EverFRESH™ Operators Guide

Global Technical Support: 800-668-6283

Refer to T-374 EverFRESH Manual for a complete reference of operation & service procedures.

62-12184 Rev D

EverFRESH™ Description

The EverFRESH™ system can control container atmosphere by supplying nitrogen and fresh air into the contained space and by simultaneously controlling levels of oxygen and carbon dioxide. This extends the produce ripening process, which increases shelf life and enables longer cargo routes for certain perishable commodities.

Starting the Refrigeration Unit

Caution: Check that the unit circuit breaker and start-stop switch are in the OFF (“0”) position before connecting to any electrical power source.

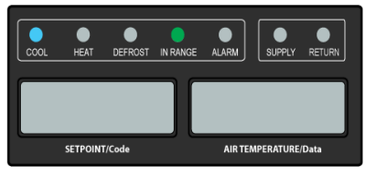
1. Check power source for proper voltage.
2. Connect the refrigeration unit power plug and turn the main power ON.
3. Turn the refrigeration unit circuit breaker ON (“1”).
4. Start the refrigeration unit by turning the start-stop switch (ST) to ON position (“1”).

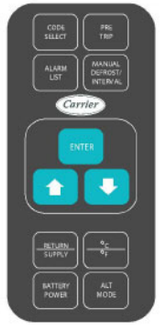
⚠ WARNING

Potential hazardous atmosphere and low oxygen levels exist inside the container. Ventilate before entering. Stay away from doors while venting.

Operation of Keypad / Display

Once the refrigeration unit is operating, EverFRESH operation is available through the system keypad located on the right side of the unit and the display module will show state.





Setup EverFRESH Operation and View CO2 and O2 Setpoints

1. Press the CODE SELECT key on the keypad.
2. Press the Arrow keys until “Cd 71” is in the left display, then press ENTER.

3. Press the Arrow keys to access “FrESh” mode, then press ENTER to access “FrESh” parameters.

4. With “CO2SP” in the left display, use the Arrow keys to select the CO2 setpoint. Then, press ENTER.

5. With “O2 SP” in the left display, use the Arrow keys to select the O2 setpoint. Then, press ENTER.

Other Operation Modes in Cd 71

When “OFF” mode is selected, all EverFRESH operations will be disabled and all EverFRESH alarms will be cleared. When a setpoint less than -1.0°C (30.2°F) is selected on the unit, OFF mode is automatically enabled and the display will show dashes “- - - - -”. The current EverFRESH setting will be saved.

When “PUrGE” mode is active, all EverFRESH operations are suspended while gas levels are pre-charged in the container. All EverFRESH control actions are suspended in order to purge the container to a desired gas concentration.

View EverFRESH CO2 and O2 Values Inside the Container

1. Press the CODE SELECT key on the keypad.
2. Press the Arrow keys until “Cd 44” is in the left display, then press ENTER. Code 44 allows the user to view the CO2 and O2 concentration values.

3. Press the Down Arrow key to toggle between the different values available in this sub menu.

CO2 Setpoint	
CO2 %	
O2 Setpoint	
O2 %	
O2 Voltage (mV)	
Membrane Pressure Transducer (Bar / PSIG)	

CO2 Injection Mode (Cd 76)

CO2 injection mode is only available if the unit is configured with the CO2 injection option and Cd71 has been set to “FrESh” mode.

1. Press the CODE SELECT key on the keypad.
2. Press the Arrow keys until “Cd 76” is in the left display, then press ENTER.

3. Use the Arrow keys to toggle between “On” and “OFF” and press ENTER to confirm the selection.

AL907	Manual Fresh Air Vent Open
Cause	For units equipped with EverFRESH and a Vent Position Sensor (VPS), the controller will monitor the manual fresh air opening at a pre-determined time. If during this time the manual fresh air vent is open and EverFRESH is active, an alarm will be generated. If alarm is active, the controller monitors the manual fresh air once per hour. Upon clearing the alarm, the controller returns to monitoring at the pre-determined time.
Component	Vent Position Sensor (VPS)
Action	Manually reposition the vent to 0% and confirm using Cd45. If Cd45 is not reading 0%, perform a calibration of the panel. If a zero reading cannot be obtained, replace the defective VPS. If the unit is loaded, ensure the vent is closed. Note and replace the VPS on the next PTI. The alarm will not affect the EverFRESH system from operating.

AL909	O2 Sensor Fault
Cause	Triggered anytime the O2 sensor reading is outside of the normal operation range, after an initial signal was detected.
Action	Control CO2 by running the EverFRESH Air Compressor (EAC) and opening the EverFRESH Air Valve (EA). Controlling CO2 via the EA will also prevent low O2 and cargo loss. If both AL909 and AL910 are active, run the EAC and open the EA.
Component	O2 Sensor, O2 Amplifier
Troubleshoot	Check Cd44 and scroll down to 02V. The O2 sensor output will be displayed in millivolts (130mV to 4100mV is good range). Check wiring (refer to schematic), and check for bad connections or wires positioned improperly. If the O2 sensor is available, remove the upper fresh air panel and evaporator motor and replace the sensor. If after replacing the sensor Cd44 reads outside of the normal range and AL909 continues, replace the amplifier. If parts are not available, turn the EverFRESH option off via Cd71 and open the manual fresh air vent.

AL910	CO2 Sensor Fault
Cause	Triggered anytime the CO2 sensor reading is outside of the normal operation range, after an initial signal was detected.
Action	Control O2 to setpoint. Controlling O2 may allow CO2 to increase, replace sensor as soon as possible. If both AL909 and AL910 are active, run the EverFRESH Air Compressor (EAC) and open the EverFRESH Air Valve (EA).
Component	CO2 Sensor
Troubleshoot	Check wiring (refer to schematic), and check for bad connections or wires positioned improperly. Check the voltage on the back of MD connectors pin MD09 (-) and MD03 (+12 VDC) with the controller energized. If 12 VDC is not available, check the controller. If 12 VDC is available, check the back of pin MD02 for a voltage between 1.0 - 4.7 VDC. If not present, replace the sensor. If part is available, remove the upper fresh air panel and evaporator motor and replace the sensor. If no part is available, take no action and service at next PTI.

AL929	Loss of Atmospheric Control
Cause	Triggered whenever the CO2 level is above its setpoint by 2%. Or, when the O2 level is below its setpoint for longer than 30 minutes. The alarm is triggered off when the levels return to within the normal range.
Action	Enable Alarm LED. Open the fresh air vent and verify air compressor is enabled.
Setup	Verify all EverFRESH components are functioning properly by checking for EverFRESH alarms and running a P-20 PreTrip.
Troubleshoot	If a component is not functioning properly, it will fail the appropriate P-20 sub test. Note components in order below.
Component	Membrane Pressure Transducer (MPT)
Troubleshoot	Remove the MPT. Turn on the container unit. Using Cd44, verify the MPT pressure reads between -5 psig and 5 psig. Outside this range, or if AL977 is active, replace the sensor.
Component	EverFRESH Air Compressor (EAC)
Troubleshoot	Verify EAC fuses FEF1, FEF2 & FEF3. Check P20 results for a failure mode: • Possible detected failure with EAC current consumption, check compressor motor windings, and verify voltage on all 3 phases. • MPT failure. Follow steps above. • Failure of AC contactor for EAC. Ohm contactor coil and check resistance across contactor legs, with power removed.
Component	EverFRESH Air Valve (EA)
Troubleshoot	A closed or plugged EA solenoid could prevent fresh air from entering the container. P20-2 tests the valve. Potential failure results: • MPT pressure fails to change when the valve is energized. Check for signs of blockage in the valve or piping. • EA current is not correct. Access function code Cd74 and perform a ML5 self-check to verify the controller is functioning properly. If it passes, perform an ohm check between the CA08 pin and TRX2 (ground) using the carrier service tool (part # 22-50485-00).
Component	Water Drain Valve (WDV)
Troubleshoot	A closed or plugged WDV or filter housing could prevent any air from entering the container. P20-3 tests valve operation. Potential failure results: • MPT pressure fails to change when the valve is energized. Check for signs of blockage by removing the WDV housing and particulate filter housings. Clean any debris. While removed, inspect the WDV and associated piping for blockage. • EA current not correct. Access function code Cd74 and perform an ML5 self-check to verify the controller is functioning properly. If it fails, replace the controller. If it passes self-check, replace the WDV.
Component	EverFRESH Nitrogen Valve (EN)
Troubleshoot	An open or leaky EN valve would allow N2 to go into the sensor sensing chamber, causing an inaccurate reading. P20-5 tests this valve. Potential failure results: • If tests fail, remove the EN and verify the valve is not clogged or damaged. • EA current is not correct. Access function code Cd74 and perform a ML5 self-check to verify the controller is functioning properly. If it fails, replace the controller. If it passes self-check, replace the EN.

AL962	Oxygen (O2) Out of Range
Cause	This is a notification alarm and not a risk to fresh produce, but the benefit of atmosphere control is lost. O2 reaches pulldown limit and then O2 exceeds 5% over setpoint for 30 minutes.
Component	Upper Fresh Air Panel
Troubleshoot	Verify Upper Fresh Air Panel has not been opened.
Component	EverFRESH Air Valve (EA)
Troubleshoot	An EA that is stuck open can allow continuous flow of fresh air into the container when compressor on. Refer to troubleshooting in the AL929 alarm section.
Component	Container Air Tightness
Troubleshoot	Seal container where possible (access panels, rear doors, mounting hardware, etc).

AL976	Air Compressor Internal Protector Open
Cause	EverFRESH Air Compressor (EAC) internal protector open.
Component	EverFRESH Air Compressor (EAC)
Troubleshoot	Follow steps defined in AL929 EAC testing.
Component	ML5 Controller
Troubleshoot	Perform an ML5 self-diagnostic test via function code Cd74.

AL977	Membrane Pressure Transducer (MPT) Fault
Cause	When the EverFRESH Air Compressor (EAC) is running and pressure not between -5 and 200 psig or the EAC has been OFF for five minutes and pressure not between -5 and 5 psig.
Component	Membrane Pressure Transducer (MPT)
Troubleshoot	With the EverFRESH system off for 15 minutes, bring up function code Cd44 and scroll to "EF Pt". Verify that the value is between -5 psig and 5 psig. A "- - - - " value indicates a failed sensor or harness. Pressure outside of range indicates a bad sensor, replace if bad.
Component	ML5 Controller
Troubleshoot	Perform an ML5 self-diagnostic test via function code Cd74.

AL978	Air Compressor Pressure Low
Cause	EverFRESH Air Compressor (EAC) engaged and Fresh Air Vent (FAV) and Water Drain Valve (WDV) are closed and compressor has been running for longer than 20 seconds and Membrane Pressure Transducer (MPT) Pressure < 75 psig.
Component	Membrane Pressure Transducer (MPT)
Troubleshoot	With the EverFRESH system off for 15 minutes, bring up function code Cd44 and scroll to "EF Pt". Verify the value is between -5 and 5 psig. A "- - - - " value indicates a failed sensor or harness. Pressure outside of range indicates a bad sensor, replace if bad.
Component	System Plumbing
Troubleshoot	Inspect plumbing, hoses, fittings, check valve, and orifices for signs of leakage. Repair as required. With the compressor running, spray the pressure relief valve with soapy water. Replace if leaking. If a spare pressure relief valve not available, try to open and close the valve with an O-Ring on the valve to try and re-seat.

AL979	Air Compressor Pressure High
Cause	EverFRESH Air Compressor (EAC) engaged and pressure > 135 psig.
Component	Membrane Pressure Transducer (MPT)
Troubleshoot	With the EverFRESH system off for 15 minutes, bring up function code Cd44 and scroll to "EF Pt". Verify that the value is between -5 psig and 5 psig. A "- - - - " value indicates a failed sensor or harness. Pressure outside of range indicates a bad sensor, replace if bad.

AL979	Air Compressor Pressure High (continued)
Component	System Plumbing
Troubleshoot	Inspect plumbing, hoses, fittings, check valve, and orifices for signs of leakage. Repair as required.

AL980	EverFRESH Air Valve (EA) Fault
Cause	When the system energizes the EverFRESH Air Valve (EA) solenoid and membrane pressure does not drop 40 psi, the alarm is triggered. The alarm triggers OFF when membrane pressure transducer (MPT) pressure drop is more than 40 psi when EA is opened .
Component	EverFRESH Air Valve (EA) Solenoid
Troubleshoot	Run a P20 test to verify mechanical and electrical performance of the solenoid. If the electrical test fails, replace the valve. If the mechanical test fails, check for obstructions blocking system flow. Remove obstructions. If it still fails, replace the valve.
Component	ML5 Controller
Troubleshoot	Perform an ML5 self-diagnostic test via function code Cd74.

AL981	Water Drain Valve (WDV) Fault
Cause	When the system energizes the Water Drain Valve (WDV) and membrane pressure does not drop 40 psi, the alarm is triggered. The alarm triggers OFF when membrane pressure transducer (MPT) pressure drop is more than 40 psi when the EverFRESH Air Valve (EA) is opened.
Component	Water Drain Valve (WDV)
Troubleshoot	Inspect WDV bowl and outlet piping for obstructions, clean components. Run P20 test to verify mechanical and electrical performance of solenoid. If the electrical test fails, replace the valve. If the mechanical test fails, check for obstructions blocking system flow. Remove obstructions. If valve fails, replace it.
Component	ML5 Controller
Troubleshoot	Perform an ML5 self-diagnostic test via function code Cd74.

AL982	CO2 Injection Fault
Cause	If unit is configured with CO2 injection option, this alarm is triggered when Cd71 is set to “On” to enable CO2 injection and CO2 is less than the CO2 setpoint by 0.5% and IPT < 20 psig.
Component	CO2 supply
Troubleshoot	Verify CO2 supply is available and supplied at recommended pressure.
Component	CO2 Injection Port Schrader Valve
Troubleshoot	If proper pressure is available at the CO2 injection supply port, verify that the Schrader valve is being depressed by the supply hose properly to allow flow.
Component	CO2 Injection Solenoid
Troubleshoot	Run a P20 test to evaluate the solenoid and replace if test fails.

AL983	CO2 Injection Pressure Transducer Fault
Cause	If unit is configured with CO2 injection option, this alarm is triggered when Cd71 is set to “On” to enable CO2 injection and the volts are not in the range of 0.5 to 4.95 VDC.
Component	CO2 Injection Pressure Transducer (IPT)
Troubleshoot	From function code Cd74, run a controller self-diagnostic test. Evaluate results to see if there is a controller or transducer issue. If there is a sensor issue, or the test passes, change the transducer .