

Eskimo Ice

INSTALLATION MANUAL FOR REMOTE ICE-MAKING SYSTEMS

For model:

- EIR600D



Condensing Unit

Auger Unit

Control Panel

EIR600D Components

Dometic Marine Division
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L-2448B English

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INTRODUCTION

WARNINGS AND NOTICES

**DANGER**

This equipment is not ignition protected per CFR 183.410 and may not be installed in areas that may be exposed to flammable gas.

**DANGER**

The equipment referenced in this manual operates on 115 or 230 volts AC. Such voltages can be lethal, therefore proper care must be taking during installation, operation, and servicing to prevent injury or loss of life.

**DANGER**

The equipment referenced in this manual operates with compressed refrigerant at high pressures. Proper care must be taken during installation, operation, and servicing to prevent injury or loss of life due to improper procedures.

**WARNING**

Never install the unit in the bow of a boat. It must be installed on the transom, in the aft, or in a machinery space that does not require ignition protection that is as far aft of midship as possible.

**WARNING**

This manual contains essential safety information concerning the safe and proper installation, operation, and maintenance of your ice making system. It is very important that you read and understand the contents of this manual thoroughly before installing or using the equipment. You should keep this manual on your boat for future reference. Failure to follow Dometic approved installation, start-up, operation, and troubleshooting procedures will void the warranty. If there are any statements in this manual that you do not understand, contact your local dealer for assistance or the Dometic Marine Service Department:

- **Phone:** +1 804-746-1313 or +1 954-973-2477 (8AM - 5PM US Eastern Time)
- **Fax:** +1 804-746-7248 or +1 954-979-4414
- **Email:** sales@dometicusa.com

**NOTICE**

Some equipment may be shipped with specific installation sheets or wiring diagrams that may supercede the information located in this manual. Dometic reserves the right to update or change any information located herein at any time and without prior notice.

**NOTICE**

Your ice-making system uses the environmentally safe refrigerant R-134a. Federal law forbids the intentional release of any refrigerant gas into the environment. Make certain that any field service is performed by a specialist with the proper equipment to prevent loss of refrigerant during servicing.

ICE MAKING AND REFRIGERATION BASICS

The evaporator in the ice maker evaporates liquid refrigerant to remove heat from fresh water in order to freeze it. As the water freezes onto the wall of the evaporator shell, it is scraped off by the auger and pushed to the ice-collection box.

How It Works

The basic principle of an ice machine system is that a liquid refrigerant absorbs heat as it turns into a gaseous state (evaporates) and releases heat as it turns back into a liquid state (condenses). The system consists of five main components:

- **Evaporator** - Absorbs heat from the fresh water in the evaporator causing the fresh water to freeze..
- **Auger** - Scrapes the frozen fresh water from the sides of the evaporator and extrudes it into the discharge hose.
- **Condenser** - Releases heat into the seawater and turns the refrigerant gas back into a liquid.
- **Compressor** - Drives the refrigerant through the loop.
- **Metering Device** - Meters the flow of refrigerant to the evaporator.

The ice maker's refrigerant compound has a very low boiling point. It flows in a closed loop between an evaporator and a condenser, alternately absorbing and releasing heat. This process removes the heat from the fresh water in the evaporator/ auger assembly and causes the fresh water to freeze on the inside of the evaporator wall. The heat absorbed by the refrigerant is transferred to the seawater.

A water pump circulates seawater through the inner tube in the condenser coil which cools the refrigerant in the outer tube and condenses it from a gas into a liquid. The heat from the refrigerant is exchanged to the seawater and discharged overboard. The liquid refrigerant is then pumped through the evaporator coil and the cycle repeats.

The Effect of Seawater and Fresh Water Temperatures

Seawater and freshwater temperatures affect the ice machine's efficiency and capacity. The system is most efficient when the seawater and fresh water temperatures are 55-80°F (13-27°C). The ideal temperature for both is 70°F (21.1°C).

High Temperatures - As water temperatures approach 90°F (32°C) and above, the water's ability to absorb heat diminishes, so the capacity of the system decreases. Also, when seawater temperature increases above 90°F (32°C), the system could sustain a high-pressure shutdown to protect the compressor.

Low Temperatures - As water temperatures approach 40°F (4.4°C) and below, the water's ability to provide heat exchange diminishes, so the capacity of the system decreases. Also, as the water temperature decreases, the system could sustain a low-pressure shutdown to protect the compressor.



CAUTION

Extreme care should be taken in operating any unit below seawater temperatures of 40°F (4.4°C). The seawater could freeze in the condenser tubing, possibly causing it to burst, which is not covered by the warranty.

The Effect of Ambient Air Temperature

The ambient air temperature affects the ice machine's efficiency and capacity, but not as significantly as the water temperatures. The system is most efficient when the ambient air temperature is 55-80°F (13-27°C). At temperatures above and below this range, ice production will decrease.

COMPONENTS OF THE ICE MAKER

CONDENSING UNIT

The condensing unit has an R-134a compressor, seawater-cooled condenser, a receiver/filter/drier, an accumulator, and a sight glass/moisture indicator. The condensing unit also has the control box attached, which is remote-mountable up to 7 feet (2.2m) away with plug-and-play electrical connections for the electrical harness to the auger unit and the optional remote display.

AUGER UNIT

The auger unit contains the evaporator barrel, auger rotor, gearbox, motor, water reservoir, and expansion device. The freshwater delivered to it is converted to ice which exits the system via an ice-delivery hose routed to a storage box up to 30 feet (9m) away. The unit comes with quick-connect refrigerant fittings and is pre-charged with refrigerant from the factory. The unit has plug-and-play electrical connections for the ice-level sensor and the electrical harness to the condensing unit.

CONTROL BOX

The condensing unit has an electrical control box with digital display that can be mounted on the unit or remotely mounted up to 7' (2.2m) away.

The control box (Figure 7, page 12) contains the system function switches, digital display, and system indicator lights. It lets you control all system operations and provides visual indications of system activity, such as whether the system is running or has a fault. If a fault condition is detected, the system shuts down automatically. The control panel lets you restart the system after a sustained fault. See the "The Digital Control" on page 11 for further operating instructions.

LINESETS

Linesets, generally made of copper tubing, connect the auger unit to the condensing unit. The liquid line is 1/4" (6.4mm) copper tubing and the suction line is 1/2" (38mm) copper tubing. The suction line comes pre-insulated to prevent frost. Flexible tube sections are available, but are only recommended for installations where one part moves in relation to another, such as a lifting deck.



CAUTION

Flexible tubes are prone to fatigue and should only be used where needed for occasional service access, not in areas of continuous access.

STORAGE BOX

The storage box is the destination point where the ice will accumulate via the ice-delivery hose. An ice-level sensor installed in the storage box halts ice production when the box is full.

The storage box should be able to hold water and have at least 2" (51mm) of insulation to keep the ice frozen as long as possible. It is helpful to install a drain in the box at the end opposite from the ice input. To improve ice-production performance, keep the drain plugged to prevent cold air and cold water from escaping the storage box.

SEAWATER SYSTEM

Seawater is pumped into the ice-making unit to efficiently cool the hot refrigerant via a cupronickel coaxial tube design. The condensing unit may be connected to its own single-station pump or to a larger, multi-station pump via a pump relay box.

The seawater system (Figure 3, page 8) consists of a thru-hull fitting, seacock, strainer, seawater pump, seawater hose, and overboard discharge.

FRESHWATER SUPPLY

Use the 1/4" SAE male flare fitting on the auger unit to supply freshwater for ice making. Provide water with pressure of at least 15 PSI. An in-line water filter (included in kit) is **mandatory** to comply with Dometic Warranty Regulations, to help prevent clogging of the needle valve in the water reservoir, and to help keep the auger walls from fouling with mineral deposits which will cause premature failure of water seals and bearings. See "Fresh Water Filter and Y Strainer" on page 14 for maintenance instructions.

REFRIGERANT CHARGE

The condensing unit, the auger unit, and the linesets are all pre-charged with the correct amount of R-134a refrigerant. No charge adjustment should be necessary upon installation, but always confirm that operating pressures and superheat are within the correct operating range. If service is required, see data plate for correct charge amount.

SIGHT GLASS/MOISTURE INDICATOR

The sight glass on the condensing unit provides visual moisture indication and is only functional when refrigerant is flowing through the sight glass for at least 10 minutes. **Sight glass should not be used for refrigerant charging or status.**

QUICK-CONNECT FITTINGS (QC)

The quick-connect fittings allow all parts of the system to be factory evacuated and precharged with refrigerant. They also provide easy and quick installation in the field, and are polarized so they can not be hooked up incorrectly. The fittings can be reused if the unit is ever relocated. Note: Fittings should be lubricated with 134a-compatible oil to ensure a proper seal.

CONSTANT PRESSURE VALVE (CPV)

The CPV is used as the expansion valve of the refrigerant system. It allows high-pressure liquid to become low-pressure liquid and start the refrigeration process. The simple and reliable CPV provides a constant system pressure over a wide range of ambient and seawater temperatures. The valve pressure is set at the factory and should not require any field adjustments. On the rare occasion that an adjustment is necessary, the system must be correctly charged and operating for at least 20 minutes at an ice-making temperature before any adjustments are made. Recommended pressure is 6 to 7.5 PSI (6.8 PSI is ideal) as determined by an accurate gauge capable of reading low-pressures. Misadjustment of the valve can cause reduced ice production, damage to components, and voiding of the warranty. If under warranty, call for authorization before adjusting CPV, otherwise warranty will be voided.

INSTALLATION PROCEDURES

This section covers the installation procedures for your ice-making system. **Read the manual completely before attempting to install any equipment.**

CHOOSING THE CORRECT EQUIPMENT VOLTAGE

Know the frequency and voltage provided where your ice-making system will be used and select the appropriate 60 Hz or 50 Hz model. **Do not operate a 60Hz unit on 50Hz power or a 50Hz unit on 60Hz power, as this will cause damage and void the warranty.**

The voltage rating of a unit is a nominal rating. The voltage in a given location may be higher or lower by as much as 10% and the system will still operate correctly. For example, in a 60 Hz environment you may see 110 VAC to 120 VAC, or 208 VAC to 240 VAC. In a 50 Hz environment common voltages range from 220 VAC to 240 VAC.

INSTALLING THE SYSTEM

SELECTING THE CONDENSER SITE

Never install the unit in the bow of the boat. Dometic ice-making units are designed to be installed in any convenient location on the transom, in the aft, or in a machinery space that does not require ignition protection that is as far aft of midship as possible. The condenser can be located in living areas if necessary. Some considerations:

- **This equipment is not ignition protected per CFR 183.410 and may not be installed in areas that may be exposed to flammable gas.**

- The unit will produce condensation, so the drip pan is necessary.
- The unit is water cooled and does not need direct ventilation, but do not install in a sealed space.
- The space around the unit may be insulated to reduce noise if necessary.

Site Location Check List

- Location is aft of midship. **Never install the unit in the bow of the boat.**
- Location is not exposed to flammable gas.
- Location provides adequate space for access to refrigerant, seawater, and electrical connections.
- Location provides accessibility for service and maintenance.
- Location is away from direct spray, from engine air intakes, and from water washdown.
- Mounting space is a flat, horizontal surface.
- Maximum refrigerant-tubing run is 50 feet (15.2m).

MOUNTING THE CONDENSING UNIT

1. Do not remove any covers, caps, or fittings that may expose any wiring or refrigerant until you are ready for those steps of the installation.

On a flat, horizontal surface, orient the unit so the refrigerant, seawater, and electrical connections are accessible. Use screws or bolts through the holes in the four corners of the pan to secure it. You can remove and turn the pan to better orient the drain stub.

2. The auger has an elbow where the ice exits. The elbow rotates 360 degrees to let the ice-discharge hose go in any direction toward the ice box. Make sure the elbow is oriented upward so water can re-enter the auger barrel instead of flowing to the ice box. If you decide to remotely mount the control box, be sure it is away from direct spray, from engine air intakes, and from water washdown.
3. If pump wires need to be extended by butt connections, make sure they are tightly crimped and heat shrunk.
4. AC power source must be installed and grounded/bonded in accordance with ABYC standards.
5. Connect control wires to terminal strip with ring terminals.

INSTALLING CONDENSATE DRAINAGE

The condensate drain pan is 2.0" (51mm) high with two drain locations. During conditions of high humidity, condensate may be produced at a rate of approximately one-half gallon (1.9 liter) per hour. With this in mind, it is important to route condensate drains downward to a sump pump. It is not recommended to route condensate drains to the bilge.

After the condensate drain installation is complete, test the installation by pouring one quart (liter) of water into the pan and checking for good flow.

SELECTING THE AUGER SITE

The auger should be installed close to the ice-storage box. This minimizes the amount of tubing between the box and auger, and minimizes the time required for ice to enter the box. It also reduces the amount of melting that takes place in the hose and reduces the chance for ice clogging.

Site Location Check List

- Choose a location as close to the ice-storage box as possible.
- Orient the unit so refrigerant, feedwater, and electrical connections are accessible.
- Orient the unit so the front and/or top cover may be removed for service and maintenance.
- Choose a substantial vertical surface, or a flat, horizontal surface.
- Do not place in an area of direct salt spray.

MOUNTING THE AUGER UNIT

1. Do not remove any covers, caps, or fittings that may expose any wiring or refrigerant until you are ready for those steps of the installation.
2. Securely fasten to a sturdy vertical wall using the keyhole slots in the rear of the unit, or secure to a flat, horizontal surface using the tabs provided on the bottom of the unit.

- The auger unit has an elbow on the top-right side where the ice exits. The elbow rotates 360 degrees to accommodate any direction of the hose to the ice box. Make sure the elbow is oriented upward so water can re-enter the auger barrel instead of flowing to the ice box.

INSTALLING ICE-DELIVERY HOSE

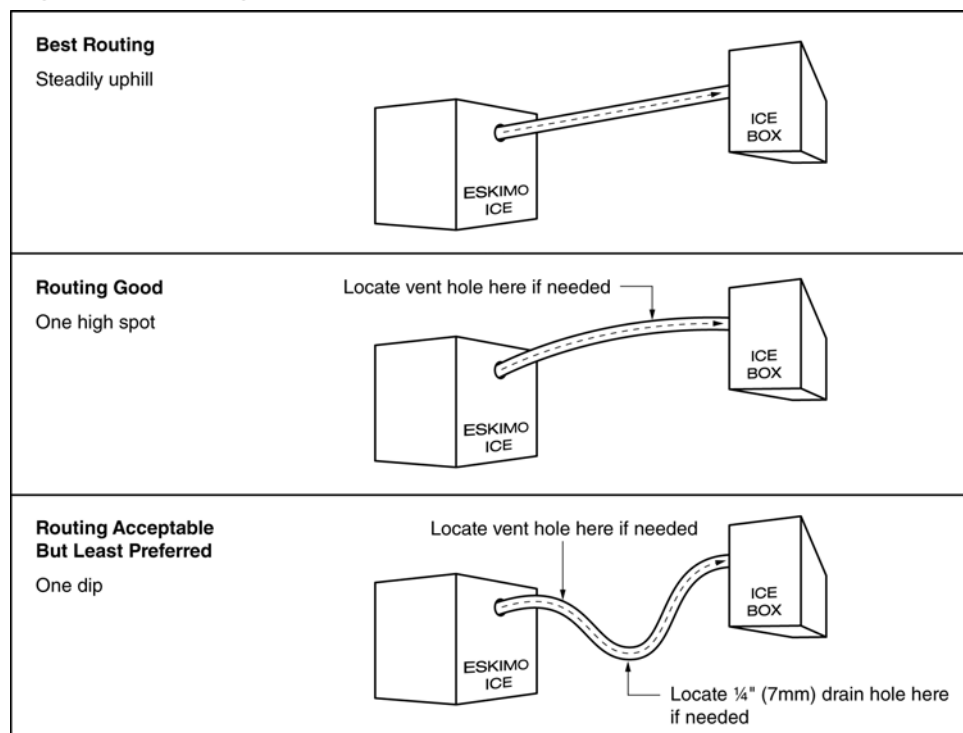
Planning the Route

The maximum length of the ice-delivery hose is 30 feet (9m).

The best hose routing provides a level but slightly upward rise from the auger to the box, with very few bends. No bend should be tighter than a radius of 18" (458mm). Refer to Figure 1 below to see:

- Best Routing** - A continuous uphill route of travel from the auger unit.
- Good Routing** - A continuous route of travel, with only one high spot.
- Acceptable Routing** - A route of travel which includes one low spot and two high spots.

Figure 1: Routing of Ice-Delivery Hose



Procedure

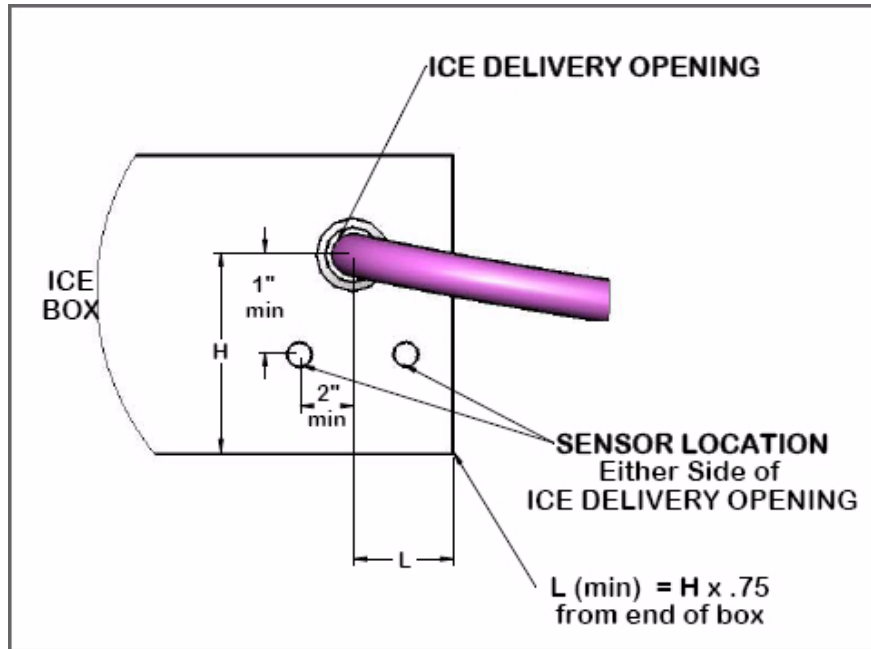
- Install the proper thru-hull in the ice box using the supplied fitting. The thru-hull must be large enough for the 1-1/4" (32mm) ice-delivery hose, and its location should facilitate the best hose route from the auger (as described above and shown in Figure 1, page 5).
- Insulate the full length of hose with 1-5/8" (42mm) ID, 1/2" (13mm) thick wall insul-tube, minimum.
- If needed, drill a 1/4" (6.4mm) air-vent hole where shown in Figure 1, page 5 for your type of hose route. Do not block the air vent with insulation.
- If there are any dips in the hose you may need to drill a 1/4" (6.4mm) hole in the hose for water relief. While the water will not prevent ice flow, in low ambient conditions this water could freeze which would prevent ice delivery. Do not block the hole with insulation.
- Secure each hose end with double hose clamps so the hose will not get pulled out. In addition, PVC glue may also be used at the thru-hull end.
- Securely strap hose to bulkhead, keeping in mind that the hose will be much heavier once filled with ice. Be careful not to kink, flatten, oval or crush hose, because any obstructions will prevent free flow of ice.

INSTALLING THE ICE-LEVEL SENSOR

To prevent overflow, this sensor stops ice production when the ice in the storage box reaches the level of the sensor. Use Figure 2 below to determine placement for the ice-level sensor at the storage box location.

1. The sensor must be located below and to the side of the ice-delivery hole. Drill a 23/32" (19mm) hole for sensor.
2. Use the 2 lock nuts provided to secure sensor into the hole.
3. Use marine-grade sealant around the hole if desired. (Remember that the unit may have to be removed at some time.)
4. Route the cable to the auger unit and plug the end into the matching socket.

Figure 2: Location of Ice-Level Sensor (front view)



INSTALLING THE REFRIGERANT LINESETS

The linesets, auger, and condensing unit all have quick-connect (QC) fittings. QC fittings allow connection and disconnection of the system with no loss of refrigerant.

1. Refrigerant lines may run uphill, downhill, or sloping as necessary. They can have bends, but avoid sharp bends that could kink the tubing.
 2. Route the lines directly to each unit, and approach the QC in a straight line.
 3. Do not try to screw fittings together that are incorrectly mated, as this will destroy the fittings. Connect the fittings with this method:
 - Lubricate the male fitting face and threads lightly with refrigeration-grade oil.
 - Hand-thread the nut of the female QC onto the male-threaded QC by rotating the union nut clockwise.
 - Tighten the female thread connection with a wrench while holding the opposite coupling with a wrench. Exception: If the male QC is held by a metal bracket at each unit, it does not need a wrench on it.
 - Tighten each assembly to 35 foot-pounds with a torque wrench. If you don't have a torque wrench, tighten each assembly until the fittings "bottom out," then use a marker to make a line on each coupling half hex. Turn with wrenches an additional 1/6 to 1/4 turn to completely seal the assembly.
- WARNING:** If the steps above are not followed and the fittings are cross-threaded together, the fittings will be destroyed and the warranty voided.
4. Once connections are made, fully insulate the suction line from unit to unit.

INSTALLING THE FEEDWATER SYSTEM

Feedwater for the auger unit should be fresh water supplied by the boat's potable water system. The water reservoir has a float switch to ensure the unit does not operate without a water supply.

Requirements

- Supplied feedwater must have a pressure of at least 15 PSI.
- The water system must be able to supply at least 4 GPH when the ice maker is operating.
- Install the in-line filter (supplied in kit) just prior to the auger unit to remove sediment which may clog the needle valve in the water reservoir.
- Dometic recommends installing a shut-off valve in the feedwater line between the source and the filter to facilitate filter changes.

**WARNING**

Use of saltwater as feedwater will damage auger components and evaporator barrel and will void the warranty.

**WARNING**

Failure to install and use a water filter will void the warranty.

Procedure

1. Run copper tubing or equivalent from the freshwater source to the in-line water filter.
2. Run copper tubing or equivalent from the water filter to the auger water input, and connect with the supplied 1/4" SAE male flare connection on the unit.
3. Ensure there are no leaks in the field-installed portion of the system.

Water Quality and Filters

No water from a municipality is "pure" feedwater, but water from a vessel's onboard water maker comes close. The feedwater problem is that water contains suspended and dissolved feedwater solids. Pure water freezes first, leaving the feedwater solids to increase in concentration in the unfrozen feedwater. Solids also bond to the evaporator wall during feedwater freezing, forming scale. Eventually, built-up scale will shorten machine life.

A filter must always be used, preferably one supplied by Dometic for use with ice makers. Replace the filter at least twice yearly, or more often if the machine is used frequently. While filters help clean the water, a yearly cleaning of the evaporator barrel is required. See "Evaporator Cleaning" on page 14 of the "OWNER MAINTENANCE" section.

Using saltwater to make ice is not approved by Dometic. Saltwater is very corrosive, and it contains many more dissolved and suspended solids than freshwater. If you want a brine solution for your catch, we suggest sprinkling salt over the ice in the storage box. **USE OF SALTWATER AS FEEDWATER IN ANY DOMETIC ICE MAKER WILL CAUSE SEVERE DAMAGE AND VOID THE WARRANTY!**

INSTALLING THE SEAWATER COOLING SYSTEM

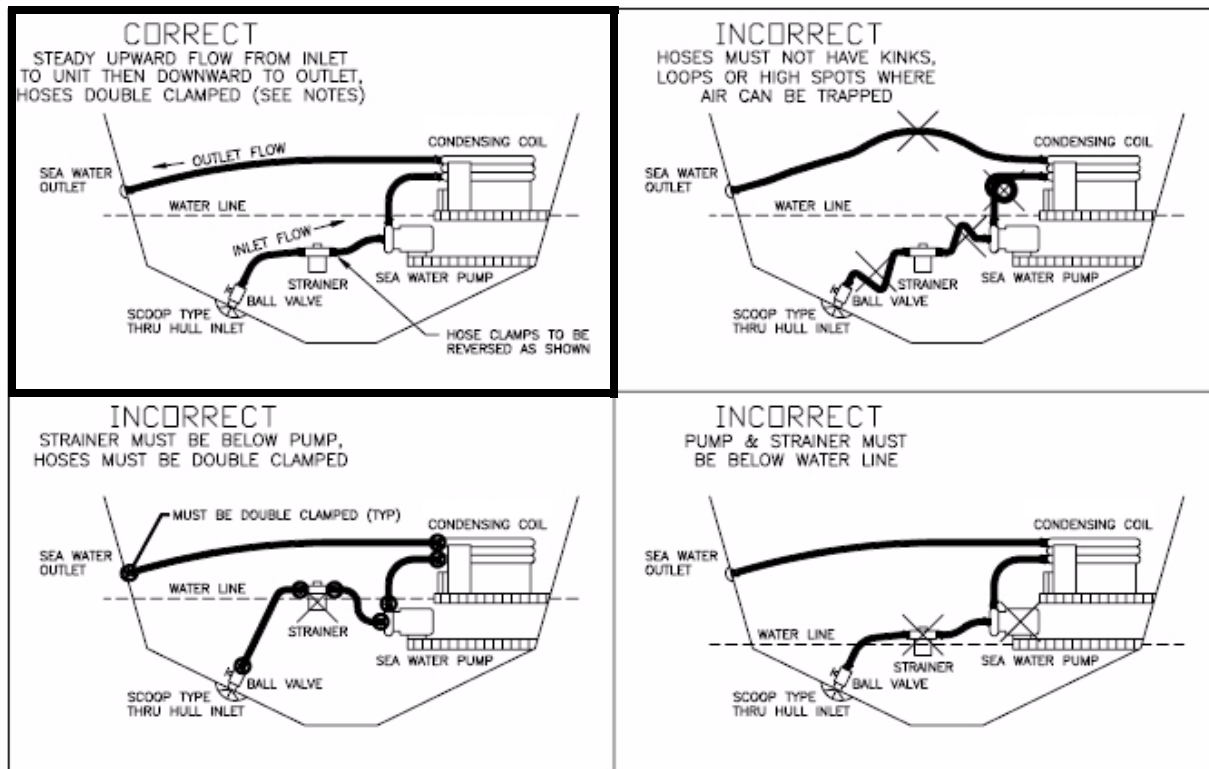
Self-Draining System

A poorly plumbed seawater system is the most common installation problem. When water flow is lost, not only will the ice maker cease to produce ice, but the pump could be damaged from running without water flow.

When using a centrifugal seawater pump, it is imperative that the seawater piping be routed continually uphill from the thru-hull to the condenser, then smoothly up or down to the overboard discharge without any dips or loops, and with only one high point in the system. This type of routing is called self-draining because all water will drain out of the piping if the boat is taken out of the water.

If air gets into the system, which can happen in heavy seas or with a sharp turn, it can become trapped in the pump. Because centrifugal pumps cannot pump air, water flow is lost. A self-draining system, however, allows air in the piping to rise naturally through the pump and be expelled. It also makes winterizing the system much easier. Figure 3, page 8 shows a properly plumbed system and some common mistakes.

Figure 3: Seawater Piping Recommendations



NOTES:
 1) THRU HULL INLET, BALL VALVE, HOSE AND STRAINER SHOULD BE SIZED NO SMALLER THAN PUMP INLET.
 2) INSTALL THRU HULL FITTING AS FAR BELOW THE WATER LINE AS POSSIBLE.
 3) PUMP NEEDS DEDICATED THRU HULL NOT SHARED WITH OTHER PUMPS.
 4) AVOID OR MINIMIZE 90° ELBOW FITTINGS AS MUCH AS POSSIBLE, ROTATE PUMP HEAD TOWARDS DIRECTION OF WATER FLOW.

Thru-Hull Inlet Fitting

A separate thru-hull fitting must be installed for each seawater pump. Do not attempt to draw water from the thru-hull fitting of an engine, generator, or other device.

Install a scoop-type thru-hull fitting:

1. Drill a properly sized hole for the thru-hull fitting as far below the water line and as close to the keel as possible.
2. Make sure the scoop of the thru-hull fitting faces the bow.
3. Bed the scoop with marine sealant designed for underwater use, and tighten the nut onto the thru-hull to secure it.

Seacock

The seacock must be accessible and easy to close in case of emergency or to clean the strainer.

1. Install a full-flow seacock directly onto the thru-hull fitting.
2. Use threaded-seal tape to seal the threads.

Seawater Piping

- Only use reinforced marine-grade hose or other suitable piping (PVC, CPVC, cupronickel, or stainless steel).
- Double clamp all hose connections.
- Use only plastic, bronze, or stainless steel fittings (do not use brass).
- Avoid loops or dips in all hose runs.
- Make sure enough hose is used to allow for future removal of components.
- Use the correct size hose, fittings, and components: 5/8" seawater hose, 3/4" inlet. Note that the pump inlet piping (including thru-hull and strainer) may need to be larger than the outlet pipe size. Do not use pump connections to determine hose size.
- The "pump inlet" recommended pipe size includes all fittings and hose up to the pump connection (thru-hull, seacock, strainer, hose, manifold). The "pump discharge" recommended pipe size includes all fittings and hose from the pump discharge up to the overboard discharge, and should be a minimum of 5/8".

Strainer

A seawater strainer must be installed between the seacock and the pump, and should be situated to provide easy access for cleaning. The strainer must be located vertically above the seacock and below the pump so any air that gets into the strainer can get out.

1. Mount the strainer to a bulkhead so it is properly supported before connecting hoses.
2. Make sure the water flow through the strainer is in the correct direction. Some strainers have an arrow that shows correct flow direction.
3. Run appropriate seawater piping from the seacock to the strainer, and use threaded-seal tape on pipe threads.

Seawater Pump

Required Flow Rate

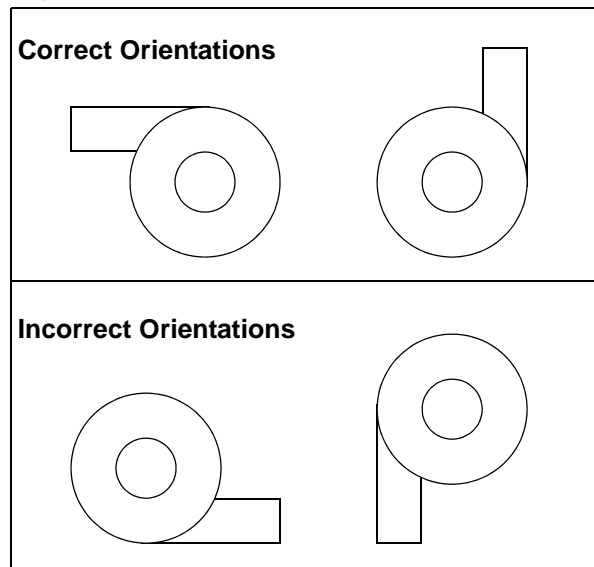
The Dometic EI600D ice maker requires 2.5 GPM (150 GPH) and the EI250D requires 1.25 GPM (75 GPH) of seawater flow for rated performance.

Centrifugal Pumps

Centrifugal pumps are not self-priming, and must be mounted so they are below the heeled waterline in any given operating condition. The pump should be accessible for future service.

1. Mount the pump so the outlet is directed upward. If you are using the Dometic pump, other mounting orientations are acceptable as shown in Figure 4 below, and the head on these pumps can be rotated to allow mounting on a vertical bulkhead.
2. Run appropriate seawater piping from the strainer to the pump, and use threaded-seal tape on pipe threads.

Figure 4: Dometic Pump Head Orientation



Self-Priming Pumps

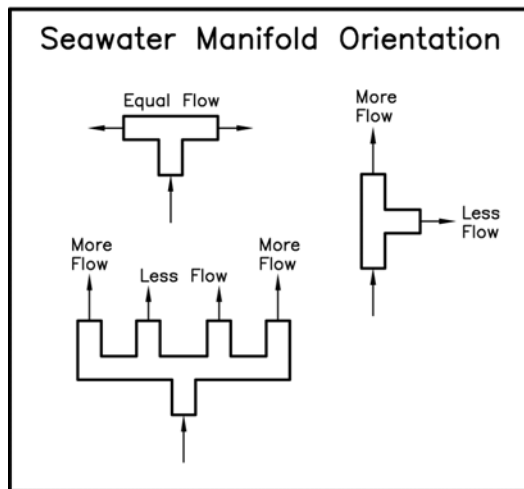
Self-priming pumps are available if a centrifugal pump cannot be mounted below the waterline.

Manifolds

If a pump serves multiple units, a seawater manifold is needed to supply water to all units. This can be as simple as a tee for two units, or a custom manifold for seven to eight units.

It is very important to consider manifold orientation so that all units get their required flow. See Figure 5 below for proper orientation tips. Verify the manifold still provides the required flow rate for the ice maker.

A manifold can also be used on the outlets of multiple ice makers when using a single overboard discharge.

Figure 5: Seawater Manifold Orientation**Pump Relay**

The pump relay (if needed) is generally located in the engine room or mechanical space near the seawater pump, but can be mounted anywhere that is convenient and accessible. It must be in a dry location, away from water spray, with some room for heat dissipation.

Choose your pump relay based on the number of units that will operate off one pump. Choose each trigger to reflect the voltage of the unit it serves. The polarity of the signal from the unit does not matter to the trigger, but the voltage is very important.

Connection to Ice Maker

Connect a hose from water discharge of pump to water inlet on the condensing coil.

Overboard Discharge

Connect a hose from the water outlet of the condensing coil to the overboard discharge. The overboard discharge should be located 1" to 2" (25-50mm) above the waterline. This facilitates visual confirmation of water flow and also keeps it close to the waterline to minimize splashing.

If the overboard discharge is located below the waterline a valve must be installed per ABYC guidelines.

Note: In some applications a Sea Chest might impede water flow depending on the water volume other devices discharge into the common overboard. Proper water flow must be confirmed to ensure proper operation of ice maker if a Sea Chest is used.

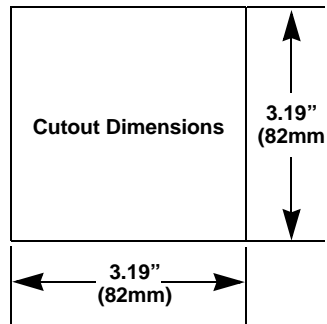
Bonding

Bond all metallic parts (thru-hull, valves, strainer, manifolds, etc.) that are in contact with seawater to the vessel's bonding system in accordance with ABYC standards. Items should only be bonded or grounded once. If an item is in contact with an electrically grounded part (pump, seawater condenser) then it should not be bonded again.

INSTALLING THE REMOTE DIGITAL DISPLAY

For easier operation accessibility, an optional remote digital display may be installed wherever desired, however, it can not be exposed to saltwater spray. The remote display requires a cable that must be ordered separately, and is available in lengths up to 100' (30.5m).

1. Find a convenient location that is protected from saltwater spray.
2. Use the cutout dimensions provided in Figure 6, page 11 to prepare the mounting space.
3. Route the display's cable to control box and plug into the mating 8-pin male RJ45 connector.
4. Mount the remote display into the cutout.
5. If you are relocating the existing display, cover the hole on the back of the box.

Figure 6: Cutout Dimensions for Digital Display

OPERATION

This section of the manual provides the essential information for safe operation for all Dometic ice makers. For more detailed operation information, refer to the *Digital Control Operations Manual*. If you encounter any operational problems, call your dealer or the Dometic Marine Service Department at 954-973-2477.

START-UP CHECK LIST

Before you start the system

- Confirm freshwater supply is on.
- Confirm that electrical connections are correct and tight.
- Confirm that the circuit breaker is of the correct size.
- Confirm the ice-level sensor is mounted securely and the cable is routed safely.
- Confirm all units are mounted securely.
- Confirm seawater connections have correct flow direction and all connections are tight.
- Confirm there are no loops or dips in the seawater system.
- Confirm all metallic parts are bonded correctly.
- Confirm frequently accessed parts are easily accessible (i.e., control panel, filters, CPV, refrigerant ports, etc.).
- Confirm ice-delivery hose is securely fastened and has insulation, air hole, and drain hole, if needed.

STARTING THE SYSTEM

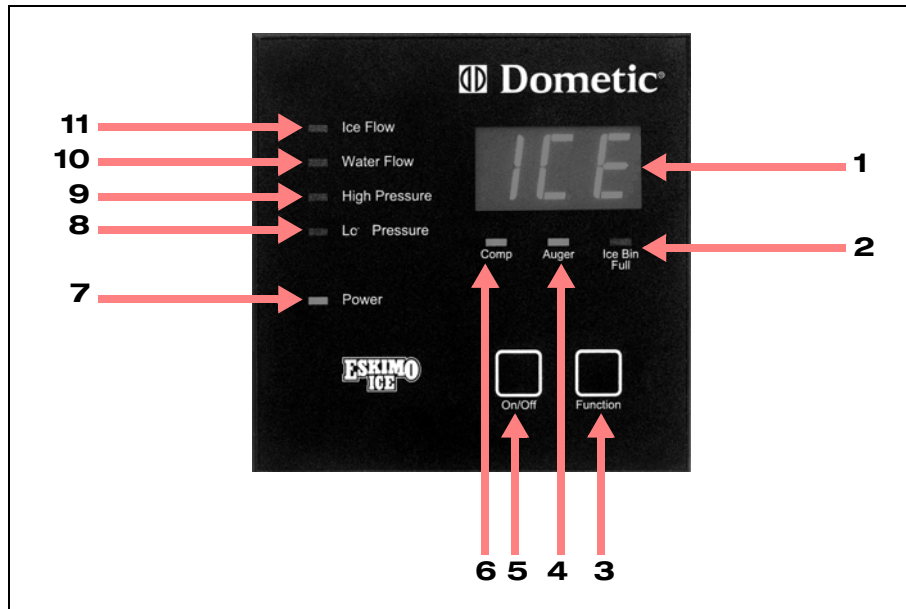
1. Turn on the designated circuit breaker for the unit and also the one for the pump if it is on a separate breaker at the boat's electrical panel.
2. Open the seacock on the pump intake.
3. Press the On/Off switch on the ice-maker to power-on the unit. It displays "dly" to indicate it is in timer-delay mode for up to 150 seconds under normal default parameters before it displays "ICE" to indicate that it is in the ice-producing mode.
4. Confirm water is flowing through the overboard discharge.
5. Look for ice output within 5 to 10 minutes of system start-up, plus approximately one minute for each foot of hose between storage box and auger unit.

NOTE: The seawater pump should start automatically whenever the unit is running. Regularly check for seawater flow by observing the overboard discharge. If you do not observe any flow when the system is running, check for obstructions in the seawater cooling system.

THE DIGITAL CONTROL

The control system is programmed to operate the unit within assigned parameters. It uses sensors, timers, and counters to protect system components from failure due to loss of fresh water, loss of seawater, ice clogs, low refrigerant charge, high pressure, low pressure, or auger-motor start failures. To prevent overflow, a sensor also controls system operation based on ice level in the storage bin. The control panel shows system function and failure mode, if one occurs.

See Figure 7 and Table 1 on page 12 to identify all parts of the control. **See the *Digital Control Manual* for operation details.**

Figure 7: Control Panel**Table 1: Digital Control - Diagram Legend**

1	Digital display	7	Power indicator
2	Ice Bin Full indicator	8	Low Pressure fault light
3	Function button	9	High Pressure fault light
4	Auger indicator	10	Water Flow fault light (for freshwater feed)
5	Power button (on/off)	11	Ice Flow fault light (for clogs)
6	Compressor indicator		

SYSTEM SHUTDOWN

Temporary Shutdown - Some system conditions result in a temporary shutdown followed by an automatic restart once the situation is resolved. This is normal behavior, for example when the ice-level sensor detects that the ice bin is full.

Sustained Shutdown - Some system failures result in a sustained shutdown and are indicated by the appropriate fault code flashing in the digital display. A reset indicates an actual problem, not just a passing event, and the cause should be investigated.

Sustained shutdown in need of reset is caused by any of these events:

- High-pressure switch triggered 3 times within 30 minutes.
- Low-pressure switch triggered 3 times within 30 minutes.
- Ice-clog switch on ice-discharge nozzle triggered 3 times within 30 minutes.
- Auger motor high amps and low amps each time the fault occurs.
- Compressor high amps and low amps each time the fault occurs.

NOTE: If system needs to be reset more than twice within one day, have the system serviced.

SYSTEM RESTART/RESET

Use any of these methods to restart operation:

- Turn the unit off then on at either the main digital control box or the optional remote digital display.
- Press the Reset switch on the unit's control panel.
- Turn the unit's circuit breaker off then on.

SERVICING THE SYSTEM

This section contains information critical to correct servicing of this Dometic ice-making system. Read and understand all information before beginning. If you have any questions, call the Dometic service department at 804-746-1313.

REFRIGERANT

Your Dometic ice-making system contains R-134a refrigerant, an environmentally safe gas. The unit comes pre-charged with the right amount of refrigerant for operation and should not need seasonal recharging. If recharging is necessary, R-134a is a single-component refrigerant and should never be charged in the liquid phase while the unit is running.

R-134A TOOLS

Use a dedicated R-134a gauge set. This system uses common automotive-type quick connects for gauge connections. They help ensure that only R-134a tools are used. If you need a gauge set to fit the connections, consult your local supply house or contact your dealer and ask for Dometic part number A-134a.

Care must be taken when using vacuum pumps and recovery equipment with R-134a and other refrigerants. See the manufacturer's manuals before operating this type of equipment.

CONSTANT PRESSURE VALVE (CPV)

One feature of the CPV is that it is not overly charge-sensitive; the head pressure does not vary with charge. Another good point is the suction pressure remains fairly stable independent of head pressure, seawater temperature, or ambient temperature. The downside of this is you cannot charge by pressure, only by superheat or a weighed-in charge which is located on data plate.

The CPV comes set from the factory and should not need resetting in the field. If it does, then only a qualified technician should do so. Changes in the setting must be made slowly, 1/4 turn per 10 minutes, to allow for settling of the pressures. Correctly charge the system by the weight indicated on the data plate. Recommended pressure is 6 to 7.5 PSI (6.8 PSI is ideal) as determined by an accurate gauge capable of reading low-pressures. Misadjustment of the valve can cause reduced ice production, damage to components, and voiding of the warranty. If under warranty, call for authorization before adjusting CPV, otherwise warranty will be voided.

QUICK CONNECT FITTINGS (QCs)

QCs can be used in a method similar to base valves. To check compressor suction valve integrity, remove the liquid line QC at the condensing unit. Within 15-20 minutes, the unit should be pulling a vacuum in the 25-27" HG range.

You can also use QCs to troubleshoot leaks by narrowing down the search to individual parts, such as linesets, condensing unit, and auger unit. Disconnect the QCs and pressurize all parts separately.

RECHARGING THE SYSTEM

System Shutdown

Optimally, turn the system off 4 to 6 hours prior to servicing to allow refrigerant to reach ambient temperature. This will expedite the recovery of the refrigerant.

Evacuate Refrigerant

1. Connect the gauge set to both the high and low side ports. Attach the center line of gauge set to the recovery unit.
2. Evacuate system per governing EPA regulations.
3. With the gauge set still connected to both ports, attach the center line of the gauge set to the vacuum pump.
4. Turn on vacuum pump. Open both high and low manifolds and allow the pump to run so the vacuum reaches 28" HG. Close gauge-set valves and turn off pump.
5. Leave the system for 15 minutes then observe the gauges. If any vacuum has been lost, check for leaks, especially at any mechanical fittings.
6. Repeat the vacuum process until a vacuum of 200 microns or less is achieved, 50 microns is ideal. If the system was open to the environment, or was wet as indicated by the sight glass, allow 12 to 24 hours for evacuation. Close gauge-set valves and turn off pump. If no vacuum is lost, proceed with charging.

NOTE: If moisture was a problem, refer to Refrigeration Bulletin 02-1 for instructions on clean up. This bulletin is available on the DometicEnviro.com Customer News and Information website under Technical Field Notices 2002: "Control of Moisture in Refrigeration Systems" (FN#175-I2).

Charging the System

1. Remove line from vacuum pump and connect to a bottle of R-134a. The charge should be weighted in by placing the bottle on a refrigerant scale.
2. Turn the bottle upside down and purge the charge hose at the gauge set.
3. Allow refrigerant to flow in the high side until the correct charge is reached. Disconnect refrigerant bottle.

Setting the CPV

1. Start the system and run for 15 minutes. Observe the low pressure gauge. Adjust the CPV to maintain 6 to 7.5 PSI (6.8 PSI is ideal) as determined by an accurate gauge capable of reading low-pressures. Misadjustment of the valve can cause reduced ice production, damage to components, and voiding of the warranty. If under warranty, call for authorization before adjusting CPV, otherwise warranty will be voided.
2. Turn valve adjustment knob clockwise (in) to raise pressure and counterclockwise (out) to lower pressure. Only make 1/4-turn adjustments at a time, and allow 10 minutes between adjustments for system to equalize.
3. Make sure the valve is dry, and replace the cap on CPV, being careful not to disturb the setting by gripping the cap too tightly.
4. Remove gauge set and replace service-port caps.

OWNER MAINTENANCE

The periods and procedures given for maintenance and cleaning are guides only and should not to be construed as absolute or invariable. Cleaning frequency will vary depending on local water conditions (hard water, etc.) and the ice volume produced.

SEAWATER SYSTEM

Check the seawater strainer daily and remove any debris. If you are in water where jellyfish or other debris are a problem, it may be necessary to add a strainer on the outside of the thru-hull fitting. Verify that all water connections are tight, and check for water flow from the overboard discharge. The centrifugal pump does not need any routine maintenance.

FRESH WATER FILTER AND Y STRAINER

Change the filter at least twice per year, or every 1500 gallons, whichever comes first. The correct filter helps prevent clogging of the needle valve and scale buildup within the evaporator chamber. Occasionally check the Y strainer and clean away any debris.

EVAPORATOR CLEANING

Once per year the evaporator should be cleaned by an authorized service agency. The following steps should be used:

1. Shut off feedwater supply to the ice machine.
2. Disconnect clear tubing from bottom evaporator, and drain all water from the evaporator. Reconnect the tubing.
3. Prepare cleaning solution: Mix 8 ounces (237ml) of Scotsman Ice Machine Cleaner, or equivalent, with two quarts (1.9L) of hot water. If another solution is used, follow instructions on bottle.
4. Remove cover to the water reservoir.
5. Slowly pour the cleaning solution into the reservoir.
6. Turn the machine to the ON position.
7. Continue pouring cleaning solution into the reservoir, maintaining the level just below overflow, while the machine makes ice.
8. Continue ice making until all the solution is used and the reservoir is empty.
9. Turn the machine to the OFF position.
10. Wash and rinse the water reservoir.
11. Open the water supply to the ice maker
12. Turn the machine to the ON position
13. Let the machine make ice for **AT LEAST 15 minutes** to flush out any remaining cleaning solution.
14. Remove all ice from the ice bin; do not use any ice produced during the cleaning cycle.
15. Use hot water to rinse the ice bin.

**WARNING**

Ice-machine cleaners use strong acids. Read and follow all instructions and warnings on the container of the solution you use.

AUGER MOTOR AND GEARBOX

The auger motor and gearbox are permanently lubricated and need no maintenance unless leakage or contamination has occurred.

COMPRESSOR

The compressor has no user-serviceable parts, and is lubricated constantly during operation.

REFRIGERANT GAS

The refrigerant included in the system is adequate for the life of the system and should not need routine or seasonal charging. If the need exists for routine charging, have your dealer look for a refrigerant leak that needs repair.

WATER RESERVOIR

Every 3 months clean and flush the water reservoir to keep ice clean and clear.

FEEDWATER FILTER AND Y STRAINER

Change the filter at least twice per year, or every 1500 gallons, whichever comes first. The correct filter helps prevent clogging of the needle valve and scale buildup within the evaporator chamber. Occasionally check the Y strainer and clean away any debris.

WINTERIZING THE SYSTEM

Close the seacock and remove the inlet hose from the condensing unit. Allow all water to drain from the system. Loosen screws on the pump head to allow water to drain from the pump. Cutoff feedwater supply, and drain at the auger unit. Remove water from the water reservoir inside the auger unit. You may also add non-toxic antifreeze to the water reservoir.

On the EI250D, use a shop wet-vac to remove the water from the evaporator through the ice discharge spout tube, or remove the water tank assembly from the spout and drain it.

TROUBLESHOOTING GUIDE

Before calling for service, review this list. It may save time and expense. This list contains common occurrences that are not a result of defective workmanship or materials. If you still need service after trying these procedures, call you local dealer, or the DometicCorporation, Environmental Division service department at (804) 746-1313. .

PROBLEM	POSSIBLE REASONS & SOLUTIONS
Unit does not operate at all.	<ol style="list-style-type: none"> 1. Power switch in the "Off" position. Press power switch to turn the unit on. 2. Check for tripped breaker or blown fuses. 3. Significantly low voltage to unit. 4. Misconnected or loose plugs or wiring. 5. Ice level is high enough. Move ice around box.
High-pressure fault. (HPF)	<ol style="list-style-type: none"> 1. Check seawater system for clogs or faulty pump. 2. Faulty pump relay trigger at relay station (if pump is used for more than one unit). Replace trigger.
Low-pressure fault. (LPF)	<ol style="list-style-type: none"> 1. Low refrigerant charge. Have a certified technician check the pressure. 2. Improperly set Constant Pressure Valve. Set per instructions in "Setting the CPV" on page 14. If under warranty, call for authorization before adjusting CPV, otherwise warranty will be voided.

PROBLEM	POSSIBLE REASONS & SOLUTIONS
Ice-clog fault. (SPT)	<ol style="list-style-type: none"> 1. Check for obstruction at the ice discharge in the ice storage bin. 2. Check for frozen ice-delivery hose. 3. Check routing for dips or kinks in the ice-delivery hose. 4. Check for auger motor failure.
Feedwater fault. (H2O)	<ol style="list-style-type: none"> 1. Check water pressure in boat's potable water system. 2. Check for a supply valve that has been turned off. 3. Check for a clogged feedwater filter. 4. Check for a clogged Y strainer located on the feedwater line of the unit. 5. Check for a clogged needle valve in the water reservoir.
Ice delivery volume seems less or slower.	<ol style="list-style-type: none"> 1. High seawater temperature. 2. High feedwater temperature. 3. Low seawater flow. Check pump and strainer. 4. Drive motor weak. Replace motor. 5. Auger corroded or stained due to water conditions. Clean and/or replace assembly. 6. Inlet water filter or Y-strainer partially clogged. Clean or replace filter. Remove clog. 7. Loss of refrigerant charge. Consult trained technician.
Water leaks.	<ol style="list-style-type: none"> 1. Defective water seal. Replace seals. 2. Water level in reservoir too high. Adjust float.
Excessive noise from evaporator/auger assembly.	<ol style="list-style-type: none"> 1. Mineral or scale deposit on auger and evaporator walls. Clean evaporator as described in "Evaporator Cleaning" on page 14. 2. Low water supply. Check for fouled filter or float valve. 3. Gear-reducer assembly loose on mounts. Tighten the mounts. 4. Gear-motor end-play or worn bearing. Replace worn part.
Oil in auger assembly drain pan.	<ol style="list-style-type: none"> 1. Water in gear reducer has raised level of oil so it runs out the weep hole on top of gear housing. 2. Leaking water seals in the evaporator/auger assembly. Replace seals. 3. Loose or missing drain hose on weep hole which might allow condensate to leak into weep hole. Attach or tighten hose.

TECHNICAL ASSISTANCE

If you need technical assistance with your Eskimo Ice system go to www.dometic.com to locate a sales and service dealer near you or contact Dometic Customer Support:

- **USA:** 800-542-2477 8:00 AM to 5:00 PM Eastern Time, or 888-440-4494 after hours and weekends
- **Europe & the Middle East:** +44 (0) 870-330-6101
- **All other areas:** Visit our website to find your nearest dealer: www.dometic.com

WARRANTY AGREEMENT

Please refer to the warranty data sheet packaged with your kit for more information.

SYSTEM CONNECTION AND WIRING DIAGRAMS

SYSTEM CONNECTION

Figure 8: Fresh-Water Connection Diagram

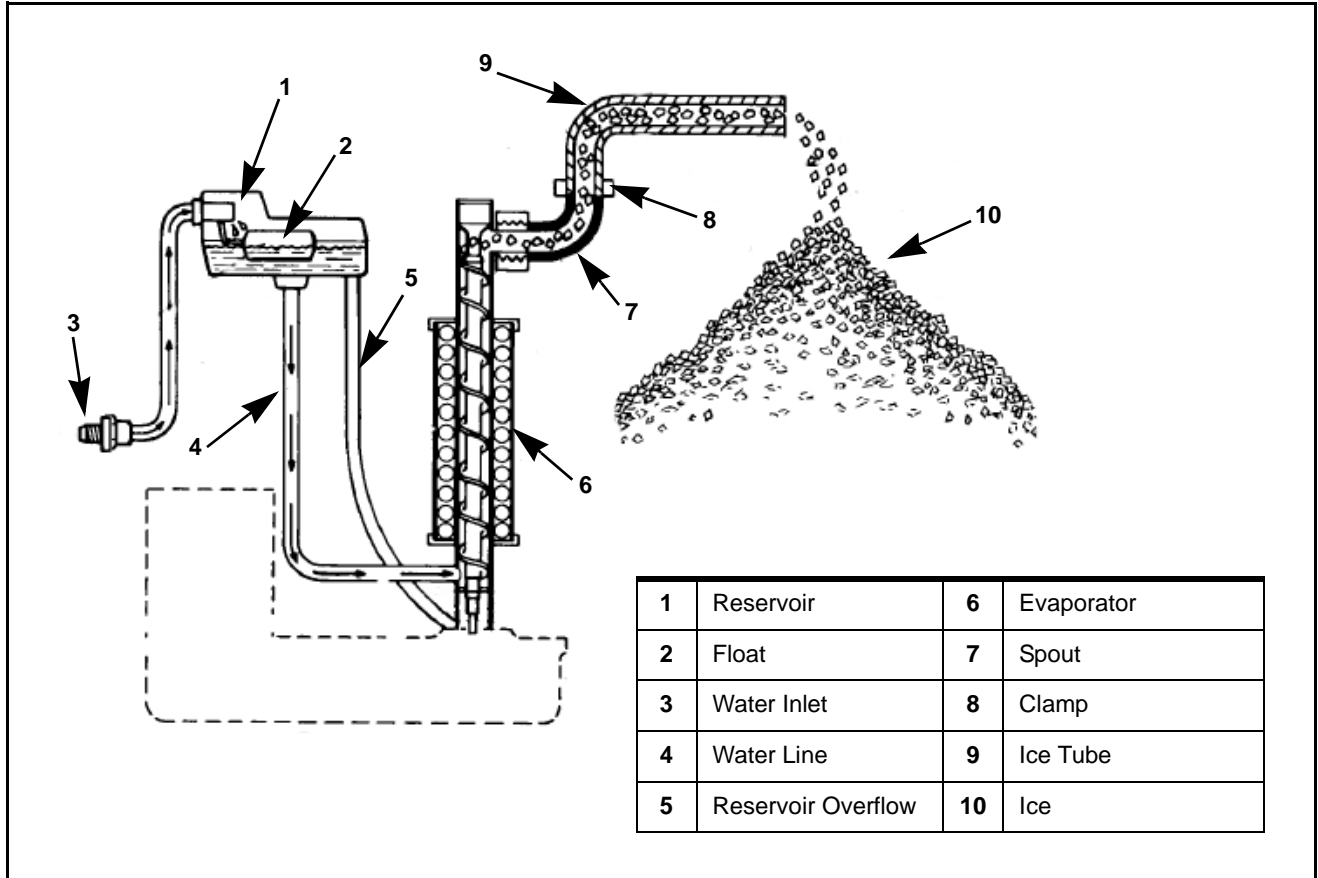
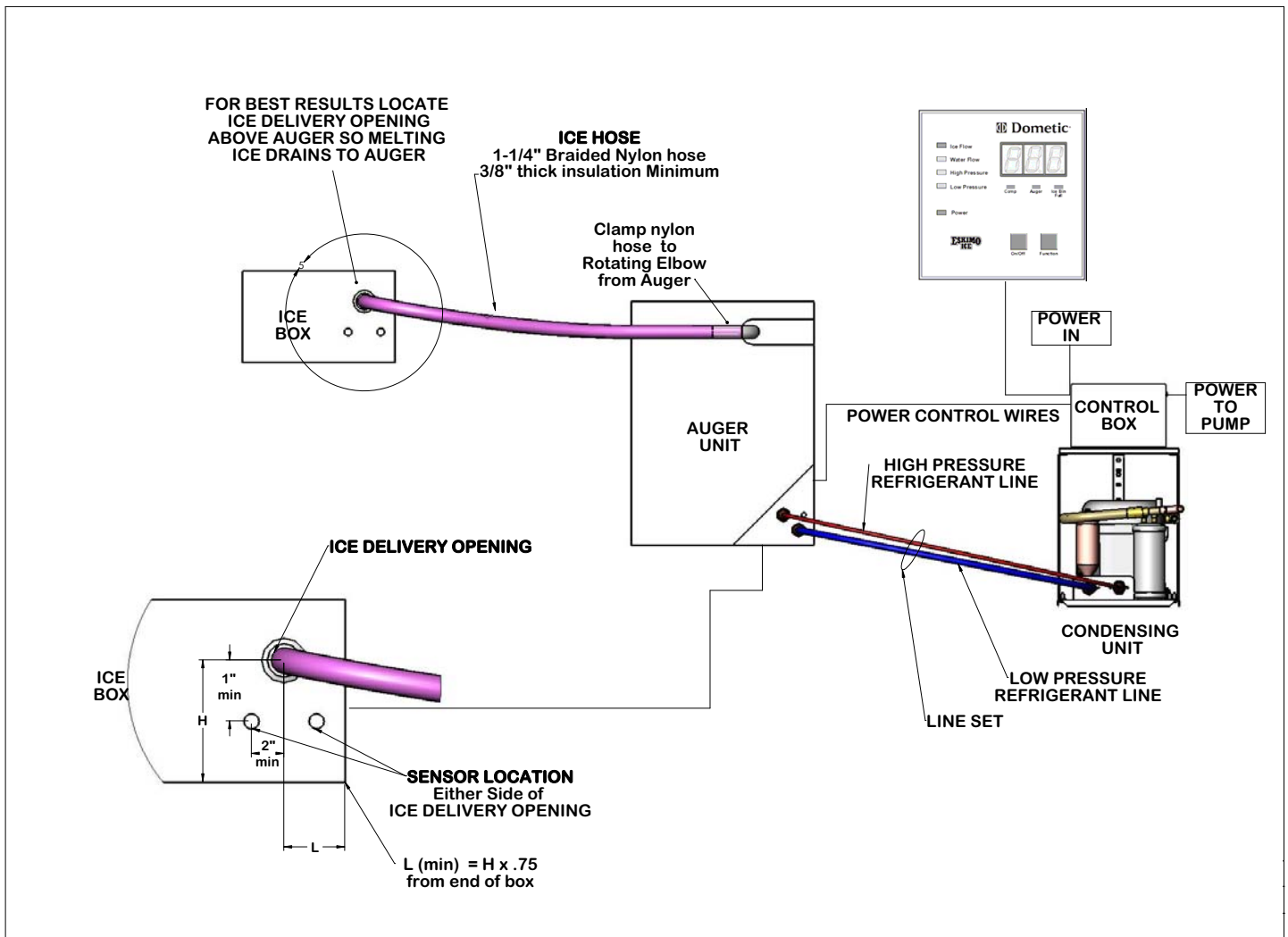
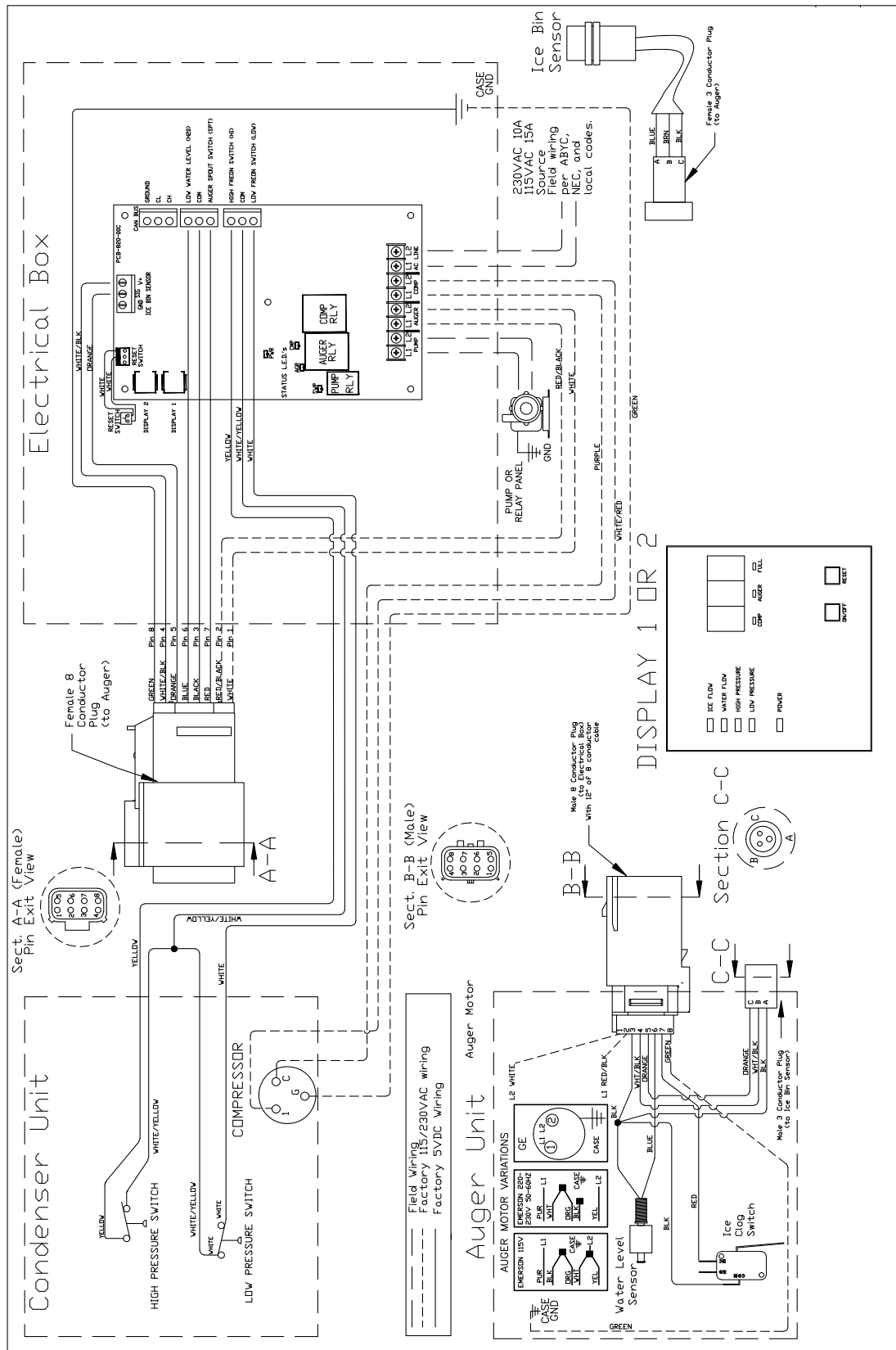


Figure 9: Complete Remote System Hookup Diagram



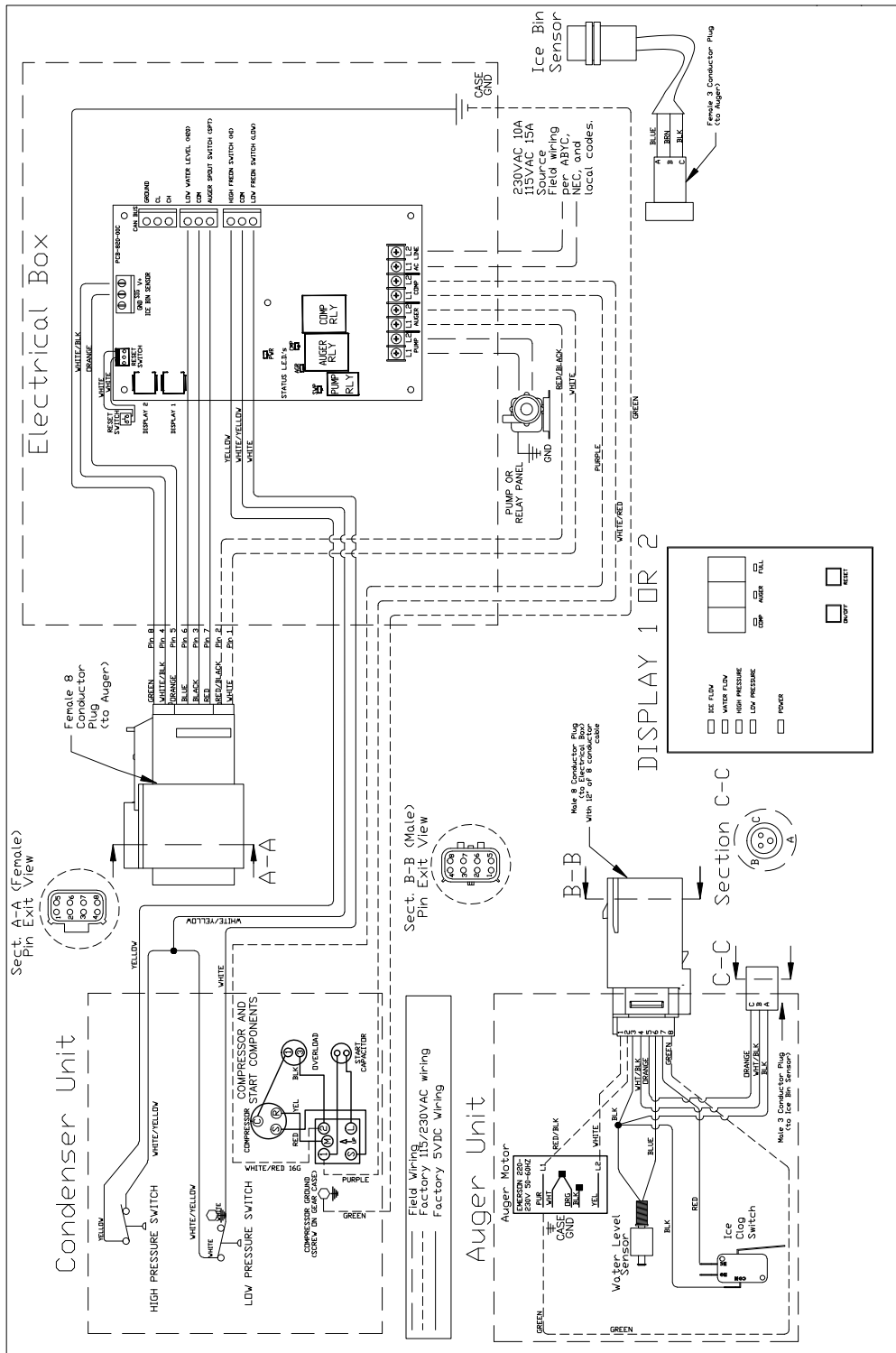
EIR600D (115V/60Hz/1 & 230V/60Hz/1)

Figure 10: Wiring Diagram for EIR600D (115V/60Hz/1 & 230V/60Hz/1)



EIR600D (220V/50Hz/1)

Figure 11: Wiring Diagram for EIR600D (220V/50Hz/1)



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