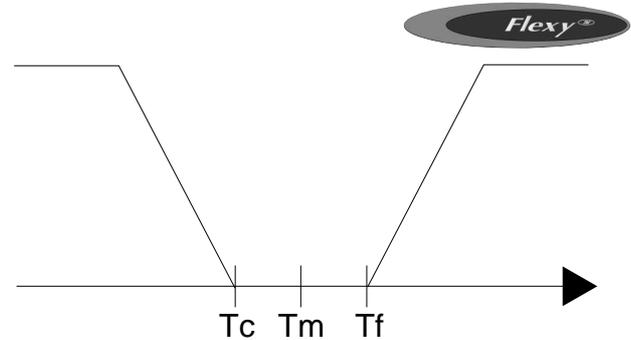


The CLIMATIC™ 'Comfort' control Display allows an untrained person to easily operate a Lennox Roof-Top. This display connects to a single Rooftop and, through the use of the control keys, LED's and display the user can see how the connected Rooftop is operating, whether there are any faults, modify the comfort setpoint and override the Rooftop operation. If installed correctly the CLIMATIC™ "Comfort" control display can be installed up to 1000 m away from the Rooftop unit.



**DISPLAY (1 - figure 39)**

In 'Automatic' operation the comfort setpoint is displayed in the event of a fault detected on the unit an error code is automatically displayed.

The + / - keys (2) are used to change the heating/cooling/operating setpoints.

The LED (3) indicates the current operating mode :

- In 'Automatic' mode, i.e. in the programmed time schedules, the LED flashes,
- In forced occupied mode, the LED is permanently on
- In forced unoccupied mode, the LED is off.

**Forced Occupied Key (4)**

Pressing this key will override the Automatic control and force the unit to run in its "Occupied" mode. Whilst in this mode the LED (3) will remain permanently on. To return to "Automatic" mode press button (6) when the LED (3) will flash again.

**Forced Unoccupied Key (5)**

If, to save energy, the installations are not used within a period programmed for automatic use, it is possible, by pressing this key, to force the unit into its to "unoccupied" mode. The LED (3), which was previously flashing or lit, will now go out.

**Automatic Operation Key (6)**

If the system was previously set to forced occupied mode (LED (3) lit) or forced unoccupied mode (LED (3) off), this key allows you to return to the automatic programmed mode. The LED will flash.

**NOTE :** 'Forced' modes will automatically be re-set at 00:00h

LED (7) Indicates whether the unit is operating or not.

LED (8) Indicates that the filters are dirty.

LED (9) Indicates a general fault has been detected by the CLIMATIC™. Refer to the "Fault codes" section of this manual.

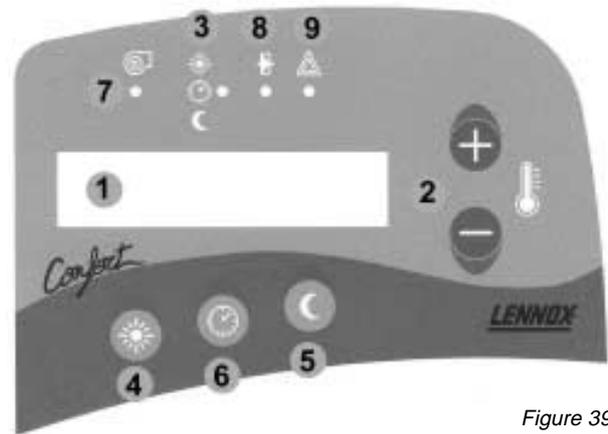


Figure 39

**KP17 COMFORT CONTROL DISPLAY WIRING**

Failure to install the Comfort control display with the recommended cable may cause the display to malfunction. The KP17 remote must be connected to the CLIMATIC™ using a 4 x 0.5 mm<sup>2</sup> braid-screened cable. This connection is provided through a remote interface card which is located within the Control panel section. Refer to the wiring section of this manual.

This display unit allows you to read and modify all the values of the variables or setpoints of the rooftop to which it is connected.

The dialogue with the controller is initiated by the CLIMATIC™. If, after 3 attempts, no communication is established, a message will be displayed signalling the problem. The unit will then try to re-connect at regular intervals.

**NOTE :** If your ROOFTOP already has a KP17 Comfort display connected (see previous section) simply disconnect it and connect this panel to the same location, once completed re-connect the KP17. It is not necessary to switch off the power to the CLIMATIC™ whilst the KP02/KP17 is being changed.

**CALLOUT :**

- 1 LIQUID CRYSTAL DISPLAY
- 2 RAISE/LOWER KEYS
- 3 "FILTER" LED (flashing red)
- 4 "ADDRESS" KEY
- 5 "MODE" KEY
- 6 "VALUE" KEY
- 7 "UNIT RUNNING" LED
- 8 "MODE" LED
- 9 "GENERAL ALARM" LED.

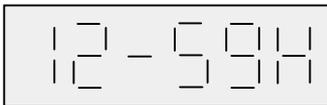


Figure 40

**1 - DISPLAY FORMATS**

**Hour**

Default display. If the display unit has been inactive for 5 minutes, this screen will automatically be displayed.



<--> 12 hours and 59 minutes

**Date**



<--> 8 April 1999

**Variable or setpoint address**

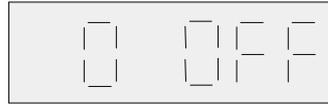


**Variable or setpoint value**

**Digital Values**



1 <--> ON



0 <--> OFF

**Temperatures**

Temperatures are displayed in °C, to an accuracy of 0.1 °C



<--> -21.6 °C



<--> + 105.8 °C

**Pressures**

Pressure is given in bars, to an accuracy of 0.1 bar.

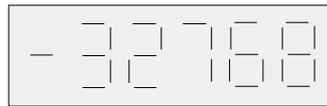


<--> 18.3 bars

**Other analog values**



Valeurs displayed



Values non displayed

**Specific Displays**

**Software Version**

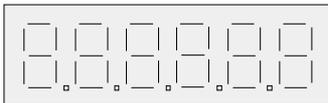
When the unit is powered up, the KP02 software version number is displayed.



<--> version 1.0 (for example)

**Display Test**

The display can only be tested for correct operation when the unit is powered up and by pressing on the 3 keys "A", "M" and "-" simultaneously. If the display is working correctly, the following will be displayed :



All digits are properly displayed.

**Communication Error**

If there is no communication between the KP02 display unit and the CPU card, the following message is displayed :



<--> "Communication problem"



## 2 - OPERATING MODES

The maintenance display allows for 4 modes of operation. Key **[M]** allows you to move successively and in a loop from one mode to the next.

The current mode is indicated by the status of LEDs **[V]** and **[C]** :

**Status of LEDs associated with current mode :**

	<b>[V]</b>	<b>[C]</b>
<b>A.</b> The variable mode allows you to read the values of variables	lit	not lit
<b>B.</b> The setpoint mode allows you to change the settings	not lit	lit
<b>C.</b> The read date mode allows you to view the time and the date	not lit	not lit
<b>D.</b> The date setting mode allows you to change the time and the date	lit	lit

### A : VARIABLES MODE

Pressing key **[A]** displays the address of the variable being read.

To go to a higher address, press **[A]** while simultaneously pressing on **[+]**.

The address will increase slowly by pressing **[+]** intermittently or more quickly by keeping your finger on the key.

To go to a lower address, proceed as above but with the **[-]** key.

When the required address appears, press **[V]** to display the variable value. If you do not press any key, the display will automatically return after a minute. The variables are updated every second.

### B : SETPOINTS MODE

The setpoint address can be chosen in the same way as for the variable address (see above).

When the address of the required setpoint appears, pressing **[V]** will likewise display the current value.

To increase the setpoint press **[V]** while holding down the **[+]** key at the same time.

The address will increase slowly by pressing **[+]** intermittently or more quickly by keeping your finger on the key.

To go to a lower setpoint, proceed as above but with the **[-]** key as well as the **[V]** key.

The new value is applied when **[V]** is released.

### **PASSWORD**

Access to all the setpoints is password-protected. Enter the password before making changes.

To do so, following the above procedure : go to address setting n° 0 and enter the number corresponding to your password.

If the password code is correct, the following message will appear when key **[V]** is released :



If the keypad has been inactive for 5 minutes, the password is reactivated. You must therefore enter it again to continue making changes to the setpoint values.

### C : DATE READING MODE

One of the following modes

- Hour
- or date

can be chosen by pressing **[A]** and briefly pressing on **[+]** or **[-]**.

Pressing **[V]** will display the value of the data selected, otherwise it will automatically be displayed after a minute.

### D : DATE SETTING MODE

This mode allows the 6 date modes to be set :

- Hours and minutes <-->
- Day of the month <-->
- Day of the week <-->
- Month <-->
- Year <-->

In the same way as for the setpoints, the value can be increased by simultaneously pressing on keys **[V]** and **[+]** and they can be decreased by simultaneously pressing on **[V]** and **[-]**.



For different types of data, the setting ranges are as follows :

Item	Minimum value	Maximum value
Hours and minutes	00-00H	23-59 H
Day of the month	1	31
Day of the week	1	7
Month	1	12
Year	0	99

Changes are only incorporated when key **[A]** is pressed.

**NOTE** : The compatibility of the value for the day of the month is not checked when it is entered. You might therefore enter February 31st but when you try to validate, it will be ignored and the preceding value stored.

### 3 - POWER SUPPLY (LED 7 - figure 40)

When lit, the LED indicates that the machine is powered up.

### 4 - MODE (LED 8 - figure 40)

This LED indicates the current operating mode.  
 In normal mode, i.e. within the programmed schedules, the LED flashes.  
 In forced day mode, the LED is permanently on and in forced night mode, the LED is off.

### 5 - FILTER DIRTY (LED 3 - figure 40)

This LED indicates that the CLIMATIC™ has detected that the filter is blocked.

### 6 - GENERAL FAULT (LED 9 - figure 40)

This LED indicates a general fault has been detected. Refer to the "Fault codes" section of this manual.



## LIST OF SETPOINTS

### 1st Level

		Min.	Factory	Maxi.
0	Password to access level 2 setpoints and variables	0	#	255
1	Temperature, required setpoint for room, day mode	8.0	21.0	35.0
2	(Used by KP17 only) KP17 Remote control, override, occupied mode	Off	Off	On
3	(Used by KP17 only) KP17 Remote control, override, automatic mode	Off	Off	On
4	(Used by KP17 only) KP17 Remote control, override, unoccupied mode	Off	Off	On
5	Fault reset	Off	Off	On
6	Remote control, On / Off, unit	Off	Off	On
7	(Special software request) Remote control, On / Off, customer output KP12/2	Off	Off	On
8	(Used for setting up different time zones) Mode, Selection 0 = Day            1 = Week-end    2 = Night        3 = 4 = Morning      5 = Midday      6 = Evening     7 = BMS	0	0	7
9	Defines end of weekend/Start of week (1 = Sunday, 2 = Monday, etc) Mode, day of the week, start of mode	1	#	7
10	(Used with setpoint 8 - mode selection - to define the hour of the start time) Mode, hour, start of mode	0	#	23
11	Used with setpoint 8 - mode selection - to define the minute of the start time Mode, minute, start of mode	0	#	59
12	Defines end of week/Start of weekend (6 = Friday, 7 = Saturday, etc) Mode, day of the week, end of mode	1	#	7
13	Used with setpoint 8 - mode selection - to define the hour of the stop time Mode, hour, end of mode	0	#	23
14	Used with setpoint 8 - mode selection - to define the minute of the stop time Mode, minute, end of mode	0	#	59
15	Defines day mode deadzone, other time zones = cooling setpoint) Mode, temperature, room cooling setpoint	8.0	#	35.0
16	Defines day mode deadzone (other time zones = heating setpoint) Mode, temperature, room heating setpoint	8.0	#	35.0
17	(FLEXY™ only) On = Absolute humidity (g/kg) / Off = Relative humidity (%)	Off	Off	On
18	(FLEXY™ only) Mode, relative humidity (%), room minimum setpoint required	0	#	100
19	(FLEXY™ only) Room mode, Relative humidity (%), maximum setpoint required	0	#	100
20	(FLEXY™ only) Mode, Absolute humidity (g/kg), room minimum setpoint required	0.0	#	30.0
21	(FLEXY™ only) Mode, Absolute humidity (g/kg), room maximum setpoint required	0.0	#	30.0
22	Mode, Percentage, Minimum fresh air	0	#	100
23	Mode, Fan activity in control zone (cooling mode/heating mode)	Off	#	On
24	Mode, Fan activity in dead zone	Off	#	On
25	(Special application request only) Mode, Fan automation, dead zone	Off	#	On
26	(FLEXY™ only) Mode, Fan low speed, control zone	Off	#	On



		Min.	Factory	Maxi.
27	(FLEXY™ only) Mode, Fan low speed, dead zone	Off	#	On
28	(FLEXY™ only) Mode, Fan low speed automation	Off	#	On
29	(on = unit runs at maximum 50% during "night mode") Mode, Low noise	Off	#	On
30	(J-BUS only) Remote control, override, Mode	Off	Off	On
31	(J-BUS only) Remote control, Override, Low fan speed	Off	Off	On
32	(J-BUS only) Remote control, Override damper with recycled air	Off	Off	On
33	(J-BUS only) Remote control, Override damper with minimum fresh air	Off	Off	On
34	(J-BUS only) Remote control, Override damper with fresh air	Off	Off	On
35	(J-BUS only) Remote control, Override 50% load limit	Off	Off	On
36	(J-BUS only) Remote control, Override heating cancellation	Off	Off	On
37	(J-BUS only) Remote control, Override cooling cancellation	Off	Off	On
38	(J-BUS only) Remote control, Override electrical heaters cancellation	Off	Off	On
39	On = Electrical heaters during defrosting	Off	On	On
40	(Alarm only) Room temperature, low setpoint	5.0	10.0	20.0
41	(Alarm only) Room temperature, high setpoint	20.0	40.0	40.0
42	Room relative humidity (%), low setpoint	0	0	50
43	Room relative humidity (%), high setpoint	50	100	100
44	Room absolute humidity (g/kg), low setpoint	0.0	0.0	30.0
45	Room absolute humidity (g/kg), high setpoint	0.0	30.0	30.0
46	Temperature, Curved gradient of anticipated speed	0.0	10.0	20.0
47	(0 = Start at times set in "modes" only, no anticipation start Value, Gradient of anticipated speed	0	12	100
48	Quantity of CO2, Ppm, minimum fresh air	0	1000	2000
49	Quantity of CO2, Ppm, maximum fresh air	0	1500	2000
50	Percentage, Fresh air damper opening before fan will start	0	10	100

**2nd Level**

		Min.	Factory	Maxi.
51	Maximum temperature, required setpoint for room, day mode	21.0	27.0	35.0
52	Minimum temperature, required setpoint for room, day mode	8.0	17.0	21.0
53	(Compressor minimum run time in seconds)	25	180	1800
54	Differential temperature, engaged heat setting	0.0	1.0	10.0



		Min.	Factory	Maxi.
55	Differential temperature, heating setting between 2 steps	0.1	1.0	10.0
56	Differential temperature, engaged cooling setting	0.0	1.0	10.0
57	Differential temperature, cold setting between 2 steps	0.1	1.0	10.0
58	(Not used - special option only) On = Compressors then chilled water coil, room setting	Off	Off	On
59	On = Heat pump and/or sas then hot water coil or elec. heat, room setting	Off	On	On
60	On = Gas then heat pump, room setting	Off	Off	On
61	On = Supply setting on	Off	Off	On
62	Time, sampling of supply setting (integration delay)	1	10	120
63	On = Compressors then chilled water coil, supply setting	Off	Off	On
64	On = Heat pump and/or gas then hot water coil or elec. heat, supply setting	Off	Off	On
65	On = Gas then heat pump, supply setting	Off	Off	On
66	(Not used - Future facility) - Reserved On = constant supply air temperature via air damper modulation	Off	Off	On
67	(FLEXY™ only) Time, Sampling of humidity setting	1	10	120
68	(FLEXY™ only) Humidity range (%), humidity setting	1	5	50
69	(FLEXY™ only) Differential humidity (%), Engaged dehumidity setting	1	5	50
70	(FLEXY™ only) Differential humidity (%), Dehumidity setting between 2 steps	1	5	50
71	Supply temperature, low setpoint, 1st level	setpoint 72 +2.0	8.0	19.0
72	Supply temperature, low setpoint, 2nd level	setpoint 73 +2.0	6.0	17.0
73	Supply temperature, low setpoint, 3rd level	1.0	2.0	15.0
74	Supply temperature, high setpoint, 1st level	20.0	40.0	70.0
75	Supply temperature, high setpoint, 2nd level	setpoint 74	60.0	70.0
76	Temperature, Outside air minimum setpoint, (Outdoor air <Setpoint 76 = No free cooling, Min % fresh air)	0.0	5.0	30.0
77	Temperature, Outside air maximum setpoint, (Outdoor air >Setpoint 77 = 50 % compressors OFF in cooling)	0.0	26.0	60.0
78	(Not used - future facility) - Percentage, maximum fresh air, Damper modulation to provide constant supply air temperature	0	60	100
79	Outside air temperature, setpoint, 50% compressor (Outdoor air <Setpoint 79 = 50 % compressors stop)	10.0	12.0	30.0
80	Outside air temperature, setpoint, 100% compressor (Outdoor air <Setpoint 80 = ALL compressors stop)	10.0	12.0	30.0
81	Icing temperature setpoint, evaporator coil	-5.0	-1.0	3.0
82	Defrost temperature setpoint, evaporator coil	5.0	10.0	15.0
83	Delay, icing setpoint, evaporator coil	1	360	600
84	Outside air temperature, setpoint, 100% compressor heatpump (Outdoor air <Setpoint 84 = ALL compressor stop)	-50.0	-20.0	20.0
85	Outside temperature, setpoint, authorised defrosting, condenser coil	8.0	10.0	20.0
86	(on LINEA™ only)* - (R22 = -3, R407C = 1) Battery temperature, setpoint, authorised defrosting, condenser coil	-10.0	-3.0	6.0

\* : LINEA is another range of LENNOX ROOFTOP. For more information, please consult your regional office



		Min.	Factory	Maxi.
87	Coefficient, icing time, condenser coil	0	3	12
88	Number, condenser restart, condenser coil	1	1	8
89	Low temperature, setpoint, air/water cooled heat exchanger (non standard)	4.0	5.0	20.0
90	High temperature, setpoint, air/water cooled heat exchanger (non standard)	20.0	45.0	46.0
91	Outside temperature, setpoint, 100% electrical heater discharge (Outdoor air > Setpoint 91 = electric heater stop)	-20.0	10.0	30.0
92	Sensing setpoint, air flow cutout	0.0	0.2	5.0
93	Sensing setpoint, clogged filters	0.0	2.5	5.0
94	Sensing setpoint, missing filters	0.0	0.5	5.0
95	KP17 = on = On/Off unit	Off	Off	On
96	Delay, closing, KP 12-2 "Day" input	4	60	65535
97	Delay, Opening, KP 12-2 "Day" input	2	300	65535
98	Unit type	0	0	65535
99	On = "LINEA™" series, Off = "FLEXY™" series	Off	#	On
100	On = Low ambient Option fitted (Disable setpoints 79 & 80) (Off = Enable setpoints 79 & 80)	Off	#	On
101	(FLEXY™ only) On = Advanced Control Pack option fitted	Off	#	On
102	Slave J-Bus, number	1	1	10
103	Link, number	0	0	7
104	All setpoint values override to factory default EPROM values (centre column)	Off	Off	On
105	Test stages (for factory test procedures only reduces all delay timers to 0)	0	0	65535

\* : LINEA is another range of LENNOX ROOFTOP. For more information, please consult your regional office



**VARIABLE LIST** *(june 2001)*

**1st Level**

0	Error code
1	Temperature, room
2	Relative humidity (%),room
3	Temperature, outside air
4	Relative humidity (%), outside, air
5	Temperature, supply Air
6	Temperature, chilled water battery
7	Temperature, compressor, no. 1
8	Temperature, compressor, no. 2
9	Temperature, compressor, no. 3
10	Temperature, compressor, no. 4
11	Temperature, condenser, no. 1
12	Temperature, condenser, no. 2
13	Temperature, condenser, no. 3
14	Temperature, condenser, no. 4
15	Temperature, air/water cooled heat exchanger, water outlet
16	Pressure, air flow (mb)
17	Air quality sensor, CO <sup>2</sup> (ppm)
18	Pressure, compressor, no. 1
19	Pressure, compressor, no. 2
20	Pressure, compressor, no. 3
21	Pressure, compressor, no. 4
22	Volt free contact, remote control, unit Off
23	Volt free contact, remote control, forced occupied mode
24	Volt free contact, remote control, forced unoccupied mode
25	Volt free contact, remote control, 50% load limit
26	Volt free contact, remote control, heating disable
27	Volt free contact, remote control, cooling disable
28	Volt free contact, remote control,low ventilation speed
29	Auxiliary contact, blower fan
30	Volt free contact, error, DAD board, detected smoke
31	Auxiliary contact, compressor, no. 1
32	Auxiliary contact, compressor, no. 2
33	Auxiliary contact, compressor, no. 3
34	Auxiliary contact, compressor, no. 4
35	Pressure switch, compressor, no. 1, low pressure
36	Pressure switch, compressor, no. 2, low pressure
37	Pressure switch, compressor, no. 3, low pressure
38	Pressure switch, compressor, no. 4, low pressure
39	Auxiliary contact, condenser fan, no. 1
40	Auxiliary contact, condenser fan, no. 2
41	Auxiliary contact, condenser fan, no. 3
42	Auxiliary contact, condenser fan, no. 4
43	Volt free contact, air/water cooled heat exchanger, water flow regulator
44	Auxiliary contact, pump (hot water coil - frost protection pump)
45	Auxiliary contact, electrical heater, no. 1
46	Auxiliary contact, electrical heater, no. 2
47	Auxiliary contact, gas grade, no. 1
48	Auxiliary contact, gas grade, no. 2
49	Volt free contact, humidifier, error, control & setting board
50	Volt free contact, leak water
51	Volt free contact, information, miscellaneous source
52	Output, supply fan



53	Output, low speed supply fan
54	Output, Extract fan
55	Output, compressor, no. 1
56	Output, compressor, no. 2
57	Output, compressor, no. 3
58	Output, compressor, no. 4
59	Output, compressor, no. 1, hot gas injection valve
60	Output, compressor, no. 1, cycle reversing valve
61	Output, compressor, no. 2, cycle reversing valve
62	Output, compressor, no. 3, cycle reversing valve
63	Output, compressor, no. 4, cycle reversing valve
64	Output, condenser fan, no. 1
65	Output, condenser fan, no. 2
66	Output, condenser fan, no. 3
67	Output, condenser fan, no. 4
68	(FLEXY™ only) - Output, pump
69	Output, electrical heater, no. 1, 1st level
70	Output, electrical heater, no. 1, 2nd level
71	Output, Electrical Heater, no. 2
72	Output gas grade, no. 1, 1st level
73	Output, gas grade, no. 1, 2nd level
74	Output, gas grade, no. 2
75	Output, humidifier
76	Output, miscellaneous
77	Proportional action, economiser
78	Proportional action, chilled water battery
79	Proportional action, hot water battery
80	Proportional action, electrical heaters, static relays
81	Proportional action, humidifier
82	Status, supply fan
83	Status, damper
84	Status, chilled water coil
85	Status, hot water coil
86	Status, compressor, no. 1
87	Status, compressor, no. 2
88	Status, compressor, no. 3
89	Status, compressor, no. 4
90	Status, condenser fans
91	Status, pump
92	Status, electrical heaters
93	Status, gas
94	Status, humidifier
95	Room setpoint, minimum setting, heating
96	Room setpoint, maximum setting, cooling
97	Room setpoint, minimum power point, heating
98	Room setpoint, maximum power point, cooling
99	Setpoint, supply setting
100	Setting, minimum power point, heating, supply
101	Setting, maximum power point, cooling, supply
102	Setting, minimum setpoint, humidification, room
103	Setting, maximum setpoint, dehumidification, room
104	Setting, minimum power point, humidification, room
105	Setting, maximum power point, dehumidification, room
106	Function, operational conditions
107	On = Special software
108	Version number, Software

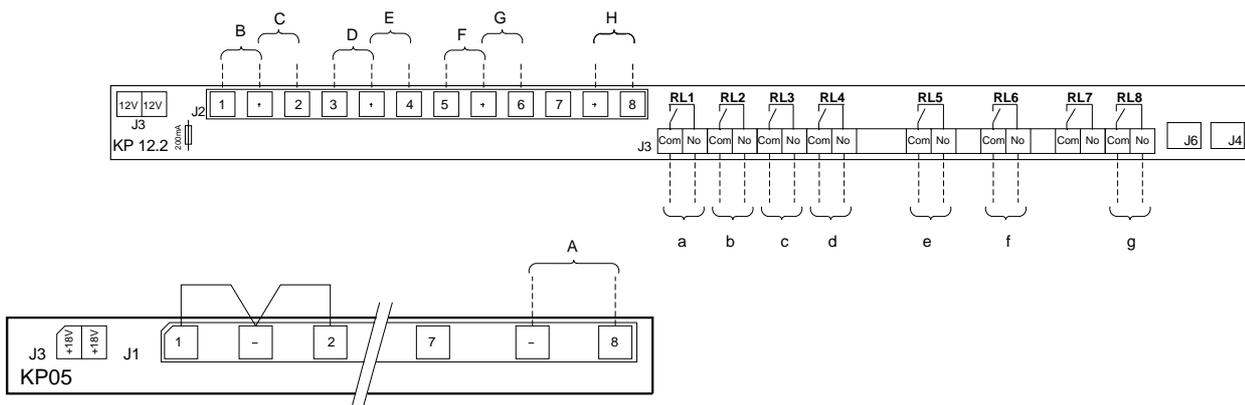
This option is used for making a connection to the BMS only, by a set of hard contacts. It requires the addition of a KP05 card, if this is not already in place, and a KP12 card. Input connection must be by screened cable only.

Limits of relays :

- 10A – 250V with resistive load
- 4A – 250V with inductive load.

Input	Function
<b>A</b>	Instruction shift : A 0/20mA signal can be used to add a linear shift of 0 to 10 °C to the setpoint temperature (mid-point between air-conditioning and heating setpoint). If your command signal is a different type, our engineers can advise you on the type of interface to use before input to the CLIMATIC™
<b>B</b>	Unit on/off (ROOFTOP on when unit is off).
<b>C</b>	Contact - force night operation
<b>D</b>	Contact - force day operation
<b>E</b>	Contact - force operation at 50%.
<b>F</b>	Lock heating function
<b>G</b>	Lock air-conditioning function.
<b>H</b>	Feedback of information from an external client component

Output	Function
<b>a</b>	Signal filter fault
<b>b</b>	Signal fan fault
<b>c</b>	Signal compressor fault
<b>d</b>	Signal fault on gas burner or electric coil.
<b>e</b>	Signal supplying temperature greater than setpoint (Setpoint 74)
<b>f</b>	Signal supplying temperature less than setpoint (setpoint 71)
<b>g</b>	Command from an external client component



**ON - OFF**

The unit is declared On if setpoint 6 (C06) is ON.  
 The unit can be stopped by a remote control command by hard contact.  
 On KP12 extension card - see chapter on BMS contact kit.

For certain configurations a CLIMATIC™ system actuator can be used to control an external function (option: Client).  
 The Client option is declared On if setpoint 7 (C07) is ON.

**DEFINITION OF TIME SLOT PARAMETERS**

The CLIMATIC™ allows you to programme 5 operating zones per day, in addition to an idle zone for the weekend.  
 Slot activation is :

- automatically controlled by the CLIMATIC™, if you have defined these time parameters for each slot
- forced manually by action on the controller (instructions 02/03 and 04 for KP02).
- forced by the BMS contacts kit ( see this chapter).
- forced by the computer connection.

The five available time slots are :

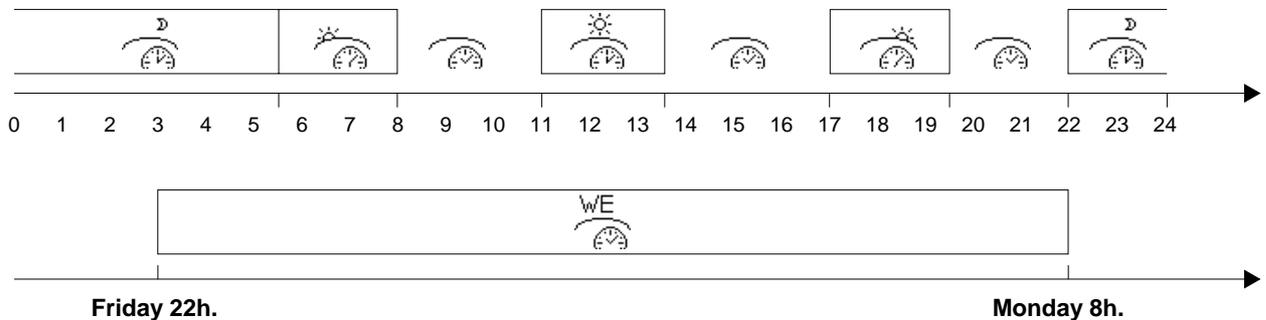
-  **WEEK-END**
-  **NIGHT**
-  **MORNING**
-  **NOON**
-  **EVENING**

If none of the time slots listed above is active, the active slot is :

-  **DAY**

A particular time slot :

-  **BMS** is activated if the unit is connected to a computer network.



With the KP07 :

- Go directly to the screen concerning the time slot to be modified, enter the parameters described below on the screen (see organisation of screens in KP07chapter).

With the KP02 :

- The slot to be set up must first be defined by the 08 instruction. Enter the information below then return to the 08 instruction to go to the next slot.

## DESCRIPTION OF PARAMETERS

Parameters are defined for the time slot. Select by instruction 08 setting.

0 = DAY / 1 = WEEKEND / 2 = NIGHT / 3 = unused / 4 = MORNING / 5 =MIDDAY / 6 = EVENING / 7 = BMS.

Instruction	Description
09	Day of the week of start of setting . From 1 to 7, 1 = Sunday.
10	Hour of start of setting
11	Minutes for start of setting
12	Day of the end of setting
13	Hour of end of setting
14	Minutes of end of setting
15	Setpoint in heating
16	Setpoint in air conditioning
17	Defined if the hygrometry values below are taken as absolute (ON) or relative (OFF).
18	Minimum relative humidity of ambient air (%)
19	Maximum relative humidity of ambient air (%)
20	Minimum absolute humidity of ambient air (g/kg of dry air)
21	Maximum absolute humidity of ambient air (g/kg of dry air)
22	Relative value of minimum flow of new air (%)
23	Fan operation in regulation zone *. ON on OFF off
24	Fan operation in neutral zone*. ON on OFF off
25	Automatic fan operation in neutral zone*. In this zone after operation in air-conditioning mode, the fan is off. If after one hour the ambient air is still in this zone the fan is started up again.
26	On ON, forces low speed fan operation in the regulation zone*.
27	On ON, forces low speed fan operation in the neutral zone*.
28	On ON, forces automatic low speed operation. If the unit is in air-conditioning or dehumidifying mode and less than 3 compressors are in use the fan then switches to low speed.
29	Low noise
30	Instruction used to force operation in the current setting

\* The regulation zone is defined for a temperature less than the heating instruction or greater than the air-conditioning instruction. The neutral zone is between these 2 values.

NOTE : The end of the night slot night is defined by the start of the morning slot : this is why there is no need to define the end of the night slot in the table below

Setpoint value for KP02	DAY = 0	WEEK-END = 1	NIGHT = 2	MORNING = 4	MIDDAY = 5	EVENING = 6	BMS = 7
9	-	7	-	-	-	-	-
10	-	22	22	6	12	19	-
11	-	0	0	0	0	0	-
12	-	2	-	-	-	-	-
13	-	6	-	6	12	19	-
14	-	0	-	0	0	0	-
15	23.0	30.0	30.0	23.0	23.0	23.0	23.0
16	19.0	10.0	10.0	19.0	19.0	19.0	19.0
17	Off	Off	Off	Off	Off	Off	Off
18	0	0	0	0	0	0	0
19	100	100	100	100	100	100	100
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	30.0	30.0	30.0	30.0	30.0	30.0	30.0
22	20	0	0	0	20	20	20
23	On	On	On	On	On	On	On
24	Off	Off	Off	Off	Off	Off	Off
25	Off	Off	Off	Off	Off	Off	Off
26	Off	Off	Off	Off	Off	Off	Off
27	Off	Off	Off	Off	Off	Off	Off
28	Off	Off	Off	Off	Off	Off	Off
29	Off	Off	Off	Off	Off	Off	Off
30	Off	Off	Off	Off	Off	Off	Off

## ADVANCE ACTIVATION OF THE MORNING SLOT

Depending on the thermal inertia of the building or the installation and external climatic conditions, it is possible to advance the switch from the NIGHT slot to the MORNING slot.

The time advanced, in minutes, is calculated using the following formula :

Time advanced = (gradient start temperature) x inertia coefficient

For example :

- Outside temperature 0 °C
- Gradient start temperature set to + 10 °C (i.e. below 10°C outside, you want to advance start-up)
- Inertia coefficient set to 12
- Start of Morning slot set to 8h30

In these conditions the switch to the morning slot will be advanced by:  $(10 - 0) \times 12$  i.e. 120 min.

The installation will therefore start up at 6h30 instead of 8h30.

## REGULATION OF AMBIENT AIR

Two power factors, one for cooling (variable 98), the other for heating (variable 97), are calculated according to the difference in temperature between the Setpoint and the reference temperature.

The progression of these cooling or heating power factors is limited by the temperature hysteresis and the activation differentials between 2 stages.

If the hysteresis value is 0, the power factor concerned is no longer limited.

See below for setting hysteresis and activation differentials.

The power factors are periodically recalculated by the CLIMATIC™. The integration time (setpoint 53) is adjustable. This parameter should depend on the air agitation ratio of the unit and temperature variations in the sector to be air conditioned.

## ORDER OF COMPONENTS IN REGULATION

### Cooling operation

**Setpoint 58 = Off**  
Damper → Water coil → Compressors

**Setpoint 58 = On**  
Damper → Compressors → Water coil

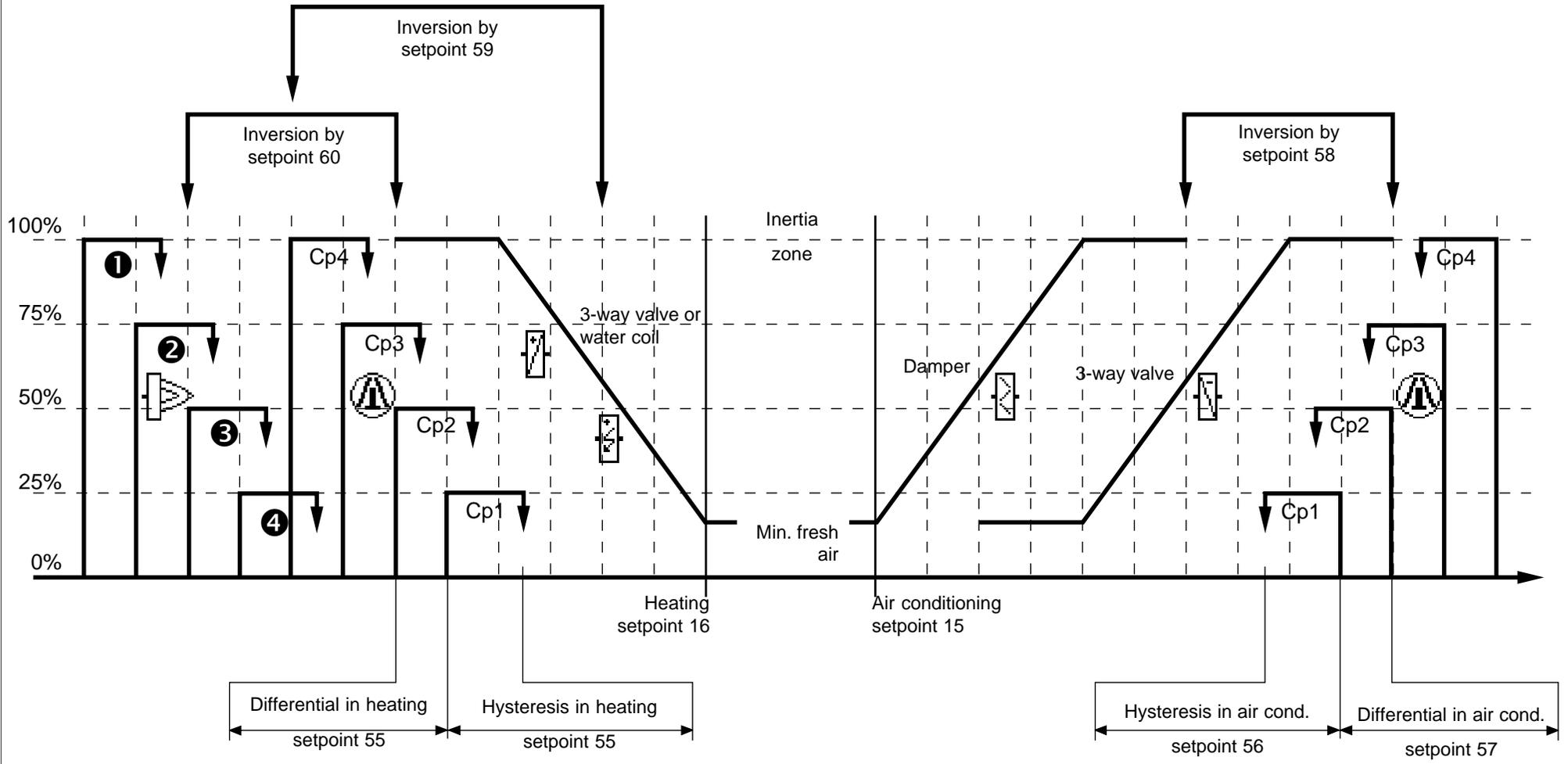
### Heating operation

**Setpoint 59 = Off**  
Water coil or electric coil → Compressors → Gas

**Setpoint 59 = On**  
Compressors → Gas → Water coil or electric coil

**Setpoint 60 = Off**  
Water coil or electric coil → Gas → Compressors

**Setpoint 60 = On**  
Water coil or electric coil → Compressors → Gas



- ❶ : Gas 2 + Gas 1
- ❷ : Gas 2 + 1/2 Gas 1
- ❸ : Gas 1
- ❹ : 1/2 Gas 1

Cp1...Cp4 : Compressor no. 1...4

Figure 79



## REGULATION OF SUPPLY AIR

Supplying air regulation should be activated by setting setpoint 61 to ON.

The main aim of supplying air regulation is to maintain the temperature of supplied air at a value close to the average of the neutral zone, if ambient air regulation is not active.

Two power factors, one for cooling (variable 101), and the other for heating (variable 100), are calculated according to the difference in temperature between the setpoint and the reference temperature.

The power factors are periodically recalculated by the CLIMATIC™. The integration time (setpoint 62) is adjustable

## REGULATION IN HUMIDITY

Two power factors, one for dehumidifying (variable 105), the other for humidifying (variable 104), are calculated according to the difference in relative hygrometry between the setpoint and the reference relative hygrometry.

The power factors are recalculated periodically by the CLIMATIC™. The integration time is adjustable (setpoint 67).

## ORDER OF COMPONENTS IN REGULATION

### Cooling operation

Setpoint 63 = Off  
Damper → Water coil → Compressors

Setpoint 63 = On  
Damper → Compressors → Water coil

### Heating operation

Setpoint 64 = Off  
Water coil or electric coil → Compressors → Gas

Setpoint 64 = On  
Compressors → Gas → Water coil or electric coil

Setpoint 65 = Off  
Water coil or electric coil → Gas → Compressors

Setpoint 65 = On  
Water coil or electric coil → Compressors → Gas

## BLOWING REGULATION BY AIR DAMPER

Regulation of air supplying by the air damper must be activated by setting setpoint 66 to ON.

The aim of air supplying regulation by the air damper is to even out the temperature of supplied air to a value close to the average of the neutral zone.

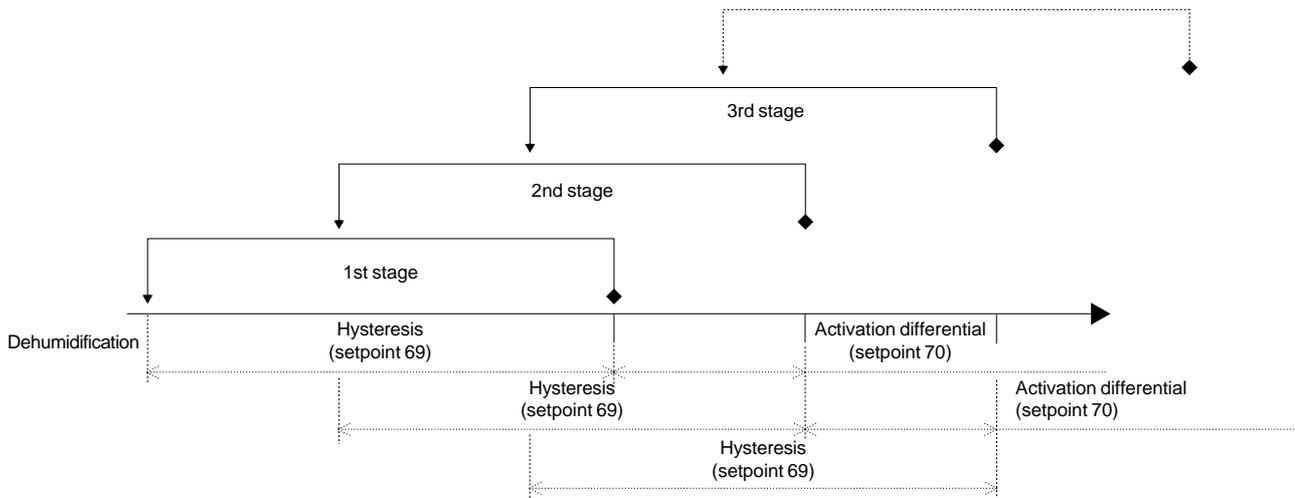
This function is not taken into account if blowing regulation is active.

A power factor (variable 'R\_Supply\_Damper') is calculated according to difference in temperature between the setpoint and the ambient and outside temperatures.

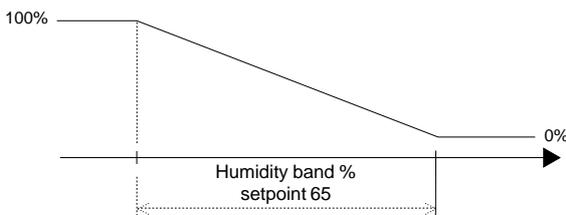
The progression of the power factor is limited by the maximum percentage of fresh air (setpoint 78) if the outside temperature is less than the minimum outside air temperature (setpoint 76).

The power factor is recalculated periodically by the CLIMATIC™. The integration time is adjustable (setpoint 62).

**REGULATION IN DEHUMIDIFYING**



**REGULATION IN HUMIDIFYING**

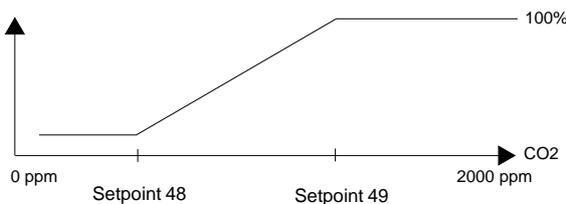


**SETTING THE FRESH AIR MINIMUM**

The minimum value for opening the damper to outside air can be set by instruction (see configuration of operating zones). This value is expressed directly as a percentage.

**CO<sup>2</sup> SENSOR**

Where a CO<sup>2</sup> sensor is connected to the unit, the value of the fresh air minimum is calculated according to the CO<sup>2</sup> ratio. The value measured by the sensor can be read in variable 17.



Setpoint 48 defines the number of ppm up to which the fresh air minimum is still achieved. Setpoint 49 defines the number of ppm from which 100% fresh air is used.

**ENTHALPY FUNCTION**

This function is used to control the use of the economiser register according to air enthalpy. If the outside hygrometry is greater than the inside hygrometry, the respective enthalpy values are then calculated. According to the result obtained, input of new air is optimised.

**COMPRESSOR-RELATED FUNCTIONS**

**Anti-short cycle**

The CLIMATIC™ provides protection of the compressors against frequent restarts. This is why the compressors cannot be started, even if requested to do so by regulation, unless the time since they were last put into operation is greater than six minutes.

**Equalisation of compressor operating times (F series)**

The CLIMATIC™ program is organised to equalise compressor operating times

**Defrost function**

For heat pump units and air condensation units, cycle inversion phases are programmed for defrosting the outside coil.

Defrosting is activated depending on :

- outside temperature (limit set by setpoint 85),
- coil temperature (limit set by setpoint 86),
- with overall weighting by an icing constant (setpoint 87).

<b>000</b>	No error
<b>001</b>	Failure air flow
<b>004</b>	Dirty filters
<b>005</b>	Missing filters
<b>011</b>	Faulty electrical heater batteries
<b>012</b>	Supply air overtemperature
<b>013</b>	Temperature too low
<b>014</b>	Faulty gas burner no. 1
<b>015</b>	Faulty gas burner no. 2
<b>022</b>	Supply temperature too low
<b>023</b>	Room overtemperature
<b>031</b>	Faulty humidifier
<b>032</b>	Room humidity too low
<b>033</b>	Room overtemperature
<b>041</b>	Faulty pump
<b>081</b>	Faulty return air or room temperature sensor
<b>082</b>	Faulty return air or room relative humidity sensor
<b>083</b>	Faulty outside temperature sensor
<b>084</b>	Faulty outside relative humidity sensor
<b>085</b>	Faulty supply air temperature sensor
<b>086</b>	Faulty cold water loop temperature sensor
<b>087</b>	Faulty water condenser outlet temperature sensor
<b>091</b>	Faulty blower fan
<b>092</b>	Faulty condenser : system 1 or 2
<b>093</b>	Faulty condenser : system 3 or 4
<b>094</b>	Customer error
<b>095</b>	Water leak
<b>096</b>	Condenser water temperature too low
<b>097</b>	Condenser water overtemperature
<b>098</b>	Faulty water flow
<b>099</b>	Error : smoke
<b>111</b>	Faulty condensation temperature sensor no. 1
<b>112</b>	Faulty pressure transmitter no. 1
<b>113</b>	Faulty frost power temperature sensor no. 1
<b>115</b>	Faulty high pressure or faulty electrical compressor no. 1
<b>117</b>	Faulty low pressure compressor no. 1
<b>121</b>	Faulty condenser temperature sensor no. 2
<b>122</b>	Faulty pressure transmitter no. 2
<b>123</b>	Faulty frost temperature sensor no. 2
<b>125</b>	Faulty high pressure or faulty electrical power compressor no. 2
<b>127</b>	Faulty low pressure compressor no. 2
<b>131</b>	Faulty condenser temperature sensor no. 3
<b>132</b>	Faulty pressure transmitter no. 3
<b>133</b>	Faulty frost temperature sensor no. 3
<b>135</b>	Faulty high pressure or faulty electrical power compressor no. 3
<b>137</b>	Faulty low pressure compressor no. 3
<b>141</b>	Faulty condenser temperature sensor no. 4
<b>142</b>	Faulty pressure transmitter no. 4
<b>143</b>	Faulty frost temperature sensor no. 4
<b>145</b>	Faulty high pressure or faulty electrical power compressor no. 4
<b>147</b>	Faulty low pressure compressor no. 4

The following text includes references such as [C11] and [V25]. They relate to the threshold or variable numbers used with the KP02 unit.

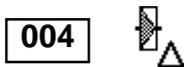
### **Wrong Air Flow**



If the pressure differential obtained by the analog sensor [V16] is less than the setpoint value [C92] for more than 20 seconds, and if the blower fan has operated for more than 1 minute 30 seconds, the air flow safety system is activated and stops the ventilation.

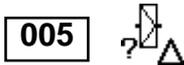
The air flow safety system automatically stops after 1 minute 30 seconds and is automatically locked out after 3 cut-outs in the same day. In this case a manual reset is obligatory. The cut-out counter is reset to zero every evening at 20:00 if the value does not exceed 3 failures.

### **Dirty Filters**



If the pressure differential obtained by the analog sensor [V16] is greater than the setpoint value [C93] for more than one minute, the CLIMATIC™ indicates that the filters are dirty. The unit is not stopped.

### **Missing Filters**



If the pressure differential obtained by the analog sensor [V16] is less than the setpoint value [C94] for more than one minute, the CLIMATIC™ indicates that the filters are missing. The unit is not stopped.

## **SUPPLY AIR TEMPERATURE SAFETY SYSTEM**

### **Supply Air Overtemperature Limit**

#### ***1st Safety Level***

If the supply air temperature is greater than or equal to the setpoint [C74], the heat control system starts to reduce progressively. The control cycle will recommence normal operation for a temperature lower than 3°C below this setpoint.

#### ***2nd Safety Level***

If the supply air temperature is greater than or equal to the setpoint [C75], the safety system is activated. The safety system automatically stops at a temperature lower than 3°C below this setpoint.



### **Supply Air Temperature Too Low**

#### ***1st Safety Level***

If the supply air temperature is greater than or equal to the setpoint [C71], the cold control system starts to reduce progressively. The control cycle will recommence normal operation for a temperature in excess of 3°C above this setpoint.

#### ***2nd Safety Level***

If the supply air temperature is less than or equal to the setpoint [C72], the unit automatically positions its fresh air damper to the all air recycled position and cuts out cold production. This safety level automatically stops at a temperature in excess of 3°C above this setpoint.

#### ***3rd Safety Level***

If the supply air temperature is less than or equal to the setpoint [C73] for more than 15 minutes and for 15 minutes after the fan has started, the "supply air temperature too low" safety system is activated. The unit shuts down completely.

This safety system cuts out if the supply air temperature is greater than 3°C above this setpoint. It is automatically maintained after 3 cut-outs in the same day, and in this case a manual reset is obligatory. The cut-out counter is reset to zero every evening at 20:00 if the value does not exceed 3 failures.



NOTE : If a unit has a hot water battery, the temperature setpoint value is fixed at +6°C and the

register time set to 5 seconds. In addition, if the antifreeze thermostat is opened, the 3rd safety level is immediately automatically maintained. In this case, manual resetting of the thermostat followed by the CLIMATIC™ is obligatory

### Room Overtemperature Safety System



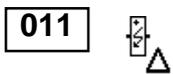
#### **Upper Room Air Limit**

If the room temperature is greater than or equal to the setpoint [C41], the safety system is activated. It automatically cuts out at a temperature lower than 3°C below this setpoint.



#### **Lower Room Air Limit**

If the room temperature is less than or equal to the setpoint [C40], the safety system is activate

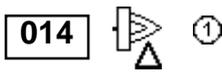


#### **Faulty Electrical Heater Batteries**

The electrical heater battery safety thermostats act directly on the heater stage contactors. This information is fed to the CLIMATIC™ via auxiliary contacts.

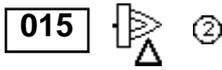
If the CLIMATIC™ gives the order to the heater to operate and if 5 seconds later the auxiliary contact is still open, the heat safety system is activated and stops the electrical heater assembly. This safety system is automatically locked-out. In this case a manual reset is obligatory.

Note: This fault is also displayed in the event of a contact "shunt".



#### **Faulty Gas Burners**

If there is a fault with the gas control boxes the heat safety system is activated and stops the respective burner.



This safety system automatically cuts out on the CLIMATIC™ and the control unit must be manually reset.



#### **Faulty Humidifier (Flexy Only)**

If there is a fault with the gas control unit for more than a minute, the safety system is activated and stops the humidifier.

This safety system is automatically locked-out. In this case a manual reset is obligatory.

### Room Humidity Safety System



#### **Lower Room Limit**

If the room humidity is less than or equal to the setpoint [C42] or [C44], the safety system is activated. It automatically cuts out at a humidity of 3% above this setpoint.



#### **Upper Room Limit**

If the room humidity is greater than or equal to the setpoint [C43] or [C45], the safety system is activated. It automatically cuts out at a humidity of 3% below this setpoint.



#### **Faulty Pump**

The internal protection of the water pump motor acts directly on the pump contactor. This information is transmitted to the CLIMATIC™ via an auxiliary contact of the contactor.

If the CLIMATIC™ gives the pump the order to operate and if 5 seconds later the auxiliary contact remains open, the safety system is activated and stops the pump.

The safety system is immediately automatically locked out. In this case, manual resetting is obligatory.

Note: This error is also displayed in the event of a "shunt" of the auxiliary contact of the contactor.

**Sensor Status**

081			Room temperature sensor missing or faulty.
082			Room relative humidity sensor missing or faulty
083			Outside air temperature sensor faulty
084			Outside relative humidity sensor faulty
085			Supply Air temperature sensor faulty
086			Temperature sensor on cold water loop faulty
087			Temperature sensor on condenser water outlet faulty.

**NOTE :**

Missing or faulty room, supply air or outside air temperature sensors can affect the overall control system. A safety device will be activated and all equipment except for the ventilation will cut out. Failure of the other sensors will only stop the equipment involved.

**089****Faulty inter card link**

The inter card link is faulty or missing.

**Faulty blower fan**

The fan contactor is not connected although the CLIMATIC™ requests it.

- The thermostat fire safety mechanism, or the fire insertion, is open.
- The internal protection of the blower fan motor is open.

The fire detector and the fan motor internal protection act directly on the fan motor contactor. This information is transmitted to the CLIMATIC™ via an auxiliary contact of the contactor. If the CLIMATIC™ gives the order to operate to the fan and if the auxiliary contact is still open 5 seconds later, the fan safety system is activated and stops the unit.

The safety system is immediately automatically locked out. In this case, manual resetting is obligatory.

If a unit is fitted with an all-or-nothing servomotor-powered damper, the detection time extends to 2 minutes (Flexy™ only).

**Note :** This error is also displayed in the event of a "shunt" of the auxiliary contact of the contactor.

**091****Faulty ventilation, condenser circuit 1 or 2**

The fan contactor is not connected although the CLIMATIC™ requests it.

The fan motor internal protection acts directly on the fan motor contactor. This information is transmitted to the CLIMATIC™ via an auxiliary contact of the contactor.

If the CLIMATIC™ gives the order to operate to the fan and if the auxiliary contact is still open 5 seconds later, the fan safety system is activated and stops the condenser fan and the compressors concerned.

The safety system is immediately automatically locked out. In this case, manual resetting is obligatory.

**092****Faulty ventilation, condenser circuit 3 or 4**

The fan contactor is not connected although the CLIMATIC™ requests it.

The fan motor internal protection acts directly on the fan motor contactor. This information is transmitted to the CLIMATIC™ via an auxiliary contact of the contactor.

If the CLIMATIC™ gives the order to operate to the fan and if the auxiliary contact is still open 5 seconds later, the fan safety system is activated and stops the condenser fan and the compressors concerned.

The safety system is immediately automatically setpoint. In this case, manual resetting is obligatory.

**093**

**094****Customer error**

A fault has been detected, external to the unit.

**095****Water leak**

If the contact of the water leak detection card is closed for more than 30 seconds, the safety system is activated.

**WATER HEAT EXCHANGER OUTLET TEMPERATURE SAFETY SYSTEM.****Condenser Water Temperature Too Low****096**

If the temperature of the water loop is less than or equal to the preset setpoint **[C89]** during the operation of one of the compressors, the condenser safety mechanism is applied. The compressors are stopped.

This safety mechanism automatically cuts out if the loop temperature exceeds 4°C from this setpoint.

It is also automatically locked out after 3 failures within a day. In this case, manual resetting is obligatory. The counter is reset to zero every evening at 20:00 if its value does not exceed 3 failures.

**Condenser Water Temperature Too High****096**

The temperature of the water loop is greater than or equal to the preset setpoint **[C90]** during the operation of one of the compressors, the condenser safety mechanism is applied. The compressors are stopped.

This safety mechanism automatically cuts out if the loop temperature is less than 4°C from this setpoint.

It is also automatically locked out after 3 failures within a day. In this case, manual resetting is obligatory. The counter is reset to zero every evening at 20:00 if its value does not exceed 3 failures.

**Faulty Water Flow****098**

If the contact of the water flow controller is open for more than 20 seconds, the condenser safety mechanism is applied. The compressors are stopped.

This safety mechanism automatically cuts out if the loop temperature is less than 4°C from this setpoint.

It is also automatically locked out after 3 failures within a day. In this case, manual resetting is obligatory. The meter is reset to zero every evening at 20:00 if its value does not exceed 3 failures.

**Error : Smoke****099**

If the contact closes due to the smoke detector card, the smoke safety mechanism is activated. The unit is completely shut down and the fresh air louver is set to the fresh air position.

This safety mechanism is automatically locked out. In this case, manual resetting is obligatory.

**Refrigeration system faults**

<b>111</b>			①	
<b>121</b>			②	Faulty condenser temperature sensor
<b>131</b>			③	
<b>141</b>			④	
<b>112</b>			①	
<b>122</b>			②	Faulty pressure transmitter sensor, refrigeration system
<b>132</b>			③	
<b>142</b>			④	
<b>113</b>			①	
<b>123</b>			②	Faulty refrigeration system, frost temperature sensor
<b>133</b>			③	
<b>143</b>			④	

**High pressure switch safety or compressor electrical safety**

<b>115</b>		①	The compressor contactor is not connected although the CLIMATIC™ requests it. - The high pressure pressostat is open. - The internal protection of the compressor motor is open.
<b>125</b>		②	The high pressure pressostat and the compressor motor thermal protection act directly on the compressor contactor. This information is transmitted to the CLIMATIC™ via an auxiliary contact of the contactor.
<b>135</b>		③	If the CLIMATIC™ gives the order to operate to the compressor and if the auxiliary contact is still open 5 seconds later, the fan safety system is activated and stops the compressor. The safety system automatically cuts out after 4 minutes.
<b>145</b>		④	It is also automatically locked out after 3 failures within a day. In this case, manual resetting is obligatory. The counter is reset to zero every evening at 20:00 if its value does not exceed 3 failures.

**Faulty low pressure compressor**

<b>117</b>		①	If the low pressure pressostat is open and the compressor has been operating for more than 2 minutes, the low pressure safety system is activated and stops the compressor. This safety system is not taken into account during the defrost cycle for the heat pump units.
<b>127</b>		②	The compressor is engaged when the pressostat contact closes.
<b>137</b>		③	It is also automatically locked out after 3 failures within a day. In this case, manual resetting is obligatory. The counter is reset to zero every evening at 20:00 if its value does not exceed 3 failures.
<b>147</b>		④	



- The network voltage should not vary from + or - 10 % of the supply required for the equipment,
- The supply variation between the phases should never exceed + or - 3 %.

1. Check that there is current in the electrical panel,
2. Check that the filters are not clogged,
3. Make sure the fans are in good working order (belts tensioned, etc...),
4. Test the operation of the compressor(s),
5. If the equipment is fitted with an electrical reset safety mechanism, reset it and test to see if the fault re-occurs. If so, have the following checks performed by trained personnel.

## MAIN OPERATING FAULTS

### No Air Flow (blower side)

**Problem :**

- Low performance.
- Danger of one or more compressors cutting out (low pressure switch cutout).
- Danger of evaporator freezing.
- Possible cutout of the electrical heaters safety thermostat.

**Cause :**

- The blow sleeve assemblies drop their load excessively (sleeves too small, closed valves, obstacle).
- Blocked filters or coils.
- Wrongly tensioned or broken belts.

**Solution :**

- Check the sleeve assemblies.
  - Check the filters, coils and service them, if necessary.
  - Check the belts, re-tension or replace them, if necessary.
- 

### No Air Flow (condenser side)

**Problem :**

- Compressor cutout (high pressure switches).

**Cause :**

- Dirty coils.
- One or more fans do not work properly.

**Solution :**

- Clean the coil.
  - Change one or more faulty fans.
- 

### Fan stops following thermal relay cutout (indicated via an error code)

**Problem :**

- The fan and the compressors are not working.

**Cause :**

- Drive absorbed power too high:
  - Air flow too high.
  - Belts over tensioned.
  - Bearing seized.
  - Phase Lost
  - Supply voltage too low or unbalanced phases (+/- 3%).

**Solution :**

- Reset the thermal relay.
  - If the error recurs:
    - Check the thermal relay setting (it must correspond to the rated current shown on the drive plate).
    - Check the flow, belts and bearings.
    - Check the supply voltage.
- 

### Stopping compressor (indicated via an error code)

**Problem :**

- Thermal or freezing process drops or stops,

**Causes :**

- The compressor absorbs very high current (very hot air on the evaporator and condenser inlet, missing flow, voltage too low or unbalanced phases (+/- 3%).
- The compressor is manually out of action.
- The coil thermal safety is open.
- The compressor is powered by two phases instead of three.

**Solution :**

- Try to restart when the compressor is cold. If the fault recurs:
    - Check the air flows (see lack of air flow).
    - Check that the fans are working properly and the outer heat exchangers are clean.
    - Check the supply voltage.
    - If the compressor is manually out of action, replace it.
-

**The unit no longer works****Cause :**

- No supply voltage.
- Ruptured remote control fuses.
- Wrong connections.

**Solution :**

- Check the supply voltage.
  - Check the fuses.
  - Check and tighten the connections.
- 

**The fan rotates but the compressor does not work****Problem :**

- The air rerun conditions are not followed.

**Cause :**

- The control does not engage the compressor(s), a pressure switch has tripped.
- The drive of the compressor(s) is out of action.

**Solution :**

- Check the control supply voltage.
  - Check the connections.
  - Reset the pressure switches (electrical control only).
  - Check the compressor supply voltage.
  - See previous sections.
- 

**Refrigerant fluid level too low****Problem :**

- Evaporator partly frozen.
- Low pressure switch cutout.

**Cause:**

- Refrigerant liquid leak.

**Action:**

- Search for leaks, repair if necessary and add some refrigerant liquid.
- 

**The electrical heater battery is not powered****Problem :**

- Variable temperatures,

**Cause :**

- One or more fuses are ruptured.
- The safety thermostat is open (temperature is too high due to insufficient air flow),

**Solution :**

- Check the electrical supply and fuses.
  - Check the ohmic values.
  - Reset the safety thermostat and check the air flow (first section)
-

Regular maintenance of your Rooftop will extend its operating life and reduce operating faults. We recommend that the unit is serviced by a trained refrigeration engineer.

A log book kept near the equipment detailing work carried out, by whom and when, is an excellent diagnostic tool.

The panel opening key is required for this work (see "TRANSPORT").

## MOTOR-FAN ASSEMBLY

After 50 operating hours check the belt tension and the pulley screws for tightness. Repeat this check every two months.

The fans contain bearings that are "lubricated for life", but we recommend replacing them every 10,000 operating hours.

During this inspection, check the condition of the anti-vibration mounts, by looking for any cracks or signs of abnormal wear.

## FILTERS

The filters fitted as standard are manufactured with a washable and recyclable material. The CLIMATIC™ indicates if they are blocked. The cleaning schedule is directly related to the environment in which the equipment is operated. However, monthly cleaning is recommended. A blocked filter will reduce the performance and reliability of the Rooftop.

After removing the filters, remove any dust and wash them in a tepid water solution with a little liquid detergent. After rinsing in fresh water, leave the filters to dry. Take all necessary precautions during operation to avoid damaging or piercing the media, as this would require the damaged cell to be replaced.

**NOTE : The equipment must never be operated with the filters removed.**

To avoid prolonged shutdown, always keep a spare filter set.

## HEAT EXCHANGERS

The performance of your equipment is directly linked to the state of the heat exchangers, and it is therefore important to ensure that they are cleaned regularly.

## EVAPORATOR COIL (INTERNAL)

The exchange area must be kept clean at all times. It is protected by the filters. If the filters are well maintained, the coil will only require occasional general cleaning.

A brief inspection should be carried out when servicing the filters.

## CONDENSER COIL (EXTERNAL)

The condenser coil is not protected by the filters. The cleaning schedule is directly related to the environment in which the equipment is operated. A brief inspection should be carried out when servicing the machine. Cleaning can be performed using compressed air or a soft brush. Maximum caution is needed as the aluminium fins are relatively fragile.

However, this type of cleaning is sometimes difficult and relatively ineffective because the clogging is caused by a

mixture of grease vapour and powder. For this reason we would recommend cleaning with PRESTOSOL, a de-greasing agent with very low toxicity, non-flammable and which does not corrode standard metals.

As a rule, it is sufficient to apply the product to the fins, moving up and down and from left to right (as if you were painting it). If the coil is very blocked, it may be necessary to wait a few minutes after first applying the product and then continue.

This cleaning must be performed when the machine is switched off. In addition, prior to restarting the machine, we recommend waiting until the coil is fully drained and the solvent has totally evaporated.

## HOT WATER COIL

At the start of the heating season, check the following :

- There is sufficient water in the system
- The coil has been correctly drained
- The percentage of antifreeze proportion is sufficient for the degree of protection required.

## CONDENSATE TRAY AND DRAIN TRAP

The trap must be free of sediment and dirt which could block the movement of condensation. Check that the siphon is not obstructed. This inspection must be carried out at least once a year, preferably at the start of the air-conditioning season.

## GAS BURNER

Once a year, before the heating season, clean the burners and the exchanger pipes using a nylon brush, the smoke box and the extraction fan.

Check that the air inlet pipe to the safety thermostats is not obstructed.

Check and adjust if necessary the min./max. pressure settings on the controllers.

Check the position of the ionisation sensors and check the ignition electrode.

To disassemble the burner, refer to the "GAS BURNER" section.

## ELECTRICAL TERMINALS

At least once a year :

- Power down the machine, blow away any dust from inside the unit, and check and tighten if necessary the connections.
- Power up the machine, test the safety mechanisms.
- An analysis of the terminal in operating mode can throw light on any strange noises from the contactors or other units. Foreign bodies can disrupt the operation of the components and causes noisy vibration.

**To avoid accidents, remember that this type of maintenance requires electrical expertise.**



## REFRIGERATION CIRCUITS

At least once a year, carry out an in-depth inspection of the refrigerant circuits.

In addition, before each season (or every 3 months if used permanently) the tasks listed in the maintenance contract must be performed, i.e. check the refrigerant charge, evaporation and condensing temperatures etc...

This work must be carried out by a trained refrigeration engineer. We shall therefore keep the details of the work and the type of checks to be performed to a minimum.

**REFRIGERANT CHARGES valid for R407c and R22**

Gamme FC/FH/FG/FD			Gamme FX		
Size	Nbr of circuits	kg	Size	Nbr of circuits	kg
50	1	9	25	2	2 x 4
60	2	7 + 7	30	2	2 x 4
70	2	8,5 + 8,5	35	2	2 x 5
85	2	13 + 13	40	2	2 x 6
100	2	13 + 13	55	2	2 x 6
120	2 + 1	(8 + 7,5) + 11	70	2	2 x 10
140	2 + 1	(9 + 9) + 11	85	2	2 x 11
160	4	4 x 11	100	2	2 x 12
190	4	4 x 11	110	4	4 x 7
			140	4	4 x 7,5
			170	4	4 x 8,5

**IN ACCORDANCE WITH THE LAW  
REFRIGERATION FLUIDS MUST BE COLLECTED.  
DEGASSING INTO THE ATMOSPHERE IS  
FORBIDDEN.**



**GENERAL**

At least once a year after winter the equipment casing must be cleaned, inspected and if necessary treated for corrosion.

The equipment casing is made of aluminium-zinc plate, with a polyester finish and oven-treated powder, and is ultra-violet resistant. The assembly is fixed with stainless steel rivets. Any corrosion can only be caused by scratches incurred on assembly or during maintenance of the Rooftop.

**MAINTENANCE SCHEDULE**

**NOTE :**

6 monthly maintenance is performed when changing from the heating season to the air-conditioning season and vice-versa. Annual maintenance is performed just before the start of the air-conditioning season or the heating season, depending on the unit.

	After 50 hours	2 months	3 months	6 months	Annually
Fan motor assembly	X				
Gas burner					X
Terminal unit					X
<b>Air-conditioning only</b>					
Filters and internal coil		X			
External coil					X
Hot water coil					X
Condensate tray					X
Refrigerant system					X
<b>Permanent operation</b>					
Filters and internal coil		X			
External coil				X	
Condensate tray				X	
Refrigerant system				X	