Cornelius

Service Manual

SERIES 1400
(R-22)

MODULAR CUBED ICE MAKER

12/91
161951806

INTRODUCTION

We have strived to produce a quality product. The design has been kept simple, thus insuring trouble-free operation.

This manual has been prepared to assist servicemen and users with information concerning installation, construction and maintenance of the ice making equipment. The problems of the serviceman and user have been given special attention in the development and engineering of our icemakers.

If you encounter a problem which is not covered in this manual, please feel free to write or call. We will be happy to assist you in any way we can.

When writing, please state the model and serial number of the machine.

Address all correspondence to:

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One Cornelius Place
Anoka, MN 55303-1592

Phone 800-554-3526
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PRINTED IN USA

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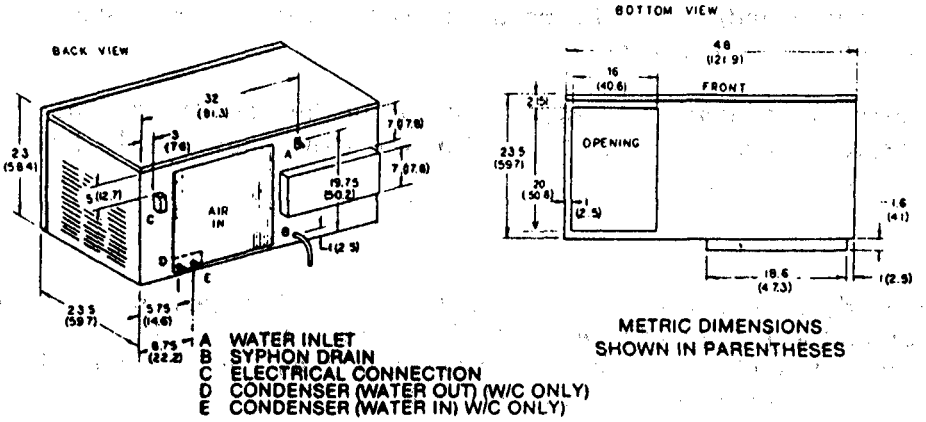
Specifications

SERIES 1400



COMMERCIAL CUBE ICE MAKER ICE PRODUCTION CAPACITY (approximate):				
Model Number (Condenser)	Ambient Temp °F	Incoming Water Temp °F 50°	70°	80°
(Air Cooled)	70°	1400	1240	1180
	80°	1320	1175	1110
	90°	1210	1085	1025
(Water Cooled)	70°	1420	1250	1120
	80°	1390	1220	1095
	90°	1360	1190	1070
	Outside Air °F			
(Remote-Air)	50°	1300	1190	1145
	70°	1230	1180	1130
	90°	1100	1050	990
	110°	950	900	860

COMPRESSOR ELECTRICAL RATING	3.25 H.P.
COMPRESSOR MODEL	CRK3-0325-PFV
CONDENSER	Air, water or remote
REFRIGERANT CHARGE (air cooled)	64 oz. R-22
(water cooled)	42 oz. R-22
(remote)	270 oz. R-22
REFRIGERANT CONTROL	TXV
TXV SUPERHEAT SETTING	6°
INLET WATER SUPPLY	3/8" SAE male flare
VOLTAGE	208-230/60/1
TOTAL AMP DRAW	14.8 amps
CRANKCASE PRESSURE REGULATOR SETTING	45 PSI Max.

INSTALLATION INSTRUCTIONS

A. UNPACKING

1. Uncrate machine and/or bin by removing the staples from around the bottom of cardboard crate and lift off.

2. Remove bolts fastening the crate skid to the bottom of the unit. If auxiliary legs have been purchased for the bin, they should be installed at this time.

B. LEVELING

If legs are used, adjust the leveling legs of the storage bin until the unit is level and all four (4) legs are in solid contact with the floor. Leveling is very important to obtain proper draining and to maintain the proper level in the water pan of the ice cuber.

NOTE: If the bin is to be installed flush to the floor, the machine must be sealed to the floor with an approved mastic such as Sears #3803-0 Caulk, Dow R.T.V. 101, 102 or G. E. 731, 732. This is an N.S.F. requirement and is the responsibility of the installer.

C. UNIT LOCATION

1. Allow at least a minimum of six (6) inches at the rear and side of the ice machine for proper air circulation.

2. This unit has been designed to be installed in an indoor location which is clean and which can be adequately ventilated; the air and water temperatures should never exceed 100 degrees nor fall below 50 degrees. (Temperatures above 100 degrees will cut the ice making capacity below an economical level; temperatures below 50 degrees will cause a malfunction of thermostatic sensors.

3. The unit should be located where air circulation is not restricted. The unit should not be located near a kitchen grill. Air which contains grease vapors will deposit grease on the condenser. The condenser should always be kept clean.

D. UNIT SET-UP

1. Take off front panel of machine and remove hardware bag or service manual envelope with the water strainer enclosed.

2. Mount the ice maker to the top of the ice storage bin or adapter in the proper position over the ice drop opening. The ice maker must then be sealed both on the outside and the inside bottom edges with an approved N.S.F. mastic such as Dow Silastic #732, 734 or General Electric RTV #101, 102. This is an N.S.F. requirement and the responsibility of the installer.

3. Remove shipping tape from evaporator curtains.

E. REMOTE CONDENSERS

Remote condensers should be installed above the ice machine in a leval configuration. They are connected to the ice making unit by copper tubing and line valves. The male half of the line valve is mounted on the ice making unit and the remote condenser. The female half is soldered on the tube ends when tubing kits are provided with the machine. If tubing kits are not provided, the female half of the line valves will be provided in a valve kit and the installer will mount them on the tubing he provides.

PLEASE NOTE THE FOLLOWING IN REGARD TO REMOTE CONDENSER INSTALLATION:

1. WHEN MAKING LINE VALVE CONNECTIONS, LUBRICATE RUBBER SEAL IN MALE HALF WITH REFRIGERATION OIL. THREAD COUPLING HALVES TOGETHER BY HAND TO INSURE PROPER MATING OF THREADS. USE PROPER SIZE WRENCHES (ON COUPLING BODY HEX AND ON UNION NUT) AND TIGHTEN UNTIL COUPLING BODIES "BOTTOM" OR A DEFINITE RESISTANCE IS FELT. USING A MARKER OR INK PEN, MARK A LINE LENGTHWISE FROM THE COUPLING HEXT TO THE BULKHEAD. THEN TIGHTEN AN ADDITIONAL 1/6 TO 1/4 TURN. THE MISALIGNMENT OF THE LINE WILL SHOW THE DEGREE OF TIGHTENING. THIS FINAL TURN IS NECESSARY TO INSURE THAT THE KNIFE EDGE METAL SEAL BITES INTO THE BRASS SEAT OF THE COUPLING HALVES FORMING THE LEAKPROOF JOINT. IF TORQUE WRENCH IS USED, TORQUE TO 35 FOOT POUNDS.

2. A LOW VOLTAGE ELECTRICAL CONTROL CIRCUIT MUST BE FIELD WIRES BETWEEN THE ICE MACHINE AND THE REMOTE CONDENSER RELAY. THOSE WIRES SHOULD BE RUN WITH THE TUBING DURING INSTALLATION. REFER TO APPLICABLE WIRING DIAGRAMS.

3. THE REMOTE CONDENSER REQUIRES A SEPARATE POWER SUPPLY FROM THE ICE MAKING UNIT. REFER TO THE REMOTE CONDENSER ON WIRING DIAGRAM.

4. WHEN VERTICAL LINES ARE INVOLVED IN THE INSTALLATION, FOLLOW STANDARD REFRIGERATION PRACTICES FOR VERTICAL LINES TO ASSURE POSITIVE OIL RETURN TO THE COMPRESSOR. VERTICAL LIFT TO BE NO MORE THAN 15 FEET.

5. WE DO NOT RECOMMEND TUBING RUNS OF MORE THAN 40 FEET.

6. A THREE WAY HEAD PRESSURE CONTROL VALVE IS USED TO MAINTAIN A RELATIVELY CONSISTENT HEAD PRESSURE BETWEEN 180 AND 200 PSI FOR R-22 IN THE RECEIVER IN COLD AMBIENT CONDITIONS TO INSURE A GOOD HARVESTING OR DEFROSTING OF THE ICE SLABS ON THE EVAPORATOR. BECAUSE OF THIS VALVE SOME LIQUID REFRIGERANT WILL BE HELD IN THE CONDENSER.

   THE HEAD PRESSURE CONTROL VALVE WILL NOT OPERATE CORRECTLY WHEN A TOTAL PRESSURE DROP OF 14 POUNDS OR MORE IS CREATED BETWEEN THE ICE MAKING UNIT, THROUGH THE TUBING TO THE REMOTE CONDENSER, THE CONDENSER AND THE RETURN TUBING TO THE ICE MAKING UNIT.

   THE ICE MAKING UNIT UTILIZING A REMOTE CONDENSER IS SHIPPED FROM THE FACTORY WITH THE RECEIVER HOLDING THE REFRIGERANT CHARGE. ADDITIONAL REFRIGERANT MAY BE REQUIRED UPON INSTALLATION DEPENDING UPON THE AMBINET CONDITIONS THE REMOTE CONDENSER IS OPERATING UNDER, THE CONDENSER AND LINE SIZING.

F. MAKE ELECTRICAL POWER SUPPLY CONNECTION

Requirements: 208-230/60hz. 1 ph. or 220V 50hz. 1 ph. when used

REFER TO SERIAL PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM TIME DELAY FUSE SIZE.

ALL WIRING MUST CONFORM TO NATIONAL AND LOCAL ELECTRICAL CODES.

G. MAKE PLUMBING CONNECTIONS

Water supply - (Install per local codes)

The water inlet connection to the unit is a 3/8" flare male connections located at the rear of the ice machine.

NOTE: If the water pressure exceeds 50 pounds, a water pressure regulator should be installed in the water inlet line between the water shut-off valve and the strainer.

Install a reducer fitting on the shut-off valve to accomodate the water strainer, which is supplied with each ice machine and MUST be used. Install the water strainer with the arrow in the proper direction of flow and with the clean out plug down. This is very important for cleaning. Connect either 3/8" or 1/2" copper tubing between the water inlet fitting of the ice machine and the water strainer.

For water cooled units, two water inlet connections are provided; one for the ice making (evaporator) section which is located on the back of the machine and is a 3/8" flared connection. The other is for the water cooled condenser. The reason for the separate water inlet connections is that some installations use a water tower for cooling the water used in the water-cooled condenser and some installations use treate water (filtered) for the ice making inlet water connection. Be sure to install water line (incoming) to the 3/8" male flare connection on the back of the unit that supplies water to the water regulating valve inside.

The setting of the water regulating valve from the factory should be 120 pounds for R-12 units and 225 pounds for R-22 units. NOTE: Always flush out water lines before starting unit. Adjustments, if necessary, should be done at installation.

H. DRAINS

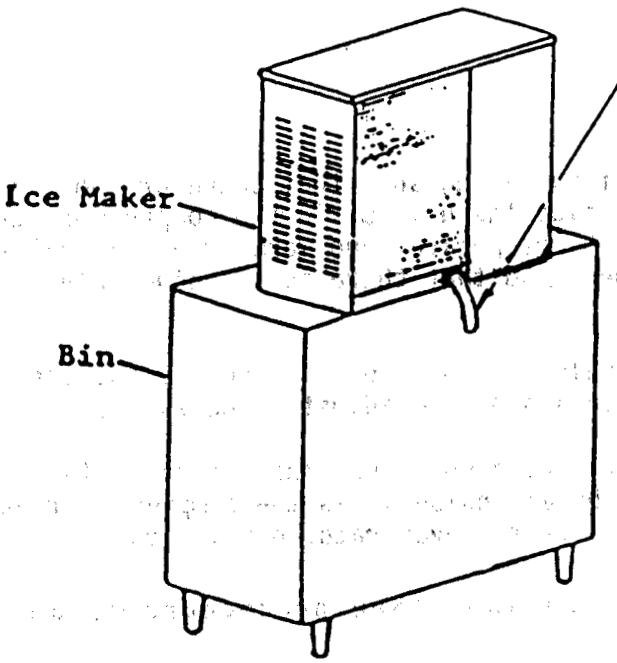
Provide a suitable trapped open drain as close as possible to the area where the ice maker is going to be installed. This may be an existing floor or a 1-1/4" trapped open drain. Two separate drain lines are required for air cooled units, one for the storage bin and one for the Dump Valve drain hose.

An additional separate drain line will be required for water cooled units from the outlet of the condenser coil to the drain. Run all gravity drain lines with a good fall to the open drain.

ALL PLUMBING MUST BE INSTALLED IN ACCORDANCE WITH LOCAL CODES.

NOTE: IN SOME CASES IT MAY BE NECESSARY TO INSULATE THE WATER SUPPLY LINE AND DRAIN LINE. CONDENSATE DRIPPING TO THE FLOOR CAN CAUSE SERIOUS STAINING OF CARPETS OR HARDWOODS.

DRAIN CONNECTION INSTALLATION INSTRUCTIONS

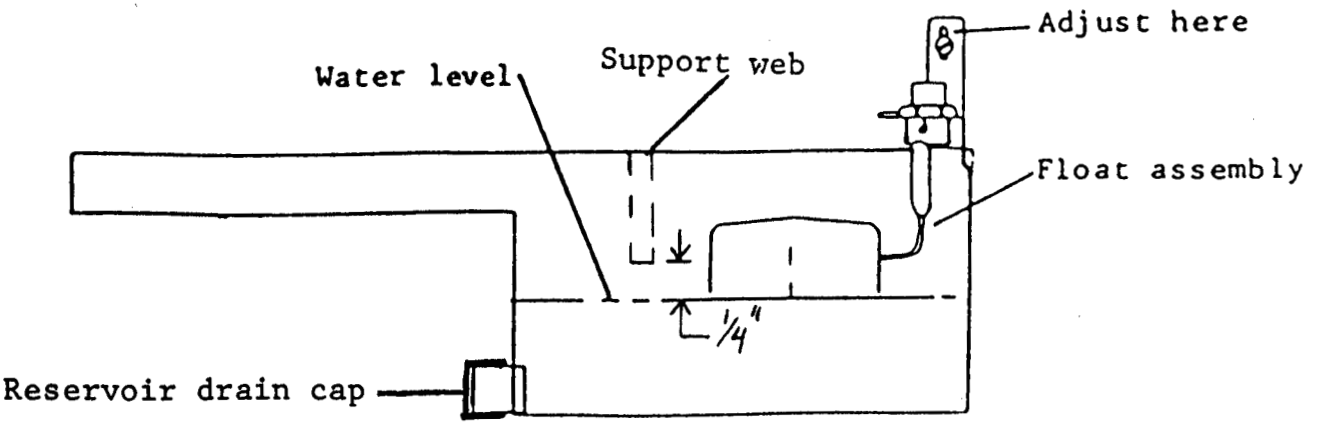


Taking care not to kink or collapse vinyl tubing at any point, route tubes to any open, trapped or vented floor drain. Run tubing to drain separately. Do not tee any drain hoses together. Add drain tubing required to reach floor drain.

I. ADJUSTMENT OF WATER LEVEL IN RESERVOIR

With the water supply turned ON and the power supply OFF'adjust float to maintain water level¼" below the support web insidereservoir

(See Illustration Below)



WARNING: Ice Maker will not operate properly when water supply temperature is below 50°F or above 100°F. Water supply pressure must not exceed 50 PSI.

J. STARTING THE UNIT

After the ice cuber has been unpacked and leveled and all plumbing and electrical connections have been made, start the unit and check for proper operation.

A cuber has three separate circuits:

A. The water circuit
B. The refrigerant circuit
C. The electrical circuit

1. Start checking the water circuit by making sure that there are no thread or flare joint leaks, either outside the unit or in the compressor section. Next check the water flow over the evaporator and make sure that all holes in the water distributor are open, and that there is no undue splash or loss of water into the ice bin.

   Also check to see if the float valve is functioning properly and the correct water level is being maintained. Re-adjust if necessary.

2. Check the refrigerant circuit by making sure that the condenser fan is running. (This will be evident by air noise.) Is the compressor running? (Feel the casing for vibration.) Is the evaporator getting cold?

3. Check bin-harvest switch operation. (See proceedure in manual)

STACKING KIT INSTALLATION INSTRUCTIONS FOR MODEL RCV-1204

1 - 43547	interface cable	1 - 43534	cover, chute top
16 - 857	screw 8/32	1 - 43535	cover, chute bottom
2 - 8022	clip, plastic	1 - 43541	slide, ice top right hand
1 - 20928	bushing, snap	1 - 43542	slide, ice top left hand
2 - 39499	strap, tie	1 - 43537	slide, ice right hand
		1 - 43539	slide, ice left hand

PLEASE SEE ILLUSTRATIONS FOR REFERENCE
FOR THE FOLLOWING INSTALL PROCEDURE:

1. After the units are mounted on each other remove evaporator curtains from the bottom machine.

2. Drill 2 each 3/16" holes 11 inches directly above weld nuts in the middle of the back wall of evaporator section if holes are not already in postion.

3. Pre-assemble right and left ice slides as shown in illustration. Do not tighten screws at this time, leave room for adjustment.

4. Bring ice slides thru the bin and lower machine and hang over bent edges of the top unit water reservoirs.

5. Insert the plastic clips and screws thru ice slide flanges into weld nuts and drilled holes on back wall of unit. Pull down on ice slides from the bottom and tighten screws securely.

6. Insert the bottom chute cover plate and punch a hole thru the splash shield to insert a mounting screw thru it and to the bottom weld nut of the plate. Insert screws thru the top slots of plate into the weld nuts of the ice slides and tighten all screws securely.

7. Insert top chute cover plate up along ice slide flanges until slots match weld nuts. Insert 5 screws into lower slots position and tighten securely.

8. Push down the top ice slide sections hanging on water reservoir bent edges and secure screws.

9. Make sure power is off to the units and remove electrical box covers from both units.

10. Remove lowest grommet from the left side of each electrial box.

11. Remove the plug from chassis base pan of the top unit in the stack.

12. Insert the snap bushing into the hole the plug was just removed from.

13. String interface cable thru the snap bushing then insert the cable thru each electrical box hole and split grommets.
Please Note: Make sure marked end of cable goes to the top unit.

14. Reinstall grommets into electrical box.

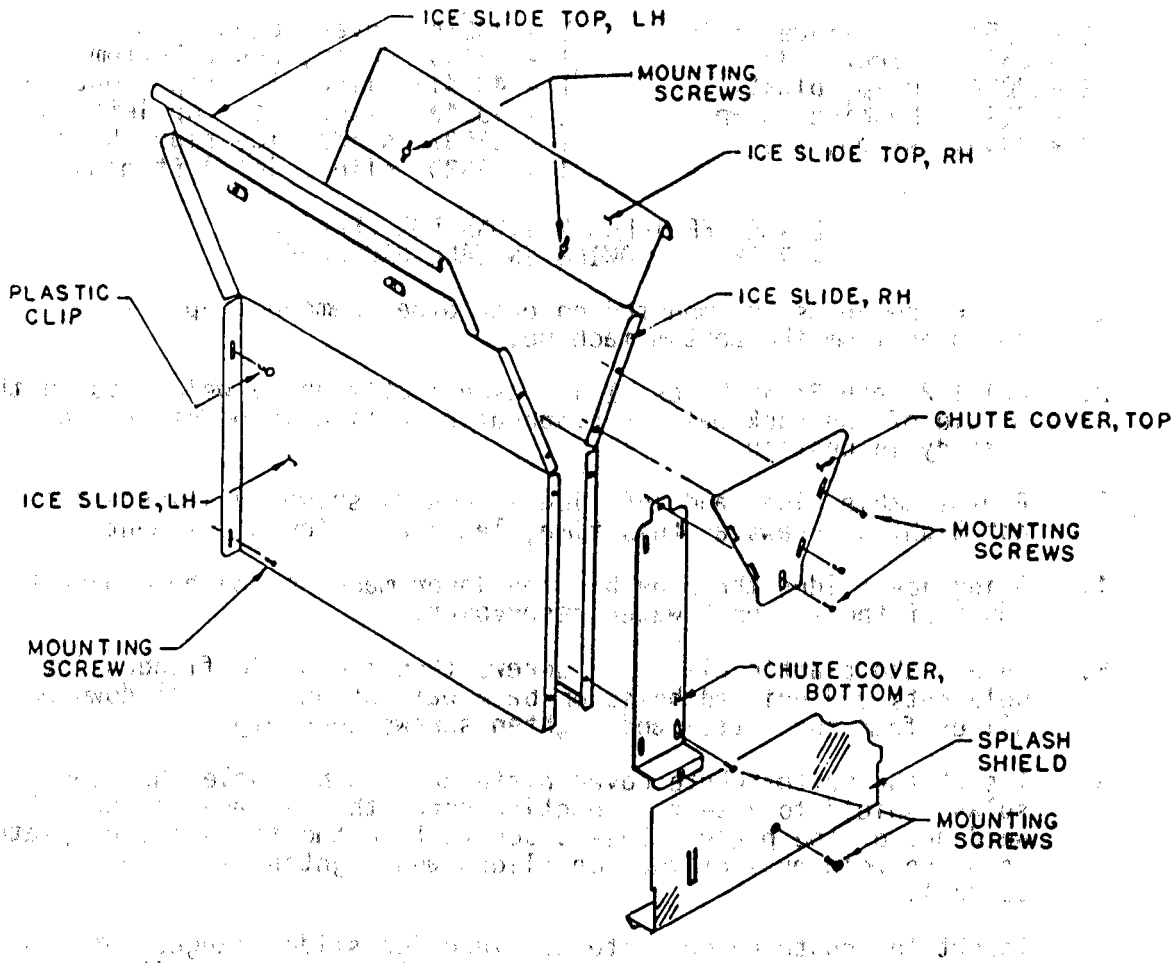
15. Plug the interface cable onto the open DC-3 terminal on the left side of each solid state control board.
Please Note: The plug connection is polarized and can only go on one way. Be careful and make sure of a good connection.

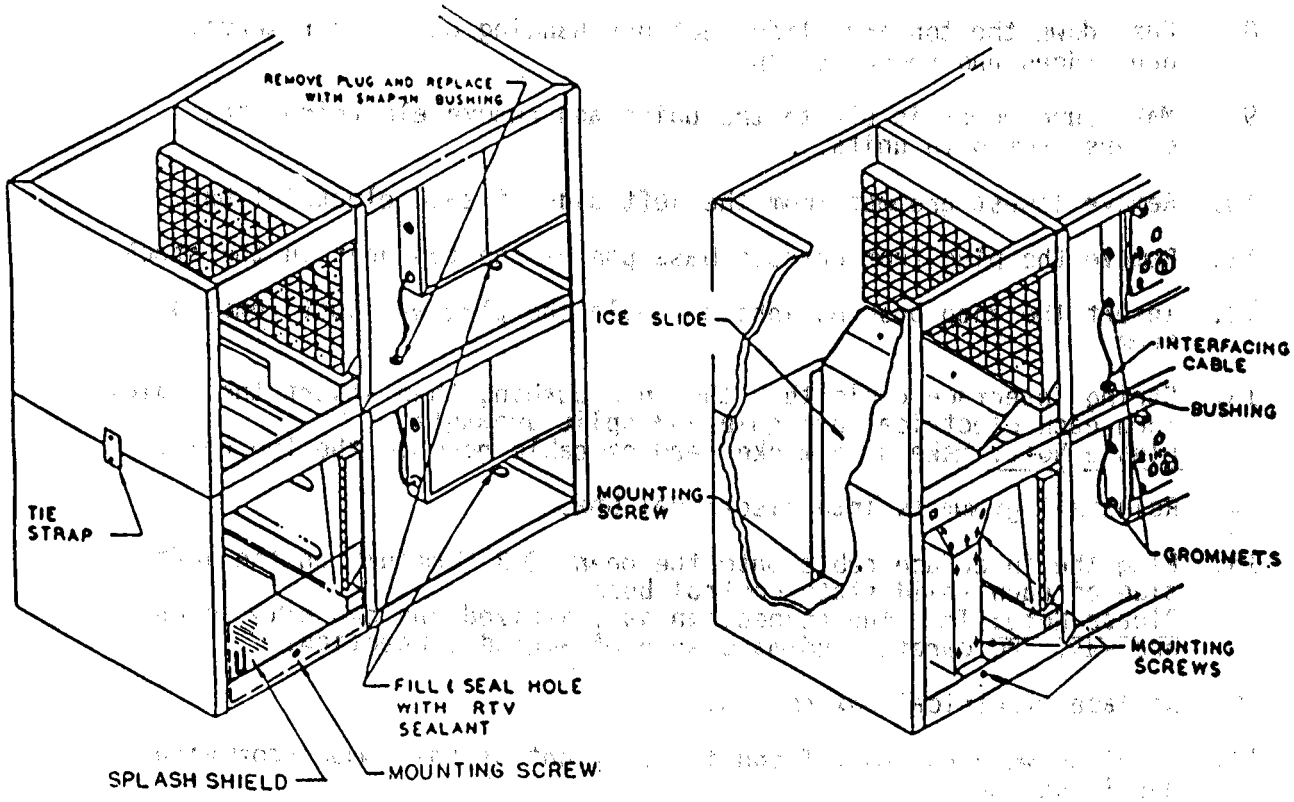
16. Replace electrical box covers.

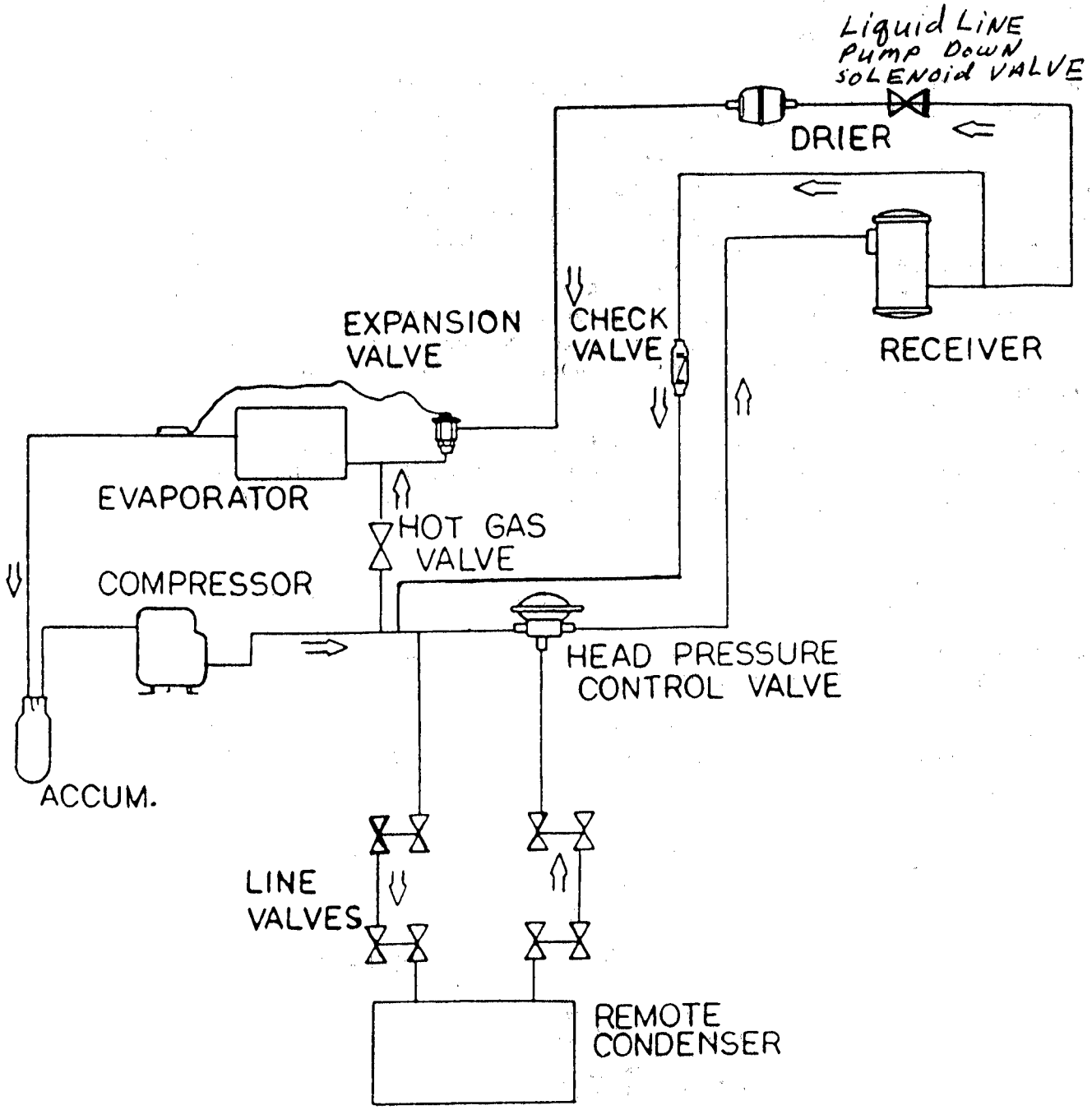
17. Plug the weld nut hole found to the right of the compressor with a mastic sealant.

18. Remove the screws from both sides of both units and insert the tie straps. Reinstall screws.

ILLUSTRATION FOR STACKING KIT INSTRUCTIONS






Liquid LINE
Pump Down
SOLENOid VALVE
DRIER
RECEIVER
EXPANSION
VALVE
CHECK
VALVE
EVAPORATOR
HOT GAS
VALVE
COMPRESSOR
HEAD PRESSURE
CONTROL VALVE
ACCUM.
LINE
VALVES
REMOTE
CONDENSER

ELECTRICAL CIRCUIT
SEQUENCE OF OPERATION

An L.E.D. digit display mounted on the solid state control board will show a status number 0,1,2,4, &6 and a decimal point to indicate what is happening in the operation of the unit.

The electrical sequence of operation you will see on the digit display for a normal ice making cycle will be as follows:

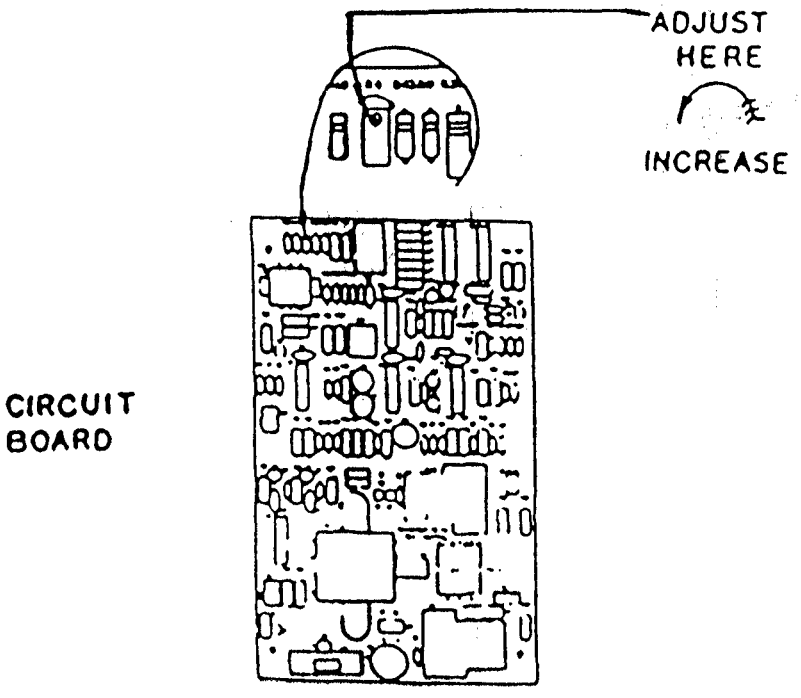
The status number 0 will be shown telling you the unit is making ice. The solid state control DELAYS the start of the water pump until the evaporator temperatures reaches 20° F. Approximately six minutes after the start up in the freeze cycle a decimal point will appear to the lower right of the "0" to tell you that the evaporator sensor has been switched on. After the evaporator temperature has pulled down low enough for the correct amount of ice to be on the evaporator, the decimal point will begin to flash and stay flashing for approximately 20 seconds. If evaporator stays below the set point, the harvest cycle will start. A number "1" on the digit display will indicate that the machine is in its harvest cycle with the hot gas valve open. The water pump continues to operate and the water dump solenoid valve is now open. The water pump shuts off approximately 15 seconds later after the water reservoir is pumped out.

PLEASE NOTE: During the freeze cycle in low ambient condition the condenser fan motor will be cycled on and off through the condenser sensor and solid state control board. The fan cycling pressures in relation to the temperatures sensed will be approximately 180# for cut out and 230# for cut in of the fan motor.

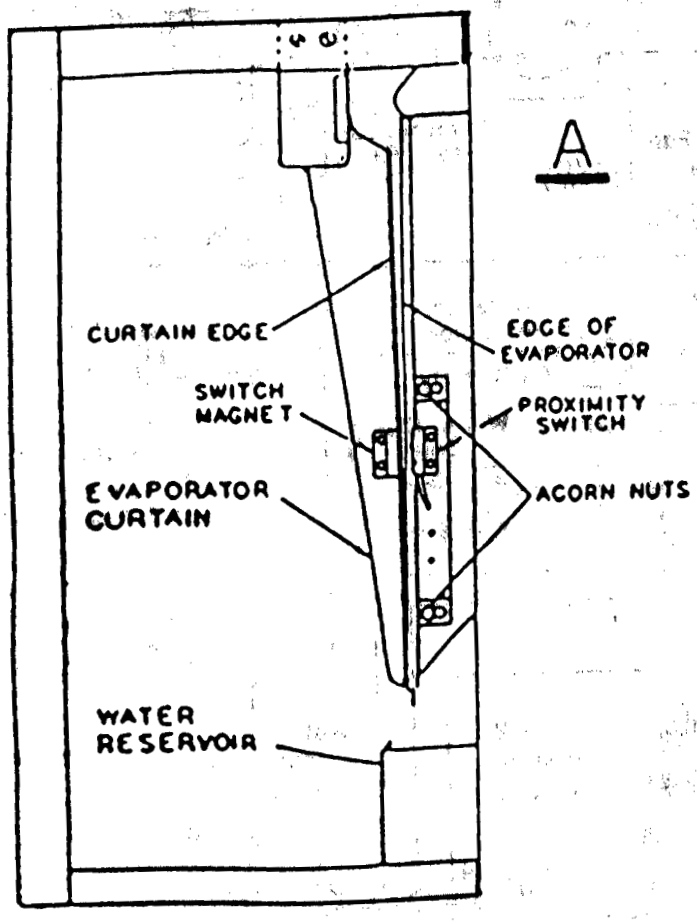
ADJUSTMENT FOR ICE BRIDGE THICKNESS

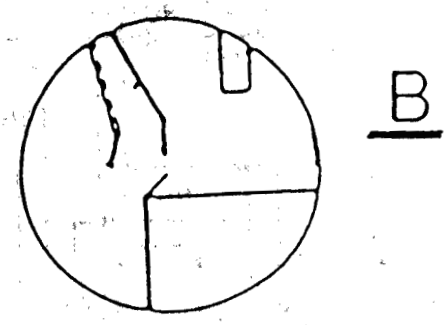
An ice bridge connecting all cubes is necessary for a proper harvest or discharge of cubes from the evaporator.

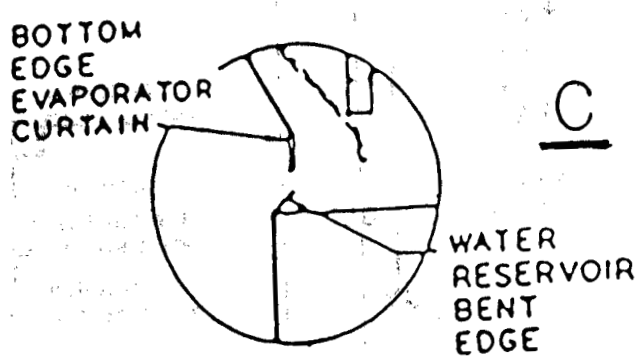
To increase ice "bridge" thickness carefully turn adjustment screw counter clockwise no more than one turn at a time. Wait and check thickness before re-adjusting.



ADJUSTMENT AND CHECK-OUT FOR HARVEST-BIN SWITCHES







CHECKOUT PROCEUDRE

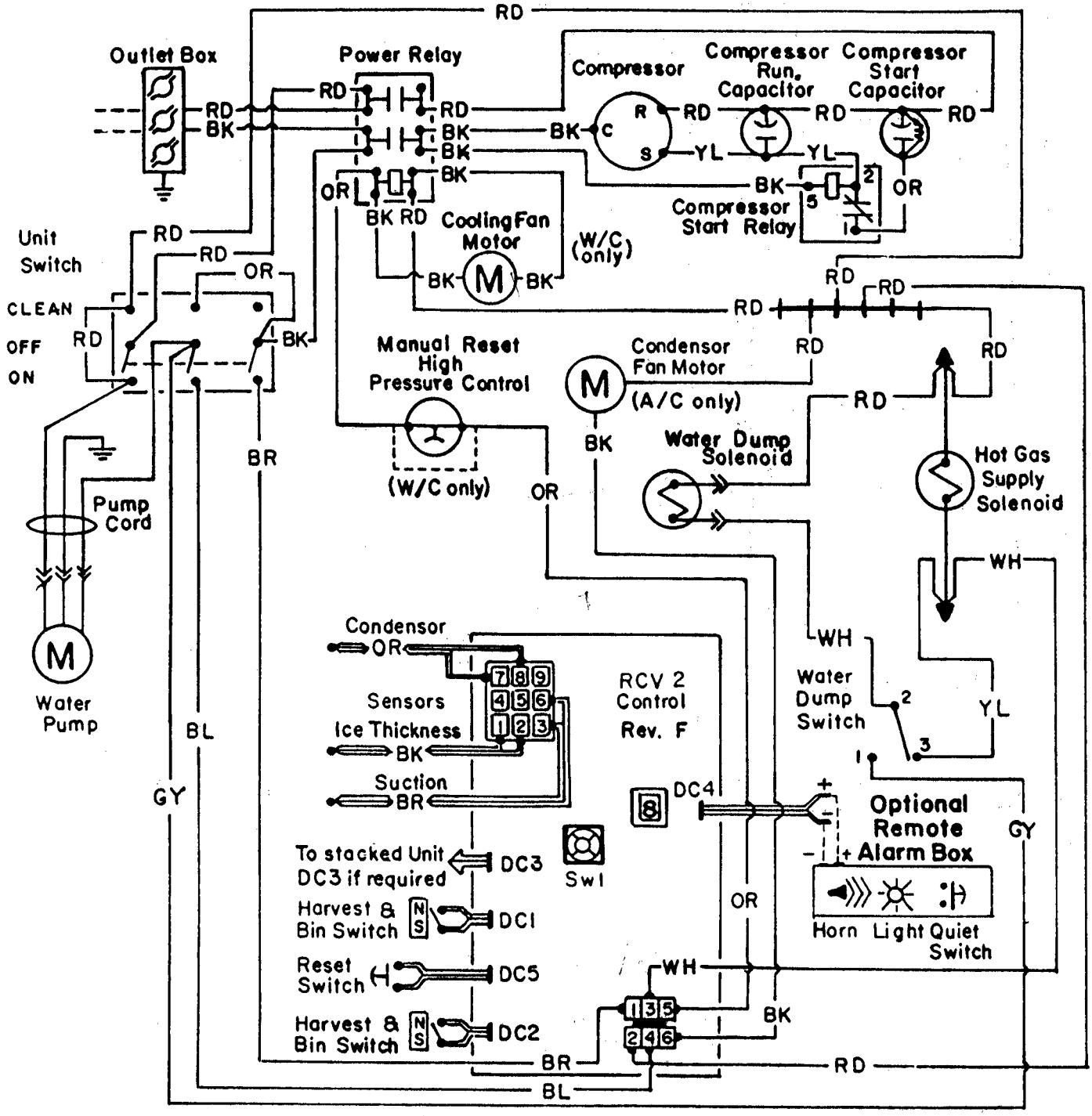
Turn on the ice machine and move the evaporator curtain(s)away from the evaporator(s). The ice machine should then shutoff in approximitly 8 seconds.(See detail A&B)

Slowly let the evaporator curtain(s) move back toward the evaporator(s) until the bottom edge of the curtain(s) is at least at the bent edge of the water reservoir or closer to the evaporator. With the curtain(s) at that position, the machineshould start.(See detail C)

ADJUSTMENT PROCEDURE

If adjustment is necessary,loosen acorn nutsand move proximity switch closer to the curtain(s)and make sure the curtain is properly mounted. (See detail A)

Re-check per above proceedure.



208/230 VOLTS 60 HZ

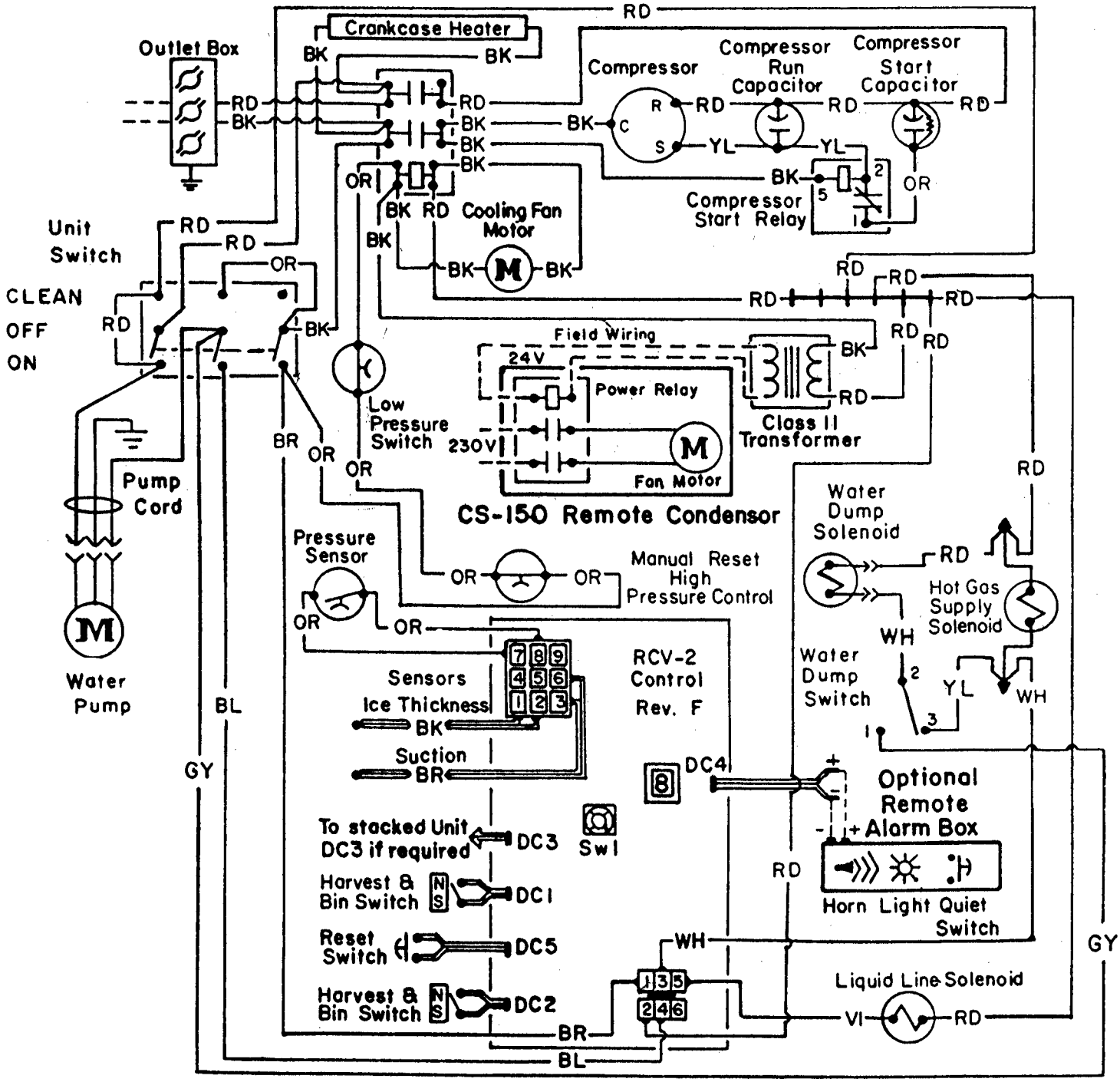
AC & WC-1400-MH

Cornelius

Note: The solid state control ***DELAYS*** the start of the water pump until the evaporator temperature reaches 20° F.

IMPORTANT White and black connector blocks are "KEYED" and MUST be inserted correctly on circuit board. DO NOT USE FORCE.

PART NO. 40606
ARTWORK 50541
REV. J



RC-1400-MH

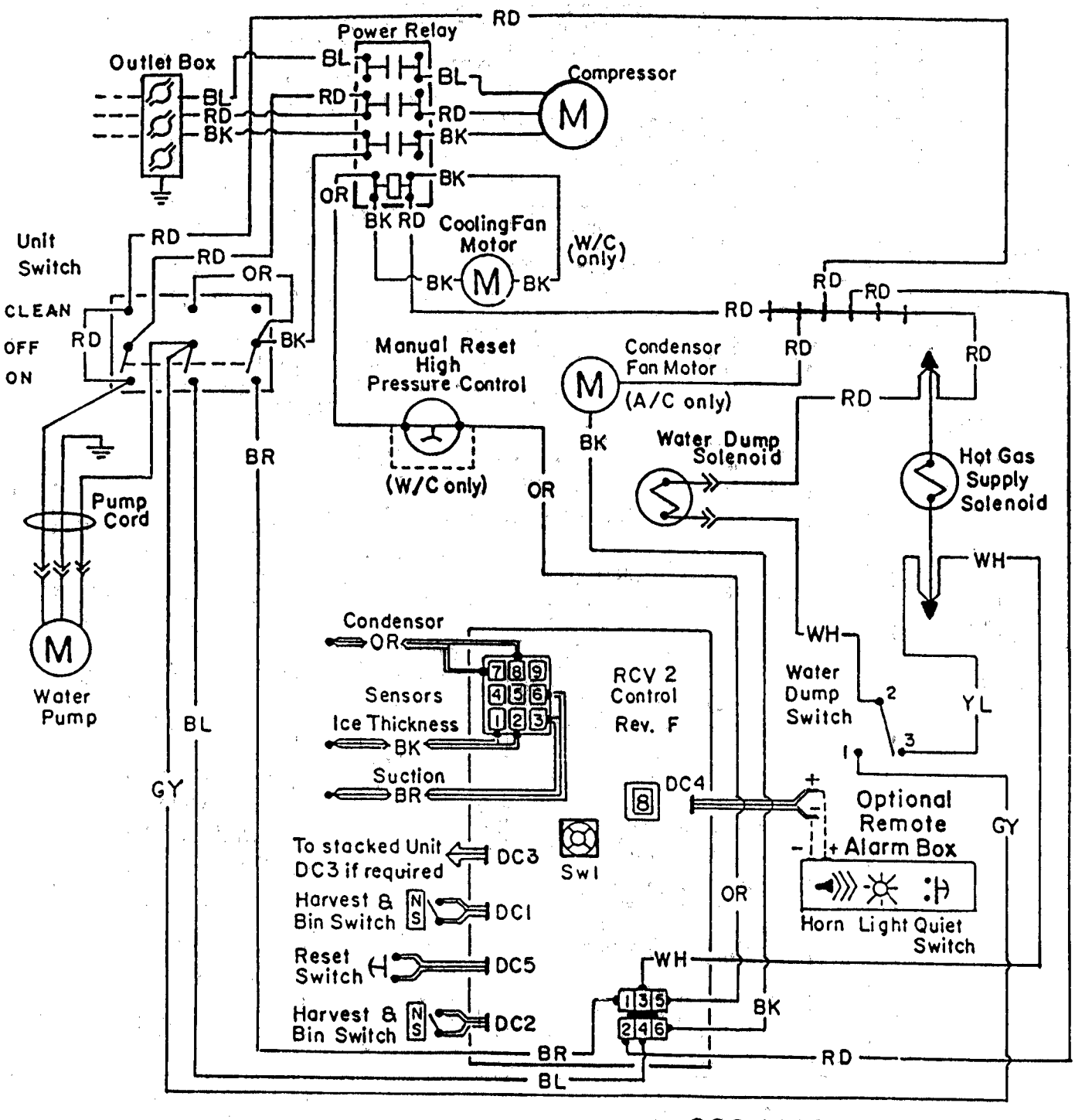
208/230 VOLTS 60 HZ

Cornelius

Note: The solid state control *DELAYS* the start of the water pump until the evaporator temperature reaches 20° F.

IMPORTANT White and black connector blocks are "KEYED" and MUST be inserted correctly on circuit board. DO NOT USE FORCE.

PART NO. 161909002
ARTWORK 50740
REV. B



208/230 VOLTS 60 HZ 3PH

AC & WC-1400-MH-3

Cornelius

Note: The solid state control *DELAYS* the start of the water pump until the evaporator temperature reaches 20° F.

IMPORTANT White and black connector blocks are "KEYED" and MUST be inserted correctly on circuit board. DO NOT USE FORCE.

PART NO. 41182
ARTWORK 50561
REV. J

SANITIZING AND CLEANING PROCEDURE

1. Remove front panel to gain access to the on-off-clean switch.

2. Push switch to "clean" and allow the ice on the evaporator to release or melt away.

3. Remove all ice from storage bin.

4. If lime scale is present add 2 oz. of "Lime-A-Way" or "Calgon Nickel-Safe Ice Machine Cleaner" directly into water reservoir. Circulate for no longer than 15 minutes. Go to Step 7 to flush out the system before going to Step 5.

   CAUTION: All ice machine cleaner must be flushed out of the system before the sanitizing solution is used in Step 5. The reaction of the two chemicals can cause hazardous gases to be generated.

5. Pour 1/2 oz. of household bleach into the water reservoir and circulate for 15 minutes to sanitize the circulating water system including the evaporator, pump, distributor and all interconnecting vinyl tubing. Go to Step 7 [illegible] out.

6. Mix a sanitizing solution of 1 oz. household bleach to one gallon of water. Using a non-metallic bristle brush, scrub the following:

   a. Inside surfaces of the ice bin including top and door.
   b. Inside surfaces of the icemaker to include evaporator section in the ice machine including the top, front panel and evaporator splash curtain.
   c. Make sure splash curtain is correctly positioned.

7. Depress dump valve switch on top of control box and allow cleaner or sanitizer to drain away. Allow float valve to fill reservoir with clean fresh water, circulate for approximately 1 minute. Depress dump valve switch and allow water to drain away. Repeat 3 times.

8. Push switch from "clean" to "on" position.

9. Replace front panel.

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WATER TREATMENT

Automatic ice-making machines can quit working for any number of reasons, mechanical, electrical or faulty refrigeration, but water problems foul them up faster than almost anything else. While ice machines vary in design, you can apply these water treatment tips to all of them.

1. START WITH THE WATER

The mineral content of water varies in different areas and as the chart shows, high hardness and alkalinity counts combine to form insoluble calcium carbonate or lime scale. If this condition is constant, the intake water must be treated constantly to prevent scale formation in the ice machine.

2. PREVENT LIME SCALE FORMATION

We recommend the installation of a Calgon Micromet Feeder on the incoming water line. No. X-8B Feeder is recommended for ice machines with a capacity of 400-450 lbs. per day. Fill the feeder with 6R Micromet, the slowly soluble poly-phosphate which lasts six months before renewing the 8-oz. charge.

Constant treatment with 6R Micromet will control lime scale and prevent minerals from sticking to the freezing surfaces in ice machines. Result - smooth movement of ice slabs, good harvest of ice cubes, efficient, automatic production.

3. REMOVE OBJECTIONABLE TASTE OR ODOR

If the bad taste or odor is traceable to the water source, install a Calgon Fine Carbon Filter to the incoming water line. The No. 1-1/2B Fine Carbon Filter is ideal for machines making up to 500 pounds of ice per day and will remove bad taste, odors, and problems caused by chlorine in the water supply. In some instances, slime growths may cause odor problems and these growths can be removed by the use of liquid ice machine cleaner.

4. SERVICE REGULARLY

A service program to clean the ice machine at regular intervals and check on filter and feeder charges is important. In the long run, it will assure adequate water treatment, reduce emergency calls and aid in the trouble-free performance of automatic ice making machines.

WINTER STORAGE

If the unit is to be stored in an area where the temperature will drop below freezing, it is most important that all water lines be drained to prevent them from freezing and possible rupture.

To blow out the water line, disconnect the water supply at the cabinet inlet and use air pressure to force the water into the water reservoir pan. This can then be removed from the water pan.

CLEANING THE CONDENSER

In order to produce at full capacity, the refrigeration condenser must be kept clean. The frequency of cleaning will be determined by surrounding condition. A good maintenance plan calls for an inspection at least every two months.

Remove the lower front panel of the machine. With a vacuum cleaner, remove all accumulated dust and lint that has adhered to the finned condenser.

CAUTION: CONDENSER COOLING FINS ARE SHARP. USE CARE WHEN CLEANING.

1. If the condenser is being cleaned from the back of the machine, remove all accumulated dust, dirt etc., that has adhered to the finned surface with a vacuum cleaner.

2. If the unit is being cleaned from the front, remove lower panel, turn the power switch off and blow through the finned surface of the condenser past the fan blade to remove accumulated dust, etc.

STATUS INDICATOR

STATUS	EXPLANATION	POSSIBLE CAUSE
0	Unit is in freeze cycle, making ice, no problems.	
1	Unit is in harvest cycle, ice should drop shortly, no problems.	
2	Indicates a full bin condition, unit off, water curtain being held open with ice.	If "2" is shown but bin isn't full, check for individual cube holding curtain open. Harvest Bin switch not adjusted properly.
4	Unit OFF due to suction line not pulling down to at least 40°F. Manual reset required.	Low on refrigerant. Defective TXV. Compressor defective or inefficient. Defective power relay, won't close. Defective start relay, won't start compressor. Low voltage to compressor no start. Defective C.P.R. valve. Defective sensor (brown wire). SENSOR NOT INSULATED PROPERLY.
6	Unit is OFF due to condenser temperature climbing too high. Manual reset required.	Dirty condenser. Defective fan motor or blade.* Gross overcharge. Extremely high ambient temperature, above 120°F. Defective sensor (orange wire).**
Decimal Point OFF	Indicates that all sensors, except condenser, are switched off for first six minutes of freeze cycle.	Normal time delay, approximately 6 minutes.
Decimal Point ON	Indicates that evaporator and suction line sensors have switched "ON".	
Decimal Point FLASHING	Indicates evaporator temperature has pulled down and unit will go into harvest after time delay.	Normal time delay of approximately 20 seconds before harvest cycle begins.

FOR MANUAL RESET - PUSH MASTER SWITCH TO "OFF" - WAIT 10 SECONDS - PUSH TO "ON" OR PUSH RESET BUTTON

* Not applicable to Water-Cooled units.

** Not applicable to Remote units.

TROUBLE SHOOTING THE SOLID STATE CONTROL BOARD

To determine if the circuit board and sensors are functioning correctly under all operating parameters, the adverse conditions must be simulated to check out the digital display status numbers.

PROCEDURE

To check #6 - Block condenser fan blade on start up. Condenser should get hot within two minutes and shut unit off on #6, condenser too hot.

To check #4 - Remove suction line sensor from thermowell anytime during freeze cycle. Machine should shut off on #4, suction line too warm when the evaporator temperature gets low enough to start the harvest cycle.

To check #2 - Hold water curtain open anytime after unit goes into harvest. Machine should shut down within approximately 8 seconds on #2, full bin.

IMPORTANT: Dual evaporator units use two harvest-bin switches, one for each evaporator. These switches are normally closed.

When the unit goes into a harvest cycle, both switches must temporarily be open before the machine will go back into the freeze cycle.

When the bin is full eicher switch being open for longer than 8 seconds will shut off the machine.

Both harvest-bin swtiches must be closed to bring the unit back on.

To check #1 - Push defrost button anytime during freeze cycle and unit should go into harvest. #1 indicates a harvest cycle, no problems.

To check #0 - A "0" indicates that the unit is in the freeze cycle and there are no problems.

PLEASE NOTE: In rare cases a "0" can be displayed on the control board and the compressor not running in water cooled and remote air cooled machines. If this occurs, the manual reset high pressure control will be open and must be reset for proper operation. The control is located in the upper rear, right corner of the compressor compartment.

After reset, check out the machine for the possible causes of the problem.

TROUBLESHOOTING THE SENSORS

1. Turn off power to machine.
2. Remove the front panel and electrical box cover of the machine.
3. Cut the suspected sensor wire at least six inches from the thermowell in which it is located.
4. Remove the sensor from the thermowell.
5. Carefully separate the wires and strip the insulation off the end.
6. Pack a glass or container with ice and add some water to make an ice-water solution. Check the temperature of the ice water with an accurate thermometer. Ice water must be 32^{0} F.
7. Insert the sensor into the ice water and soak for a minimum of two minutes.
8. With a zerod ohmmeter measure the resistance across the two wires of the sensor lead. It should read 2815 ohms + or -10% (281 ohms).

NOTE: If the above ohm reading is not within the range stated, the sensor is bad and should be replaced.

RECONNECTION OF A GOOD OR REPLACEMENT SENSOR AFTER TROUBLESHOOTING

1. Carefully separate the wires of the sensor leads coming from the solid state control and strip the insulation off the end of each wire.
2. Reconnect the sensor leads and twist the stripped ends tightly. Secure with the proper sized wire nuts.
3. Tape all the wire nut connections to insulate connections from each other.

REMOVAL OF SOLID STATE CONTROL FROM MACHINE

CAUTION: THE CIRCUIT BOARD IS FRAGILE, HANDLE WITH CARE.

1. Turn off power to machine.
2. Remove front panel.
3. Remove electrical box left front cover.
4. Disconnect the through wire plug connections from circuit board.
5. Carefully lift any corner of the circuit board while pinching closed the top part of the plastic "stand off" support with needle nose pliers. The circuit board has to be gradually worked up over all five of the "stand off" supports. The circuit board will not "pop off" until all supports have been pinched closed and the board is then holding them in that position.

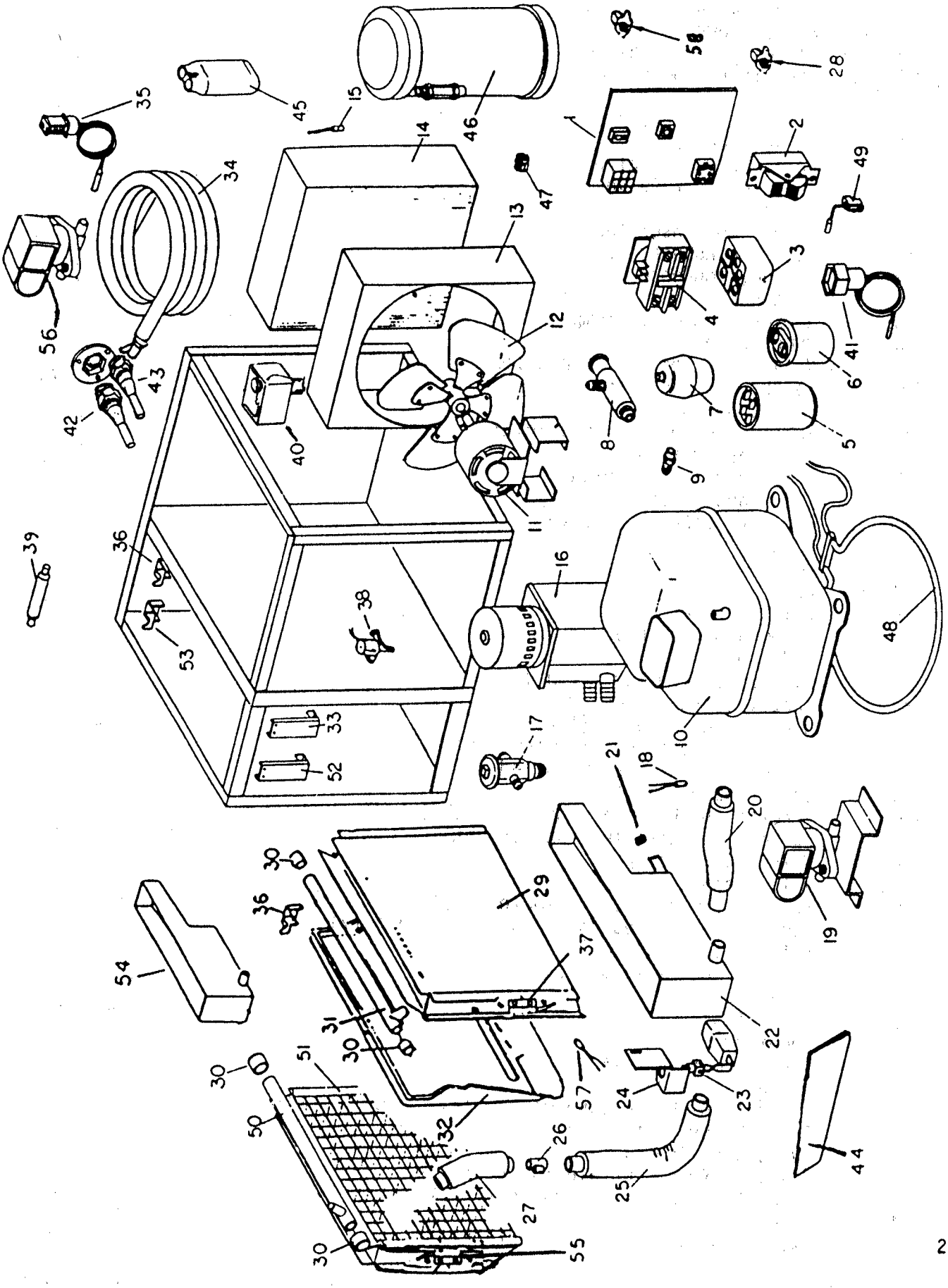
REINSTALLATION OF SOLID STATE CONTROL

1. Align all holes in the circuit board over the plastic stand-off supports.
2. Carefully push downward at all hole locations until board seats on all the stand-off supports. (Sometimes a snap will be heard as this seating takes place.)
3. After the circuit board is seated, carefully connect the three plugs to the circuit board. Note: Plug connects are polarized, make sure the plug is inserted correctly.

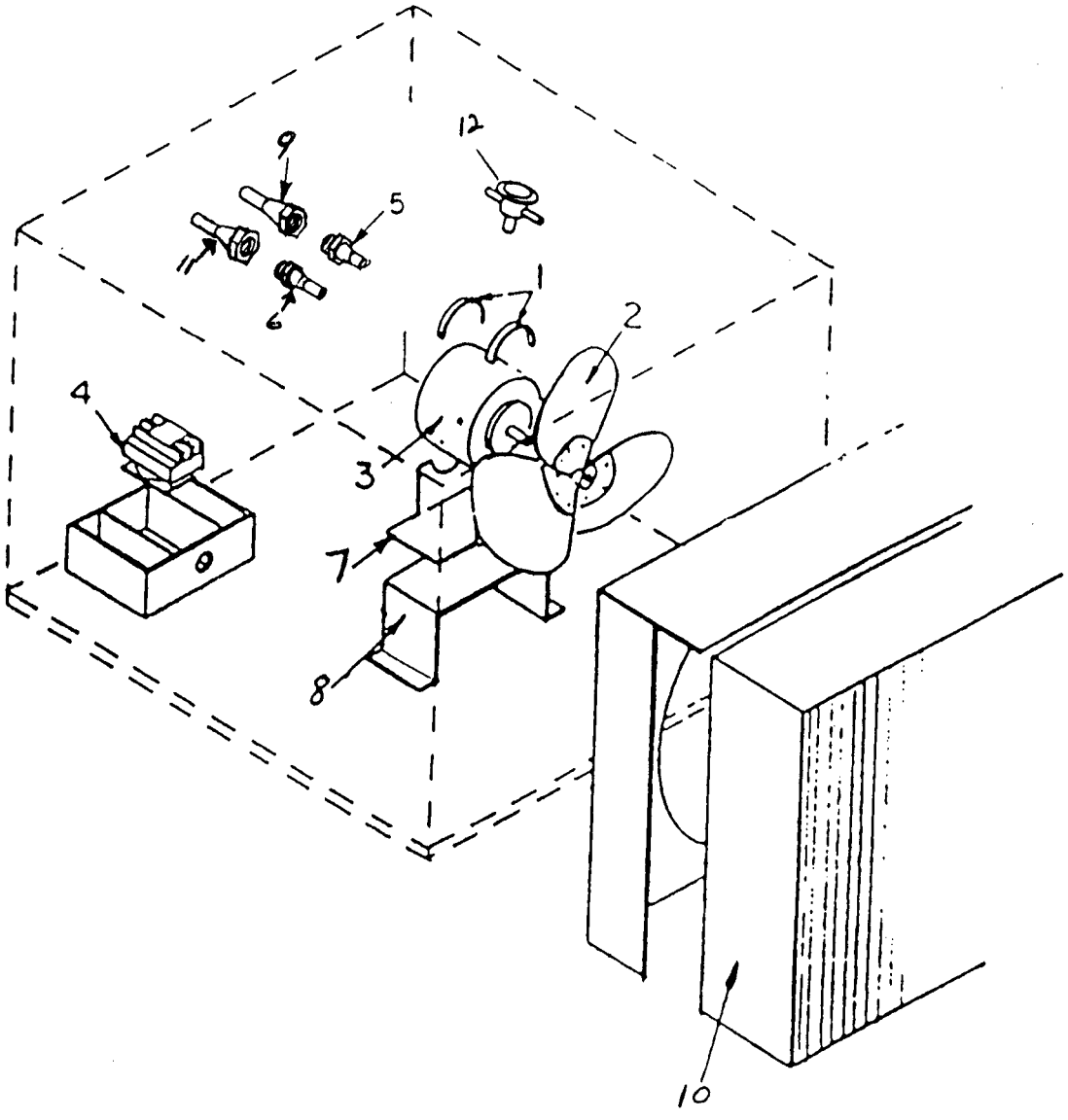
PARTS LIST

Illus. NO.	DESCRIPTION	PART NO. SERIES 1400
1	Control, circuit board	161456036 ~~40508~~
2	Switch, on-off-clean	37356
3	Relay, compressor start	41042
4	Relay, power	40713
5	Capacitor, compressor start	41044
6	Capacitor, compressor run	41043
7	Drier	37439
8	Valve, crankcase pressure regulating	37440
9	Valve, Schrader	20654
	Core, Schrader valve	21214
	Cap, Schrader valve	23988
10	Compressor	41145
11	Motor, condenser fan	39899
12	Blade, condenser fan	39898
13	Scroud, condenser	40586
14	Condenser	39897
15	Sensor, condenser temp.	38703
16	Pump, water	39144
17	Valve, thermostatic expansion	161921003
18	Sensor, suction line temp.	38703
19	Valve, hot gas	40712
20	Tube, water pan to pump inlet	38790
21	Cap, reservoir drain	45681
22	Reservoir, water (right)	41449
23	Float and valve	165681000
24	Bracket, float and valve	165692001
25	Hose	45680
26	Tee	987
27	Hose	43412
28	Switch, reset	42680
29	Evaporator (right)	45905
30	End cap	22279
31	Distributor, water (right)	43056
32	Curtain, evaporator (right)	166050001
	Curtain, evaporator (left)	166050002
33	Bracket, front curtain mount (right)	43530
34	Condenser coil, water cooled	27177
35	Valve, water regulating	1211
36	Bracket, back curtain mount (right)	38743
37	Switch, harvest-bin prox. (right)	43446
38	Valve, water dump	42781
39	Valve, check	41275
40	Switch, low pressure (remote only)	161773000
41	Control, high pressure sensor (remote only)	39644
42	Valve, line (male 1/2")	42145
43	Valve, line (male 5/8")	42624
44	Splash guard	41463
45	Accumulator	166073000
46	Receiver	38057
47	Transformer 24 volt	23683
48	Heater, crankcase	40602
49	Control, high pressure manual reset (WC & remote)	39358
50	Distributor, water (left)	43057
51	Evaporator (left)	45904
52	Bracket, front curtain mount (left)	43529
53	Bracket, back curtain mount (left)	40651
54	Reservoir, water (left)	164829001
55	Switch, harvest-bin prox. (left)	43447
56	Solenoid valve, liquid line pump down	23082
57	Sensor, evaporator	161456002
58	Switch, water dump valve	45866

ILLUSTRATED PARTS BREAKDOWN



REMOTE CONDENSER ILLUSTRATED PARTS BREAKDOWN



Illus. No.	Part No.	Description
1	35832	Clip, retainer
2	39898	Blade, condenser fan
3	161871001	Motor, condenser fan
4	27181	Relay
5	42145	Line valve (make connection 1/2")
6	42624	Line valve (male connection 5/8")
7	28627	Bracket, fan motor mounting
8	27384	Bracket, mounting
9	42146	Line valve (female 1/2")
10	161870001	Condenser
11	42625	Line valve (female 5/8")
12	37351	Control valve, head pressure