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Dometic is a customer driven, world-leading provider of innovative leisure products for the caravan, motorhome and marine markets. Dometic offers a complete range of air conditioners, refrigerators, awnings, cookers, sanitation systems, lighting, windows, doors and other equipment that makes leisure life more comfortable away from home.

Dometic also provides refrigerators for specific use in hotel rooms, offices and for storage of medical products and wine. Dometic's products are sold in almost 100 countries and are produced mainly in Dometic's own production facilities around the world. Annual sales amount to approximately 750 MEUR. Dometic has more than 4,400 employees.

# Guidelines for Adding Digital Controls To Your Boat's Air Conditioning System



*This guideline describes the advanced features of Marine Air Systems digital controls, and offers help with upgrading your existing control system. We invite you to review this information, then to call your Marine Air Systems dealer to discuss how you can make the change to your air conditioning system.*

If you have a Marine Air Systems air conditioning system with a manual switch assembly, or one of our earlier environmental control units, we have good news for you.

You can easily replace your 3-knob switch with a state-of-the-art computerized control — our **Elite™ or Passport® I/O Environmental Controls** — quickly and inexpensively. Your Marine Air Systems dealer can upgrade your air conditioning system with one of our *retrofit kits*, and in just a few hours, you can be using the powerful comfort-control capabilities available with a Elite or Passport I/O unit.

Although Elite and Passport I/O were specifically designed for Marine Air Systems air conditioning systems, in many cases you can retrofit either control to systems other than Marine Air. You should consult with your dealer for guidance.

## About Elite and Passport I/O Environmental Controls

Elite and Passport I/O are computerized control units for Marine Air cooling and heating systems. The controls can be used with all Marine Air direct-expansion seawater-cooled systems with variable-speed blowers. They can also be specified with new systems, and retrofitted in the field to replace most electromechanical switch assemblies.

You must identify your current controller if it is not a basic three-knob type, to be sure that the correct components are chosen for an upgrade to Elite or Passport I/O.

## Easy to Use

In spite of their sophistication, (more than 15 different programmable functions), the Elite and Passport I/O digital controls are remarkably easy to use.

### Standard Features of all Keypad/Displays:

- Clearly marked buttons that are self-explanatory.
- Large, easy-to read digital display giving instant reference to setpoint or cabin temperature, important operating parameters and fault code warnings.
- Small LED lights on panel to show system's operating mode and status.

### The *new* Euro-styled Elite

- Easier to operate five button control that fits into popular Vimar® bezels, allowing more flexibility with your boat's interior decor.
- It is also flash programmable, which allows for easy upgrades.

For normal operation, you simply select the desired temperature, set for automatic operation and relax. That's all. If you are currently using a 3-knob type control, you will be amazed at the difference in temperature regulation – no more wide swings.

If you want to fine-tune your settings or take advantage of the advanced programmable functions, you can enter the programming mode and make changes to the factory-set parameters. The system's non-volatile memory retains all of your settings, even when power is interrupted.

## Heating and Cooling

You can set the Elite or Passport I/O to provide cooling only, heating only or automatic changeover between heating and cooling. This means that in the Fall or Spring, when days are hot and nights are cool, the system will keep the inside of your boat at a constant comfortable temperature. Older three-knob controls generally require one to “adjust” between day and night.

## Non-Volatile Memory

Power interruptions are a common occurrence on most boats, and it's a nuisance to have to reset the air conditioning system every time power is lost momentarily. Elite and Passport I/O controls are designed to bring the Marine Air system back on line automatically to the last user-programmed settings.

To protect the compressor, the Elite and Passport I/O have a special software subroutine that automatically equalizes pressure before every compressor restart. If two or more Marine Air systems are on board, the Elite and Passport I/O can be programmed with time delays to restart the compressors sequentially, minimizing line and generator loads.

## Automatic Monitoring

The Elite and Passport I/O monitor critical system functions, such as voltage and certain refrigerant pressures. Whenever it senses potentially damaging conditions, it reacts to protect the system from harm.

Likewise, the controls automatically monitor pressures in the refrigerant lines. Any time the pressure exceeds a preprogrammed limit, either too high or too low (where a low pressure switch is installed), the controls shut the system down before it can be damaged. It then goes through a programmed subroutine of automatic restarts and system monitoring. If the out-of-tolerance condition persists after several restarts, the Elite and Passport I/O issue a sustained shutdown command. A fault display appears on the LED whenever the system is shutdown due to these conditions.

## Dehumidification

When you leave your boat unattended for long periods of time, you can program the Elite or Passport I/O to switch the air conditioning system on at pre-selected intervals to circulate and remove moisture from the air.

Whenever the Elite or Passport I/O is in dehumidification mode, all of the safety controls are on guard. If the seawater flow fails, the high-pressure switch will shut the system down. If power is briefly interrupted, the control will remember all of the settings currently in effect, and when power is restored, it will automatically resume operation in the dehumidification mode.

## Programmable

Elite and Passport I/O digital controls are programmed at the factory for "average" conditions. For optimum performance, you can fine-tune many system parameters with touchpad programming procedures. For instance, you can calibrate the temperature, change the compressor restart time delay, set for continuous or intermittent fan operation, reset the high and low fan speeds, and change the display from Fahrenheit to Celsius.

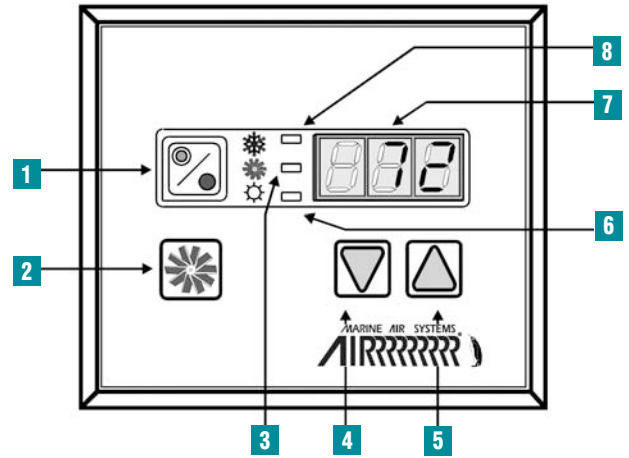
## Proven In The Field

Field experience has shown that the Elite and Passport I/O equipped air conditioning systems work better and have fewer mechanical failures than systems with electromechanical controls. This is because electronic controls can monitor and react much more capably than mechanical systems, and also because of the built-in protective features and self-diagnostics made possible by the powerful microprocessor inside both the Elite and Passport I/O.

## Inexpensive Field Upgrade

Marine Air Systems has designed Elite and Passport I/O Retrofit Kits for easy installation, minimizing costs.

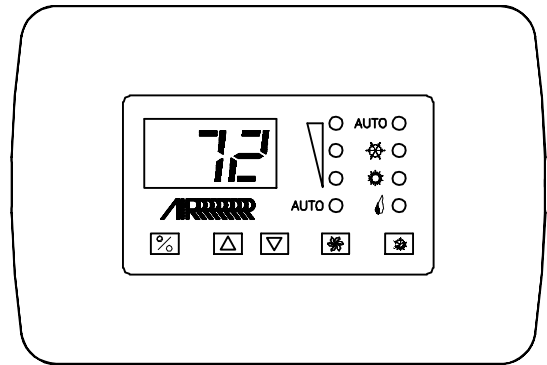
Figure 1: Passport I/O Digital Control display



- 1 Power Button
- 2 Fan Button
- 3 Fan LED Indicator
- 4 Down Button
- 5 Up Button
- 6 Heat Mode LED
- 7 Three-Digit 7 Segment Display
- 8 Cool Mode LED

Figure 2: Elite Digital Control display

(shown here with bezel, which is sold separately)



### Components Included in Elite and Passport I/O Retrofit Kits

- Circuit board inside electrical box
- Elite or Passport I/O digital display
- Bezel for Elite - black included (other colors are available)
- Harness - self-contained harness includes polarized plug
- Retrofit Plate - size and shape depends on control to be replaced.
- Display Cable - 15' for self-contained; 30' for central systems
- 7' Air Sensor Cable
- Optional Remote Air Sensor
- Operations Manual
- Quick Reference Card

The Marine Air retrofit kit makes it easy to replace your old switch assemblies with an Elite or Passport I/O digital control. But before you call your Marine Air dealer, you will need to make a few decisions.

*Your first step* should be to determine the model numbers for the Marine Air units on your boat. This will help your dealer determine exactly which components will be needed to complete the retrofit.

Next, you'll have to answer the following questions. . .

*Relative to your boat's interior:*

#### 1. What color display do you want?

- The Elite is available in Grey tones and White and the Passport I/O is available in White, Black or Silver.

#### 2. If choosing the Elite, what Bezel cover do you want for your display ?

- Vimar Idea® Bezels come in an assortment of styles and colors including Black, White, Metallics and Wood Grain.

#### 3. How long does the cable run between the electric box and the air conditioning control?

- Cables are available in standard lengths of 10, 15, 20, 30, 40 and 60 ft.

#### 4. Where will the optional temperature sensor (thermistor) be placed?

- Both the Elite and Passport I/O have temperature sensors built into the display. An optional remote air sensor is available. Normally, it should be behind the return air grill, or in front of the evaporator coil. Thermistors come with cable lengths of 10, 15, 20, 30, 40 and 60 ft.

## Worksheet

For your convenience, you can use the worksheet below. Fill in the blanks, and take it to your local Marine Air dealer. You'll find out how easy and inexpensive it is to upgrade.

*(NOTE: Each separate air conditioning system has its own control, and you'll need a separate worksheet for each.)*

**How many air conditioning systems do you have on board?** \_\_\_\_\_

**Model number of your air conditioning system:** \_\_\_\_\_

**Distance from electric box location to current air conditioning control (approximate):** \_\_\_\_\_ ft.

**Distance from temperature sensing element to unit electric box (approximate):** \_\_\_\_\_ ft.

### Display selection....

#### Passport I/O

**-Color of Keypad/Display (circle one):**

**Black**

**White**

**Silver**

#### Elite

**-Color of Display (circle one):**

**Gray Tones**

**White**

**-Color of Bezel for display.** Sorry – but we have a wide selection. Of course black and white are available, but so are gold and chrome metallics and wood grains (special order) – see what we mean? **See your Marine Air Systems dealer for Bezel availability.**