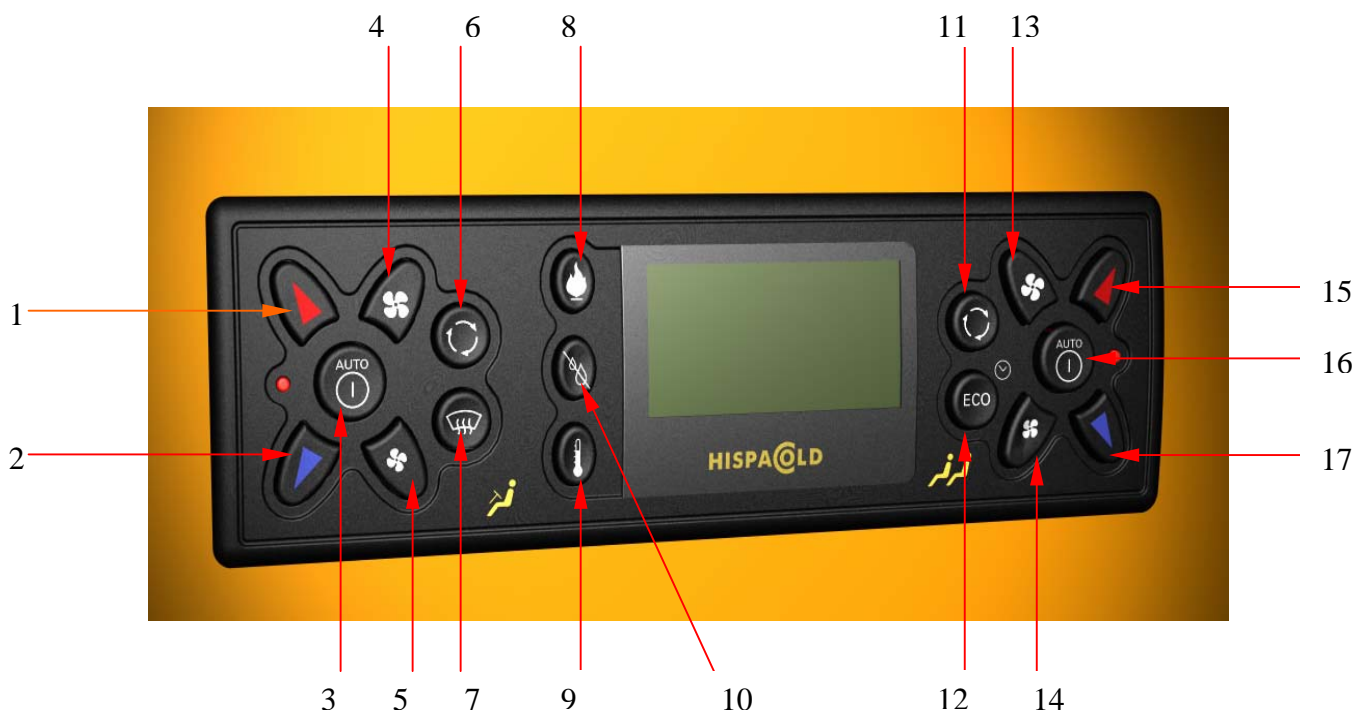


# ECOMASTER COMFORT

## USER'S MANUAL



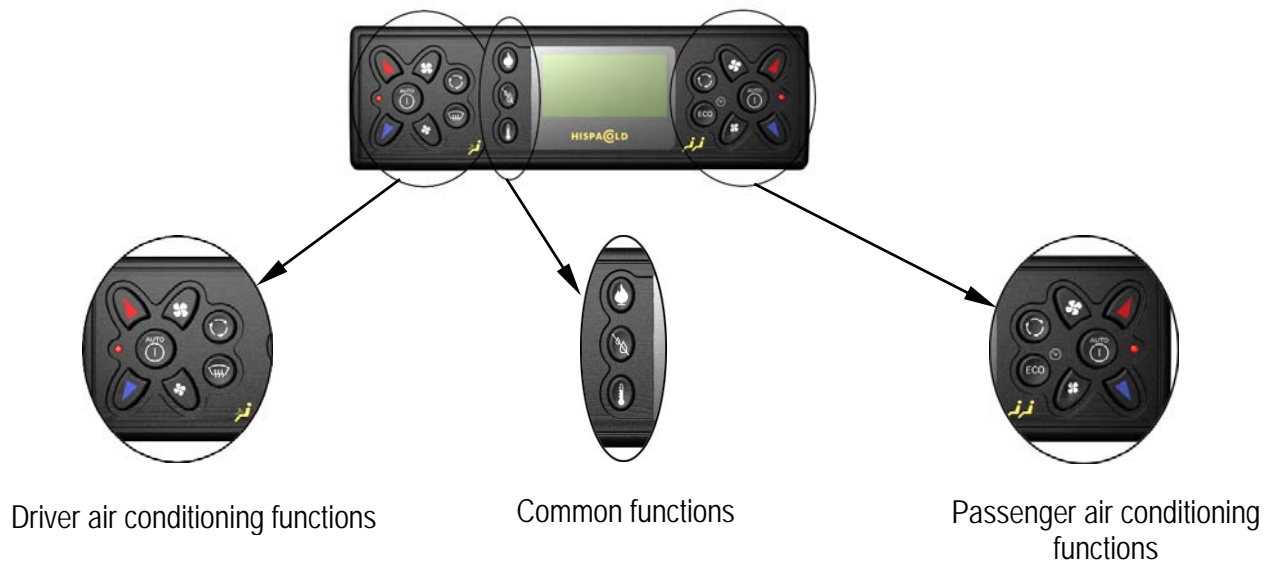
**INDEX:****1. OPERATING DESCRIPTION.**

- 1.1 Driver on/off switch for the air conditioning.
- 1.2 Driver temperature adjustment control.
- 1.3 Driver fan speed adjustment.
- 1.4 Driver recirculation baffle adjustment
- 1.5 Variation in the driver's foot/windscreen baffles
- 1.6 Driver automatic air conditioning setting.
- 1.7 Passenger air conditioning on/off switch.
- 1.8 Passenger temperature adjustment.
- 1.9 Passenger evaporator fan speed.
- 1.10 Passenger recirculation baffle adjustment.
- 1.11 Passenger automatic air conditioning setting.
- 1.12 ECO option.
- 1.13 Timer programming.
- 1.14 Preheater.
  - 1.14.1 Programmed mode.
  - 1.14.2 Normal mode.
- 1.15 Viewing interior temperature.
- 1.16 Dehumidifier option.
- 1.17 Operation in Sleeping mode.
- 1.18 Screen contrast adjustment.

**2. ERROR DETECTION AND INDICATION.**

## 1. OPERATING DESCRIPTION.


The Ecomaster Comfort front panel has three distinct areas:




When reference is made to the driver air conditioning functions, the key named will be the one in that area, with a similar shape to that for passengers.

### 1. 1. Driver on/off switch for the air conditioning.

The control is activated automatically as soon as the vehicle starts.

If the engine has not been started, the air conditioning system may be activated by pressing the  (3-16) key. As the battery is not charging in that situation, only the heating and ventilation will work at minimum ventilation speed.

The driver air conditioning may be adapted manually by holding down the  (3) key for 2 seconds.

## 1. 2. Driver temperature adjustment control.

To vary the temperature desired in the driver's area, press the keys  (2) or  (1).


If the passenger air conditioning is running, the temperature the driver can choose may be between +3° C (5° F) and -3° C (5° F) of that selected for the passenger area. That is, if 22° C is chosen for the passengers, the driver may select between 19 and 25° C.

If the passenger air conditioning is off, that limit does not exist and the driver may choose a temperature between 17° C (63° F) and 27° C (82° F).

The upper temperature limit for the driver is HI and in which the heating will work at maximum power. The lower limit is LO and in that case the air conditioning will work at maximum power.

## 1. 3. Driver fan speed adjustment.

The keys  (4) and  (5) are pressed to vary the driver area fan speed.

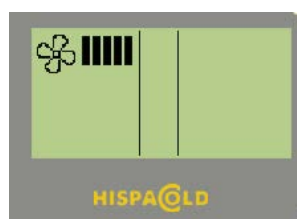
The driver fan speed may be varied from 1 to 5. If the speed the Ecomaster Comfort has selected automatically is changed, the new speed chosen is shown on the screen and the red LED beside the key  (16) goes off.

The speed selected may vary from 0 to 5, with the following limitations:

- If the vehicle motor is stopped, only up to speed 1 is allowed.
- If in dehumidifier mode, it will automatically set to speed 5.
- If the compressor is connected, the speed may not be less than 3 to avoid the evaporator freezing.


- If the driver heating is disconnected and the passenger heating needs to connect the compressor, the driver fans will start up at speed 2 to avoid the evaporator freezing.

When the fan speed of the driver air conditioning unit is modified manually, the manual screen is displayed.

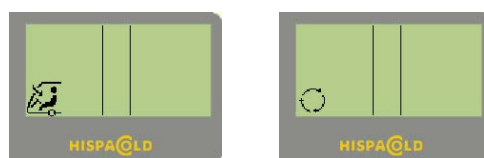


Manual screen (driver fans).

#### 1. 4. Driver recirculation baffle adjustment.


If the driver node is in air conditioning mode, the recirculation baffle position may be varied using the driver  (6) key. The positions alternate between exterior air and interior air.

When the recirculation baffle position is changed manually, the manual screen is displayed.



Manual Screen (driver recirculation baffles).

## 1. 5. Variation in the driver's foot/windscreen baffles.


If the driver node is in air conditioning mode, the foot/windscreen baffle position may be changed using the  (7) key.

When the position of the foot/windscreen baffle is changed, the Manual Screen is displayed.



Manual Screen (foot/windscreen baffle)

## 1. 6. Driver automatic air conditioning setting.

When we have manually changed the driver recirculation baffles, the foot/windscreen baffles or the demist fan speed setting, or when these are activated manually, the preheater, the dehumidification or the ECO mode, the driver node goes into manual mode and the LED beside the  (3) key is turned off.



By pressing the driver  (3) key, all the controls of the driver node are set on automatic and, if the passenger node is also on automatic, the Automatic Screen is displayed as shown below.




Fig 4.3 Automatic Screen



### 1. 7. Passenger air conditioning on/off switch.

The control is activated automatically as soon as the vehicle starts.

If the motor has not been started, the passenger heating system may be activated by pressing the passenger  (3) key. It will not be possible to activate the fan speed in this situation the battery is not charging, to avoid it going flat.

The passenger node may be switched off manually by holding down the  (3) key for 2 seconds.

### 1. 8. Passenger temperature adjustment.

To change the desired temperature in the passenger area, press the keys  (15) and  (17) .


The temperature selected may vary between 17°C (63°F) and 27°C (82°F).

The upper limit for the driver temperature is HI and in that situation, the heating will work at maximum power. The lower limit is LO and in that case the air conditioning will work at maximum power.

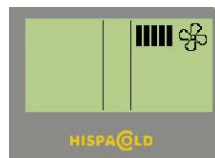
### 1. 9. Passenger evaporator fan speed.

To vary the evaporator fan speed, press the passenger  (13) and  (14) keys.

Speeds between 0 and 5 may be selected, with the following limitations:


- If the motor is stopped, no speed may be set.
- If only the driver air conditioning is running and the compressor is activated, speed 2 will automatically be activated in the passenger compartment.
- If key  (10) is pressed, speed 2 will connect.
- If the compressor is connected, the speed may not be less than 3.

When the evaporator fan setting is changed manually, the Manual Screen is displayed.



Manual Screen (evaporator fans)

### 1. 10. Passenger recirculation baffle adjustment.

If the passenger air conditioning is on, the position of recirculation baffles may be varied using the passenger  (11) key.

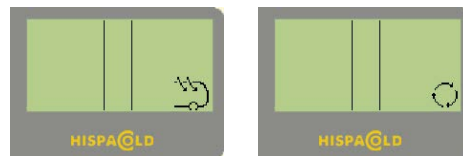
The baffles will alternate between the exterior air (Fresh) and interior air (Recirculation) positions, with the following limitations:

- If you have pressed the  (10) key, the recirculation baffles turn to exterior air.



- If the vehicle does not have ceiling heating installed, the baffles will set to interior air (recirculation) position if the temperature drops two degrees lower than that desired.
- If the interior temperature does not exceed at desired minus 2°C for more than 4 minutes, the baffles will automatically turn to recirculation.


When the recirculation baffle position is changed manually, the Manual Screen is displayed.



Manual Screen (passenger recirculation baffles)

## 1. 11. Passenger automatic air conditioning setting.

When the passenger recirculation baffles have been changed manually, the speed setting of the evaporator fans, the preheater, demister or ECO mode are activated manually, the passenger node goes into manual mode for those functions.


Pressing the passenger  (16) key returns all the controls to automatic and if the driver node is also on automatic, the Automatic Screen is displayed, which indicates the exterior temperature and the set of each node.





Automatic operation screen.

## 1. 12. ECO Option.

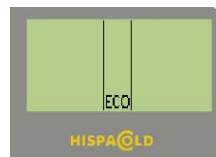
The ECO option allows the driver to deactivate the air conditioning equipment compressor in ambient conditions when its use is not necessary. While it is activated, connection of the compressor will not be possible under any circumstance.

The  (12) key is pressed to activate the ECO option.

When the  (12) key is pressed again, or the driver or passenger  (3-16) key is pressed, the option is deactivated.


If the ECO option is activated when demisting starts, it is deactivated.

When the ECO option is selected, the Manual Screen is displayed.



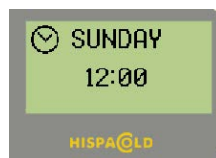
ECO Manual Screen

## 1. 13. Timer programming.





The  (12) key may be pressed for 2 seconds at any time to go to the timer programming screen.




This displays the screen shown below, where the day of the week, the time and minutes may be input.



Timer programming screen.

The driver  (1) and  (2) keys may be used to select the day, time or minutes that appear on the screen with a dark background, while the passenger  (15) and  (17) keys change the value of the field selected.


To validate the time programmed, press the  key, or let a few seconds elapse without pressing any key.

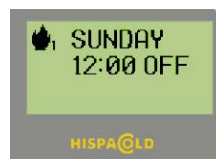
## 1. 14. Preheater.

The preheater has two functioning modes, programmed or normal mode.





### 1. 14. 1. Programmed mode.

It is possible to program two activations of the preheater in day and time. Each programming determines the day and time when we wish the bus to be warm (the control calculates the time when the preheater must be started to achieve this).

To enter programming, press the  (8) key for 2 seconds to go to the first programming screen. Press for a further 2 seconds to go to the second programming screen. Each one of the screens has a flame icon, with a number that indicates whether the programming is 1 or 2.



Preheater program screen

The driver  (1) and  (2) keys allow us to move around the day, time, minute and activation fields, and the passenger  (15) and  (17) keys modify their value.

The days to program may be from **Monday** to **Sunday** or **7 days** (for all the days of the week).

Single day programming will be erased once completed (reset to **OFF**). The ones on **7 days** remain on **AUTO** for the next day.

To activate the programming, the field of activation must be on **AUTO**. To deactivate it, just put it on **OFF**.

The preheater programming always works when not in diagnostic mode.

When the battery trip-switch is removed, a screen is displayed that shows whether the preheater is programmed. If it is, a hollow flame icon will appear with a 1 (programming 1) and/or a hollow flame icon with a 2 (programming 2).



Preheater Screen programmed.


If any of the programs is running, the flame of the relevant icon is filled in.



Preheater Screen running in programmed mode.





## 1. 14. 2. Normal mode.

In normal mode, the preheater either operates automatically, to aid heating, or manually for a set time that is determined by the user.

Briefly press the  key to enter the preheater screen. On that screen, the flame symbol shows whether it is running (flame filled in), either in normal or programmed mode, or if it is deactivated (hollow flame). If it is activated in normal mode, a counter will appear showing the time left to run.




Preheater activation screen.

The driver <sup>(1)</sup> and <sup>(2)</sup> keys are used to select the preheater operating mode (AUTO, ON or OFF). Within the option ON, an activation time may be chosen using the passenger <sup>(15)</sup> and <sup>(17)</sup> keys.

Mode	Description
AUTO	The preheater is activated if it is necessary to heat and the external temperature is less than 15° or the exterior probe is broken.
ON	The preheater connects for the time selected (except if in diagnosis mode) and then return to AUTO. If MAX time is selected, the preheater remains in operation for up to 2 hours after the vehicle motor has stopped.
OFF	The preheater is disconnected whether in AUTO or ON.

## 1. 15. Viewing interior temperature.

With the battery trip-switch on, press the <sup>(9)</sup> key to be able to view the real interior temperatures in the driver and passenger areas.






Interior temperature screen

When a few seconds have lapsed, the control will return to the screen it was on before pressing the <sup>(9)</sup> key.

### 1. 16. Dehumidifier option.

To demist the panes, in the driver as well as the passenger area, use the dehumidifier option.

When the control is in air conditioning mode, press the <sub>(10)</sub> key to activate the dehumidifier option.

The dehumidifier lasts 15 minutes and may be deactivated at will by pressing the driver or passenger <sub>(10)</sub> or <sub>(3-16)</sub> key again.

The Manual Screen is displayed when the dehumidifier option is activated.



Dehumidifier Manual Screen

**NOTE:** If the <sub>(10)</sub> key is pressed while the ECO option is activated, it will disconnect, as in order to dehumidify, the compressor must connect.

## 1. 17. Operation in Sleeping mode

If the control is in Sleeping mode (battery trip-switch off) a screen is displayed with the following elements:

- The system time.
- If the preheater is activated, the preheater flame connected.
- If there is a preheater program, the preheater flame with the program number (1 or 2).
- Whether the battery level is low.



Fig 4.4 Sleeping Screen

## 1. 18. Screen contrast adjustment.

Simultaneously press keys 0(8) and 0(9) for 2 seconds to go to the contrast adjustment screen:



Contrast adjustment screen

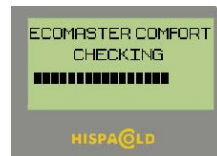
The passenger (15) and (17) keys are used to increase or decrease the contrast value between 15 and 62.



## 2. Error detection and indication.

When the system receives the signal from the battery trip-switch (+30), its outputs are checked to monitor the charges there are and ensure there are none short-circuited. It also checks the state of the probes.

While the checking lasts, the screen will look as follows:



Initial checking screen

If any anomaly is detected, an error and warning screen will be displayed, as follows:



Error and warning screen.

The attached tables show the relevant codes for each of the detectable problems:

Error codes.

No.	Message	Description
1	DINT	Short or open in the driver interior probe
2	DICE	Short or open in the driver ice probe
3	DCHN	Short or open in the driver channel probe
4	EXT	Short or open in the driver exterior probe
5	DHB	Short in the outlet of heater air (driver)
6	DV1	Short in the outlet of demister ON/OFF speed 1 (driver)
7	PMP	Short in the outlet of main pump (driver)
8	PRE	Short in the outlet of preheater (driver)
9	DS1	Short in the outlet of additional heater on speed setting 1 (driver)
10	DS2	Short in the outlet of additional heater on speed setting 2 (driver)
11	DV2	Short in the outlet of demister ON/OFF speed 2 (driver)
12	DV3	Short in the outlet of demister ON/OFF speed 3 (driver)
13	DFV	Short in the outlet of demister valve (driver)
14	DHV	Short in the outlet of heater valve (driver)
15	FWF	Short in the outlet of foot/windscreen baffle (driver)
16	DRF	Short in the outlet of driver recirculation baffles
17	DFB	Short in the outlet of demister fans (driver)
18	FXX	Preheater error number XX
19	D+30	Signal missing in +30 driver
20	PINT	Short or open in the passenger interior probe
21	PCHN	Short or open in the passenger channel probe
22	PICE	Short or open in the passenger ice probe
23	WTR	Short or open in the water probe (passengers)
24	CMP	Short in the outlet of compressor (passengers)
25	FP	Short in the outlet of recirculation pump (passengers)
26	PV2	Short in the outlet of evaporator ON/OFF speed 2 (passengers)
27	PV1	Short in the outlet of evaporator ON/OFF speed 2 (passengers)
28	PS1	Short in the outlet of additional strap heater speed 1 (passengers)
29	PS2	Short in the outlet of additional strap heater speed 2 (passengers)
30	C1	Short in the outlet of condenser ON/OFF (passengers)
31	PV3	Short in the outlet of evaporator ON/OFF speed 3 (passengers)
32	PRV	Short in the outlet of ceiling valve (passengers)
33	PHV	Short in the outlet of floor valve (passengers)
34	PRC	Short in the outlet of passenger recirculation baffles passengers
35	RB	Short in the outlet of right evaporator fans (passengers)
36	LB	Short in the outlet of left evaporator fans (passengers)
37	CB	Short in the outlet of condenser fans (passengers)
38	PRVN	Has switched from detecting to not detecting ceiling valve (passengers)
39	PHVN	Has switched from detecting to not detecting floor valve (passengers)
40	FPN	Has switched from detecting to not detecting the recirculation pump

## Warning Codes:

No.	Message	Description
1	POT?	Inconsistency of the POT selected with the configuration detected
2	RAD	Short or open in the radiation probe (driver)
3	DFBN	No charge in the demister fans PWM (passengers)
4	RH	Short or open in the humidity probe (passengers)
5	PRBN	No charge in the right evaporator fans PWM (passengers)
6	PLBN	No charge in the left evaporator fans PWM (passengers)
7	CBN	No charge in the condenser fans PWM (passengers)