2019 Ice Maker Training

Feb, 2019

Health & Safety topics

Before starting the presentation lets understand safety:

- Physical Site / Location
  - Safety exits for building
  - Safe assembly area
- Electrical Hazards
  - Voltage in Building
- Refrigeration
  - We handle R404a refrigerant
- Gas Management / CO2
  - Use this for fountain products
- Before installation please make sure you read through the installation manual.

What Is Chunklet Ice?

- Also referred to as “Soft”, “Chewy”, or “Extruded” Ice.
- It is produced through continuous compression of ice flakes… similar to a snowball.
- This process allows beverage to surround the ice and cool faster and absorb into the ice.
- Nugget ice is also perfect for blended drinks.

Chunklet Ice	Cube Ice
Fun to chew and holds the flavor of the drink.	Hard to Chew
80% Ice Fraction	100% Ice Fraction
100% Usage of water	Water re-circulation over evaporator
Lesser cost of ownership.	Higher, when compared with equivalent Chunklet model

Cornelius Ice – Carbon Models

Easy to clean, plastic front panel
High-yield - Ideal for use in demanding, high volume applications.

Designed based on our current 700# unit, more reliable.

Matches IDC Pro for modern, high-end ice maker & dispense combination.

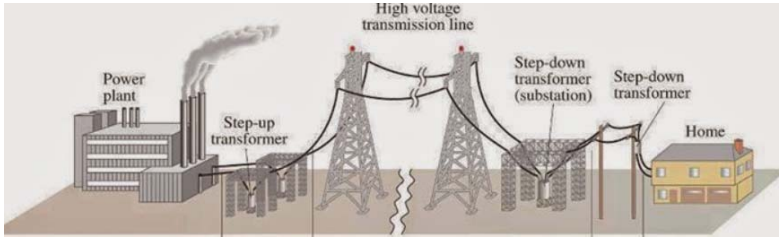
Durable Corrosion free stainless steel cladding

Model	Part#	Condenser Type	Remote Condenser Model	Daily Production @ 70° Air / 50° Water	Electrical	Height (in)	Width (in)	Depth (in)
WCC700R	621058724	Remote	WCU600	616	115/60	28	30	24
WCC700W	621058726	Water		616	115/60	28	30	24
WCC700A	621058725	Air		616	115/60	28	30	24

Installation Guide lines

Location:

- Make Sure proper air clearances for proper circulation – front and side on air cooled.
  - 12” clearance on air Intake to be maintained.
  - 4” clearance minimum on air exhaust.
- Ice-Maker should not be placed in direct sunlight or in close proximity of any object generating additional heat load on system.



Electrical requirements:

MODEL	REQUIREMENTS	REQUIREMENTS
WCC700A	110-126V/60HZ/1PH 20Amp	Stand alone circuit breaker

Notes:

- **Unit has to be plugged with individual circuit breaker of 20 Amps, no other equipment should be connected to this circuit.**
- Voltage is –5% / +10% with the compressor running.
- Discuss 1.5 KVA Buck / Boost Transformer (+/- 16/32VAC). Explain wiring diagram and the fact that only one leg is being increased or decreased.

Drain:

- Overflow line is a 3/8” i.d. flexible tubing, plumb to local guidelines.

Installation Guide lines

Water supply:

- Water Inlet - Fitting is a 1/4” (6.35mm) SAE male flare located at the rear of the unit.
- Connect water supply with a 1/4” (6.35mm) or larger copper or flexible tubing. Main water line should be 3/8”.
- Unit must be installed with only potable water.
- A shut-off valve with a loop of additional tubing for service is recommended.
- Water Pressure - Unless otherwise specified, the unit is designed to operate on water pressures between 20 P.S.I. (0.69 Mpa) and 90 P.S.I. (0.62 Mpa). 50 PSI is the ideal incoming water pressure.
- A recommended water supply is with temperatures between 50° F - 90° F (10° C - 32° C) with a pressure between 20-70 p.s.i (0.138 - 0.48 Mpa).
- For pressures above 90 P.S.I. (0.62 Mpa) a regulator must be installed. Include 50Psi water regulator.
- This equipment must be installed with adequate backflow protection to comply with applicable federal state and local codes.
- Filter – Filtration should consist of a pre filter and carbon filters to remove taste and odor.
- **IMF (Phosphate Feeder) Water Filters and Scale inhibitors are not to be used with the Continuous Flow Ice-Maker**, Taste & Odor only should be used.
- Total dissolved solids in the water should be within the below specified limit MIN dissolved solids = 270 PPM(TDS). Max dissolved solids = 500 PPM(TDS). NOTE: Water inlet for the Ice Maker should not be with RO Filtration System. NOTE: Unit must be installed per local plumbing code.

Pictorial representation:

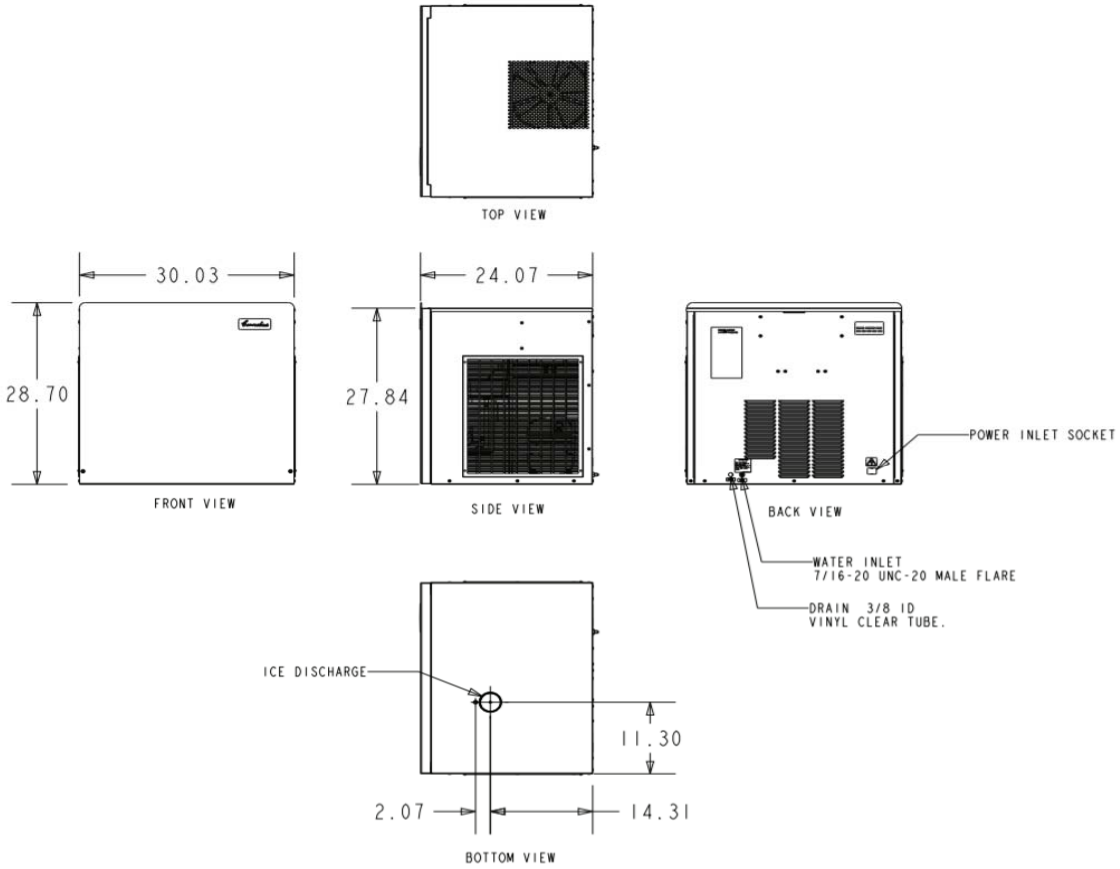


Figure 1D WCC 700A Chunklet Carbon

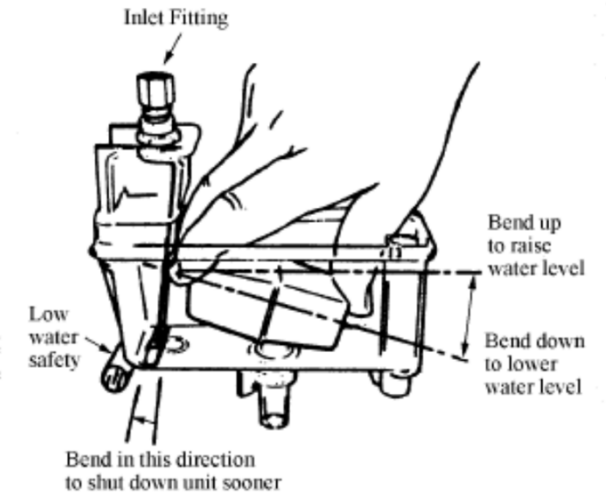
How Ice is Made:

- The Cornelius Chunklet Ice Maker creates Ice in a process called extrusion.
- Ice is frozen to an evaporator wall until it grows thick enough to harvest. At that point the ice is shaved from the wall by an auger and carried upwards to the extruding head.
- The extruding head is a finned device that forms or compresses the ice into its familiar Chunklet shape. As ice is compressed by the extruder head, whatever remaining water there is on the surface of the ice will be squeezed away leaving a uniformly shaped chunk of ice.
- The ice made in this process is soft and chewable yet resists bridging in Ice Drink dispensers when properly setup. Use of a bin stat set to a lower point, agitation time adjustments, restrictor plate adjustment and addition of a diverter plate assure this.

Auger

Extruder head

Water System Overview

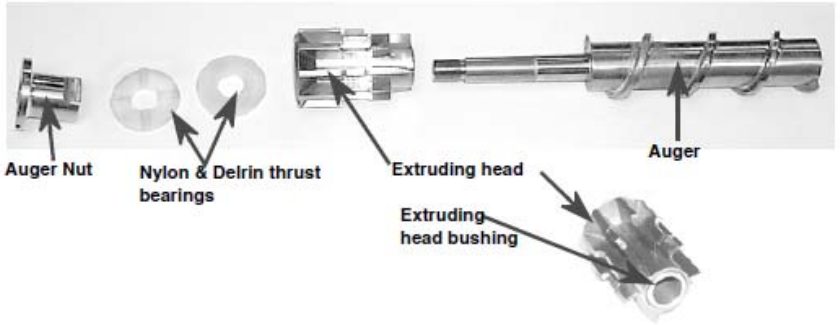


- Water level in the reservoir should be set to the water level line while operating. Looking at the center picture take note that with proper water level setting the top evaporator coil should be covered with water.
- During installation the float should be verified for:
- Proper water level.
- System safety shutdown.
- Typically water pressure would be regulated if greater than 50 psi.
- Make provisions for plastic tubing overflow lines as well.

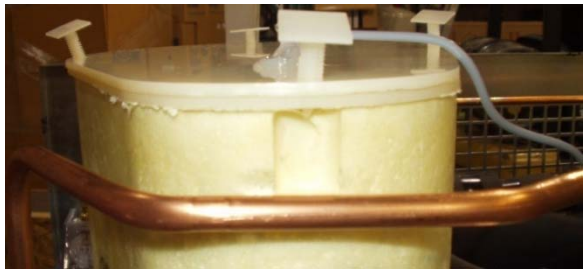
Extruder Assembly / Evaporator

Extruder & Evaporator

The extruding oilite head bushing is replaceable. It is a special bushing that contains no lead and needs to be pressed into the shaft. The thrust bearings will become worn and should be replaced bi-annually or as needed.



Breakaway mounts – should the Ice Machine not shut down these mounts are designed to break & relieve auger pressure.



- Note that compression of the Ice takes place at the top of the evaporator assembly.
- The output shaft of GEARMOTOR spins the auger with the extruding head stationary, as the ice is driven up the wall of the evaporator it compresses & is extruded into the reservoir tray. The upward movement of the ice pulls down on the extruding head therefore the thrust washers wear & need to be replaced bi-annually.

Note: pictures from a WCC500

Gear Motor – over amp manual reset switch

- Bison gearbox with GE/other reputed make motor (# 620067555)
- Manual overload (located on opposite side of motor) trips at approx. 2.4A.
- Motor cover to prevent condensation penetration.

Manual reset button – underneath bottom casing of motor.

Transmission – front end assembly

AUGER AND EXTRUDING HEAD REMOVAL

1. Disconnect unit from power supply.
2. Remove storage container cover and put aside.
3. Turn off water supply to icemaker.
4. After ice has been melted from head take hold of the auger nut and lift straight up to disengage from icemaker.
5. When replacing the auger assembly, make certain that both the auger engages the output shaft drive and the extruding head ribs engage the evaporator tube.

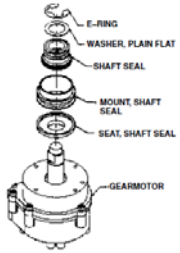
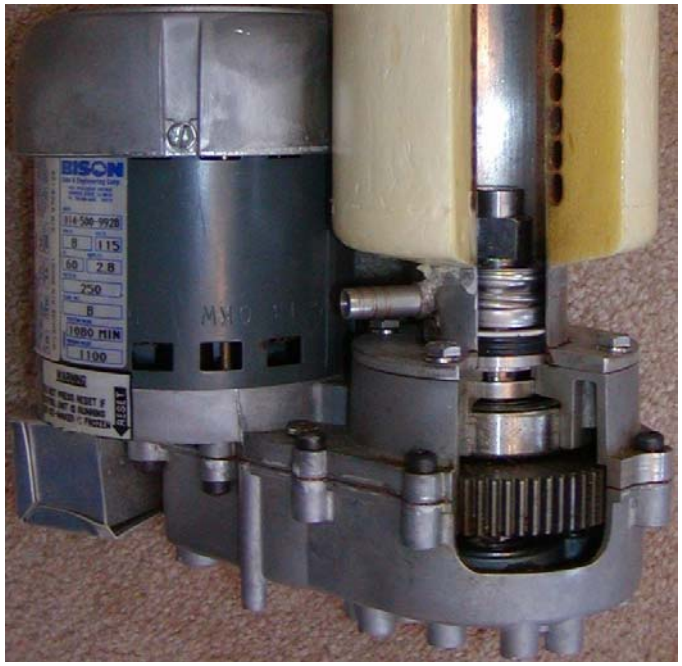


FIGURE 18. SHAFT SEAL 700 & 1000

INSTALLATION AND SHAFT SEAL REPLACEMENT 700

1. Place shaft seal locator seat and shaft seal mount over gearmotor output shaft and push down until shaft seal seat and shaft seal mount rest flush on top of gearmotor.
2. Place rubber coated ceramic seal (important: ceramic face up) over output shaft and push down until seal nest in recess of shaft seal mount (lubricate rubber on ceramic seal with rubber lubricant).
3. Place shaft seal with carbon face down (spring up) over output shaft and push (gently) downward until seal rests on carbon face of the output shaft seal.
4. Place flat washer over output shaft and let rest on the output shaft seal. Push down on the washer compressing the spring on the output shaft seal. While holding the seals (down) in place slide the e-ring into the groove on the output shaft.

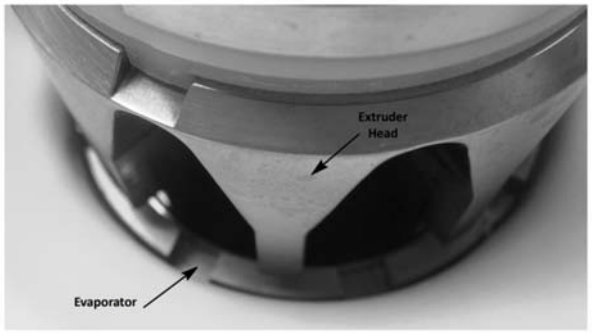


Note: picture from a WCC500

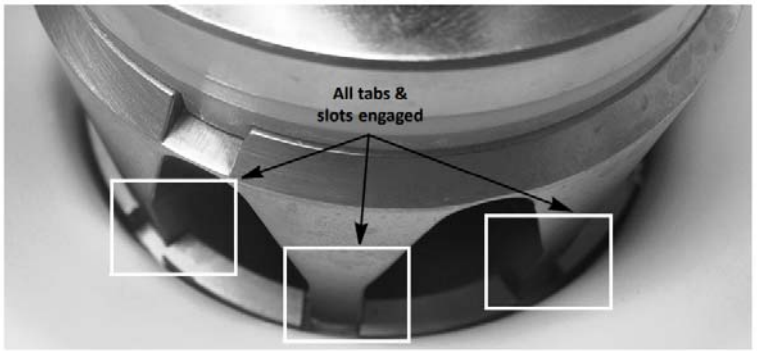
Transmission holds +/- 1 pint of 80 / 90 gear lube.

Auger Engagement

Install the extruder head as shown in the picture.



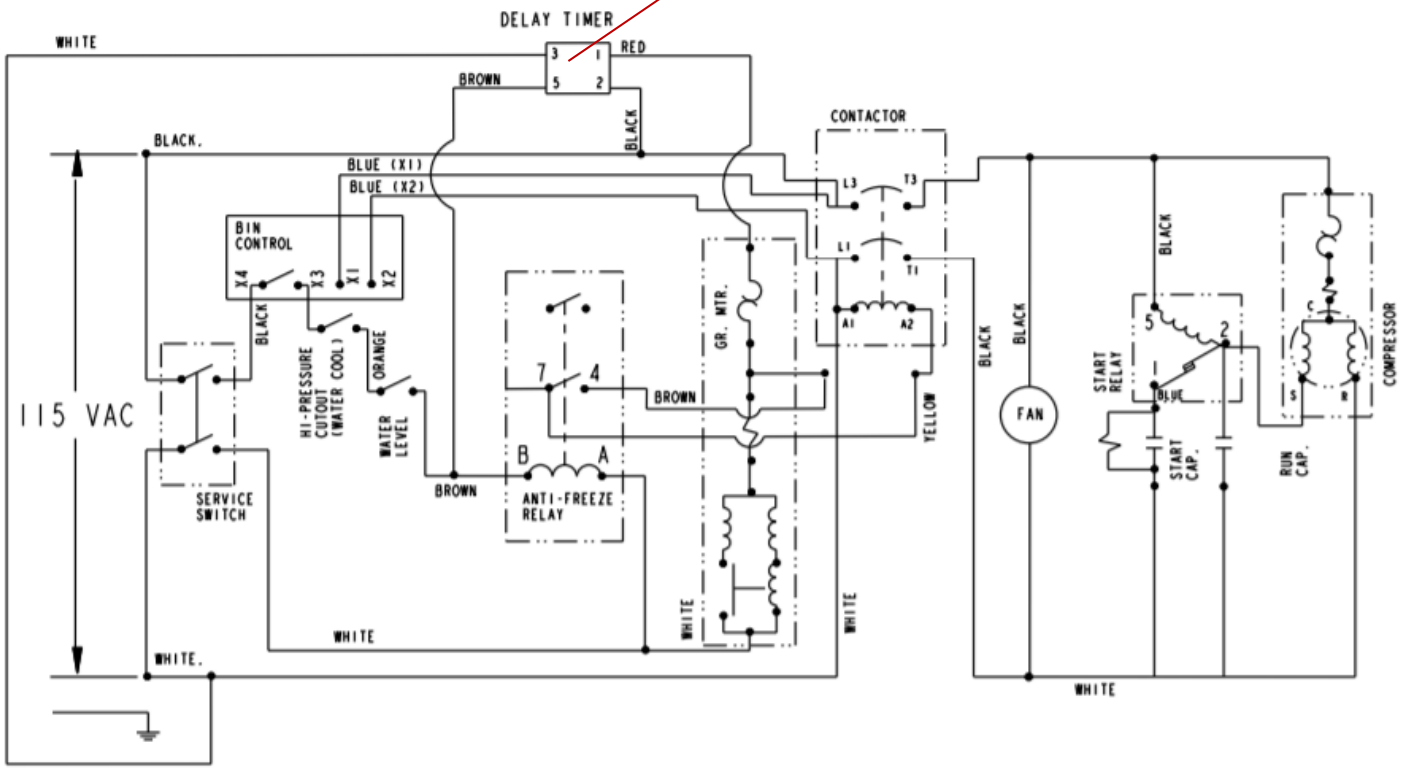
When Auger is lowered into the evaporator, rotate the auger to engage the motor drive shaft.



Carefully rotate the extruder head until the tabs on the extruder head drop into the slots on evaporator

Wiring diagram WCC700A & Carbon units

All Units are equipped with Auger delay timer to safeguard the equipment.



Auger delay time: After the refrigeration cycles shut down it helps the Auger to run 3 minutes so that it can flush out the Ice in Barrel. This will help to reduce the initial Torque on the Next start up of unit.

Key Safety Controls

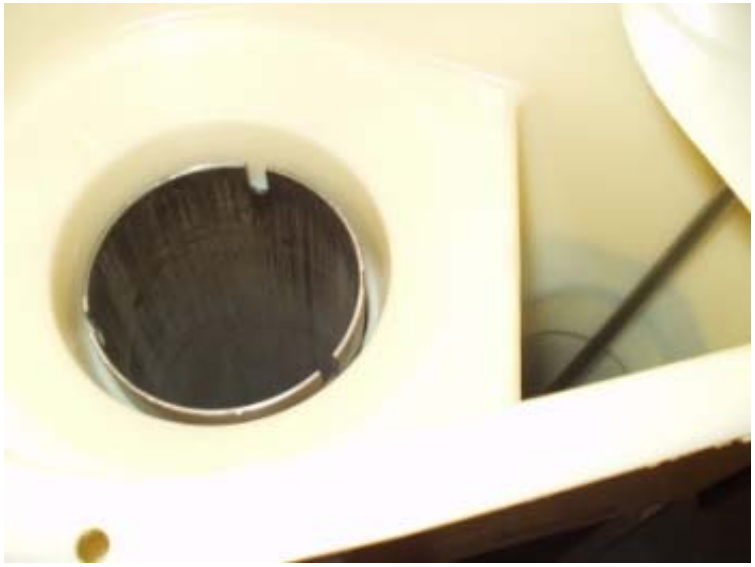
WCC Controls and Electrical

The WCC control circuit is a series circuit consisting of the following components:

1. **Bin Control/s** – Electrical power is run through the solid state bin control/s (one for the 700). This circuit consists of a PC Board, thermistor, thermistor locating sleeve and drop tube to direct the ice drop zone into the bin. The bin control is adjustable and is what stops ice production once ice backs up partially in the drop tube/s.
2. **Low Water Safety Switch** – Located in the water float assembly this will stop ice production should the water supply be interrupted, once water is restored ice production will resume if needed. This consists of a magnet (attached to the float arm) and a reed switch (attached to the float assembly bracket).
3. **Anti-freeze Relay** – This relay is used in different ways depending on the model of icemaker but it too will stop ice production. This relay is wired in with the evaporator gearmotor/s so that if a gearmotor trips on internal overload power to the compressor is interrupted and ice production stops.
4. **Manual Reset Overload** – Each gearmotor has a manual reset switch underneath the outer casing, should an over amperage situation occur this overload trips and stops ice production. The reset must be manually reset and troubleshot as to the cause.
5. **Contactor Coil** – Runs the gearmotor and refrigeration systems.
6. **Low Side Pressure Switch** – Used only on remote refrigeration and typically used to sense start and stop of ice production is also a safety, should the system be low on refrigerant or the drier be restricted ice production will stop due to low suction pressure.

Bin stat/s – Solid State

Reservoir tray with drop tube and solid stat (stainless steel) probe tube shown below.



Std. drop tube & extended drop tube for Chunklet Ice shown below.

Bin Thermostat “Lowering Kit”

Picture of Kit – lowers Ice level +/- 4 inches to reduce compacting and “snow coning”.

•Remove existing thermostat sensor from existing stainless steel sensor sleeve (sensor to be reused).

•Remove existing s/s sensor sleeve from Dispense tray cover.

•Insert Thermostat sensor into new (long) s/s sensor sleeve until it extends thru the bottom, place a small amount of silicone on the sensor and pull up into the s/s sleeve until it is flush with the bottom of the sleeve.

•Insert the new thermostat / stainless steel sleeve assembly back into the Dispense tray cover and seal with silicone.

Ice Maker Amperage & refrigeration check

Model	Voltage	**Nameplate Amps (A)**	**Running Amps (A)**
WCC700A Carbon	115V / 60Hz	**20**	**11.0 - 12.5**

Evaporator Efficiency

The evaporator on the Cornelius/Wilshire icemaker can be tested for efficiency in three easy ways.

1. Simply observe the ice coming out of the extruder head during production. As the auger rotates, an ice chunklet should pop out of each extruder slot on every rotation.
2. Frost pattern testing of the evaporator. Open up the icemaker so that the auger/extruding head can be removed (this may require waiting until the evaporator has thawed out). Remove the assembly and allow the evaporator to fill with water. Start up the icemaker and allow it to run for exactly one minute and forty-five seconds. Immediately shut the unit down, drain the evaporator or use a flashlight to look down into the cylinder. A sleeve or spiral of ice should have formed inside the evaporator tube. This sleeve should extend the full length between the refrigerant inlet and suction outlet lines. There should be no interruptions, gaps or holes in this pattern. There will not be any ice at either end, which are beyond the refrigerant lines.
3. Weighing output. The 24-hour output of the icemaker may be determined by weighing its output of Ice for 15 minutes and multiplying that figure by 96. This figure can also be used to calculate water usage. The weight of the melted ice (water) must be included in either of the above calculations for accuracy. The icemaker should be run for at least 5 minutes before starting the test.

Superheat & Suction Temperature

Cornelius/Wilshire Chunklet icemakers run at a ~ 4 degree F superheat, for those reasons they are equipped with non-adjustable expansion valves.

Suction temperature nominally runs at 8 – 12 degrees below zero, remote systems are apt to run at lower temperatures due to their environment.

Preventative Maintenance Procedures

Evaporator Squealing

- Squealing noises coming from the evaporator are accompanied by low production. These noises are caused by a “rotational freeze”. A rotational freeze is usually caused by mineral buildup on the evaporator walls. These deposits are not always visible, especially when the evaporator is wet. The production of ice depends on the ice freezing to the wall of the evaporator and being shaved off by the auger.

- The evaporator wall is belt sanded to create scratches from top to bottom. These scratches give the ice something to hold onto, preventing it from rotating with the auger. If the grooves become filled with mineral deposits, the ice will not have any grip on the evaporator and begin to rotate, instead of being shaved and pushed upward. The squealing noise is caused by the ice continuing to expand as it rotates.

- Ice sticking together in the bin is almost always the result of water chemistry. High concentrates of minerals in the water, chlorine, and salinity are usually found to be the cause. Filters that are specially designed for cubed ice makers usually contain chemicals called phosphates. These phosphates will prevent minerals from freezing into the ice cubes as the bind with the impurities, this will allow the purest water to freeze first and the mineral laden water to be dumped during the harvest cycle. The WCC Chunklet use 100% of their water, if phosphate feeders are used the minerals have no choice but to fill the bin with the Chunklet – should not use. Once there it behaves like salt causing the ice to breakdown and potentially stick together, this can result in damaged agitator blades or a large block of ice (snow cone) may form due to clumping together. **Therefore for phosphate feeders and scale inhibitors should not be used with Chunklet ice**.

Preventative Maintenance Procedures

ICEMAKER CLEANING AND SANITIZING PROCEDURES

- WARNING: Do not use any of the ice made during cleaning operations. Clean and sanitize ice storage area when cleaning icemaker.
- Turn machine off.
- Shut off water supply.
- Remove ice from storage bin.
- Mix approved cleaner (2 gallons as directed). Recommended cleaner: Nu-Calgon liquid ice machine cleaner. Mixture: 3-1/3 ounces per gallon of water.
- Cleaner must be safe for stainless steel. NO EXCEPTIONS.
- Clean auger/diverter assembly and ice transition/drop tube in a sink using cleaner mixture and reinstall in icemaker. Using cleaner, wipe down the dispense tray.
- Turn machine on and add cleaner solution to water level control until 2 gallons have been used.
- Turn on water supply and run machine for 15 minutes.
- Turn off machine and remove all ice.
- Sanitize using household liquid bleach (50 ppm chlorine). Mixture: 1 fluid ounce per gallon room temperature water. 2 minute exposure time.
- Sanitize auger/diverter assembly and ice transition/drop tube in a sink using sanitizing solution and reinstall in icemaker. Using sanitizer, wipe down the dispense tray.
- Fill icemaker with sanitizer by slowly pouring solution into water feed reservoir until full. Solution will drain through overflow tube. Do not run machine. Allow to air dry.
- If icemaker is used in conjunction with ice dispenser or storage bin, follow manufacturer's recommended cleaning instructions at this time.

Preventative Maintenance Procedures

- MAINTENANCE Preventive maintenance can increase the trouble free life of your icemaker.
- Many authorized service agencies offer service contracts for your icemaker.

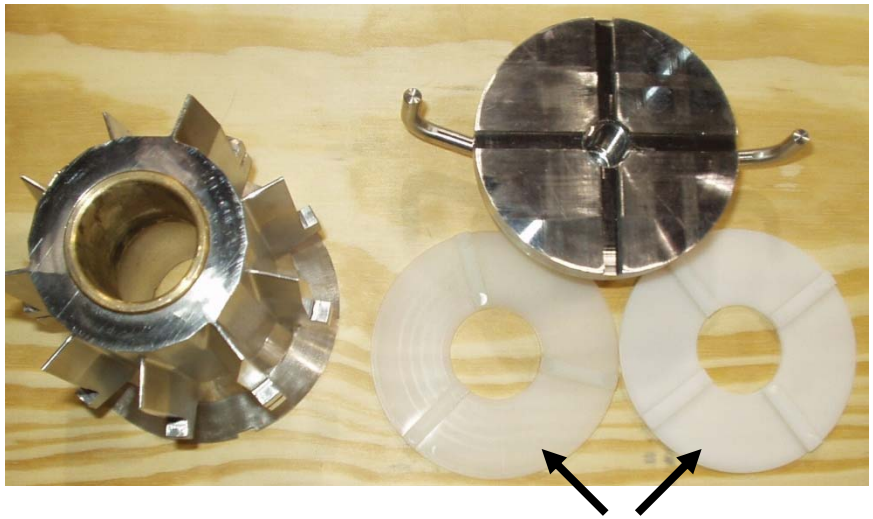
- Monthly 1. Clean the condenser. Use a brush, vacuum cleaner or blow from inside with air or CO2 gas.
- Inspect water feed reservoir at least once a month until a definite pattern for cleaning and sanitizing has been established.

- Quarterly This is the maximum period of time between cleaning and sanitizing the icemaker. In addition to recommended monthly procedure, and if a more frequent cleaning and sanitizing pattern has not been established, unit must be cleaned and sanitized.

For more details please refer the service manuals

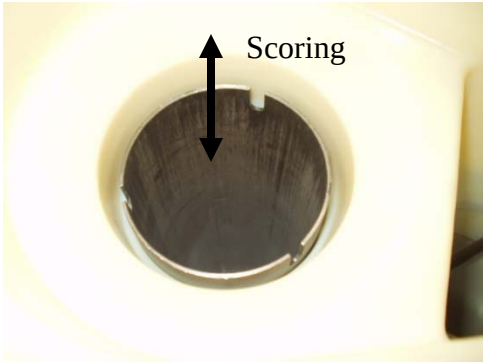
Preventative Maintenance Procedures – Evaporator / Extruder area

Extruding Head Bushing should be inspected for wear annually or before. During bi-annual PM this should be checked for side play / scoring of the evaporator.



Nylon & Delrin thrust bearings should be replaced bi-annually or before if less than 1/16" thick (see diagram-→).

Reservoir tray – evaporator w/ auger assembly removed.



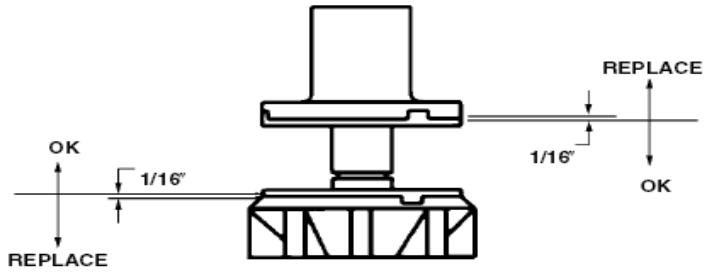
Take note that the evaporator's inner walls are scored from the factory with vertical grooves. When cleaning / de-scaling the evaporator assembly use straight Ice Machine cleaner (not Nickel-safe) and a rigid nylon brush after sitting for 15 minutes. As the factory grooves may fill with impurities if the de-scaling solution has not fully cleaned the vertical grooves please do the following. With a non-rotational movement (straight strokes up & down) use 60 grit sandpaper to score the evaporator's inner walls once again. Doing this will reduce the risk of rotational freeze. Once complete flush & sanitize.

PM – Parts

SEMI–ANNUALLY

Semi-Annually in addition to all previously established service procedures perform the following:

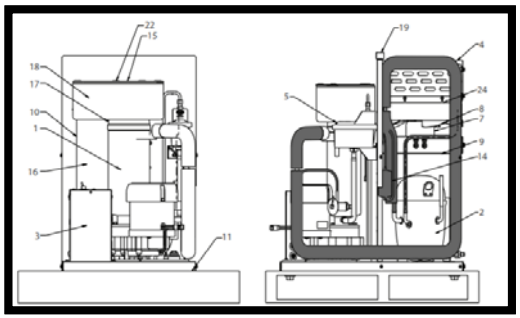
1. Check for water leaks in tube connections, water fittings and lower icemaker water seal.
2. Check drain tubes for clogs and aged tubes. Replace if tubes are stained or brittle.
3. Check for signs of condensation. Clean where necessary and replace insulation properly.
4. Check safety circuits for proper operation.
5. Check refrigeration system (see page 16).
6. Check unit for abnormal noise. Tighten machine and cabinet screws, if necessary.
7. Check white upper bearings on auger assembly. If bearings are less than 1/16″ thick, replace. See Figure 12



- P/N:638090219 – Nylon Bearing
- P/N:638090220 – Delrin thrust bearings
- P/N:630900608 – Extruder head or a bearing bush kit

WR1

Recommended – Parts



#	Part No.	Description
1	629096836	KIT EVAPORATOR REPLACEMENT WCC
2	629097851	Kit Compressor RST70
3	620068304	COMP START RELAY RST70
4	620054229	Electrical Box Assembly
	630900547	Water Level Control Assembly
5	638008483	Reed Switch Assembly
6	620068259	Valve Thermal Expansion
7	620067555	Fan Motor - 115V
8	638004393	Dryer
9	638090050	Motor – Assy Gear 120/60 WCC

Refer the Illustrated parts list for more part details

Slide 24

WR1 IS this bassed off of location or market penetration? This list is typically based off or market penetration and high failure components.
Wells, Robert, 2/18/2019

Soft Ice Dispensing Tips - Take note in regards to the IDC/ED units

Soft Ice Dispensing Tips - Take note in regards to the IDC…

- WCC700 can be front or back mounted for ease of Service.
- Hopper redesigned to accommodate hard or "chewable" Chunklet Ice.
- Hopper Ice Slide provided with Adapter Kit (to be installed in IDC).
- Agitation of the Ice should be changed to turn 2 (.5) seconds every 3 hours (dependent on throughput).
- Bin thermostat "lowering kit" must be installed (drops ice level min 4").
- We have a special Binstat Kit designed for KT (P/N#629097846)
- Ice restrictor plate should be fully opened.
- Diverter plate assists dispense

	'X' indicates dispenser is AFFECTED by Issue and Solution Blank box indicates dispenser is NOT AFFECTED by Issue or Solution									
Question or Issue	ED/DF 150	ED/DF 175	ED/DF 200	ED/DF 250	ED/DF 300	IDC 215	IDC 255	NGF 255	Flavor Fusion/Cold Fusion	Solution
Is the icemaker sized correctly for the dispenser size?	X	X	X	X	X	X	X	X	X	If no, failure to meet this criteria can result in ice makers that short cycle which will increase the amount of wet ice being introduced into the system and greatly affect ice dispense. Dispenser hopper capacity and amount of daily ice usage are key factors that need to be taken in account when sizing an icemaker to a dispenser. Under sizing an icemaker can cause ice shortage and over sizing can cause short cycling as mentioned above. Contact Cornelius Sales for icemaker to dispenser sizing details.
Does the icemaker produce 'flaked' ice?	X	X	X	X	X	X	X	X	X	Cornelius does NOT recommend the use of 'flaked' ice for dispensing and such icemakers should not be used
Is the correct icemaker adapter kit installed?	X	X	X	X	X	X	X	X	X	If no, the approved adapter kit must be installed with it's approved icemaker. Failure to do so may result in undesirable hopper fill and ice dispensing issues. Contact Cornelius Sales for approved adapter/icemaker combinations
Is the icemaker positioned properly on the adapter kit?	X	X	X	X	X	X	X	X	X	Most adapter kits are approved for front facing icemakers ONLY unless otherwise specified in the adapter kit instructions OR if kit was designed for alternate icemaker positions. Contact Cornelius Sales for adapter/icemaker application questions
Is the hopper ice slide installed?			X	X		X	X	X	X	If no, install the appropriate ice slide for that unit. ED/DF 200 - kit 629088508 (includes diverter) ED/DF 250 - kit 629088507 (includes diverter) IDC/NGF/CF/FF - ice slide is included in the appropriate adapter kit. Contact Cornelius Sales for adapter kit information.
Are the soft ice agitator's installed?	X	X	X	X	X					If no, install agitator(s). Please note there is a right and left hand agitator for the ED/DF300's ED/DF 150,175 - kit 629088514 (includes diverter) ED/DF 200 - kit 629088508 (includes diverter) ED/DF 250 - kit 629088507 (includes diverter) ED/DF 300 - kit 629088644 (includes diverter)
Is the ice diverter kit installed?	X	X	X	X	X	X	X	X	X	If no, install the appropriate ice diverter kit. ED Diverter is included in kit part numbers listed above or call Cornelius Sales for diverter kit ordering information IDC/NGF/CF/FF - kit 629097086
Is the ice restrictor open completely?	X	X	X	X	X	X	X	X	X	If no, open completely the ice restrictor. Some factors may include customer ice flow requirements and how well the ice dispenses (Be sure restrictor is installed properly!). This should be evaluated on a case by case basis.
Is the dispenser agitator off-cycle timer changed to 3 hours OFF, 2 seconds ON?	X	X	X	X	X	X	X	X	X	If no, adjust settings. (Don't forget to adjust BOTH timer boards on the 300 size units). Consult Dispenser Service Manual or call Technical Support for instructions on how to adjust settings.
Is there an icemaker bin thermostat installed?	X	X	X	X	X	X	X	X	X	If no, install an appropriate bin thermostat per the icemaker's manufacturing recommendations. Contact the icemaker manufacturer for bin thermostat ordering information.
Is the icemaker's bin stat installed at least 4" below hopper level	X	X	X	X	X	X	X	X	X	If no, adjust bin stat location (Depending on ice quality or wetness, it may be necessary to adjust deeper into hopper. Be sure bin stat does NOT interfere with agitator rotation Order ONE of kit 1611110006843 if you are using a Cornelius WCC700 icemaker. Order TWO of kit 1611110006843 if you are using a Cornelius WCC1400 icemaker.
Is dispenser and/or icemaker water supply attached to a water softener or phosphate feeder?	X	X	X	X	X	X	X	X	X	If yes, Cornelius does NOT recommend the use of a water softener/phosphate feeders and must be completely avoided
Is a water filter system installed on the icemaker?	X	X	X	X	X	X	X	X	X	Poor water quality will greatly affect icemaker/dispenser performance. The selection of the correct filter system must be handled on an individual basis as the water quality and impurities vary greatly in different parts of the country as well as in different cities.
Is the dispense count less than 30 per day?	X	X	X	X		X	X	X	X	Install extended bin stat kit 629096848 for WCC700 (Do not use on WCC1400) or 629096849 for WCC 500.

Agitator Off cycle Timer

ON TIME

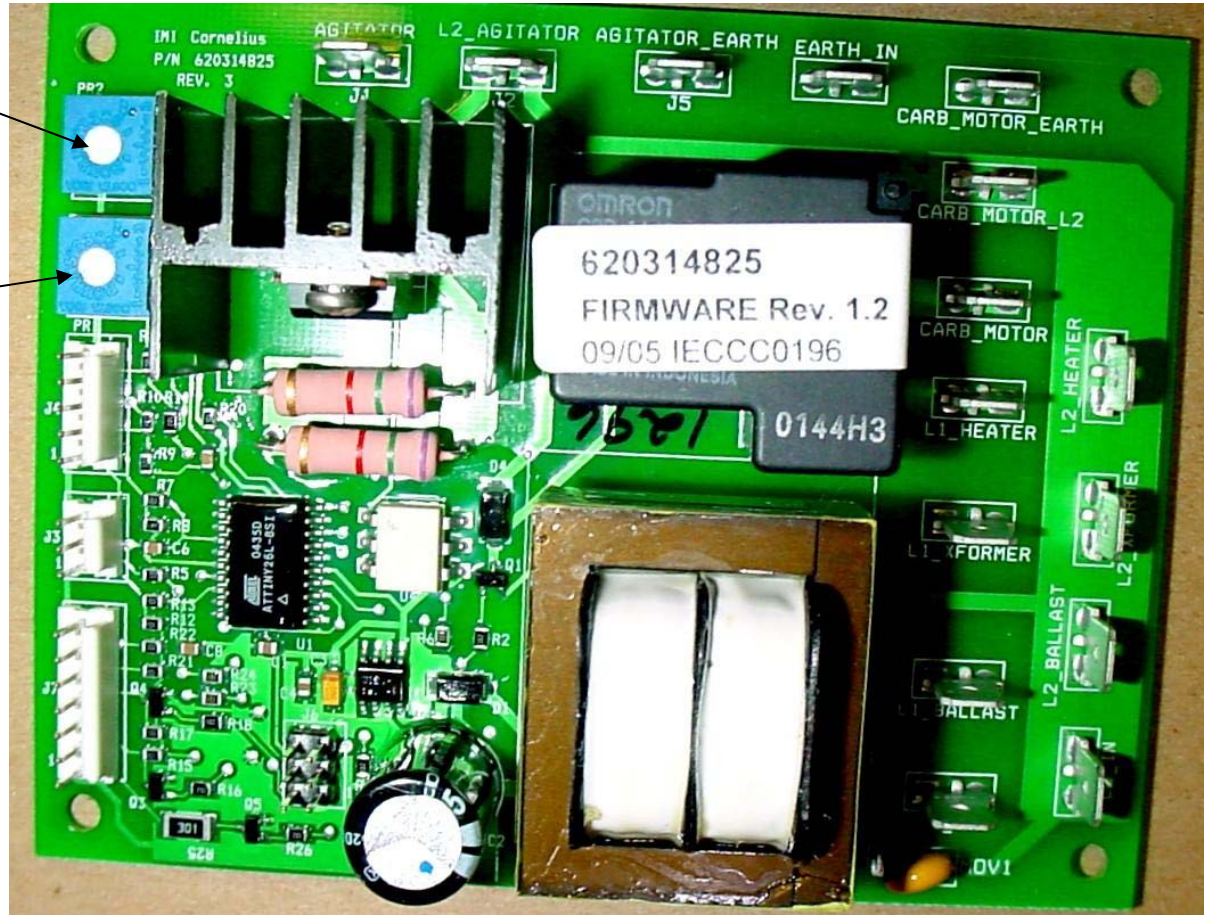
Should be set to 2 (.5 sec)
seconds run time maximum.

OFF TIME

Should be set to rest for 3 hours.

Note:

Should agitation be set incorrectly the ice may grind into small particles creating the “Snow cone effect”.



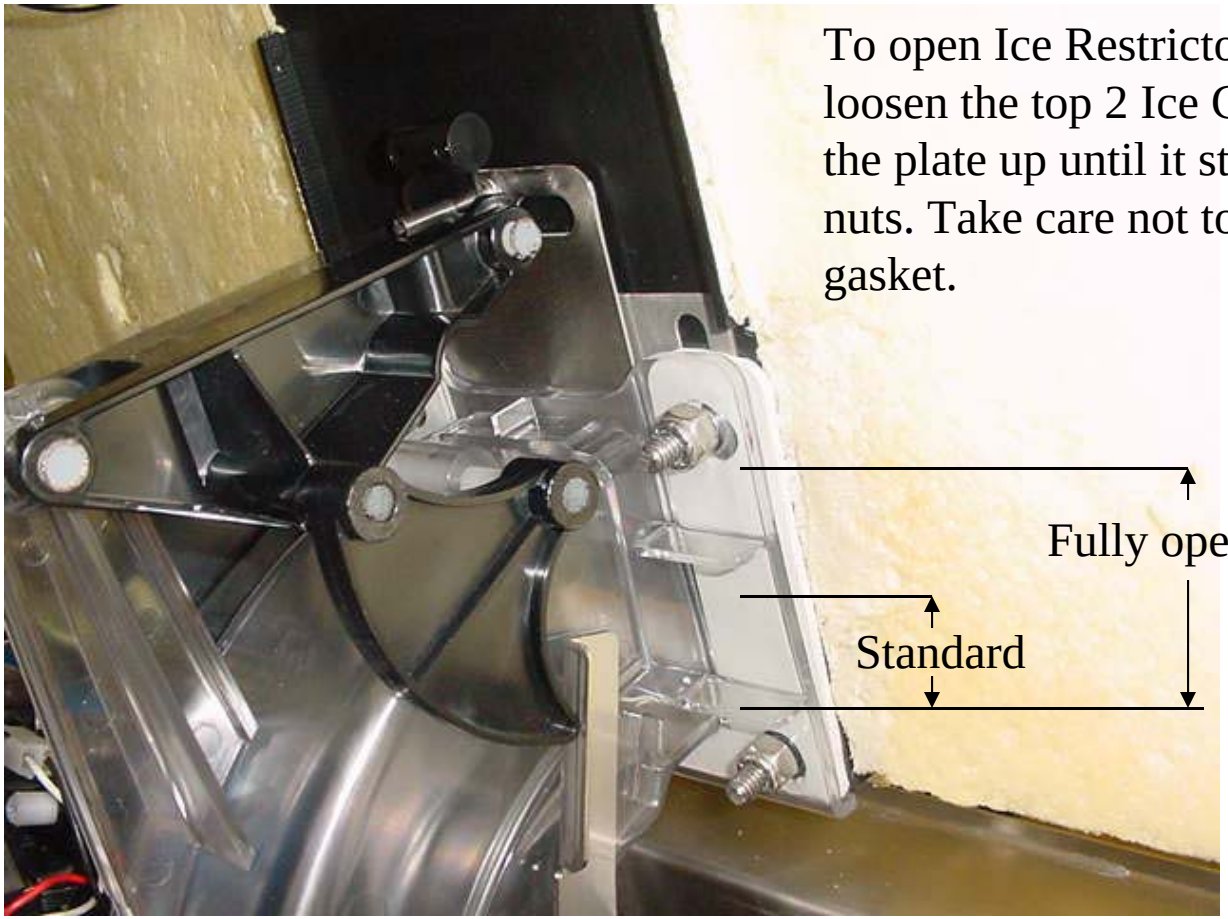
IDC e-board board shown

Pictures of IDC Ice Slide – helps better direct the ice flow.

IDC Pro Agitator

Ice Slide

Ice Restrictor Plate should be fully opened & Diverter Plate should be Installed



To open Ice Restrictor plate simply loosen the top 2 Ice Chute nuts and slide the plate up until it stops then tighten nuts. Take care not to pinch the rubber gasket.

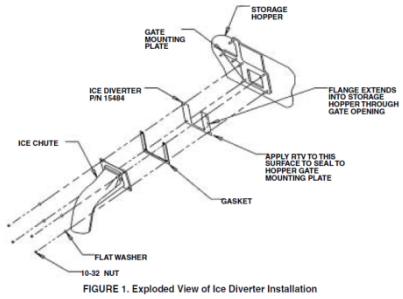


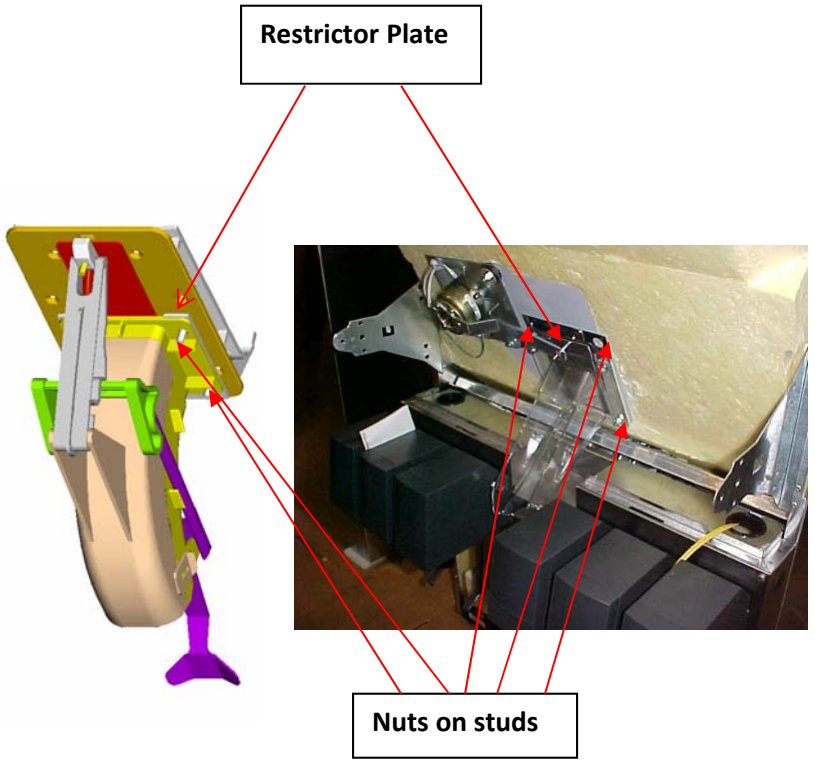
FIGURE 1. Exploded View of Ice Diverter Installation

IDC Mechanical Ice Chute Assembly shown

Ice Restrictor Plate Adjustment

The restrictor plate will need to be placed in the open position.

1. Remove the merchandiser.
2. Loosen but do not remove the four nuts on the studs that hold the ice chute onto the ice bin.
3. Once loosened, move the restrictor plate up to increase opening.
4. Retighten the nuts and reinstall the merchandiser. DO NOT OVERTIGHTEN



Technical support

For Any technical issues please reach out to Cornelius Number:

+1-800-238-3600.

Link to the Website for Manuals:

www.ice.Cornelius.com

Questions?