



Radome Environmental Control Unit

With Passport I/O Compact Digital Display

INSTALLATION, OPERATION & MAINTENANCE MANUAL



Dometic Corporation
Rev. 20170601
L-2283 English
Part Number 297200038

COPYRIGHT © 1997-2017 Dometic Corporation. All Rights Reserved.

No part of this publication may be reproduced, translated, stored in a retrieval system, or transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without prior written consent by Dometic Corporation. Every precaution has been taken in the preparation of this manual to insure its accuracy. However, Dometic Corporation assumes no responsibility for errors and omission. Neither is any liability assumed for damages resulting from the use of this product and information contained herein.

Table of Contents

INTRODUCTION	1	OPERATION	10
THIS MANUAL	1	TROUBLESHOOTING GUIDELINES	11
UNPACKING AND INSPECTION	1	MAINTENANCE	12
HOW IT WORKS	1	CONDENSER COIL	12
SAFETY CONSIDERATIONS	1	RETURN-AIR FILTERS	12
WARNINGS AND NOTICES	2	DIAGRAMS	12
INSTALLATION PROCEDURES	3	WIRING & PRODUCT DIAGRAMS	12
INTERNAL UNITS	3	TEMPLATE FOR INTERIOR UNIT	16
EXTERNAL UNITS	3	MOUNTING DIAGRAMS	17
ELECTRICAL	3		
THE DIGITAL CONTROL	3		
INDICATORS AND BUTTONS	3		
Cool Mode Indicator	3		
Fan Indicator	4		
Heat Mode Indicator	4		
Digital Display	4		
Set Point	4		
Air Sensor	4		
Fan Button	4		
Power	4		
MODES OF OPERATION	5		
Off Mode	5		
On Mode	5		
Cool Mode	5		
Heat Mode	5		
Automatic Mode	5		
Moisture Mode	5		
Fan Modes	5		
Automatic Fan Mode	5		
Manual Fan Mode	5		
Fan-Only Mode	5		
Cycled or Continuous Fan Operation	5		
Program Mode	5		
Important Programming Notes To Installer			
and End User	6		
Using Program Mode	6		
Programming	7		
Programmable Parameters	7		

INTRODUCTION

Congratulations on the purchase of your **Radome Environmental Control Unit (ECU)** air conditioning system. The Radome ECU is a self-contained direct-expansion air conditioner designed for custom applications and features:

- High-efficiency rotary compressor
- Raised lance fin evaporator coil
- Pre-charged and pre-wired systems for easy connections
- ChargeGuard® ensured environmental protection and system integrity

The **Passport I/O Compact** microprocessor-based digital control included with this unit offers the most technologically advance design and is specifically made for the unique requirements of the Radome ECU system. The control features:

- Non-volatile memory
- Low voltage display panel
- Faceplate air sensor for accurate temperature control
- LED temperature displayed in Fahrenheit or Celsius
- Compressor pressure protection

THIS MANUAL

This manual is intended to provide the information necessary to ensure proper installation, operation, and maintenance of the unit. Improper installation or misunderstood operating procedures can result in unsatisfactory performance and/or premature failure of the unit. ***Before proceeding, read this manual completely.***

The Radome ECU is covered under the warranty policy contained in this manual. In the interest of product improvement, specifications and designs herein are subject to change without prior notice.

UNPACKING AND INSPECTION

When you receive the equipment, carefully check all items against the packing list to ensure all cartons were received. Move units in the normal “up” orientation as indicated by the arrows on each carton. Examine cartons for shipping damage, removing the units from the cartons if necessary. If the unit is damaged, the carrier should make the proper notation on the delivery receipt acknowledging the damage.

HOW IT WORKS

The Radome ECU consists of four main components and a refrigerant gas circulating through the system. The **blower** draws warm interior air across the fins of the **evaporator** where the heat from the air is transferred to the refrigerant in the evaporator coil. As the refrigerant absorbs heat from the warm air, it evaporates from a liquid into a gas. The **compressor** then compresses the refrigerant gas and pumps it through the outer tube in the condenser coil. The heat from the refrigerant is exchanged to the **condenser** and discharged out of the dome. The liquid refrigerant is then passed through the evaporator coil and the cycle repeats.

Through this heat-transfer process, heat is removed from the interior dome and its temperature decreases. The cooled air blows into the dome out of the supply-air grille which is mounted on the unit.

If heating is needed in the dome instead of cooling, the electric heater option must be installed and the system programmed accordingly (see “Heat Mode” on page 5).

SAFETY CONSIDERATIONS

Installation and servicing of this system can be hazardous due to system pressure and electrical components. When working on this equipment:

- Always observe precautions described in the literature and on tags and labels attached to the unit.
- Follow all safety codes.
- Wear safety glasses and work gloves and place a fire extinguisher close to the work area.

WARNINGS AND NOTICES

**WARNING**

This manual contains essential safety information concerning the safe and proper installation, operation, and maintenance of your Radome ECU. It is very important that you read and understand the contents of this manual thoroughly before installing or using the equipment. You should keep this manual on your boat for future reference. Failure to follow Dometic approved installation, start-up, operation, and troubleshooting procedures will void the warranty. If there are any statements in this manual that you do not understand, contact your local dealer for assistance or the Dometic Marine Service Department:

- **Phone:** +1 804-746-1313 or +1 954-973-2477 (8AM - 5PM US Eastern Time)
- **Fax:** +1 804-746-7248 or +1 954-979-4414
- **Email:** sales@dometic.com

**DANGER**

ELECTRICAL SHOCK HAZARD. DISCONNECT VOLTAGE AT MAIN PANEL OR POWER SOURCE BEFORE OPENING ANY COVER. FAILURE TO COMPLY MAY RESULT IN INJURY OR DEATH.

**DANGER**

The equipment referenced in this manual operates with compressed refrigerant at high pressures. Proper care must be taken during installation, operation, and servicing to prevent injury or loss of life due to improper procedures.

**DANGER**

This equipment is not ignition protected per CFR 183.410 and may not be installed in areas that may be exposed to flammable gases. Do not install in spaces containing gasoline engines, tanks, LPG/CPG cylinders, regulators, valves or fuel line fittings. Failure to comply may result in injury or death.

**WARNING**

To minimize the hazard of electrical shock and personal injury, this component must be effectively grounded. Refer to the installation guidelines for further information.

**NOTICE**

Some equipment may be shipped with specific installation sheets or wiring diagrams that may supersede the information located in this manual. Dometic reserves the right to update or change any information located herein at any time and without prior notice.

**NOTICE**

Contains R-417A fluorinated greenhouse gas in hermetically sealed equipment. Refer to the condensing unit's product data plate label for quantity of refrigerant shown in weight, global warming potential (GWP), and equivalent tonnes of CO₂ (tCO₂e). Any refrigerant added should be noted on unit label.

INSTALLATION PROCEDURES

This section covers the installation procedures for internal and external Radome ECU systems. **Read the manual completely before attempting to install any equipment.**

INTERNAL UNITS

1. If you are installing an internal Radome ECU, select a location in the dome that will not interfere with the antenna.
2. Internal units must be accessible and have a clear area below the dome for condenser openings. There must be adequate space for air flow underneath the dome pedestal.
3. Use cutout template (see "Template For Interior Unit" on page 16) to mark and then cut openings in dome floor. Drill holes for mounting as per template.
4. Ensure that intake and discharge condenser air streams are separated with a divider so that air does not short-cycle from exhaust to intake.
5. Position the Radome ECU over openings and fasten unit using hardware provided. Ensure foam seals are tight between ECU and mounting surface and there are no leaks from outside.
6. Make electrical connections as described in "Electrical" below.
7. Use a diverter to position cool-air discharge away from the antenna.

EXTERNAL UNITS

1. If you are installing an external Radome ECU, select a location near the dome to keep evaporator ducting as short and straight as possible. Ensure that condenser openings can be clear from obstacles.
2. Mount unit to deck using hardware provided.
3. Install evaporator return and supply ducting to dome. Ensure that ducting is taught, secure, and as straight as possible to minimize bends. Use insulated ducting to reduce heat gain to dome.
4. Make electrical connections as described in "Electrical" below.
5. Position the Passport I/O Compact digital display inside the dome in a location that will sense dome temperature. To avoid short-cycling, do not place near the supply-air stream into dome .
6. Use a diverter to position cool-air discharge away from the antenna.

ELECTRICAL

1. **Turn off the A/C's power-supply circuit breaker before opening electric box.** Each A/C unit requires its own dedicated circuit breaker. Use the correct size circuit breaker to protect the system as specified on the Radome ECU's data plate label.
2. Remove the electric box panel to access the circuit board and the terminal strip mounted on it.
3. The terminal strip is labeled for proper connections of the electrical supply and ground wires (see "Wiring & Product Diagrams" on page 12). Make these connections. All connections shall be made with solderless terminals.

THE DIGITAL CONTROL

The Passport I/O Compact is a digital control that displays current temperature and operating mode, and is also used for making programming changes that affect system operation.

The control has nonvolatile memory requiring no batteries or backup power. When power is lost, the operating parameters are retained indefinitely. When power is restored, the control resumes operation as last programmed.

See Figure 1 and Table 1 on page 4 to identify all parts of the control.

INDICATORS AND BUTTONS

COOL MODE INDICATOR

Lights when the compressor is running in Cool Mode or in Automatic Mode while cooling. Automatic Mode is only used if optional electric heat is installed.

FAN INDICATOR

Lights when the fan is running.

HEAT MODE INDICATOR

Lights when the electric heater is running or in Automatic Mode while heating. Automatic Mode is only used if optional electric heat is installed.

DIGITAL DISPLAY

Shows current temperature and is also used to view and set program parameters.

SET POINT

Press the Up or Down button to set the desired room temperature. To view the set point, momentarily press and release the Up or Down button. The Radome ECU set point is 85°F.

AIR SENSOR

Dome temperature is detected by the air sensor on the face plate.

FAN BUTTON

Not used on Radome ECU.

POWER

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

Figure 1: Passport I/O Compact Display Panel and Indicators

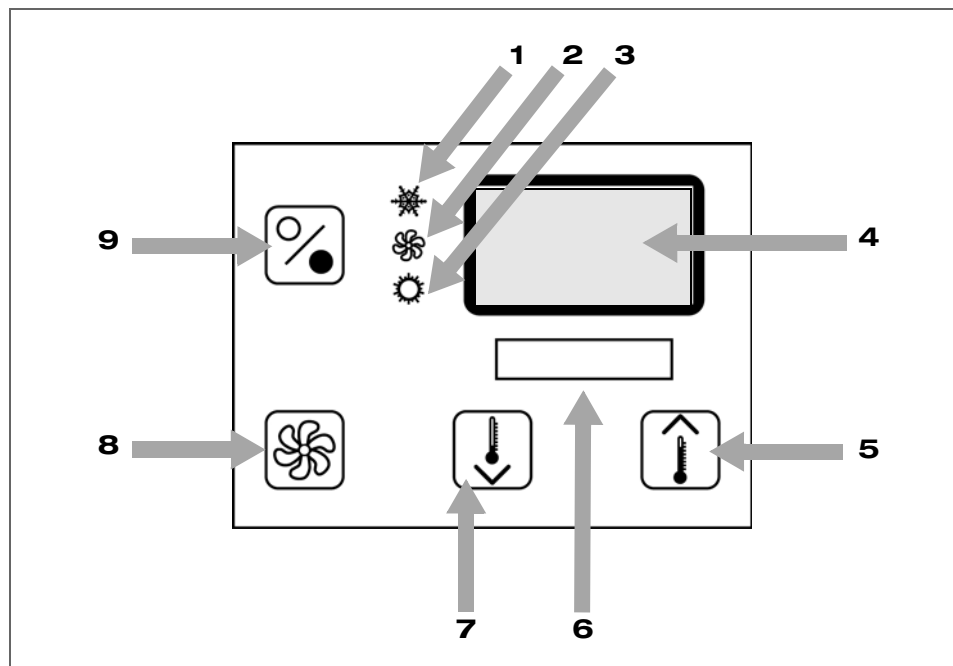


Table 1: Passport I/O Display - Diagram Legend

1	Cool Mode indicator	6	Temperature sensor
2	Fan indicator	7	Down button - Lower temperature set point
3	Heat Mode indicator (only with electric heat option)	8	Fan button (<i>Not used on Radome ECU</i>)
4	Digital display	9	Power button
5	Up button - Raise temperature set point		

MODES OF OPERATION

OFF MODE

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

ON MODE

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

COOL MODE

When Cool Mode is selected, the Cool LED is lit and the cooling system operates as required.

HEAT MODE

Not used on Radome ECU unless electric heater option is installed. See Programming Parameter "P-15: Reverse-Cycle or Electric Heat" on page 8 for more information.

AUTOMATIC MODE

Automatic Mode is only available if the electric heat option is installed. When Automatic Mode is selected, the system provides both heating and cooling as required. The Heat LED or Cool LED lights indicate the mode in use. Dome temperature in a given mode is maintained within 2°F (1.1°C) of set point. If the system was most recently cooling, the dome 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 dome 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. To make the temperature differential between cooling and heating larger, see "P-23: Auto Mode Heat Differential" on page 9.

MOISTURE MODE

Not used on Radome ECU.

FAN MODES

Automatic Fan Mode

Not used on Radome ECU.

Manual Fan Mode

Not used on Radome ECU.

Fan-Only Mode

Not used on Radome ECU.

Cycled or Continuous Fan Operation

The fan can be set to run continuously whenever the system is turned on, or it can be set to cycle on and off with the compressor. When "con" is selected, the setting is continuous fan operation. *The default setting for the Radome ECU is "con". The cycled setting ("CYC") is not used on Radome ECU.*

PROGRAM MODE

Use Program Mode to adjust operating parameters for your particular needs. Program Mode is also used to fine-tune the system for the most efficient operation within an installation. (Variables such as ducting, sensor location, and system layout affect system operation.) The control has factory default settings stored in permanent memory that can be recalled. However, reprogrammed settings can be saved as the new default, thus overwriting the factory defaults. See "P-17: Reset Memorized Defaults" on page 8 for details.



NOTE

All program parameter settings are factory configured for normal Radome ECU operation and should only be modified by qualified service personnel.

Important Programming Notes To Installer and End User

1. When powering on the control, press and immediately release the Power button so you do not unintentionally enter Program Mode. You will enter Program Mode if the Power button is pressed and held for more than 5 seconds. If you enter Program Mode unintentionally, any subsequent presses of the Up or Down buttons will change the P-1 parameter setting since it is the first parameter shown after entering this mode. This will change the operating mode to Cool Only, Heat Only, or Automatic, which could result in improper system operation. Always use care when in Program Mode. For further information, refer to "Using Program Mode" on page 6.
2. The Radome ECU is a Cool Only system (it does not have a reversing valve), therefore you must make sure the Cool Only Mode value "1" is set for parameter P-1 (this is the factory default for Radome ECU systems). DO NOT program 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.

However, if you have the electric heat option installed you CAN program Automatic Mode, which will allow the unit to switch between cooling and heating as needed based on independent high and low set points. See "Automatic Mode" on page 5 for details.

See "P-1: Operating Mode" on page 7 for more information on how to set the proper operating mode.

See "P-15: Reverse-Cycle or Electric Heat" on page 8 for more information on how to set the electric heat option.

3. You can restore the last memorized default settings by entering Program Mode and setting P-17 to "rSt".

Using Program Mode**Entering Program Mode**

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

Exiting Program Mode

Press the Power button once to exit Program Mode and return to Off Mode. Or, do not attempt any programming for 50 seconds, then the control exits Program Mode and returns to Off Mode. Any programming changes made while in Program Mode will be saved and put into operation after exiting Program Mode and returning the control to the On Mode. (If you want the programming changes to become the new defaults, see "Memorizing New Program Parameters" on page 6.) When you exit Program Mode the software version number (such as "A24") appears in the display.

Changing Parameters

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

When you reach the desired parameter number, use the Up and Down buttons to select the data or set the desired limits for the parameter being programmed. See Table 2 on page 9 for a list of the parameters, the possible settings for each, and their factory default settings for the Radome ECU.

Memorizing New Program Parameters

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

To return to the factory default settings, refer to the factory defaults listed in Table 2 on page 9 and reset the parameters manually.

Restoring Memorized Default Settings

You can restore the last memorized default settings by entering Program Mode and setting P-17 to "rSt". The memorized default settings are restored and the control returns to Off Mode. See "P-17: Reset Memorized Defaults" on page 8 for details. To return to the factory default settings, refer to the factory defaults listed in Table 2 on page 9 and reset the parameters manually.

Software Identification

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

**NOTE**

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

Programming**Programming procedure**

1. Enter Program Mode. (See "Entering Program Mode" on page 6 for details.)
2. Press and release the Fan button to increment from one program parameter to the next.
3. Use the Up and Down buttons to change the parameter's setting.
4. Press the Power button to exit Program Mode and return the control to Off Mode. Or, to memorize the changes as the new defaults, simultaneously press the Up and Down buttons (optional).

Programmable Parameters

The system's default parameters may be changed by the installing dealer or end user. Once new values are entered and memorized, the factory defaults are overwritten and the new parameters become the default values. You can restore the original factory default parameters manually. A summary of the parameters, the permitted values, and Radome ECU original factory default settings of each are listed in Table 2, page 9.

**IMPORTANT**

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

P-1: Operating Mode

For Radome ECU select "1" for Cool Mode only. If your particular system has the electric heater option installed and heating is desired, set this parameter to "2" for Heat Mode only, or to "0" for Automatic Mode. See "P-15: Reverse-Cycle or Electric Heat" on page 8 for more information.

P-2: High Fan Limit

Not used on Radome ECU.

P-3: Low Fan Limit

Not used on Radome ECU.

P-4: Compressor Staging Time Delay

Not used on Radome ECU.

P-5: Temperature Calibration

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

P-6: Failsafe Level

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.

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

- **ASF** – Indicates air sensor failure.
- **FIL** – Indicates filter needs to be cleaned or replaced.
- **HPF** – Indicates high refrigerant pressure. When in Heat Mode, "HPF" does not display and does not cause lockout.
- **LAC** – Indicates low AC voltage.
- **LPF** – Indicates low refrigerant pressure. "LPF" has a 10-minute shut down delay.

There are four failsafe levels:

Failsafe Level 0

This level provides minimal failsafe protection and is not recommended. Only the "ASF" 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.

Failsafe Level 1

This level provides the failsafe actions of level 0, 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.

Failsafe Level 2

This level provides the failsafe actions of levels 0 and 1, 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.

Failsafe Level 3

This level provides the failsafe actions of levels 0, 1, and 2, plus the system will lockout after four consecutive HPF or LPF faults, and you can clear the lockout. The system shuts down for two minutes or until the fault is cleared, whichever is longer. To clear the lockout, press the Power button once to Off Mode and press it again to On Mode.

P-7: Low AC Voltage Shutdown

Use this feature to shut down the unit if the voltage drops to a dangerously low level. By default this feature is off, but it can be set between 75 and 105 for a 115V unit, and from 175-205 for a 220/230V unit. This feature works immediately at start up, but to prevent nuisance faults it requires a five-minute delay before displaying a fault code. The fault code is "LAC".

This control has a built-in voltmeter circuit that monitors the AC input voltage. Depending on whether the input power supply is 115VAC or 230VAC, this parameter can be set to "OFF", or a number in the range of "75" to "105" (for 115VAC input power) or "175" to "205" (for 230VAC input power). The factory default setting is OFF.

When this parameter is on, the control 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 specified setting. 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 "LAC" appears in the LED display. The fault will continue until the AC input voltage rises above the specified setting, at which time the LAC fault code clears automatically and the cooling or heating cycle will commence.

After the compressor is started, the low voltage monitor will not interfere with operation and the LAC fault will not display even if the voltage does drop below the specified setting. Similarly, whenever the control is not running a cooling or heating cycle and the voltage drops below the specified setting, the LAC fault will not display.

P-8: De-Icing Cycle

Not used on Radome ECU.

P-9: Pump Sentry

Not used on Radome ECU.

P-10: Display Brightness Control

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

P-11: Fahrenheit or Celsius Selection

The default setting is °F. Select °C for Celsius. (Celsius readings are displayed in tenths, for example 22.2°).

P-12: Cycle Pump With Compressor

Not used on Radome ECU.

P-13: Reverse Auto Fan During Heating

Not used on Radome ECU.

P-14: Cycle Fan With Compressor

Not used on Radome ECU.

P-15: Reverse-Cycle or Electric Heat

Most Radome ECU systems do not support Heat Mode operation, so this parameter setting should remain at the factory default setting of "nor". If your particular system has the electric heater option installed, then this parameter should be set to "ELE" for Electric Heater Installed. See "P-1: Operating Mode" on page 7 for more information on how to enable Heat Mode operation.

P-16: Fan Motor Selection

The "SC" (Split Capacitor) default setting is correct for all Radome ECU systems.

P-17: Reset Memorized Defaults

To reset all programming parameters set this parameter to "rSt". This restores all programmable parameters to the **last saved default values**. Once new values are entered and memorized the factory defaults are overwritten, and the new parameters become the default values. To restore the original factory default parameters manually, refer to Table 2, page 9.

P-18: (Reserved for future use)**P-19: (Reserved for future use)****P-20: Air Filter Cleaning/Replacement Timer Setting**

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

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

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

P-22: Voltage Calibration

This feature displays the voltage being read by the power and logic circuit board. It displays a live reading of the voltage and can be manipulated by pressing the Up or Down buttons. Calibrating this parameter provides a more accurate voltage level when calculating low voltage for P-7. Use a reliable voltmeter as a reference when adjusting this parameter.

P-23: Auto Mode Heat Differential

(Available only in software revision A25 and newer.) This parameter creates a larger temperature differential between cooling and heating operation in Automatic Mode. It is adjustable between 4°F and 40°F and is OFF by default. Typically, in Automatic Mode (with P-23 OFF), the unit will maintain a single set point, only switching between cooling and heating when a 4°F (2.2°C) change in temperature occurs. Using this parameter creates a new secondary heating set point anywhere from 4°F to 40°F below the cooling set point. For example, if P-23 is set to 30, and the control set point is 70°F, the air conditioning unit will provide cooling only until the air temperature reaches 70°F, but it will NOT provide heating unless the air temperature drops below 40°F (70°F minus 30°F). The system would therefore maintain a wider range of temperatures (between 40°F and 70°F) without unnecessarily running the air conditioning system.

Table 2: Programmable Parameters - Ranges and Factory Defaults

Parameter Number	Description	Radome ECU Factory Default	Custom Default	Parameter Range
P-1	Operating Mode	1		0 = Auto 1 = Cool Only 2 = Heat Only
P-2	High Fan-Speed Limit	95		65 - 95
P-3	Low Fan-Speed Limit	64		30 - 64
P-4	Compressor Staging Time Delay	135		5 - 135 seconds
P-5	Temperature-Sensor Calibration	Ambient temp		Ambient plus or minus 10° F
P-6	Failsafe Level	2		0 = Minimal Protection 1 = Continuous No Display 2 = Continuous With Display 3 = Four Failures Reset Required
P-7	Low AC Voltage Shutdown (Volts)	115V: OFF 220/230V: OFF		115V: 75 - 105 220/230V: 175 - 205
P-8	De-Icing Cycle	OFF		OFF 1 = On with 5°F Display Sensor Differential 2 = On with 7°F Display Sensor Differential
P-9	Pump Sentry	OFF		OFF On = Select 100°F to 150°F
P-10	Display Brightness Control	9		4 (Dimmest) - 13 (Brightest)

Table 2: Programmable Parameters - Ranges and Factory Defaults (continued)

Parameter Number	Description	Radome ECU Factory Default	Custom Default	Parameter Range
P-11	Display Temperatures in Fahrenheit or Celsius	F		F = Fahrenheit Displayed C = Celsius Displayed
P-12	Cycle Pump With Compressor or Continuous Pump	OFF		OFF = Cycle With Compressor On = Continuous Pump
P-13	Reverse Fan Speeds During Heat Mode	rEF		nor = Normal Fan Operation rEF = Reversed Fan in Heat Mode
P-14	Continuous Fan or Cycle Fan With Compressor	con		CYC = Cycle Fan With Compressor con = Continuous Fan Operation
P-15	Reverse-Cycle Heating or Electric-Heat-Only Option Installed	nor		nor = Reverse-Cycle Heating ELE = Electric Heater Installed
P-16	Fan-Motor Type: Split Capacitor or Shaded Pole	SC		SC = Split Capacitor Fan Motor SP = Shaded Pole Fan Motor
P-17	Reset Memorized Programming Defaults	nor		rST = Reset Defaults nor = Normal
P-18	Reserved for future use			
P-19	Reserved for future use			
P-20	Air Filter Cleaning/Replacement Timer Setting (x10 hours)	0		0 = Timer Disabled 10 - 250 (100 - 2500 hours)
P-21	Current Filter Time (x10 hours) and Reset	0		Displays the elapsed time (in hours x10) since the timer was started or reset. Press Down button to reset value to 0, restart the timer, and clear the display's "FIL" reminder.
P-22	Voltage Calibration	AC Voltage		
P-23	Auto Mode Heat Differential	OFF		OFF On = Select 4°F to 40°F

OPERATION

1. Turn on the A/C circuit breaker.
2. Turn the Radome ECU system on by pressing the Power button.
3. Use the Up or Down buttons to set the temperature (set point) to 85°F.
4. Verify that there is a steady airflow out of the supply-air grille.
5. If the unit does not appear to be operating properly, refer to the "TROUBLESHOOTING GUIDELINES", below.



NOTE

Do not turn the unit off and immediately turn it back on. Allow at least 30 seconds for refrigerant pressure to equalize.

TROUBLESHOOTING GUIDELINES

Table 3: General Troubleshooting

PROBLEM	POSSIBLE REASON/SOLUTION
System will not start.	1. Air conditioner circuit breaker is off. Turn circuit breaker on at ship's panel. 2. Digital control is not turned on. Press the Power button. 3. Wrong wiring at terminal strip. Check wiring diagram; correct if necessary. 4. Input-line voltage is insufficient. Check power source (shore/generator) for proper voltage. Check wiring and terminals for proper sizes and connections. Verify with a volt-meter that the power at the unit is the same as the power source. 5. Push-on connectors or butt splices became disconnected during installation. Disconnect power supply then open electric box, check wiring diagram, correct if necessary.
No cooling.	1. Temperature set point is satisfied. Lower or raise set point. 2. Passport I/O Compact programmed for heat. Reprogram parameter P-1 for Cool Mode. 3. Obstructed condenser air flow. Check for obstructions at condenser air inlet. 4. Loss of refrigerant gas. Check air conditioning unit for refrigerant oil leakage, call service technician. 5. Coil is iced. See below. 6. Fan is not running. See below. 7. "HPF" is displayed on panel. See below. 8. "LPF" is displayed on panel. See below. 9. Compressor's thermal overload is open due to either of the above reasons. Compressor needs to cool down. Turn system off for a while (it may take up to three hours to reset thermal overload).
System runs continuously.	1. Set point temperature is set too low for cooling. Raise set point to 85°F. 2. Porthole or hatches open. Close all port holes and hatches.
Passport I/O Compact display panel not lit.	8-pin display cable plugs are not making contact (unplugged, dirty, bent, or broken pins). With MAIN POWER OFF at the circuit breaker, remove connector and inspect. If damaged, replace connector or entire display cable.
Fan is not running but the compressor is.	1. Troubleshoot fan capacitor and wiring. Send for repair or call local service technician. 2. Check the condenser fan transformer fuse in the electric box. If blown, replace with an identical fuse (15A MDL) and try to run unit. If fuse blows again, call service technician.
Low airflow.	1. Airflow is blocked. Remove any obstructions in return-air stream. Clean return-air filter and grille. Check for crushed or restricted ducting; ducting must be as straight, smooth and taut as possible. 2. Coil is iced. See below.
Coil is iced.	1. Thermostat set point is too low. Raise set point to 85°F. 2. Improper airflow. Remove any obstructions in return air stream. Clean return air filter and grille. Check for crushed or restricted ducting, must be as straight, smooth and taut as possible. See the Digital Controls Troubleshooting section below for reprogramming options. 3. Supply air is short-cycling. Redirect supply air so that is not blowing into the return air stream. Seal any air leaks on duct.

Table 3: General Troubleshooting (continued)

PROBLEM	POSSIBLE REASON/SOLUTION
"HPF" is displayed on digital control. (High Refrigerant Pressure)	1. High-pressure switch open due to improper airflow. Remove obstructions in air intake or exhaust. Confirm air is not short cycling from intake to exhaust. Ensure intake air is ambient temperature. 2. Condenser fan not running. Troubleshoot if necessary.
"LPF" is displayed on digital control. (Low Refrigerant Pressure)	1. Thermostat set point is too low. Raise to 85°F. 2. Evaporator blower is not running. Check to confirm. Troubleshoot if necessary. 3. Low pressure switch is open due to loss of refrigerant. Check air conditioning unit for refrigerant oil leakage, call service technician.
"ASF" is displayed. (Air Sensor Failure)	1. Indicates failed face plate air sensor, alternate air sensor or display cable. Unplug alternate air sensor if installed or plug in alternate air sensor if not installed. Try another display cable. 2. Damaged jack/socket in display head or on circuit board. Visually check to see that pins inside socket are not bent or corroded. Repair or replace display or circuit board if needed.
"FIL" is flashing (Filter Reminder)	Filter needs to be cleaned or replaced. Clean or replace filter, and reset P-21 to "00".
"LAC" is displayed. (Low AC Voltage)	1. Supply voltage is too low. Verify power to unit with multimeter. 2. Voltage is improperly calibrated. Verify that P-22 matches voltage reading to unit with a multimeter. Adjust P-22 if necessary.

MAINTENANCE

CONDENSER COIL

Check the condenser coil for build-up of dust or soot. Wipe with a dry cloth. Clean as needed and check annually.

RETURN-AIR FILTERS

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.

DIAGRAMS

WIRING & PRODUCT DIAGRAMS

Wiring and product diagrams are provided on the following pages for each Radome ECU model.

Figure 2: HSA 16K-C/CZ/CZ50 Self-Contained Wiring Diagram
(for units shipped after August 1, 2009)

DISPLAY SETUP

- 1) SET DISPLAY TO 85°F
- 2) SET P-1 TO 1
(COOL ONLY)
- 3) SET P-3 TO 64
(LOW FAN SPEED)
- 4) SET P-4 TO 135
(COMPRESSOR DELAY)
- 5) SET P-6 TO 2
(NO LOCKOUT)
- 6) SET P-8 TO OFF
(NO DE-ICING)
- 7) INSURE P-16 IS SC
(FAN MOTOR TYPE)
- 8) MEMORIZE NEW
SETTINGS (PRESS UP
& DOWN)

DISPLAY INSTALLATION:
INTERNALLY MOUNTED
DISPLAY REQUIRES A
27" DISPLAY CABLE.

FOR RADOMES WITH A
REMOTE MOUNTED
DISPLAY, MAKE SURE
DISPLAY IS EITHER
INSTALLED INSIDE THE
DOME OR IF NOT,
INSTALL AN ALTERNATE
AIR SENSOR INTO J4
AND LOCATE SENSOR
INSIDE THE DOME.

NOTE 1:
JUMPER #3 (JP3)
MUST BE CUT
WHEN USING LOW
PRESSURE SWITCH.

WIRING NOTES:

ALL WIRES ARE #14 GA.
UNLESS OTHERWISE NOTED

■ = BUTT SPLICE

▲ = CLOSED-END SPLICE

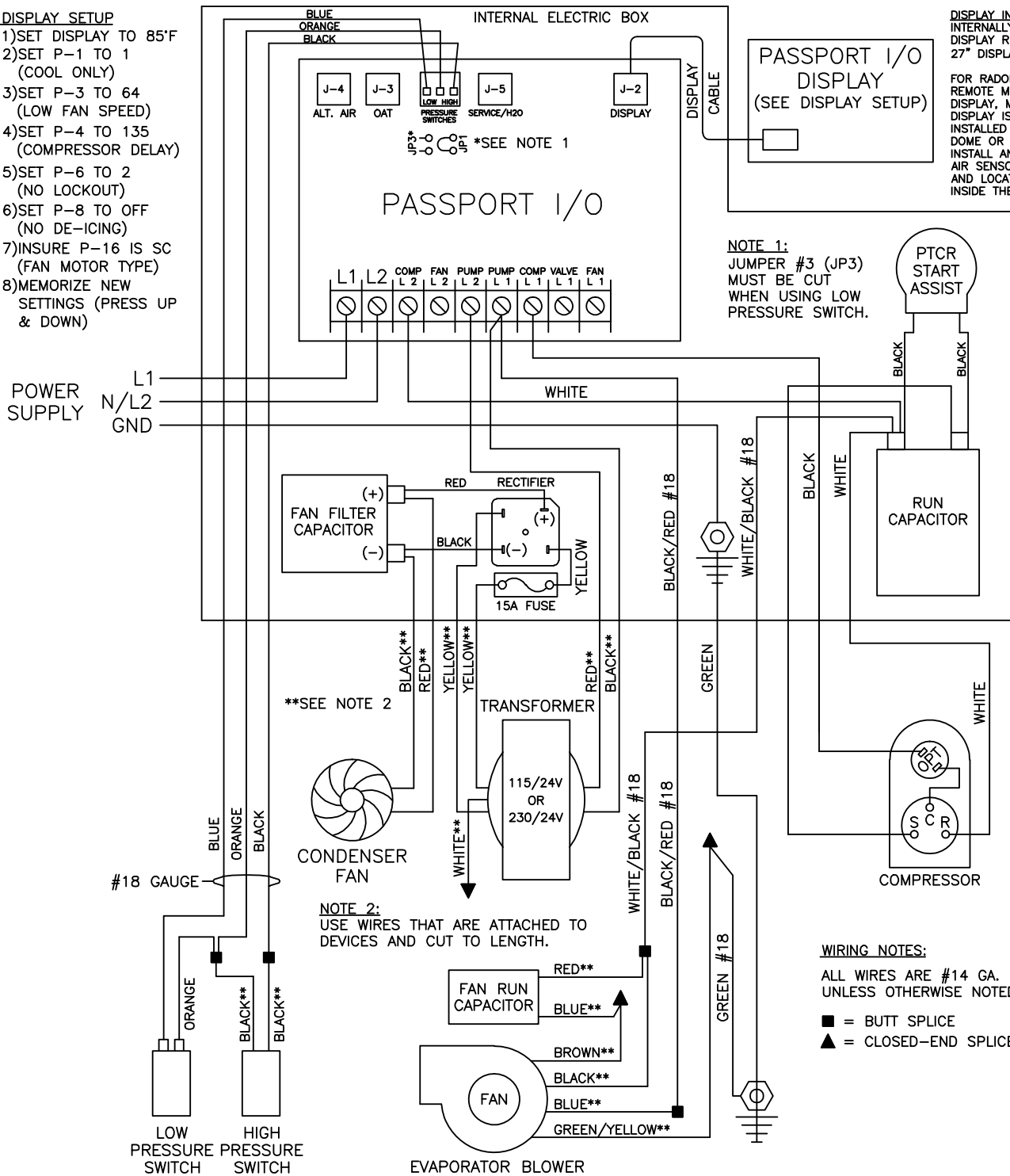


Figure 3: HSA 16K-C/CZ/CZ50 Self-Contained Wiring Diagram
(for units shipped prior to August 1, 2009)

- DISPLAY SETUP**
- 1) SET DISPLAY TO 85°F
 - 2) SET P-1 TO 1 (COOL ONLY)
 - 3) SET P-3 TO 64 (LOW FAN SPEED)
 - 4) SET P-4 TO 135 (COMPRESSOR DELAY)
 - 5) SET P-6 TO 2 (NO LOCKOUT)
 - 6) SET P-8 TO OFF (NO DE-ICING)
 - 7) INSURE P-16 IS SC (FAN MOTOR TYPE)
 - 8) MEMORIZE NEW SETTINGS (PRESS UP & DOWN)

***NOTE:**
JUMPER #3 (JP3) MUST BE CUT WHEN USING LOW PRESSURE SWITCH.

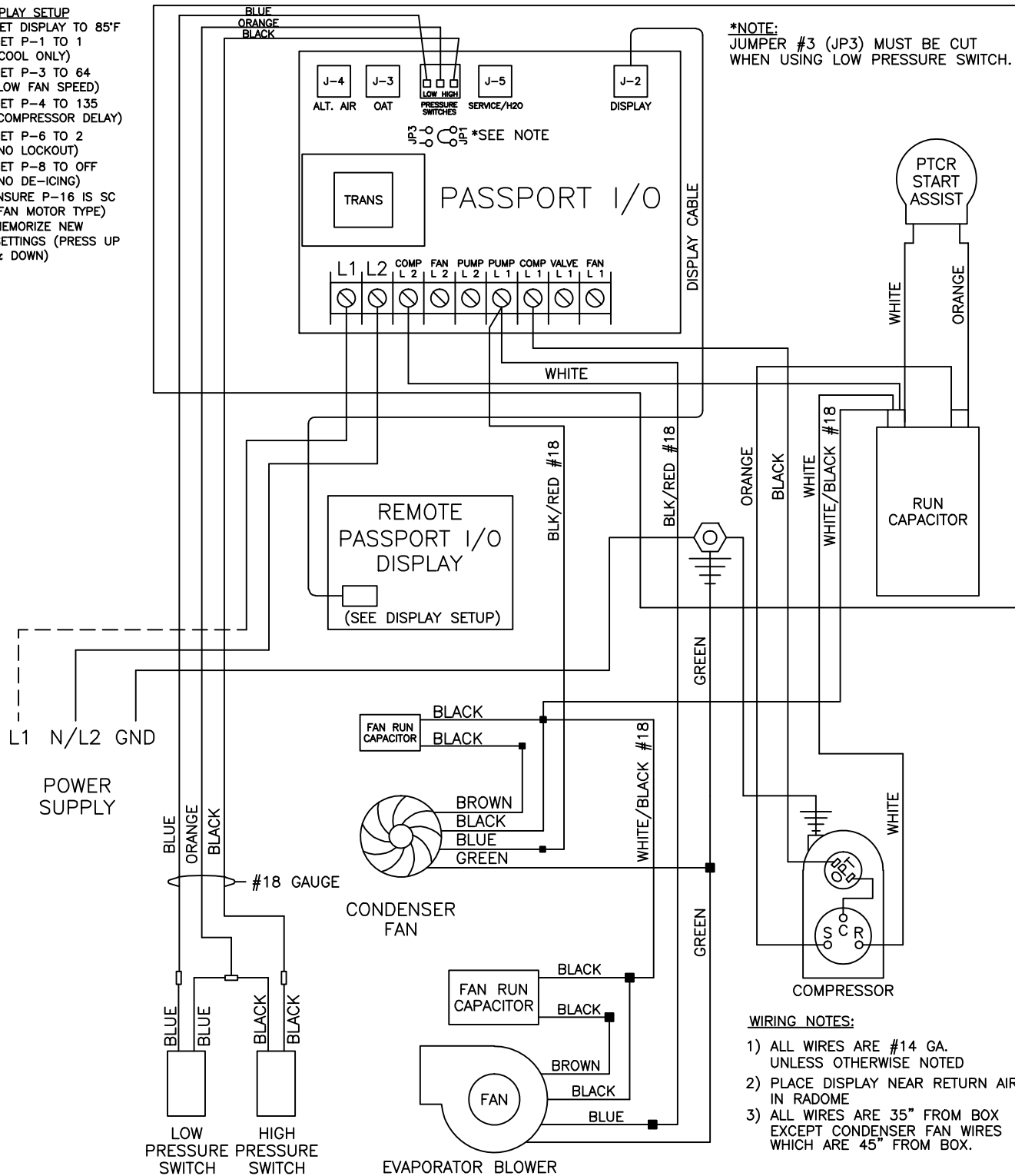
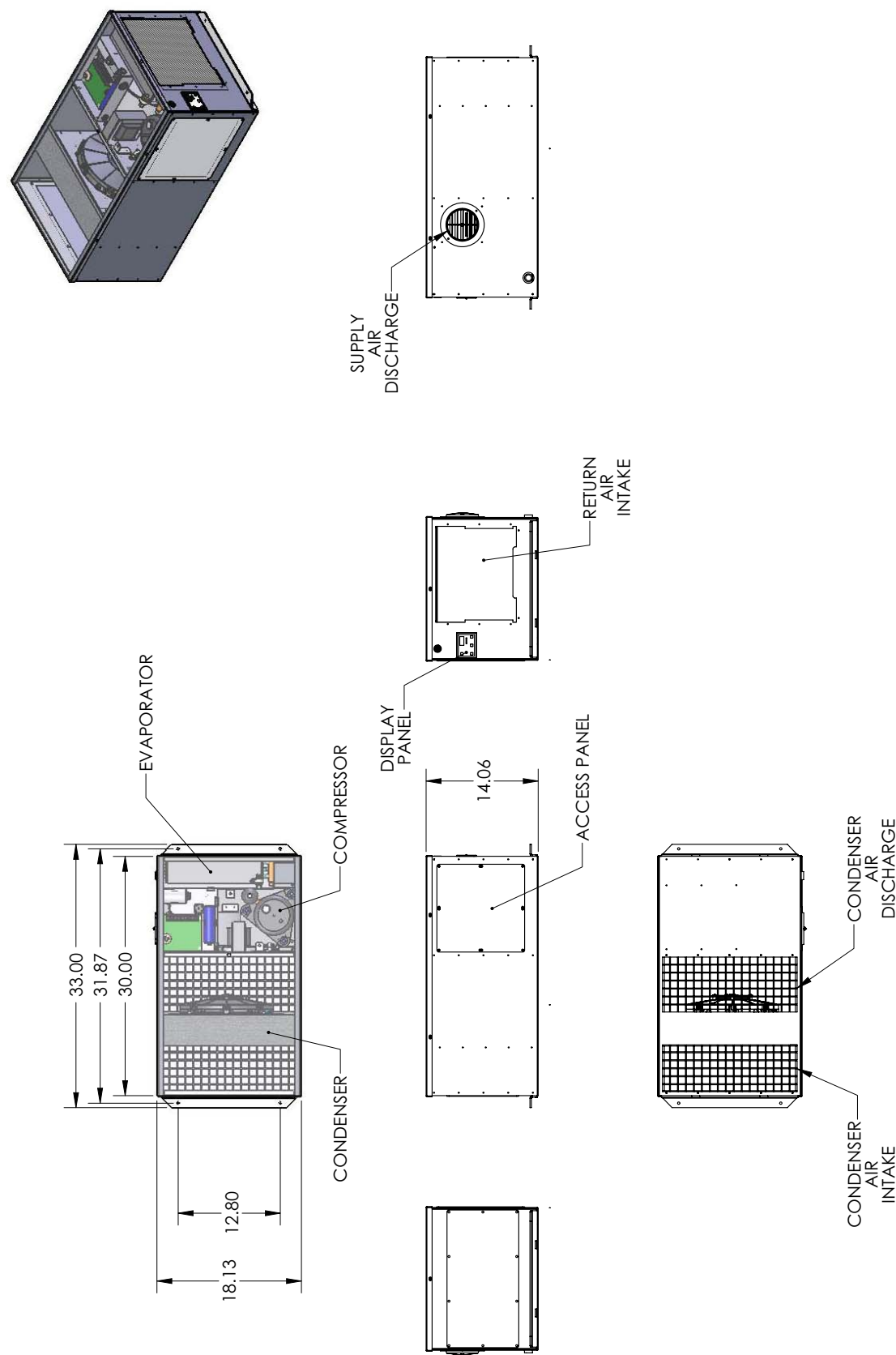


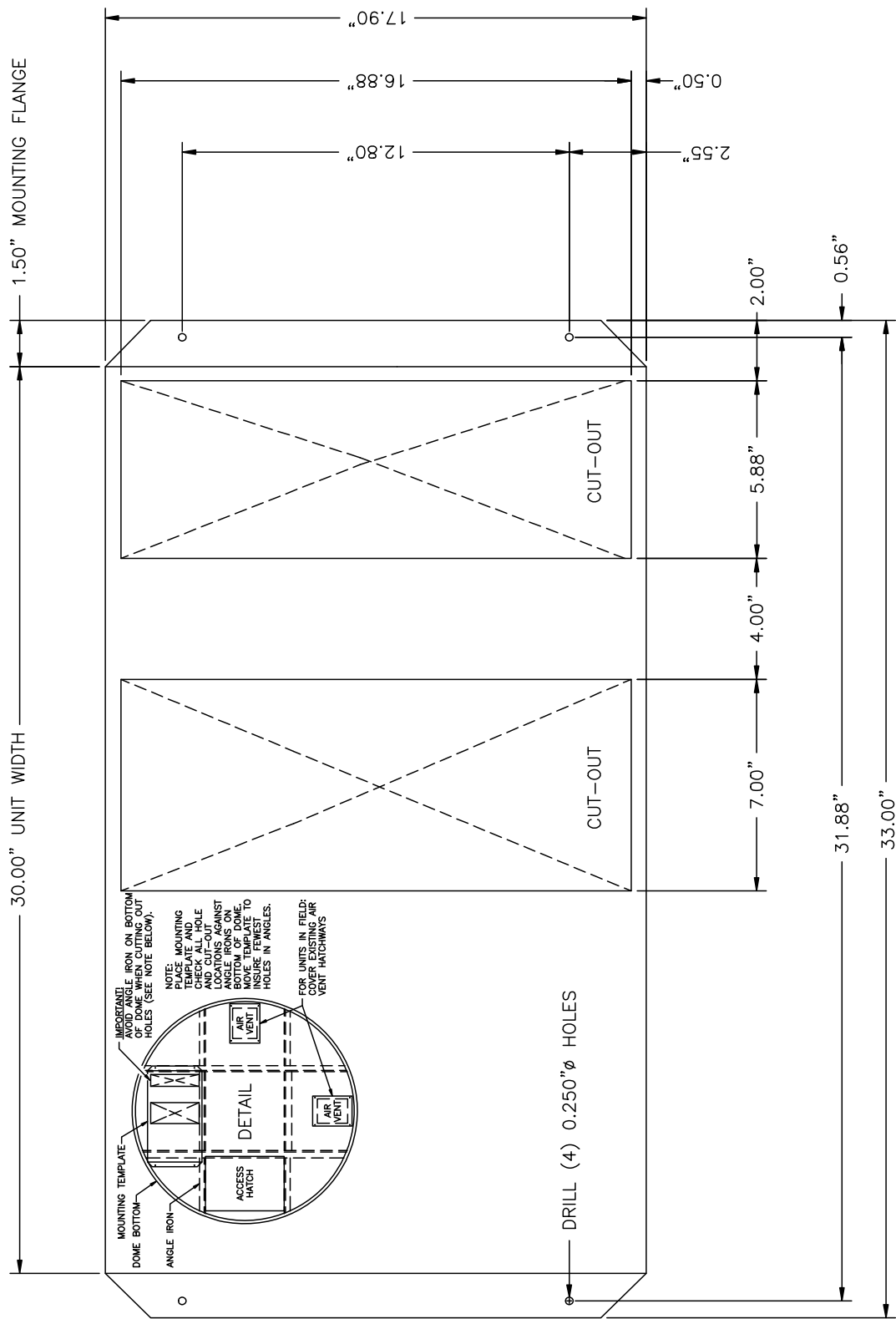
Figure 4: HSA 16K-C/CZ/CZ50 Self-Contained Product Diagram



TEMPLATE FOR INTERIOR UNIT

Figure 5: Mounting Template For Interior Self-Contained System

THIS TEMPLATE IS NOT FOR THE SPLIT UNIT



MOUNTING DIAGRAMS

Figure 6: Mounting Diagram For Self-Contained System

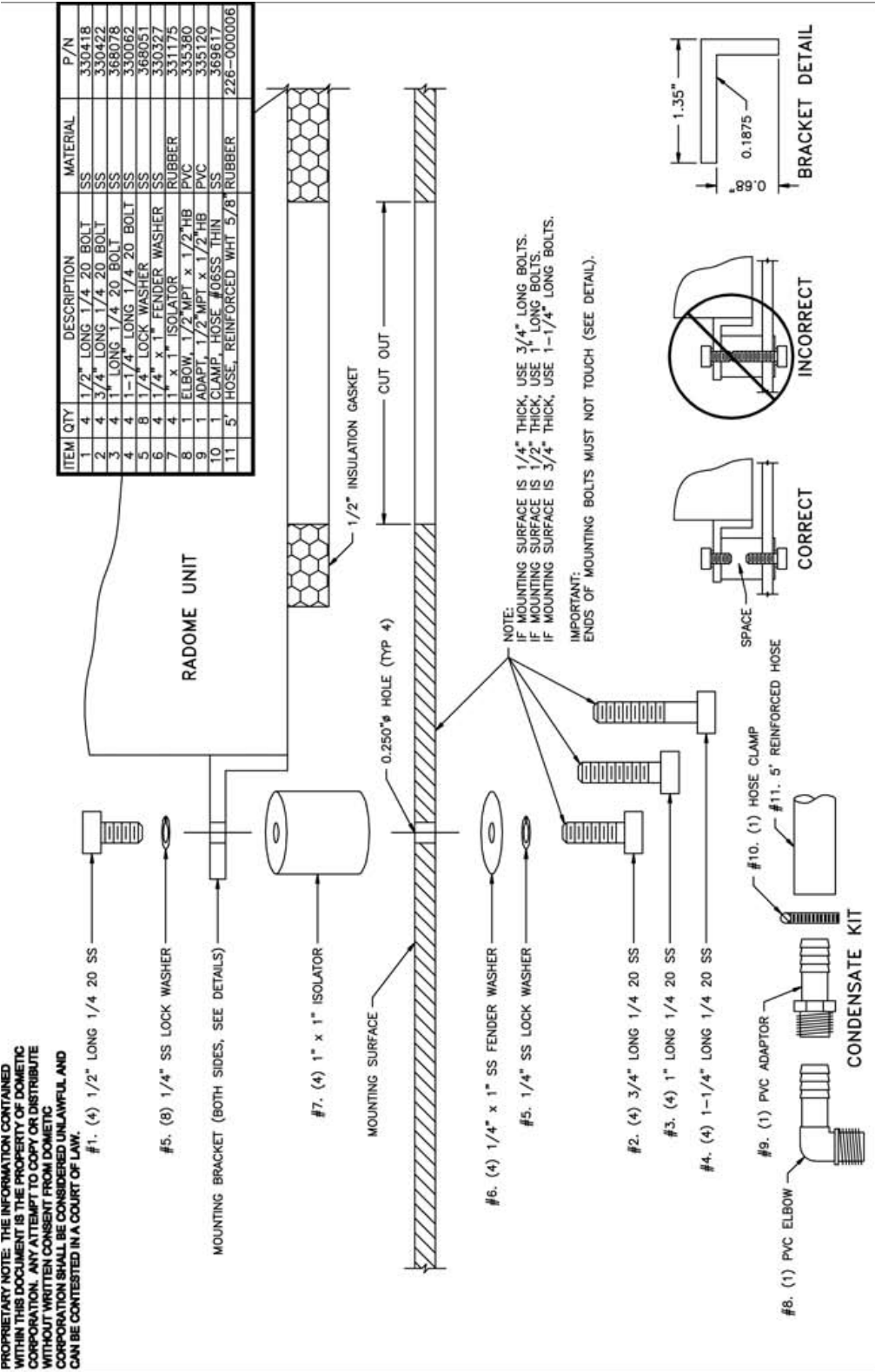
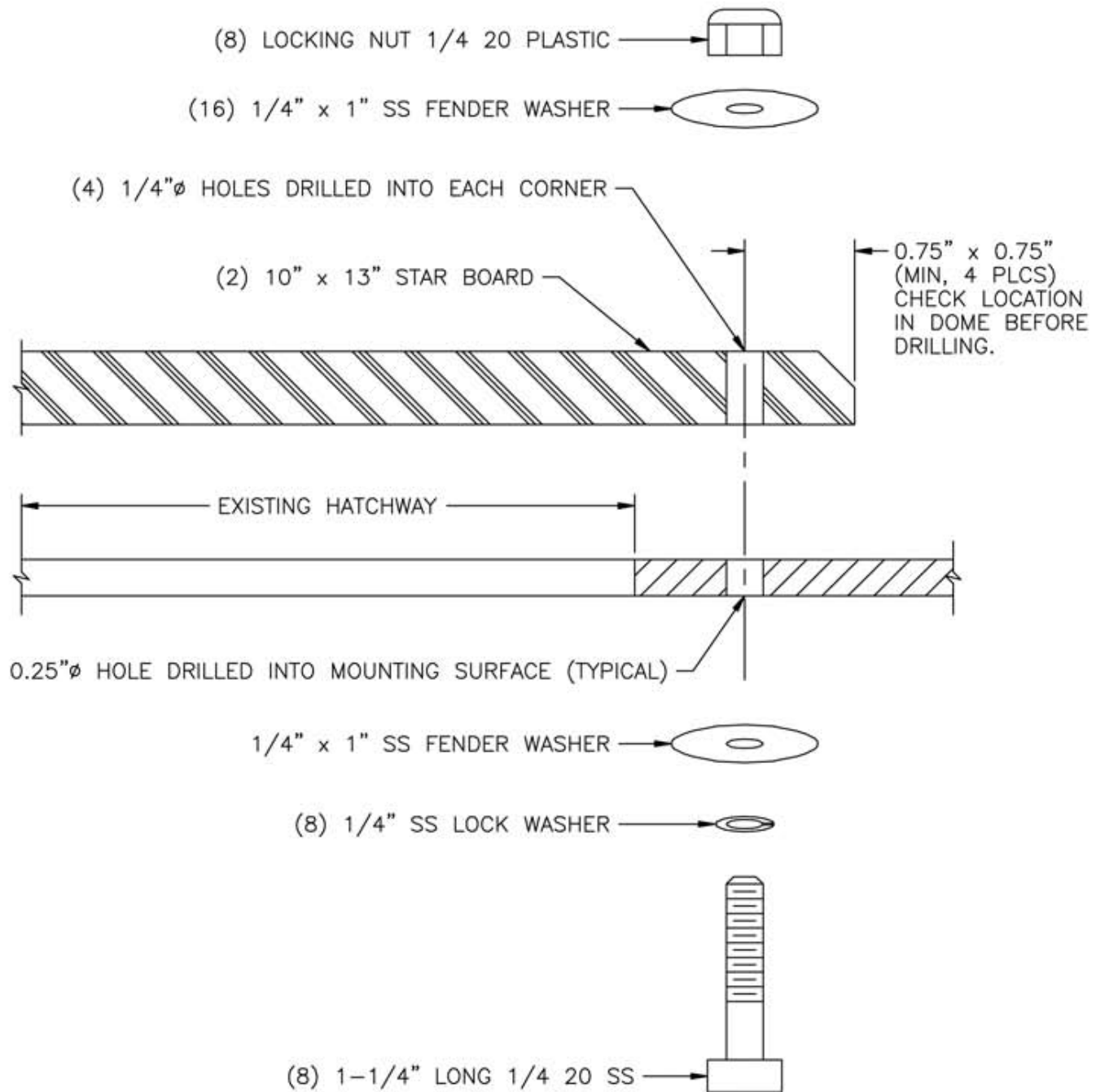


Figure 7: Mounting Diagram For System With Existing Hatchway Covers

NOTES

[illegible]

NOTES

[illegible]

NOTES

[illegible]

DOMETIC MARINE DIVISION

2000 N. Andrews Ave.

Pompano Beach, FL 33069 USA

Tel +1 954-973-2477

Fax +1 954-979-4414

Email MarineSales@dometic.com

24/7 TECH SUPPORT FOR UNITED STATES AND CANADA

8:00 AM to 5:00 PM Eastern Time: +1 800-542-2477

After hours and weekends: +1 888-440-4494

INTERNATIONAL SALES AND SERVICE

Europe and the Middle East: +44 (0) 870-330-6101

For all other areas visit our website to find your nearest distributor.

dometic.com