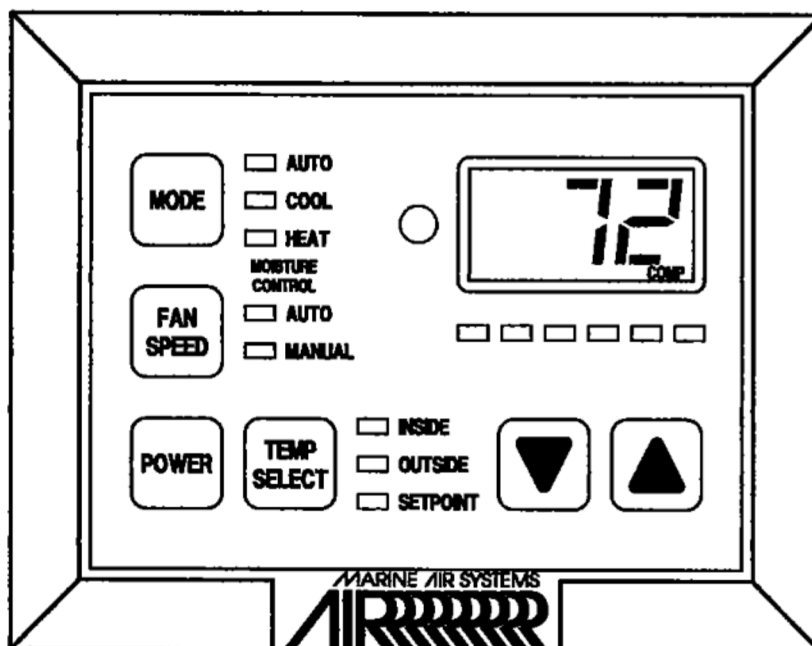# MARINE AIR SYSTEMS®

AH-Maxx
Operations Manual

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A Member of the Taylor Made Group™

Revision: 9 - Date: 7/22/97

AH-Maxx

QUICK REFERENCE GUIDE

MARINE AIR SYSTEMS

DWG# H4080005A, P/N 332903

PROGRAMMABLE PARAMETERS

Program Number	Description	Factory Default Setting*	Range
P-1>P-3	Moisture Control	–	See Operations Manual
P-4	Temperature Display Units	F	F = °Fahrenheit C = °Celsius
P-5>P-7	Temperature Calibration	–	See Operations Manual
P-8	Continuous Fan or Fan on Demand Only	ON	ON = Continuous Fan OFF = Fan on Demand
P-9>P18	Fan Speed and Auxiliary Fan Output Settings	–	See Operations Manual
P19	Air/Water Temp Differen.	10°F	
P20	Electric Heat Option	15°F	
P21	Network Station ID #	0	
P22	Water Valve Forced Open	10°F	
P23	Relative Humidity Sensor	0%RH	

*Default Settings are re-programmable, see Operations Manual.

GENERAL MAINTENANCE GUIDELINES:

Check sea water strainer weekly, clean as required.
Check return air filters monthly, clean as required.
Check for steady stream of water at overboard discharge(s).
Neglecting to check and correct any of the above may cause loss of performance and/or component failure.

MARINE AIR SYSTEMS – POMPANO BEACH, FL USA

## OPERATION BUTTON(S) DESCRIPTION

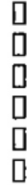|		
ON/OFF	POWER	Press and release to turn ON and OFF.
MODE	MODE	Press MODE button to select desired functions as indicated by LED's: AUTO—Automatic switching between heating and cooling. COOL—Cooling mode only. HEAT—Heating mode only. MOISTURE CONTROL—Dehumidification.
TEMP SELECT	TEMP SELECT	Press TEMP SELECT button to select desired functions as indicated by LED's: INSIDE—Actual cabin temperature. OUTSIDE—Outside air temperature (optional). SETPOINT—Desired cabin temperature.
TEMP CONTROL	▶ ◀	Press UP or DOWN button until desired temperature (setpoint) appears in display. Setpoint is automatically displayed.
FAN SPEED	FAN SPEED	Press and release FAN SPEED button to select mode: AUTO—Fan speed automatically adjusts to cabin conditions. MANUAL—Press and hold FAN SPEED button until 1 (slow) to 6 (fast) LEDs illuminate under the temperature display. Fan may be used while A/C is off.
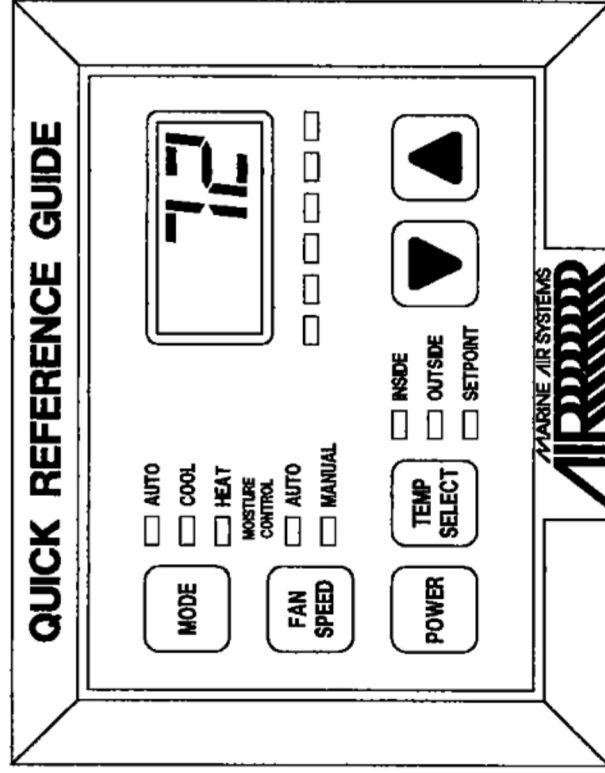
BASIC PROGRAMMING INSTRUCTIONS:

The PROGRAM MODE is used to adjust operating parameters to tailor the system for efficient operation and to allow for user flexibility.

To ENTER PROGRAM MODE: while the A/C is off, press and hold the POWER button for 5 seconds until a 'P' appers in the display. Release button and 'p-1' appears followed by the parameter value.

To UNLOCK PROGRAM MODE: enter program mode, simultaneously press and release the POWER and TEMP SELECT buttons. Program parameters may now be reset.

To SELECT PROGRAM PARAMETER: press and hold the MODE button to scroll up through the programs, press and hold the TEMP SELECT button to scroll down. There are 23 parameters, 'P-1' – 'P23'.

To CHANGE PROGRAM PARAMETER: use the UP and DOWN buttons to select the data or set the desired limits of parameter.

To LOCK NEW DEFAULT SETTINGS: once the desired programming changes have been made and before exiting program mode, simultaneously press and release the UP and DOWN buttons. Locking new defaults will render "Factory Defaults" obsolete.

To EXIT PROGRAM MODE: Press the POWER button or press no buttons for 60 seconds.

To RESET DEFAULT SETTINGS: while the A/C is off, press and hold the POWER button for 10 seconds until 'IP' appears in the display. Release button and the software version number appears.

Refer to the Operations Manual for a complete list and thorough explanation of all programmable parameters.

REV A, 3/98
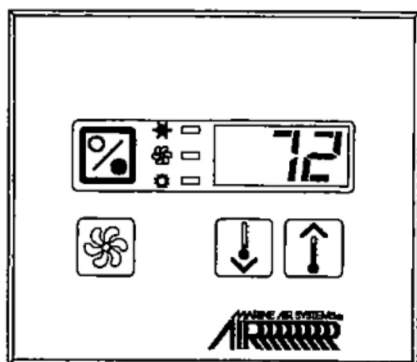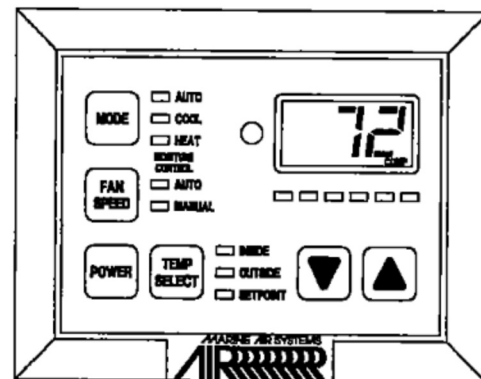
AH-PASSPORT

AH-MAXX

NO-VALVE AIR HANDLER

NOTICE

Change the following AH-Passport or AH-Maxx programmable parameters when using any Chilled Water Air Handler with NO VALVE:

AH-Passport:

U-10 must be set to **"0"** for the fan to cycle on demand of the thermostat only (all units).

U-12 must be set to **"1"** for a shaded pole fan motor (AHFD 6-16 units only).

AH-Maxx:

P-8 must be set to "OFF" for the fan to cycle on demand of the thermostat only (all units).

DATE: 11/5/98	OPERATION INSTRUCTIONS 'NO—VALVE' AIR HANDLER WITH AH—PASSPORT/MAXX CONTROLS FOR CHILLED WATER SYSTEMS	Taylor Made ENVIRONMENTAL™
SCALE: N.T.S.		
STATUS: CURRENT		
DRAWN BY: DKM APPROVED BY: D D DRAWING NO: H4080007A		Cruisair AIR GRUNERT Sentry

AIR HANDLERS

Air handlers are designed in three types of configurations; blow thru, draw thru and slim line, to allow for diversity and flexibility in application. All types must be fastened securely and level for proper operation and condensation removal. All air handlers must have an unrestricted return air stream. Air handlers, and their return air inlets, must not be located in areas open to bilges, lazarettes, heads or other areas where fumes or odors can be introduced into the conditioned air supply.

MOUNTING DIGITAL AIR HANDLER CONTROLS

Before mounting the air handler digital display panel touch pad, consider the location. The air sensor built into the display panel will provide excellent room air temperature sensing given a proper installation. The display panel should be mounted on an inside wall, slightly higher than mid-height of the cabin, in a location with freely circulating air where it can best sense average temperature. Do not mount the display in direct sunlight, near any heat producing appliances or in a bulkhead where temperatures radiating from behind the panel may affect performance. Do not mount the display above or below a supply or return air grille or in the supply air stream. Do not mount the display behind a door, in a corner, under a stairwell or any place where there is no freely circulating air. Mount the display within display cable length (custom lengths available) of the air handler. Plug the cable into the circuit board in the electrical box and into the back of the display panel. Secure the display panel to a bulkhead with the adhesive strips provided. Clean the mounting surface with *isopropyl alcohol only* prior to placement (test alcohol on hidden portion of surface first). If the adhesive strips cannot be used, use #6 truss head screws to mount the display. The panel has predrilled holes in each corner that can be accessed by peeling back the adhesive strips. **Carefully & slowly drill 5/32" holes through the front of the lexan cover lining up with the predrilled holes in back. Do not use a screw gun and do not over-tighten screws when mounting panel.** Over-tightening screws will damage the lexan cover. **If a proper location for room temperature sensing cannot be found for the display, an optional remote air sensor may be used.** Mount the remote air sensor in the return air stream behind the return air grille/opening and plug its cable into the appropriately marked socket on the circuit board. See appropriate air handler control manual for programming and operation.

CONTENTS

AH-Maxx Operations Manual
Marine Air Systems
2000 North Andrews Avenue, Extension
**Pompano Beach, Florida 33069 954-973-2477**

Introduction

The AH-Maxx is a new digital convector control designed specificality for the Mega-Yacht Industry. The standard unit consists of the Display Head, Water Inlet Sensor and a remote mounted Control Module. The system is constructed for ease of installation and high reliability in the marine environment. The following pages describe operational and user-defined parameters included in the system.

System Features

Water Inlet Sensor

Each unit is supplied with a water inlet temperature sensor which is used to control automatic heating and cooling cycles. This feature eliminates the need to manually switch from heating or cooling. The space can be heated or cooled automatically in accordance with system water temperatures. Combined with an electric chill-chaser, the system offers the ultimate in individual state room temperature control.
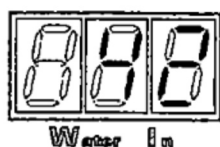
Face Plate Air Sensor

The ambient air sensor is located in the display panel. The face plate sensor produces excellent results in most installations, however, the display must be mounted on an inside wall at eye level, much the same as your home thermostat. There is an alternate (remote) air sensor available for installations requiring special treatment.
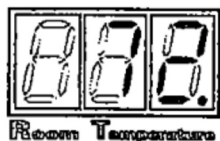
NOTE: The display should **not** be subjected to direct sunlight. The alternate (remote) air sensor should be used if these conditions cannot be met.

Advanced View Mode

Blower motor speed (in RPM), AC line frequency (Hz), relative humidity (RH), water inlet, water outlet temperatures, outside air, inside air and set point can be viewed by simply pressing and holding the Temperature Select Button for 5 seconds. Use the up and down arrows to scroll through the viewable items. Press the Select Button or press no buttons for 60 seconds to exit the view mode.
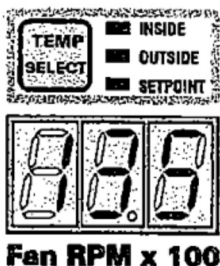
Non-Volatile EEPROM

Operating and programmed parameters are entered into nonvolatile memory and saved. If for any reason, power is lost, all parameters are saved indefinitely without the use of batteries or external power. When power is restored, the control will resume operation exactly where it left off, even if its years later.

Fan Operation

Please note... the fan will remain at speed one without the proper hydronic cooling or heating water temperature. With program parameter P-8 programmed Off, no fan operation will occur until the proper water temperature is reached.

System Features

INFO

Fan Speed Compensation

When line voltage falls, the fan speeds are automatically compensated. Correct fan speed settings are maintained, thus constant airflow is maintained. Proper fan operation is assured no matter what the AC line conditions are.

Ambient Light Sensor

The display is equipped with a photodiode which automatically controls LED brightness. This feature allows maximum visibility in very bright conditions while maintaining subdued visible levels at night.

System Features

Automatic or Manual Operation

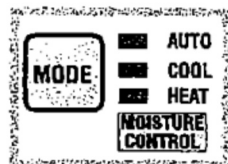Operating Modes can be easily selected from the display panel with one push button. Select Cooling, Heating, Automatic or Moisture Control by simply pressing the Mode Button. Fully automatic, or six (6) manual fan speeds can also be selected by pressing the Fan Button.

Moisture Control Dehumidification

The systems firmware contains a dehumidification moisture control mode which maintains unoccupied state rooms at predetermined temperature and humidity level. The moisture control mode is entered by simply pressing the mode button until Moisture Control is illuminated in the display panel.

Optional Features
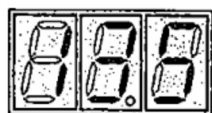
Fan RPM x 100
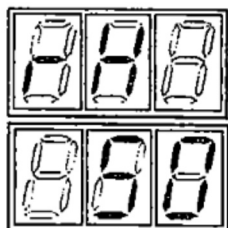
Closed Loop Fan Speed Control

The fan motor RPM (Revolutions Per Minute) can be controlled and displayed in the units three digit seven segment display panel. Maximum motor RPM can be programmed allowing for proper fan speed operation, no matter what the ducting or installation idiosyncrasies dictate. Speed and air flow can be correlated to suit individual needs and preferences. The motor manufacturers maximum RPM ratings should never be exceeded, this produces the quietest most efficient fan speed control.

Relative Humidity

Direct Readout Humidity Sensor

There is an optional Relative Humidity Sensor which simply plugs into the module board. Humidity can be viewed and controlled from the display panel much the same as setting and viewing temperatures. Install the sensor, select the desired relative humidity setting (i.e. 50%) and let the control do the rest. Humidity level is maintained in the background while the system maintains the proper temperature.

Optional Features
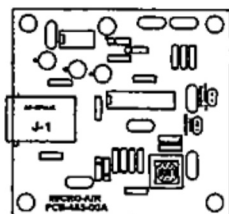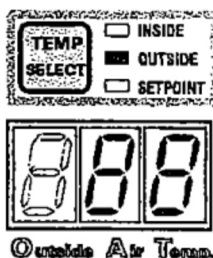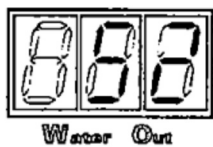
On line Networking

When each module is equipped with the necessary hardware to network all on board controls to a centrally located PC. This allows the ships engineer to operate, monitor and program the modules from one central location. Networking is accomplished by connecting the units together with an eight (8) conductor shielded phone wire using modular phone jack connectors.

Water Out Sensor

An optional water out sensor is offered for monitoring convector performance. Knowing the water in and water out temperatures allows service personnel to balance the water flow for maximum convector performance. The sensor can be supplied and installed as a permanent part of the system or can be used temporarily as a service and installation tool, allowing one sensor to be kept on hand for service purposes only. The water out data is easily accessed from the view mode.

Outside Air Sensor

The optional outside air sensor is available for monitoring the ambient air temperatures outside the vessel. When the sensor is installed, use the temperature select button to view the temperature. When the sensor is not installed, the outside LED will not illuminate and temperature select will only light the inside and set point LEDs. Networking the controls together allows the data to be shared among all the units and requires only one outside air sensor.

Alternate Air Sensor

When installation restrictions force placement of the display panel where the faceplate sensor will not function properly, the alternate air sensor must be installed. Installation is transparent and no program changes are required. Plug in the sensor and the inside temperature is automatically taken from the alternate sensor location.

When using the **OPTIONAL RELATIVE HUMIDITY SENSOR** an alternate air sensor is not required because the RH SENSORS internal hardware includes an alternate air sensor.

Auxiliary Electric Heat

Each control module is fitted with an additional forty (40) amp electric heater output. Equipping the convector with an optional Cal. Rod Heater will allow independent heat regardless of hydronic water temperature. When the Chill Chaser (Cal. Rod Heater) is installed, heating is available even though the main system is in the cooling mode. Heating is totally automatic and transparent to the state room occupants.

Operator Controls and Display Panel

Push Buttons Display and LED Locations

Refer to Figure 1 for Button, Display and LED locations listed on the following pages.

AH-Maxx Display Panel

Figure 1: AH-Maxx Control Buttons and Indicator Displays
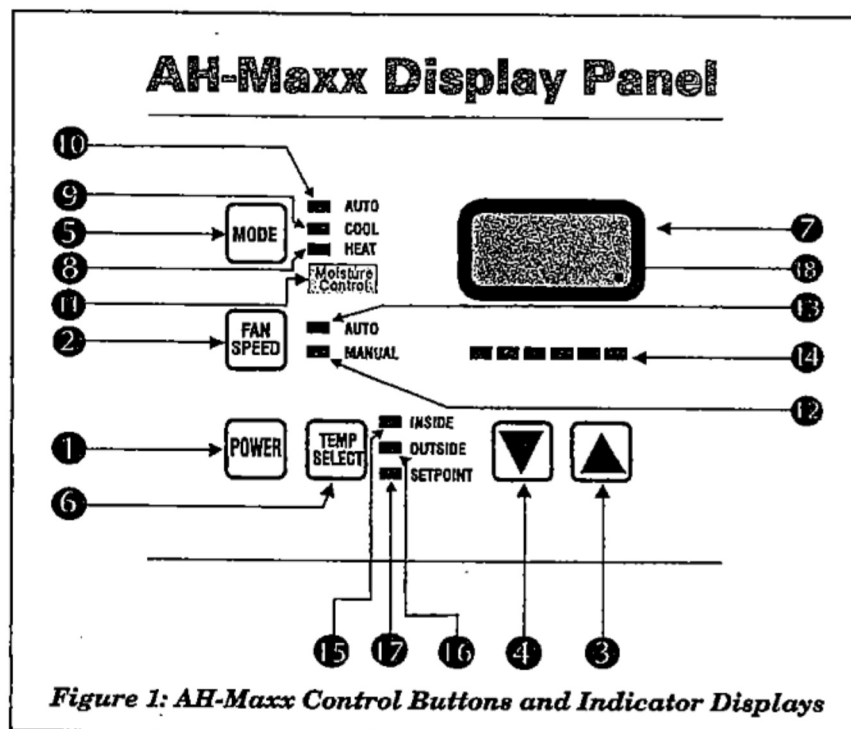
Power Button ❶

The power button is used to switch between the off and on modes, enter the program mode and reset the factory default programmable parameters.

Fan Speed Button ❷

Use this button to switch between automatic and manual fan speeds and also select a manual fan speed when in the manual mode.

Up Button ❸

Use the up button to increase the temperature set point and increase values of programmable parameters, when in the program mode. The up button is also used to scroll thru view mode items.

Operator Controls and Display Panel

Down Button ➍

The down button is used to decrease the temperature set point value and decreases values of programmable parameters, when in the programming mode. The down button is also used to scroll thorough view mode items.

Mode Button ➎
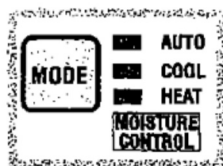
The mode button is used to switch between various modes of operation. The Operating Modes are Automatic, Heating, Cooling and Moisture Control. The button is also used to scroll up through the program features when in the program mode.

Temperature Select ➏

Press the Temperature Select Button to choose the set point, inside air or outside air temperature. The temperature selected is indicated by illuminating the appropriate LED located next to the button. The Select Button is also used to enter the View Mode by pressing and holding for five (5) seconds. The Temperature Select Button is also used to scroll down through programmable features in the Program Mode. The button is also used to clear displayed fault messages.
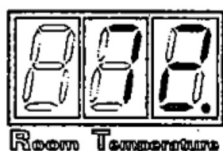
Three Digit Display ➐

The displayed information includes set point, inside and outside temperatures, AC line frequency, fan RPM, water in and water out temperatures, as well as program information and fault codes. The decimal point (far right) indicates the water valve is activated, therefore, one of the systems compressors is operating.
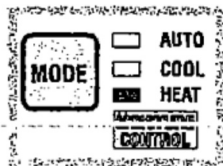
Heat Mode LED ➑

The heat mode indicator will be lit when the Heat Mode has been selected. The system will only respond to heating requirements when this mode is selected.
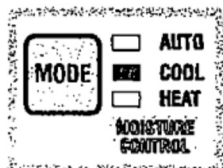
Cool Mode LED ➒

The cool mode indicator will be lit when the Cool Mode has been selected. The system will only respond to cooling requirements in this mode.

Operator Controls and Display Panel
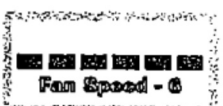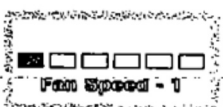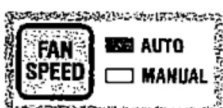
Automatic Mode ⑩

The automatic mode LED will be lit when the Automatic Mode has been selected. Automatic mode allows cooling and heating according to temperature requirements. Changing modes automatically requires a temperature differential, between room temperature and set point, of four degrees Fahrenheit (4° F).

Moisture Control Mode ⑪

Selecting Moisture Control Mode allows the temperature and humidity levels of unoccupied state rooms to be maintained at pre-selected values. Moisture control can be equipped with an optional humidity sensor which allows direct readout of relative humidity in the display panel. The humidity sensor allows control in actual Rh values, i.e. 50% Rh. No guess work or programming, simply select Moisture Control, set the required humidity level and let the AH-Maxx do the rest.

Manual Fan ⑫

The manual fan indicator LED will be lit when Manual Fan Mode has been selected. Select the manual fan speed mode by pressing and releasing the fan button to toggle the fan from automatic to the manual fan mode. Press and hold the fan button until the desired fan speed LED is lit. When a manual fan speed is selected the blower speed remains at the selected value and does not vary with the temperature. Manual fan speed selections are retained in nonvolatile memory and recalled whenever Manual Fan Mode is reentered.

Automatic Fan ⑬

The automatic fan LED will be lit when Automatic Fan Mode has been selected. Fan speeds will vary according to temperatures and mode, Heating or Cooling.

Fan Speed Bar Graph ⑭

The fan speed indicator bar graph is comprised of six LEDs, one each representing a specific fan speed. The first LED represents fan speed one (1) and is first on the left. Fan speed six (6) is represented by the last light on the right of the panel. The bar graph is operational in Automatic, Manual and Circulate Only fan modes.

Inside LED ⑮

The Inside LED is lit when the inside air temperature has been selected. The temperature shown in the display indicates the reading at the face plate or optional remote (alternate) air sensor, if installed.

Operator Controls and Display Panel
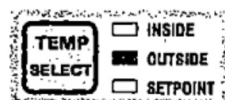
Outside Air Temperature LED ⑯

When the Outside LED is lit, the display panel indicates the outside air temperature. The outside air sensor is optional and the LED will not light if the sensor is not installed. When the controls are Networked together, only one outside air sensor is required. The data from one sensor is shared with all controls in the loop.

Set Point LED ⑰

The set point LED indicates that the current Temperature Set Point is being displayed. The set point can be viewed at any time by momentarily pressing and releasing the up or down button, or can be selected with the Temperature Select Button.
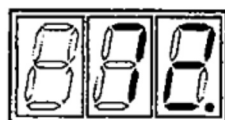
Valve / Compressor On LED ⑱

When the last decimal point to the right of the display is lit, the water valve is open which indicates one of the systems compressors is operational. The Valve LED provides visual feed back on system status for both the operator and service personnel.

Valve on LED

Modes of Operation

Off Mode

When in the Off Mode all control outputs and the display are turned off. Power is, however, maintained to the processor which means the computer remains operational. Any service work should be performed with the AC power turned off at the circuit breaker. All programed parameters and user settings are saved in nonvolatile memory. The Program Mode can only be accessed from the Off Mode.
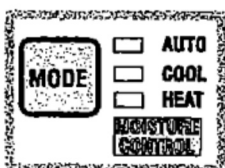
On Mode

When AH-Maxx is in the On Mode, power will be supplied to the appropriate outputs and the display will indicate the current operating status. The current state depends on the parameters stored when the control was turned off.

NOTE: When the power is interrupted or when the control is powered up for the first time a power-on reset condition occurs. The three digit display will flash all eights (8's) for one second before normal operation is resumed.
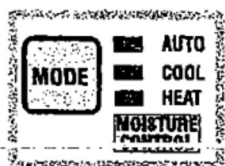
Power On Reset

Cooling Only Mode

Only cooling will be supplied when the Cool Only Mode has been selected. Enter Cooling Only by pressing the Mode Button until the Cool LED is lit.

Modes of Operation

Heat Only Mode

When the AH-Maxx is configured for Heating Mode, only heating will be supplied as required. Press the Mode Button until the Heat LED is lit to enter the Heat Only Mode.
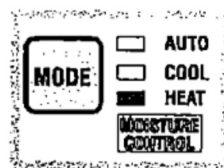
Automatic Mode

Both heating and cooling are supplied as required when in the Automatic Mode. To enter the automatic mode press the Mode Button until the Auto LED is lit. The Heat or Cool LED will be lit depending on which function is being supplied.

Temperature Hysteresis

Temperature is automatically maintained within the programmed range of the set point. For example, the factory default hystereses is two degrees Fahrenheit (2°F): When the temperature has been satisfied a two degree shift is required to establish demand. With a set point of 72°F the temperature will have to rise to 74°F before cooling will resume. A four degree shift is required to change from one mode to the other. Once the required Heating or Cooling Mode has been established, the hysteresis remains at (2°F). The four degree mode shift applies only to Automatic Mode.

Moisture Control

When AH-Maxx is configured for the Moisture Control Mode, the system maintains pre-selected temperature and humidity levels. Direct relative humidity readings (Rh) and control are available when the optional Rh Humidity Sensor is installed.

Automatic Fan Mode

Auto Fan Mode allows fan speed selection based on ambient verses set point temperature spread. The closer the ambient is to set point, the slower the fan speed. This permits a balance between efficient temperature control and quiet fan operation.

Manual Fan Mode

The Manual Fan Mode allows the user to manually adjust the fan speeds to his or her personal preferences. The fan mode is selected by pressing once and releasing the Fan Button. The Fan LED will indicate the selected mode, Auto or Manual.

Modes of Operation
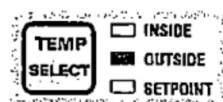
View Mode

The View Mode is a service tool, however, the user may find some of the information useful. The following items can be observed in the View and Advanced Mode: water in and water out temperatures, fan speed RPM, AC line frequency (Hz), relative humidity (Rh), inside and outside air temperatures. All view items are available by pressing the temperature select button.

Advanced View Mode is accessed by pressing and holding the temperature select button for five (5) seconds. The first item to appear in the display is the water inlet temperature followed by the items listed on page eleven (11) of this manual. The up and down buttons are used to scroll through the advanced view items.

Program Mode

The Program Mode is always entered from the OFF Mode by pressing and holding the Power Button for 5 seconds. The program mode allows the user to change any of the 23 programmable options to customize the control to suit the personal needs of the user or match specific installation requirements.

Using the AH-Maxx
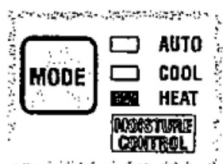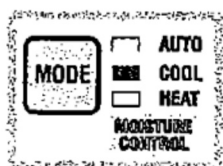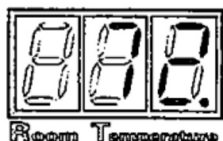
Basic Operation

Turn the unit on by pressing the Power Button once. Repeatedly press the Mode Button until the Auto LED is lit. Set the temperature by pressing the Up or Down Button until the desired set point appears in the display. Select an automatic or manual fan speed with the Fan Button. The factory default fan setting is Automatic ... making fan speed selection optional. That is all there is to it; your finished, sit back and enjoy. Turn the unit off by pressing the Power Button one more time.

Select Cool Only Mode

Repeatedly press the Mode Button until the Cool Mode LED is lit. Only cooling requirements will be satisfied in the Cool Only Mode. No heating is available in this mode.

Turn the Unit Off

Press the Power Button once to toggle the unit from the On to the Off Mode. The Power Button is also used to enter the Program Mode.

Select Heat Only Mode

Repeatedly press the Mode Button until the Heat LED turns on. Only heating will be supplied in the Heat Only Mode.

Using the AH-Maxx

Automatic Mode

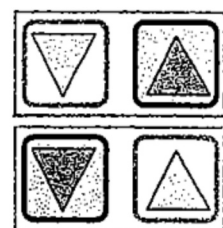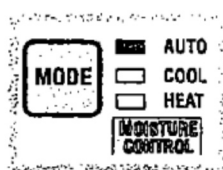Press the Mode Button until the Auto Mode LED turns on. The control is now in the Automatic Mode and heating or cooling will be supplied as required. The Cool LED will turn on during cooling and the Heat LED will be on while heating is in operation.

Moisture Control

Enter the Moisture Control Mode by pressing the Mode Button until the words Moisture Control are illuminated in the display panel. Minimum and maximum temperatures as well as humidity levels can be maintained in unoccupied cabins. Direct relative humidity readings and Rh control is available when the optional Rh Sensor is installed and parameter P-1 set to zero (0). Relative humidity level can be programmed and maintained during normal operation, as well as in the Moisture Control Mode.

Adjusting Set Point

The set point can be viewed by momentarily pressing the Up or Down Button, and adjusted by pressing and holding either button. Press and hold Up or Down to adjust the set point which should coincide with the desired room temperature. The display speed increases with the time the button is held down. The numbers change slowly at first, then rapidly increase as the button remains depressed. When the button is released the display returns to its previous state.

NOTE: *The control will maintain temperature within 2 degrees of set point. The maximum set point is 85°F and the minimum setting is 55°F.*

Fan Operation

There are six (6) separate programmable fan speeds, which are indicated by the Fan Speed Bar Graph located on the display panel. The first LED represents fan speed one (1) the next speed two (2) and so on until the final and sixth (6th) LED which represents fan speed six (6).

When Automatic Fan Mode is selected, speeds vary according to the difference between room temperature and set point. The larger the spread, the faster the fan will run, until maximum speed is reached. A six degree spread between set point and room temperature produces high fan speed. Fan speed is reduced as the set point is approached, culminating in low speed at set point. The speed is reduced one number for every one degree reduction in temperature spread.

Automatic Fan Mode

Momentarily press the fan button to toggle from Manual to Automatic Fan Mode. Auto Fan Mode is indicated by the Auto Led being lit. Automatic fan operation is detailed in the previous two paragraphs.

Using the AH-Maxx

Manual Fan Mode
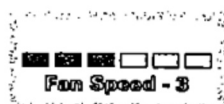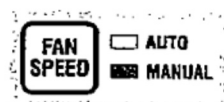
Pressing and releasing the Fan Button toggles fan Modes from Automatic to Manual. To scroll through the six (6) fan speeds press and hold the Fan Button; release the button at the desired fan speed. Releasing the button when the third LED is lit, selects fan speed three or medium.

NOTE! Selecting Manual Fan Speeds one (1) through six (6) allows fan speed operation only at the speed selected. The fan speed will not vary from the selected setting but will be corrected for low line voltage.

Fan Only Mode

While in the off mode press the Fan Speed Button once to turn the fan on. Press and hold the Fan Speed Button selecting the desired speed, which will be indicated by the Fan Speed Bar Graph. The system will only circulate air, no other functions are performed and only the Fan Speed Bar Graph is illuminated. Automatic fan speeds are not available in the Fan Only Mode.

View Mode

Press and hold the Temp Select Button for five (5) seconds. Release the button when the first viewed item, water in, appears in the display. A mnemonic code alternately flashes, along with the value, for the value being displayed. Use the Up and Down Buttons to scroll through the following items displayed in view mode:
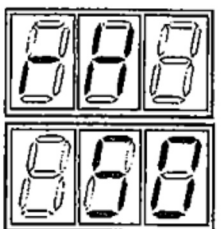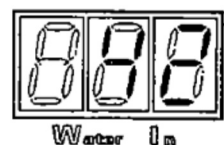
① Water In [Water Temp] [Code " in"]

② Water Out [Water Temp] [Code " out"]

③ AC Line Hz [Line Frequency] [Code "Fre"]

④ Fan RPM [Fan Speed in RPM] [Code "R-P"]

⑤ Relative Humidity [Humidity Level] [Code "Rh"]

⑥ Software Identification Code [Code "A0X"] (APPEARS WHEN EXITING VIEW MODE)

Use the Up and Down Buttons to scroll through the view items.

Exit the View Mode by pressing the Temp Select Button which returns the unit to normal operation.

The Software version identification code is flashed in the display for three (3) seconds immediately after exiting View Mode.

The control will automatically exit the View Mode if no buttons are pressed for one (1) minute.

NOTE! *To view the Water Out Temperature the optional water out sensor must be installed. If the sensor is not installed, the Water Out option will not show up in the view menu.*

Program Mode

Program Mode

POWER
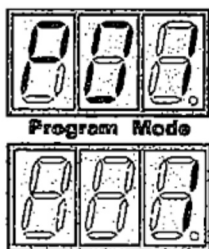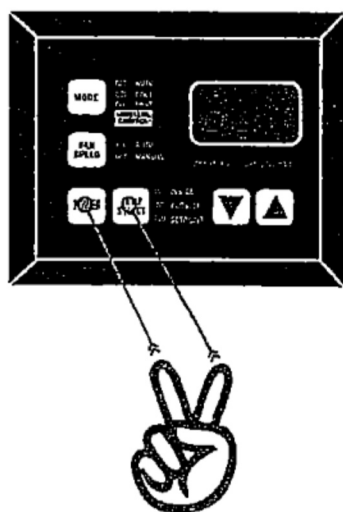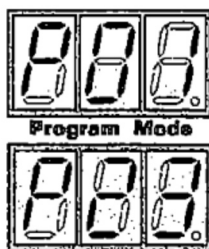
Program Mode

Overview

The Program Mode is used to change or adjust any one of the systems twenty-three (23) programmable options. AH-Maxx is shipped with Factory Default Settings of these programmable parameters, which are stored in permanent memory and can be recalled any time.

Programming Lock

Recent field problems related to programming mistakes precipitated the inclusion of a program lock. The purpose of the lock is to prevent untrained personnel from making erroneous program changes. Defeat the lock by entering the program mode and momentarily pressing the power and select buttons simultaneously.

WARNING: Untrained or persons not familiar with the operational concepts of the entire system can may cause serious damage if allowed into the programming mode.

Enter the program mode as usual, press the power and temperature select button simultaneously to defeat the lock.

This information should be made available only to trained service personnel.

NOTE: Program mistakes and the damage resulting from any programming errors is not covered under implied or stated warranty.

IMPORTANT!

Severe electrical disturbances can sometimes upset the controls operating sequences. Operator confusion related to program parameters can also cause, what seem to be, functional problems. Whenever there is any doubt as to proper control operation, Factory Default Parameters should be re-initialized.

Entering the Program Mode

From the Off Mode press and hold the Power Button for five (5) seconds, at which time "P01" appears in the display. Release the button and "P01" followed by the parameter value is displayed. AH-Maxx is now in the programming mode.

NOTE ! AH-Maxx will exit the Program Mode and return to Off if no buttons are pressed or programming attempted for one (1) minute.

Program Mode
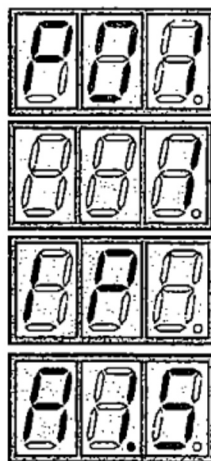
Restore
Factory Defaults

Restoring Factory Default Settings

Initialize the Factory Default settings from the Off Mode by pressing and holding the Power Button for ten (10) seconds. Five (5) seconds after the button is pressed "P01" appears in the window, ten (10) seconds later "I P" is displayed indicating the default settings have been restored. Releasing the button momentarily displays the Software Version Number (i.e. "A1.5") and returns the unit to the Off Mode.

Using Program Mode

Once in the Program Mode, use the Mode Button to scroll up or the Temp Select Button to scroll down through the program parameters. Program numbers are displayed "P-nn", where "nn" represents program numbers 1 to 23. The Up and Down Buttons are used to select desired program data limits. Some parameters are selected On or Off; again use the Up or Down Buttons. These methods are followed throughout the program mode, however, special instructions are included where required.

Exiting Program Mode

Exit the Program Mode using one of the two following methods:

1 - Press the Power Button once, the system exits Programming and returns to the Off Mode.

2 - Not pressing any button for one (1) minute, allows the unit to exit Programming and return to the Off Mode.

Software Identification Numbers always appears in the display (i.e."A1.5") for one (1) second prior to exiting the Program Mode.

Programmable Parameters
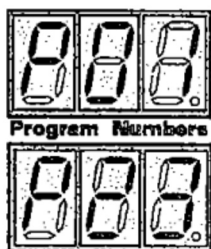
Program Numbers

There are twenty-three (23) Programmable Parameters along with the Factory Default Settings listed on page 14. The following details abbreviations, mnemonics and special programming instructions:

Unoccupied Mode can only be programmed if the optional Rh sensor __is not__ used. Rh is controlled by selecting a specific value, i.e. (50%Rh).

Fan speed programming numbers are represented by arbitrary units which allow individual adjustment of each speed. Spacing must be maintained between the various speeds. For example, setting six at 92 and five at 92 will eliminate fan speed six.

The ambient air to water temperature differential defines the point where the water valve opens allowing hydronic heating or cooling.

Electric Heat Assist Option defines the method used for heating, i.e. hydronic heat only, electric heat only, or a combination hydronic and electric heating.

Programmable Parameters

| P-#	Programmmable Parameter	Default	Values
P-1	Unoccupied Mode Dehumidification Level Select Zero (0) When Using Rh Sensor	Level 1	1, 2, & 3 or 0 to Select Rh Sensor
P-2	Unoccupied Mode High Temp. Set Point	85°F / 29°C	74°F to 95°F 23°C to 35°C
P-3	Unoccupied Mode Low Temp. Set Point	55°F / 13°C	50°F to 70°F 10°C to 21°C
P-4	Display Temperature Degrees Fahrenheit (°F) or Degrees Celsius (°C)	Degrees Fahrenheit (°F)	Degrees F (°F) or Degrees °C
P-5	Temperature Calibration - Inside Air Sensor	0°F	± 10°F
P-6	Calibrate [Optional] Outside Air Sensor	0°F	± 10°F
P-7	Temperature Hysteresis	2°F	1°, 2° or 3°F
P-8	OFF = Cycle W/ Demand ON = Cont. Fan	On	On / Off
P-9	Automatic Fan Speed Spread	1°F	1/2, 1°F or 2°F
P-10	Reverse Heat Mode Automatic Fan Speeds Increases Fan Speed as Set Point is Approached	Off	On / Off
P-11	Turn On Aux Output With Fan Speed Number ? Zero Allows Aux Output to Follow Main Fan	Fan Speed 4	Speeds 0 thru 6
P-12	Auxilary Output Fan Speed Compensation	Zero (0)	± 20VAC
P-13	Fan Speed Six (6) Setting ... Without Tachometer With Tachometer	90% Line Voltage 1610 RPM	30 to 100% 530 to 1790 RPM
P-14	Fan Speed Five (5) Setting ... Without Tachometer With Tachometer	80% Line Voltage 1430 RPM	30 to 100% 530 to 1790 RPM
P-15	Fan Speed Four (4) Setting ... Without Tachometer With Tachometer	75% Line Voltage 1340 RPM	30 to 100% 530 to 1790 RPM
P-16	Fan Speed Three (3) Setting ... Without Tachometer With Tachometer	65% Line Voltage 1160 RPM	30 to 100% 530 to 1790 RPM
P-17	Fan Speed Two (2) Setting ... Without Tachometer With Tachometer	60% Line Voltage 1070 RPM	30 to 100% 530 to 1790 RPM
P-18	Fan Speed One (1) Setting ... Without Tachometer With Tachometer	50% Line Voltage 890 RPM	30 to 100% 530 to 1790 RPM
P-19	Ambient Air to Hydronic Water Temp Differential	10°F	5°F to 25°F
P-20	Electric Heater Assist Option - Water to Ambient Temperature - Differential	15°F	5°F to 25°F O = Heater OFF
P-21	Network Station I. D. Number	0	0 thru 255
P-22	Hydronic Valve Forced Open Forces valve Open for Start-Up Service	Off (Normal)	On = Forced Open Off = Normal
P-23	Calibrate Relative Humidity Sensor	0 % RH	± 10%

Using Programmable Parameters
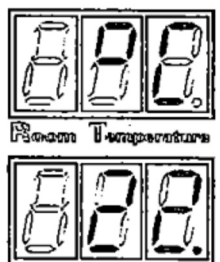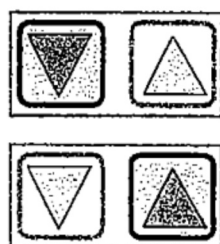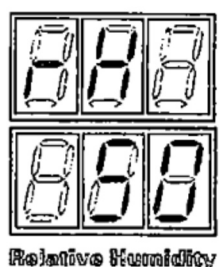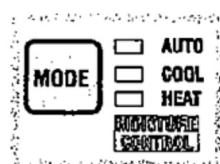
Moisture Control Level P-1

The Moisture Control Mode contains a dehumidification cycle which prevents mildew and reduces energy consumption. Level One (1) starts the fan every three and one-half (3.5) hours, circulates air for fifteen (15) minutes, samples air temperature and initializes cooling until the temperature is reduced two (2° F) degrees Fahrenheit. Every four (4) hours the cycle is repeated while, at the same time, maintaining maximum and minimum room temperatures. Moisture Control can be programmed at one of three (3) levels as shown in the table below. The factory default is two (2° F) degrees Fahrenheit.

IMPORTANT ! When using the optional Relative Humidity Sensor... Jumper **JMP1** must be installed, program parameter One (1) set to zero (0), and the Rh Sensor plugged into the Alternate Air Sensor jack.

Dehumidification Level	AH - Maxx Program Setting	Reduction in Temp Before Cooling is Stopped
Controlled by Rh Sensor	Zero (0)	Adjustable - 30 thru 80% Rh
1	1	2°
2	2	4°
3	3	6°

Moisture Control High Temperature Set Point P-2

This function sets the maximum cooling temperature that will be maintained during Moisture Control. The range is 74° through 95° Fahrenheit; room temperature is not allowed to exceed this setting. Use the Up or Down Button to select the desired setting — factory default is 85° F.

Moisture Control Low Temperature Set Point P-3

Low temperature set point defines the minimum temperature maintained during Moisture Control. The adjustment range is 50° through 70° Fahrenheit; room temperature will be maintained at this setting. Use the Up and Down Buttons for making your selection — factory default is 55° Fahrenheit.

Temperature Display Units P-4

Temperature units displayed can be Fahrenheit or Celsius as circumstances require. Program °F or °C as needed, however, for purposes of resolution all temperature functions are based on Fahrenheit. Factory default setting is degrees Fahrenheit.

Using Programmable Parameters
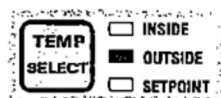
Inside Air Sensor Calibration P-5

The inside air sensor can be calibrated plus or minus (±) ten (10° F) degrees Fahrenheit. Enter the Program Mode and the current calibration offset is displayed ... Factory Default is zero (0). Use the Up or Down Button to select the desired offset.

Outside Air Sensor Calibration P-6

Various Outside Air Sensor locations may cause readings to vary making individual sensor calibration necessary. Select program option P-6 and follow the same steps described in the previous paragraph. The adjustment range is plus or minus 10° Fahrenheit and factory default is zero (0).

Temperature Hysteresis P-7

Hysteresis is defined as the difference between set point and actual room temperature. When the difference is exceeded, AH-Maxx will call for heating or cooling as required. To prevent oscillation there is a four (4) degree spread required for automatic mode change, which is not affected by this option. The control can be programmed for one (1), two (2) or three (3) degrees hysteresis — factory default is two (2° F) degrees Fahrenheit.

Cycle Fan On Demand Only P-8

Normally, the fan remains on all the time; however, option P-8 allows the fan to cycle off when demand is satisfied. Cycling the fan with demand reduces overall system noise and is a viable option for areas that are well insulated and not subjected to direct sun light.

- On selects continuous fan operation.

- Off allows the fan to cycle with demand only.

Selecting __On__ with the __OPTIONAL__ Cal. Rod Heater installed....the fan remains on two (2) minutes after demand is satisfied carrying away residual heat and preventing duct work overheating.

Automatic Fan Speed Spread P-9

Automatic Fan Speeds are directly linked to temperature changes in both the Heating and Cooling Modes. There are three (3) options available: one-half (1/2°) degree, one (1°) degree and two (2°) degrees Fahrenheit. Selecting 1/2° allows the fan speed to increase one value for each 1/2° Fahrenheit room temperature exceeds set point. For example, when room temperature exceeds the set point by three (3°) degrees Fahrenheit, fan speed value will be six (6) or high speed.

Note!

Using Programmable Parameters

Speed 6 Fast

Speed 1 Slow

Speed 3 Medium
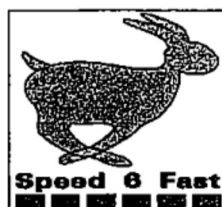
Automatic Fan Speed Spread P-9 (Continued.)

Program value one (1) will bring the fan to high speed when the room temperature exceeds set point by six (6° F) degrees Fahrenheit — Factory Default Setting is one (1).

Select value two (2) and high speed will occur when room temperature is twelve (12° F) degrees Fahrenheit greater than set point. With setting two (2) high fan speed is not likely to recur after set point has been achieved. This setting has been provided to reduce overall system noise by minimizing operation at or near high fan speed.

Reverse Automatic Fan Speed P-10

When OFF is selected, the fan speed decreases as the set point is approached. Selecting ON reverses the automatic fan speed operation during heating, increasing fan speed as the set point is approached.

Auxiliary Fan Output P-11 & P-12

Use P-11 to select the automatic fan speed at which the auxiliary output is turned ON. Select zero (0) to allow the auxiliary output to follow the main fan at all times.

NOTE ! ... The auxiliary fan output will not turn on while in the Moisture Mode, unless P-11 is programmed for activation with fan speeds one (1) two (2) or three (3). See pages 22 & 23 for more details.

P-12 is used to adjust the auxiliary fan speed to match the main fan output.

Individual Fan Speed Settings P-13 Thru P-18

Individual fan speed adjustments allow the blower motor combination to be customized for each particular installation, thereby reducing system noise, while maximizing efficiency.

Each of the six (6) individual fan speeds can be programed to meet particular requirements for each installation. Numbers displayed are arbitrary units, however, when the OPTIONAL RPM SENSOR is used, the numbers represent motor speed in revolutions per minute ... RPM. Tachometer program limits DO NOT prevent settings from overlapping. Motor RPM adjustment range is 350 RPM through 1790 RPM. Each fan speed adjustment, P-13 high speed through P-18 low speed, can be individually selected while the fan is operating allowing instant airflow feed back.

While selections are made, the LED pertaining to the speed being programmed is turned on allowing the operator to program the function without constantly referring to the manual. Once programmed, individual speeds are maintained in both Manual and Automatic Fan Modes.

Fan Speed - 6

**Fan Speed - 3**

Fan Speed - 1

IMPORTANT!

Correcting installation and ducting errors with fan programming will severely reduce the system's performance and derate the BTU values. Get all the air-conditioning you paid for; maintain proper airflow across each convector.

Using Programmable Parameters

Air to Water Temperature Differential P-19

The difference between ambient air temperature and hydronic 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 ten (10° F) opens the valve when water temperature is ten degrees less than ambient while in Cooling Mode and greater than ten (10° F) in Heating Mode. Figure two (2), shown below, illustrates the relationship between ambient air and hydronic water temperature.
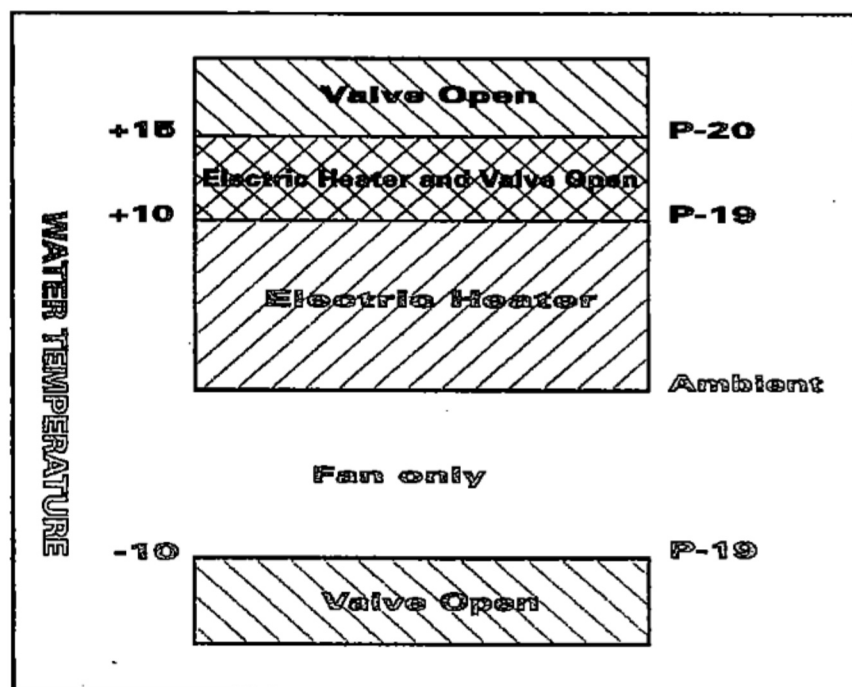
Careful selection of the temperature differential can fully utilize the ships heating and cooling resources. For example, while in Cooling Mode, using a ten degree value will allow valve opening and maximize cooling while the hydronic system is coming down to temperature ... Default Setting 10° F.

Optional Electric Heat Assist P-20

When equipped with **OPTIONAL** Cal. Rod heaters individual locations can provide heat while the main system is cooling. The heaters can also supplement the ships main heating unit when extremely cold conditions are encountered. Fig. 2 illustrates the relationship between valve opening and the electric heater operation. Selecting one of the lower values increases the ability of the heaters to supplement the ships main heating system ... Factory Default 15°F.

Using Programmable Parameters

Network Station I D Number P-21

An **Optional Networking System** is available for linking all the controls onboard together. Networking allows the ships engineer to operate, monitor and program all modules from a central location. When using the network, each control must have an assigned I. D. number which range from one (1) through two-hundred fifty-five (255), with one (1) being the first unit identified. Since the system is optional the factory default is zero (0), no network installed. Network I. D. numbers are NOT programmable from the systems central computer.

Chiller Water Valve Forced Open P-22

P-22 allows service personnel to force the water valve open and remain open while servicing or bleeding the system. Programming ON forces the valve open, OFF maintains normal operation — Factory Default is OFF. Once programmed the valve will remain open four (4) hours, after which the system will revert to normal operation. The valve may be manually returned to normal operation by selecting OFF any time during the cycle.

Note!

Normal operation is maintained even though the valve is forced open while servicing or bleeding the system. All other control functions operate normally allowing cooling or heating to continue as required.
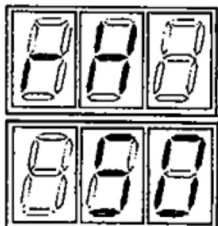
Optional Features

Relative Humidity Sensor

An OPTIONAL Relative Humidity Sensor is available which simply plugs into the appropriate RJ-45 jack (labeled Alt / Hum) located on the module board. The sensor provides direct relative humidity (RH) readings as well as humidity control. Operation is very simple and straight forward. Plug in the sensor, install **JMP-1** and program parameter **P-1** to Zero (0). The relative humidity readings will appear in the display while in the Moisture Mode. The **Up** and **Down** buttons are used to select the desired relative humidity, the same as selecting temperatures while in heating or cooling modes. The adjustable range is thirty (30 %Rh) through eighty (80 %Rh) percent relative humidity — Sensor Operating Range is twenty (20 %Rh) through ninety-five (95 %Rh) percent relative humidity.

THE DISPLAY will ONLY INDICATE RH readings when the Optional Relative Humidity Sensor is installed and Moisture Mode has been selected. Accuracy is plus or minus two (± 2%) percent RH in both the VIEW and SET modes.

WITHOUT the Optional RH Sensor, Moisture Mode is programmed and operated as previously described on pages ten (10) and fifteen (15) of this manual.

Relative Humidity

Optional Features
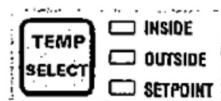
Water out Sensor

The sensor is used to monitor convector efficiency by comparing water inlet and outlet temperatures. Water out is the second item displayed in the view mode and is accessed by pressing and holding the select button for 5 seconds. Use the up or down button to scroll through the view items.

Outside Air Sensor

Outside air temperature can be seen by toggling the select button once after the sensor has been installed. Simply press and release the button until the Outside LED is illuminated. The outside air temperature is shown in the display.

Pressing the Select Button once causes the unit to advance to the next viewed item. The Select Button is a toggle function and must be pressed and released to select different items.

Alternate Air Sensor

The ambient air sensor is located in the display panel which should be located on an inside wall, at eye level, NOT in direct sun light. When these conditions cannot be met; an optional alternate air sensor is available. The sensor is installed by plugging into the Alt / Hum jack located on the control module. The ambient temperature will be taken at the sensor location. Operation is transparent and no programming is required.

When using the Relative Humidity Sensor an alternate air sensor IS NOT required.

New Defaults

Severe electrical disturbances can sometimes upset the controls operating sequences. Operator confusion related to program parameters can also cause, what seem to be, functional problems. Whenever there is any doubt as to proper control operation, Factory Default Parameters should be re-initialized.

More sophisticated programming requests require substantial programming efforts during the controls initial installation. To insure that all this hard work is not lost your, programming can be saved, as the New Factory Defaults, by the following procedure.

Enter and unlock the programming as previously described. Make the necessary program changes and test run the system. When you are satisfied with the systems performance save your work, as the New Factory Defaults, by momentarily pressing the up and down buttons simultaneously.

The next time someone has to re-initialize defaults, your work will not be lost and the correct values will be restored.
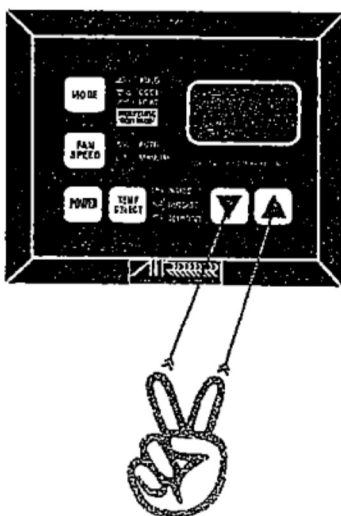
Typical Application

Use the application shown on this page when electric heaters are not installed in the cooling units. Both cooling units should be similar in BTU capacity, ducting configuration and static loading. The blower motors should be identical to insure similar fan speed control and air volume output from both units. The optional electric heaters are not recommended for use with this application. The slave cooling unit can be programed to turn off at a specific fan speed setting to reduce cabin noise as the set-point is approached. For consistent heat or cool output the aux output follows the water valve allowing both heating and cooling from both cooling units. When a manual fan speed is selected the aux output will remain on until the automatic fan setting is achieved. The aux output will operate at the programmed manual fan speed setting and will turn on and off at the programmed value selected with parameter P-11.

For Example: Selecting the default setting 4 turns off the aux output at or below fan speed 4 and turns on the output above speed 4. The On/Off function of the aux output always follows the automatic fan.
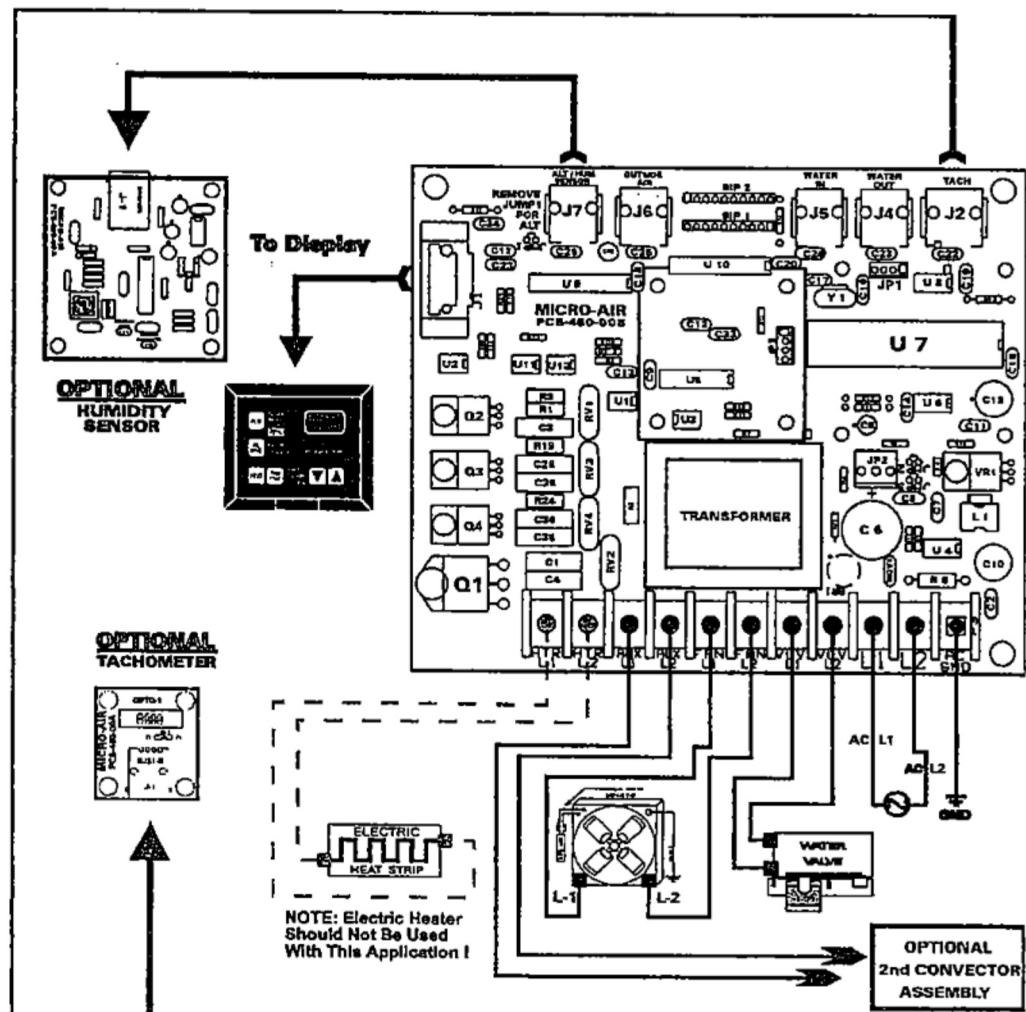
Optional Wiring - Parallel Second Convector

Operate Two Convectors With Electric Chill Chasers From One Module ... When its necessary to connect two convectors with electric chill chasers to one module, use the method shown on this page (22). The convectors should be similar in BTU capacity, ducting configuration and static loading. The blower motors should be identical to allow similar fan speed control and blower output from both units. Auxiliary operation is the same as described on the previous page with the addition of the chill chaser option.

Both convectors will supply automatic hydronic heating, automatic cooling and electric chill chaser heat when hydronic heat is not available.

NOTE: When the electric chill chaser cycles off, the auxiliary and main fan continue to operate for two minutes to disperse the residual heat from the electric element.
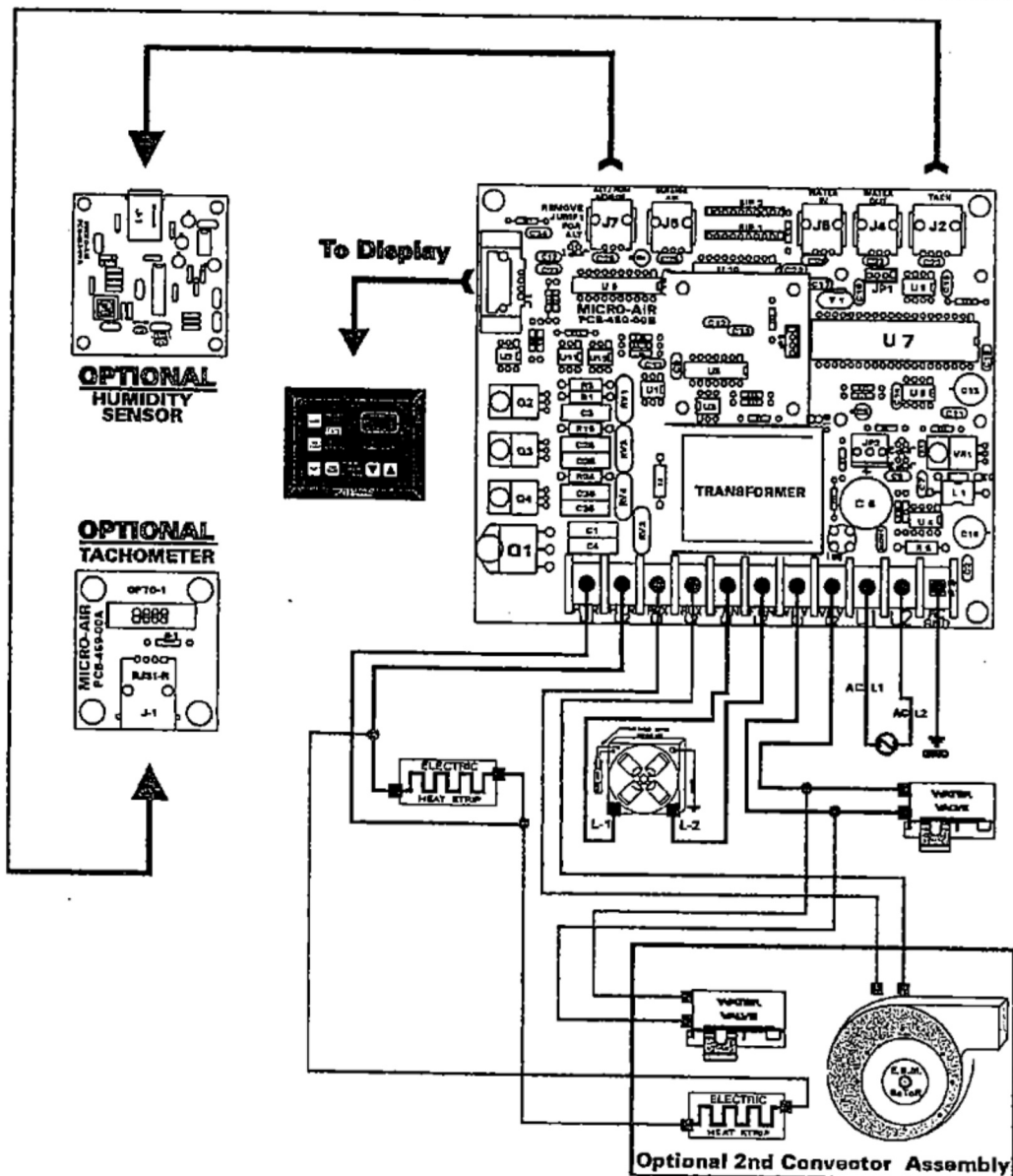
Auxiliary Fan Output P - 11 & P - 12

Purpose

The purpose of this option is to reduce the blower noise from a second convector during periods of moderate heat load. The quietest dual convector installation can be achieved by using one of the methods shown on pages 21 and 22 of this manual.

The auxiliary output allows a second cooling unit to be operated from one module. This feature is used where large areas require more than one unit for adequate cooling. The need for installing a second module assembly is eliminated and the possibility for conflicting set-points of the two thermostats eliminated.

Use the application shown on page 21 for installations that do not have electric heaters installed in the cooling unit.

Use the application shown on page 22 for units that have electric heaters installed in the cooling unit.

P -11... The auxiliary blower can be programmed to turn on with any of the six (6) fan speeds. Selecting three (3), for example, will turn on the second unit when automatic fan speed three is required. Temperature conditions requiring automatic fan speed of three (3) or less, will allow the second unit to remain off, thus reducing blower noise.

The auxiliary output always follows the automatic fan algorithm even if a manual fan speed is selected. Use program parameter P-11 to select the point where the auxiliary output is turned on and off.

NOTE: When the optional electric heater is installed and heating is required, the auxiliary output will always follow the primary fan. This insures that the blower of the second cooling unit will remain on while the electric heat is in use.

Optional Wiring shown on page 22 of this manual ...
The second convector can be wired to the same valve and electric heater output as the first, providing the combined electric heaters do not exceed thirty (30) amps. The second blower is connected to the auxiliary fan output as shown on page twenty-two (22).

P-12 Speed Control

Program option P-12 can be used to more closely match the speed requirement of the second convector to the installation conditions. The auxiliary output follows the fan output which may not always match the requirements of the second unit. Option P-12 can be used to vary the auxiliary output plus or minus twenty (± 20 VAC) volts AC. Careful use of options P-11 and P-12 will allow the installation of two very different blower types on one module with significant noise reductions during periods of reduced heat loads.
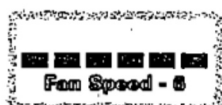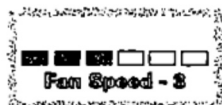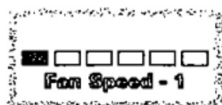
**IMPORTANT !**

Water Sensor Installation

Sensor Location

Sensors should be located as close to the water valve as possible and securely mounted with stainless steel clamps. The sensor housing is brass providing compatibility with copper tubing used in the water system. The standard wire length is seven (7) feet, however, custom lengths are available on request. Maximum safe length for the water sensor cable is one-hundred (100) feet.

Note!

Proper operation of the water valve requires data from the Water In Sensor — the system cannot operate properly without Water -In Data! Extreme Care should be taken not to mix-up Water In and Water Out Sensors during installation.

Water Sensors MUST Be Fastened Securely Using Stainless Steel Clamps.

BRASS SENSOR HOUSING

Water Out

Water In

WATER VALVE
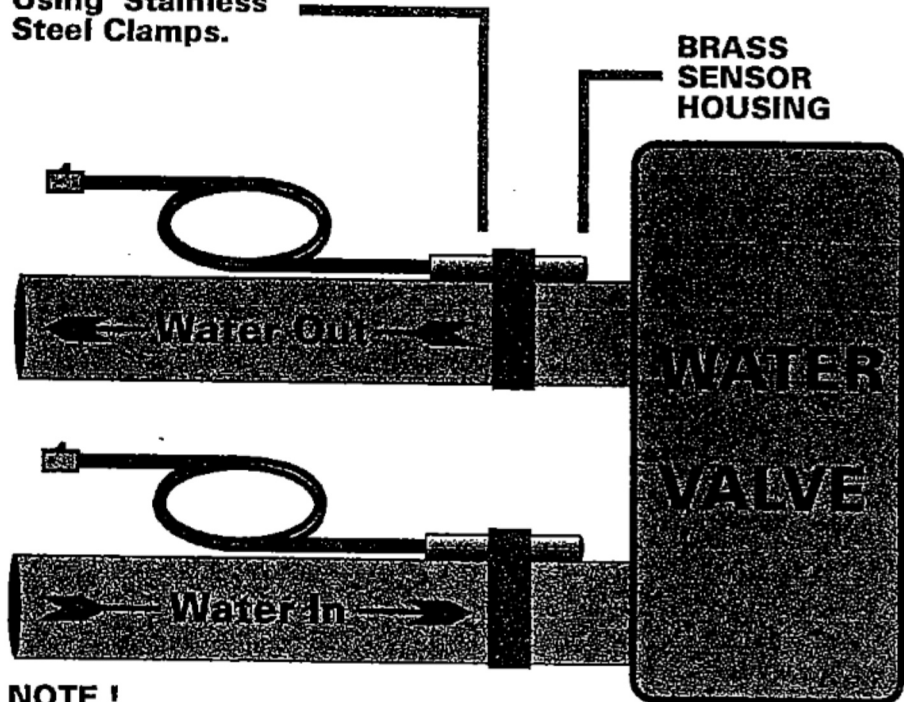
NOTE !
Sensors Should be Wrapped With Insulation to Minimizing Heat Leakage!

Water Out Sensor

The water out sensor is primarily used during installation, servicing and periodically checking performance of the convector its installed on. The system will function normally WITHOUT the Water Out Sensor ... which is Optional.

Module Installation

Chassis Location and Mounting

The chassis should be mounted in the upright position with the wire entry locations at the bottom. The enclosure is designed to be drip proof and must be mounted upright to protect the PC board from possible water leaks. The module should be located in the air-conditioning space as close to the controlled convector as possible.
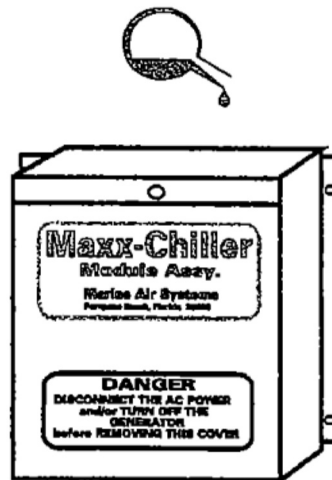
The PC board and all components on the board are conformal coated to protect against moisture and dampness, however, this will not protect the electrical connections required at the time of installation. Water MUST NOT be allowed in direct contact with the PC board or any of the associated wiring.

The chassis / housing is designed to be drip proof. Every effort should be made to install the assembly upright ... as shown.

There are three cover screws which MUST BE installed when the cover is replaced upon completion of the installation.

The screws are necessary because the cover is an integral part of the controls heatsink. Without these screws the unit will eventually overheat and shut down on thermal overload.

Wiring Safety

Electrical Shock Hazard

The basic function of this control deals with 120 or 220 VAC. This amount of AC power can be very <u>DANGEROUS</u> and must be handled with extreme care.

NEVER work on the module with the AC turned power ON ! Always turn off the power at the circuit breaker before removing the cover ... AC power can be lethal if improperly handled !!!

Installing and Using The Rh Sensor

Overview

The Relative Humidity (Rh) Sensor is housed in a small aluminum chassis with a perforated lid. The chassis assembly contains the Rh sensor element and an air temperature sensor. The temperature sensor is included because the Rh sensor must be temperature compensated for accuracy.
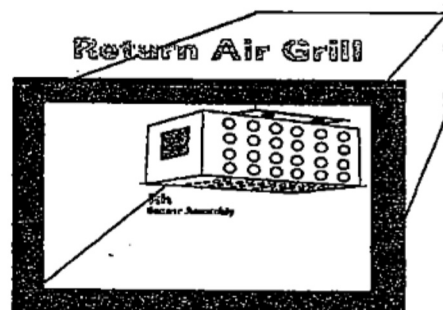
NOTE ! ... When using the optional Rh sensor no alternate air sensor is required. Room temperature is taken from the return air ducting where the sensor assembly **MUST** be located.

When the Rh sensor is installed the system will automatically ignore the faceplate temperature sensor. Room temperature readings are taken from the return air ducting where the Rh sensor is mounted.

The sensor is connected to the module with five conductor shielded data cable using phone type connectors with gold plated contacts. The standard cable length is seven (7) feet and the maximum allowed cable length is one hundred (100) feet.

Location & Mounting

The chassis assembly is supplied with four isolation grommets and stain-

less mounting screws pressed into the housing. For best results, mount the assembly in the top of the return air housing as indicated. Do not overtighten the screws thus avoiding crushing the grommets which isolate the chassis from the ducting. Maintaining isolation from the ducting will yield more accurate results. The assembly should be mounted in the top of the return air ducting for best results. The perforations in the cover should be located crosswise in the return air stream assuring adequate airflow through the sensor housing.
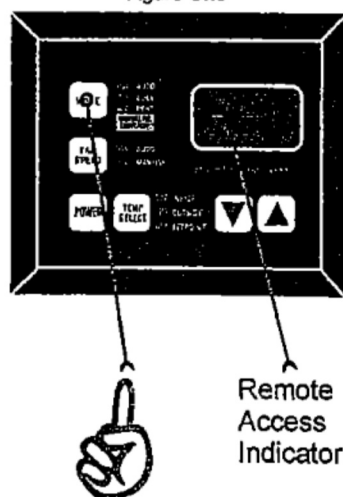
Programming

Install Jumper **JMP-1**, shown on page twenty-one (21), across both connector pins. Plug in the sensor, enter the Program Mode and program parameter **P-1** to Zero (0). The Rh Sensor will be automatically recognized and no further programming is required. When Moisture Mode is selected, the display will indicate relative humidity. Use the Up and Down Buttons to select the desired humidity level. The selectable range is thirty (30% Rh) through eighty percent (80% Rh) Relative Humidity.

SPECIFICATIONS

SET POINT RANGE .... 55° F to 85° F

DISPLAY TEMPERATURE RANGE .... 0° F TO 150° F

OPERATING VOLTAGE RANGE .... 65 through 275 VAC

MAXIMUM AMBIENT TEMPERATURE .... 180° F

AC LINE FREQUENCY .... 50 or 60 Hz

TEMPERATURE SENSOR ACCURACY .... ± 1° at 72° F

HUMIDITY SENSOR ACCURACY .... ± 2% Rh

Rh ADJUSTMENT RANGE .... 30 to 80% Rh

HUMIDITY SENSOR OPERATING RANGE .... 20 to 90% Rh

TACHOMETER ACCURACY .... ± 10 RPM

TACHOMETER DISPLAY RANGE .... ZERO to 1800 RPM

TACHOMETER ADJUSTMENT RANGE .... 350 to 1790 RPM

ELECTRIC HEATER OUTPUT .... 30 AMPS at 215 VAC MAX

FAN 1 OUTPUT .... 8 AMPS at 215 VAC MAX

VALVE OUTPUT .... 5 AMPS at 215 VAC MAX

AUXILIARY FAN 2 OUTPUT .... 8 AMPS at 215 VAC MAX

Network Cabin to Cabin Access

Figure One

Remote
Access
Indicator

Figure Two

Use Up Arrow To Select
The Desired Cabin

Figure Three

Remote Cabin Selected

Systems equipped with the Lan-Maxx Network allow cabin to cabin access by using the allowing procedure.

Mode Button... Press and hold the mode button while in either the on or off mode. When zero (0) appears in the display release the mode button and use the up arrow to select the I. D. number of the cabin you wish to select. Programmed cabin numbers are available from page 19 of this manual. Once you have selected the desired cabin press the mode button a second time and the decimal point to left of the middle digit will turn on indicating you are accessing a remote cabin. At this time anything done to the display will actually control the cabin accessed. The remote cabin can be turned on, turned off, mode changed, programmed and any other function that is normally performed from the display panel.

Exit Remote Cabin Accessing... by not pressing any buttons for one (1) minute or by again pressing and holding the mode button until the number of the cabin last accessed appears in the display. When this number appears, select zero and press the mode button a second time. The unit will now exit the remote access mode. This method is also used to remote control a different cabin by selecting the I.D. number of the new to be accessed.

Figure one... illustrates the mode button which is used to enter the remote access mode and also the decimal point that indicates remote cabin access is available.
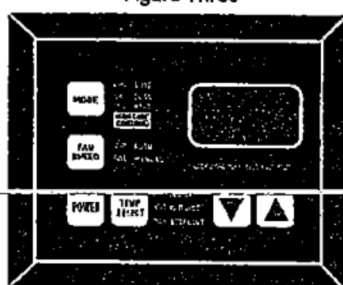
Figure two... illustrates the control is ready to accept input from the up arrow to select a remote cabin. Selecting eight (8), for example, would connect the display to the galley for remote control.

Figure three... indicates the remote cabin has been accessed and is ready for control input from the display. The remote access will time out after one minute if no input is given to the remote cabin which, in this case, is the galley, unit I.D. number eight (8).

Note... a CABIN cannot be accessed remotely when the system is connected to the ships computer and the unit or cabin you are trying to access is being programmed via the computer. When the computer programming is finished the unit is again available for cabin to cabin remote access.

AH-Maxx Trouble Shooting Guide

BASIC AH-Maxx SYSTEM START-UP PROBLEMS

PROBLEM	PROBABLE CAUSE	SOLUTIONS
• No lights in the display and the system does not heat or cool. Power on reset does not occur when AC power is applied.	• AC breaker is not turned on or AC power is not available. • Display cables or jacks broken or dirty. • Display cable is improperly assembled. • AC input is less than 75 VAC…All units.	• Check for AC power at circuit breaker • Check for AC power at module input. • Clean all jacks and plugs. • Try another known good display cable. • Check the system wiring diagram
• The system operates but there is no cooling or heating and no heat or cool lights.	• The set-point is satisfied!	• Raise or lower the set-point to allow the unit to cycle.
• The display flashes randome temperatures, (usually 255) and the system will not operate. • The display flashes zero and the system will not run.	• The face plate air sensor is shorted or the display cable has been damaged • The face plate air sensor is open or the display cable is broken	• 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.
• System displays room temperature but there is no fan, valve or heater.	• Set-point is satisfied and P-8 is programmed to cycle the fan on demand	• Raise or lower the set-point to allow the system to cycle on… Check P-8.
• The system runs but there is no cooling or heating	• The hydronic water is not cool enough. • The water sensor is in the wrong location. • The hydronic water system is air-bound. • The hydronic water pump is inoperable.	• Check the chiller for proper operation • Re-locate sensor to the convector inlet pipe. • Bleed the air from the water system • Check wiring replace pump if necessary.
• The system operates but there is no fan. • The fan runs but only high speed, lower speeds are not available. • The fan runs very slow and is noisey.	• 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.	• Check and correct fan motor wiring • Check for proper duct sizes, correct any ducting restrictions and check wiring. Return the module for fan output triac replacement • Check fan motor and replace triac or return module for repair
• You can enter the program mode but aren't allowed to make any program changes.	• The programmable parameters are locked to prevent accidental programming changes.	• Refer to pages 12 for instructions. • Un-lock the programmable parameters.

REV072297

APPENDIX A: PAGE 1

AH-Maxx Trouble Shooting Guide

ADVANCED AH-Maxx SYSTEM PROBLEMS

PROBLEM	PROBABLE CAUSE	SOLUTIONS
• System runs continuously and is not able to achieve set-point.	• Face plate air sensor is located in direct sun light or the display is mounted on an outside wall. • Outside air sensor is plugged into the alternate air sensor jack. • Set-point temperature set too low. • Insufficient hydronic cooling water. • No hydronic cooling water.	• Re-locate the display assembly… If this is not possible install an alternate air sensor. • Check the module board and plug the outside air sensor into the proper jack. • Raise the set-point to a reasonable level (68 or 72° F). • Restricted water flow or air is trapped in convector. • Check the main chiller module for proper operation
• System short cycles and display indicates low temperatures.	• Supply air vent is blowing directly on display face plate. • The alternate air sensor improperly installed.	• Re-direct the air guide vanes, relocate the display or install an alternate air sensor. • Check and correct the sensor location.
• Convector coil is cool, hydronic water flow and temperature is correct but the system is still not cooling or heating properly.	• Duct work is restricted. • Temperature set-point is set too high. • Low fan speed is programmed too low… P-18	• Check and repair ducting. • Lower the set-point to a reasonable level (68 to 72°F). • Raise the low fan speed parameter P-18.
• All eights ("888") appear in the display on start-up and the system operates normally.	• Power on reset indicating all LED's are ok and the system is functional.	• This is the normal system boot-up routine and occurs when the AC power is first applied.
• All eights ("888") appear in the display and the system shuts-down or trips the AC breaker when the system attempts to start.	• Insufficient dock power to handle the start surge. • Locked compressor rotor… Temporary! • Locked compressor rotor… Permanent!	• Check the shore power, move to a better dock or switch to the ships generator. • Temporary system imbalance, wait 5 min & re-start. • Compressor or start components have failed… Call for service.
• The AC breaker trips when switching from shore to ships power… Applies to vessels with two or more staged chiller modules on board.	• Multiple stage chiller compressor time delays are not set, or are all set at the same value.	• Enter the Hydro-Matic programming mode and set the staging delays at least 5 seconds apart… See the main chiller manual for further instructions.
• Unit is programmed to cycle fan on demand but fan continues to run after set-point is satisfied in heat mode.	• Chill chaser or electric heating supplement was required… fan remains on 2 minutes to cool element.	• After the heating requirement is satisfied, the fan remains on to remove residual heat from the electric heating element.
• System seems to operate properly, but there is no fan or fan runs very slow and makes a loud humming noise.	• Fan motor is 220 and supply is 115 VAC. • Fan is improperly wired. • Fan motor is defective. • Fan output triac has failed.	• Change voltage or replace fan motor. • Correct the wiring. • Replace the fan motor. • Return control module for repair or call for service.

AH-Maxx Trouble Shooting Guide

ADVANCED AH-Maxx SYSTEM PROBLEMS

PROBLEM	PROBABLE CAUSE	SOLUTIONS
• The system operates fine, however, in heating the fan continues to run for two minutes after the set point is satisfied even though the fan is programmed to cycle on demand.	• The main hydronic system is in the cooling mode and the particular cabin called for heating which was supplied by the electric chill chaser.	• This is normal operation. The fan will remain on for 2 minutes after the set point is satisfied when the electric heater or chill chaser is required.
• Tachometer shows much higher RPM reading than setting indicates. Seen in view mode with optional tachometer installed.	• The fan motors run capacitor is improperly wired.	• Check and correct the run capacitor wiring.
• The fan output voltage measures higher than the AC line voltage.	• This is normal operation for most split capacitor fan motors because of the high efficiency of their design and the back EMF generated by these motors.	• None required.

AH-Maxx Trouble Shooting Guide

AH-Maxx Stuck Button Chart

Stuck Button	Display Behavior
Power On Mode	Display indicates "888" on Power-Up then appears to work normally, however, none of the buttons function.
Power Off Mode	Display will indicate "888" on Power-up, then "P01", then "1" then "IP" and continues to display IP. The control does not function
Fan Button	The display indicates "888" on Power-Up. No other buttons function and unit operates in last memorized mode.
Temp Select	Display indicates "888" on Power-Up and enters the view mode. The water in temperature is displayed and the control operates in the last memorized state. No other buttons function.
Up Button	The original setpoint will increase to 85°F, where it will stay, and no other buttons will function. On power-Up the display will indicate "888" all LED's will be lit and the control will not function.
Down Button	The original setpoint will decrease to 55°F, where it will stay, and no other buttons will function. On power-Up the display will indicate "888" all LED's will be lit and the control will not function.
Mode Button	The display indicates "888" on Power-Up. No other buttons function and unit operates in last memorized mode.

AH-Maxx Display Cable Trouble Shooting Guide

Display Problem	Possible Display Cable Causes
The Display Indicates "888" … The Power and Fan Buttons Operate.	- Line 1 Shorted to Line 2.
No Display and the Buttons Do Not Operate.	- Line 1, Line 3 or Line 6 is Open. - Line 2 Shorted to Line 3.
Display Indicates "888" and No Buttons Function.	- Line 4 Open. - Line 3 Shorted to Line 4. - Line 4 Shorted to Line 5. - Line 5 Shorted to Line 6.
The Display Flashes "888" Then "255" and the Buttons Function OK.	- Line 6 is Shorted to Line 7. - Line 7 is Shorted to Line 8.
No Display and the Buttons Function OK.	- Line 2 is Open.
The Display Indicates 255 and the Buttons Function OK.	- Line 7 or Line 8 is Open.
The Display Indicates "888" and No Buttons Function.	- Line 5 is Open.

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