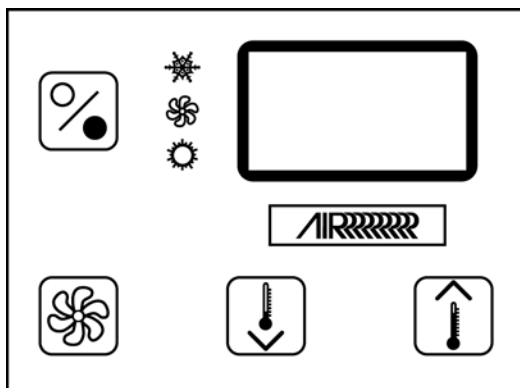


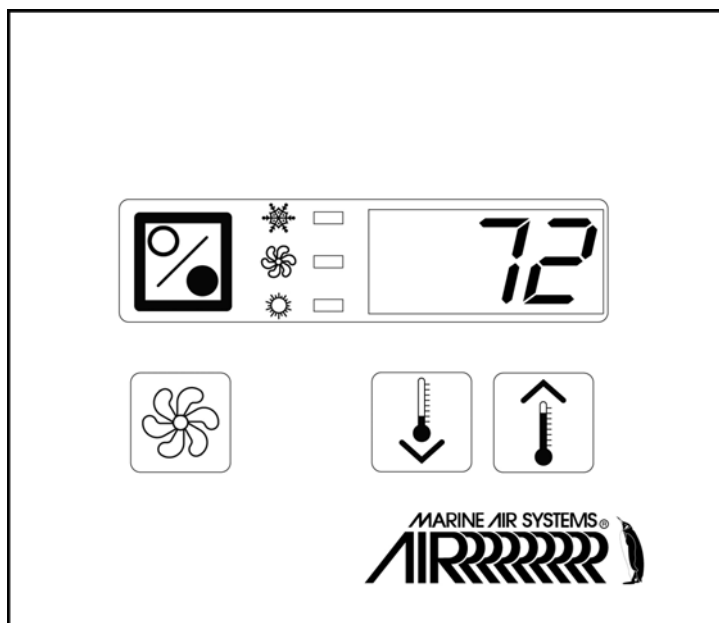


AH-Passport I/O (for CW systems)

OPERATIONS MANUAL



AH-Passport I/O Compact



AH-Passport I/O (legacy model)

Dometic Marine
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INTRODUCTION	1	PROGRAMMING	8
READ THIS MANUAL BEFORE PROCEEDING	1	Programming procedure	8
FEATURES	1	Programmable Parameters	8
Standard	1	FAULT-HANDLING CODES	11
Optional	1	TEMPERATURE DIFFERENTIAL OF AIR & WATER	11
DESCRIPTION OF CONTROL	2	TROUBLESHOOTING	12
Power	2	GENERAL TROUBLESHOOTING	12
Set Point	2	DIGITAL-CONTROLS TROUBLESHOOTING	13
Fan	2	MAINTENANCE	13
Memory	2	Return-Air Filter	13
IMPORTANT PROGRAMMING NOTES TO INSTALLER AND		SPECIFICATIONS	14
END USER	4	OPERATIONAL	14
NORMAL HEATING OR COOLING CYCLE	4	DIMENSIONS	14
INSTALLING THE DISPLAY PANEL	4	CABLE LENGTHS	14
CHOOSING THE LOCATION	4	SYSTEM INPUTS	14
MOUNTING THE DISPLAY	4	WARRANTY AGREEMENT	14
MOUNTING THE OPTIONAL SENSORS	5	DIAGRAMS	15
Remote Air Sensor	5	SAMPLE APPLICATION	15
Outside-Air Temperature Sensor	5	SAMPLE WIRING DIAGRAM	16
Water-Inlet Sensor	5		
OPERATION	5		
OPERATOR CONTROLS AND DISPLAY PANEL	5		
Display Indicators	5		
Button Functions - Single	5		
Button Functions - Dual	6		
MODES OF OPERATION	6		
Off Mode	6		
On Mode	6		
Automatic Mode	6		
Cool Mode	6		
Heat Mode	6		
Moisture Mode	6		
Fan Modes	6		
Program Mode	7		
USING PROGRAM MODE	7		
Entering Program Mode	7		
Exiting Program Mode	7		
Changing Parameters	7		
Memorizing New Program Parameters	7		
Restoring Memorized Default Settings	7		
Software Identification	7		

INTRODUCTION

The AH-Passport I/O is a microcontroller-based unit designed for use with chilled water air conditioning systems.

READ THIS MANUAL BEFORE PROCEEDING

Read this manual completely before you proceed with the installation and operation of the AH-Passport I/O. If you have questions or require assistance with your AH-Passport I/O, call your dealer or the Dometic Marine Service Department at +1 954-973-2477.

The AH-Passport I/O is covered under existing Marine Air Warranty Policy. Incorrect installation, neglect and system abuse are not covered under Marine Air Warranty Policy.

FEATURES

STANDARD

- Universal 115/230 volt, 50/60 Hz AC power supply.
- User-friendly four-button display panel.
- 5V microcontroller located in the display.
- Option to display temperature in degrees Fahrenheit or Celsius.
- Ambient air sensor in face plate.
- Water-in sensor for individual cabin heating.
- 15 programmable parameters.
- Nonvolatile memory requires no backup power.
- Humidity Mode control.
- De-icing cycle prevents evaporator icing.
- Programmable fan operation.
- Programmable display brightness.

OPTIONAL

- Outside air-temperature sensor.
- Alternate air-temperature sensor.
- Chilled water inlet sensor.
- Electric heating control capabilities.
- Air Filter Cleaning or Replacement Timer (available in software revision A21 or newer).

This manual provides all necessary information for proper installation and operation of the AH-Passport I/O. Poor installation or misunderstood operating parameters will result in unsatisfactory performance and possible failure.

DESCRIPTION OF CONTROL

See Figure 1 and Table 1 on page 3 to identify all parts of the control.

POWER

Press the Power button once to engage the system. The display is blank when the system is off and indicates current room temperature when the system is on.

SET POINT

Press the Up or Down button to set the desired room temperature. To view the set point, momentarily press and release the Up or Down button.

FAN

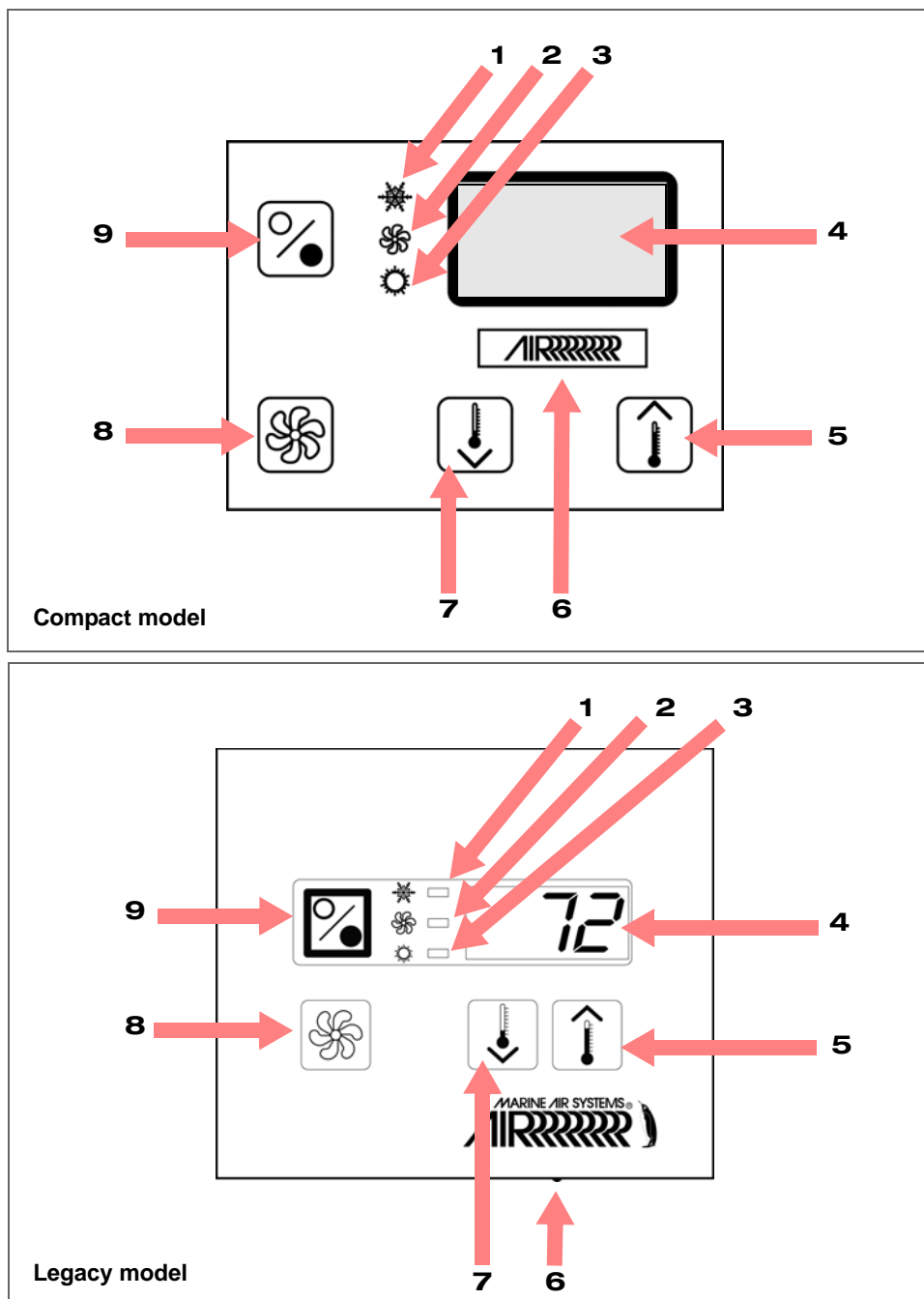
Fan-speed operation is automatic, allowing fan speed to decrease as set-point temperature is approached in the Cool Mode. The fan operates at low speed when set point is satisfied.

Normally the automatic fan speed operation is reversed in the Heating Mode, however, you can program the fan to operate the same as in the Cooling Mode.

Press the Fan button to select manual fan speeds if you want to override automatic operation. You can program the fan to run only during a cool or heat cycle, otherwise the fan runs constantly.

MEMORY

The AH-Passport I/O has nonvolatile memory requiring no batteries or backup power. When power is lost, the operating parameters are retained indefinitely. When power is restored, the control resumes operating as last programmed.

Figure 1: AH-Passport I/O Display Panel and Indicators**Table 1: AH-Passport I/O Display - Diagram Legend**

1	Cool Mode indicator	6	Temperature sensor
2	Fan indicator	7	Down button - Lower temperature set point
3	Heat Mode indicator	8	Fan button
4	Digital display	9	Power button
5	Up button - Raise temperature set point		

IMPORTANT PROGRAMMING NOTES TO INSTALLER AND END USER

1. If your air handler has a Shaded-Pole (SP) fan motor instead of a Split-Capacitor (SC) High-Velocity (HV) fan motor, you **MUST** program "SP" into parameter P-16 before operating the equipment. The SP units are recognizable by an overhanging blower motor. (The SC motor of an HV unit is inside the blower, and the unit has "VTD" or "HV" in the model number.) **Only reprogram this parameter if you do NOT have an HV blower.**
2. Standard air handlers come equipped with chilled-water bypass valves. However, for "no-valve" air handlers, the fan must be set to "cycle on demand" via programming parameter P-14. Verify that the installed air handlers have bypass valves; if not, change parameter P-14 to "CYC" for cycle-on-demand fan operation
3. When powering on the control, press and immediately release the Power button so you do not unintentionally enter Program Mode. You will enter Program Mode if the Power button is pressed and held for more than 5 seconds. If you enter Program Mode unintentionally, any subsequent presses of the Up or Down buttons will change the P-1 parameter setting since it is the first parameter shown after entering this mode. This will change the operating mode to Cool Only, Heat Only, or Automatic, which could result in improper system operation. Always use care when in Program Mode. For further information, refer to "Using Program Mode" on page 7.

NORMAL HEATING OR COOLING CYCLE

In **Automatic Mode**, heating and cooling are supplied as required. Based on the set point, Automatic operation maintains a 2°F (1.1°C) temperature variation. If a 4° F (2.2° C) change in temperature occurs, the unit shifts to the opposite mode. Once in Heat Mode or Cool Mode, the control maintains a 2°F (1.1°C) differential.

If you program **Cool Mode**, only cooling is supplied. The cabin temperature is maintained within 2°F (1.1°C) of set point. If you program **Heat Mode**, only heating is supplied. The cabin temperature is maintained within 2°F (1.1°C) of set point. When the heating or cooling set point is satisfied, the hydronic water valve closes and the fan returns to low speed. The fan speed remains constant if Manual Fan Speed is selected.

For more programming information on this feature, see "P-1: Operating Mode" on page 27.

When cooling or heating is required, the water valve will not open unless the water temperature is adequate. You can view the water temperature by simultaneously pressing the Up and Power buttons. The fan remains in low speed until the adequate water temperature is available. Heat will be supplied when no heating water is available only if the Optional Electric Heater has been installed and programmed.

Adequate cooling or heating water temperature is defined by programmable parameter P-19. Its factory default is set at a 15° F (8.3° C) differential from the ambient air temperature. While in Heating or Cooling Mode, the control maintains a 2° F (1.1° C) temperature variation. A 4° F (2.2° C) swing is required to cause the unit to shift to the opposite mode. Once in a new mode, Heating or Cooling, the control maintains a 2° F (1.1° C) differential.

INSTALLING THE DISPLAY PANEL

CHOOSING THE LOCATION

Before mounting the control panel, consider the location. The display panel's built-in air sensor provides excellent room-air temperature sensing when properly located and installed. For air-sensor location see item 6 in Figure 1, page 3.

Mount the display panel 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. Its distance from the air handler control box must be within the 15' (4.5m) length of the display cable (custom lengths available).

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 in the supply-air stream.** Do not mount the display above or below a supply-air or return-air grille. Do not mount the display behind a door, in a corner, under a stairwell or any place where there is no freely circulating air.

If you can not mount the display in a suitable location for accurately sensing room temperature, install the optional remote air sensor.

MOUNTING THE DISPLAY

1. Make the cut-out for the display panel.
 - **For Compact** - Cut-out size is 2.4" (61mm) wide by 1.8" (46mm) high.
 - **For legacy model** - Cut-out size is 3.375" (86mm) wide by 2.875" (73mm) high.
2. Plug one end of the display cable (8-pin connector) into the upper-right socket on the circuit board in the electric box and the other end into the back of the display panel.

3. Clean the mounting surface with **isopropyl alcohol only** (test alcohol on hidden portion of surface first), then secure the display panel to a bulkhead with the adhesive strips provided. If the adhesive strips cannot be used directly on the bulkhead, use the plastic bulkhead adapter. The bulkhead adapter (sold separately) mounts to the bulkhead with screws and the display panel is secured to the adapter with adhesive strips. Do not use a screw gun and do not over-tighten screws when mounting adapter.

MOUNTING THE OPTIONAL SENSORS

**NOTE**

Do not staple any sensor cables when mounting.

REMOTE AIR SENSOR

Install the optional remote air sensor if the display can not be mounted in a proper location for accurately sensing room temperature. Installing the remote air sensor overrides the display's built-in sensor. The standard cable length for the remote air sensor is 7 feet (2.1m).

1. Mount the remote air sensor in the return-air stream behind the opening of the return-air grille.
2. Plug its cable (6-pin connector) into the "ALT AIR" socket #J4 in the upper-left corner of the circuit board.

OUTSIDE-AIR TEMPERATURE SENSOR

Install the optional outside-air temperature sensor to monitor the temperature outside the cabin. Outside-air sensor cables are available in various lengths.

1. Mount the sensor outside but not in direct sunlight.
2. Plug its cable into the "OAT" socket #J3.

WATER-INLET SENSOR

Plug the water-inlet sensor cable into the "SERVICE/H2O" socket #J5. Attach the sensor to the chilled water inlet on the air handler. Ensure that sensor makes good contact with the copper pipe. DO NOT attach to rubber or plastic hose.

OPERATION

OPERATOR CONTROLS AND DISPLAY PANEL

Refer to Figure 1, page 3 for the button locations and display functions listed below.

DISPLAY INDICATORS

- **Cool Mode Indicator** - The Cool Mode LED lights when the cool-only mode is selected or when the unit is in an Automatic Mode cooling cycle.
- **Fan Indicator** - The Fan Indicator LED lights when a manual fan speed is selected.
- **Heat Mode Indicator** - The Heat Mode LED lights when the heat-only mode is selected or when the unit is in an Automatic Mode heating cycle.
- **Digital Display** - The 3-digit, 7-segment digital display shows inside air temperature when the control is on. It displays the set point when either the Up or Down button is pressed. The display also indicates program information and fault codes. When the control resumes operation after a power interruption, "888" appears in the display and all the LEDs light for one second. This is normal **Power-On Reset** operation.

BUTTON FUNCTIONS - SINGLE

- **Power button** - Press and release to toggle between the On and Off Modes.
- **Up button** - Press and release to display the set point. Press and hold the Up button to increase the set point. Set point increases one degree each time the button is pressed.
- **Down button** - Press and release to display the set point. Press and hold the Down button to decrease the set point. Set point decreases one degree each time the button is pressed.
- **Fan button** - Press to advance through the available fan settings. One through six indicates Manual Fan Speeds. One is the lowest fan speed and six is the highest fan speed. The letter "A" displays when automatic fan operation is selected.

BUTTON FUNCTIONS - DUAL

- **Up & Down buttons (On Mode)** - Simultaneously press the Up and Down buttons while in the On Mode to display the chilled water temperature.
- **Up & Down buttons (Off Mode)** - Simultaneously press the Up and Down buttons while in the Off Mode to display outside air temperature (if the optional outside air temperature sensor is installed).
- **Up & Down buttons (Program Mode)** - Simultaneously press the Up and Down buttons while in the Program Mode to set new program defaults.
- **Fan & Down buttons (On Mode)** - Simultaneously press the Fan and Down buttons while in the On Mode to blank the display for night operation.
- **Power & Down buttons (On Mode)** - Simultaneously press the Power and Down buttons while in the On Mode to enter the Moisture Mode.

MODES OF OPERATION

OFF MODE

When the control is in 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 On Mode, power is supplied to the appropriate outputs and the display indicates the current state of operation. The operating and program parameters resume based on those last stored when the unit was operating.

AUTOMATIC MODE

When Automatic Mode is selected, the system provides both heating and cooling as required. The Heat LED or Cool LED lights indicate the mode in use. Temperature in a given mode is maintained within 2° F (1.1° C) of set point, however a 4° F (2.2° C) difference is required for the control to change modes. Once the mode changes, temperature is maintained within 2° F (1.1° C) of set point.

COOL MODE

When Cool Mode is selected, the Cool LED is lit and the cooling system operates as required. If the ambient temperature drops below the set point, the system will not automatically switch to the Heat Mode.

HEAT MODE

When Heat Mode is selected, the Heat LED is lit and the heating system operates as required. If the ambient temperature rises above the set point, the system will not automatically switch to the Cool Mode.

MOISTURE MODE

Use Moisture Mode to help control humidity. While in the On Mode, simultaneously press the Power and Down buttons. The first cycle starts in one minute. Every four hours, the fan circulates air for 30 minutes. During this time, the air temperature is sampled and entered into memory. If necessary, the cooling cycle starts and continues until the temperature is lowered 2° F (1.1° C). Four hours after the temperature is satisfied the cycle repeats. The "HU1" code displays while in Moisture Mode. Press the Power button once to end Moisture Mode.

FAN MODES

Automatic Fan Mode

The control has six automatic fan speeds available: The fastest fan speed is "6", the slowest is "1". Automatic Fan Mode allows the control to determine the required fan speed based on temperature differential. This permits a balance between the most efficient temperature control and slower, quieter fan speeds. To select Automatic Fan Mode, press and release the Fan button until the letter "A" displays.

Manual Fan Mode

There are six manual fan speeds available: The fastest fan speed is "6", the slowest is "1". Manual Fan Mode allows you to select and maintain a desired fan speed. When a manual fan speed has been selected, the Fan LED lights. The speed level is momentarily displayed when it is selected. Press and release the Fan button until the desired fan speed number is displayed.

Fan-Only Mode

Use the Fan-Only Mode to operate the fan for air circulation when no cooling or heating is desired. From the Off Mode press and release the Fan button to start fan speed 1. Press and release again to increment through the other speeds. After reaching

speed level 6, press and release the Fan button to turn off the fan. Turning on the control will revert the fan to the Automatic Mode or the last selected manual fan setting.

Cycled or Continuous Fan Operation

The fan can be set to run continuously whenever the system is turned on, or it can be set to cycle on and off with the compressor. To change this fan operational setting, select either "CYC" or "con" in P-14. When "CYC" is selected, the setting has been changed to cycled. When "con" is selected, the setting has been changed to continuous.

PROGRAM MODE

Use Program Mode to adjust operating parameters for your particular needs. Program Mode is also used to fine-tune the system for the most efficient operation within an installation. (Variables such as ducting, sensor location, and system layout affect system operation.) The control has factory default settings stored in permanent memory that can be recalled. However, reprogrammed settings can be saved as the new default, thus overwriting the factory defaults. See "P-17: Reset Memorized Defaults" on page 9 for details.

USING PROGRAM MODE

ENTERING PROGRAM MODE

You can only enter Program Mode from the Off Mode. If necessary, press the Power button to enter Off Mode. Press and hold the Power button while in the Off Mode until the letter "P" appears in the display. The characters "P1" followed by the P-1 parameter setting appear in the display. The control is now in the Program Mode. If no programming is attempted for one minute, the control exits Program Mode and returns to Off Mode.

EXITING PROGRAM MODE

Press the Power button once to exit Program Mode and return to Off Mode. Or, do not attempt any programming for 50 seconds, then the control exits Program Mode and returns to Off Mode. Any programming changes made while in Program Mode will be saved and put into operation after exiting Program Mode and returning the control to the On Mode. (If you want the programming changes to become the new defaults, see "Memorizing New Program Parameters" below.) When you exit Program Mode the software version number (such as "A24") appears in the display.

CHANGING PARAMETERS

While in Program Mode, press and release the Fan button to increment from one program parameter to the next until you reach the desired parameter number. The programmable parameters range from P-1 through P-22.

When you reach the desired parameter number, use the Up and Down buttons to select the data or set the desired limits for the parameter being programmed. See Table 2 on page 10 for a list of the parameters, the possible settings for each, and their factory default settings.

MEMORIZING NEW PROGRAM PARAMETERS

If you want new parameters to be the program defaults, adjust the parameters to the desired settings, then press the Up and Down buttons simultaneously while in Program Mode. This memorizes the new settings as program defaults and exits the Programming Mode.

To return to the factory default settings, refer to the factory defaults listed in Table 2 on page 10 and reset the parameters manually.

RESTORING MEMORIZED DEFAULT SETTINGS

You can restore the last memorized default settings by entering Program Mode and setting P-17 to "rSt". The memorized default settings are restored and the control returns to Off Mode. See "P-17: Reset Memorized Defaults" on page 9 for details. To return to the factory default settings, refer to the factory defaults listed in Table 2 on page 10 and reset the parameters manually.

SOFTWARE IDENTIFICATION

The control's software version (such as "A24") appears in the display for one second prior to exit from Program Mode, then the control returns to Off Mode.



NOTE

If you have any reason to contact Dometic about the system or programming the control, you must have the software identification number and air conditioning unit serial number available. The serial number may be found on the dataplate label.

PROGRAMMING

PROGRAMMING PROCEDURE

1. Enter Program Mode. (See “Entering Program Mode” above for details.)
2. Press and release the Fan button to increment from one program parameter to the next.
3. Use the Up and Down buttons to change the parameter’s setting.
4. Press the Power button to exit Program Mode and return the control to Off Mode. Or, to memorize the changes as the new defaults, simultaneously press the Up and Down buttons (optional).

PROGRAMMABLE PARAMETERS

The system’s default parameters may be changed by the installing dealer or end user. Once new values are entered and memorized, the factory defaults are overwritten and the new parameters become the default values. You can restore the original factory default parameters manually. A summary of the parameters, the permitted values, and original factory default settings of each are listed in Table 2, page 10.



IMPORTANT

If you have any programming problems or confusion occurs, reset the Memorized Default Settings by entering Program Mode and setting P-17 to “rSt”.

P-1: Operating Mode

Select an operating mode: For Automatic Mode select “0”, for Cool Mode select “1”, for Heat Mode select “2”.

P-2: High Fan Limit

Values for the upper fan-speed limit range from 65 to 95. Set a higher number to increase the fan speed or a lower number to slow the fan speed.

P-3: Low Fan Limit

Values for the lower fan-speed limit range from 30 to 64. Set a higher number to increase the fan speed or a lower number to slow the fan speed.



IMPORTANT

Once the high and low fan speed limits are set, the unit automatically readjusts the remaining speeds to produce six equally spaced fan speeds in both Automatic and Manual Fan Modes.

P-4: (Reserved for future use)

P-5: Temperature Calibration

This feature calibrates the ambient sensor within a range of $\pm 10^{\circ}\text{F}$. Adjust this parameter to display the correct room-temperature reading. Note that setting increments are in $^{\circ}\text{F}$ even when the control is set to display $^{\circ}\text{C}$.

P-6 through P-9: (Reserved for future use)

P-10: Display Brightness Control

The display brightness can be adjusted from 4 to 13, with 4 being the dimmest and 13 the brightest. Typically a dark cabin will require a setting of 4 or 5. A very bright cabin will require a setting of 10 to 13.

P-11: Fahrenheit or Celsius Selection

The default setting is $^{\circ}\text{F}$. Select $^{\circ}\text{C}$ for Celsius. (Celsius readings are displayed in tenths, for example 22.2°).

P-12: (Reserved for future use)

P-13: Reverse Automatic Fan Speeds During Heating

The automatic fan speeds can be reversed during Heat Mode to improve heat output in cooler climates. The fan will speed up as the set point is approached. Lowering the fan speed when the cabin is cold increases head pressure and helps raise supply temperature. Increasing the fan speed as the set point is approached also reduces unnecessary high pressure faults. The fan switches to low speed when the set point is satisfied and the compressor cycles off. The fan can be programmed to operate the same as in cooling by programming P-13 “nor” which represents normal fan operation during reverse cycle heating.

P-14: Cycle Fan With the Cooling or Heating Demand

You can program the fan to run continuously when the system is on, or allow it to cycle with the cooling or heating demand. The default is “con” for continuous fan. To cycle the fan select “CYC”.



IMPORTANT

When used with optional electric heat, the fan remains on for four minutes after the heater cycles off.

P-15: Electric Heat Option

Units may have an electric heater added to heat a cabin when the chiller system is in cooling mode. Electric heaters are also used to supplement the circulated water heating (via the hydronic valve) when necessary. Set to "ELE" for the electric heat option or set to "nor" to disable.

- **For software revision A12 and older:** When this parameter is programmed for electric heat, only the electric-heater relay located toward the middle of the circuit board is energized during a heating cycle. The electric-heater relay only exists on circuit boards with revision E or older. (See "Sample Wiring Diagram" on page 16.)
- **For software revision A13 and newer:** When programmed for electric heat, both the electric-heater relay and the compressor relay are energized. This change supports circuit boards with revision F and newer, without the electric-heater relay. Therefore, circuit boards that do not have electric-heater relays require a display with software revision A13 or newer to properly energize the compressor relay. When using this configuration, the electric heater L1 connection must be connected to the COMP L1 terminal on the AH-Passport I/O circuit board (see "Sample Wiring Diagram" on page 16).
- **Installation Note:** Since both the compressor-relay and electric-heat relay outputs only support a maximum of 30 amps at 115VAC or 20 amps at 230VAC of resistive load, when installing an optional electric heater that exceeds this load, it is necessary to install an additional contactor that is rated to handle the full load of the electric heater. Please consult with Dometic Customer Service or with an authorized service technician for assistance.

P-16: Fan Motor Selection

The "SC" (Split Capacitor) default setting is correct for air handlers with high-velocity blowers. Only change the setting to "SP" if your unit has a Shaded Pole fan motor, recognizable by a blower-motor overhang and "F" in the model number (such as AT12FZ). The SC motor of a high-velocity unit is inside the blower, and the unit has "HV" in the model number (such as AT12HVZ). **If your air handler model has a Shaded Pole fan motor, you must change parameter P-16 to "SP" prior to operating the equipment.** Save this change as a new default by simultaneously pressing and releasing the Up and Down buttons prior to exiting the program mode. Make note of new default in the Programmable Parameters table.

P-17: Reset Memorized Defaults

To reset all programming parameters set this parameter to "rSt". This restores all programmable parameters to the **last saved default values**. Once new values are entered and memorized the factory defaults are overwritten, and the new parameters become the default values. To restore the original factory default parameters manually, refer to Table 2, page 10.

P-18: Hydronic Water Valve Forced Open

This parameter opens the water valve to bleed air from the system. "OPn" forces the valve open for 4 hours while the AH-Passport I/O control is turned off. If you want to utilize the system in its normal operating mode prior to completion of the 4-hour period, before turning on the AH-Passport I/O you must return the valve to its normal position by changing P-18 back to "nor" manually.

P-19: Water Temperature Differential

This parameter sets the temperature differential between ambient air temperature and hydronic water temperature that controls the water valve. For example, selecting 10° F opens the valve when water temperature is ten degrees less than ambient in cooling mode and 10°F greater than ambient in the heating mode.

Careful selection of the temperature differential can fully utilize the ship's heating and cooling resources. For example, while in cooling mode and using a ten degree value, the valve will open to allow some cooling while the hydronic system is coming down to temperature. See Figure 2 on page 11 for a graphical explanation of this parameter.

P-20: Air Filter Cleaning/Replacement Timer Setting

(Available only in software revision A21 and newer.) Use this feature for a reminder to clean or replace the unit's air filter. The parameter entered represents that number times 10 hours. Select the number of operating hours until the filter reminder appears. Parameter choices are between 10 (100 hours) and 250 (2500 hours). Dometic recommends that you check the air filter at least every 500 hours of operation. The default setting is off, designated with "00".

P-21: Filter Cleaning/Replacement Timer Value & Reset

(Available only in software revision A21 and newer.) This parameter displays the current elapsed time (in hours times 10) since the timer was started or reset. For example, if the value of P-21 is "30", then between 300-399 hours have elapsed since the timer was started or reset. Once the value of P-21 reaches the value set in P-20 (explained above), "FIL" flashes on the LED display every 10 seconds until it is cleared. To clear the "FIL" reminder, press either the Up or Down button while viewing the P-21 parameter. This resets P-21 to 0 and restarts the timer.

P-22: Voltage Calibration

(Available only in software revision A21 and newer.) This feature displays the voltage being read by the power and logic circuit board. It displays a live reading of the voltage and can be manipulated by pressing the Up or Down buttons. Use a reliable voltmeter as a reference when adjusting this parameter.

Table 2: Programmable Parameters - Ranges and Factory Defaults

Parameter Number	Description	Factory Default	Custom Default	Parameter Range
P-1	Operating Mode	0		0 = Auto 1 = Cool Only 2 = Heat Only
P-2	High Fan-Speed Limit	95		65 - 95
P-3	Low Fan-Speed Limit	55		30 - 64
P-4	Reserved for future use.			
P-5	Temperature-Sensor Calibration	Ambient temp		Ambient plus or minus 10° F
P-6	Reserved for future use.			
P-7	Reserved for future use.			
P-8	Reserved for future use.			
P-9	Reserved for future use.			
P-10	Display Brightness Control	9		4 (Dimmest) - 13 (Brightest)
P-11	Display Temperatures in Fahrenheit or Celsius	F		F = Fahrenheit Displayed C = Celsius Displayed
P-12	Reserved for future use.			
P-13	Reverse Fan Speeds During Heat Mode	rEF		nor = Normal Fan Operation rEF = Reversed Fan in Heat Mode
P-14	Continuous Fan or Cycle Fan With Compressor	con		CYC = Cycle Fan With Compressor con = Continuous Fan Operation
P-15	Chilled-Water Heating or Electric Heat Option	nor		nor = Chilled-Water Heat Only ELE = Electric Heater Installed
P-16	Fan-Motor Type: Split Capacitor or Shaded Pole	SC		SC = Split Capacitor Fan Motor SP = Shaded Pole Fan Motor
P-17	Reset Memorized Programming Defaults	nor		rST = Reset Defaults nor = Normal
P-18	Water Valve Forced Open 4 Hours to Bleed the Chilled Water System	nor		nor = Normal Operation OPn = Valve Forced Open
P-19	Temperature Differential of Ambient Air to Chilled Water	15° F		5° F to 25° F
P-20	Air Filter Cleaning/Replacement Timer Setting (x10 hours)	0		0 = Timer Disabled 10 - 250 (100 - 2500 hours)
P-21	Current Filter Time (x10 hours) and Reset	0		Displays the elapsed time (in hours x10) since the timer was started or reset. Press Down button to reset value to 0, restart the timer, and clear the display's "FIL" reminder.
P-22	Voltage Calibration	AC Voltage		

FAULT-HANDLING CODES

One of the following fault codes displays when a fault is detected:

- **ASF** – Indicates air sensor failure.
- **FIL** – Indicates filter needs to be cleaned or replaced.

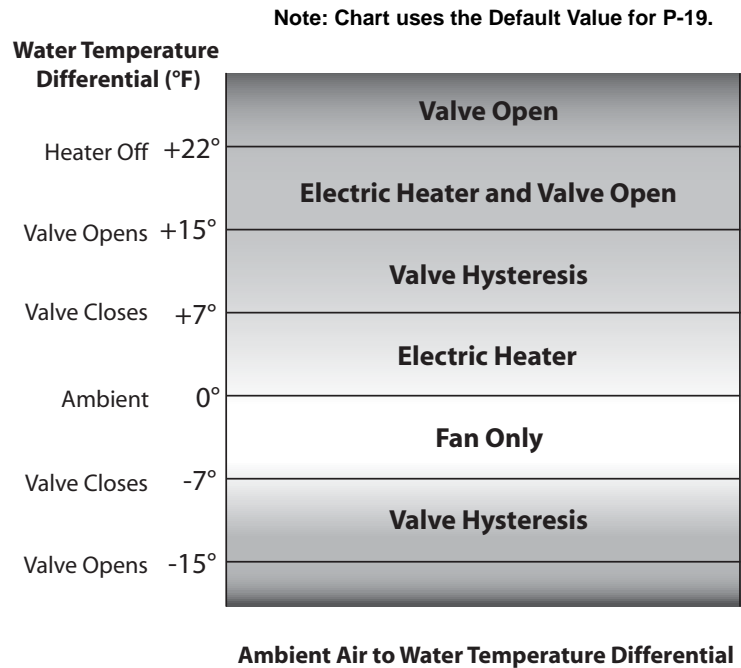
TEMPERATURE DIFFERENTIAL OF AIR & WATER

The optional electric heater overlaps with the chilled-water heat by 22° F (12.2° C). The heater turns on when heat is required and remains on until the chilled-water temperature exceeds the ambient by 22° F (12.2°C) or until the room temperature is satisfied. During very cold conditions electric heat overlaps the chilled-water heat to supplement heating. Note that parameter P-19 setting increments are in °F even when the control is set to display °C.



IMPORTANT
The system’s air sensor is located in the control’s display panel, therefore the display **MUST** be located on an interior wall at eye level. It must **NOT** be located in direct sunlight or inside a cabinet.
If these conditions cannot be met, you must purchase the Optional Remote Air Sensor and install it in the return-air stream.

Figure 2: Ambient Air to Water Temperature Differential



TROUBLESHOOTING

GENERAL TROUBLESHOOTING

See additional troubleshooting information in the manual for your specific chiller system.

Table 3: General Troubleshooting

PROBLEM	POSSIBLE REASON/SOLUTION
System will not start.	<ol style="list-style-type: none"> 1. Air handler circuit breaker is off. Turn circuit breaker on at ship's panel. 2. Digital control is not turned on. Press the Power button. 3. Wrong wiring at terminal strip. Check wiring diagram; correct if necessary. 4. Input-line voltage is insufficient. Check power source (shore/generator) for proper voltage. Check wiring and terminals for proper sizes and connections. Verify with a volt-meter that the power at the unit is the same as the power source. 5. Push-on connectors or butt splices became disconnected during installation. Disconnect power supply and open electric box, check wiring diagram, correct if necessary.
Fan is not running.	Check "Digital-Controls Troubleshooting" on page 13.
No cooling or heating.	<ol style="list-style-type: none"> 1. Temperature set point is satisfied. Lower or raise set point. 2. Fan is not running. Check your specific control troubleshooting section. 3. Digital control is programmed for Cool or Heat only, or mechanical-control thermostat is rotated too far toward either Cooler or Warmer setting. See the control's Operations Manual for instructions. 4. Chilled-water loop is inadequately cooled or heated, chiller system is not in the proper mode of operation, or Electric Heater is disabled. If the air handler system is equipped with water-temperature sensors, check the water temperature at the digital control by pressing the Up and Power buttons simultaneously while in On mode. If the water temperature is not at least 15°F warmer (for heat mode) or cooler (for cool mode), the water valve will not open. See "Temperature Differential of Air & Water" on page 11 and the P-19 programmable parameter for more information. If the air handler system is equipped with an electric heater, ensure that programmable parameter P-15 is set to "ELE".
Low airflow.	<ol style="list-style-type: none"> 1. Airflow is blocked. Remove any obstructions in return-air stream. Clean return-air filter and grille. Check for crushed or restricted ducting; ducting must be as straight, smooth and taut as possible. 2. Fan speed is set to manual low. If the fan speed is set to manual low, press and release the Fan button until the desired fan speed and airflow are reached. If you want automatic fan speed control, press and release the Fan button until the letter "A" displays.
System runs continuously.	<ol style="list-style-type: none"> 1. Set point temperature is improperly set: too low for cooling or too high for heating. Raise or lower set point. 2. Porthole or hatches open. Close all port holes and hatches. 3. Improper air sensor location. Check your specific control troubleshooting section.

DIGITAL-CONTROLS TROUBLESHOOTING

See also "General Troubleshooting" on page 12.

Table 4: Digital-Controls Troubleshooting

PROBLEM	POSSIBLE REASON/SOLUTION
Digital display panel is not lit.	The 8-pin display-cable plugs are not making contact (unplugged, dirty, bent, or broken pins). With POWER OFF at the circuit breaker, remove connector and inspect. If damaged, replace connector or entire display cable.
Fan is not running or runs continuously.	Digital control is programmed for either fan cycling with cooling/heating demand or continuous fan operation. Reprogram parameter P-14. Note: After the unit cycles off, the fan will continue to run for two minutes in Cool Mode and four minutes in Heat Mode regardless of parameter setting.
Fan is not running but a cooling/heating demand exists.	Failed triac on circuit board. Send for repair or call local service technician.
Fan runs continuously although it is set to cycle with cooling/heating demand.	Failed triac on circuit board. Send for repair or call local service technician.
No cooling or heating.	Digital control programmed for heat or cool only. Reprogram parameter P-1.
System runs continuously.	Improper air sensor location. Verify display head location with criteria found in the control manual. Install alternate air sensor if necessary. Ensure the control display is located out of direct sunlight and away from open doors or hatches. Or, if using an alternate air sensor, ensure the sensor is located directly in the system's return-air path to obtain an accurate reading.
"ASF" is displayed. (Air Sensor Failure)	<ol style="list-style-type: none"> Indicates failed face plate air sensor, alternate air sensor or display cable. Unplug alternate air sensor if installed or plug in alternate air sensor if not installed. Try another display cable. Damaged jack/socket in display head or on circuit board. Visually check to see that pins inside socket are not bent or corroded. Repair or replace display or circuit board if needed.
"FIL" is flashing (Filter Reminder)	Filter needs to be cleaned or replaced. Clean or replace filter, and reset P-21 to "00".

MAINTENANCE

RETURN-AIR FILTER

Check the return-air filter about once a month and clean as necessary. To clean the filter, remove it from the unit, rinse with water, air dry and reinstall.

SPECIFICATIONS

OPERATIONAL

Set Point Operating Range	65°F to 85°F (18.3°C to 29.4°C)
Ambient Temperature Operating Range Displayed	5°F to 150°F (-15°C to 65.6°C)
Sensor Accuracy	± 2°F @ 77°F (±1.1°C @ 25°C)
Low Voltage Limit 115 Volt Units	.75 VAC
Low Voltage Limit 220 Volt Units	.175 VAC
Low Voltage Processor Reset	.50 VAC
Line Voltage	115 Through 240 VAC
Frequency	50 or 60 Hz
Fan Output	6 Amps @ 115 VAC
Fan Output	6 Amps @ 230 VAC
Valve Output	1/4 Amp @ 115/230 VAC
For circuit boards revision F and newer :	
Heater Output (using compressor relay)	30 Amps @ 115 VAC
Heater Output (using compressor relay)	20 Amps @ 230 V
For circuit boards revision E and older :	
Heater Output (using heater relay)	30 Amps @ 115 VAC
Heater Output (using heater relay)	20 Amps @ 230 V

DIMENSIONS

Compact model - Display Panel	3.19" (82mm) X 2.5" (64mm)
Compact model - Panel Cut Out	2.4" (61mm) X 1.8" (46mm)
Legacy model - Display Panel	4.5" (114mm) X 3.86" (98mm) high
Legacy model - Panel Cutout	3.375" (86mm) X 2.875" (73mm)

CABLE LENGTHS

Display Cable	15' (4.6m) Standard
Alternate Air Sensor (optional)	7' (2.1m) Standard
Outside Air Sensor (optional)	15' (4.6m) Standard
All custom cable lengths supplied in standard 5' (1.5m) increments	75' (22.9m) Maximum



NOTE

Maximum length of display and sensor cables is 75 feet (22.9m). The outside-air sensor and alternate air sensor are optional items and are not included with the standard control package.

SYSTEM INPUTS

Ambient or Inside-Air Temperature	1
Water Inlet Temperature Sensor	1
Alternate Inside-Air Temperature Sensor (optional)	1
Outside-Air Temperature Sensor (optional)	1

WARRANTY AGREEMENT

This control may be covered under Dometic's Unit Warranty or Dometic's Part Warranty. Please refer to the specific warranty data sheet for more information.

DIAGRAMS

SAMPLE APPLICATION

Figure 3: System Layout Example

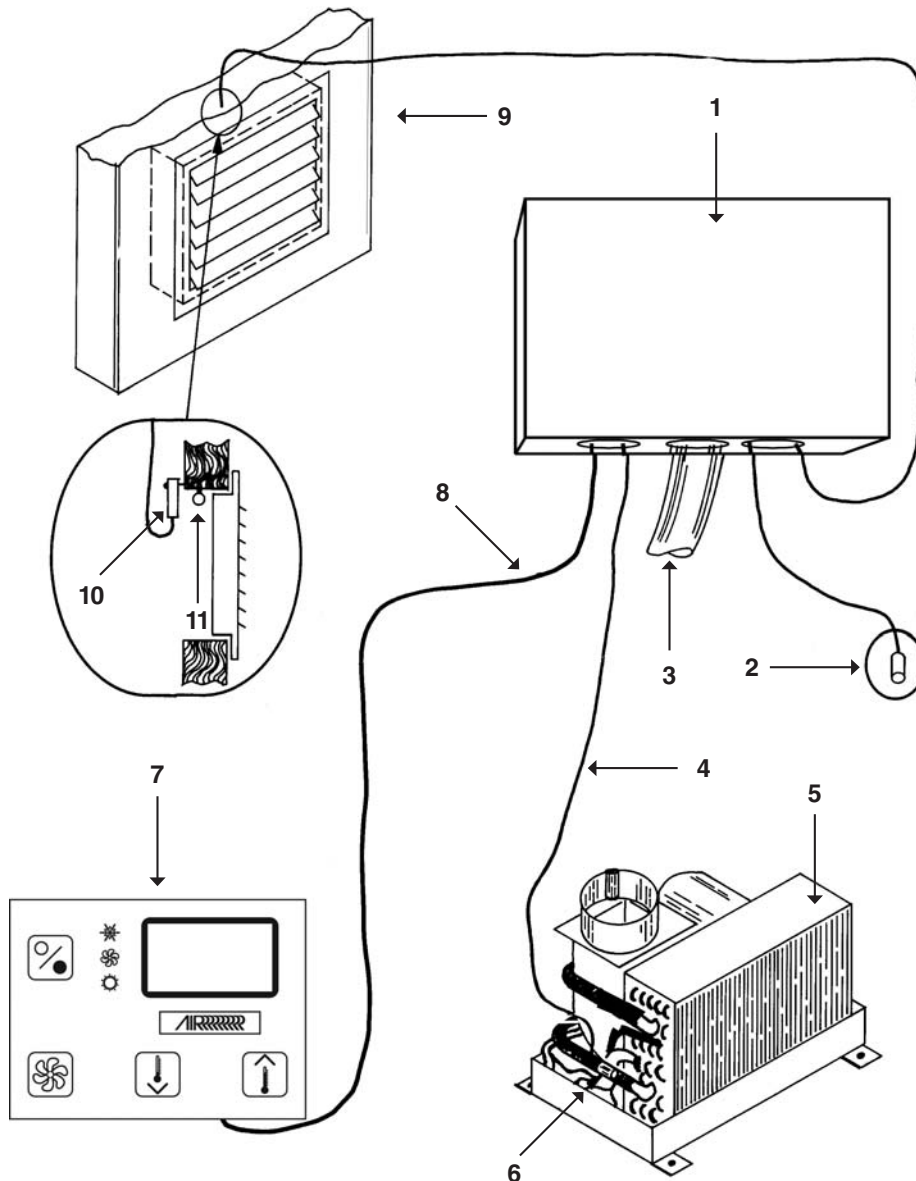


Table 5: System Layout Example - Diagram Legend

1	Electrical Box	6	Water Inlet Sensor
2	Optional Outside Air Sensor	7	Control Display Panel
3	AC Wire Harness	8	8-Conductor Shielded Display Cable
4	6-Conductor Shielded Sensor Cable	9	Return-Air Grille
5	Convector Assembly	10, 11	Optional Remote Air Sensor (your choice of 2 installation locations)

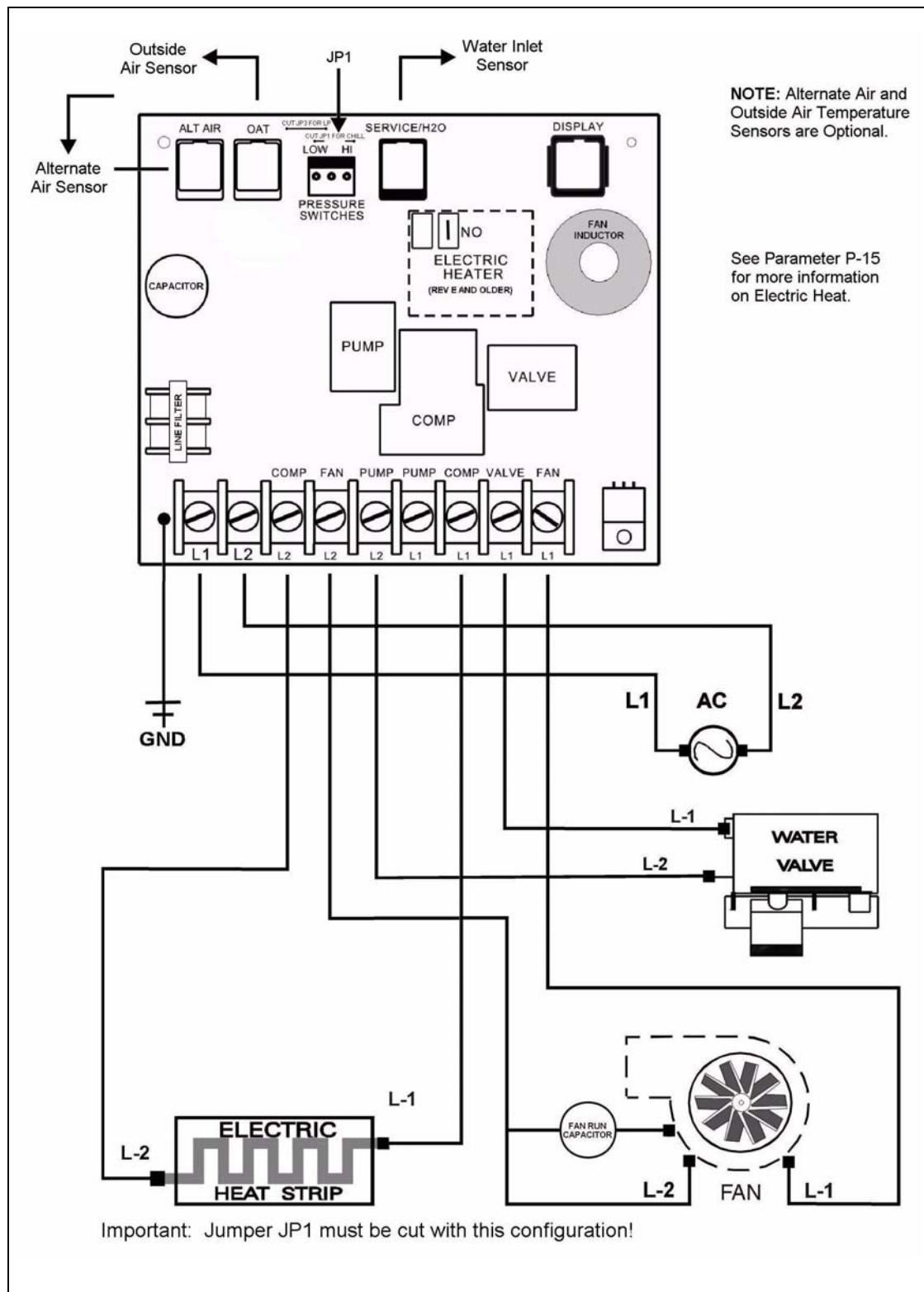
SAMPLE WIRING DIAGRAM



IMPORTANT

This is a sample diagram. Wire colors may vary. See unit's specific diagram located in electrical box. Turn power off before opening electrical box.

Figure 4: Sample Digital Control Wiring Diagram



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