



Ecomaster Comfort user manual

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1. Functional description

The fascia of the Ecomaster Comfort has three distinct control areas:



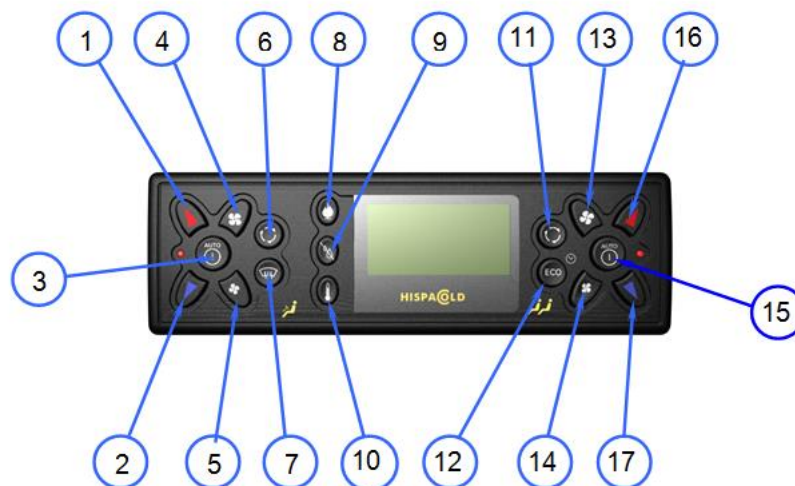
Driver Climatization Unit functions

Shared functions

Passenger Climatization Unit functions

When reference is made to climatization functions for the driver unit, the keypad is the one on this side and similarly for the passenger unit.

In the central part of the control panel is a display screen which informs the driver about its operation.



Normally the Ecomaster Comfort operates in automatic mode, that is, the climatizer itself selects the air speed, the position of the flaps and the functioning of the rest of the components of the climatization so that its functioning is optimum.

In these operating conditions, the automatic screen will be displayed indicating the outside temperature and the image of a bus with the selected temperatures for driver and passenger systems. In addition, the two LEDs located next to the keys (3),(15) will light up indicating automatic operation.



Automatic screen

Nevertheless, the driver can decide to change the operation of any of the system's components at any time.

Each time the speed of the fans or the driver or passenger unit flaps are changed manually or the ECO, re-heat or pre-heater functions are pressed, the manual screen will appear showing the symbols of the components which are functioning in manual mode.



Manual screen.

1.1. Switching the driver climatization unit on and off.

The controls come on automatically as soon as the vehicle is started up. At this point a check is made of all the systems and the following message is displayed on the screen:




Initial check screen.


Immediately after making this check, the automatic operation screen will be displayed, with the temperatures saved the last time the climate unit was switched off.



Automatic screen.

If the check detects an error, the error screen will be displayed (see section: Detection and Indication of Errors).

It is possible to switch on the climatization system by pressing the  (3) key, even though the engine is stopped, providing the ignition switch is on. Since in this situation the battery is not charging, only the driver's heater and ventilation will operate with the minimum fan speed.

You can switch off the driver climate unit manually by holding down the  (3) key for 2 seconds. It will be indicated on the following screen.



Driver climate unit off screen.

1.2. Selecting the driver unit temperature.

To select the desired temperature for the driver unit, press the  (2) or  (1) keys.


If the passenger climatization unit is on, the selected temperature for the driver unit can be between +3° C (5° F) and -3° C (5° F) of that selected for the passengers' area. This means, if the selected passengers' area temperature is 22° C (72° F), the driver can choose between 19° and 25° C (66° and 77° F).

If the passenger climatization unit is off, the above limit does not apply and the driver can select any temperature between 17° C (63° F) and 27° C (82° F).

The upper limit for the driver temperature is HI and in this position the heating will operate at maximum power continuously. The lower limit is LO and in this case the air conditioning will operate at maximum power continuously.

1.3. Selecting the driver unit's fan speed.

To adjust the fan speed of the driver unit, press the  (4) and  (5) keys.

The driver unit fan speed can be selected between 5 levels. If you adjust the automatic speed setting selected by the Ecomaster Comfort, the new speed selected will be displayed on the screen and the red LED next to the  (3) key will go off.

The selected speed can range from 1 to 5, with the following limitations:

If the engine is not running, only speed 1 is possible.

- If the driver node is in A/C mode with the compressor on, the speed will never be lower than 3 to prevent the evaporator freezing.
- If the driver climate unit is off and the passenger climatization unit needs the compressor to switch on, the driver's fans will come on at speed 2 to prevent the evaporator freezing.


- If it is set to Soft demist, the system will fix speed 3 and this speed can't be manually changed. In the same way, if Hard demist is selected, the system will fix speed 5 and this speed can't be manually changed.
- If it is set to LSD (Long Soft Demist), speed can be manually changed between speed 3 and speed 5.

When the speed of the fans of the driver climate unit is adjusted manually, the Manual screen will be displayed.

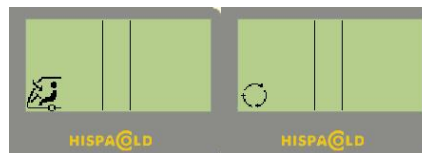


Manual screen (driver's fan).

1.4. Adjusting the driver unit air recirculation flaps.

If the driver node is set to climatization, the positions of the recirculation flaps can be adjusted using the driver unit key  (6). You can select either air from outside (renewal) or inside (recycling).


When the recirculation flaps are adjusted manually, the following display will appear on the screen:



Manual screen outside air Manual screen inside air.

Under certain conditions the system will not allow manual change of the flaps position, as it is the case when Demist function is working.

1.5. Adjusting the position of the driver unit floor/windscreen flaps.

If the driver node is set to climatization, the position of the floor/windscreen flaps can be adjusted using the  (7) key.

When the position of the floor/windscreen vents is adjusted manually, the following display will appear on the screen:




Air to driver's feet


Air to screen.

Air to feet and screen

Under certain conditions the system will not allow manual change of the flaps position, as it is the case when Demist function is working. If Demist is ON, the flap will be in Windshield position and it can't be manually modified.

1.6. Setting the driver climate unit to automatic.

If the position of the driver unit recirculation flaps, floor/windscreen flaps, or the speed of the defroster are adjusted manually, or if the pre-heater, defroster or ECO mode are manually switched on, the driver climate unit changes to manual mode, and the LED located next to the  (3) key goes off.


By pressing driver unit key  (3) all the driver unit controls are switched back to automatic and, if the passenger node is also set to automatic, the automatic screen appears as shown below.




Automatic screen.

1.7. Switching the passenger climatization unit on and off.

The system remembers the state before the last vehicle shut down. When starting again, the system will fix the SET before to that last disconnection.

It is possible to switch on the climatization system by pressing key  (15) even though the engine is stopped, providing the ignition is on. Since in this situation the battery is not charging, in order to prevent it going flat, it will not be possible to switch on the fan and you will only be able to have heating with the convector system.

The passenger node can be switched off manually by holding down key  (15) for 2 seconds. In this case, the part of the screen corresponding to the passenger unit will remain blank.



Screen with passenger climatization off

1.8. Adjusting the passenger unit selected temperature.

To adjust the desired temperature in the passengers' area, press keys  (16) and  (17).

The selected temperature can be between 17°C (63°F) and 27°C (82°F).

The upper passenger unit temperature limit is HI and in this position the heating will operate at maximum power continuously. The lower limit is LO and in this case the air conditioning will operate at maximum power continuously.

1.9. Adjusting the speed of the passenger unit evaporator fans.

To adjust the speed of the evaporator fans, press passenger unit keys  (13) and  (14).

The selected speed can range from 1 to 5, with the following limitations:


- If the engine is not running, no speed can be switched on.
- If only the driver climatization unit is on and the compressor is switched on, speed 2 will automatically be switched on in the passenger unit.
- If the system is in any of the Demist modes (Soft or Hard), only speed 2 is possible, and that speed can't be manually changed.
- If the compressor is operating the speed cannot be lower than 3.


When the speed of the evaporator fans is adjusted manually, the Manual screen will be displayed.



Manual screen (evaporator fans).

1.10. Adjusting the position of the passenger unit air recirculation flaps.

If the passengers' climatization is on, the position of recirculation flaps can be adjusted using passenger unit key  (11). The flaps will alternate between the positions for outside air (Renewal) and inside air (Recirculation), with the following limitations:

If you have pressed key  (9), the recirculation flaps will be set to outside air. If the vehicle does not have roof heating installed, the flaps will be in the inside air (recirculation) position if the temperature inside is more than two degrees below the selected level. If the inside temperature does not exceed the selected temperature minus 2°C for more than 4 minutes, the flaps will automatically reset to the recirculation position. When you adjust the position of the recirculation flaps manually the manual screen will be displayed.



Passenger outside air screen.

Passenger inside air screen.

1.11. Setting the passenger climatization unit to automatic.

If the position of the passenger unit recirculation flaps or the speed of the evaporator fans are adjusted manually, or if the pre-heater, defroster or ECO mode are selected manually, the passenger climatization will switch to manual and the LED located next to key (15) will go off.

By pressing passenger key (15) all the settings return to automatic and, if the driver node is also set to automatic, the automatic screen is displayed indicating the outside temperature and the one selected for the driver's area and that of the passengers.

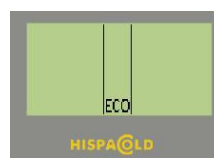


Automatic operation screen.

1.12. ECO Option

The ECO option allows the driver to switch off the compressor of the air-conditioning unit in atmospheric conditions in which its use is not regarded as necessary. While the ECO option is on it is not possible to switch on the compressor.

- To switch on the ECO option, press the ECO (12) key.
- This option is switched off by re-pressing the ECO (12) key or pressing the driver or passenger unit keys (3),(15).
- If you press the defrost key (9) while the ECO option is on, it will be switched off. When you select the ECO option, the following Manual screen will be displayed.



ECO Manual screen

1.13. Programming the clock.








At any time, if you press down key  (12) for 2 seconds, the screen changes to the clock programming function.

Here the screen will appear as shown below, allowing the setting of the day of the week, hour and minutes.



Day/time programming screen.

With the driver unit  (1) and  (2) keys, we can select the day, the hour or the minutes which will appear on the screen against a dark background, while the passenger keys  (16) and  (17) allow us to adjust the settings of the chosen field.


Confirmation of the time programmed is given by pressing key  (12). Once the time has been validated in this way the screen will return to the previous display.

1.14. Pre-heater.

The pre-heater offers two operating modes: programmed or normal mode.



1.14.1. Programmed mode.


The pre-heater can be programmed to come on twice in days and time. Each of the programmes sets the day and time when we want the bus to be warm (the controls calculate what time the pre-heater needs to come on in order to do so).

To enter programming, press the  (8) key for 2 seconds, and you will enter the screen for the first program. If you press for another 2 seconds, you will enter the screen for the second program. Each of these screens has a flame symbol with a number which indicates if it is program 1 or 2.





Pre-heater program screen

Use the driver unit  (1) and  (2) keys to move between the fields of day, hour, minutes and Activation. The selected field will be highlighted in bold as shown in the drawing.

With passengers' keys  (16) and  (17) you can adjust the settings of the selected field.

You can program any day from **Monday** to **Sunday** or **7 days** (for all the days of the week).

The programs for a single day are erased once completed (they are set to **OFF**). Those for **7 days** remain at AUTO for the following day.

Once the day and time have been set, the program has to be activated. To do this you have to place the cursor over the “Activate” field and adjust it from **OFF** to **AUTO** by using passenger keys  (16) and  (17).

If you want to switch off a program, you simply go into the programmed pre-heater mode and change the “Activate” field from **AUTO** to **OFF**.

The pre-heater program always operates as long as we are not in diagnostic mode.

The programmed pre-heater indication will appear on the screen when the batteries are switched off. On the screen a hollow flame symbol appears with the number 1 (program 1) and/or a hollow flame with number 2 (program 2).



Pre-heater programmed screen.

If the pre-heater is operating because one of the programs switches it on, the flame of the corresponding symbol is shown filled in.



Pre-heater screen operating in programmed mode.

NOTE: *The pre-heater will not come on if the outside temperature is above 15°C.*

1.14.2. Normal mode.

In normal mode, the pre-heater either operates automatically as a support for the heating system or else manually during a time determined by the user.

If you press key (8) for a short time you enter the pre-heater screen. In this screen, the flame symbol indicates if it is operating (flame filled in), whether in normal or programmed mode, or if it is switched off (hollow flame). If it is working in normal mode, a counter will appear with the operating time remaining.

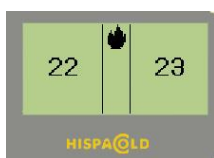


Pre-heater Activation screen.

Using the driver's keys (1) and (2) you select the operating mode of the pre-heater (AUTO, ON or OFF). For the ON option, you can select a time for the heater to come on using passenger keys (16) and (17).

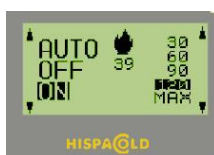
Mode	Description
AUTO	The pre-heater comes on if it is necessary and the outside temperature is below 15° or the outside sensor is broken.
ON	The pre-heater comes on for the selected time, (unless you are in diagnostic mode) and then returns to AUTO mode. If you select the MAX time, the pre-heater continues to operate for 2 hours after the motor of the vehicle has stopped.
OFF	Switches off the pre-heater whether in AUTO or ON mode. When OFF is chosen, the preheater will only work if there is a request coming from a programmed mode. Any other petition to activate the pre-heater will not be considered by the system, even those that the system makes automatically as a support for heating.

Once the ON mode is selected, after a few seconds the screen will show the pre-heater operating symbol.




Pre-heater operating screen in ON mode.

To see how much longer the pre-heater is programmed to operate, simply press briefly key (8) and the screen below will appear in which the time remaining will be displayed below the illuminated flame symbol.



Pre-heater time remaining screen.

When OFF is selected and the bus is shut down, the system will remember OFF in the next starting. For the system to work in AUTO mode again, it is required to go to the Preheater display and choose AUTO. As information to the driver that OFF is selected, symbol  is displayed in both Auto and Manual modes.

1.15. Inside temperature display.

By pressing key  (10) the real inside temperatures in the driver's and passengers' areas are displayed.



Inside temperatures screen

After a few seconds, the screen returns to the display shown before pressing key  (10).



1.16. Reheat option


When the system is in Climatization state, by pressing key , Demist function is displayed.

The following screen is displayed, in which Soft Demist is the preselected mode.



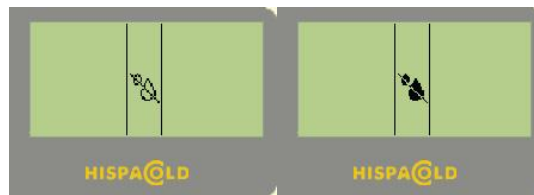
If not any key is pressed after few seconds, Soft Demist will be validated. It can also be validated by pressing the Demist key.

By pressing  and  in the driver area, options HARD and OFF can be chosen.

If, to enter to Demist, key  is pressed for a while, HARD will be the preselected mode.



Once the chosen option is validated, one of the next two screens will be displayed.



Screen Soft Demist.

Screen Hard Demist.

If before activating any of the Demist functions we were in manual mode, the display will show Auto mode and the Auto leds will be ON. Demist functions are considered as automatic modes of working.

If Demist is chosen but driver is OFF, Demist will work and will activate the driver area.

If, while Demist is ON, driver área is switched OFF by the driver, the system will leave the Demist mode. If, on the contrary, passanger area is switched OFF by the driver, Demist mode will remain active.

1.17. Operating in Sleeping mode

If the panel is in sleeping mode (with the vehicle's battery main switched off) a screen will display the following elements:

- The time of the system.
- If the pre-heater is on, the pre-heater connected flame.
- If there is a pre-heater program selected, the flame of the pre-heater with the program number (1 or 2).
- The battery symbol if the battery level is low.



Sleeping screen

1.18. Adjusting screen contrast.

By simultaneously pressing keys (9) and (10) for 2 seconds, you enter the contrast adjustment screen:



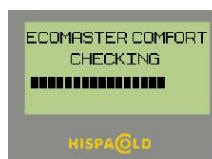
Contrast adjustment indicator screen.

With passengers' keys (16) and (17) you can increase or decrease the contrast setting between 15 and 62.

2. Autochecking. Error codes.

When the system receives the signal from the battery cut-off (+30), it checks its outputs, to check which elements are switched on and if there is a short circuit. It also checks the state of the temperature sensors.

While this check is made the screen looks like this:



Initial check screen.

If any type of anomaly is found, the errors and warnings screen appears as shown below.



Errors and warnings screen.

In the attached tables you can see the codes corresponding to each of the detectable problems:

Error codes.

Nº	MESSAGE	DESCRIPTION
1	DINT	Short or Open circuit in the driver's interior sensor
2	DICE	Short or Open circuit in the driver's ice sensor
3	DCHN	Short or Open circuit in the driver's channel sensor
4	EXT	Short or Open circuit in the driver's exterior sensor
5	DHB	Short circuit at blower heater output (driver)
6	DV1	Short circuit at speed 1 ON/OFF defroster output (driver)
7	PMP	Short circuit at main pump output (driver)
8	PRE	Short circuit at preheater output (driver)
9	DS1	Short circuit at output of guide heater blower speed 1(driver)
10	DS2	Short circuit at output of guide heater blower speed 2(driver)
11	DV2	Short circuit at defroster output speed 2 ON/OFF (driver)
12	DV3	Short circuit at defroster output speed 3 ON/OFF (driver)
13	DFV	Short circuit at defroster valve output (driver)
14	DHV	Short circuit at driver's heater valve output (driver)
15	FWF	Short circuit at feet/windscreen flap output (driver)
16	DRF	Short circuit at driver recirculation flap output
17	DFB	Short circuit at defroster fans output (driver)
18	FXX	preheater mistake number XX
19	RDFV	The return of the defroster valve is missing (driver)
20	RDHV	The return of the driver's heater valve is missing (driver)
21	PINT	Short or Open circuit in the passenger's interior sensor
22	PICE	Short or Open circuit in the passenger's ice sensor

N°	MESSAGE	DESCRIPTION
23	PCHN	Short or Open circuit in the passenger's channel sensor
24	WTR	Short or Open circuit in the water sensor (passenger)
25	CMP	Short circuit at compressor output (passenger)
26	FP	Short circuit at recirculation pump output (passenger)
27	PV2	Short circuit at ON/OFF evaporator output speed 2(passenger)
28	PV1	Short circuit at ON/OFF evaporator output speed 1(passenger)
29	PS1	Short circuit at stair heater blower output speed 1 (passenger)
30	PS2	Short circuit at stair heater blower output speed 2 (passenger)
31	C1	Short circuit at ON/OFF condensor output (passenger)
32	PV3	Short circuit at ON/OFF evaporator output speed 3(passenger)
33	PRV	Short circuit in the roof valve output (passengers)
34	PHV	Short circuit in the floor valve output (passenger)
35	PRC	Short circuit at passenger recirculation flap output (passenger)
36	RB	Short circuit at right evaporator fans output (passengers)
37	LB	Short circuit at left evaporator fans output (passengers)
38	CB	Short circuit at condensor fans output (passenger)
39	PRVN	The roof valve was previously detected but now it is not detected (passenger)
40	PHVN	The floor valve was previously detected but now it is not detected (passenger)
41	FPN	The recirculation pump was previously detected but now it is not detected (passenger)
42	RPRV	The return of the roof valve is missing (passenger)
43	RPHV	The return of the floor valve missing (passenger)
44	MDFV	Motorised defogger valve without return position
45	MDHV	Motorised additional heater valve without return position
46	MPRV	Motorised roof valve without return position
47	MPHV	Motorised floor valve without return position

Warning codes:

N°	Message	Description
1	POT?	Inconsistency between POT selected and configuration detected
2	RAD	Short or Open in radiation sensor (driver)
3	DFBN	No charge in defroster fans PWM (passengers)
4	RH	Short or Open in humidity sensor (passengers)
5	PRBN	No charge in right evaporator fans PWM (passengers)
6	PLBN	No charge in left evaporator fans PWM (passengers)
7	CBN	No charge in condenser fans PWM (passengers)
8	LPD	Low pressure error (Driver zone)
9	HPD	High pressure error (Driver zone)
10	LPP	Low pressure error (Passenger zone)
11	HPP	High pressure error (Passenger zone)