











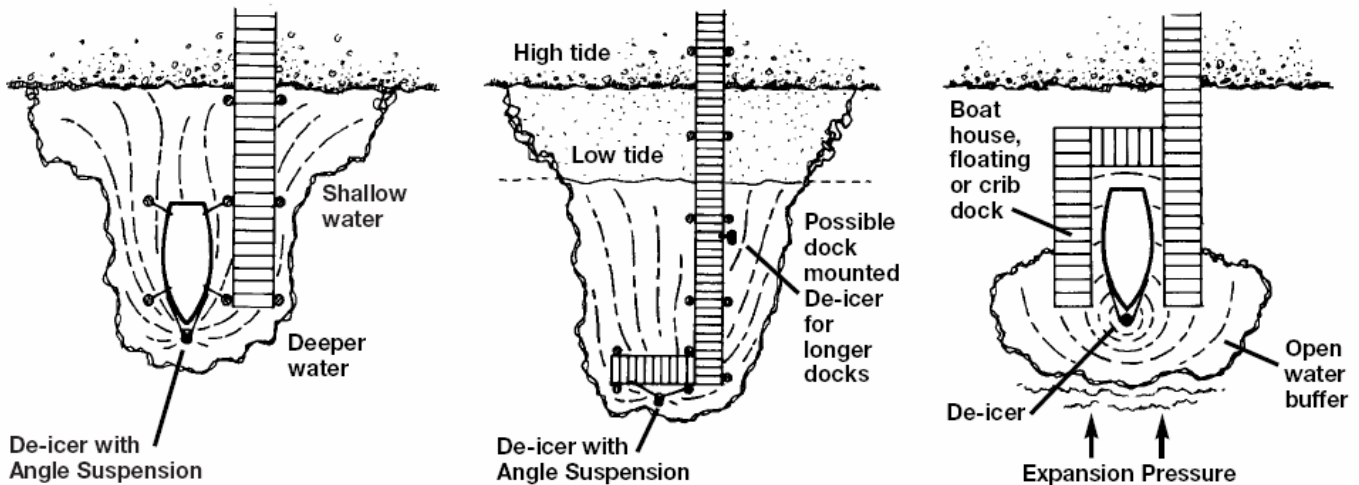




Although conditions change from one climate to another, a **good guide is 4-6 feet deep for vertical installation**, and slightly shallower in angled operation, but at least 1 foot off the bottom. Operating your De-Icer too close to the bottom may increase the possibility of debris being picked up, causing the propeller to clog. In colder climates, warmer water is a more important factor than surface circulation, so you may wish to install your De-Icer deeper than the above guide lines. De-Icers generally will work in shallower water, but are less effective and due to the constraints of your installation, you may have to settle for a shallower installation. It is recommended that you experiment with more than one possible location for the best installation results.

### STEP THREE

When you have determined both your De-Icing objectives and best installation points, it is time to analyze what external constraints your De-Icing location (structures, i.e., dock, boat, etc.) may have that could affect the flow of warmer water at the surface. Any obstruction at the surface of the water may slow or stop the flow of warmer water. A natural current, such as in a river, will tend to force your De-Icing efforts downstream.



Once you have determined your external constraints, you can choose your installation point(s). Some useful tricks you may wish to consider are:

- De-Ice from the upstream side and let the current help, rather than hinder.
- Boats are designed to allow water to flow from the bow to the stern with the least resistance. It is generally easier to De-Ice a boat by installing the De-Icer at or near the bow, angled to push the De-Icing flow of water toward the stern.
- It is generally easier to De-Ice a shallow area by bringing the warmer water from a deeper area into the shallow area. Angle your De-Icer from the deeper water toward the shallow water.
- When using more than one unit, it is better to angle all units in one direction, creating a current rather than installing De-Icers in opposing directions.
- In tidal waters, split the difference in water depth so the De-Icer is in shallow water at low tide and deep water at high tide. If you are De-Icing a boat, it is easier to tie your De-Icer to the boat and allow the boat and De-Icer to rise and fall with the tide together.

### STEP FOUR

When installing your Kasco De-Icer for suspended operation with the provided ropes, make sure the ropes or suspension lines are spread at least 8 to 10 feet apart. The high starting torque of your Kasco De-Icer may cause suspension lines that are too close together to twist up and possibly damage the electrical power cord. Tie each rope with a secure knot from the dock piling, cleat, boat etc. so the De-Icer hangs vertically.

Angling your Kasco De-Icer with suspension operation can be accomplished easily by simply changing the mounting location of one suspension line. There is no need to remove the knot and splice of the rope, simply change the point at which the line leaves the propeller cage by looping the rope around the top circular band over 1 to 4 vertical cage wires (more than 4 not recommended). This will move the support lines off center

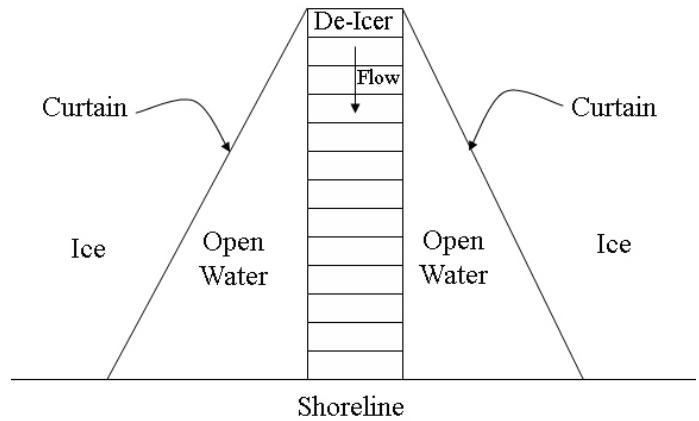
and allow the unit to hang at a slight angle. After installation and the unit is turned on, your Kasco De-Icer will swing up to an angle (the angle is dependent on how many cage wires you move the line) and the De-Icer will hold that angle during operation. This allows you to aim the flow of warmer water in the desired location. If the Universal Dock Mount or Horizontal Float were purchased, see their Assembly and Installation Instructions later in this manual.

**STEP FIVE**

Once your De-Icer is properly installed and secured, you can now plug the unit into a properly grounded and GFI protected circuit. If a C-10 Thermostat or C-20 Timer/Thermostat Controller was purchased, they can be plugged into the outlet receptacle and the De-Icer plugged into the controller. See Controller Instructions later in this manual.

**STEP SIX (OPTIONAL)**

On installations where open water area is required or desired to be limited/controlled, a curtain technique can be used to block the flow of water and restrict the open water area. By draping a canvas tarp as a curtain in the water, you can successfully disrupt the flow of water from the De-Icer. The canvas can be tied above the water level and weighted at the bottom (easiest if you fold the tarp in half and lay a chain in the fold as the weight). The curtain needs to hang into the water a few feet. This curtain will allow you to protect only the area you need. As always, we recommend the ice-free area is well marked.



**UNIT SPECS.**

Model	Voltage	Operating Amps	Lock Rotor Amps
F2400D	110-120	5.0 @ 120V	12 @ 120V
F3400D	110-120	6.7 @ 120V	18 @ 120V
F3400HD	208-240	3.4 @ 240V	9 @ 240V
4400D	110-120	11.3 @ 120V	40 @ 120V
4400HD	208-240	5.7 @ 240V	20 @ 240V

**Kasco De-Icer Sizing Chart**

Average Low Air Temperature (°F)

HP Size	34°-20° Orientation		19° - 0° Orientation		Minus 1° to Minus 20° Orientation		Great Lakes Orientation	
	Angled	Vertical	Angled	Vertical	Angled	Vertical	Angled	Vertical
1/2 HP	30' x 100'	65'	25' x 60'	50'	25' x 50'	45'	20' x 40'	35'
3/4 HP	35' x 120'	85'	30' x 80'	70'	30' x 75'	65'	25' x 50'	45'
1 HP	40' x 150'	95'	35' x 90'	80'	35' x 85'	75'	30' x 60'	55'

Assumption:

Unobstruted water

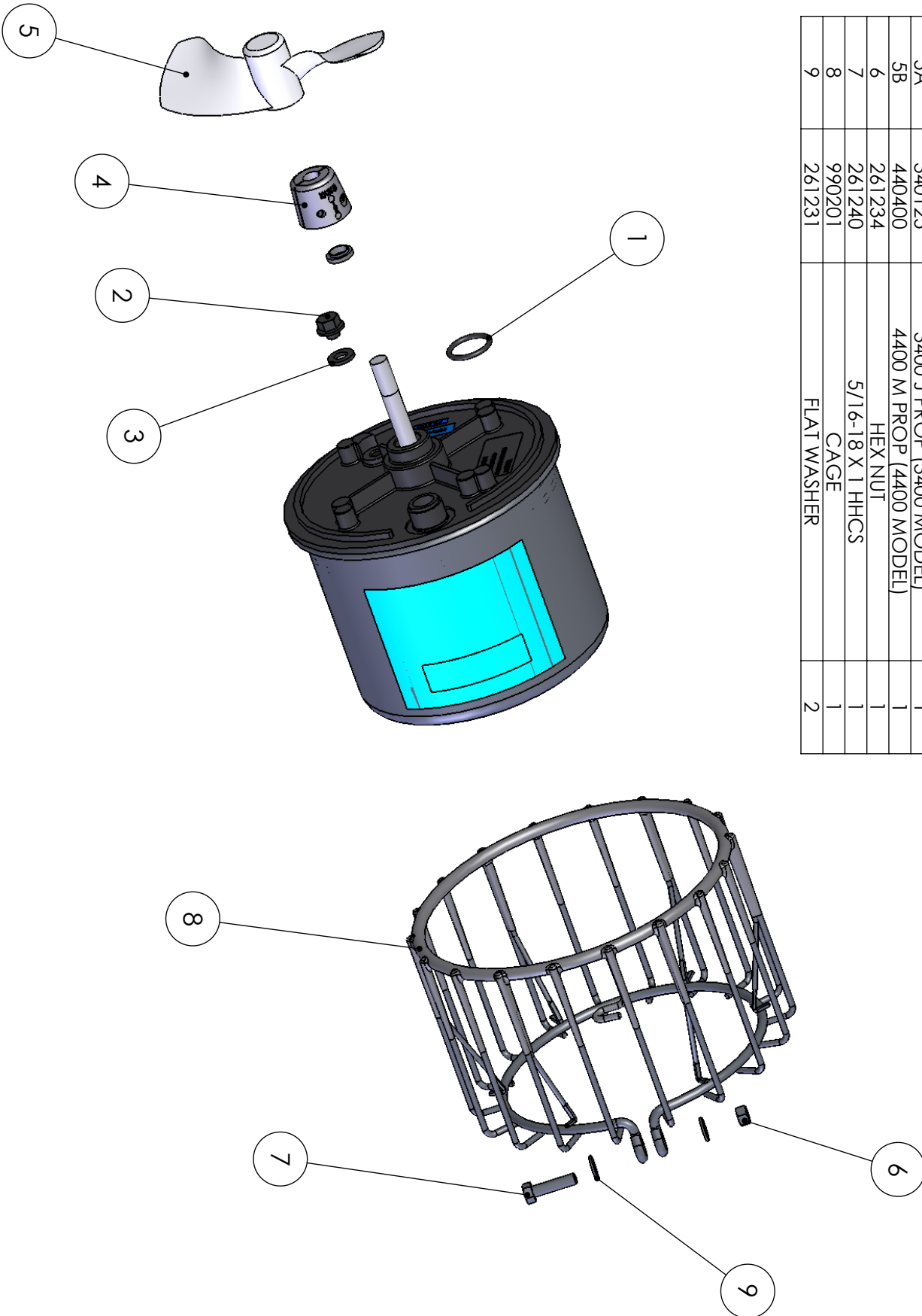
200 acre plus body of water with 20 feet plus maximum water depth or greater

Water depth in de-icing area 4 feet plus

\* Size may vary greatly based on a number of local conditions

# REPLACEMENT PARTS & ASSEMBLY DIAGRAM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	990275	CORD O RING	1
2	990280	SEALING PLUG	1
3	990285	SEALING WASHER	1
4	243475	ZINC ASSEMBLY (2400 & 3400 MODELS)	1
4A	840475	ZINC ASSEMBLY (4400 MODELS)	1
5	240170	2400 K PROP (2400 MODEL)	1
5A	340125	3400 J PROP (3400 MODEL)	1
5B	440400	4400 M PROP (4400 MODEL)	1
6	261234	HEX NUT	1
7	261240	5/16-18 X 1 HHCS	1
8	990201	CAGE	1
9	261231	FLAT WASHER	2





# C-10 Thermostat Unit Control

## Owners Instructions



### **CAUTION:**

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-10 on a vertical surface and operate only with the cover closed.
- Never lift your Kasco De-Icer or C-10 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.
- There are certain conditions under which no circulator can prevent ice damage such as ice that moves due to wind or current, extremely cold weather where ice forms all the way to the bottom and in some cases where the bottom water temperature is the same as ice (very shallow water). Effective operation can be somewhat restricted by too little bottom clearance.

### **INSPECTING YOUR C-10 UNIT CONTROL:**

Upon receiving your Kasco C-10 Unit Control, please unpack and inspect your C-10 for any possible damage that may have happened during shipment. Any damage or shortage should be reported to your dealer/delivery service immediately to ensure prompt resolution.

### **INSTALLATION:**

This unit must be mounted on a vertical surface close enough to your power supply to allow at least a slight slack in the power cord from the C-10. Select the screw(s) with which to mount your C-10. You will need two for the mounting holes at the top of the box and one for the mounting hole located at bottom of the C-10 box.

**Important:** Your C-10 is designed to operate only one Kasco De-Icer. For the most accurate operation, avoid placing your C-10 in direct sunlight.

### **OPERATION:**

#### **Step One:**

Plug the C-10 Power Cord into a properly grounded 120V outlet.

#### **Step Two:**

Set the temperature you desire the De-Icer to turn on using the Thermostat dial on the C-10. It is recommended to set the temperature at 30°F (top black numbers). The C-10 works on temperature fall. When the ambient air temperature reaches the set point on the thermostat, the De-Icer will turn on. There is a 2.5°F differential, so when the temperature rises to 2.5°F above the set thermostat temperature, the De-Icer will turn off.

#### **Step Three:**

Plug the *INSTALLED* Kasco De-Icer into the piggy-back plug of the C-10.

### **RECOMMENDATIONS & INFO:**

Use the following guide lines and hints to assist in customizing your setting for local conditions.

- De-Icers set up small localized currents the longer they run. Fewer and longer operation cycles will prove to be more effective than more frequent and shorter operation cycles.
- Fresh water freezes at 32°F, salt water at 28°F, and brackish water will freeze somewhere in between depending on the salinity level.
- Once activated, the thermostat stays activated until the temperature rises the 2.5°F differential, putting the temperature above the freezing point.
- If the temperature is hovering near the freezing point, any ice formation is minimized.
- Daily observation is suggested for all de-icing installation.
- A number of factors can increase freeze rates such as wind, snow, and colder temperatures. A sunny day can actually retard freezing.

**TWO YEAR LIMITED WARRANTY:**

Kasco Marine, Inc. warrants the C-10 Thermostat Control to be free from defects in material and workmanship under normal use and service. The Kasco Marine, Inc. obligation under this warranty is limited to replacing free of charge any defective part within two (2) years from date of purchase. Customer shall pay all shipping charges.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTIES EXPRESS OR IMPLIED, AND ANY OTHER OBLIGATION OR LIABILITY WHATEVER ON THE PART OF KASCO MARINE, INC. AND IN NO EVENT SHALL KASCO MARINE, INC. BE LIABLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES.

No warranty registration is required, only original purchase receipt is needed for limited warranty coverage.

Warranty is void: If thermostat is damaged by unauthorized tampering or improper use.

**KASCO SERVICE PARTS:**

If the service parts listed below are not available from your local marine dealer, please order direct from Kasco Marine.

F2400 (1/2 HP) "K" Propeller

F3400 (3/4 HP) "J" Propeller

4400 (1 HP) "M" Propeller

Zinc Anode

Electric Power Cable, 25' length (16 gauge)

*Other lengths and gauges are available by special order.*

Specifications are subject to change without prior notice.

All orders shipped via United Parcel Service.



For Optional Kasco Parts or accessories, contact your local dealer or call Kasco Marine, Inc. at (715) 262-4488.



***The Industry Leader in  
Ice Control Engineering.***

KASCO MARINE, INC.  
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Prescott, WI 54021-1241

*Phone (715) 262-4488 \* Fax (715) 262-4487*

**[www.De-Icer.com](http://www.De-Icer.com) \* [sales@kascomarine.com](mailto:sales@kascomarine.com)**

# Kasco Model C-20 Time & Temperature Unit Control

## Owners Instructions



(Please read completely before installing and operating your Kasco Equipment)

### CAUTION:

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 pre-cautions 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.
- There are certain conditions under which no circulator can prevent ice damage such as ice that moves due to wind or current, extremely cold weather where ice forms all the way to the bottom and in some cases where the bottom water temperature is the same as ice (very shallow water). Effective operation can be somewhat restricted by too little bottom clearance.

### INSPECTING YOUR C-20 UNIT CONTROL:

Upon receiving your Kasco C-20 Unit Control, please unpack and inspect your C-20 for any possible damage that may have happened during shipment. Any damage or shortage should be reported to your dealer/delivery service immediately to ensure prompt resolution.

### INSTALLATION:

This unit must be mounted on a vertical surface close enough to your power supply to allow at least a slight slack in the power cord from the C-20. Select the screw(s) with which to mount your C-20. You will need one for the slot near the top of the box and you may wish to utilize the two additional mounting holes located near the inside bottom of the C-20 box. At this time, prior to final installation, you may wish to do some pre-programming of the timer and thermostat (see Programming below).

Install the De-Icer power cord through the hole in the lower left portion of the C-20 housing and plug it into the receptacle inside the C-20.

*Important:* Your C-20 is designed to operate only one Kasco De-Icer. For the most accurate operation, avoid placing your C-20 in direct sunlight. Complete programming the timer and thermostat now.

### PROGRAMMING:

The advance design of Kasco’s C-20 gives you both time and temperature control of your De-icer. The C-20 is wired in a series configuration giving you control based on both time and temperature. Your Kasco De-Icer will only operate when both the timer and the thermostat are activated. The red indicator light will only be lit when both time and temperature are activated.

Timer	Thermostat	De-icer
Off	Off	Off
On	Off	Off
Off	On	Off
On	On	On

You will need to program both the timer and thermostat to complete your programming and we will address the how’s, why, and recommendations for each separately below.

**TIMER:** The timer is programmable in 30 minute increments, but do not program the timer in segments of less than a one hour period at any time.

#### • Setting Timer:

1. Pull out each tripper for every half hour of ON time between desired hour mark on dial.
2. Turn dial clockwise  $\curvearrowright$  one or more revolutions until correct time-of-day is adjacent to the timer arrow in the center of dial.

**THERMOSTAT:** The thermostat has a 6°F differential. This means that the De-Icer will come ON at the temperature setting and will not go OFF until the temperature reaches 6°F above the ON setting.

#### • Setting Thermostat:

Set dial to temperature at which you wish to have your Kasco De-Icer begin activation.

### RECOMMENDATIONS:

Use the following guide lines and hints to assist in customizing your setting for local conditions.

- De-Icers set up small localized currents the longer they run. Fewer and longer operation cycles will prove to be more effective than more frequent and shorter operation cycles.
- Fresh water freezes at 32°F, salt water at 28°F, and brackish water will freeze somewhere in between depending on the salinity level. Most people find that by setting the thermostat a couple degrees below the freezing point, they can minimize unneeded operation time for two reasons:
  - A. Once activated, the thermostat stays activated until the temperature rises the 6°F differential, putting the temperature above the freezing point.

















