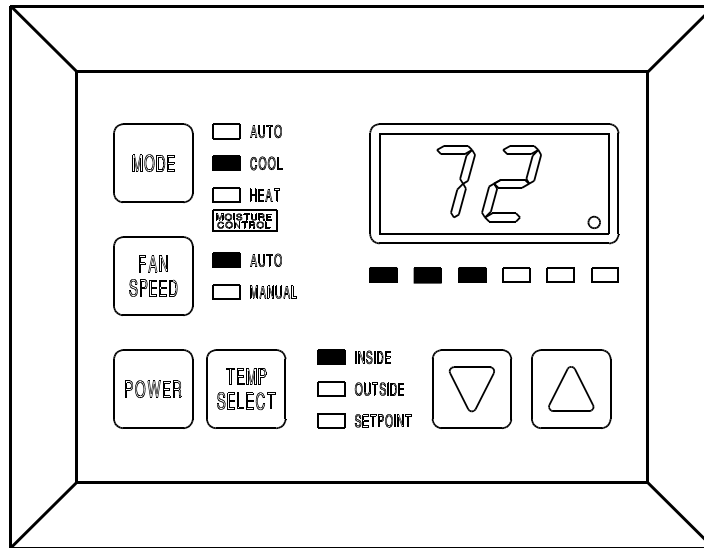


AQUA AIR

MARINE AIR CONDITIONING
SYSTEMS

Aqua-Air Tempwise 2001 Chillwater Digital Thermostat

Operating Manual



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INTRODUCTION

The **Tempwise 2001** Control is designed for use with **Aqua-Air** Chilled Water Air Conditioning Systems. The **Tempwise 2001** has a universal power supply that operates on 115V or 230V, 50 or 60 Hz AC power. The **Tempwise 2001** includes the following standard and optional features:

Standard Features

- Paintable Face Plate Cover with recess for matching wall covering insert**
- User friendly 6 button display panel**
- Five volt logic and micro controller located in the display**
- 3-digit 7-segment display indicates /F or /C**
- Automatic fan speed reduction as set point is approached**
- Six (6) manual fan speeds**
- 18 programmable parameters for custom installations**
- Water In Sensor allowing individual cabin heating**
- Moisture Mode for controlling relative humidity**
- Universal AC power supply**
- Nonvolatile memory retains settings without batteries**
- Programmable display brightness control for night use**

Optional Features

The following optional items can be added by plugging the device into the appropriate jack and making the necessary programming changes:

- Custom Polished Brass Display Panels**
- Electric Heating element Option**

This manual is intended to provide information necessary to insure proper installation and operation of the **Tempwise 2001**. Poor installation and/or MISUNDERSTOOD operating parameters will result in unsatisfactory performance and premature failure of the **Tempwise 2001**.

Read This Manual Completely Before Proceeding!

If you require assistance prior to or during the installation of the **Tempwise 2001** call **Aqua-Air** at (305) 884-8363 or Fax your questions to **Aqua-Air** at (305) 883-8549. The **Tempwise 2001** is covered under existing **Aqua-Air Manufacturing** Warranty Policy. Incorrect installation, neglect and system abuse are not covered under **Aqua-Air's** warranty policy.

NOTE: In order to continually improve the **Tempwise 2001** Control, **Aqua-Air** reserves the right to change this product's basic operation, specifications and design criteria without prior notice.

BASIC OPERATION

The **Tempwise 2001** is a user friendly, easy to operate, programmable temperature control.

- Press the ON/OFF button once to engage the system. The display indicates room temperature when the system is on and the display is blank when the system is off.
- Press and release the Mode Button until the desired Mode LED is illuminated.
- Set the room temperature by pressing the up or down button. The set point can be viewed by momentarily pressing and releasing the up or down button.

Fan speed operation is automatic. The fan speed decreases as set point temperature is approached. The fan will operate at low speed when set point is satisfied. Manual fan speeds can be selected by pressing the Fan Speed Button and selecting the desired fan speed. The fan will operate at the speed selected and will not change speeds with room temperature.

The fan can be programmed to cycle on and off with the Heating and Cooling demand. Normally the automatic fan speed operation is reversed in the heating mode, however, the fan speeds can be programmed to operate the same as in the cooling mode.

NORMAL HEATING OR COOLING CYCLE

When heating or cooling is called for, the water valve switches to the appropriate mode. Four (4) seconds later the automatic fan control adjusts the fan to the proper speed. When the demand is satisfied, the water valve cycles off and the fan returns to low speed. If cooling is required, the water valve will not open unless adequate cooling water is available. The fan will remain in low speed until adequate cooling water is available. If heating is required the valve will not open unless adequate heating water is available. The fan remains in low speed until adequate heating water is available. The water temperature can be viewed by simultaneously pressing the Up and Down Buttons while in the On Mode. Heat will be supplied when no heating water is available if the Optional Electric Heater (Electric heating element) has been installed and programmed.

While in the **Heating** or **Cooling** Mode, the controller will maintain a two degrees Fahrenheit (2/F) temperature variation. A four degree swing is required to cause the unit to shift to the opposite mode. Once in a new mode, Heating or Cooling, the **Tempwise 2001** will maintain a two degree differential.

MOISTURE MODE

While in the **On** mode, press the Mode Button until the Moisture Control LED is lit. Every four (4) hours, the fan is started and air circulated for thirty (30) minutes. During this time the air temperature is sampled and entered into memory. The cooling cycle is started and continues until the temperature is lowered 2/F. The system is allowed a maximum of one hour running time to reach the desired temperature. Four (4) hours after the temperature is satisfied or the Cooling Mode times out, the cycle is repeated. During the humidity cycle the water valve LED is lit while the system is cooling. The first cycle starts 1 minute after selecting this mode.

MEMORY

The **Tempwise 2001** has nonvolatile memory which requires no batteries or any form of backup power. When power is lost the operating parameters are retained indefinitely. When power is restored, the control resumes operating as last programmed. All operating and programming parameters are entered into nonvolatile memory instantly and are retained indefinitely.

OPERATOR CONTROLS AND DISPLAY PANEL

Refer to **Figure 1** for the buttons locations and display functions listed on the following pages.

Tempwise 2001 Display Panel

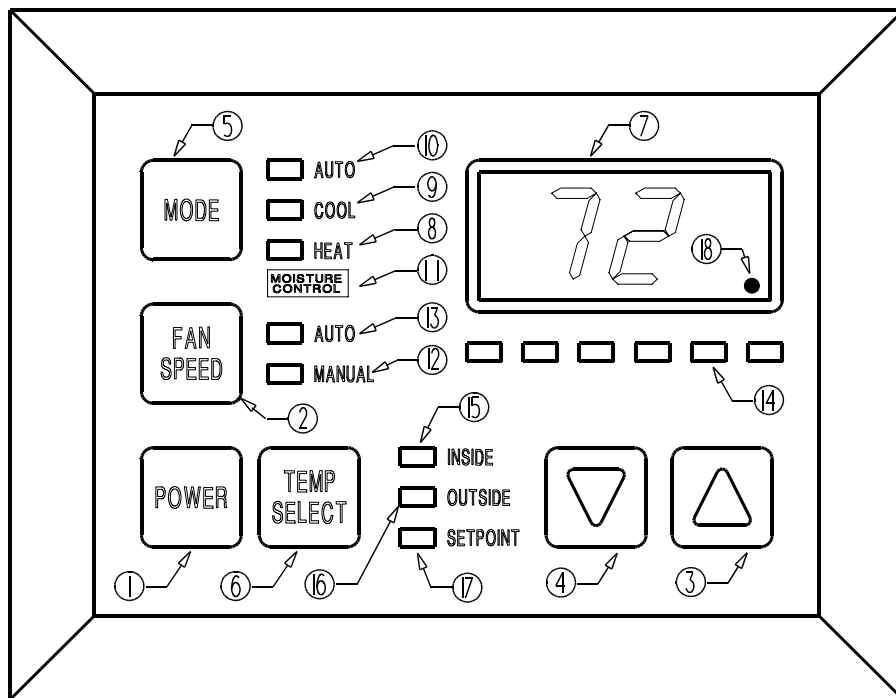


Figure 1: Tempwise 2001 Control Buttons and Indicator Displays

1. **POWER BUTTON** - The power button is used to toggle between the **On** and **Off** modes. Press the power button once to toggle the unit to the **On** mode. Press the power button again to toggle to the **Off** mode.
2. **FAN SPEED BUTTON** - The fan speed button is used to switch between Auto and Manual Fan Speeds. Pressing and releasing the Fan Speed Button once

toggles the fan mode as indicated by the Fan LED indicator lamps. Press and release the fan speed button until the desired Automatic (A) or Manual Fan Speed (1 through 6) is selected.

3. **UP BUTTON** - Momentarily press the **up button** and the set point will appear in the temperature display. Press and release the up button to increase the set point one degree. The set point is increased by one degree each time the up button is pressed and released. The highest set point allowed is 85/F. The up button is used with the down button to display the Water In temperature when the control is on. The up button is also used to increase program values in the program mode.
4. **DOWN BUTTON** - Momentarily press and release the **down button** to display the set point. Press and release the down button to decrease the set point. The set point is decreased one degree each time the down button is pressed and released. The lowest set point allowed is 55/F. The down button is used in conjunction with the up button to display Water In temperature when the control is on. The down button is also used to reduce program values in the program mode.
5. **MODE BUTTON** - The mode button is used to select one of the four operating modes. Press and release the mode button and the **Tempwise 2001** will advance to the next mode. Continue to press and release the Mode button until the desired operating mode is reached. The mode selected is indicated by the Mode LED, i.e., Cool, Heat, Automatic or Moisture Mode.
6. **TEMP SELECT BUTTON** - Press and release the **Temp Select** button to view inside air temperature, outside air temperature (optional) or the set point. The appropriate LED, Inside, Outside or Set Point will be lit indicating which temperature is being displayed. If no outside air sensor is installed three (3) dashes will appear in the Three Digit Display.
7. **THREE DIGIT SEVEN SEGMENT DISPLAY** - The inside air temperature is displayed in the window whenever the control is turned on. The three digit 7 segment display provides a readout of the return air temperature. The display also indicates program information, fault codes and outside air temperature when the optional outside air sensor is installed. The display momentarily indicates the set point when the up or down button is pressed. When the control resumes operation after a power interruption all the display LEDs will turn on for one second. This is a normal operating condition and is referred to as "Power On Reset".

8. **HEAT MODE LED** - The heat mode LED will be lit when the Heat Mode has been selected. The heat mode LED is also lit when the optional electric heat is installed and the heat mode is selected. Electric heater status, on or off, is indicated by the right side decimal point (18).
9. **COOL MODE LED** - The cool mode LED will be lit when the Cooling Mode has been selected.
10. **AUTO LED** - The auto LED is lit when the automatic heating or cooling mode has been selected. The control will automatically switch to heating or cooling when this mode is selected.
11. **MOISTURE CONTROL LED** - The moisture mode LED is lit when the Moisture Control has been selected. This mode is used to control humidity during periods when the vessel is unoccupied.
12. **MANUAL FAN LED** - The manual fan LED will be lit when one of six manual fan speeds has been selected.
13. **AUTO FAN LED** - The auto fan LED is illuminated when automatic fan speed operation has been selected.
14. **FAN SPEED BAR GRAPH** - There are six (6) individual fan speed LED's in the Fan Speed Bar Graph. Each LED represents one (1) fan speed. Low fan speed (1) is indicated by illuminating the first LED. High fan speed is indicated by illuminating all six (6) LED's. Any of the six (6) fan speeds available are displayed by illuminating the appropriate LED's.
15. **INSIDE LED** - The inside LED is lit when the inside air temperature is being displayed.
16. **OUTSIDE LED** - The outside LED is turned on when the outside temperature is displayed (optional).
17. **SET POINT LED** - The set point LED is turned on when the set point is displayed.
18. **VALVE LED** - The water valve operating status (Open or Closed) is indicated by turning on the right most decimal point in the 3 Digit Display.

DUAL BUTTON FUNCTIONS

Up & Down Buttons - Simultaneously Press the Up and Down buttons, while in the **On** Mode, to view the chillwater inlet temperature.

Simultaneously Press the UP & Down Buttons while in the program mode to set new custom programming defaults.

MODES OF OPERATION

Off Mode

When the **Tempwise 2001** is in the **Off** mode, all control outputs are turned off. Program parameters and user settings are saved in nonvolatile memory. The program mode can only be accessed from the **Off** mode.

On Mode

When the control is in the **On** mode, power will be supplied to the appropriate control outputs and the display will indicate the current state of operation. The operating and program parameters resume based on those stored the last time the unit was operating.

Cool Only Mode

When “**Cool**” LED is on, only the cooling systems are selected and operated as required. When the temperature drops below the set point, the system will not automatically switch to the heating mode. Cooling only is available for customers that do not want automatic cooling and heating operation.

Heating Only Mode

When the “**Heat**” LED is on, only the heating systems are selected and operated as required. Should the temperature rise above the set point, the system will not automatically switch to the cooling mode. Heating only is supplied for customers that require the system to not automatically switch from the heating to the cooling mode.

Automatic Mode

When the “**Automatic**” LED is on, both heating and cooling are supplied as required. The heat and cool LEDs will be lit according to the mode required. When the system requires the water valve to be turned on for heating or cooling the water valve LED will turn on when the valve is on and will turn off when the valve is off.

Temperature in a given mode will be maintained within two degrees Fahrenheit (2/F) of the setpoint temperature, however, a four degree difference is required to allow the control to change modes. Once in a new mode, the temperature will remain within two degrees Fahrenheit (2/F) of the set point.

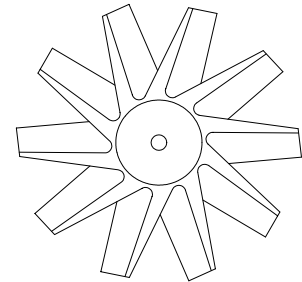
Moisture Mode

While in the “**On**” mode, press the **Mode** Button until the Moisture Mode LED is illuminated. Every four (4) hours, the fan is started and air circulated for thirty (30) minutes. During this time the air temperature is sampled and entered into memory. The cooling cycle is started and continues until the temperature is lowered 2/F. The system is allowed maximum of one hour running time to reach the desired temperature. Four (4) hours after the temperature is satisfied or the one hour timer runs out the cycle is repeated. During the humidity cycle the water valve LED is lit while the water valve is turned on and the system is cooling. The first cycle starts one minute after selecting this mode.

FAN MODES

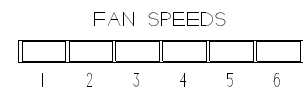
Automatic Fan Speeds

Tempwise 2001 has six automatic fan speeds available. Speed six is high, three is medium and one is low or the slowest speed. Automatic fan mode allows the **Tempwise 2001** to determine the required fan speed based on room temperature. The closer the room temperature is to the set point, the slower the fan will run. This permits a balance between the most efficient temperature control and slower, quieter fan speeds. Automatic fan operation is the factory default, however, manual fan speed control is available.



Manual Fan Speeds

Six (6) is the fastest and one (1) represents the slowest fan speed. Manual fan mode allows the user to select and maintain the desired fan speed manually. When a manual fan speed has been selected, the fan speed bar graph will indicate the speed selected by the number of LED's lit. Select speed 3, for Fan Speeds example, and the first 3 LEDs in the fan bar graph will turn on. Manual Fan Mode is sometimes preferred when room temperature is constantly changing due to varying heat loads.



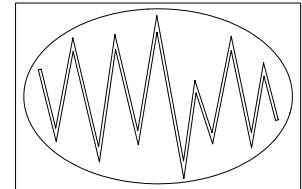
PROGRAM MODE

Program Mode Overview

The program mode is used to adjust the systems operating parameters to suit the particular needs of individual users. The program mode is also used to tailor the air-conditioning system for the most efficient operation within an installation. Installation variables such as, ducting, sensor location and system layout affect the perceived operation of the overall system. The program mode allows the system to operate as efficiently as possible under all conditions. The **Tempwise 2001** is shipped with factory programmable default settings which are stored in permanent memory and can be recalled at any time.

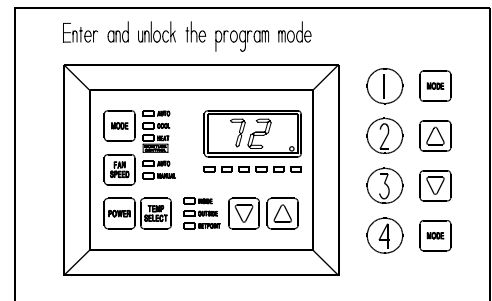
Warning

Severe electrical disturbances can sometimes upset the **Tempwise 2001** operating sequences. Operator confusion related to program parameters can also cause what may seem to be operational problems. Whenever there is any doubt as to the proper operation of the controller, Factory Default Parameters should be re-initialized.



Entering Program Mode

The program mode can only be entered from the off mode. From the off mode and in the following order, press the **Select**, **Up**, **Down** and the **Select** buttons. These buttons have to be pressed and released in the order given. The letter "P" appears in the display. The buttons have to be pressed in the sequence described. Remember "**SUDS**"... It's the key to enter and unlock the program mode. The characters "P" then "P1" followed by the parameter setting, appear in the display. The **Tempwise 2001** control is now in the program mode. Exit the program mode, to the off mode, by pressing and releasing the power button.



NOTE: The control will exit the program mode and return to the "off" mode if no programming is attempted for one (1) minute.

Restore Memorized Default Settings

IMPORTANT! The memorized default settings can be restored by entering the software ID program mode and setting P-16 to **rSt**. Exit the program mode and the software version number appears in the display. The memorized default settings are restored and the **Tempwise 2001** control returns to the **off** mode. The software version number is always displayed when you exit the program mode.

USING THE PROGRAM MODE

Increment from one program parameter to the next by pressing the Mode Button while in the program mode. Press and release the Mode Button to advance to the desired parameter. Use the up and down buttons to change the program parameter values. The programmable parameters range from P-1 through P-18.

Up and Down Buttons

The up and down buttons are used to select the data or set the desired limits for the parameter being programmed. This method is followed throughout the **program** mode, however, special instructions are included for individual functions as required.

Exiting the Program Mode

There are two methods to exit the **Program** mode. Press the power button and the **Tempwise 2001** control will return to the **Off** mode. Not pressing any buttons or attempting any program changes for sixty (60) seconds will allow the control to exit the **Program** mode to the **Off** mode. Any programming changes that were made while in the **Program** mode will be memorized and put into operation when the **Program** mode is exited and the control is returned to the **On** mode.

Software Identification

The software version of the control is identified for one (1) second prior to the exit from the program mode. The software identification number, i.e. "**A10**" will appear in the display for one second, then the control will return to the off mode.

Should there be any reason to contact Aqua-Air Manufacturing about the system or programming the Tempwise 2001 be sure to have the software identification number available.

PROGRAMMING

Programmable Parameters

There are eighteen (18) programmable parameter locations with their Factory Default Settings listed in this section. The table below indicates what these parameters are, along with the permitted values and the original Factory Default Settings.

Program Number	Description	Default	Range
P-1	High Fan Speed Limit (arbitrary units)	85	56 - 85
P-2	Low Fan Speed Limit (arbitrary units)	50	30 - 55
P-3	Unused - Reserved for future use	N/A	N/A
P-4	Temperature Sensor Calibration	0	Ambient \pm 10/F
P-5	Unused - Reserved for future use	N/A	N/A
P-6	Unused - Reserved for future use	N/A	N/A
P-7	Unused - Reserved for future use	N/A	N/A
P-8	Unused - Reserved for future use	N/A	N/A
P-9	Display Brightness Control	13 = Maximum	4 = Low 13 = Maximum
P-10	Display /F or /C	/F	/F = Fahrenheit Displayed /C = Celsius Displayed
P-11	Outside Air Temp Sensor - Only when Alt Air Sensor is Not Required	OFF	OFF = Alt Air Connected On = OAT Sensor Only
P-12	Reverse Fan Speeds in Heating Mode	rEF = Reversed	nor = Normal Fan Operation rEF = Reversed in Heating
P-13	Continuous Fan or Cycle Fan on Demand	con = Continuous Fan Operation	CYC = Cycle On Demand con = Continuous
P-14	Hot Water Heating Only or Electric Heat Option Installed	nor = Hot Water Heat	nor = Hot Water Heat only ELE = Elect. Heat Installed
P-15	Fan Motor Type	SP = Shaded Pole	SP = Shaded Pole SC = Split Capacitor
P-16	Reset Memorized Programming Defaults	nor = Normal	nor = Normal rest = Reset Defaults
P-17	Water Valve Forced Open 4 Hours to Bleed the Chillwater System	nor = Normal Operation	nor = Normal Operation Opn = Open
P-18	Ambient Air to Chillwater Temperature Differential	15/F	5/F to 25/F

Should any programming problems or confusion occur, reset the memorized default settings by entering the program mode and setting P-16 to rest.

P-1: High Fan Limit

The upper fan speed limit can be tailored to suit various motors and operating conditions. The high fan limit is adjusted with the system installed and operational. The range of values are 56 through 85 and represent arbitrary units. Setting a higher number, results in a higher fan speed, setting lower numbers, lowers the high fan speed limit. Use the up and down buttons to select the desired high fan speed limit. The factory default setting is eighty-five (85).

P-2: Low Fan Limit

The low fan limit determines the lowest output allowed for the low fan speed. The range of values for the low fan speeds are 30 through 55, in arbitrary units. Use the up and down buttons to select the desired low fan speed limit. Setting a higher number, results in a higher fan speed, setting lower numbers, lowers the low fan speed limit. The factory default setting is 50.

IMPORTANT! Once the high and low fan speed limits are set, the unit will automatically readjust the remaining fan speeds to produce six (6) equally spaced in both the automatic and manual fan speeds modes.

P-3: Reserved For Future Options

Program item P-3 is reserved for future options.

P-4: Temperature Calibration

Use this feature to calibrate the air sensor within a range of ± 10 /F. Enter the program mode and the ambient temperature appears in the display. Use the up and down keys to select the desired offset. The temperature in the display will increase or decrease according to the offset programmed. The factory default setting is zero.

P-5, P-6, P- 7 & P-8: Reserved For Future Options

Program items P-5, P-6, P-7 and P-8 are reserved for future options.

P-9: Display Brightness Control

The display brightness can be adjusted to suit ambient cabin lighting conditions. The allowed settings are four (4) to thirteen (13), with four (4) being the dimmest and thirteen (13) the brightest. Typically a dark cabin will require a setting of four or five. A very bright cabin will require a setting of twelve or thirteen. The factory default setting is thirteen (13).

P-10: Fahrenheit or Celsius Selection

The unit can be programmed to display either Fahrenheit or Celsius. Programming /F selects degrees Fahrenheit and programming /C displays degrees Celsius. The factory default setting is /F, Fahrenheit. When degrees Celsius (/C) is selected the readings are displayed in tenths, i.e. 22.2/.

P-11: Outside Air Sensor Option

On this unit, there is no faceplate temperature sensor. The return air sensor is plugged in the Alternate Air Sensor jack and therefore, the outside air temperature option is not available.

P-12: Reverse Automatic Fan Speeds During Heating

The automatic fan speeds can be reversed during the heating mode to improve personal comfort in cooler climates. The fan speed is decreased as the temperature spread increases. The fan will speed up as the set point is approached. Lowering the fan speed when the cabin is cold raises the supply air temperature. The fan switches to low speed when the set point is satisfied and the water valve cycles off. The fan can be programmed to operate the same as in cooling by programming P12 **nor** which represents normal fan operation during the heating cycle. The factory default is **rEF**, which reverses the automatic fan speeds during heating.

P-13: Cycle Fan with the Cooling or Heating Demand

The fan can be programmed to run continuously when the system is on or can be allowed to cycle with the demand. When cycled with demand, the fan will operate only when heating or cooling is called for. To cycle the fan with the Heating or Cooling Demand select "**CYC**". To operate the fan continuously select **con** which represents continuous fan operation. The factory default is continuous fan operation "**con**" when the system is on.

P-14: Electric heating element Option

Units may be equipped with Electric heating element or an in-line electric duct heater. Electric heating elements are used when the chillwater system is in the cooling mode and a particular cabin requires heating. The electric heating elements are also used to supplement chillwater heating when necessary. Program P-14 for **ELE** to select the Electric heating element option. The factory default is **nor** which normally selects Chillwater Heating and Cooling only. **IMPORTANT:** Please note that option P-14 has to be programmed for **ELE** to allow electric heat electric heating element operation.

P-15: Fan Motor Selection

There are two basic fan motor types, shaded pole (SP) and split capacitor (SC). Each motor reacts differently to speed control and each motor requires different timing for optimum fan speed variation. The default setting is "**SP**" which selects the shaded pole motor type, however, "**SC**" should be selected if a split capacitor type of fan motor is used. **Aqua-Air Manufacturing** supplies shaded pole type fan motors, therefore, the factory default selection is "**SP**".

P-16: Reset Memorized Defaults

The default programming parameters can be reset by entering the program mode and selecting "**rst**". This will restore the programmable parameters to the values selected when the system was shipped. The program parameters listed on page nine may be altered by **Aqua-Air Manufacturing**, the installing dealer or the end user. Once new defaults are entered (see page 7, dual button functions) and memorized the new defaults will be reset. The original factory programmable parameters as listed on page twelve (12) will have to be restored manually.

Why Memorize New Defaults?

Once the desired programming changes have been made and the system tests satisfactorily, your work can be saved as the new factory defaults. Your new defaults are initiated by simultaneously pressing and releasing the up and down buttons prior to exiting the program mode. New defaults can be initialized at any time by entering the program mode and following the above instructions. Once new defaults have been initialized the control will revert back to the new defaults whenever factory defaults are restored as described on page 10 of this manual.

P-17: Chillwater Valve Forced Open

This feature allows service personnel to force the chillwater water valve open to facilitate bleeding air from the system. Selecting **OPn** will force the valve open for 4 hours while normal cooling and heating is maintained. The valve can be returned to normal operation anytime during the cycle by selecting **nor** which stands for normal operation.

P-18: Ambient to Water Temperature Differential

The difference between ambient air temperature and chillwater water temperature is used to control water valve opening and closing. The programmable range is five (5/F) through twenty-five (25/F) degrees Fahrenheit. Selecting fifteen (15/F) opens the valve when water temperature is fifteen (15/F) degrees less than ambient in cooling mode and fifteen degrees (15/F) greater than ambient in the heating mode. **Figure 3** illustrates the relationship between ambient air and chillwater water temperature using the factory default values.

Careful selection of the temperature differential can fully utilize the ships heating and cooling resources. For example, while in the cooling mode and using a ten degree value, the valve will open to allow some cooling while the chillwater system is coming down to temperature. The programmable range is 5 to 25/F and the Factory Default Setting is 15/F.

AMBIENT AIR TO WATER TEMPERATURE DIFFERENTIAL

When equipped with an optional electric heater, the heater will overlap with the chillwater heat by twenty-two degrees Fahrenheit (22°F). The heater will turn on when heat is required and remain on until the chillwater water temperature exceeds the ambient by twenty-two degrees Fahrenheit or until the room temperature is satisfied.

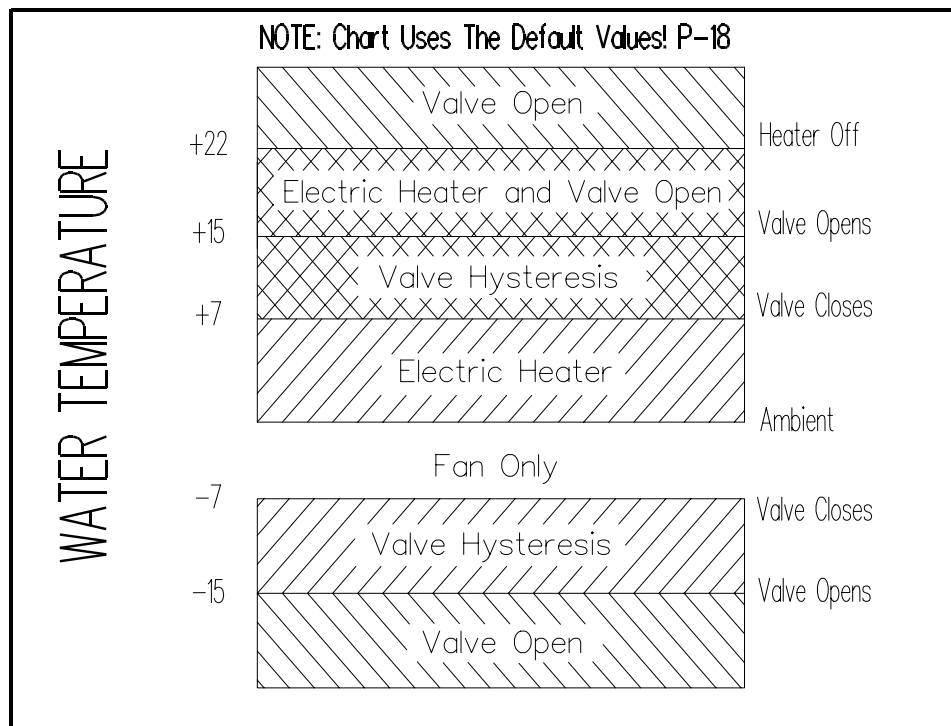


Figure 3: Ambient Air to Water Temperature Differential

The electric heat is allowed to overlap the chillwater heat to supplement the main heating system during very cold conditions.

SPECIAL HARDWARE INSTRUCTIONS

Bimini Jumpers

The **Tempwise 2001** is equipped with four (4) emergency operation jumpers... Fan, Water Valve, Auxiliary Fan and Heater. Should any of these outputs fall, the output can be forced On by moving the jumper to the position indicated below.

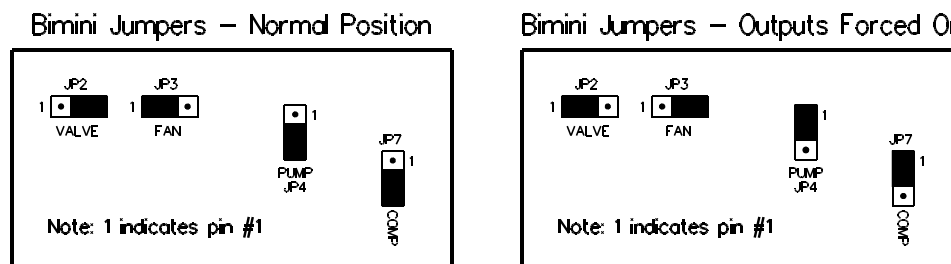


Figure 4: Bimini Jumpers Settings

IMPORTANT! The Heater Relay and Heater Bimini Jumper (JP7) are marked Compressor Relay and COMP because the same Input / Output printed circuit board is used for both the **Tempwise 2001** (Direct Expansion Control) and the **Tempwise 2001** (Chillwater Control).

CAUTION! Allowing the **Tempwise 2001** to operate with any or all of the outputs forced **On** while unattended can cause serious damage to the air conditioning system and/or vessel.

Do not leave the cabin unattended while any of the outputs are forced On.

Specifications

SET POINT RANGE	55/F - 85/F
TEMPERATURE RANGE DISPLAYED	0/F - 150/F
SENSOR ACCURACY	±2/F @ 77/F
LOW VOLTAGE LIMIT - 115V UNITS	75VAC
LOW VOLTAGE LIMIT - 230V UNITS	175VAC
LOW VOLTAGE PROCESSOR RESET	65VAC
LINE VOLTAGE	115 - 230VAC
FREQUENCY	50-60 Hz
FAN CIRCUIT RATING	6A @ 230V
VALVE CIRCUIT RATING	1/4A @ 230V
PUMP CIRCUIT RATING	6A @ 230V
HEATER CIRCUIT RATING	20A @230V
MINIMUM OPERATING TEMPERATURE	0/F
MAXIMUM OPERATING TEMPERATURE	180/F
MAXIMUM RH CONDITIONS	99% non-condensing
POWER CONSUMPTION	Less than 5 Watts

Operating Temperatures

Set Point	55 to 85/F	15.6 to 29.4/C
Display Range	0 to 150/F	-17.8 to 65.6/C
Air Sensor Temperature	0 to 150/F	-17.8 to 65.6/C

Dimensions

Display Panel	5.13"W x 4.125"H
Panel Cut Out	4.56"W x 3.375"H

(Continued next page)

Cable Lengths¹

Display	15' std. Optional to 50'
Air Sensor	7' std. Optional to 50'
Water Sensor	7' std. Optional to 50'

System Inputs

Inside Air Temperature Sensor
Water Inlet Temperature Sensor

¹**NOTE:** Maximum length of display cable is fifty (50) feet. Sensor cable lengths should be limited to 50 feet. The outside air sensor is an optional item not available on all models and is not included with the standard control package.

Basic System Start-up Problems

PROBLEM	PROBABLE CAUSE	SOLUTIONS
<ul style="list-style-type: none"> • No lights in the display and the system does not heat or cool. Power on reset does not occur when AC power is applied. 	<ul style="list-style-type: none"> • AC breaker is not turned on or AC power is not available. • Display cable or jacks broken or dirty. • Display cable is improperly assembled. • AC input is less than 75 VAC. 	<ul style="list-style-type: none"> • Check for AC power at circuit breaker. • Check for AC power at module inputs. • Clean all jacks and plugs. • Try another known good display cable. • Check for proper AC power.
<ul style="list-style-type: none"> • The system operates but there is no water valve and no heat or cool lights. 	<ul style="list-style-type: none"> • The set point is satisfied. 	<ul style="list-style-type: none"> • Raise or lower the set point to allow the unit to cycle.
<ul style="list-style-type: none"> • The display toggles between AAA and zero (0), and the system will not run. 	<ul style="list-style-type: none"> • The face plate air sensor is shorted or the display cable has been shorted or damaged. • The face plate air sensor is open or the display cable is broken. 	<ul style="list-style-type: none"> • Clean all plugs and jacks. • Try an alternate air sensor or replace the display with a known good display. • Try a known good display cable. • Check the existing display cable for screws, staples and other damage.
<ul style="list-style-type: none"> • System displays room temperature but there is no fan or water valve operation. 	<ul style="list-style-type: none"> • Set point is satisfied and P-13 is programmed to cycle the fan on demand. • See page 12 of this manual. 	<ul style="list-style-type: none"> • Raise or lower the set-point temperature to allow the system to cycle on... Check P-13.
<ul style="list-style-type: none"> • The system operates but the fan does not operate. • The fan runs but only in high speed, lower speeds are not available. • The fan runs very slow and is noisy. 	<ul style="list-style-type: none"> • The fan wiring is incorrect. • Ducting is restricted or fan is miswired or triac has failed in closed mode. • Fan triac has failed or motor is defective. 	<ul style="list-style-type: none"> • Check and correct fan motor wiring. • Check for proper duct sizes, correct any duct restrictions and check wiring. Return the module for fan output triac replacement. • Check fan motor and replace triac or return module for repair or call for service.

Advanced Chillwater System Problems

PROBLEM	PROBABLE CAUSE	SOLUTIONS
<ul style="list-style-type: none"> • System runs continuously and is not able to achieve set-point. 	<ul style="list-style-type: none"> • Set-point temperature set too low. • Insufficient hydronic cooling water. • No Hydronic cooling water. 	<ul style="list-style-type: none"> • Raise the set point to the 68// 72/F range. • Restricted water flow or air is trapped in convector. • Check the main chiller module for proper operation.
<ul style="list-style-type: none"> • System short cycles and display indicates low temperatures. 	<ul style="list-style-type: none"> • Supply air vent is blowing directly on display face plate. • The alternate air sensor improperly installed. 	<ul style="list-style-type: none"> • Re-direct the air guide vanes, relocate the display or install an alternate air sensor. • Check and correct the air sensor location.
<ul style="list-style-type: none"> • Convector coil is cool (hot), hydronic water flow and temperature is correct but the system is still not cooling (heating) properly. 	<ul style="list-style-type: none"> • Duct is restricted. • Set-point temperature is set too low. • Low fan speed is programmed too low... P-2. 	<ul style="list-style-type: none"> • Check and repair ducting • Raise the set point to the 68/72/F range. • Raise the low fan speed parameter... P-2.
<ul style="list-style-type: none"> • All eights (888) appear in the display on start-up and the system operates normally. 	<ul style="list-style-type: none"> • Power on reset indicating all LED's are OK and the system is functional. 	<ul style="list-style-type: none"> • This is the normal boot-up routine and occurs when the AC power is first applied.
<ul style="list-style-type: none"> • The AC breaker trips when switching from shore to ships power. Applies to vessels with two or more staged chillers modules on board. 	<ul style="list-style-type: none"> • Multiple stage chiller compressor time delays are not set, or are all set at he same value. 	<ul style="list-style-type: none"> • Enter the Hydromatic programming mode and set the staging delay at least 5 seconds apart... See the main chiller manual for further instructions.
<ul style="list-style-type: none"> • Unit is programmed to cycle fan on demand but fan continues to run after set-point is satisfied in heat mode. 	<ul style="list-style-type: none"> • Chill chaser or electric heating supplement was required. Fan remains on for 3 minutes to cool down element. 	<ul style="list-style-type: none"> • After the heating requirements are satisfied, the fan remains on to remove residual heat from the electric heating element.
<ul style="list-style-type: none"> • System seems to operate properly but there is no fan or fan runs very slow and makes a loud humming noise. 	<ul style="list-style-type: none"> • Fan Motor is 230V and supply is 115V. • Fan is improperly wired. • Fan motor is defective. • Fan output triac has failed. 	<ul style="list-style-type: none"> • Change voltage or replace fan motor. • Correct the wiring. • Replace the fan motor. • Return control module for repair or call for service.

<ul style="list-style-type: none"> • System operates but valve and heater outputs appear to be reversed. 	<ul style="list-style-type: none"> • Jumper JP1 not removed from module board. 	<ul style="list-style-type: none"> • JP1 must be removed for the module to function as a chiller control.
<ul style="list-style-type: none"> • The system operates fine, however, in heating mode the fan continues to run for three minutes after the set point is satisfied even though the fan is programmed to cycle on demand. 	<ul style="list-style-type: none"> • The main hydronic system is in the cooling mode and the particular cabin called for heating which was supplied by the electric heater. 	<ul style="list-style-type: none"> • This is normal operation. The fan will continue to run for 3 minutes after the set point is satisfied when the electric heater or chill chaser is required.

Tempwise 2001 Stuck Button Chart

Stuck Button	Display Behavior
POWER SELECT UP DOWN	From the Off Mode, the control will reset ("888") and the display will go blank. From the On Mode, the display will not reset, ambient temperature is displayed, all outputs work but no buttons work.

Tempwise 2001 Display Cable Troubleshooting Guide

Display Problem	Possible Causes
No display and the buttons will not work.	<ul style="list-style-type: none"> - The cable is assembled backwards. - Pin 1 is open - Pin 3 is open
No buttons, no display but the fan is running.	<ul style="list-style-type: none"> - Pin 5 is open - Check Bimini jumper for proper location
No relays turning on, display is on, buttons operate and fan is running.	<ul style="list-style-type: none"> - Pin 2 is open - Pin 1 and Pin 2 are shorted - Pin 4 is open
No fan output.	<ul style="list-style-type: none"> - Pin 6 is open
All the relays are on, no fan operation and no display.	<ul style="list-style-type: none"> - Pin 2 and Pin 3 are shorted