



Ecomaster Basic AC user manual

Reference: MH-086



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Category: Manual

| Document privacy. | | |
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| Revision control | | | |
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1. Functional description

1.1. Keyboard and control lights (LEDs)



(3) Air conditioning ON/OFF



(4) Evaporator fans speed (low/high)



(5) Flaps positioning (open or closed)



(1) Decrease the temperature selected



(2) Increase the temperature selected.



(6) Control light No.6. LEDs bar. Indicates temperature selected, current interior temperature and ice temperature. Inside the diagnostic mode indicates the number of the errors detected



(7) Control light No 7. Compressor status. Red ON / Green OFF



(8) Control light No 8. Fan speed. Green -> Low speed / Red -> High speed. If there is no light, the fans are off



(9) Control light No 9. Flaps status. Red -> Indoor air / Green -> Outdoor air

1.2. Forced ventilation.

To activate the forced air fan press the key  (4). When pressed once the evaporator fans will start up at low speed. Pressing a second time will change the speed to high; pressing a third time will stop the fans.

When the fans are at low speed led No.8 located next to the key will light up in green; the light will turn red if light speed is selected.

Note: fans may not start if the vehicle engine is stopped or if the alternator is not charging.

During fan operation the status of recirculation flaps can be selected by using the key  (5). Each time the key is pressed the position of the flaps changes from allowing the entry of outside air to the recirculation position.

When the flaps are in recirculation mode, led No.9 located beside the key will light up in red. If fresh air is entering from outside, the led will light up in green.

1.3. Air conditioning.

To Start up the air conditioning simply press the  (3) after starting the engine. If the engine is not running or there is a low battery level, then the air conditioning will not start when the key  (3) is pressed.

When first started led No.6 in the led bar Hill Light up indicating that the temperature selected is 22°C. To turn off the air conditioning simply press the key  (3), again, turning off all the led lights in the bar.

When the air conditioning is started the flaps will automatically move to the recirculation position; this position can be changed by pressing the key  (5).

If the control node loses +30 V signal, It shall recover standard configuration (AC y 22°C) unless whether a temperature restriction exists. In this case, the control node keeps the limits selected

If the control node loses engine signal but the time without signal is lower than 30 minutes, the control node remembers the last configuration selected

If the control node is manually shut down manually, it will be disconnected until the driver turn on manually or loses +30 V signal. In this case, the control node recover the standard configuration (AC y 22°C)

If the Ecomaster Basic is manually shut down by pressing the key  (5), and then started up again by pressing the same key, the control will begin to work at the temperature of 22°C .

1.4. Temperature selected.

Upon activating the air conditioning a series of led lights in a bar will light up, indicating the temperature selected.

The greater the number of led lights lit up, the higher the level of cold desired, and therefore the lower the temperature selected; or conversely, the lower number of lights that are lit the higher the temperature selected.

To select a lower temperature, i.e. colder temperatures, press the key  (1). Each time you press the key  (1) another light in the led bar will light up.

To select a higher, or less cold, temperature, press the key  (2). Each time you press the key  (2) a light in the led bar will turn off.

The temperature selected corresponding to the number of led lights lit up as shown in the figure.

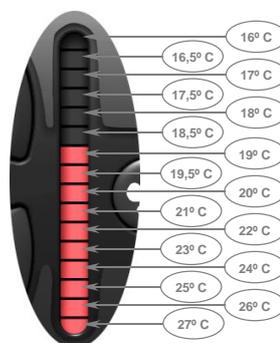


Figure 1: Temperature scale

1.5. Inner temperature

While the air conditioning is functioning the control will indicate interior temperature with a blinking led light as shown in the table above (if the thirteenth led from the top blinks, this indicates that the temperature is 24°C; if the seventh light blinks then the temperature is 19°C, etc.).

If the temperature is above 27°C the bottom led will blink; if the temperature is below 16°C the upper led will blink. If no led is blinking, this means there is an error in the interior temperature sensor.

1.6. Compressor operation

When the compressor is activated the led next to the key  (3) will light up. The led will blink if the control activates the compressor output but detects that there is no return from the pressure switches due to disconnection of the compressor as a result of high or low pressure.



Note: There is a delay of 20 seconds between the time the compressor led lights up and activation of the compressor.

1.7. Ice protection. Ice temperatura display

If the system installed includes an ice sensor in the evaporator, the temperature measured by this sensor can be visualized by simultaneously pressing the  (2) and  (1) the keys for 5 seconds, after the air conditioner has been turned on..

The temperature registered by the de-icer will be shown for 20 seconds, with the LED blinking in the bar as seen in the figure above.

If the temperature is over 11°C, the lower LED will blink; if the temperature is below 0°C the upper LED will blink. Failure of any of the LED to blink means there is a fault in the de-icer gauge.

To protect against ice, the compressor will stop if the temperature measured is below 3°C.

1.8. Temperature restriction

Temperatures allowed to be selected are from 16 (upper position) to 27 (lower position) degrees (see figure below in order to obtain more information)

It's possible to set a maximum value lower than 27 or a minimum value higher than 16. If the minimum value and maximum value are the same, the system always works at the same temperature. The driver cannot change it.



In order to set the new limits, see the procedure below:

- Verify that Ecomaster Basic has voltage and It is off. In this position, flaps light must be the only LED on.
- Press   buttons during 5 sec at the same time. After, press  buttons during 5 secs until the led bar light completely
- Each press of  key increase the lower limit. Each press of  key decrease the upper limit
- If you want to set a lower limit lower than the current limit, press  until set the desired limit
- If you want to set an upper limit higher than the current limit, press  until set the desired limit
- In order to leave temperature restriction mode, press t   keys during almost 5 secs

1.9. Software version

Press  y  keys during 5 secs. One LED light from the bar will light during 20 sec in order to show the software version (Number starts from the bottom)

For example, if the software version is 3.0, the third LED light from the bar will light



If software versión is a BETA versión, for example 4.00C, the first led of led bar (begining from above) will blink:



2. Detection of errors

Every time the air conditioner is activated by pressing the  (3) button, the control will perform a diagnostic to detect errors or faults. If the control detects any of the following errors then one or various LEDs will blink, as shown in the following table:



| Led blinking | Description |
|--------------|--|
| 1 | Error in the temperature gauge |
| 2 | Error in de-icer gauge |
| 3 | Short circuit in the compressor output |
| 4 | Short circuit in the evaporator fan output at low speed |
| 5 | Short circuit in the evaporator fan output at high speed |
| 6 | Short circuit in the re-circulation flaps outputs |

() If the control node detects a short circuit or lack of charge (fan non controlled by PWM), errors 7 and 8 must not be shown at the initial check, but it must be shown only in diagnosis mode*

The following warnings may also appear when errors are indicated:

| Led blinking | Description |
|--------------|--|
| 9 | No return to the pressure switches |
| 10 | Low battery |
| 11 | No signal to the alternator (engine off) |
| 12 | Internal error 1 |
| 13 | Internal error 2 |
| 14 | Internal error 3 |
| 15 | Short circuit to GND in the evaporator fan PWM |
| 16 | Short circuit to GND in the condenser fan PWM |

In case of GND error detection, the transistor must not shutdown

By simultaneously pressing the  (3) and  (5) for 5 seconds at any time, the control will check and indicate any errors or warnings.

Errors will be visualized for 20 seconds or until the  (3) and  (5) keys are simultaneously pressed for 5 seconds.

| | | | | |
|----|------|------------------------|-----|-----|
| 11 | TR1- | Re-circulation flaps - | +30 | 1 A |
| 12 | TR1+ | Re-circulation flaps + | +30 | 1 A |

3. Anexo I: Ecomaster Basic Double Deck buses – Use of two Ecomaster Basic controllers

3.1. Identifying the floor operated by the control

When we control the AC in a double deck bus using two Ecomaster Basic controls, we should first identify what is the controller operating each floor. In different chassis and bus models, the position of the controllers may be different.

Next steps are to be followed:

1. Switch both controllers OFF by pushing the compressor key. All the leds but the fresh air one will remain OFF.
2. Push the compressor key in any of the controllers. The evaporator motors of the deck that controller is operating will start running.
3. The other controller operates the other floor.

3.2. Identifying the master-slave control

One of the controls operates the compressor and will be called as MASTER. The other one will be called SLAVE. The SLAVE control will only cool its floor, if the MASTER control is asking for cold/compressor on its own floor.

To identify the MASTER-SLAVE control:

1. Switch both controllers OFF by pushing the compressor key. All the leds but the fresh air one will remain OFF.
2. Push the compressor key in any of the controllers.
3. Ask for Cool Max by pushing the  key till all the leds in the led bar are ON:



NOTE: the SET temperature must be 2 C above the interior temperature for the compressor to engage.

4. After 30 seconds:
 - If the compressor led is ON that control is the MASTER one.
 - If the compressor led blinks, that control is the SLAVE one.



3.3. System operating

Once identified what control operates each floor along with its authority (MASTER-SLAVE), next indications are to be followed:

1. The MASTER control is the one which activates de compressor.
2. In case the MASTER control is not asking for compressor (because it has either reached the SET temperature or because it is switch OFF), the floor operated by the SLAVE control will not cool. In this situation, the compressor led of the MASTER control will be OFF and the compressor led of the SLAVE control will be blinking.
3. It is suggested that the SET temperature in the MASTER control to be lower (more leds in the leds bar ON) than the SET temperature in the SLAVE control.

