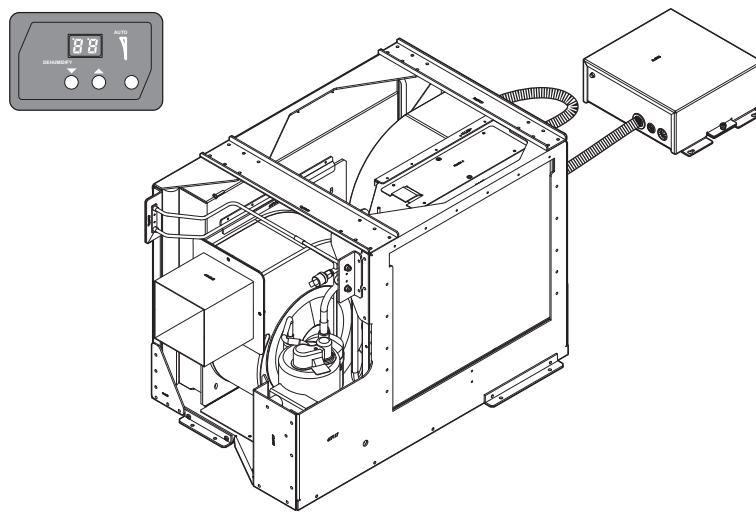




SPECIALTY VEHICLES AIR CONDITIONER



ASCDU15HV 1161, Q3 Control

EN

Universal Self-Contained Air Conditioning Unit and Q3 Control

Installation and Operation Manual 3

For more product information:

Visit: www.dometic.com

Read these instructions carefully. These instructions **MUST** stay with this product.

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1 Explanation of Symbols and Safety Instructions

This manual has safety information and instructions to help you eliminate or reduce the risk of accidents and injuries.

1.1 Recognize Safety Information

 **This is the safety alert symbol.** It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

1.2 Understand Signal Words

A signal word will identify safety messages and property damage messages, and also will indicate the degree or level of hazard seriousness.

 **DANGER!**
Indicates a hazardous situation that, if **not** avoided, will result in death or serious injury.

 **WARNING**
Indicates a hazardous situation that, if **not** avoided, could result in death or serious injury.

 **CAUTION**
Indicates a hazardous situation that, if **not** avoided, could result in minor or moderate injury.

NOTICE: Used to address practices **not** related to physical injury.

 Indicates additional information that is **not** related to physical injury.

1.3 Supplemental Directives

To reduce the risk of accidents and injuries, please observe the following directives before proceeding to operate or install this appliance:

- Read and follow all safety information and instructions.
- Read and understand these instructions before installing or operating this product.

- The installation must comply with all applicable local or national codes, including the latest edition of the following standards:

U.S.A.

- ANSI/NFPA70, National Electrical Code (NEC)
- ANSI/NFPA 1192, Recreational Vehicles Code
- ANSI Z21.57, Recreational Vehicles Code

Canada

- CSA C22.1, Parts I & II, Canadian Electrical Code
- CSA Z240 RV Series, Recreational Vehicles

1.4 General Safety Messages

 **WARNING: ELECTRICAL SHOCK, FIRE, AND/OR EXPLOSION HAZARD. Failure to obey the following warnings could result in death or serious injury:**

- Use only Dometic replacement parts and components that are specifically approved for use with the appliance.
- This unit is a complex mechanical-electrical system and must be installed by a professional installation technician.
- Avoid improper installation, adjustment, alterations, service, or maintenance of the appliance. Service and maintenance must be done by a qualified service person only.
- Do **not** modify this product in any way. Modification can be extremely hazardous.
- Use care when diagnosing and/or adjusting components on a powered unit.

 **WARNING: ELECTRICAL SHOCK HAZARD. Failure to obey the following warnings could result in death or serious injury:**

- Ensure the electrical switches are in the Off position before installing the unit.
- Lock-out and tag the switch with a suitable warning label.
- Open the electrical disconnect switches before connecting the unit to power.
- Before operating the unit, be certain it is properly grounded.

⚠ WARNING: EXPLOSION HAZARD. Failure to obey these warnings could result in death or serious injury.

- Avoid puncturing or breaking the unit or any of the unit's tubing.
- When installing this equipment, always observe precautions described in the literature, 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.
- Failure to follow these guidelines could result in a system rupture that would release high-pressure gas and airborne shrapnel.

NOTICE: Improper installation or misunderstood operating procedures can result in unsatisfactory performance and/or premature failure of these units.

2 General Information

This section provides general information about the refrigerant used in this system and the general information regarding the unit.

The images used in this document are for reference purposes only. Components and component locations may vary according to specific product models. Measurements may vary ± 0.38 in. (10 mm).

2.1 R-410A Reference Information

This section provides information regarding the type of refrigerant used in this air conditioning unit.

- This system uses R-410A refrigerant.
- R-410A is an environmentally safe hydrofluorocarbon (HFC) refrigerant.
- R-410A refrigerant operates at a higher pressure than R-22. Ensure that the servicing equipment and replacement components used are designed to operate with R-410A.

i Refer to the service manual for this unit for more information on R-410A refrigerant.

2.2 Q3 Control Standard Features

This list provides the functions that are standard for the Q3 control when used with the ASCDU15HV 1161.

- 115 Volt, 60 Hz AC power supply
- User-friendly, four-button display panel
- Option to display temperature in degrees Fahrenheit or Celsius
- Programmable functions
- Non-Volatile Memory (NVM) requires no backup power
- Switch inputs for high/low refrigerant pressure
- Time function (away mode)
- Anti-icing cycle prevents evaporator icing
- Programmable fan operation
- Programmable display brightness
- Air-filter cleaning or replacement timer
- Low-voltage monitor

i An optional outside temperature sensor is available for this unit.

2.3 Product Data Plate

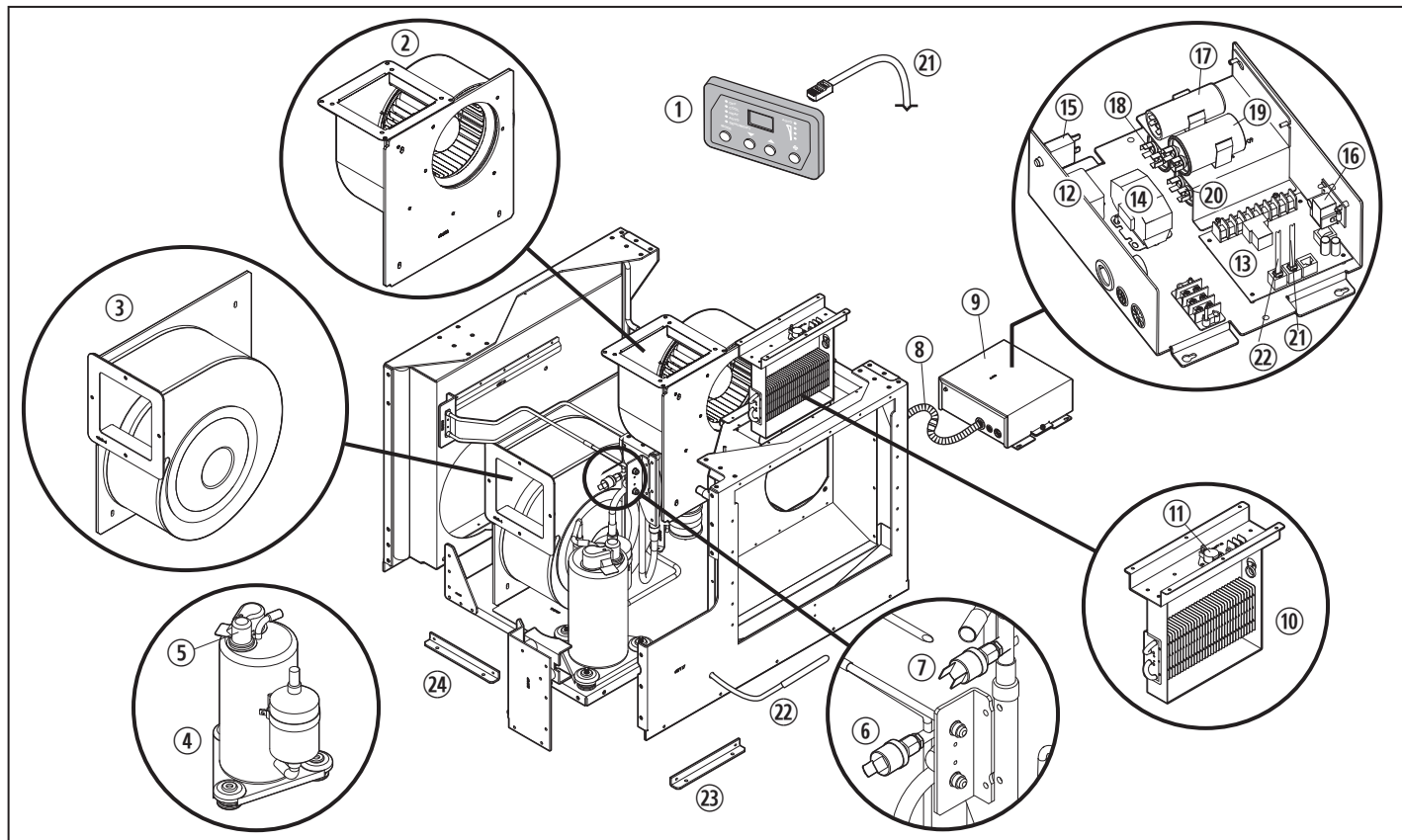
MFG. NO. 710015113		PROD. NO. 921053890		SERIAL NO.		SKU NO. 9600005548		CE	
DESCRIPTION ASCDU15HV1161 2.5KW 115/60/1								SHOP ORDER	
CAP. (BTU)	VOLTAGE/HERTZ	PHASE	MAX. FUSE	MIN. FUSE	FLA. COOL	FLA. HEAT	RoHS		
15000	115*	1	40	30	25.7	24.3			
FAN	L.R.A.	REFRIG. --- OZ/GRAMS	ICO2b	GWP	OIL	DIAGRAM	DPEV02		
5.92	69.8	R410A	38/1078	2.25	2088	POE	340494	DOF700	
OPERATE AT 60HZ ONLY VOLTAGE - 104 MIN. 126 MAX. FREQ-57-63HZ.						PATENT(S):			
						2000 NORTH ANDREWS AVE POMPANO BEACH, FL 33069 USA 954-973-2477 WWW.DOMETIC.COM			
Assembled in USA						DOMETIC			

1 Data Plate

① Amp Draw Cool and Heat

② Weigh-In Charge

2.4 Component Identification



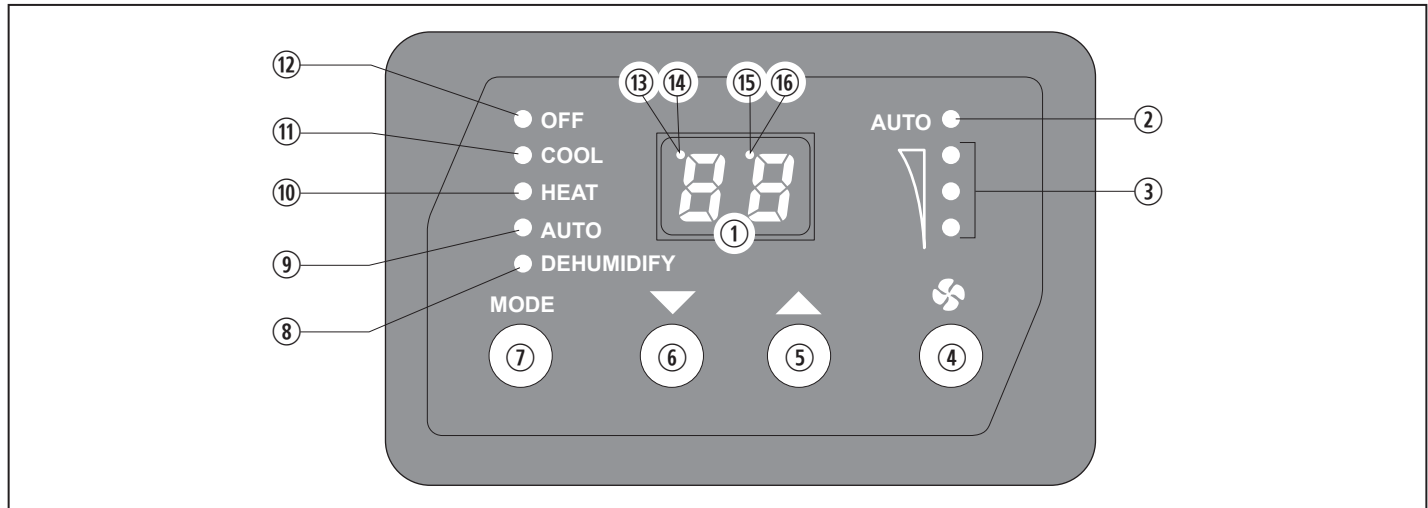
2 ASCDU15HV 1161 Air Conditioning Unit Component Locations

- | | |
|--|---|
| ① Q3 Control | ⑬ Unity Control Board |
| ② Evaporator Blower Assembly | ⑭ Compressor Contactor (30 A, 115 V) |
| ③ Condenser Blower Assembly | ⑮ Circuit Breaker (25 A, 250 V) |
| ④ Compressor Assembly | ⑯ Dometic Q Heat Relay |
| ⑤ Compressor Thermal Overload Switch | ⑰ Compressor Start Capacitor |
| ⑥ High-Pressure Switch (HPS) | ⑱ Compressor Run Capacitor |
| ⑦ Low-Pressure Switch (LPS) | ⑲ Evaporator Blower Capacitor |
| ⑧ 10 ft (3 m) Interconnect Cable | ⑳ Condenser Blower Capacitor |
| ⑨ Electrical Box | ㉑ Display Cable 15 ft (4.6 m) |
| ⑩ Auxiliary Heater Assembly | ㉒ Temperature Sensor 15 ft (4.6 m) |
| ⑪ Auxiliary Heater Thermal Overload Switch | ㉓ Unit Hold Down Bracket (Universal) ¹ |
| ⑫ Compressor Start Relay | ㉔ Unit Hold Down Bracket (Fixed) ² |

¹ Universal: unit hold down brackets that can fit into any set of two holes found on the three sides of the unit that have five mounting holes available for mounting the bracket.

² Fixed: located on the side of the unit with only one set of mounting holes.

2.5 Controls Description



3 Q3 Control

Ref.	Description	Ref.	Description
1	Data Display – Large LED readout displays current temperature, set point, programmed values, and error messages.	9	Auto Mode Indicator – Illuminates when Auto Mode is selected. Flashes if the optional Aux Heater is enabled. Refer to “Programmable Functions, Ranges, and Factory Defaults” on page 18.
2	Auto Fan Mode Indicator – Lit when fan is running in Automatic Fan Mode.	10	Heat/Aux Heat Mode Indicator – The Heat Mode light flashes continuously when on Auxiliary Mode (Heat Mode utilizes electric heat for this application).
3	Fan Speed Indicators – Column of three LEDs that indicate the current fan speed of high, medium, or low (refer to fan speed operation).	11	Cool Mode Indicator – Lights when Cool Mode is selected or indicates the compressor is on when cooling in Auto mode.
4	Fan Button – Press to select Automatic or Manual Fan Mode, indicated by the Auto Fan LED indicator being On or Off. In Manual Fan Mode, additional presses of the Fan button will adjust the fan speed higher, then lower, then back to Auto. In Auto Fan Mode, the fan speed is controlled by the control board as a function of the difference between set point and inside temperature. Refer to “Programmable Functions, Ranges, and Factory Defaults” on page 18.	12	Off Mode Indicator – Lights when the system is off. Note that the Data Display remains on. You can continue to adjust the set point, display readings, and activate the manual fan to circulate the air while the system is in Off Mode.
5	Up Button – Press to adjust the set point up. In programming mode, press to scroll through the program modes and adjust the values.	13	Cooling Indicator – A dot in the upper left corner of the data display lights to indicate the compressor is running in Cool mode. In Auto mode, the Cool LED indicator lights to indicate the compressor is running.
6	Down Button – Press to adjust the set point down. In programming mode, press to scroll through the program modes and adjust the values.	14	Heating Indicator – A dot in the upper left corner of the data display lights to indicate the electric heat is running in Heat mode. In Auto mode, the Heat LED indicator lights to indicate the electric heat is running.
7	Mode Button – Press to cycle through the modes of operation. Mode sequence selections are Off, Cool, Heat, Auto, and Dehumidify.	15	Set Point Indicator – A dot in the upper center of the display lights to indicate the set point is being adjusted. Normally the display defaults to inside temperature.
8	Dehumidify Mode Indicator – Lights when the Dehumidify Mode is selected.	16	Manual Fan Mode Indicator – A dot in the upper center of the display lights to indicate the manual fan mode is selected. Note: the Auto Fan Mode indicator (2) turns off when the fan is running in Manual Fan Mode.

3 Intended Use

The basic principle behind an air conditioner is the transfer of heat from one place to another. In an air-cooled air conditioner, heat is removed from the inside air and transferred to the outside air. The efficiency of the system operation depends on both outside air and inside air temperatures.

When cooling, the air conditioner will operate most efficiently in outside air temperatures below 95 °F (35 °C). At higher outside air temperatures, the unit will operate but at a reduced capacity. A high-pressure shut down may occur at outside ambient air temperatures near 130 °F (54 °C).

The Dometic ASCDU15HV 1161 is a direct-expansion air-cooled air conditioning system designed for use in air-cooled applications. It is a self-contained pre-charged unit. A complete system requires the installation of controls and ducting. This system is designed for use with the Q3 control. The Q3 control is a micro-controller-based unit designed for use with direct expansion (DX) air conditioning systems. Filling of the system with refrigerant is not required, as this system comes pre-charged from the factory.

The manufacturer accepts no liability for damage in the following cases:

- Faulty assembly or connections
- Damage to the product resulting from mechanical influences and excess voltage
- Alterations to the product without express permission from the manufacturer
- Use for purposes other than those described above

Dometic Corporation reserves the right to modify appearances and specifications without notice.

This manual contains essential information to ensure the proper installation, operation, and maintenance of your ASCDU15HV 1161 System. If you have questions or require assistance with your unit, call your Dometic RV Service Department at +1 574-264-2131.

4 Specifications

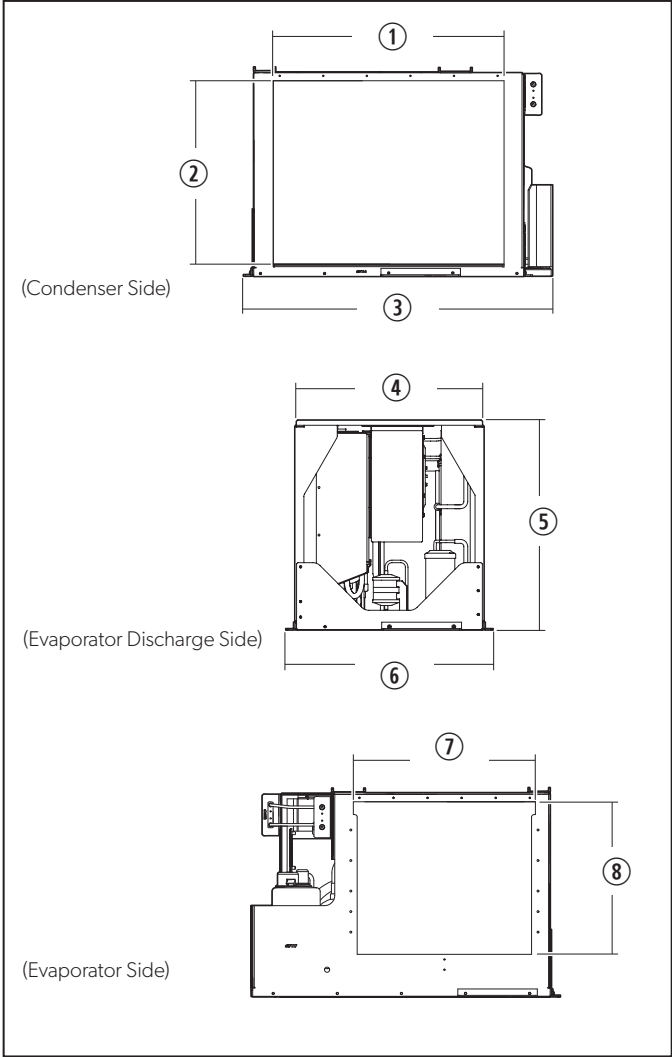
This section provides the unit specification information needed for successful installation.

4.1 System Specifications

Refer to this table for any questions regarding the specifications of this system.

Description	Range
Model	ASCDU15HV 1161
Nominal Cooling Capacity	15,000 BTU/HR
Nominal Heating Capacity	8550 BTU/HR
Set Point Operating Range	55 °F–99 °F (13 °C–37 °C)
Sensor Accuracy	± 2 °F @ 77 °F (± 1 °C @ 25 °C)
Low Voltage Limit 115 Volt Units	90 VAC
Line Voltage	95–115 VAC
Phase	1
Frequency	60 Hz
Maximum Fuse	40 A
Minimum Fuse	30 A
Fan Amps Combined Condenser and Evaporator	5.92 A
Compressor FLA Cooling	25.7 A
Compressor LRA	69.8 A
Heat FLA	24.3 A
Refrigerant Charge	38 oz / 1078 g
Compressor Oil	POE
Minimum Operating Temperature	0 °F (-18 °C)
Maximum Ambient Operating Temperature	130 °F (54 °C)
Maximum RH Conditions	99% Non-Condensing
Weight	136 lbs (62 kg)
Length	30.12 in. (76 cm)
Width	20.13 in. (51 cm)
Height	20.37 in. (52 cm)
Metal Finish	Bare Aluminum

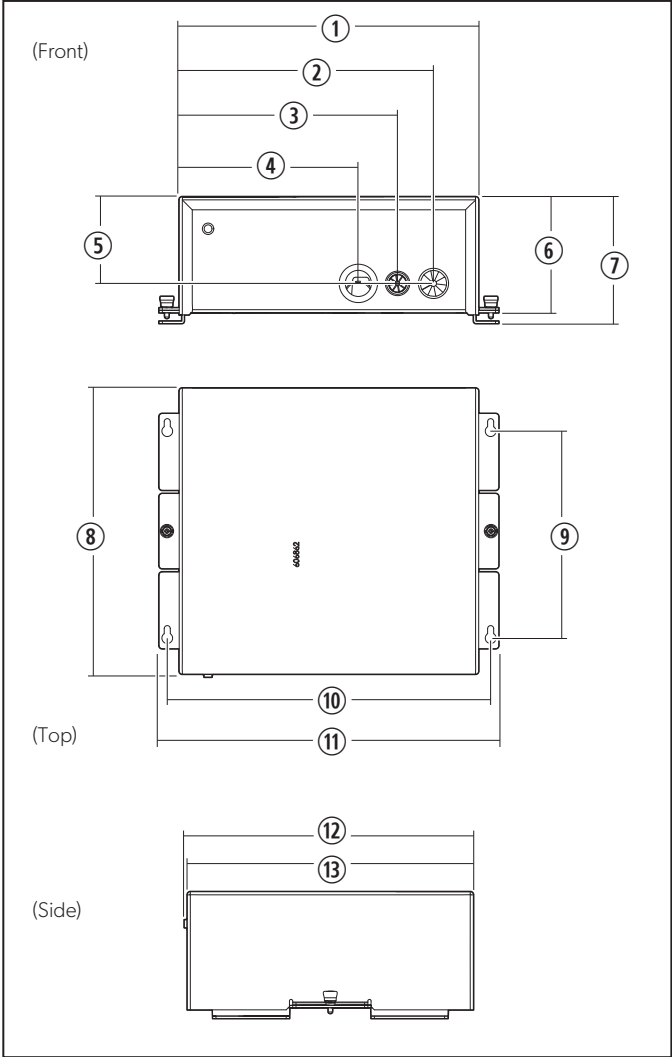
4.2 Air Conditioner Dimensions



4 ASCDU15HV 1161 Dimensions

Ref.	Dimension
Condenser Side View	
1	22.50 in. (57 cm)
2	17.88 in. (45 cm)
3	30.12 in. (76 cm)
Evaporator Discharge Side View	
4	18.38 in. (46 cm)
5	20.37 in. (51 cm)
6	20.13 in. (51 cm)
Evaporator Side View	
7	17.75 in. (45 cm)
8	14.88 in. (38 cm)

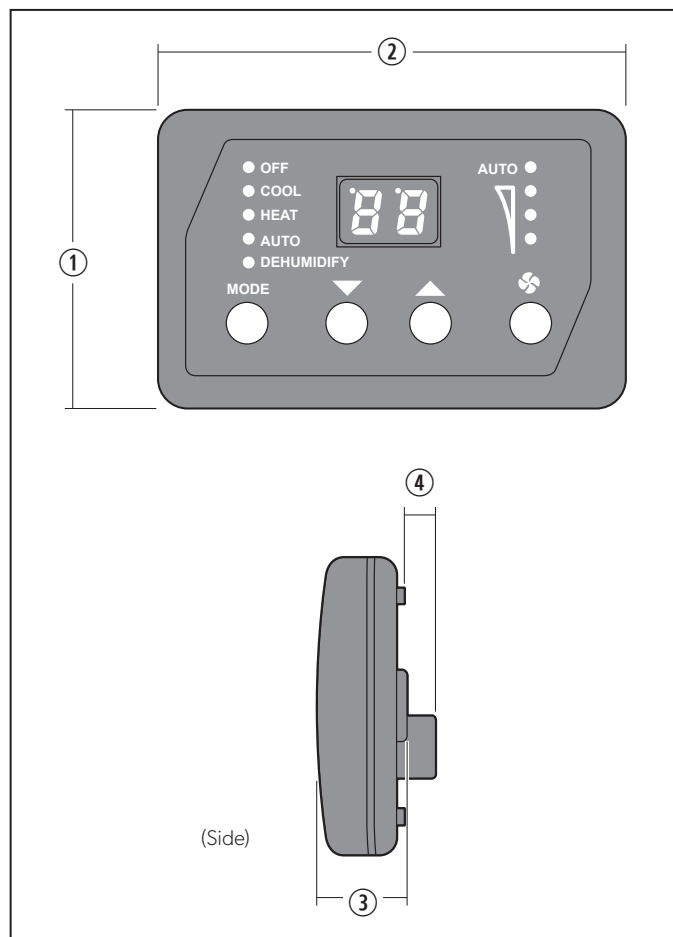
4.3 Electrical Box Dimensions



5 Electrical Box Dimensions

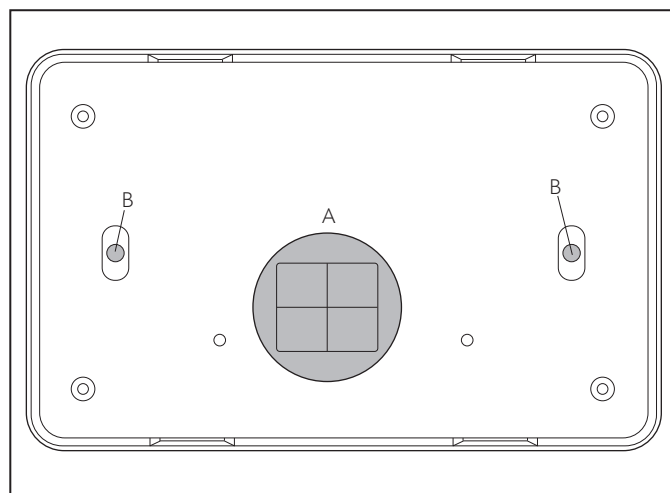
Ref.	Dimension	Ref.	Dimension
Front View		Top View	
1	11.46 in. (29.1 cm)	8	10.95 in. (27.8 cm)
2	9.73 in. (24.7 cm)	9	7.92 in. (20.1 cm)
3	8.36 in. (21.2 cm)	10	12.38 in. (31.4 cm)
4	6.86 in. (17.4 cm)	11	13 in. (30 cm)
5	3.31 in. (8.4 cm)	Side View	
6	4.43 in. (11.2 cm)	12	11.06 in. (28 cm)
7	4.84 in. (12.3 cm)	13	10.95 in. (27.8 cm)

4.4 Q3 Control Dimensions



6 Q3 Control Dimensions

Ref.	Dimension
1	2.51 in. (64 mm)
2	3.97 in. (101 mm)
3	0.75 in (19 mm)
4	0.25 in. (7 mm)



7 Cut Out Dimensions

Dimension	Size
A	1 in. (25 mm) Hole in Bulkhead (for CXP Cable Connection)
B	0.1 in. (2 mm) Mounting Holes

i The Q3 Control package includes the drill and cut template (P/N 086812).

4.5 Cable Lengths

Description	Size
Display Cable	15 ft (5 m) Typical
Indoor Air Sensor	15 ft (5 m) Standard on Self-Contained Systems
Outside Air Sensor (optional)	75 ft (23 m) Maximum
Custom Display-Cable [All Lengths are Supplied in Standard 5 ft (1.5 m) Increments]	75 ft (23 m) Maximum

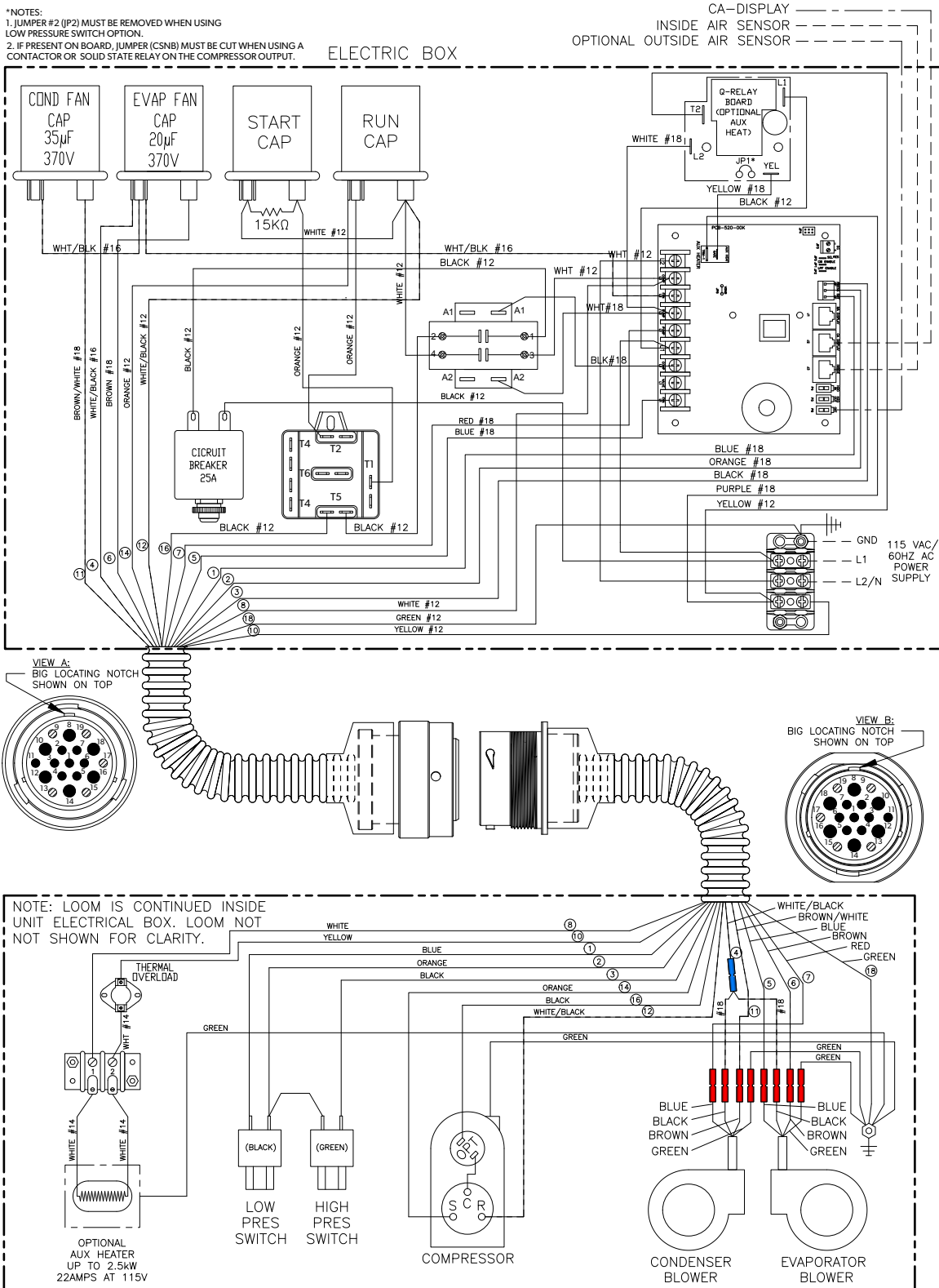
i The maximum length of display and sensor cables is 75 ft (23 m).

4.6 System Inputs

The following system features are monitored via the Q3 control:

- Ambient or inside air-temperature
- High refrigerant pressure
- Low refrigerant pressure
- Optional outside air-temperature sensor

5 Wiring Diagram



8 System Wiring Diagram

6 Installation

⚠ WARNING: HEALTH HAZARD. Failure to obey these warnings could result in death or serious injury.

- The installer must prevent toxic fumes from entering the conditioned space. Consideration should be given to installing a P-trap in the condensate drain lines(s) so that normal discharge of condensate can fill the trap and prevent the ingress of carbon monoxide (CO) or other potentially harmful vapors.
- Ensure that the selected location is sealed from direct access to harmful vapors.
- Do **not** terminate the condensate drain line within 3 ft (1 m) of any outlet of engine or generator exhaust systems or in a compartment housing an engine or generator.

⚠ WARNING: ELECTRICAL SHOCK/FIRE HAZARD. Failure to obey these warnings could result in death or serious injury.

- Disconnect the voltage at the main panel or power source before opening any cover.
- Disconnect all power before wiring the unit.
- Upon installation, effectively ground the unit.
- Do **not** use gas piping as an electrical ground.
- The unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur.
- Wiring must conform with NEC or CEC and all local electrical codes.
- Use the proper sized wires. Be sure they are not undersized.
- Use copper stranded conductors when wiring the unit.

⚠ CAUTION: HEALTH HAZARD.

United States federal law prohibits the intentional release of refrigerant gas into the environment, including the R-410A refrigerant used in this air conditioning system. Special care must be taken when installing, charging, and servicing Dometic equipment to prevent any loss of refrigerant. Failure to obey this caution could result in minor or moderate injury.

NOTICE: This product contains R-410A fluorinated greenhouse gas in sealed equipment. Refer to the units' data plate for quantity of refrigerant shown in weight.

i Before installing the unit, verify that voltage, amperage, and circuit protection requirements listed on the units' data plate agree with the provided power supply.

6.1 Preparing for System Installation

Refer to this list when preparing for the installation of the air conditioning unit and Q3 control.

- Selecting a good location for your air conditioner is the most important part of installation preparation.
- Avoid locations that expose the unit to water from higher level runoff and overhangs.
- Locate the unit in an area that provides adequate clearance for servicing.
- Locate the unit on a level surface or other sturdy platform.
- Be sure to consider the size and the area you are planning to cool prior to installation.
- Since cold air falls, it is highly recommended that the supply-air grille is installed as high as possible.
- Do not locate the unit where the fresh air supply to the outdoor coil may be restricted or where recirculation from the condenser fan discharge is possible.
- Plan the following connections which must be made prior to the installation of the unit:
 - Ducting
 - Condensate Drain
 - Electrical Power Connections
 - Location of the Control Panel

Select the location of the unit and the units' support system (pad, rails, or other), that provides for the minimum clearances required for safety. This includes the clearance to combustible surfaces, airflow clearances, wiring, and service access below, around, and above the unit as specified in the unit drawings. Locate the unit so that the outdoor coil (condenser) airflow is unrestricted.

6.2 Unpacking and Inspection

Units are securely packed. Upon arrival, carefully check all of the items against the packing list to ensure all of the cartons were received and the correct equipment was received. Always keep the unit in the upright position as indicated by the arrows on each carton.

Check the cartons for external damage. If damage is found, immediately file a written request for inspection by the carrier agent. The carrier is responsible for performing a prompt inspection of the damage and for a thorough investigation of each claim. The distributor or manufacturer will not accept claims from dealers for transportation damage. If no damage is found, carefully remove and dispose of all shipping material.

After unpacking, keep the unit as upright as possible.

NOTICE: Laying a unit on its side or top could cause equipment damage. If a unit is placed on its side or top, inspect the unit for damage.

6.3 Installing the Field Power Supply

All field wiring must comply with NEC and all local codes. The unit's wire size is based on Minimum Circuit Amps (MCA) on the unit data plate.

Refer to the units' data plate for Maximum Circuit Breaker (MCB) device size.

Use Heating, Air-Conditioning, and Refrigeration (HACR) type circuit breakers or time delay fuses to ensure a sufficient time delay to permit the compressor to start.

The voltage to the compressor terminals during operation must be within the voltage range indicated on the units' data plate.

Operation on improper line voltage constitutes improper use and may cause damage to the electrical components.

 Connect the wiring as per the wiring diagram located on the unit.

1. Connect the vehicle's power supply to the unit.
2. Install a ground-fault and short-circuit over-current protection device (fuse or breaker) per NEC Article 440 (or local codes).

6.4 Mounting the Unit

1. Use an appropriate tool to cut the required clearance to mount the unit into the planned location.
2. Place the unit into position.
3. Secure the unit in place using the attached mounting brackets (the bracket location may be adjusted if needed).

6.5 Installing the Ducting and the Grilles

 Upon installation of the ducting, be certain that the ducting is the proper size and all connections are secured and sealed. Verify the routing of the ducting does not create sharp bends, mashing, or excess slack in the ducting.

1. Install the appropriate size return-air grille. Make certain that the air path between the return-air grille and the unit is sealed so that only air from the conditioned space will be drawn through the evaporator.
2. Connect the evaporator supply ducting to the evaporator blower and to the supply-air grilles.
3. Connect the discharge ducting to the condenser blower and to a discharge grille. Be sure that the discharge air cannot recirculate into the condenser intake.

6.6 Wiring the Unit

Disconnect all power before wiring the unit.

Do not use gas piping as an electrical ground.

The unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur.

Wiring must conform with NEC or CEC and all local electrical codes.

Use the proper sized wires. Be sure they are not undersized.

Use copper stranded conductors when wiring the unit.

Check all factory and field electrical connections for tightness. Field-supplied wiring shall conform with the limitations of 63 °F (17 °C) rise.

6.7 Installing the Required Ambient Temperature Sensor

 Do not staple the sensor cables when mounting.

The ambient temperature sensor is located on the unit. If relocation of the sensor is necessary, adhere to the following guidelines:

- The ambient temperature sensor should be located in a reliable return-air stream moving from the room to be controlled to the air conditioner it is plugged into.
 - locating the ambient temperature sensor on the back of the air conditioner coil is not ideal and can result in false readings for several reasons.
 - it is best to locate the ambient temperature sensor just inside of a return-air grille or passage.
 - the standard cable length for the ambient temperature sensor is 15 ft (2.1 m).
1. Find the coiled temperature sensor cable located on the top of the unit.
 2. Uncoil the cable and route to the electrical box.
 3. Plug the cable into the port labeled "INSIDE" on the circuit board located in the electrical box.

6.8 Installing the Q3 Control

1. Plan the location of the display using the drill and cut template (P/N 086812), included with the unit. Choose a location that is easily accessible.
2. Drill a 1 in. (2.5 cm) hole in the planned location of the Q3 control.
3. Install the Q3 control into the drilled hole.
4. Secure the Q3 control in place using the appropriate size and number of screws.
5. Plug one end of the display cable (6-pin connector) into the back of the Q3 control.

6. Connect the other end of the display cable into the port labeled "CA" on the circuit board located in the electrical box.
7. Ensure all cables are firmly connected.

6.9 Installing the Optional Outside Air Temperature Sensor

 Do not staple the sensor cables when mounting.

1. plan the location of the outside air temperature sensor.
2. install the outside air temperature sensor to monitor temperature outside the cabin. outside air temperature sensor cables are available in various lengths. mount the sensor outside but not in direct sunlight.
3. plug in the outside air temperature sensors' two-pin connector to the socket labeled "Outside Temp" (white) located on the edge of the circuit board.

6.10 Start Up Checklist

Refer to this checklist before starting the unit after the initial installation of the air conditioning system.

6.10.1 Pre-Start-Up

Unit

Is there any shipping damage? (Y/N)

If so, where?

Will this damage prevent unit start-up? (Y/N)

Does the power supply agree with the unit? (Y/N)

Has the ground wire been connected? (Y/N)

Has the circuit protection been sized and installed properly? (Y/N)

Are the power wires to the unit sized and properly installed? (Y/N)

Has water been placed in the drain pan to confirm proper drainage? (Y/N)

Are the proper air filters in place? (Y/N)

Has the correct air flow been confirmed? (Y/N)

Controls

Are the Q3 control and Temperature Sensing Cables connected properly? (Y/N)

Are the wiring terminals (including the main power supply) tight? (Y/N)

6.10.2 Starting the Unit

1. Turn the circuit breaker for the air conditioner to the On position.
2. Turn the control on.
3. Use the Q3 control to set the system for cooling or heating and to adjust the set point temperature so the unit will turn on.
4. Once the system is operational, place your hand in front of the supply-air grille to ensure there is a steady stream of air coming out of the supply-air grille.
5. Allow the unit to run for 30 minutes at high fan speed.
6. Check the temperature differential between discharge and return air by placing an accurate thermometer in front of the discharge grille and then in front of the return-air grille.
 - In Cool Mode, the difference between the discharge and the return should be 15 °F–20 °F (8 °C–11 °C), with normal ambient air temperature.
 - In Heat Mode, the temperature differential can be as high as 25 °F (14 °C).

If the unit does not appear to be operating properly, refer to “Troubleshooting” on page 25.

Check Parameters

L1 to L2/N Volts

Have the indoor unit fan settings been checked? (Y/N)

Has the outdoor unit fan operation been checked? (Y/N)

Entering indoor unit air temperature

Leaving indoor unit air temperature

Outside air temperature

Total unit amperage in Cool Mode

	V
	°F or °C
	°F or °C
	°F or °C
	A

7 Operation

This section contains the necessary information in order to properly operate the air conditioner and the Q3 control once the initial startup sequence has been completed.

WARNING: FIRE AND/OR EXPLOSION HAZARD.

R-410A refrigerant systems operate at higher pressures than standard R-22 systems. Do **not** use R-22 to service the equipment or components on R-410A refrigerant equipment. Failure to obey this warning could result in death or serious injury.

WARNING: BREATHING HAZARD. Failure to obey these warnings could result in death or serious injury.

- Refrigerants are heavier than air. They can “push out” the oxygen in your lungs in an enclosed space. To avoid possible death or difficulty breathing:
 - **Never** sniff a refrigerant.
 - **Never** purge refrigerant into an enclosed room or space. All refrigerants must, by law, be reclaimed.
 - If an indoor leak is suspected, thoroughly ventilate the area before beginning work.
- **Never** burn refrigerant as poisonous gas will be produced.
- Always follow EPA guidelines.

WARNING: BURN HAZARD.

Liquid refrigerant can be very cold. To avoid possible frostbite or blindness, avoid contact and wear gloves and goggles. If liquid refrigerant does contact your skin or eyes, get medical help immediately. Failure to obey this warning could result in death or serious injury.

-  This unit is factory charged with the required amount of refrigerant. If refrigerant recharging is required, call Dometic for the proper amount of refrigerant required for this system.
-  The electrical power source must agree with the units' data plate rating. Check the tightness of all of the electrical connections. Ensure all barriers and covers are in place at this point.

7.1 Understanding Button Functions

-  For the button locations and Q3 control functions, refer to “Q3 Control” on page 6.

The following list contains the button functions for the Q3 control.

- **Mode button** – Press and release to toggle between the Off and all other modes of operation.
- **Up button** – Press and release to display the set point. Press and hold the Up button to increase the set point. The set point increases one degree each time the button is pressed.

- **Down button** – Press and release to display the set point. Press and hold the Down button to decrease the set point. The set point decreases one degree each time the button is pressed.
- **Fan button** – Press to select the Automatic Fan Mode, the Manual Fan Mode, or to advance through the manual fan speeds.
- **Display Outside Temperature (optional)** – Press the Fan and Down buttons simultaneously to display the outside temperature (optional). If the outside temperature is not available, open or shorted (closed), the display flashes "--" instead of a temperature reading. Press the Fan and Down buttons simultaneously to display the outside temperature (optional). If outside temperature is not available, open or shorted (closed), the display flashes "--" instead of a temperature reading.

7.2 Normal Heating or Cooling Cycle

If you select Cool Mode, only cooling is supplied. If you select Heat, only heat is supplied. The conditioned space temperature in either mode is maintained within the compressor differential setting.

During a Cooling or Heating cycle, the fan will operate at a fan speed depending on the fan's operational mode. If a Manual fan speed is selected, the fan will operate at this speed at all times, even if the set point has been satisfied and the cooling or heating cycle has ended. If the fan is in Auto mode, the fan speed will be determined by programmable function 4, the Fan Response Differential, and programmable function 22, Fan-Speed Divisions. Refer to these parameters for further details on the fan speeds during Auto fan operation. When in Auto fan mode, the fan speed will return to low speed once the set point temperature has been satisfied and the cooling or heating cycle has ended.

7.3 Modes and Programmable Functions

This section provides the detailed information about each mode.

7.3.1 Power On and Basic Modes

Press the Mode button to turn the system on. In three seconds, the system will start operating in whichever mode it was running prior to the last shut down. For the initial startup, the control will be in Cool Mode. To change modes before the system starts, press the Mode button before the three-second startup completes (while the display is flashing). Or, while the system is on, press the Mode button at any time to change the mode.

The modes available are:

- Off
- Cool
- Heat
- Auto (automatically switches between Cool and Heat Modes, depending on set point requirements)
- Dehumidification Mode

7.3.2 Dehumidification Mode

Press the Mode button until the Dehumidify LED indicator illuminates. The display flashes "HU" during this mode of operation. When Dehumidification Mode is activated, the Humidity Control Program automatically turns the air conditioning system on at timed intervals to remove moisture from the air. The system is programmed at the factory for average values. To change the factory settings, see "10: Dehumidification Pre-Circulation Time" on page 21, "11: Dehumidification Time" on page 21, and "12: Dehumidification Overall Time Period" on page 21.

i When the system is in Dehumidification Mode, all system safeguard controls remain active. For example, if the line voltage falls below preset limits, the system will automatically shut down. If the AC power is interrupted, the system will automatically resume operation in Dehumidification Mode when power is restored.

7.3.3 Adjusting the Set Point

To view the set point, press and release the Up or Down button. To adjust the set point, press the Up or Down buttons to set the desired room temperature (press and hold either button to scroll). The set point range is 55 °F–99 °F (12 °C–37 °C). After selecting the desired set point temperature, if no buttons are pressed for three seconds, the display automatically reverts to showing the conditioned space temperature. Conditioned space temperature is continuously displayed. The upper center dot in the Q3 control lights when the set point is being adjusted.

7.3.4 Fan Operation and Control

Press the Fan button to adjust the fan speed while in Manual Fan Speed Mode or to switch between Manual and Automatic Fan Speed Modes. The fan may be operated manually whether the system is on or off as long as there is power to the unit. Automatic Fan Speed Mode can only operate when the system is on. Fan behavior also depends on how the Fan Mode function is programmed: “C” for continuous or “I” for intermittent running with the compressor. See “7: Fan Mode” on page 20. When in Manual Fan mode, the Auto Fan LED is off.

7.3.5 Nonvolatile Memory

The Q3 control has non-volatile memory requiring no batteries or backup power. When power is lost, the operating parameters are retained indefinitely. When power is restored, the Q3 control resumes operating as last programmed.

7.3.6 Display Inside Temperature

The Q3 control continuously displays conditioned space temperature. If Mode or Set Point is changed, after three seconds the Q3 control automatically reverts to showing inside temperature. If inside temperature is greater than 99 °F (37 °C) or less than 0 °F (-17 °C), the display shows either 99 °F (37 °C) or 0 °F (-17 °C) respectively as the maximum or minimum inside temperature.

7.3.7 Dimming the Display

Press the Mode and Up buttons simultaneously and repeatedly to select the brightness setting for the Q3 control.

7.3.8 Sleep Mode

Sleep Mode dims all LEDs. When in Sleep Mode, press any button to brighten the Q3 control, then operate as usual. See “18: Sleep Mode” on page 22.

7.3.9 Lockout Display Mode

Press the Mode, Up, and Fan buttons simultaneously to select the Lockout Display Mode setting. This mode locks the Q3 control in the current mode selected. If a button is pressed, the Q3 control flashes “LC” for 2 seconds then goes back to displaying the inside temperature. In Lockout Mode, the Q3 control shows conditioned space temperature and the indicators operate as normal, yet all button presses are ignored until Mode and Up and Fan buttons are pressed simultaneously, then “UL” displays momentarily and the buttons are unlocked for normal operation. In Lockout Mode all sensors operate as normal and any fault and error codes will be displayed.

7.3.10 Anti-Ice Routine

The Q3 control occasionally shuts down the compressor when in Cool Mode to allow any ice to melt that may have formed on the evaporator coil. The Anti-Ice Routine shutdown occurs when the conditioned space temperature falls below 70 °F (21 °C). The default setting of 70 °F (21 °C) can be adjusted. See “21: Anti-Icing Routine Adjustment” on page 22.

During a ten-minute cycle period, the compressor shuts off for 15 seconds for each degree below 70 °F (21 °C) (default). For example, if the inside temperature is 67 °F (19 °C), the compressor will shut off for 45 seconds, and then run for nine minutes and 15 seconds, repeating this cycle in ten-minute intervals.

8 Programmable Functions, Ranges, and Factory Defaults

This section provides a quick reference table for the programmable functions, ranges, and factory defaults for the Universal Air Conditioning Unit.

8.1 Quick Reference Table

Refer to the following table for the programmable functions, ranges, and factory defaults for the Universal Air Conditioning Unit.

i For detailed information on the Function, Ranges, and Factory Defaults, refer to “Description of Functions” on page 19.

Function Number	Description	Factory Default	Required Settings	Function Range
1	Compressor Time Delay	0	–	0–70 seconds
2	Display Fahrenheit, Celsius, or Auto	°F	–	F, C, or A
3	Compressor Differential	12 [12/8 = 1.5 °F (0.8 °C)]	–	2–31
4	Fan Response Differential	8 [8/8 = 1 °F (0.6 °C)]	–	2–31
5	Low Fan Speed	38	–	2–57
6	High Fan Speed	85	–	41–99
7	Fan Mode	C (Continuous)	–	C = Continuous I = Intermittent
8	AC Line Voltage Calibration	–	–	Plus or minus 1%
9	Temperature Calibration	–	–	Plus or minus 1%
10	HU (Humidity) Pre-circulation	10 minutes	–	0–30 minutes
11	HU Dehumidification	30 minutes	–	10–60 minutes
12	HU Time Period	12 hours	–	2–16 hours
13	Software Revision	Current Version	–	N/A
14	Product Software	dE (Direct Expansion)	–	dE = Direct Expansion
15	Low-Pressure Switch Test	OA = OK FA = Fault	–	N/A
16	High-Pressure Switch Test	OA = OK FA = Fault	–	N/A
17	LCD or LED Segment Test	Displays all LCD graphics or LED segments	–	N/A
18	Sleep Mode (LCD back light off or LEDs dim)	On	–	On = Continuous display SL = Sleep Mode
19	Cool-Only Mode	HP	The Q3 control MUST be set to “CL” for this function.	HP = Heat Pump CL = Cool Only (must be set to CL)
20	High-Pressure Delay	3 minutes	–	1–5 minutes
21	Anti-Icing Routine Adjustment	70 °F (21 °C)	–	65 °F–80 °F (18 °C–26 °C)

Function Number	Description	Factory Default	Required Settings	Function Range
22	Fan-Speed Divisions	5	–	3 = 3 speeds 5 = 5 speeds
23	Aux Heat/Heat Enable/Disable	--	The Q3 control MUST be set to "h1" for this function.	-- = Aux Heat/Heat Disabled h1 = Aux Heat/Heat Enabled (must be set to h1)
24	Seawater Low Limit Temp	N/A	N/A	N/A
25	Humidity Sensor Limit	N/A	N/A	N/A
26	Air Filter Timing Setting (x 100 hours)	0	–	0 = Disabled 1–25 = 100–2500 hours
27	Select FAMU (Fresh Air Makeup) Operation	N/A	N/A	N/A
28	CAN Bus Unit ID	N/A	N/A	N/A
29	CAN Bus Group ID	N/A	N/A	N/A
30	Custom Medium Fan Speeds	2	–	2 or 5, or 2 or 3
31	Medium Low Fan Speed	50	–	2–99
32	Medium Fan Speed	62	–	2–99
33	Medium High Fan Speed	74	–	2–99

i If a factory reset is performed, parameter 19 **MUST** be set to "CL" and parameter 23 **MUST** be set to "h1" to enable Aux Heat/Heat mode.

8.2 Description of Functions

The following sections contain information on the programmable functions available within the Q3 control.

1: Compressor Time Delay

If programmable function 19 is set to "CL", there will be a five-minute time delay before the display shows readings. If an attempt is made to change the five-minute time delay, the changes will not be recognized by the system.

2: Fahrenheit, Celsius, or Auto Selection

Select "F" for Fahrenheit. Select "C" for Celsius. Auto selection defaults to 60 Hz and F.

3: Compressor Restart Differential

The compressor restart differential is the ambient temperature change needed for the compressor to cycle on and off. The factory setting of 1.5 °F (0.8 °C)

should be adequate for most applications. Differential selections are available in increments of 1/8 °. All program functions must be adjusted in °F, even if the temperature display is changed from Fahrenheit to Celsius (refer to "2: Fahrenheit, Celsius, or Auto Selection" on page 19). To change the settings one degree, add or subtract eight. Be careful not to set the compressor restart differential too low. This will cause the compressor to start and stop often, placing an undue load on the electrical system and shortening the life of the compressor.

4: Fan Response Differential

When the fan is in the Auto fan mode, the fan speed is governed by how much the conditioned space temperature differs from the set point. The fan runs faster when the difference is greater. As the conditioned space cools or warms, and the temperature approaches the set point, the fan slows down automatically.

The fan response differential can be adjusted from $1/4^{\circ}$ to 4° , in $1/8^{\circ}$ increments. All program functions must be adjusted in $^{\circ}\text{F}$ even if the temperature display is changed from Fahrenheit to Celsius. Refer to "2: Fahrenheit, Celsius, or Auto Selection" on page 19.

The fan speed range is divided by the Q3 control system into five equal increments. If the fan response differential is set at $1/2^{\circ}$, then the fan speed will change 20% for each $1/2^{\circ}$ of temperature deviation from the set point. Lowering the fan speed differential will cause the fan to change speeds more frequently as the temperature changes. Raising the fan speed differential will result in slower fan speed changes for a given temperature change. The factory setting of $1/2^{\circ}$ is ideal for most applications.

i If the compressor restart and the fan response differentials are both set to the factory default or a comparable range and the Auto fan mode is on, then the fan will not run at high speed unless the conditioned space temperature rises 3°F (-16°C) above the set point.

5: Low Fan Speed

You can adjust the lowest fan speed to suit individual preferences. For instance, you may wish to decrease the low fan speed setting to minimize fan noise.

i For the most efficient operation of your system, you should keep the low fan speed at the highest possible setting, consistent with a comfortable noise level. Running the fan speed too low may have an adverse effect on the system and may cause the evaporator coil to freeze and shut down on low pressure.

6: High Fan Speed

A blower will often reach its highest speed at a voltage lower than full line voltage. For example, at a line voltage of 115 VAC, the blower might reach its fastest speed at 110 VAC. At higher voltages, the blower speed will not increase significantly.

The high fan speed adjustment allows you to set the maximum high-speed voltage to the threshold of the blower high-speed response. The Q3 control system divides the fan speed voltage steps into five equal increments (between the low-speed and high-speed adjustments).

Accurately setting the high and low fan speed adjustments can help ensure that each fan speed increment step results in a noticeable change of fan speed.

- While in programming mode, listen to the fan noise level and use the Up button to raise the displayed value past the point that you can hear an increase in the fan noise level.
- Press the Down button to lower the voltage until you hear a drop in the fan speed. Raise that number by two or three to ensure that it is set at the highest speed.

7: Fan Mode

You can select continuous or intermittent fan operation. Select "C" and the fan will run continuously while the system is on. Select "I" for intermittent operation and the fan will cycle on and off with the compressor.

i If you select intermittent fan operation, you should relocate the thermistor from the return-air grille to a conditioned space wall where it can best sense the average room temperature. Check with your dealer or call Dometic for more information.

8: AC Line Voltage Calibration

The unity control board assembly has a built-in voltmeter that senses AC line voltage and this feature displays the voltage being read. The unity control board automatically responds to sustained low-voltage or high-voltage conditions by shutting down the air conditioning system to prevent compressor damage. At installation, the unity control board voltmeter should be calibrated to line voltage within $\pm 1\%$. To check or re-calibrate the AC line voltage:

- Line voltage will be displayed as the last two digits of the voltage. On 115 VAC systems, 95 VAC appears as "95", 100 VAC as "00", and 115 VAC as "15".
- To check accuracy or to calibrate, turn off all on-board AC loads and measure the line voltage with an accurate voltmeter.
- Press the Up or Down buttons to recalibrate the value as required.

9: Temperature Calibration

This feature calibrates the ambient sensor within a range of $\pm 1\%$. The temperature sensor should be within one or two degrees of the actual room temperature.

i Setting increments are in $^{\circ}\text{F}$ even when the Q3 control is set to display $^{\circ}\text{C}$. Adjust this parameter to display the correct room-temperature reading.

To check accuracy or to calibrate:

- The sensed temperature is displayed. Place an accurate thermometer beside the sensor and compare the temperatures.
- Press the Up or Down buttons to recalibrate the value as required.

10: Dehumidification Pre-Circulation Time

The humidity control program (HU) automatically operates the air conditioning system for a programmed time period to help control humidity. This dehumidification feature works in three stages:

1. The fan comes on at high speed to circulate air for ten minutes.
2. The fan then drops to low speed, and the compressor cycles on in the cool mode to dehumidify.
3. After the dehumidification cycle, the system turns off. The process repeats according to the programmed time period.

The compressor time delay setting (see “1: Compressor Time Delay” on page 19) governs when the dehumidification cycle starts. Every one second of compressor delay equals a six-minute advance into the dehumidification cycle.

The factory default settings are:

- Pre-circulation cycle—10 minutes
- Dehumidification cycle—30 minutes
- Overall time period—12 hours

The factory settings are adequate for most moderate climates and boats. For very humid climates, shorten the overall time period and extend the dehumidification time. In dry climates, select a longer overall time period between cycles and a shorter dehumidification time.

Programmable function 10 governs the pre-circulation cycle time and should not be changed.

11: Dehumidification Time

The dehumidification time determines how long the compressor runs in the dehumidification mode (see “10: Dehumidification Pre-Circulation Time” on page 21). The display shows the dehumidification time period in minutes. You can select 0, 10, 20, 30, 40, or 50 minutes. Select a longer dehumidification time in climates with high humidity. Select a lower dehumidification time in climates with low humidity.

12: Dehumidification Overall Time Period

This setting determines how often the system performs the dehumidification process. The display shows the overall time period in hours. You can select intervals of 2, 4, 6, 8, 10, 12, 14, or 16 hours. Choose a shorter overall time period in climates with high humidity. Choose a longer overall time period in climates with low humidity.

Recommended Humidity Control Settings

Outside Temp.	Relative Humidity	Time Period	Dehumidification Time
Below 80 $^{\circ}\text{F}$ (27 $^{\circ}\text{C}$)	75–85%	12 hours	10 minutes
	Above 85%	8 hours	20 minutes
80 $^{\circ}\text{F}$ –90 $^{\circ}\text{F}$ (27 $^{\circ}\text{C}$ –32 $^{\circ}\text{C}$)	75–85%	10 hours	30 minutes
	Above 85%	6 hours	40 minutes
Below 90 $^{\circ}\text{F}$ (32 $^{\circ}\text{C}$)	75–85%	8 hours	50 minutes
	Above 85%	6 hours	60 minutes

13: Software Revision Level

This setting displays the software version and revision level of the system. It will display a two-digit number such as “05” for version five. Have this information ready prior to calling a dealer or the factory for service assistance.

14: Determining Your Product Type

The system default is dE for “direct expansion self-contained.”

15: Low-Pressure Switch Test

WARNING: EXPLOSION HAZARD.

During this test, low- and high-pressure faults are ignored. The system must be monitored closely during this test and must be shut down immediately if pressures exceed 625 PSI (44 Bar). Failure to obey this warning could result in death or serious injury.

NOTICE: The system should only be operated for a brief period of time if pressures fall below 30 PSI (2 Bar). If the system is operated below 30 PSI (2 Bar) for an extended period of time, the system can ingest liquid and compressor damage can occur.

The low-pressure switch test is used to test the low-pressure circuit for a fault or to test for a low charge in the system. This test can also be used to charge a system. Press the Mode button to enter the low-pressure switch test. During this test, the unit will operate in cool mode at high fan speed, and the display will show “OA” (closed circuit) if the low-pressure switch circuit is OK or “FA” (open circuit) if the low-pressure switch has a fault or the system is low in charge. Press the Fan button to exit this test mode.

16: High-Pressure Switch Test

WARNING: EXPLOSION HAZARD.

During this test, low- and high-pressure faults are ignored. The system must be monitored closely during this test and must be shut down immediately if pressures exceed 625 PSI (44 Bar). Failure to obey this warning could result in death or serious injury.

NOTICE: The system should only be operated for a brief period of time if pressures fall below 30 PSI (2 Bar). If the system is operated below 30 PSI (2 Bar) for an extended period of time, the system can ingest liquid and compressor damage can occur.

The high-pressure switch test is used to test the high-pressure circuit for a fault, an overcharged system, or the loss of air flow. Press the Mode button to enter the high-pressure switch test. During the test, the unit will operate in cool mode at high fan speed, and the display will show “OA” (closed circuit) if the high-pressure switch circuit is OK or “FA” (open circuit) if the high-pressure switch circuit has a fault or system is overcharged or has loss of condenser air flow. Press the Fan button to exit this test.

17: LED Segment Test

Press the Mode button to test the display. All LED segments should display. Press the Fan button to exit this test.

18: Sleep Mode

Select “SL” for sleep mode and the LEDs remain dim or the back light remains off until a key is pressed, which will temporarily brighten the display. Select On and the Q3 control LEDs stay at the current brightness setting.

19: Cool-Only Mode

Select “CL” for cool-only operation and the unit will operate in cooling or (optional) aux heat/heat modes.

NOTICE: The unit must be placed in CL Mode. If the unit is left in HP Mode, unit damage can occur.

 In “CL” cool-only mode, a five-minute compressor delay will initiate whenever the compressor shuts down on the set point, a fault occurs, or there is a power outage. The five-minute delay will begin immediately after the compressor shuts down. The Q3 control will show the remaining time delay countdown at two-second intervals when the compressor is called to operate within the five-minute countdown period. If the five-minute delay period has passed before the compressor is called to operate, the compressor will come on with no delay.

20: High-Pressure Restart Delay

This function is used when the standard three-minute delay during the high-pressure fault routine requires an extended restart delay. The restart delay can be increased up to five minutes between high-pressure fault off cycle.

21: Anti-Icing Routine Adjustment

The anti-icing routine prevents ice build up 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 the set point. Factors that substantially increase run time include operating the system with hatches and doors open, and programming an unrealistic set point [for example 65 °F (18 °C)]. Such situations can cause the evaporator to form ice on warm, humid days.

This function is used during cooling operation to allow any ice that may have formed on the evaporator coil to melt when the conditioned space temperature drops below 70 °F (21 °C) (default). This routine works in ten-minute cycles during which time the compressor cycles off for 15 seconds for each degree the ambient temperature is below 70 °F (21 °C) (default) and runs during the rest of the ten-minute cycle. For example, if the conditioned space temperature is 67 °F (19 °C), the compressor will shut off for 45 seconds (3 x 15 seconds), and then run for nine minutes and 15 seconds (ten minutes minus 45 seconds), repeating in ten-minute intervals. You may adjust the conditioned space temperature at which the anti-icing routine is initiated. The range of adjustment is 65 °F–80 °F (18 °C–26 °C).

22: Fan Speed Division

You can select either five or three fan-speed divisions based on the fan response differential (see “4: Fan Response Differential” on page 19). The default is set at five fan-speed divisions.

For custom programming parameters, the fan speed division must be set to five.

The default is set at five fan-speed divisions.

The Q3 control displays either the individual high, medium, and low fan-speed LEDs if three speeds are selected, or a combination of the high, medium, and low fan-speed LEDs if five speeds are selected, for example:

- Low speed = low LED
- Medium low speed = medium and low LEDs
- Medium speed = medium LED
- Medium high speed = medium and high LEDs
- High speed = high LED

23: Aux Heat Enabled/Disabled

Programmable function 23 must be set to “h1” and programmable function 19 must be set to “CL” for this system to operate properly in aux heat/heat mode.

 When you enable the aux heat/heat function (“h1”), the fan will delay turning off for 30 seconds to allow the auxiliary heater to cool down. The delay occurs when the auxiliary heater cycles off after the set point is reached or when the mode is changed.

24: Seawater Low Limit Temp

Do not adjust. The feature is not available.

25: Humidity Sensor Limit

Do not adjust. The feature is not available.

26: Air Filter Timing Setting and Reset

Use this feature for a reminder to clean or replace the unit’s air filter. Select the number of operating hours until the filter reminder appears in the Q3 control flashing “Ar” then “FL”. The value entered represents that number times 100 hours. Function values are between 1 (100 hours) and 25 (2500 hours). Dometic recommends that you check the air filter at least every 500 hours of operation or more often depending on use. The default setting is off, designated with “00.” To reset the timer and stop the flashing filter reminder, press the Fan, Up, and Down buttons simultaneously.

27: Select FAMU Operation

Do not adjust. The feature is not available.

28: CAN Bus Unit ID

Do not adjust. The feature is not available.

29: CAN Bus Group ID

Do not adjust. The feature is not available.

30: Custom Medium Fan Speed

You can set the number of fan speeds that can be modified by selecting either two or five speeds (if function 22, fan speed division, is set to five).

If function 22 is set to three, the selection options for function 30 will be two or three. If three is selected, then 32, medium fan speed, will be enabled.

If function 22 is set to five and function 30 is set to five, you can modify three more fan speeds (medium low, medium, and medium high) as functions 31, 32, and 33, if enabled.

31: Fan Speed Medium Low

You can adjust the medium low fan speed to suit individual preferences. For instance, you may wish to decrease the medium low fan speed setting to minimize fan noise.

32: Fan Speed Medium

You can adjust the medium fan speed to suit individual preferences. For instance, you may wish to decrease the medium fan speed setting to minimize fan noise.

33: Fan Speed Medium High

You can adjust the medium high fan speed to suit individual preferences. For instance, you may wish to decrease the medium high fan speed setting to minimize fan noise.

9 Programming the Q3 Control

The Q3 control must be in the off mode prior to entering programming mode.

i Your air conditioning unit is cool only and does not have a reversing valve. Once Programmable function 19 and programmable function 23 are set, the only allowable operational modes that can be selected are Off, Cool, Heat, and Dehumidify. Refer to "Programmable Functions, Ranges, and Factory Defaults" on page 18.

i **You must set programmable function 19 to "CL" for cool only and programmable function 23 to "h1" for heat.**

9.1 Entering Programming Mode

To enter the programming mode, press the Mode button, then select the off mode. Once in off mode:

1. Simultaneously press and hold the Mode and Down buttons for three seconds. "PO" flashes in the display while the buttons are being held. When "PO" stops flashing and the off LED flashes, you have successfully entered programming mode.
2. Press the Up or Down buttons to scroll until the desired programmable function number (1–29) is displayed. Refer to "Programmable Functions, Ranges, and Factory Defaults" on page 18.
3. Press the Mode button to access the programmable value of the displayed function number. The function's current value flashes on the display.
4. Press the Up or Down buttons to change the value of that function.

5. Press the Fan button to save the new setting and return to program mode. Scroll to another function number and continue programming, or press Fan again to exit programming mode and return to off mode.

i Whether your Q3 control is set to display temperature in °F or °C, at temperature-related programming values must be adjusted in °F only.

9.2 Customizing the Functions

The system's default setting may be changed by the installing dealer or end-user.

A summary of the function settings, permitted values, and original factory default settings of each are listed in "Programmable Functions, Ranges, and Factory Defaults" on page 18. Record the data for any function settings you change in the custom settings column of that table.

9.3 Restoring Factory Default Settings

You can restore the original factory default settings and overwrite all the customized changes you made. To restore the factory default settings, switch to off mode and then press and hold the Up and Down buttons simultaneously. Hold the buttons for three seconds while "00" flashes in the display. Successful memory reset is indicated by a "1" flashing back and forth across the display. Release the buttons. The system returns to the off mode.

i **After restoring the factory default settings, for the unit to function, you must set cool only mode (programmable function 19) to "CL" and aux heat/heat (programmable function 23) to "h1". Any other user programmable functions must be reprogrammed.**

10 Troubleshooting

Before you call for service, review this list. It may save you time and expense. If you need service after trying these procedures, call your nearest Dometic dealer.

10.1 General System Troubleshooting

This list contains common occurrences that are not a result of defective workmanship or materials.

Problem	Possible Reason	Possible Solution
The system will not start.	The air conditioner circuit breaker is off.	Turn the circuit breaker on at the panel.
	The Q3 control is not turned on.	Press the power button on the Q3 control.
The system runs continuously.	The set point temperature is improperly set. It is either too low for cooling or too high for heating.	Raise or lower the set point temperature.
	The door is open.	Close the door.
	The air sensor is in the improper location.	Refer to "Digital-Controls Troubleshooting" on page 26.
	The outside temperature is too high for efficient cooling.	The outside air temperature will directly affect the air conditioning unit's cooling efficiency. This air conditioning unit can effectively cool outside air temperatures up to 95 °F (35 °C). It will operate at higher outside temperatures however, the cooling capacity will be reduced.
There is low airflow through the system.	The airflow through the evaporator is blocked.	Inspect for and remove any obstructions in the return-air stream.
		Clean the return-air filter and grille.
		Check for crushed or restricted ducting. The ducting must be straight, smooth, and as taut as possible.
	The fan coil is iced.	See below.
	The fan speed is set to manual low.	If the fan speed is set to manual low, press and release the Fan button until the desired fan speed and airflow are reached. If you want automatic fan speed control, press and release the Fan button until the letter "A" displays.
The fan is not running.	Refer to "Digital-Controls Troubleshooting" on page 26 .	
The evaporator coil is iced.	The Q3 control set point is too low.	Raise the set point.
	There is improper airflow through the evaporator.	Remove any obstructions in the return-air stream. Clean the return-air filter and grille.
		Check for crushed or restricted ducting. The ducting must be straight, smooth, and as taut as possible. Refer to "Digital-Controls Troubleshooting" on page 26 for reprogramming options.
	The supply air is short-cycling.	Redirect the supply air so that it is not blowing into the return-air stream.
		Seal any air leaks that may be present in the ducting.
	The humidity level is too high.	Close the hatches and the doors.
	When all else fails.	Switch the air-conditioning unit to Aux Heat/Heat until the ice melts or use a hair dryer to melt the ice.

Problem	Possible Reason	Possible Solution
There is no cooling or heating.	The temperature set point is satisfied.	Lower or raise the set point using the Q3 control.
	The condenser air flow is obstructed.	Check for any obstructions at the condenser. free the condenser of any obstructions and clean the condenser if necessary.
	There has been a loss of refrigerant gas.	Check the air conditioning unit for refrigerant leaks. If leaks are found, call a service technician for repair.
	The outside temperature is too high for efficient cooling.	The outside air temperature will directly affect the air conditioning unit's efficiency. This air conditioning unit can effectively cool temperatures up to 95 °F (35 °C).
	The evaporator coil is iced (in cooling).	Refer to "Troubleshooting" on page 25.
	The fan is not running.	- Refer to "Digital-Controls Troubleshooting" on page 26. - Check the capacitor, connections, and motor. - Call a qualified Dometic service technician.
	The control is in fan-only mode.	Set the system for Cool Mode or for Aux Heat/Heat Mode.
	The digital control is programmed for Cool or Aux Heat/Heat only.	Refer to "Digital-Controls Troubleshooting" on page 26.
	The high-pressure switch is open (in cooling) due to improper air flow.	The intake may be plugged. Verify the condenser fan operation.
	The compressor's thermal overload is open due to lack of air flow though the condenser.	Allow the compressor to cool. Turn the system off for a while (it may take up to three hours to reset the thermal overload).

10.2 Digital-Controls Troubleshooting

WARNING: ELECTRICAL SHOCK HAZARD.

The control board operates at 115 VAC or 230 VAC. Ensure the power is off before removing the cover of the control box. Failure to obey this warning could result in death or serious injury.

Use this table to troubleshoot problems with the Q3 control. Refer also to "General System Troubleshooting" on page 25.

Problem	Possible Reason	Possible Solution
The evaporator fan is not running when the Compressor shuts off.	The Q3 control is programmed for fan cycling with the compressor.	Change Programmable Function 7. Refer to "Programmable Functions, Ranges, and Factory Defaults" on page 18.
The evaporator fan runs continuously at various speeds.	The Q3 control is programmed for continuous operation which is the preferred factory default.	Change Programmable Function 7. Refer to "Programmable Functions, Ranges, and Factory Defaults" on page 18.
The evaporator fan is not running but the Compressor is running.	The circuit board failed.	Send for repair or call a local service technician.
The Q3 control display panel is not illuminated.	There is no power to the Q3 control.	Turn the circuit breaker on.
	Check the control and temperature sensor cables and connections.	Replace the digital or temperature sensor cables if necessary.
	The Q3 control failed.	Contact an authorized Dometic servicing dealer for replacing the Q3 control.

Problem	Possible Reason	Possible Solution
The Q3 control is erratically displaying the temperature.	A power surge or other event has caused a processor glitch.	Shut the power to the unit off and then back on.
	A power surge or other event has caused a processor glitch.	Perform the Restore Factory Default Settings routine and reprogram the control for functions 19 and 23. Refer to "Programmable Functions, Ranges, and Factory Defaults" on page 18.
	There is a loose connection.	Check the sensor cables and connections. Refer to "Wiring Diagram" on page 10.
	The inside temperature sensor is installed incorrectly.	Check the wiring. Refer to "Wiring Diagram" on page 10.
	The temperature sensor is out of calibration.	Calibrate the temperature. Refer to "9: Temperature Calibration" on page 21.
	The unity circuit board is malfunctioning.	Replace the unity circuit board. Contact a qualified service technician to replace and retest the system.
The unit is on however there is no cooling or heating.	The wrong mode has been selected.	Check the Programmable Functions. Ensure Programmable Function 19 is set to "CL" and Programmable Function 23 is set to "h1". Refer to "Programmable Functions, Ranges, and Factory Defaults" on page 18.
There is no heat.	The wrong mode has been selected.	Check the Programmable Functions. Ensure Programmable Function 19 is set to "CL" and Programmable Function 23 is set to "h1". Refer to "Programmable Functions, Ranges, and Factory Defaults" on page 18.
The evaporator coil is iced.	There is improper airflow through the evaporator.	Refer to "General System Troubleshooting" on page 25 before reprogramming the Q3 control.
		Change Programmable Function 21 to increase the duration of the Anti-Icing Routine. If the anti-icing cycle does not melt the ice, switch the air-conditioning unit to Aux Heat/Heat Mode until the ice melts or use a hair dryer to melt the ice.
The system runs continuously.	The Air Sensor has been installed in the improper location.	Verify the Air Sensor location. Ensure the sensor is located out of direct sunlight and away from open doors or hatches.
"Ar/FL" is flashing (Filter Reminder).	The filter needs to be cleaned or replaced.	Clean or replace the filter. Reset and stop the flashing by pressing the Fan, Up, and Down buttons simultaneously.
"HI / - -" is flashing.	The high-pressure switch is open (in cooling) due to improper condenser air flow.	Verify the proper condenser fan operation. Check for blockages in the condenser air flow.
"LO / - -" is flashing.	The low-pressure switch is open due to low Evaporator flow and/or low return-air temperatures.	Try restarting the air conditioning unit. The installed low-pressure switch has a ten-minute shutdown time delay that may be in effect.
	The low-pressure switch is open due to loss of refrigerant.	Check the air conditioning unit for a refrigerant leak. If a leak is found, call a service technician.
"HI / PS" is flashing (High Pressure).	The head pressure is above 575 PSI in the system.	Check the head pressure.
"LO / AC" is flashing (Low Pressure).	The supply voltage is too low.	Verify the power to the unit using a multimeter.
	Voltage is improperly calibrated.	Verify that Programmable Function 8 matches the voltage reading to the unit with a multimeter. Adjust Programmable Function 8 if necessary. Refer to "Programmable Functions, Ranges, and Factory Defaults" on page 18.

 Contact an authorized Dometic servicing dealer if the problem continues or for replacement parts.

11 Faults and Error Messages

To protect the equipment, certain fault conditions trigger a shutdown, and the system will not restart until the fault is repaired.

If an operational failure occurs, the display will flash a fault or error code message. Fault code displays are canceled by pressing the mode button.

 This system is equipped with the high-pressure and low-pressure switches to enable the high- and low-pressure shutdown to operate.

11.1 High-Pressure Shutdown (HI/PS)

 This function is only applicable in AC mode.

The high-pressure switch is monitored by the unity control board. The high-pressure switch opens when the discharge pressure rises above a preset maximum limit. If the high-pressure switch opens, the unity control board will attempt three restarts and will have a five-minute countdown between restarts before it shuts down the entire system. The Q3 control will alternately flash "HI" and "PS." This is a sustained shutdown, and even when the pressure lowers after the shutdown, the system will remain off until it is reset by pressing the mode button on the Q3 control.

11.2 Low-Pressure Shutdown (LO/PS)

 This function is only applicable in AC mode.

The low-pressure switch is monitored by the unity control board. The low-pressure switch opens when the suction pressure drops below a preset minimum limit. If the low-pressure switch opens, the unit will first run for two minutes and then shut down for 50 seconds. This will happen four times. If the switch has not closed, the unit will shut down for 15 minutes, and the display will alternately flash "LO" and "PS." After 15 minutes of shutdown, the cycle starts again, and the unit will run for two minutes and then shut down for 50 seconds. This will repeat four more times.

If after eight attempted compressor starts, the low-pressure switch does not stay closed, the unit will go into a sustained shutdown and the Q3 control alternates flashing "LO" and "PS".

If the low-pressure switch closes at any time before the sustained shutdown, the unit will operate normally.

11.3 Low-Voltage Shutdown

 This function is only applicable in AC mode.

The low-voltage protection feature is always active. If the AC line voltage drops and remains below the limit (90 VAC for a 100 VAC system, 100 VAC for a 115 VAC system) for more than three minutes, the Q3 control shuts down the entire system. The Q3 control alternates flashing "LO" and "AC". This is a sustained shutdown, and the system will not resume operation even if the line voltage returns to normal levels. To reset, press the mode button.

For the low-voltage shutdown function to work properly, the unity control board internal voltmeter should be calibrated. This should be done when the system is installed.

11.4 Fault Codes and Indicator Codes

Refer to the table if the Q3 control is displaying a fault code or an indicator code.

Code	Description	Result
LO / AC	Operating voltage remained below the acceptable time limit for three minutes or more (90 volts for a 100V system, 100 volts for a 115 V system).	Shutdown
HI / PS	The head pressure is above the maximum preset limit. This indicates a condenser fan failure.	Shutdown
HP / --	The high-pressure switch failed open circuit wires open.	Shutdown
LO / PS	The suction pressure is below the minimum preset limit. This indicates a loss of gas, ambient temperature that is too low, evaporator fan failure, dirty filter, or dirty coil.	Shutdown
LP / --	The suction pressure is below the minimum preset limit, failed low-pressure switch, or circuit wires are open.	Shutdown
IS / -- or --	An inside temperature sensor failure flashes "IS/-" for three seconds if the Mode button is pressed. After three seconds, the Q3 control shows a constant "--". Cool or Heat Mode may be selected for emergency operation and the display will show a constant "--".	Emergency Operation
Ar / FL	The Q3 control flashes "Ar / FL" for 15 seconds every 30 minutes indicating the Return-Air Filter needs to be cleaned or replaced. Reset and stop the flashing by pressing the Fan, Up, and Down buttons simultaneously.	Continue Operation
LC	"LC" flashes momentarily if a button is pressed indicating the Q3 control is locked in the current mode of operation. Enter or exit lock mode by pressing the Mode, Up, and Fan buttons simultaneously. "UL" flashes for three seconds when exiting lock mode.	Continue Operation
OU / 1st digit / 2nd 2 digits or OU	The Q3 control displays the optional outside temperature as "OU" then the first digit followed by second two digits. The Q3 control displays "OU" if the optional outside temperature sensor is not installed or failed open or shorted. See "Understanding Button Functions" on page 15.	Continue Operation
LO / SE	"LO/SE" will display if the optional thermal couple was plugged into the blue port. Plug the optional thermal couple into the red port.	Shutdown or Switch to Optional Electric Heat

12 Maintenance

⚠ WARNING: ELECTRICAL SHOCK HAZARD.
Ensure the power to the unit is shut off before cleaning or servicing the unit. Failure to obey this warning could result in death or serious injury.

⚠ WARNING: CORROSIVE CHEMICALS.
Avoid spilling or splashing the cleaning solution. Follow all warnings and recommendations given by the manufacturer of any cleaners or premixed solutions.

These items should be part of a routine maintenance program until a specific schedule for each can be identified for this installation.

Monthly
Task
Clean or replace the return-air filter.
Check the condensate drain for blockages.
Check for any obstructions in the system.
Annually
Task
Clean and inspect the condenser coils.
Visually inspect the connecting lines and coils for signs of oil leakage.
Check the wiring for loose or broken connections.
Check the evaporator coils. Clean using appropriate indoor coil cleaner if necessary.

12.1 Checking the Condensate Drains

Check the Condensate Drain for obstructions every three months. Check for obstructions by rapidly pouring a quart of water into the Condensate Pan. If the water does not completely drain within 30 seconds, check the drain outlet for clogs.

12.2 Cleaning the Return-Air Filter

Check the Return-Air Filter once a month (or more often if local conditions and usage patterns dictate) and replace or clean as necessary. To clean the filter:

- Remove the filter from the unit.
- Rinse the filter with water.
- Let the filter air dry.
- Install the filter back into the unit.

i The filters in this unit may need to be checked more often depending on the operating conditions and the usage patterns.

12.3 Refrigerant Gas

The refrigerant gas used in the air conditioning system is adequate for the life of the system. Routine charging of the system is not necessary.

12.4 Checking the Condenser Coil

A dirty condenser coil reduces the unit’s efficiency. A reduction of efficiency will raise the total system pressure and decrease the unit’s ability to produce cold air. The condenser coil can be flushed using low-pressure water hose if necessary. Use appropriate outside coil cleaner if cleaning the coil using coil cleaner.

With the system turned off at the circuit breaker on the panel:

- Check and clean the condenser coil with coil cleaner.
- Rinse the coil to flush any residual cleaner from the system.
- Restart the system and check operation parameters after a thorough cleaning has taken place. Additional cleaning may be necessary with extreme contamination.

i For the purpose of protecting the environment, dispose of any contaminated cleaning solutions in accordance with federal, state, and/or local regulations.

12.4.1 Routine Cleaning of the Condenser Coils

NOTICE: Harsh chemicals, household bleach, or acid or basic cleaners should **not** be used to clean the outdoor or indoor coils of any kind. These cleaners can be very difficult to rinse out of the coil and can accelerate corrosion at the fin/tube interface where dissimilar materials are in contact. Use an environmentally sound coil cleaner as described above.

NOTICE: Do **not** use an outdoor coil cleaner on an indoor coil. Use of an outdoor coil cleaner could result in unit damage. Choose an appropriate cleaner and follow the manufacturers instructions.

NOTICE: High velocity water from a pressure washer, water hose, or compressed air should **never** be used to clean a coil. The force of the water or air jet will bend the fin edges and increase air side pressure drop.

Periodic cleaning with an environmentally sound coil cleaner is essential to extend the life of the coils. Coil cleaning should be part of the unit's regularly scheduled maintenance procedures to ensure the long life of the coil. Failure to clean the coils may result in reduced performance.

Avoid the use of the following:

- Coil brighteners
- High-pressure washers
- Poor-quality water for cleaning
- Use of non-recommended coil cleaners is strongly discouraged since the coil and unit durability could be affected.

12.5 Checking the Compressor Overload

The compressor overload interrupts power to the compressor when either the current or internal motor winding temperature becomes excessive, and automatically resets when the internal temperature drops to a safe level. This overload may require 60 minutes (or longer) to reset. If the overload is suspected of being open, disconnect the electrical power to the unit and check the circuit through the overload with an ohmmeter or continuity tester.

13 Disposal



Place the packaging material in the appropriate recycling waste bins, whenever possible. Consult a local recycling center or specialist dealer for details about how to dispose of the product in accordance with all applicable national and local regulations.

LIMITED TWO-YEAR WARRANTY

LIMITED TWO-YEAR WARRANTY AVAILABLE AT WWW.DOMETIC.COM/WARRANTY.

IF YOU HAVE QUESTIONS, OR TO OBTAIN A COPY OF THE LIMITED WARRANTY FREE OF CHARGE, CONTACT:

DOMETIC CORPORATION
CUSTOMER SUPPORT CENTER
1120 NORTH MAIN STREET
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