



Prodigy Plus Flaked and Nugget

Now with Sealed, maintenance-free bearings



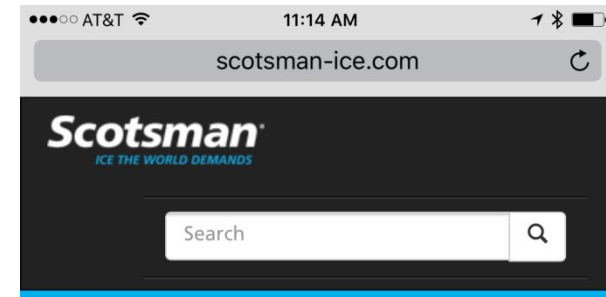
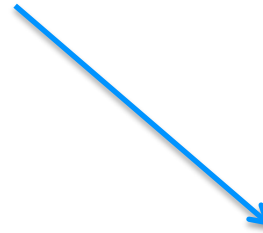
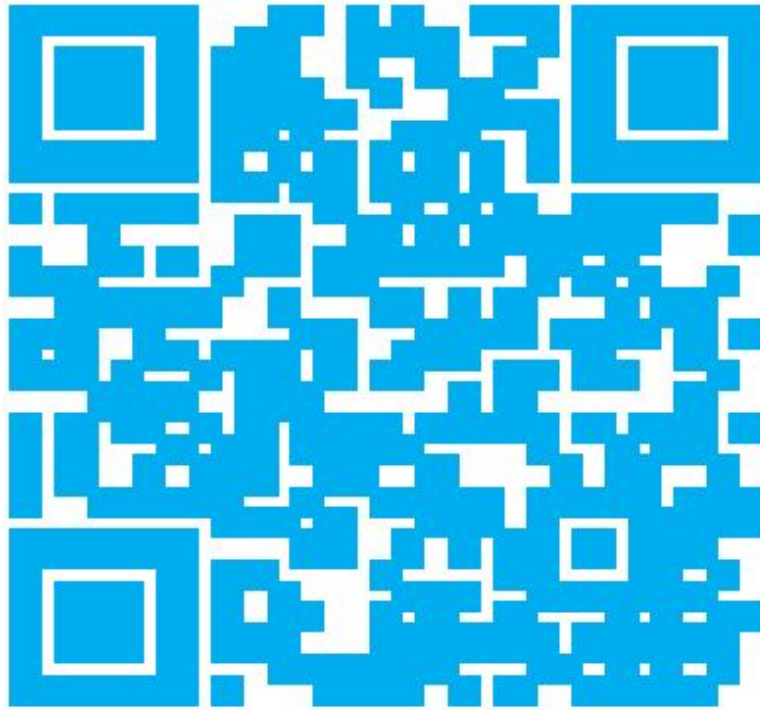
Scotsman®



SERVICE SUPPORT

Technical Service 1-800-533-6006

Check out the new mobile ready website



Service Information Menu

PARTS BREAKDOWN

SERVICE MANUALS

USER MANUALS

CLEANING & MAINTENANCE

TECHNICAL & DIAGNOSTIC TOOLS

INSTRUCTIONS

BULLETINS

www.scotsman-ice.com/service





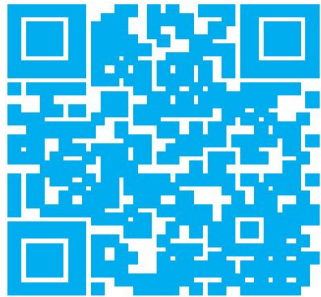
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Service Support App



Check out the new mobile ready website

Service site



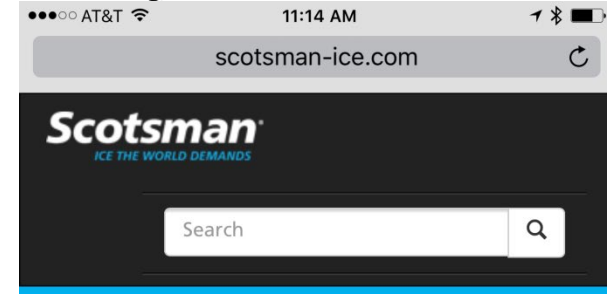
www.scotsman-ice.com/service

How to Video



<https://youtu.be/AuW7YuC9etg>

Scan the qr code above or go to www.scotsman-ice.com/service on your smart phone, the “add to home screen” and you are all set. For more info, got to <https://youtu.be/AuW7YuC9etg> or scan the qr code watch the how to video for iPhone and Android



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Technical Service Virtual Business Card



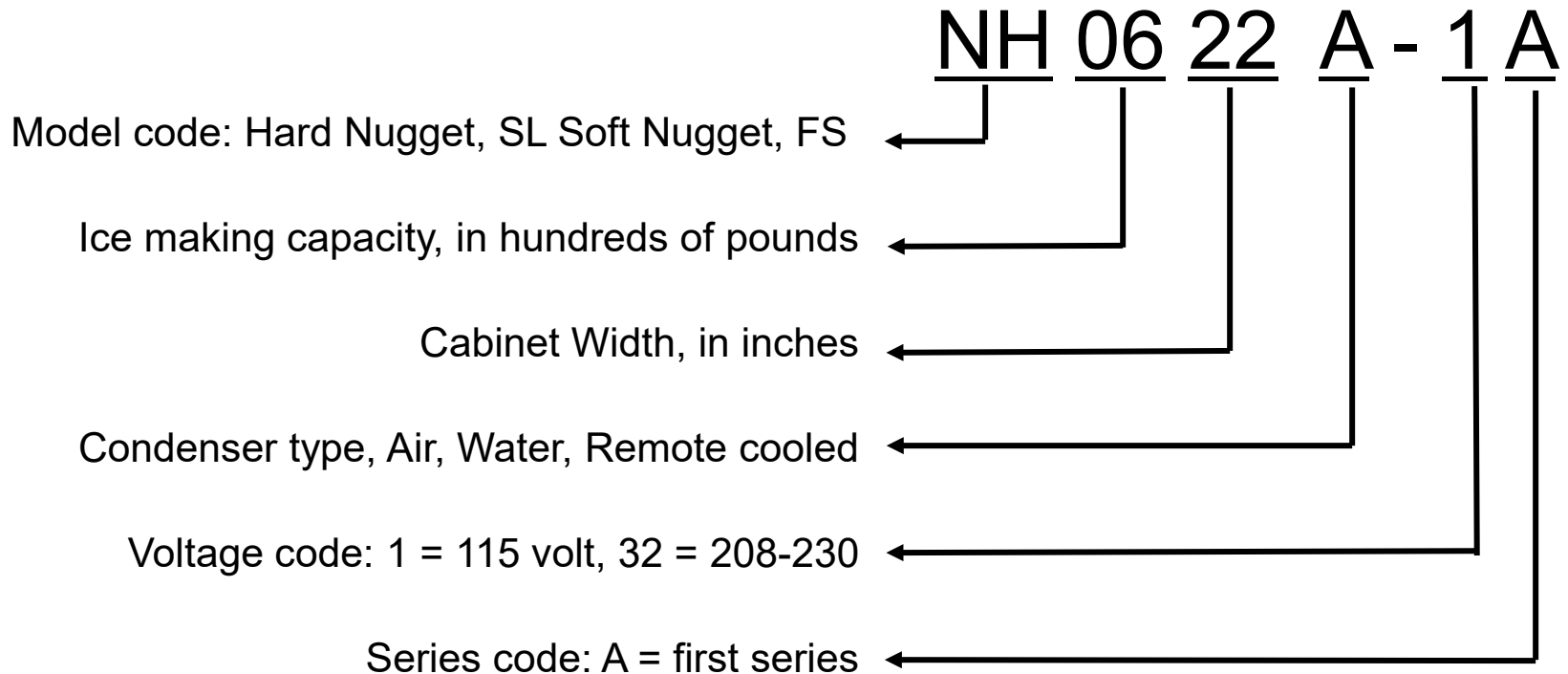
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Model Numbers

NH, NS and FS are new as of the Mid 2020



Scotsman®



What's New

- Three new extruder assemblies with sealed bearings
- HID Style Evaporator with lower adapter with bearing housing
- Coupling drive

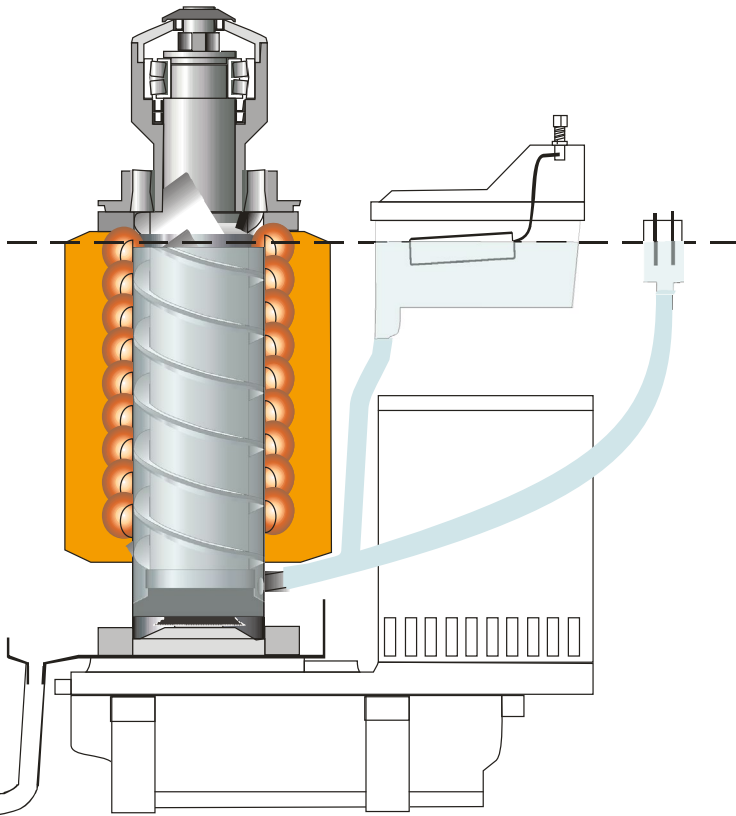


Scotsman
ICE THE WORLD DEMANDS

- **A continuous flow ice machine**

- Vertical, water filled, refrigerated cylinder
- Constant water in and ice flow out
- Ice crystals continuously form in the evaporator
 - Forced up by the auger and squeezed out thru slots or holes

CCW 9-11 RPM



Flaked ice: 6 holes

Hard Nugget: 8 holes

Soft Nugget ice: 16 holes



Flaked and Nugget - Refrigeration

- Steady state operation
- Two refrigerants
 - R-134a
 - AFE424, MDT2, MDT3, MDT4, HID312
 - Most operate at 12-13 PSIG suction
 - R-404A – all others since 1995 changeover
 - Suction pressure varies by model, condenser and ambient, smaller machines have higher pressure
 - Overall 22 to 46 PSIG
 - Remote low side EPR is set per unit size
 - Superheat on TXV models:
 - 6-8 degrees up to Prodigy
 - 12 degrees for Prodigy

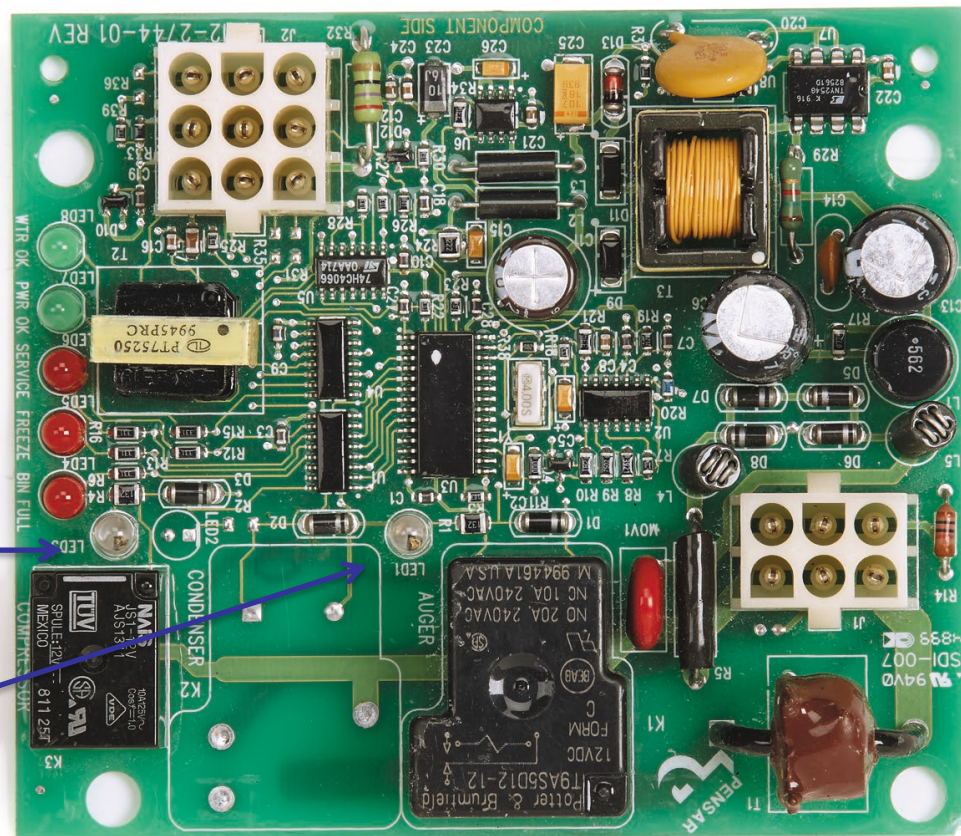
Prodigy Remote Flaker / Nugget

- Use condensers
 - ERC111 – N0622 and F0822
 - ERC311 – all others
- Head change only: re-use prior condenser
 - Must be same refrigerant
 - Add headmaster kit KPFHM



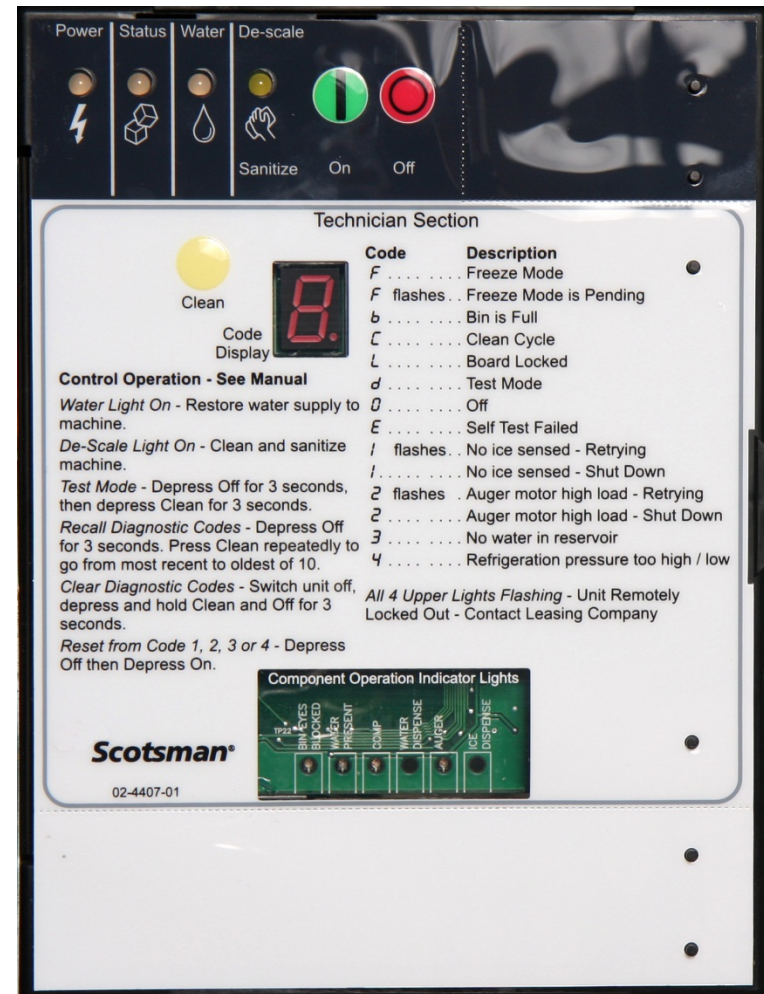
AutoSentry Controller

- Seven Lights
 - Water OK
 - Power OK
 - Service -Trips at 6 amps
 - Freeze
 - Bin Full
 - Compressor (LED3)
 - Gear Reducer (LED1)



Prodigy Controller

- Eight Lights
 - Power
 - Status
 - Water
 - De-scale / Sanitize
 - Bin Eyes Blocked
 - Water Present
 - Comp
 - Auger
- Code Display
- Three switches





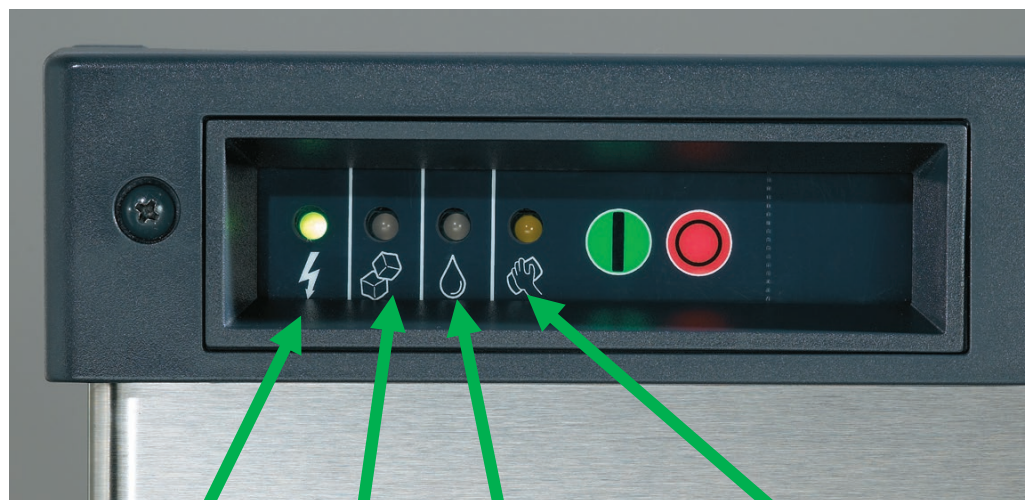
AutoSentry Plus

- AutoSentry monitors auger motor current
 - Overloaded motor draws more current
 - High current triggers shut down
 - Code 2 displayed
 - Retry in 4 minutes
 - 2 restart attempts to manual reset
- AutoSentry Plus adjusts the current cut out point based on the voltage supplied
- 115VAC cut out point is 6 amps for legacy and **3 amps SL**
- 230VAC cut out point is 3 amps for legacy and **1.5 amps SL**



Flaker Operation

AutoAlert Light Panel – Duplicated in Prodigy Plus



Same Lights and
Switches,
different place

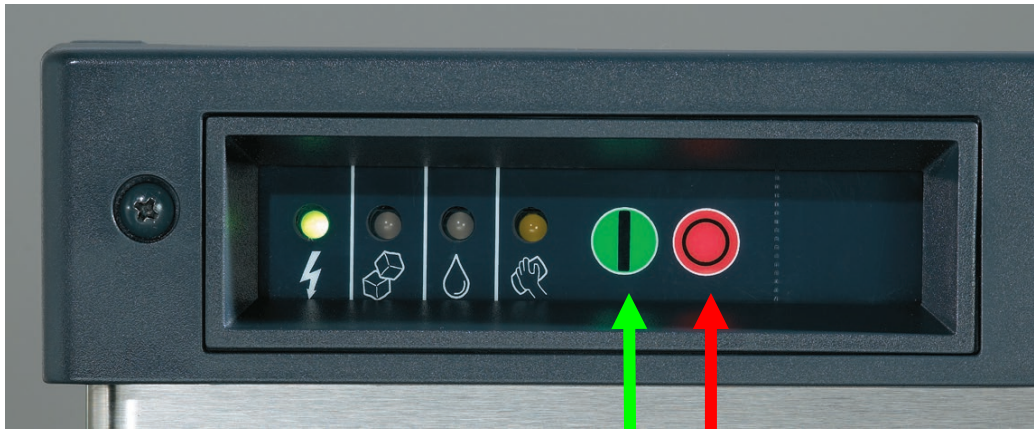
Power Light Status Light Water Light Time to Clean Light



Prodigy Plus Lower
Light and Switch Panel



AutoAlert Light Panel



On Switch Button

Off Switch Button



Prodigy Plus Lower
Light and Switch Panel



Electrical Sequence – Start Up

- Pre-start
 - Ice sensor sees empty chute (call for ice)
 - Water sensor has conductivity at probes (water OK)
- On button push starts unit
 - Auger motor starts
 - Compressor and fan motor start
- Controller checks for ice falling
 - Check begins 6 minutes after a restart
 - Must sense ice in a 10 minute span or shuts unit down (Code 1)

Start Up

- Push and release either On button
 - F code displayed
 - Status light ON
 - Auger drive motor will power up
 - Compressor will power up
 - Fan motor operates with compressor





Electrical Sequence – Shut Down

- Infrared light to photo eye receiver blocked by ice in chute
 - Signals controller to shut down
 - Controller shuts off compressor (AC or WC) or liquid line valve (RC or RL)
 - Auger motor operates for 60 seconds to clear evaporator of ice
 - Remote will pump down until low side pressure drops below 15 PSIG.



Bin Control Methods

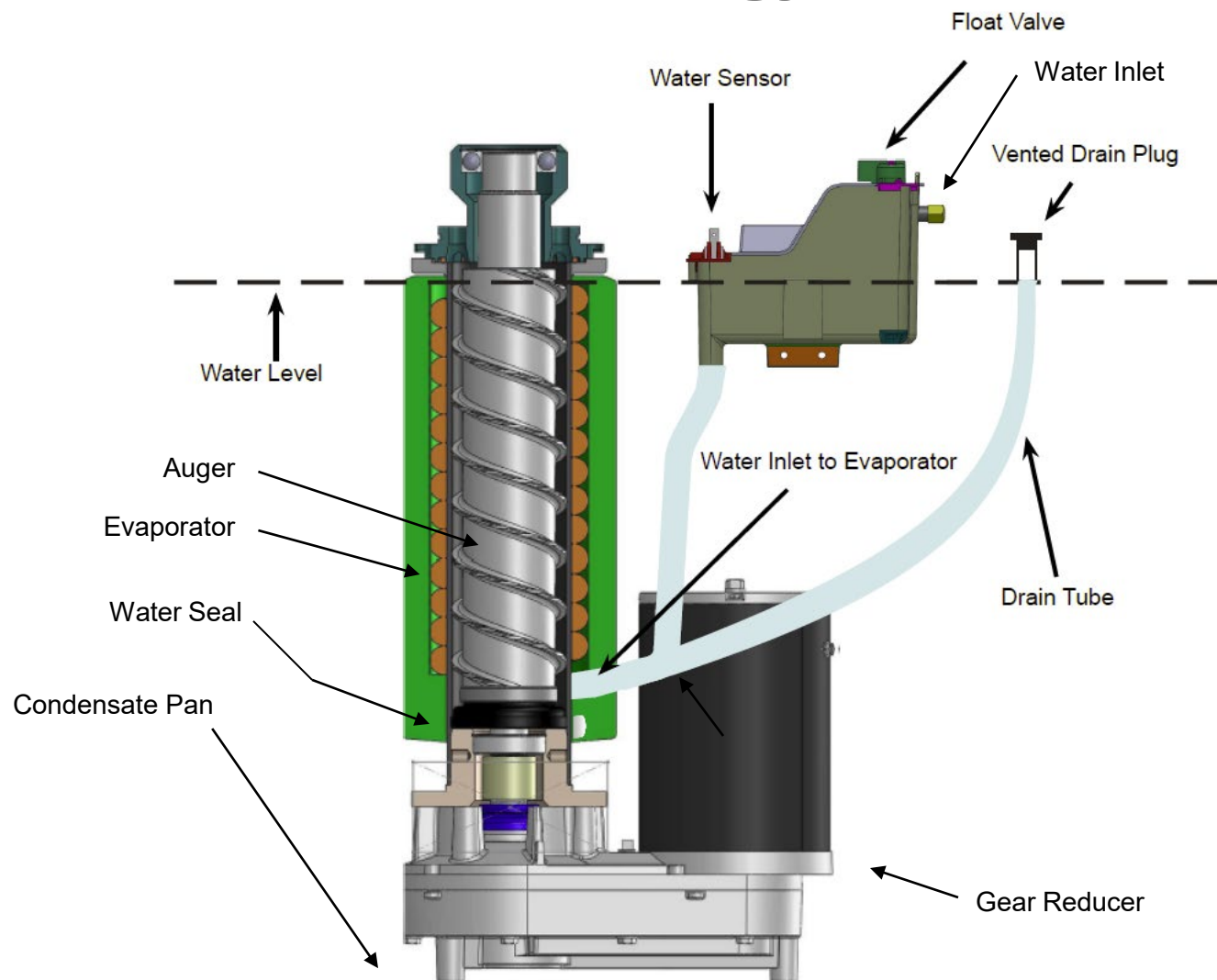
- Standard: Photo eye set
 - Infrared emitter and receiver at base of chute
- Optional: KVS
 - Control and sensor
 - Sensor mounts in base of unit
 - Ice level is adjustable
- Optional: Bin stat (opens on temperature fall)
 - Mounts to control box strut
 - Connects to blue wires in control box



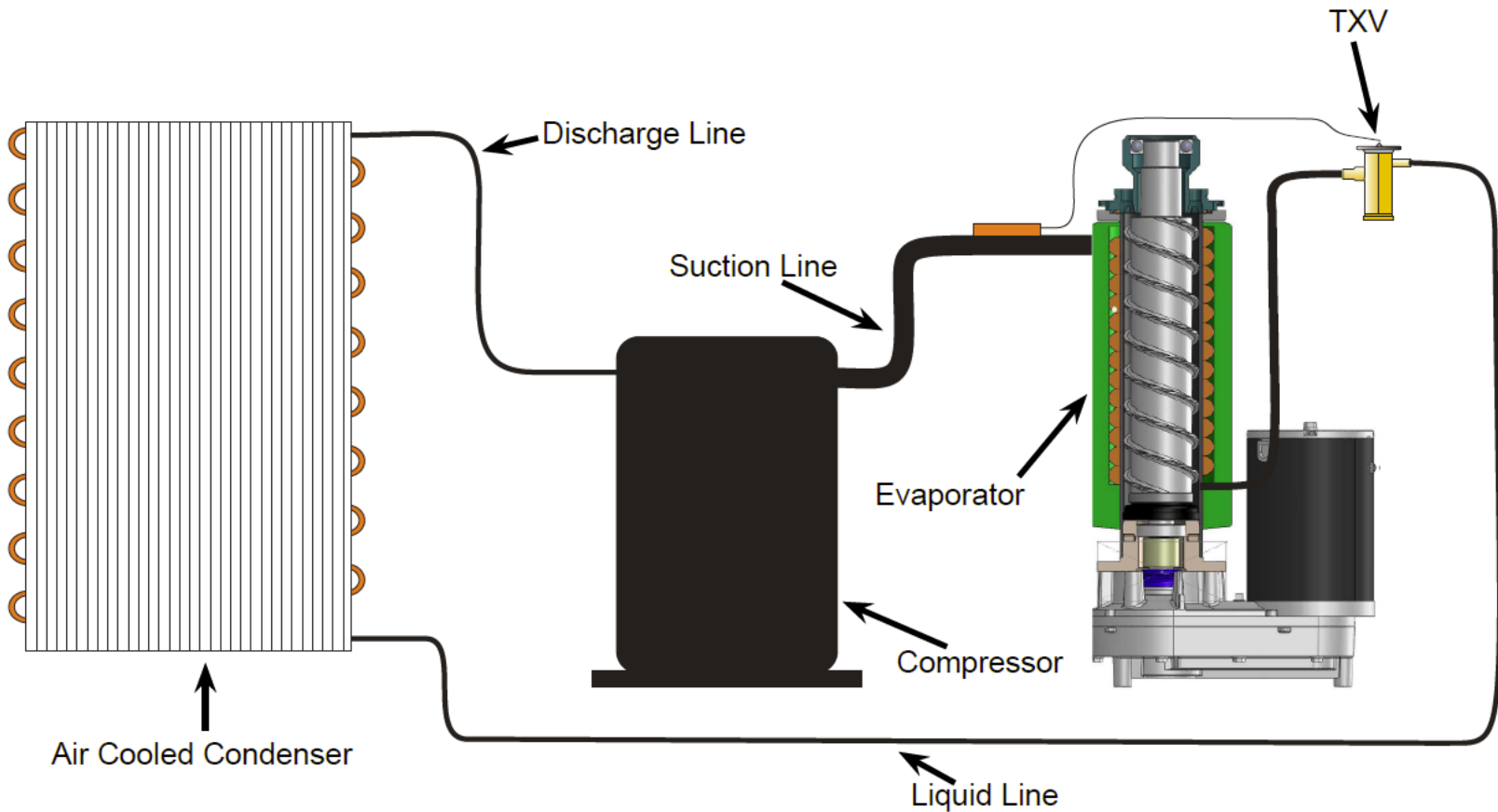
Power or Water Interruptions

- Power supply lost and restored
 - Automatic restart
 - 4 minute delay to restart
 - F code blinks until unit starts
- Water supply lost and restored
 - Automatic restart
 - 4 minute delay to restart

Water Schematic – Prodigy 2020

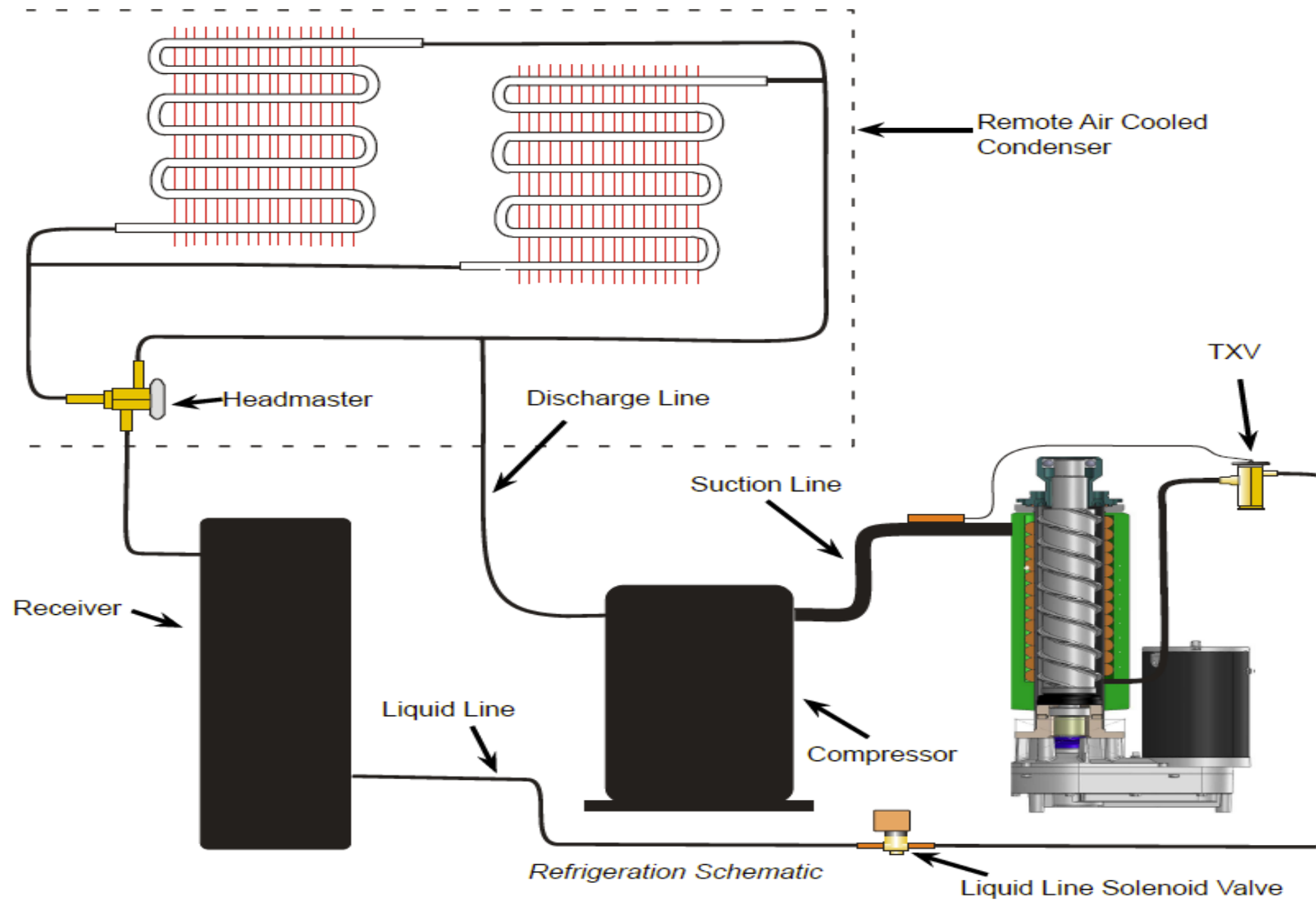


Refrigeration Schematic, Air Cooled



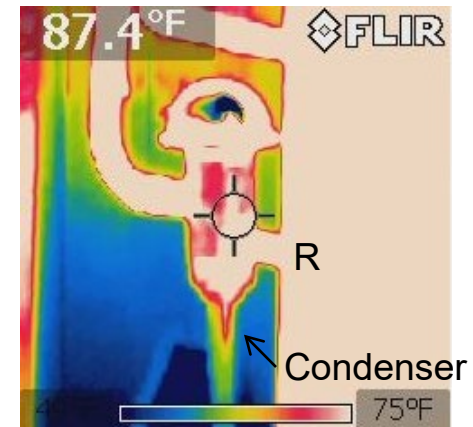
Refrigeration Schematic

Refrigeration Schematic, Remote Air

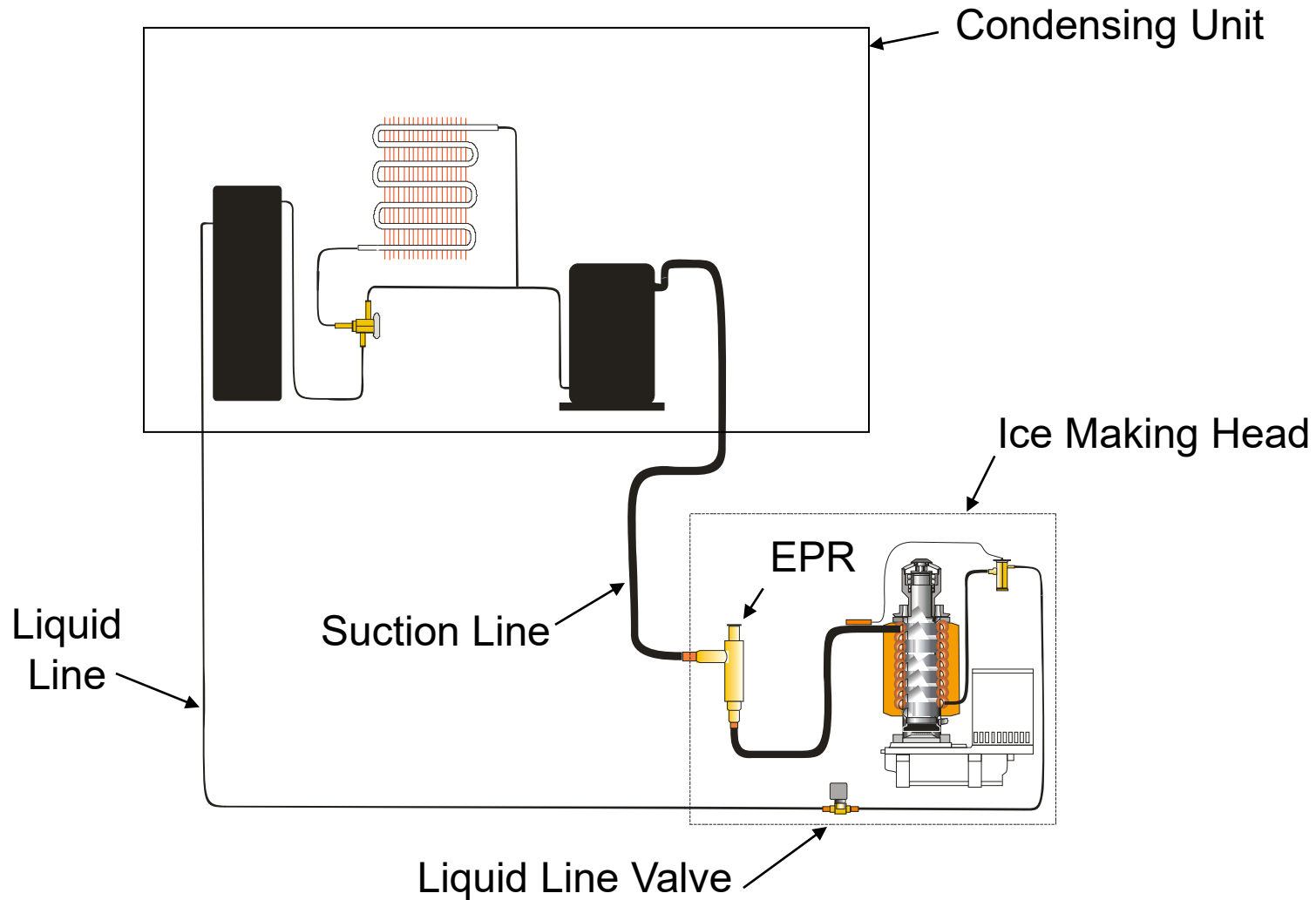


Flaked and Nugget – Remote Refrigeration

- Head pressure control valve (headmaster)
 - Maintains minimum discharge pressure
 - 180 PSIG prior
 - 220 PSIG current
 - Was in ice head, now part of condenser
- Liquid line solenoid
 - Powered by controller
- Receiver
- Pump down pressure switch
 - Operates compressor contactor



Refrigeration Schematic, Remote Low Side

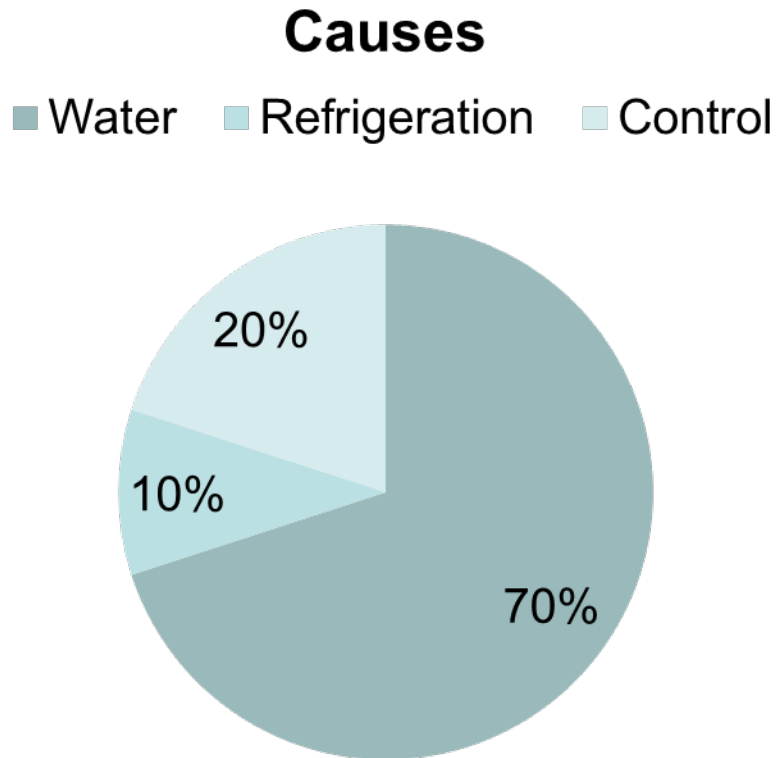




General Diagnostics

Recipe for Ice

- Same as a cuber
 - Water
 - Refrigeration
 - Control system





Flaked and Nugget – No Ice

- Continuous flow machines **must have water at all times**
- All have water sensor to stop operation if water supply fails, methods include:
 - Water Pressure - AFE
 - Heated Thermistor – Prior NM/FM, MDT3 thru MDT6
 - Conductivity – Prodigy, NU130, MDT2 and AutoSentry
- All auto restart when water supply is restored



Flaked and Nugget – No Ice (Bin Full)

- Bin control stopping operation
 - Thermostat machines – AF & AFE
 - Open bin stat
 - Electronic models – all others
 - Scale on photo eye set
 - Optional KVS set too low



Flaked and Nugget – No Ice

- Gear reducer motor overloaded
 - Stalled motor breaks circuit to compressor contactor with **centrifugal switch**
 - MDT3 thru MDT6, AF & AFE, Many prior
 - Over-amped motor triggers controller to shut system down
 - **AutoSentry** (NME/FME) cut out point
 - 5 amps with old Emerson motor, 6 with GE or Marathon
 - Legacy Prodigy cut out point 3 or 6 amps by voltage
 - **Solid Lube Prodigy cut out point 1.5 or 3 amps by voltage**

Gear Reducer Overloaded

- Causes:

- Low water level
- Scale on evaporator
- Scale on auger
- Worn bearings
- Damaged gear reducer





Flaked and Nugget – No Ice

- Refrigeration – All Models
 - Low charge
 - TXV or cap tube restricted
 - High or low pressure control open
 - Contactor failure
 - Compressor failure
 - Will not start, Does not pump, failed valves



Flaker Maintenance



Maintenance – Recommended Every 6 Months

- Water System

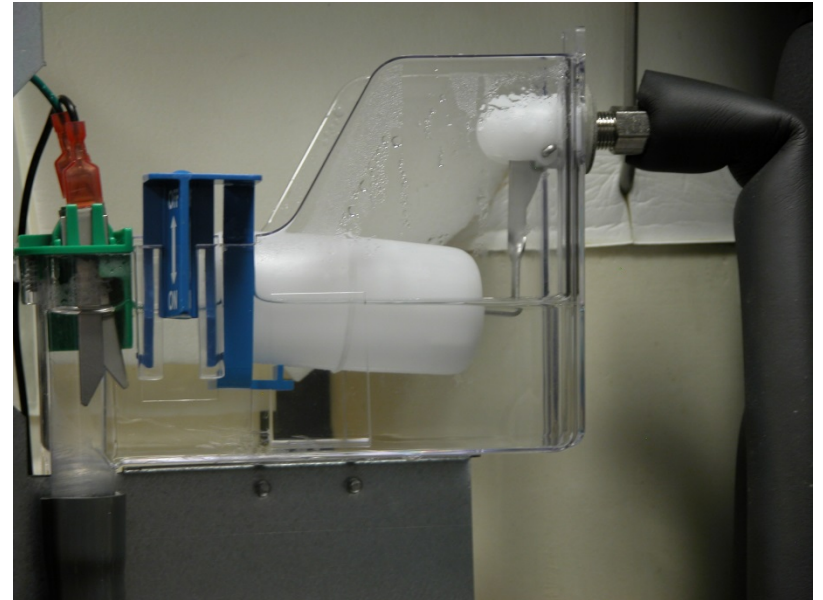
- Scale removal

- Shut off water
 - Drain reservoir
 - Cover photo eyes to protect from spills
 - Scale Removal
 - Sanitation
 - Complete unit lookover



Flaker Maintenance: Scale Removal

- Shut Off Water



Flaker Maintenance: Scale Removal

- Drain Reservoir
- Pro Tip: Refill with hot water to warm up evaporator and auger and then drain



Flaker Maintenance: Scale Removal

- Mix Scale Remover

- Legacy – (same as NS,FS) will use 8 oz. of Clear1 to 3 qts. of hot water
- Solid Lube Rev. A for NS,FS will use 8 oz. of Clear1 to 3 qts. of hot water
- Solid Lube Rev. A for NH will use 3 oz. of Clear1 to 3 qts. of hot water
- (Coming Soon) Rev. B all will use 50/50 12oz of Clear1 to 12 oz of hot water



Flaker Maintenance: Scale Removal

- Cover Photo Eyes
- Add scale remover and water solution



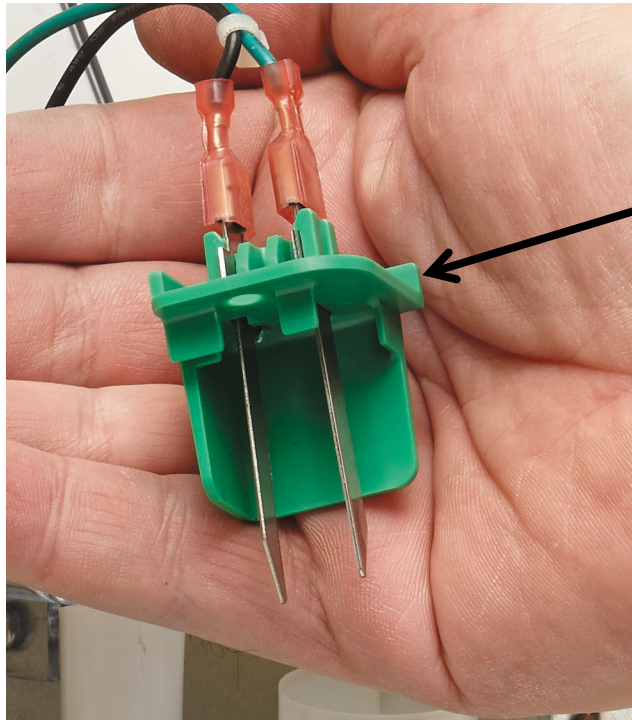
Flaker Maintenance – Scale Removal

- Clean mode
- Push Clean button
 - Legacy and Solid Lube Rev. A – 20 minute auger / 20 minute timed ice making keep reservoir full of solution
 - Solid Lube Rev. B 30 minute auger
 - Resets clean light



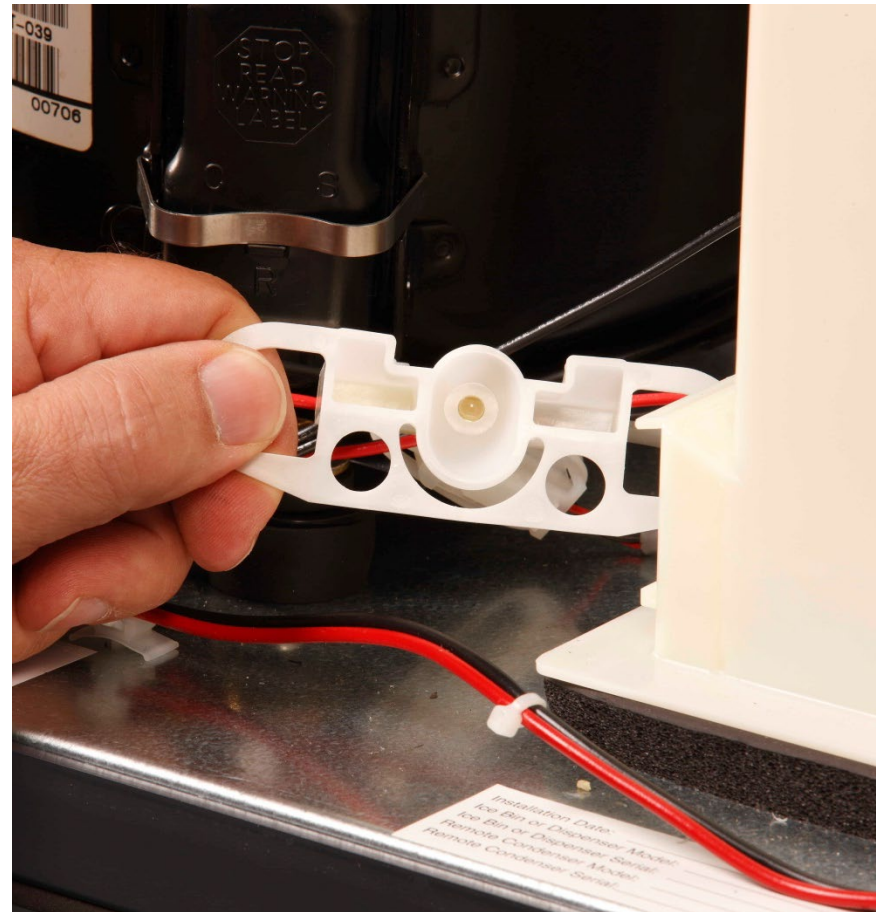
Maintenance – Current Version

- Check water level sensor
 - Probes clean and not shorted



Maintenance - Other

- Clean ice sensors
 - Photo eye set
 - Slide out to remove
 - Wipe with diluted ice machine scale remover



Bearing Access –Legacy-

- Push bail clamp back
- Remove chute cover
- Remove ice sweep
- Remove breaker cover
 - Left hand threads



Maintenance –Legacy-

- Bearing service
 - Grease all white – OK
 - Grey streak – add grease to check
 - All grey - repack
 - Repack with grease needle
- Replacement
 - Use arbor press to remove and press in new bearing



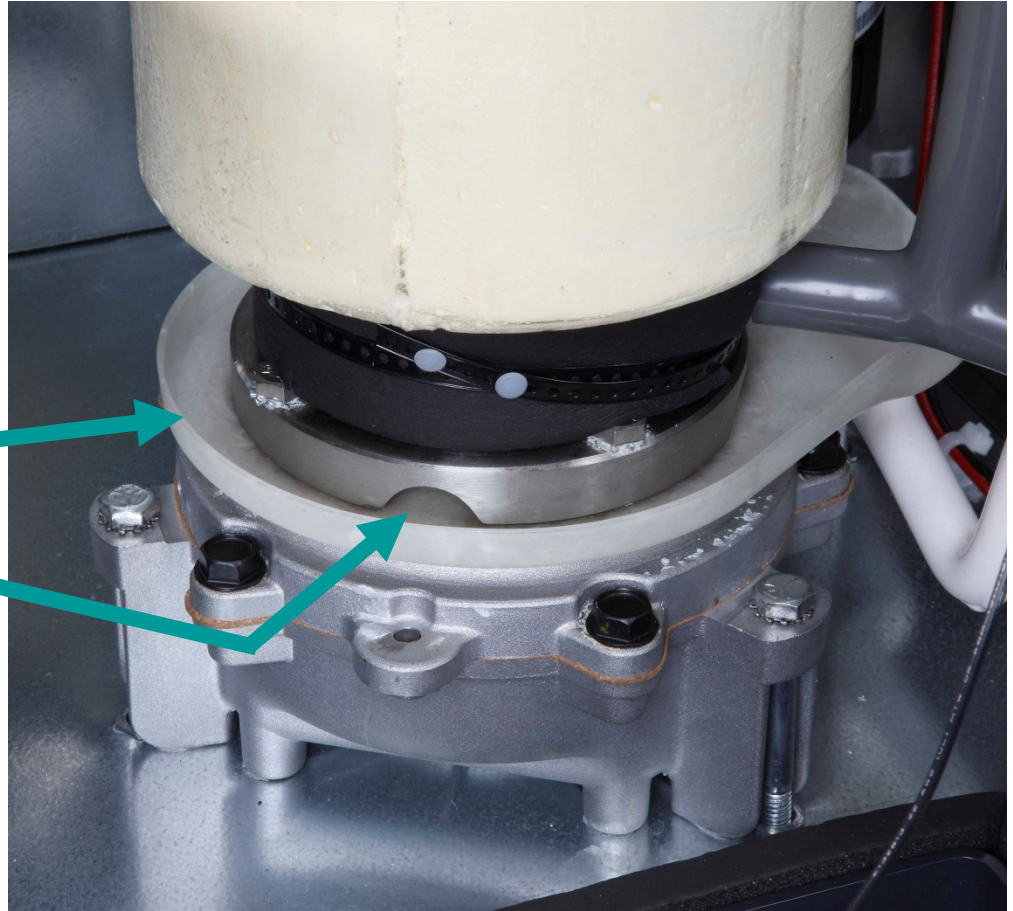
Maintenance –Legacy-

- Water Seal

- Check condensate pan
- Water seal leak drains into pan

Condensate Pan

Drain Slot





Flaker Diagnostics



Display Codes

- F = Freeze mode
- b = Bin full
- C = Clean cycle
- L = Locked
- d = test mode
- O = Off
- E = self test failed
- 1 = No ice sensed
- 2 = Auger motor over amp
- 3 = No water sensed
- 4 = Refrigeration system pressure too high / low

A blinking code means a mode change – will restart or has restarted



Diagnostics

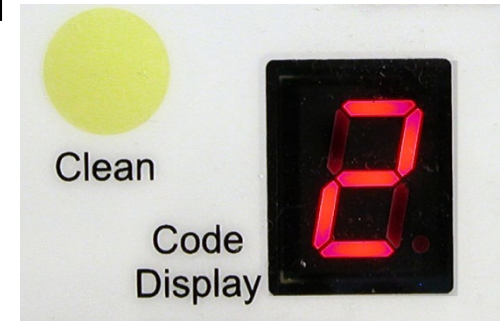
- Code 1: No ice sensed
 - Rule out: high or low pressure cut out (Code 4)
 - Rule out: no water (Code 3)
 - Auger motor over amp (Code 2)
 - Check:
 - Excessively hot conditions – restricted air flow
 - Dirty air filter or condenser
 - Lack of refrigeration – charge, expansion valve, fan motor, headmaster

Diagnostics

- Code 2: Auger motor overloaded
- Auto restarts 2 times
- 4 minutes between restarts

- Check

- Motor condition
- Liquid line valve for leak thru (remote low side)
- Scale on evaporator & auger
- Bearing condition
- Gear reducer condition
- Compressor contactor sticking
- Low pressure control (remote pump down) not opening



Diagnostics

- Code 3: No water in reservoir
 - Check filters
 - Check float valve
 - Check sensor
 - Two-Probe Sensor in leg of hose to evaporator
 - Test: short probes together
 - Turns indicator light on
 - Space between probes turns light off

Probes





Diagnostics

- Code 4: High or Low Pressure Control Open
 - Pressure controls are automatic reset type
 - Code 4 indicates one of them opened
 - Unit off, Code 4 means one is still open
 - Unit on, Code 4 in recall code list – was open in past
 - Restart unit to check
 - High (Cut Out 450, Cut In 350):
 - Water cooled may be water interruption
 - Air cooled may be fan motor
 - Low (Cut Out 15, Cut In 30):
 - TXV restricted
 - Charge too low
 - Auger motor or auger not turning

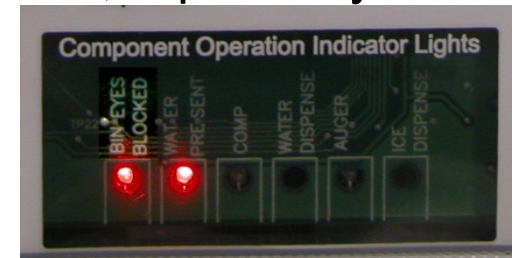


Controller Button Process

- Reset controller
 - Push Off, then On
- Recall Diagnostic Codes
 - Hold Off button in for 3 seconds
 - Push Clean button to cycle thru the stored codes
- Clear Diagnostic Codes
 - From Standby – Status Light OFF
 - Push and HOLD **Clean and Off** buttons for 3 seconds

Diagnostics

- Unit off, **b** in code display, bin is not full
 - Check “Bin Eyes Blocked” indicator light
 - Scale on photo eyes, clean and recheck
 - If clean and Bin Eyes Blocked light is ON, replace eye set
 - Photo eyes out of mounting slot
 - Ambient light on photo eyes
 - Photo eye failure
 - Optional KVS set too low or sensor out of socket
 - Optional Bin Stat is open





Diagnostics: Refrigeration

- Low charge symptoms
 - High superheat
 - Normal is 10 - 15 degrees F. but varies with ambient
 - Overheated compressor
 - Note: Normal Tecumseh dome temperature is hot
 - Low ice making capacity
 - Low suction pressure
 - 400 - 500 lb normal is 37 - 40 PSIG – higher at high ambient
 - 600 – 800 lb normal is 32 - 36 PSIG
 - 900 lb + normal is 25 - 30 PSIG



Diagnostics – Low Capacity

- Clean machine first
 - Scale build up will cut capacity
- Check for air in water inlet hose
 - Bubbles in hose cause restriction, that causes low capacity and low suction pressure
 - Correct by changing water reservoir
- Test by catching ice
 - Operate unit for 10 minutes prior to test
 - 15 minutes weight x 96 = 24 hour capacity
 - Low capacity units will be very low



Flaker Service

Service

- Remove the Auger
 - Shut off water
 - Drain reservoir & evaporator
 - Push bail clamp back
 - Remove cover
 - Remove ice sweep
 - Remove upper chute

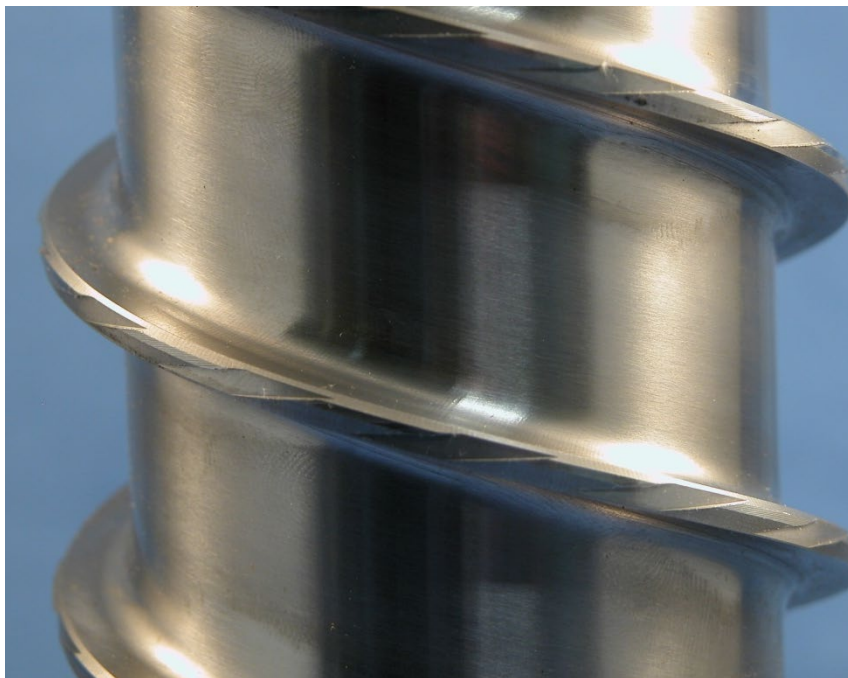


Service

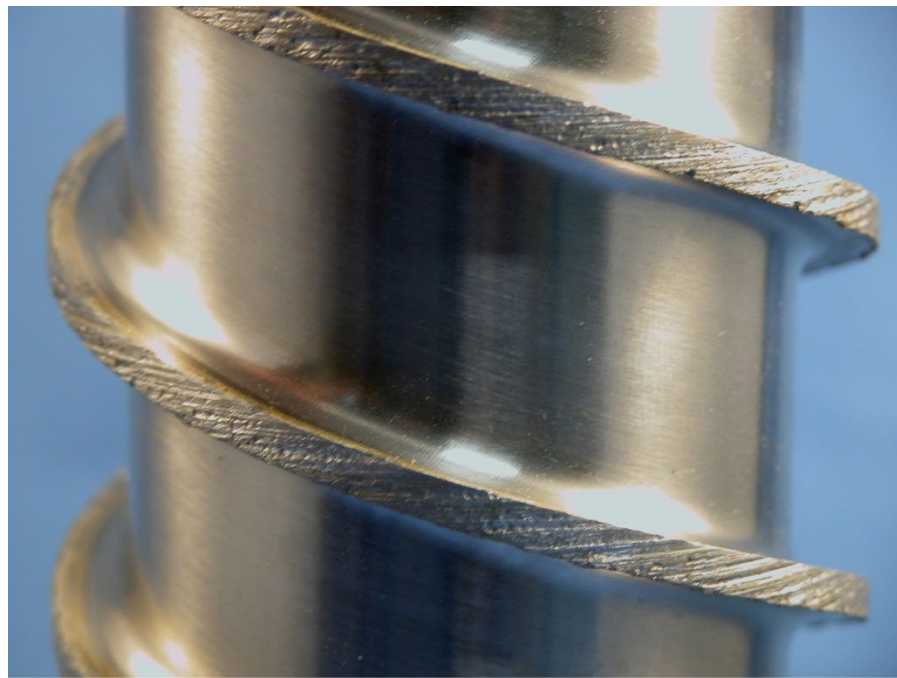
- Loosen auger stud
- Remove 4 allen head bolts
- Lift Auger out, dry off
 - Works best clean & bright
 - Examine auger edges
 - Excessive bearing wear will cause auger damage
 - Check evaporator wall for scale
- Replace Water Seal



Auger



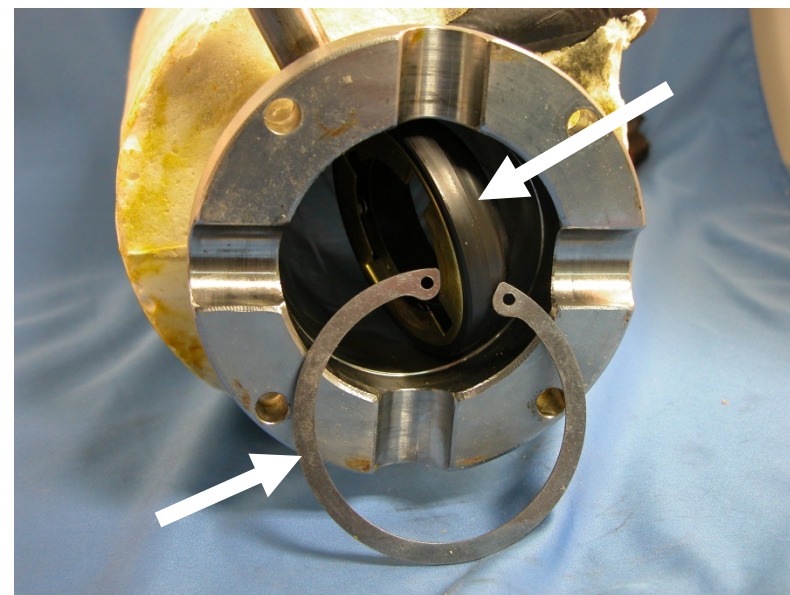
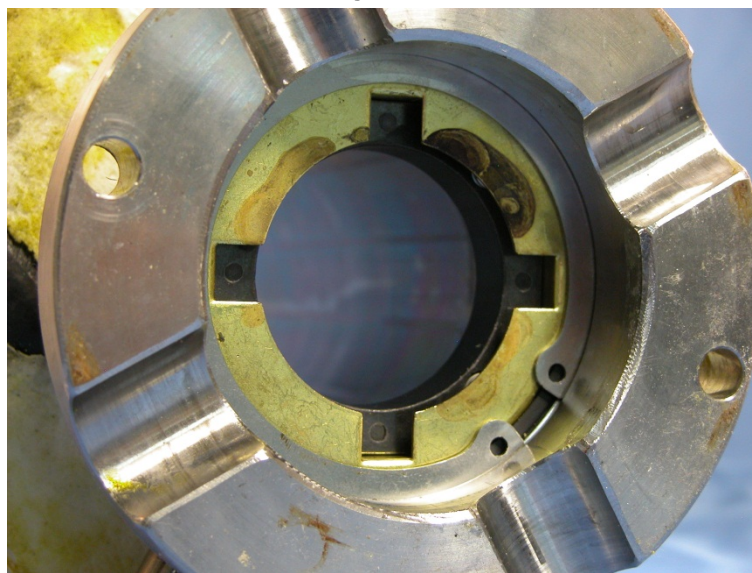
Auger as it should look,
clean and not damaged.



Damaged Auger –
replace, do not use!

Water Seal Replacement

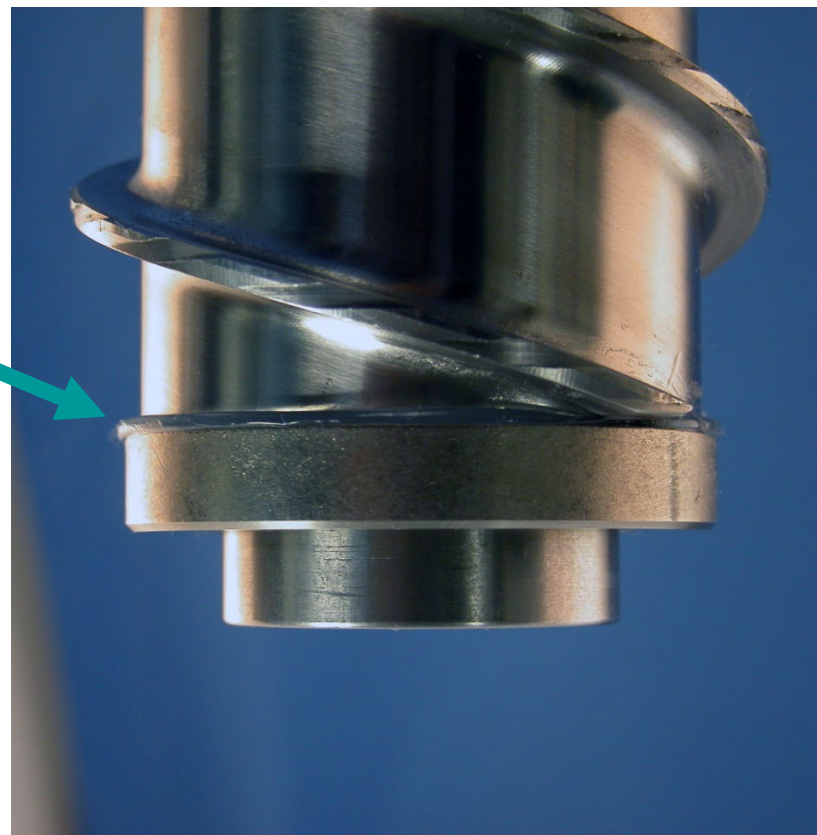
- Remove auger
- Separate from gear reducer
- Remove retainer and stationary half of seal



- Lubricate new seal half
- Insert seal into tube
- Install retainer
- Reposition seal onto retainer

Water Seal Replacement

- Rotating Half
 - Clean auger shoulder
 - Add bead of food grade sealant to shoulder
 - Lubricate rubber
 - Slide onto auger
 - Sealant fills gap



Service: Top Bearing

- Remove auger stud
- Separate breaker from auger, check bearing
 - Remove / Replace bearing using arbor press
 - Install new lip seals, cup side up
 - 2" PVC coupling install tool
 - Lube seals with food grade grease before installing bearing



The background of the slide is a close-up photograph of ice. The top portion shows several clear, rectangular ice cubes. The bottom portion, which serves as the primary background for the text, is a dense field of irregular, white, and translucent ice nuggets.

Nugget Ice Applications

for
Ice Beverage Dispensers

Nugget Ice Dispensing

- Manual Fill Dispenser Modifications
 - Must be set up for Nugget ice dispensing
 - Adapter
 - Kits
 - Adjustments





General Info

- N0422, N0622, N0922 or N1322
 - Scotsman
 - ID150
 - ID200, ID250
 - Cornelius
 - ED150, DF150
 - ED200, DF200
 - ED250, DF250
 - Lancer
 - Special 30" unit with N in the part number
 - Has special extended liner and different agitator
 - Sensation model – new product



Scotsman or Cornelius Dispensers

- ID150
 - Add adapter, kits KVS, KNUGDIV
- ED150
 - Add adapter, kit KDIL-PN-150
- ID200 or ID250
 - Add adapter, kits KVS, KNUGDIV
- ED200 or ED250
 - Add adapter, kit KDIL-PN-200 or 250
- All - Change agitation time to .5 seconds on every 3 hours



Cornelius Dispensers

- ED300
 - Add Cornelius adapter
 - Add Cornelius agitator kit
 - Add Scotsman bin control kit
- Flavor Fusion (IDC215/255)
 - Add Cornelius adapter
 - Add Scotsman KVS
 - Add diverting plate for Flavor Fusion



Special Agitators for some...



Special Agitator for ED150 & Nugget Ice

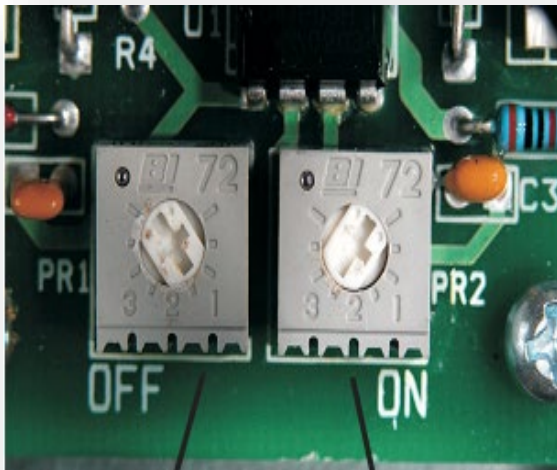
Diverter

- Required for Scotsman and Cornelius dispensers – will not dispense Nugget ice without it
- Installs in chute of dispenser
- Guides or diverts the ice into the chute as it is pushed past



Agitation

- **Agitation must be minimized when dispensing Nugget Ice**
 - Cornelius has adjustments on their controller
 - Lancer has dip switches
 - SerVend can't be adjusted but disconnecting the yellow wire to the agitation relay stops agitation



Vari-Smart or KVS

- Adjustable ice level

12-2 O'clock



Adjustment Knob

Scotsman

Lookout for Bent agitator arms.



Adjustments RLS only on R404

EPR

N0622L and N0922L = 30 PSIG

N1322L = 26 PSIG

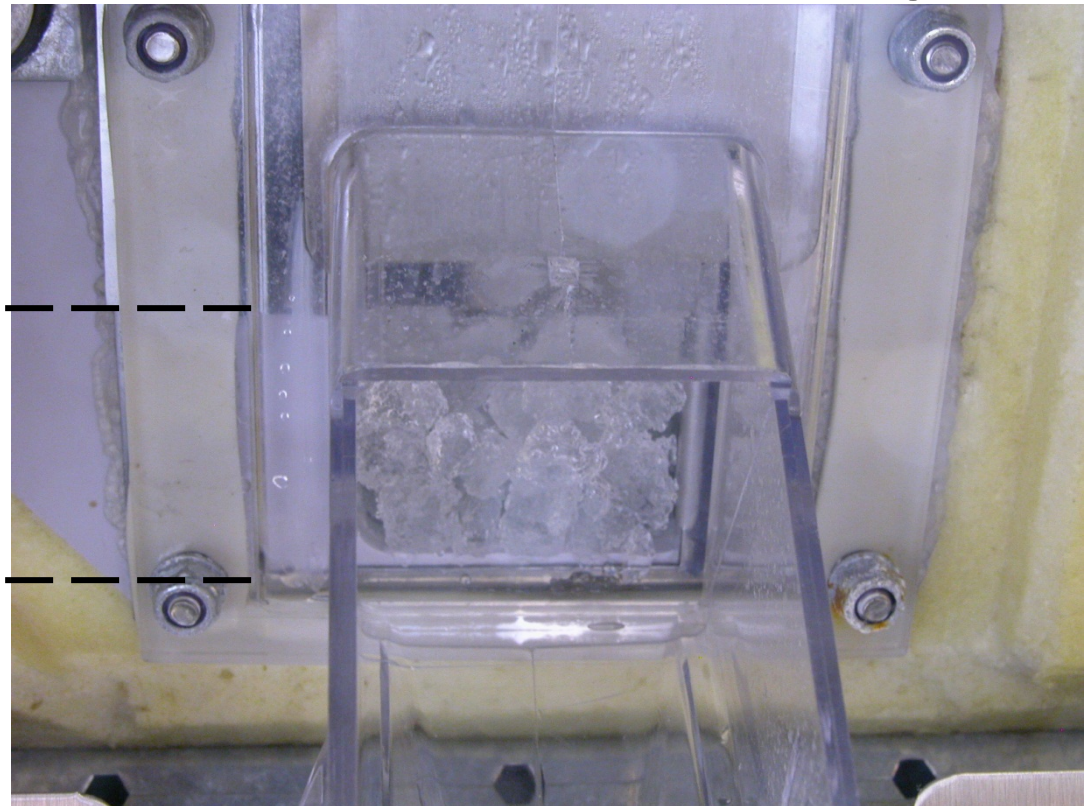
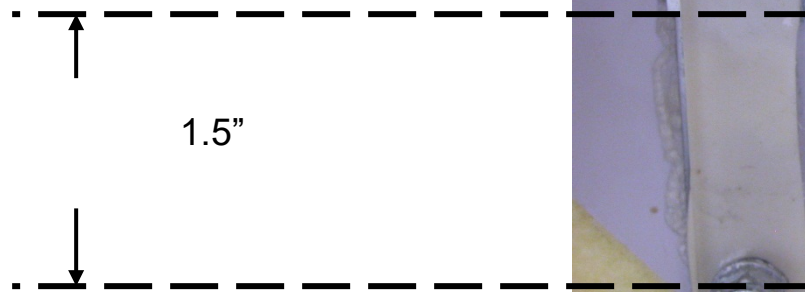
Superheat should be at 12F

If there is a EPR at the Rack it should be full open.

Restrictor Plate

- Cornelius or Scotsman
 - Removal allows very rapid dispensing
 - Recommended: **remove** or keep and set opening to 1.5"

Restrictor Plate Mounting Holes
are Slotted





All Brands and Models

- Agitation must be minimized when dispensing Nugget Ice
 - Scotsman has adjustment features for on time and interval
 - Cornelius has adjustments on their controller
 - Lancer has dip switches
 - SerVend can't be adjusted but disconnecting the yellow wire to the agitation relay stops agitation

Ice Slide

- Slide is part of KDIL-PN-200 or 250 kits
- Inserts from above into slot in bottom of dispenser hopper
- Distributes ice evenly over the cold plate





Questions?

