

Q7. How do I adjust the Economizer for minimum damper settings?

Older Hardware

There are two methods to set the Minimum Damper setting for the Economizer:

- A** By setting the appropriate ECTO and potentiometer settings:
 - Set 0.09 ECTO for Minimum Blower Low
 - Adjust the potentiometer (MIN POS SET) for Minimum Blower High
- B** By setting the appropriate settings though the Damper menu as described in question Q6.

NOTE - For units with a single speed blower, set only the HIGH speed minimum position.

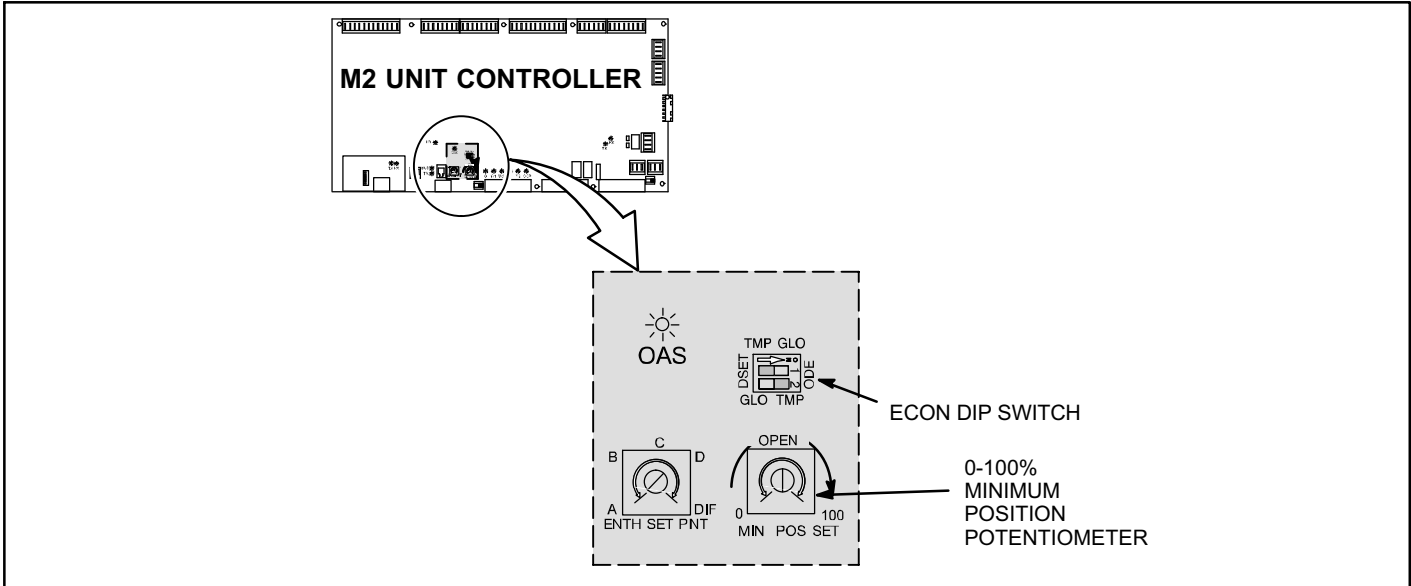


Figure 6. Older Economizer controls

Newer Hardware

The newer M2 hardware minimum damper settings are changed using the Prodigy® controller’s user interface. Follow the flowchart in figure 7 to access the minimum damper settings.

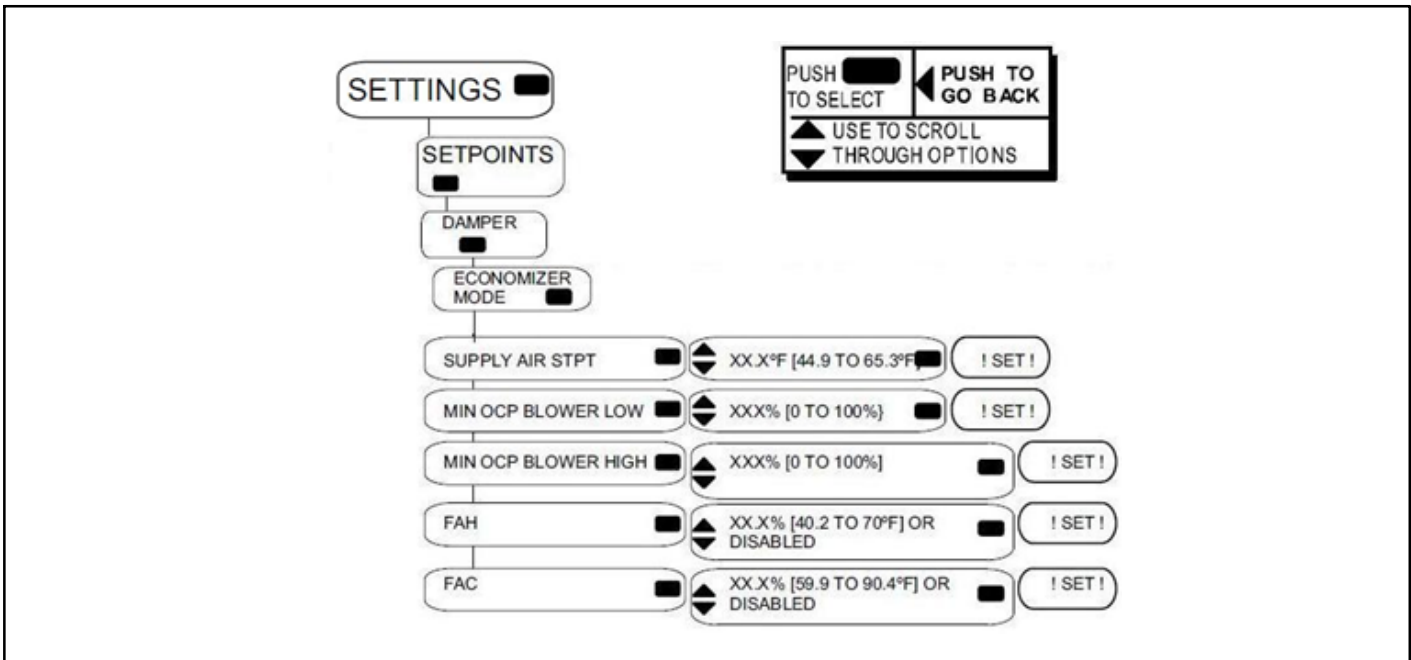


Figure 7. New M2 Hardware Economizer minimum damper settings flowchart

Economizer (Damper)

General

The economizer, when configured, controls

- damper position, which determines how much outdoor air is used to meet free cooling or indoor air quality (IAQ) requirements, and
- the optional power exhaust fans.

On a cooling demand, outdoor air is used for free cooling instead of first-stage compressor(s) when outdoor air is suitable (OAS).

Outdoor Air Suitable (OAS) LED (Early M2 hardware)

A yellow LED which is labeled OAS provides economizer status. A steady yellow LED indicates that outdoor air is suitable for free cooling. A flashing yellow OAS light indicates the IAQ sensor requires outdoor air. (A flashing yellow LED can also mean that the economizer dampers are open to bring in fresh air while a compressor is on.) If the economizer is already operating, a flashing yellow OAS light indicates the IAQ sensor requires more outdoor air than is suitable for free cooling.

DIP Switch Settings (Early M2 hardware)

The DIP switch setting determines the mode used to enable free cooling. The DIP switch also has a mode to set the damper minimum position and test damper operation. DIP switch is factory-set when the economizer is factory-configured.

Free Cooling Discharge Air Setpoint

When outdoor air conditions are suitable and economizer is set to provide free cooling, dampers will modulate to achieve a discharge air temperature of 55°F (13°C) default. This setpoint is adjustable between 45° and 65°F.

The setpoint can also be automatically increased when outdoor or return air temperatures drop. See Outdoor Air Reset and Return Air Reset in the Discharge Air Control section in the *Prodigy Application Guide (Advanced Features)* manual. These settings must be enabled and adjusted using the Prodigy CONTROL/ECTO menu to make changes to ECTO values. Refer to the Prodigy Application Guide. The unit does not have to be operating in discharge air cooling mode to adjust the free cooling discharge air setpoint, or to use setpoint reset.

During free cooling operation, the damper modulates to maintain a discharge air temperature equal to the free cooling discharge air setpoint. If the damper has been continuously at its maximum open position for at least three minutes, then a second stage cooling demand will be allowed to turn on the first stage of mechanical cooling. While the mechanical cooling is on, the damper is held to its maximum position, and does not modulate until the second stage demand is satisfied. On a third stage cooling demand, the second stage of mechanical cooling will be turned on.

Outdoor Air Suitability

There are five modes which can be used to determine if the outdoor conditions will enable free cooling.

- Old hardware: DIP switch is set to ODE (Outdoor Enthalpy), and the Enthalpy Setpoint potentiometer is set A-through-D.
- New hardware: Configuration is set to Single Enthalpy Economizer Control and ECTO 6.26 setpoint value is set to between 12 and 19mA, 150 to 240 counts.

Enthalpy Setpoint

This setting pertains to the ODE free cooling mode only. The M2 will enable free cooling when outdoor air enthalpy (A7) is less than the enthalpy setpoint. Table 2 shows the approximate enthalpy setpoints for each potentiometer setting at 50% relative humidity. The ECTO 6.26 column is the correlating values used in the new hardware.

Example:—At setting “A”, the enthalpy control will modulate dampers open when outdoor air is at 73°F and 50% relative humidity. If space temperatures are too warm, rotate the potentiometer to “B” (old hardware) or enter a count of 173 (ECTO 6.26 if new hardware). The enthalpy control will now modulate dampers open when outdoor air is 70°F and 50% relative humidity.

NOTE - When in outdoor enthalpy mode, a value between 130-240 counts is entered. When in differential enthalpy mode a 2mA (or 26 count) difference between outdoor and indoor enthalpy corresponds to about a 3.5°F difference in temperature at constant relative humidity (or about a 12%RH difference at constant temperature). When in differential enthalpy mode, a value between 0-75 counts is entered.

Table 2. Enthalpy Control Setpoints

The recommended enthalpy setpoint is “A”. If the economizer is allowing air which is too warm or too humid to enter the system, the enthalpy control may be changed to a lower setting (B, C, or D).	Control Setting	Enthalpy Control Setpoint At 50% Relative Humidity Approximate Degrees F (C)	ECTO 6.26 cnt (mA)
	A	73 (23)	150 (11.8)
	B	70 (21)	173 (13.6)
	C	67 (19)	199 (15.5)
	D	63 (17)	224 (17.6)

Economizer (Damper) (Continued)

There are six options available to determine outdoor air suitability (OAS) for free cooling. See table 3. Economizer settings are shown for each mode in figure 6.

The appropriate sensors are provided when the economizer is factory-configured. When the economizer is field-configured, the ODE mode requires additional field-provided sensor(s). See table 3. The TEMP mode uses sensors provided with all units.

Table 3. Free Cooling Options

Free cooling mode	DIP SW positions	MODE Selection	CONTROL Selection	OAS Setpoint Calculation
	Older M2 Hardware	Newer M2 Hardware		
Temperature offset	1,2 to TMP	TEMP	OFFSET	OAT<RAT-OFFSET (0 to 40 F)
Temperature setpoint	1,2 to TMP	TEMP	OAT STPT	OAT<OAT STPT (41 to 70 F)
Remote	1,2 to TMP	TEMP	ANY	OAS sent by network.
Enthalpy differential (Potentiometer set to DIFF) for old hardware, or ECTO 6.26 = 0 to 75 counts for OFFSET in new hardware. Old hardware does not use an OFFSET.	1,2 to ODE	ENTH	N/A	ODE<IDE (old hardware) or ODE < IDE - OFFSET (new hardware)
Enthalpy setpoint (Potentiometer set to A-D) for old hardware, or ECTO 6.26 = 130 to 240 counts for new hardware.	1,2 to ODE	ENTH	N/A	ODE<POT (old hardware) or ODE < ECTO 6.26 (new hardware)
Global input	1,2 to GLO	GLOBAL	N/A	GLO input
Mode	Outdoor air is suitable for free cooling when:			
TEMP OFFSET	Outdoor air temperature (RT17) is less than return air temperature (RT16) by at least the OFFSET value.			
TEMP OAT STPT	Outdoor air temperature (RT17) is less than the OAT STPT value.			
Remote	Either of the TEMP modes can be used when a network OAS signal is provided by an energy management or building control system, via BACnet, LonTalk, or L Connection. The network can command OAS, NOT OAS, or AUTO. AUTO returns to local control of OAS, which is the selected TEMP mode..			
ENTH (differential)	Outdoor air enthalpy* (A7) is less than return air enthalpy (A62) by at least the OFFSET value. (There is no OFFSET value in old hardware.)			
ENTH (setpoint)	Outdoor air enthalpy (A7) is less than enthalpy setpoint potentiometer position A, B, C, or D (for old hardware), or less than ECTO 6.26 STPT value (new hardware).			
GLOBAL	Global input is energized by (P297-9). This setting is also used for outdoor air damper applications. Global input also brings on the blower. (This mode is NOT used when OAS signal is provided via network connection. GLO is only used when a 24VAC signal is used to energize the P297-9 GLO input.)			
Enthalpy includes effects of both temperature and humidity.				

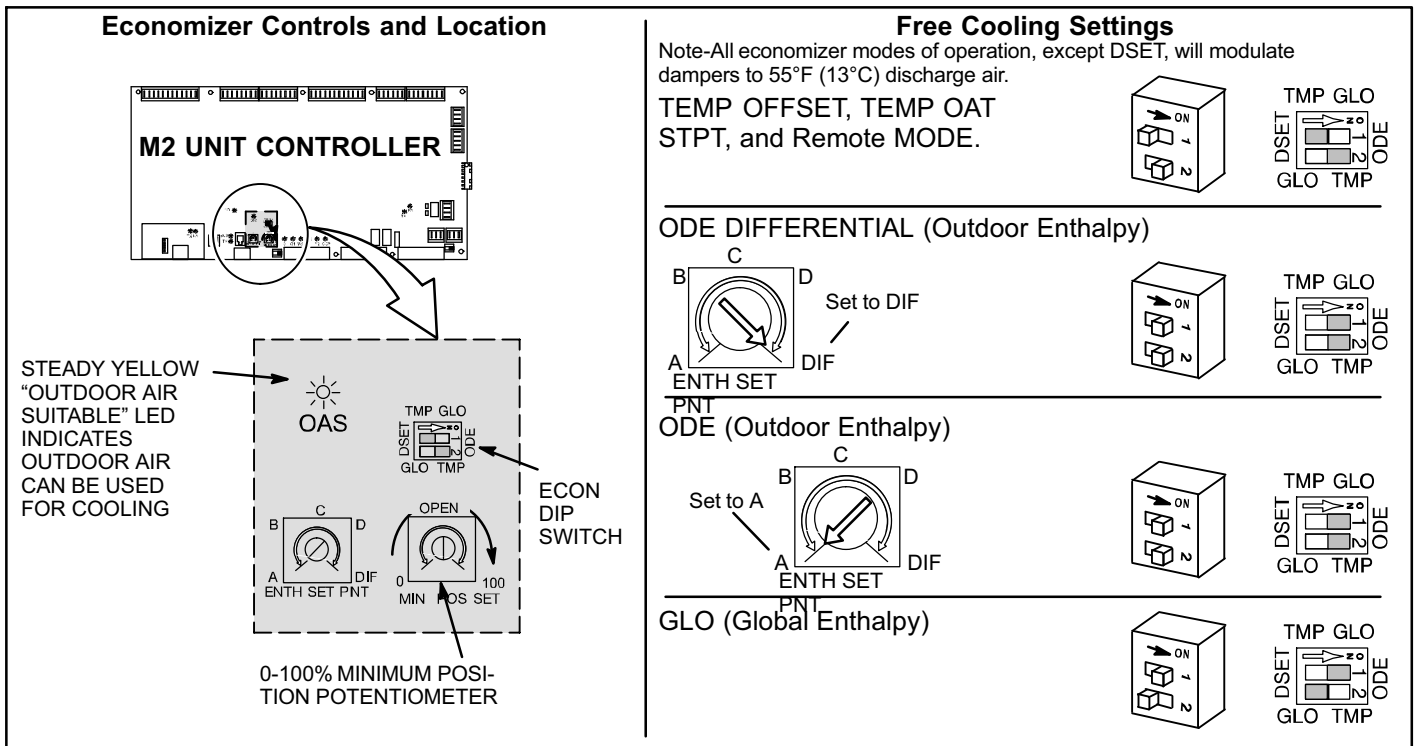


Figure 8. Economizer controls and free cooling settings (Early M2 Hardware)

Q8. What are error codes 74 and 93 and how do I resolve them?

First, determine if this unit should be in zone sensor mode or not, by determining the type of control system being used. If control is not setup in zone sensor mode: Simply changing the unit back to thermostat mode will solve both error codes. If control is setup in zone sensor mode: There are two basic possibilities.

- A No zone sensor input. Go to the data menu and see if there is an A2 sensor reading. If not, the 93 is there as an affect of the code 74 and the answer is to check zone sensor and wiring.
- B Loss of communication with network controller. If there is a zone temp reading, troubleshoot the communication issue. Check for proper address, communication wire connections, and polarity, and for proper system mode setting at ECTO 6.01.

Q9. What is the Error Code 114 and why am I seeing it?

Please see Service Flash CU-10-2 for an in depth look into error 114. The other fix is the replacement of the M2 board and display. If the CU-10-2 Service Flash cannot be found, please contact a Lennox Service Representative.

Q10. How do I make my Unit Controller software work with Windows 7 and Windows 8?

A: Additional steps when installing UC Software with Windows 7 or Windows 8.

1. Click **Start**
2. Click **Computer**
3. Double Click Local Disk C:
4. Double Click Program Files (x86)
5. Right Click L-Connection
6. Click Copy
7. Click the BACK arrow at the top of the screen
8. Right Click Program Files and click Paste

This will copy L-Connection from Program Files (x86) to Program Files. Close everything out and click on the L-Connection icon again and the program should work. If it does not, un-install and reinstall your UC and NCP software again and repeat the procedures outlined above.