



R Model Flake & Nugget

Technician's Handbook

This manual is updated as new information and models are released. Visit our website for the latest manual.
www.manitowocice.com

America's #1 Selling Ice Machine
Part Number 000007661 7/11

Read These Before Proceeding:

Caution

Proper installation, care and maintenance are essential for maximum performance and trouble-free operation of your Manitowoc equipment. If you encounter problems not covered by this handbook, do not proceed, contact Manitowoc Foodservice Group. We will be happy to provide assistance.

Important

Routine adjustments and maintenance procedures outlined in this handbook are not covered by the warranty.

Warning

PERSONAL INJURY POTENTIAL

Do not operate equipment that has been misused, abused, neglected, damaged, or altered/modified from that of original manufactured specifications.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision concerning use of the appliance by a person responsible for their safety.

We reserve the right to make product improvements at any time. Specifications and design are subject to change without notice.

Table of Contents

General Information

Model Numbers	7
Self Contained	
Air & Water-Cooled Models	7
QuietQube Remote Air-cooled Models with Remote Condensing Units	8
Rack Units	8
Model/Serial Number	9
Manitowoc Cleaner and Sanitizer	9
Ice Machine Warranty Information	9

Installation

Location of Ice Machine	11
Installation Requirements	11
Potable Water Requirements	12
Drain Connections	12
Ice Machine Clearance Requirements	13
Cooling Tower Applications (Water-Cooled Models Only)	14
Heat of Rejection	15
RF Models	15
RN Models	15
Electrical Service	15
Voltage	15
Fuse/Circuit Breaker	16
Ground Fault Interrupter Circuit (GFIC)	16

Maintenance

Cleaning and Sanitizing	17
Exterior Cleaning	17
RF Model Cleaning/Sanitizing	18
Removal of Parts for Cleaning/Sanitizing	24
Ice Chute Removal - RFS Models	26
Ice Chute Removal - RF Models	28
Ice Chute Switch Actuator Removal	29
RN Models Cleaning/Sanitizing	30
Cleaning the Condenser	32
Removal from Service/Winterization	33

Operation

Ice Making Sequence of Operation	35
RF0244/RF0266/RF0385/RF0388/RF0399	35
RF0300	35
RF0650/RF1200/RF2300	36
RF1200C/RF2300C	37
RF1200C/RF2300C	38
RN0400	39
RN1000/RN1400	40
RN1000C/RN1200C	41
Thermostat Settings	43
RF Models	43

Troubleshooting

Electrical Flowcharts	45
RF0244/RF0266RF0385//RF00388/ RF0399 Air & Water	46
RF0300 Air & Water	51
RF0650/RF1200 Air & Water	56
RF-2300 Air & Water	61
RN1000/RN1400 Air & Water	68
RN1000C/RN1200c QuietQube Remote Condensing Unit	76
RF1200C QuietQube	86
RF2300C QuietQube	92
Capillary Tube Models	99
Thermostatic Expansion Valve Models .	100

Component Specifications

Bin Thermostat	101
Low Temperature Thermostat	101
High Pressure Cutout (HPCO) Control	101
Low Pressure Cutout (LPCO) Control	102
Fan Cycle Control	102
Filter-Driers	103
Suction Cleanup Filter-Drier	103
Total System Refrigerant Charge	104

Charts

Cycle Times/24-Hour Ice Production/ Refrigerant Pressure Charts	105
Flake Ice Machines	106
RF0244A	106
RF0266A	107
RF0385A	108
RF0388A	109
RF0399A	110
RF0300A & RFS0300A	111
RF0650A & RFS0650A	112
RF1200A & RFS1200A	113
RF1200W & RFS1200W	114
RF1278c	115
RF2300A	116
RF2300W	117
RF2378c	118
Nugget Models	119
RN1000A	119
RN1000W	120
RN1400A	121
RN1400W	122
Rn1078c	123
Rn1278c	124
Rack Models	125
RF1279R	125
RF2379R	126

Diagrams

Wiring Diagrams	127
Flake Models	128
RF0244/RF0266/RF0385/RF0388/RF0399 Air-Cooled	128
RF0300 Air-Cooled	130
RF0650 - RF1200 Air-Cooled	132
RF1200 Water-Cooled	134
RF1200C QuietQube Head Section ..	136
RF2300 Air-Cooled & Water-cooled ..	138
RF2300C QuietQube Head Section ..	140
Rack Models	142
RF1279R Head Section	142
RF2379R Head Section	144
Nugget Models	146
RN1000/RN1400 Air & Water Cooled	146
RN1000C/RN1200C QuietQube Head Section	147
Condensing Units	148
RCU Condensing Unit 1ph	148
RCU Condensing Unit 3ph	149
Refrigeration Tubing Schematics	150
Flake Models	150
RF0244/RF0266/RF0388/RF0399 RF0300/RF0650 Air-cooled	150
RF1200 Air-cooled	152
RF1200 Water-cooled	154
RF2300 Air-cooled	156
RF2300 Water-cooled	158
RF1200C QuietQube Head Section & RCU1075 Condensing Unit	160
RF2300C QuietQube Head Section & RCU2375 Condensing Unit	162
Nugget Models	164
RN1000/RN1400 Air & Water-cooled .	164
RN1000C/RN1200C QuietQube Head Section & RCU1075/RCU1275 Condensing Unit	166

General Information

Model Numbers

SELF CONTAINED AIR & WATER-COOLED MODELS

Flake Models			
Self Storage Air-Cooled	Self Storage Water-Cooled	Modular Air-Cooled	Modular Water- Cooled
RF0244A	–	–	–
RF0266A	–	–	–
RFS0266A	–	–	–
RF0385A	–	–	–
RF0388A	–	–	–
RF0399A	–	–	–
–	–	RF0300A	–
–	–	RFS0300A	–
–	–	RFS0644A	–
–	–	RF0650A	RF0650W
–	–	RFS0650A	RFS0650W
–	–	RF1200A	RF1200W
–	–	RFS1200A	RFS1200W
–	–	RF2300A	RF2300W
Nugget Models			
Self Storage Air-Cooled	Self Storage Water-Cooled	Modular Air-Cooled	Modular Water- Cooled
–	–	RN1008A	RN1009W
–	–	RN1408A	RN1409W

QUIETQUBE REMOTE AIR-COOLED MODELS WITH REMOTE CONDENSING UNITS

Flake Models	
QuietQube Head	RCU Remote Condensing Unit
RF1278C	RCU1075
RF2378C	RCU2375
Nugget Models	
QuietQube Head	RCU Remote Condensing Unit
RN1078C	RCU1075
RN1278C	RCU1275

RACK UNITS

Flake Models	
Head Section	Rack Remote Condensing Unit
RF1279R	Supplied by Others
RF2379R	Supplied by Others

NOTE: Rack units share a common refrigeration circuit with other equipment, such as display cases and glass door freezer displays. Rack units have been modified to function with rack systems and will not function correctly with RCU condensing units.

Model/Serial Number

These numbers are required when requesting information from your local Manitowoc Distributor, or Manitowoc Ice. The model and serial number are listed on the MODEL/SERIAL NUMBER DECAL affixed to the ice machine.

Manitowoc Cleaner and Sanitizer

Manitowoc Ice Machine Cleaner and Sanitizer are available in 16 oz. (473 ml) bottles. These are the only cleaner and sanitizer approved for use with Manitowoc products.

Cleaner Part Number		Sanitizer Part Number	
16 oz.	000000084	16 oz.	9405653
1 gal	N/A	1 gal.	9405813

Ice Machine Warranty Information

Warranty information for all ice machine models is available on our website at www.manitowocice.com.

This Page Intentionally Left Blank

Installation

Location of Ice Machine

The location selected for the ice machine must meet the following criteria. If any of these criteria are not met, select another location.

- The location must be free of airborne and other contaminants.
- The location must not be near heat-generating equipment or in direct sunlight.
- The location must be capable of supporting the weight of the ice machine and a full bin of ice.
- The location must allow enough clearance for water, drain and electrical connections in the rear of the ice machine.
- The location must not obstruct airflow through or around the ice machine.

Installation Requirements

- The air temperature must be at least 50°F (10°C), but must not exceed 110°F (43°C).
- The water temperature must be at least 40°F (4°C), but must not exceed 90°F (32°C).
- The ice machine and bin must be level.
- Vent the ice machine and bin drains separately.
- Bin drain termination must have an air gap.
- RF Models Only: A backflow preventer is required on water inlet lines.
- Routine adjustments and maintenance procedures outlined in this manual are not covered by the warranty.

Potable Water Requirements

- Plumbing must conform to local codes.
- Do not connect the ice machine to a hot water supply. Be sure all hot water restrictors installed for other equipment are working. (Check valves on sink faucets, dishwashers, etc.)
- If water pressure exceeds maximum pressure (70 psig [483 kPa] RN1000; 80 psig [552 kPa] for all other models) obtain a water pressure regulator from your Manitowoc distributor.
- A water shut-off valve is required to clean the ice machine.
- A union for both the ice making and condenser water lines is required.
- Water inlet lines require insulation to prevent condensation.
- RF Models: A backflow preventer is required on water inlet lines.

Drain Connections

- Drain lines must have a 1.5 inch drop per 5 feet of run (2.5 cm per meter), and must not create traps.
- The floor drain must be large enough to accommodate drainage from all drains.
- Separate insulated bin and water-cooled condenser drain lines are required.
- The bin and ice machine drains require a vent.

Ice Machine Clearance Requirements

Head Sections	Self-Contained Air-Cooled	Self-Contained Water-Cooled*	QuietQube Air-Cooled
Back	5" (12.7 cm)	5" (12.7 cm)	0" (0 cm)
Sides/Top	8" (20.3 cm)	8" (20.3 cm)	0" (20 cm)

RCU Units	Remote Condensing Unit*
Front/Back	24" (61.0 cm)
Sides/Top	6" (15.2 cm)*

* Water-Cooled Only - There is no minimum clearance required. This value is recommended for efficient operation and servicing only.

NOTE: Allowance must be made for removal when the ice machine is built-in. Monthly removal of the top panel is required for cleaning and sanitizing.

Cooling Tower Applications (Water-Cooled Models Only)

A water cooling tower installation does not require modification of the ice machine. The water regulator valve for the condenser continues to control the refrigeration discharge pressure.

It is necessary to know the amount of heat rejection, and pressure drop through the condenser and water valves (inlet and outlet) when using a cooling tower on an ice machine.

- Water entering the condenser must not be lower than 37°F (3°C) or exceed 90°F (32°C).
- Water flow through the condenser must not exceed 5 gal. (19 L) per minute.
- Allow for a pressure drop of 7 psi (48 kPa) between the condenser water inlet and the outlet of the ice machine.
- Water exiting the condenser must not exceed 110°F (43°C).

Heat of Rejection

RF MODELS

Model	Heat of Rejection ¹
RF0244	2,400 BTUH (605 Kcal/hr)
RF0266	2,400 BTUH (605 Kcal/hr)
RF0385	3,500 BTUH (882 Kcal/hr)
RF0388	3,500 BTUH (882 Kcal/hr)
RF0399	3,500 BTUH (882 Kcal/hr)
RF0300/ RFS0300	3,500 BTUH (882 Kcal/hr)
RF0650	7,700 BTUH (1941 Kcal/hr)
RF1200	14,000 BTUH (3529 Kcal/hr)
RF1279R	7850 BTUH (1978 Kcal/hr)
RF2300	29,500 BTUH (7436 Kcal/hr)
RF2379R	15700 BTUH (3956 Kcal/hr)

RN MODELS

Series Ice Machine	Heat of Rejection ¹	
	Air-Cooled	Water-Cooled
RN1000 - 50/60 Hz	11,300 BTU/hr (2848 Kcal/hr)	12,800 BTU/hr (3226 Kcal/hr)
RN1400 - 50 Hz	16,000 BTU/hr (4032 Kcal/hr)	16,400 BTU/hr (4133 Kcal/hr)
RN1400 - 60 Hz	15,500 BTU/hr (3906 Kcal/hr)	15,500 BTU/hr (3906 Kcal/hr)

¹ The figure shown is an average.

Electrical Service



Warning

All wiring must conform to local, state and national codes.

VOLTAGE

The maximum allowable voltage variation is $\pm 10\%$ of the rated voltage on the ice machine model/serial number plate at compressor start-up.

FUSE/CIRCUIT BREAKER

A separate fuse/circuit breaker must be provided for each ice machine. Circuit breakers must be H.A.C.R. rated (does not apply in Canada).



Warning

The ice machine must be grounded in accordance with national and local electrical codes.

GROUND FAULT INTERRUPTER CIRCUIT (GFIC)

A GFCI/GFI circuit protection is not recommended with our equipment. If a GFCI/GFI is required by code a GFCI/GFI breaker rather than outlet must be used to avoid intermittent nuisance trips.

Maintenance

Cleaning and Sanitizing

Maintenance procedures covered in this manual are not covered by the warranty.



Caution

Use only Manitowoc approved Ice Machine Cleaner (part number 000000084) and Sanitizer (part number 9405653). Do not mix Cleaner and Sanitizer solutions together. It is a violation of Federal law to use these solutions in a manner inconsistent with their labeling. Read and understand all labels printed on bottles before use.



Warning

Wear rubber gloves and safety goggles (and/or face shield) when handling ice machine Cleaner or Sanitizer.

EXTERIOR CLEANING

Remove dust and dirt off exterior surfaces with mild household dish-washing detergent and warm water. Wipe dry with a clean, soft cloth.

RF MODELS CLEANING/SANITIZING PROCEDURES

Cleaning/Sanitizing Procedure

This procedure must be performed once every month.

- All ice must be removed from the bin
- The ice machine and bin must be disassembled cleaned and sanitized
- The ice machine produces ice with the cleaner and sanitizer solutions
- All ice produced during the cleaning and sanitizing procedure must be discarded

Procedure to Clean/Sanitize

Use Ice Machine Cleaner part number 000000084.

Use Ice Machine Sanitizer part number 9405653.

Step 1 Remove front and top covers and set the toggle switch to the OFF position.

Step 2 Remove all ice from the bin.

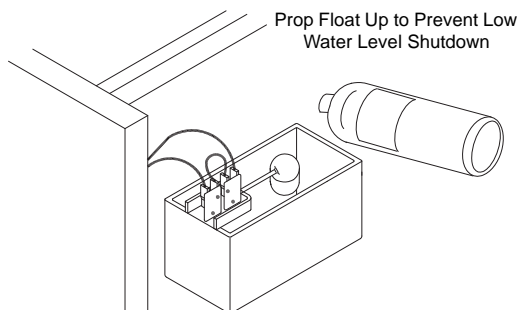
Step 3 Turn off the ice making water supply and drain water from evaporator and reservoir.

Step 4 Remove the top cover from water reservoir.

Step 5 Follow the chart and premix cleaner and water.

Amount of Water	Amount of Cleaner Part Number 000000084
1 gallon (4 Liters)	3 ounces (90 ml)

Step 6 Fill the evaporator and reservoir with cleaning solution.



Step 7 Move the toggle switch to the ON position. The ice machine will make ice with the cleaning solution and deposit the ice in the bin. Add the remaining cleaner/water solution as the water level in the reservoir drops.

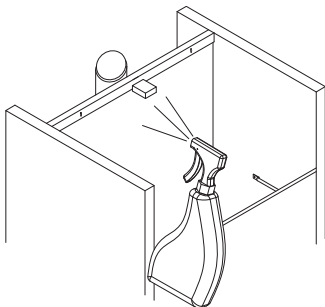
NOTE: Do not allow the cleaner/water level to drop below the minimum water level. The ice machine will discontinue the cleaning cycle if the water float switch opens.

Step 8 After all of the cleaner/water solution has been added turn on the ice making water supply. Continue the freeze cycle for 10 minutes to remove the cleaning solution from the water circuit.

Step 9 Place the toggle switch in the OFF position.

Step 10 Refer to disassembly for cleaning/sanitizing and remove parts for hand cleaning/sanitizing.

- Hand clean all parts
- Rinse all parts with clear potable water
- Sanitize all parts - do not rinse after sanitizing
- Spray all interior bin surfaces with sanitizer (do not rinse sanitized areas).
- Spray evaporator discharge spout



Step 11 Reassemble ice machine.

Step 12 Turn off the ice making water supply.

Step 13 Refer to chart and premix water and sanitizer.

Amount of Water	Amount of Sanitizer
1 Gallons (4 L) Water	1/2 ounce (15 ml)

Step 14 Fill the evaporator and reservoir with sanitizer/water solution.

Step 15 Move the toggle switch to the ON position. The ice machine will make ice with the sanitizer/water solution and deposit the ice in the bin. Add the remaining sanitizer/water solution when the water level in the reservoir drops.

NOTE: Do not allow the sanitizer/water level to drop below the minimum water level. The ice machine will discontinue the cleaning cycle if the water float switch opens.

Step 16 After all of the sanitizer/water solution has been added to the reservoir, turn on the ice making water supply.

Step 17 Continue the freeze cycle for 30 minutes and then discard all ice produced.

Heavily Scaled Cleaning Procedure

Perform this procedure if you have some or all of these symptoms.

- Excessive grinding, popping or squealing noises from the evaporator
- Grinding noise from gearbox
- Ice machine trips speed sensor

NOTE: A Cleaning/Sanitizing Procedure must be performed after this procedure.

Procedure to Clean Heavily Scaled Flake Ice Machines

Step 1 Remove front and top covers and set the toggle switch to the OFF position.

Step 2 Remove all ice from the bin.

Step 3 Turn off the ice making water supply.

Step 4 Remove the top cover from water reservoir.

Step 5 Refer to chart below:

Premix cleaner with lukewarm water in a non-metallic container.

Model	Water Reservoir Capacity	Mix Cleaner and Water Use Ice machine nickel safe cleaner, part number 00000084 only	
		Cleaner	Water
RF0244 RF0266 RF0385 RF0388 RF0399	14 oz (400 ml)	9 oz (266 ml)	5 oz (148 ml)
RF0300 RF0650	17 oz (500 ml)	11 oz (325 ml)	6 oz (177 ml)
RF1200	34 oz (1 L)	23 oz (680 ml)	11 oz (325 ml)
RF2300	68 oz (2 L)	46 oz (1.3 L)	22 oz (650 ml)

Step 6 Remove all water from the evaporator and water reservoir. Add the entire cleaner/water solution and re-install the reservoir cover.

Leave the cleaner/water solution in the evaporator for a minimum of 4 hours.

Step 7 Remove all cleaner/water from the evaporator and water reservoir.

Step 8 Follow the standard cleaning and sanitizing procedures.

REMOVAL OF PARTS FOR CLEANING/SANITIZING

Warning

Disconnect electric power to the ice machine at the electric switch box and wear rubber gloves and safety goggles (or face shield) while handling cleaner or sanitizer.

Caution

Do not mix Cleaner and Sanitizer solutions together. It is a violation of Federal law to use these solutions in a manner inconsistent with their labeling.

1. Turn off the water supply to the ice machine at the water service valve.
2. Remove the components listed on the following pages for cleaning and sanitizing.
3. Soak the removed part(s) in a properly mixed solution of cleaner and water.

Solution Type	Water	Mixed With
Cleaner	1 gal. (4 L)	16 oz (500 ml) cleaner Part Number 000000084

4. Use a soft-bristle brush or sponge (NOT a wire brush) to carefully clean the parts.
5. Use the solution and a brush or sponge to clean all disassembled components and the inside of the bin.
6. Rinse all cleaned parts with clear water.
7. Mix a solution of sanitizer and water.

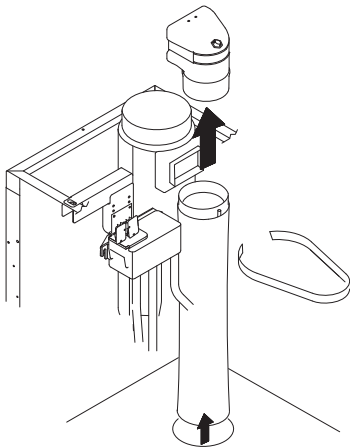
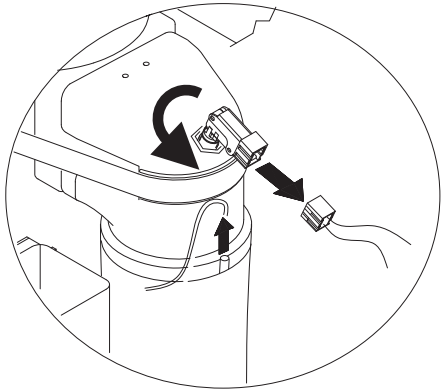
Solution Type	Water	Mixed With
Sanitizer	3 gal. (11 L)	2 oz (60 ml) sanitizer Part Number 94-0565-3

8. Soak the parts in the sanitizer/water solution for 10 minutes. Use the sanitizer/water solution and a sponge to sanitize all removed components and the inside of the bin. Do not rinse the sanitized parts.
9. Continue with step 11 of the cleaning/sanitizing procedure.

ICE CHUTE REMOVAL - RFS MODELS

RFS0300/RFS0650/RF1200/RF2300 Only

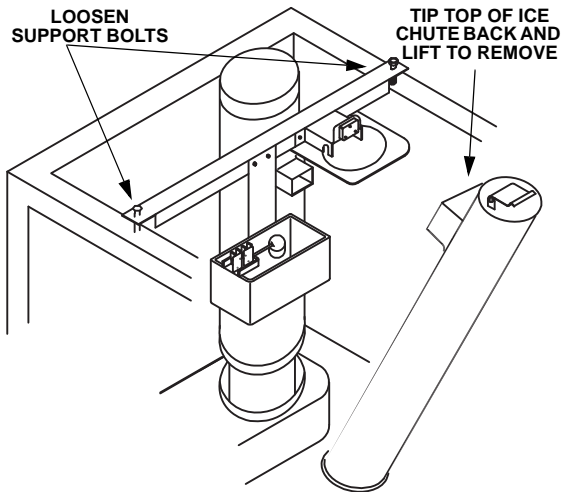
1. Place the toggle switch in the OFF position, turn off the water supply and disconnect electrical power to the ice machine.
2. Disconnect water supply.
3. Remove water reservoir cover.
4. Remove microswitch and bin thermostat from the ice chute.
5. Remove retainer, ice chute elbow and ice chute.



ICE CHUTE REMOVAL - RF MODELS

RFS0300/RFS0650/RF1200/RF2300 Only

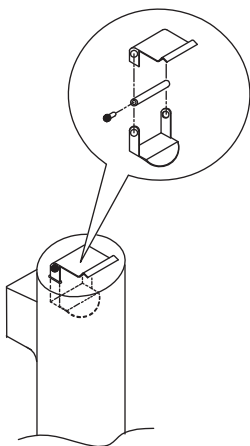
1. Place the toggle switch in the OFF position, turn off the water supply and disconnect electrical power to the ice machine.
2. Disconnect water supply.
3. Remove water reservoir cover.
4. Remove bin thermostat from ice chute.
5. Loosen bolts holding cross member.
6. Lift cross member and remove ice chute.



ICE CHUTE SWITCH ACTUATOR REMOVAL

RFS0300/RFS0650/RF1200/RF2300 Only

1. Pull to remove nylon end cap.
2. Slide pin to remove.
3. Remove both sections of the pressure switch bracket.



**INCORRECT REASSEMBLY CAN
RESULT IN AN ICE MACHINE
THAT WILL NOT RUN**

RN MODELS CLEANING/SANITIZING PROCEDURE

Use Ice Machine Cleaner part number 000000084.

Use Ice Machine Sanitizer part number 94-0565-3.

Step 1 Remove all ice from the bin/dispenser.

Step 2 Remove front and top covers.

Step 3 Mix a solution of cleaner and water.

Amount of Luke Warm Water	Amount of Cleaner Part Number 000000084
1 gallon (4 Liters)	4 ounces (120 ml)

Step 4 To start a cleaning cycle, depress the CLEAN switch to drain the water from the evaporator. Wait for the LOW WATER light to energize.

Step 5 Remove cover from the cleaning cup and add cleaner/water solution until the HI WATER light energizes, then replace cleaning cup cover. The machine will clean and then flush three times in approximately twelve minutes.

Step 6 While the ice machine is in the clean cycle, prepare for the sanitizing cycle by mixing a solution of sanitizer and water.

Amount of Luke Warm Water	Amount of Sanitizer Part Number 94-0565-3
1 gallon (4 L) Water	1/2 ounce (15 ml)

Step 7 To start a sanitize cycle, depress the clean switch to drain the water from the evaporator. Wait for the LOW WATER light to energize.

Step 8 Remove cover from the cleaning cup and add sanitizer/water solution until the HI WATER light energizes, then replace cleaning cup cover. The machine will sanitize and then flush three times in approximately twelve minutes.

Step 9 Press the OFF switch, then unscrew the ice chute connector.

Step 10 Using disposable food service grade gloves insert one dry sponge into the transport tube going to the evaporator (NOT the tube going to the bin), then insert one sponge soaked in the sanitizer water solution. With the pusher tube supplied with the sponge kit, push sponges all the way down the transport tube 16 inches (41 cm) or the length of the pusher tube.

Step 11 Reconnect chute connector and press the ON switch. Allow the ice machine to run for 10 minutes, then press the OFF switch. Catch and remove all sponges and ice from the bin/dispenser.

Step 12 Clean and sanitize the bin/dispenser:

- Disconnect power to the dispenser to prevent injury.
- Use the cleaner and sanitizer ratios from the charts on the previous page.
- Heavy accumulations of scale will require removal of components for cleaning and sanitizing.
- Rinse parts with clear water after cleaning - do not rinse parts after sanitizing.

Step 13 Spray all interior bin/dispenser surfaces with sanitizer (do not rinse sanitized areas).

Step 14 Place rocker switch in the ON position and reinstall all removed panels.

4. Lift out ice damper.

5. Remove ice deflector.

A. Remove the two thumbscrews.

CLEANING THE CONDENSER

Warning

Disconnect electric power to the ice machine at the electric service switch before cleaning the condenser. The condenser fins are sharp. Use care when cleaning them.

Air-Cooled Condenser

Clean the condenser at least every six months. Follow the steps below.

1. Some models have a washable aluminum filter. Clean the filter with a mild soap and water solution.
2. Shine a flashlight through the condenser to check for dirt between the fins. Blow compressed air through the condenser fins from the inside or use a commercial condenser coil cleaner. Follow the directions and cautions supplied with the cleaner.
3. Straighten any bent condenser fins with a fin comb.
4. Carefully wipe off the fan blades and motor with a soft cloth. Do not bend the fan blades. If the fan blades are excessively dirty, wash with warm, soapy water and rinse thoroughly.

Warning

If you are cleaning the condenser fan blades with water, cover the fan motor to prevent water damage.

Removal from Service/Winterization

Caution

If water is allowed to remain in the ice machine in freezing temperatures, severe damage to some components could result. Damage of this nature is not covered by the warranty.

Follow the procedure below.

1. Disconnect the electric power at the circuit breaker or the electric service switch.
2. Turn off the water supply.
3. Disconnect and drain the incoming ice-making water line at the rear of the ice machine.
4. Disconnect drain tubing and drain water into container and discard.
5. Make sure water is not trapped in any of the water or drain lines.
6. Water cooled - Use compressed air to remove all water from the condenser.

This Page Intentionally Left Blank

Operation

Ice Making Sequence of Operation

NOTE: Flake ice machines use an auger to remove ice from the evaporator. Occasional noises (creaks, groans, squeaks, or pops) are a normal part of the ice making process.

RF0244/RF0266/RF0385/RF0388/RF0399

Self-Contained Air-Cooled

When the toggle switch is placed in the “ON” position the following controls must be in the closed position before the ice machine will start:

- A. Bin Thermostat
- B. Low Evaporator Temperature Thermostat
- C. Low Water Level Switch

Placing the toggle switch in the ON position starts the gear motor and refrigeration system. The float valve controls the water inlet valve and water level. The freeze cycle ends when ice contacts the bin thermostat. The ice machine will restart when ice no longer contacts the bin thermostat.

RF0300

Self-Contained Air-Cooled

When the toggle switch is placed in the “ON” position the following controls must be in the closed position before the ice machine will start:

- A. Bin Thermostat
- B. Low Evaporator Temperature Thermostat
- C. Ice Chute Safety Switch
- D. Low Water Level Switch

Placing the toggle switch in the ON position starts the gear motor and a 10 minute compressor time delay. The compressor starts and the float valve controls the water inlet valve and water level. The freeze cycle ends when ice contacts the bin thermostat. The ice machine remains off until ice no longer contacts the bin thermostat.

RF0650/RF1200/RF2300

Self-Contained Air-Cooled

When the toggle switch is placed in the ON position the following controls must be in the closed position before the ice machine will start:

- A. Bin Thermostat
- B. High Pressure Cut-out Switch
- C. Ice Chute Safety Switch
- D. Low Pressure Switch
- E. Low Water Level Switch

Placing the toggle switch in the ON position starts the gear motor. After the rotation speed sensor verifies 10 minutes of correct rotation the time delay ends and the compressor starts. The ice machine will continue to make ice until ice contacts the bin thermostat. The ice machine remains off until ice no longer contacts the bin thermostat.

RF1200C/RF2300C

QuietQube Remote Air-cooled Models with Remote Condensing Unit

When the toggle switch is placed in the ON position the following controls must be in the closed position before the ice machine will start:

- A. Bin Thermostat
- B. High Pressure Cut-out Switch
- C. Ice Chute Safety Switch
- D. Low Pressure Switch
- E. Low Water Level Switch

Placing the toggle switch in the ON position starts the gear motor. After the rotation speed sensor verifies 10 minutes of correct rotation the time delay ends and the liquid line solenoid valve opens.

- When the refrigerant pressure is high enough to close the low-pressure control the contactor coil energizes and the compressor starts.
- The refrigerant pressure will increase and close the fan cycling pressure control and the condenser fan motor starts.

The ice machine will continue to make ice until ice contacts the bin thermostat and the liquid line solenoid valve closes and the refrigeration system pumps down.

- The refrigerant pressure drops and the fan cycling pressure control opens stopping the condenser fan motor.
- When the refrigerant pressure is low enough to open the low pressure control, the contactor coil is de-energized and the compressor stops.

The ice machine remains off until ice no longer contacts the bin thermostat.

RF1200C/RF2300C

Head Section with Rack Refrigeration system

When the toggle switch is placed in the ON position the following controls must be in the closed position before the ice machine will start:

- A. Bin Thermostat
- B. Ice Chute Safety Switch
- C. Low Water Level Switch

Placing the toggle switch in the ON position starts the gear motor. After the rotation speed sensor verifies 10 minutes of correct rotation the time delay ends and the liquid line and suction solenoid valves energize.

The ice machine will continue to make ice until ice contacts the bin thermostat and the liquid line and suction solenoid valves close.

The ice machine remains off until ice no longer contacts the bin thermostat.

RN0400

Self-Contained Air-cooled & Water-Cooled

NOTE: Ice machines use an auger to remove ice from the evaporator. Occasional noises (creaks, groans, squeaks, or pops) are a normal part of the ice making process.

Operation

The ice machine will not start until:

- A. The compressor rocker switch is moved to "ON".
- B. Ice does not contact the bin thermostat bulb.
- C. The water reservoir is full of water.

With power supplied and the compressor rocker switch in the ON position, the gear motor and refrigeration system start. The float valve controls the water inlet valve and water level. The freeze cycle ends when ice contacts the bin thermostat. A 20 minute delay period initiates. The ice machine will restart when ice no longer contacts the bin thermostat and the 20 minute delay period expires.

RN1000/RN1400

Self-Contained Air-Cooled & Water-Cooled

NOTE: Ice machines use an auger to remove ice from the evaporator. Occasional noises (creaks, groans, squeaks, or pops) are a normal part of the ice making process.

Operation

The ice machine will not start until:

- A. The rocker switch is moved to ON.
- B. The transport tube shuttle switch is closed.
- C. The water reservoir is full of water.

Placing the toggle switch in the ON position starts the gear motor and refrigeration system. The water level sensor controls the water inlet valve and water level. The freeze cycle ends when ice contact opens the transport tube switch. A 60 minute time delay period initiates. The ice machine will restart when the ice transport tube switch closes and the 60 minute time delay period expires.

Flush Cycle

The ice machine will automatically flush the evaporator.

The refrigeration system will shut down and the gear motor will continue to run. After the flush is complete, the machine will refill and start the refrigeration system without a time delay.

RN1000C/RN1200C

QuietQube Remote Air-cooled Model with Remote Condensing Unit

NOTE: Ice machines use an auger to remove ice from the evaporator. Occasional noises (creaks, groans, squeaks, or pops) are a normal part of the ice making process.

Operation

The ice machine will not start until:

- A. The rocker switch is moved to ON.
- B. The transport tube switch is closed.
- C. The water reservoir is full of water.

Placing the toggle switch in the ON position starts the gear motor and energizes the liquid line solenoid valve. The refrigerant pressure at the condensing unit increases and the low pressure switch closes and starts the refrigeration system. The water level sensor controls the water inlet valve and water level. The freeze cycle ends when ice contact opens the transport tube switch. The liquid line solenoid valve closes and the refrigerant pressure at the condensing unit drops. The low pressure switch opens and turns off the refrigeration system. A 60 minute time delay period initiates. The ice machine will restart when the ice transport tube switch closes and the 60 minute time delay period expires.

Ice Production/Quality Check

QUALITY CHECK

Ice quality varies with ambient and water temperatures, and is measured by the amount of water in the ice. Generally speaking, higher incoming water temperature results in lower ice quality. Lower water temperature results in higher ice quality.

ICE PRODUCTION CHECK

NOTE: Ice production checks that are within 10% of the charted capacity are considered normal due to variances in air and water temperatures. Actual temperatures will seldom match the chart exactly.

1. Run the ice machine a minimum of 10 minutes to allow the system to stabilize.
2. Catch the ice in a non-perforated container for 7 minutes and 12 seconds or for more accuracy 14 minutes and 24 seconds.
3. Weigh the container and ice, then deduct the weight of the container.
4. Convert ounces to pounds.
5. Example: 3 lbs. 12 oz. converts to 3.75 lbs.
6. (12 oz. \div 16 oz. = .75 lb.)
7. Determine the 24-hour ice production capacity.
 - A. 7 minutes 12 seconds = Multiply the total ice weight by 200.
 - B. 14 minutes 24 seconds = Multiply the total ice weight by 100.

Thermostat Settings

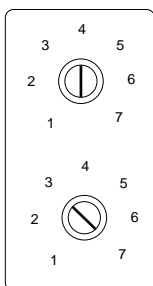
RF MODELS

Bin Thermostat:

The bin thermostat sensing bulb is located in the ice chute on modular models and in the bin thermostat holder on the right side of the bin on self storage models. The bin thermostat turns the ice machine on and off as the level of ice in the bin changes. Use the initial setting from the chart and adjust as required.

Evaporator Low Temperature Safety Thermostat:

The evaporator low temperature safety thermostat protects the ice machine if the evaporator temperature is too cold. Refer to chart for correct setting.



Bin Thermostat
Small Numbers = Less ice in bin
Large Numbers = More ice in bin
Start at Chart Setting, then adjust as required

Evaporator Low Temperature Safety Thermostat
Refer to chart for setting
Incorrect settings will cause ice machine to shut off prematurely

Thermostat Setting Chart

Model	Bin Thermostat Setting	Evaporator Thermostat Setting
RF0244	5	5
RF0266	5	5
RF0388	5	7
RF0399	5	7
RF0300	4	7
RF0650	4	N/A
RF1200	5	N/A
RF2300	5	N/A

This Page Intentionally Left Blank

Troubleshooting

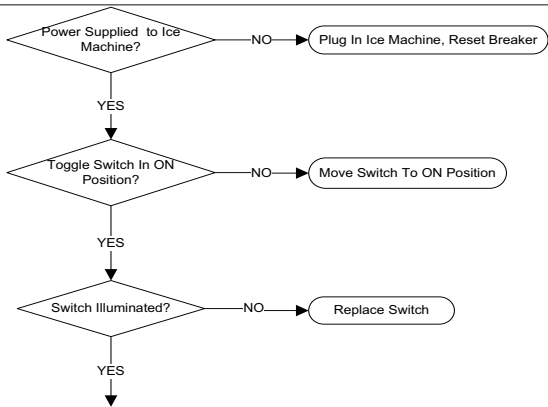
Electrical Flowcharts

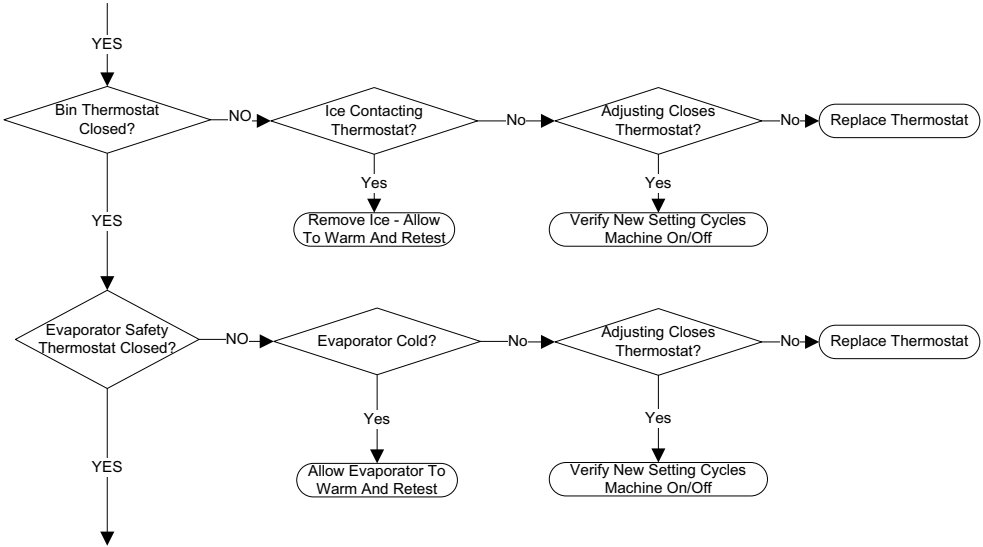
Diagnostic troubleshooting for the ice machine involves following flowcharts that are dependant on symptoms of the failed machine.

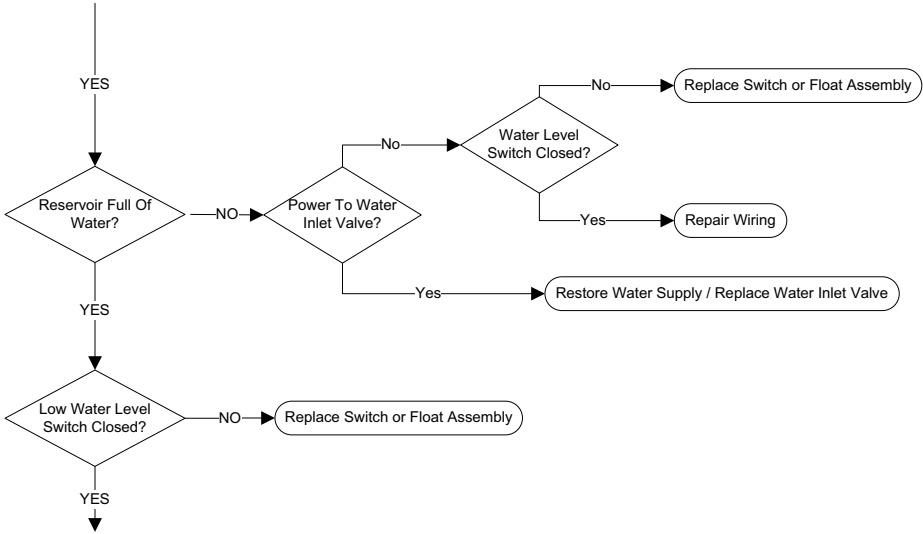
Follow the flowcharts for the failure symptom and model you are working on.

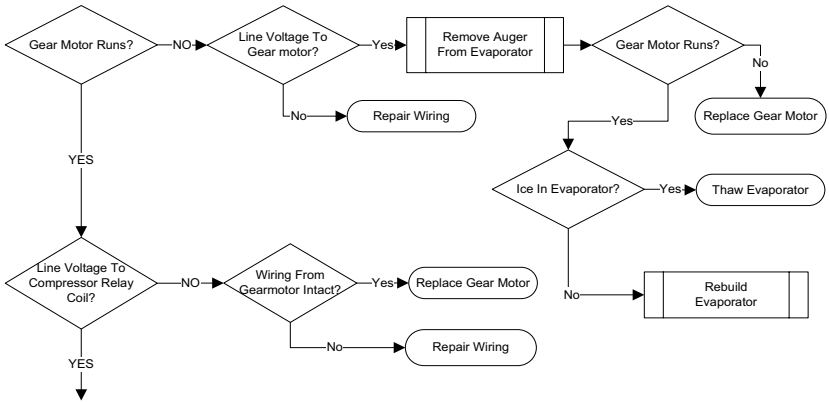
NOTE: Refer to the sequence of operation to determine where in the sequence the ice machine has failed. An example would be an ice machine that energizes the gear motor, but the compressor does not energize. Following the electrical flowchart will quickly and easily eliminate non issues.

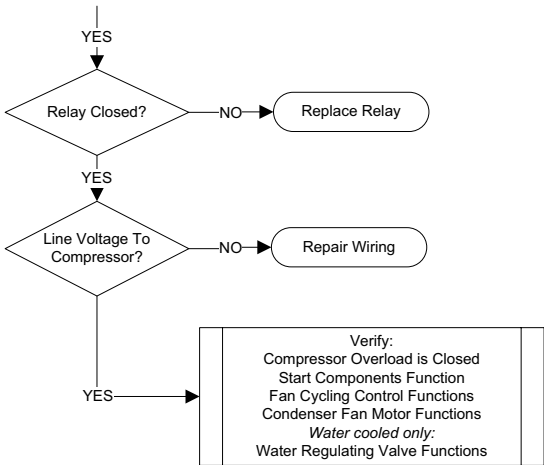
Electrical Flowchart – RF0244/RF0266/RF0385/RF0388/RF0399 Air & Water



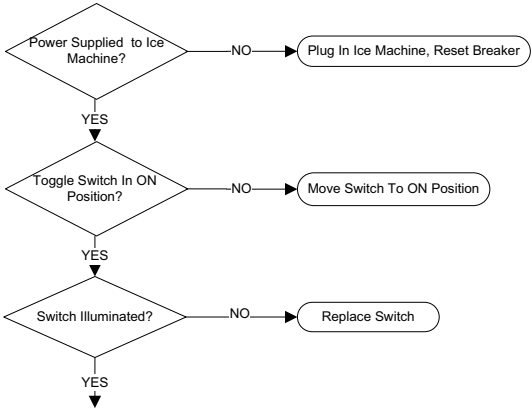


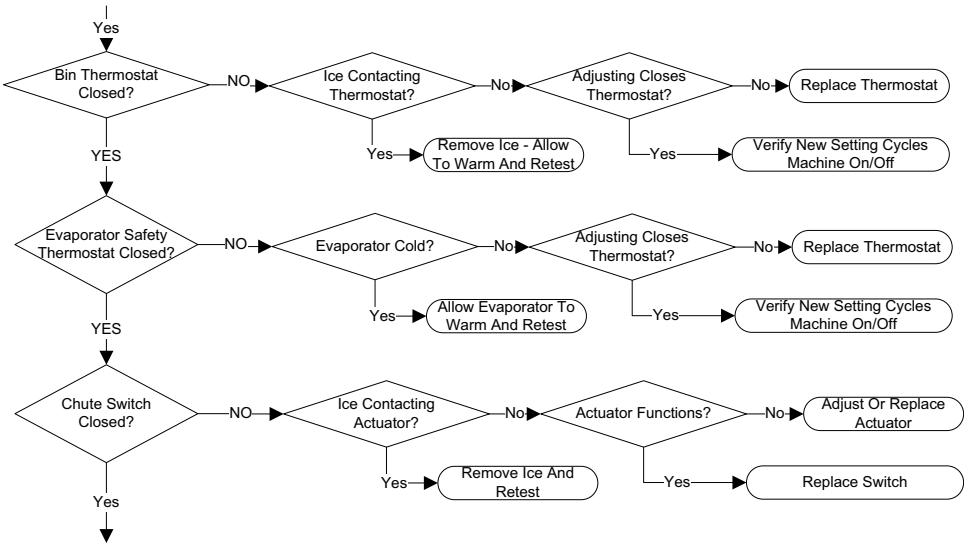


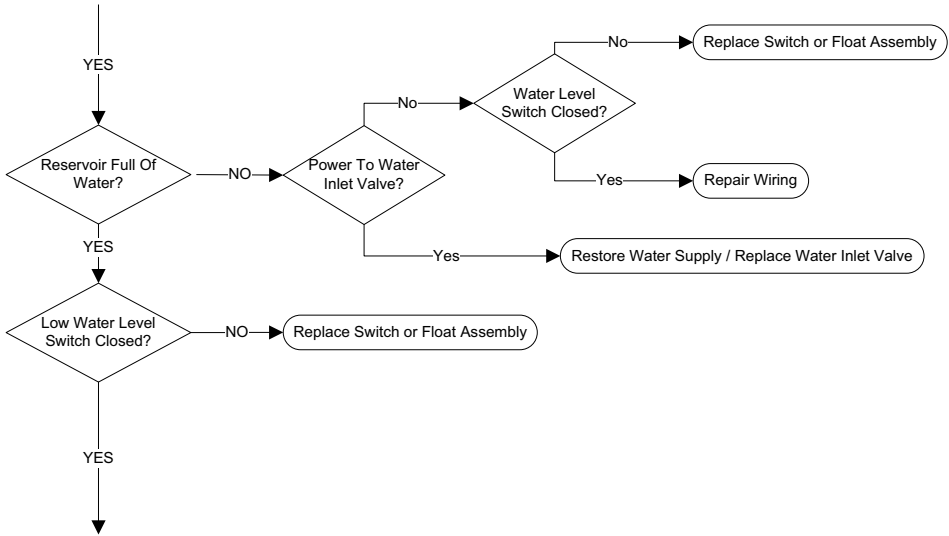


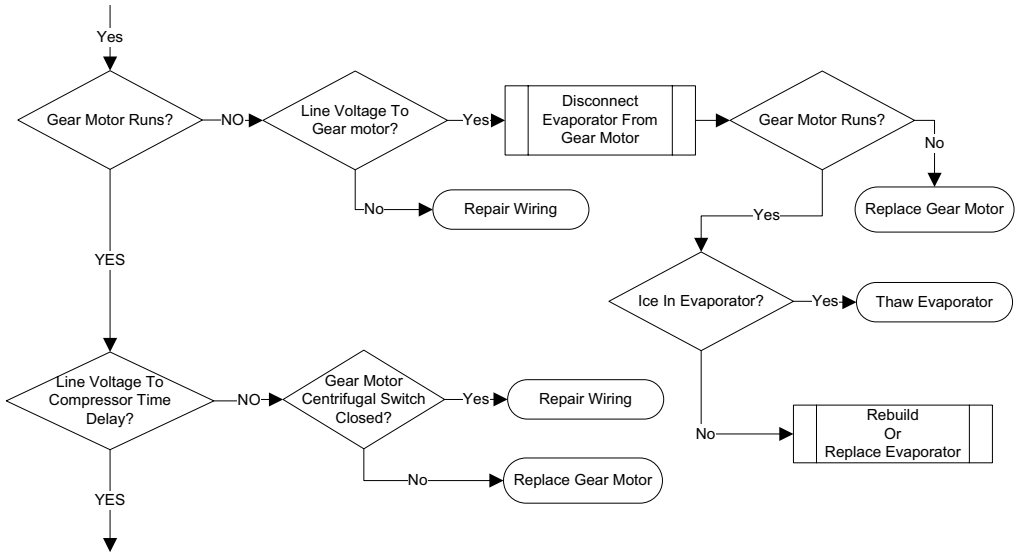


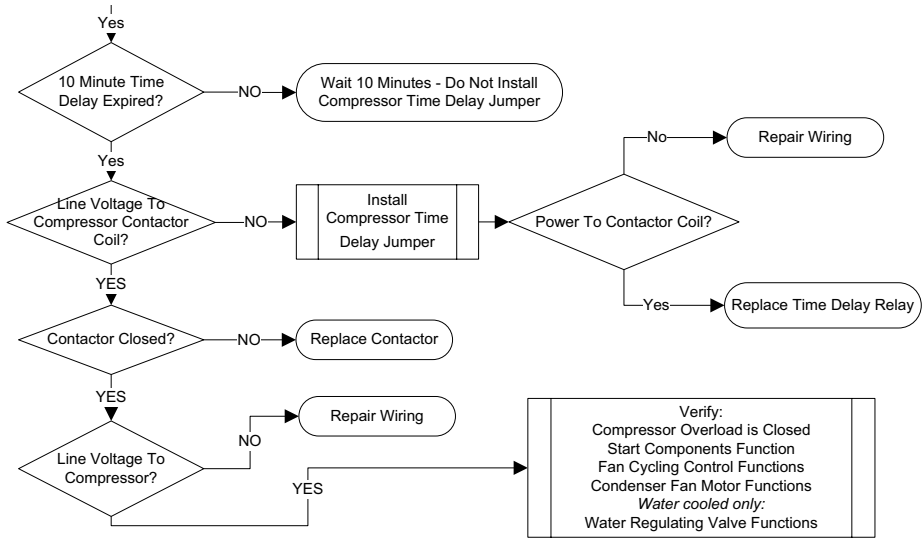
Electrical Flowchart – RF0300 Air & Water



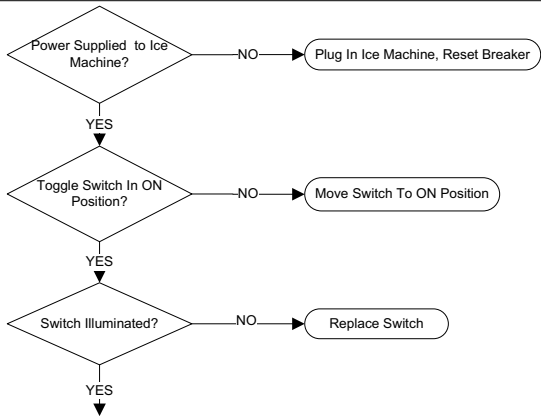


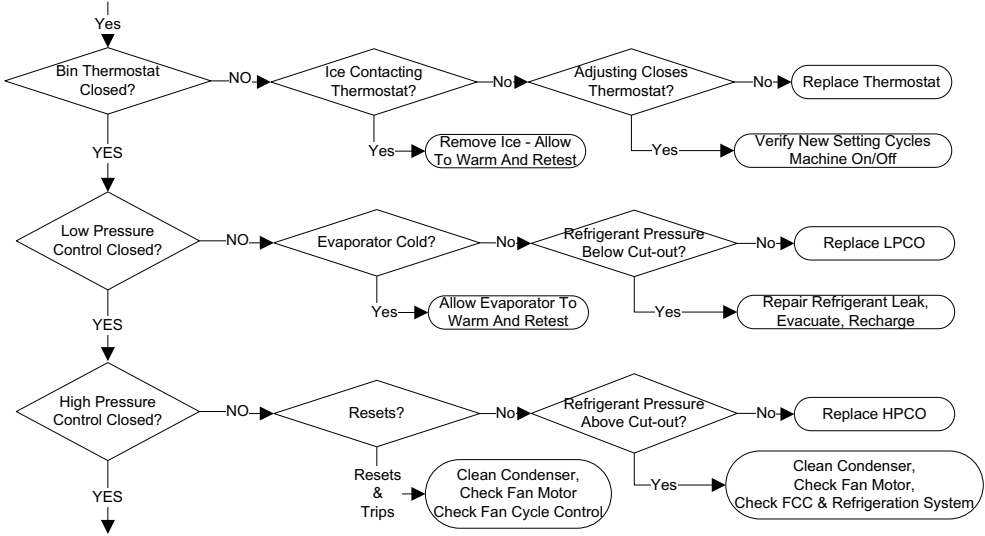


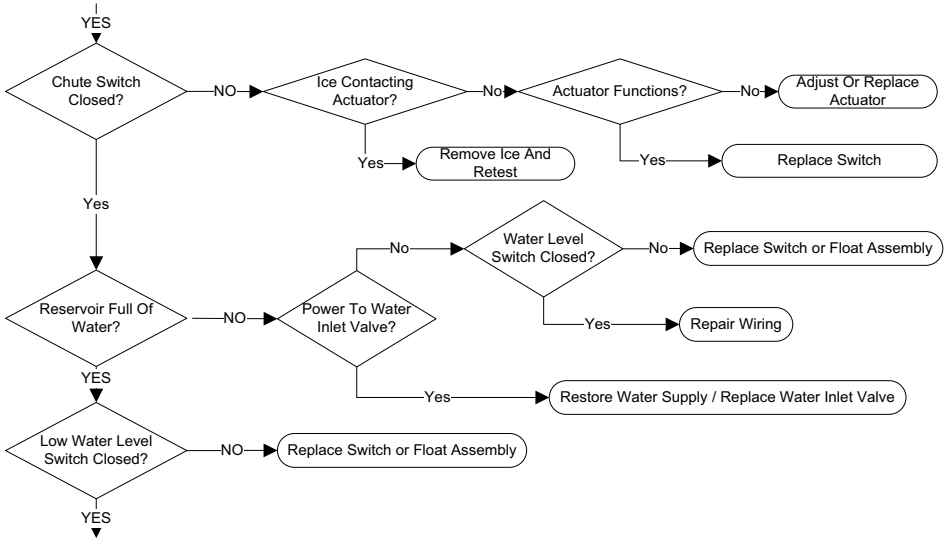


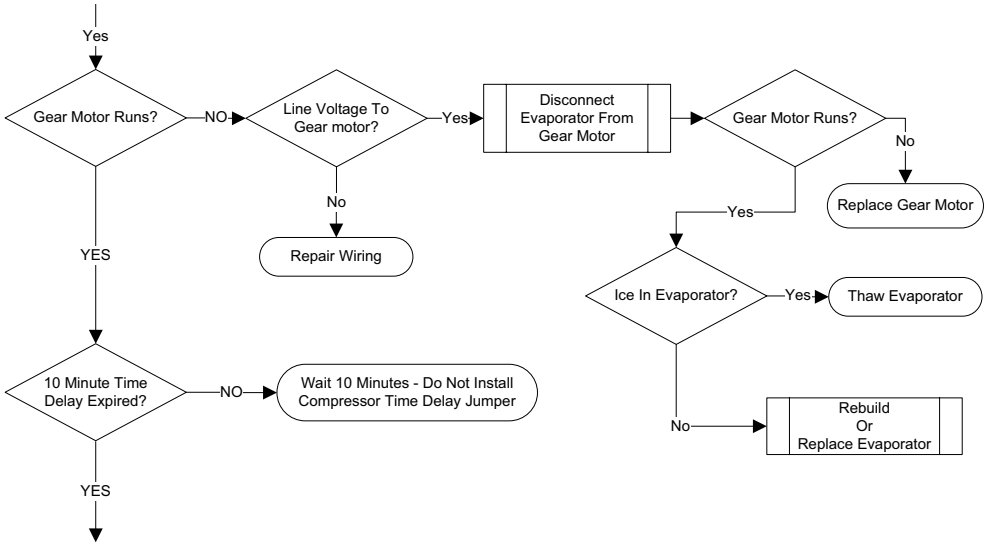


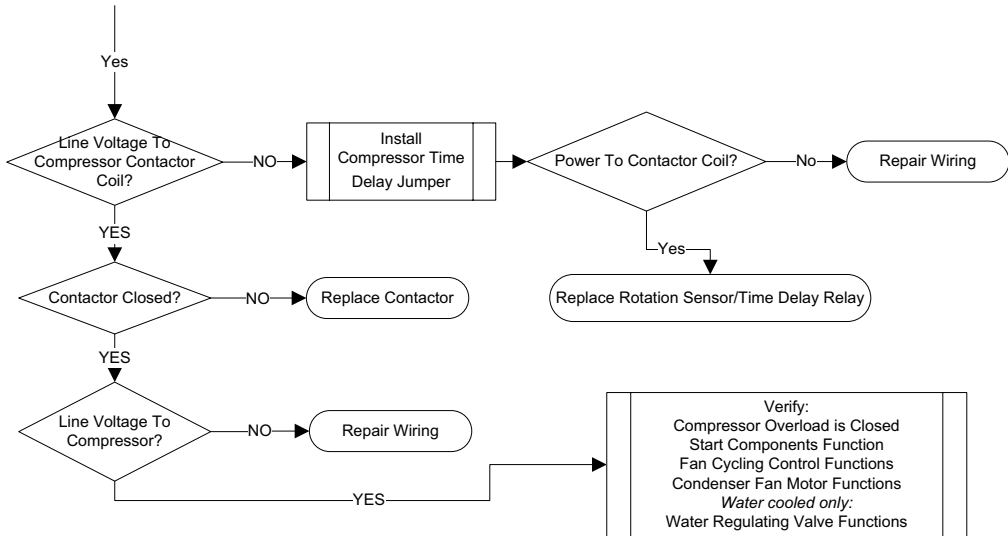
Electrical Flowchart - RF0650/RF1200 Air & Water



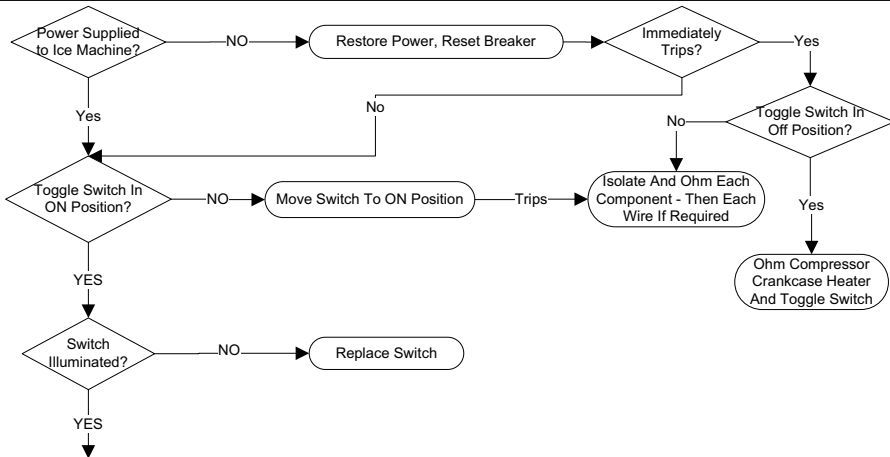


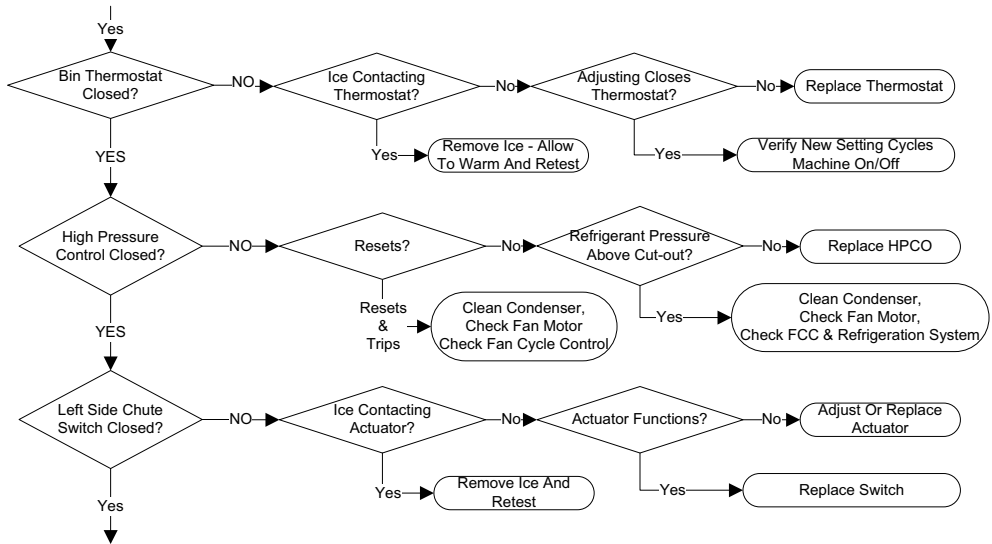


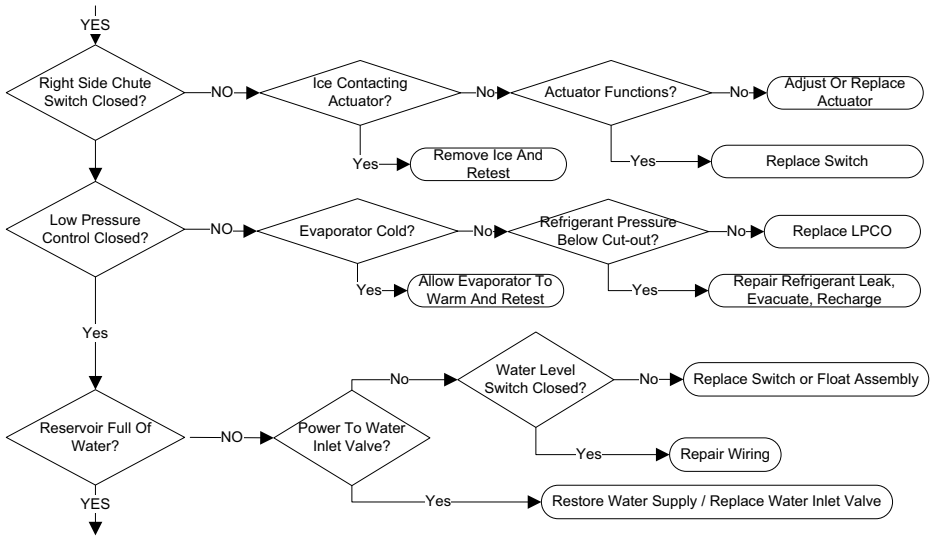


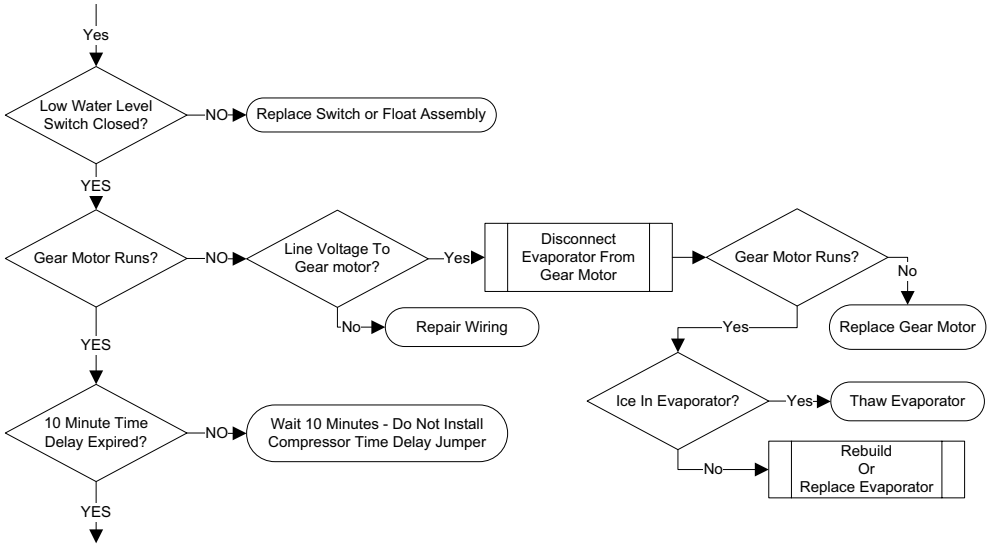


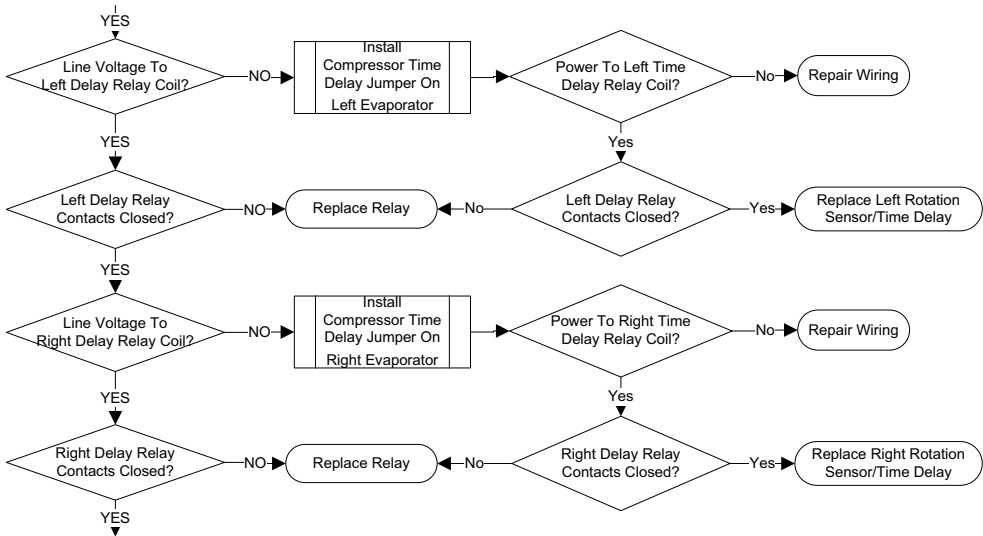
Electrical Flowchart – RF2300 Air & Water

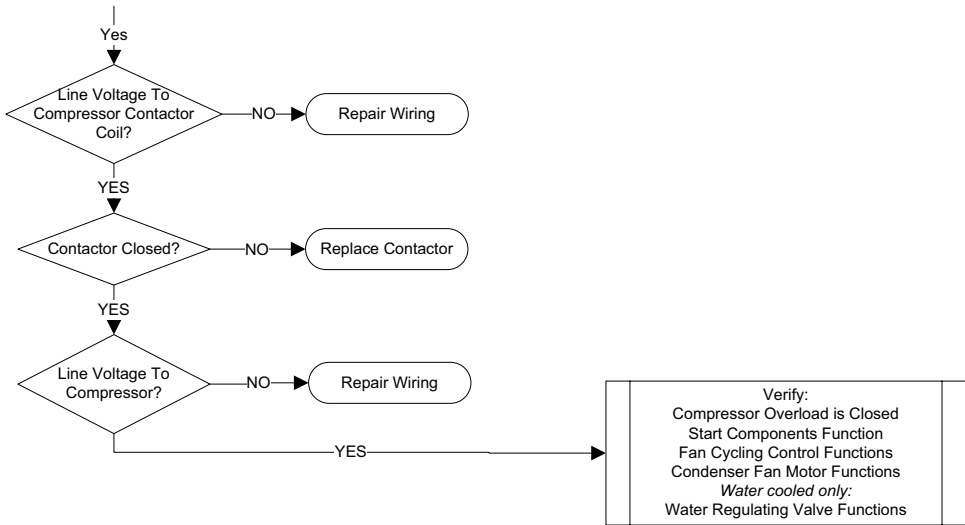




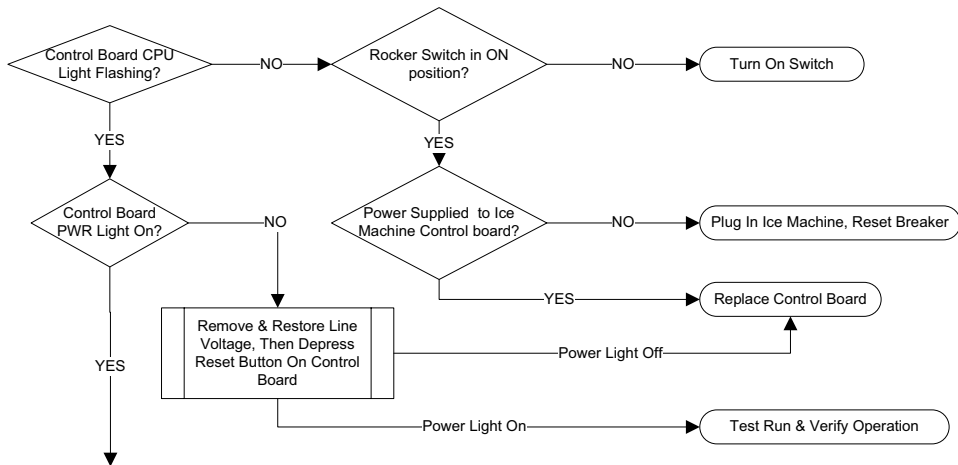


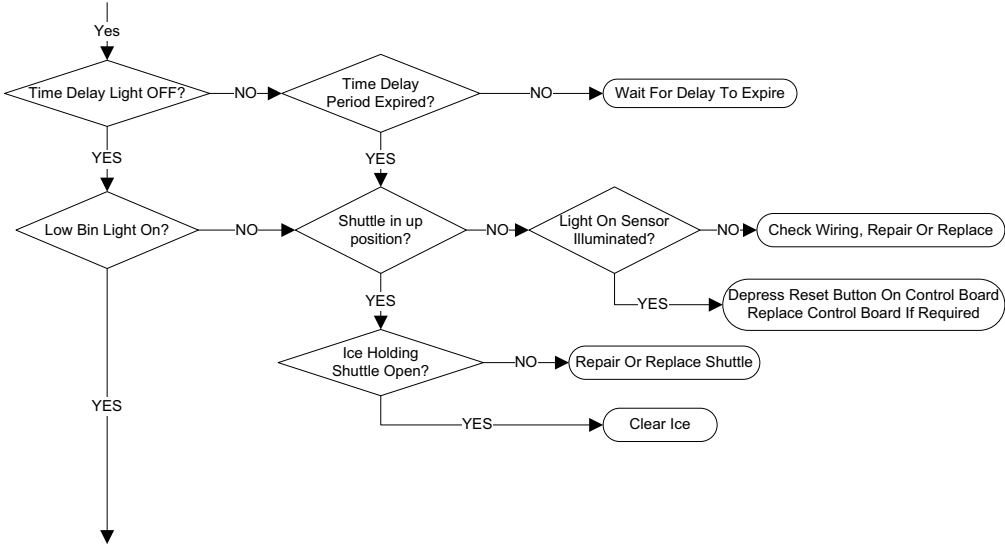


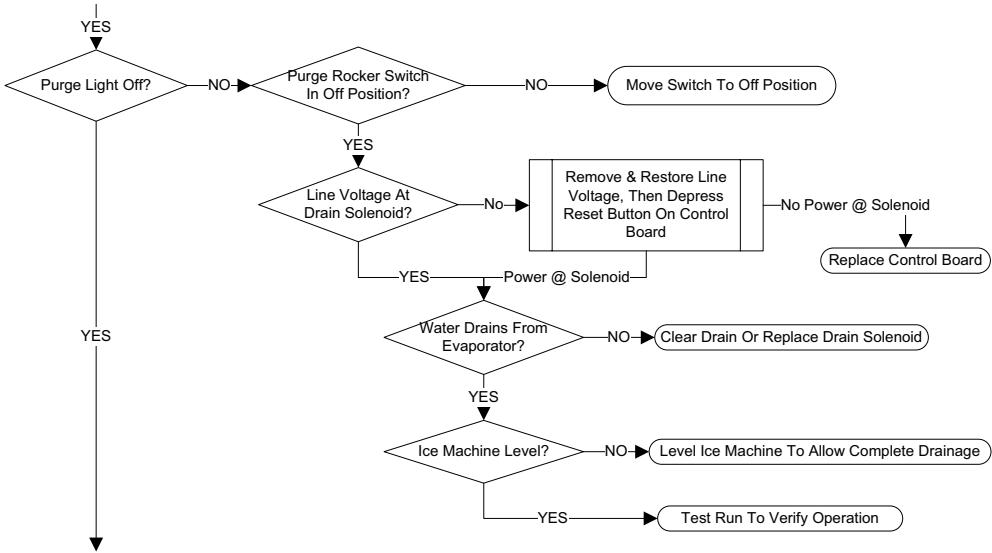


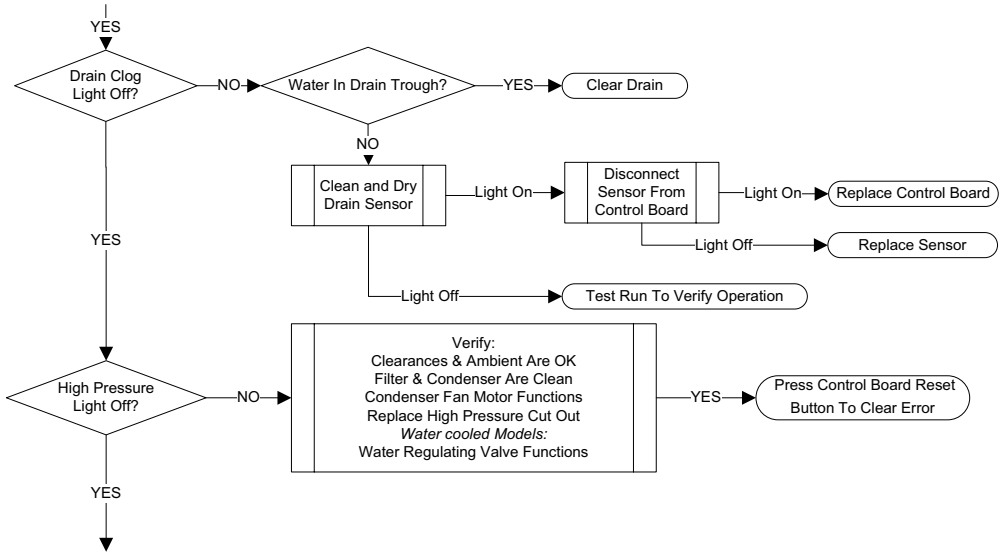


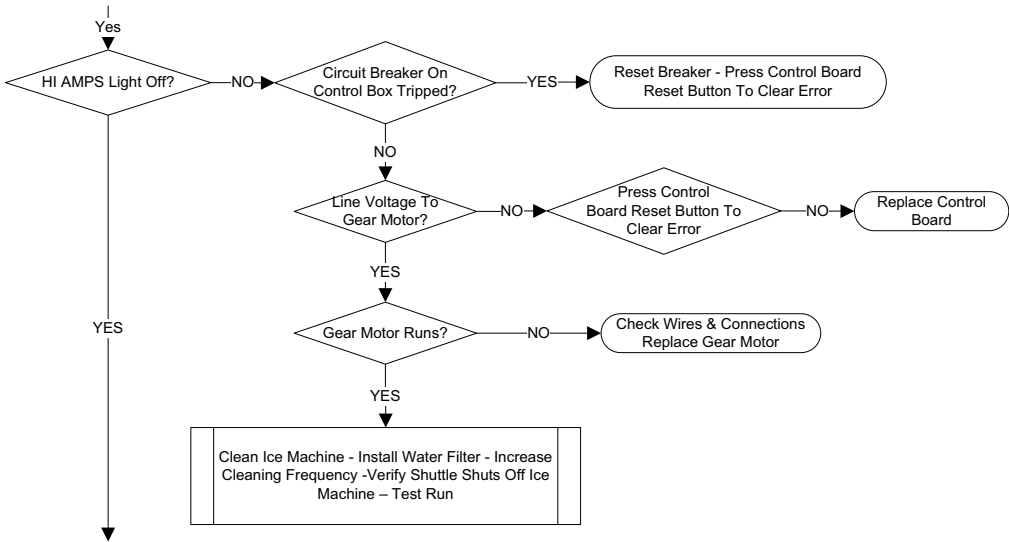
Electrical Flowchart – RN1000/RN1400 Air & Water

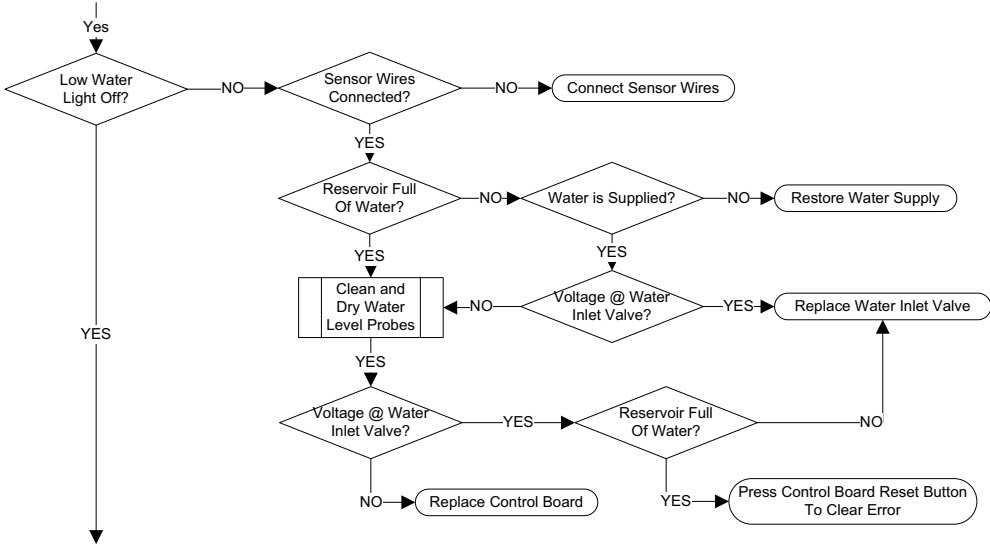


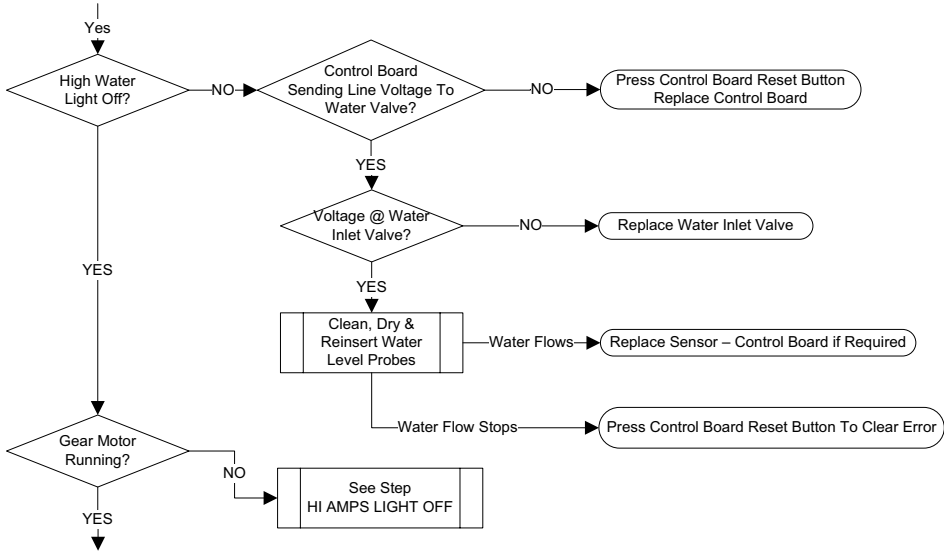


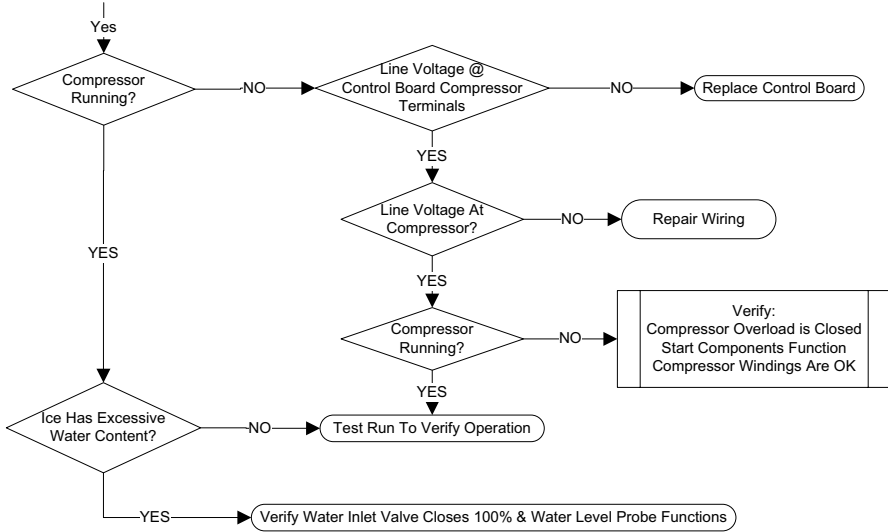




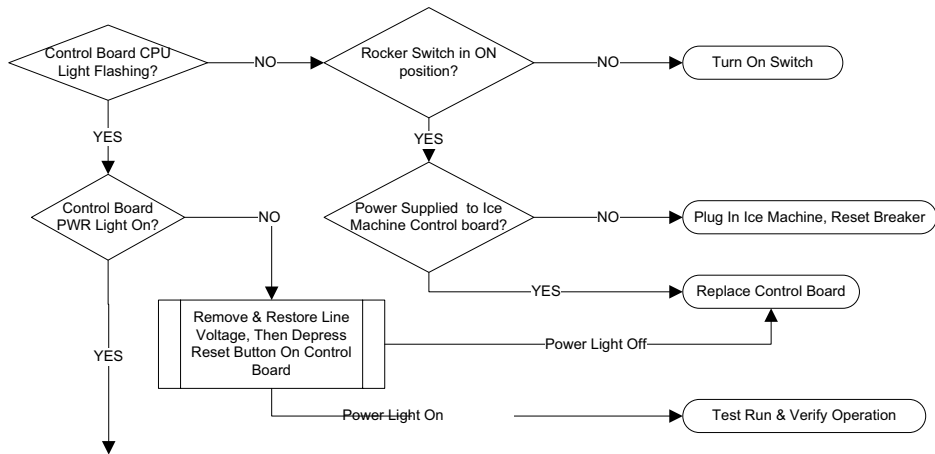


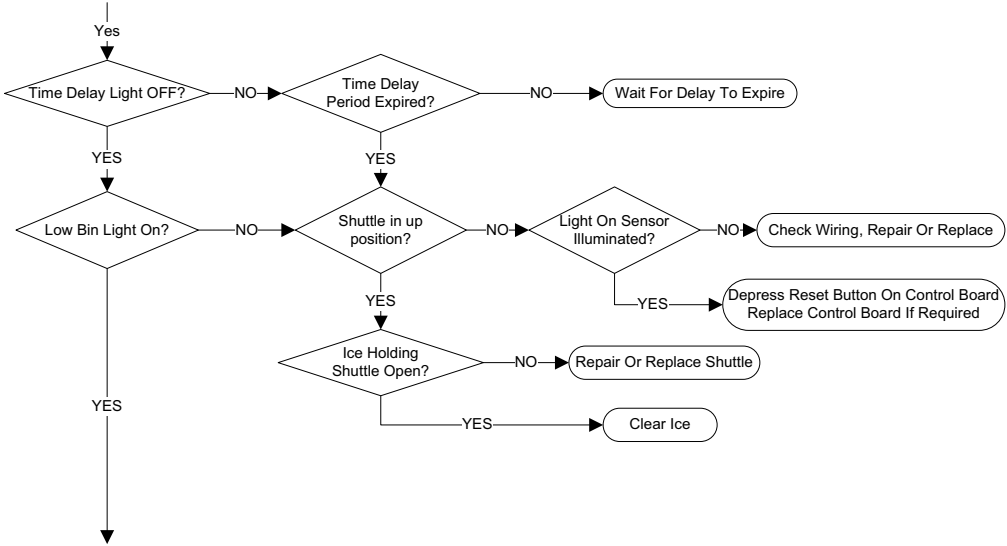


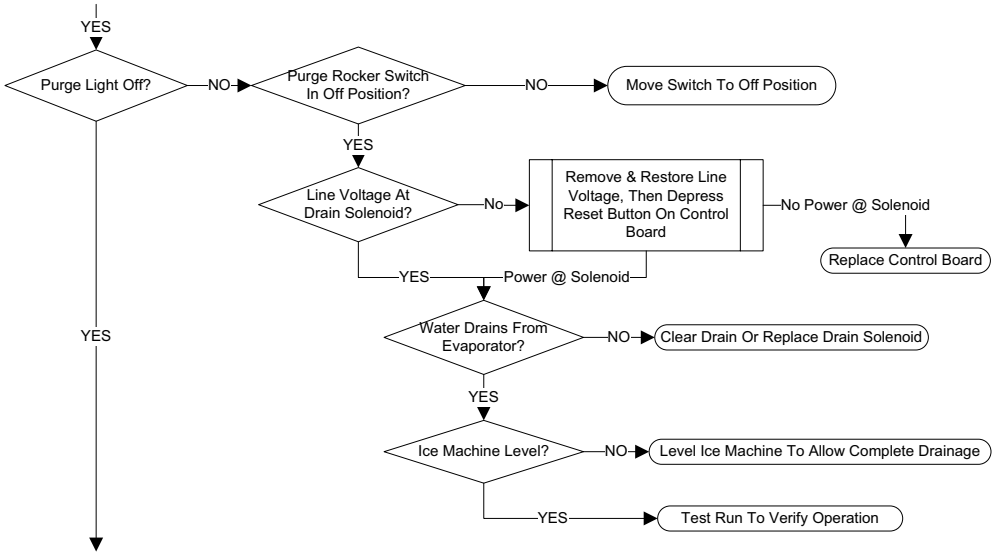


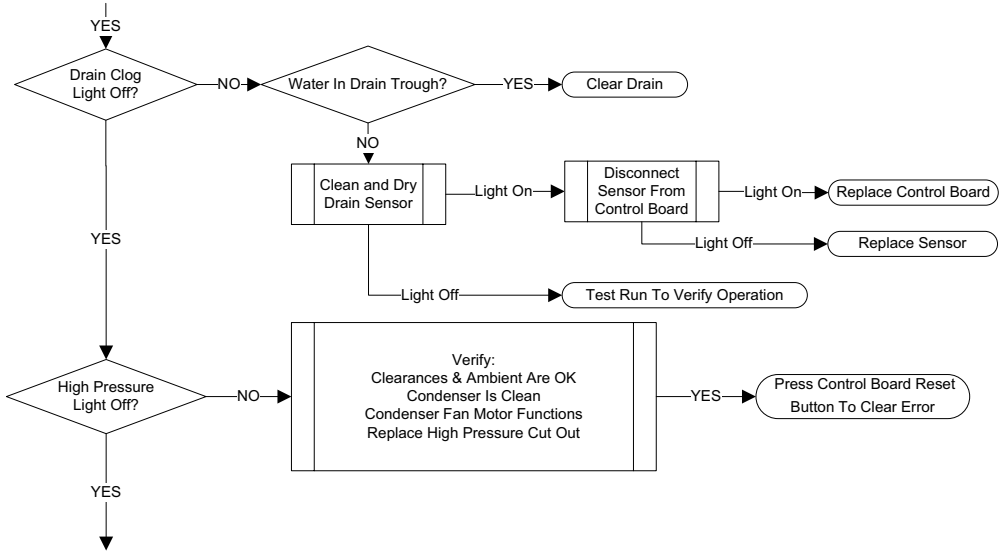


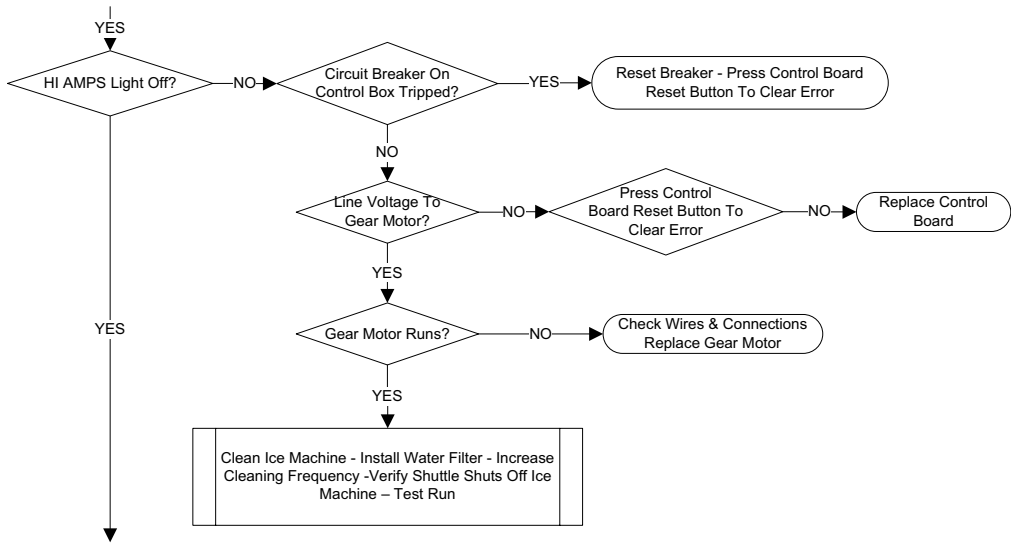
Electrical Flowcart – RN1000C/RN1200C QuietQube Remote

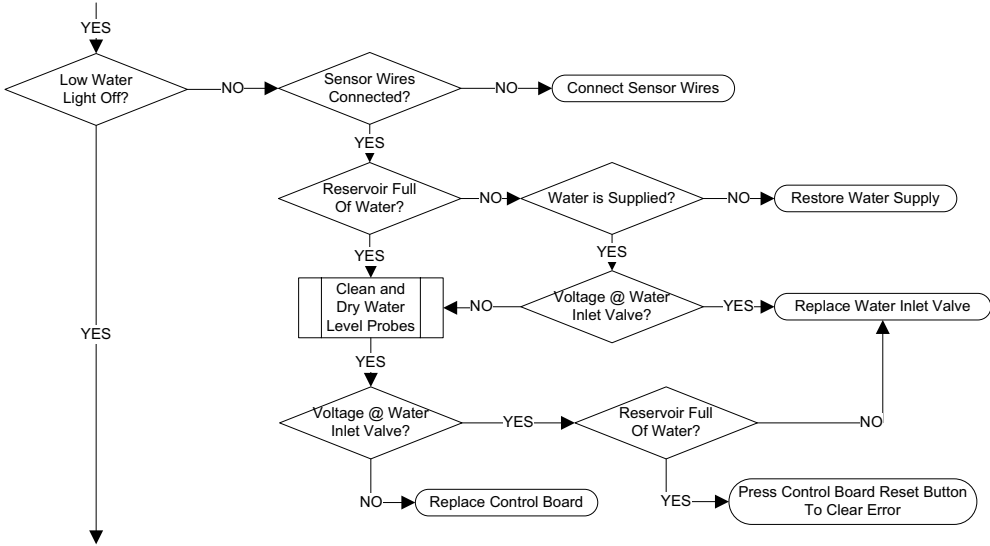


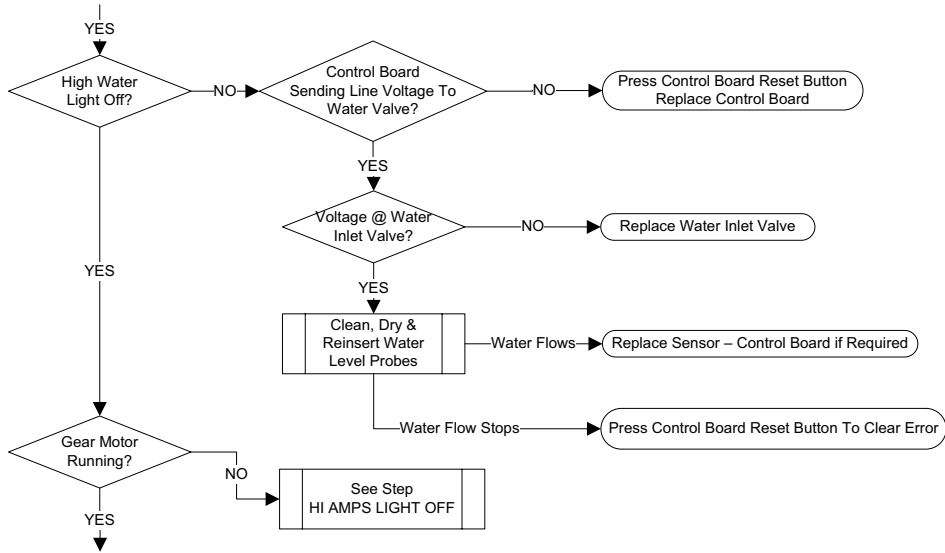


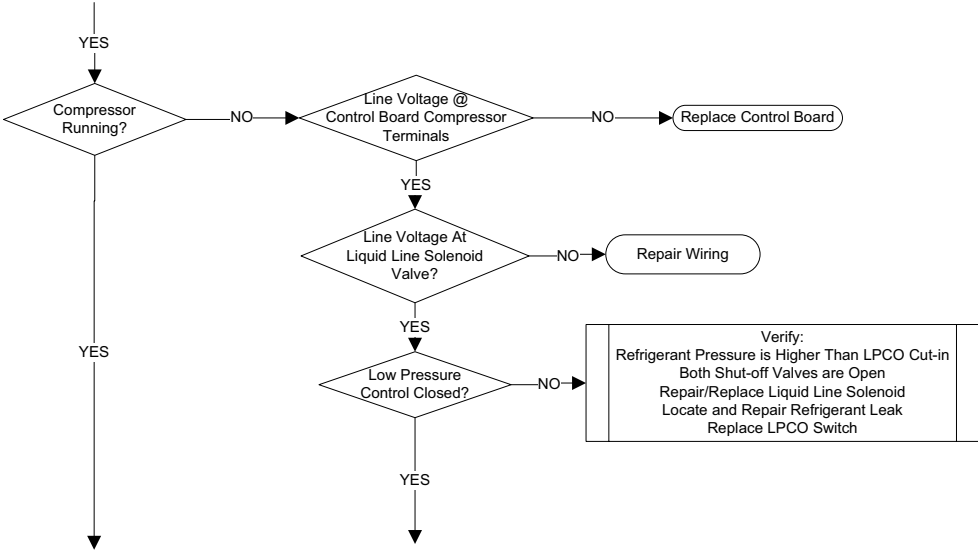


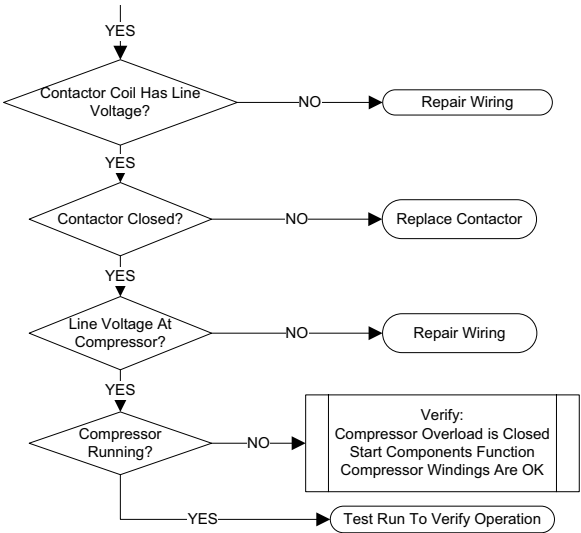




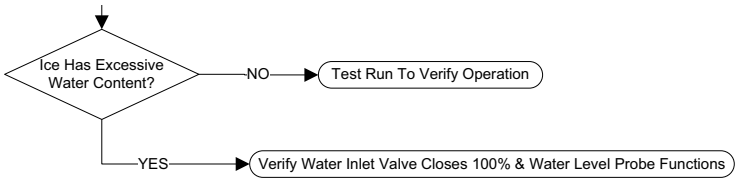


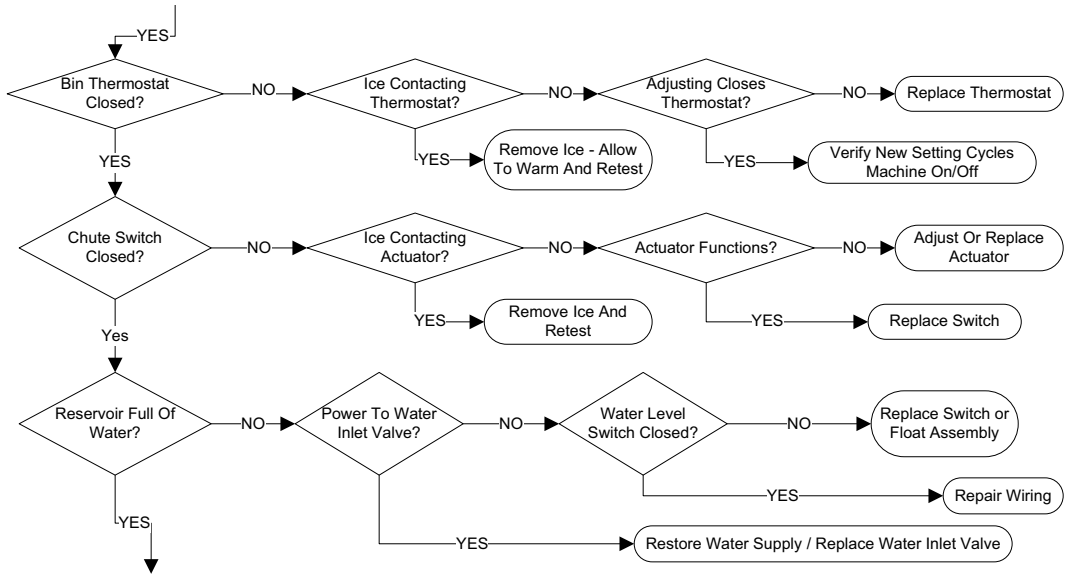


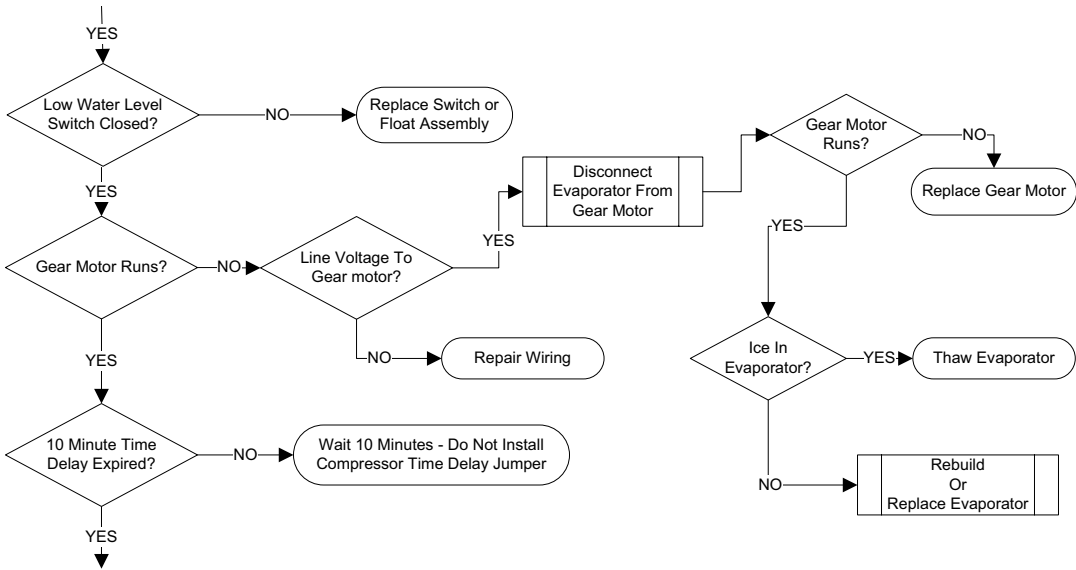


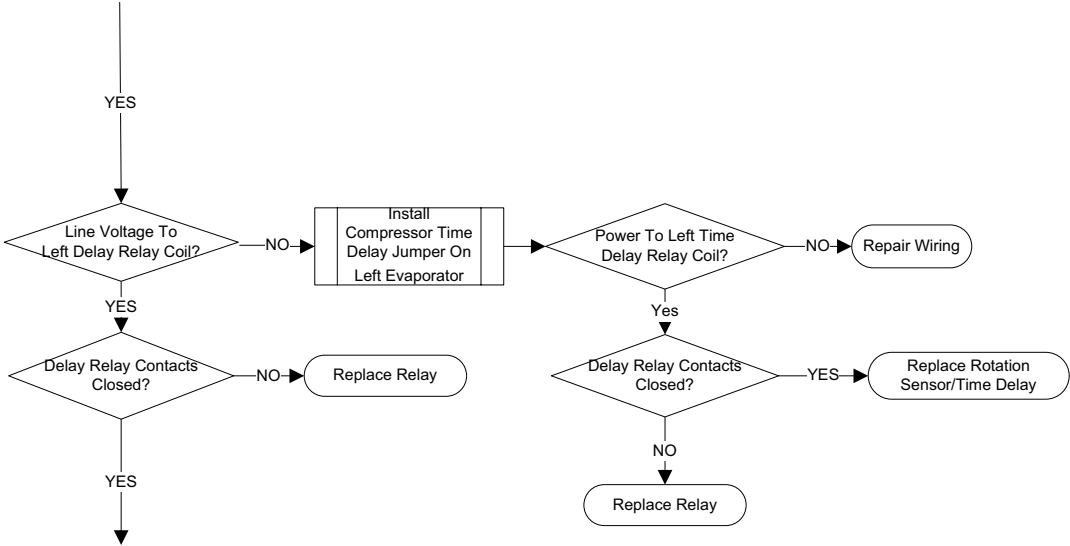


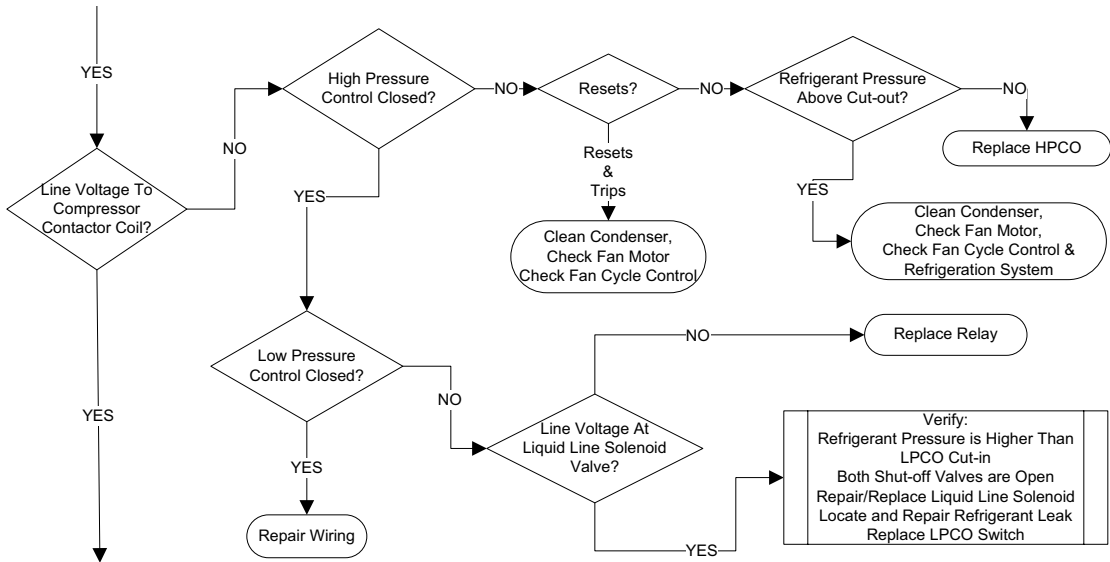
YES ↓

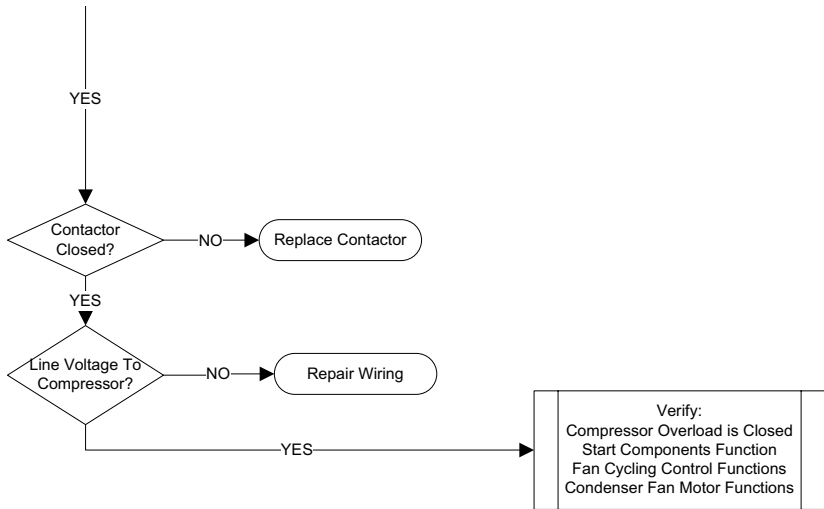




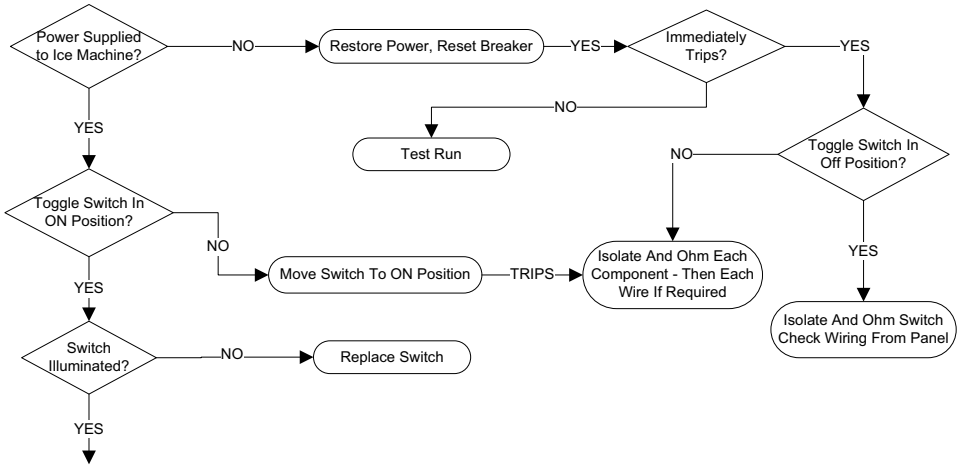


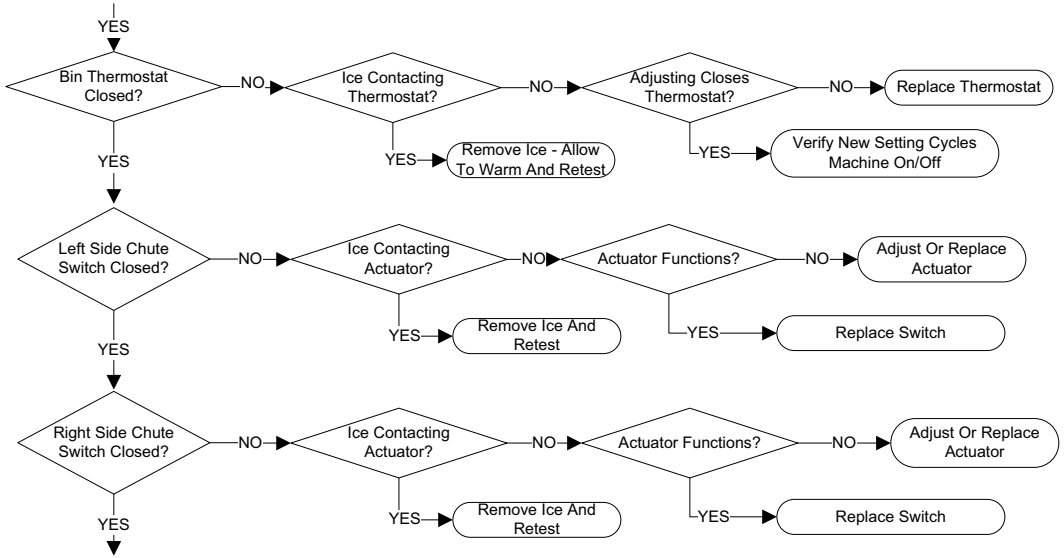


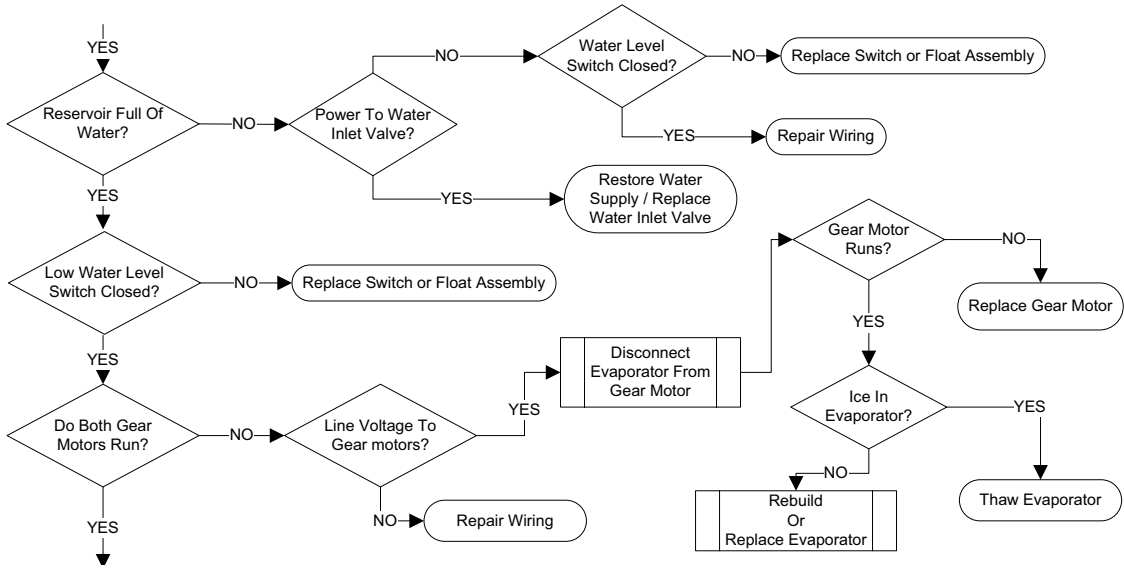


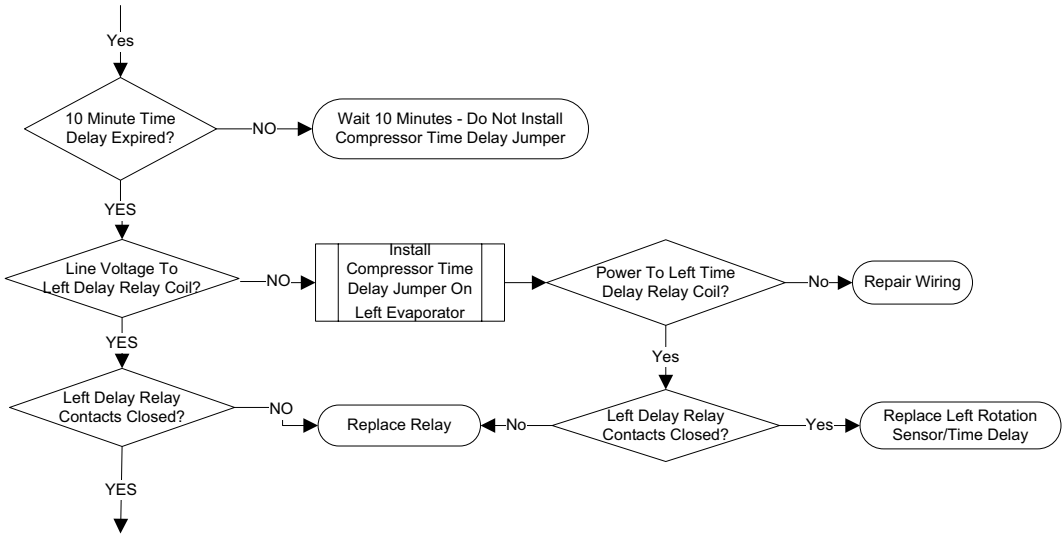


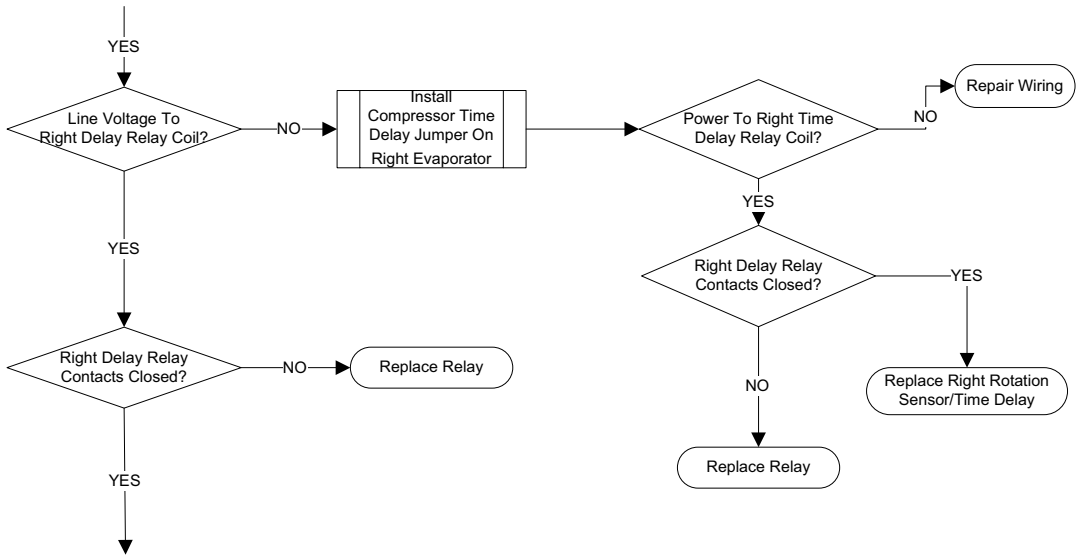
Electrical Flowchart - RF-2300C QuietQube

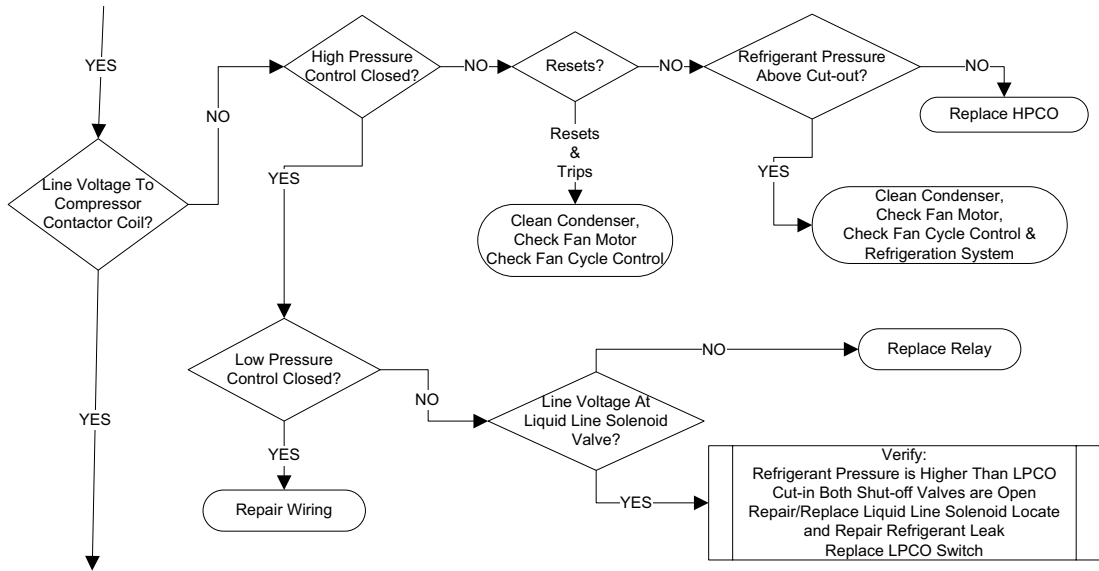


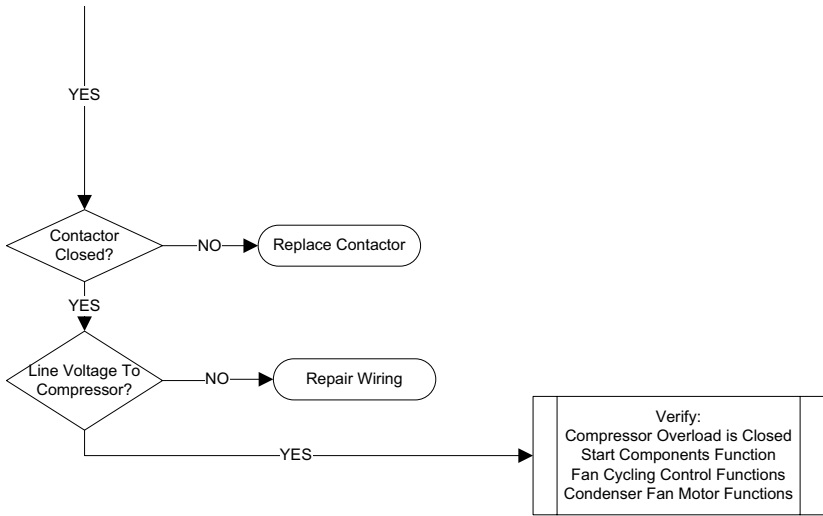












Capillary Tube Models

If the gear motor and/or compressor are not energized refer to Electrical Troubleshooting Refer to Operational Pressure Charts for normal pressures and temperatures				
	Low on Refrigerant	Overcharge of Refrigerant	Non Condensable in System	Restricted Capillary Tube
Discharge Pressure	Low	High	High	Low
Suction Pressure	Low	High	High	Low
Evaporator Inlet Temperature	Normal	Low	High	Low
Evaporator Outlet Temperature	High	Normal	High	Low
Compressor Discharge Line Temperature Normal Range = > 165° @ 70° - 210° @ 110° > 74°C @ 21°C - 99°C @ 43°C)	High Increases with run time	Normal	High Increases with run time	High Increases with run time

Thermostatic Expansion Valve Models

If the gear motor and/or compressor are not energized refer to Electrical Troubleshooting Refer to Operational Pressure Charts for normal pressures and temperatures					
	Low on Refrigerant	Overcharge of Refrigerant	Non Condensable In System	Liquid Line Restriction, Suction Line Restriction, Or TXV Starving	Flooding TXV or Loose Sensing Bulb
Discharge Pressure	Low	High	High	Low	High
Suction Pressure	Low	High	High	Low	High
Evaporator Inlet Temperature	Normal	Normal or Low	High	Normal	Normal or High
Evaporator Outlet Temperature	High	Normal	High	High > 12° Differential between Inlet and Outlet	< 10° Differential between Inlet and Outlet
Discharge Line Temperature	High	Normal	High Increases With Run Time	High Increases With Run Time	Low Decreases With Run Time

Component Specifications

BIN THERMOSTAT

Model	Setting	Cut-Out	Cut-In
RF0244/RF0266 RF0388/RF0399 RF0644/RF1200 RF2300	5	37°F ±1 6°C ±.1	43°F ±1 3°C ±.1
RFS0300/ RFS0650	4		
RFS1200	3		

LOW TEMPERATURE THERMOSTAT

(Evaporator safety thermostat)

(RF0244/RF0266/RF0385/RF0388/RF0399/RF0300 ONLY)

Model	Setting	Cut-Out	Cut-In
RF0244/RF0266 /RF1200 RF2300	5	37°F ±1 6°C ±.1	43°F ±1 3°C ±.1
RF0388/RF0399 RF0644/RFS0300	7		

HIGH PRESSURE CUTOUT (HPCO) CONTROL

Model	Cut-Out	Cut-In
RF0650/ RF1200/RF2300	435 psig ±10 (3000 kPa ±69) 30 bar ±.69	Manual Reset
RN1000/RN1400	425 psig ±10 (2930 kPa ±69) 29 bar ±.69	287 psig ±10 (1979 kPa ±69) 19.79bar ±.69 Auto Reset
RN1000C/RCU1075 RN1200C/RCU1275 RF1200C/RCU1075	450 psig ±10 (3100 kPa ±69) 31 bar ±.69	295 psig ±10 (2034 kPa ±69) 20 bar ±.69 Auto Reset
RF2300C/RCU2375	450 psig ±10 (3100 kPa ±69) 31 bar ±.69	Manual Reset

LOW PRESSURE CUTOUT (LPCO) CONTROL

Model	Cut-Out	Cut-In
R0F650/ RF1200	7 psig \pm 2 (.5 bar \pm .2)	36 psig \pm 2 (2.5 bar \pm .2)
RF2300	12 psig \pm 2 (.8 bar \pm .2)	Manual Reset
RN1000C/RCU1075 RN1200C/RCU1275 RF1200C/RCU1075 RF2300C/RCU2375	12 psig \pm 3 (.8 bar \pm .2)	35 psig \pm 5 (2.4 bar \pm .4)

FAN CYCLE CONTROL

Model	Cut-Out (Open)	Cut-In (Close)
RF0244	230 \pm 5 (16 bar \pm .34)	250 \pm 5 (17.2 bar \pm .34)
RF0266	230 \pm 5 (16 bar \pm .34)	250 \pm 5 (17.2 bar \pm .34)
RF0385	260 \pm 5 (18.1 bar \pm .34)	280 \pm 5 (19.3 bar \pm .34)
RF0388	260 \pm 5 (18.1 bar \pm .34)	280 \pm 5 (19.3 bar \pm .34)
RF0399	260 \pm 5 (18.1 bar \pm .34)	280 \pm 5 (19.3 bar \pm .34)
RF0300 60 hz	260 \pm 5 (17.8 bar \pm .34)	275 \pm 5 (16.6 bar \pm .34)
RF0300 50 hz	260 \pm 5 (17.8 bar \pm .34)	280 \pm 5 (19 bar \pm .34)
RF0650 60 hz	230 \pm 5 (16 bar \pm .34)	250 \pm 5 (17.2 bar \pm .34)
RF0650 50 hz	215 \pm 5 (14.8 bar \pm .34)	230 \pm 5 (16 bar \pm .34)
RF1200 60 hz	260 \pm 5 (17.8 bar \pm .34)	275 \pm 5 (19 bar \pm .34)
RF1200 50 hz	240 \pm 5 (16.6 bar \pm .34)	260 \pm 5 (17.8 bar \pm .34)
RF2300	250 \pm 5 (17.2 bar \pm .34)	265 \pm 5 (18.4 bar \pm .34)

FILTER-DRIERS

The size of the filter-drier is important. The refrigerant charge is critical. Using an improperly sized filter-drier will cause the ice machine to be improperly charged with refrigerant.

Important

Driers are covered as a warranty part. The drier must be replaced any time the system is opened for repairs.

SUCTION CLEANUP FILTER-DRIER

Contaminated systems must have a suction line filter-drier installed to remove contamination. An access valve must be installed on the inlet side of the suction filter to allow pressure drop readings to be obtained.

Suction Line Clean-Up Filter		
Model	Drier Size	End Connection Size
All Models	UK-165S	5/8 in.

TOTAL SYSTEM REFRIGERANT CHARGE

Important

This information is for reference only. Refer to the ice machine serial number tag to verify the system charge. Serial plate information overrides information listed on this page.

Model	Refrigerant Charge
RF0244A	7.5 oz / 210 g
RF0266A	7.5 oz / 210 g
RF0385A	11.25 oz / 320 g
RF0388A	11.25 oz / 320 g
RF0399A	11.25 oz / 320 g
RF0300A	11.25 oz / 320 g
RF0650A	19.5 oz / 550 g
RF1200A	24.75 oz / 700 g
RF1200W	16.25 oz / 460 g
RF1200C	156 oz / 4.42 kg
RF2300C	240 oz / 6.08 kg
RF2300A	63.5 oz / 1800 g
RF2300W	38.75 oz / 1100 g
RN1000A	24 oz / 680 g
RN1000W	15 oz / 426 g
RN1000C	156 oz / 4.42 kg
RN1200C	156 oz / 4.42 kg
RN1400A	34 oz / 652 g
RN1400W	21 oz / 426 g

NOTE: All ice machines are charged using R-404A refrigerant.

Charts

Cycle Times/24-Hour Ice Production/ Refrigerant Pressure Charts

These charts are used as guidelines to verify correct ice machine operation.

Accurate collection of data is essential to obtain the correct diagnosis.

- Zero out manifold gauge set before obtaining pressure readings to avoid misdiagnosis.
- Discharge and suction pressure are highest at the beginning of the cycle. Allow system to stabilize for a minimum of 10 minutes, then verify the pressures are within the range indicated.
- Water temperature will affect suction and discharge pressure - 50°F (10°C) water temperature will result in pressures on the lower end of the ranges specified. 90°F (32°C) water temperatures will result in pressures on the upper end of the range specified.

Flake Ice Machines

RF0244A

SELF STORAGE AIR-COOLED

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	182lbs	7.86
90°F/70°F	150 lbs	7.86
21°C/10°C	83 kgs	7.86
32°C/21°C	68 kgs	7.86

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	220-250 1517-1724	38-40 262-276
90°F PSIG 32°C kPa	300-320 2068-2206	45-51 310-352
110°F PSIG 43°C kPa	360-390 2482-2689	49-55 338-379

RF0266A**SELF STORAGE AIR-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	182lbs	7.86
90°F/70°F	150 lbs	7.86
21°C/10°C	83 kgs	7.86
32°C/21°C	68 kgs	7.86

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	220-250 1517-1724	38-40 262-276
90°F PSIG 32°C kPa	300-320 2068-2206	45-51 310-352
110°F PSIG 43°C kPa	360-390 2482-2689	49-55 338-379

RF0385A**SELF STORAGE AIR-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	332	6.41
90°F/70°F	294	5.79
21°C/10°C	NA	NA
32°C/21°C	NA	NA

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	243-270 1675-1862	31-36 214-248
90°F PSIG 32°C kPa	273-315 1882-2172	34-39 234-269
110°F PSIG 43°C kPa	348-380 2399-2620	38-43 262-296

RF0388A**SELF STORAGE AIR-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	332 lbs	6.41
90°F/70°F	270 lbs	6.41
21°C/10°C	151 kgs	6.41
32°C/21°C	122 kgs	6.41

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	235-270 1620-1862	29-32 200-221
90°F PSIG 32°C kPa	255-280 1758-1930	29-35 200-241
110°F PSIG 43°C kPa	320-340 2706-2344	31-38 214-262

RF0399A**SELF STORAGE AIR-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	332 lbs	6.41
90°F/70°F	270 lbs	6.41
21°C/10°C	151 kgs	6.41
32°C/21°C	122 kgs	6.41

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	260-280 1793-1930	32-34 221-234
90°F PSIG 32°C kPa	270-290 1862-2000	29-35 200-241
110°F PSIG 43°C kPa	340-360 2344-2482	31-38 214-262

RF0300A & RFS0300A
SELF CONTAINED AIR-COOLED

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	311 lbs	6.48
90°F/70°F	259 lbs	6.48
21°C/10°C	141 kgs	6.48
32°C/21°C	117 kgs	6.48

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	260-275 1792-1896	28-31 193-214
90°F PSIG 32°C kPa	260-280 1792-1930	30-36 207-248
110°F PSIG 43°C kPa	325-350 2240-2413	32-38 221-262

RF0650A & RFS0650A**AIR-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	688 lbs	5.06
90°F/70°F	540 lbs	5.06
21°C/10°C	312 kgs	5.06
32°C/21°C	245 kgs	5.06

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	240-265 1655-1827	33-35 228-241
90°F PSIG 32°C kPa	280-300 1930-2068	34-40 235-276
110°F PSIG 43°C kPa	340-370 2344-2551	40-46 275-318

RF1200A & RFS1200A**AIR-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	1186 lbs	5.63
90°F/70°F	864 lbs	5.63
21°C/10°C	538 kgs	5.63
32°C/21°C	392 kgs	5.63

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	255-280 1755-1930	32-34 220-234
90°F PSIG 32°C kPa	325-350 2240-2413	36-42 248-290
110°F PSIG 43°C kPa	400-425 2758-2930	45-51 310-352

RF1200W & RFS1200W**WATER-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature Around Ice Machine °F/°C	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	1204 lbs	4.11
90°F/70°F	1004 lbs	4.11
21°C/10°C	546 kgs	4.11
32°C/21°C	455 kgs	4.11

OPERATING PRESSURES PSIG & kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	245-255 1689-1758	29-31 200-214
90°F PSIG 32°C kPa	270-280 1862-1930	29-35 200-241
110°F PSIG 43°C kPa	275-290 1896-2000	30-36 207-248

Condenser Water Consumption	
103	Gallons/100 lbs. of Ice
390	Liters/45 kgs. of Ice

RF1278C**QUIETQUBE REMOTE AIR COOLED**

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG					
Air Temperature Around Ice Machine °F/°C	Water Temperature °F/°C				
	50/10	60/16	70/21	80/27	90/32
-20°F -29°C	1413 641	NA	NA	NA	NA
70°F 21°C	1182 536	NA	NA	NA	NA
90°F 32°C	NA	NA	975 442	NA	NA
120°F 49°C	NA	NA	NA	NA	603 274

OPERATING PRESSURES PSIG/kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
50°F PSIG 10°C kPa	185-200 1276-1379	23-28 159-193
70°F PSIG 21°C kPa	225-255 1551-1758	30-35 207-241
80°F PSIG 27°C kPa	230-280 1586-1931	31-36 214-248
90°F PSIG 32°C kPa	243-305 1675-2103	33-38 228-262
120°F PSIG 49°C kPa	355-400 2448-2758	38-43 262-296

NOTE: Preliminary data.

RF2300A**AIR-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature/ Water Temperature	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	2291	6.04
90°F/70°F	1717	6.04
21°C/10°C	1039 kgs	6.04
32°C/21°C	779 kgs	6.04

OPERATING PRESSURES PSIG & kPa		
Air Temperature Entering Condenser	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	290-310 1999-2137	35-38 241-262
90°F PSIG 32°C kPa	350-380 2413-2620	38-43 262-296
110°F PSIG 43°C kPa	410-430 2827-2965	43-49 296-338

RF2300W**WATER-COOLED**

Characteristics will vary depending on operating conditions.

ICE PRODUCTION		
Air Temperature Around Ice Machine °F/°C	24 hour Ice Production	kWh/100 lbs kWh/45 kg
70°F/50°F	2291	6.04
90°F/70°F	1717	6.04
21°C/10°C	1039 kgs	6.04
32°C/21°C	779 kgs	6.04

OPERATING PRESSURES PSIG & kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
70°F PSIG 21°C kPa	290-310 1999-2137	35-38 241-262
90°F PSIG 32°C kPa	350-380 2413-2620	38-43 262-296
110°F PSIG 43°C kPa	410-430 2827-2965	43-49 296-338

RF2378C**QUIETQUBE REMOTE AIR COOLED**

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG					
Air Temperature Around Ice Machine °F/°C	Water Temperature °F/°C				
	50/10	60/16	70/21	80/27	90/32
-20°F -29°C	2448 1110	NA	NA	NA	NA
70°F 21°C	2137 969	NA	NA	NA	NA
90°F 32°C	NA	NA	1748 793	NA	NA
120°F 49°C	NA	NA	NA	NA	1118 507

OPERATING PRESSURES PSIG/kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
50°F PSIG 16°C kPa	175-200 1207-1379	26-31 176-214
70°F PSIG 21°C kPa	220-250 1517-1724	31-36 214-248
80°F PSIG 27°C kPa	225-275 1551-1896	32-37 221-255
90°F PSIG 32°C kPa	250-310 1724-2137	33-38 228-262
120°F PSIG 49°C kPa	365-410 2517-2827	38-43 262-296

Nugget Models

RN1000A

AIR-COOLED

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG					
Air Temperature Entering Condenser °F/°C	Water Temperature °F/°C				
	50/10	60/16	70/21	80/27	90/32
60°F 16°C	1135 515	1070 486	1015 461	967 439	924 420
70°F 21°C	1100 499	1000 454	938 426	902 410	859 390
80°F 27°C	962 437	916 416	871 395	826 375	782 355
90°F 32°C	828 376	816 371	794 361	755 343	698 317
100°F 38°C	786 357	728 331	686 312	654 297	610 277

OPERATING PRESSURES PSIG/kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
60°F PSIG 16°C kPa	220-240 1517-1655	33-38 228-262
70°F PSIG 21°C kPa	225-245 1551-1689	37-42 255-290
80°F PSIG 27°C kPa	235-250 1620-1724	38-43 262-296
90°F PSIG 32°C kPa	235-250 1620-1724	39-44 269-303
100°F PSIG 38°C kPa	255-280 1758-1931	41-46 283-317

RN1000W**WATER-COOLED**

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG					
Air Temperature Around Ice Machine °F/°C	Water Temperature °F/°C				
	50/10	60/16	70/21	80/27	90/32
60°F 16°C	1071 486	1025 465	971 441	912 414	849 386
70°F 21°C	1035 470	979 444	932 423	888 403	842 382
80°F 27°C	975 443	912 414	870 395	839 381	814 370
90°F 32°C	885 402	826 375	786 357	759 345	745 338
100°F 38°C	762 346	723 328	683 310	642 392	603 274

OPERATING PRESSURES PSIG/kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
60°F PSIG 16°C kPa	220-240 1517-1655	33-38 228-262
70°F PSIG 21°C kPa	225-245 1551-1689	37-42 255-290
80°F PSIG 27°C kPa	235-250 1620-1724	38-43 262-296
90°F PSIG 32°C kPa	235-250 1620-1724	39-44 269-303
100°F PSIG 38°C kPa	255-280 1758-1931	41-46 283-317

RN1400A**AIR-COOLED**

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG					
Air Temperature Entering Condenser °F/°C	Water Temperature °F/°C				
	50/10	60/16	70/21	80/27	90/32
60°F 16°C	1462 663	NA	NA	NA	NA
70°F 21°C	1456 660	NA	NA	NA	NA
80°F 27°C	NA	NA	NA	NA	NA
90°F 32°C	NA	NA	1100 499	NA	NA
110°F 43°C	NA	NA	NA	NA	801 363

OPERATING PRESSURES PSIG/kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
50°F PSIG 10°C kPa	224-235 1544-1620	24-29 165-200
70°F PSIG 21°C kPa	238-275 1641-1896	26-31 179-214
80°F PSIG 27°C kPa	245-290 1689-1999	28-33 193-228
90°F PSIG 32°C kPa	316-370 2179-2551	34-39 234-269
100°F PSIG 38°C kPa	382-430 2634-2965	41-46 283-317

RN1400W**WATER-COOLED**

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG					
Air Temperature Around Ice Machine °F/°C	Water Temperature °F/°C				
	50/10	60/16	70/21	80/27	90/32
50°F 10°C	1606 728	NA	NA	NA	NA
70°F 21°C	1514 687	NA	NA	NA	NA
80°F 27°C	NA	NA	NA	NA	NA
90°F 32°C	NA	NA	1100 499	NA	NA
110°F 43°C	NA	NA	NA	NA	1151 522

OPERATING PRESSURES PSIG/kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
50°F PSIG 10°C kPa	220-230 1516-1586	24-29 165-200
70°F PSIG 21°C kPa	220-230 1517-1586	25-30 172-207
80°F PSIG 27°C kPa	225-235 1551-1620	26-31 179-214
90°F PSIG 32°C kPa	225-235 1551-1620	27-32 186-221
100°F PSIG 38°C kPa	265-275 1827-1896	33-38 228-262

RN1078C**QUIETQUBE REMOTE AIR COOLED**

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG					
Air Temperature Around Ice Machine °F/°C	Water Temperature °F/°C				
	50/10	60/16	70/21	80/27	90/32
-20°F -29°C	1120 508	-	-	-	-
70°F 21°C	898 407	-	-	-	719 326
90°F 32°C	-	-	770 349	-	-
120°F 49°C	-	-	-	-	490 222

OPERATING PRESSURES PSIG/kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
60°F PSIG 16°C kPa	240-250 1655-1724	33-35 227-241
70°F PSIG 21°C kPa	245-265 1689-1827	35-38 241-262
80°F PSIG 27°C kPa	245-270 1689-1862	36-39 248-269
90°F PSIG 32°C kPa	250-270 1724-1862	37-40 255-276
120°F PSIG 49°C kPa	360-400 2482-2758	45-49 310-338

RN1278C**QUIETQUBE REMOTE AIR COOLED**

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG					
Air Temperature Around Ice Machine °F/°C	Water Temperature °F/°C				
	50/10	60/16	70/21	80/27	90/32
50°F 10°C	1201 545	NA	NA	NA	NA
70°F 21°C	1138 516	NA	NA	NA	NA
90°F 32°C	NA	NA	981 445	NA	NA
120°F 49°C	NA	NA	NA	NA	681 309

OPERATING PRESSURES PSIG/kPa		
Air Temperature Around Ice Machine °F/°C	Freeze Cycle	
	Discharge Pressure	Suction Pressure
50°F PSIG 10°C kPa	190-200 1310-1379	21-26 145-179
70°F PSIG 21°C kPa	227-265 1565-1827	25-30 172-207
80°F PSIG 27°C kPa	230-260 1586-1793	26-31 179-214
90°F PSIG 32°C kPa	238-280 1641-1931	27-32 186-221
120°F PSIG 49°C kPa	356-400 2455-2758	34-39 234-269

Rack Models

RF1279R

QUIETQUBE REMOTE AIR COOLED

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG	
Water Temperature °F/°C	
50/10	
1413 lbs 641 kg	

SUCTION PRESSUREPSIG/kPa	
Freeze Cycle	
Liquid Line Pressure	Acceptable Suction Pressure Range
185-200 1276-1379	23-28 159-193
225-255 1551-1758	30-35 207-241
230-280 1586-1931	31-36 214-248
243-305 1675-2103	33-38 228-262
355-400 2448-2758	38-43 262-296

NOTE: Preliminary data.

RF2379R**QUIETQUBE REMOTE AIR COOLED**

Characteristics will vary depending on operating conditions

24-HOUR ICE PRODUCTION IN LB/KG	
Water Temperature	
°F/°C	
50/10	
2448 lbs	1110 kg

SUCTION PRESSUREPSIG/kPa	
Freeze Cycle	
Liquid Line Pressure	Acceptable Suction Pressure Range
175-200 1207-1379	26-31 176-214
220-250 1517-1724	31-36 214-248
225-275 1551-1896	32-37 221-255
250-310 1724-2137	33-38 228-262
365-410 2517-2827	38-43 262-296

NOTE: Preliminary data.

Diagrams

Wiring Diagrams

The following pages contain electrical wiring diagrams. Be sure you are referring to the correct diagram for the ice machine you are servicing.



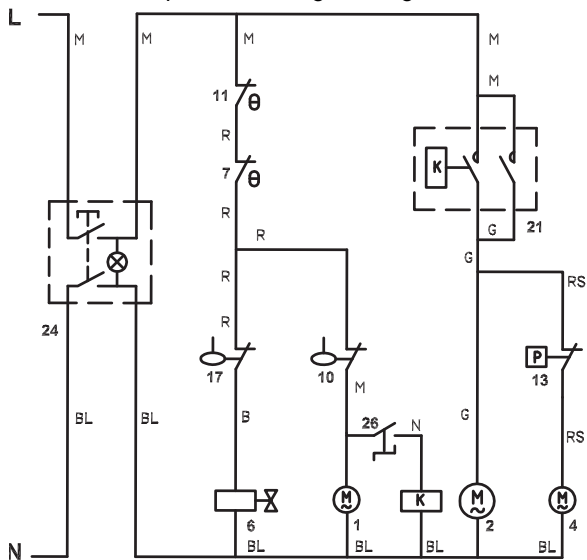
Warning

Always disconnect power before working on electrical circuitry.

Flake Models

RF0244/RF0266/RF0385/RF0388/RF0399
AIR-COOLED

Refer to Nameplate for Voltage Rating



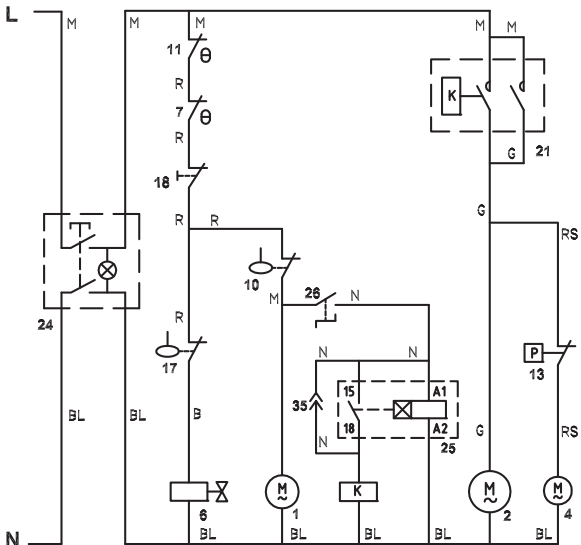
WIRING DIAGRAM LEGEND

RF0244/RF266/RF0385/RF0388/RF0399

1	Gear Motor
2	Compressor
4	Condenser fan motor
6	Water Inlet valve
7	Evaporator low temperature safety
10	Low water level safety
11	Bin thermostat
12	High temperature limit (snap disc)
13	Fan cycle control
17	Water level switch
21	Compressor relay
24	On/Off switch
26	Gear motor centrifugal switch
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
RS	Pink

RF0300 AIR-COOLED

Refer to Nameplate for Voltage Rating

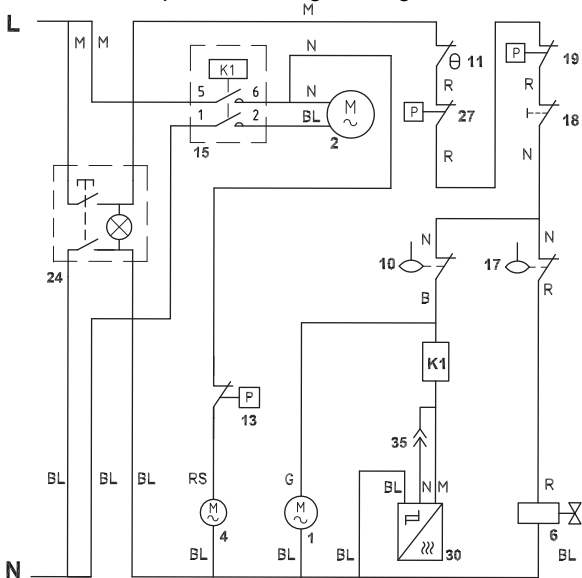


WIRING DIAGRAM LEGEND RF0300

1	Gear Motor
2	Compressor
4	Condenser fan motor
6	Water inlet valve
7	Evaporator low temperature safety
10	Low water level safety
11	Bin thermostat
13	Fan cycle control
17	Water level switch
18	Ice chute safety switch
21	Compressor relay
24	On/Off switch
25	Compressor time delay
26	Gear motor centrifugal switch
35	Compressor time delay by-pass
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
RS	Pink

RF0650 - RF1200 AIR-COOLED

Refer to Nameplate for Voltage Rating



WIRING DIAGRAM LEGEND RF0650 - RF1200

1	Gear Motor
2	Compressor
4	Condenser fan motor
6	Water inlet valve
10	Low water level safety
11	Bin thermostat
13	Fan cycle control
15	Contactora
17	Water level switch
18	Ice chute safety switch
19	High pressure cut out
21	Compressor relay
24	On/Off switch
25	Compressor time delay
27	Low pressure cut out
30	Rotation sensor
35	Compressor time delay by-pass
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
RS	Pink

WIRING DIAGRAM LEGEND RF1200 WATER

1	Gear Motor
2	Compressor
4	Condenser fan motor
6	Water inlet valve
10	Low water level safety
11	Bin thermostat
13	Fan cycle control
15	Contactors
17	Water level switch
18	Ice chute safety switch
19	High pressure cut out
21	Compressor relay
24	On/Off switch
25	Compressor time delay
27	Low pressure cut out
30	Rotation sensor
35	Compressor time delay by-pass
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
RS	Pink

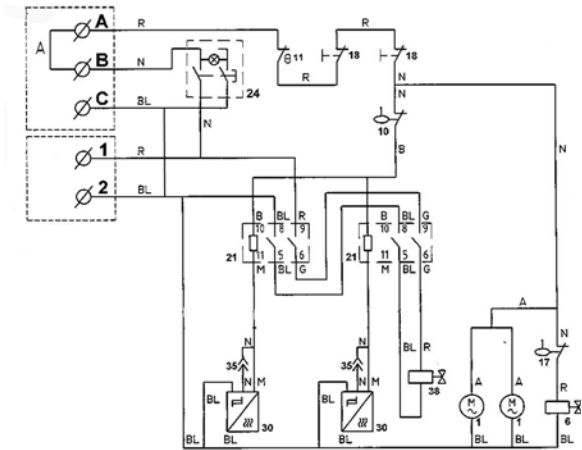
WIRING DIAGRAM LEGEND RF1200C

1	Gear Motor
6	Water inlet valve
10	Low water level safety
11	Bin thermostat
17	Water level switch
18	Ice chute safety switch
21	Compressor Relay
24	On/Off switch
30	Rotation sensor
35	Compressor time delay by-pass
38	Solenoid Valve
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
V	Violet
A	Orange

WIRING DIAGRAM LEGEND RF2300 AIR-COOLED

1	Gear Motor
2	Compressor
4	Condenser fan motor (air-cooled only)
6	Water inlet valve
10	Low water level safety
11	Bin thermostat
13	Fan cycle control
15	Contactator
17	Water level switch
18	Ice chute safety switch
19	High pressure cut out
24	On/Off switch
25	Compressor time delay
27	Low pressure cut out
29	Compressor time delay relay
30	Rotation sensor
35	Compressor time delay by-pass
37	Remote indicator panel terminals
Rc	Compressor crankcase heater
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
RS	Pink
A	Orange

RF2300C QUIETQUBE HEAD SECTION

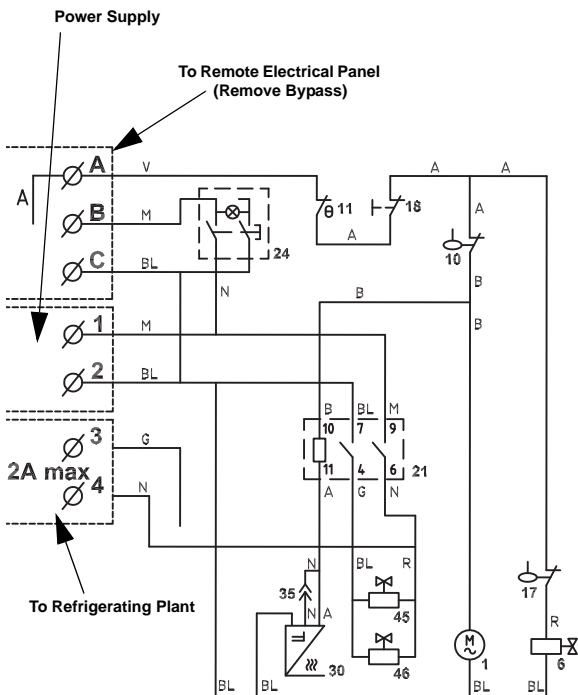


WIRING DIAGRAM LEGEND RF2300C

1	Gear Motor
6	Water inlet valve
10	Low water level safety
11	Bin thermostat
17	Water level switch
18	Ice chute safety switch
21	Compressor Relay
24	On/Off switch
30	Rotation sensor
35	Compressor time delay by-pass
38	Solenoid Valve
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
A	Orange

Rack Models

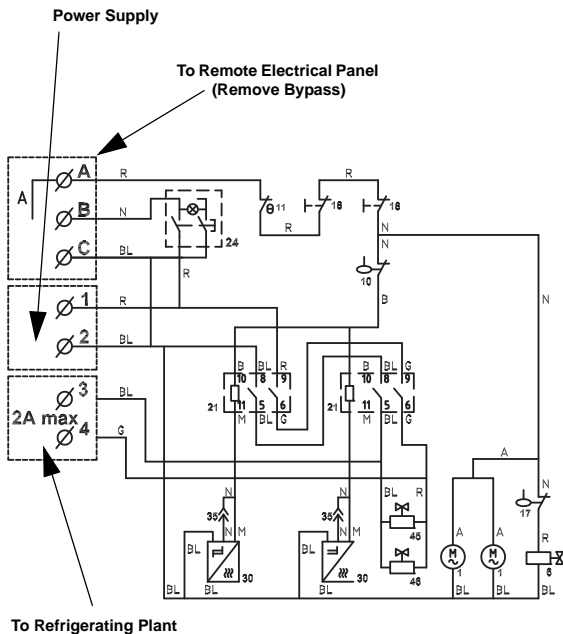
RF1279R HEAD SECTION



WIRING DIAGRAM LEGEND RF1200C

1	Gear Motor
6	Water inlet valve
10	Low water level safety
11	Bin thermostat
17	Water level switch
18	Ice chute safety switch
21	Compressor Relay
24	On/Off switch
30	Rotation sensor
35	Compressor time delay by-pass
45	Suction Line Solenoid Valve
46	Liquid Line Solenoid Valve
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
V	Violet
A	Orange

RF2379R HEAD SECTION

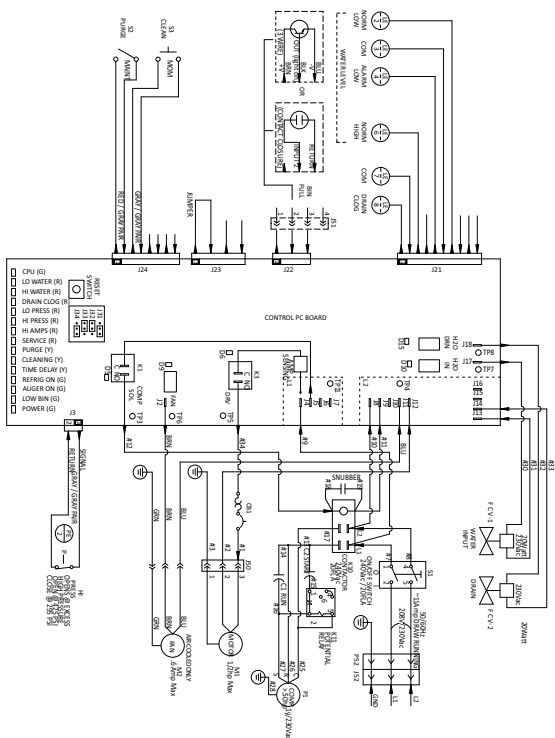


WIRING DIAGRAM LEGEND RF1200C

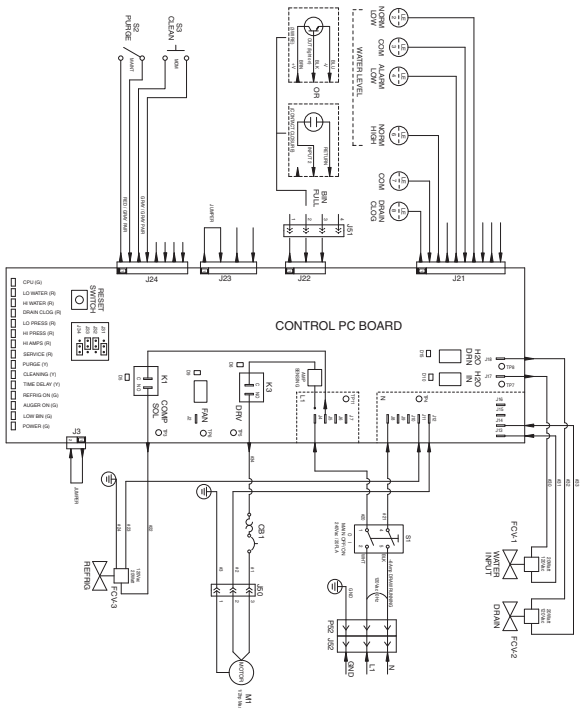
1	Gear Motor
6	Water inlet valve
10	Low water level safety
11	Bin thermostat
17	Water level switch
18	Ice chute safety switch
21	Compressor Relay
24	On/Off switch
30	Rotation sensor
35	Compressor time delay by-pass
45	Suction Line Solenoid Valve
46	Liquid Line Solenoid Valve
Wire Color Designation	
B	White
BL	Blue
G	Grey
M	Brown
N	Black
R	Red
V	Violet
A	Orange

Nugget Models

RN1000/RN1400 AIR & WATER COOLED



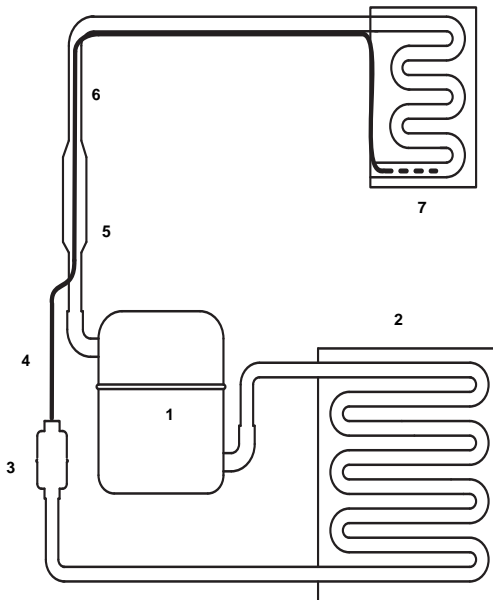
RN1000C/RN1200C QUIETQUBE HEAD SECTION



Refrigeration Tubing Schematics

Flake Models

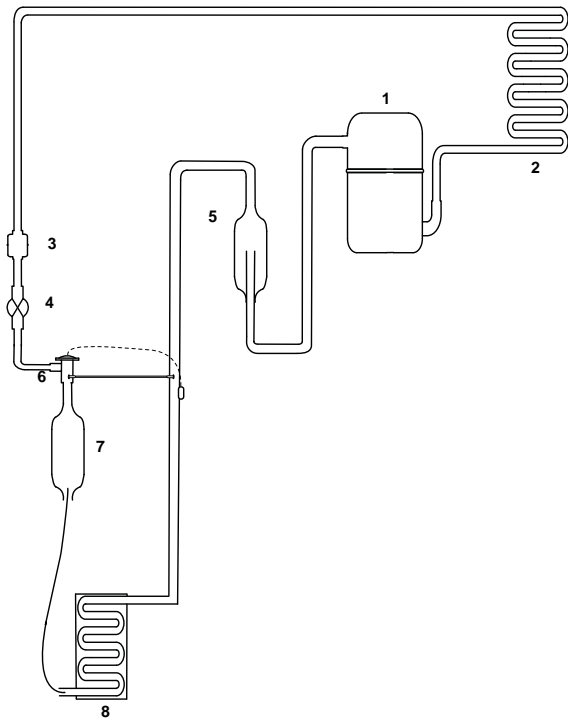
RF0244/RF0266/RF0388/RF0399
RF0300/RF0650 AIR-COOLED



TUBING DIAGRAM LEGEND

1	Compressor
2	Condenser
3	Liquid Line Drier
4	Capillary tube
5	Accumulator
6	Heat Exchanger
7	Evaporator

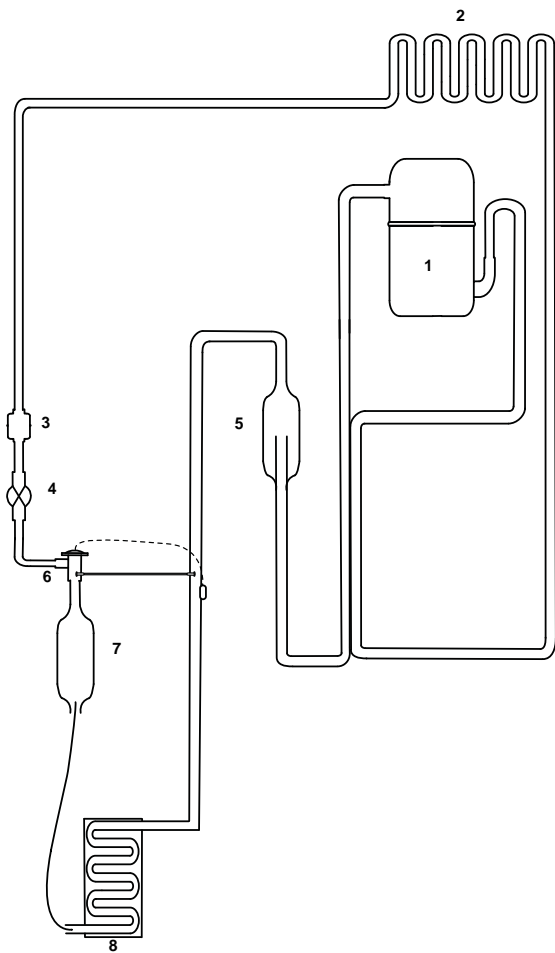
RF1200 AIR-COOLED



TUBING DIAGRAM LEGEND

1	Compressor
2	Condenser
3	Liquid Line Drier
4	Liquid Line Solenoid Valve
5	Suction Accumulator
6	Thermostatic Expansion Valve
7	Liquid Accumulator
8	Evaporator

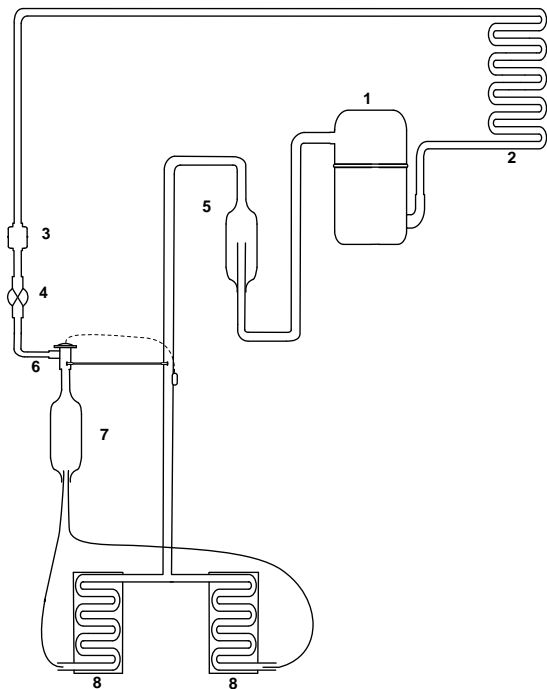
RF1200 WATER-COOLED



TUBING DIAGRAM LEGEND

1	Compressor
2	Condenser
3	Liquid Line Drier
4	Liquid Line Solenoid Valve
5	Suction Accumulator
6	Thermostatic Expansion Valve
7	Liquid Accumulator
8	Evaporator

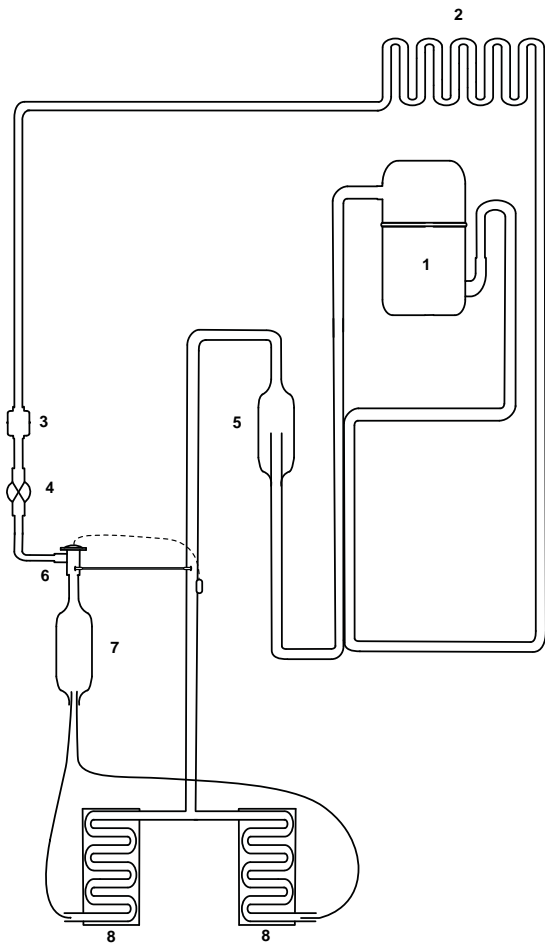
RF2300 AIR-COOLED



TUBING DIAGRAM LEGEND

1	Compressor
2	Condenser
3	Liquid Line Drier
4	Liquid Line Solenoid Valve
5	Suction Accumulator
6	Thermostatic Expansion Valve
7	Liquid Accumulator
8	Evaporator

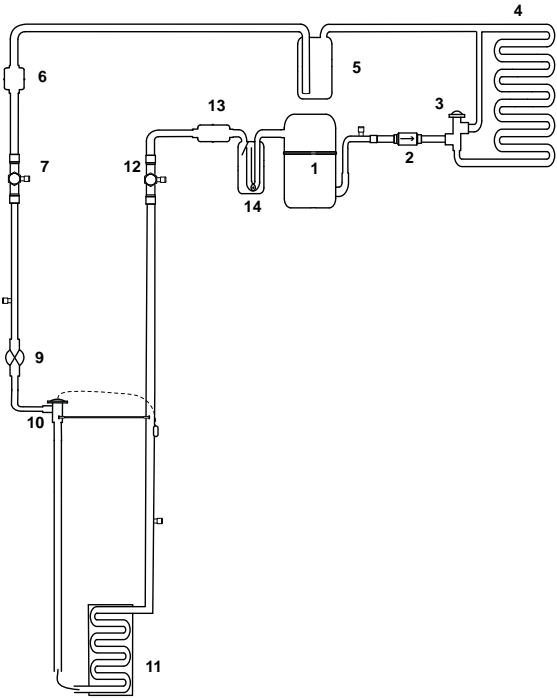
RF2300 WATER-COOLED



TUBING DIAGRAM LEGEND

1	Compressor
2	Condenser
3	Liquid Line Drier
4	Liquid Line Solenoid Valve
5	Suction Accumulator
6	Thermostatic Expansion Valve
7	Liquid Accumulator
8	Evaporator

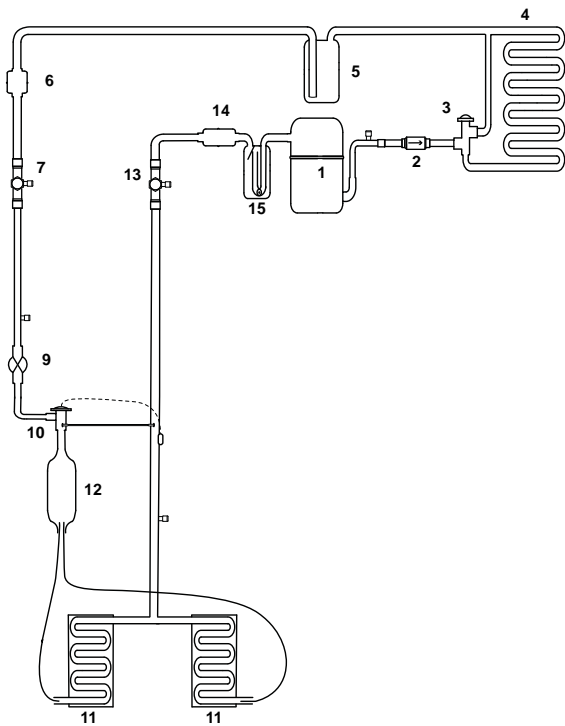
**RF1200C QUIETQUBE HEAD SECTION &
RCU1075 CONDENSING UNIT**



TUBING DIAGRAM LEGEND

1	Compressor
2	Check Valve
3	Head Pressure Control Valve
4	Condenser (air or water cooled)
5	Receiver
6	Condensing unit Liquid Line Drier
7	Liquid Line Shut-off Valve
8	Ice Machine Liquid Line Drier
9	Liquid Line Solenoid Valve
10	Thermostatic Expansion Valve
11	Evaporator
12	Suction Line Shut-off Valve
13	Suction Line Filter
14	Suction Accumulator

RF2300C QUIETQUBE HEAD SECTION & RCU2375 CONDENSING UNIT

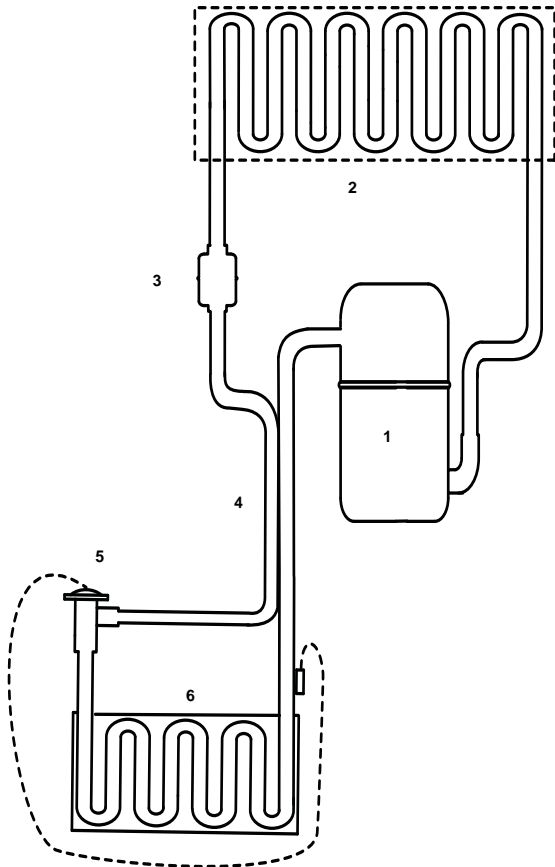


TUBING DIAGRAM LEGEND

1	Compressor
2	Check Valve
3	Head Pressure Control Valve
4	Condenser (air or water cooled)
5	Receiver
6	Condensing unit Liquid Line Drier
7	Liquid Line Shut-off Valve
8	Ice Machine Liquid Line Drier
9	Liquid Line Solenoid Valve
10	Thermostatic Expansion Valve
11	Evaporator
12	Liquid Accumulator
13	Suction Line Shut-off Valve
14	Suction Line Filter
15	Suction Accumulator

Nugget Models

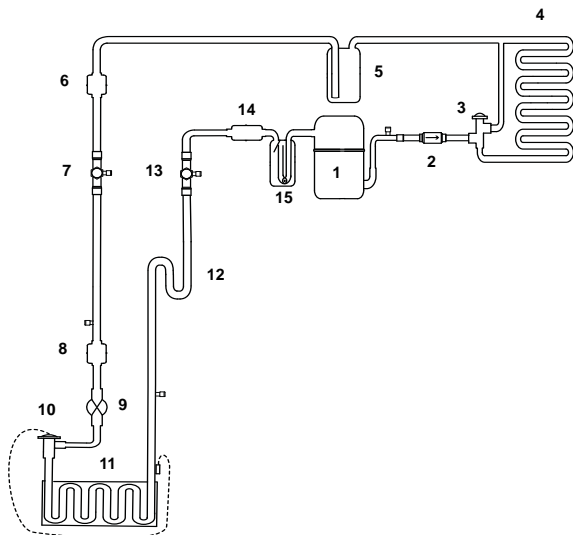
RN1000/RN1400 AIR & WATER-COOLED



TUBING DIAGRAM LEGEND

1	Compressor
2	Condenser (air or water cooled)
3	Liquid Line Drier
4	Heat Exchanger
5	Thermostatic Expansion Valve
6	Evaporator

RN1000C/RN1200C QUIETQUBE HEAD SECTION & RCU1075/RCU1275 CONDENSING UNIT



TUBING DIAGRAM LEGEND

1	Compressor
2	Check Valve
3	Head Pressure Control Valve
4	Condenser (air or water cooled)
5	Receiver
6	Condensing unit Liquid Line Drier
7	Liquid Line Shut-off Valve
8	Ice Machine Liquid Line Drier
9	Liquid Line Solenoid Valve
10	Thermostatic Expansion Valve
11	Evaporator
12	S Trap (20' + Rise Only)
13	Suction Line Shut-off Valve
14	Suction Line Filter
15	Suction Accumulator

This Page Intentionally Left Blank

This Page Intentionally Left Blank

This Page Intentionally Left Blank



Manitowoc Ice
2110 South 26th Street, P.O. Box 1720
Manitowoc, WI 54221-1720, USA
Ph: 920-682-0161 Fax: 920-683-7589
Visit us online at: www.manitowocfsg.com