

## INTERMEDIATE DIGITAL THERMOSTAT CONFIGURATION INSTRUCTIONS

RPARTS Part Number 015-0004 o Carel Part Number IR33W00

This thermostat is the “ECM controller” upgrade option for Glacier Bay refrigeration systems built between 1994 and 2008. The programming instructions below pertain to Glacier Bay applications but are also suitable for other similar systems.

The Carel IR33W00 “W” thermostat is very similar to the Carel IR33V00 “V” thermostat (RPARTS part number 015-0005) except that it can regulate the system operation by using a second internal relay within the thermostat. The second internal relay allows another method of controlling the system with two sets of parameters rather than just one. This feature is enabled by switching between the two Carel internal relays with an external relay that is activated by the engine ignition switch or other source of voltage when the engine or other charging source is running. This allows the control system to know when the engine and/or generator is running and use the additional power being generated to “top-off” the holding plate without over-cooling it.

The model “W” thermostat allows the refrigeration system to recognize the presence of additional power (i.e. running engine or generator) when a positive DC voltage is applied to the proper terminal in the Glacier Bay control box control relay via a key switch or oil pressure switch. It does not respond to a rise in the boat’s 12v supply voltage, therefore it is not activated by a shore-power charger, wind generator or solar panels. During “normal” operation, the system is driven by the values programmed into the first relay’s set of parameters. When the engine is started, the system begins operating from the second relay’s set of parameters.

## Setting the "c" Parameters

When configuring the IR33W, if the display does not show the expected values or if there is uncertainty of the current programming status, just wait for the IR33W to timeout and exit the configuration mode. Then start over at the first step below.

1. Enter into Configuration Mode by pressing PRG with SET for >5 seconds until display changes to blinking 0 then press  $\uparrow$  arrow to change display to password of 77 then press SET button
2. The display should show "c0", at this point. You are now ready to program the "c" parameters from the Summary of "c" Parameters table located below. Use the following instructions and the table to set the "c" parameters.
3. With "c" and a number displayed, reference the table for the value to be programmed. Press SET to display the current value for this "c" parameter.
4. Use the  $\uparrow\downarrow$  arrow keys to change the display to the Recommended Value from the table.
5. Press SET to return to the "c" parameter selection mode.
6. Then use the  $\uparrow\downarrow$  arrow key to change the display to next "C" parameter from the table then continue at Step 3 above.
7. After setting the last "c" parameter, press and hold PRG for >5 seconds to retain the unit setting.

### Summary of "c" parameters and recommended settings

C Parameter	Recommended Value	Comments
c0	9	1 for Std mode, 9 for ECM mode
c13	0	Probe type 0= NTC range (-50T+110°C)
c18	1	Temperature units, 0 for C or 1 for F
c19	7	Define 2nd Probe (NTC2) purpose c19=7, for independent 2 <sup>nd</sup> probe enables box temperature display
c33	1	Enables special mode to enable use of c36 and c37 c33=1 special mode parameters enabled
c34	1	Output 1 Relationship C34=1 relates Output 1 to Setpoint 1 and P1
c35	0	C35=0 selects On/off type
c36	100	
c37	-100	
c38	2	Output 2 Relationship C38=2 relates Output 2 to Setpoint 2 and P2
c39	0	C35=0 selects On/off type
c40	100	
c41	-100	

## **PROGRAMMING THE SET POINTS & DIFFERENTIALS**

The following procedure is used to program the holding plate set point (ST1, ST2) and differential (P1, P2) parameters. The set point is the temperature at which the system will turn off, and the differential added to the set point will be the temperature at which the system will turn on.

The first set point "ST1" and first differential "P1" are active in the "normal" mode and control the system when the engine (or generator) is not running. The second set of parameters "ST2" and "P2" take over whenever the engine (or generator) is started and control the system in "engine-drive" mode.

The Glacier Bay factory default setting for "ST1" and "ST2" is 22° F for the TSS-26 Glacier Bay refrigerator plate and -16° F for the TSS-10 Glacier Bay freezer plate. The factory default setting for "P1" is 8° F for the TSS-26 refrigerator plate and 16° F for the TSS-10 freezer plate. The Glacier Bay factory default setting for "P2" is 4° F for the refrigerator plate and 12° F for the freezer plate. Glacier Bay freezer plates made before 2001 are TSS-5 plates. "ST1" and "ST2" was factory programmed for -9° F, with "P1" set at 9° F and "P2" set at 5° F.

1. Hold down "SEL" until "ST1" is displayed. "ST1" will flash when "SEL" is released.
2. Use the arrow keys to adjust the display until the desired system shut off temperature is displayed. This should be a few degrees below the freezing point of the plate, 22° F for a Glacier Bay refrigerator plate, and -16° F for a Glacier Bay freezer plate.
3. Press "SEL" to enter the "ST1" setting.
4. After entering the "ST1" set point, enter the "ST2" set point with the arrow keys. The set point for both "ST1" and "ST2" should be entered as the same value.
5. Press "SEL" to enter the "ST2" setting.
6. Press "PRG" to retain both the "ST1" and "ST2" settings.
7. Hold down "PRG" until "P1" is displayed. "P1" will flash when "PRG" is released.
8. Use the arrow keys to adjust the display until the desired number of degrees above the setpoint the system is to turn on at appears. For a Glacier Bay refrigerator plate, this should be 8° F, for a Glacier Bay freezer plate it should be 16° F.
9. Press "SEL" to enter the "P1" setting.
10. After entering the "P1" differential, enter the "P2" differential with the arrow keys. The differential for "P2" will always be lower than "P1". Setting "P2" at a lower value will cause the compressor to start sooner when the engine is running than it does under normal operation. For a Glacier Bay refrigerator plate, this should be 4° F, the Glacier Bay freezer plate setting should be 12° F.

11. Press "SEL" to enter the "P2" setting.

12. Press "PRG" to retain both the "P1" and "P2" settings.

These settings are a starting point; they may be optimized by careful observation of system operation. Changing the values will change the run time and holdover time, at an optimum setting maximum holdover will be obtained with optimum run time. The values should be varied and records made of changes to determine the best settings for any individual system. This is time consuming and should be left to the vessel operator to experiment with to determine the best settings.

### Summary of recommended setpoints and differential settings

Parameter	Recommended Value	Comments
St1		Setpoint 1 GB TSS-26 Refrig = 22F GB TSS-10 Freezer (2001 or later) = -16F GB TSS-5 Freezer (before 2001) = -9F
St2		Setpoint 2 Only with ECM model and Requires c0 = 9 GB TSS-26 Refrig = 22F GB TSS-10 Freezer (2001 or later) = -16F GB TSS-5 Freezer (before 2001) = -9F
P1		Differential for St1 GB TSS-26 Refrig = 8F GB TSS-10 Freezer (2001 or later) = 16F GB TSS-5 Freezer (before 2001) = 9F
P2		Differential for St2 Only with ECM model and Requires c0 = 9 GB TSS-26 Refrig = 4F GB TSS-10 Freezer (2001 or later) = 12F GB TSS-5 Freezer (before 2001) = 5F

<b>Digital Thermostat Connections  Cross Reference  Move wire from screw number on old to screw  number on new</b>					
Signal Name	ECM IR32W 015- 0003	ECM IR33W 015- 0004	Std IR32V 015- 0002 Old	Std IR33V 015- 0005 New	Std FG 015- 0010
NO1	1	3	1	3	
COM1	2	1	2	1	
NC1	3	2	3	2	
PWR +	4	6	4	6	
PWR -	5	7	5	7	
PRB COM	7	10	7	10	
PLT PRB +	8	8	8	8	
BOX PRB +	9	9	9	9	
NO2	13	13	n/a	n/a	n/a
NC2	14	15	n/a	n/a	n/a
COM2	15	14	n/a	n/a	n/a