



MOVING WATER FORWARD, SINCE 1968



C-20 CONTROL PANEL

Installation & Operation Manual



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SAFETY FIRST

To ensure the safe operation and long life of your Kasco equipment, always take the following precautions:

- Always keep people and objects clear of the de-icer propeller when operating.
- Always disconnect the power before servicing or removing your de-icer.
- Always operate your Kasco De-icer in the water.
- Operating your de-icer dry (on shore or dock) can cause damage to the seals or injure operator.
- Always mount your C-20 on a vertical surface and operate only with the cover closed.
- Never lift your Kasco De-icer or C-20 control by the power cable. This could damage the power cable and make your de-icer or control unsafe to operate.
- Kasco Marine highly recommends that all possible precautions be taken around open water de-icing areas to ensure the safety of the public, i.e., "Thin Ice" and/or "Open Water" signs, appropriate lighting, fencing or other safety measures as required in your area.

Completely read these instructions and warnings prior to installing and operating your Kasco equipment.

This portable timer is designed to CONTROL the connected equipment only. **THIS SWITCH IS NOT TO BE USED AS A POWER DISCONNECT!** Unplug The C-20 and the equipment it controls before servicing. Mount at least 5 ft. from open water. Refer to your de-icer owner's manual for additional safety and de-icer installation/operation instructions. The C-20 is designed to operate only ONE Kasco De-icer.

INSTALLATION INSTRUCTIONS

The C-20 must be mounted upright on a vertical surface or post. For the most accurate operation, do not mount in direct sunlight. Mount close to a GFCI-protected 120V outlet to allow slack in the C-20 power cord. Mount high enough above ground level for easy use and to prevent ground moisture/flooding from damaging the C-20. Use corrosion resistant screws to mount the C-20: one screw for the top hanger slot and one for the bottom mounting tab to secure the C-20. Insert your de-icer power cord through the hole in the bottom of the C-20 enclosure. The C-20 connected power cord extends about 30" outside the enclosure. Allow enough slack to prevent strain on the plug while ensuring that it is fully connected. You can install the closure plate provided by snapping into place from the outside of the enclosure hole.

NOTE Install closure plate with 3R (outdoor use) rating to maintain enclosure environmental integrity.



OPERATION & MAINTENANCE

UNDER NO CIRCUMSTANCES SHOULD ANYONE ENTER THE WATER WHEN A UNIT IS IN OPERATION.

Use the following tips and suggestions to assist in customizing your settings for local conditions.

- De-icers will create small localized currents the longer they run. Fewer and longer operation cycles will prove to be more effective than more frequent and shorter operating cycles.
- Fresh water freezes at 32°F, salt water at 28°F, and brackish water will freeze somewhere in between.
- Setting the thermostat a couple degrees below the freezing point can minimize unneeded operation time.
- Daily observation is required for all de-icing installations. Adjust operating times based on when you can observe the operation. This will help you check the de-icer is operating properly.
- Several factors can increase freeze rate. Such as, wind, snow, and colder temperatures. When picking operation times, set the de-icer to operate more when conditions promote quicker freezing.
- Your settings will likely require some fine tuning. Remember to observe your de-icer installation and be prepared to adjust your settings of the C-20. Thermostat tolerance may also need to be taken into account. The actual ON/OFF point of the thermostat may be $\pm 2.7^{\circ}\text{F}$ of the actual ambient temperature.
- Operating with fewer, longer cycles will provide the most efficient de-icing. The following is an example of setting the timer over a 24 hour period. The 4 ON cycles below allow for more operating time during dark hours and less during daytime hours. (This is suggested due to increased freezing rate at night).

Cycle	Time	Duration
ON	7:00 a.m. - 9:00 a.m.	2 hours
OFF	9:00 a.m. - 1:00 p.m.	4 hours
ON	1:00 p.m. - 3:00 p.m.	2 hours
OFF	3:00 p.m. - 7:00 p.m.	4 hours
ON	7:00 p.m. - 10:00 p.m.	3 hours
OFF	10:00 p.m. - 12:00 a.m.	2 hours
ON	12:00 a.m. - 5:00 a.m.	5 hours
OFF	5:00 a.m. - 7:00 a.m.	2 hours

This sample would allow the de-icer to operate a maximum of 12 hours in a 24 hour period. During the ON cycles, the thermostat would determine if the de-icer operates based on its dial setting. Actual settings and durations of run time will depend on your installation requirements and regional demands for de-icing.

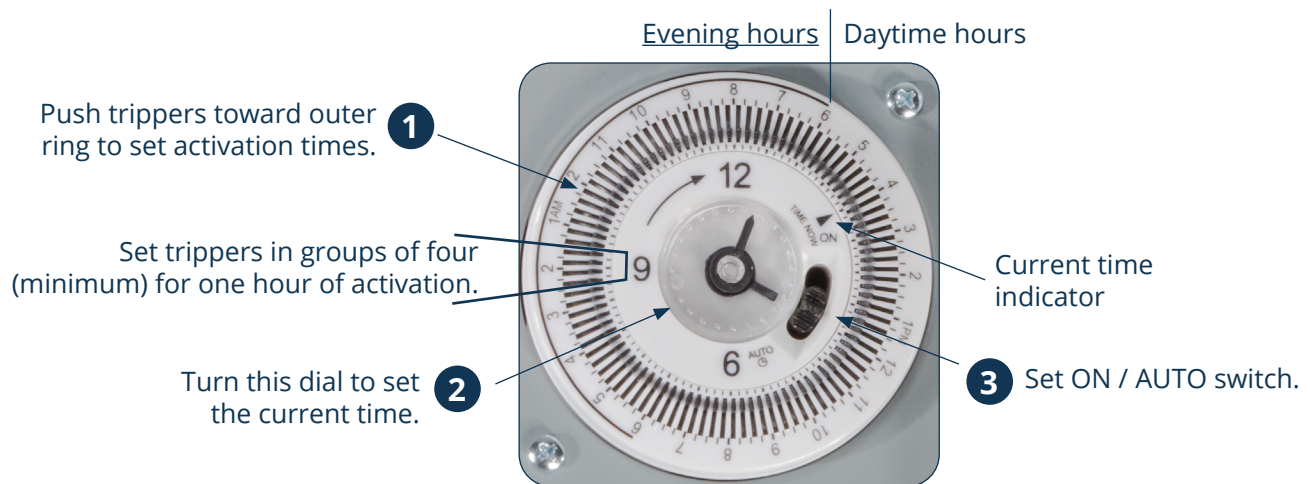
- When not in use (summer time), store the C-20 indoors away from salt air. This will help extend the life of the C-20 controller.
- Operate with the door closed to keep salt air away from internal components.
- Mount the C-20 out of direct sun light. This will prevent excessive internal heating of the controller. Internal heating may prevent the C-20 from operating correctly. For more accurate thermostat measurements, mount controller in a shaded area and away from any heat source.
- Allow at least one hour for the C-20 to reach ambient temperature when installing.
- If you are uncertain as to whether the de-icer is working, simply plug a light into the C-20 and leave it out at night so that you can see if the light comes on at the preset temperature and time.

TIME & TEMPERATURE CONTROL

The C-20 energizes your De-icer only when both the timer and thermostat turn on. The Indicator light will illuminate when both timer and thermostat are on (de-icer outlet is energized).

Timer	Thermostat	De-icer
OFF	OFF	= OFF
ON	OFF	= OFF
OFF	ON	= OFF
ON	ON	= ON

Timer Setting



1. Push each tripper to the outer ring for every 15 minutes of activation time.
 - For most efficient and effective de-icing, do not set the timer in segments of less than one hour activation time. (Set 4 trippers on together for 1-hour minimum.)
2. Set the current time by turning the innermost dial (clear) clockwise to advance the hour and minute hands until the clock face displays the correct time AND the "TIME NOW" arrow is indicating the current time on the outermost dial. (Note the PM hours are indicated by a black line at the outer edge.)
 - Setting the time by spinning the inner dial will help to avoid turning either dial too quickly.
3. Use the AUTO/ON switch to cycle the de-icer based on time and/or temperature.
 - Set AUTO/ON switch to **AUTO** for automatic timer control when the air temperature is at or below the thermostat setting.
 - To bypass the timer and operate only based on temperature, set the ON/AUTO switch to **ON**. This will cycle the de-icer based on temperature.
 - To bypass the thermostat and operate only on time, set the switch to **AUTO** and the thermostat to its highest temperature setting.



If the ambient temperature rises above the highest setting of the thermostat, the de-icer will shut off.

TIME & TEMPERATURE CONTROL (CONT.)

Thermostat Setting

The unit will operate whenever the outside air temperature is colder than the temperature you set on the thermostat.

To set the thermostat, simply turn the dial to the temperature at which you want the de-icer to turn on. (Remember the timer must also be set to ON or AUTO for the de-icer to energize.)

The thermostat has a 6°F ON/OFF differential. This differential helps prevent short cycling of the de-icer. Set the thermostat to the desired ON temperature, and it will shut off approximately 6°F above the ON setting.



The C-20 control must acclimate to the outdoor ambient temperature for proper operation. Allow at least 1 hour for the C-20 to adjust to ambient temperature.