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Installation - Operation - Maintenance - Service

# FRICK SHELL - ICE<sup>®</sup> MAKERS

MODELS: SA150 and SA300

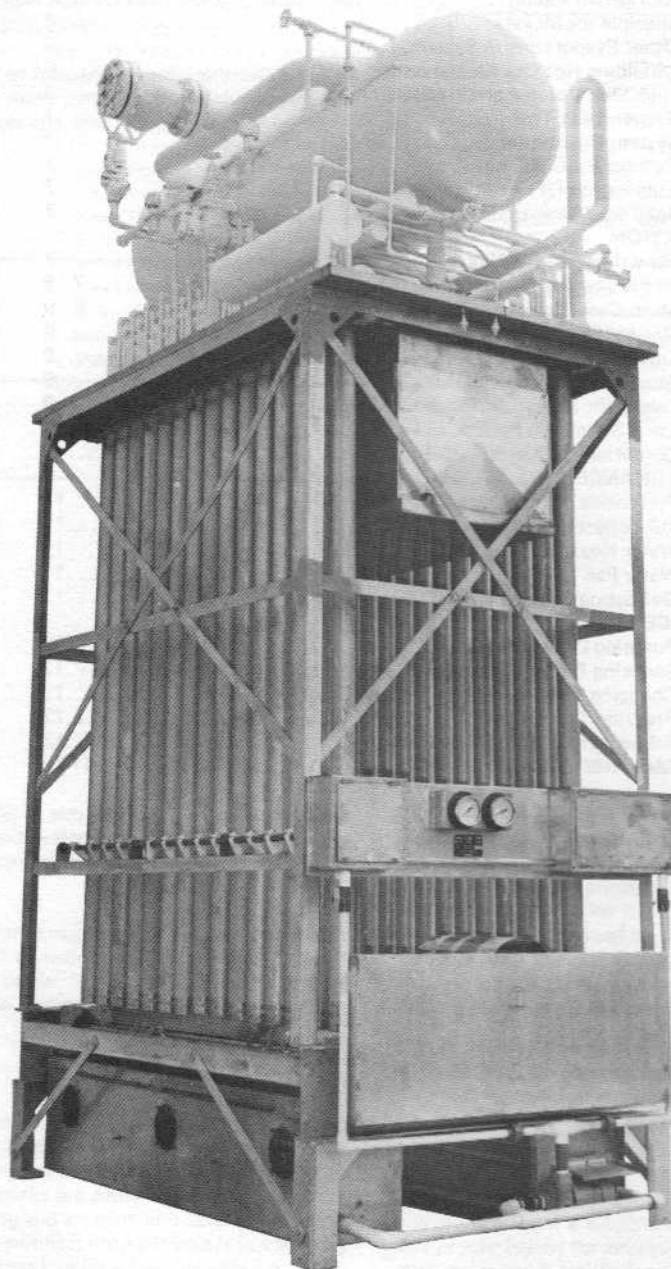


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This manual has been prepared to acquaint the serviceman with the installation, operation, maintenance and service procedures recommended by Frick Company for the SA Shell-Ice Makers.

**DESCRIPTION** — The Frick Shell-Ice Makers are automatic ice making units designed to economically produce clear, solid fragmented ice in large quantities — 13 thru 43 tons per 24 hours.

The two models of Frick Shell-Ice Makers are similar in construction and consist basically of a freezing section; harvesting section and control panel. Each section is factory assembled for easy installation.

The freezing section includes supporting frame, stainless steel freezing tubes with liquid and gas headers, accumulator with float switch level control, stainless steel drip pan, oil and liquid traps, water distribution system, automatically operated suction, liquid and hot gas valves, necessary solenoids and stop valves.

The harvesting section consists of supporting base, ice breaker assembly and motor; ice sizer, water drain pan with float valve, recirculating pump and motor, baffle plates and water grid.

The control panel is factory wired and includes timer, terminal board, relay restarter mechanism, ice selector switch and pressure gauges.

To facilitate handling, the freezing and harvesting sections are shipped separately.

Optional features, available at extra cost, include oversize ice breaker motor for ice thickness over 3/8 inch and ice handling equipment.

**MODEL NO. EXPLANATION**



**TABLE 1 — SHELL-ICE MAKER DESIGN DATA**

Model Number	No. of Tubes	Pumps Motor HP	Breaker Motor HP		Nominal Operating Wts.
			Std Motor	Oversize Motor	
SA150	15	1/3	2	3	9000
SA300	30	1	5	7-1/2	16000

**INSTALLATION**

**INSPECTION**

Frick Shell-Ice Makers are shipped in two sections — base assembly with ice breaker mechanism and water pan; freezing section with tubes and accumulator. The control panel and other hardware will be shipped in a separate carton.

Carefully inspect the shipment for damages on arrival. Make a note of any damages on the carrier's bill of lading before signing and file all claims for damages against the carrier immediately. Frick Company should also be notified as to the nature and extent of any damages found.

**HANDLING**

When the Shell-Ice Maker arrives on the job site precautions must be taken to prevent damage to the machine during unloading and erection. Do not attach hoists or slings to the freezing tubes. These tubes constructed of No. 16 gauge material are easily damaged. Protect the tubes at all times during unloading and erection and keep the wooden supporting frame and clamps in position until the unit is in a vertical position in its final location. Lifting lugs have been provided to facilitate handling of the freezing section. Do not attach hoists to other points when transporting the unit.

**LOCATION AND FOUNDATIONS**

The Shell-Ice Maker should be located in a convenient area and as close as possible to the place where the ice will be used. If possible, the machine should be mounted directly over the ice storage room. This eliminates complicated and expensive conveyor equipment needed to transport the ice from the Shell-Ice Maker to the storage area. An opening in the roof of the storage area will allow the ice to fall directly from the machine into the ice storage. If the room is square and the ice slide is located in the center of the ceiling, the ice will distribute itself evenly in the room.

If it is decided to mount the Shell-Ice Maker in this fashion, the storage area must be constructed so that it will support the weight of the machine. A steel framework on a concrete foundation is recommended. Nominal operating weight for your Shell-Ice Maker is listed in Table 1.

If it is necessary to place the Shell-Ice Maker on the same level with the storage room a suitable conveyor must be used to raise the ice to the proper height for dropping it into the storage. An enclosed screw type conveyor is satisfactory for this purpose.

## ICE STORAGE

It is not practical to store large quantities of fragmentary ice for long periods of time. "Shell-Ice" is no exception; however, due to the curved surface there is less tendency for Shell-Ice to stick together in storage. A storage of sufficient size to hold not more than 3 days supply is recommended. Since "Shell-Ice" weighs approximately 34 lbs. per cubic foot, the storage should be constructed accordingly. Be sure to insulate the storage with urethane or insulation equivalent to retard melting and sticking of the ice.

It is not recommended to store "Shell-Ice" in a bin with sides sloping toward a smaller opening in the bottom. After several harvests the ice will bridge over making removal difficult. Storages with vertical sides are the most satisfactory.

## ERECTION

All erection and other assembly work should be carried out by qualified riggers and erectors who are familiar with refrigeration and ice making equipment. It is highly recommended that this work be done by a Frick Factor to insure satisfactory installation and adjustment of your new Frick Shell-Ice Maker.

Frick Shell-Ice Makers are shipped in two sections — base assembly with ice breaker and water box; freezing section with tubes and accumulator. Erection drawings are furnished with each machine and should be followed carefully. It is necessary to mount the base assembly first. If the Shell-Ice Maker is to be located over the storage area, steel rails or plate should be placed under the mounting legs at right angles to the roof members to distribute the weight of the machine and prevent the mounting legs from damaging the roofing materials. The steel rails should at least be 6 inches wide and extend the entire length of the Shell-Ice Maker base so that two of the four mounting legs rest on each rail. Be sure to level the machine before anchoring or securing with suitable anchor bolts.

If the Shell-Ice Maker is to be located on the same level as the storage area, it is recommended that the base be mounted and leveled on a concrete foundation. Elevate the Ice Maker to allow sufficient room for a hopper and screw conveyor with suitable drain piping. The steel rails may be omitted when mounting in this manner.

Attach the hoisting equipment securely to the lifting lugs on the accumulator and raise the freezing section to its proper position over the base. Carefully remove the wooden supporting frame and clamps and lower the freezing section into the base. Bolt in place at the four points shown on the assembly drawings.

The ice and water splash sheets should be installed next. These sheets are in sections and will be shipped in a separate crate with the machine. Install the end water sheets with the slotted end down and the flanges facing each other as shown on the assembly drawings. Fasten the sheets to the frame at points shown using the round head screws and nuts provided. Do not omit the lock washers. Draw the bolts finger tight only. The end ice sheets are bent at an angle of approximately 10° and should be attached to the flanged end sheets so that they extend inward towards the ice breaker.

Now install the ice breaker side sheets. Fasten them along their bottom edge to the top ice breaker stationary bar using the U-bolts provided. Tighten the U-bolts, keeping the ice side plates inside the flange on the end water sheets.

Insert the flat water side sheets keeping them outside the ice side sheets and inside the flange on the end water sheets. Tighten all bolts on the ice and water splash sheets.

Install the ice breaker motor, pulleys and belt guard. Carefully align pulleys and adjust the belt for proper tension.

Install the electrical control panel as shown on the drawings. Be sure to install the spacing washers between the frame and the panel.

## RE-STARTING SHAFT

Now install the restarting device (Fig. 1) in its proper position on the frame as shown on the drawing. Insert the long end of the shaft (Fig. 2) through the opening in the back of the control panel. Be sure the water deflecting rubber washers are in place.

Bolt the bearing brackets in place and tighten all bolts. Adjust the thrust clamps on each end of the restarting shaft (Fig 2) for minimum end movement of this shaft. A 1/16" movement is desirable. Check after adjusting to insure that there is no binding of this shaft.

Adjust the feeler arms on the re-starter shaft so that all feelers touch the tubes at the same time. This is best accomplished by adjusting two end feeler arms first. Tighten all clamping bolts securely.

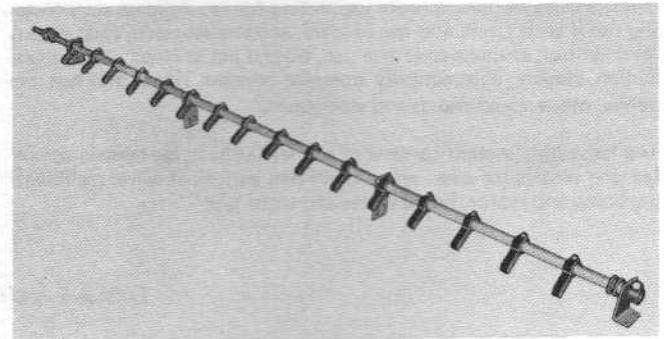


Fig. 1 — Restarting Device

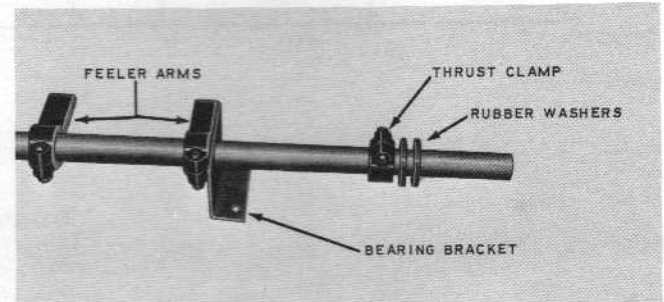


Fig. 2 — Control Box End of Restarting Device

## ADJUSTMENT OF CONTROL ARM AND MICRO-SWITCH

Now install the counterweighted control arm on the end of the re-starter shaft which extends through the control box. (See Fig. 3). Position the control arm on the re-starter shaft so that it will not bind on the magnet housing. Rotate the re-starter shaft so that the feeler arms rest against the tubes. Manually lift the half moon weight so that it is in the "UP" or energize position. Clamp the control arm to the re-starter shaft, allowing 1/16" to 1/8" clearance between the control arm and the half moon weight. (See Fig. 4). Be sure the feeler arms are against the tubes and that the half moon weight is all the way up when the clamping operation is done.

Adjust the circuit breaking screw next. (See Fig. 4). With the half moon weight held manually in the "up" position, insert a 1/16" spacer between one of the feeler arms and one of the tubes. Adjust the circuit breaking screw so that the micro-switch button de-

presses sufficiently to operate the switch — listen for a light click. Be sure that the spacer remains between the feeler arm and the tube and that the half moon weight is completely raised when the circuit breaking screw is adjusted.

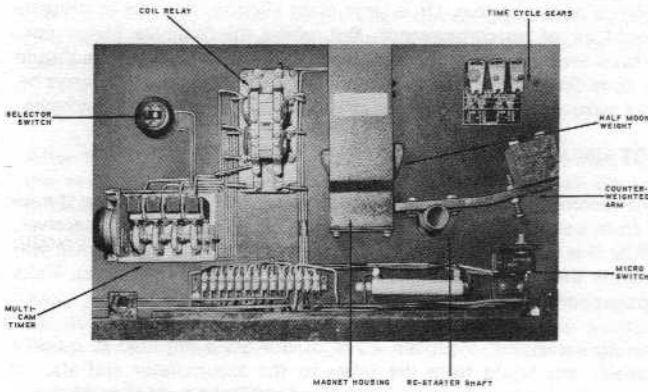


Fig. 3 — Control Box and Components

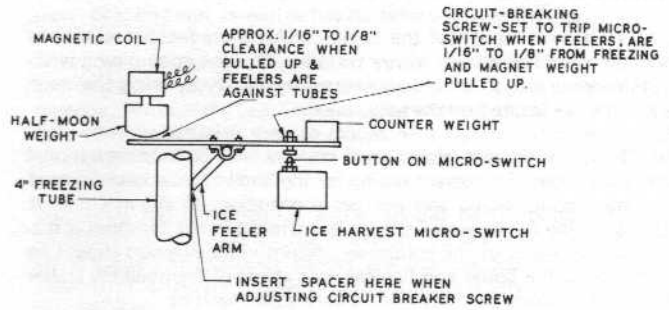


Fig. 4 — Adjustments of Restarter Controls

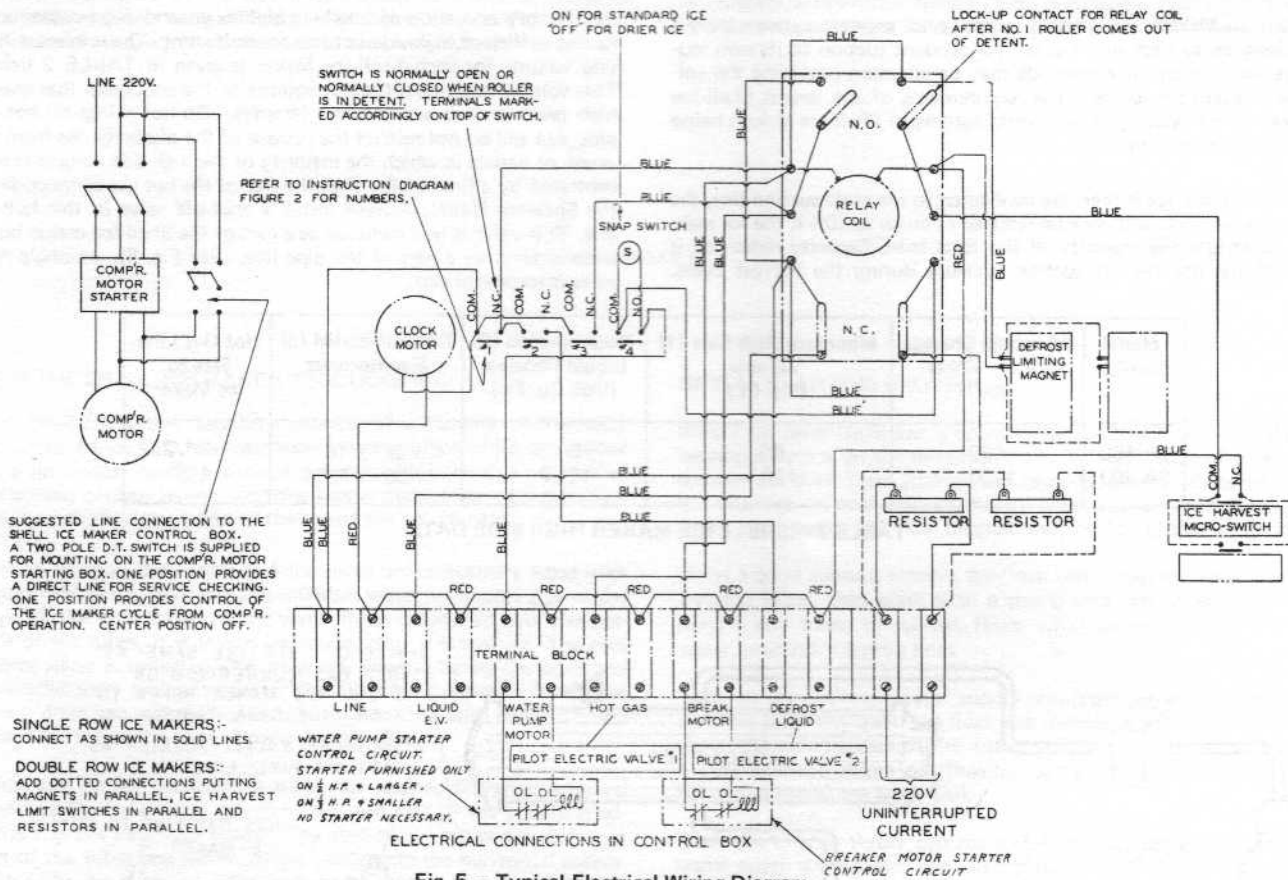


Fig. 5 — Typical Electrical Wiring Diagram

**ELECTRICAL CONNECTIONS**

**NOTE:** All wiring must comply with all existing national and local codes.

Control wiring has been made at the factory and should not be changed. Wire only from the power source to the terminal strip and from

the terminal strip to the solenoid valves, water pump, and ice breaker motor. (See Fig. 5).

