LENNOX®

CONTROL AND REGULATION
WITH CLIMATIC

RT

GENERAL PROGRAM
Version 3

ROOFTOP
Air conditioning unit

Version anglaise

CONTENTS

THE CLIMATIC.

Characteristics.

Outputs.

Potential free all-or-nothing actuator

Contact limits:
AC: 10 A 25O V resistive load
    4 A 250 V resistive load.
With an inductive load, an RC (resistive capacitative) circuit must be installed on the terminals.

Analogue output

Supplies a voltage of 0 to 10 Volt dc.

Inputs.   (Shielded wire is mandatory)

Resistive sensor:

C.T.N. measurement range: 200 Ω to 600 KΩ

Display.

The display has 5 keys :

$\boxed{+}$: By pressing this key, the values of the setpoints and variables displayed can be increased.

$\boxed{-}$: By pressing this key, the values of the setpoints and variables displayed can be decreased.

$\boxed{H}$: Enables readout and adjustment of hours, minutes and days.

Setting the time on the CLIMATIC control:

00:00   Press the H key once, The time is displayed.

00:   Press the H key a second time H, the hours are displayed. Modify using + or -.

:00   Press the H key a third time, the minutes are displayed. Modify using + or -.

0   press the H key a fourth time, the day of the week is displayed. Modify using + or -.

   Note.: Sunday = 1, Monday = 2, ... , Saturday = 7

$\boxed{C}$: Enables access to and modification of the setpoints. These variables are displayed in the corresponding units.
When the key is pressed, the setpoint number (00 to 15) appears, when the key is released, the value of the variable is displayed.
Each press of the C key scrolls up the next setpoint. The value of the setpoint displayed can be modified with the + and - keys.

$\boxed{V}$: This key gives access to internal variables. When it is pressed, the number of the variable is displayed and when it is released, the value of that variable is displayed.
To change addresses, use the + and - keys.

Remark :

A **manual** reset procedure requiring the user to press several keys simultaneously may be necessary to clear certain defaults.

To check the wiring to a board input, call up the address corresponding to the sensor or contact.

Analysis of information :

When the pointer points to an address between 0 and 15, one of the following cases applies :
- if the board input is shorted, the figure 99,5 will be displayed.
- if the board input is open ended, the figure -28 will be displayed.
- if a sensor or resistance is placed between the two terminals, a temperature will be displayed.

If a contact is wired without a sensor,
- if the contact is closed, the figure 1 is displayed if the unit is L (logic), or 255 if the unit is U (unit).
- if the contact is open, the figure 0 is displayed if the unit is L (logic), 000 if the unit is U (unit).

CLIMATIC RS 232 LINK

CLIMATIC boards can be connected with a 4 wire link to a personal computer either directly, or using a phone modem, or to a programmable automated system in J-BUS mode via a bridge.
If such a connection is made, all the CLIMATIC variables can be monitored, or modified if necessary from a remote location.

CLIMATIC control variables

Units

CLIMATIC variables can be used under four types of units:

$\boxed{/C}$: this unit is used to express temperature values (amounts). The CLIMATIC control works with a temperature range from -28.0 to 99.5 in increments of 0,5.
This units can be recognised on the display by the presence of the decimal point.

$\boxed{/K}$: this unit is used to express temperature differences. The CLIMATIC works with a range from 000.0 to 127.5 in increments of 0,5.
This unit can be recognised by the presence of a decimal point and by display of 3 digits for the whole number part.

$\boxed{/U}$: this unit enables visualisation of amounts (percentages, times, counter values, The CLIMATIC works with a range from 000 to 255 in increments of 1.
These units can be recognised on the display by the absence of the decimal point.

$\boxed{/N}$: this unit is identical to /U units.

Variables using these units are not visible on the display.

$\boxed{/L}$: this unit enables visualisation of logic values 'OFF' 0 or 'ON' 1

This unit can be recognised by the presence of a figure 0 or a figure 1.

Organisation of variables

The Z80 microprocessor manages 256 internal variables.

Distribution of the variables is as follows:

from variable nr 000 to variable nr 015   Temperature sensor inputs
from variable nr 016 to variable nr 031   Hygrometry sensor inputs or potential free contacts
from variable nr 032 to variable nr 120   Operating variables, not stored on shutdown
from variable nr 121 to variable nr 122   Analogue output values 000=0V / 255=10V
from variable nr 123 to variable nr 127   Hour counter on-off status

from variable nr 128 to variable nr 143   Logic outputs (relays)
from variable nr 144 to variable nr 175   Pre-assigned variables

from variable nr 176 to variable nr 178   1st hour counter, stored on shutdown
from variable nr 179 to variable nr 181   2nd hour counter, stored on shutdown
from variable nr 182 to variable nr 184   3rd hour counter, stored on shutdown
from variable nr 185 to variable nr 187   4th hour counter, stored on shutdown
from variable nr 188 to variable nr 190   5th hour counter, stored on shutdown
from variable nr 192 to variable nr 207   Setpoints, stored on shutdown
from variable nr 208 to variable nr 223   Inter-board variables, stored on shutdown
from variable nr 224 to variable nr 255   Operating variables, stored on shutdown

All variables stored on shutdown are saved in battery (Li) maintained RAM (6116) in case 12V ac power supply is lost.

A jumper located to the left of the battery
must be placed in position T
when the unit is put into service for the first time.

A read-only memory or EPROM contains the variable management program on the board. Depending on the type of program and the type of unit, use of the variables may be different.

SETPOINTS.

Spt. nr 0	**CONSA**	C	Desired conditioned space temperature	C_1
Spt. nr 1	**MORTE**	K	Dead band between heating and cooling	C_2
Spt. nr 2	**ABAIS**	K	Value of decrease of the CONSA setpoint in Standby or Night mode	
Spt. nr 3	**TROS_DU**	C	Requested dew point temperature for dehumidification	
Spt. nr 4	**TROS_HU** or **T_VOLET**	C	Requested dew point temperature for humidification Minimum outdoor t°. threshold for free-cooling lock-out	
Spt. nr 5	**T_CHAUD**	C	Outdoor t°. threshold for electric heater lock-out	
Spt. nr 6	**T_FROID**	C	Outdoor t°. threshold for compressor operation lock-out	
Spt. nr 7	**MINIAIR**	U	Minimum % of outdoor air intake	C_3
Spt. nr 8	**DV_J**	U	Daily setback time	C_4
Spt. nr 9	**FV_J**	U	Time of return to Normal Operation after Daily Setback	C_5
Spt. nr 10	**DV_H**	U	Time and Day of Weekly Setback	
Spt. nr 11	**FV_H**	U	Time and day of return to Normal after Weekly setback	
Spt. nr 12	**P_ANTI**	U	End of setback anticipation ramp	
Spt. nr 13	**FRIMAIR**	U	Regulation parameters	
Spt. nr 14	**MA_AR_D**	U	On/Off	
Spt. nr 15	**INIT**	U	Initialisation function	
246	**MODE_RT**	U	Configuration setpoint	
247	**M_VOLET**	C	Maximum outdoor t°. threshold for free-cooling lock-out	
248	**T_FR_34**	C	Outdoor air T° threshold setpoint for lockout of mechanical cooling with compressors 3 & 4	
249	**DING_A**	U	Integration duration setpoint	
250	**ENCL_F**	K	Setpoint Cooling regulation initiation threshold	
251	**DIFET_F**	K	Setpoint Cooling regulation differential threshold	
252	**ENCL_C**	K	Setpoint Heating regulation initiation threshold	
253	**DIFET_C**	K	Setpoint Heating regulation differential threshold	

Rapid setpoint call-up on the full message display

To adjust supplementary setpoints (248 to 253) :
Adjust setpoint n°015 to the number of the supplementary setpoint concerned,
then adjust setpoint n°013 to the required value.

Caution :
*For setpoints in **K** units, multiply the setpoint value in nr 013 by 2 :*
(e.g. 1K = 002U)
*For setpoints in **C** units, add 28 to the setpoint value in nr 013 then multiply by 2*
(e.g. 22C ~> (22 + 28) ´ 2 = 100U)

INITIALISATION FUNCTION.

Zeroing of internal CLIMATIC counters is carried out as follows.
Set the INIT setpoint (setpoint nr 015) to the required value, change the setpoint, then press simultaneously on the + & - keys.

INIT = 240 Resets setpoints to factory values INIT = 245 Power up counter = 0 INIT = 250 Fan running hours = 0	INIT = 251 Compressor nr 1 operating hours = 0 INIT = 252 Compressor nr 2 operating hours = 0 INIT = 253 Compressor nr 3 operating hours = 0 INIT = 254 Compressor nr 4 operating hours = 0

CONFIGURATION.

The MODE_RT setpoint enables certain functions to be obtained

bit n°0 : **001** : Fan stoppage in dead band
bit n°1 : **002** : Fan stoppage in dead band after heating
bit n°2 : **004** : No backup resistance heating during defrost
bit n°3 : **008** : HEAT PUMP then 3-way valve
bit n°4 : **016** : Cancellation of the HEAT PUMP function
bit nr 5 : **032** : Operation, Gas then HEAT PUMP
bit nr 6 : **064** : Fan re-start, then Free-cooling in Standby mode
bit nr 7 : **128** : Low capacity operation during the Standby mode
The selection of several functions at the same time is made by adding values together.

ON-OFF FUNCTION.

Variables used :

MA_AR_D	setpoint nr 14, variable nr 206	On/Off
MA_AR	variable nr 096	Unit On/Off status

The system is declared «On» if setpoint nr 14 is at 001.

On units fitted with a display with complete readout,
If the 'Local / Remote' button [S5] is 'ON' then,
The « On » button [S3] at 'ON' will force setpoint nr 14 to a value of 001.
The « Off » button [S3] at 'OFF' will force setpoint nr 14 to a value of 001.

STANDBY FUNCTION.

Variables used :

D_VJ	setpoint nr 08, variable nr 200	adjustment of the start of daily unoccupied period
F_VJ	setpoint nr 09, variable nr 201	adjustment of the end of daily unoccupied period
D_VH	setpoint nr 10, variable nr 202	adjustment of the start of weekly unoccupied period
F_VH	setpoint nr 11, variable nr 203	adjustment of the end of weekly unoccupied period
P_ANTI	setpoint nr 12, variable nr 204	adjustment of the gradient for the anticipation function
ORDI	variable nr 221	information supplied by a B.M.S. Bit nr 0 : forced standby Bit nr 1 : forced standby cancellation
C_VEIL	input 2.0 24EL, variable nr 048	Standby forcing switch
C_RELAN	input 2.1 24EL, variable nr 049	Operation forcing switch
C_NUIT	input 2.5 24EL, variable nr 053	ëNightí function switch
VEILLE	variable nr 098	Standby function
ANTICIP	variable nr 099	Anticipation function
HORSGEL	variable nr 100	Building frost protection function

A weekly and a daily standby function can be programmed via the CLIMATIC control.
The VEILLE variable is ON when the function is activated.

During the standby function, the unit is stopped.

If the unit is fitted with an outdoor air damper, the 2nd level low discharge air safety function restarts unit ventilation *(see discharge air temperature safety).*

As a supplement to the Standby function a building frost protection function, HORSGEL, restarts the unit if indoor temperature drops below +12°c. This function is cancelled once indoor temperature rises back above 16°c.

In addition, anticipated unit restart can be programmed by the CLIMATIC control.

CLIMATIC clock function

If DV_J, setpoint n°08, has a value of 022 and FV_J, setpoint n°09, has a value of 006 then the daily unoccupied period will be activated every day at 22.00 hours until 6.00 hours the next morning.

If DV_H, setpoint n°10, has a value of 207 and FV_H, setpoint n°11, has a value of 082, the weekly unoccupied period will be activated on the 7th day (Saturday) at 20.00 hours [20 7] until the 2nd day (Monday) at 8.00 hours [08 2].

The weekly function takes precedence over the daily function

Full message display

If the 'Local / Remote' button [S5] is 'ON' then
button [S1] at 'ON' will force the unit into Standby (unoccupied) mode

External contact

Closing input 2.0 on the 24EL board forces the unit into Standby mode.

RS-232 / J-BUS

Activation of bit nr 0 in the ORDI variable forces the unit into Standby mode.

CANCELLATION OF STANDBY FUNCTIONS.

CLIMATIC clock

To cancel the daily program, set the DV_J, setpoint nr 08, & FV_J, setpoint nr 09, to the same value.
To cancel the weekly program, set the DV_H, setpoint nr 10, & FV_H, setpoint nr 11, to the same value

Full message display

If the 'Local / Remote' button [S5] is at 'ON' then
Setting button [S2] at 'ON' will cancel any request for Standby mode.

External contact

Closing input 2.1 on the 24EL board cancels any requests for Standby mode.

RS-232 / J-BUS

Activation of bit nr 1 in the ORDI cancels any request for Standby mode.

ANTICIPATED START-UP AT THE END OF STANDBY MODE.

If the Roof-top unit is in standby mode through the action of the CLIMATIC clock, the unit can be restarted before the time set in setpoint, depending on the outdoor air temperature.

The number of hours of anticipation is calculated with the following formula:

$$Nb.d\,heure = \frac{(+10°c - T\_EXT) \times P\_ANTI}{16}$$

For example, if the outdoor air temperature is +0°C, with the loading ramp set at 006 and the end of standby set for 8h00, under these conditions, the number of hours of anticipation = 3, and the Roof-top unit will start at 5h00 instead of 8h00.

« NIGHT » FUNCTION.

If input 2.5 on the 24EL board is closed, or if the Standby function is activated as well as bit nr 7 of the MODE_RT variable, fan operation is maintained. The temperature setpoint is reduced by a value of ABAIS (setpoint nr 02).

CONTROL.

Variables used :

CONSA	setpoint nr 00, variable nr 192	Desired conditioned space temperature
MORTE	setpoint nr 01, variable nr 193	Dead band between heating and cooling
ABAIS	setpoint nr 02, variable nr 194	Value of decrease of CONSA setpoint in Standby or Night mode
T_VOLET	setpoint nr 04, variable nr 196	Minimum outdoor t°. threshold for free-cooling lock-out
T_CHAUD	setpoint nr 05, variable nr 197	Outdoor t°. threshold for electric heater lock-out
T_FROID	setpoint nr 06, variable nr 198	Outdoor t°. threshold for compressor operation lock-out
M_VOLET	setpoint ---- , variable nr 247	Maximum outdoor t°threshold for free-cooling lock-out
T_FR_34	setpoint ---- , variable nr 248	OAT temp. threshold stp. for lockout compressors 3 & 4
DING_A	setpoint ---- , variable nr 249	Integration time
ENCL_F	setpoint ---- , variable nr 250	Setpoint Cooling regulation initiation threshold
DIFET_F	setpoint ---- , variable nr 251	Setpoint Cooling regulation differential threshold
ENCL_C	setpoint ---- , variable nr 252	Setpoint Heating regulation initiation threshold
DIFET_C	setpoint ---- , variable nr 253	Setpoint Heating regulation differential threshold
T_AMB	input X0, variable nr 000	Conditioned space temperature
T_EXT	input X2, variable nr 002	Outdoor air temperature
T_SOUF	input X4, variable nr 004	Discharge temperature
MA_50	input 1.4 24EL, variable nr 044	50% compressor offloading switch
MA_100	input 1.5 24EL, variable nr 045	100% compressor offloading switch
MA_RE	input 1.6 24EL, variable nr 046	100% electric heat offloading switch
MA_BEC	input 1.7 24EL, variable nr 047	Hot water valve offloading switch
C_RNEUF	input 2.2 24EL, variable nr 050	100% outdoor air forcing switch
C_RRECY	input 2.3 24EL, variable nr 051	100% recycled air forcing switch
C_RMINI	input 2.4 24EL, variable nr 052	Minimum outdoor air forcing switch
CONSA_A	variable nr 066	Real value of conditioned space temperature setpoint
CONSA_S	variable nr 067	Real value of discharge air temperature setpoint
MAXI_F	variable nr 069	Maximum number of cooling control stages.
MAXI_C	variable nr 070	Maximum number of heating control stages.
PROF	variable nr 075	Cooling control power factor
PROC	variable nr 076	Heating control power factor
STEP_GF	variable nr 077	Number of compressor stages for cooling operation
STEP_GC	variable nr 078	Number of compressor stages for heating operation
STEP_RC	variable nr 080	Number of electric heat stages
REGUL_F	variable nr 109	Opening of the proportional valve for cooling
REGUL_C	variable nr 110	Opening of the proportional valve for heating

Two power factors, PROF for cooling, and PROC for heating, are calculated based on the difference in temperature between the setpoint and the temperature read by the CLIMATIC control.
For cooling, the reference point is defined as CONSA.
For heating, the reference point is defined as CONSA - MORTE.
Progression of the cooling power factor is limited by the ENCL_F and DIFET_F setpoints.
Progression of the cooling power factor is limited by the ENCL_C and DIFET_C setpoints.
If ENCL_F or ENCL_C has a value of 0, the power factor concerned is no longer limited.

Power factors are periodically recalculated by the CLIMATIC control. Integration time, DING_A is adjustable. This parameter should depend on the unit air throughput rate and temperature variations within the conditioned space.
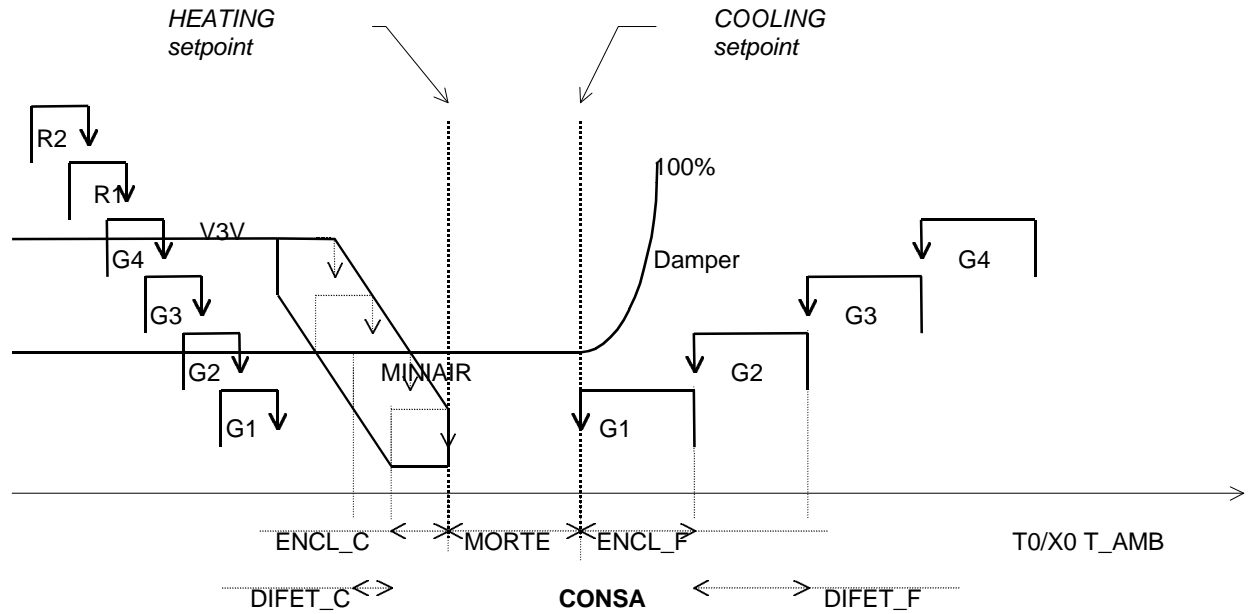
Offsetting the conditioned space temperature setpoint

The required temperature for the conditioned space is adjustable with the CONSA setpoint (setpoint nr 00).
If the unit is connected to a remote control box, the temperature required in the conditioned space can be adjusted with the potentiometer, between +15°c and +25°c. This option should be wired to input X14 on the CLIMATIC control.
If the Standby or Night functions are activated, the setpoint is reduced by the value of the ABAIS setpoint (setpoint nr 02).

Discharge air temperature setpoint calculation (option)

In the case of discharge air temperature control, calculation of the setpoint follows same rules shown above.

OFFLOADING AUTHORISATION.

Economiser

Outdoor air temperature :
The Economiser function is authorised if :
     T_EXT < T_AMB and if T_EXT > Spt. T_VOLET and if T_EXT < Spt. M_VOLET

Enthalpy function.

A calculation of the weight of water in a given volume of air can be made by the CLIMATIC control, if the humidity sensor corresponding to this function is wired to terminals X3. If such is the case, and under certain outdoor air conditions, the economiser function will be locked out and the outdoor air intake damper will be positioned at the minimum outdoor air intake position.

Full message display

If the 'Local / Distance' button [S5] is at 'ON' then
If button [D4] is 'ON' the damper is forced into the « 100% return air recycling » position.
If button[D5] is 'ON' the economiser function is cancelled.
If button[D6] is 'ON' the damper will be forced into the « 100%. Outdoor air » position.

External contact

Closing input 2.3 on the 24EL board forces the damper into the 100% recycled return air position.

Closing input 2.4 on the 24EL board cancels the Economiser function.
Closing input 2.2 de la carte 24EL board forces the damper into the 100% Outdoor Air position.

RS-232 / J-bus

Activation of bit nr 6 in the ORDI variable cancels the Economiser function.

Compressors

Outdoor air temperature

Compressor cooling is authorised if :
        T_EXT > setpoint. T_FROID

Mechanical cooling with compressors 3 & 4 is authorised if
        T_EXT > Spt. T_FR_34

Full message display

If the 'Local / Distance' button [S5] is at 'ON' then
If button [D2] is at 'ON' compressor operation is forced to 50%.
If button [D3] is at 'ON' forces offloading of 100% of compressor operation.

External contact

Closing input 1.4 on the 24EL board forces 50% compressor offloading.
Closing input 1.5 on the 24EL board forces 100% compressor offloading.

RS-232 / J-bus

Activation of bit nr 3 of the ORDI variable forces 50% compressor offloading.
Activation of bit nr 4 of the ORDI variable forces 100% compressor offloading.

Electric resistance heaters / Gas burners

Outdoor air temperature

Electric resistance heater operation is authorised if :
        T_EXT < Setpoint. T_CHAUD or during the defrost phase

Full message display

If the 'Local / Distance' button [S5] is at 'ON' then
If button [D1] is at 'ON' the electric resistance heaters are offloaded 100%.

External contact

Closing input 1.6 on the 24EL board forces 100% offloading of the electric heaters.

RS-232 / J-bus

Activation of bit nr 2 of the ORDI variable forces 100% offloading of the electric heaters.

Hot water heating coil

External contact

  Closing input 1.7 on the 24EL board forces 100% offloading of the heating coil.

RS-232 / J-bus

  Activation of bit nr 5 of the ORDI variable forces 100% offloading of the heating coil.

HUMIDITY CONTROL.

Variables used :

TROS_DU	setpoint nr 03, variable nr 195	Dew point temperature required for dehumidification
TROS_HU	setpoint nr 04, variable nr 196	Dew point temperature required for humidification
H_AMB	input X1, variable nr 017	Relative humidity of conditioned space air
H_EXT	input X3, variable nr 019	Relative humidity of outdoor air
ENTHA	variable nr 083	ëEnthalpyí control function
STEP_DU	variable nr 085	Dehumidification function
STEP_HU	variable nr 086	Humidification function

Enthalpy function

A calculation of the weight of water in a given volume of air can be made by the CLIMATIC control, if the humidity sensor corresponding to this function is wired to terminals X3. If such is the case, and under certain outdoor air conditions, the economiser function will be locked out and the outdoor air intake damper will be positioned at the minimum outdoor air intake position.

Dehumidification and Humidification functions

On RTD type dehumidifying Rooftop units, indoor humidity control is provided.
In this case, relative humidity is calculated according to conditioned space temperature and a dew point temperature threshold provided by the TROS_DU setpoint. If the relative humidity detected in the conditioned space by the CLIMATIC control is greater than the calculated threshold, the dehumidification function is activated.

In the same manner, the TROS_HU setpoint is applied for management of a humidifier.

VENTILATION.

Variables used :

C_PV	Input 2.6 24EL, variable nr 054	Low speed switch
ORDI	variable nr 221	Information provided by the B.M.S. Bit nr 7 : Forced operation at low speed
POST_V	variable nr 097	Duration of post-ventilation in seconds
VENT_S	Trigger J1, CLIMATIC board, variable nr 128	Discharge fan
PV	Trigger A8, 8RS2ANA board, variable nr 136	Low speed

Operation of the discharge fan, also called the air handling fan, depends on the following conditions :
  Unit On/Off status
  Post-ventilation status
  High or low speed status

Low speed

Low speed is an optional feature.

External contact

Closing input 2.6 on the 24EL board forces fan operation at low speed.

RS-232 / J-bus

Activation of bit nr 7 of the ORDI variable forces fan operation at low speed.

Post-ventilation

In the event that one of the compressors or a heating stage is activated the post-ventilation function will force rotation of the fan for 2 minutes after the stop command has been issued.

COMPRESSOR.

Variables used :

T_EXT	input X2, variable nr 002	Outdoor air temperature
T_BP_G1	input X5, variable nr 005	Evaporating temperature, compressor nr 1
T_BP_G2	input X6, variable nr 006	Evaporating temperature, compressor nr 2
T_BP_G3	input X7, variable nr 007	Evaporating temperature, compressor nr 3
T_BP_G4	input X8, variable nr 008	Evaporating temperature, compressor nr 4
DEGI	variable nr 079	Number of the compressor currently on defrost
ANTICC1	variable nr 104	Time in minutes since start-up of compressor nr 1
ANTICC2	variable nr 105	Time in minutes since start-up of compressor nr 2
ANTICC3	variable nr 106	Time in minutes since start-up of compressor 3
ANTICC4	variable nr 107	Time in minutes since start-up of compressor 4
COMP_G1	Trigger J2 CLIMATIC board, variable nr 129	Compressor unit nr 1
COMP_G2	Trigger J3 CLIMATIC board, variable nr 130	Compressor unit nr 2
COMP_G3	Trigger J4 CLIMATIC board, variable nr 131	Compressor unit nr 3
COMP_G4	Trigger J5 CLIMATIC board, variable nr 132	Compressor unit nr 4
INJ_G1	Trigger J4 CLIMATIC board, variable nr 131	Hot gas injection, unit nr 1
INJ_G2	Trigger J5 CLIMATIC board, variable nr 132	Hot gas injection, unit nr 2
VENTC12	Trigger J6 CLIMATIC board, variable nr 133	Condenser fan units nr 1 & nr 2
VENTC34	Trigger J7 CLIMATIC board, variable nr 134	Condenser fan units nr 3 & nr 4
VIC_G12	Trigger A9, 8RS2ANA board, variable nr 137	Cycle changeover valve units nr 1 & nr 2
VIC_G34	Trigger A10, 8RS2ANA board, variable nr 138	Cycle changeover valve units nr 3 & nr 4
TOGEL12	variable nr 242	Freeze-up time, in minutes, of compressor nr 1 & nr 2
TOGEL34	variable nr 243	Freeze-up time, in minutes, of compressor nr 3 & nr 4
TO_DEGI	variable nr 244	Time, in minutes, of the defrost cycle

Anti Short-cycle

The CLIMATIC program includes a function to prevent compressors from being started up too frequently. This totally prohibits compressor start up, even if the control thermostat is calling for cooling, if the time that has elapsed since the previous start up is lower than 6 minutes.
Variables ANTICCx must be at 000 for compressor start up to be authorised.

Compressor operating time equalisation.

The CLIMATIC program is designed to manage compressor operating time equalisation to within four hours.

Defrost function

If the three conditions listed below are met for more than 45 minutes, a defrost cycle will be initiated :

- 1° Operation of the unit in heat pump mode.
- 2° Outdoor air temperature lower than +10°C.
- 3° Compressor suction temperature lower than +2°C

The duration of the cycle is programmed for 2 to 3 minutes, compressor by compressor

If the outdoor air temperature rises back above the +10°C and if the two conditions above were true for 1 minute, a forced defrost cycle is initiated.

ELECTRIC HEATERS.

Variables used :

PROC	variable nr 076	Heating power factor
REGUL_R	variable nr 108	Request for electric heater start-up
STEP_RC	variable nr 080	Number of electric heat stages
CHAU_1	Trigger A11, 8RS2ANA board, variable nr 139	1st stage electric heat
CHAU_2	Trigger A12, 8RS2ANA board, variable nr 140	2nd stage electric heat

The number of stages of backup heating, electric resistance heaters or gas burners, requested by the control depends on the heating power factor.

OUTDOOR AIR DAMPER.

Variables used :

DISPO_V	variable nr 112	Availability of an outdoor air damper
REGUL_V	variable nr 111	Opening of the outdoor air damper
VOLET	Signal 0-10V AN1, 8RS2ANA board, variable nr 122	Proportional air damper

Minimum outdoor air adjustment

The minimum opening value of the outdoor air damper is adjustable via a setpoint. This value is expressed directly as a percentage.
The setpoint can be replaced by the action of a remote potentiometer, from 0% to 100%, an option that can be wired into input X15 of the CLIMATIC control.

Free-Cooling

If the outdoor air temperature is lower than the conditioned space temperature and if enthalpy control authorises it, cooling can be ensured by proportional opening of the outdoor air damper, providing an Economiser function.

PROPORTIONAL VALVE, COOLING, CHILLED WATER COIL

Variables used :

PROF	variable nr 075	Cooling power factor
REGUL_F	variable nr 109	Opening of the proportional valve for cooling
VANNE	Signal 0-10V AN0 board 8RS2ANA, variable nr 121	Proportional cooling or heating valve
CHOFROI	Trigger A15 board 8RS2ANA, variable nr 143	Inversion of proportional cooling or heating valve

The percentage the valve is opened by depends on the cooling power factor.

PROPORTIONAL VALVE, HEATING, HOT WATER HEATING COIL OR TRIAC

Variables used :

PROC	variable nr 076	Heating power factor
REGUL_C	variable nr 110	Opening of the proportional heating valve
VANNE	Signal 0-10V AN0 board 8RS2ANA, variable nr 121	Proportional cooling or heating valve
CHOFROI	Trigger A15 board 8RS2ANA, variable nr 143	Inversion of proportional cooling or heating valve

The percentage the valve is opened by depends on the heating power factor

HUMIDIFIER.

Variables used :

STEP_HU	variable nr 086	Humidification function
HUMIDIF	Trigger A13 board 8RS2ANA, variable nr 141	Humidifier

Humidifier action depends on the CLIMATIC control.

INCIDENT CODES.

000	No incidents	
001	Incorrect airflow	*24EL 0.5*
003	Extraction fan or condenser fan (M) default	*24EL 0.2*
004	Clogged filters	*24EL 0.6*
011	Electric heater default	*24EL 0.1*
012	Discharge air overtemperature	*X4*
014	Default on gas burner nr 1	*24EL 1.0*
015	Default on gas burner nr 2	*24EL 1.1*
017	Gas heat exchanger overtemperature	*24EL 1.3*
022	Discharge air under temperature	*X4*
041	Pump default (X)	*24EL 0.4*
081	Faulty return air or room temperature sensor	*X0*
083	Faulty discharge air temperature sensor	*X4*
084	Faulty outdoor air temperature sensor	*X2*
089	Inter-board link default	*J9*
091	Fan default *(KVS safety chain)*	*24EL 0.0*
094	Customer specific default contact	*24EL 2.7*
095	Water leakage or dehumidifier default	*24EL 1.2*
096	Condenser water under temperature	*X13*
097	Condenser water overtemperature	*X13*
098	Water flow default	*X13*
099	Smoke detection	*24EL 0.7*
115	High pressure default on compressor nr 1 or condenser fans	*X9 or 24EL 0.2*
116	Discharge overtemperature default on compressor nr 1	*X9*
117	Low pressure default on compressor nr 1	*X5*
125	High pressure default on compressor nr 2 or condenser fans	*X10 or 24EL 0.2*
126	Discharge overtemperature default on compressor nr 2	*X10*
127	Low pressure default on compressor nr 2	*X6*
135	High pressure default on compressor nr 3 or condenser fans	*X11 or 24EL 0.3*
136	Discharge overtemperature default on compressor nr 3	*X11*
137	Low pressure default on compressor nr 3	*X7*
145	High pressure default on compressor nr 4 or condenser fans	*X12 or 24EL 0.3*
146	Discharge overtemperature default on compressor nr 4	*X12*
147	Low pressure default on compressor nr 4	*X8*

| 001 | **Incorrect airflow.**
board input 0.5*; Pressure switch SP6* |

Variables used :
P_DA	input 0.5 24EL, variable nr 037	Airflow pressure switch contact status
DEF_VS	variable nr 227	fan safety device monitoring
		Bit nr 1 : Airflow pressure switch
TO_VS	variable nr 235	Airflow cut-out counter

If the contact on the airflow safety pressure switches closes for more than 20 seconds, and the discharge air fan has been running for more than 1 minute 30 seconds, the airflow safety function is activated and the fans are shut down. Incident code **001** is displayed, the general default contact is activated.
The airflow safety function automatically resets itself 1 minute 30 seconds after it has tripped.
This safety condition is held if it happens 3 times in the same day, in which case reset must be done manually. Cut-out counters are reset to zero every evening at 20h.00 if there has been no more than 3 cut-outs.

| 003 | **Extraction and condensing fan default**
24EL board 0.2; KVC |

Variables used :
AUX_VC12	input 0.2 24EL, variable nr 034 condenser fan auxiliary contact status
DEF_CD	variable nr 233	condenser safety device monitoring
		Bit nr 0 : condenser fans

On 'M' type units, a single fan is used for condensing and extraction.
The fan contactor has not cut in despite a request from the CLIMATIC control.
The fan motor thermal safety device *ST36* is open
The thermal protection devices on the condenser fan motors act directly on the condenser fan motor contactors. Information is relayed to the CLIMATIC through the auxiliary contacts on the contactors.
If the CLIMATIC commands fan operation and, five seconds later, the auxiliary contact is still open, condenser fan protection is activated and stops the fans and compressors concerned. Incident code **003** is displayed, the general default contact is activated.
This safety trip out is maintained, and manual reset is mandatory.

| 004 | **Clogged filter information**.
 24EL board 0.6; pressure switch SP5 |

Variables used :
P_FIL	input 0.6 24EL, variable nr 038	filter pressure switch contact status
DEF_VS	variable nr 227	fan safety device monitoring
		Bit nr 0 : Filter pressure switch

If the filter pressure switch opens for more than 1 minute, the CLIMATIC generates a filter dirty default. Incident code **004** is displayed, the general default signal contact is activated, the unit does not shut down.

Discharge air temperature safety
 CLIMATIC X4; BT14; ST41

Variables used :
ST_SOUF	variable nr 225	Discharge air temperature safety
		Bit nr 0 : 1° level high limit
		Bit nr 1 : 1° level low limit
		Bit nr 2 : 2° level low limit
		Bit nr 3 : 3° level low limit
		Bit nr 4 : 2° level low limit
TO_SOUF	variable nr 234	low level limit default counter
		(255u in the case of antifreeze th'stat cut-out)

High air discharge temperature limit

1st safety level

If the air discharge temperature is +40°C or more, heating regulation stages off progressively. The regulation cycle picks up and operates normally once the temperature has dropped back to less

than 35°C.

<div style="border:1px solid;display:inline-block;padding:2px">012</div> 2nd safety level

If the air discharge temperature is +60°C or greater, the safety thermostat is activated. This safety device resets itself automatically when the temperature drops back under 55°C. Incident code 012 is displayed, the general default contact is activated.

Low air discharge temperature limit

1st safety level

If the air discharge temperature is +10°C or lower, cooling regulation is progressively staged off. The regulation cycle picks up and operates normally once the temperature has risen above 15°C.

2nd safety level

If the discharge air temperature is +8°C or lower, the Roof-Top automatically positions its outdoor air damper into the 100% return air position. This safety level is cleared when the temperature rises above +12°C.

<div style="border:1px solid;display:inline-block;padding:2px">022</div> 3rd safety level

If the discharge air temperature is +2°C or lower for more than 15 minutes and 15 minutes after start up of the ventilation, the low discharge air temperature safety thermostat opens and the Roof-Top unit is completely shut down. Incident code **022** is displayed, the general default contact is activated.
This safety protection is cleared when the temperature rises above +15°C. In addition, the fault condition is maintained if the fault occurs three times in the same day, in which case the unit has to be reset manually. This default counter is reset every day at 20.00h if the number of counts has not exceeded 3.

Note: On a Roof-top unit equipped with a hot water heating coil, the temperature limit threshold is set at +6°C and the delay before fault recognition is 5 seconds. In addition, if the antifreeze protection thermostat trips, the 3rd safety level is immediately adopted and held, and the thermostat then the CLIMATIC control have to be manually reset.

<div style="border:1px solid;display:inline-block;padding:2px">011</div> **Electric resistance heater default**
24EL board 0.1; KR1, KR2, ST2, ST3, ST4

Variables used :
AUX_RE	input 0.1 24EL, variable nr 033	Electric resistance heater auxiliary contact status
DEF_RE	variable nr 228	resistance heater safety device monitoring Bit nr 0 : Heater thermal protection

Electric resistance heater safety thermostats (or Klixons), act directly on the heater stage contactors. This information is relayed to the CLIMATIC control by the contactor auxiliary contacts. If the CLIMATIC control commands operation of the electric resistance heaters and if 5 seconds later the auxiliary contact is still open, the electric heater safety function is activated and cuts out all electric heaters. Incident code **011** is displayed, the general default contact is activated.
This safety trip out is maintained, and manual reset is mandatory.

Note: This default is also displayed if the contactor auxiliary contacts are « shunted ».

<div style="border:1px solid;display:inline-block;padding:2px">014</div> **Gas burner default**
24EL board 1.0 & 1.1; RDB1, RDB2

<div style="border:1px solid;display:inline-block;padding:2px">015</div>
Variables used :
D_BRUL1	input 1.0 24EL, variable nr 040	Default relay, control block, 1st gas burner
D_BRUL2	input 1.1 24EL, variable nr 041	Default relay, control block, 2nd gas burner
DEF_RE	variable nr 228	heater safety device monitoring Bit nr 1 : 1st gas burner default Bit nr 2 : 2nd gas burner default

If the default relay on the gas burner control blocks opens, the heater safety function is activated and the burner concerned is shut down. Incident code **014** or **015** is displayed, the general default contact is activated.

This safety function resets itself automatically on the CLIMATIC control, but the control block on the burner must be reset manually.

017 **Gas heat exchanger overtemperature**
24EL board 1.3; RTTH

Variables used :
D_ECHAN	input 1.3 24EL, variable nr 043	Heat exchanger thermostat status
DEF_RE	variable nr 228	heater safety device monitoring
		Bit nr 4 : Gas heat exchanger thermostat

If the safety thermostat located on the heat exchanger opens, the heater safety function is activated and the gas burners are shut down. Incident code **017** is displayed, the general default contact is activated.
This safety trip out is maintained, and manual reset is mandatory.

041 **Pump default**
24EL board 0.4; KP

Variables used :
AUX_P	input 0.4 24EL, variable nr 036	circulating pump auxiliary contact
DEF_CD	variable nr 233	condenser safety device monitoring
		Bit nr 5 : circulating pump, system X

The thermal protection device on the circulating pump, acts directly on the pump contactor. This information is relayed to the CLIMATIC control by the auxiliary contact on the contactor.
If the CLIMATIC control commands pump operation and 5 seconds later, the auxiliary contact is still open, the condenser safety function is activated and stops the pump. Incident code **041** is displayed, the general default contact is activated.
This safety trip out is maintained, and manual reset is mandatory.

Note: This default is also displayed if the contactor auxiliary contacts are « shunted ».

Sensor status

081 Room thermostat missing or defective.
CLIMATIC X0; BT10
083 Discharge air thermostat defective.
CLIMATIC X4; BT14
084 Outdoor air thermostat defective.
CLIMATIC X2;

Variables used :
S_SONDE	variable nr 224	Bit nr 0 for the outdoor air temperature sensor
		Bit nr 1 for the discharge air temperature sensor
		Bit nr 2 for the indoor air temperature sensor

The absence or defective operation of the conditioned space sensor, discharge air sensor or outdoor air sensor can cause incorrect operation of the control system. In this case, a safety device trips and all components are stopped with the exception of the fans. Incident code **081** for the conditioned space sensor, **083** for the discharge sensor and **084** for the outdoor air temperature sensor, is displayed; the general default contact is activated.

089 **Inter-board link default**
CLIMATIC J9;

Variables used :
NCAR	variable nr 165	Number of the CLIMATIC board
PRECAR	variable nr 166	Presence of linked boards

The inter-board link is missing or defective.

091 **Fan default**
24EL board 0.0; KVS

Variables used :
AUX_VS	input 0.0 24EL, variable nr 032	Fan contactor auxiliary contact status
DEF_VS	variable nr 227	fan safety device monitoring
		Bit nr 2 : Fan contactor

Fan contactor contacts have not made when the CLIMATIC demands fan operation.
- The fire safety thermostat, or fire safety insert, has opened. *ST1, terminals 11 & 12*
- One of the « Klixons » on the electric resistance heaters has opened. *ST2, ST3 & ST4*
- The thermal protection device on the air handling fan has tripped. *ST5*

The fire safety thermostat, the fan motor thermal protection device, and the electric heater protection thermostats (Klixons) all act directly on the fan motor contactor. This information is transmitted to the CLIMATIC control by the contactors auxiliary contact.
If the CLIMATIC control gives the command for fan operation and 5 seconds later, the auxiliary contact is still open, the fan safety protection cuts in and the entire Roof-Top unit is shut down. Incident code **091** is displayed, the general default contact is activated.
This safety trip out is maintained, and manual reset is mandatory.

If the Roof-Top unit is equipped with a servo-motor driven damper, detection time is increased to 2 minutes.

Note: This incident code will also be displayed if the auxiliary contact is shunted.

| 094 |

Customer specific default contact
24EL board 2.7;

Variables used :
D_CLI   input 2.7 24EL, variable nr 055   Miscellaneous customer default contact

A default outside the unit has been activated. Incident code **094** is displayed, the general default contact is activated.

| 095 |

Water leak or humidifier default
24EL board 1.2; RFO, HLK/24

Variables used :
D_HU_FO   input 1.2 24EL, variable nr 042   Humidifier or water leak default relay

If the contact on the humidifier control board, or if the contact on the leak detection board closes for more than 30 seconds, the CLIMATIC control indicates a default and closes down the humidifier. Incident code **095** is displayed, the general default contact is activated.

| 096 |

Condenser water under temperature
CLIMATIC X13; BT44

Variables used :
T_EAU   input X13, variable nr 013   Water circuit temperature
DEF_CD   variable nr 233   condenser safety device monitoring
                                                Bit nr 2 : water circuit under temperature
TO_SEAU   variable nr 240   Water circuit temperature default counter

If the water circuit temperature drops below +4°c during operation of one of the compressors, the condenser safety function is activated, the compressors are shut down. Incident code **096** is displayed, the general default contact is activated.
This safety protection is cleared if the if the water loop temperature rises above 8°C. In addition, the fault condition is maintained if the fault occurs three times in the same day, in which case the unit has to be reset manually. This default counter is reset every day at 20.00h if the number of counts has not exceeded 3.

| 097 |

Condenser temperature overtemperature
CLIMATIC X13; BT44

Variables used :
T_EAU   input X13, variable nr 013   Water circuit temperature
DEF_CD   variable nr 233   condenser safety device monitoring
                                                Bit nr 3 : water circuit overtemperature
TO_SEAU   variable nr 240   Water circuit temperature default counter

If the water circuit temperature rises above +44°c during operation of one of the compressors, the condenser safety function is activated, the compressors are shut down. Incident code **097** is displayed, the general default contact is activated.
This safety protection is cleared if the if the water loop temperature drops below 40°C. In addition, the fault condition is maintained if the fault occurs three times in the same day, in which case the

unit has to be reset manually. This default counter is reset every day at 20.00h if the number of counts has not exceeded 3.

Water flow default temperature
CLIMATIC X13; SD1, SD2

Variables used :
DEBIT   input X13, variable nr 029   water flow switch contact status
DEF_CD   variable nr 233   condenser safety device monitoring
                                                                   Bit nr 4 : water flow switch
TODEBIT   variable nr 241   Water flow default counter

If the water flow switch contacts open for more than 20 , the condenser safety function is activated, the compressors are shut down. Incident code **098** is displayed, the general default contact is activated.
This safety protection is cleared if the contacts close for more than 20 seconds. In addition, the fault condition is maintained if the fault occurs three times in the same day, in which case the unit has to be reset manually. This default counter is reset every day at 20.00h if the number of counts has not exceeded 3.

Smoke default
 Carte 24EL 0.7*; BF1*

Variables used :
D_FUMEE   input 0.7 24EL, variable nr 039   smoke detector contact status
DEF_VS   variable nr 227   fan safety device monitoring
                                                                   Bit nr 3 : Smoke detection

If the contact provided on the smoke detection board closes, the smoke detection safety function is activated, the unit shuts down completely, the outdoor air damper is driven to the 100% outdoor air position. Incident code **099** is displayed, the general default contact is activated.
This safety trip out is maintained, and manual reset is mandatory.

High pressure safety switch, or condenser fan safety devices.
 CLIMATIC X9, X10, X11, X12; SP1, SP2, SP3, SP4
 Carte 24EL 0.2, 0.3; ST36, ST37, ST38, ST39

Variables used :

Contact readout. These are declared open if the temperature read is -28.0
T_HP_G1   input X9, variable nr 009   for the 1st compressor
T_HP_G2   input X10, variable nr 010   for the 2nd compressor
T_HP_G3   input X11, variable nr 011   for the 3rd compressor
T_HP_G4   input X12, variable nr 012   for the 4th compressor
High pressure safety switch monitoring. Activation du bit nr 1.
DEF_G1   variable nr 229   for the 1st compressor.
DEF_G2   variable nr 230   for the 2nd compressor.
DEF_G3   variable nr 231   for the 3rd compressor.
DEF_G4   variable nr 232   for the 4th compressor.

Cut-out counter
TOPHP12   variable nr 238   The tens indicate cut-outs on the 2nd compressor
                                                                 The units indicate cut-outs on the 1st compressor
TOPHP34   variable nr 234   The tens indicate cut-outs on the 4th compressor
                                                                 The units indicate cut-outs on the 3rd compressor

AUXVC12   input 0.2 24EL, variable nr 034   condenser fan 1 & 2 auxiliary contact status
AUXVC34   input 0.3 24EL, variable nr 035   condenser fan 3 & 4 auxiliary contact status
DEF_CD   variable nr 233   condenser fan safety device monitoring
                                                                 Bit nr 0 : condenser fans, circuits 1 & 2
                                                                 Bit nr 1 : condenser fans, circuits 3 & 4

If the contact of the high pressure switch opens and if the compressor has been running for more than 5 seconds, the high pressure safety protection is tripped and the compressor is shut down.
Incident code **115**, **125, 135 or 145** is displayed, depending on which compressor is concerned, the general default contact is activated.
The compressor will be authorised to start up again as soon as the contact is closed.
This safety condition is held if it happens 3 times in the same day, in which case reset must be done manually. Cut-out counters are reset to zero every evening at 20h.00 if there has been no

more than 3 cut-outs.

The thermal protection devices on the condenser fan motors act directly on the condenser fan motor contactors. Information is relayed to the CLIMATIC through the auxiliary contacts on the contactors.
If the CLIMATIC commands fan operation and, five seconds later, the auxiliary contact is still open, condenser fan protection is activated and stops the fans and compressors concerned. Incident code **115**, **125, 135 or 145** is displayed, the general default contact is activated.
This safety trip out is maintained, and manual reset is mandatory

| 116 |
| 126 |
| 136 |
| 146 |

Discharge overtemperature protection.
 CLIMATIC X9, X10, X11, X12; BT19, BT20, BT21, BT22

Variables used:

Temperature monitoring, with its value in units
T_HP_G1   input X9, variable nr 009   for the 1st compressor
T_HP_G2   input X10, variable nr 010   for the 2nd compressor
T_HP_G3   input X11, variable nr 011   for the 3rd compressor
T_HP_G4   input X12, variable nr 012   for the 4th compressor

Default logged. Activation of bit nr 2.
DEF_G1   variable nr 229   for the 1st compressor
DEF_G2   variable nr 230   for the 2nd compressor
DEF_G3   variable nr 231   for the 3rd compressor
DEF_G4   variable nr 232   for the 4th compressor

If the compressor discharge temperature exceeds 140°c, i.e. 253u, discharge temperature protection is triggered and the compressor is stopped. Incident code **116**, **126**, **136** or **146** is displayed according to which compressor is concerned, the general default contact is activated.
This safety trip out is immediately maintained, and manual reset is mandatory

| 117 |
| 127 |
| 137 |
| 147 |

The low pressure switch is, or has been, open.
 CLIMATIC X5, X6, X7, X8; SP11, SP12, SP13, SP14

Variables used:

Contact readout. These are declared open if the temperature read is -28.0
T_BP_G1   input X5, variable nr 005   for the 1st compressor
T_BP_G2   input X6, variable nr 006   for the 2nd compressor
T_BP_G3   input X7, variable nr 007   for the 3rd compressor
T_BP_G4   input X8, variable nr 008   for the 4th compressor

Cut-out counters
TOPBP12   variable nr 236   The tens indicate cut-outs on the 2nd compressor
                                               The units indicate cut-outs on the 1st compressor

TOPBP34   variable nr 237   The tens indicate cut-outs on the 4th compressor
                                               The units indicate cut-outs on the 3rd compressor

Default logged. Activation of bit nr 0.
DEF_G1   variable nr 229   for the 1st compressor
DEF_G2   variable nr 230   for the 2nd compressor
DEF_G3   variable nr 231   for the 3rd compressor
DEF_G4   variable nr 232   for the 4th compressor

If the low pressure switch opens and if the compressor has been operating for more than 2 minutes, low pressure safety protection is activated and the compressor is stopped. This safety protection is not taken into account during the defrost cycle on Roof-Top heat pumps.
Incident code **117, 127, 137 or 147** is displayed, depending on which compressor is concerned. The general default contact is activated.
The compressor will be authorised to start up again as soon as the contact is closed. This safety condition is held if it happens 3 times in the same day, in which case reset must be done manually. Cut-out counters are reset to zero every evening at 20h.00 if there has been no more than 3 cut-outs.

NOTIONS ON OCTETS AND BITS.

All CLIMATIC variables are memorised with one Octet.

An Octet is a computing unit with a value between 0 and 255.
A (decimal) value of 255 corresponds to a binary value of 11111111.

Relationship between Bits and Octets

nr 7	nr 6	nr 5	nr 4	nr 3	nr 2	nr 1	nr 0

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	064	032	016	008	004	002	001

The value of an octet is equal to its number of active bits, i.e. bits that are « ON », see table above.

- If all eight bits are inactive,
    the value of the Octet is 000.

- If bit nr 0 is active and the seven others are inactive,
    the value of the Octet is 001.

- If bits nr 0 and nr 4 are active and the six others are inactive,
    the value of the Octet is 001 + 016 i.e. 017.

- If all eight bits are active,
    the value of the Octet is 001 + 002 + 004 + 008 + 016 + 032 + 064 + 128 i.e. 255.

So, to activate bits nr 0 and nr 1, set the value for the variable to 001 + 002 i.e. 003.

BOARD LINKS (J9).

Setpoint setback potentiometer

If the inter-board link is used, a single control box with a potentiometer connected to the unit with CLIMATIC board nr 0 is sufficient, since the other units receive the setback value via the common information bus.

Enthalpy function.

If the inter-board link is used, a single outdoor air relative enthalpy sensor connected to the unit with CLIMATIC board nr 0 is sufficient, since the other units receive the enthalpy value via the common information bus.

Zoning.

If the inter-board link is used, the CLIMATIC control calculates the number of units demanding cooling then the number of units demanding heat.
If the number of units demanding cooling is greater than or equal to the number of units demanding heat heating regulation will be inhibited on the latter.
By the same principle, if the number of units demanding heat is greater than the number of units demanding cooling, cooling regulation will be inhibited on the latter.

If there is an inter-board link, a single outdoor air temperature sensor and/or a single room temperature sensor can be connected to the unit equipped with CLIMATIC board Nr 1. The other units receive the corresponding temperature values via the link.

RS-232 (J11) LINK TO A COMPUTER OR B.M.S.

Some commands, available through potential-free contacts, connected to the 24EL can be triggered via the RS-232 port. These commands can be accessed through the ORDI variable at address 221.

Note :
To enable the CLIMATIC to take account of the ORDI variable, the following conditions must be satisfied :
Either the B.M.S.variable, at address 220, must be greater than zero.
Or bit nr 7 of the MA_AR_D setpoint, setpoint nr 14 address 206, must be active.

The B.M.S. variable enables account to be taken of the validity of the link between the CLIMATIC and the BMS.. The CLIMATIC decrements the GTC variable by one unit every second. The B.M.S. program must periodically regenerate this value. A dropped link or the stoppage of the B.M.S. will result in zeroing the validation variable and return the CLIMATIC to free-standing operation.

Codes for the ORDI variable, address 221.

> Bit nr 0 : Unoccupied
> Bit nr 1 : Forced occupation
> Bit nr 2 : Electric resistance heater shutdown
> Bit nr 3 : 50% compressor capacity reduction
> Bit nr 4 : 100% compressor capacity reduction
> Bit nr 5 : Heating valve offloading
> Bit nr 6 : Forced operation at minimum outdoor air
> Bit nr 7 : Request for low speed

TABLE OF J-BUS ADDRESSES

$\boxed{\text{/C}}$ Temperature   Range from -28.0 to +99.5 in increments of 0.5

Write $Octet = (T + 28) \times 2$ e.g. $(22.5 + 28) \times 2 = 101$

Read $T = \left(\dfrac{Octet}{2}\right) - 28$ e.g. $\left(\dfrac{101}{2}\right) - 28 = 22.5$

$\boxed{\text{/K}}$ Temperature   Range from 0.0 to +127.5 in increments of 0.5

Write $Octet = T \times 2$ e.g. $1.5 \times 2 = 003$

Read $T = \left(\dfrac{Octet}{2}\right)$ e.g. $\left(\dfrac{003}{2}\right) = 1.5$

$\boxed{\text{/U}}$ Unit   Range from 000 to +255 in increments of 1

Write $Octet = U$ e.g. $48 = 048$

Read $U = Octet$ e.g. $048 = 48$

$\boxed{\text{/L}}$ Logical   Range OFFí 0 or ONí 1

Write $Off = 000$
             $On = 255$

Read $000 = Off$
             $255 = On$

CLIMATIC			**Write**	J-BUS
CONSA	/C	192	Required conditioned space temperature	00h
MORTE	/K	193	Deadband between heating and cooling	01h
ABAIS	/K	194	Value of reduction of CONSA for Night mode operation	02h
TROS_DU	/C	195	Dew point temperature for dehumidification	03h
TROS_HU	/C	196	Dew point temperature for dehumidification	04h
T_VOLET	/C	196	Outdoor air T° threshold for free-cooling inhibition	05h
T_CHAUD	/C	197	Outdoor air T° threshold for electric heater inhibition	06h
T_FROID	/C	198	Outdoor air T° threshold for cp cooling inhibition	07h
T_FR_34	/C	248	Ture threshold for compressor 3 & 4 cooling lockout	08h
ENCL_F	/K	250	Cooling regulation cut-in threshold	09h
DIFET_F	/K	251	Cooling regulation differential threshold	0Ah
ENCL_C	/K	252	Heating regulation cut-in threshold	0Bh
DIFET_C	/K	253	Heating regulation differential threshold	0Ch
HE	/U	146	Hours	30h
MN	/U	145	Minutes	31h
JS	/U	147	Day of the week *(Sunday = 1)*	32h
RAH	/U	167	Clock reset *Force once to 255 after each clock reset*	33h
DING	/U	249	Integration time	34h
MINIAIR	/U	199	Minimum % of outdoor air	35h
DV_J	/U	200	Time for start of daily unoccupied period	36h
FV_J	/U	201	Time for end of daily unoccupied period	37h
DV_H	/U	202	Time and day of start of weekly unoccupied period *207 = 20.00h. on the 7th day*	38h
FV_H	/U	203	Time and day of end of weekly unoccupied period *082 = 08.00h. on the 2nd day*	39h
P_ANTI	/U	204	Gradient for end of unoccupied period anticipation function	3Ah
ORDI	/U	221	Component off-loading *bit nr 0 : Unoccupied mode* *bit nr 1 : Forced unoccupied mode* *bit nr 2 : Electric resistance heater offloading* *bit nr 3 : 50% compressor capacity reduction* *bit nr 4 :100% compressor capacity reduction* *bit nr 5 : Hot water valve offloading* *bit nr 6 : Forced operation at minimum outdoor air* *bit nr 7 : Request for low speed* *The CLIMATIC program only takes account of these bits if the BMS variable is greater than 0.*	3Bh
GTC	/U	220	BMS link validity *This must be greater than 0 if the ORDI variable is used. The CLIMATIC program decrements this value by 1 unit per second*	3Ch
MA_AR_D	/U	206	ON/OFF *bit nr 0 : Unit ON/OFF* *bit nr 1 :Unit control via switch A14 (customer)*	3Dh

CLIMATIC			**Read**	J-BUS
T_AMB	/C	000	Room or return air temperature	80h
T_EXT	/C	002	Outdoor air temperature	81h
T_SOUF	/C	004	Discharge air temperature	82h
T_BP_G1	/C	005	Evaporator refrigerant temperature, unit 1	83h
T_BP_G2	/C	006	Evaporator refrigerant temperature, unit 2	84h
T_BP_G3	/C	007	Evaporator refrigerant temperature, unit 3	85h
T_BP_G4	/C	008	Evaporator refrigerant temperature, unit 4	86h

T_HP_G1	/C	009	Discharge temperature, unit 1	87h
T_HP_G2	/C	010	Discharge temperature, unit 2	88h
T_HP_G3	/C	011	Discharge temperature, unit 3	89h
T_HP_G4	/C	012	Discharge temperature, unit 4	8Ah
T_EAU	/C	013	Water circuit temperature	8Bh
H_AMB	/U	017	Conditioned space RH	A0h
H_EXT	/U	019	Outdoor air RH	A1h
DEGI	/U	079	Defrost function *= number of compressor currently undergoing defrost*	A2h
POST_V	/U	097	Duration of post-ventilation after heating (seconds)	A3h
VANNE	/U	121	Proportional heating or cooling valve or triac *Signal 0-10V / 000 = 0V / 255 = 10V*	A4h
VOLET *or* HUMID_P	/U	122	Proportional air damper *or* Proportional signal from Humidifier *Signal 0-10V / 000 = 0V / 255 = 10V*	A5h

S_SONDE	/U	224	Sensor status
			       bit nr 0 : Outdoor air sensor faulty
			       bit nr 1 :Discharge air sensor faulty
			       bit nr 2 : Room air sensor faulty
				A6h

ST_SOUF	/U	225	Discharge air temperature safety
			       bit nr 0 : 1° high level limit
			       bit nr 1 : 1° low level limit
			       bit nr 2 : 2° low level limit
			       bit nr 3 : 3° low level limit (Alarm)
			       bit nr 4 : 2° low level limit (Alarm)
				A7h

DEF_VS	/U	227	Discharge fan default
			       bit nr 0 : Filter pressure switch
			       bit nr 1 : Airflow pressure switch
			       bit nr 2 : Fan contactor (Stoptherm, DI)
			       bit nr 3 : Smoke detection
				A8h

DEF_RE	/U	228	Electric heater default
			       bit nr 0 : Resistance heater contact (Klixon)
			       bit nr 1 : 1st gas burner default
			       bit nr 2 : 2nd gas burner default
			       bit nr 4 : Gas heat exchanger thermostat
				A9h

DEF_G1	/U	229	Compressor NR 1 default
			       bit nr 0 : Low pressure switch
			       bit nr 1 : High pressure switch
			       bit nr 2 : Discharge overtemperature
				AAh

DEF_G2	/U	230	Compressor NR 2 default
			       bit nr 0 : Low pressure switch
			       bit nr 1 : High pressure switch
			       bit nr 2 : Discharge overtemperature
				ABh

DEF_G3	/U	231	Compressor NR 3 default
			       bit nr 0 : Low pressure switch
			       bit nr 1 : High pressure switch
			       bit nr 2 : Discharge overtemperature
				ACh

DEF_G4	/U	232	Compressor NR 4 default
			       bit nr 0 : Low pressure switch
			       bit nr 1 : High pressure switch
			       bit nr 2 : Discharge overtemperature
				ADh

DEF_CD	/U	233	Condenser default
			       bit nr 0 : Condenser fans circuit 1 & 2
			       bit nr 1 : Condenser fans circuit 3 & 4
			       bit nr 2 : Water loop under temperature (OR)
			       bit nr 3 : Water loop overtemperature (OR)
				AEh

				bit nr 4 : Water flow switch (OR)	
				bit nr 4 : Water flow switch (OR)	
				bit nr 5 : Circulating pump (X)	
PANNE	/U	255		Incident code	AFh
TO_VS0	/U	176		VENT_S (+1 every minute)	B0h
TO_VS1	/U	177		VENT_S (+1 every 4 hours)	B1h
TO_VS2	/U	178		VENT_S (+1 every 1000 hours)	B2h
TO_G10	/U	179		COMP_G1 (+1 every minute)	B3h
TO_G11	/U	180		COMP_G1 (+1 every 4 hours)	B4h
TO_G12	/U	181		COMP_G1 (+1 every 1000 hours)	B5h
TO_G20	/U	182		COMP_G2 (+1 every minute)	B6h
TO_G21	/U	183		COMP_G2 (+1 every 4 hours)	B7h
TO_G22	/U	184		COMP_G2 (+1 every 1000 hours)	B8h
TO_G30	/U	185		COMP_G3 (+1 every minute)	B9h
TO_G31	/U	186		COMP_G3 (+1 every 4 hours)	BAh
TO_G32	/U	187		COMP_G3 (+1 every 1000 hours)	BBh
TO_G40	/U	188		COMP_G4 (+1 every minute)	BCh
TO_G41	/U	189		COMP_G4 (+1 every 4 hours)	BDh
TO_G42	/U	190		COMP_G4 (+1 every 1000 hours)	BEh
VENT_S	/L	128		Discharge fan	C0h
COMP_G1	/L	129		Compressor, unit nr 1	C1h
COMP_G2	/L	130		Compressor, unit nr 2	C2h
COMP_G3 INJ_G1	/L	131		Compressor, unit nr 3 *or* Hot gas injection, unit nr 1	C3h
COMP_G4 INJ_G2	/L	132		Compressor, unit nr 4 *or* Hot gas injection, unit nr 2	C4h
VENTC12	/L	133		Condenser fans, units nr 1 & nr 2	C5h
VENTC34	/L	134		Condenser fans, units nr 3 & nr 4	C6h
ALARME	/L	135		General default signal	C7h
PV	/L	136		Low speed	C8h
VIC_G12	/L	137		Cycle changeover valve, units nr 1 & nr 2 (HP)	C9h
VIC_G34	/L	138		Cycle changeover valve, units nr 3 & nr 4 (HP)	CAh
CHAU_1	/L	139		1st stage electric heat	CBh
CHAU_2	/L	140		2nd stage electric heat	CCh
CHAU_3 HUMIDIF	/L	141		3rd stage electric heat *or* Humidifier	CDh
CLIENT POMPE	/L	142		Misc. customer control *or* Pump for system X	CEh
CHOFROI	/L	143		Heating or cooling proportional valve changeover	CFh
MA_AR	/L	096		Unit ON/OFF status	D0h
VEILLE	/L	098		Unoccupied function	D1h
ANTICIP	/L	099		End of unoccupied period anticipation function	D2h
HORSGEL	/L	100		Building frost protection function	D3h

VARIABLES.

0	T0	**T_AMB**	C	Conditioned space or return air temperature
2	T2	**T_EXT**	C	Outdoor air temperature
4	T4	**T_SOUF**	C	Discharge air temperature
5	T5	**T_BP_G1**	C	Evaporator refrigerant temperature, unit 1
6	T6	**T_BP_G2**	C	Evaporator refrigerant temperature, unit 2
7	T7	**T_BP_G3**	C	Evaporator refrigerant temperature, unit 3
8	T8	**T_BP_G4**	C	Evaporator refrigerant temperature, unit 4
9	T9	**T_HP_G1**	C	Discharge temperature, unit 1
10	T10	**T_HP_G2**	C	Discharge temperature, unit 2
11	T11	**T_HP_G3**	C	Discharge temperature, unit 3
12	T12	**T_HP_G4**	C	Discharge temperature, unit 4
13	T13	**T_EAU**	C	Water circuit temperature
15	T15	**LOCAL**	L	Local / Remote button on display
16	X0	**X0**	U	Conditioned space or return air temperature
17	X1	**H_AMB**	U	Conditioned space air RH
19	X3	**H_EXT**	U	Outdoor air RH
29	X13	**DEBIT**	L	Water flow switch
30	X14	**POTTEMP**	U	Temperature offset potentiometer (4-20 mA)
32	NV0	**AUX_VS**	L	Discharge fan contactor auxiliary contact
33	NV1	**AUX_RE**	L	Electric heater contactor auxiliary contact
34	NV2	**AUXVC12**	L	Condenser 1 & 2 fan contactor auxiliary contact
35	NV3	**AUXVC34**	L	Condenser 3 & 4 fan contactor auxiliary contact
36	NV4	**AUX_P**	L	Pump contactor auxiliary contact
37	NV5	**P_DA**	L	Airflow pressure switch
38	NV6	**P_FIL**	L	Clogged filter pressure switch
39	NV7	**D_FUMEE**	L	Smoke detector
40	NV8	**D_BRUL1**	L	1st burner default relay
41	NV9	**D_BRUL2**	L	2nd burner default relay
42	NV10	**D_HU_FO**	L	Water leakage or humidifier default relay
43	NV11	**D_ECHAN**	L	Exchanger overheat protection default relay
44	NV12	**MA_50**	L	50% compressor offloading switch
45	NV13	**MA_100**	L	100% compressor offloading switch
46	NV14	**MA_RE**	L	100% electric heat offloading switch
47	NV15	**MA_BEC**	L	Hot water valve offloading switch
48	NV16	**C_VEIL**	L	Unoccupied mode forcing switch
49	NV17	**C_RELAN**	L	Forced re-start initiation switch
50	NV18	**C_RNEUF**	L	100% outdoor air forcing switch
51	NV19	**C_RRECY**	L	100% recycled air forcing switch
52	NV20	**C_RMINI**	L	Minimum outdoor air forcing switch
53	NV21	**C_NUIT**	L	Night mode forcing switch
54	NV22	**C_PV**	L	Low speed switch
55	NV23	**D_CLI**	L	Customer misc. defaults
66	N2	**CONSA_A**	C	Real value of conditioned space temperature setpoint
67	N3	**CONSA_S**	C	Real value of discharge air temperature setpoint
68	N4	**CH_FR**	L	Heating Cooling control
69	N5	**MAXI_F**	U	Maximum number of cooling control stages. Conditioned space.
70	N6	**MAXI_C**	U	Maximum number of heating control stages. Conditioned space.
75	N11	**PROF**	U	Cooling control power factor
76	N12	**PROC**	U	Heating control power factor
77	N13	**STEP_GF**	U	Number of compressor stages for cooling operation
78	N14	**STEP_GC**	U	Number of compressor stages for heating operation
79	N15	**DEGI**	U	Defrost function
80	N16	**STEP_RC**	U	Number of electric heat stages
81	N17	**C_NMI**	U	NMI contact
82	N18	**TO_NMI**	U	NMI block cut-out counters
83	N19	**ENTHA**	L	Enthalpy control function
85	N21	**STEP_DU**	L	Dehumidification function
86	N22	**STEP_HU**	U	Humidification function
90	N26	**FLAG**	L	Calculation variable
96	V0	**MA_AR**	L	Unit on/off status
97	V1	**POST_V**	U	Post-ventilation after heating (seconds)

98	V2	**VEILLE**	L	Standby function
99	V3	**ANTICIP**	L	Anticipation function for end of standby
100	V4	**HORSGEL**	L	Building frost protection function
101	V5	**OK_AIR**	L	Correct airflow status
102	V6	**REGUL_G**	U	Request for unit start-up
104	V8	**ANTICC1**	U	Anti short-cycle function, unit nr 1
105	V9	**ANTICC2**	U	Anti short-cycle function, unit nr 2
106	V10	**ANTICC3**	U	Anti short-cycle function, unit nr 3
107	V11	**ANTICC4**	U	Anti short-cycle function, unit nr 4
108	V12	**REGUL_R**	U	Request for electric heat start-up
109	V13	**REGUL_F**	U	Opening of the proportional valve for cooling
110	V14	**REGUL_C**	U	Opening of the proportional valve for heating
111	V15	**REGUL_V**	U	Opening of outdoor air damper
112	V16	**DISPO_V**	L	Availability of the outdoor air damper
113	V17	**DISPO_G**	L	Availability of the hygiene sensor
114	V18	**REGUL_S**	U	Request for fan start-up
115	V19	**TT_SOUF**	L	Working variable
116	V20	**FG_SOUF**	L	Variable for display
119	V23	**LEC**	L	Variable for display
121	AN0	**VANNE**	U	Proportional heating or cooling valve or triac
122	AN1	**VOLET**	U	Proportional air damper
128	A0	**VENT_S**	L	Discharge fan
129	A1	**COMP_G1**	L	Compressor unit nr 1
130	A2	**COMP_G2**	L	Compressor unit nr 2
131	A3	**COMP_G3**	L	Compressor unit nr 3
132	A4	**COMP_G4**	L	Compressor unit nr 4
133	A5	**VENTC12**	L	Condenser fans unit nr 1 & nr 2
134	A6	**VENTC34**	L	Condenser fans unit nr 3 & nr 4
135	A7	**ALARME**	L	General default
136	A8	**PV**	L	Low speed
137	A9	**VIC_G12**	L	Cycle changeover valve units nr 1 & nr 2
138	A10	**VIC_G34**	L	Cycle changeover valve units nr 3 & nr 4
139	A11	**CHAU_1**	L	1st stage electric heat
140	A12	**CHAU_2**	L	2nd stage electric heat
141	A13	**HUMIDIF**	L	Humidifier
142	A14	**CLIENT**	L	Customer misc. control
143	A15	**CHOFROI**	L	Inversion of proportional heating or cooling valve
150	NCARS	**NCARS**	U	CLIMATIC board number (RS-232)
165	NCAR	**NCAR**	U	CLIMATIC board number (inter-board link)
166	PRECAR	**PRECAR**	U	Presence of linked boards
176	TO00	**TO_VS0**	U	VENT_S (+1 every minute)
177	TO01	**TO_VS1**	U	VENT_S (+1 every 4 hours)
178	TO02	**TO_VS2**	U	VENT_S (+1 every 1000 hours)
179	TO10	**TO_G10**	U	COMP_G1 (+1 every minute)
180	TO11	**TO_G11**	U	COMP_G1 (+1 every 4 hours)
181	TO12	**TO_G12**	U	COMP_G1 (+1 every 1000 hours)
182	TO20	**TO_G20**	U	COMP_G2 (+1 every minute)
183	TO21	**TO_G21**	U	COMP_G2 (+1 every 4 hours)
184	TO22	**TO_G22**	U	COMP_G2 (+1 every 1000 hours)
185	TO30	**TO_G30**	U	COMP_G3 (+1 every minute)
186	TO31	**TO_G31**	U	COMP_G3 (+1 every 4 hours)
187	TO32	**TO_G32**	U	COMP_G3 (+1 every 1000 hours)
188	TO40	**TO_G40**	U	COMP_G4 (+1 every minute)
189	TO41	**TO_G41**	U	COMP_G4 (+1 every 4 hours)
190	TO42	**TO_G42**	U	COMP_G4 (+1 every 1000 hours)
192	CO0	**CONSA**	C	Requested conditioned space temperature
193	CO1	**MORTE**	K	Dead-band between cooling and heating
194	CO2	**ABAIS**	K	Value of the reduction of CONSA for Night operation
195	CO3	**TROS_DU**	C	Dew point temperature for dehumidification
196	CO4	**T_VOLET**	C	Outdoor air temp. threshold for free cooling inhibition
197	CO5	**T_CHAUD**	C	Outdoor air temp. threshold for electric heat inhibition
198	CO6	**T_FROID**	C	Outdoor air temp. threshold for compressor inhibition

199	CO7	**MINIAIR**	U	Minimum % of outdoor air
200	CO8	**DV_J**	U	Time of start of daily unoccupied period
201	CO9	**FV_J**	U	Time of end of daily unoccupied period
202	CO10	**DV_H**	U	Time and day of start of weekly unoccupied period
203	CO11	**FV_H**	U	Time and day of end of weekly unoccupied period
204	CO12	**P_ANTI**	U	Ramp for end of unoccupied period anticipation function
205	CO13	**FRIMAIR**	U	Control parameters
206	CO14	**MA_AR_D**	U	On/OFF
207	CO15	**INIT**	U	Initialisation function
208	CM0	**MPOTART**	K	Transmitted temperature potentiometer
209	CM1	**MPOTARA**	U	Potentiometer for transmitted minimum outdoor air setting
210	CM2	**MT_ECO**	U	Transmitted enthalpy function
211	CM3	**T_EXT_C**	C	Transmitted outdoor air temperature
212	CM4	**ZONE_0**	U	rt nr 0 (0) no cooling no heating (1) cooling (2) heating
213	CM5	**ZONE_1**	U	rt nr 1 (0) no cooling no heating (1) cooling (2) heating
214	CM6	**ZONE_2**	U	rt nr 2 (0) no cooling no heating (1) cooling (2) heating
215	CM7	**ZONE_3**	U	rt nr 3 (0) no cooling no heating (1) cooling (2) heating
216	CM8	**ZONE_4**	U	rt nr 4 (0) no cooling no heating (1) cooling (2) heating
217	CM9	**ZONE_5**	U	rt nr 5 (0) no cooling no heating (1) cooling (2) heating
218	CM10	**ZONE_6**	U	rt nr 6 (0) no cooling no heating (1) cooling (2) heating
219	CM11	**ZONE_7**	U	rt nr 7 (0) no cooling no heating (1) cooling (2) heating
220	CM12	**GTC**	U	B.M.S. dialogue confirmation
221	CM13	**ORDI**	U	Component offloading (binary) by the B.M.S.
222	CM14	**NBC**	L	Inter-board variable
223	CM15	**NBCM**	U	Inter-board variable
224	IN0	**S_SONDE**	U	Sensor status
225	IN1	**ST_SOUF**	U	Discharge air safety
226	IN2	**S_DA**	L	Airflow safety
227	IN3	**DEF_VS**	U	Discharge fan default
228	IN4	**DEF_RE**	U	Crankcase heater default
229	IN5	**DEF_G1**	U	Compressor nr 1 default
230	IN6	**DEF_G2**	U	Compressor nr 2 default
231	IN7	**DEF_G3**	U	Compressor nr 3 default
232	IN8	**DEF_G4**	U	Compressor nr 4 default
233	IN9	**DEF_CD**	U	Condenser default
234	IN10	**TO_SOUF**	U	Low discharge air temperature default cut-out counter
235	IN11	**TO_VS**	U	Discharge fan default cut-out counter
236	IN12	**TOPBP12**	U	Low pressure cut-out counter unit nr 1 & nr 2
237	IN13	**TOPBP34**	U	Low pressure cut-out counter unit nr 3 & nr 4
238	IN14	**TOPHP12**	U	High pressure cut-out counter unit nr 1 & nr 2
239	IN15	**TOPHP34**	U	High pressure cut-out counter unit nr 3 & nr 4
240	IN16	**TO_SEAU**	U	Exchanger temperature default cut-out counter
241	IN17	**TODEBIT**	U	Water flow default cut-out counter
242	IN18	**TOGEL12**	U	Freeze-up time on compressors nr s 1 & 2
243	IN19	**TOGEL34**	U	Freeze-up time on compressors nr s 3 & 4
244	IN20	**TO_DEGI**	U	Defrost cycle duration
245	IN21	**TO_RST**	U	Re-start counter
246	IN22	**MODE_RT**	U	Configuration setpoint
247	IN23	**M_VOLET**	C	Maximum OAT setpoint for Free-Cooling lockout
248	IN24	**T_FR_34**	C	OAT setpoint for compressor 3&4 lockout
249	IN25	**DING_A**	U	Integration time setpoint
250	IN26	**ENCL_F**	K	Cooling control cut-in threshold setpoint
251	IN27	**DIFET_F**	K	Cooling control differential threshold setpoint
252	IN28	**ENCL_C**	K	Heating control cut-in threshold setpoint
253	IN29	**DIFET_C**	K	Heating control differential threshold setpoint
254	IN30	**AFFICHE**	U	Variable for display
255	IN31	**PANNE**	U	Incident code

DISPLAY.
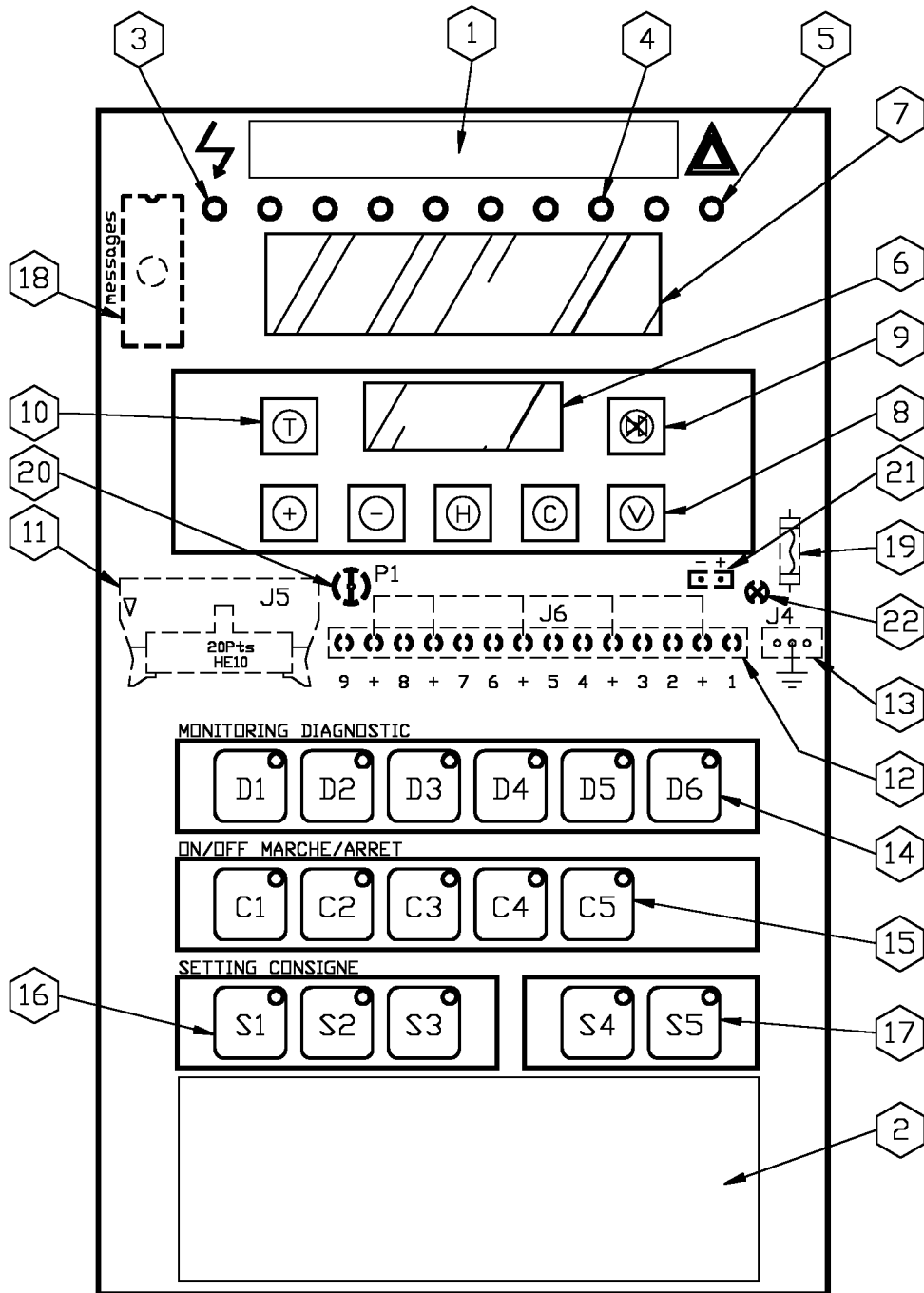
LEGEND :

| 1 | Green LED description leaflet, *removable from the rear.* |

| 2 | Keys D1 to D6, C1 to C5 & S1 to S5 description leaflet, *removable from the rear.* |

| 3 | Yellow « power on » LED |

| 4 | Eight green LEDs |

| 5 | Red default LED |

| 6 | Digital display |

| 7 | Alpha-digital display, *describes the value displayed on the digital display.* |

| 8 | CLIMATIC function keys, *see page 2.* |

| 9 | Buzzer clearing key, *the buzzer is an option.* |

10 Language change, *Two languages are available : French or English*.

11 20 pin CLIMATIC connector on the rear.

12 Nine potential-free contacts for the eight green LEDs and the red LED.

13 12 VAC power connector

14 Six keys for the offloading functions.

15 Five shortcut keys for calling up setpoints.

16 Three function keys for Start-Stop-Standby.

17 Two keys, one for resetting the safety devices, the other for selecting Remote/Local mode.

   Selecting the Remote mode deactivates keys 14 15 16

   and their functions are no longer taken into account by the CLIMATIC program.

18 Message and key configuration EPROM

19 Slow-Blow 1A fuse protecting green LEDs and lighting for the two LCD displays.

20 Alpha-digital display contrast adjustment potentiometer, on rear side.

21 Two-pin connector for the buzzer, on the rear side (option).

Before replacing the display, recover the message EPROM from the old display, as well as the description leaflets.

The leaflets are located behind the removable panels at the rear of the display.

If there is no display, check the power supply to the CLIMATIC. The display power supply is used only for the LCD display and the 10 LEDs on the upper section of CL 07.

DEFINITION OF INCIDENT CODES
FOR ROOFTOP, MODUL'AIR, CAT AND ORD UNITS.

000	No defaults	RT	MA	CAT	ORD

Airflow defaults **PAN_DA**

001	Incorrect airflow	RT	MA		ORD
004	Clogged filters	RT	MA		ORD

Heating defaults **PAN_C**

011	Electric heating coil default	RT	MA		ORD
012	Discharge air overtemperature	RT	MA		ORD
013	Return or room air under temperature				ORD
014	Default on gas burner nr 1	RT			
015	Default on gas burner 2	RT			
016	Default on gas burner 3	RT			
017	Gas heat exchanger overtemperature	RT			

Mechanical cooling defaults **PAN_F**

022	Discharge air under temperature	RT	MA		ORD
023	Return or room air overtemperature				ORD

Humidity defaults **PAN_H**

031	Humidifier default				ORD
032	Return air relative humidity too low				ORD
033	Return air relative humidity too high				ORD

C.A.T. specific defaults **PAN_CAT**

041	Default, pump nr 1 or nr 2 circuit nr 1			CAT	
042	Default, pump nr 3 or nr 4 circuit nr 2			CAT	
043	Default, pump nr 5 or nr 6 circuit nr 3			CAT	
044	Domestic hot water circulating pump default			CAT	
045	Regulated water circuit circulating pump default			CAT	
046	Default indicator, boiler nr 1			CAT	
047	Default indicator, boiler nr 2			CAT	
048	Boiler water level default			CAT	
049	Retention tank level default			CAT	
051	Temperature too low, circuit nr 1			CAT	
052	Temperature too low, circuit nr 2			CAT	
053	Temperature too low, circuit nr 3			CAT	
054	Temperature too low, domestic hot water circuit			CAT	
055	Temperature too low, boiler circuit			CAT	

Miscellaneous defaults **PAN_D**

071	Temperature sensor default, water loop outlet nr 1			CAT	
072	Temperature sensor default, water loop outlet nr 2			CAT	
073	Temperature sensor default, water loop outlet nr 3			CAT	
074	Temperature sensor default, domestic hot water outlet			CAT	
075	Temperature sensor default, boiler return water			CAT	
076	Temperature sensor default, boiler leaving water			CAT	
081	Temperature sensor default, return air or room air	RT	MA		ORD
082	Humidity sensor default, return air RH				ORD
083	Temperature sensor default, discharge air	RT	MA		ORD
084	Temperature sensor default, outdoor air	RT	MA	CAT	

085	Temperature sensor default, chilled water				ORD
086	Temperature sensor default, hot water				ORD
089	Inter-board link default	RTw			
091	Ventilation default (Firestat, Stop therms, no 24V power supply)	RT	MA		ORD
092	Fan thermal safety cut-out on 1st condenser or cooling tower				ORD
093	Fan thermal safety cut-out on 2nd condenser or pump				ORD
094	Customer specific default contact	RT	MA		
095	Water leakage default				ORD
096	Condenser water temperature too low	RT	MA		
097	Condenser water overtemperature	RT	MA		
098	Humidifier or water flow default	RT	MA		
099	Smoke default	RT	MA		

Compressor   defaults   **PAN_1**   **PAN_2**   **PAN_3**   **PAN_4**

1n1 : n = number of the compressor concerned

1n1	Discharge temperature sensor faulty				ORD
1n2	Subcooling temperature sensor faulty				ORD
1n3	Evaporator refrigerant temperature sensor faulty				ORD
1n4	Tripped internal electric motor protection				ORD
1n5	High pressure default	RT	MA		ORD
1n6	Discharge overtemperature	RT	MA		ORD
1n7	Low pressure default	RT	MA		ORD
1n8	Refrigeration circuit empty				ORD

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CLIM_RT3/ANGLAIS**/**12-97