NU130

Nugget Ice Machine

Scotsman
Ice Systems

NU130 Cabinet

- 15 inch wide cabinet
- Air cooled only
- Can be built in – air in and out the front
- Service panel on side
- Stainless Steel
- Listed for outdoor use

Scotsman Ice Systems

Components

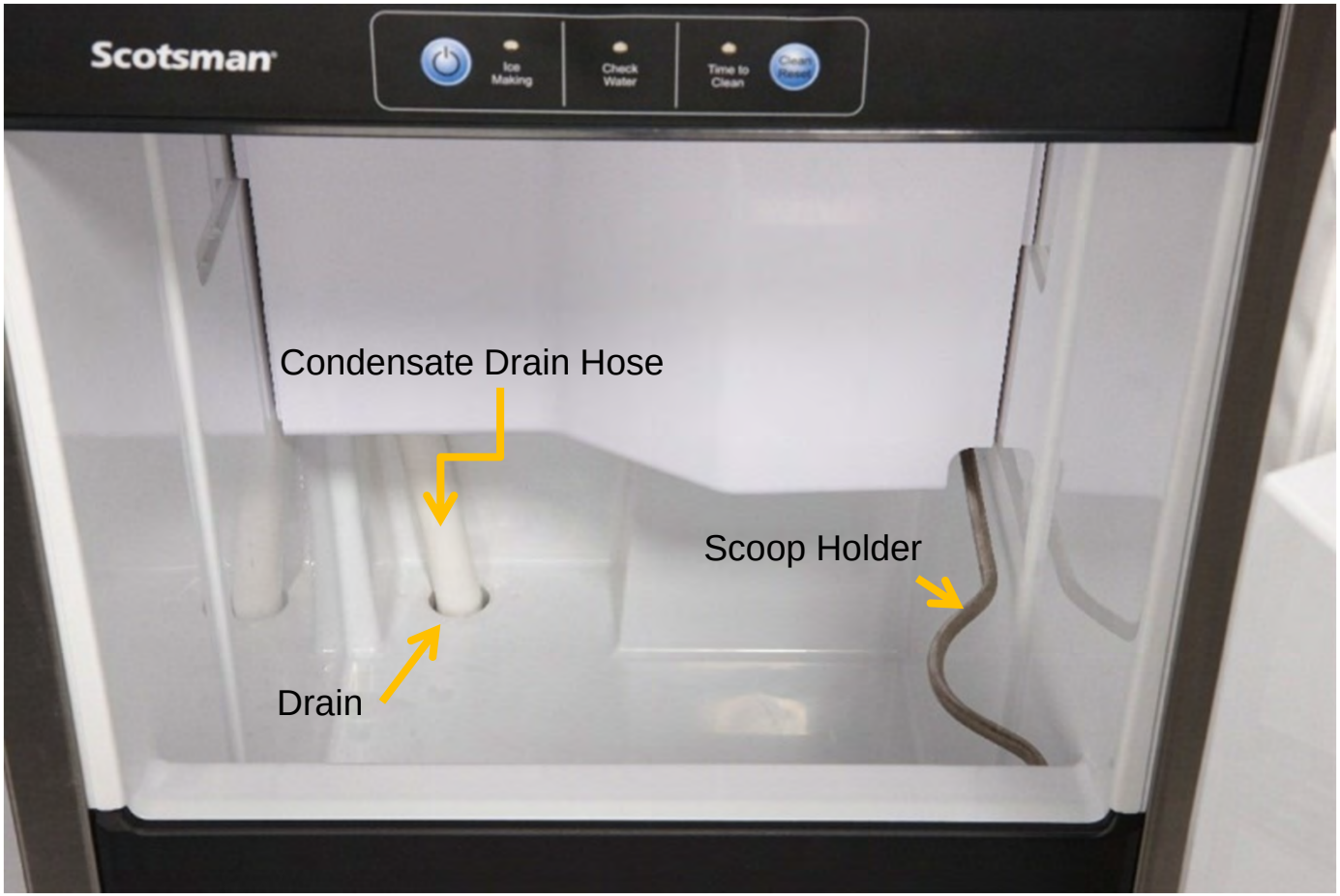
- Compared to cube ice machines:
  - **No** spray pump
  - **No** spray jets
  - **No** hot gas valve
  - **No** inlet water solenoid valve
  - **No** Freeze or Harvest Cycles
- But it does have:
  - Continuous flow, steady state system
  - Auger
  - Gear reducer
  - Float valve

Scotsman Ice Systems

In the Bin

Scotsman Ice Systems

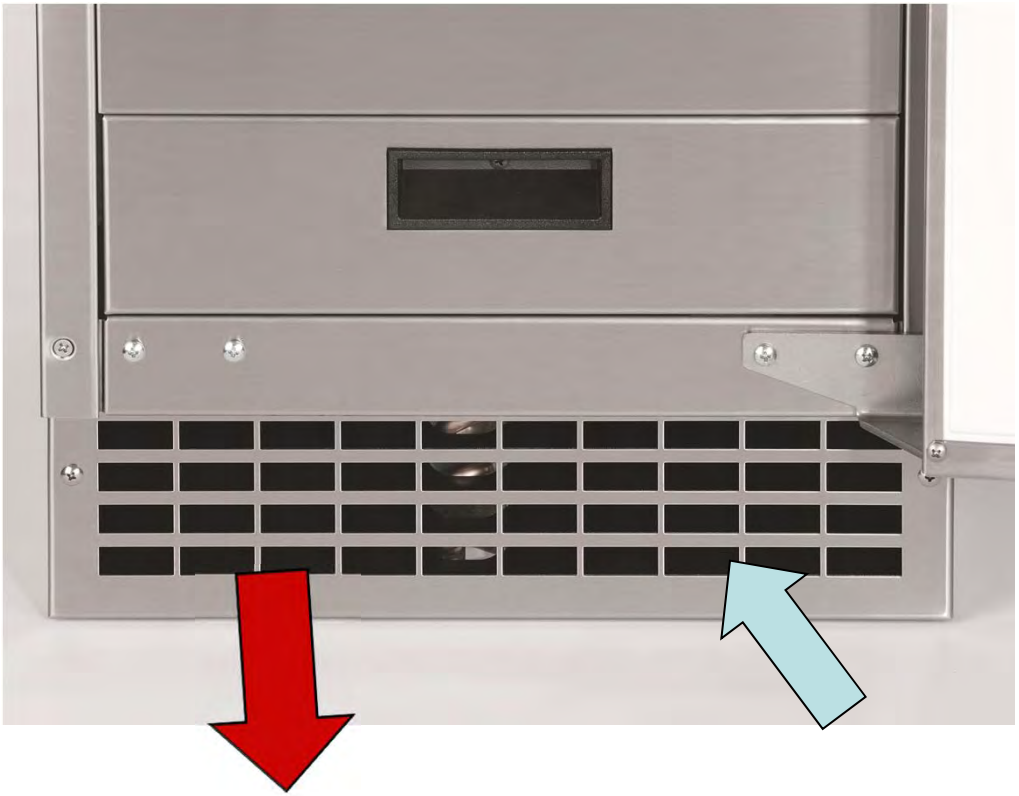
In the Bin



Scotsman Ice Systems

Cabinet

- Air in and out the front
- Front Service Panel
- Kickplate
  - Access to condenser



Scotsman Ice Systems

Side Service Panel

Provides access to bin drain, drain pump (when used), fan motor and compressor.

Scotsman Ice Systems

Reverse Door Swing

- Remove top pin
  - Lift door off bottom pin
- Remove hole plugs
- Switch hinges top to bottom & side to side
- Install hole plugs
- Reattach door

Scotsman Ice Systems

Installation

- Power
  - 115 volt model with power cord
- Water
  - ¼” OD copper tube on back, compression fitting ships in attached bag
- Drain
  - Gravity model
  - Pump model or kit (A39462-021)

Scotsman Ice Systems

Electrical

- 115 volt, 60 Hz power
- Unit must be on separate 15 amp circuit
- Outlet should be accessible or must use circuit breaker to shut off power during service
- No extension cords permitted

Scotsman Ice Systems

Water Supply Connection

- Connection on back
- Compression fitting shipped with unit
- 20 to 80 lb pressure
- Coil inlet tubing to this fitting when unit built in
- Back flow prevention is by air gap at the float valve

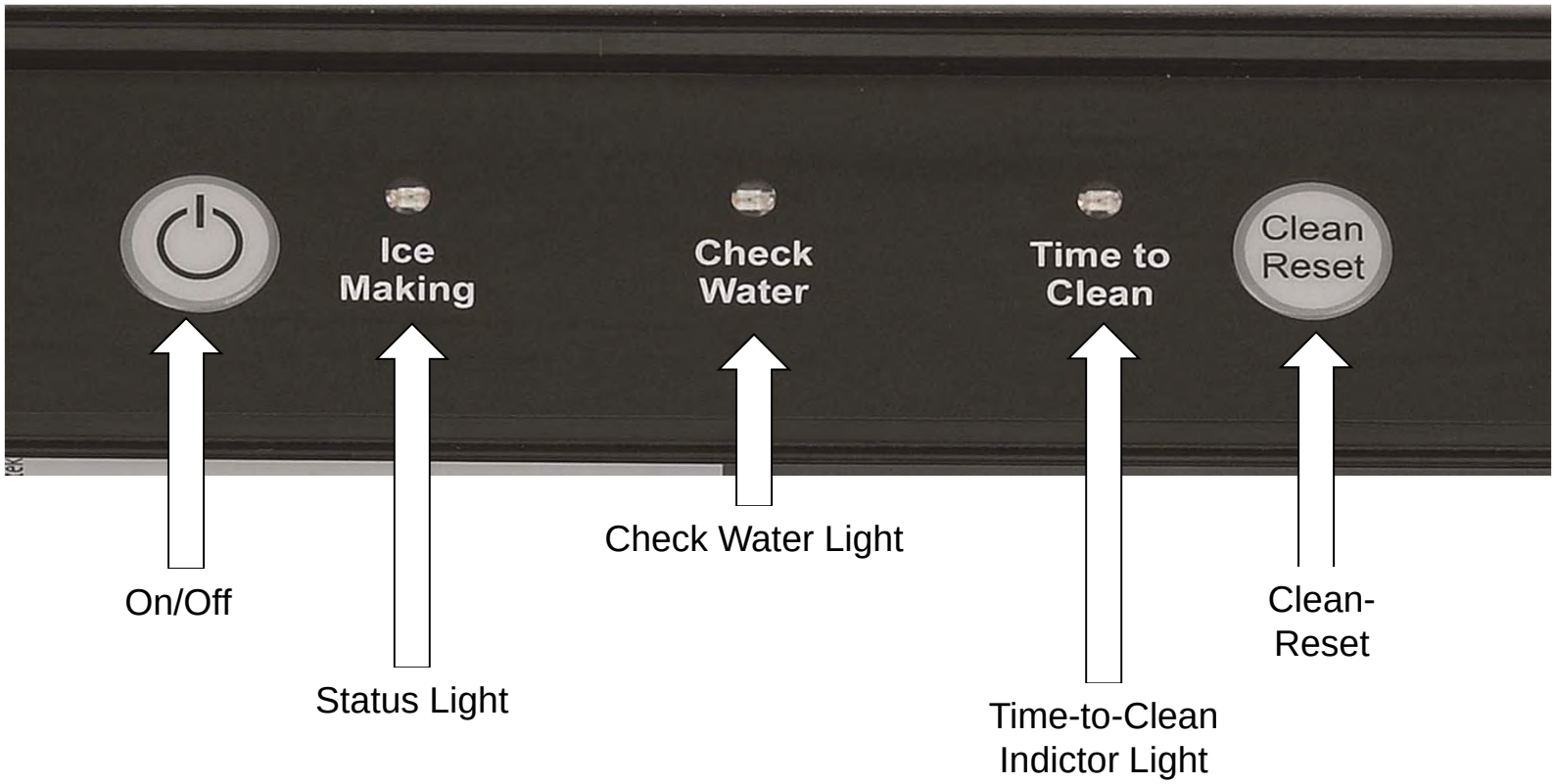
Scotsman Ice Systems

Drain

- Gravity
  - Connect to hose inside cabinet
  - Drain tubing must not trap water
  - Vent and use rigid tubing outside of cabinet
  - Route and slope to drain
  - Maintain code air gap
- Drain Pump
  - Hose pre-connected
  - Route to drain
  - Maintain code air gaps
  - Pump will activate when water backs up into inlet hose
  - Conversion kit available

Scotsman Ice Systems

Control Panel



Scotsman Ice Systems

Initial Start Up

- Connect power
  - Panel lights blink and go out
- Turn on water supply
- Push On-Off button
  - Ice making light switches ON
- Compressor, Fan Motor and Auger Drive Motor operate
- In about 10 minutes ice will begin to fall into the bin

Scotsman Ice Systems

Control Panel – Ice Making Mode

- Green Ice Making Light
  - Indicates ready to make ice
  - Does not indicate operation, bin full or empty

Scotsman
Ice Systems

Control Panel – Check Water

- Red Light
  - Indicates Lack of Water to Machine
  - No ice will be made while light is on
  - Restarts automatically when water restored

Scotsman
Ice Systems

Control Panel – Time to Clean

- Yellow Light
  - On after 6 months of power up time
  - Indicates the machine needs to be cleaned
    - Scale removed
    - Condenser cleaned
    - Unit sanitized

Scotsman
Ice Systems

Ice Making Components

- Evaporator
  - Vertical stainless steel, refrigerated tube
  - Refrigeration coil wrapped on outside of tube
  - 12 internal grooves
    - Guide ice vertically

Scotsman Ice Systems

Ice Making Components

- Auger
  - Double-spiral, solid stainless steel auger

Water Seal

Scotsman Ice Systems

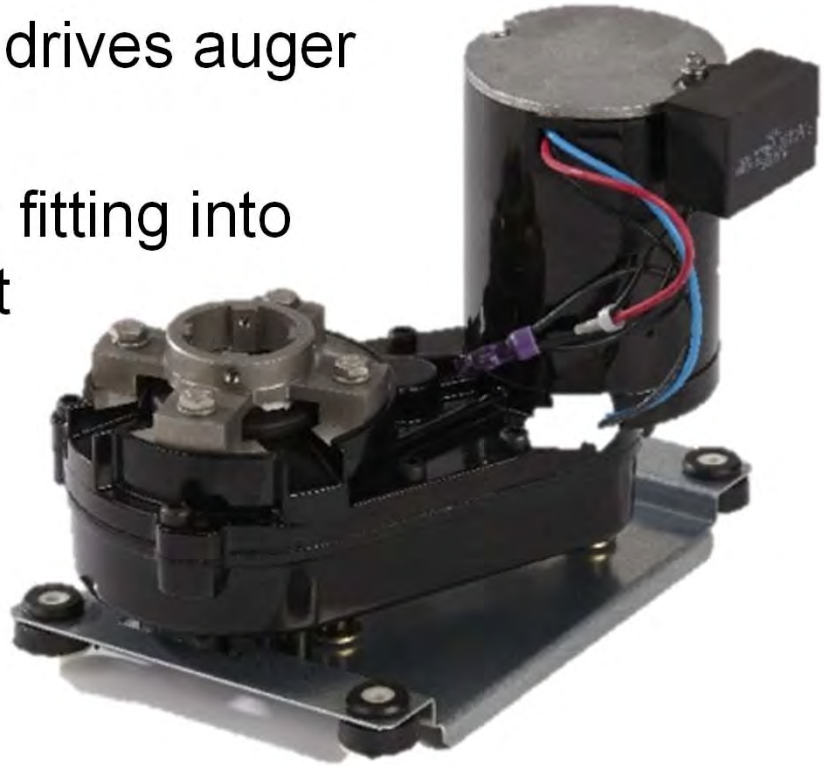
Ice Making Components

- Breaker Head
  - Combination extruding head and bearing retainer

Scotsman Ice Systems

Ice Making Components

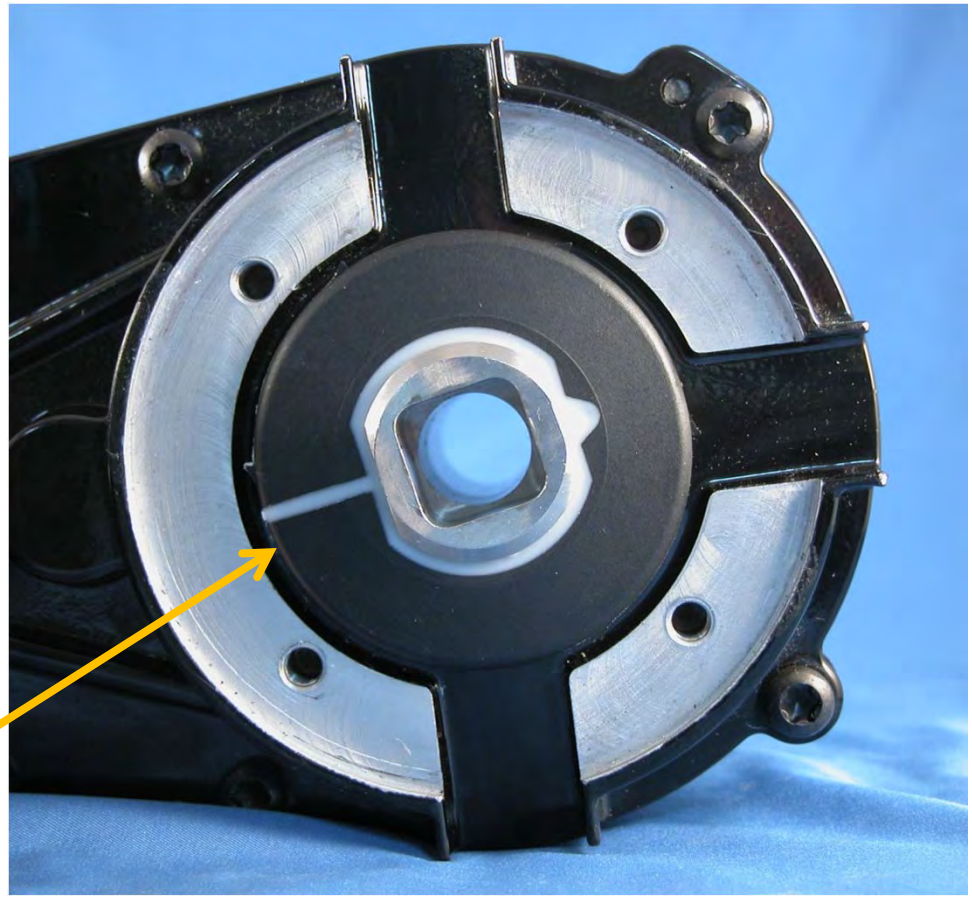
- Gear Reducer
  - Auger drive motor drives auger at 11 RPM CCW
  - Auger engaged by fitting into hollow output shaft
    - Square Drive



Scotsman Ice Systems

Top of Gear Reducer

- Hollow shaft
  - Water shed rotates with shaft
- Condensation relief slots
  - Mounting shelf acts as drain pan
- No vent



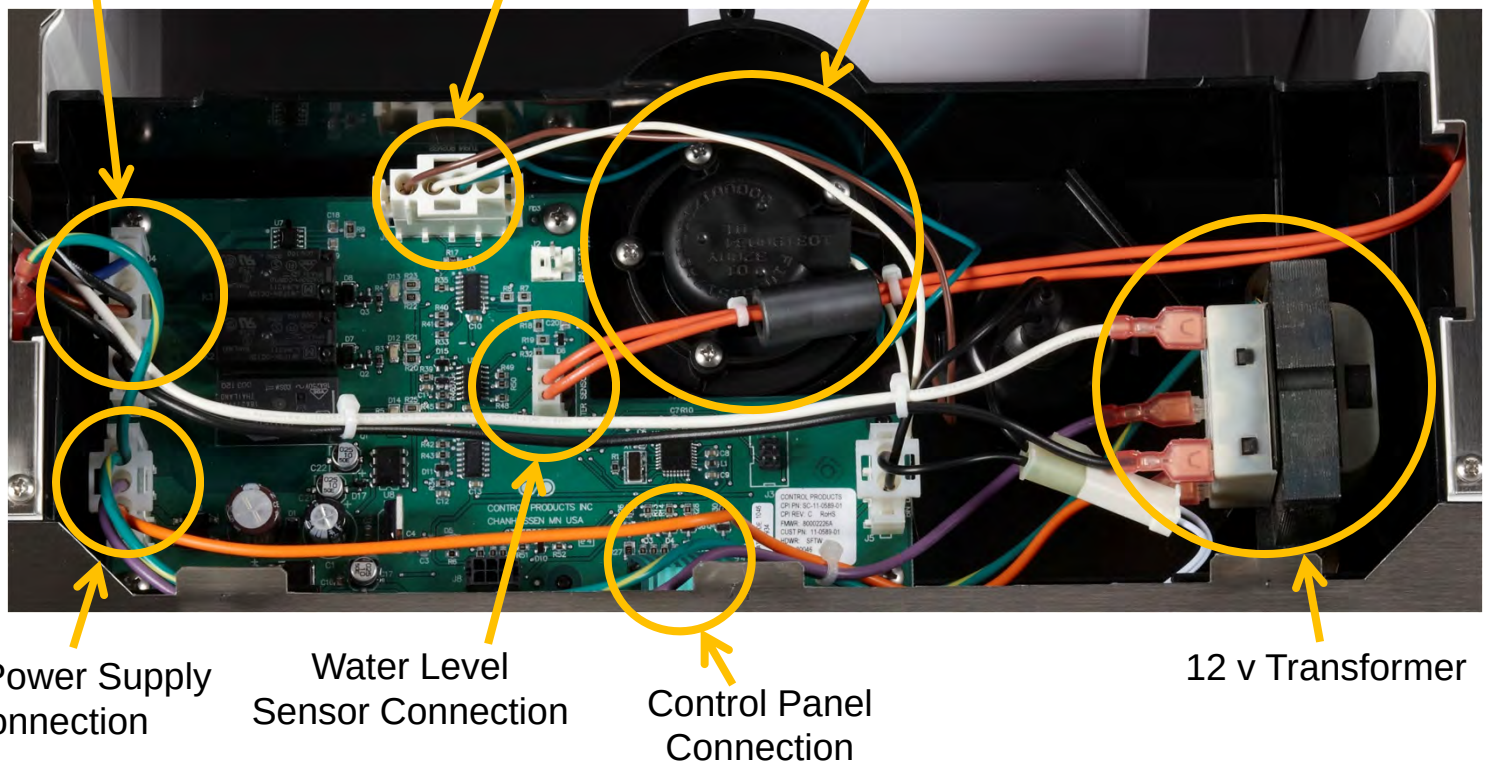
Scotsman Ice Systems

Control System

- Transformer - 12 volt secondary
- Controller
  - Operates auger motor and compressor/fan motor
  - Connected to water and ice sensors
- Control Panel – has lights and switches
- Water Level Sensor – water conductivity
- Ice Level Sensor - ultrasonic

Scotsman Ice Systems

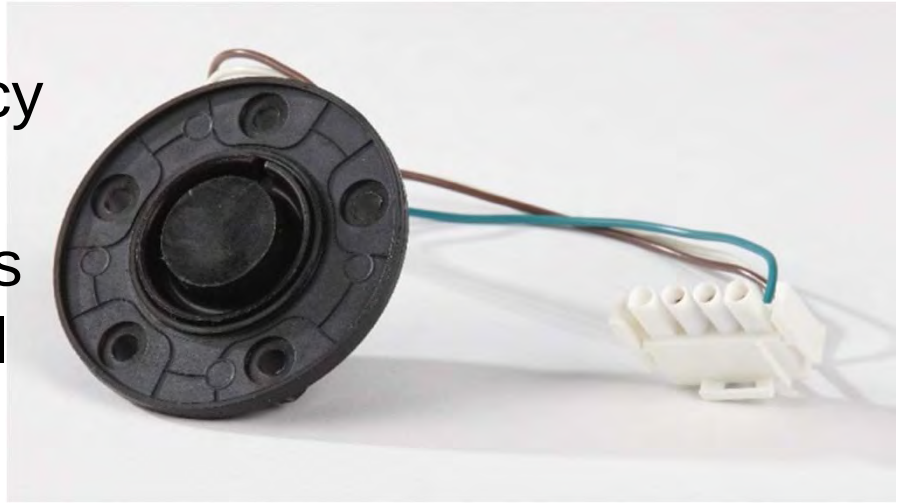
Control Box



Scotsman Ice Systems

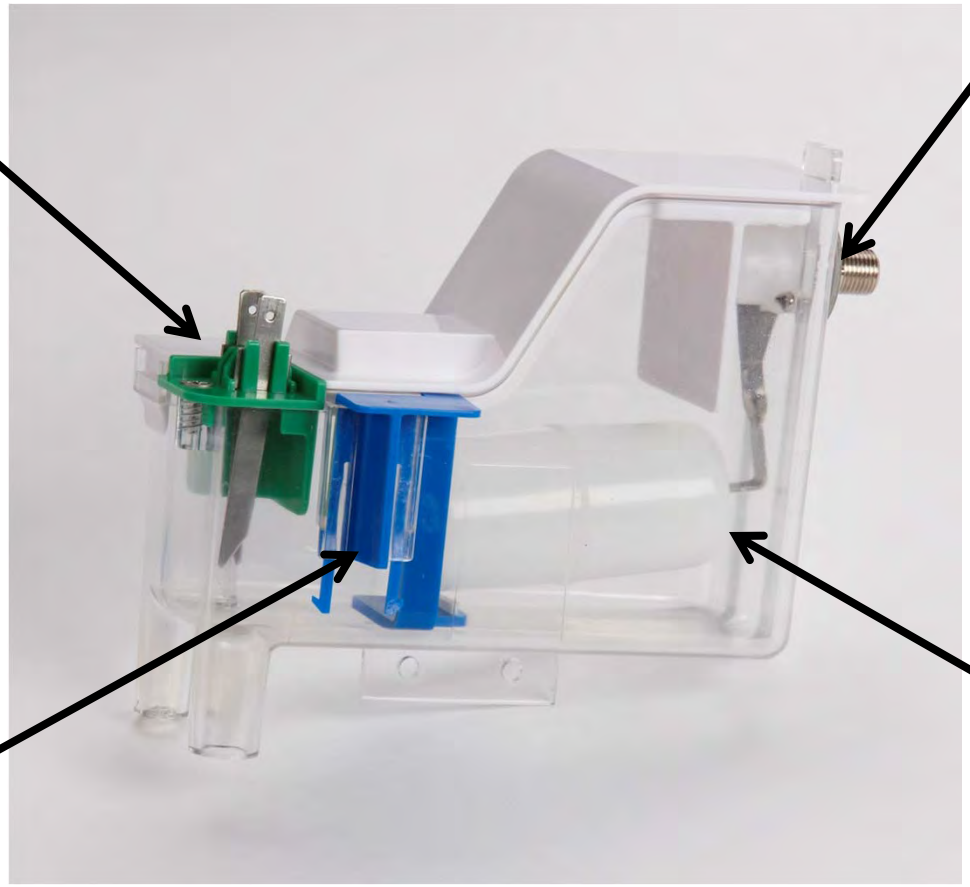
Bin Sensor

- Ultrasonic System
  - Emits high frequency sound
  - Controller measures time to return signal
  - Time tells controller the distance from sensor to ice
    - More time = lower ice level
    - Either on or off, not adjustable



Scotsman Ice Systems

Water Reservoir



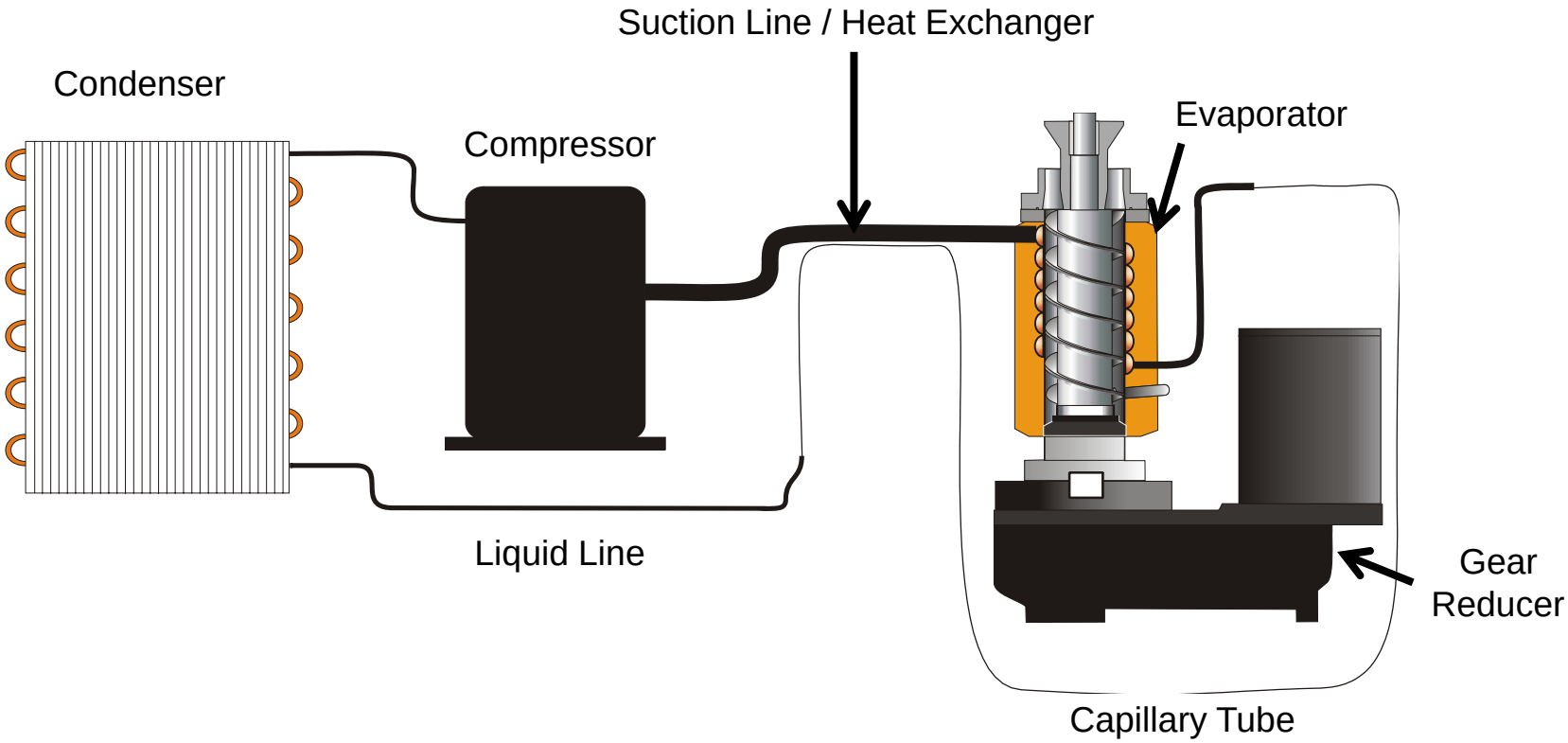
Scotsman Ice Systems

Refrigeration System

- R-134a
  - 4.5 oz charge
- Cap tube metering device
- Steady-state operation
  - System pressures steady while making ice
  - No access valves, do **not** attach long hoses

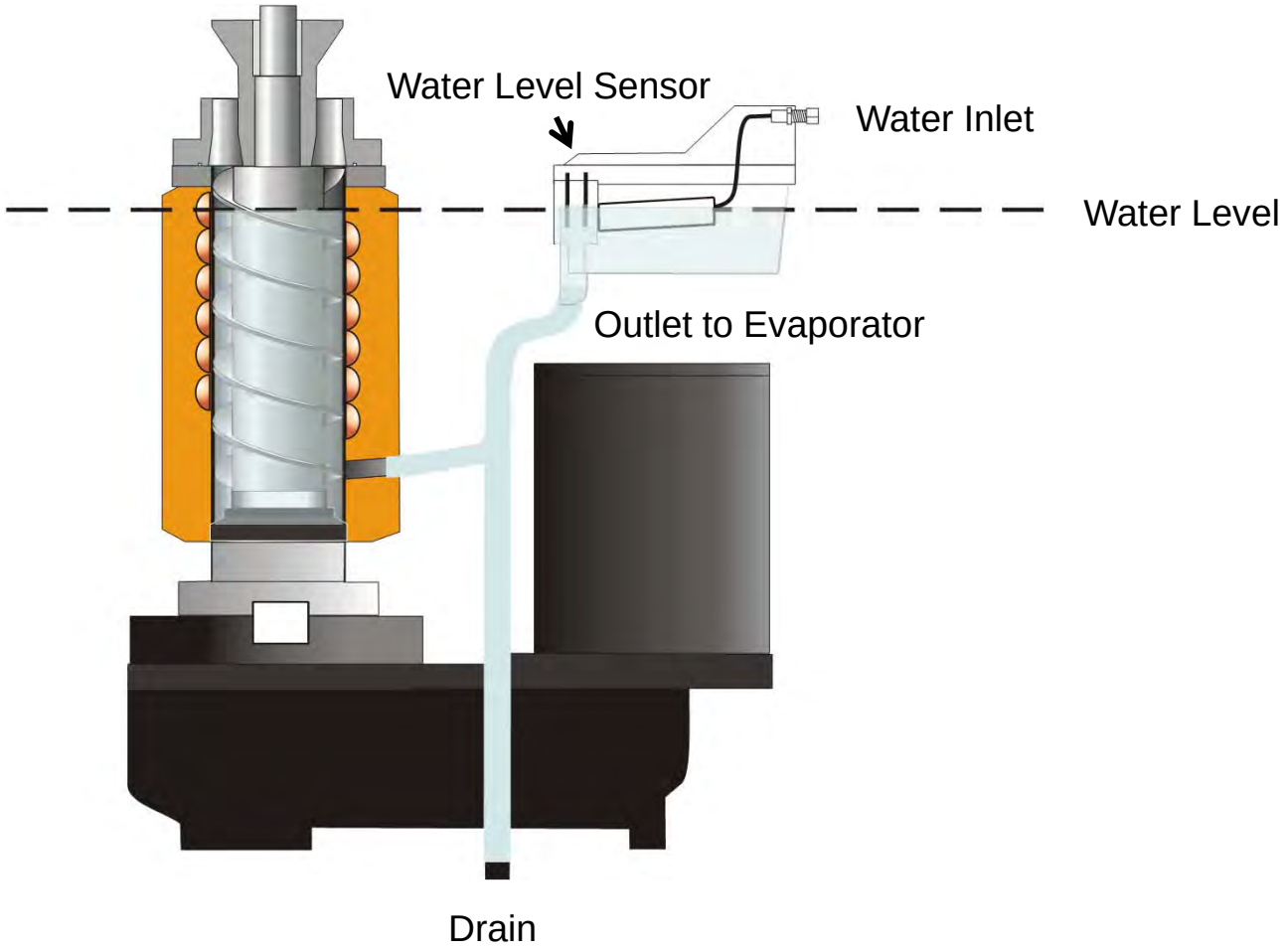
Scotsman Ice Systems

How It Works – Refrigeration Schematic



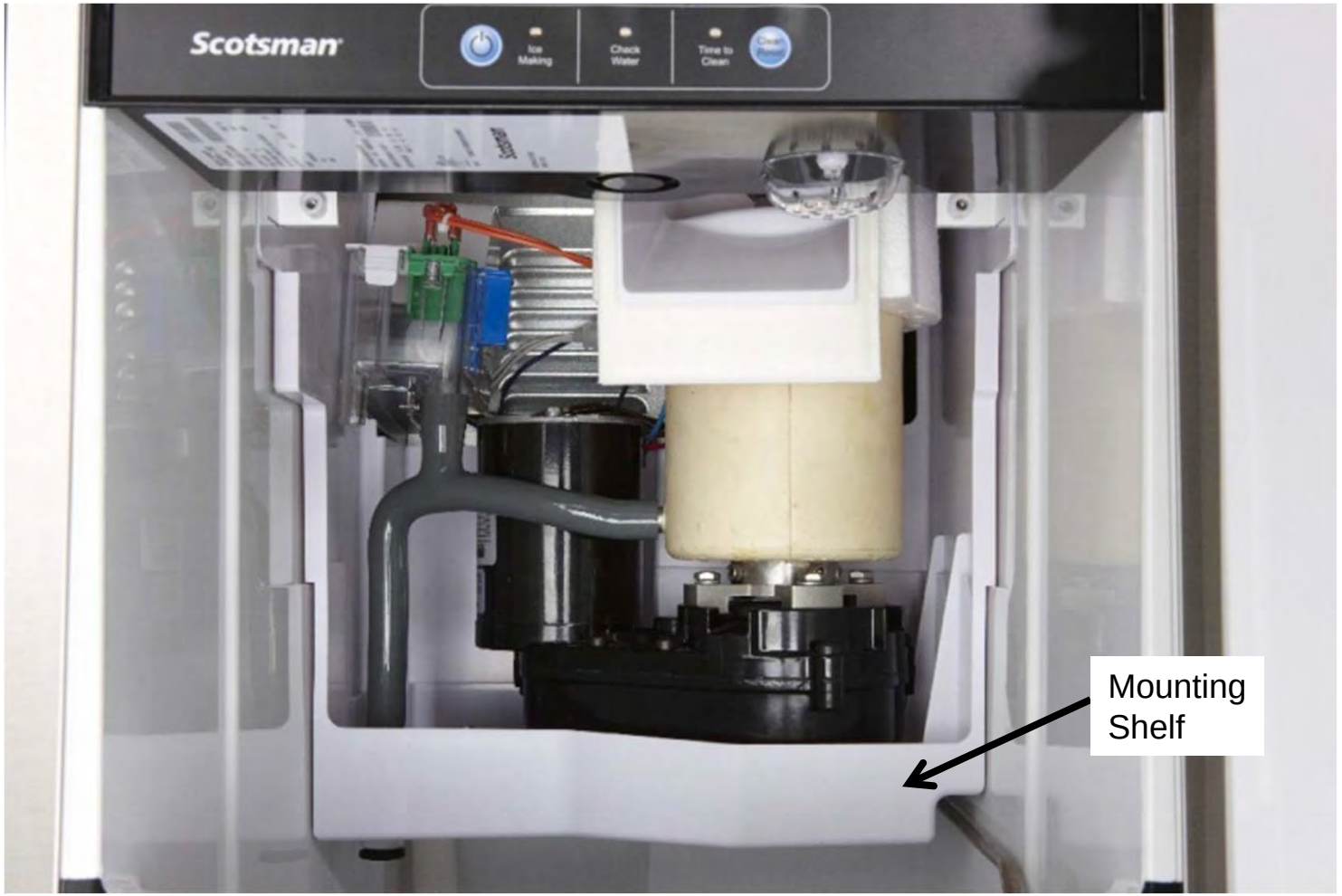
Scotsman
Ice Systems

How it Works – Water Schematic



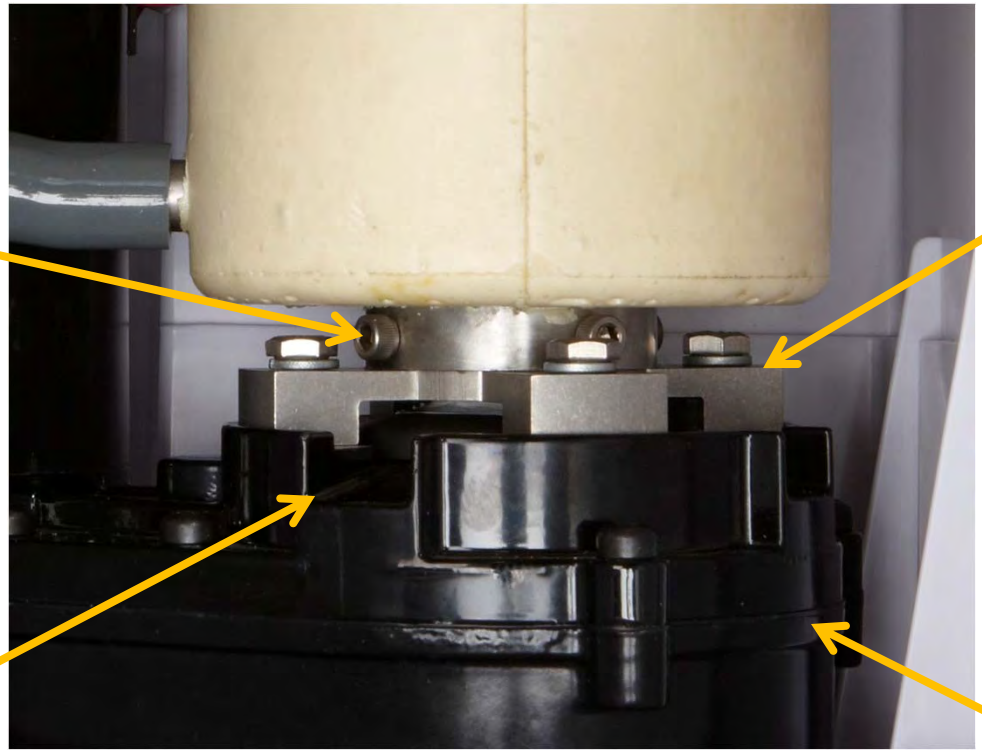
Scotsman Ice Systems

Components Assembled



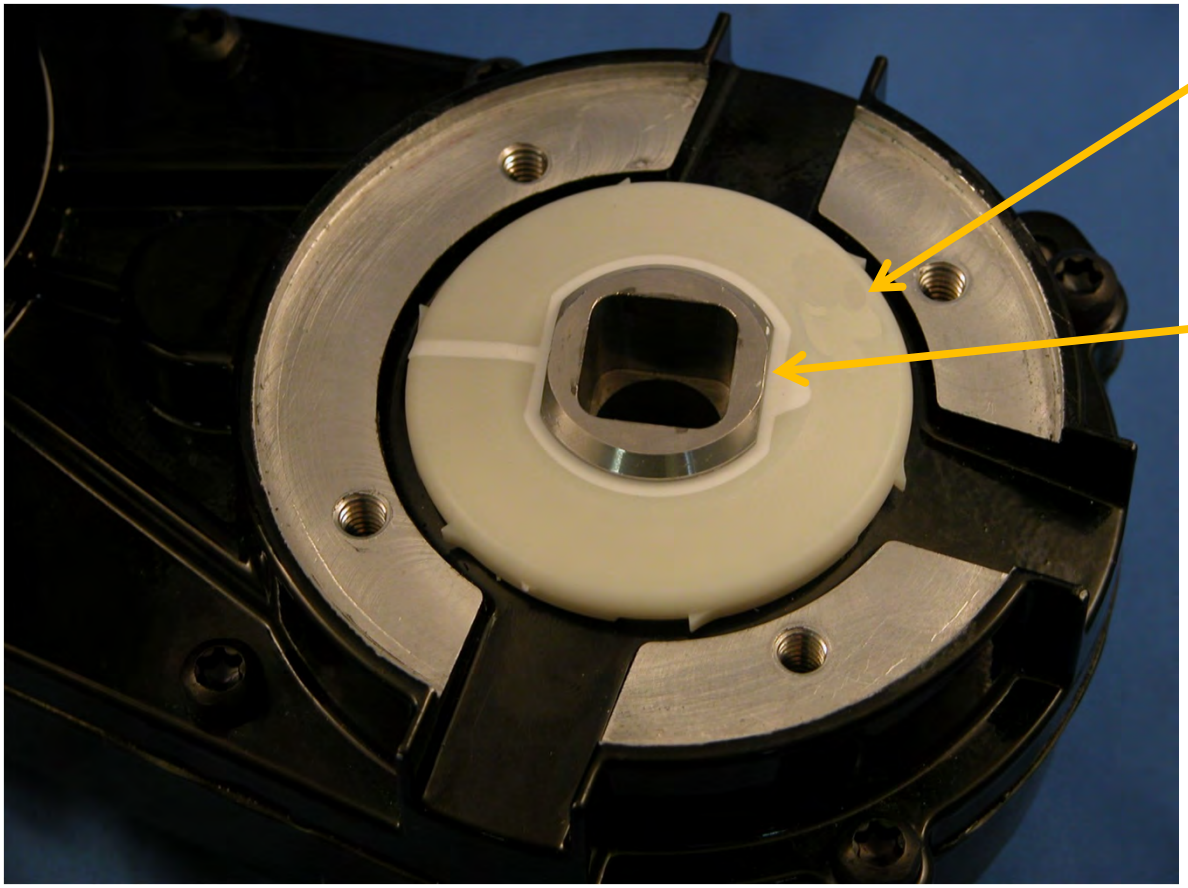
Scotsman Ice Systems

Evaporator to Gear Reducer



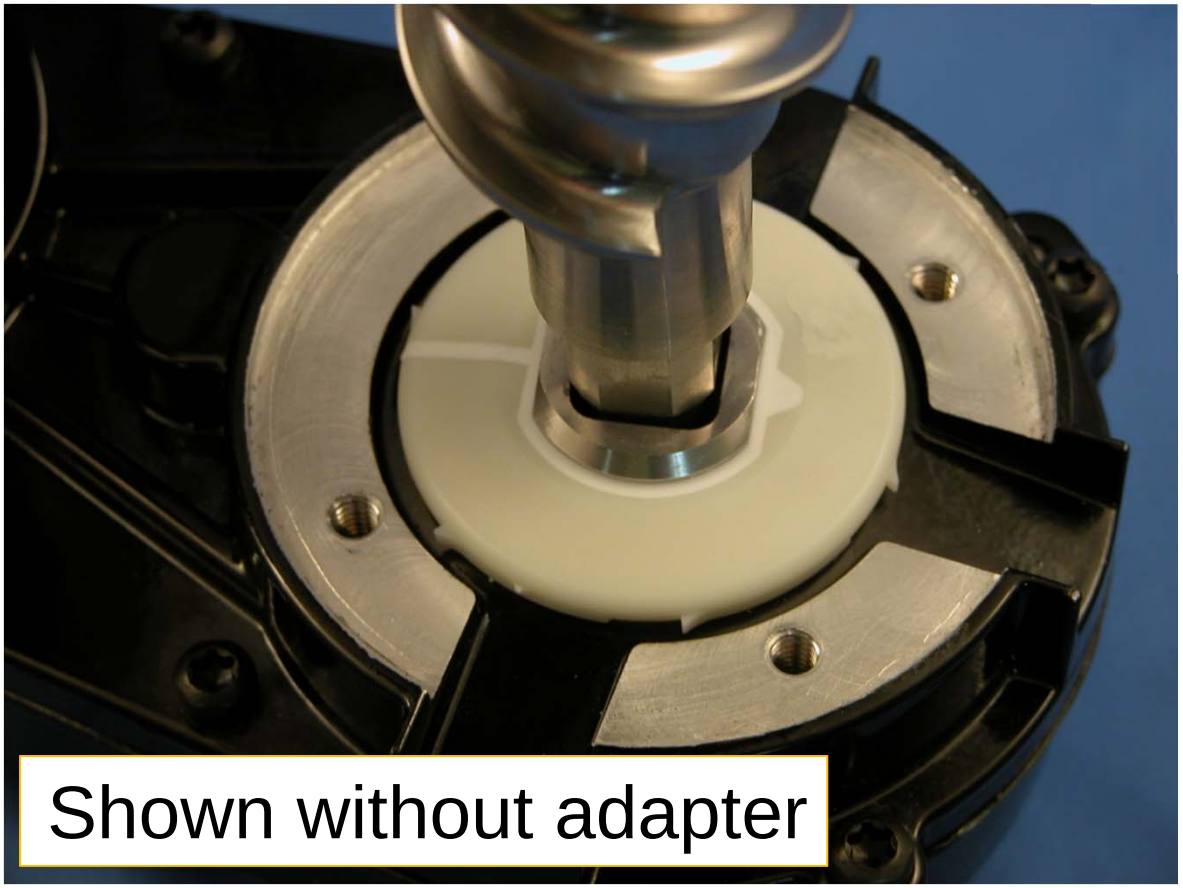
Scotsman Ice Systems

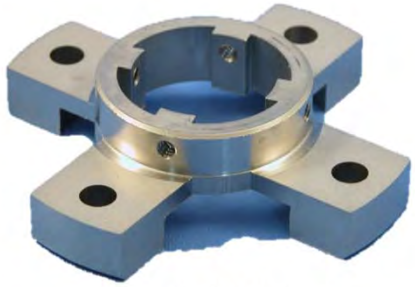
Output Shaft Area



Scotsman Ice Systems

Auger Engagement





Adapter

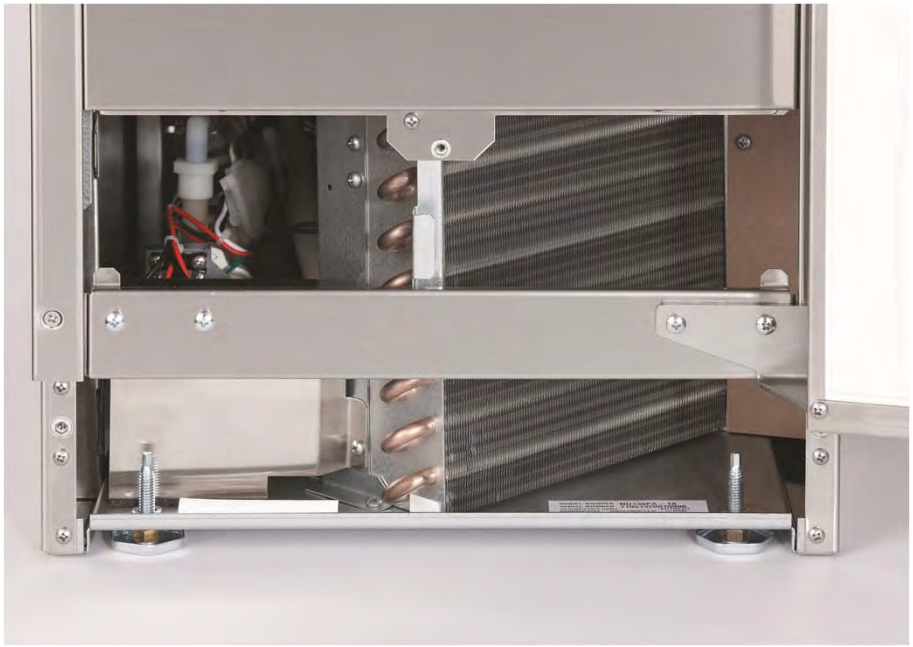
Scotsman
Ice Systems

Normal Full Bin Ice Level

Scotsman
Ice Systems

Maintenance

- Air cooled condenser
  - Remove service panel
  - Remove kickplate
  - Vacuum condenser



Scotsman Ice Systems

Maintenance – Scale Removal

- Hard water scale will form on the ice making surfaces
  - Reduces capacity
  - Increases loads
  - Increases noise
- Scale is commonly limestone
  - Must be dissolved by food grade acid
    - Ice machine scale remover

Scotsman Ice Systems

Scale Removal

- Begin
  - Shut machine off
  - Remove ice
  - Remove back panel of bin
    - Two thumbscrews

Scotsman Ice Systems

Scale Removal - 2

- Locate water reservoir
- Push tab and remove cover

Scotsman Ice Systems

Scale Removal - 3

- Push Blue Float Valve On/Off Lever Up
  - Shuts water off

Scotsman Ice Systems

Scale Removal - 4

- Pull drain plug and drain water system
- Return drain plug

Scotsman Ice Systems

Scale Removal - 5

- Prepare scale remover solution
  - Need 16 ounces of **solution**
  - Will need squirt bottle for built in situations
  - Squirt bottle available premixed – 19-0664-01

  Or

  - Mix Scotsman Clear 1 Scale remover with water
    - Ratio: 2.5 ounces to 32 ounces water

Scotsman Ice Systems

Scale Removal - 6

- Add scale remover solution to water reservoir until it is full
  - About 8 ounces

Scotsman Ice Systems

Scale Removal - 7

- Push and Hold BOTH On/Off and Clean buttons for 5 seconds

Scotsman Ice Systems

Scale Removal - 8

- Only the Auger motor operates for 10 minutes
- Compressor turns on, ice is made for 40 minutes
  - Must be present to add scale remover solution while unit is making ice
  - After all 16 ounces of solution is used up, push the Float Valve On/Off lever Down to switch the water back on

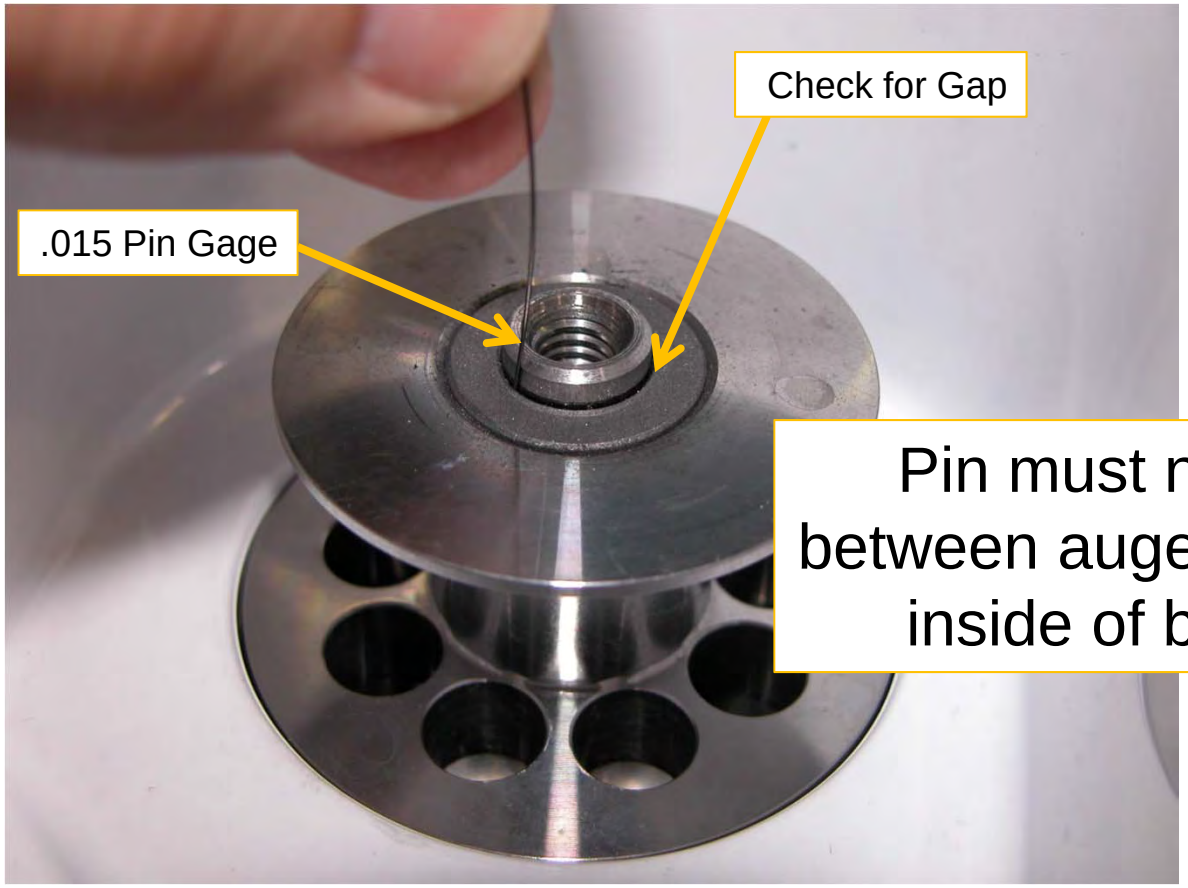
Scotsman Ice Systems

Scale Removal - Finish

- After machine shuts off
  - Shut water off
  - Drain water system
  - Re-plug drain
  - Switch water back on
  - Rinse bin drain
  - Wipe up loose scale from gear reducer
  - Return bin back panel
    - Push in at bottom to snap in
  - Switch unit back on

Scotsman Ice Systems

Top Bearing Check

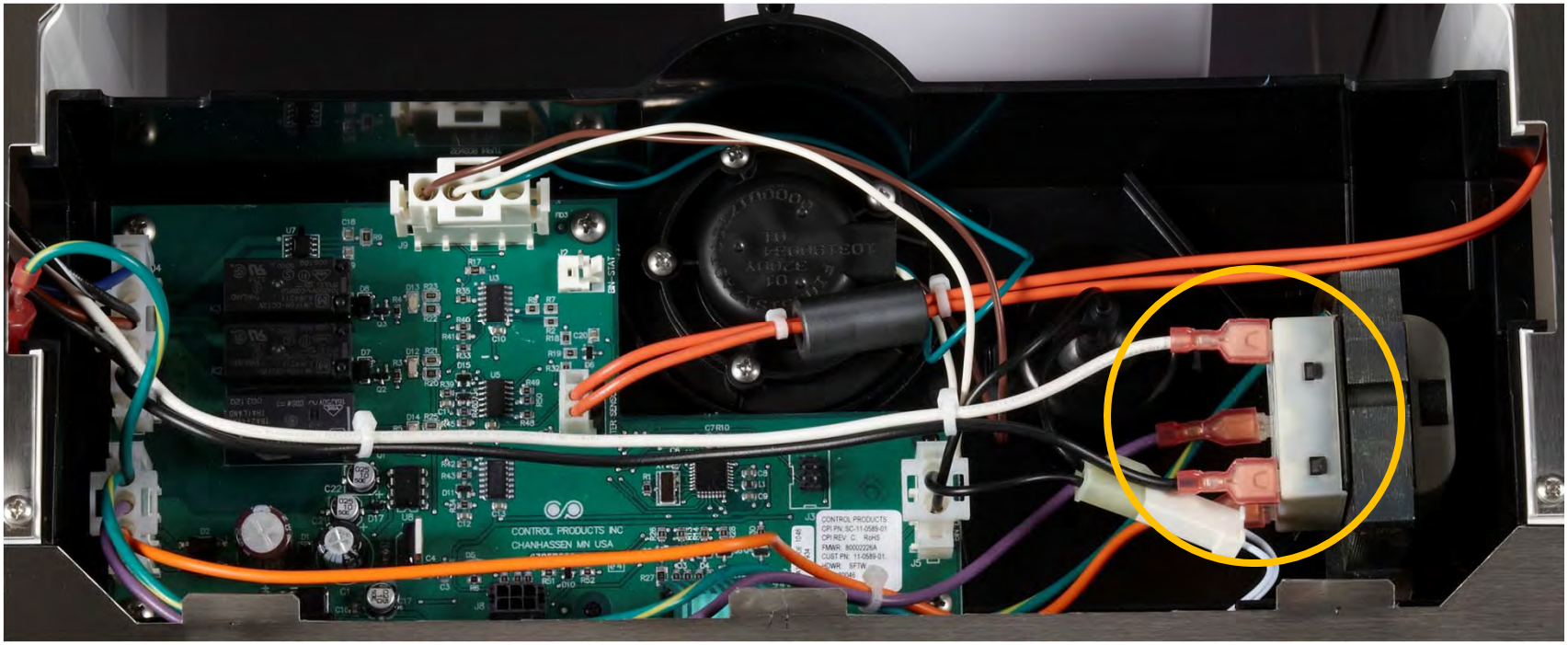


Pin must not slide between auger shaft and inside of bearing.

Scotsman Ice Systems

Diagnostics – Simple to Complex

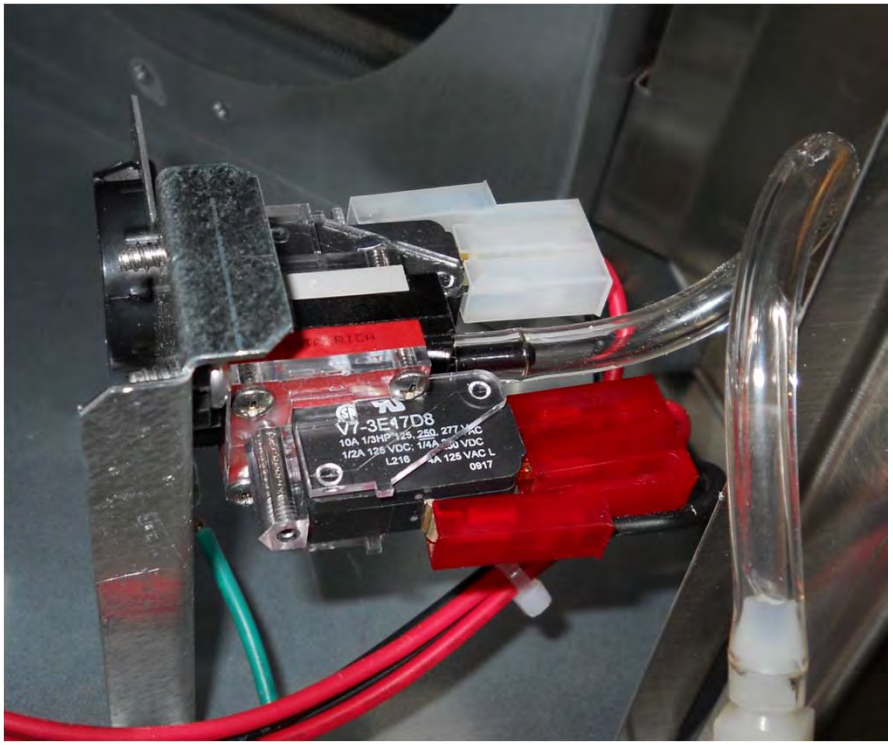
- No Ice – no response at control panel
  - Check power to transformer primary



Scotsman
Ice Systems

No Power to Transformer

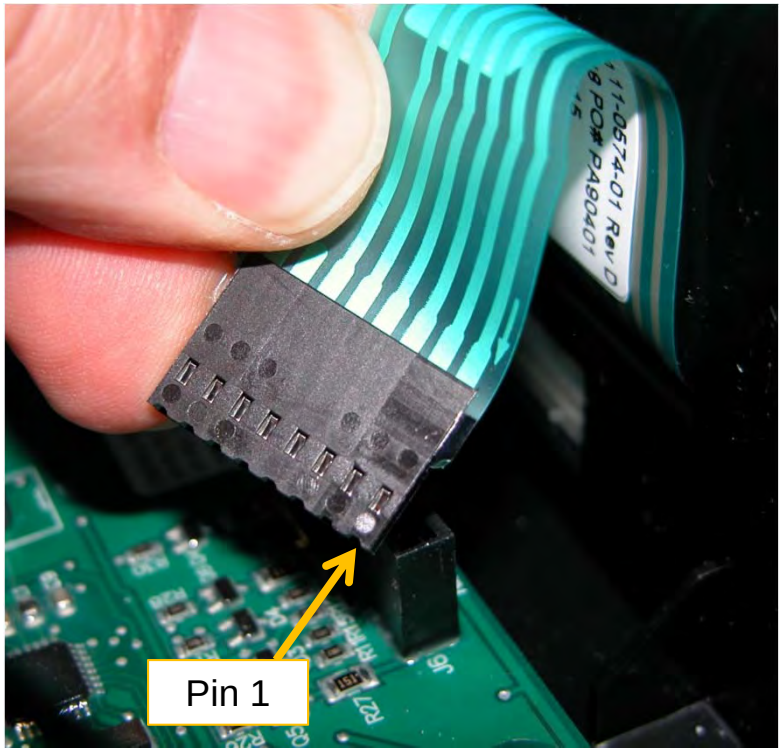
- Power Disconnected
- Pump model – open safety pressure switch
  - Water in bin, pump or drain failure
  - No water in bin, switch failure



Scotsman Ice Systems

No Ice – no control panel response

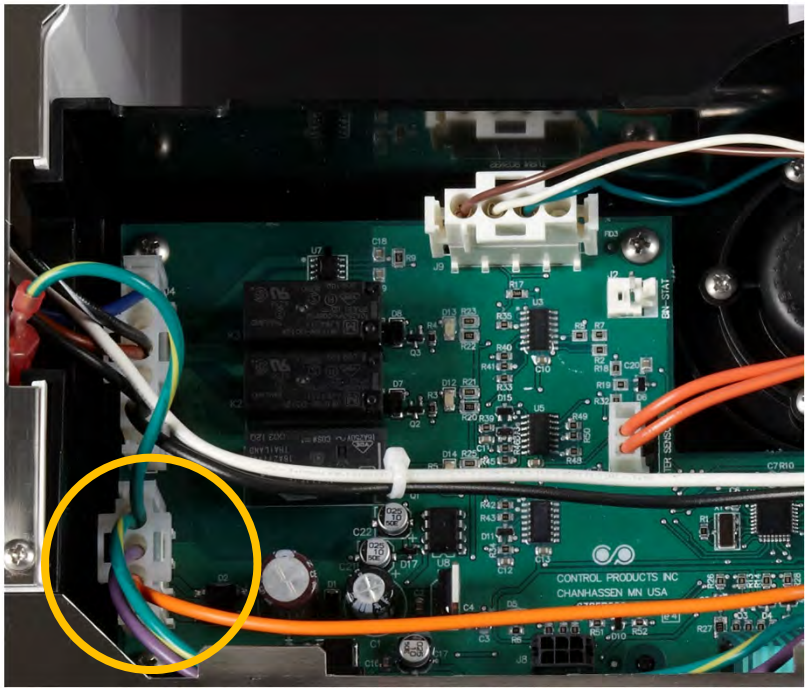
- Power to transformer OK
  - Check secondary for 12 volts AC
  - If OK check control panel
    - Unplug ribbon cable at J6 and check switches
    - (Dot is pin 1), Pin 2-3 On/Off Switch; Pin 4-3 Clean Reset Switch
      - About 10 ohms when activating a button, and Open when not pressing a button



Scotsman Ice Systems

No Ice – no control panel response

- Control Panel OK
- Check power to controller
  - 12 volts to connection
  - If OK, switch power on and off, if still no response, replace controller



Scotsman
Ice Systems

No Ice – no water light is ON

- Check water supply
- Check float valve
- Check water level sensor

Scotsman
Ice Systems

No Ice – Water Check

- Is float down and no water?
  - If yes and water is not flowing in, valve is plugged or not working
  - If no, is shut off lever up?
  - If float is up and shut off lever is down, valve is not working

Scotsman Ice Systems

No Ice – Water Check

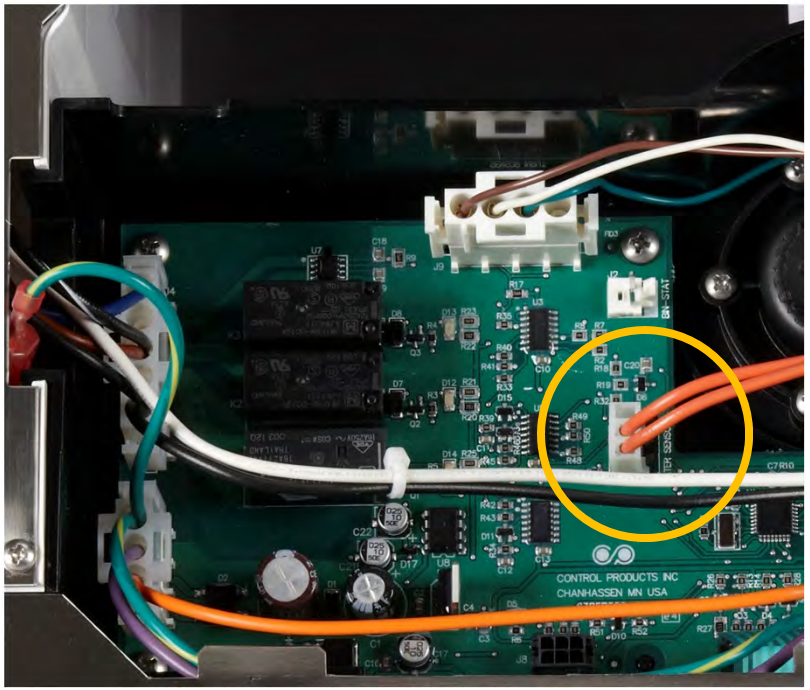
Check Water Light is On, but the reservoir has water

- Water is too clean
  - Must be 10 microSiemens/cm or more of conductivity
- Water sensor wire disconnected
- Controller cannot read sensor

Scotsman Ice Systems

No Ice – No Water Light is ON

- Water Sensor Check
  - Unplug sensor at J7
  - Short center and right pins together
  - Light should go out



Scotsman
Ice Systems

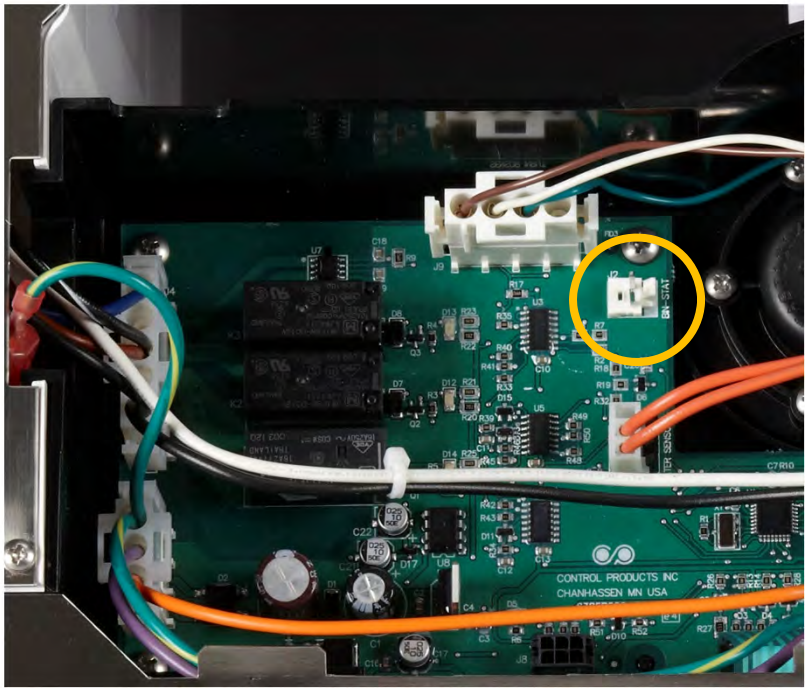
No Ice – Ice Making Light is ON

- Two minute delay after power reset
- Or in restart window
  - 60 second restart attempt time
- Wait or reset controller to check
  - Press Off/On to stop and again to start
  - If does not start, check bin control

Scotsman Ice Systems

No Ice – Ice Making Light is ON

- Bin Control Check
  - Locate J2 (bin stat)
  - Short pins together
    - Unit should start
    - If yes, replace bin control sensor
    - If no, replace controller



Scotsman
Ice Systems

No Ice – Ice Making Light is ON

- Refrigeration System Check
  - Compressor and Fan motor **both** off but Auger motor is operating. Check for voltage (Bk/W) – at controller, controller's compressor relay may have failed
  - Fan blade not turning – check for free action of fan blade, check motor windings
  - Compressor off – may have overheated if fan not turning. Check starting components and compressor windings

Scotsman Ice Systems

No Ice – Ice Making Light is ON

- Auger motor, Compressor and Fan are operating, ice sweep is turning, condenser is clean.
  - Possible refrigerant leak
  - Possible compressor valve failure
    - Add temporary access valve to process tube of compressor to check suction pressure – MUST use short hose (6”) or charge will be affected.
    - Suction pressure should be about 8 -10 PSIG

Scotsman Ice Systems

No Ice – 3 Lights Blinking

- Auger Motor Over 1 Amp
  - Normal is .5 to .6 amps
  - Lights will blink once every 2 seconds
  - 4 minutes to restart
- Auger Motor Low or No Amp Draw
  - Lights will blink twice every 2 seconds
  - 20 minutes to restart – motor cool down time
- Controller Failure
  - Lights will blink once every 10 seconds

Scotsman Ice Systems

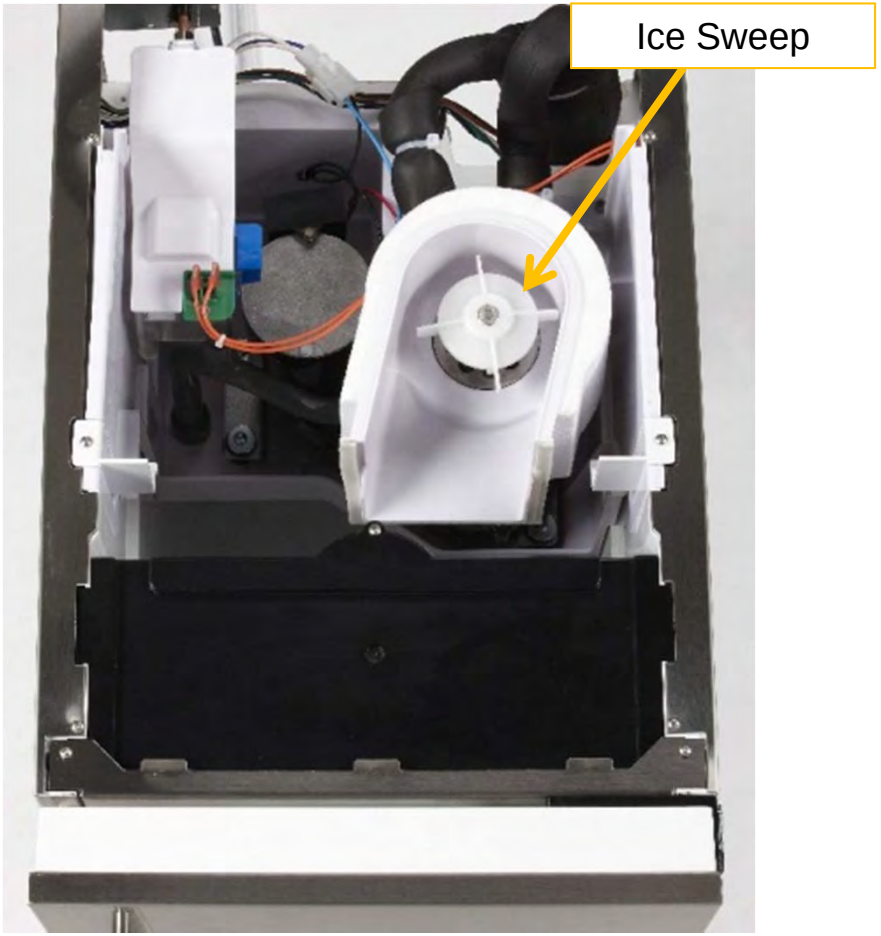
Repair Procedures

- Top panel access is required for many components, including:
  - Gear reducer, auger, breaker, water seal, reservoir, controller, transformer, bin control
  - Shut off and Drain water from evaporator prior to service of any part of it

Scotsman Ice Systems

Removal and Replacement

- Ice making components
  - Begin with the ice sweep
  - Rotate CCW to remove



Scotsman Ice Systems

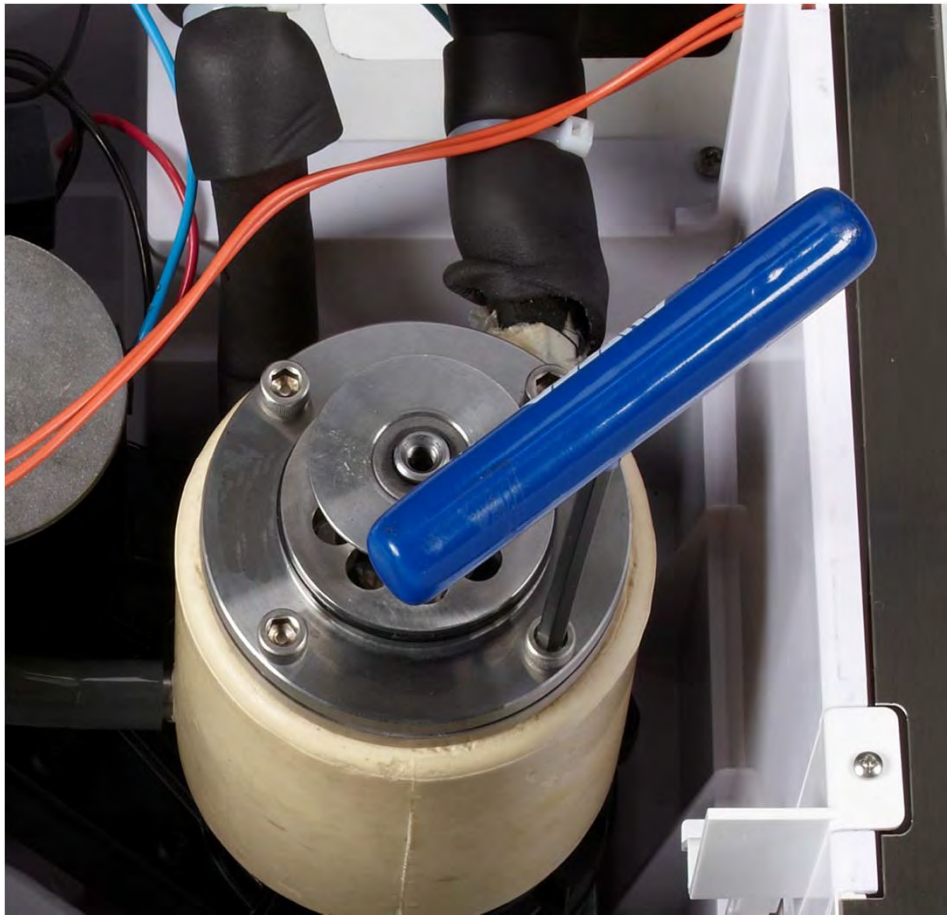
Removal and Replacement

- Remove back panel of bin
- Lift ice chute up and off evaporator

Scotsman Ice Systems

Removal and Replacement

- Remove 4 allen head bolts and lift breaker off evaporator

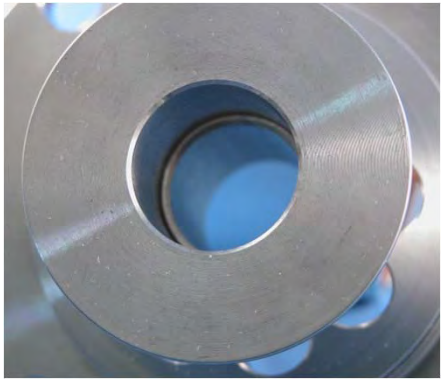


Scotsman Ice Systems

Removal and Replacement

- Breaker & Bearing
  - Bearing is non-metallic and does not require any lubrication
  - Bearing can be replaced by driving it out and pushing another in

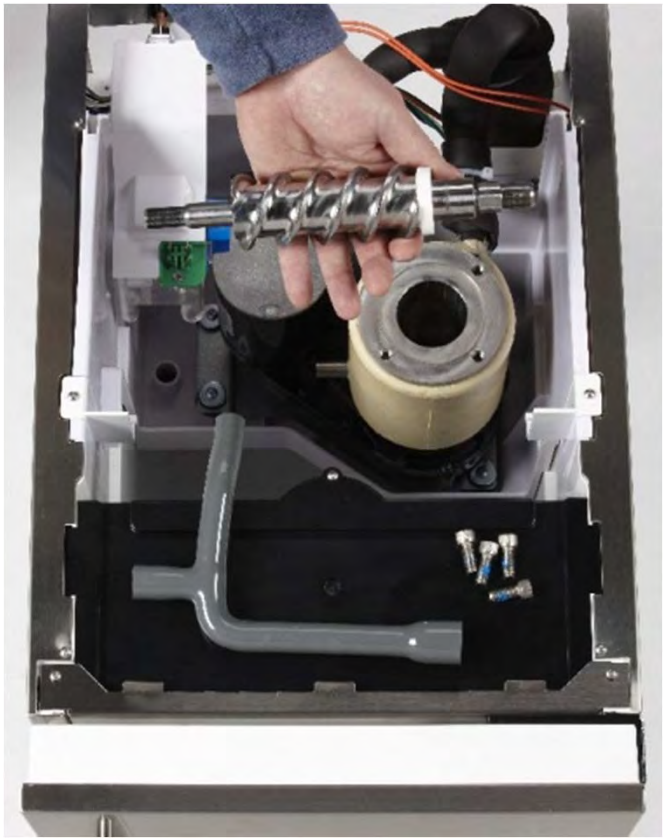
Breaker w/out bearing



Scotsman Ice Systems

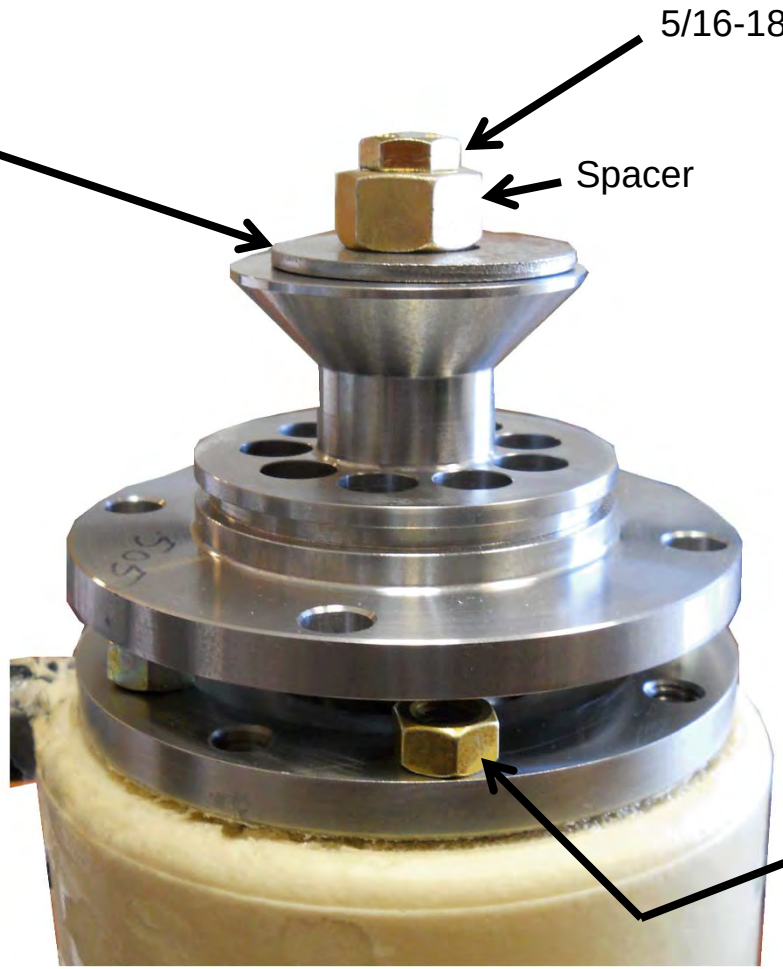
Removal and Replacement

- Lift auger out of evaporator
- Disconnect drain hose from evaporator



Scotsman Ice Systems

Removing Stuck Auger



Shim breaker, tighten cap screw to lift auger

Scotsman Ice Systems

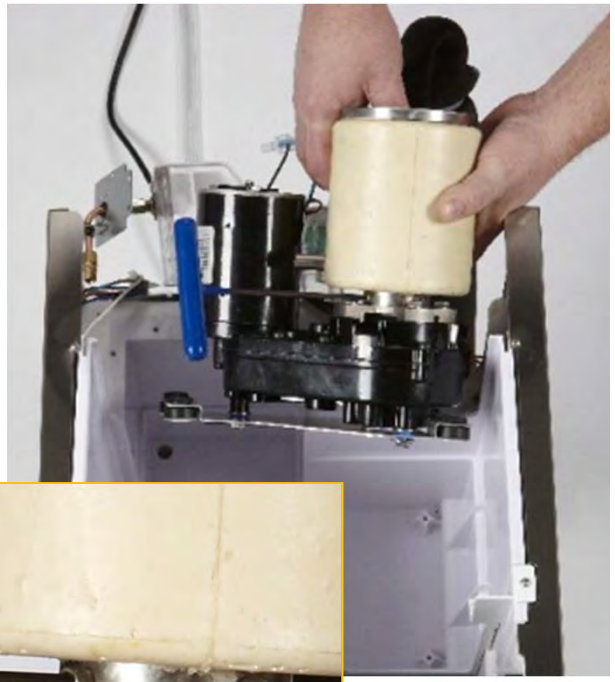
Removal and Replacement

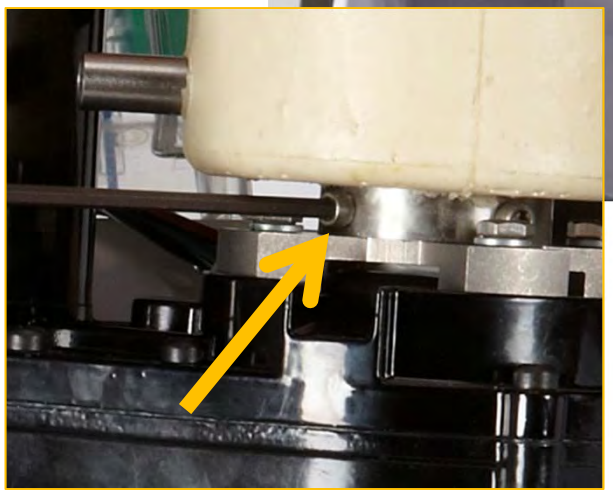
- Separate Evaporator from Gear Reducer
  - Disconnect electrical harness from auger motor
  - Remove 4 phillips screws holding gear reducer mounting plate to shelf

Scotsman Ice Systems

Removal and Replacement

- CAREFULLY lift gear reducer & evaporator up
- Rest on back wall
- Remove 4 allen head screws holding evaporator to adapter





Scotsman Ice Systems

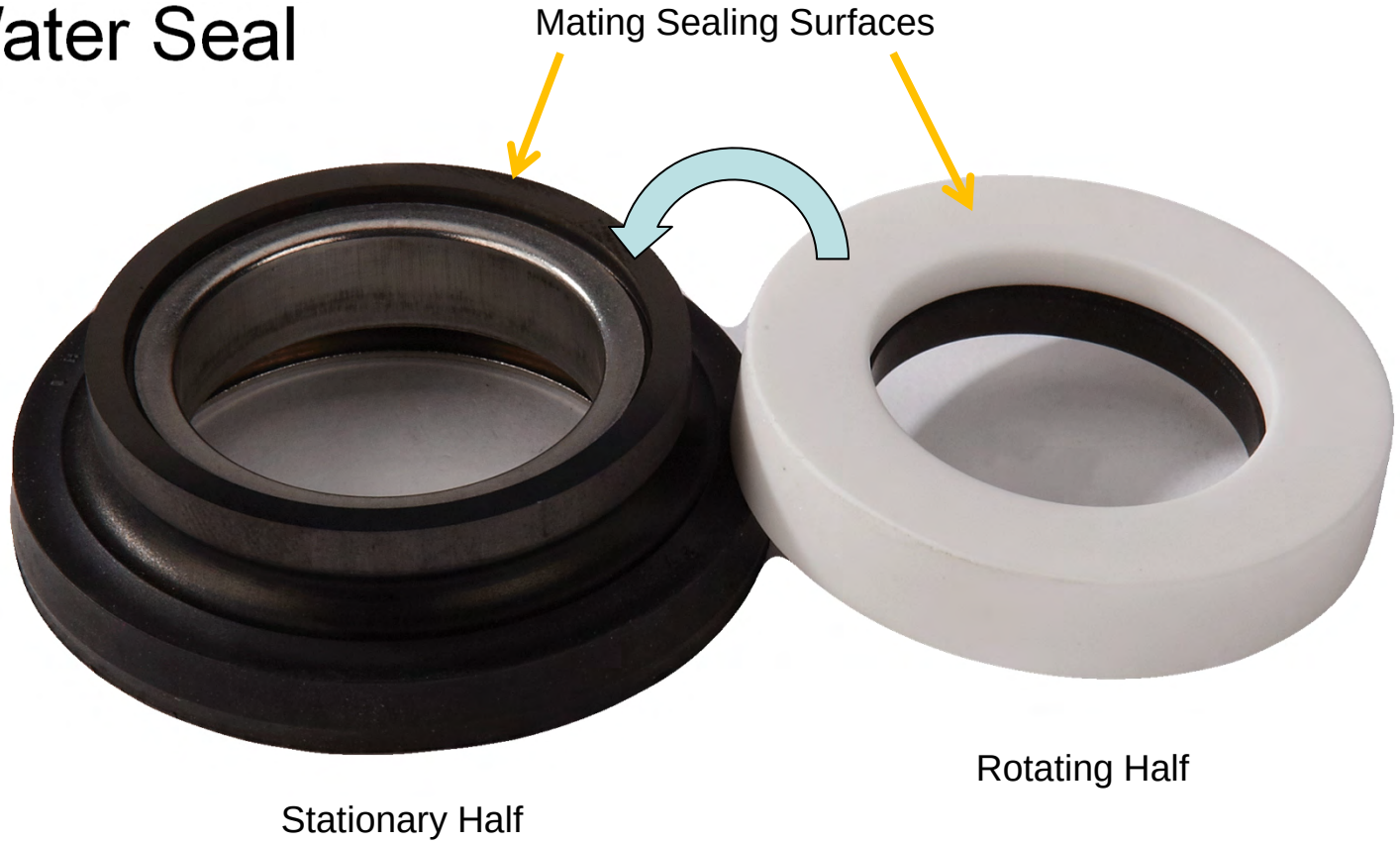
Removal and Replacement

- Separate Evaporator from Gear Reducer
- Remove water seal from evaporator

Scotsman Ice Systems

Removal and Replacement

- Water Seal



Scotsman Ice Systems

Removal and Replacement

- Water Seal – Rotating Half on Auger
  - Remove seal ring
  - Clean auger
  - Add sealant to auger
  - Install new seal
    - Rubber side up
    - Wet rubber
    - Push onto auger
    - Do NOT touch mating surfaces

Scotsman Ice Systems

Removal and Replacement

- Water Seal – Stationary Half
  - Wet outside edge
  - Push into evaporator tube
  - Stop when flush with end of tube
    - Adapter will push seal to proper depth (as shown)

Scotsman Ice Systems

Removal and Replacement

- IF replacing gear reducer, be sure not to overtighten mounting bolts

Scotsman Ice Systems

Removal and Replacement

- Place evaporator tube onto gear reducer
  - Adapter will position water seal to correct depth
  - Secure with the original 4 allen head screws
  - Reattach assembly to shelf
  - Install auger into evaporator tube
  - Reattach breaker to top of evaporator

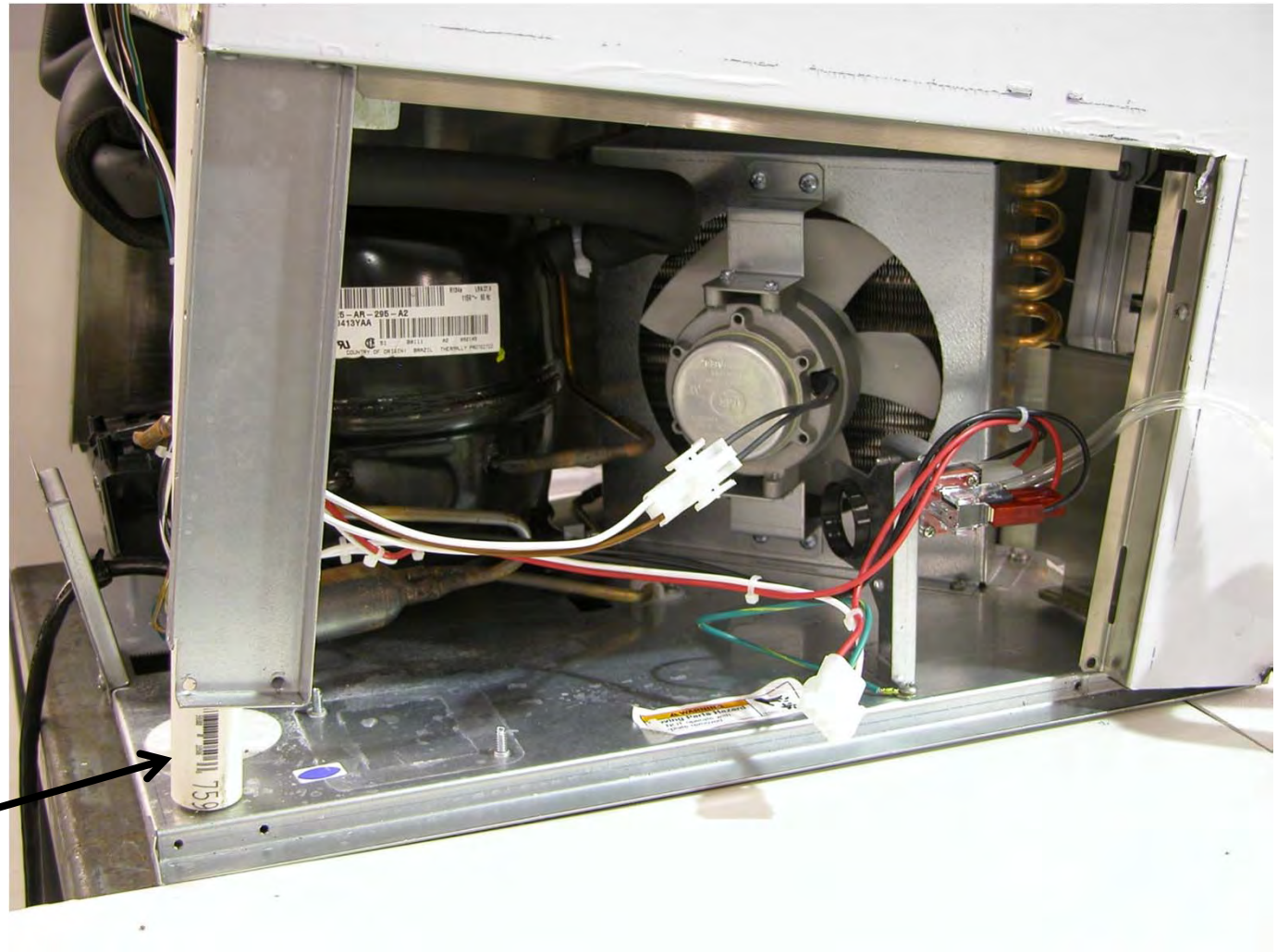
Scotsman Ice Systems

Removal and Replacement

- Compressor Access
  - Remove side service panel, front service panel and kickplate. Remove back panel.
  - Remove screws under side service panel
  - Remove 2 screws at back bottom corners
  - Loosen 2 screws at front bottom corners
  - Tip cabinet forward
  - Support with 11 inch prop

Scotsman Ice Systems

Compressor



Scotsman
Ice Systems

Summary

- NU130 is a continuous flow ice machine
- Ice form is chewable Nugget
- 15 inch cabinet
- Air cooled
- Pump or Gravity Drain
- R-134a

Scotsman Ice Systems

Scotsman®

Scotsman
Ice Systems