Smart Touch Cabin Control
Installation & Operations Manual

Smart Touch Cabin Control
(shown without bezel)
Table of Contents

INTRODUCTION ........................................... 1
Read This Manual Before Proceeding .......... 1
Features .................................................. 1
Standard .................................................. 1
Optional .................................................. 1
How It Works ............................................ 1
The Importance of Seawater Temperature ... 1
Description of Control ............................... 2
Important Programming Notes to Installer and
End User .................................................. 3
Memory ..................................................... 4
Normal Heating or Cooling Cycle ............... 4
Reversing Valve Operation (For DX Systems Only) 4

Installing The Display Panel ...................... 4
Choosing the Location ................................. 4
Mounting the Display .................................... 5
Mounting the Optional Sensors ................... 6
Remote Air Sensor ........................................ 6
Outside Air Temperature Sensor ................. 6
Service Sensor (For DX Systems Only) ....... 6
Water Inlet Sensor (For CW Systems Only) ... 6
Seawater Temperature Sensor - Optional (For
DX Systems Only) .................................... 6
Humidity Sensor - Optional ........................... 6

Rechargeable Battery Backup ..................... 6

Operation ............................................... 7
Operator Controls and Display Panel .......... 7
Home Screen Icon Functions ....................... 7
Main Screen Icon Functions ....................... 8

Modes of Operation .................................... 9
Off Mode ............................................... 9
On Mode ............................................... 9
Automatic Mode ....................................... 9
Cool Mode ............................................. 9
Heat Mode ............................................. 9
Moisture Mode ........................................ 9
Dehumidification Mode Indicator ............... 9
Fan Modes .............................................. 9

Main Menu ............................................. 10
Control Parameters ................................... 11
Program Scheduler .................................... 18
Date/Time Menu ....................................... 18
System Menu ......................................... 19
Troubleshooting/Commissioning ............... 21
Fault Handling, History & Run Hours .......... 22
Quick-Start Operations Checklist ............... 23

Main Menu Navigation Tree ......................... 24
Main Menu Programmable Parameters .......... 27

Troubleshooting ....................................... 32
General Troubleshooting ............................. 32
Digital Controls Troubleshooting ............... 34

Maintenance ............................................ 36
System Components .................................... 36
Reversing Valve (For DX Systems Only) ....... 36
Seawater Strainer (For DX Systems Only) ..... 36
Condenser Coil (For DX Systems Only) ......... 36
Return-Air Filter ....................................... 36
Winterization (For DX Systems Only) .......... 36

Specifications .......................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40

Specifications .......................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40

Specifications .......................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40

Specifications ........................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40

Specifications ........................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40

Specifications ........................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40

Specifications ........................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40

Specifications ........................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40

Specifications ........................................... 37
Operational ............................................. 37
Dimensions ............................................. 37
Cable Lengths .......................................... 37
System Inputs .......................................... 37

Diagrams ............................................... 38
Wiring Diagrams for DX and CW Systems ....... 38

CW Systems Layout ................................... 40
INTRODUCTION
The Smart Touch Control is a microcontroller-based unit designed for use with direct expansion (DX), reverse-cycle air conditioning systems.

READ THIS MANUAL BEFORE PROCEEDING
Read this manual completely before you proceed with the installation and operation of the Smart Touch. If you have questions or require assistance with your Smart Touch control, contact the Dometic Marine Service Department at +1 954-973-2477.

The Smart Touch is covered under existing Dometic Owner’s Limited Warranty Policy. Incorrect installation, neglect and system abuse are not covered under the Dometic warranty policy.

FEATURES

STANDARD

• User-friendly touchscreen display requires no manual for basic operation.
• 5-volt logic and microcontroller located in the display.
• Automatic and three programmable manual fan speeds.
• 22 programmable parameters for custom installations.
• Moisture Mode for controlling relative humidity.
• De-icing cycle to prevent evaporator coil icing.
• Dehumidification control.

• Dehumidification control. Programmable compressor staging delays.
• Universal 220/115-230 volt, 50/60 Hz AC power supply.
• Nonvolatile memory retains settings without batteries.
• Programmable display-brightness control.
• Programmable failsafe modes.
• Fits Vimar® Eikon and Eikon EVO switch bezels.

OPTIONAL

• Outside air temperature sensor.
• Alternate air temperature sensor.
• Pump Sentry water sensor.
• Electric heating control capabilities.
• Seawater inlet temperature sensor.

• Auxiliary heating control capabilities.
• Humidity sensor for advanced humidity control.
• CAN-bus network capability.
• Air Filter Cleaning or Replacement Timer.
• Low-Voltage Monitor.

This manual provides all necessary information for proper installation and operation of the Smart Touch Display. Poor installation and misunderstood operating parameters will result in unsatisfactory performance and possible failure.

HOW IT WORKS
The basic principle behind an air conditioner is the movement of heat. In a marine DX air conditioner, heat is removed from the inside cabin air and transferred to the seawater. In reverse-cycle heating, the refrigerant flow is reversed and heat is extracted from the seawater and discharged into the living space. The efficiency of the system operation depends on both seawater and cabin temperatures.

THE IMPORTANCE OF SEAWATER TEMPERATURE
In Cool Mode, the air conditioner will operate most efficiently in seawater temperatures below 90°F (32°C). At higher seawater temperatures the unit will operate, but at a reduced capacity. A high-pressure shutdown may occur at higher seawater temperatures.

In Heat Mode, the opposite is true. As the seawater gets colder, there is less heat available, and the heating efficiency is reduced. Full heating capacity is obtained at approximately 55°F (13°C) seawater temperature. Performance drops to about 50% of rated capacity in 40°F (4.4°C) water. Below this, the system pressure can be so low that the unit will shut down on a low-pressure fault. This problem is compounded when the cabin is also cold. See “Digital Controls Troubleshooting” on page 34.
DESCRIPTION OF CONTROL
See Figures 1 and 2 to identify Home and Main screen displays.

Figure 1: Smart Touch Home Screen

Smart Touch Home Screen Display Layout
1. Temperature Indicator icon (Inside, Set Point, Outside, Water Temperatures, and Humidity)
2. Up icon - Raise temperature set point
3. Down icon - Lower temperature set point
4. Main Screen icon
5. Power icon

WARNING
Do not operate your air conditioning unit in water that is cooler than 38°F (3.3°C). Doing so could lead to water freezing in the condenser coil which can cause damage to the unit.
Figure 2: Smart Touch Main Screen

Smart Touch Main Screen Display Layout
1. Mode Selection icon
2. Home Screen icon
3. Up icon - Raise temperature set point
4. Fan Mode Selection icon
5. Fan Mode Indicator (Auto, high, medium, low)
6. Temperature Indicator (Inside, Set Point, Outside, Water, and Humidity)
7. Down icon - Lower temperature set point
8. Menu icon
9. Status & Schedule icon
10. Power icon

IMPORTANT PROGRAMMING NOTES TO INSTALLER AND END USER
1. If your air conditioning unit is Cool only (if it does not have a reversing valve), then you MUST select Cool Only Mode. DO NOT select Automatic Mode for a Cool Only unit. If Automatic Mode is selected and the thermostat calls for heat, the compressor will run. Since there is no reversing valve, the air conditioning unit will supply cool air when heating is desired. Cool Only units do not heat. See “Modes of Operation” on page 9 for more information on how to set the proper operating mode.

2. If your air conditioning unit has a Shaded-Pole (SP) fan motor instead of a Split-Capacitor (SC) High-Velocity (HV) fan motor, you MUST program “SP” into General Setting 8, “Fan Motor Type”, 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 General Setting if you do NOT have an HV blower.

NOTICE
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.

NOTICE
Do not staple any sensor cables when mounting.
MEMORY
When the Smart Touch loses power, the operating parameters are retained for up to 2 years. When power is restored, the control resumes operating as last programmed. The Smart Touch has a battery backup. If the battery backup is removed, only time and date settings will be lost.

NORMAL HEATING OR COOLING CYCLE
In Automatic Mode, heating and cooling are supplied as required. If cooling is required, the system will start a cooling cycle when the cabin temperature exceeds the set point by 2°F (1.1°C) and will continue to cool until the temperature equals the set point. (See “General Setting, Set Point Temperature Differential”, on page 13 for instructions on how to reduce this variation to 1°F [0.55°C].) The cabin temperature must drop below the set point by at least 4°F (2.2°C) in order for the system to switch from cooling to heating. Similarly, if heating is required, the system will start a heating cycle when the cabin temperature is below the set point by 2°F (1.1°C) and will continue to heat until the temperature equals the set point. The cabin temperature must exceed the set point by at least 4°F (2.2°C) in order for the system to switch from heating to cooling. If you select Cool Mode, only cooling is supplied. If you select Heat Mode, only heating is supplied. The cabin temperature in either mode is maintained within 2°F (1.1°C) of set point by default. (See “General Setting, Set Point Temperature Differential”, on page 13 for instructions on how to reduce this variation to 1°F [0.55°C].) When the heating or cooling set point is satisfied, the compressor cycles off and the fan returns to low speed. The fan speed remains constant if Manual Fan Speed is selected. For more information on this feature, see “Modes of Operation” on page 9.

(For CW systems only)
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 pressing the Temperature indicator icon until the Water temperature is displayed. The fan remains in low speed until the adequate water temperature is available. Heat will be supplied when no heating is available (water temperature is inadequate) only if the Optional Electric heater has been installed and programmed.

Adequate cooling or heating water temperature is defined by the Water Temperature Differential setting, under CW Control Parameters. Its factory default is set at 15°F (8.3°C) differential from the ambient air temperature.

REVERSING VALVE OPERATION (FOR DX SYSTEMS ONLY)
The position of the reversing valve determines if the system is in Cool Mode or Heat Mode. In addition, the reversing valve is programmed to toggle in these situations:
- When the system is running and heating or cooling is required, the reversing valve toggles to the opposite mode to reduce the starting surge of the compressor.
- When a cooling or heating cycle is called for and if the system has been off for less than 5 minutes.
- When a cycle is interrupted from the display panel by pressing the Power icon or changing the set point.

Unnecessary valve toggling is limited to reduce reversing valve noise. You can totally eliminate valve toggling by programming the minimum compressor staging delay to 5 minutes or greater (see “DX Operational Setting Compressor Start Delay” on page 15 for more information). Power-On Reset, which occurs when the system is powered up, always initiates a valve toggle.

INSTALLING THE DISPLAY PANEL
CHOOSING THE LOCATION
Figure 3: Smart Touch Display Front Panel
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 Figure 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 conditioner must be within the 15 ft (4.5 m) 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 cannot 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. Cut-out size is 2.900" (7.36 cm) wide by 2.165" (5.50 cm) 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.

**Figure 4: Smart Touch Display Mounting Dimensions**

(Drawing not to scale – not a template)

3. Secure the display panel to the bulkhead using the four screws provided. Do not use a screw gun and do not over tighten screws when mounting, because either method may damage the display.
4. When the display is securely mounted, mount the bezel over the display frame until it snaps into place.

**Figure 5: Smart Touch Display Top View Mounting Dimensions**
Mounting the Optional Sensors

Remote Air Sensor
Install the optional remote air sensor if the display cannot 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 ft (2.1 m).

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 inside jack #J3 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" plug #P6.

Service Sensor (For DX Systems Only)
Install the optional condenser coil temperature sensor into the “H2O OUT” plug #P5. Use of this sensor must be enabled by going to DX Operational Setting and then Pump Sentry feature.

Water Inlet Sensor (For CW Systems Only)
When using the AH Mode with a chilled-water air handler, plug the water-inlet sensor cable into the “H2O IN” plug #P4. Attach the sensor to the chilled-water inlet on the air handler. Ensure that the sensor makes good contact with the copper pipe. DO NOT attach to rubber hose.

Seawater Temperature Sensor - Optional (For DX Systems Only)
Install the optional seawater temperature sensor to monitor the temperature of the seawater feeding the air conditioner. Ensure that the sensor is in direct contact with the copper pipe and use thermal mastic to ensure good heat transfer. Strap the sensor wire in place for strain relief and to prevent the sensor from being accidentally removed. Plug the sensor’s 2-pin connector into the “Loop Water Out” (blue) socket located on the circuit board.

Humidity Sensor - Optional
Install the optional humidity/temperature combo sensor to monitor the relative humidity of the cabin. Locate the sensor in the same location as the ambient air temperature sensor. Plug the combo sensor’s 6-pin connector into the inside temperature socket located on the edge of the circuit board. The control board automatically detects the presence of this combo sensor and immediately starts measuring humidity.

Rechargeable Battery Backup
The Smart Touch comes with a rechargeable battery. The battery recharges whenever the control is powered, similar to a computer motherboard battery, so there should never be a need to install or replace the backup battery. When the Smart Touch is plugged into a control that is powered up, the battery is not being drained. Only when the AC power to the control board is powered off is the battery being drained in the Smart Touch itself. The battery backup will last over two years of "powered-off time" or inactivity.

When the battery drains due to inactivity, the only information that is lost is the date and time. No other information is lost. Also, the screen lock PIN will be reset to its default ("1234") when the battery gets drained. All other programming parameters, calibrations, program scheduler settings, etc., are retained in flash memory forever and do not use the battery power at all.

When the battery drains, there will be no visible indication on the display during normal power up. What will happen is that upon a subsequent (AC) power down and power up, the user will immediately be prompted to set the date/time setting. This is their indication that the battery got drained due to inactivity.
OPERATION

OPERATOR CONTROLS AND DISPLAY PANEL

HOME SCREEN ICON FUNCTIONS

Figure 6: Smart Touch Home Screen Icon Functions

1. **Power On/Off Icon** - Press and release to toggle between the On and Off Modes.
2. **Up Icon** - Press and release to display the set point. Press and release the Up icon as many times as desired to increase the set point. Set point increases one degree each time the icon is pressed.
3. **Down Icon** - Press and release to display the set point. Press and release the Down icon as many times as desired to decrease the set point.
4. **More Icon** - Press and release to change display to Main Screen.
5. **Status Icon** - Shows the system status. (OFF, PENDING, ACTIVE, STANDBY, FAULT)
6. **Temperature Indicator Icon** - Press and release to select from Set Point(s), Inside, Outside, Service/Water Temperatures, and Humidity.
7. **Force Sleep Mode Icon** - Press and release to force sleep mode to initiate immediately, if enabled (i.e. Sleep Delay not equal to OFF)
**Main Screen Icon Functions**

Figure 7: Smart Touch Main Screen Icon Functions

1. **Mode Icon Indicator** - The Mode icon indicates the current mode active. Press and release to select one of the four operating modes. Continue to press and release the Mode Icon until the desired operating mode is reached. The mode icons (Auto, Cool, Heat, Auxiliary Heat, or Moisture) light to indicate which mode is selected. It shows 5 different icons depending on the mode:
   - **Auto Mode Icon Indicator** - The Auto Mode icon is shown when the system is in Automatic Mode, which switches to cooling or heating as required to satisfy the temperature set point.
   - **Cool Mode Indicator** - The Cool Mode icon is shown when the cool-only mode is selected or when the unit is in an Automatic Mode cooling cycle.
   - **Heat Mode Indicator** - The Heat Mode icon is shown when the heat-only mode is selected or when the unit is in an Automatic Mode heating cycle.
   - **Auxiliary Heat Mode Indicator** - The Auxiliary Heat Mode icon is shown when the Aux heat-only mode is selected or when the unit is in an Automatic Mode Auxiliary heating cycle.
   - **Moisture Mode Indicator** - The Moisture Mode icon is shown when the Moisture Mode is selected. This mode controls humidity during periods when the vessel is unoccupied.

2. **Fan Mode Indicator** - Auto or Manual Indicator icon shows when Automatic fan speed or either of the three Manual speeds are selected.

3. **Power Icon** - Press and release to toggle between the On and Off Modes.

4. **Up Icon** - Press and release to display the set point. Press and release the Up icon as many times as desired to increase the set point. Set point increases one degree each time the icon is pressed.

5. **Down Icon** - Press and release to display the set point. Press and release the Down icon as many times as desired to decrease the set point.

6. **Fan Icon** - 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 icon 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. Press and release to advance from Auto Fan to Manual Fan. Press and release the Fan Icon to advance the manual fan speeds, from low to high. Press and release again to return to the Automatic Fan mode. The selected Fan Mode is indicated by the Fan Indicator icon. You can change the fan operating mode from Continuous to Cycled by going to Main Menu, Control Parameters, General Settings, and then Fan Operate Mode.

7. **Temperature Set Point and Humidity Indicator Icon** - Press and release to select from Set point(s), Inside, Outside, or Service/Water temperatures and Humidity.

8. **Main Menu Icon** - Press the Menu icon to show the Main Menu page.

9. **Status/Schedule Icon** - Press the Status/Schedule icon to view any fault occurring in the system.

10. **Dometic/Date/Time Icon** - This shows the date and time if enabled. To enable it, press Menu, Date/Time Menu, and then Date/Time Display.
MODES OF OPERATION

OFF Mode
When the control is in Off Mode, all control outputs are turned off. All settings are saved in nonvolatile memory.

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 Auto Mode icon is shown. Cabin temperature in a given mode is maintained within 2°F (1.1°C) of set point by default. (See “General Settings, Set Point Temperature Differential” on page 13 for instructions on how to reduce this variation to 1°F [0.55°C].) If the system was most recently cooling, the cabin temperature must drop below the set point by at least 4°F (2.2°C) in order for the system to switch from cooling to heating. Similarly, if the system was most recently heating, the cabin temperature must exceed the set point by at least 4°F (2.2°C) in order for the system to switch from heating to cooling. This behavior prevents small temperature overshoots from causing the system to switch between heating and cooling when it is not necessary.

COOL Mode
When Cool Mode is selected, the Cooling mode icon is shown and only 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 Heating mode icon is shown and only 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 you are away from the boat or away from a particular cabin. While the control is in the On Mode, press the Mode icon until the Moisture Mode icon is shown. Once Moisture Mode is enabled, the fan circulates the air for 30 minutes. During this time, the air temperature is sampled and entered into memory. After 30 minutes, a cooling cycle starts and continues until the temperature is lowered 2°F (1.1°C) or until the cooling cycle runs a maximum of one hour.

Four hours after the temperature is satisfied or the cooling cycle times out, this cycle repeats. Moisture Mode will also prevent your boat or a particular cabin from dropping below a minimum temperature as a means to prevent the contents from freezing. When the temperature drops low, eliminating moisture may become less of a concern and maintaining some minimum temperature may become more important. After the 30-minute fan circulation, if the temperature is at or above the factory default setting of 50°F (10°C), a cooling cycle is started and runs as described above. However, if the temperature is below 50°F (10°C), a heating cycle will be started instead. The heating cycle will continue until the temperature reaches 50°F (10°C) or until the heating cycle runs a maximum of one hour. Four hours after the temperature is satisfied or the cooling/heating cycle times out, the entire cycle repeats, each time determining whether cooling or heating is required. See “General Settings, Humidity Mode Minimum Temperature” on page 13 for more information on how to adjust the 50°F (10°C) factory default to a different temperature that may better suit your particular requirements. The adjustment range is 40°F (4.4°C) to 75°F (23.9°C). NOTE for DX systems only: On systems configured with reverse-cycle heat, the Moisture Mode heat cycle will not be allowed to run when the ambient temperature is below 40°F (4.4°C). This is necessary to protect the condenser coil from freezing. Systems configured with electric heat will be allowed to run the Moisture Mode heat cycle regardless of the room temperature.

DEHUMIDIFICATION Mode Indicator
The word DEHUMIDIFY displays when the control is in Dehumidification Mode. It flashes if optional humidity sensor is connected and operating in the Cooling Mode.

FAN Modes
Automatic Fan Mode
Smart Touch has three automatic fan speeds available: High, Medium and Low. Automatic Fan Mode allows the Smart Touch 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 icon until the word “Auto” above the fan speed graph is shown.
MODES OF OPERATION

Manual Fan Mode

There are three manual fan speeds available: High, Medium and Low. Manual Fan Mode allows you to select and maintain a desired fan speed. When a Manual Fan speed has been selected, the speed is indicated by the Fan Speed bar graph. The bar level will increase as you increase the speed setting. Press and release the Fan icon until the desired speed is reached.

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 icon to start Low fan speed. Press and release again to select Medium fan speed. Press and release a third time to select High fan speed. Press and release a fourth time to turn off the fan or place it in Auto mode. Turning on the control will revert the fan to the Automatic Mode or the last selected manual fan setting.

NOTICE

For DX systems only: If your air conditioning unit is Cool only (if it does not have a reversing valve) then Cool Mode MUST be selected. DO NOT set to Automatic Mode for a Cool-Only unit. If Automatic Mode is selected and the thermostat calls for heat, the compressor will run. Since there is no reversing valve, the air conditioning unit will supply cool air when heating is desired. Cool-Only units do not heat.

MAIN MENU

Use the Main Menu settings to adjust operating parameters for your particular needs. Main Menu 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. For this see Main Menu, Control Parameters, and then Recall Defaults. Reprogrammed new settings can be saved as Memorized settings and can be recalled and saved at any time. See “Main Menu, Control Parameters, Memorize Settings, and Recall Memorized” on page 17 for details.

Main Menu Screens Layout

Figure 8: Smart Touch Main Menu Screen Layout

1. Home Icon - Press this icon at any time to return to the Home Screen
2. Back Icon - Press this icon to return to the previous screen
3. Scroll Down Icon - Press this icon to go to the next set of settings
4. Main Menu Selection Options - Press any icon to modify the selected option
General Settings Screen Icon Layout

Figure 9: Smart Touch General Settings Screen Icon Layout

1. **Home Icon** - Press this icon at any time to return to the Home Screen
2. **Back Icon** - Press this icon to return to the previous screen
3. **Up Icon** - Press the icon to increase the setting
4. **Down Icon** - Press the icon to decrease the setting
5. **Save Icon** - Press this icon save the desired setting changes

**CONTROL PARAMETERS**

**General Settings**

To access the General Settings, go to Main Menu, Control Parameters, and the General Settings.

1. **High Fan Speed Values** for the upper fan-speed limit range from 35 to 95. Set a higher number to increase the fan speed or a lower number to slow the fan speed.

2. **Medium Fan Speed Values** for the upper fan-speed limit range from 35 to 95. Set a higher number to increase the fan speed or a lower number to slow the fan speed.

3. **Low Fan Speed Values** for the lower fan-speed limit range from 32 to 85. Set a higher number to increase the fan speed or a lower number to slow the fan speed.

4. **Inside Temp Calibration** This setting calibrates the ambient sensor within a range of ±10°F. Adjust this parameter to display the correct room temperature reading. Note that setting increments are in °F even when the control is set to display °C.

5. **Temperature Units (°F/°C/Auto)** The default setting is °F. Select °C for Celsius. (Celsius readings are displayed in tenths, for example 22.2°). Auto corresponds to “automatic by line frequency”, where 60 Hz automatically sets the unit to Fahrenheit or °F, and 50 Hz automatically sets the unit to Celsius or °C.

6. **Reversed Fan Speed in Heat** Reverse Automatic Fan Speeds during Heating lets you automatically reverse the fan speed during Heat Mode. This improves 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 selecting the Off option, which represents normal fan operation during reverse-cycle heating.
7. **Electric Heat and Auxiliary Heat Option** (ELEC=electric heat, AUX HEAT=reverse-cycle & auxiliary electric heat, Off=Use of reverse-cycle heat)

   **For DX Applications**
   ELECTRIC HEAT Units not equipped with reverse-cycle heat may have an electric heater added. Set to “ELEC” for the electric heat option or “OFF” to disable. Reversing-valve toggle (energizing of reversing-valve output) will not occur prior to compressor start-up if the electric heat option is selected. For legacy PPIO boards, the valve output and electric heat relay will both be energized when DX electric heat is called for. Since the valve-relay output only supports a maximum of 15 amps at 115V AC or 10 amps at 230V AC 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.

   AUX HEAT= Reverse-cycle & Auxiliary electric heat (Only available for following firmwares or newer: SmartTouch A25 connected to U-Board R3V36, and SmartTouch A26 connected to U-board Two 01T07) The control board allows operation of an optional auxiliary (aux) electric heater output. If an auxiliary electric heater is not installed, select “OFF” to disable the auxiliary electric heater. Selecting “AUX HEAT” allows the auxiliary electric heater to be operated at the same time as the reverse-cycle heating when the dehumidification feature is active and required. Auxiliary heat output will also operate when using the optional Seawater Low Limit Adjustment or AutoChangeover feature, if enabled. See DX Setting # 8.

   **For CW Applications**
   ELECTRIC HEAT (ELEC=use electric heat and/or hydronic heat, OFF=use only hydronic heat. Factory Default: ELEC) The control board allows operation of an optional electric heater. The default for this feature is “ELEC” indicating electric heat is enabled and installed. If an electric heater is not installed, select “OFF” to disable the electric heater. The compressor and spade terminal outputs will be energized when CW electric heat is called for. Selecting “ELEC” allows the electric heater to be operated at the same time as the hydronic valve when the dehumidification feature is active and required.

   Please consult with Dometic Customer Service or with an authorized service technician for assistance.

8. **Fan Motor Type** The Split Capacitor default setting is correct for air conditioning units with high-velocity blowers. Only change the setting to Shaded Pole if your unit has a Shaded Pole fan motor, recognizable by a blower-motor overhang. (The Split Capacitor motor of a high-velocity unit is inside the blower, and the unit has “VTD" or "HV" in the model number.)

9. **Filter Hours Setting** Reminder for air filter cleaning or replacement is determined by the number of hours of fan operation. Filter Hours Setting can be set as a reminder to clean or replace the unit’s air filter. Select the number of operating hours until the filter reminder appears. Parameter choices are between 100 hours and 2500 hours. Dometic recommends that you check the air filter at least every 500 hours of operation. Once set, the timer keeps track of the total amount of run hours that the fan accumulates. Once the timer setting is reached, flashes briefly on the status icon until it is cleared. Display of the room temperature continues and the normal operation of the system is not affected. The reminder can only be cleared and the timer reset via General Setting, and then Filter Hours Setting.

10. **Filter Hours Reset** The Filter Hour Reset setting shows the number of filter reminder hours accumulated and allows clearing via a CLR icon. This parameter displays the current elapsed time in hours since the timer was started or reset. To clear the reminder, press the CLR icon. This resets the value to 0 and restarts the timer.

11. **CAN Bus Unit ID** This parameter selection icon is grayed out whenever the Smart Touch is not plugged into a control board with the CAN bus daughterboard option. In other words, this parameter displays only when CAN-bus network capability is available and the Smart Touch is plugged into a networked control board. This parameter does not display when the Smart Touch is plugged into a standard control board. Each control on the same CAN-bus network must be assigned a unique Unit ID (0 -255). For example, the control that is set to 5 will respond to commands with a destination address of 5.
12. **CAN Bus Group ID** This parameter selection icon is grayed out whenever the Smart Touch is not plugged into a control board with the CAN bus daughterboard option. In other words, this parameter displays only when CAN-bus network capability is available and the Smart Touch is plugged into a networked control board. This parameter does not display when the Smart Touch is plugged into a standard control board. Assign the address for the control's CAN-bus network group (0 - 255). This number should be unique and different than any CAN-bus Unit ID. For example, all controls that are set to 100 will respond to commands with a destination address of 100 (in addition to responding to commands that target their individual Unit IDs).

13. **Voltmeter Calibration** This parameter allows adjustment of the line voltage reading as measured by the Smart Touch. This setting 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 icons. Calibrating this parameter provides a more accurate voltage level when calculating low voltage. Use a reliable voltmeter as a reference when adjusting this parameter.

14. **Set Point Temperature Differential** This parameter is the temperature differential in Fahrenheit for all modes of operation: Automatic, Cool, or Heat. Refer to “Modes of Operation” on page 9 for more information on how this parameter affects these modes. By default, this parameter setting is 2°F (1.1°C). It can be set to either 1°F (0.55°C) or 2°F (1.1°C). Setting this parameter to 1°F (0.55°C) will result in the control maintaining the room temperature closer to the desired set point. However, this may result in more frequent shorter-duration cooling or heating cycles. In most cases, the factory default of 2°F (1.1°C) is adequate for maintaining a comfortable temperature variation around the desired set point. If you desire less variation in temperature, set this parameter to 1°F (0.55°C).

15. **Humidity Mode Min Temp** This parameter is the minimum room temperature in Fahrenheit for which Moisture Mode will run a cooling cycle to remove moisture from the air. If the room temperature is below this parameter setting, Moisture Mode will run a heating cycle instead. By default, this parameter is set to 50°F (10°C), and it can be adjusted between 40°F (4.4°C) to 75°F (23.9°C). Please refer to the description of “Moisture Mode” on page 9 for more information on how Moisture Mode functions and utilizes this parameter.

16. **Auto Fan Speed Temp Differential** This setting sets the incremental differential (with cumulative steps) between the ambient temperature and the set point temperature at which the fan speed will increment to the next speed. Note that there is 1°F hysteresis in the auto fan speed differential to prevent the speed from changing if the room temperature changes by a fractional degree causing speed fluctuations. Also General Settings Reversed Fan Speeds in Heat, and Set Point Temperature Differential, both have an effect on the operation of the auto fan speed.
17. **Supply Air Temp Limit** Enabling this parameter has no effect unless General Setting Electric Heat Option or Auxiliary Heat Option is also enabled (set to “On”). Use of this parameter requires that the OAT sensor is placed in the supply air stream immediately downstream of the blower discharge. This setting is the maximum the supply air discharge temperature will allow. Heat mode will be shut down if the temperature of this sensor exceeds the programmed setpoint. Heat mode will be restored once a 10°F hysteresis has been satisfied. Heat mode will also be restored if power is cycled to the control and the OAT sensor temperature is less than the setting but still within the hysteresis. There is no fault indication when this condition occurs and no lock-out. The discharge temperature can be displayed by pressing the temperature icon until the temperature title shows Outside (same as viewing the Outside Air Temperature).

18. **DX/CW Mode Selection** Choosing “Set by Jumper” preserves the status of the control board operation where if the “Removed for CW” jumper on the main control board is not removed, the Smart Touch will operate in DX mode, and if the jumper is removed, the Smart Touch will operate in CW mode. The other choices for this parameter allow the jumper to be overridden, if desired.

19. **Inside Temp Sensor Selection** If the alternate air temperature sensor is plugged into the control board, it is used as the inside temperature, and if it is not plugged in, the built-in display temperature sensor is used for inside temperature. This parameter allows this behavior to be overridden if desired.

20. **Fan Operational Mode** The fan can be set to run continuously whenever the system is turned on, or it can be set to cycle on and off in conjunction with the cooling or heating cycles.

21. **Dual Temp Set Points** When Off, there is only one common set point, which is adjustable and used for both heating and cooling. When On, two separate set points are selectable and used, one for cooling and one for heating.

22. **Humidity Sensor Limit Adjustment**  
   **For DX applications** (Optional; Factory Default: 60% RH) If the optional humidity sensor is connected to the control board, this feature allows the system to dehumidify with auxiliary electric heat (if auxiliary electric heat is installed and enabled) when the cabin humidity rises above 60% (default) relative humidity (RH). The electric heater will cycle on and off to maintain set point while the compressor turns on to dehumidify. When the room temperature has reached the set point, the compressor will remain on. The display will indicate that the system is in “Dehumidify” mode. If the temperature decreases by one degree, the auxiliary electric heat will turn on to maintain the set point and the compressor will remain on. If the temperature increases back to set point, the electric heat will turn off. If the temperature increases one degree above the set point, the compressor will remain on. This operation will continue until the cabin’s relative humidity is less than 60% (default). If an electric heater is not installed, the compressor run time will extend by operating to 1°F lower than set point. This cycle continues until the cabin’s relative humidity is less than 60% (default). The range of adjustment is 50% to 80% RH.

   **For CW applications:** (Optional; Factory Default: 60% RH) If the optional humidity sensor is connected to the control board, this feature allows the system to dehumidify with electric heat (if electric heat is installed and enabled) when the cabin humidity rises above 60% (default) relative humidity (RH). The electric heater will cycle on and off to maintain set point while the bypass valve opens to allow cold loop water to enter the air handler coil to dehumidify. This operation continues until the cabin’s relative humidity is less than 60% (default). If an electric heater is not installed, the bypass valve’s on time will extend by operating to 1°F lower than set point. This cycle continues until the cabin’s relative humidity is less than 60% (default). The range of adjustment is 50% to 80% RH.
**DX Operational Settings**

1. **Compressor Start Delay** The compressor staging delay is for installations where more than one system operates from the same power source. Setting different staging delays allows compressors to start at different times when power is interrupted. Stage the units at least 5 seconds apart. Minimum delay is 5 seconds and maximum is 135 seconds.

2. **Failsafe** To protect the equipment, certain fault conditions trigger a lockout: The control shuts down and will not restart until the fault is repaired. The lockout condition depends on a combination of the failsafe level you have programmed as well as the type of fault detected.

   - **Faults Not Detected** - This level provides minimal failsafe protection and is not recommended. Only the “Air Sensor Failure” fault is detected and displayed. The control shuts down and will not restart until the fault is repaired. When the fault is repaired the control restarts after a 2-minute delay.
   - **Faults Detected But Not Displayed** - This level provides the failsafe actions of **Faults Not Detected**, plus all other faults are detected but not displayed. The system shuts down for 2 minutes or until the fault is cleared, whichever is longer. The system restarts when the fault is cleared.
   - **Faults Detected and Displayed** - This level provides the failsafe actions of the previous two levels, plus all faults are displayed. The system shuts down for 2 minutes or until the fault is cleared, whichever is longer. The system restarts when the fault is cleared.
   - **Faults Detected and Displayed with Lockout** - This level provides the failsafe actions of previous 3 levels, plus the system will lockout after four consecutive High Pressure Fault, Low Pressure Fault, or High Water Temperature in Condenser Coil faults, and you can clear the lockout. The system shuts down for 2 minutes or until the fault is cleared, whichever is longer. To clear the lockout, press the Power icon once to Off Mode and press it again to On Mode.

3. **Low Voltage Monitor** The Smart Touch has a built-in voltmeter circuit that monitors the AC input voltage. Depending on whether the input power supply is 100V AC or 115V AC or 230V AC, this parameter can be set to “Off”, 75-120V AC for 100-115V AC input power, or 175-240V AC for 230V AC input power. The factory default setting is Off. When this parameter is set to 75-120 or 175-240V AC, the Smart Touch checks the AC input voltage prior to each cooling or heating cycle and prevents the compressor from starting if the voltage is less than the one set. This provides extra protection for the compressor and components within the system during low voltage (brownout) conditions. If this low voltage condition occurs, the fault code **Low AC Voltage** appears in the Status icon in the Main display. The fault will continue until the AC input voltage rises above selected voltage value, at which time the **Low AC Voltage** fault code clears automatically and the cooling or heating cycle will commence. After the compressor is started, the low voltage monitor continues to check the AC input voltage. If it drops below the specified setting and remains below for 5 minutes, the system will shut down and the **Low AC Voltage** fault will be displayed. The system will remain shut down until the voltage goes back above the specified setting. Once the voltage is restored, after the normal fault recovery delay, the system will be restarted. As with all faults, system lockout (sustained shutdown) will occur after the fourth consecutive **Low AC Voltage** fault. See Fault Handling, History & Run Hours for further details on system lockout.

4. **De-Ice Cycle** The de-icing cycle prevents ice buildup on the evaporator coil during extended periods of cooling operation. Installation variables such as grille sizes, length of ducting, insulation, and ambient temperatures determine the run time required to achieve set point. Factors that substantially increase run time include operating the system with hatches and doors open and programming an unrealistic set point (e.g. 65°F/18.3°C). Such situations can cause the evaporator to form ice on warm humid days. De-icing is accomplished by closely monitoring the room air temperature in 10-minute intervals during a cooling cycle. Depending on the parameter value and the change in room temperature during these monitoring intervals, the control performs various actions to prevent ice from forming or to melt ice.
that has already formed. This is accomplished by short compressor shutdown periods combined with a one-speed increase in fan speed and by periodic Heat Mode cycles with the fan turned off. The parameter setting for the de-icing feature depends on whether you are using the optional alternate air-temperature sensor or the display’s built-in room air-temperature sensor. Installation of an optional alternate air temperature sensor (located in the return air path) greatly increases the effectiveness of the de-icing feature, and this option should be considered whenever the display sensor cannot read the room temperature accurately.

- **If using an optional alternate air temperature sensor**, set this parameter to *Enable with 5°F/3°C Sensor Differential* to turn the de-icing feature on, or to *Off* to disable.

- **If using the display’s built-in room air temperature sensor**, this feature has 2 selectable behavior modes. Both modes attempt to compensate for any temperature discrepancy the display sensor experiences. (Although discrepancy is not typical, installation variables such as where the display is placed inside the room – near an open door or in direct sunlight – can affect how accurately it reads the actual room temperature.) Set this parameter to *Enable with 5°F/3°C Sensor Differential* to assume the display sensor may be reading the room temperature as much as 5°F (2.8°C) greater than the actual evaporator temperature (standard). For more extreme installations, set this parameter to *Enable with 7°F/4°C Sensor Differential* to assume the display sensor may be reading the room temperature as much as 7°F (3.9°C) greater than the actual evaporator temperature. The setting of the second option should only be used if the selection of the first option does not prevent evaporator ice from forming.

5. **Pump Sentry** Smart Touch can be equipped with an optional temperature sensor that is used to monitor the condenser coil temperature. The sensor is plugged into the “H20 OUT” sensor plug. The Pump Sentry setting can be programmed for a temperature between 100 and 150°F (37.8 and 65.6°C), depending on seawater temperature and the system type. (Note that setting increments are in °F even when the control is set to display °C.) Connect the water sensor to the condenser coil outlet and insulate it. When the coil temperature rises above the programmed value, the pump and compressor are shut down and “Pump Sentry Fault” flashes in the display.

6. **Pump Operate Mode** Cycle pump with Compressor to increase pump life and conserve electricity. The pump can be programmed to cycle on and off with the compressor. The pump can also be programmed to operate continuously whenever power is applied. To program the pump for continuous operation, set the setting to *Continuous*.

7. **Low Pressure Detection** When selecting “Set by Jumper”, if the “Enable LP” jumper on the main control board is not removed, the low pressure switch will be disabled, and if the jumper is removed the low pressure switch will be enabled. Choosing “Disabled (Use Caution)” will force the Smart Touch to ignore the low pressure switch, treating it as disabled even if the jumper is removed. This should only be done when advised by Dometic Customer Service. As with all faults, system lockout (sustained shutdown) will occur after the fourth consecutive Low Pressure fault.

8. **Seawater Low Limit Adjustment** (Optional; Factory Default: 40°F) If the optional seawater sensor is connected to the control board, this feature allows the system to switch from reverse-cycle heat to electric heat (if an auxiliary electric heater is installed and enabled) if the seawater temperature drops below 40°F (4.4°C) (default) and the reverse-cycle heat has operated more than five minutes. Once the seawater rises 3°F above the Seawater Low Limit temperature, the system returns to reverse-cycle heating. If an aux heater is not installed, the system will shut down and flash “LO” then “SE” when the seawater drops below 40°F (4.4°C) (default). Once the seawater rises 3°F above the Seawater Low Limit temperature, the system goes back into reverse-cycle heating and stops flashing “LO” then “SE”. The range of adjustment is 35°F to 50°F.
CW Operational Settings

1. **Water Valve Force Open** This parameter opens the water valve to bleed air from the system. "On" forces the valve open for 4 hours while the Smart Touch control is turned off. If Cool mode is activated or if AC power is interrupted to the control’s electric box during this 4-hour period, this valve override feature is canceled. You can return the valve to normal operation at any time by changing the setting back to “Off”.

2. **Water Temp 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 10 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 10 degree value, the valve will open to allow some cooling while the hydronic system is coming down to temperature. See the Figure 22 for a graphical explanation of this parameter.

**Memorize Settings**

If you want new parameters to be the program defaults, adjust the parameters to the desired settings, and then go to Memorize Settings and press the Save icon. This memorizes the new settings as program defaults. To return to the factory default settings, refer to the Recall Factory Defaults listed.

**Recall Memorized Settings**

If you want to restore the last memorized default settings, then go to Recall Memorized and press the Save Icon. The memorized default settings are restored. To return to the factory default settings, refer to the Recall Factory Defaults listed.

**Recall Factory Default Settings**

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. If you want to restore the original factory default parameters manually, then go to Recall Defaults and press the Save Icon.

**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.

**NOTICE**

If you have any programming problems or confusion occurs, reset the Memorized Default Settings and try again.
Program Scheduler

Program Scheduler lets you start and/or stop the A/C unit at specific time, day of the week, mode and temperature set point. To access the Program Scheduler, go to Main Menu, Program Scheduler, and select the setting to modify.

1. **Scheduler mode** As soon as the Program Scheduler is enabled, it will immediately start applying the programs as defined in the various day settings.

2. **Program:** Mon-Fri

3. **Program:** Sat-Sun

4. **Program:** Day of the Week (Seven different programs)

Each program has a mode, time, cooling set point, and heating set point (if dual set points are enabled). The Mode choices are Off, Cool, Heat, Auto, Dehumidify. If Dual Set Points is selected, the cooling set point is settable for Cool and Auto, and the heating set point is settable for Heat and Auto. Set points are not settable for Off or Dehumidify.

Date/Time Menu

Date/Time Menu lets you set the display time, its format, and optional display on Main Screen. To access the Date/Time Menu, go to Main Menu, and Date/Time Menu, and select the setting to modify.

1. **Date/Time Display** Choose between On or Off to control the display of date/time on Main Screen only.

2. **Date/Time Format** Choose between Automatic by Line Freq (60Hz line frequency results in M/D/Y 12-hour format, and 50Hz line frequency results in D/M/Y 24-hour format), M/D/Y 12-hour, or D/M/Y 24-hour.

3. **Date/Time Settings** This setting allows date and time modification. Each date and time value are individually editable. The day of the week will automatically be calculated based upon the date.
**SYSTEM MENU**

System menu lets you modify system settings related to the display. For instance, the screen background, font, icon colors, screen saver configuration, and text editing are some of them. To modify any of the Display Settings, go to Menu and then System Menu.

1. **Firmware Version** To access the control’s software version (such as “A23”), go to Menu, System Menu, and then Firmware Version.

2. **Display Setup** The available Display Settings to modify are below. Press the Save icon after completing the desired modifications.
   a. Display Brightness
   b. Background Color
   c. Icon Text Color
   d. Icon Inside Color
   e. Icon Border Color
   f. Data Block & Title Colors

3. **Sleep Mode Settings** The available Sleep Mode Settings to modify are below. Press the Save icon after completing the desired modification.
   a. **Sleep Mode Display** Lets you select from different options to show after the Sleep Mode Delay has ended (Standard Logo, Custom Logo, Custom Text, Blank Screen Backlight Off, Blank Screen Backlight On)
   b. **Sleep Mode Delay** Lets you select either Off, or 0 to 600 seconds of delay before showing the Sleep Mode Display configured. If Off is selected, the display will not go into Sleep Mode.
   c. **Sleep Mode Text Edit** Allows editing of the display text when the screen is in Sleep Mode. Text is edited using arrow icons for each character. Character choices are as follows: "ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789&'*@:,°=!-()%.+#?/". The total number of characters that will fit on the screen is a function of the font size, with an absolute maximum of 25.
d. **Sleep Mode Text Color** Allows the text color during the Sleep Mode to be changed. There are 126 different colors to choose from.

![Figure 31: Smart Touch Sleep Mode Settings Text Color Edit](image)

![Figure 32: Smart Touch Download Custom Logo](image)

e. **Download Custom Logo** This option is normally grayed out unless the Smart Touch detects that the special programming cable is plugged into its 8-pin jack (i.e. it is not plugged into a control board). There is a PC program called the “SmartTouch Downloader” that enables selection of a 24-bit bitmap file (BMP) and transmission to the Smart Touch. Instructions for this PC program are provided separately.

![Figure 33: Smart Touch System Menu Display Lock](image)

4. **Display Lock** Allows to modify any of the Display Lock Settings. The available Display Lock Settings to modify are below.

![Figure 34: Smart Touch Display Lock Invalid PIN Message](image)

a. **Set Access Locked by Pin** Lets you set a security PIN to access the display based on the levels configured. When the icon is pressed, the configured PIN will be requested. Once the PIN is entered, access to all levels is allowed. The PIN entry will be required again if the system enters sleep mode and the level at which the PIN is required is accessed again. The PIN entry will also be required again if this level setting is changed or if the display is AC power cycled.
5. **Cleaning Mode** Allows screen wipe down for 30 secs with the backlight off and touch panel off. Screen and touch panel will automatically come back on in 30 seconds. Operation is not affected during this time. To turn off the display so it can be cleaned, go to Menu, System Menu, and press Cleaning Mode (30SEC). Press the Save icon after completing the modification.

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**Troubleshooting/Commissioning**

1. **System Status** It displays live readings and status of all sensors, voltage, frequency, mode status, cycle fault count, etc.

2. **Help & Information** Lets you browse complete descriptions of each fault that can occur. It also lets you scan a QR code using a smartphone to access the Smart Touch website. The fault descriptions shown in this option are the same as the ones shown when a live fault help is requested from the Main Screen by pressing the hidden icon over the top of the Status text window.
MODES OF OPERATION

Smart Touch Cabin Control Installation & Operations Manual

MODES OF OPERATION

Figure 38: Smart Touch
High Pressure Fault Help

a. Fault Help Lookup
   i. Air Sensor Fault Help
   ii. High Pressure Fault Help
   iii. Low Pressure Fault Help
   iv. Low AC Fault Help
   v. Pump Sentry Fault Help
   vi. Lost AC Fault Help
   vii. Seawater Low Temperature Limit Fault Help

Figure 39: Smart Touch
QR Code Link for More Help

b. Link to Get More Help Lets you scan a QR code to access the Smart Touch website to obtain more Smart Touch help.

Figure 40: Smart Touch
Troubleshooting and Commissioning

3. Commission Procedure Provides instructions on how to commission a unit.
   It lets you have the main inputs and outputs of the unit tested, step by step.
   Steps vary depending on DX or CW. Successful completion will add an entry into the Fault History screen.

Fault Handling, History & Run Hours

To protect the equipment, certain fault conditions trigger a lockout: The control shuts down and will not restart until the fault is repaired. The lockout condition depends on a combination of the failsafe level programmed, as well as the type of fault detected. All of these options have a CLEAR icon. Pressing this icon clears the visible fault history, compressor run hours, and fan run hours. Pressing and holding the CLEAR icon for 10 seconds will bring back the lifetime fault history and run hours.

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

- **Air Sensor Failure** - Indicates air sensor failure.
- **Filter needs to be Cleaned or Replaced** - Indicates filter needs to be cleaned or replaced.
- **High Pressure Fault** - Indicates high refrigerant pressure. When in Heat Mode, it does not display and does not cause lockout.
- **Low AC Voltage** - Indicates low AC voltage.
- **Low Pressure Fault** - Indicates low refrigerant pressure. It has a 10-minute shutdown delay.
- **Pump Sentry Fault** - Indicates high water temperature in condensing coil.
- **Lost AC Fault** - Indicates loss of power.
- **Seawater Low Temperature Limit Fault** - Indicates the seawater temperature is below 40°F (4.4°C).
1. Faults History Lets you view the history of previously cleared faults and the current active faults.

   **NOTE:** To view the cleared faults, hold CLR button 10 seconds.

2. Compressor Run Hours Lets you see the current amount of hours the compressor has run. The value can be cleared by pressing the CLR icon.

   **NOTE:** To view the cleared faults, hold CLR button 10 seconds.

3. Fan Run Hours Lets you see the current amount of hours the fan has run. The value can be cleared by pressing the CLR icon.

   **NOTE:** To view the cleared faults, hold CLR button 10 seconds.

   When used with optional electric heat or Auxiliary heat, the fan remains on for 4 minutes after the heater cycles off even if fan is set to cycled operation.

**Quick-Start Operations Checklist**

1. Ensure seawater-intake ball valve (seacock) is open.
2. Make sure the control is powered OFF.
3. Turn on the air conditioner circuit breaker. If the seawater pump has its own circuit breaker, turn that on also.
4. Turn the control ON.
5. Press the Fan icon. Verify that the fan is running and that there is steady airflow out of the supply-air grille.
6. Select a temperature set point lower than the current cabin temperature. This starts the compressor and seawater pump.
7. Check for a steady solid stream of water from the overboard discharge.
8. Verify that there is steady airflow out of the supply-air grille.

   If the unit does not appear to be operating properly, refer to the guidelines in “TROUBLESHOOTING” on page 32.

**NOTICE**

Do not turn the unit off and then immediately turn it back on. Allow at least 30 seconds for refrigerant pressure to equalize.
Figure 46: Navigation Tree - Part 2 of 3

Program
Mode Cool/Dehumidify /Heat/Aux
Heat/Auto
Temp °F/RH %
Hour ##
Min ##
Time of Day AM/PM

Fault History & Run Hours
Fault History (Max 500 entries)
Compressor Run Hours # Hrs
Fan Run Hours # Hrs

System Menu
See page #

Control Parameters
See page #

Menu
Control Parameters
Program Scheduler
Date/Time Menu
System Menu
Troubleshoot/Commission
Fault History & Run Hours

Program Scheduler
Scheduler Mode On/Off
Program Mon-Fri
Program Sat-Sun
Program Monday
Program Tuesday
Program Wednesday
Program Thursday
Program Friday
Program Saturday
Program Sunday

Date/Time Menu
Date/Time Display On/Off
Date/Time Format Automatic by line/
(M/D/Y) 12 Hour/
(D/M/Y) 24 Hour
Date/Time Settings
Day of the week [Mon-Sun]
Date
Month [01-12]
Day [01-31]
Year [00-99]
Time
Hour [01-12]
Min [00-59]
Time of Day AM/PM

Help & Information
Fault Help Lookup
Air Sensor Fault Help
High Pressure Fault Help
Low Pressure Fault Help
Low AC Fault Help
Pump Sentry Fault Help
Seawater Sensor Fault Help
Lost AC Fault Help
Link to get more help
Scan QR Code

Commission Procedure
Into & System
Inside Temp Sensor
Low Fan Speed Test
Med Fan Speed Test
High Fan Speed Test
Fault Check
Pump Test
Cool Test
R/C Heat Test
Pass Confirmation

System Status
Volt 115 V
Freq. 60Hz
Display # °F
Alt # °F
Out # °F
Water # °F
Humidity %
HPS Ok/Alm
LPS Ok/Alm
Pump Off/On
Comp Off/On
Valve Off/On
Fan Off/Spd 1/Spd 2/Spd 3
Status Off/On
Faults #
Figure 47: Navigation Tree - Part 3 of 3

Display Setup
- Display Brightness: [5-100] %
- Background Color: Select color
- Button Text Color: Select color
- Button Inside Color: Select color
- Button Border Color: Select color
- Data Block & Title Colors: Select color

System Menu
- Firmware Version: #
- Display Setup
- Sleep Mode Settings
- Display Lock
- Cleaning Mode (30 sec): Save

Display Lock
- Set Access Locked by Pin: None (No Lock)/Control Parameters/All Menu Settings/Main Screen/Home Screen
- Change Pin
  - Enter Current Pin: ####
  - Enter New Pin: ####

Sleep Mode Settings
- Sleep Mode Display: Standard Logo/Blank Screen
- Backlight On/Blank Screen Backlight
- Off/Custom Text/Custom Logo
- Sleep Mode Delay (sec): Off/[10-600] sec
- Sleep Mode Text Edit: Enter Text (max 25 characters)
- Sleep Mode Text Color: Select Color
- Download Custom Logo*
### Table 1: Main Menu – Programmable Parameters

<table>
<thead>
<tr>
<th>Main Category Item</th>
<th>Sub Item 1</th>
<th>Sub Item 2</th>
<th>Sub Item 3</th>
<th>Range (min/max) or Choices</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVAC Control Settings</td>
<td>Page 1 ▼</td>
<td>Page 1 ▼</td>
<td>High Fan Speed</td>
<td>35</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Medium Fan Speed</td>
<td>32</td>
<td>85</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Low Fan Speed</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inside Temp Calibration</td>
<td>±50°F or ±25°C</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Temperature Units (°F/°C)</td>
<td>Auto/°F/°C</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reversed Fan Speed in Heat</td>
<td>Off/On</td>
<td>On</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electric Heat or Auxiliary Heat Option</td>
<td>Off/Elec/Aux Elec Heat</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fan Motor Type</td>
<td>Shade-Pole/Split-Capacitor</td>
<td>Split-Capacitor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Filter Hours Setting</td>
<td>Off/100-2500 Hours</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Filter Hours Reset</td>
<td>Clear only</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CAN Bus Unit ID</td>
<td>1</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>CAN Bus Group ID</td>
<td>1</td>
<td>255</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Voltmeter Calibration</td>
<td>70-140V AC or 170-260V AC</td>
<td>0 (none)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Set Point Temp Differential</td>
<td>1 or 2°F / 0.5 or 1.0°C</td>
<td>2°F/1°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Humidity Mode Min Temp</td>
<td>40°F/5°C</td>
<td>75°F/25°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Auto Fan Speed Temp Differential</td>
<td>1-3°F or 0.5-1.5°C</td>
<td>2°F/1°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Supply Air Temp Limit</td>
<td>Off/95-140°F or Off/35-60°C</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DX/CW Mode Selection</td>
<td>Set by Jumper / DX Override / CW Override</td>
<td>Set by Jumper</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inside Temp Sensor Selection</td>
<td>Auto / Display / Alt. Air</td>
<td>Auto</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fan Operational Mode</td>
<td>Continuous or Cycled</td>
<td>Continuous</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dual Temp Set Points</td>
<td>Off/On</td>
<td>Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Humidity Sensor Limit</td>
<td>[50%-80%]</td>
<td>60%</td>
</tr>
<tr>
<td>Main Category Item</td>
<td>Sub Item 1</td>
<td>Sub Item 2</td>
<td>Sub Item 3</td>
<td>Range (min/max) or Choices</td>
<td>Factory Default</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>-----------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>HVAC Control Settings (continued)</td>
<td>DX Operational Settings</td>
<td>Page 1 ↓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor Start Delay</td>
<td>5 sec</td>
<td>135 sec</td>
<td>15 sec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failsafe Level</td>
<td>Faults Not Detected / Faults Detected But Not Displayed / Faults Detected and Displayed / Faults Detected and Displayed with Lockout</td>
<td>Faults Detected and Displayed with Lockout</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low-Voltage Monitor</td>
<td>Off/75-120V AC or Off/175-240V AC</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>De-Ice Cycle</td>
<td>Disabled / Enabled with 5°F/3°C Sensor Differential / Enabled with 7°F/4°C Sensor Differential</td>
<td>Enabled with 5°F/3°C Sensor Differential</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pump Sentry</td>
<td>Off/100-150°F or Off/40-65°C</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pump Operational Mode</td>
<td>Continuous or Cycled</td>
<td>Continuous</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Pressure Detection</td>
<td>Set by Jumper / Disabled</td>
<td>Set by Jumper</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seawater Low Limit Adjustment</td>
<td>[35-50°F]</td>
<td>40°F</td>
<td></td>
</tr>
<tr>
<td>CW Operational Settings</td>
<td>Page 2 ↓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water Valve Force Open</td>
<td>Off/On</td>
<td>Off</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water Temp Differential</td>
<td>5°F/3°C</td>
<td>25°F/14°C</td>
<td>15°F/8°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Memorize Settings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recall Memorized Settings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recall Factory Default Settings</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 2: Main Menu – Program Scheduler & Date Time Menu

<table>
<thead>
<tr>
<th>Main Category Item</th>
<th>Sub Item 1</th>
<th>Sub Item 2</th>
<th>Sub Item 3</th>
<th>Range (min/max) or Choices</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program Scheduler</strong></td>
<td>Page 1 down</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheduler Mode Select</td>
<td></td>
<td>Off/On</td>
<td></td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td>Monday-Friday</td>
<td>Prgm 1 thru 4</td>
<td></td>
<td></td>
<td>6:00 AM (06:00)/Cool/72°F (22°C) 8:00 AM (08:00)/Cool/72°F (22°C) 4:00 PM (16:00)/Cool/72°F (22°C) 10:00 PM (22:00)/Cool/72°F (22°C)</td>
<td></td>
</tr>
<tr>
<td>Saturday-Sunday</td>
<td>Prgm 1 thru 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Date/Time Settings</strong></td>
<td>Page 1 down</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date/Time Display</td>
<td></td>
<td>Off/On</td>
<td></td>
<td></td>
<td>Off</td>
</tr>
<tr>
<td>Date/Time Format</td>
<td></td>
<td>Automatic by Line Freq or D/M/Y 24-hour or M/D/Y 12-hour</td>
<td></td>
<td></td>
<td>Automatic by Line Freq</td>
</tr>
<tr>
<td>Date/Time Settings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Category Item</td>
<td>Sub Item 1</td>
<td>Sub Item 2</td>
<td>Sub Item 3</td>
<td>Range (min/max) or Choices</td>
<td>Factory Default</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------</td>
<td>------------</td>
<td>------------</td>
<td>---------------------------</td>
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</tr>
<tr>
<td>System Settings</td>
<td>Page 1 ‡</td>
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<td></td>
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<tr>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Display Settings</td>
<td>Page 1 ‡</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Display Brightness</td>
<td>5%</td>
<td>100%</td>
<td>100%</td>
<td>Dometic Preferred Defaults</td>
</tr>
<tr>
<td></td>
<td>Background Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Button Text Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Icon Text Color</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Page 2 ‡</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Button Inside Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Button Border Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Block &amp; Title Colors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep Mode Settings</td>
<td>Page 1 ‡</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sleep Mode Display</td>
<td></td>
<td></td>
<td></td>
<td>Standard Logo</td>
</tr>
<tr>
<td></td>
<td>Sleep Mode Delay</td>
<td>Off / 10-600 sec</td>
<td></td>
<td>60 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sleep Mode Text Edits</td>
<td>25 characters max with 3 different font sizes</td>
<td></td>
<td>&quot;YOUR TEXT&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Page 2 ‡</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sleep Mode Text Color</td>
<td>See choices above</td>
<td></td>
<td>Dometic Preferred Default</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Download Custom Logo</td>
<td></td>
<td></td>
<td>Blank display (black background)</td>
<td></td>
</tr>
<tr>
<td>Display Lock Mode</td>
<td>Set Access Locked by PIN</td>
<td>None (No Lock) / Control Parameters / All Menu Settings / Main Screen / Home Screen</td>
<td></td>
<td>None (No Lock)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change PIN</td>
<td></td>
<td></td>
<td>1234</td>
<td></td>
</tr>
<tr>
<td>Cleaning Mode</td>
<td></td>
<td></td>
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</table>
### Table 3: Main Menu – System Menu, Troubleshooting, Faults & History (continued)

<table>
<thead>
<tr>
<th>Main Category Item</th>
<th>Sub Item 1</th>
<th>Sub Item 2</th>
<th>Sub Item 3</th>
<th>Range (min/max) or Choices</th>
<th>Factory Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Troubleshooting/Commissioning</td>
<td>Page 1 ↓</td>
<td>System Status Screen</td>
<td>Fault Help Lookup</td>
<td>Page 1 ↓</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Air Sensor Fault Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High Pressure Fault Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low Pressure Fault Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Page 1 ↓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low AC Fault Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pump Sentry Fault Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lost AC Fault Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Seawater Sensor Fault Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Link to Get More Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commission Procedure</td>
<td>Page 1 ↓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fault History &amp; Run Hours</td>
<td>Page 1 ↓</td>
<td>Fault History</td>
<td></td>
<td>Maximum of 500 entries (FIFO)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compressor Run Hours</td>
<td></td>
<td></td>
<td>Grayed out in DX mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fan Run Hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## TROUBLESHOOTING

### General Troubleshooting

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE REASONS</th>
<th>SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>System will not start.</td>
<td>1. Air conditioner circuit breaker is off.</td>
<td>1. Turn circuit breaker on at ship’s panel.</td>
</tr>
<tr>
<td></td>
<td>2. Digital control is not turned on.</td>
<td>2. Turn on the control.</td>
</tr>
<tr>
<td></td>
<td>3. Miswired at terminal strip.</td>
<td>3. Check wiring diagram; correct if necessary.</td>
</tr>
<tr>
<td></td>
<td>4. Input-line voltage is insufficient.</td>
<td>4. Check power source (shore/generator) for proper voltage.</td>
</tr>
<tr>
<td></td>
<td>5. Push-on connectors or butt splices became disconnected during installation.</td>
<td>Check wiring and terminals for proper sizes and connections.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Verify with a voltmeter that the power at the unit is the same as the power source.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Disconnect power supply and open electric box. Verify connections are tight.</td>
</tr>
<tr>
<td>System runs continuously.</td>
<td>1. Set point temperature is improperly set: too low for cooling or too high for heating.</td>
<td>1. Raise or lower set point.</td>
</tr>
<tr>
<td></td>
<td>2. Porthole or hatches open.</td>
<td>2. Close all port holes and hatches.</td>
</tr>
<tr>
<td></td>
<td>3. Seawater temperature too high for cooling or too low for heating.</td>
<td>3. Seawater temperature will directly affect the air conditioning unit’s efficiency. This air conditioning unit can effectively cool your boat in water temperatures up to 90°F (32.2°C) and heat (if reverse cycle option is installed) in water as low as 40°F (4.4°C).</td>
</tr>
<tr>
<td></td>
<td>4. Improper air sensor location.</td>
<td>4. Check your specific control troubleshooting section.</td>
</tr>
<tr>
<td>Low airflow.</td>
<td>1. Airflow is blocked.</td>
<td>1. 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.</td>
</tr>
<tr>
<td></td>
<td>2. Fan speed is set to Manual Low.</td>
<td>2. If the fan speed is set to Manual Low, press and release the Fan icon until the desired fan speed and airflow are reached. If automatic fan-speed control is desired, press and release the Fan icon until the fan speed indicator at the top of the fan speed graph shows AUTO.</td>
</tr>
<tr>
<td></td>
<td>3. Fan coil is iced.</td>
<td>3. See “Fan coil is iced” on page 28.</td>
</tr>
<tr>
<td>Fan is not running.</td>
<td></td>
<td>Check “Digital-Controls Troubleshooting” on page 34.</td>
</tr>
<tr>
<td>No heating</td>
<td>Unit is “cool only”, or if reverse cycle, reversing valve may be stuck.</td>
<td>Tap reversing valve lightly with rubber mallet while unit is in heat mode. Call for service if that does not correct the problem.</td>
</tr>
<tr>
<td>Water coil is iced in the Heating Mode.</td>
<td>Seawater temperature is below 40°F (4.4°C).</td>
<td>Shut down system to prevent damage to condenser. Allow coil to defrost.</td>
</tr>
<tr>
<td>Fan coil is iced.</td>
<td>1. Thermostat set point is too low.</td>
<td>1. Raise set point.</td>
</tr>
<tr>
<td></td>
<td>2. Improper airflow.</td>
<td>2. 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. See “Digital Controls Troubleshooting” on page 34 for reprogramming options.</td>
</tr>
<tr>
<td></td>
<td>3. Supply air is short-cycling.</td>
<td>3. Redirect supply air so that is not blowing into the return air stream. Seal any air leaks on duct.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If all else fails, switch air conditioning unit to heat until ice melts or use hair dryer to melt.</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>POSSIBLE REASONS</td>
<td>SOLUTIONS</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>No cooling or heating</td>
<td>1. Temperature set point is satisfied.</td>
<td>1. Lower or raise set point.</td>
</tr>
<tr>
<td></td>
<td>2. Obstructed seawater flow.</td>
<td>2. Clean seawater strainer. Check for obstructions at speed scoop thru-hull inlet. Check for a good steady flow from the overboard discharge.</td>
</tr>
<tr>
<td></td>
<td>3. Seawater pump may be air-locked.</td>
<td>3. Remove hose from pump discharge to purge air from line.</td>
</tr>
<tr>
<td></td>
<td>4. Loss of refrigerant gas.</td>
<td>4. Check air conditioning unit for refrigerant oil leakage; call service technician.</td>
</tr>
<tr>
<td></td>
<td>5. Seawater temperature too high for cooling or too low for heating.</td>
<td>5. Seawater temperature will directly affect air conditioning unit’s efficiency. This air conditioning unit can effectively cool your boat in water temperature up to 90°F (32.2°C) and heat (if reverse-cycle option is installed) in water temperatures as low as 40°F (4.4°C).</td>
</tr>
<tr>
<td></td>
<td>7. Fan is not running.</td>
<td>7. Check your specific control troubleshooting section.</td>
</tr>
<tr>
<td></td>
<td>8. Seawater plumbing is air-locked.</td>
<td>8. Ensure that seawater plumbing is installed per the guidelines in this manual.</td>
</tr>
<tr>
<td></td>
<td>9. Digital control is programmed for Cool or Heat only, or mechanical-control thermostat is rotated too far toward either Cooler or Warmer setting.</td>
<td>9. See digital control manual for reprogramming.</td>
</tr>
<tr>
<td></td>
<td>10. (For CW systems only) Chilled-water loop is inadequately cooled or heated, chiller system is not in the proper mode of operation, or Electric Heater is disabled.</td>
<td>10. If the air handler system is equipped with water-temperature sensors, check the water temperature at the digital control. 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 “CW Operational Settings” on page 17. If the air handler system is equipped with an electric heater, ensure that Option 7, Electric Heat or Auxiliary Electric Heat option, is enabled.</td>
</tr>
<tr>
<td></td>
<td>11. High-pressure switch is open (in cooling) due to improper seawater flow.</td>
<td>11. Strainer or intake may be plugged. Seacock may be closed. Check seawater hose for kinks or collapses. Verify pump operation. Check pump circuit breaker if applicable.</td>
</tr>
<tr>
<td></td>
<td>12. High-pressure switch is open (in heating) due to improper airflow.</td>
<td>12. 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.</td>
</tr>
<tr>
<td></td>
<td>13. High-pressure switch is open (in heating) due to high seawater temperature.</td>
<td>13. System may cycle on high pressure if seawater temperature is above 55°F (12.8°C).</td>
</tr>
<tr>
<td></td>
<td>14. Compressor’s thermal overload is open due to either of the above reasons.</td>
<td>14. Compressor needs to cool down. Turn system off for a while (it may take up to three hours to reset thermal overload).</td>
</tr>
</tbody>
</table>
## Digital Controls Troubleshooting

See also “General Troubleshooting” on page 32.

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE REASONS</th>
<th>SOLUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital display panel is not shown.</td>
<td>The 8-pin display-cable plugs are not making contact (unplugged, dirty, bent, or broken pins).</td>
<td>With POWER OFF at the circuit breaker, remove connector and inspect. If damaged, replace connector or entire display cable.</td>
</tr>
<tr>
<td>Fan is not running or runs continuously.</td>
<td>Digital control is set for either fan cycling with compressor or continuous fan operation.</td>
<td>Under Control Parameters, General Settings, change the fan operation to cycled or continuous. Note: When configured for electric heat, after a heat cycle ends the fan will stay on for 4 minutes even if the fan is set to cycled operation.</td>
</tr>
<tr>
<td>Fan is not running but the compressor is.</td>
<td>Failed triac on circuit board.</td>
<td>Send for repair or call local service technician.</td>
</tr>
<tr>
<td>Fan runs continuously although it is set to cycle with compressor.</td>
<td>Failed triac on circuit board.</td>
<td>Send for repair or call local service technician.</td>
</tr>
<tr>
<td>No cooling or heating</td>
<td>1. Digital control programmed for heat or cool only. 2. “High Pressure Fault” or “Low Pressure Fault” is displayed. 3. (For CW systems only) Chilled-water loop is inadequately cooled or heated, chiller system is not in the proper mode of operation, or Electric Heater is disabled.</td>
<td>1. Press Mode icon to achieve desired mode. 2. See below. 3. If the air handler system is equipped with water-temperature sensors, check the water temperature at the digital control. 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 “CW Operational Settings” on page 17. If the air handler system is equipped with an electric heater, ensure that Option 7, Electric Heat or Auxiliary Heat option, is enabled.</td>
</tr>
<tr>
<td>No heat</td>
<td>Digital Control may be set to Electric Heat, not Reverse Cycle.</td>
<td>Reprogram Reverses Fan Speed in Heat under General Settings</td>
</tr>
<tr>
<td>Unit switches to heat while in Cool Mode.</td>
<td>De-icing feature enabled due to coil icing up.</td>
<td>Reprogram De-Ice Cycle under the DX settings.</td>
</tr>
<tr>
<td>Fan coil is iced.</td>
<td>Improper airflow.</td>
<td>See the General Troubleshooting section first, before reprogramming digital control. Reprogram De-Ice Cycle under the DX settings to enable de-icing. If de-icing cycle does not melt ice, switch air conditioning unit to heat until ice melts or use hair dryer to melt ice. If problem persists, reprogram Low Fan Speed Limit to 75 for maximum value.</td>
</tr>
<tr>
<td>System runs continuously.</td>
<td>Improper air sensor location.</td>
<td>Verify display head location with criteria found in the control manual. Install alternate air sensor if necessary.</td>
</tr>
<tr>
<td>“ASF” (Air Sensor Failure) is displayed.</td>
<td>1. Indicates failed face plate air sensor, alternate air sensor or display cable. 2. Damaged jack/socket in display head or on circuit board.</td>
<td>1. Unplug alternate air sensor if installed or plug in alternate air sensor if not installed. Try another display cable. 2. Visually check to see that pins inside socket are not bent or corroded. Repair or replace display or circuit board if needed.</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>POSSIBLE REASONS</td>
<td>SOLUTIONS</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>-----------</td>
</tr>
<tr>
<td>“FIL” (Filter Reminder) is flashing</td>
<td>Filter needs cleaning or replacement.</td>
<td>Clean or replace filter, and reset “Filter Hours Reset”.</td>
</tr>
</tbody>
</table>
| “HPF” (High Pressure Fault) is displayed. | 1. High-pressure switch is open (in cooling) due to improper seawater flow.  
2. High-pressure switch open (in heating) due to improper airflow. | 1. Strainer or intake may be plugged. Seacock may be closed. Check seawater hose for kinks or collapses. Verify pump operation; check pump circuit breaker if applicable.  
2. Remove obstructions in return air stream. Clean air filter and grille. Check for crushed or restricted ducting. Ducting must be as straight, smooth and taut as possible. If problem persists, reprogram Low Fan Speed Limit for maximum value. Set Low Fan Limit to 75, and set the reverse fan speeds during Heating Mode by changing the Reverses Fan Speed in Heat under General Settings or manually set fan speed to high. |
| “LAC” (Low AC Voltage) is displayed. | 1. Supply voltage is too low.  
2. Voltage is improperly calibrated. | 1. Verify power to unit with multimeter.  
2. Verify that Voltage Calibration under General Settings matches voltage reading to unit with a multimeter. Adjust Voltage Calibration if necessary. |
| “LPF” (Low Pressure Fault) is displayed. | 1. Low-pressure switch is open due to low seawater and/or low return air temperatures.  
2. Low pressure switch is open due to loss of refrigerant. | 1. Try restarting the air conditioning unit. The optional low pressure switch has a 10 minute shutdown time delay that may be in effect.  
2. Check air conditioning unit for refrigerant oil leakage; call service technician. |
| “PLF” (Low Pump Flow) is displayed. | 1. Condenser coil is too hot.  
2. Thermistor is damaged.  
3. Damaged jack/socket on circuit board. | 1. Verify that unit is getting water flow and that condenser is not fouled.  
2. Unplug water sensor if installed. Try another if it is available.  
3. Visually check to see that pins inside socket are not bent or corroded. Repair or replace circuit board if needed. |
MAINTENANCE

SYSTEM COMPONENTS

REVERSING VALVE (FOR DX SYSTEMS ONLY)
Reverse-cycle (cooling and heating) units have a reversing valve that must be energized periodically to keep the internal parts moving freely. To do this, switch the air conditioner unit into Heat Mode for a few seconds once a month.

SEAWATER STRAINER (FOR DX SYSTEMS ONLY)
Ensure your pump receives adequate seawater flow by regularly cleaning the strainer basket. Periodically check the overboard discharge for a steady stream of water. Check seawater intake speed scoop for obstructions. Make sure hoses are not looped, kinked or crushed.

CONDENSER COIL (FOR DX SYSTEMS ONLY)
A marine-growth-fouled coil reduces efficiency, raising total system pressure and decreasing its ability to produce cold air.

1. With the system turned off at the circuit breaker on the ship’s panel, disconnect the inlet and outlet connections of the condenser coil.
2. Use chemical-resistant hoses (white PVC 5/8” I.D., etc.) to connect the inlet of the condenser coil to the outlet of a chemical resistant, submersible pump (P-500 pump, etc.) and let the hose connected to the coil outlet flow freely into the container mentioned below.
3. Place a strainer or piece of screen over the inlet of the pump and submerge the pump into a container filled with a 5% solution of muriatic or hydrochloric acid and fresh water or use a premixed over-the-counter solution. Use as large a container as possible to hold the solution (5-25 gal [19-95 liters]).
4. Power the pump and circulate the solution through the condenser coil for 15-45 minutes depending upon the size of the coils and the extent of the contamination. Visual inspection of the solution in the container should indicate when the contamination removal has stopped.
5. Circulate fresh water through the coil to flush any residual acid from the system.
6. Restart the system and check operational parameters to ensure thorough cleaning has taken place. Additional cleaning may be necessary with extreme contamination.

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.

WINTERIZATION (FOR DX SYSTEMS ONLY)
There are several methods of winterization, some of which work better than others. Any method that causes the antifreeze solution to flow downward is the method of choice. By this means, the antifreeze solution displaces any trapped water and eliminates the possibility of it freezing in hidden areas.

Choose the method that works best for you. In the following methods, the first two use a 50/50 nonpolluting biodegradable antifreeze/water solution:

- Pump antifreeze solution into the overboard thru-hull fitting, and discharge through the intake thru-hull fitting.
- Use the seawater pump to pump antifreeze solution through the system and discharge through the overboard thru-hull fitting: Close seacock, remove hose from strainer discharge, raise hose above pump (so pump does not lose its prime) and pour in antifreeze solution. Pump solution through system. The strainer and hose to seacock need to be drained of water.
- Use pressurized air injected at the overboard discharge fitting to force system water through the seawater intake fitting, thus expelling any trapped water from the system.

CAUTION
Avoid spilling or splashing the solution. Follow all warnings and recommendations given by the manufacturer of any acids or premixed solutions.

NOTE: For the purpose of protecting the environment, dispose of any contaminated acid solutions in accordance with federal, state and/or local regulations.
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: 95V AC
Low Voltage Limit 220 Volt Units: 195V AC
Low Voltage Processor Reset: 50V AC
Line Voltage: 115 Through 240V AC
Frequency: 50 or 60 Hz
Fan Output: 6 Amps @ 115V AC, 6 Amps @ 230V AC
Valve Output: 1/4 Amp @ 115/230V AC
Heater Output (using valve relay): 15 Amps @ 115V AC
Heater Output (using valve relay): 10 Amps @ 230V AC
Aux Heater Output (using off-board relay): 30 Amps @ 115V AC / 230V AC
Pump Output: 1/4 HP @ 115V AC, 1/2 HP @ 230V AC
Compressor Output: 1 HP @ 115V AC, 2 HP @ 230V AC
Minimum Operating Temperature: 0°F (-17.8°C)
Maximum Ambient Operating Temperature: 180°F (82.2°C)
Maximum RH Conditions: 99% Non Condensing
Power Consumption: Less Than 5 Watts

Dimensions

Display Panel: 4.41” (112 mm) X 2.96” (76 mm)
Panel Cut Out: 3.31” (85 mm) X 2.19” (56 mm)
Bezel Size: 4.85” (124 mm) X 3.25” (83 mm)

Cable Lengths

Display Cable Self Contained: 15 ft (4.6 m) Standard
Display Cable Central System: 30 ft (9.1 m) Standard
Alternate Air Sensor (optional): 7 ft (2.1 m) Standard
Alternate Air Sensor Central System (optional): 30 ft (9.1 m) Standard
Outside Air Sensor (optional): 15 ft (4.6 m) Standard
All custom cable lengths supplied in standard 5’ (1.5m) increments: 75 ft (22.9 m) Maximum

System Inputs

Ambient or Inside Air Temperature: 1
High Refrigerant Pressure: 1
Low Refrigerant Pressure (optional): 1
Alternate Inside Air Temperature Sensor (optional): 1
Outside Air Temperature Sensor (optional): 1
Pump Sentry Condenser Coil Sensor (optional): 1
Humidity Sensor (optional): 1
Figure 1: Sample Digital Control Wiring Diagram for DX Systems

NOTICE
This is a sample diagram. Wire colors may vary. See unit’s specific diagram located in electrical box or in air conditioning unit's installation manual. Turn power off before opening electrical box.
Figure 2: Sample Digital Control Wiring Diagram for CW Systems

NOTICE
This is a sample diagram. Wire colors may vary. See unit’s specific diagram located in electrical box or in air conditioning unit's installation manual. Turn power off before opening electrical box.
CW SYSTEMS LAYOUT

Figure 3: System Layout Example for Chilled Water Applications

CHILLED WATER APPLICATIONS DIAGRAM LEGEND

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electrical box</td>
</tr>
<tr>
<td>2</td>
<td>Optional outside air sensor</td>
</tr>
<tr>
<td>3</td>
<td>AC wire harness</td>
</tr>
<tr>
<td>4</td>
<td>6-conductor shielded sensor cable</td>
</tr>
<tr>
<td>5</td>
<td>Convector assembly</td>
</tr>
<tr>
<td>6</td>
<td>Water inlet sensor</td>
</tr>
<tr>
<td>7</td>
<td>Control display panel</td>
</tr>
<tr>
<td>8</td>
<td>8-conductor shielded display cable</td>
</tr>
<tr>
<td>9</td>
<td>Return-air grille</td>
</tr>
<tr>
<td>10</td>
<td>Optional remote air sensor</td>
</tr>
<tr>
<td>11</td>
<td>(your choice of 2 installation locations)</td>
</tr>
</tbody>
</table>
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