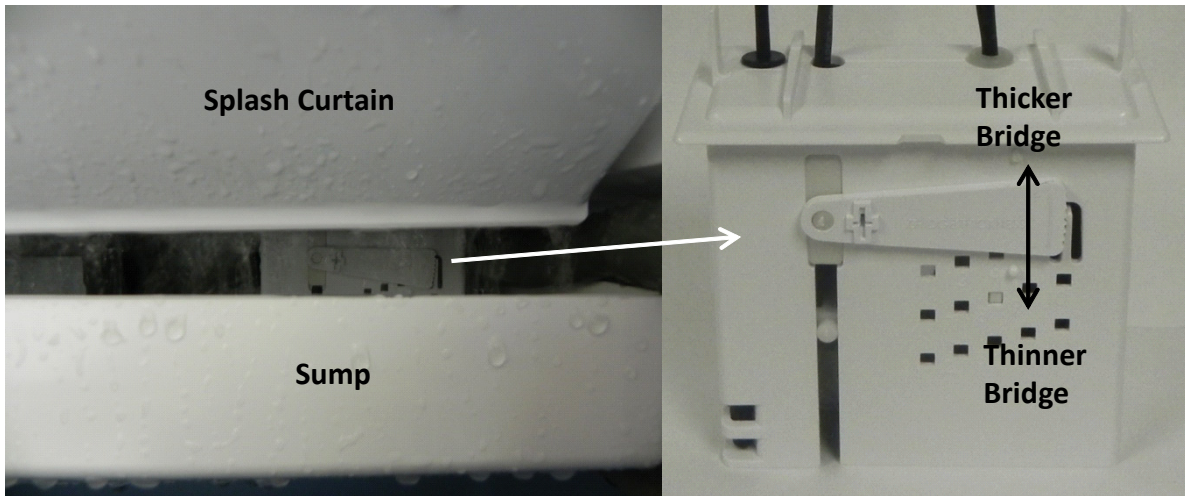
Low Float Switch LED
High Float Switch LED

As the water level rises, the floats rise with it and the contacts of the switches will open and the LED's on the Board will go OFF. This can be verified by removing the Sump and checking first the LED's on the Board. Without the presence of water, both floats should be in the down position and the LED's on the Board should be illuminated. If one or both LED's are OFF, disconnect the Float Switches at the connectors along with the Thermistor and remove the Float Housing by gently pulling down on it from the ice drop zone.



Thermistor Connector
High Float Switch Connector
Low Float Switch Connector

Open the housing and examine each float for movement of the float and cleanliness. With a meter set on continuity, verify the contacts on the float open and close with movement of the float. If float is clean and contacts do not change with float movement, replace Float Switch Housing Assembly. If one or both of the LED's remain OFF with Float Switches that are known to be good, the Board or Wiring Harness may be the issue.

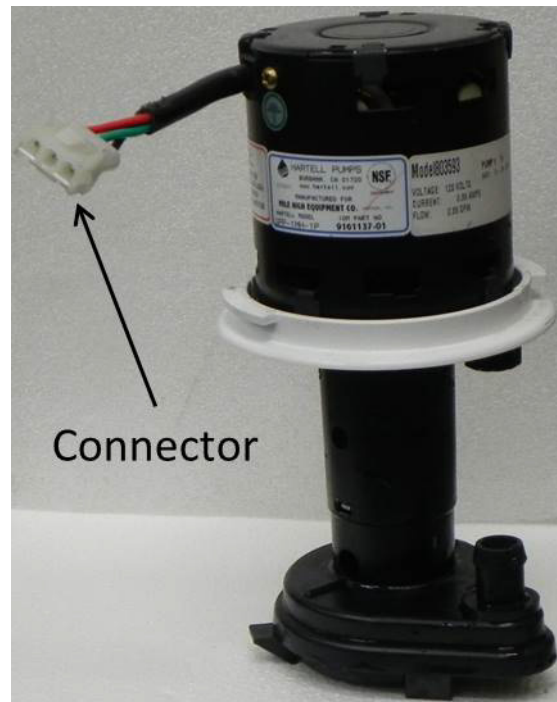


The Bridge Thickness on units under 400# production should be $3/16$ " while units over 400# production should be $1/8$ " thick when measured across the middle of the plate. Minor Adjustments can be made to the bridge thickness by moving the Water Level Adjustment Arm of the Float Housing up for a thinner bridge or down for a thicker bridge. This adjustment can be made at any time during the freeze or defrost cycle and the results verified on the following cycle.

Water Pump

Operation

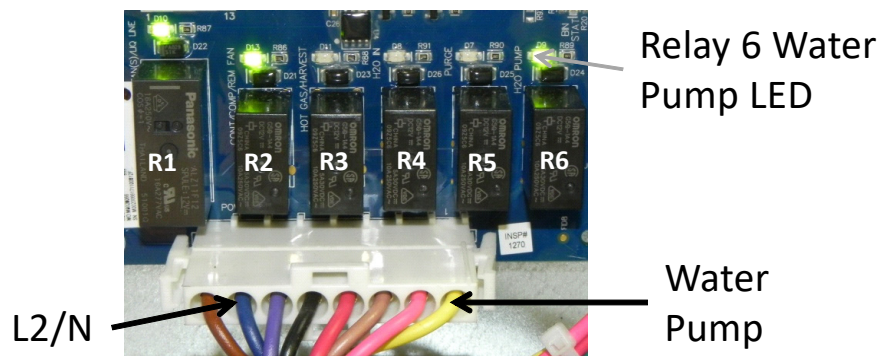
Relay 6 on the Board (LED ON) energizes the Water Pump after the 30 second Pre-Chill of the Evaporator during the Freeze Cycle. In the first 3 Freeze Cycles after a shutdown (turned OFF or Bin Full) the Water Pump will perform a shutdown for 20 seconds to help prevent the Sump from slushing. The Water Pump will then be energized to complete the Freeze Cycle (see Sequence of Operations pg. 9) The Water Pump is active continuously during the Cleaning Cycle after the Sump is filled (see Cleaning Instructions pg. 56).



Troubleshooting

If Relay 6 LED is ON but the Water Pump does not run, verify line voltage between the Yellow and Blue wires on the Molex. If line voltage isn't found, verify connection of Molex to Board and re-verify. If no voltage is found, the issue is the Board. If line voltage is found, verify line voltage at Water Pump connector. If no voltage found, the issue is the wiring or connectors. If line Voltage is found, but Water Pump won't spin, the issue is the Water Pump. Clean or replace as required.

When verifying voltage out of Board, check at the Blue and Yellow wires.



Voltage can also be checked at the connector at the Water Pump.

Water Pump Removal

The “foot” of the Water Pump points towards the right front corner of the unit. Grasp the foot and turn counter clockwise. When the foot points towards the right rear corner, you will feel the weight of the pump as the collar clears the base connections. Lower the Water Pump and disconnect. Re-install the Water Pump by first making the electrical connection, then push Pump up pointing the Foot at the right rear corner and turn clockwise to secure.

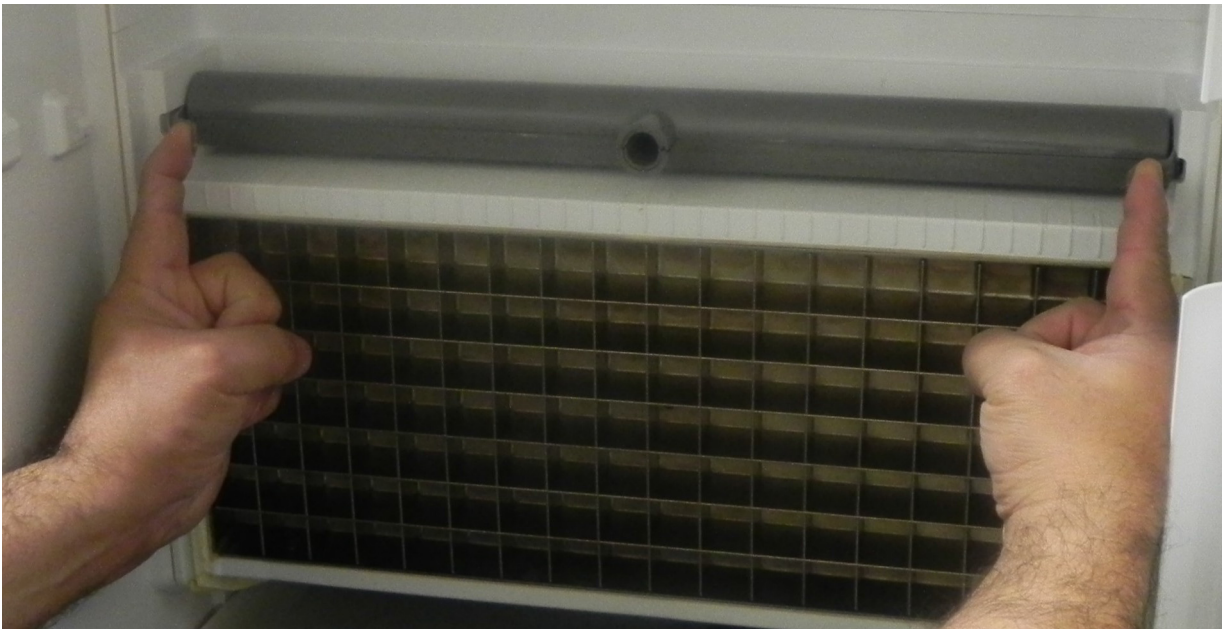
Water Distribution Tube

The Water Distribution Tube has an inner tube and an outer tube. The water enters through the inner tube and sprays the water up into the outer tube relieving the pressure on the water. Gravity takes over and the water runs out the outer tube holes pointed down. The water runs smoothly and evenly over the Evaporator.

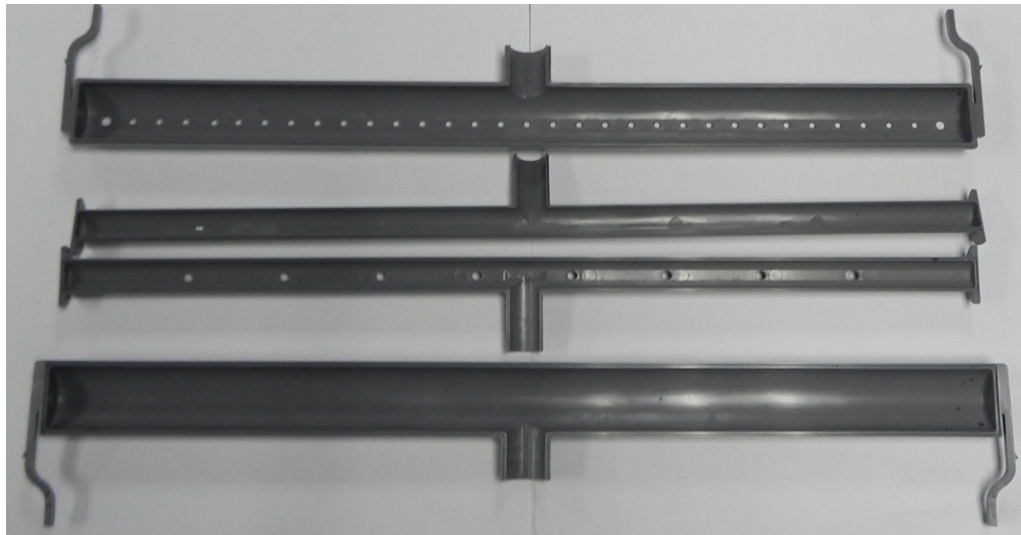
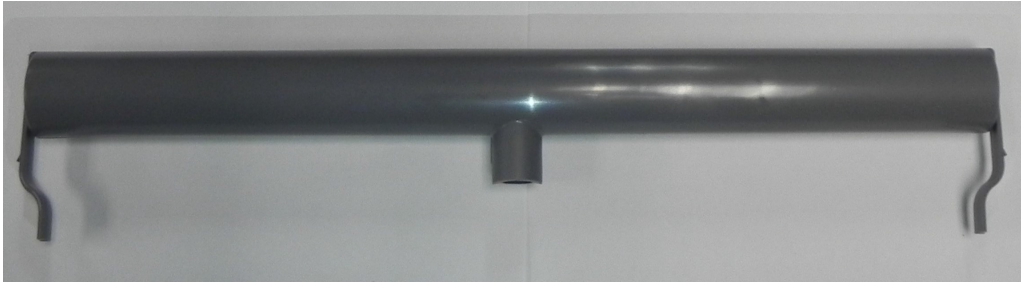


Removal and Disassembly

Disconnect Water Pump Tube from Water Distribution Tube.



Gentle squeeze the tabs inward on the Water Distribution Tube and forward towards the front of the unit.



The Water Distribution Tube comes apart easily. It should be taken apart and cleaned regularly along with the rest of the unit. The pieces are Pokeyoke, meaning it only goes back together one way.

Water Inlet Valve

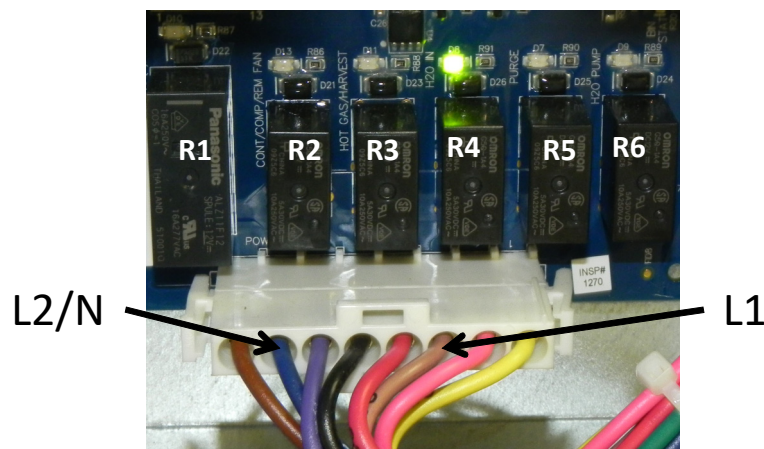
Operation

Relay 4 on the Board (LED ON) energizes the Valve first on initial start-up to fill the Sump until the contacts of the High Float Switch open, indicating a proper amount of water for ice making. The purpose is to verify water supply before starting the unit. After the initial cycle is complete, the Valve will be energized during the Harvest Cycle and if needed, re-energized during the Pre-Chill to complete filling the Sump (See Sequence of Operation pg. 9). In either case, Relay 4 will be illuminated when Water Inlet Valve is energized. During the Cleaning and Sanitizing Cycle the Water Inlet Valve will be energized several times during the rinse and purge portion of the cycle (see Cleaning Instructions pg. 56).



Troubleshooting

The maximum fill time allowed to open the contacts of the High Float Switch is 5 minutes. If Relay 4 is illuminated and the Water Inlet Valve doesn't open, verify water supply to the unit, then check for line voltage between the Tan and Blue wires on the Molex. If line voltage is not present, the issue is the Board. If line voltage is present, check for line voltage at the Water Inlet Valve coil. If no line voltage is present, the issue is the wiring or connectors. If line voltage is present, check resistance of coil. No resistance = open coil, replace Valve. If coil checks out, verify Water Inlet Valve for cleanliness and clean or replace as needed. Also verify incoming water supply and for plugged filters.

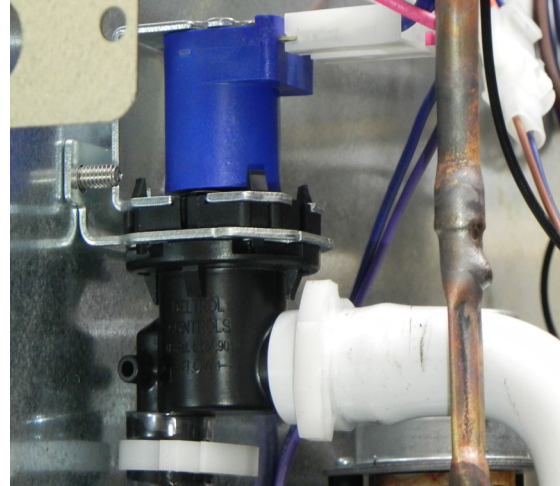


Voltage can also be verified at the connector at the coil of the Water Inlet Valve.

Purge Valve

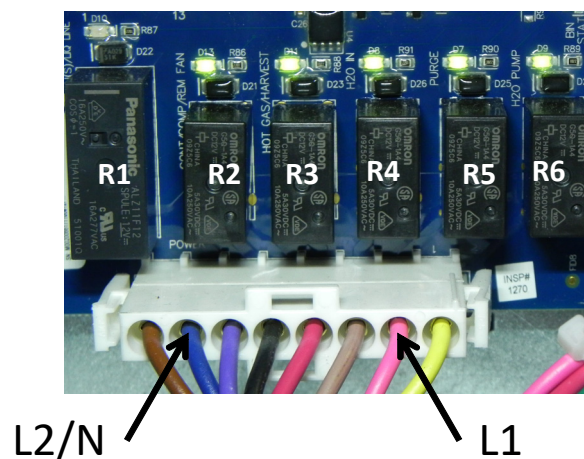
Operation

The Purge Valve is located in the back of the Evaporator. The Valve should open when energized by Relay 5 on the Board (LED ON) during the Harvest Cycle to help empty the mineral laden water (see Sequence of Operation pg. 9) and during the Cleaning/Sanitizing Cycle (see Cleaning Instructions pg. 56).



Troubleshooting

The Purge Valve is located in the back of the Evaporator. The Valve should open when energized by Relay 5 on the Board (LED ON) during the Harvest Cycle to help empty the mineral laden water and during the Cleaning/Sanitizing Cycle. If Purge Valve fails to open with Relay 5 LED illuminated, unplug Connector at coil of Valve and check for line voltage. If none is found, check output voltage at Molex at Board between Pink and Blue wires. If no voltage is found, the Board is the issue. If output voltage is found, wiring between Molex and connector at Valve is the issue.

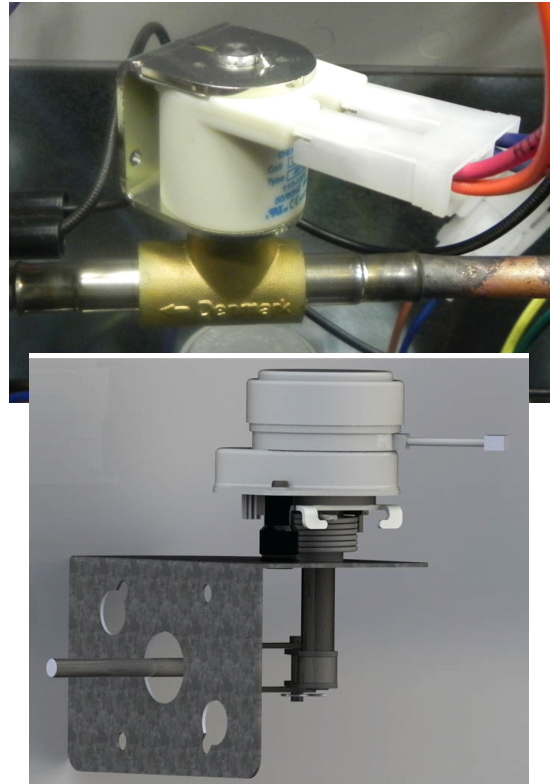


Voltage can also be verified at the connector at the coil on the Purge Valve.

Harvest Assist Assembly/Hot Gas Valve

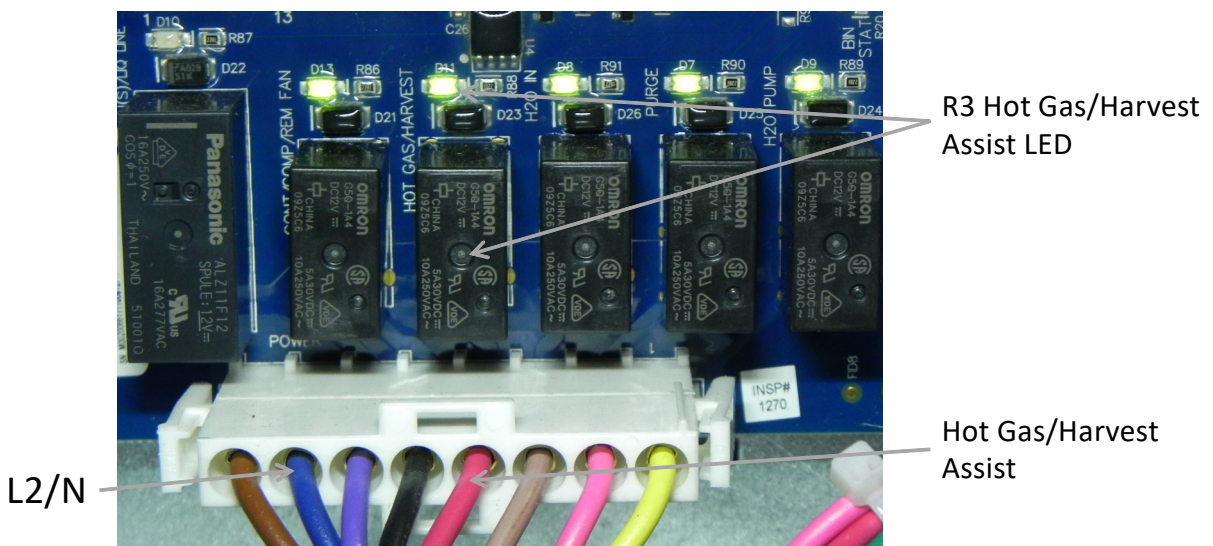
Operation

The Harvest Assist Assembly is mounted to the back of the Evaporator Assembly. It is energized by Relay 3 along with the Hot Gas Valve. As the unit enters the Harvest Cycle, Relay 3 will illuminate indicating voltage is being sent to the Harvest Assist Assembly and the probe will be pushed forward to meet the ice slab. As the Evaporator warms, the Probe on the Harvest Assist will move forward to help release the ice from the plate. As the ice slab falls it will open the Magnetic Curtain Switch contacts. Relay 3 will then be de-energized and the Harvest Assist will automatically return to the starting position.



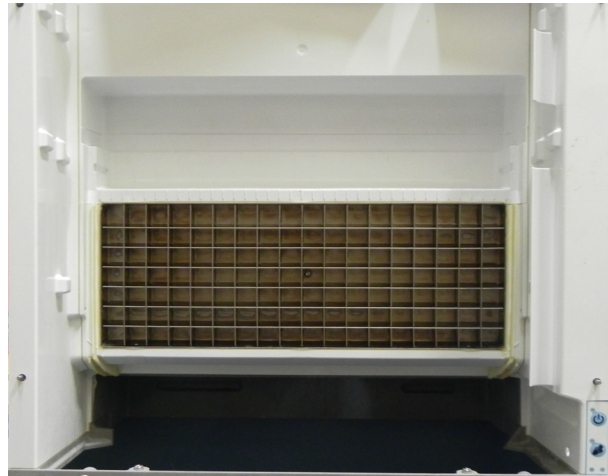
Troubleshooting

The Harvest Assist Assembly is energized with the Hot Gas Valve throughout the Defrost Cycle by Relay 3. To quickly verify operation, put the unit into Diagnostics program by pressing both the Power and Wash buttons for 6 seconds, then quick press BOTH the Power and Clean buttons until the Harvest Cycle is initiated (R2 - R6 LED's above component Molex should illuminate). Verify LED for Relay 3 is illuminated and check voltage between the Blue and Red wires at Molex. If no voltage is present, the Board or Molex may be the issue. If voltage is verified, Check for voltage at the wiring connector for the Harvest Assist. If voltage is verified and the probe is not pushed forward, the issue is the Harvest Assist.



Evaporator Assembly

The nickel plated Evaporator Assembly has a copper core to assure good heat transfer. Water is pumped gently over the Evaporator during the freeze cycle for even ice formation.



Evaporator Operation

The Evaporator should be fully flooded with refrigerant for most of the freeze cycle to assure even ice formation. The serpentine on the back of the Evaporator starts at the bottom right corner of the plate (viewed from the front). The refrigerant lines run horizontally back and forth to the middle of the plate then rise along the left hand side to the top. The lines continue “serpentine” downward to the middle of the plate and exit the Evaporator.

Troubleshooting

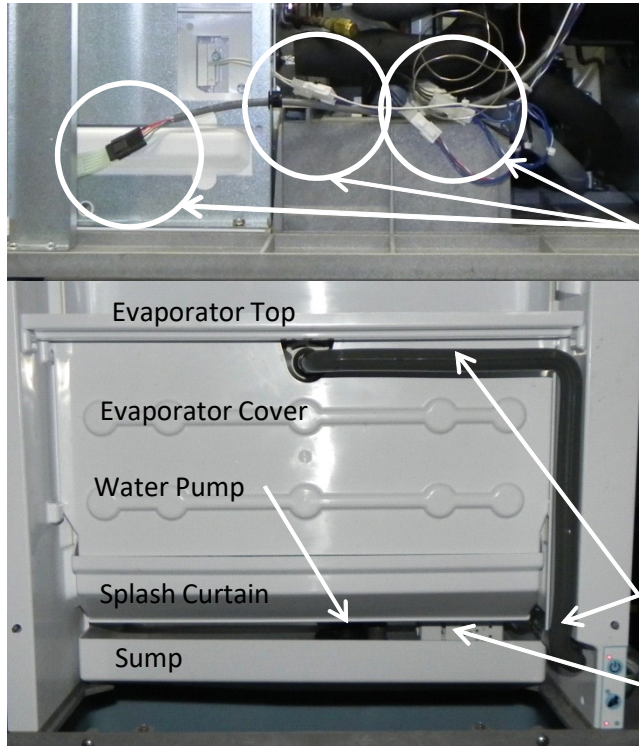
The Evaporator should always have a nickel appearance. Should the Evaporator have a “rust” color after a thorough cleaning, the plating may have come off and a replacement may be required. A dull “rainbow shimmer” may indicate an improper cleaner was used on the unit. Only approved Nickel Safe ice machine cleaner should be used.

An improper ice formation can be caused by a water or refrigeration issue.

A dirty water system can cause poor water flow over the Evaporator resulting in improper ice formation. See pg 56 for Cleaning Instructions.

A refrigeration issue such as a low charge or restricted TXV could show on the Evaporator as ice forming on the bottom of the plate with thin to no ice forming on the top half. Verify refrigeration pressures on the Technical Specifications chart on pg. 60.

Should the ice slab resist coming off the plate, examine the Evaporator for lose of plating, pitting, mineral accumulation and/or loose horizontal dividers. Should any of the horizontal dividers separate from the base, replacement of the Evaporator is recommended.



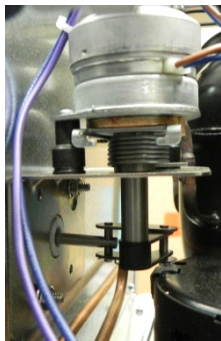
While recovering the refrigerant from the unit, disconnect High and Low Float Switches, Thermistor, Curtain Switch and Push Pad ribbon and move the wiring clear of the area.

Connectors

Remove the Splash Curtain, Evaporator Cover, Top Evaporator Cover, Water Distribution Tube, Water Pump Tube and its connector, Sump, Water Pump, and Float Switch Housing Assembly.

Water Pump Tube & Connector

Float Switch Housing

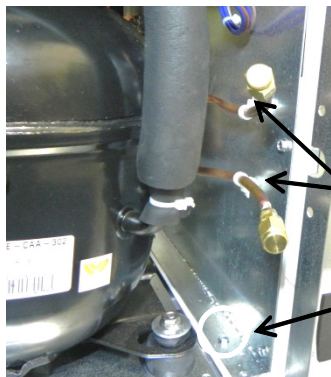


Harvest Assist Assembly



Purge Valve

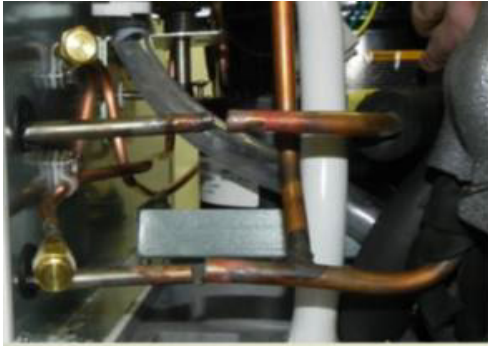
On the rear of the Evaporator Assembly, disconnect Harvest Assist Assembly, Purge Valve and Purge Tube and remove from unit.



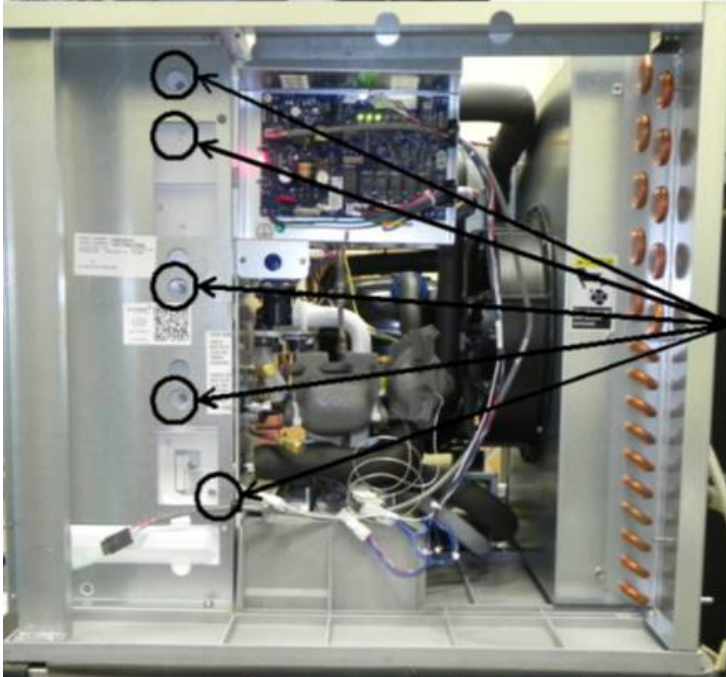
Cut Zip Ties

Remove 1/4" screws

Clip Zip Ties holding Service Port tubes to rear of Evaporator. Remove 3) 1/4" screws on right side, left side and center holding Evaporator Assembly to base.



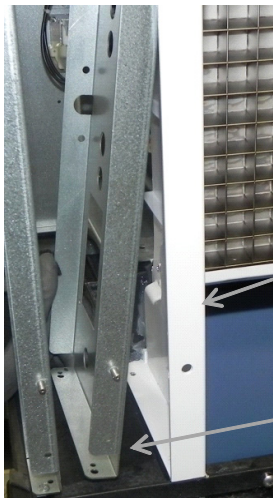
Once unit is recovered, unsolder Evaporator refrigerant lines



Remove 5) 1/4" screws securing Evaporator to surround on right hand side of unit.

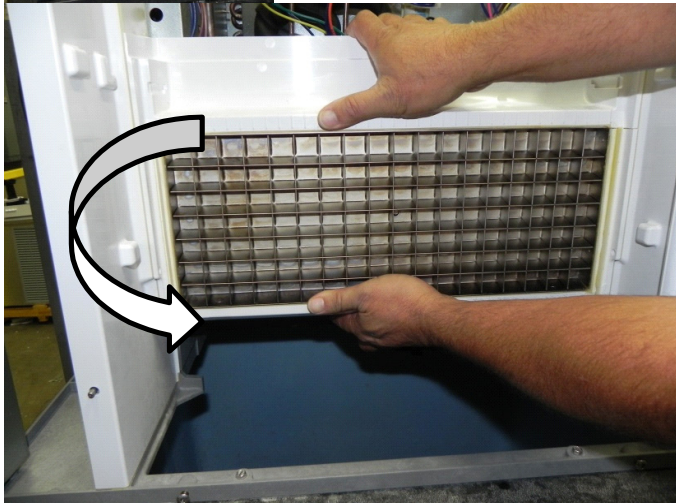


Remove 2) 1/4" screws where frame meets The base on the left hand side of the unit.

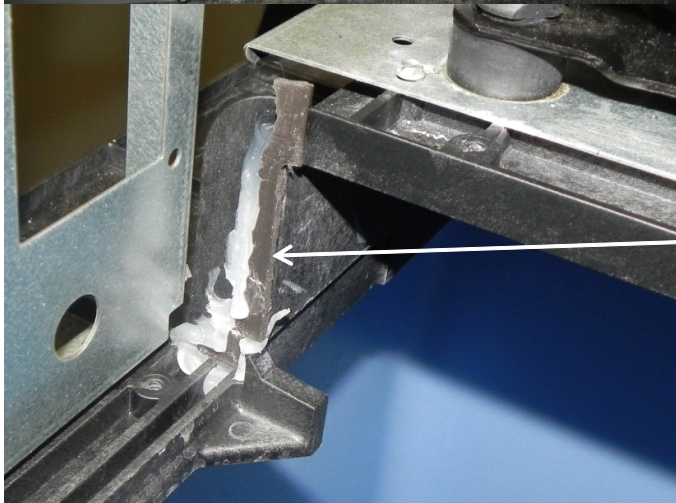


Surround

Pull bottom of frame out to clear left hand surround.



Grasp and remove Evaporator freeing the Left Hand side first. The Left Hand Surround will come out with the Evaporator; the Right Hand surround will be left in place. Once the Evaporator is out, separate the surround from the Evaporator by removing the five – 1/4" Screws on the Left Hand side of the Evaporator. Remove Curtain Switch on Right Hand side of Evaporator and place on new Evaporator and mount Left Hand Side surround on new Evaporator.

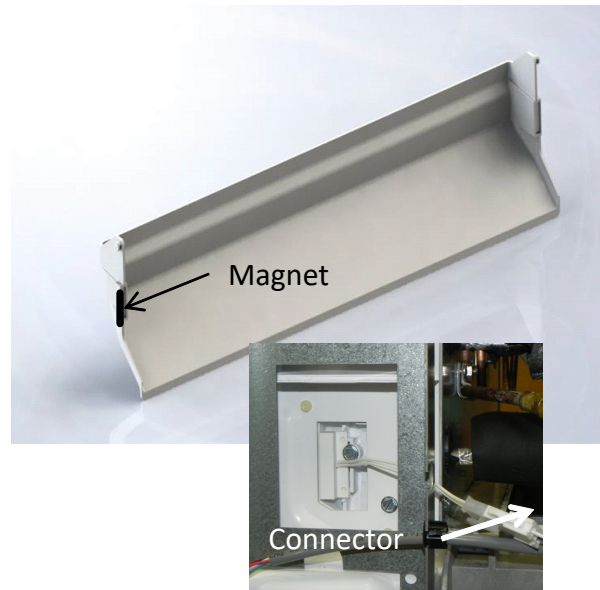


Remove old silicone from base where shown in picture. Run a 3/8" bead of silicone included with Evaporator kit to replace existing where surround and Evaporator meet on the base.

Install Evaporator and reverse procedure for installation of components. Be sure to replace the Drier on all open system repairs.

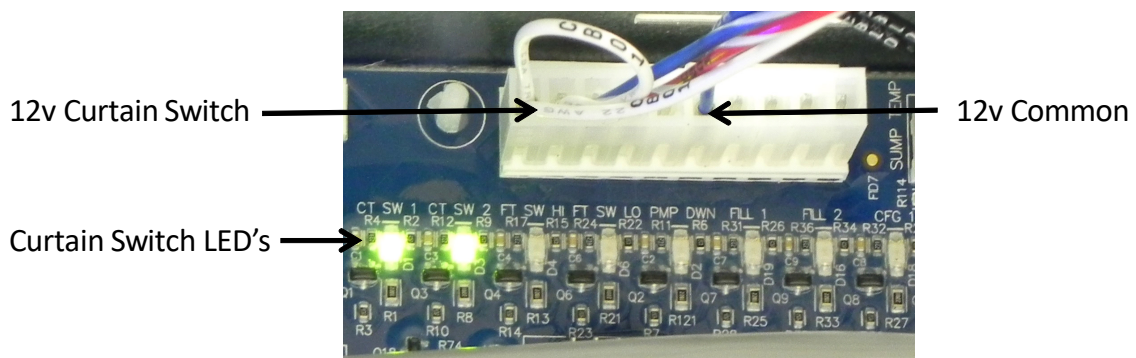
Magnetic Curtain Switch

The Magnetic Curtain Switch is a proximity switch that closes the contacts when the Splash Curtain closes. LED's on the Board indicate a closed switch when illuminated.



Troubleshooting

Should the LED's on the Board be off when the Splash Curtain is closed, first verify the magnet is in place on the Splash Curtain and the Wiring Harness is properly connected at the Switch and at the Board. If all is verified, use a different magnet against the switch. If it still will not close, replace the Magnetic Curtain Switch.

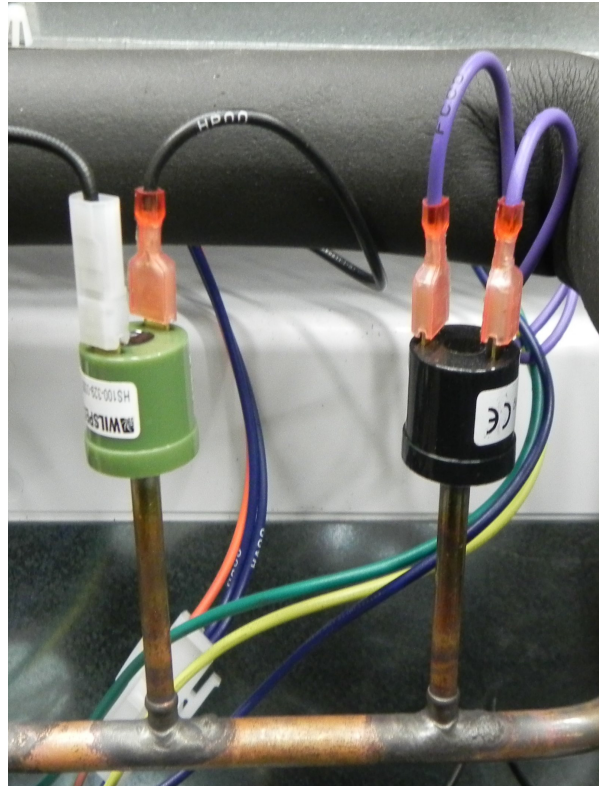


High Pressure Cut-out (left)

The High Pressure Cut-out is set to open at 450 psig and de-energizes the Contactor as a safety on the unit.

Fan Cycle Control (right)

The Fan Cycle Control helps maintain head pressure in cooler ambient temps. The control closes at 250 psig, energizing the Fan Motor and opens at 200 psig.

**Troubleshooting****High Pressure Cut-out**

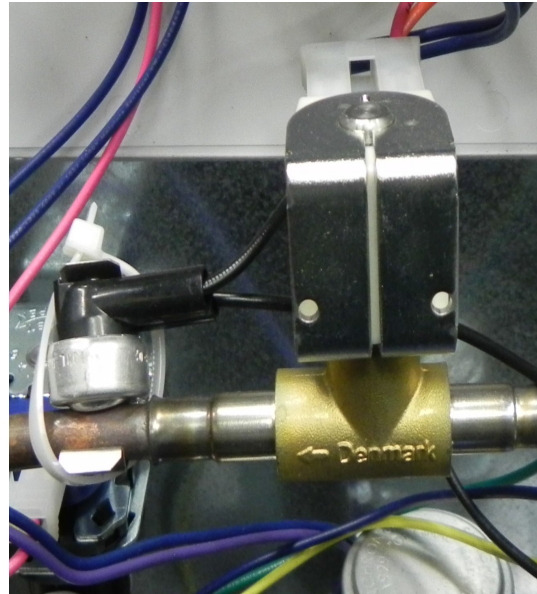
The High Pressure Cut-out opens at 450 psig to de-energize the Contactor and shutdown the Compressor. The control re-closes at 350 psig. Should the control open during the Freeze Cycle, the unit may go into Error 1 state, indicating the Freeze Cycle has run for more than 1 hour. To quickly check the unit operating pressure, run a Diagnostic Cycle with stub gauges on the unit. A dirty or blocked Condenser, failed Fan Cycle Control, failed Fan Motor, high side restriction or refrigerant over charge can be the cause.

Fan Cycling Control

The Fan Cycle Control closes on pressure rise at 250 psig and opens on pressure drop at 200 psig to maintain head pressure in cooler ambient conditions. The cut-in and cut-out should never be erratic. Should the contacts of the control close and/or open outside these parameters, the control should be replaced.

High Temp Safety

The High Temp Safety is a bi-metal thermostat strapped to the line at the outlet of the Hot Gas Valve. Should the Hot Gas Valve stick open and the refrigerant line reach 180 degrees F., the High Temp Safety would open, dropping power to the Contactor and shut down the Compressor. When the line temperature drops below 120 degrees F., the contacts of the Safety will close, allowing power to the Contactor.



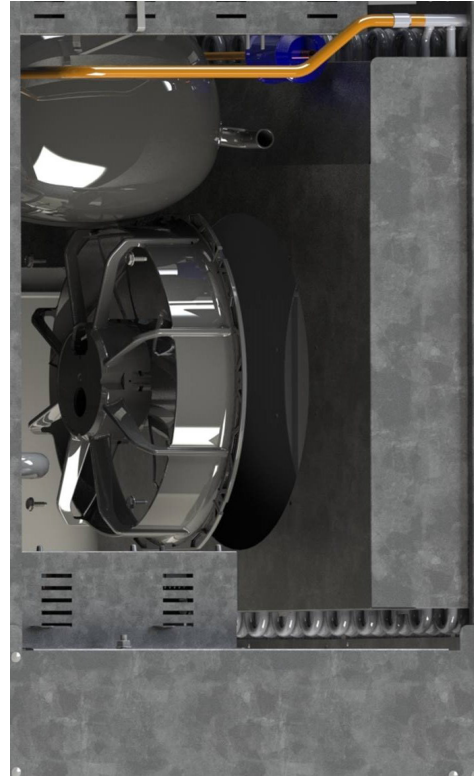
Troubleshooting

Should the Compressor not run with the R2 relay LED illuminated, verify if High Pressure Cutout is closed and Contactor coil is good. The discharge line from the Hot Gas Valve should be cool to the touch during a freeze cycle. With a line temperature below 120 degrees F. (confirming hot gas valve is closed), the contacts in the High Temp Safety should be closed. Disconnect both leads of the High Temp Safety and check for continuity. If open with a cool line, the safety will need to be replaced.

Fan Motor

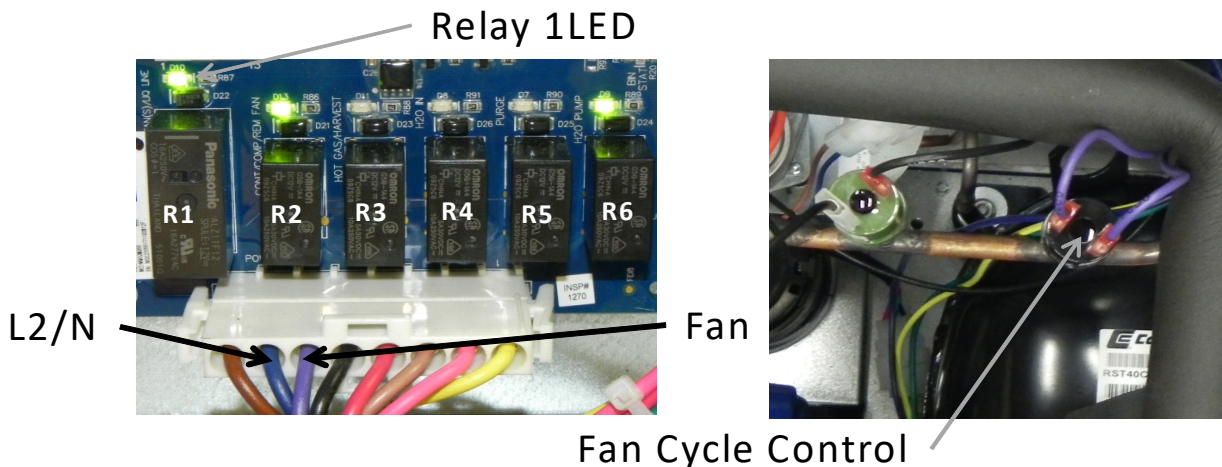
Operation

The Fan Motor (Self Contained Air Cooled Units) is Mounted to the Fan Shroud covering the Condenser at the rear of the unit. It is energized by Relay 1 and controlled by the Fan Cycling Switch. The Switch should close at 250 psi of head pressure and power the Motor. The Fan Cycle Switch should open at 200 psi of head and the Fan Motor will de-energize.



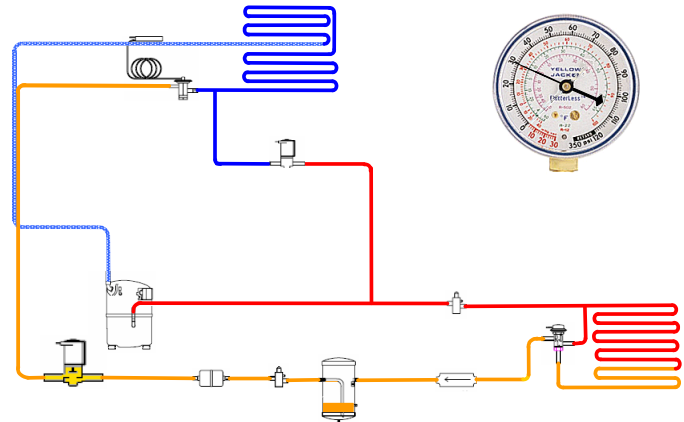
Troubleshooting

When the Fan Motor is inoperable or cycling outside of the operational parameters, first verify the LED for Relay 1 is illuminated, indicating the Board is calling for the Fan Motor to run. If the unit is in the Freeze Cycle and the LED is not illuminated, the issue may be the board. If it is illuminated, check voltage between the Violet and Blue with a meter. Line voltage should be shown. If inappropriate voltage is shown, verify Molex connection at the Board and correct if loose. If still no voltage out, replace the Board. If voltage is verified, check contacts of Fan Cycle Switch for voltage then check contacts which should be closed at pressures above 250 psi. If open in these conditions, jump control. If Fan Motor comes on, issue is Fan Cycling Control. If Motor does not come on, check connection at Motor. If verified, the issue is the Fan Motor.



REFRIGERATION SECTION

The Refrigeration Section on a CIM Cuber contains the Compressor, Thermostatic Expansion Valve, Hot Gas Valve and Condenser. Remote systems also utilize a Mixing Valve (LAC), Liquid Line Solenoid and Receiver.



Refrigeration Section Operation

The Compressor drives the refrigeration system. Ice-O-Matic uses a Thermostatic Expansion Valve to control refrigerant flow through the Evaporator.

Troubleshooting - System

When troubleshooting the refrigeration system, always use stub gauges to limit the amount of refrigerant lost during connecting and disconnecting.

Always verify the refrigeration systems operating pressures when diagnosing any refrigeration component. The Compressor should pull within 10% of the RLA when measured 5 minutes into the Freeze Cycle and greater than 70% of RLA during the Freeze Cycle to be considered efficient.

Thermostatic Expansion Valve

The Thermostatic Expansion Valve meters refrigerant through the Evaporator.

Troubleshooting - Expansion Valve

First verify proper system pressures and charge. Verify the TXV bulb is securely mounted at 7 degrees off vertical and well insulated. Generally a low suction pressure with a normal head pressure will show as poor ice formation top to bottom on the Evaporator and indicate a low side restriction such as at the TXV. Should suction run high or not drop, verify bulb connection to suction line and look for sweating or frosting on the dome of the Compressor indicating TXV is stuck open.

Hot Gas Valve

The Hot Gas Solenoid Valve opens to provide gas to the Evaporator during the Harvest Cycle.

Troubleshooting - Hot Gas Valve

Should the valve not open at the initiation of the Harvest Cycle (R3 LED ON), verify voltage at the coil of the solenoid. If no voltage is present, verify Molex is properly connected at Board and Voltage is present at Molex. If Voltage is present at coil, verify resistance through coil. If coil shows open, replace the coil. If coil checks out, place magnetic donut on top of coil. If valve will not open, replace Hot Gas Valve body. Should suction pressure run high, check temperature of the inlet and outlet line of the Hot Gas Valve. Should be greater than 10 degree F. different. If less than 10 degrees F., the Valve is leaking and should be replaced. (See also pg.44.)

Liquid Line Solenoid

The Liquid Line Solenoid opens to allow refrigerant to flow from the Receiver on Remote Systems. It is energized by R1 along with the Remote Fan Motors. Diagnosis of Liquid Line Solenoid is much the same as the Hot Gas Solenoid Valve (see above.)

Mixing Valve

The 220 psig. Mixing Valve (or LAC) Is used to maintain head pressure in low ambient .

Troubleshooting - Mixing Valve

In lower ambients, the Mixing Valve should be bypassing the Condenser to maintain head pressure. The inlet and outlet lines at the Condenser would be the same temp. in bypass mode. In warmer ambients the Mixing Valve is pushing refrigerant to the Condenser Coil and there would be approx. 20 degree F. temperature difference. A low charge would be identified by hot inlet and outlet lines at the Condenser and a hot Receiver. Always verify charge before condemning the Mixing Valve.

 **WARNING**

Electrical shock and/or injury from moving parts inside this machine can cause serious injury. Disconnect electrical supply to machine prior to performing any adjustments or repairs.

Failure to perform the required maintenance at the frequency specified will void warranty coverage in the event of a related failure.

General Maintenance Procedure

To insure economical, trouble free operation of your machine; it is recommended that the following maintenance be performed every 6 months.

1. Clean the ice-making section per the instructions below. Cleaning should be performed a minimum of every 6 months. Local water conditions may require that cleaning be performed more often.
2. Check ice bridge thickness. See page 10 for proper thickness and adjustment procedure.
3. Check water level in Sump. See page 10 for proper water level and adjustment procedure.
4. Clean the condenser (air-cooled machines) to ensure unobstructed air flow.
5. Check for leaks of any kind: water, refrigerant, oil, etc.
6. Check the bin control switch (if applicable) for proper adjustment.
7. Check the Water Regulating Valve (water cooled machine) for proper adjustment by measuring the discharge pressure which should be adjusted to maintain 250 psi (17.01 bar/ 1.723 MPa). Adjust the water regulating valve as required. Water exiting the condenser should be between 100°F (38°C) and 110°F (43°C).
8. Check all electrical connections.
9. Oil the fan motor if the motor has an oil fitting. (Self contained air-cooled models only)
10. Check the water filter (if applicable) and replace if dirty or restricted
11. Inspect the evaporator water distribution tube to insure even distribution of water across the face of the evaporator.
12. Clean Remote Condenser if applicable.

Cleaning Instruction for Ice-O-Matic CIM Series Ice Machines

Note: Proper cleaning of an ice machine requires two parts: descaling and sanitizing.

Descaling should be scheduled at a minimum of twice per year but no more than once per month.

Descaling dissolves the mineral deposits on the evaporator and other surfaces. It removes scale, calcium, lime scale and other mineral buildup. Ice-O-Matic requires a “nickel-safe” cleaner such as Nu-Calgon Nickel-Safe Ice Machine Cleaner or equivalent diluted per manufacturer’s instructions.

Sanitizing should be performed after each descaling but no more than once per month.

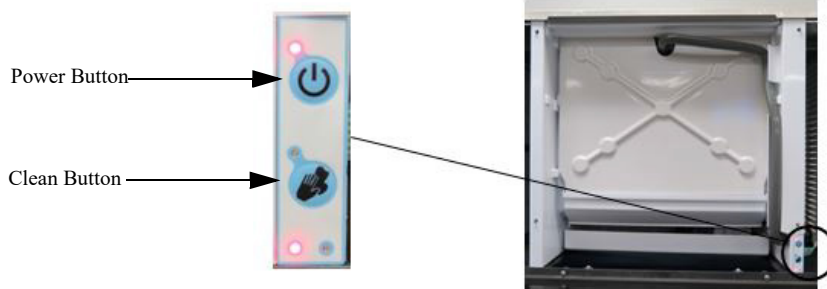
Sanitizing disinfects the machine and removes microbial growth including mold and slime. Ice-O-Matic requires a sanitizer such as Nu-Calgon IMS-III or equivalent diluted per manufacturer’s instructions.

Please refer to www.iceomatic.com for approved chemical formulations and proper pH balance.

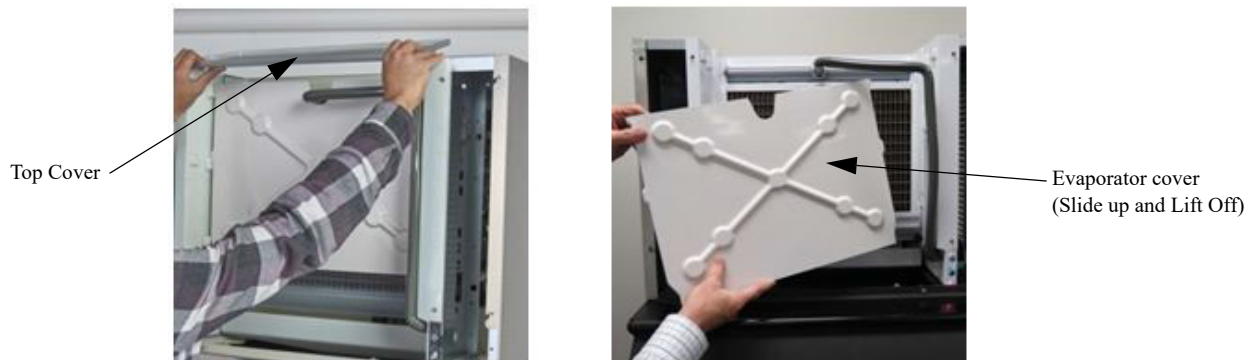
CAUTION: Do not mix cleaner (descaler) and sanitizer together.

Note: Electrical power will be ON when performing the following cleaning instructions.

1. Remove all ice from storage means to prevent any contamination of ice in storage.
2. Remove the front panel of the ice machine by loosening the two front panel screws with a Phillips head screwdriver. Lift panel to remove.
3. Press and hold the POWER button for 3 seconds to initiate a harvest cycle (blue light will begin to flash for Manual Harvest mode). This ensures there is no ice on the plate and the water is emptied from the sump.



4. Once the ice machine has completed its harvest cycle, the POWER light will go to solid red (OFF mode).
5. Remove the upper evaporator cover and leave the lower curtain.



6. Quick press the CLEAN button to start the process. Ice machine will show a solid red and flashing yellow light during the cleaning cycle.
7. The machine will first verify that the sump is empty with the pump ON and the purge valve energized.
8. When the sump is mostly empty, the machine will begin to fill the sump (about 30 seconds to a minute).
9. The pump turns ON when the water fill reaches the proper fill level. Measure the appropriate amount of descaler according to the machine size and sump volume from chart below. Carefully pour the descaler into the sump using the lower curtain to prevent splash. Replace upper evaporator cover.

| Model | Sump Size (volume) Gallons (in liters) | Example: Nu-Calgon Nickel-Safe Ice Machine Cleaner Descaler Concentration Ratio 5 fl.oz. per 1 gal. of water (39 mL per 1 Liter of water) | Example Nu-Calgon IMS-III Sanitizer Concentration Ratio 1.6 fl. oz. per 1 gal. of water (12.5 mL per 1 Liter of water) |
|---------------------|---|--|---|
| CIM0320/330 | .9 (3.4) | Add 4.5 fl. oz. (133 mL) | Add 1.5 fl. oz. (44mL) |
| CIM0430/520/530/630 | 1.2 (4.5) | Add 6 fl. oz. (177 mL) | Add 2 fl. oz. (59 mL) |



10. The machine will remain in the WASH cycle for 15 minutes.
11. After WASH time, the machine will PURGE and re-fill with the water pump ON.
12. The machine will RINSE (less than one minute) then repeat PURGE/FILL/RINSE multiple times.
13. The machine will end the cleaning cycle with a mostly empty sump and a solid red and yellow light.
14. Quick press the CLEAN button to return to OFF mode.
15. Remove the upper Evaporator Cover and lower Evaporator Curtain. Using a solution with the proper concentration of cleaner (descaler or sanitizer), wipe down with a clean soft cloth the Evaporator, Water Spillway, Water Distributor, upper Evaporator Cover, lower Evaporator Curtain and all splash surfaces. Verify that all residue and residual minerals have been removed.
16. If a full clean of water components is required, this can be done by referring to the service manual for water system component breakdown. This is recommended to be done by a qualified service agent.
17. Re-assemble all ice machine water system components in reverse order.
18. Sanitizing the ice machine is recommended after descaling. Repeat the process with sanitizer at correct ratio.
19. It is recommended to clean (descale and sanitize) the storage means after cleaning the ice machine.
20. Quick press the POWER button to return the ice machine to the ice making cycle.
21. Replace the front panel and tighten the two panel screws with a Phillips screwdriver.

Chemicals for Descaling and Sanitizing

It is important to use solutions that do not harm the ice machine. Never use cleaning or sanitizing solutions that contain Nitric Acid, Sulfuric Acid, Hydrochloric Acid, Carboic Acid, Acetic Acid, diluted Acetic Acid or non-food-grade vinegar (concentration of acetic acid greater than 6% and does not contain enzymes created in processing) or any chlorine-based solution such as bleach, chlorine dioxide or any type of salts such as potassium chloride (potassium salts) or sodium chloride. Check the label or the manufacturer's Material Safety Data Sheet (MSDS) to be sure. These chemicals can attack the surface of the evaporator as well as other metal components causing corrosion and flaking.

Please refer to www.iceomatic.com for approved chemical formulations and proper pH balance.

Cleaning Stainless Steel and Aluminum

Commercial grades of stainless steel and aluminum are susceptible to rusting or corrosion if not properly maintained. It is important that you properly care for the stainless steel and aluminum surfaces of your ice machine and bin to avoid the possibility of rust or corrosion.

Use the following recommended guidelines for keeping your machine looking like new:

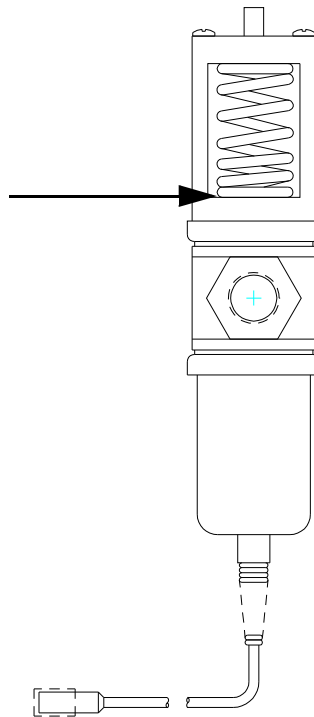
1. **Clean the stainless steel and aluminum thoroughly once a week.** Clean frequently to avoid build-up of hard, stubborn stains. Hard water stains left to sit can weaken the metals corrosion resistance and lead to rust or corrosion. Use a nonabrasive cloth or sponge, working with, not across, the grain.
2. **Do not use abrasive tools to clean the metal surface.** Do not use steel wool, abrasive sponge pads, wire brushes or scrapers to clean the metal.
3. **Do not use cleaners that use chlorine or chlorides.** Do not use chlorine bleach products to clean the metal surfaces. Chlorides break down the metals protective layer.
4. **Rinse with clean water.** If chlorinated cleansers are used, you must thoroughly rinse the surface with clean water and wipe dry immediately.
5. **Use the right cleaning agent.** The table below lists the recommended cleaning agents for common metal cleaning problems.

| Cleaning Activity | Cleaning Agent | Method of Application |
|-------------------------------------|---|---|
| Routine Cleaning | Mild dish soap, ammonia, glass cleaner, or mild detergent with water. Household kitchen cleaning chemicals approved for metal surfaces. | Apply with clean cloth or sponge. Rinse with clean water and wipe dry. |
| Removing grease or fatty acids | Oven cleaners | Apply generously; allow to stand for 15-20 minutes. Rinse with clean water. Repeat as required. |
| Removing hard water spots and scale | Vinegar | Swab or wipe with clean cloth. Rinse with water and wipe dry. |

Winterizing Procedures

IMPORTANT: Whenever the ice machine is taken out of operation during the winter months, the procedure below must be performed. Failure to do so may cause serious damage and will void all warranties.

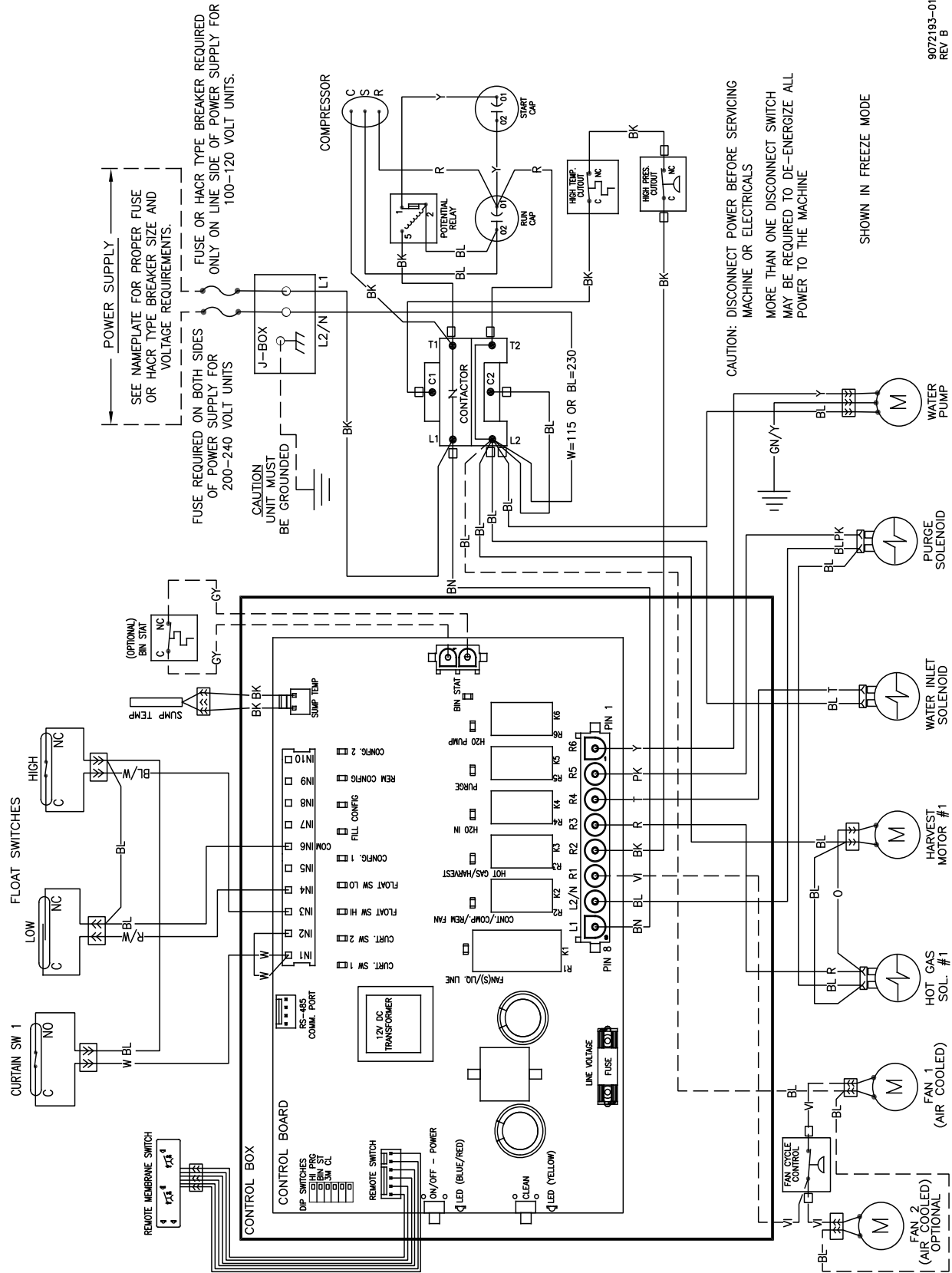
1. Turn off water to machine.
2. Make sure all ice is off of the evaporator(s). If ice is being made, initiate harvest by pressing the Power Button for approximately 3 seconds. The unit will shut off automatically following the harvest.
3. Disconnect the tubing between the water pump discharge and water distribution tube and drain any water.
4. On water cooled machines, hold the water regulating valve open by prying upward on the water valve spring with a screwdriver while using compressed air to blow all the water out of the condenser.



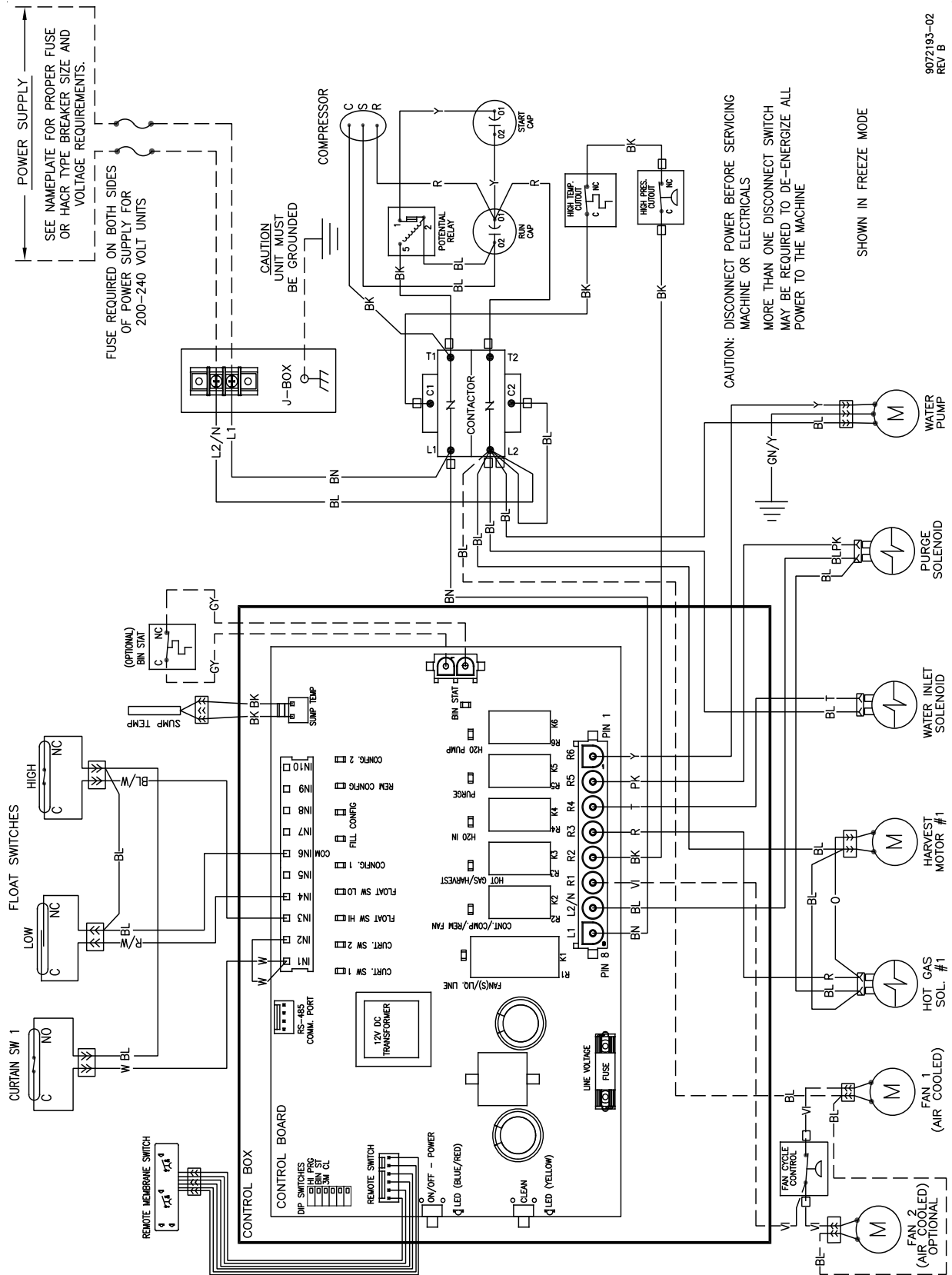
5. Remove all of the ice in the storage bin and discard.

| Model | Voltage/Htz/ Phase | Approx. Suction Press | Approx. Head Press | Avg. Batch Weight Half/Full | Approx Cycle Time 90/70 Minutes | Avg. Water Usage per 100 lbs. Produced in Gallons | | Min Circuit Ampacity | Max Fuse Size | kWH Used | Comp. LRA | Comp. RLA | Ref. Type | Charge in ounces |
|----------|-----------------------|--------------------------|-----------------------|-----------------------------------|---------------------------------------|--|--------------------|-------------------------|------------------|----------|--------------|--------------|-----------|---------------------|
| | | | | | | Potable | Water Condenser | | | | | | | |
| CIM0330A | 115/60/1 | 50-30 | 175-400 | 3.025/3.375 | 18-23 | 20 | | 11 | 15 | 6.69 | 50 | 8.1 | R-404a | 20 |
| CIM0330W | 115/60/1 | 50-30 | 250 | 3.025/3.375 | 16-21 | 19.6 | 179 | 10.7 | 15 | 5.19 | 50 | 8.1 | R-404a | 13 |
| CIM0335A | 220-240/50/1 | 50-30 | 175-400 | 3.025/3.375 | 19-24 | 22 | | 6.9 | 16 | 7.32 | 29.9 | 5.1 | R-404a | 22 |
| CIM0430A | 115/60/1 | 50-30 | 175-400 | 5.025/5.65 | 22-26 | 19.8 | | 11 | 15 | 5.43 | 50 | 8.1 | R-404a | 24 |
| CIM0430W | 115/60/1 | 50-30 | 250 | 5.025/5.65 | 19-22 | 17.8 | 169 | 10.7 | 15 | 4.75 | 50 | 8.1 | R-404a | 14 |
| CIM0435A | 220-240/50/1 | 50-30 | 175-400 | 5.025/5.65 | 20-24 | 20 | | 8.7 | 16 | 5.97 | 37 | 6.3 | R-404a | 24 |
| CIM0436A | 115/60/1 | 50-30 | 175-400 | 5.025/5.65 | 17-20 | 18 | | 6.3 | 15 | 5.46 | 26.5 | 4.6 | R-404a | 24 |
| CIM0436W | 115/60/1 | 50-30 | 250 | 5.025/5.65 | 20-24 | 17.7 | 185 | 6.1 | 15 | 4.37 | 26.5 | 4.6 | R-404a | 14 |
| CIM0530A | 115/60/1 | 50-30 | 175-400 | 5.025/5.65 | 18-22 | 19.9 | | 17.8 | 30 | 5.87 | 70 | 13.5 | R-404a | 20 |
| CIM0530W | 115/60/1 | 50-30 | 250 | 5.025/5.65 | 15-18 | 20 | 181 | 17.4 | 30 | 4.7 | 70 | 13.5 | R-404a | 14 |
| CIM0530R | 115/60/1 | 50-30 | 220-400 | 5.025/5.65 | 17-21 | 19.6 | | 20.1 | 30 | 6.21 | 70 | 13.5 | R-404a | 132 |
| CIM0535A | 220-240/50/1 | 50-30 | 175-400 | 5.025/5.65 | 18-21 | 20 | | 11.2 | 16 | 6.11 | 38 | 8.5 | R-404a | 22 |
| CIM0535W | 220-240/50/1 | 50-30 | 250 | 5.025/5.65 | 16-19 | 19.5 | 190 | 11 | 16 | 5 | 38 | 8.5 | R-404a | 13 |
| CIM0535R | 220-240/50/1 | 50-30 | 220-400 | 5.025/5.65 | 17-20 | 20 | | 12 | 20 | 6.31 | 38 | 8.5 | R-404a | 132 |
| CIM0635A | 220-240/50/1 | 50-30 | 175-400 | 5.025/5.65 | 16-19 | 20 | | 8.1 | 16 | 5.72 | 37 | 5.8 | R-404a | 22 |
| CIM0636A | 208-230/60/1 | 50-30 | 175-400 | 5.025/5.65 | 16-19 | 18.6 | | 9.2 | 15 | 5.63 | 46 | 6.9 | R-404a | 20 |
| CIM0636W | 208-230/60/1 | 50-30 | 250 | 5.025/5.65 | 14-16 | 19.2 | 180 | 9 | 15 | 4.27 | 46 | 6.9 | R-404a | 14 |
| CIM0636R | 208-230/60/1 | 50-30 | 220-400 | 5.025/5.65 | 14-16 | 19 | | 10 | 15 | 5.29 | 46 | 6.9 | R-404a | 132 |

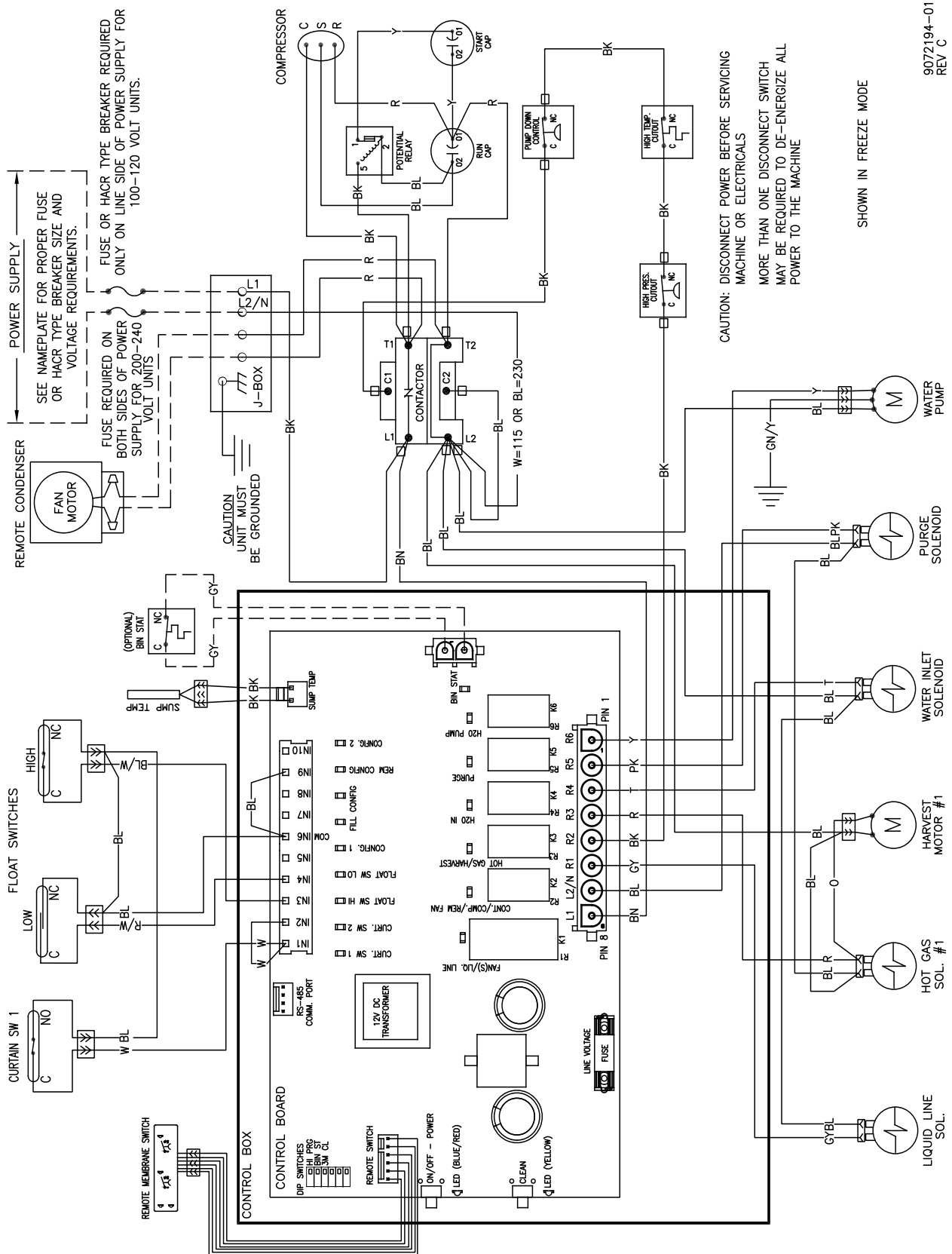
CIM0330, 0430, 0436, 0530, 0636 Air and Water Cooled Units



CIM0335, 0435, 0535, 0635 Air and Water Cooled Units



CIM0530, 0636 Remote Cooled Units



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CIM0535 Remote Cooled Units

