G SERIES CUBER

INSTALLATION & SERVICE GUIDE
Part Number 5006772

Servend
A Manitowoc Company

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WARRANTY POLICY

SerVend retains the right to refuse payment for the following conditions. Premium labor rates, holidays, overtime, travel time, flat service call charge, mileage or material charges.

SerVend will not pay for:

Corrections to your installation, to instruct you how to care for your equipment, maintenance, leveling, or cleaning. Replacement of fuses, circuit breakers, building wiring or plumbing to accommodate installation of this equipment. Repairs to this equipment when used in a non-approved installation, or removal of equipment for repairs. Repairs due to improper installation or correcting original installation. Repairs due to transportation or mishandling.

Adjustments to SerVend equipment.

Repairs when accessibility of equipment is hindered by ambient conditions. Repairs to parts or systems caused by unauthorized modifications. Return service calls for the same problem. Any claim submitted with improper, inaccurate or illegible labor forms.

Damage due to failure of electrical supply, water supply, or improper ventilation around the product. Damages due to fire, flooding or freezing. Damage and/or defects attributed to the use of any non factory accessory or components, including but not limited to filters, reclaimers, remote condensers, or any other devices attached to SerVend equipment. Labor or part claim for components proven at our facilities not to be defective. Repairs or replacement of damaged components. Labor claims (including diagnostic) submitted over the times allowed in our current labor time chart.

The other of the warranted equipment is responsible for any transportation costs for replacement components.

SerVend will pay for:

Replacement parts and designated labor hours to repair defects in material and workmanship during the warranty period. Service provided by an authorized SerVend service company.

Please see your dealer for a copy of the detailed SerVend warranty for your equipment.

PURCHASED PARTS WARRANTY

Following the expiration of SerVend's standard cuber and dispenser warranty, replacement purchased (from SerVend) parts are covered by the parts warranty. Any replacement part purchased by the owner of the SerVend equipment shall be warranted for a period of ninety (90) days from date of purchase, or proof of installation of said purchased part(s)

Following the expiration of SerVend extended parts warranties (compressor or evaporator), any purchased (from SerVend) part is covered by the parts warranty. These components (compressor or evaporator) are covered for a period of one (1) year from date of purchase or proof of installation of said purchased part(s).

The owner of the equipment will be required to pay for any labor to replace these defective parts. The owner shall also be responsible for transportation costs to obtain and return any defective parts.

The purchased parts policy shall cover any part or component supplied as a standard original equipment part is covered under this warranty.

FREIGHT CLAIM LOSS OR DAMAGE

The delivery freight company, distributor or dealer is responsible for loss or damage to your merchandise. All claims must be filed with the party that delivers your merchandise.

Check the number of containers delivered against the number shown on your receipt. If the total is not correct, have the driver note the shortage on your receipt. Check all cartons for visible damage, open and check the contents of any carton in question before the driver leaves. Be sure the driver notes the type and degree of damage on your receipt. All damaged merchandise must be inspected within 15 days of delivery. Please notify your carrier immediately.

If concealed damage is found when merchandise is unpacked, place the packing material with the merchandise and request an inspection from the delivering carrier. File your claim for loss or damage at once. Delays in filing will only hinder achieving a satisfactory resolution to your claim.

SAFETY INSTRUCTIONS

Installation and start-up of this equipment should be done by a qualified service technician. Operation, maintenance, and cleaning information in this manual are provided for the user/operator of the equipment.

REFRIGERANT LEAK AND REPLACEMENT POLICY

In any instance where there is a partial charge of R-404A refrigerant in a SerVend ice maker or a compressor electrical burn out, SerVend requires the following:

Recover and properly dispose of any remaining refrigerant charge in the machine. After all repairs are made to the system, replace the refrigerant with a weighed in charge (listed on the serial name plate) of new virgin refrigerant. This policy also applies to any machine having a compressor replacement with an electrical burn out.

RE-USE OF CURRENT REFRIGERANT

In any instance where a component in a SerVend ice maker is replaced, the following is policy.

Properly recover the refrigerant charge from the system. Replace the component in question. Check the system for refrigerant leaks using dry nitrogen. Replace the original refrigerant back to the machine. This will apply with all component changes EXCEPT a compressor electrical burn out. In the event of a compressor burn out refer to the refrigerant leak policy above.

REPLACEMENT OF FILTER DRIERS

In regards to filter driers on SerVend R-404A equipment, the following is SerVend policy.

Whenever entering a refrigerant system on a SerVend ice maker always replace the filter drier. The replacement filter drier must be of one size larger than the original equipment filter drier, according to the replacement chart found in the specification section of this manual. When making any repair to the sealed system under warranty, the filter drier is considered a part of the repair to the system, and SerVend driers MUST be used.

If the filter drier is not replaced or SerVend parts are not used in the repair, all warranties are voided.

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SERVEND CUBER MODEL NUMBERING SYSTEM

Example:

MODEL	-	G	7	A	M	A	S	-	A
		(1)	(2)	(3)	(4)	(5)	(6)		(7)

(1) Series of the machine

C	=	R-502 refrigerant - 30” or 48” wide cuber
S	=	R-502 refrigerant - 22” wide cuber
B	=	Ice Storage Bin
G	=	R-404A ice machines - all widths

(2) Nominal Capacity per 24 hours in 100 pounds

i.e. 7	=	700 pounds

(3) Type of Condenser

A	=	Air Cooled
W	=	Water Cooled
R	=	Remote Cooled

(4) Size of Cuber

M	=	Mini Cube (3/8” x 7/8” x 7/8”)
F	=	Full Cuber (7/8” x 7/8” x 7/8”)
J	=	Jumbo Cube (7/8” x 7/8” x 1 1/2”)

(5) Electric Code

VOLTS			CYCLE	PHASE
A	=	208/230	60	1
B	=	115	60	1
C	=	208/230;200/220	60/50	1
D	=	220/240	50	1
G	=	208/230	60	3

(6) S = Stainless Steel Panels (blank) = Painted Panels

(7) Generation Code

A, B, C, etc.

SERVEND SERIAL NUMBER SYSTEM

Effective August 12, 1991 all SerVend dispensers, cubers and bins manufactured by SerVend International have a new serial numbering system.

SAMPLE

94	H	G	01	0001	
Year Manufactured	Month	Product Code	Major Change Code	Unit S/N	

The above serial number is defined as:
Hotel dispenser built in August, 1994 - 1st unit built under major code #1

MONTH MANUFACTURED		PRODUCT CODE
January	A	A = K Seried (obsolete)
FebruaryB		B = KD Seried (obsolete)
March	C	C = M Series
April	D	D = MD Series
May	E	E = B Series
June	F	F = H Series
July	G	G = Cubers
August	H	H = Bins
September	J	J = Drop-In
October	K	7 = Remote Condensers
November	L	
December	M	

Alphabet codes will not use the letter “I” to prevent confusion with the number “1”.

Unit Serial number will roll back to 0001 at the beginning of each new year and/or with each major change code.

MAJOR CHANGE CODE IS AN ENGINEERING TRACKING CODE FOR SERVEND USE. A major change code of ‘XX’ identifies an engineering field test unit.

ICE MACHINE INSTALLATION INSTRUCTIONS

To assure maximum efficiency and performance from your new SerVend equipment, we recommend the installation and start up be performed by SerVend Contracted Service Company.

For best performance, select a location away from all heat sources such as ovens, direct sunlight, etc.. Avoid placing air cooled models in kitchens whenever possible as grease, flour or other airborne particles will collect on the condenser and fan blade. This will require increased maintenance and will reduce efficiency.

Discuss the best location with your SerVend Contracted Service Company representative. Always allow 15 cm (6”) clearance around the ice maker for air circulation. This includes the top, back, and both sides. Restricted air circulation will affect the maintenance free life of your ice maker and its efficiency.

Your ice maker will perform at optimum efficiency in an approximate 21^0 C (70^0 F) room with 10^0 C (50^0 F) water. Increased air or water temperatures will decrease performance. Never operate your machine with ambient temperatures below 10^0 C (50^0 F) or above 38^0 C (100^0 F). If the ice maker is located in an unheated are, it must be protected from freezing temperatures or shut down and winterized.

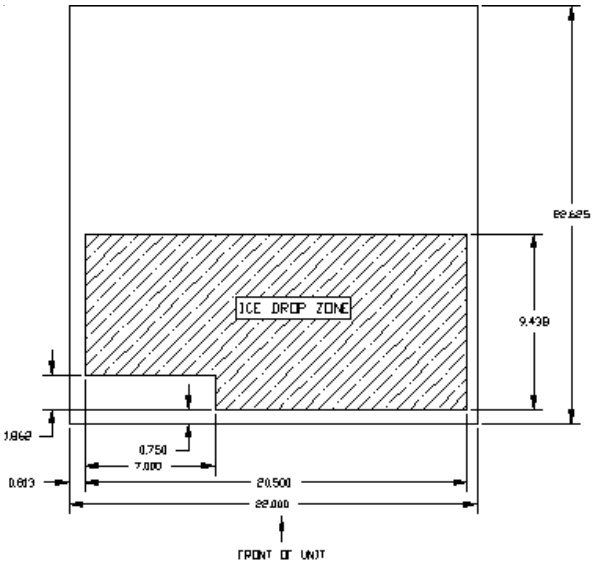
STORAGE BIN

Remove the sides and top from the ice storage bin. Lay the flattened carton on the floor. Place the bin on its back on the corrugated carton to prevent scratching. Screw the legs into the bin bottom. Set the bin on its legs. Move the bin to its final location, level the bin by screwing the feet either up or down. Remove the carton from the ice maker and place the ice maker on the bin. Align the machine with the bin back and sides. Remove the internal packing from the ice maker.

Level the ice maker head. Remove the water curtain and place a torpedo level on the face of the evaporator. With the level held against the lower edge of the metal evaporator, level the unit left to right. Accomplish this adjustment by the bin legs. Place the level in the vertical position on the face of the evaporator. Level the machine from front to back (evaporator plumb). This is critical to have the EVAPORATOR level and plumb.

ICE DROP ZONE

If this installation of a SerVend ice maker is on a different manufacture bin or other storage device, the opening to allow the ice to fall into that device is as indicated on the following drawings:



CUBER WITH ICE DISPENSER

Install the dispenser according to the instructions provided. Remove the carton from the ice maker and place the ice maker on the dispenser. Align the machine with the dispenser front. Secure the unit with earthquake brackets if provided. Remove the internal packing from the ice maker.

Level the ice maker head. Remove the water curtain and place a torpedo level on the face of the evaporator. With the level held against the lower edge of the metal evaporator, level the unit left to right. This is done by the utilization of shims between the ice maker head and the dispenser. Place the level in the vertical position on the face of the evaporator. Level the machine from front to back (evaporator plumb).

IT IS CRITICAL TO HAVE THE EVAPORATOR PLUMB AND LEVEL.

Install the ice deflector baffle in the evaporator space behind the front panel. Remove the front panel from the cuber. Remove the bottom screw from the component box cover. Slide the ice deflector between the left side panel and enclosure and between the component box cover and enclosure. Slide slot and notch in ice deflector over the front channel. Install the screw in the component box cover. Replace the front panel on the cuber. Refer to the drawing on previous page.

INSTALLATION INSTRUCTION REMOTE CONDENSER:

Follow the standard installation instructions for the remote condenser head. These instructions are listed previously in this section of this manual. Do not power the ice maker unit before the remote system installation is complete

INSTALLATION OF A SERVEND REMOTE ICE MAKER WITH A NON-SERVEND CONDENSER CAN VOID ALL FACTORY WARRANTIES.

LOCATION OF REMOTE CONDENSER

The placement of the remote condenser is very important. Place the condenser where the air flow through the condenser will be unobstructed. The intake to the condenser must have a minimum clearance of 1 m (3 ft.) to the closest object. The discharge minimum clearance must be 3 m (9 ft.). The maximum remote tubing line length is 15 m (50 ft.).

DO NOT INSTALL A REMOTE MACHINE WITH LONGER LINES WITHOUT WRITTEN PERMISSION FROM THE FACTORY. INSTALLATION WITH LONGER LINES WILL VOID YOUR WARRANTY.

In using longer line lengths, you can starve the compressor of oil. Longer lines can also provide a very high pressure drop in the tubing.

When placing the remote condenser, keep in mind the maximum height and drop from the ice maker head. The condenser cannot be placed over 10 m (35 ft.) above the head. The condenser cannot be placed more than 5 m (15 ft.) below the head.

NOTE: HEIGHT + LENGTH SHOULD NOT EXCEED 50 FEET.

ASSEMBLY OF THE REMOTE CONDENSER

Select an area for the condenser that is well ventilated. The condenser must be located away from the discharge of other condensers and ventilators.

Unpack the condenser assembly at the final location. Turn the condenser upside down. This eases further assembly.

Assemble the four legs to the base panel. Place the leg gussets on the legs and attach the support brackets. Use the diagrams included for additional guidance. Turn condenser upright and place in proper position.

Using the mounting holes in the base of the leg gussets, secure the condenser to the mounting surface. Remember to properly seal all roof and wall penetrations.

INSTALLATION OF THE REMOTE TUBING

Unpack the pre-charged tubing from the carton. Carefully unroll the tubing. **BE SURE YOU DO NOT KINK THE TUBING.** Position the tubing in its proper location. Do not connect any of the tubing ends at this time.

When making a roof penetration, proceed as follows: Cut a 10 cm (4in.) hole in the roof. Seal around the line set at the hole with appropriate sealant. Place a roof flange over the tubing penetration, sealing again.

INSTALLATION OF THE REMOTE TUBING

Decide if the tubing is of the proper length. A service loop is advisable behind the ice maker head. If you must coil the tubing, you need to shorten the length as described below. Servend has line sets available in 6 m (20 ft.), 10 m (35 ft.), and 15 m (50 ft.). To ease service, SerVend has placed access ports on each end of both tubes.

You may need to lengthen the remote tubing (maximum total length of 15 m - 50 ft.) Evacuate the charge in the tubing. Cut the lines and insert the needed length. The size of the condenser incoming line is 1/2" and the remote discharge line is 5/16". These are O.D. refrigeration tubing size. Solder the sections together and evacuate the tubing. You man add one or two ounces of refrigerant to act as a holding charge.

You may need to shorten the line length. Evacuate the charge in the tubing. Cut the lines and remove the excess length. Solder the sections together and evacuate the tubing. You may add one or two ounces of refrigerant to act as a holding charge.

Working at one end, apply refrigeration oil to the threads of the connectors (both male and female).

Hand thread the fittings onto the machine. Using two wrenches, tighten the fitting an additional 1/8 turn. **DO NOT TURN MORE THAN 1/4 TURN.**

Working at the other end, apply refrigeration oil to the threads of the connectors (both male and female). Hand thread the fittings onto the machine. Using two wrenches, tighten the fitting an additional 1/8 turn. **DO NOT TURN MORE THAN 1/4 TURN.**

When the fittings are attached to the machines, the line seals are broken. Removal of the tubing will discharge the operating charge of the machine.

PLUMBING LINES AND CONNECTIONS

All plumbing (water and drain) connections must conform to local and national codes. Please refer to diagrams concerning the locations of all connections.

To prevent water condensation, insulate all water and drain lines.

It may be necessary to connect the potable water supply to a water treatment system. Contact your local SerVend Contracted Service Company for the proper size required. DO NOT connect this or any commercial ice maker to a water softener using salt. The salt can precipitate out of the water during the freeze cycle. The salt water can be detrimental to the components of the machine and can not be ingested by some of your customers. The incoming water pressure must not exceed 8.4 kg/cm^2 (120 psi) and not lower than 1.4 kg/cm^2 (20 psi). Water supply lines to the water cooled condenser should include a standpipe for the prevention of "water hammer." Locate shut off valves in all water supply lines. It is impossible to connect a water cooled condenser to a recirculation system or cooling tower. However, you must maintain a minimum of .7 kg/cm^2 (10 psi) pressure drop across the condenser when operational.

DRAINS

To ensure trouble free drainage, vent the cuber and bin drains to the atmosphere at the cabinet. Each of the drains should have a 25 cm (10") standing vent pipe to the atmosphere. This allows oxygen to enter the drain, slowing the formation of algae in the drain. Venting also relieves back pressure on the drains allowing faster and easier water removal. Drain lines require a drop of 6 mm (1/4") per 30 cm (1") line length. Lines should end over an open, trapped, vented drain.

ELECTRICAL CONNECTIONS SELF CONTAINED

All supply wiring and connections must conform to national and local codes. Properly size wiring and electrical protection devices to the nameplate specifications. Connect the cuber to a separate location between the cuber and the protection device. You must ground the cuber by the control box ground screw provided or a proper conduit connection. See wiring connection diagram on this page.

ELECTRICAL CONNECTIONS REMOTE CONDENSER:

Connection of the remote ice making head is accomplished similar to that found in the installation section of this manual. Please refer to the self contained installation instructions previously established in this manual.

The power supply for the remote condenser is routed to the condenser separately, not through the ice maker head. Obtain the proper voltage from the vicinity of the condenser. A manual disconnect should be installed in the electric line. You may connect electric from the power distribution panel direct to the condenser.

DO NOT RUN THE POWER WIRES FROM THE ICE MAKER HEAD TO THE REMOTE CONDENSER.

Route the power supply wires to the condenser junction box. Connect the wires to the proper wires. Properly ground the condenser.

The fan motor of a remote condenser is independently controlled. This is accomplished through the use of a fan cycle switch inside the condenser. The fan will energize at approximately 17.5 kg/cm^2 (250 PSI) and will turn off at 13 kg/cm^2 (185 PSI).

Please follow all local codes when installing any equipment.

ADJUSTMENT OF THE WATER LEVEL

Each water pan has a water level mark molded into it. The water mark is the crease in the water pan about one half way up the front of the water pan. The proper water level is achieved when the water in the water pan is at this water level mark on the pan. This should be checked when the float has just filled the pan and closed off the supply of water to the pan.

Adjust the float by loosening the screw on the float bracket. This will allow you to rise or lower the float assembly.

EXAMPLE OF WATER LEVEL MARK:

With the water level set, turn only the water pump on. This will circulate the water throughout the system. Check to assure the float returns the water level to the proper water level mark and shuts off.

ADJUSTMENT OF THE WATER CURTAIN

The water curtain acts as a shield to prevent the water being circulated across the evaporator from going into the ice bin. With the water curtain missing the float must allow additional make up water to the machine.

Before making any adjustments be sure the ice maker evaporator is level and plumb.

The water pan should rest on the plastic holding blocks. See drawing on previous page.

Adjust the water curtain to a maximum clearance of 3 mm (1/8”) above the water pan. Adjust the curtain as close to the evaporator as possible. Adjustments to the curtain are attainable through the plates holding the curtain pins. Loosen the two screws on each of the curtain plates. This will allow the plate to adjust up and down, forward and back.

The water curtain should not touch and yet clear the Hall switch by a maximum of 1.5 mm (1/16”). This adjustment is accomplished in two ways. First the curtain should have little lateral (left to right) movement. If the curtain moves laterally more than 1.5 mm (1/16”) the addition of a curtain shim behind the curtain plate is necessary. If the curtain moves less than 1.5 mm (1/16”) with more than 1/5 mm (1/16”) clearance or touching the Hall switch you must adjust the position of the switch. To adjust the Hall switch, loosen the lock nuts on the body of the switch, allowing proper placement of the switch.

STACKING KITS

Stacking allows more ice production in the same foot print size. All G5 and larger SerVend ice makers are stackable with the same physical size ice maker. When ordering a stacking kit for your machine, always order by using the model number of the bottom ice maker.

EXAMPLE You have a G-7 ice maker installed and wish to add additional capacity. You can then order a K7-SK stacking kit for the lower machine. Then you could place either another G-7 on top, or install a G-9 machine on top.

INSTALLATION INSTRUCTIONS

Install the bottom ice maker on the bin according to the ice maker installation instructions.

Remove front panel, top cover, component box cover and left side cover of the bottom ice maker.

On air cooled units ONLY:

Remove the right side and back panels.

Install support bracket (item #3) as shown in Figure 1of the instructional diagram. Replace the back panel at this time.

Replace left side panel, inserting a gasket between panel and bottom flange as shown in Figure 1 of the instructional diagram.

On air cooled units, place the air condenser baffle on bottom unit as shown in Figure 2 of the instructional diagram.

Install stacking kit top panel (item #1) as shown in Figure 2 of the instructional diagram.

Before installing the second unit and inserting stacking kit ice chute, start the bottom unit per start up procedures. Allow at least four complete cycles of the bottom unit.

Replace front panel and component box cover.

Install second unit on top of bottom unit following the instructional diagram.

Make sure each unit is connected to a separate fused circuit.

Install the ice chute (item #2) in the bottom unit as shown in Figure 3 of the instructional diagram. Hook the down-turned flange on top of ice chute into the upturned flange on stacking kit top panel.

Use two #8-32 x 1 inch SS screws and ESNA nuts to attach the ice chute to the bottom of the bottom unit and to attached the bottom unit to the top unit.

Start the top unit per start up procedures. Allow the top unit to complete at least four cycles.

After start up procedures have been completed, replace any panels removed.

INSTALLATION CHECK LIST

- Is the cuber evaporator level and plumb?
- Are electric connections complete?
- Is the proper voltage supply provided? Check the nameplate and verify before turning power on to the machine.
- Turn power on to the machine.
- Has the water inlet pressure been checked? Is it within guidelines?
- Are water filters installed?
- Are water shut off valves open?
- Are the drain connections made properly? Is the bin drain separate from the ice maker drain?
- When used, is the water cooled condenser drained separately?
- Are the cuber and bin drains vented at the rear of the equipment with an open stand pipe?
- Are all drain lines vented at the floor?
- Are the drain lines insulated and sloped to the open floor drains?
- Is there 15 cm (6”) clearance around the cuber for ventilation?
- Is the cuber installed in ambient temperatures with a minimum of 10^0 C (50^0 F) or above 38^0 C (100^0 F)?

WARNING! If the air temperature drops below 10^0 C (50^0 F) the unit must be shut down.

- Is the water temperature maintained between 7^0 C (45^0 F) and 32^0 C (90^0 F)?

WARNING! If the water temperature drops below 5^0 C (40^0 F) the unit must be shut down.

- Does the water curtain move freely?
- Is the water level set properly in the water pan?
- Is the water pan seated properly on the plastic support blocks?
- Is the ice maker and the bin sanitized?
- Is the air cooled baffle installed, if necessary, to prevent condenser air recirculation?
- If the ice maker is being installed with an ice dispenser, is the ice deflector installed?

START UP PROCEDURE SELF CONTAINED

Open the potable water valve to the machine. Allow water to fill the water pan. Check the water level in the pan. The water level should be up to the water level mark in the water pan with the float “at rest”. Adjust the water level if necessary.

Apply power to the machine. Turn the toggle switch to the pump position. Check the water flow across the top evaporator extrusion. The water flow should be even across the top. If the water “creeks” across the top with streams and dry spots, clean the top extrusion with a SCOTCH BRITE™ pad or CLEAN shop cloth. Do not rough up the extrusion with any abrasion material.

With the water pump on in the pump position, check the dump valve. Depress the manual dump switch and hold. This should clean out most of the water in the water pan while allowing the float to refill the pan. When releasing the purge switch, the flow of water through the purge valve should cease.

Place the toggle switch in the off position to allow the water to refill the water pan.

Place the toggle switch in the ice position. The compressor, condenser fan (if air cooled), and water pump will operate. Depress the manual harvest switch. The water pump and fan motor will stop. The harvest solenoid will open. Swing the water curtain open and hold for a maximum of thirty (30) seconds. The compressor will stop. Release the water curtain. The machine will restart in the ice making mode.

There is a minimum freeze time built into the circuit board. This minimum time is not in effect on an initial freeze cycle of the machine.

For optimum life and performance of the ice maker, the bridge should be a minimum of 3 mm (1/8”) to a recommended thickness of 5 mm (3/16”) in the center of the sheet of ice.

Allow the ice maker to make two (2) complete sheets of ice before making any bridge thickness adjustments. Make these adjustments with the machine in the off position.

Adjustment to the bridge thickness is done at the circuit board. On the bottom (front) of the board in the control box is a set of 8 DIP switches. To have a thicker bridge, turn the next (right) switch “on”. To have a thinner bridge, turn the next (left) switch “off”. It is acceptable to have all of the switches either on or off. Follow the indicator wedge above the switch case for thicker or thinner bridge. The switch is on if the top is pushed in.

For future service on this equipment, place your phone number on the front or side panel of the machine.

Before leaving, be sure the owner understands the ice maker operation and the value of preventative maintenance.

REMOTE START UP PROCEDURE

Remove the left side panel from the ice maker.

Locate the receiver tank. Remove the service valve stem cap from both receiver tank valves. Open the receiver valves fully (backseat) to allow the refrigerant to flow throughout the system.

Leak check the remote tubing connections. This would include both fittings at the ice maker and the condenser.

Replace the side panels of the ice maker.

Follow the start up procedure as outlined at the top of this page.

When power is applied to the remote machine, the compressor may operate for a short time. This is the normal pump down cycle. The unit may do this periodically.

DOES THE OWNER/OPERATOR KNOW?

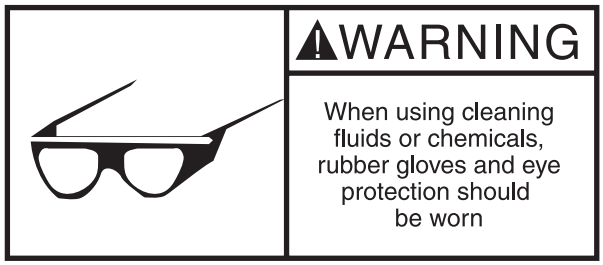
- The location of the electrical disconnect switch and water shut off valves?
- How to start, clean, sanitize, and shut down the ice machine?
- How the bin full operation works?
- Proper method for cleaning the air cooled condenser and fan blade?
- Use and location of the high pressure reset, if equipped?
- How to inspect the distributor tube and water system for mineral deposits?
- How to identify when the water filter needs to be changed?

Who to contact for service?

ICE MAKER CLEANING PROCEDURE:

The use of non approved ice machine cleaners is expressly forbidden and will void your warranty. The approved ice machine cleaners are:

Calgon (Green) Nickel Safe Cleaner
Lime-A-Way Ice Machine Cleaner



WARNING: When using any cleaning fluids or chemicals, always wear rubber gloves and eye protection.

Turn the selector switch to the off position. Remove all ice from the storage bin.

Pour 4 oz. of approved cleaner in the water pan. Turn the toggle switch to the pump position. Allow this solution to circulate over the evaporator for 10 minutes.

While the solution is running in the machine, take some of the solution on a rag to wipe the inside of the machine and the water curtain.

Clean the air cooled condenser and fan blade of all dirt.

Push the purge switch and hold. When the solution in the water pan has been flushed out release the purge switch. Allow the water to refill the pan.

Circulate this refill water over the evaporator for three (3) minutes. Then repeat pushing of the purge switch and hold. When the solution in the water pan has been flushed out release the purge switch. Allow the water to refill the pan.

Turn the toggle switch to the ice position. Discard the first batch of ice.

SANITIZE CYCLE:

Turn the toggle switch to the pump position. Push the purge switch allowing the water in the water pan to drain out. Allow the water to refill the pan and check the water level. Adjust the water level if required.

Add 7cl. (1/4 oz.) unscented laundry bleach (5.25% Cl Na O concentration) mixed to yield 200 PPM of available chlorine to the water pan. Allow the pump to circulate the solution for five (5) minutes.

ALTERNATE: You may use the commercial ice machine sanitizer following the directions on the container.

Push the purge switch to remove this solution from the machine.

Wipe all surface areas of the bin and ice contact areas with a solution of 28 ml (1 oz.) liquid laundry bleach per gallon water. You may use a commercial sanitizer mixed according to package directions.

Turn the toggle switch to the ice position. Discard the first batch of ice.

4 RELAY CIRCUIT BOARD (SERIES 007 MICROCHIP)

SEQUENCE OF OPERATION

Place the toggle switch in the ice making mode. The power LED and the LED(s) by the curtain terminal connections will be illuminated. You will also energize 3 of the 4 relays on the board. These are indicated by the illumination of green LED lights along the side of each rely. Activated will be the dump solenoid, compressor contactor, water pump and fan motor, or water pump and pump down solenoid on remote units. The dump solenoid relay will be energized for six (6) seconds at the beginning of the freeze cycle. At the end of the dump cycle the water pump and dump valve will stop for eight (8) seconds. At the end of this time period the water pump will resume.

As the ice builds on the evaporator a bridge is built from one cube to the next. At the bottom of the evaporator this bridge begins to roll over the lower extrusion. As the thickness of the ice builds, the temperature of the ice decreases. On this lower extrusion is located the SerVend ice thickness control. This control senses the temperature of the ice. When the ice temperature reaches a specific point as determined by adjustments on the circuit board, the control indicates the machine should enter the harvest mode. This harvest mode is initiated at any time after the first eight (8) minutes of operation. This delay prevents premature harvest.

SEQUENCE OF OPERATION

During the harvest mode of operation two relays should be energized. These relays control the compressor (green LED) and the hot gas solenoid (red LED). This mode allows the hot gas to flow directly from the compressor tot the evaporator. This will warm up the evaporator allowing the sheet of ice to slide off.

As each falls from the evaporator it will push the curtain away from the evaporator. As the curtain moves, the target on the curtain will move out of range of the electronic sensing Hall switch. If the ice holds the curtain target out of the range of the Hall switch, the machine will shut down. This acts as a bin full indicator. When the curtain returns to the closed position, the machine will return to the freeze mode. As the curtain moves away from the evaporator the machine will remain in the harvest mode for 30 seconds or until the curtain resets against the evaporator, whichever is first. If the machine remains in the harvest mode, the circuit board will restart the unit in freeze at the end of nine (9) minutes. Removal of the water curtain(s) can cause the machine to not operate. If the machine is in the freeze mode, and the water curtain is taken off, when the machine is to enter the harvest mode the machine will stop operation.

The cuber can be placed in the harvest mode at anytime. Be sure the water curtain is in place. With the toggle switch in the ICE mode, gently press the harvest switch located on the circuit board. This will immediately enter the machine in the harvest mode. If the machine is manually placed in the harvest mode, the minimum freeze time for the next cycle only, is not applicable.

4 RELAY CIRCUIT BOARD (SERIES 008 MICROCHIP)

SEQUENCE OF OPERATION

This programing version is the same as the 007 chip except for the following:

The water dump cycle is moved to the end of the freeze cycle. This chip energizes the valve for 30 seconds. This will also allow the water to refill the water pan while a harvest cycle is in progress.

4 RELAY CIRCUIT BOARD COMPONENTS

The top relay (with green LED) controls the water pump on all machines. This relay also controls the condenser fan motors on an air cooled self contained ice maker.

The second relay (with green LED) from the top controls the compressor contactor on self contained machines. On a remote cooled machine, this contactor controls the pump down solenoid.

The third relay (with red LED) from the top controls the operation of the hot gas solenoid valve.

The fourth (bottom) relay (with green LED) controls the operation of the water dump solenoid valve.

The EV terminals on the circuit board just below the fourth relay are for the ice thickness control. This controls the thickness of the ice on all machines. On all equipment this works as a high temperature safety. On a dual evaporator machine, the control is connected to the left (facing the machine) evaporator.

The terminals marked HI TEMP in the lower left corner are used on a dual evaporator machine only. The ice thickness control from the right evaporator connects to this terminal. This controls the high temperature safety of this evaporator only. This has nothing to do with the thickness of the ice.

Approximately one half way up the right side of the circuit board is a bank of three DIP switches. The left and center switch control how often the water dump valve operates. With both of the switches in the down (1) position the dump valve operates at the beginning of each freeze cycle. With the left switch in the up (3) position and the center switch down (1) the machine will dump water at the beginning of every 3rd freeze cycle. With the left switch down (1) and the center switch up (5) the dump solenoid will operate at the beginning of every 5th freeze cycle.

Please remember, the less the water is dumped, the more mineral build up on the evaporators.

The right switch of this three switch bank tells the board how many evaporators are in this machine. The switch should be placed at the one (1) or two (2) position corresponding to the number of evaporators in your machine.

4 RELAY CIRCUIT BOARD COMPONENTS

Just below the 3 DIP switch case is a yellow LED. This is the POWER light. Whenever power is applied to the machine with the toggle switch to the ICE position, this light will be on. If the machine is off due to a bin full situation, this light will still be illuminated.

If the power light is flashing, this is giving you a warning. A flashing light indicates that any of the following conditions may apply:

- High temperature cut out
- Curtain switch set incorrectly one curtain with two thermistors attached or two curtains with one thermistor attached
- Missing ice thickness control
- Mis-wired ice thickness control
- Shorted ice thickness control
- Open ice thickness control

To restart the machine, investigate the reason for the flashing light and subsequent shut down. Correct the cause of the shut down. Turn the toggle switch to the off position for 5 seconds. Turn the toggle switch to the ICE position. The machine should restart.

In the lower right corner of the board are two sets of three spade terminals. The curtain/Hall switch(s) attach to these terminals. If you are working on a machine with a single evaporator, your Hall switch connects to the bottom set of terminals marked “CURTAIN ONE”. If you are working on a dual evaporator machine, the left Hall switch connects to the terminals marked “CURTAIN ONE”. The right Hall switch will then connect to the terminals marked “CURTAIN TWO”.

Between the sets of curtain terminals is a set of three prongs with a sleeve jumper. Be sure this jumper is covering the top and middle prongs. This is the setting for the Hall switch used on your equipment. If the jumper is missing or on the bottom and middle terminals, the machine will not work or may work in harvest cycle when it should be freezing and freezing when it should be harvesting.

To the left of the jumper mentioned above is a manual harvest switch. By depressing this switch one time the machine can go immediately into harvest. This will happen if the toggle switch is to the ICE position, the curtain is in place and the power light is steady on.

At the bottom of the circuit board in the center is a bank of 8 DIP switches. These switches control the thickness of the ice. Above the switch bank is a wedge giving a visual indicator of the direction to move the switches. The top of the switch pushed down indicates that switch is energized. Turn switches on or off in succession from left to right. Do not skip switches in this bank.

Slightly to the left of the ice thickness DIP switches is a small potentiometer. This is a very coarse thickness adjustment. Do not move this adjustment more than one (1) graduation at a time. To increase thickness with this potentiometer, turn the control clockwise. To decrease thickness, turn this control counterclockwise.

4 RELAY CIRCUIT BOARD

CHECKING THE CIRCUIT BOARD

There are only two checks you must make in the field on this board.

1. If the LED along side the relay is energized the relay should be energized. With your meter in parallel to the component you are testing you should observe voltage. If there is no voltage, the relay (board) is defective.

2. If you are experiencing bin control problems and have tested the Hall switch to be good, take a voltage test. Remove the Hall switch leads from the + (positive) and the - (negative) terminals. With the toggle switch in the ICE position and your meter set to D.C. volts, place the leads on the corresponding terminals. Your voltage reading should be from 12 to 24 volts D.C.. If you have any other voltage reading check the transformer load side. If the voltage is the same as found at the circuit board, verify the incoming voltage to the transformer is correct. If the transformer is putting out the correct voltage, change the circuit board. If the transformer is putting out the wrong voltage with correct line voltage, change the transformer. Transformer actual voltage should read AC voltage.

COMPRESSOR & START COMPONENTS

When compressors fail to start or run properly, normally it is a result of an external failure. You should not rule out electric voltage, start, or run component failure.

Check for the proper voltage. Low or not voltage will require you to trace the electric wiring to determine where the electric failure has occurred. Correct any discrepancy you may find. The lowest voltage should be no lower than 95% of the ice maker name plate voltage of a dual voltage machine. A single voltage machine should be no lower than 90% of the name plate voltage. High voltage is 10% greater than the name plate voltage.

A defective capacitor or relay may prevent the compressor from starting. If the compressor attempts to start or hums check the start components.

The potential relay contacts are normally closed. These contacts are opened by the counter electromotive force from the compressor at approximately 80% of the operating speed. When the contacts open this removes the start capacitor from the circuit. The start and run winding with the run capacitor remain in the circuit. If this relay fails to open in during operation you should check the holding coil for continuity.

The current relay contacts are normally open. As the compressor starts, the high current draw produces a magnetic field. This magnetic field draws the relay armature in. The contacts for the start circuit will then close. If the coil on the relay is open, the relay will not operate.

If a capacitor shows any sign of leaking or damage, replace it.

When checking capacitors, a capacitor tester must be used. Remove the resistor (if any) from the terminals. Attach the tester to the capacitor. If you use an ohm meter to test capacitors, you can check only of an open, shorted, or grounded capacitor.

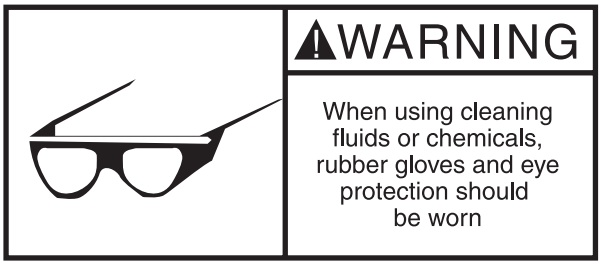
The resistance testing of compressor windings must be accomplished without wires or components attached. Using an ohm meter, obtain a reading of the compressor windings. Place one lead on the common (C) terminal. Place the second lead on the start (S) and run (R) terminal in succession. Compare your readings with those from the compressor manufacturer.

To check the compressor for ground, use your ohm meter. Place one lead on a good compressor case ground. The copper suction line tubing works very well for this. Place the other lead in sequence on the common, start, and run terminals. If you obtain any reading of a circuit through the case, the windings are shorted to ground. The compressor must be replaced.

If the overload protector on the compressor trips, you should check the following items. The voltage at the compressor terminals should be no less than 95% of the ice maker name plate voltage of your particular machine. Check the ambient operating temperatures, be sure you have not exceeded the ambient limits of 38^0 C (100^0 F). Check the condenser for high head pressure conditions. Tripping can also be caused by defective capacitors or start relay.

Compressors used in the R-40A machines use polyol ester oil (POE). This oil is very susceptible to moisture contamination. An open compressor or can of oil can become saturated with moisture within 15 minutes. Please reduce the open refrigerant system time. Current accepted POE oils are:

Mobil # EAL 22 CC-package AK ICI # RL 184

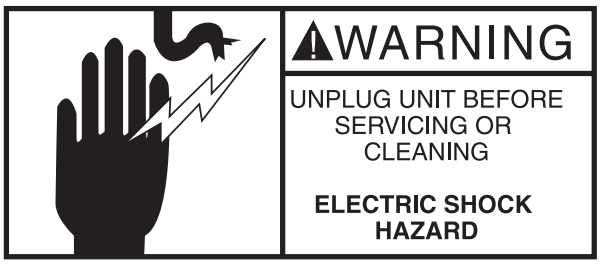


CAUTION: POE oils are caustic to the skin. Always wear gloves and goggles when working with the refrigeration system.

Any defective compressor returned to SerVend must be stubbed with copper tube and soldered closed.

COMPRESSOR CONTACTOR

The contactor serves as the power supply switch for the compressor circuit. Voltage to the coil of the contactor is



supplied by the control board relay on self contained models.
Caution: On 230 volt models, the contactor breaks only one power leg. The ice maker is still “live”.

Remote models are wired through controls outside the control board. The coil receives power through the low pressure cut out and therm-o-disc(s).

CHECKING THE CONTACTOR

The top terminals of the contactor should always have line voltage present. The lower two terminals must have the same line voltage when the contactor is energized. If the lower terminals have a different voltage when the contactor is energized, replace the contactor. To check the contactor coil, you may either ohm check the coil with the coil supply wires removed or check for power to the coil with your meter leads in parallel to the coil.

EVAPORATOR

The ice is made on a nickel-coated copper evaporator plate. This plate has the refrigerant serpentine coil attached to the back of the plate. As the water cascades over the evaporator, check the distribution tube at the top of the evaporator. The water must flow from the tube with the holes in the appropriate direction.

FAN CYCLE CONTROL

This is a high slide pressure control that cycles the condenser fan motor off at approximately 13 kg/cm2 (180 PSI) and will engage at 17.5 kg/cm^2 (250 PSI). It’s purpose is to maintain a minimum head pressure for operation in low ambient conditions.

The fan cycle control is used on all remote condensers. It is also installed in the left fan of a dual evaporator self contained air cooled machine. Also on the G9 air cooled self contained units.

CHECKING THE FAN CYCLE CONTROL

Install a high side gauge to the high side service valve. Do not attach the gauge to the receiver valve. Operate the system and observe the pressures with the fan cycling. If the cycling pressures vary greater than $\pm$ 10% of the previously mentioned pressures, replace the contorl. This control is non adjustable.

FLOAT VALVE

The water level in the water pan is controlled by use of a float valve. This valve modulates to allow a sufficient volume of make up water into the pan for production into ice.

Adjustment of the valve is accomplished by the valve bracket. This bracket has two screws. Loosen the screws to move the float and bracket up or down to raise or lower the amount of water in the pan.

Located within the float valve is a flow control washer. This washer prevents high water pressure from interfering with the operation of the float valve. At pressures below 1.4 Kg/cm^2 (20 PSI) to 3.9 Kg/cm^2 (55 PSI) the flow control washer is inactive. The flow washer begins to hold back the water pressure from the float valve from 3.9 Kg/cm^2 (55 PSI) to 8.4 Kg/cm^2 (120 PSI). At pressures above 8.4 Kg/cm^2 (120 PSI) the flow control washer will not control the incoming water pressure, you must use a water pressure regulating valve.

HALL SWITCH

The Hall switch operates in conjunction with a magnetic target on the side of the water curtain. This has two functions on the SerVend machine.

The Hall switch serves as a bin full control. When the bin fills up the curtain is held away from the face of the evaporator and out of the range of the Hall switch. As ice is removed from the bin, the curtain will fall back toward the evaporator. This will again put the target within range of the Hall switch and the machine will restart.

This switch also acts as a harvest termination control. As the ice falls off the evaporator, the curtain swings out taking the target out of the switch range. The ice will then fall into the bin allowing the curtain to immediately fall back against the evaporator. At that time, the target will return to the Hall switch range. This will put the machine directly from harvest into freeze.

CHECKING THE HALL SWITCH

Turn the toggle switch to the ICE position. With the curtain in the closed position against the evaporator check the LED on the circuit board. This is the LED at the curtain switch terminals on the circuit board. The corresponding curtain position LED should be on. With the LED on, pull the curtain away from the evaporator. The LED should go off. Release the curtain, allowing it to fall against the evaporator. The LED should go on. If the LED operates in this manner, the switch is good. If the LED does not operate this way, and voltage is correct according to the section checking the circuit board on page IV-14, change the switch.

HEAD PRESSURE CONTROL VALVE

The head pressure control used on SerVend remote ice makers is a modulating control. This control maintains the proper head pressure in the remote condenser. At outdoor temperatures above 20° C (70° F) the refrigerant will flow from the compressor tot the valve. The valve then moves the flow to the condenser onto the receiver. At outdoor temperatures below 21° C (70° F) the refrigerant flow is from the compressor tot the valve. The valve then mixes the discharge line and the condenser line. The resultant mixture is sent tot he receiver. This “by-pass” mode supplements the condenser pressures and is used to maintain proper operating head pressure.

CHECKING THE HEAD PRESSURE CONTROL

Install a gauge at the receiver tank. With outdoor temperatures below 21° C (70° F) receiver pressures will be 13 kg/cm2 (180 PSI) to 17 kg/cm^2 (240 PSI) $\pm$ 3%.

A head pressure control that stays in by-pass may be the result of a system that is short of refrigerant. Before replacing the head pressure control, check the fan cycling control. If it is not cycling, add refrigerant in 1 kg (2 lb.) increments up to 2 kg (4 lb.). Allow the machine several minutes to “balance” between additions. If the addition of refrigerant corrects the valve problems, locate and repair a refrigerant leak.

REPLACEMENT OF A HEAD PRESSURE VALVE

Always snap off the stub line at the dome before using a torch to heat the lines for removal. When installing the new valve, be sure the dome area is covered with ample heat sink before applying heat to the valve stubs.

HIGH PRESSURE CUT OUT

Al SerVend water cooled, remote condenser, and G2 air products contain a high pressure cut out. The function of this switch is to turn the ice maker off in the event of excessive pressure developing in the high pressure side of the refrigeration system. This switch will open the power circuit to the circuit board at 35.2 kg/cm^2 (500 PSI). This is a manual reset control located beside the power toggle seitch. To reset this control, push the red button in.

In the event the high pressure control shuts down the machine, find the reason for this shut down. Correct any necessary problems then restart the machine.

HOT GAS VALVE

SerVend employs a hot gas defrost method of harvesting the ice. When the ice reaches the proper temperature, the ice sensing control initiates the board to open the hot gas bypass valve. This electrically operated solenoid valve will allow hot discharge refrigerant gas leaving the compressor to return to the inlet of the evaporator. The flow of liquid refrigerant from the expansion valve will then cease. The hot refrigerant warms the evaporator therefore allowing the ice to melt and slide off the evaporator.

If the hot gas valve fails to open, check the electric power supply to the coil of the valve. This power supply is supplied to the coil from the circuit board. The power should be checked in parallel and should be present when the red LED is energized. If there is power to the coil without the coil operating, remove the wire leads from the coil of the valve. Place your continuity meter on the coil terminals. You should have continuity at these terminals. If there is no continuity, replace the coil.

If the coil is energized but the valve still fails to operate, you may have a sticking valve that needs to be replaced.

A leaking valve can cause excessive freeze times, uneven bridge thickness, high suction pressures, etc.. A leaking hot gas valve is difficult to troubleshoot. Several methods to determine if this valve is leaking in the closed mode are as follows:

1. The hand temperature method. Place you hand on the outlet of the valve. The outlet line of the valve should feel ambient temperature or a little cooler.

2. The use of an electronic sight glass. This can be beneficial in the detection of a leaking valve. Install the probes on the outlet line of the valve, several inches apart. If there is a small leak in the valve, the instrument should detect hot gas condensing due to the pressure drop and cooler temperatures of the evaporator section.

3. Use of a pinch off tool. By closing the line between the hot gas valve and the evaporator, you will be able to determine if the valve is leaking.

ICE CAPACITY

The ice manufacturing capacity of any maker is affected by many operating conditions. These conditions include, but are not limited to, water and air temperatures, electric and ocation of equipment, etc.. We have included in the operating specifications section typical production capabilities for SerVend ice makers at specific conditions.

All printed capacity ratings are laboratory readings. If you are working with a 50 Hz. unit cycle time will increase 12% while capacity will decrease approximately 12%.

ICE CAPACITY CHECK PROCEDURE

Of paramount importance in checking the ice produciton of any machine is the collection of accurate data.

Measure the ambient air temperature 5 cm (2") from the condenser fins if air cooled. If not air cooled, measure air temperature 5 cm (2") from either the right or left side panel about one half way from the front to the back of the unit.

The incoming water temperature should be measured in the water stream at the inlet of the float valve. Be sure your thermometer does not read the water pan temperature.

Allow the machine to make one sheet of ice. Catch this sheet and weigh it. During produciton, time the complete cycle. Production time includes the freeze and harvest times added together.

With this information the calculation can be made.

1440 (number of minutes in a day) + total cycle time X weight of one sheet of ice X number of evaporators - ice produciton.

ICE THICKNESS CONTROL DIAGNOSIS

Before replacing a potential ice thickness control, please check the following:

1. Are the wire leads to the circuit board secure and tight?

2. Is the tip of the control mounted to the front of the plastic extrusion? The tip of the thermistor should not be recessed into the thermistor hole.

3. Is there a glob of sealant over the tip of the control? A very slight film is OK. If the tip of the control has an overabundance of silicone, it can act as an insulator to the ice.

4. After the cachine seats for 24 hours is the first sheet of ice OK? Does each succeeding sheet of ice get thinner? This could be a sealing problem with water in the sensor well.

CHECK PROCEDURE

1. Clear the evaporator of any ice. This can be done with the use of the manual harvest switch on the circuit baord.

2. Place the machine in the ice mode. Allow the unit to make one sheet of ice.

3. At the end of a normal freeze time, manually harvest the ice.

4. Observe the sheet of ice. Is the bridge thickenss even from top to bottom? Is the bridge thinner at the top of the sheet than at the bottom?

5. If your sheet of ice is thinner at the top than at the bottom, your machine is probably suffering from a water loss or a refrigeration problem. Please refer to the appropriate sections for help.

6. If your ice has an even bridge from top to bottom, proceed with the OHM meter check.

7. Remove the control wires from the EV terminals on the circuit board. Do not remove the control from the evaporator extrusion. In a dual evaporator machine, only the left ice thickness control (connected to the EV terminals) determines the thickness of the ice.

8. If the ice sensing control is "open" or "shorted", the power light on the circuit board will flash. The machine will not operate, replace the control.

9. Attach your ohm meter to the ends of the wires. Your meter should be capable of reading 5,000 to 40,000 ohms accurately.

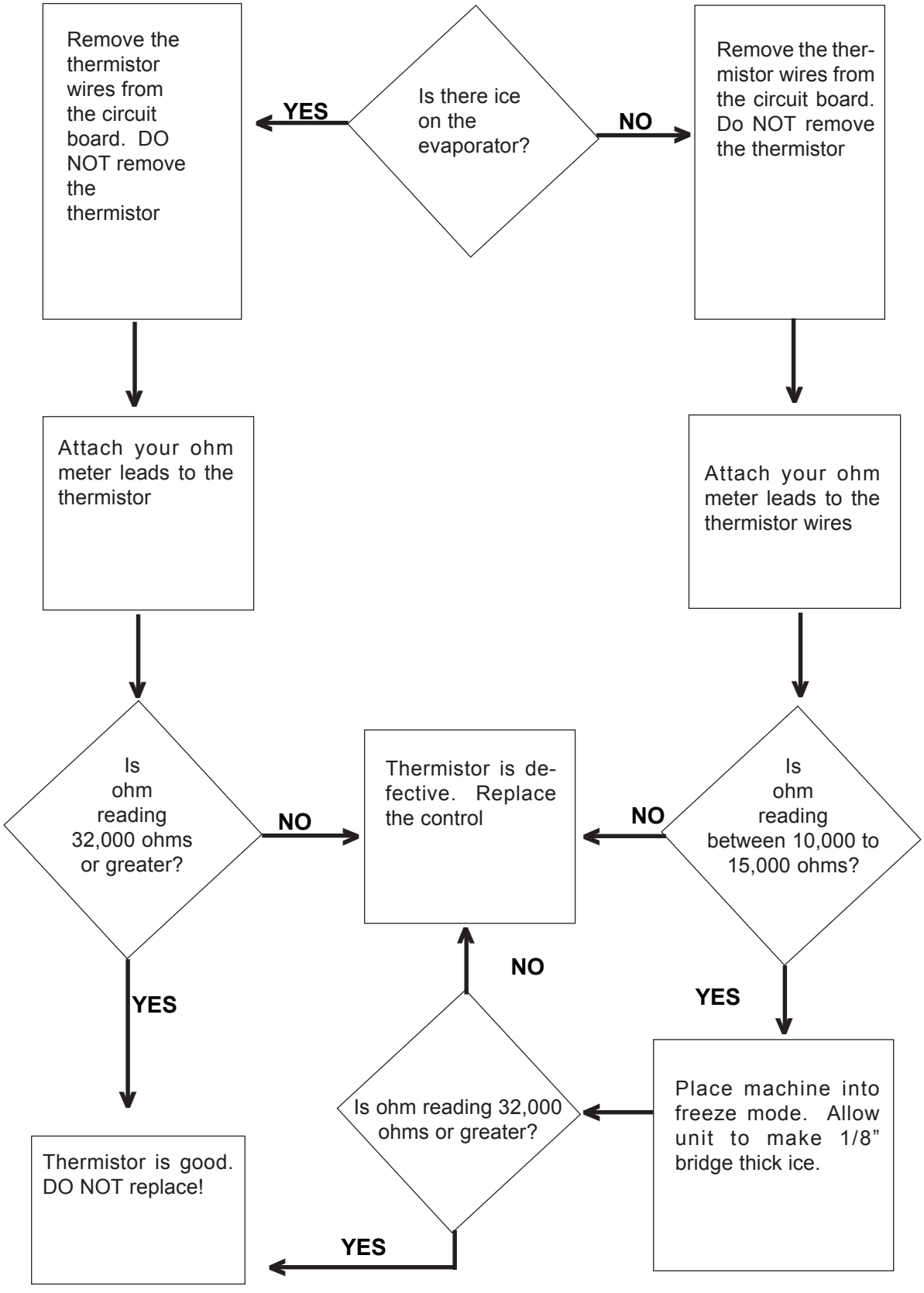
10. At room temperature, with no ice on the evaporator, your control should read ABOUT 10,000 to 15,000 OHM resistance.

11. Place an ice cube on the tip of the control. You should obtain a reading about 25,000 to 36,000 ohms. You may hold in the contactor for the compressor to freeze the evaporator rather than hold ice on the tip. Do not hold the contactor in for more than two minutes. Flood back to the compressor may occur with damage to the compressor.

These readings are approximate. Do not be concerned if your readings are slightly different.

If your control responds comparable to the above readings, this control is good. If your control does not respond, replace this ice sensing contorl.

CHECKING THE THERMISTOR



ICE THICKNESS CONTROL REPLACEMENT

1. Shut off water and electric supply to the ice maker.

2. Remove the float valve and the water pan from the machine. Remove the side panel from the control box side of the machine.

3. Use a 1.5 mm (1/16") punch to push the control out of the extrusion. Clean the old silcone out of the hole.

4. Remove the old control from the machine. Thread the new control through the machine from the complressor compartment. Push the control tip through the enclosure toward the evaporator.

5. When routing the new control wires to the cifcuit board, be sure the wires do not touch any hot gas lines. Attach the lead wires to the circuit board in the appropriate positions. There is no polarity in the wires of the ice thickness control.

6. Using GE RTV-108 silicone, fill the hole with silicone. This silicone is available from your local SerVend distributor.

7. Immediately after filling the hole with silicone, place your thumb over the front of the hole for the ice sensing control. Push the new control into the hole from behind the evaporator. This will allow the silicone to encompas the outside of the control jacket. Continue to push the control into the hole until the control hits the stop at the front of the hole. Never make a sharp bend with the control nor allow the wire to loop behind the evaporator. This can produce internal damage to the control.

8. The ice thickness control must touch the front stop on the lower plastic extrusion.

9. With your thumb still over the opening, wipe your thumb sideways over and off the control. By doing this, you will allow a very slight silicone seal to remain on the control tip. Add a dab of silicone to the wire at the back of the evaporator to prevent water from entering the sensor well.

10. Reinstall the water pan and restore the utilities to the machine.

11. Wait for 15 minutes before allowing water to run over the evaporator, allowing the silicone to dry tack free.

12. Check the water level in the water pan and turn the machine to the ICE position.

13. Allow the machine to make one batch of ice. You man check this bridge thickness. Adjust the bridge thickness if necessary.

ICE THICKNESS CONTROL ADJUSTMENT

Adjustment to the bridge thickness on a new start-up must only be done AFTER the machine has made one sheet of ice. Make subsequent adjustments after each sheet of ice.

Adjustment to the bridge thickness is done at the circuit board. On the bottom (front) of the board in the control box is a set of 8 DIP switches. To have a thicker bridge, turn the next (right) switch "on". To have a thinner bridge, turn the next (left) switch "off". It is acceptable to have all of the switches either on or off. Follow the indicator wedge above the switch case for thicker or thinner bridge. The switch is on if the top of the switch is down.

If further adjustment is necessary, you may adjust the potentiometer. Locate this "pot" left of the 8 DIP switch case. Remember this is a coarse adjustment. Move this pot no more than one (1) graduation at a time. You will then have to adjust the DIP switches for proper thickness.

To adjust this potentiometer on the board thinner, turn the pot counterclockwise. To adjust the board thicker, turn the pot clockwise.

After adjusting the board, you must reset the board. Turn the selector switch to the "OFF" position, then turn the switch back to the "ICE" position.

SAFETY THERM-O-DISC

The therm-o-disc is a high temperature safety control. The therm-o-disc is located on the evaporator inlet line for remote cooled machines. This component is insulated to prevent ambient air from effecting operation. The safety control is nonadjustable and set to open at 49° C (120° F) and will close at 35° C (95° F) evaporator inlet line temperature. This component prevents the cuber from overheating if the product should remain in a hot gas harvest cycle for any reason.

Wiring of this control is in series with the compressor contactor. The therm-o-disc will provide a second high temperature safety cutout device. This will protect the ice maker during the pump down cycle. At that time, power to the circuit board and ice thickness control is off.

CHECKING THE THERM-O-DISC

Disconnect the therm-o-disc leads at the compressor contactor and the low pressure control. Check the control with an OHM meter for continuity. If there is no continuity replace the control if its temperature is below 32° C (90° F).

Should the control be open because of high temperature, you may temporarily manually hold the compressor contactor closed. This will run the compressor and cool the evaporator inlet line to be certain the therm-o-disc will re-close.

THERMOSTATIC EXPANSION VALVE

The refrigerant metering devise used on SerVend products is a thermostatic expansion valve. This valve automatically adjusts the flow of refrigerant to the evaporator. This flow is in proportion to the amount of heat transferred to the refrigerant by the evaporator.

CHECKING THE EXPANSION VALVE

BEFORE changing any expansion valve, you must first check the following items. This must be operating correctly before proceeding.

1. The condenser and the fan blade, if air cooled, must be clean and operating properly.

2. The water supply must be sufficient to the water pan. There must be plenty of water to flow over the evaporator.

3. The refrigerant charge of the machine is correct. There is no moisture in the refrigerant system. To check for moisture seizing an expansion valve, gently warm the body of the valve. This is done with the machine in the ice mode. Apply heat to the body of the valve with a heat gun. You should only have to heat the body to about 2° C (35° F). If there is moisture in the system, you will experience a rapid change in system suction pressure.

4. The hot gas valve(s) is (are) not leaking.

5. The expansion valve bulb is located in the proper position, clean and tight. The bulb must be insulated from the ambient temperatures.

On some 30” wide self-contained machines, mounting of the expansion valve bulb is in the vertical position. This bulb is positioned so the capillary tubing extends from the upper portion of the bulb. On all other machines, the bulb is in the normal (10:00 to 2:00 O’clock) position.

Frost on the suction line leading to the compressor is not an indication of a defective expansion valve. With high ambient temperatures, long run times coupled with low evaporator temperatures can produce frost.

If your expansion valve is starving the evaporator, you may experience one of more of the following:

- Lower than normal suction pressure for the operating conditions.

- Low or non existent ice production.

- Thick ice pattern on the bottom of the evaporator and thin ice on the top.

If your expansion valve is flooding the evaporator, you may experience higher than normal suction pressure. This pressure may not modulate down.

SERVEND USES SPECIAL THERMOSTATIC EXPANSION VALVES. THE SUPERHEAT SETTINGS ARE MADE SPECIFICALLY FOR SERVEND. DO NOT ATTEMPT TO USE AN ‘OFF THE SHELF’ VALVE AS A REPLACEMENT, THIS WILL VOID ANY WARRANTIES.

WATER PUMP

The SerVend ice maker produces ice with the recirculation of water over the evaporator. The water recirculation is accomplished through the use of a water pump. The electric motor on the pump is driven by either 115 volts or 220 volts. The motor then turns a magnetic drive which in turn powers the pump impeller assembly.

All SerVend water pumps are interchangeable with the exception of the electric motor. One 115 volt and one 220 volt replacement pump will replace any pump in any SerVend ice maker.

The impeller section of the pump can be disassembled for cleaning or repair. With the removal of the six front screws, the complete impeller section is exposed.

DO NOT DISASSEMBLE THIS PUMP EXCEPT ON A WORK BENCH OR TABLE. SMALL PARTS CAN BE LOST.

WATER PUMP

After disassembly, the impeller section can be placed in ice machine cleaner, or simply replaced if necessary.

When reassembling the pump, start with the front housing assembly. Place the inside portion of the front housing up then place the “O” ring case half seal on the front housing assembly. This “O” ring will set on the inside portion of the front housing around the appropriate ledge. Place the shaft with the “D” washer in the hole in the inside center of the front housing. Slide the impeller assembly on the shaft of the front housing/shaft assembly. The impellers must be facing the front housing/shaft assembly. Then place the Teflon spacer washer on the shaft next to the magnetic drive of the impeller assembly. Assemble the rear housing with the cup portion over the impeller assembly, forming a complete housing assembly. Take this assembly and place it into the balance of the pump.

When ordering replacement impeller assemblies for your water pump, please specify either a March or Hartell pump assembly, depending on the brand pump the assembly is intended for.

Removal of water pump from a 22” or 48” wide ice maker.

Removal of water pump from a 30” wide ice maker.

DISASSEMBLY OF A SERVEND WATER PUMP

WATER REGULATING VALVE

The water regulating valve is put to use in the condenser water line of a water cooled unit only. Its function is to maintain the proper operating head pressure by controlling the amount of water flow through the condenser. The valve is adjustable and factory set to maintain a head pressure of 17.6 kg/cm^2 (250 PSI). Setting the water regulating valve to maintain discharge water temperature eliminates the need to enter the sealed refrigeration system. Take the water temperature as close to the condenser discharge as possible.

Should adjustment of the valve be required, there is a stem on the top of the valve. Allow the machine to operate for six (6) minutes in the freeze cycle before making any adjustments. Turn the stem clockwise to increase the discharge water temperature (increase pressure) and counterclockwise to decrease the discharge water temperature (decrease pressure).

The water regulating valve must close off the condenser water flow completely during the hot gas harvest cycle. If the valve fails to close during the harvest mode, the condenser will continue to condense the hot gas needed for the harvest cycle. This will produe excessively long harvest times.

Leaking water regulating valves are normally the result of scale build up on the valve diaphragm. If there is scale build up, the valve should be flushed, not replaced. To flush the valve, open the adjusting stem full open counterclockwise. You may also force the valve spring up with a screw driver. Opening and closing the water supply to the valve and condenser will result in the valve being flushed out. Should this not correct the problem, you may change the valve diaphragm. The diaphragm can be changed without resultant loss of refrigerant.

Water hammer may cause damage to the water regulating valve also. Water hammer will result from condenser inlet and drain lines being reversed. Proper installation of water cooled equipment should always include an anti-water hammer stand pipe in the supply inlet water line as close to the cuber as possible.

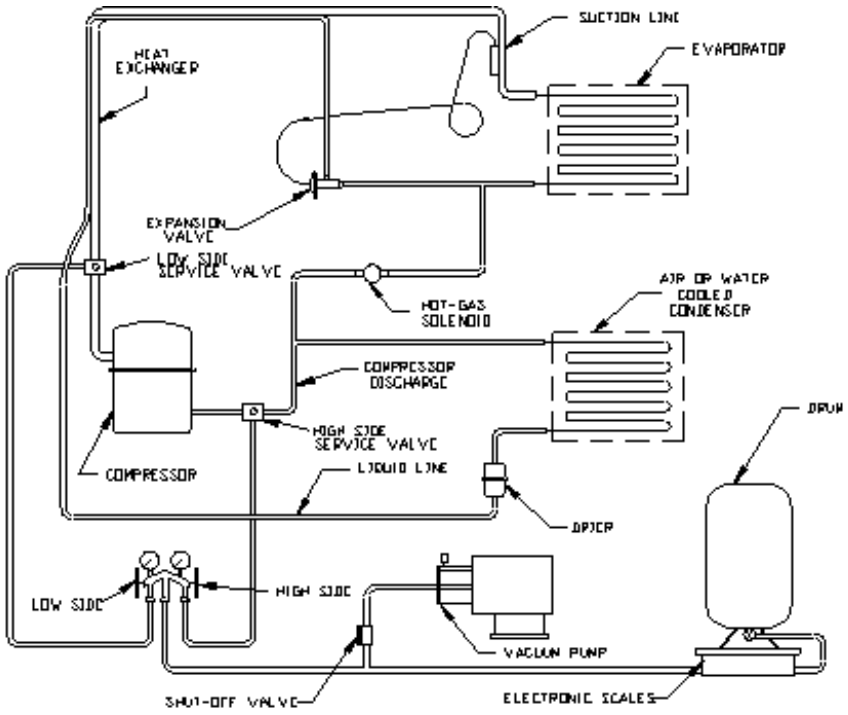
SYSTEM EVACUATION

In the event a refrigeration system is opened for repairs, the refrigerant must be recovered, the system evacuated, and recharged according to refrigerant weight. You MUST always change the filter drier when opening the refrigeration system for repairs.

Evacuation of the system includes a vacuum to 200 microns. Hold this vacuum for 5 minutes. You may expect a slight loss of vacuum as normal (up to 500 microns). A rapid rise to normal atmospheric pressure indicates a system leak. A slow rise to approximately 1000 microns indicates moisture is present in the system.

SELF CONTAINED SYSTEM ACCESS POINTS

The SerVend ice makers have two service valves on each machine. These are located in the control box at the front of the machine. When taking any pressure readings attach your set of gauges to these valve ports. Also use these connections in the event you need to recover or recharge refrigerant.



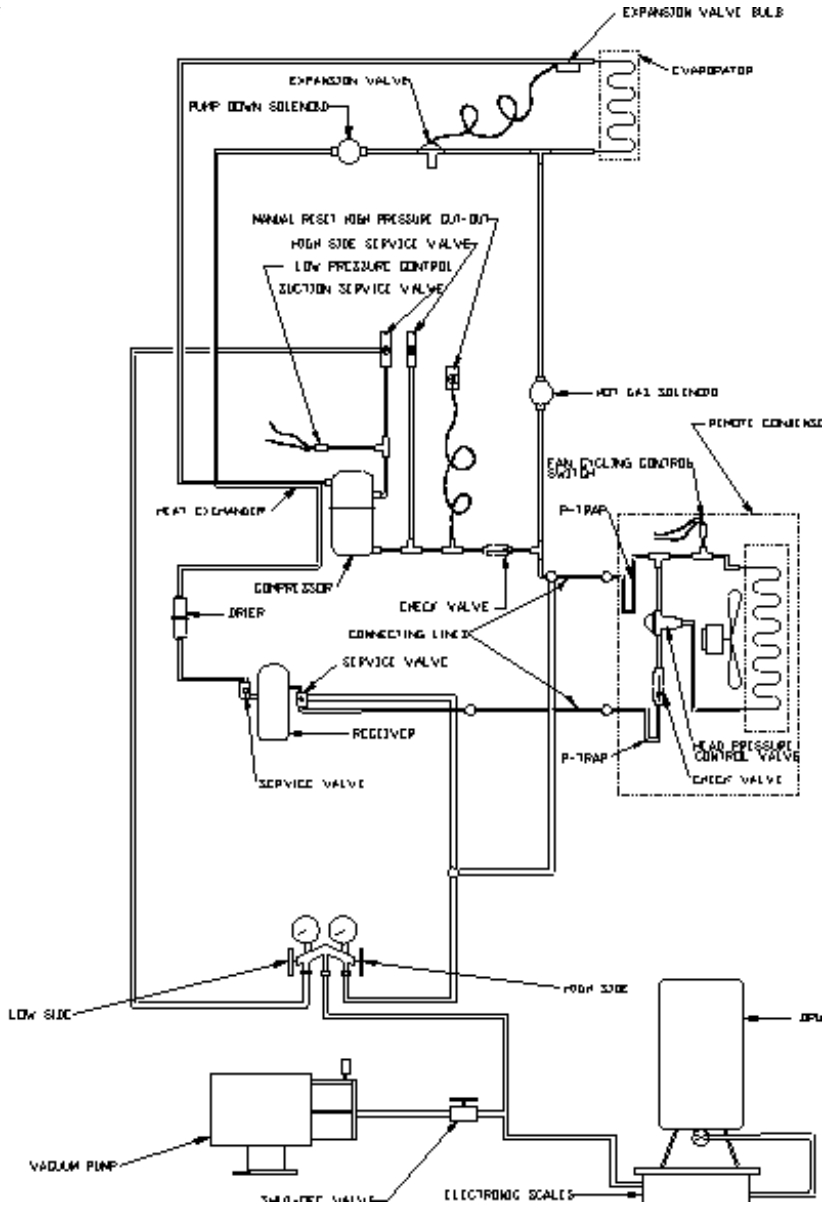
REMOTE REFRIGERATION SYSTEM ACCESS POINTS

On SerVend remote ice makers there are two access valves at the front of the unit. When evacuating the equipment, you CANNOT use the high side valve for access into the system. There are check valves in the system that will prevent evauation from the access valves.

Access to the system for evacuation purpose is through a four point ice maker connection. Place your manifold hoses from your vacuum pump to the following connections:

1. Access valve at the discharge tubing of the line set in the back of the ice maker head.
2. Receiver inlet valve.
3. Low side access vlave.
4. High side access valve.

All of these points must be accessed for complete evacuation due to check valves, etc. in the system.



CHARGING THE SYSTEM

Charging the system by sight glass, system pressure, amperage, temperature, or wound are NOT acceptable. The ONLY acceptable methods of charging a SerVend ice maker are through the use of an electronic scale, or charging cylinder.

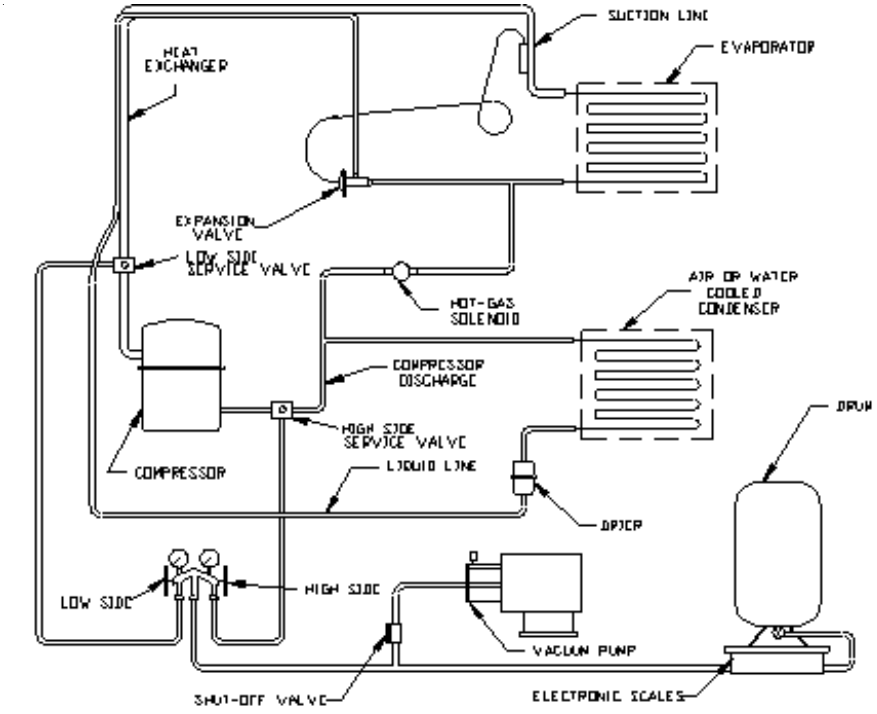
On a self contained ice maker, begin with the ice maker refrigeration system in vacuum, introduce the proper charge (in liquid form) through the high side access valve. Do not start the ice maker until the flow of refrigerant stops or the proper charge has been introduced to the system. If refrigerant flow stops before all of the needed refrigerant has been added, you may close off the high side charging hose, and introduce vapor only through the low side vlave with the machine in the operation mode.

CLEANING UP A CONTAMINATION SYSTEM

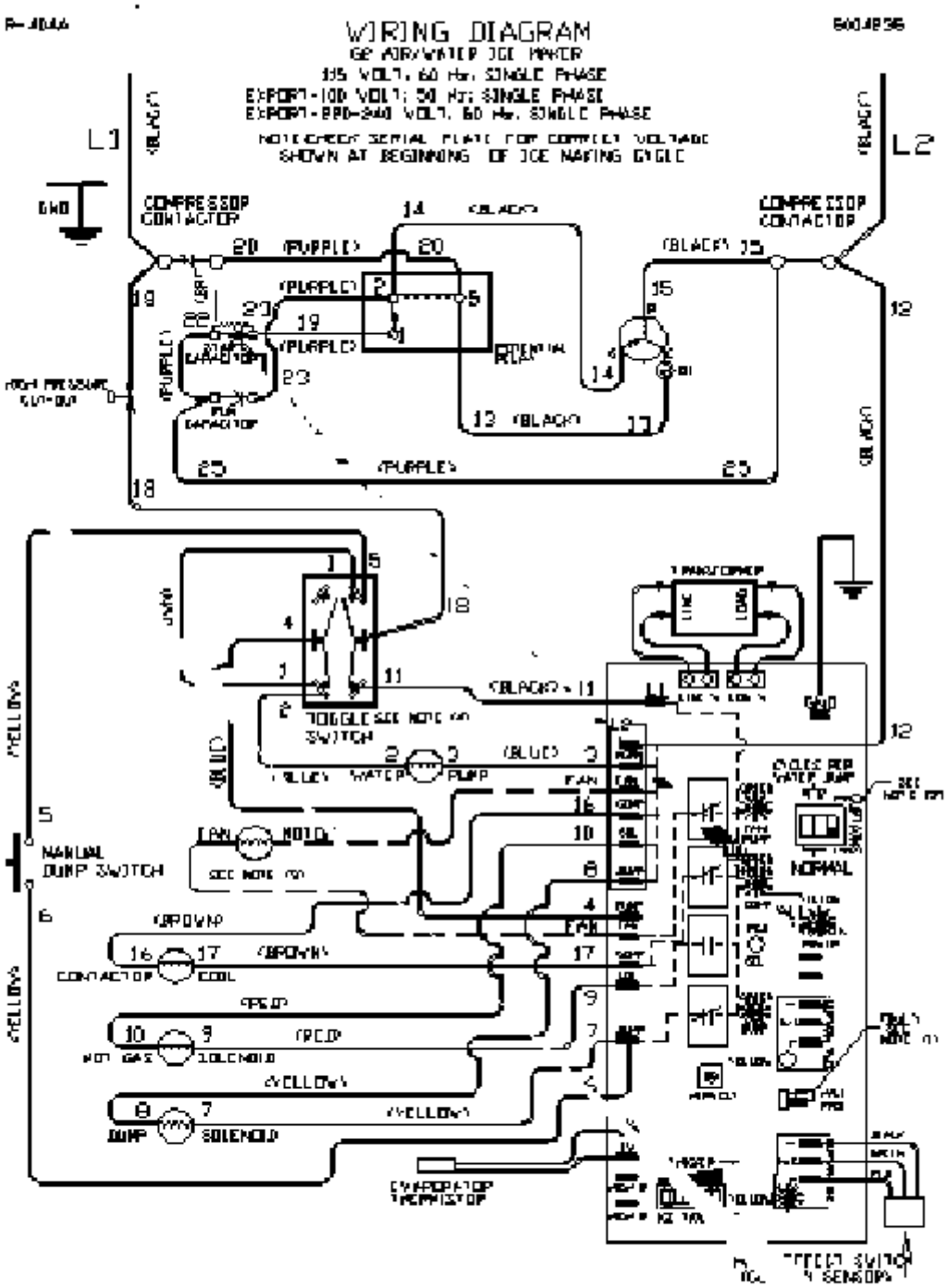
If you experience moisture in the system, you must clean up the system before placing the machine into service. Clean up would include purging with dry nitrogen and pulling a deep vacuum for an extended length of time while adding heat to the system from an external source.

If you have experience acid in the refrigeration system you must clean up the system. Install the recommended replacement drier on the equipment. In the event the acid is severe, several drier changes may be required. If you install a suction lin drier, this can be left in the system for the 24 hour clean up period only. Do NOT run the system indefinitely with a suction line drier.

Always follow the evacuation and purging information contained elsewhere in this manual.



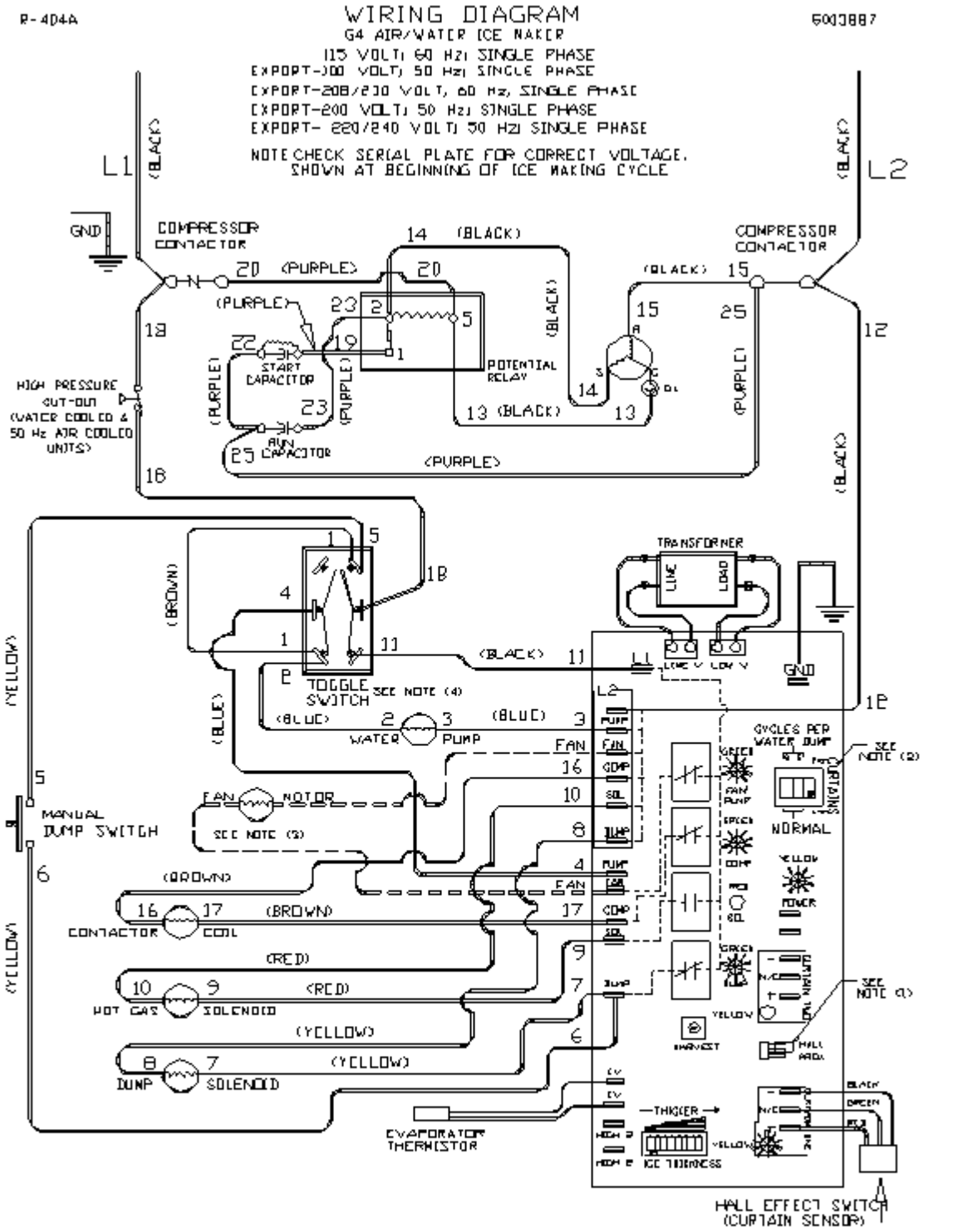
WIRING DIAGRAMS



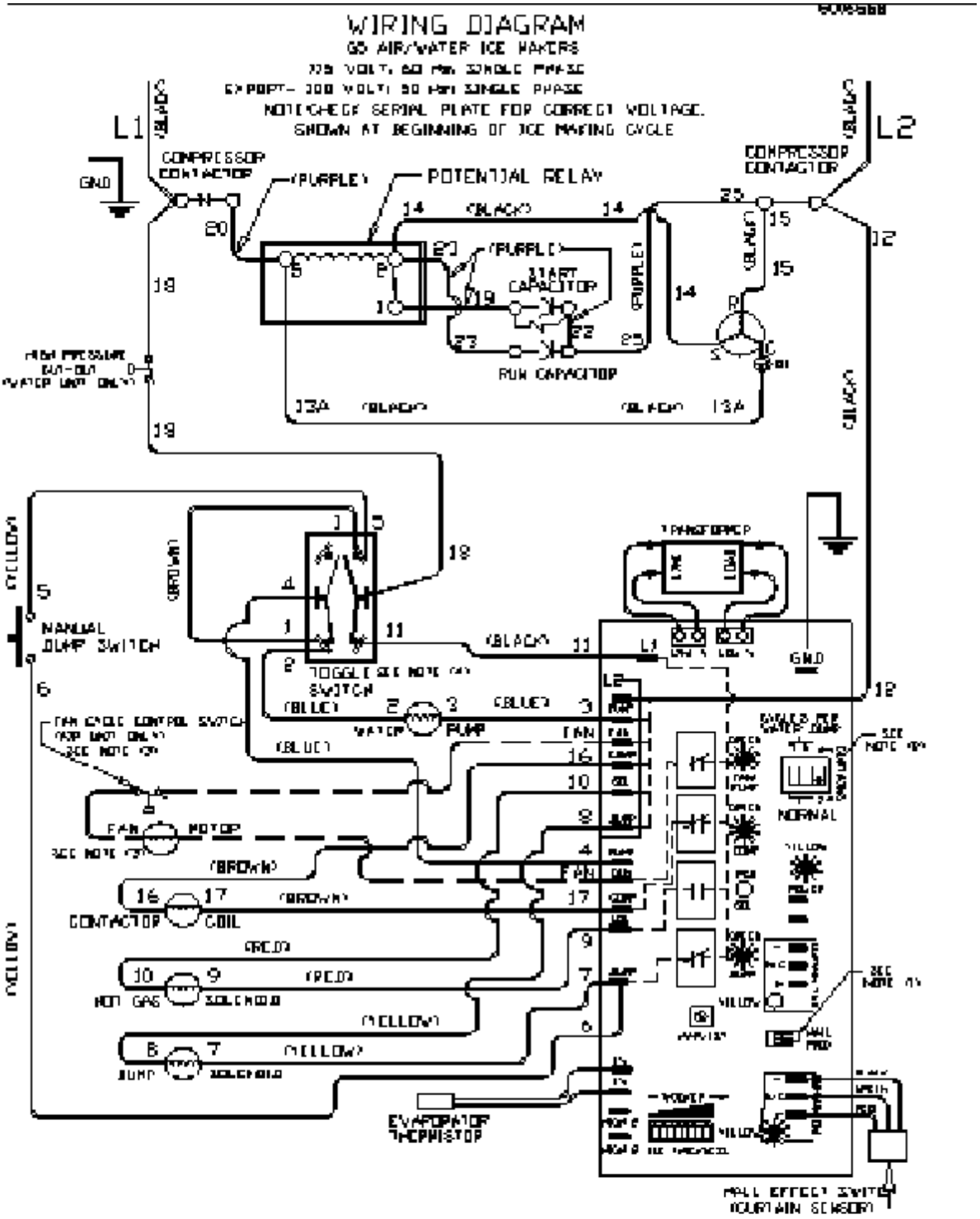
NOTES:

1. SLEEVE JUMPER POSITIONED AS SHOWN FOR MODELS WITH HALL EFFECT CURTAIN SWITCH.
2. DIP SWITCH SET AS SHOWN FOR ONE CURTAIN OPERATION.
3. FAN MOTOR ON AIR-COOLED UNITS ONLY. FAN WIRED DIRECTLY TO BOARD.
4. TOGGLE SWITCH VIEWED FROM BACK OF SWITCH.

WIRING DIAGRAMS



WIRING DIAGRAMS



NOTES:

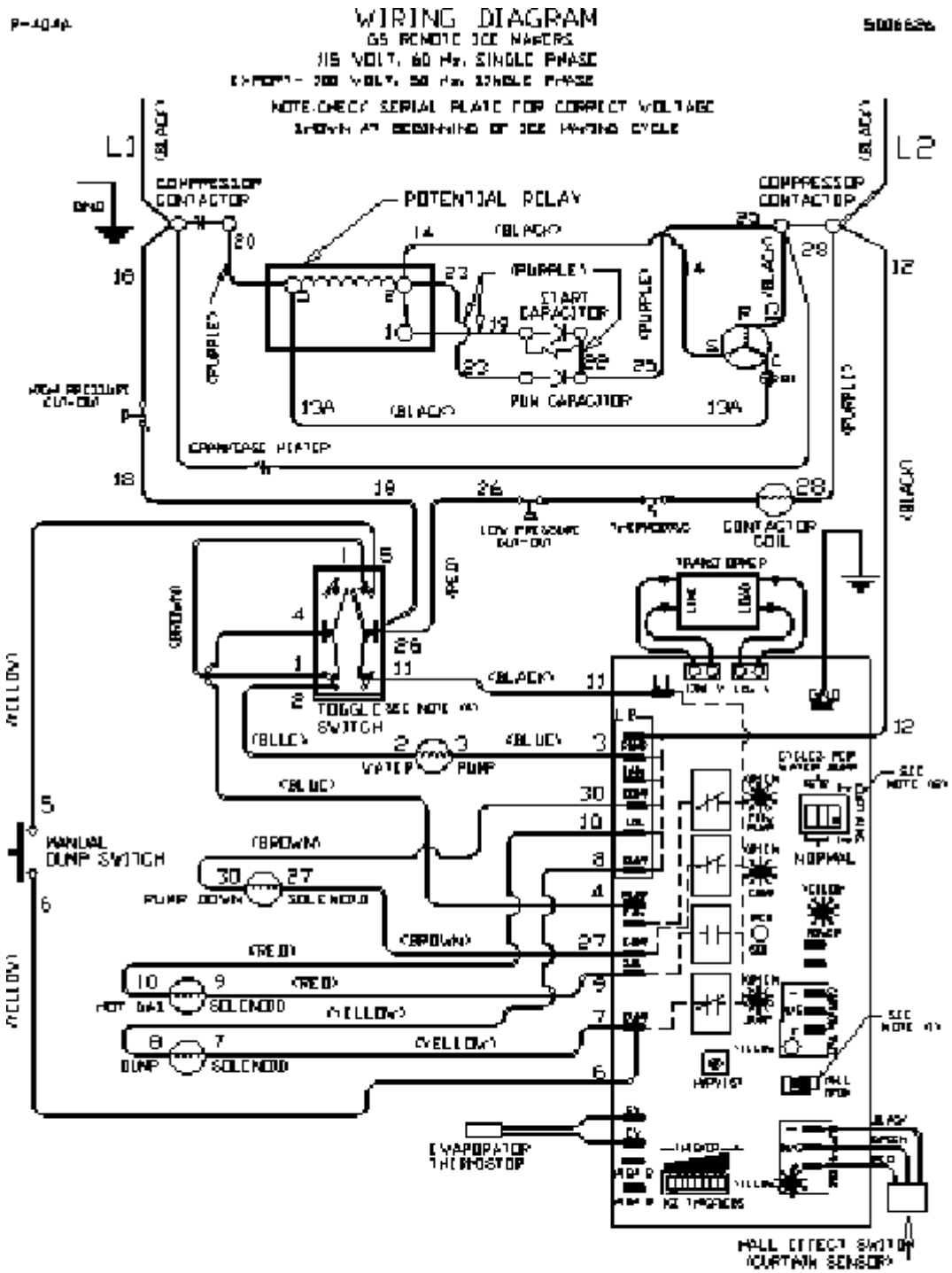
1) SLEEVE JUMPER POSITIONED AS SHOWN FOR MODELS WITH HALL EFFECT CURTAIN SWITCH.

2) DIP SWITCH SET AS SHOWN FOR ONE CURTAIN OPERATION

3) FAN MOTOR AND FAN CYCLE SWITCH ARE ON AIR COOLED UNITS ONLY.

4) TOGGLE SWITCH VIEWED FROM BACK OF SWITCH

WIRING DIAGRAMS



NOTES:

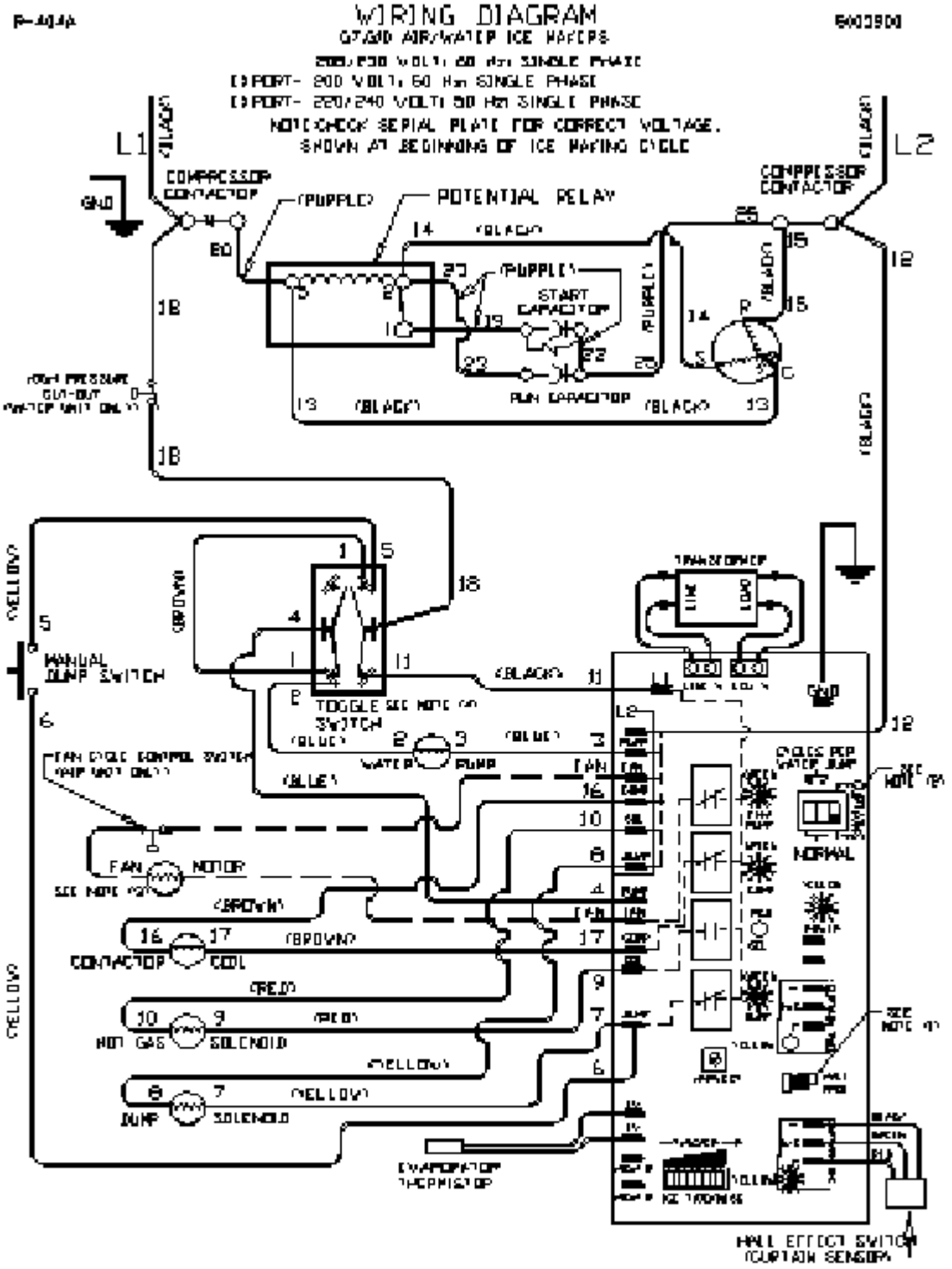
1) SLEEVE JUMPER POSITIONED AS SHOWN FOR MODELS WITH HALL EFFECT CURTAIN SWITCH

2) DIP SWITCH SET AS SHOWN FOR ONE CURTAIN OPERATION

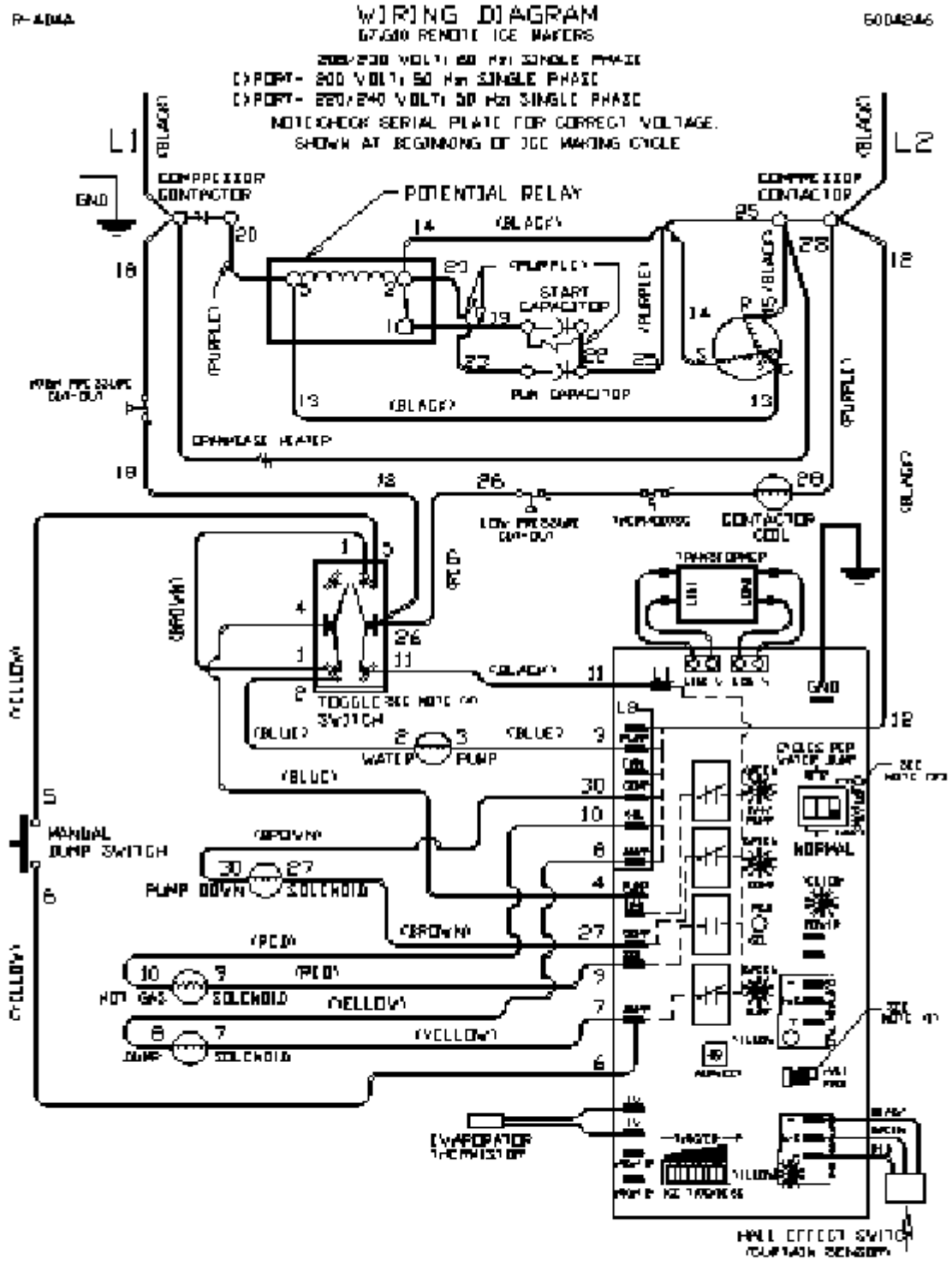
3) DO NOT RUN WIRES FROM CUBER TO REMOTE CONDENSER. L1 AND L2 COMING FROM REMOTE CONDENSER WILL BE WIRED DIRECTLY TO ELECTRICAL SERVICE THROUGH A DISCONNECT BOX.

4) TOGGLE SWITCH VIEWED FROM BACK OF SWITCH

WIRING DIAGRAMS



WIRING DIAGRAMS



NOTES:

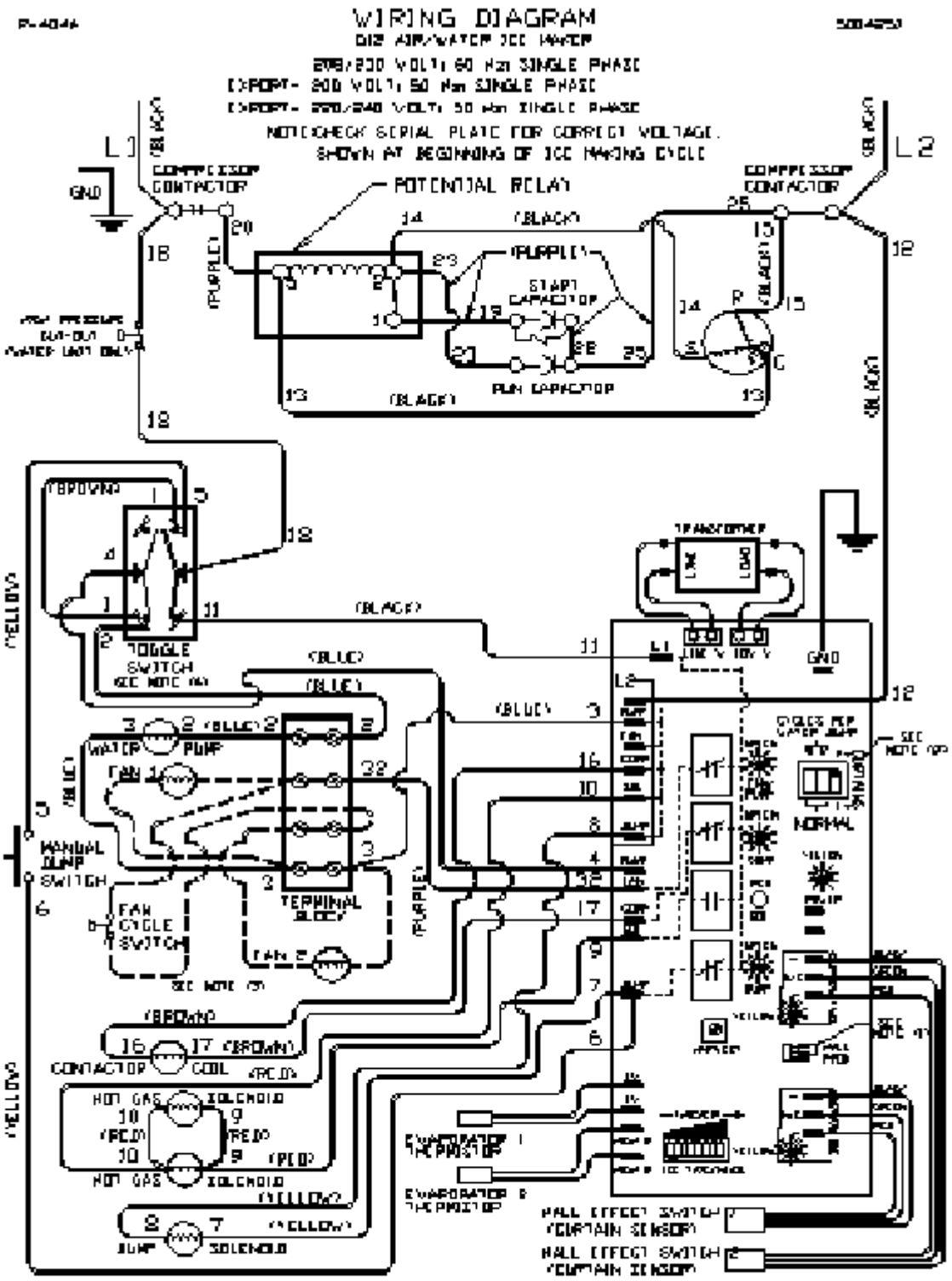
1) SLEEVE JUMPER POSITIONED AS SHOWN FOR MODELS WITH HALL EFFECT CURTAIN SWITCH.

2) DIP SWITCH SET AS SHOWN FOR ONE CURTAIN OPERATION.

3) DO NOT RUN WIRES FROM CUBER TO REMOTE CONDENSER. L1 AND L2 COMING FROM REMOTE CONDENSER WILL BE WIRED DIRECTLY TO ELECTRICAL SERVICE THROUGH A DISCONNECT BOX.

4) TOGGLE SWITCH VIEWED FROM BACK OF SWITCH.

WIRING DIAGRAMS



NOTES:

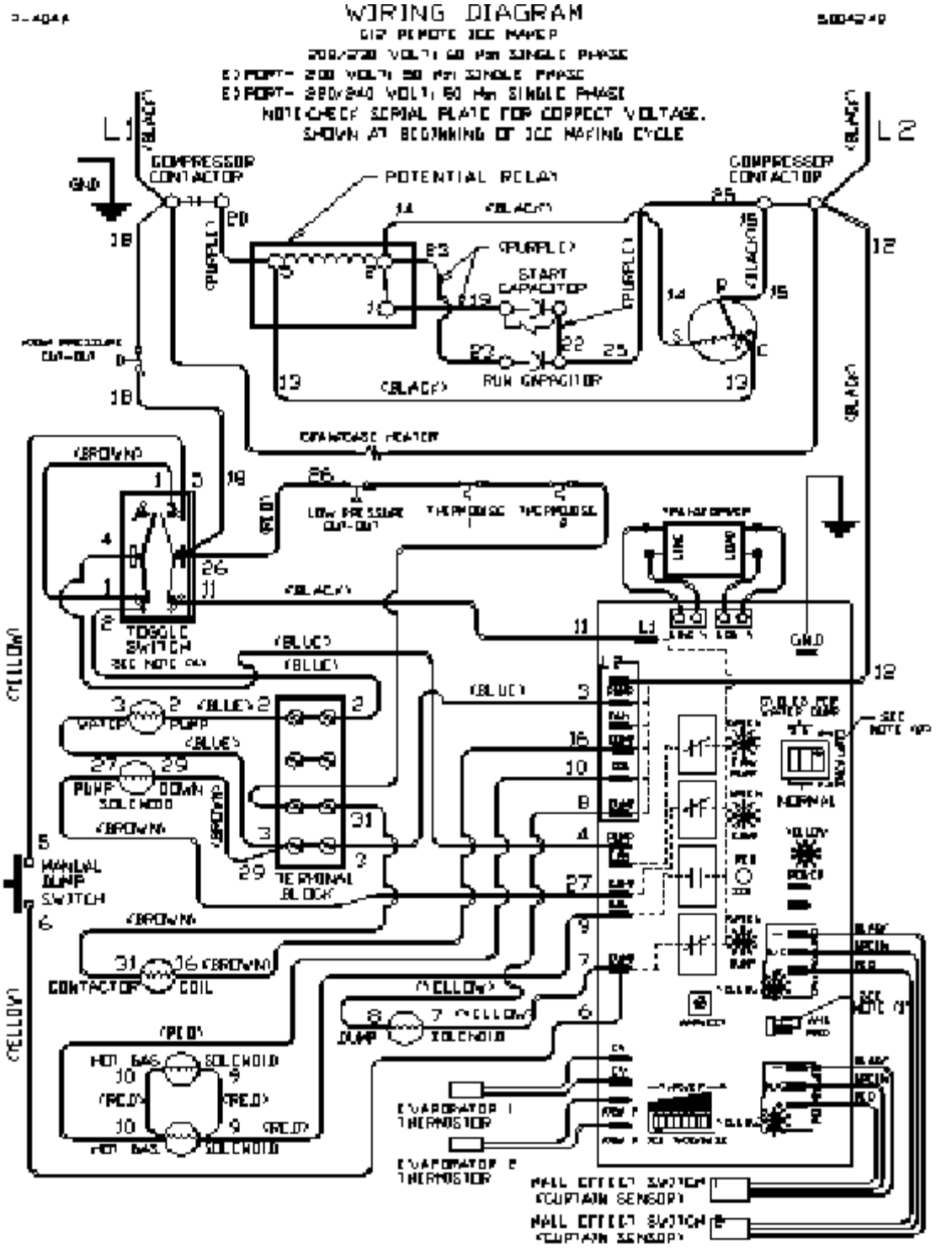
1) SLEEVE JUMPER POSITIONED AS SHOWN FOR MODELS WITH HALL EFFECT CURTAIN SWITCH.

2) DIP SWITCH SET AS SHOWN FOR TWO CURTAIN OPERATION.

3) FANS AND FAN CYCLE SWITCH ARE ON AIR-COOLED UNITS ONLY.

4) TOGGLE SWITCH VIEWED FROM BACK OF SWITCH.

WIRING DIAGRAMS



NOTES:

1) SLEEVE JUMPER POSITIONED AS SHOWN FOR MODELS WITH HALL EFFECT CURTAIN SWITCH.

2) DIP SWITCH SET AS SHOWN FOR TWO CURTAIN OPERATION.

3) DO NOT RUN WIRES FROM CUBER TO REMOTE CONDENSER. L1 AND L2 COMING FROM REMOTE CONDENSER WILL BE WIRED DIRECTLY TO ELECTRICAL SERVICE THROUGH A DISCONNECT BOX.

4) TOGGLE SWITCH VIEWED FROM BACK OF SWITCH.

WIRING DIAGRAMS

WIRING DIAGRAM

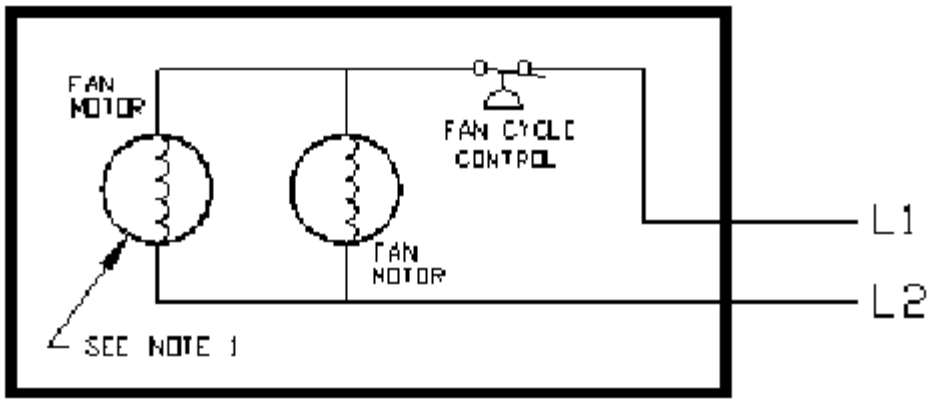
K9-RC, K12-RC, KG5-RC, KG9-RC AND KG12 - REMOTE CONDENSERS

115 VOLT; 60 HZ; SINGLE PHASE
EXPORT-100 VOLT; 50 HZ; SINGLE PHASE — MODELS { KG5-RCB-A

208/230 VOLT; 60 HZ; SINGLE PHASE
EXPORT-200 VOLT; 50 HZ; SINGLE PHASE — MODELS { K9-RCA-A, KG9-RCA-A, K12-RCA-A, KG12-RCA-A

EXPORT-220/240 VOLT; 50 HZ; SINGLE PHASE — MODELS { K9-RCD-A, KG9-RCD-A, K12-RCD-A, KG12-RCD-A

NOTE: CHECK SERIAL TAG FOR CORRECT VOLTAGE



NOTES:
1) K9-RC AND KG5-RC, KG9-RC USES ONLY ONE FAN MOTOR.
2) L1 AND L2 GOING TO REMOTE CONDENSER WILL BE WIRED DIRECTLY TO ELECTRICAL SERVICE THROUGH A DISCONNECT BOX.

SPECIFICATIONS

DATA PER ARI STANDARDS & WATER CONSUMPTION

Data Per ARI Standards (32°C (90°F) Air / 21°C (70°F) Water)
Water & KWH Consumption - Per 100 lbs. (45.36 kg) Of Ice

MODEL	CONDENSER	WATER	POTABLE	WATER	KWH	Kj
	GALLONS	LITERS	GALLONS	LITERS		
G2A*B	N/A	N/A	17.5	66.2	10.0	36000
G4A*B	N/A	N/A	14.5	54.9	7.0	25200
G5A*B	N/A	N/A	14.6	56.6	7.9	28413
G7A*B	N/A	N/A	14.6	55.3	6.6	23760
G10A*B	N/A	N/A	15.0	56.8	6.3	22680
G12A*B	N/A	N/A	14.3	54.1	6.3	22680

∗ = Letter designating cube size. M / mini cube; F / full cube; J / jumbo Cube

Data Per ARI Standards (32°C (90°F) Air / 21°C (70°F) Water)
Water & KWH Consumption - Per 100 lbs. (45.36 kg) Of Ice

MODEL	CONDENSER	WATER	POTABLE	WATER	KWH	Kj
	GALLONS	LITERS	GALLONS	LITERS		
G2W*B	176	666	17	64.3	7.7	27720
G4W*B	164	620	14.5	54.8	5.8	20700
G5W*B	137	520	15.5	60.0	6.3	22574
G7W*A	118.2	447	15.7	59.4	5	18000
G10W*A	107	405	14.8	56	5	18000
G12W*A	118.3	447.8	14.1	53.4	4.7	16920

∗ = Letter designating cube size. M / mini cube; F / full cube; J / jumbo Cube
Water cooled units based upon 17.5 Kg/cm² (250 PSI) head pressure setting.

OPERATING LIMITS

OPERATING LIMITS MINIMUM/ MAXIMUM	AIR TEMPERATURE (SELF CONTAINED)	AIR TEMPERATURE (REMOTE)	WATER TEMPERATURE	WATER PRESSURE
DEGREES F	500/100	-10/+110	45/90	N/A
DEGREES C	10/38	-29/+45	7/32	N/A
PSIG	N/A	N/A	N/A	20/120
Kg/cm²	N/A	N/A	N/A	1.4/8.4

PRESSURE - TEMPERATURE CHART FOR R-404A

SHADED NUMBERS = LIQUID
REGULAR NUMBERS = VAPOR
INFORMATION COURTESY ALCO CONTROLS

PSIG	° F	° C	Kg / cm²
0	-50	-45.5	0
2.5	-44	-42.2	0.17
3.4	-42	-41.1	0.24
5.5	-40	-40	0.38
6.5	-38	-38.8	0.45
7.5	-36	-37.7	0.52
8.6	-34	-36.6	0.6
9.7	-32	-35.5	0.68
11	-30	-34.4	0.75
12	-28	-33.3	0.84
13	-26	-32.2	0.92
15	-24	-31.1	1
16	-22	-30	1.1
17	-20	-28.8	1.2
19	-18	-27.7	1.3
20	-16	-26.6	1.4

PSIG	° F	° C	Kg / cm²
22	-14	-25.5	1.5
23	-12	-20.8	1.6
25	-10	-23.3	1.7
26	-8	-22.2	1.8
28	-6	-21.1	2
30	-4	-20	2.1
32	-2	-18.8	2.2
34	0	-17.7	2.3
35	2	-16.6	2.4
37	4	-15.5	2.6
39	6	-14.4	2.7
42	8	-13.3	2.9
44	10	-12.2	3
46	12	-11.1	3.2
48	14	-10	3.3
51	16	-8.8	3.5
53	18	-7.7	3.7
55.6	20	-6.6	3.9

PRESSURE - TEMPERATURE CHART FOR R-404A

PSIG	° F	° C	Kg / cm²
58.2	22	-5.5	4
60.9	24	-4.4	4.2
63.6	26	-3.3	4.4
66.5	28	-2.2	4.6
69.4	30	-1.1	4.8
72.3	32	0	5
75.4	34	1.1	5.3
78.5	36	2.2	5.5
81.8	38	3.3	5.7
85.1	40	4.4	5.9
88.5	42	5.5	6.2
91.9	44	6.6	6.4
95.5	46	7.7	6.7
99.2	48	8.8	6.9
103	50	10	7.2
109	52	11.1	7.6
113	54	12.2	7.9
117	56	13.3	8.2

PSIG	° F	° C	Kg / cm²
121	58	14.4	**8.5**
125	60	15.5	**8.7**
130	62	16.6	**9.1**
134	64	17.7	**9.4**
139	66	18.8	**9.7**
144	68	20	**10.1**
148	70	21.1	**10.4**
153	72	22.2	**10.7**
158	74	23.3	**11.1**
164	76	24.4	**11.5**
169	78	25.5	**11.8**
174	80	26.6	**12.2**
180	82	27.7	**12.6**
185	84	28.8	**13**
191	86	30	**13**
197	88	31	**14**
203	90	32	**14**
209	92	33	**15**

PRESSURE - TEMPERATURE CHART FOR R-404A

PSIG	° F	° C	Kg / cm²
215	94	34	**15**
222	96	36	**16**
229	98	37	**16**
235	100	38	**17**
242	102	39	**17**
249	104	40	**18**
256	106	41	**18**
264	108	42	**19**
271	110	43	**19**
279	112	44	**20**
286	114	46	**20**
294	116	47	**21**
302	118	48	**21**
311	120	49	**22**
319	122	50	**22**
328	124	51	**23**
336	126	52	**24**
345	128	53	**24**

PSIG	° F	° 54	Kg / cm²
354	130	54	**25**
364	132	56	**26**
373	134	57	**26**
383	136	58	**27**
392	138	59	**28**
402	140	60	**28**
413	142	61	**29**
423	144	62	**30**
434	146	63	**31**
444	148	64	**31**
449	150	66	**32**

G2 SPECIFICATIONS

ELECTRIC_CODE	B		C		D	
VOLTS__	115	115	208/230	208/230	220/240	220/240
PHASE_____	1	1	1	1	1	1
HERTZ	60	60	60	60	50	50
NUMBER_OF_WIRES	2	2	2	2	2	2
CONDENSER_STYLE	AIR	WATER	AIR	WATER	AIR	WATER
MINIMUM CIRCUIT AMPS	12.5	11.7	6.3	5.85	5.58	5.18
MAXIMUM_FUSE_SIZE	20	15	10	10	20	15
COMPRESSOR_H.P.	1/3	1/3	1/3	1/3	1/3	1/3
LRA	46	46	23.8	23.8	22.1	22.1
RLA	8.3	8.3	5.0	5.0	3.7	3.7

ELECTRIC_CODE	B		C		D	
CONDENSER_STYLE	AIRE	AGUA	AIRE	AGUA	AIRE	AGUA
CONDENSER FAN MOTOR						
AMPS_____	0.53	N/A	0.4	N/A	0.4	N/A
WATTS_____	9	N/A	9	N/A	9	N/A
AIR CONDITIONING LOAD (AIR COOLED)	4,605 BTUH	N/A	4605	N/A	4,605 BTUH	N/A
WATER_PUMP_AMPS	1.05	1.05	0.55	0.55	0.55	0.55
REFRIGERANT__	404A	404A	404A	404A	404A	404A
OUNCES	18	14	18	14	18	14
GRAMS__	510	397	510	397	510	397

G4 SPECIFICATIONS

ELECTRIC_CODE	B		D		C	
VOLTS__	115	115	220/240	220/240	208/230	208/230
PHASE_____	1	1	1	1	1	1
HERTZ	60	60	50	50	60	60
CONDENSER_STYLE	AIR	WATER	AIR	WATER	AIR	WATER
NUMBER_OF_WIRES	2	2	2	2	2	2
MINIMUM CIRCUIT AMPS	15.4	14.3	5.93	5.6	7.9	7.3
MAXIMUM_FUSE_SIZE	20	20	20	20	20	20
COMPRESSOR_H.P.	½	½	½	½	½	½
LRA	51	51	22.9	22.9	24.1	24.1

ELECTRIC_CODE	B		D		C	
CONDENSER_STYLE	AIR	WATER	AIR	WATER	AIR	WATER
CONDENSER_FAN_MOTOR						
AMPS__	1.1	N/A	0.38	N/A	0.6	N/A
WATTS_____	25	N/A	18.3	N/A	18.3	N/A
AIR CONDITIONING LOAD (AIR COOLED)	6,002 BTUH	N/A	6,002 BTUH	N/A	6,002 BTUH	N/A
WATER_PUMP_AMPS	1.05	1.05	0.55	0.55	0.55	0.55
REFRIGERANT__	404A	404A	404A	404A	404A	404A
OUNCES_____	20	15	20	15	20	15
GRAMS_	567	425	567	425	567	425

G5 SPECIFICATIONS

ELECTRIC_CODE	B		
VOLTS__	115	115	115
PHASE	1	1	1
HERTZ	60	60	60
CONDENSER_STYLE	AIR	WATER	REMOTE
NUMER OF WIRES	2	2	2
MINIMUM CIRCUIT AMPS	15.5	14	14
MAXIMUM_FUSE_SIZE	20	20	20
COMPRESSOR H.P.	¾	¾	¾
LRA	59.0	59.0	59.0
RLA	15.2	15.2	15.2

ELECTRIC_CODE	B		
CONDENSER_STYLE	AIR	WATER	REMOTE
CONDENSER_FAN_MOTOR			
AMPS____	1.1	N/A	N/A
WATTS_	25	N/A	N/A
AIR CONDITIONING LOAD (AIR COOLED)	8290	N/A	N/A
WATER PUMP AMPS	1.05	1.05	1.05
REFRIGERANT	404A	404A	404A
OUNCES	24	15	160
GRAMS	680	425	4536

G7 SPECIFICATIONS

ELECTRIC_CODE	A			D		
CONDENSER_STYLE	AIR	WATER	REMOTE	AIR	WATER	REMOTE
CONDENSER_FAN_MOTOR						
AMPS_____	0.7	N/A	N/A	0.54	N/A	N/A
WATTS__	35	N/A	N/A	23.2	N/A	N/A
AIR CONDITIONING LOAD (AIR COOLED)	9,517 BTUH	N/A	N/A	9,517 BTUH	N/A	N/A
WATER_PUMP_AMPS	0.55	0.55	0.55	0.55	0.55	0.55
REFRIGERANT	404A	404A	404A	404A	404A	404A
OUNCES_____	26	16	160	26	16	160
GRAMS	737	453	4536	737	453	4536

G10 SPECIFICATIONS

ELECTRIC_CODE	A			D		
VOLTS_	208/230	208/230	208/230	220/240	220/240	220/240
PHASE	1	1	1	1	1	1
HERTZ	60	60	60	50	50	50
CONDENSER_STYLE	AIR	WATER	REMOTE	AIR	WATER	REMOTE
NUMER_OF_WIRES	2	2	2	2	2	2
MINIMUM CIRCUIT AMPS	13.7	12.8	12.8	13.98	13.18	13.18
MAXIMUM_FUSE_SIZE	25	20	20	25	20	20
COMPRESSOR_H.P.	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2	1-1/2
LRS	56	56	56	55	55	55
RLA	9.8	9.8	9.8	10.1	10.1	10.1

ELECTRIC_CODE	A			D		
CONDENSER_STYLE	AIR	WATER	REMOTE	AIR	WATER	REMOTE
CONDENSER_FAN_MOTOR						
AMPS__	1.5	N/A	N/A	1.4	N/A	N/A
WATTS_	75	N/A	N/A	50	N/A	N/A
AIR CONDITIONING LOAD (AIR COOLED)	11,187 BTUH	N/A	N/A	11,187 BTUH	N/A	N/A
WATER_PUMP_AMPS	0.55	0.55	0.55	0.55	0.55	0.55
REFRIGERANT	404A	404A	404A	404A	404A	404A
OUNCES_____	34	20	160	34	20	160
GRAMS	964	567	4536	964	567	4536

G12 SPECIFICATIONS

ELECTRIC_CODE	A			D		
VOLTS	208/230	208/230	208/230	220/240	220/240	220/240
PHASE	1	1	1	1	1	1
HERTZ	60	60	60	50	50	50
CONDENSER_STYLE	AIR	WATER	REMOTE	AIR	WATER	REMOTE
NUMER_OF_WIRES	2	2	2	2	2	2
MINIMUM CIRCUIT AMPS	22.2	20.8	20.8	20.88	19.8	19.8
MAXIMUM_FUSE_SIZE	35	35	35	35	35	35
COMPRESSOR_H.P.	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2
LRS	96	96	96	75.9	75.9	75.9
RLA	16.2	16.2	16.2	15.4	15.4	15.4

ELECTRIC_CODE	A			D		
CONDENSER_STYLE	AIR	WATER	REMOTE	AIR	WATER	REMOTE
CONDENSER_FAN_MOTOR						
AMPS_____	0.85(2)	N/A	N/A	0.85 (2)	N/A	N/A
WATTS	50 (2)	N/A	N/A	50 (20	N/A	N/A
AIR CONDITIONING LOAD (AIR COOLED)	15,639 BTUH	N/A	N/A	15,639 BTUH	N/A	N/A
WATER_PUMP_AMPS	0.55	0.55	0.55	0.55	0.55	0.55
REFRIGERANT	404A	404A	404A	404A	404A	404A
OUNCES	65	24	160	65	24	160
GRAMS	1843	680	4536	1843	680	4536

"KG" CONDENSER SPECIFICATIONS

MODEL NUMBER	KG5	KG9		KG12	
ELECTRIC_CODE	B	A	D	A	D
VOLTS	115	208/230	220/240	208/230	220/240
PHASE_____	1	1	1	1	1
HERTZ	60	60	50	60	50
CONDENSER_STYLE	REMOTE	REMOTE	REMOTE	REMOTE	REMOTE
NUMBER_OF_WIRES	2	2	2	2	2
MINIMUM_CIRCUIT_AMPS	15	15	10	15	10
MAXIMUM_FUSE_SIZE	15	15	10	15	10
COMPRESSOR	N/A	N/A	N/A	N/A	N/A
LRA	N/A	N/A	N/A	N/A	N/A
RLA	N/A	N/A	N/A	N/A	N/A

MODEL NUMBER	KG5	KG9		KG12	
ELECTRIC_CODE	B	A	D	A	D
CONDENSER_FAN_MOTOR					
AMPS	1.4	1.5	1.4	1.5 (2)	1.4 (20
WATTS	35	50	50	75 2)	50 (2)
WATER_PUMP_AMPS	N/A	N/A	N/A	N/A	N/A
REFRIGERANT	404A	404A	404A	404A	404A
OUNCES	1	1	1	1	1
GRAMS	28	28	28	28	28

COMPRESSOR SPECIFICATIONS

MODEL	ELECTRIC CODE-VOLTS HZ/PH	OIL RECHARGE (POLYOLESTER)	OVERLOAD TRIP POINT	OHM VALUE START WINDING	OHM VALUE RUN WINDING	CAPACITOR START	CAPACITOR RUN
G2	B 115/60/1	18 oz.	12.9 amps	9.85	0.86	43-52 MFD 330 v	15 MFD 440 v
	C 208/230/60/1	18 oz	7.0 AMPS	8.96	2.73	88-106 MFD 330 v	12 MFD 370 v
	D 220/240/50/1	18 oz	5.2 AMPS	8.35	3.36	88-106 MFD 330 v	15 MFD 370 v

G2	ELECTRIC CODE-VOLTS HZ/PH	COMPRESSOR BRAND	COMPRESSOR MODEL NUMBER	COMPRESSOR RELAY NUMBERS GEN. ELEC WHITE RODGERS	LRA	RLA *
	B 115/60/1	Copeland	JS35C1E-CAA	GE-3ARR3CT10V5 WR-128146-1653AK	46.0	8.3
	C 208-230/60/1	Copeland	JS35C1E-CAV	GE-3ARR3CT10A5 WR-128146-1653AK	23.8	5.0
	D 220/240/50/1	Copeland	JS35C1E-PAJ	GE-3ARR3CT10A5 WR-128146-1653AK	22.1	3.7

* RLA on 60 Hz. units U.L. specifications
* RLA on 50 Hz. units from compressor mfg. specifications

COMPRESSOR SPECIFICATIONS

MODEL	ELECTRIC CODE-VOLTS HZ/PH	OIL RECHARGE (POLYOLESTER)	OVERLOAD TRIP POINT	OHM VALUE START WINDING	OHM VALUE RUN WINDING	CAPACITOR START	CAPACITOR RUN
G4	B 115/60/1	20 oz.	14.2 amps	4.08	0.59	243-292 MFD 115 v	15 MFD 370 v
	C 208/230/60/1	20 oz	7.5 AMPS	18.30	2.10	43-52 MFD 220 v	10 MFD 370 v
	D 220/240/50/1	20 oz	5.6 AMPS	5.47-6.29	3.59 - 2.99	88-106 MFD 330 v	25 MFD 370 v

G4	ELECTRIC CODE-VOLTS HZ/PH	COMPRESSOR BRAND	COMPRESSOR MODEL NUMBER	COMPRESSOR RELAY NUMBERS GEN. ELEC WHITE RODGERS	LRA	RLA *
	B 115/60/1	Copeland	RS43C1E-CAA	GE-3ARR3CT5M5 WR-128306-1633MK	51.0	9.1
	C 208-230/60/1	Copeland	RS43C1E-CAV	GE-3ARR3CT10V5 WR-128306-1653VK	24.1	5.4
	D 220/240/50/1	Copeland	JS55C1E-CAZ	GE-3ARR3CT10B5 WR-128306-16438K	22.9	4.0

* RLA on 60 Hz units U.L. specifications
* RLA on 50 Hz units from compressor mfg. specifications

COMPRESSOR SPECIFICATIONS

MODEL	ELECTRIC CODE-VOLTS HZ/PH	OIL RECHARGE (POLYOLESTER)	OHM VALUE START WINDING	OHM VALUE RUN WINDING	CAPACITOR START	CAPACITOR RUN
G5	B 115/60/1	20 oz	5.68	0.57	72-86 MDF 330 v	30 MDF 440 v.
	ELECTRIC CODE-VOLTS HZ/PH	COMPRESSOR BRAND	COMPRESSOR MODEL NUMBER	COMPRESSOR RELAY NUMBERS GEN. ELEC WHITE RODGERS	LRA	RLA *
	B 115/60/1	Copeland	RS64C1E-CAA	GE-3ARR3CT2455 WR-128306-16435K	59.0	15.2

* RLA on 60 Hz units U.L. specifications
* RLA on 50 Hz units from compressor mfg. specifications

MODEL	ELECTRIC CODE-VOLTS HZ/PH	OIL RECHARGE (POLYOLESTER)	OVERLOAD TRIP POINT	OHM VALUE START WINDING	OHM VALUE RUN WINDING	CAPACITOR START	CAPACITOR RUN
G7	A 208-230/60/1	41 oz	15.3 AMPS	3.10	1.16	145-174 MFD 220 v	30 MFD 370 v.
	D 220/240/50/1	41 oz	14.2 AMPS	3.79	1.39	130-156 MFD 250 v.	30 MFD 370 v
	ELECTRIC CODE-VOLTS HZ/PH	COMPRESSOR BRAND	COMPRESSOR MODEL NUMBER	COMPRESSOR RELAY NUMBERS GEN. ELEC. WHITE RODGERS		LRA	RLA *
	A 208/230/60/1	Copeland	CS10K6E-PFV	GE-3ARR3CT24S5 WR-128306-1643SK		56.0	9.8
	D 220/240/50/1	Copeland	CS10K6E-PFJ	GE-3ARR3CT10V5 WR-128306-1653VK		55.0	10.1

* RLA on 60 Hz units U.L. specifications
* RLA on 50 Hz units from compressor mfg. specifications

COMPRESSOR SPECIFICATIONS

MODEL	ELECTRIC CODE-VOLTS HZ/PH	OIL RECHARGE (POLYOLESTER)	OVERLOAD TRIP POINT	OHM VALUE START WINDING	OHM VALUE RUN WINDING	CAPACITOR START	CAPACITOR RUN
G10	A 208-230/60/1	41 oz	17.4 AMPS	2.66	1.08	145-174 MFD 220 v	35 MFD 370 v.
	D 220/240/50/1	41 oz	17.5 AMPS	2.64	3.35	145-174 MFD 220 v.	35 MFD 370 v
	ELECTRIC CODE-VOLTS HZ/PH	COMPRESSOR BRAND	COMPRESSOR MODEL NUMBER	COMPRESSOR RELAY NUMBERS GEN. ELEC. WHITE RODGERS		LRA	RLA *
	A 208/230/60/1	Copeland	CS14K6E-PFV	GE-3ARR3CT24S5 WR-128306-1643SD		61	12.4
	D 220/240/50/1	Copeland	CS14K6E-PFJ	GE-3ARR3CT24S5 WR-128306-1653SK		58	12.5

* RLA on 60 Hz units U.L. specifications
* RLA on 50 Hz units from compressor mfg. specifications

MODELO	ELECTRIC CODE-VOLTS HZ/PH	OIL RECHARGE (POLYOLESTER)	OVERLOAD TRIP POINT	OHM VALUE START WINDING	OHM VALUE RUN WINDING	CAPACITOR START	CAPACITOR RUN
G12	A 208-230/60/1	41 oz	15.3 AMPS	3.10	1.16	145-174 MFD 220 v	30 MFD 370 v.
	D 220/240/50/1	41 oz	21.5 AMPS	3.79	1.39	130-156 MFD 250 v.	30 MFD 370 v
	ELECTRIC CODE-VOLTS HZ/PH	COMPRESSOR BRAND	COMPRESSOR MODEL NUMBER	COMPRESSOR RELAY NUMBERS GEN. ELEC. WHITE RODGERS		LRA	RLA *
	A 208/230/60/1	Copeland	CS20K6E-PFV	GE-3ARR3CT10S5 WR-128306-1643SD		96.0	16.2
	D 220/240/50/1	Copeland	CS20K6E-PFZ	GE-3ARR3CT10V5 WR-128306-1653VK		75.9	15.4

* RLA on 60 Hz units U.L. specifications
* RLA on 50 Hz units from compressor mfg. specifications

COMPRESSOR SPECIFICATIONS

PART NAME	ELECTRIC VOLTAGE CODE	VOLTAGE/HZ/ PHASE	OHM VALUE	WATTAGE
Hot gas valve coil	A	208-230/60/1	545	N/A
	B	115/60/1	1430	N/A
	C	208-230/60/1 200-220/50/1	545	N/A
	D	220-240/50/1	545	N/A
	F	208-230/60/1	545	N/A
Pump Motor	A	208-230/60/1	77 +/-5%	N/A
	B	115/60/1	19.4 +/-5%	N/A
	C	208-230/60/1 200-220/50/1	77 +/-5%	N/A
	D	220-240/50/1	77 +/-5%	N/A
	F	208-230/60/1	77 +/-5%	N/A

PART NAME		ELECTRIC VOLTAGE CODE	VOLTAGE/HZ/ PHASE	OHM VALUE	WATTAGE
Fan Motor	G2	B	115/60/1	31	9
		C	208-230/50-60/1	104	9
		D	220-240/50/1	104	9
	G4	A	208-230/60/1	105	25
		B	115/60/1	71	25
	G5	B	115/60/1	105	52
	G7	A	208-230/60/1	47	35
		B	220-240/50/1	70	35
	G10	A	208-230/60/1	21	75
		D	220-240/50/1	21	75
	G12	A	208-230/60/1	31	50
		D	220-240/50/1	55	50

CONTROL	CUT OUT		CUT IN	
Therm-O-Disc	49°C	120°F	35°C	95°
Low Pressure Control	0.9 Kg/cm²	13 PSI	3.1 Kg/cm	45 PSI
Hi Pressure Control	35.2 Kg/cm²	500 PSI	Reset. Manual	Reset. Manual
Fan Cycling Control	13 Kg/cm²	180 PSI	17.5 Kg/cm²	250 PSI
Head Pressure Control	15.1 Kg/cm²	215 Cerrado	17 Kg/cm²	240 abierto

MODEL G-2 A

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
5/5 C	1.1707317	2.9/1.7	7.5	7.0/6.8	5.6/5.4	3.4	0.96
21/10 C	15.1/12.9	3.4/1.8	10.6	10.4/10.2	8.5/8.4	1.0	1.03
26/21 C	17.4/15.5	4.0/2.1	12.9	12.0/11.7	10.0/9.8	0.8	0.93
32/21 C	17.9/20.5	4.4/2.0	16.4	13.6/13.0	11.5/10.7	0.6	0.99
32/32 C	20.5/17.4	3.9/1.9	16.4	13.6/13.2	11.5/10.8	0.6	0.98
43/38 C	27.3/22.4	6.2/2.1	28.3	17.3/14.8	15.1/14.6	0.5	1.05

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
40/40 F	137/116	41/24	7.5	99/97	80/77	3.4	2.12
70/50 F	215/183	48/26	10.6	148/145	121/119	1.0	2.28
80/70 F	248/220	57/30	12.9	170/167	142/139	0.8	2.06
90/70 F	254/291	63/28	16.4	193/185	164/152	0.6	2.18
90/90 F	291/248	55/27	16.4	194/187	164/154	0.6	2.16
110/100 F	388/318	88/30	28.3	246/211	215/208	0.5	2.32

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-2 W

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
5/5 C	17.5/17.3	3.4/2.0	9.6	10.4/9.8	8.6/8.2	0.8	1.00
21/10 C	17.4/17.3	3.4/2.0	10.8	10.4/10.1	9.0/8.8	0.8	1.00
26/21 C	17.6/17.4	4.1/2.0	13.0	10.9/10.6	9.4/9.1	0.7	1.00
32/21 C	17.9/17.5	5.0/2.1	13.5	11.1/10.8	9.6/9.4	0.7	1.00
32/32 C	18.5/17.6	4.9/2.1	14.4	12.9/12.0	10.3/10.9	0.7	0.98
43/38 C	21.7/18.7	5.8/2.0	19.3	13.2/12.8	11.5/11.2	0.6	0.96

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
40/40 F	249/246	48/28	9.6	148/140	122/116	0.8	2.22
70/50 F	248/246	49/28	10.8	148/144	128/125	0.8	2.22
80/70 F	250/247	59/28	13.0	155/151	133/130	0.7	2.20
90/70 F	254/249	71/30	13.5	158/153	136/133	0.7	2.20
90/90 F	263/250	70/30	14.4	183/170	146/155	0.7	2.16
110/100 F	308/266	82/29	19.3	188/182	163/159	0.6	2.12

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-4 A

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
5/5 C	10.5/9.2	3.5/2.5	8.5	6.3/5.8	5.4/5.1	4.0	1.86
21/10 C	15.5/14.1	3.7/2.5	13.1	9.6/9.1	7.6/6.9	1.1	2.1
26/21 C	17.6/16.2	3.9/2.5	16.9	10.6/9.9	8.6/8.2	0.9	2.2
32/21 C	20.3/18.6	5.5/2.6	19.9	11.8/11.2	9.6/8.9	0.8	2.2
32/32 C	20.3/18.6	4.5/2.8	22.6	11.9/11.3	9.6/9.3	0.8	2.2
43/38 C	25.0/23.2	5.1/2.7	33.7	13.4/12.5	10.8/10.3	0.7	2.2

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
40/40 F	150/131	50/35	8.5	90/82	77/73	4.0	4.1
70/50 F	221/200	53/35	13.1	133/129	108/98	1.1	4.73
80/70 F	250/231	55/35	16.9	151/141	122/117	0.9	4.76
90/70 F	289/264	64/37	19.9	168/159	136/127	0.8	4.78
90/90 F	289/264	64/40	22.6	169/162	136/132	0.8	4.78
110/100 F	356/330	72/38	33.7	191/178	154/146	0.7	4.86

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-4 W

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
5/5 C	17.6/17.4	3.4/2.2	13.5	8.7/8.5	7.1/6.8	1.5	2.13
21/10 C	17.2/17.4	3.4/2.2	14.6	9.1/8.9	7.1/6.8	1.3	2.13
26/21 C	17.2/17.4	3.8/2.3	15.0	9.9/9.5	7.8/7.5	1.2	2.13
32/21 C	17.2/17.4	3.9/2.3	17.5	9.6/9.2	7.6/7.3	1.2	2.18
32/32 C	19.4/18.9	4.5/2.5	19.4	10.5/10.1	8.6/8.1	1.2	2.18
43/38 C	21.2/20.9	5.0/2.6	25.4	11.3/10.8	9.3/8.8	1.0	2.22

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

MODEL G-4 W

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
40/40 F	250/247	48/31	13.5	124/121	97/93	1.5	4.70
70/50 F	252/247	49/31	14.6	129/126	101/97	1.3	4.70
80/70 F	252/247	54/32	15.0	141/135	112/107	1.2	4.70
90/70 F	252/247	55/32	17.5	136/131	108/104	1.2	4.80
90/90 F	276/269	64/36	19.4	150/144	122/115	1.2	4.80
110/100 F	301/297	71/37	25.4	160/153	132/125	1.0	4.9

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-5 A

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
5/5 C	13.7/12.4	3.0/2.0	9.75	9.9/9.8	7.0/6.8	1.0	2.2
21/10 C	15.7/14.3	3.1/2.0	10.5	10.1/10.3	7.2	.9	2.2
26/21 C	15.8/14.6	3.4/2.3	11.2	10.2/10.5	7.2	.9	2.2
32/21 C	20.6/18.7	3.5/2.2	15.6	13.1/13.2	9.6/9.5	.8	2.2
32/32 C	20.7/18.9	3.6/2.3	16.7	13.2	9.6/9.4	.8	2.2
43/38 C	25.8/23.5	4.1/2.4	22.5	15.8/16.0	12.1/12.0	.6	2.2

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
40/40 F	195/176	42/29	9.8	141/139	99/97	1.0	4.8
70/50 F	223/203	45/29	10.5	143/146	102	.9	4.8
80/70 F	225/207	48/32	11.2	145/149	103/102	.9	4.8
90/70 F	293/266	50/31	15.6	186/187	136/135	.8	4.8
90/90 F	294/269	51/32	16.7	188	137/134	.8	4.8
110/100 F	367/334	59/34	22.4	225/227	172/171	.6	4.9

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-5 W

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
5/5 C	17.5/17.2	3.1/1.9	11.9	9.8	6.8	1.3	2.3
21/10 C	17.7/17.5	3.2/2.0	12.8	9.9/10.1	7.0/6.9	1.3	2.2
26/21 C	17.6/17.1	3.2/1.9	13.8	10.6/10.9	7.4/7.3	1.2	2.2
32/21 C	17.6/17.3	3.3/2.0	14.3	10.7/11.0	7.5/5.6	1.2	2.2
32/32 C	18.3/17.7	3.4/2.1	15.7	11.6/11.8	8.3/8.2	1.0	2.2
43/38 C	21.0/19.5	3.6/2.1	17.7	12.6	9.0/8.8	.9	2.2

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
40/40 F	249/244	44/27	11.9	140	97/96	1.3	5.0
70/50 F	252/249	46/28	12.8	141/143	99/98	1.3	4.9
80/70 F	250/243	46/27	13.8	151/155	105/104	1.2	4.8
90/70 F	250/246	47/29	14.3	152/156	107/80	1.2	4.8
90/90 F	260/252	49/30	15.7	165/168	118/117	1.0	4.8
110/100 F	298/278	51/30	17.7	179	128/125	.9	4.9

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-7 A

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	16.5/15	2.6/1.7	9.5	10.8/11.1	5.5/5.6	1.25	2.25
26/21 C	19.2/16.9	4/2.4	11.5	12.3	10.6	1	2.28
32/21 C	21.3/18.9	4.2/2.3	14	13.4/13.9	7	1	2.26
32/32 C	21.8/19.1	3.1/1.8	15	13.8/13.9	7.1	.75	2.26
43/38 C	25.7/23	3.6/1.9	23.5	16.3	8.5	.75	2.35

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

MODEL G-7 A

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	234/214	37/24	9.5	153/158	78/80	1.25	4.98
80/70 F	273/240	58/34	11.5	175	151	1	5.04
90/70 F	303/268	60/33	14	191/197	100	1	5.00
90/90 F	310/272	44/26	15	196/198	101	.75	5.00
110/100 F	365/327	51/27	23.5	232	121	.75	5.20

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-7 W

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	17.5/17.8	2.7/1.8	10	10.5	5.6	1.5	2.4
26/21 C	10.6/10.5	2.9/1.8	12.5	11.3/10.9	5.9/5.6	1.25	2.3
32/21 C	17.9/17.4	2.7/1.8	12	11.3	5.9	1.25	2.4
32/32 C	18.6/18.1	2.9/1.9	13	12.4	6.2/6.7	1	2.3
43/38 C	20.7/19	3.2/1.8	16.5	12.4/12.9	6.7/6.9	1	2.5

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	2249/253	38/26	10	150	79	1.5	5.19
80/70 F	251/250	41/26	12.5	160/155	84/79	1.25	5.17
90/70 F	255/248	38/26	12	160	84	1.25	5.2
90/90 F	265/258	41/27	13	177	88/95	1	5.09
110/100 F	295/270	46/25	16.5	176/183	95/98	1	5.47

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-7 R

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	14.6/15.2	2.2/3.4	8.6	10.9/11.3	9.2/9.6	1.0	2.2
26/21 C	15.5/17.1	1.8/2.8	10.9	12.2/14.4	6.1/10.3	1.0	2.3
32/21 C	17.9/18.9	2.0/3.0	11.7	13.9/14.3	7.5/7.8	0.8	2.2
32/32 C	18.2/19.1	1.6/3.0	12.3	14.3/14.6	7.1/7.9	0.8	2.2
43/38 C	22.6/24.7	2.3/3.4	17.1	17.7/22.7	9.9/10.4	0.7	2.2

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	207/216	31/49	8.6	155/161	131/137	1.0	4.9
80/70 F	221/243	26/40	10.9	174/205	87/146	1.0	5.1
90/70 F	255/268	28/42	11.7	197/203	106/111	1.0	5.0
90/90 F	259/271	23/43	12.3	203/207	101/112	0.8	4.8
110/100 F	321/351	49/32	17.1	252/323	141/148	0.7	4.8

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-10 A

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	16.8/14.9	2.7/1.7	9.5	10.8/11.1	5.9/5.8	1	2.75
26/21 C	18.7/16.8	3/1.8	10	12	6.8/6.5	1	2.57
32/21 C	20.9/18.9	3/1.9	12.25	13.6/13.4	7.8/7.6	.75	2.83
32/32 C	21.2/18.9	3.1/1.9	12	13.8/13.6	7.7/7.6	.75	2.67
43/38 C	26.1/23.1	3.8/2.0	18.5	16.7/16.6	9.7/9.6	.5	3.02

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	239/212	38/24	9.5	153/157	84/82	1	6.06
80/70 F	266/239	42/25	10	171	96/93	1	5.66
90/70 F	297/268	43/27	12.25	193/191	111/108	.75	6.23
90/90 F	301/268	44/27	12	196/194	110/108	.75	6.10
110/100 F	371/328	54/28	18.5	238/236	138/136	5	6.86

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-10 W

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	17.4/17.1	2.9/1.9	8.6	11.3	5.8	1.3	6.5
26/21 C	17.4/17.1	3.1/1.9	9.75	11.9	6.0	1.25	2.90
32/21 C	17.5/17.2	3.0/1.9	10	11.9	6.0	1.25	2.88
32/32 C	18.5/18.2	3.1/1.9	11.25	12.6	6.5	1	2.90
43/38 C	19.9/19.1	3.1/2.0	12.5	13.1	6.6	1	2.80

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	248/243	41/27	8.6	161	83	1.3	6.5
80/70 F	248/243	44/27	9.75	169	85	1.25	6.40
90/70 F	249/244	43/26	10	169	86	1.25	6.36
90/90 F	263/259	45/27	11.25	179	92	1	6.40
110/100 F	283/272	45/28	12.5	186	94	1	6.17

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-10 R

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	16.1/16.3	1.1/2.3	8.5	11.0	5.8	1.3	2.9
26/21 C	16.3/18.5	1.8/2.8	9.6	12.1	6.3	1.1	2.8
32/21 C	19.0/20.4	1.9/3.0	10.8	14	7.3	1.0	2.8
32/32 C	18.8/20.7	1.9/3.0	11.4	13.9	7.2	0.9	2.7
43/38 C	23.3/25.6	2.0/3.3	15.0	17.3	9.1	0.9	2.6

Measurments in metric units (Pressure = KG/CM2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	229/232	16/32	8.5	156	82	1.3	6.3
80/70 F	232/263	25/40	9.6	172	90	1.1	6.2
90/70 F	270/290	27/42	10.8	199	104	1.0	6.1
90/90 F	267/294	27/43	11.4	198	103	0.9	6.0
110/100 F	332/364	28/47	15.0	246	130	0.8	5.7

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-12 A

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	16.9/14.8	2.7/1.8	9	11.7	5/5.7	1.25	2.21
26/21 C	19.7/17.4	3/1.8	11	13.3	6.1/6.6	1.25	2.21
32/21 C	21.9/19.5	3.1/2	12.5	15.2	6.8/7.7	1	2.15
32/32 C	21.8/19.3	3/1.9	14.25	14.6/15.1	6.8/7.6	1	2.28
43/38 C	29.6/23.1	4.3/1.8	24.5	17.8	8.2/9.0	.75	2.59

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	241/210	38/26	9	167	71/81	1.25	4.88
80/70 F	280/247	42/26	11	189	87/94	1.25	4.88
90/70 F	311/278	44/28	12.5	216	98/100	1	4.74
90/90 F	310/274	43/27	14.25	208/215	98/108	1	5.03
110/100 F	421/329	61/26	24.5	253	117/128	.75	5.71

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-12 W

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	17.1/16.7	2.8/1.8	9.75	11.7	6.1/5.7	1.5	2.29
26/21 C	17.2/16.9	2.8/1.8	11	12.3	6.5/6.0	1.25	2.26
32/21 C	17.6/17.0	3.0/1.8	11	12.5/12.2	6.5/6.0	1.25	2.26
32/32 C	19.5/18	3.1/1.9	12.5	12.9/13.4	7.1/6.3	1	2.21
43/38 C	21.8/20.1	3.3/1.9	15	13.6/13.8	7.4/6.6	1	2.26

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	243/238	40/25	9.75	166	87/81	1.5	5.05
80/70 F	244/241	40/26	11	175	92/86	1.25	5.00
90/70 F	250/242	42/25	11	178/173	92/86	1.25	5.00
90/90 F	278/256	44/27	12.5	184/190	101/89	1	4.87
110/100 F	310/286	47/27	15	193/196	105/94	1	4.99

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

MODEL G-12 R

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Kg
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
21/10 C	16.8/18.7	1.8/2.8	9.9	11.5	5.3/5.8	1.5	2.2
26/21 C	17.1/19.3	1.8/2.9	10.8	12.4	5.8/6.3	1.5	2.1
32/21 C	19.3/21.2	1.9/3.0	11.9	14.1	6.8/7.3	1.2	2.1
32/32 C	19.0/21.4	1.9/3.0	12.7	14.1	6.8/7.5	1.2	2.1
43/38 C	23.9/26.7	2.2/3.4	16.1	17.9	9.1/9.6	0.8	2.1

Measurments in metric units (Pressure = KG/CM^2 / Temperatures = Celsius / Ice Weight = KG)

These are average statistics. Your particular figures will vary.

AMBIENT TEMPERATURE DEGREES	FREEZE CYCLE			HARVEST CYCLE			ICE WEIGHT Lb.
AIR/WATER	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	HEAD PRESSURE	SUCTION PRESSURE	CYCLE TIME MINUTES	
70/50 F	239/266	25/40	9.9	163	76/82	1.5	4.9
80/70 F	243/274	26/41	10.8	177	83/90	1.5	4.7
90/70 F	274/302	27/42	11.9	200	96/104	1.2	4.7
90/90 F	270/305	27/43	12.7	200	97/107	1.2	4.6
110/100 F	340/380	31/49	16.1	255	130/136	0.8	4.6

Measurments in US Standard Units (Pressure = PSI / Temperature = Fahrenheit / Ice Weight = Pounds)

Servend

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