User manual
CLIMATIC™ 50 - NEOSYS

• • • Providing indoor climate comfort

INTERNAL USE
LENNOX TECHNICIANS
VERSION

CL50-NEOSYS-IOM/0609-E

Climatic 50

CHILLER & HEAT PUMP FOR NEOSYS RANGE

INSTALLATION OPERATING & MAINTENANCE MANUAL

Ref: CL50-NEOSYS-IOM/0609-E

LENNOX have been providing environmental solutions since 1895, our range of rooftop and chiller continues to meet the standards that have made LENNOX a household name. Flexible design solutions to meet YOUR needs and uncompromising attention to detail. Engineered to last, simple to maintain and Quality that becomes a standard. Further Information on www.lennoxeurope.com.

The technical informations and specifications contained in this manual are for reference only. The manufacturer reserves the right to modify these without warning and without obligation to modify equipment already sold.

TABLE OF CONTENTS

Page

INTRODUCTION

CLIMATIC™50

The new generation of microprocessor based control, **CLIMATIC™50** may be fitted to the Lennox Chiller or Heat pump range. It inherits 20 years of technology and field operating experience from its predecessors the CLIMATIC™1 and CLIMATIC™2.
LENNOX has found the latest hardware technology available on the market place and developed software specifically designed for Chiller and Heat pump applications, maximising the LENNOX unit's efficiency and performance.

Compatibility

This documentation is compatible with the programs Chiller and Heat pump:

- **NEOSYS standards) range (STD from software version NA050 STD - Vers. 03.0 - Rev 00.0,**
- **NEOSYS twins range (TWN) from software version NA050 TWN - Vers. 01.0 - Rev 00.0.**

Warning

Any parameter modification should be carried out by trained and licensed competent technician.

Before start-up or restart of a unit controlled by Climatic 50, it is mandatory to check adequacy between Climatic™50 and the unit with its options.

- **Menus (38xx) for unit and options,**
- **Menus (39xx) for communication.**

In case of wrong parameters, I/O links could be incorrect and may create some operation problems for the units and ultimately breakdowns.
Lennox cannot be held responsible for any claims on the units due to a wrong parameters sequence or a parameters modification carried out by non competent technicians. In this case, the warranty will be legally null and void.

WIRING CONNECTIONS

IMPORTANT WARNING

Any wiring modification on the CLIMATIC™50 must be done by Lennox technician or employees having valid electrical qualification and authorisation.

For any modification of wiring on the 24V supply or on 4-20mA sensor, check the polarity prior to apply the power. Wrong polarity may cause serious damage and destroy the pLAN network. Lennox will not accept liability for damage caused by wrong power connection or any wiring modification done by people without valid training and qualifications.

Any external connection with the unit, using 24Vac voltage should not exceed a length of more than 30m. It concerns external contacts connected to Climatic™50 on logical inputs. Over 30 m, the installer must interface this information with relays or converters.
In any case, the 24Vac control voltage must not be used to drive external function with Climatic™50 logical output.

WARNING*: Separate as much as possible probes, displays, logical input cables from power cables with strong inductive load, in order to avoid possible electromagnetic perturbations.*

CONNECTION

SENSORS AND PROBES

- External sensors or probes connection must be carried out with the following cable:
  - Cable length up to 20m: AWG22 (0.34 mm ²), 1 pair crossed with screen.
  - Cable length up to 50m: LiYCY-P (0.34 mm ²), 1 pair with general shield.
- The cable length should not exceed 50m.
- For a better electromagnetic protection, Lennox recommends the use of LiYCY-P cable

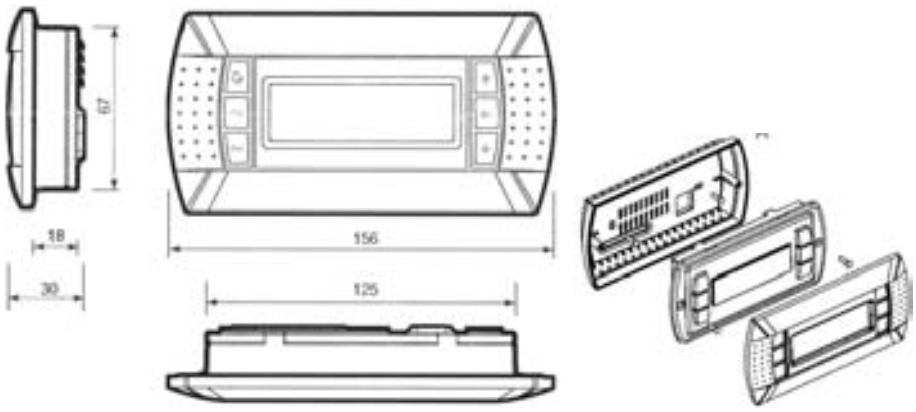
DISPLAY DS50

- The Display DS50 can be connected to the Climatic™ either on one of the RJ12 connectors located on the board DT50, or directly on the main board BM50 connector J10.
- Connection is carried out by the flat 1.5m cable delivered with this DS50.
- In any the case, Display DS50 cannot be remotely connected.
- In case of Master/Slave installation, one, and only one, display DS50 must be connected on the pLan bus.

DISPLAY DC50 (Remote CONNECTION)

Warning: A wrong wiring of the display immediately damage it and/or the main board BM50.

- The optional DC50/DM50 is designed to be mounted on the wall.
- Fit the cable from the DT50 board through the back piece
- Fasten the back piece to the wall using the rounded head screws supplied in the packaging
- Connect the cable from the main board on the connector on the back of the DC50 display
- Fasten the front panel on the back piece using the flush head screws supplied
- Finally fit the click-on frame



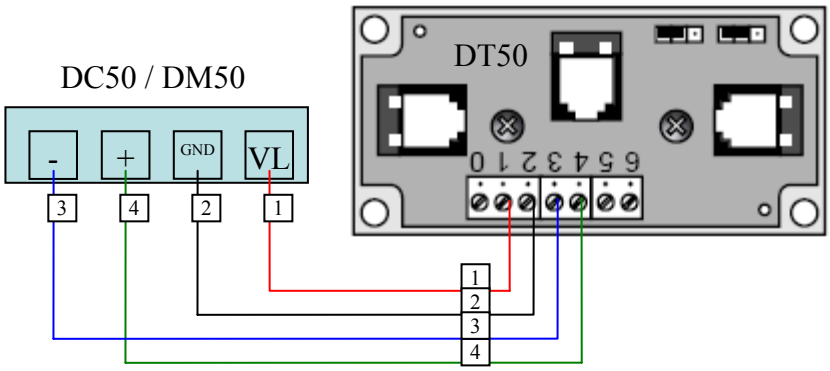
Display DC50 or DM50 is connected to the Climatic™ with the DT50 screw connector.

- Connection must be carried out by the following cable:
  - Cable length up to 300m: AWG22 (0.34 mm ²), 2 pairs crossed with screen.

- Cable length up to 500m: LiYCY-P (0.34 mm ²), 2 pairs with general shield.

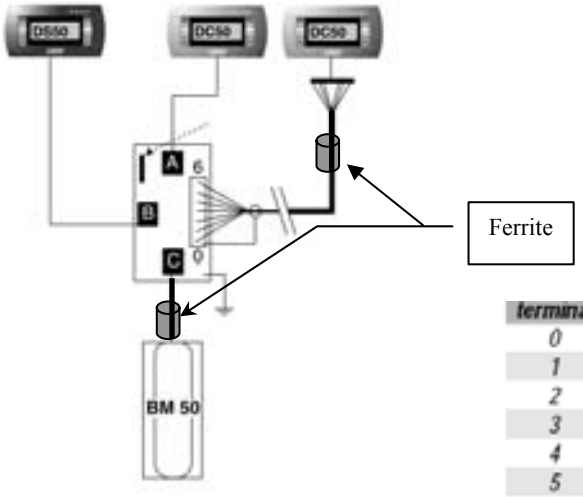
- The cable length should not exceed 500m.
- For a better electromagnetic protection, Lennox recommends the use of LiYCY-P cable

CONNECTION ON DT50 DERIVATOR



Terminal connection board installation guide DT 50

The board is fitted with three "telephone" RJ12 plugs. Ensure the board is correctly connected.
Standard connection is:



terminal	wire function	connections
0	earth	shield
1	+VRL (≈30Vdc)	1st pair A
2	GND	2nd pair A
3	Rx/Tx-	3rd pair A
4	Rx/Tx+	3rd pair B
5	GND	2nd pair B
6	+VRL (≈30Vdc)	1st pair B

BM50 on connector 'C',
DC50 on connector 'A' or 'C',
DS50 on connector 'B'.

Jumpers:
"Displays" are supplied directly by the Climatic board with 30Vdc. Take particular care at the path this 30V is taking when several boards are being used.

J14 and J15 can switch on or off the direct current from the power supply:

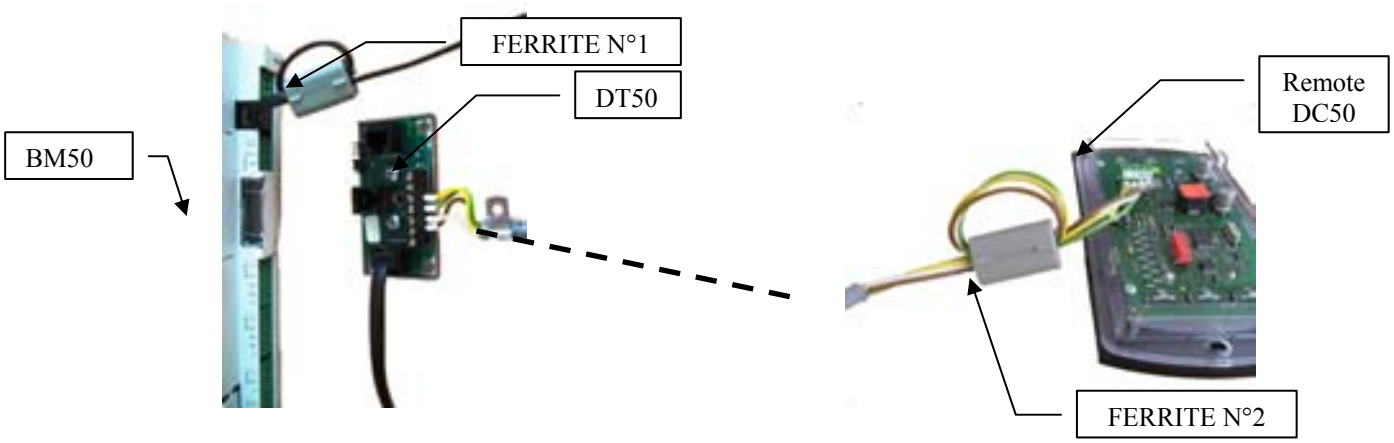
J14 and J15 set between1-2:
Connectors 'A', 'B', 'C' and screw connector 'SC' are in parallel. Power is supplied to all connectors.

J14 and J15 set between2-3:
Connectors 'B' and 'C' are powered in parallel but connector 'A' and screw connector SC are not.
Displays connected to these ports will not be powered.

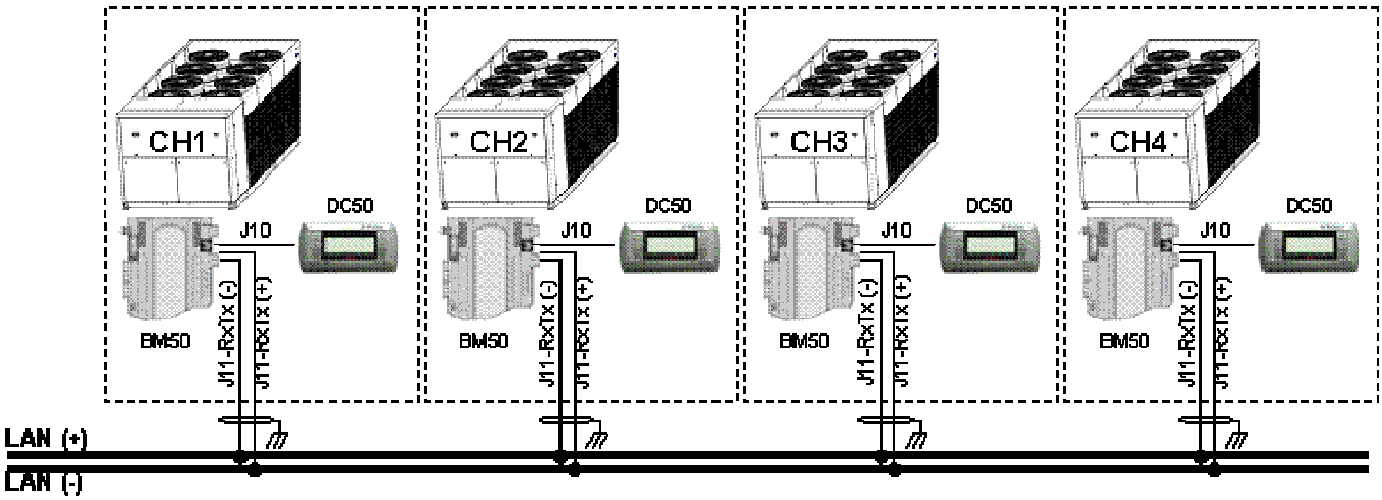
If J14 and J15 are set in different positions the "terminal connection board" DT50 DOES NOT WORK and so the connected displays do not operate.

Ferrites Protection of Display

To avoid the appearance of disturbances HF, which can cause the destruction of components in the displays, you must equip the cable with a ferrite when installing it (provided by Lennox).

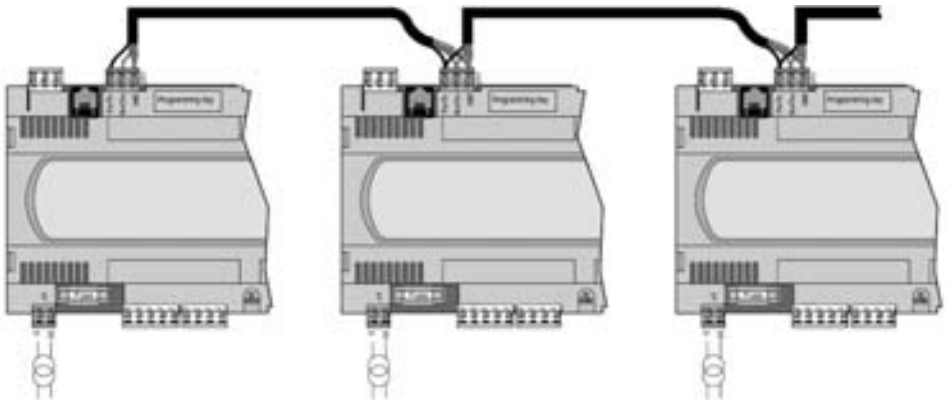


COMMUNICATION MASTER / SLAVE

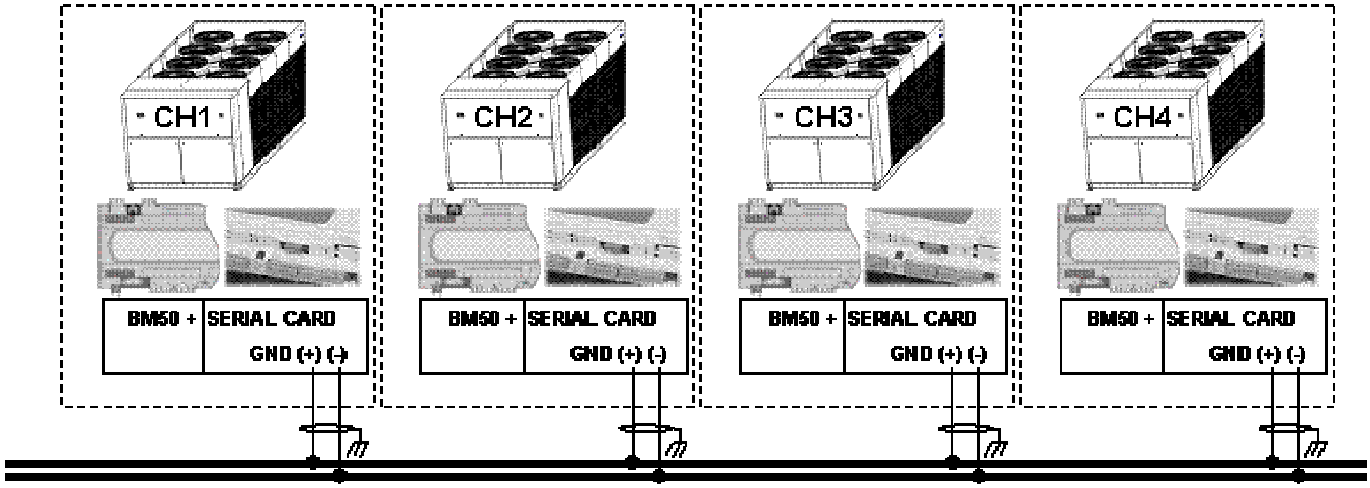


The intercard bus (pLan) is connected to Climatic™50 on the J11 connector of board BM50.
A star connection is not recommended, for an optimum operation it is advised to connect a maximum of two cables per unit.
Connection must be carried out by the following cable:
- Cable length up to 300m: AWG22 (0.34 mm ²), 2 pairs crossed with screen.
- Cable length up to 500m: LiYCY-P (0.34 mm ²), 2 pairs with general shield.
The cable length should not exceed 500m.
For a better electromagnetic protection, Lennox recommends the use of LiYCY-P cable.

Warning:
The power 24Vac of boards BM50 should not be connected to the earth

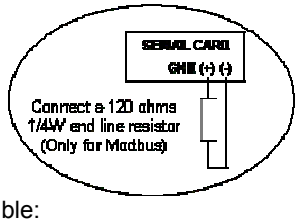


BMS COMMUNICATION



RS485 MODBUS / LON WORKS FTT 10A

The communication bus is connected to Climatic™50 Serial Card daughter board on the BM50.
A star connection is not recommended, for an optimum operation it is advised to connect a maximum of two cables per unit.
In case of RS485bus, a resistance of 120Ω 1/4W can be connected on the last unit between the terminals + and -.



Connection must be carried out by the following cable:
- Cable length up to 300m: AWG22 (0.34 mm ²), 2 pairs crossed with screen.
- Cable length up to 1000m: LiYCY-P (0.34 mm ²), 2 pairs with general shield.

The cable length should not exceed 1000m.
For a better electromagnetic protection, LENNOX recommends the use of LiYCY-P cable.

CONFIGURATION

Function

LENNOX© proposes a parametric designed software for the NEOSYS chillers & Heat pumps ranges.
For a first use, before any operation of the unit, Climatic™50 must be set with parameters in accordance to the range, the size and the various options of the unit.

Description

The unit configuration is done with following menus (refer also to Menu Tree chapter):

(3811) → Unit range choice,

[NAC]	NEOSYS, air/water (cooling only),
[*NAH*]	NEOSYS, air/water reversible (heat pump),
[NSR]	Non standard request unit.

(3812) → Unit size choice,

SOFTWARE	NAC	NAH
NA050 STD-Vers. 03.0-Rev 00.0	NAC-200-STD	NAH-200-STD
NA050 STD-Vers. 03.0-Rev 00.0	NAC-230-STD	NAH-230-STD
NA050 STD-Vers. 03.0-Rev 00.0	NAC-270-STD	NAH-270-STD
NA050 STD-Vers. 03.0-Rev 00.0	NAC-300-STD	NAH-300-STD
NA050 STD-Vers. 03.0-Rev 00.0	NAC-340-STD	
NA050 STD-Vers. 03.0-Rev 00.0	NAC-380-STD	
NA050 STD-Vers. 03.0-Rev 00.0	NAC-420-STD	
NA050 STD-Vers. 03.0-Rev 00.0	NAC-480-STD	
NA050 STD-Vers. 03.0-Rev 00.0	NAC-540-STD	
NA050 STD-Vers. 03.0-Rev 00.0	NAC-600-STD	
NA050 STD-Vers. 03.0-Rev 00.0	NAC-640-STD	
NA050 TWN-Vers. 01.0-Rev 00.0	NAC-680-TWN	
NA050 TWN-Vers. 01.0-Rev 00.0	NAC-760-TWN	
NA050 TWN-Vers. 01.0-Rev 00.0	NAC-840-TWN	
NA050 TWN-Vers. 01.0-Rev 00.0	NAC-960-TWN	
NA050 TWN-Vers. 01.0-Rev 00.0	NAC-1080-TWN	

(3813) → Unit with or without Electronic Expansion valve,

(3821) → Evaporator pumps configuration (No, single or double),
(3822) → Installation glycol percentage,
(3823) → Option free Cooling or not,
(3824) → Option heat recovery or not,
(3825) → Option power factor correction or not,

(3831), (3832), (3833), (3834) → Parametric digital output configuration of extension board BE50 1 to 4,
(3841), (3842), (3843), (3844) → Parametric digital input configuration of extension board BE50 1 to 4,
(3851), (3852), (3853), (3854) → Parametric analog input configuration of extension board BE50 1 to 4,

(3861) → Restore the standard Lennox settings or not (This parameter don't modify the settings **(38xx)**,

SCHEDULING – CLOCK SETTING

CLOCK SETTING

Function

Climatic™ 50 has a real time clock board, allowing dates and hours functionalities (weekly program, event recording,…).

Description

Menus (**3121**) to (**3125**) give the possibility of setting the internal clock.
The day of the week is calculated by Climatic™50.
For the countries of the Euro, the controller allows the automatic swing of the hour summer in hour winter and vice versa. This functionality can be cancelled by menu (**3126**).

(3121) → Hour,
(3122) → Minute,
(3123) → Day of the month,
(3124) → Month,
(3125) → Year,
(3126) → Enable automatic switch summer time / winter time.

SCHEDULING

Function

Controlling operation of the unit according to the time and day.

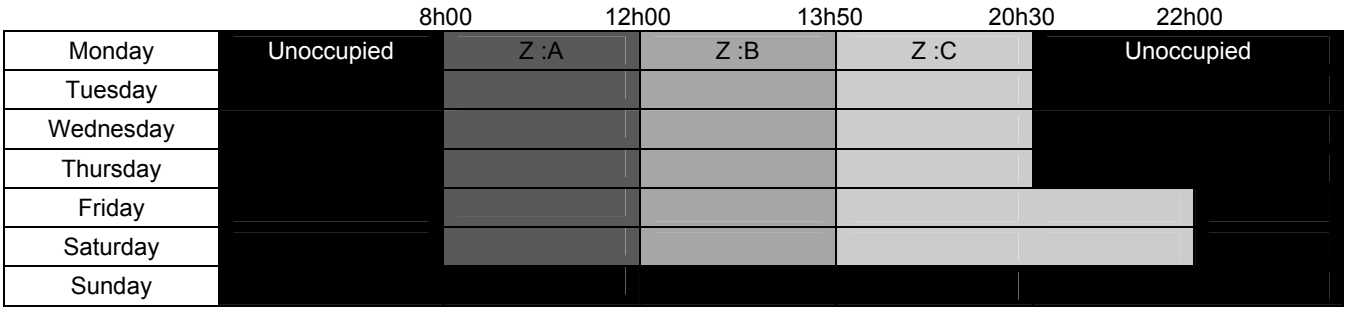
Description

Climatic™50 can handle 4 time zones over the 7 days of the week:

- Zone unoccupied « Night »,
- Zone A «Day A»,
- Zone B «Day B»,
- Zone C «Day C»,

Starting time (hours and minutes) of each of these zones for each days of the week, can be set using menus (3211) to (3214), (press 'PRG key to change day).
Each set point integrates the hour and minute's adjustment, thus a value of 8.3 equal 8.30 a.m.

(3211) → Hour, minute of the night starting time (unoccupied)
(3212) → Hour, minute of the "day A" starting time
(3213) → Hour, minute of the "day B" starting time
(3214) → Hour, minute of "day C" starting time



For each time zone, the set following set points following can be modified:

LIST SET POINT BY ZONE	Code	DISPLAY CONFORT	DISPLAY MAINTENANCE
Change over control			
Cooling / Heating priority	(3311)	Yes	Yes
Water temperature			
Cooling Water T° Set point A	(3321)	Yes	Yes
Cooling Water T° Set point B	(3322)	Yes	Yes
Cooling Air Ambient T° Set point A	(3323)	Yes	Yes
Cooling Air Ambient T° Set point B	(3324)	Yes	Yes
Heating Water T° Set point A	(3331)	Yes	Yes
Heating Water T° Set point B	(3332)	Yes	Yes
Heating Air Ambient T° Set point A	(3333)	Yes	Yes
Heating Air Ambient T° Set point B	(3334)	Yes	Yes
Compressor enable			
Enable compressor on circuit N°1	(3411)	Yes	Yes
Enable compressor on circuit N°2	(3412)	Yes	Yes
Fan condensing			
Fan Mode Set point	(3611)	Yes	Yes
Low Noise Value Set point	(3612)	Yes	Yes
Cooling water pump(s)			
Enable pump(s)	(3711)	Yes	Yes
Programming			
Beginning of zone; each day		Yes	Yes
Start Uno	(3211)	Yes	Yes
Start z.A	(3212)	Yes	Yes
Start z.B	(3213)	Yes	Yes
Start z.C	(3214)	Yes	Yes

With the DS50, for each set point, press on the key `**PRG** to change the periods and to validate the good set point for the good zone.

Note: “Monday” is considered as the first day of the week for programming the CLIMATIC™50.

Factory settings:

“Day A” activated from Monday to Saturday 6h→22h
Night mode (unoccupied) for the remaining of time, Sunday included

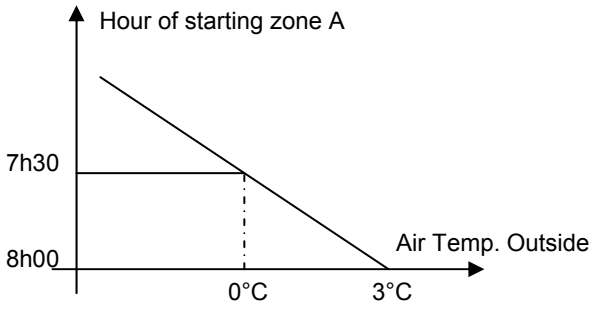
ANTICIPATION

Function

This allows an anticipated start-up in the morning depending on the outdoor temperature.

Description

This function only works for zone 'A', and allows the unit to move from 'unoccupied' zone to zone 'A' earlier if the outdoor temperature is under a certain value. Use this function to anticipate the heating start-up during cool days.



This can be adjusted with set point (**3221**) and (**3222**).

(3221) → Bottom of the slope (°C), Anticipation starting point,
(3222) → Slope in Minutes of anticipation per degrees.

***Example*:**
Unit with day 'A' starting at 8.00 am; (3221) set to 3°C and (3222) set to 10 mn/°C;
If the outside temperature is 0°C, then Day A will start at 7.30 a.m.

CHANGE OVER – (REVERSIBLE UNITS ONLY)

Function

For reversible units only, this allows the reversible units to change automatically from winter to summer operation.

Description

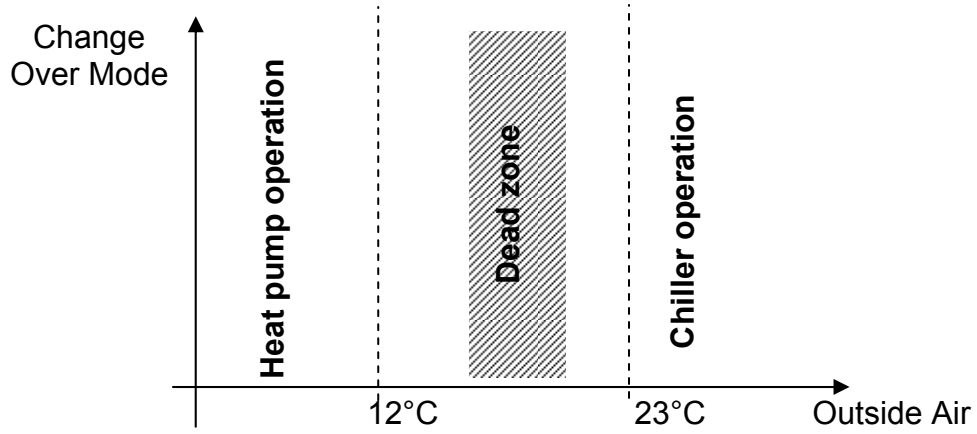
This function will change the unit from production of hot water to production of chilled water automatically and can be set up with following set points:

(**3311**) = Change over mode according to following values:
Cool. Only → Unit operating in cooling mode only,
Heat. Only → Unit operating in heating mode only,
Auto. → Automatic change over according to the settings (3312) & (3313), Pumps are running in dead zone,
Auto. Stop → Automatic change over according to the settings (3312) & (3313), Pumps are stopped in dead zone.

(**3312**) → Change over winter setting
The set point (3312) is the outside air temperature under which the unit will operate as a heat pump.

(**3313**) → Change over summer setting
The set point (3313) is the outside air temperature over which the unit will operate as a chiller.

Example:
(**3312**) = 12°C
(**3313**) = 23°C



Permutation, Cool or Heat Mode (optional)

The choice of the operating mode in cooling or heating is automatically carried out according to the room temperature and the temperature set points adjustment.
Meanwhile as an option, using free contacts on parametric inputs, it is possible to disable one mode or another. (See Customized Input / Output (BE.50))

- With a free contact and **(3841), (3842), (3843), (3844)** = [*Sw Cool*], the contact closing will disable the cooling mode,
- With a free contact and **(3841), (3842), (3843), (3844)** = [Sw *Heat*], the contact closing will disable the heating mode.

EVAPORATOR PUMP(S) MANAGMENT

Function

Ensure the presence of a flow rate of heat transfer fluid in the evaporator heat exchanger.

Description

Seven types of control rules can be set. They are defined using the menu (**3711**) on the DS50 Service Display.

If (**3711**) = “Started“: Climactic™50 does not control the pumps,
If (**3711**) = “Stopped”: Pumps are stopped,
If (**3711**) = “P1 Only”: Climactic™50 controls only the pump N°1,
If (**3711**) = “P2 Only”: Climactic™50 controls only the pump N°2,
If (**3711**) = “P1-N_P2-R”: Climactic™50 controls handles both pumps with N°1 as standard and N° 2 as backup,
If (**3711**) = “P2-N_P1-R”: Climactic™50 controls handles both pumps with N°2 as standard and N° 1 as backup,
If (**3711**) = “Clock”: Climactic™50 controls handles both pumps equalizing running times and switching from one pump to the other every Tuesday at 02h00 am.

In the case of single pumps, the pump N°‘k’ is running if all of the following conditions are met:
⇨ At least one ON/OFF of circuit “n” is ON,
⇨ Unit remote ON/OFF is ON *,
⇨ Unit is NOT in the unoccupied zone*,
⇨ Set point (**3711**) is not set to “Stopped”,
⇨ Configuration (**3821**) is not set to “No”,
⇨ Pump has been stopped for 1 minute or is already running,
⇨ There isn’t electrical fault on the pump,
⇨ There is a « flow rate » fault.

(*) These conditions are ignored if the outdoor temperature is below set point (**3341**) + 1°C and if the outlet water temperature is below set point (**3321**) +1°C, in order to prevent the water from freezing.

A pump can be controlled by the Climactic™50 even if the network pump is not handled by the refrigeration unit (electrically speaking).

In the case where the customer is handling the control of his own pump, the following procedure must be followed:

- Start the pump at least 1 minute before validating the remote ON/OFF switch operation.
- Switch off the pump 2 minutes at least after the remote ON/OFF switch has gone to 0.

In the case of double pumps, the pump N°’k’ is running if all of the following conditions are met:
⇨ The conditions detailed above for the single pump must be met for the pump ‘k’,
⇨ In the case of forced operation, pump N°’k’ is running (set point (**3711**) is set to “P1 Only” for pump N°1 and “P2 Only” for Pump N°2)
⇨ When running « Standard/Backup » operation, pump N°’k’ has priority (Set point (**3711**) set to “P1-N_P2-R” for Pump N°1 and “P2-N_P1-R” for pump N°2).
⇨ In the case of “equalized run time” operation the running time of pump N°’k’ is the smallest.

In case of a fault on a pump when the set point (**3711)** is set to « P1-N_P2-R », « P2-N_P1-R » or « Clock », the second pump, if available, will automatically start.

NOTE*:* Climactic™50 stops the pumps only 2 minutes at least after the request to switch the whole unit OFF has been given, in order to prevent any risks of freezing the evaporator heat exchanger.

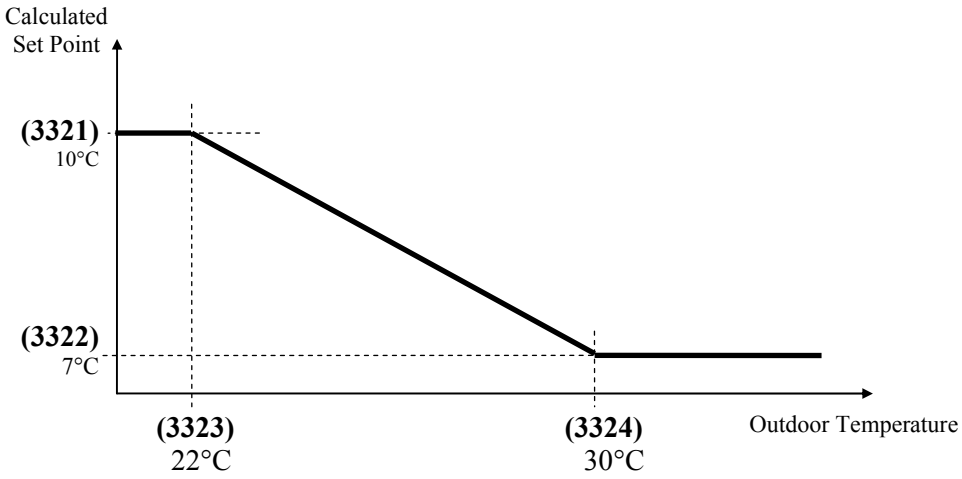
THERMOSTAT – DYNAMIC SET POINT CALCULATE

Function

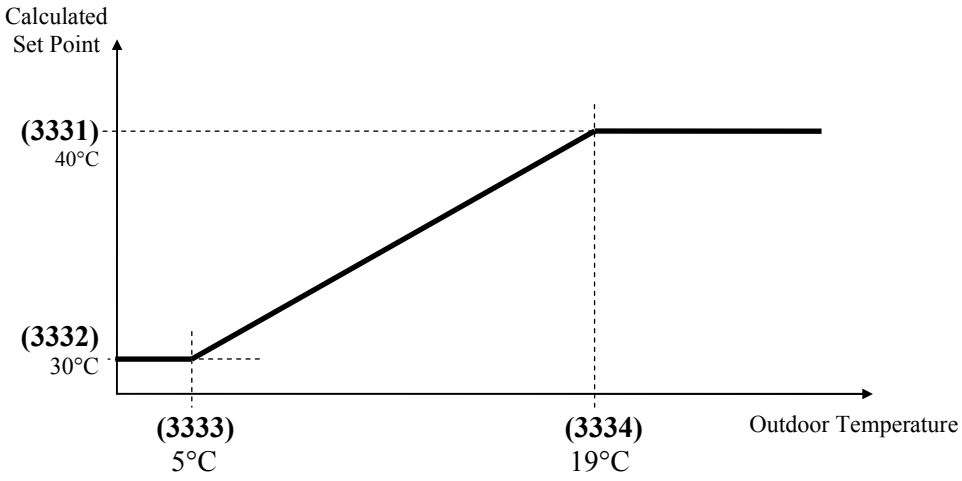
Set the chilled or hot water circuit temperature, depending on the outdoor conditions in order to optimise the energy consumption.

Description

Calculation of the chilled water set point :



Calculation of the chilled water set point:



NOTE*:* Values are given only for indications. The gradient can be positive or negative.

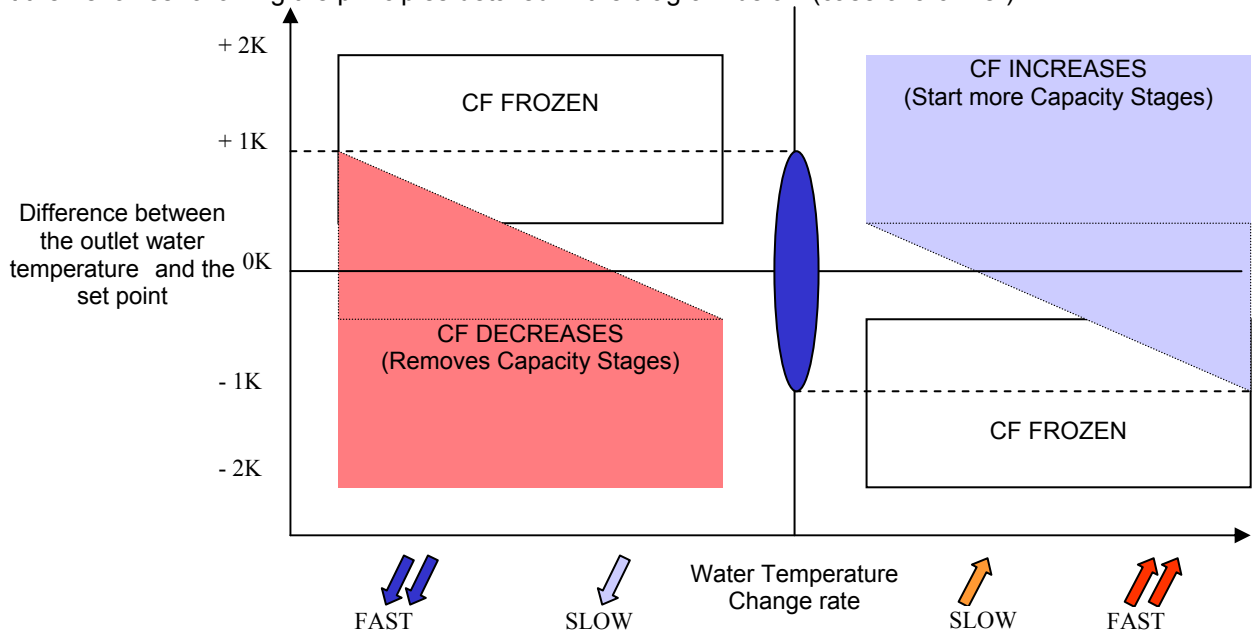
THERMOSTAT – Control principle

Function

Adjust and hold the fluid outlet temperature as close as possible to the set point, by controlling the number of compressor stages depending on the thermal load of the system.

Description

Climactic™50 controller calculates constantly the required capacity to reach the temperature set point.
This variable is called “CAPACITY FACTOR” (CF) and its value can vary from 0 to 100%.
It is directly linked to the number of control stages of the unit.
Thus for a unit with 4 stages of regulation, the CF will start and stop a stage with the following values: ~0-25-50-75-100%.
It then evolves following the principles detailed in the diagram below (case of a chiller):



In order to anticipate, the reference point is recalculated each time the difference between air temperature and set point reach a minimum or a maximum.

In any cases, for a chiller, if the low water temperature limit is reached, compressors are stopped.

Moreover, the set point (**3325**) limits the power factor in cooling mode, and the set point (**3335**) set point limits the power factor in heating mode. The control calculates the difference between the Inlet and Outlet water temperature.

Example:
For a unit with 2x2 scroll compressors, with four steps (25.0% by stage); if the (**3326**) set point is equal to 5°C, then 5 / 4 = 1.25°C, and if the chilled water Inlet temperature set point is equals to 7°C the power factor can go up to the 25.0% (1 stage) only if T°Inlet ≥ (SP_Water (**3321**) + 1.25K).

Then the power factor can go up to the 50.0% (2 stages) only if T°Inlet ≥ (SP_Water (**3321**) + 2.5K), (2x1.25K), and so…

COMPRESSORS

Function

From a outlet temperature need (Capacity Factor) the compressors are started and stopped with a determined sequence in order to minimize the anti short cycle protection effect and to equalize the operating time.

Description

Compressors Start/Stop sequences.

This sequence is set by the memorized compressor operating time and it also includes the other compressors back-up function, if they are not available. However, for circuits with tandem compressors (small + big), the compressor management favours the unit performance, COP, rather than the compressor operating time balance.

The compressor starts if all the following conditions are satisfied:

- The remote ON/OFF switch for the complete unit is ON,
- The ON/OFF control for the considered circuit is ON,
- The water circulation flow has been detected for at least 1 minute,
- The unit, the circuit and the compressor don't have major faults,
- The control requires the starting of the compressor,
- The compressor has the lowest operating time among the stand by compressors,
- The compressor has been switch OFF for at least 1 minute,
- The compressor has not been brought into service for at least 5 minutes.

Each compressor state can be checked on the following menus: (**2312**), (**2322**), (**2332**), (**2342**), (**2352**), and (**2362**).
To check the operating time of each compressor use menus: (**2318**), (**2328**), (**2338**), (**2348**), (**2358**), and (**2368**).
To reset an operating time counter, put the DS50 cursor on the line and press the key `ENTER during 20sec.

Compressor operation authorization

The Climactic™50 may limit the operation of the compressors according to the outdoor temperature. As well, the user may choose to limit the operation of the compressors by using contacts or the DS50 settings.

Outdoor temperature

All compressors are automatically disabled if all the following conditions are satisfied:

- The unit is equipped with thermostatic expansion valve,
- The unit is operating in cooling mode,
- The outside temperature is below 5.0°C.

High pressure unloading

- High pressure unloading consists in reducing the circuit capacity by stopping one or more compressors on the concerning circuit before the high pressure reaches its limits in order to keep a partial capacity with high outdoor temperature.

DS50 Settings

- Stop one or several compressors of the unit, defined by the settings (**3411**), (**3412**) of the terminal DS50. (If the compressor number is not displayed, the compressor is disabled).

(3411) → Compressors authorization on the circuit N°1 (adjustment by zone),
(3412) → Compressors authorization on the circuit N°2 (adjustment by zone).

Free contacts (Optional - See Customized Input / Output (BE.50))

- Stop one of the two circuit of the unit (all compressors on the concerning circuit), defined by the setting of the free contact.
- Stop one or several compressors of the unit if the compressor number, defined by the setting of the free contact.

DEFROST – (REVERSIBLE UNITS ONLY)

Function

Avoid the evaporator icing (external coil) in heat pump operation in winter time.

Description

To avoid the icing of the external air exchanger in winter operation, it is necessary to reverse the refrigerant cycle on a regular basis to de-ice by heating the exchanger. A defrost is activated when the air temperature is under a set point (**3622**).

When defrost is demanded, the sequence is as following:

1. Stop compressors and fans,
2. Reverse the 4 way valve,
3. Start compressors,
4. When the condensing pressure reaches 35 bars or if the compressors are operating for more than 6 minutes, the compressors are stopped,
5. Start fans at full speed during 1minute in order to dry the exchanger (The time is adjustable with the set point (**3625**)).
6. Reverse the 4 way valve,
7. End of defrost.

Two different types of defrost demand are possible:

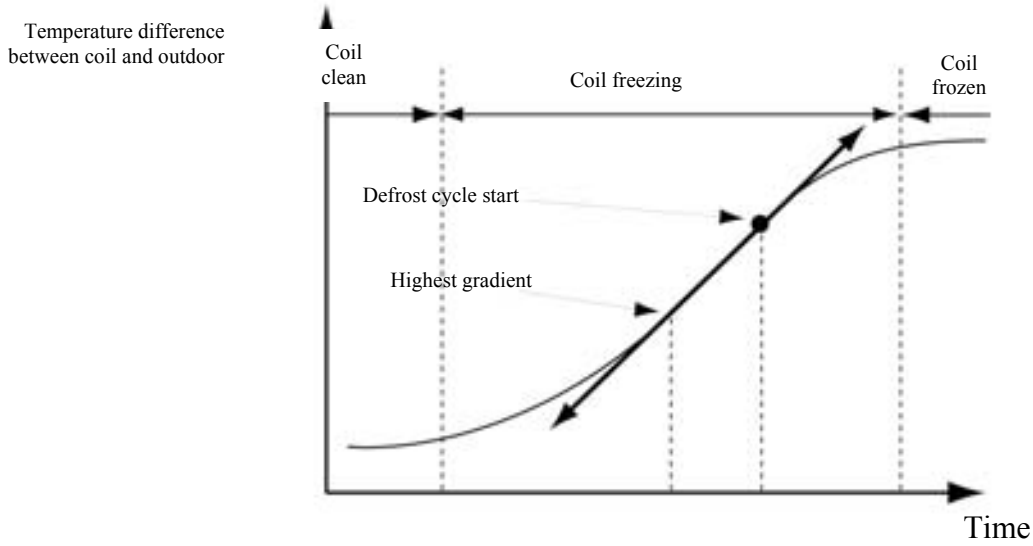
- Dynamic defrost: set point (**3621**) = Dynamic,
- Cycling defrost: set point (**3621**) = Cyclic.

Cycling defrost

The unit will start a cyclic defrost in heating mode under a regular period of time defined by the set point (**3624**).

Dynamic defrost

This allows the unit to start the defrost cycle only when required. This is achieved through the measurement of the temperature difference between the coil and the outdoor. The defrost will be initiated shortly after the Climatic™50 has located the largest gradient in the curve.



(3621) → Defrost mode,
(3622) → Outside air temperature under which the defrost cycle is activated,
(3623) → LP temperature under which the defrost cycle is activated for the cyclic mode and defrost cycle activation sensibility for the dynamic mode (standard ratio between dry coil ΔT and iced coil ΔT),
(3624) → Minimum compressors operating time between 2 defrosts,
(3625) → Number of times the fans restart depending on/according to pressure.

SUPPLEMENT OF HEATING (REVERSIBLE UNITS ONLY)

Function

The heat pump units allows to control supplementary of heating capacity, providing dry contacts to connect up to 4* electrical heaters on the expansion board (BE50) driven by the Climactic™50. The supplement of heating stages are started and stopped with a pre-determined order.
(*) See the complete description below.

Description

Operation priority, Compressors / Additional heating

From factory setting, in heat pump mode, Climatic™50 starts compressors first and then if necessary, starts additional heating.

The electrical heaters start if all the following conditions are satisfied:

- The remote ON/OFF switch for the complete unit is ON,
- The ON/OFF control for the considered circuit is ON,
- The unit is running in heating mode,
- The water circulation flow has been detected for at least 1 minute,
- The unit doesn't have major faults,
- The unit is at full load (all available compressors are running) for at least 2 minutes.

The pre-determined order for activation of the electrical heater uses a LIFO structure (Last In First Out). The rotation is based on the principle that the first electrical heater which will be stopped is the one which have started the last one. So the pre-determined order to switch OFF to ON is always the same: Heater N°1, 2, 3, (4) and the switching to OFF is: Heater N° (4), 3, 2, 1.

The control of the electrical heaters uses the same principle as the thermostat control for the compressors.

NOTE*:* The fourth electrical heater (4) is use in backup mode, which means only when none of the compressors is running.

CONDENSING FANS CONTROL

Function

Maintain the condensing pressure as stable as possible in order to increase the unit performances, while avoiding excessive cycling.

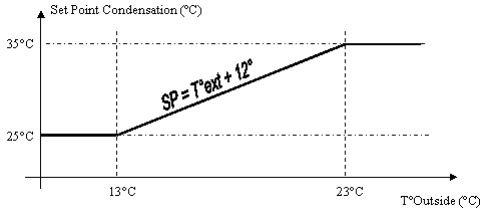
Description

Identical to the complete machine control logic, the Climactic™50 aims is to reach and hold the high pressure set point. The Climactic™50 control the fan thanks to the inverter ATV21, which constitutes a frequency speed variation driver.

Operation

The unit uses one fan driver by circuit, except for specific size of unit which use a third one common to the two circuits. There are two types of condensation temperature set point:

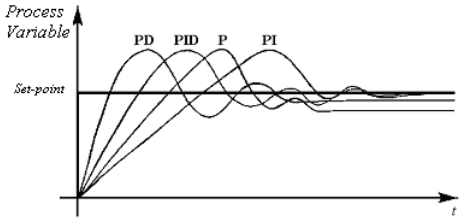
- For units using thermostatic expansion valve, the set point is defined by the setting (**3616**),
- For units using electronic expansion valve, the set point is automatically calculate according to the outdoor temperature. This function offers better efficiency during operating in part load compressors.



Condensation set point for units with electronic expansion valve

- The condensing pressure is controlled by a P.I.D algorithm, which is configurable thank to the settings:

P = (**3613**): Proportional set point,
I = (**3614**): Integral set point,
D = (**3615**): Derivate set point.



Function

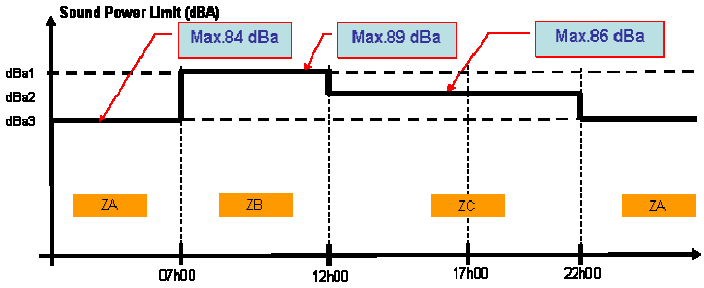
The fan speed limit is controlled by the Smart Acoustic System™ which allows progressive adaptation of the unit to the building load while respecting the noise level constraints and the operating limits.

Description

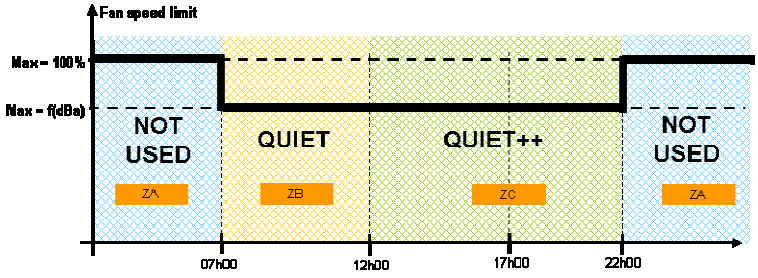
The maximum sound level and the fan strategies can be adjusted per time zone (ZA, ZB, ZC, ZD, Inoc, BMS) on the Climactic™50. Customer can choose between “High performance” or “Low noise” operating as well as in heating or cooling mode.

Operation

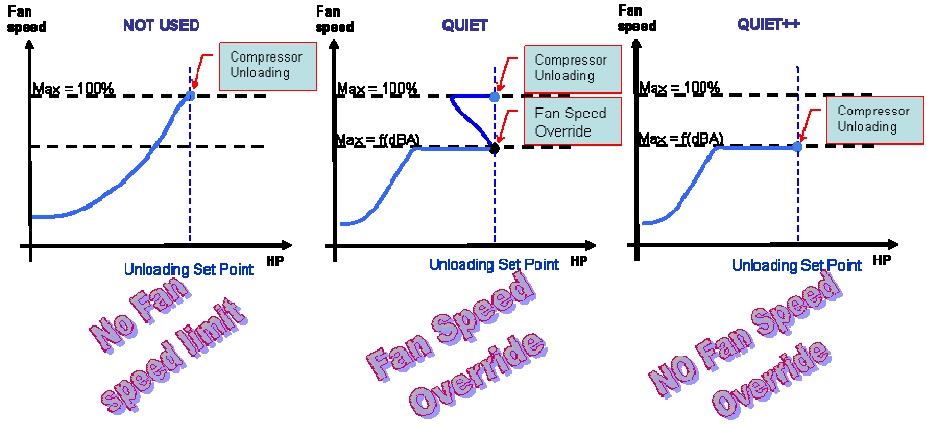
- The maximum sound level desired can be adjusted by the setting (**3612**), expressed in dBa. The minimum sound level depends on the size of the unit and defines the maximum capacity (%) of the condensing fan allowed.



- The Climactic™50 can manage 3 different strategies for the fan and compressors, defined by the setting (**3611**): **NOT USED, QUIET, QUIET++**. This set point controls the fan capacity (%) and the compressors in case of condensing pressure too high.



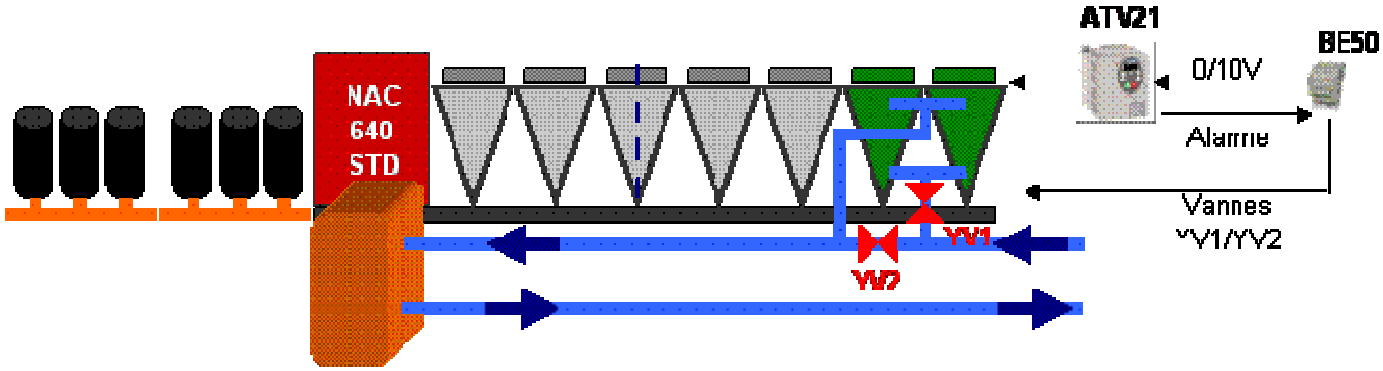
If (**3611**) = “NOT USED“, there isn’t any control of the capacity limit of the fan. The capacity range is [0;100]%.
If (**3611**) = “QUIET“, the Climactic™50 controls the capacity limit of the fan according to the set point (**3612**). In case of condensing pressure too high, the controller unlocks the capacity limit to prevent from HP security alarm.
If (**3611**) = “QUIET++“, the Climactic™50 controls the capacity limit of the fan according to the set point (**3612**). In case of condensing pressure too high, the controller unloads a compressor to contain the HP pressure.



FREECOOLING OPTION

Function

Ensure optimum cooling capacity though the use of free cooling, therefore reducing electrical consumption.



Description

The freecooling fans are controlled by a PID algorithm. They have a higher priority face to the compressors. Once the freecooling is over 95.0% during 2min, the compressors are allowed to start according to the water thermostat algorithm (cf. previous part). In case of decreasing of the freecooling capacity under 90.0%, the thermostat capacity is lock to prevent from starting of a new step of compressors.

The freecooling is enable if the following conditions are satisfa:

- The unit is ready (On/Off, water flow, no probe alarm, etc..),
- The freecooling driver is operating (none alarm)
- T°outside < (T°inlet – 3°C).

CUSTOMIZED INPUT/OUTPUT

Function

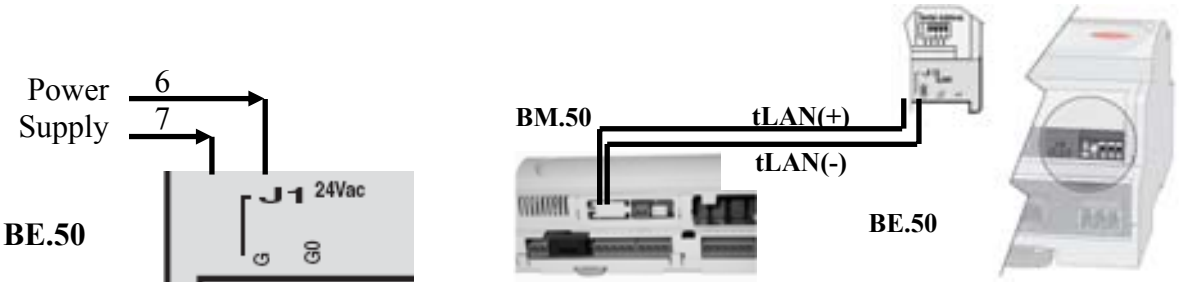
The Climactic™50 main board (BM.50) and the optional expansion board (BE.50) offers possibilities to customize some input / output for remote control of the unit. So it is possible to customize:

- 5 digital outputs NC or NO set up with parameters (**3841**), (**3842**), (**3843**) and (**3845**),
- 6 digitals inputs set up by parameters (**3851**), (**3852**), (**3853**) and (**3854**),
- 4 analogical inputs (4-20mA or Lennox NTC temperature probe), set up with parameters (**3861**), (**3862**), (**3863**) and (**3864**).

In case of "Twins" unit (NAC 680, 760, 840, 960, 1080), the customized input/output must be connected on the master unit (BM50 with pLAN address = 1).

Description

The wiring connection between the BM.50 and the BE.50 is described on the following figure:



The various possibilities of customized inputs / outputs functions can be configured as follow:

Please, respect the wiring connections warning before connect the free input/output. (cf. "WIRING CONNECTIONS" section).

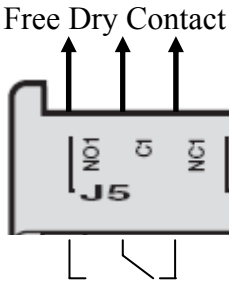
DIGITAL OUTPUTS NC or NO – DRY CONTACTS

Electrical characteristics: Maximum commutable power: 2000VA, 250Vac.

The corresponding between the connectors and the settings is:
(3831) → Setting for the digital output on the connector BE50-J5-NO1,
(3832) → Setting for the digital output on the connector BE50-J6-NO2,
(3833) → Setting for the digital output on the connector BE50-J7-NO3,
(3834) → Setting for the digital output on the connector BE50-J8-NO4.

The following items can be used for each output:

[*Not Used*.]	Contact not used,
[*C.1 Alarm]*	Alarm on circuit N°1,
[C.2 Alarm]	Alarm on circuit N°2,
[Fans Al.]	Alarm on the condensing fan,
[Pump Al.]	Alarm on the pump,
[Flow Al.]	Alarm on the flow rate,
[Heat. Mode]	Unit operating in heating mode (Reversible unit only),
[C.1 100%]	Circuit N°1 running at full load (compressors),
[C.2 100%]	Circuit N°2 running at full load (compressors),
[U. 100%]	Unit running at full load (Circuits N°1&2),
[U. On]	Unit ready to start,
[Z:A]	Unit operating Zone A,
[Z:B]	Unit operating Zone B,
[Z:C]	Unit operating Zone C,
[Uno]	Unit operating Zone Unoccupied,
[Bms]	Unit operating Zone BMS,
[Free]	Free for BMS acting,
[Elec.H.]	Electrical heaters (up to 4) (Reversible unit only).



Example
BE50-J5.NO1

DIGITAL INPUTS – DRY CONTACTS

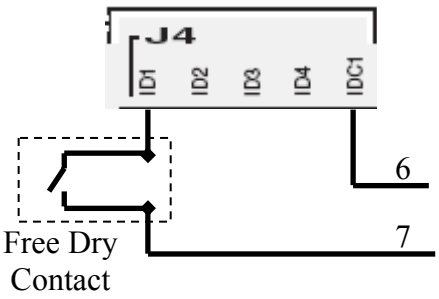
Electrical characteristics: 24Vac or 24Vdc, 50/60Hz.

The corresponding between the connectors and the settings is:
(3841) → Setting for the digital output on the connector BM50-J8-ID13,
(3842) → Setting for the digital output on the connector BM50-J8-ID14,
(3843) → Setting for the digital output on the connector BE50-J4-ID1,
(3844) → Setting for the digital output on the connector BE50-J4-ID2,
(3845) → Setting for the digital output on the connector BE50-J4-ID3,
(3846) → Setting for the digital output on the connector BE50-J4-ID4.

The following items can be used for each input:

[*Not Used*]	Input not used,
[Sw Setpoint]	Switch to the second cooling / heating set point,
[Sw Cool.]	Switch the unit to the cooling mode,
[*Sw Heat.]*	Switch the unit to the heating mode,
[C1 Disable]	Disable the circuit N°1 (all compressors),
[C2 Disable]	Disable the circuit N°2 (all compressors),
[Circ.1-Cp.1]	Disable the compressor N°1 on the circuit N°1,
[Circ.1-Cp.2]	Disable the compressor N°2 on the circuit N°1,
[Circ.1-Cp.3]	Disable the compressor N°3 on the circuit N°1,
[Circ.2-Cp.1]	Disable the compressor N°1 on the circuit N°2,
[Circ.2-Cp.2]	Disable the compressor N°2 on the circuit N°2,
[Circ.2-Cp.3]	Disable the compressor N°3 on the circuit N°2,
[Z:A]	Unit operating Zone A,
[Z:B]	Unit operating Zone B,
[Z:C]	Unit operating Zone C,
[Uno]	Unit operating Zone Unoccupied,
[Bms]	Unit operating Zone BMS,
[*Free*]	Free for BMS system information,
[Elec.H.]	Electrical heaters fault (Reversible unit only).

Example
BE50-J4.ID1



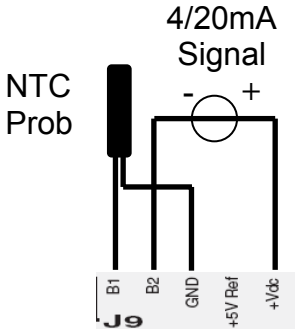
ANALOG INPUTS

Electrical characteristics: The analog input on the same connector J9 (B1 and B2) must use the same type of signal (4/20mA or NTC). As well, the analog input on the same connector J10 (B3 and B4) must use the same type of signal (4/20mA or NTC).

The corresponding between the connectors and the settings is:
(3851) → Setting for the analog input on the connector BE50-J9-B1,
(3852) → Setting for the analog input on the connector BE50-J9-B2,
(3853) → Setting for the analog input on the connector BE50-J10-B3,
(3854) → Setting for the analog input on the connector BE50-J10-B4.

The following items can be used for each input:

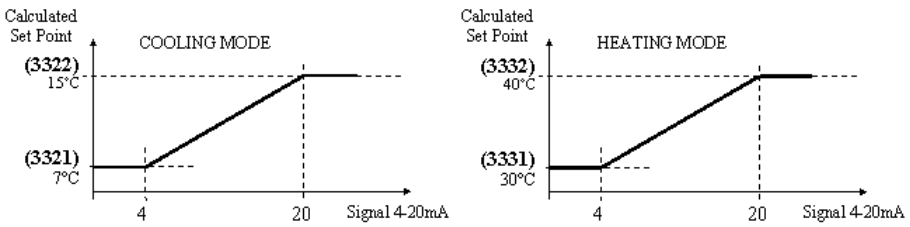
[*Not Used*]	Not used,
[*S.P Water*]	Water set point 4-20mA signal,
[*S.P Offset*]	Water set point offset 4-20mA signal,
[*Free NTC*]	Free temperature probe connection.



Example
BE50-J9.B1,
BE50-J9.B2

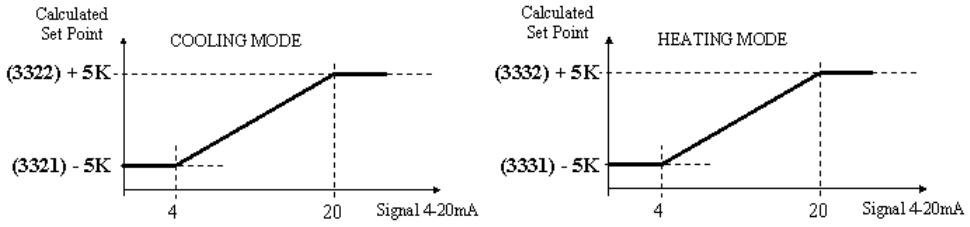
Water set point cooling / heating 4-20mA signal:

The 4-20mA signal sent to the unit is linearly converted using the 2 water temperature set points. To increase the precision, you can customize 2 range of water set point according to the cooling or heating mode operating.



Water set point offset 4-20mA signal:

The 4-20mA signal sent to the unit is linearly converted using a -5K to +5K range of temperature set point.



Free temperature probe connection:

Lennox NTC sensor: The measured value will be displayed on following addresses (**2171**), (**2172**), (**2173**) or (**2174**).

STANDARD INPUT/OUTPUT

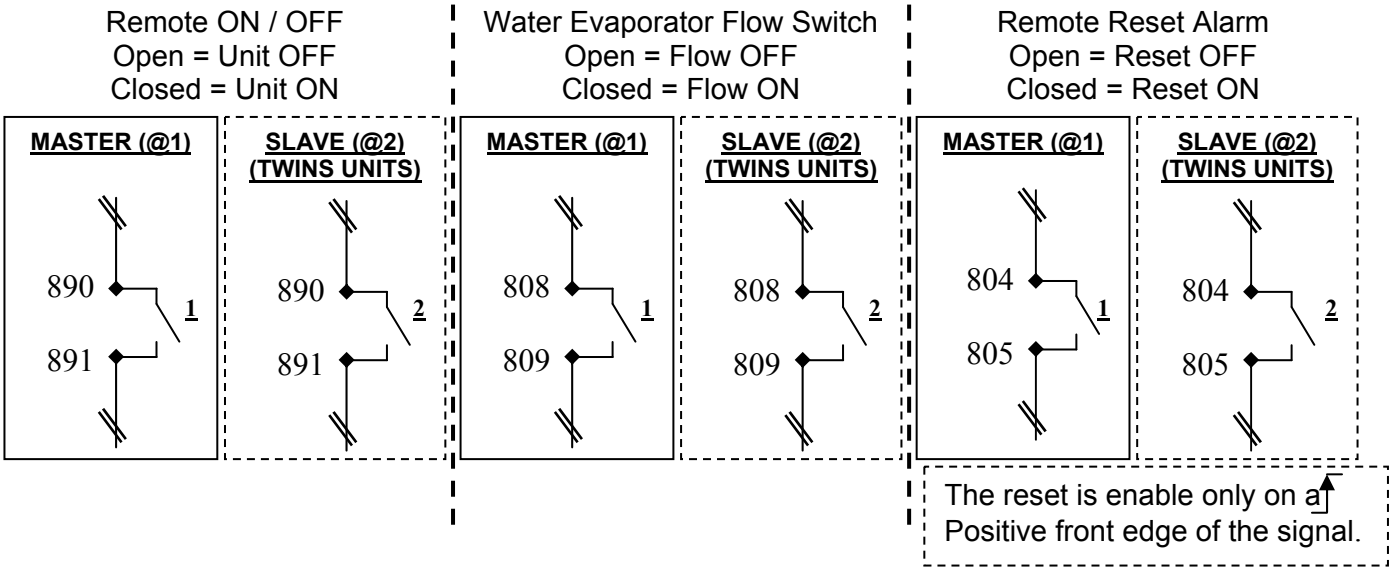
Function

The Climactic™50 main board (BM.50) offers free dry contacts to control the unit. These free dry contacts are connected directly to terminals (orange colour) identified as follow:

- [824 - 825] : 24V relay customers power supply (Option),
- [826 - 827] : 24V power ON the unit (Option),
- [804 - 805] : Remote alarm reset (NC = Enable Reset),
- [808 - 809] : Water evaporator customer flow switch,
- [890 - 891] : Remote ON / OFF of the unit.
- [870 – 871 - 872] : Alarm relay (NC = Alarm OFF).

Connection

The following figure described how to connect the free dry contacts of Climactic™50.
For the contacts [824 - 825] and [826 - 827], refers to the electrical diagram.
NOTE:
In case of TWINS units (NAC 680, 760, 840, 960, 1080), it's necessary to use a double contact to control the 2 parts of unit.



ERROR CODES ALARMS

001 Flow Rate Water Evaporator
011 Electrical Heater(s)
012 High Outlet Water Temperature
013 Low Inlet Water Temperature
022 Low Outlet Water Temperature
023 High Inlet Water Temperature
024 Electrical Box Temperature
040 Pump Flow
041 Pump 1
042 Pump 2
070 Clock card
071 BE50
078 Temperature Probe Electrical Box
081 Temperature Probe Water Inlet
083 Temperature Probe Outside
085 Temperature Probe Water Outlet
086 Temperature Probe Water Heat Recovery Inlet
087 Temperature Probe Water Heat Recovery Outlet
092 Circuit 1 Condenser fan
093 Circuit 2 Condenser fan
094 Circuit 3 Condenser fan
107 Freecooling fan
108 Correction Power factor
111 Circuit 1 Probe High Pressure
112 Circuit 1 Probe Low Pressure
114 Circuit 1 Compressor(s)
115 Circuit 1 High pressure
116 Circuit 1 Reversing Valve Locked
117 Circuit 1 Low pressure
118 Circuit 1 Risk of Frosting
121 Circuit 2 Probe High Pressure
122 Circuit 2 Probe Low Pressure
124 Circuit 2 Compressor(s)
125 Circuit 2 High pressure
126 Circuit 2 Reversing Valve Locked
127 Circuit 2 Low pressure
128 Circuit 2 Risk of Frosting
210 Circuit 1 EEV Driver
211 Circuit 1 EEV Low Superheat Temperature
214 Circuit 1 EEV L.O.P
215 Circuit 1 EEV Valve NOT Closed
216 Circuit 1 EEV Probe Low Pressure or Suction Temperature
217 Circuit 1 EEV Motor
219 Circuit 1 EEV Battery
220 Circuit 2 EEV Driver
221 Circuit 2 EEV Low Superheat Temperature
224 Circuit 2 EEV L.O.P
225 Circuit 2 EEV Valve NOT Closed
226 Circuit 2 EEV Probe Low Pressure or Suction Temperature
227 Circuit 2 EEV Motor
228 Circuit 2 EEV E.E.P.R.O.M

Insufficient Evaporator Water Flow Rate

Error code: 001

Description

The flow switch (FSE) is detecting a low water flow rate in the evaporator heat exchanger for more than 3 seconds.

Action

- ☞ Immediate shut down of the complete unit.
- ☞ Fault signalling.

Reset

The unit restarts automatically 2 minutes after the onset of failure.

The fault will no longer be reset automatically after 3 cut outs in the same day and must be reset manually.

Note: The fault counter is cleared and reset every day at 06:00 am, provided the maximum number of faults has not been reached.

Possible causes	Solving the problem
Problem with the pump control wiring.	Check the pump connections
Problem with the flow switch wiring	Check the flow switch connections
Dirty or clogged water filter.	Clean the water filter.
Wrong setting of the flow switch.	Check the flow switch settings.
Problem with the pump control wiring.	Check the pump connections

Chilled Water Temperature Out of Range

Error code: 012, 013, 022, 023, 024

Description

The chilled water temperature (Inlet or Outlet) measured by the probe is outside the permitted range. This range can vary according to the presence or not of glycol with the chilled water (factory setting).

Lower limit of water temperature: water temperature < safety threshold
Upper limit of water temperature: water temperature > safety threshold

(2112) → Water inlet evaporator temperature,
(2113) → Water outlet evaporator temperature,
(3341) → Safety threshold, lower limit of water evaporator temperature in cooling mode,
(3342) → Safety threshold, upper limit of water evaporator temperature in cooling mode,
(3343) → Safety threshold, lower limit of water evaporator temperature in heating mode,
(3344) → Safety threshold, upper limit of water evaporator temperature in heating mode,
(2116) → Electrical box temperature.

Action

- ☞ No safety.
- ☞ Fault signalling.
- ☞ Memorisation is displayed.

Reset

Automatic resetting of the fault as soon as the temperature reaches the permitted operating range.

Note: After a change over switch, the alarms 013 and 023 are disabled during 30min.

Possible causes	Solving the problem
Temperature probe failed	Replace probe or sensor.
Problem with wiring of probe	Check the connections of the probe or sensor

Electrical Heater(s) Elements

Error code: 011

Description

A safety remote signal is sent to indicate a problem with the electric heater(s).

Action

☞ Heating elements switch off immediately.
☞ Fault signalling. Memorisation is displayed.

Reset

Manual reset.

Possible causes	Solving the problem
Problem with the external material which managed the heater(s)	Check the connections
Problem with the wiring of the heating elements	Check the connections

Insufficient Flow Rate Provided by the Pump

Error code: 001, 040

Description

Pump 'k' supplying flow rate to the evaporator has been ordered to start for 20 seconds. The flow switch (F.S.E) is detecting insufficient flow rate in the heat exchanger for more than 30 seconds.

Action

Case 1: The unit only handles SINGLE pump

- Immediate shut down of compressors and pump 'k',
- Fault signal 001 is signalling,
- The remote fault signal is delayed by 2 minutes.

Case 2: The unit handles DOUBLE pumps and the "Normal/ Safety" mode or "Clock" has been activated.

- Immediate shut down of pump 'k'.
- Start up of the 2nd pump (refer to "EVAPORATOR PUMP(S) CONTROL" section for more details),
- If the F.S.E is detecting a flow rate, then the fault 040 is signalling, the unit is then running normally,
- If the F.S.E is not detecting any flow rate the fault 040 is signalling, the unit is then shut down,
- The remote fault signal is delayed by 2 minutes.

Reset

Manual reset.

Possible causes	Solving the problem
Problem in the pump control wiring.	Check the pump connections
Problem with flow switch wiring.	Check the flow switch connection
Dirty water filter	Clean the water filter
Wrong setting of the flow switch	Adjust the setting of the flow switch

Pump(s) Circuit Breaker(s) Open

Error code: 041, 042

Description

The thermal magnetic trip circuit breaker protecting the pump 'k' has tripped.

Action

Case 1: The unit only handles SINGLE pump

- Immediate shut down of pump 'k',
- Immediate shut down of the unit,
- Fault signal is signalling,
- The remote fault signal is delayed by 2 minutes.

Case 2: The unit handles DOUBLE pumps and the "Normal/ Safety" mode or "Clock" has been activated.

- Immediate shut down of pump 'k',
- Start up of the 2nd pump (refer to "EVAPORATOR PUMP(S) CONTROL" section for more details)
- Fault signal 041 is signalling for Pump 1 and 042 for Pump 2,
- The remote fault signal is delayed by 2 minutes.

Reset

Manual reset.

If the unit was stopped (case 1), the unit will restart automatically 20 seconds after the fault signal has disappeared and the Climatic^{TM}50 has restarted the pump.

Possible causes	Solving the problem
Wrong wiring or tightening of the connections.	Control all connections
Wrong setting on the circuit breaker	Set circuit breaker according with pump normal running current

Faulty in Real Time Clock Error

Error code: 070

Description

The real time clock card, incorporated in the Climatic™50 card, is defective.

Action

☞ Fault signalling. Memorisation is displayed.

Reset

Automatically reset.

Possible causes	Solving the problem
The battery is exhausted	Replace the daughter card
The daughter card is not inserted correctly	Check the connection

Extension board fault (BE50)

Error code: 071

Description

Communication between the BM50 and the BE50 is down.

Action

☞ The unit carries on running,
☞ Fault signalling. Memorisation is displayed.

Reset

The fault disappears automatically as soon as communication is re-established.

Possible causes	Solving the problem
Incorrect addressing of the BE50	Configure the Serial Address dip-switches (on, off, off, off)
BM50 or BE50 damaged	Replace the defective component
Problem with the BIOS	Replace the BIOS with version 3A.57 or 3.64 or above
Incorrect wiring or loose connection between BM50 and BE50	Check connections and wiring

Faulty Probes and Sensors

Error code: 078, 081, 083, 085, 111, 112, 121, 122

Description

One or more temperature probes or pressure sensors in the cooling systems or elsewhere are short circuited, cut or disconnected.

Action

- ☞ Immediate shut down of the unit (for error code 081, 083, 085),
- ☞ Immediate shut down of the failure circuit (for error code 111, 112, 121, 122) (the other circuit still remain available),
- ☞ Fault signalling. Memorisation is displayed.

Reset

The unit returns to normal operation after the signal from the faulty probes or sensors is re-established.

Possible causes	Solving the problem
Damaged probes or sensors	Replace probe or sensor
Incorrect wiring or loose connection on a probe or sensor	Check probe and sensor connections and wiring

The compressors Electrical Protection

Error code: 114, 124

Description

During start up or operation of a compressor:
The thermal magnetic trip breaker or the compressor internal protection from circuit concerned is tripped.
The phase rotation protection has detected an incorrect connection (standard on screw compressor and available as a special request on other units).

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling.
- ☞ Display of fault:

114, Circuit 1,
124, Circuit 2.

Reset

Manual reset.

Important*:* For manual reset of internal protection cut off, if the problem comes from a high discharge temperature, wait for 30 min prior to any manual reset to allow the scroll temperature to decrease sufficiently. If the temperature is still too high, the compressor will trip again just after starting.

Possible causes	Solving the problem
Dirty condenser	Clean the condenser
Fan out of order	Replace the fan
Incorrect wiring of the high pressure switch	Check the wiring of the high pressure switch
Dirty filter drier	Replace the filter drier

Fan(s) Circuit

Error code: 092, 093, 094, 107

Description

The condenser fan motor or driver control is no longer active.

Action

☞ The unit carries on running,
☞ Fault signalling. Memorisation is displayed.

Reset

The safety device is automatically cancelled is the fault disappeared.

Possible causes	Solving the problem
Motor thermal protection devices activated	Check the air system
Motor thermal protection devices activated	Check the motors
Motor driver device	Check the driver
Problem with the fan wiring	Check the connections

Compressors shut down on LP Cut OFF

Error code: 117, 127

Description

The low pressure switch off the circuit has been open for 2 minutes while one of the compressors on the circuit has operated.
The low pressure switch off the circuit has been opened for 1 hour.

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling.
  If a DS50 is connected to the unit; Memorisation and display of all faults.
  Otherwise; Memorisation and display only of the 3rd daily fault.
- ☞ Display of fault:
  117, Circuit 1,
  127, Circuit 2.

Reset

Automatic reset of the fault as soon as the low pressure becomes greater than the safety pressure switch cut-off limit.
The fault will no longer be reset automatically after 3 cut-outs in the same day and must be reset manually.

Note*:* The fault counter is cleared and reset every day at 06:00 am provided the maximum number of faults has not been reached.

Possible causes	Solving the problem
Not enough refrigerant in the circuit	Adjust the refrigerant charge
Faulty expansion valve	Check that the expansion valve is operating correctly
Faulty low pressure switch	Replace the low pressure switch

Compressors shut down on HP Cut OFF

Error code: 115, 125

Description

During start up or operation of a compressor:
The HP pressure switch of the circuit is open.
The internal protection of a compressor in the circuit has tripped.
The flow thermostat of a compressor in the circuit has tripped.

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling.
  If a DS50 is connected to the unit; Memorisation and display of all faults.
  Otherwise; Memorisation and display only of the 3rd daily fault.
- ☞ Display of fault:

115, Circuit 1,
125, Circuit 2.

Reset

The safety device is automatically cancelled 4 minutes after activation.
The fault will no longer be reset automatically after 3 cut-outs in the same day and must be reset manually.

Note*:* The fault counter is cleared and reset every day at 06:00 am provided the maximum number of faults has not been reached.

Important*:* For manual reset of internal protection cut off, if the problem comes from a high discharge temperature, wait for 30 min prior to any manual reset to allow the scroll temperature to decrease sufficiently. If the temperature is still too high, the compressor will trip again just after starting.

Possible causes	Solving the problem
Dirty condenser	Clean the condenser
Fan out of order	Replace the fan
Incorrect wiring of the high pressure switch	Check the wiring of the high pressure switch

4-way reversing valve locked

Error code: 116, 126

Description

The unit doesn't detect differential pressure between high pressure and low pressure. The 4-way reversing valve is probably locked (On heat pump unit only).

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling.
  If a DS50 is connected to the unit; Memorisation and display of all faults.
  Otherwise; Memorisation and display only of the 3rd daily fault.
- ☞ Display of fault:
  116, Circuit 1,
  126, Circuit 2.

Reset

Automatic reset of the fault as soon as the low pressure becomes greater than the safety pressure switch cut-off limit.
The fault will no longer be reset automatically after 3 cut-outs in the same day and must be reset manually.

Note*:* The fault counter is cleared and reset every day at 06:00 am provided the maximum number of faults has not been reached.

Possible causes	Solving the problem
Faulty reversing valve	Check that the reversing valve is operating correctly

Evaporator Freezing Protection

Error code: 118, 128

Description

This fault signal is activated on units chilling water without frost protection additives (Water without Glycol or Brine) and with thermostatic expansion valves.

One compressor from the considered circuit has been running for at least 2 minutes (4 minutes for reversible units) and the saturated temperature T°BP is lower than the set point (**3421**) for more than n* minutes (for reversible units only).
This safety feature is disabled for n* minutes after start-up or stop of a compressor on the considered circuit.

(*)
n = 4 minutes during 15 min after starting of the circuit,
n = 2 minutes after.

Action

☞ Immediate shut down of the compressors on the failure circuit concerned,
☞ Fault signalling.
If a DS50 is connected to the unit; Memorisation and display of all faults.
Otherwise; Memorisation and display only of the 3rd daily fault.
☞ Display of fault.
118, Circuit 1,
128, Circuit 2.

Reset

The safety device is automatically cancelled 2 minutes after activation.
The fault will no longer be reset automatically after 3 cut-outs in the same day and must be reset manually.

Note*:* The fault counter is cleared and reset every day at 06:00 am provided the maximum number of faults has not been reached.

Possible causes	Solving the problem
Dirty condenser	Clean the condenser
Fan out of order	Replace the fan
Incorrect wiring of the high pressure switch	Check the wiring of the high pressure switch
Dirty filter drier	Replace the filter drier

EEV Error

Error code: 210, 220

Description

The E.E.V (Electronic Expansion Valve) driver is not communicated with the Climatic™50 board on the pLAN network.

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling.
- ☞ Display of fault:

210, Circuit 1,
220, Circuit 2.

Reset

The safety device is automatically cancelled once the communication is re-established.

Possible causes	Solving the problem
Wrong device address	Check the address (internal dip switch in the EEV)
Incorrect wiring of the EEV driver	Check the wiring of the EEV driver

EEV Low Superheat Temperature

Error code: 211, 221

Description

The superheat temperature measured by the E.E.V (Electronic Expansion Valve) driver is outside the permitted value.

Lower limit of superheat temperature: superheat temperature < safety threshold

Action

☞ Immediate shut down of the compressors on the failure circuit concerned,
☞ Fault signalling.
If a DS50 is connected to the unit; Memorisation and display of all faults.
Otherwise; Memorisation and display only of the 3rd daily fault.

☞ Display of fault:
211, Circuit 1,
221, Circuit 2.

Reset

The safety device is automatically cancelled 2 minutes after activation.
The fault will no longer be reset automatically after 3 cut-outs in the same day and must be reset manually.

Note*:* The fault counter is cleared and reset every day at 06:00 am provided the maximum number of faults has not been reached.

Possible causes	Solving the problem
Expansion valve failure	Check the wiring of the expansion valve
Incorrect wiring of the probe or sensor	Check the wiring of the probe or sensor

EEV L.O.P (LOW OPERATING PRESSURE)

Error code: 214, 224

Description

The suction pressure (expressed in °C) measured by the E.E.V (Electronic Expansion Valve) driver is outside the permitted value.

Low limit of suction pressure: suction pressure < safety threshold

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling.
  If a DS50 is connected to the unit; Memorisation and display of all faults.
  Otherwise; Memorisation and display only of the 3rd daily fault.
- ☞ Display of fault:

214, Circuit 1,
224, Circuit 2.

Reset

The safety device is automatically cancelled 2 minutes after activation.
The fault will no longer be reset automatically after 3 cut-outs in the same day and must be reset manually.

Note*:* The fault counter is cleared and reset every day at 06:00 am provided the maximum number of faults has not been reached.

Possible causes	Solving the problem
Not enough refrigerant in the circuit	Adjust the refrigerant charge
Faulty expansion valve	Check that the expansion valve is operating correctly
Faulty low pressure switch	Replace the low pressure switch

EEV Valve NOT Closed

Error code: 215, 225

Description

The expansion valve has not been closed once the shut down of the compressor.

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling.
  If a DS50 is connected to the unit; Memorisation and display of all faults.
  Otherwise; Memorisation and display only of the 3rd daily fault.
- ☞ Display of fault:

215, Circuit 1,
225, Circuit 2.

Reset

The safety device is automatically cancelled 2 minutes after activation.
The fault will no longer be reset automatically after 3 cut-outs in the same day and must be reset manually.

Note: The fault counter is cleared and reset every day at 06:00 am provided the maximum number of faults has not been reached.

Possible causes	Solving the problem
Faulty expansion valve	Check that the expansion valve is operating correctly
Incorrect wiring or loose connection on the valve	Check valve connections and wiring

EEV Faulty Probe or Sensor

Error code: 216, 226

Description

One or more temperature probes or pressure sensors connected to the EEV (Electronic Expansion Valve) are short circuited, cut or disconnected.

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling. Memorisation is displayed.
- ☞ Display of fault:

216, Circuit 1,
226, Circuit 2.

Reset

The unit returns to normal operation after the signal from the faulty probes or sensors is re-established.

Possible causes	Solving the problem
Damaged probes or sensors	Replace probe or sensor
Incorrect wiring or loose connection on a probe or sensor	Check probe and sensor connections and wiring

EEV Failure Motor

Error code: 217, 227

Description

The step by step motor of the EEV (Electronic Expansion Valve) is failure.

Action

- ☞ Immediate shut down of the compressors on the failure circuit concerned,
- ☞ Fault signalling. Memorisation is displayed.
- ☞ Display of fault:

217, Circuit 1,
227, Circuit 2.

Reset

The unit returns to normal operation after the signal from the faulty probes or sensors is re-established.

Possible causes	Solving the problem
Faulty expansion valve	Check that the expansion valve is operating correctly
Incorrect wiring or loose connection on a the valve	Check valve connections and wiring

EEV EEPROM

Error code: 218, 228

Description

The EEPROM of the EEV (Electronic Expansion Valve) driver is failure.

Action

☞ Immediate shut down of the compressors on the failure circuit concerned,
☞ Fault signalling. Memorisation is displayed.
☞ Display of fault:
218, Circuit 1,
228, Circuit 2.

Reset

The unit returns to normal operation after the signal from the faulty probes or sensors is re-established.

Possible causes	Solving the problem
Power supply of the driver	Check the connections, wiring and voltage supply value

MASTER/SLAVE

Function

Link several units in order to allow a "Master/Slave" relationship between each unit. In case of "Twins" unit (NAC 680, 760, 840, 960, 1080), the master/slave settings must be configured.

Description

Configuration of the pLan network

To configure the addresses of the cards for the pLan network, see chapter: (Configuring the pLan address of the BM50)

For the pLan network, each unit must have a different address:
Unit 1 → Master unit,
Units 2 to 4 → Slave units.

Master/Slave Modes

Several master/slave modes are available and may be configured by using set points (**3913**):

Cascade Twins:

All units start / stop in same time and try to reach the water capacity demand. The master unit manages the increasing of capacity and tries to equalise the step(s) compressor(s) engaged. The decreasing of step(s) is controlled individually by each unit. The power factor of the cooling / heating capacity is also calculated individually on each unit. In case of alarm on the unit, the water control will continue and engage the next steps according to the availability of each unit.

Cascade Chain:

The units start in cascade (one after the other) and try to reach the water capacity demand. The master unit manages the starting of each unit. The power factor of the cooling / heating capacity is calculated individually on each unit. In case of alarm on the unit, the water control will continue and engage the next unit according to the availability of each unit.

Back-up Twins, Rotating Back-up Twins:

One of the units is selected in backup and is kept in standby. In case of alarm on one of the operating units, the unit in standby is allowed to start to replace the unit with alarm. As consequence, the faulty unit is stopped and declared in standby.
In case of more than 2 units, the units running (except the unit in standby) are managed as same as "Cascade Twins" mode.

Back-up Chain, Rotating Back-up Chain:

The back-up functionality is the same as "Back-up Twins", except that in case of more than 2 units, the units running are managed as same as "Cascade Chain" mode.

The Climatic™50 manage the rotation between the units declared for the "Cascade" or "Rotating Back-up" modes every week according to the following table.
In case of 4 units, the rotation is as follow:

Week	Example	Unit rotation
Week (n modulo 5)	Week 1	….U1→ U2 → U3→ U4→….
Week (n+1 modulo 5)	Week 2	….U4→ U1 → U2→ U3→….
Week (n+2 modulo 5)	Week 3	….U3→ U4 → U1→ U2→….
Week (n+3 modulo 5)	Week 4	….U2→ U4 → U3→ U1→….

In case of 2 units, the rotation is as follow:

Week	Example	Unit rotation
Week (n modulo 2)	Week 1	….U1→ U2 → U3→ U4→….
Week (n+1 modulo 2)	Week 2	~~….U4→U1→U2→U3→….~~ ~~….U3→U4→U1→U2→….~~ ….U2→ U4 → U3→ U1→….

Master/Slave outlet temperature, outside temperature.

Function may be configured using set points (**3914**), (**3915**).
The outlet and outside temperatures used for the unit control can be determined from the following calculations:
[*Not Used* → Each machine regulates with its own sensors,
[*M/S Temp*] → Slave units regulate with the values of the Master unit probes or sensors,
[*M/S Aver.*] → All the units regulate with the average of the values of the probes or sensors on the bus.
To calculate the averages, the number of units connected must be entered in set point (**3912**).

In all modes, each unit is independent for fault management.

(3911) → pLan address, see chapter: Configuring the pLan address of the BM50,
(3912) → Number of cards connected or number of compressors desired,
(3913) → Master/Slave Mode:

[*Not Used*]	None,
[CasdeTwins]	Cascade Twins mode,
[*CasdeChain*]	Cascade Chain mode,
*[*BackTwins]	Back-up Twins mode,
*[*BackChain]	Back-up Chain mode,
*Rol[*BackTwins]	Back-up Twins mode + weekly rotation,
*[Rol*BackChain]	Back-up Chain mode + weekly rotation.

(3914) → Choice of management of outlet temperatures,
(3915) → Choice of management of outside temperatures.

BMS

Function

This is used to link a Climatic™ to a BMS network for remote control of the unit.

Description

The Climatic™ 50 can communicate using various protocols:
(**3922**) = 0: CLIMALINK system,
(**3922**) = 1: ADALINK system,
(**3922**) = 2: LNXVISION system,
(**3922**) = 3: MODBUS protocol,
(**3922**) = 4: BACNET system,
(**3922**) = 5: TREND system,
(**3922**) = 6: CAREL system,
(**3922**) = 7: LONWORKS system.

Tables of MODBUS, LONWORKS, BACNET & TREND addresses are given in an appendix at the end of this manual.

The identification number of each unit can be set (**3921**) and the communication speed is adjustable from 1200 Bauds to 19200 Bauds (**3923**).

(3921) → Address of the unit on the bus,
(3922) → Choice of type of protocol,
(3923) → Choice of communication speed.

MODBUS protocol

For this option the BM50 must be fitted with the PCO1004850 card.
This card is used to interface a BM50 with an RS485 type bus.
The card provides optically coupled isolation between the regulator and the RS485serial network.

On the Climatic™, set point (**3922**) = MODBUS:
Transmission Mode = RTU,
Baud Rate = set point (**3923**) (1200/2400/4800/9600/19200),
Word Length = 8,
Parity = NONE,
Stop Bits = 2,
Card Id = set point (**3921**) = (1 to 199).

LONWORKS protocol

For this option the BM50 must be fitted with the PCO10000F0 card
This card is used to interface a BM50 with a LonWorks® network by FTT-10A 78 kbs (TP/FT-10).

On the Climatic™, set point (**3922**) = LonWorks,
Baud Rate = set point (**3923**) = (4800),
Device Id = set point (**3921**) = (1 to 199).

'Watchdog' function with the Climatic™50.

The Climatic™50 automatic control system, being passive on the bus, cannot detect all communication failures with the BMS. Therefore in the event of a communication failure, the unit will continue to function with the last settings transmitted by the BMS.
To prevent this risk from hindering correct operation of the unit, the BMS must regularly write a non-zero value in word 01h. On its side, the Climatic™50 automatic control system decrements the value of word 01h by 5 units every 5 seconds.

The items below are not taken into account by the Climatic™50, if word 01h is equal to 0, and in this case it works with set points programmed internally.
This function does not prevent writing of bit or word; these can always be read on the DS50 display (set to BMS mode by means of the 'PRG' button)
Word 01h being available in read/write on our display, we are able to test the BMS mode manually and see the value decrementing then returning to internal control mode.
Points affected by word 01h:
Words: 02H/03H /05H/06H,
Bits: 03H/16H/0AH/0BH,
Other: (**3924**) → Communication watchdog.

Configuring the BM50 pLan address

Function

It may be necessary to change the address of the BM50 card on the pLan network – mainly in the case of Master/Slave installation. To do this, use the following procedure:

Description

Set the address of the DS50 display to 0;

Sds.1

Access the configuration mode by pressing the buttons ↑ ↓ ↵, for at least 5 seconds until the Sds.1 screen appears:
Press button ↵ to position the cursor over the 'Setting' line
With the ↑ or ↓ button, set the address of the display to 00 (instead of the standard value of 32) and confirm with button ↵

Sds.2

The Sds.2 screen appears.

Changing the address of BM50

Sds.3

Switch the power supply to the BM50 card off, then on again after 5 seconds.
When the Sds.3 screen appears, press, the 'Alarm' and ↑ buttons for 5 seconds.

Sds.4

The Sds.4 screen appears.
Press the button ↵ to position the cursor over the 'pLan address' line
With button ↑ or ↓ set the desired pLan address (1 to 12) and confirm with button ↵

Reset the original address of the DS50 (32) using the above procedure.

Allocation of Displays to the BM50

Function

Ensure there is a good connection between the BM50 and its displays

Description

For each Climatic™50 card the following setting must be made using the DS50.

Disconnect the pLan bus at J10 and J11 and connect the DS50, directly to J10 of the BM50;

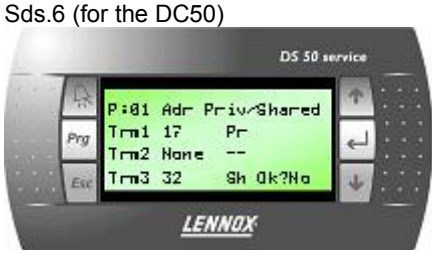
Sds.1

Access the configuration mode by pressing buttons ↑ ↓ ↵, for at least 5 seconds until the Sds.1 screen appears:
Press the button ↵ to position the cursor over the 'Setting' line
Press button ↵ again to position the cursor over the 'I/O board adress' line
With button ↑ or ↓ replace '- -' with the address of the BM50 connected and confirmed with button ↵

Sds.5

The Sds.5 screen appears.
Press button ↵

Sds.6 (for the DC50)



The Sds.6 screen appears.
The field "P:XX " shows the selected pLan address. In this example the value "01" has been selected.
The fields in the "Adr" column represent the addresses of the terminal displays associated with this BM50, while the "Priv/Shared" column indicates the status of the selected terminal.
Pr: Private
Sh: Shared
Sp: Shared Printer (N/A)

Move the cursor from field to field using button ↵
Select the value desired using button ↑ or ↓.
To exit the configuration procedure and save the data, select the "OK?No", field, choose "Yes" using buttons ↑ or ↓ and confirm by pressing ↵

Trm1 is reserved to allocate the **DC50** to the BM50.
Its value differs depending on the pLan address of the BM50 (See the opposite table)
Its status is always 'Pr'

Trm3 is reserved to allocate the **DS50** to the BM50.
Its value is always 32
Its status is always 'Sh'

pLan address of the BM50	Trm1 DC50
1	17 pr
2	18 pr
3	19 pr
4	20 pr

If the terminal remains inactive (no button is pressed) for 30 seconds, the configuration procedure is aborted automatically.

DC50 COMFORT DISPLAY

Function

This display is connected remotely; it is intended for users with no technical knowledge. This display gives access to general operating data of the unit. It does not give access to detailed operating data.
It can be used to set or change the programming of the various time periods and the temperature set point for each period.
It also has the ability to set a 3 hours override and force an unoccupied mode, or any other different time periods, for a maximum of 7 days. It displays a real time clock and the various fault signals.

Description

Buttons

'Prg' Access set points


'Clock Access the clock

'Esc' Return to the previous display


'Up' Access overrides or increase values


'Enter', Confirms the selection


'Down' Access overrides or decrease values

Brightness/Contrast

The display has a set contrast, but this can be adjusted manually. For manual adjustment of the contrast, press the 'Prg' and 'Clock buttons simultaneously and press buttons ↑ or ↓ to increase or reduce the contrast.

Configuring the terminal address

Sdc.1

The address of the terminal (DC50 or DM50) must be checked after having switching on the card.

Access the configuration mode by pressing buttons ↑ ↓ ↵ simultaneously for at least 5 seconds, until the Sdc.1 screen appears.
Press the 'Enter' button to position the cursor over the 'Setting' line
With button ↑ or ↓ set the address of the display. See table below for the DC50, the DM50 is always 31, then confirm with button ↵

pLan address with BM50 connected	DC50 Address
1	17 (local display) 21 (remote display)
2	18 (local display) 22 (remote display)
3	19 (local display) 23 (remote display)
4	20 (local display) 24 (remote display)

Sdc.2

The Sdc.2 screen appears.

If after 5 seconds the display is not correct;
Return to the configuration mode by pressing buttons ↑ ↓ ↵ simultaneously for at least 5 seconds until the Sdc.1 screen appears.
Press button ↵ to position the cursor over the 'Setting' line
Press, the button ↵ again to position the cursor over the 'I/O board address' line
With the button ↑ or ↓ , replace '- -' with the address of the BM50 connected and confirm with button ↵
Then repeat the procedure "Allocation of Displays to the BM50"

Main screen

Sdc.3

On the first line, as a double display:
Outlet temperature
On the second line:
Outside air temperature
Current time period (Z:A, Z:B, Z:C, Uno)
Mode of operation (Heat, Dead or Cool)

3 hours override

This function can be used to override either the desired outlet temperature for 3 hours.

Sdc.3

If an override is active, the time period display is alterned with the 'Ove' symbol.
The 'Esc' button is used to cancel the override mode.

From the main screen, press button ↑ or ↓

Sdc.4

Screen Sdc.4 is used to change the override values
The present time period is shown on the 2nd line. This period will remain fixed for 3 hours.
Press ↵ to position the cursor over the 'Water SP' line
With button ↑ or ↓ to set the desired temperature and confirm with the 'Enter' button.
Press ↵ to position the cursor over the 'Mode SP' line
With button ↑ or ↓ to set the desired mode and confirm with button ↵
The DC50 returns to the main display.

A single press on the 'Esc' button cancels the changes and returns to the main screen.
It will revert back to the main screen after 15 seconds without any activity.

Clock Menu

These screens are used to display and change the time and date on the BM50.

Sdc.5

From the main screen, press the 'clock' button
The Sdc.5 screen displays the time and date.

To change the time or date:
Press ↵ to position the cursor over the time.
With button ↑ or ↓ set the time and confirm with button ↵
Position the cursor over 'minutes'.
With button ↑or ↓ set the minutes and confirm with button ↵
Position the cursor over 'month'.
With button ↑or ↓ set the month and confirm with button ↵
Position the cursor over 'year'.
With button ↑or ↓ set the year and confirm with button ↵
Position the cursor over 'hours'.
…

Pressing the 'Esc' returns to the main screen

It will revert back to the main screen after 15 seconds without any activity.

"Programming" Menu

These screens are used to display and change the set points of the BM50 for each time period.

Sdc.6

From the main screen, press the "Prg" button,
Screen Sdc.6 displays the menu.

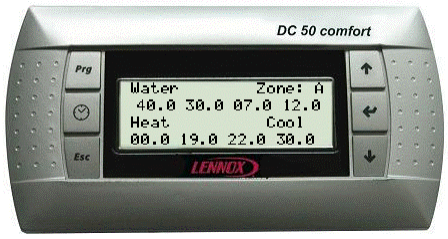
With button ↑or ↓ to select the "Setting" item and confirm with button ↵
Pressing the 'Esc' returns to the main screen.

The next screen display the unit status for each zone by pressing on the "Clk" button.

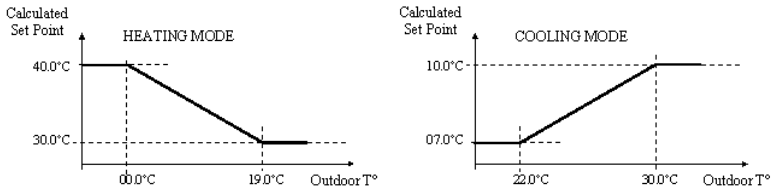
Sdc.7.a

From the Sdc.6 screen; press the 'Prg' button
Screen Sdc.7.a displays the change over mode.
Position the cursor over "Mode"
With button ↑or ↓ set the desired mode for period A and confirm with button ↵
With button ↑or ↓ set the winter outside temperature the period A and confirm with button ↵
With button ↑or ↓ set the summer outside temperature the period A and confirm with button ↵
Press the button 'Clk' to change the time period.
Repeat the procedure for each time period (Z:A, Z:B, Z:C, Uno).

Sdc.7.b



From the Sdc.7.a screen; press the 'Prg' button
Screen Sdc.7.b displays the water set points.
With button ↑or ↓ set the desired temperature for period A and confirm with button ↵
Press the button 'Clk' to change the time period.
Repeat the procedure for each time period (Z:A, Z:B, Z:C, Uno).



Sdc.7.c

From the Sdc.7.b screen; press the 'Prg' button
Screen Sdc.7.b displays the period settings.
Position the cursor over period A
With button ↑or ↓ set the start time for period A and confirm with button ↵
Position the cursor over period B.
With button ↑or ↓ set the start time for period B and confirm with button ↵
Position the cursor over period C.
With button ↑or ↓ set the start time for period C and confirm with button ↵
Position the cursor over the Uno period.
With button ↑or ↓ set the unoccupied period and confirm with button ↵
Position the cursor over period A.
…
Pressing the 'Esc' returns to the main screen.
Select the day of the week by repeatedly pressing the 'Clock' button

It will revert back to the main screen after 15 seconds without any activity.

Major Alarm

Sdc.8

In the event of activation of a fault on the unit, screen Sdc.8 is displayed.
Button 'Prg' is illuminated.
All buttons are deactivated

The only way to regain control of the DC50 is to resolve the fault on the unit.

To display the alarm history of the unit, press button ↵

Sdc.9

The history can store the last 32 alarms occurring on the unit.
Each alarm is memorised at the date and time of occurrence of the fault.
An active alarm is signified by the symbol '∗'.
An acknowledged alarm is signified by the symbol '='.
Each alarm is signified by a 3 digit code (see ERROR CODES)

Sdc.10

Press the 'Alarm' button to reset all the alarms, if possible
The number of active alarms returns to 0, no active alarm is shown in the menu, and the 'Alarm' button is no longer illuminated.

To highlight the title of the error code, position the cursor over the line desired with buttons ↑or ↓, then confirm with the 'Enter' button

Use the 'Esc' button to return to the previous levels.

Start/stop

Sdc.3

From the main screen, press the ↵button
The Sdc.11 screen appears.

Sdc.11

To stop the unit:
With button ↑or ↓ set the value to 'Yes' and confirm with button ↵
The unit stops and the Sdc.12 screen appears

WARNING: Switching off the unit disables all the safety devices

Pressing the 'Esc' returns to the main screen.

Sdc.12

If the unit is stopped, the Sdc.12 screen appears.
To start the unit, press button ↵
The unit starts and the main screen appears.

1 week override

This function overrides the operating periods for a maximum of 7 days.

Sdc.13

From the Sdc.11 screen, press button ↵ twice to position the cursor over the 'Override a period' line
With button ↑or ↓ set the period desired and confirm with button ↵
The Sdc.13 screen appears.
With button ↑or ↓ set the days of the week to the period desired and confirm with button ↵

In this example, the unit will remain in the unoccupied period on Tuesday when confirmed until midnight on Thursday.

DS50 SERVICE DISPLAY

Function

This plug and play type display is intended for maintenance technicians.

Description

Buttons

'Alarm' summarises the Alarm menu	'Up' scrolls the menu upwards or increases the value
'Prg' Changes the time period	'Enter' confirms the selection
'Esc' Returns to the previous screen	'Down' scrolls the menu downwards or reduces the value

Brightness/Contrast

The display has a set contrast, but it can be adjusted manually. To set the contrast manually, press the 'Alarm' and 'Prg' buttons simultaneously and press buttons ↑ and ↓ to increase or decrease the contrast

Start-up screens

S.1

The DS50 display is provided to communicate with all the BM50s connected to the pLan bus alternately.
On activation of the display, screen S.1, the line 'Unit:' line requests entry of the pLan number of the desired BM50.
With button ↑or ↓replace '- -' with the address of the BM50 and confirm with button ↵

S.2

The S.2 screen appears.
Press the 'Prg' button or any other button to continue
If a DC50 is connected to the BM50, the display and buttons on the remote display are inhibited and the word 'Lennox' is displayed.
This disappears as soon as the DS50 is disconnected from the BM50.

S.3

This S.3 screen indicates the versions of the software loaded in the BM50.
In this example, it shows us;
A version 050.01 'NA' NEOSYS program
A version 4.22 Bios
A version 4.03 Boot

S.4

In the case of a specific program for one job (NSR), this is identified by the display of a factory number to the left of the S.4.program version.
Language selection
Twelve languages are currently available (DE, DK, FR, GB, IT, NL, PL, PT, RO, SE, SP, TR) but only 2 are installed in the factory (English + xxx).
The language required must therefore be specified at the time of ordering.
If required, another language can be downloaded on site by a Lennox technician.
With button ↑or ↓select 'English' or the second language initially loaded and confirm with button ↵
To continue without changing the language, press the 'Prg', 'Esc' or ↵ buttons

Navigation in the screens

Main menu (0000)

S.5

The four digits in brackets indicate the number of the current menu.
The two digits beside the brackets indicate the pLan number of the selected card.
The display on the right indicates the period of operation and the current time conditions.

S.6

Scrolling the menus
Press button ↑or ↓ to move the cursor upwards or downwards. The item selected is displayed in CAPITAL letters preceded by the symbol '→'. It can then be selected by pressing button ↵.
A '+' or '++' symbol beside the number of the first or third line indicates the existence of one or more additional lines.

Data (2000)

S.7

Examples S.6 to S.9 show how the menu tree changes each time button ↵ from the menu is pressed

↵ Data (2000)
↵ General (2100)
↵ Temperature (2110)
(2111) Outside temperature 16.0°C
(2112) Inlet temperature 12.0°C
(2113) Outlet temperature 07.0°C

S.8

Press "Esc" at any time sends to return to the previous level of the menu tree. In the example shown above, "Esc" must be pressed 3 times to return to the main menu (0000)

S.9

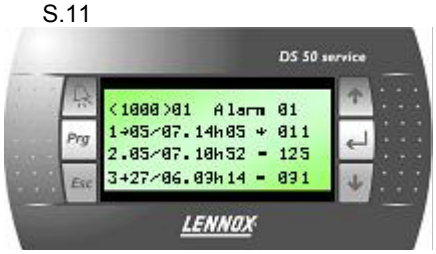
Alarms (1000)

S.10

In the event of an alarm on the unit, the 'Alarm' button is illuminated in red.
In the event of a filtration fault, the 'Prg' button is illuminated in yellow.

To display the alarm history of the unit, position the cursor over the '1 Alarm' line with buttons ↑or ↓, then confirm with button ↵ or press the 'Alarm' button directly, wherever you are in the menu tree.

S.11



The history can store the last 32 alarms occurring on the unit.
Each alarm is memorised at the date and time of occurrence of the fault.
An active alarm is signified by the symbol '*'.
An acknowledged alarm is signified by the symbol '='.
Each alarm is signified by a 3 digit code (see ERROR CODES)

Press the 'Alarm' button to reset all the alarms, if possible
The number of active alarms returns to 0, no active alarm is shown in the menu, and the 'Alarm' button is no longer illuminated

S.12

Pressing the 'Alarm' key for more than 10 seconds resets the history of the 32 alarms to zero.

To highlight the title of the error code; position the cursor over the line desired, with buttons ↑or ↓, then confirm with button ↵
Use the 'Esc' button to return to the previous levels of the menu tree.

Set points (3000)

S.13

To changed a parameter on a set point;
Select the 'SET POINTS line from the main menu, then navigate to the sub-menus until the desired set point is displayed (e.g. 3120).
Position the cursor over the line desired (e.g. 2.) then confirm with button ↵

S.14

Screen S.14 is used to change a set point (e.g. Minutes p.3122)
The maximum and minimum thresholds for the parameter are displayed on the right of the screen, as well as the predefined default value.
With button ↑ or ↓ set the desired value and confirm with button ↵

Use the 'Esc' button to return to the previous levels of the menu tree.
Pressing the 'Esc' button once without confirmation with the 'Enter' button cancels the change.

S.15

If the day of the week is displayed on the first line, the parameter in question can be set to a different value for each day of the week
To display and change the values of other days, press the 'Prg' button.
Pressing the 'Prg' button confirms the change in the same way as button ↵

S.16

If the period of operation is displayed on the first line, the parameter in question can be set to a different value for each for each period (Z.A, Z.B, Z.C, Uno and BMS).
To display and change the values of other periods, press the 'Prg' button.
Pressing the 'Prg' button confirms the change in the same way as button ↵

Special dignostic screens

In order to analyse the operation of the unit, it is possible to use the following screens which can be reached by pressing the 'Prg' button in menu 0000 or the data menus 2xxx

Press button ↑or ↓ to navigate from one screen to another

Screens are available as functions of the program configuration.

T.1

T.1 Water Control

Cooling set point – Cooling capacity – Inlet Temperature,
Heating set point – Heating capacity – Outlet Temperature,
Compressors Circuit N°1 – Deltat T°(Measure Inlet - Outlet)
Compressors Circuit N°2 – Deltat T°(Calculated Inlet – Outlet at full load)

T.2

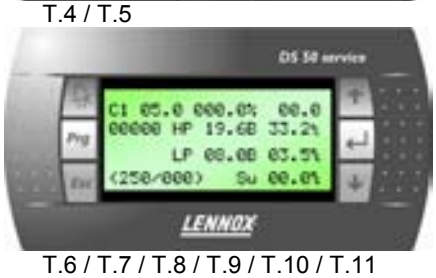
T.2 Defrost Control (reversible units only)

T.3

T.3 Fan Condensing Control

Capacity limit – Outdoor Temperature,
CIR – CAPA – SP – T°HP
Circuit N°1 – Capacity C1 – Actual Set point C1 – T°HP C1
Circuit N°2 – Capacity C2 – Actual Set point C2 – T°HP C2

T.4 / T.5



T.4 Frigorific Pressure Circuit N°1
T.5 Frigorific Pressure Circuit N°2

Superheating set point - Opening of the EEV (%) - Superheating value (*)
Opening of the EEV (steps) (*) - High pressure (Bars) - High pressure (°C)
Low pressure (Bars) - Low pressure (°C)
(Actual Cooling Capacity/Max Cooling capacity) – Suction Temperature(*)
(*) = (Electronic Expansion Valve only - EEV)

T.6 / T.7 / T.8 / T.9 / T.10 / T.11

T.6 Operating Hour Counter of Circuit N°1 – Compressor N°1
T.7 Operating Hour Counter of Circuit N°1 – Compressor N°2 (**)
T.8 Operating Hour Counter of Circuit N°1 – Compressor N°3 (**)
T.9 Operating Hour Counter of Circuit N°2 – Compressor N°1
T.10 Operating Hour Counter of Circuit N°2 – Compressor N°2 (**)
T.11 Operating Hour Counter of Circuit N°2 – Compressor N°3 (**)
(**) = (Depend on the number of compressor on the unit)

T.12 / T.13

T.12 Operating Hour Counter Evaporator Pump N°1 (***)
T.13 Operating Hour Counter Evaporator Pump N°2 (***)
(***) = (Option)

T.14

T.14 pLAN Bus

--LINK--
Number of BM50 board present on the pLan bus (in case of several units)

Number of BM50 board on the pLan bus in standby mode (in case of several units)

DS50 MENU THREE

Menu	Item	Menu	Item	Menu	Item	Menu	Item	UNIT	MIN	MAX	FACTORY
1000	ALARM										
2000	DATA	2100	GENERAL	2110	TEMPERATURE	2111	OUTSIDE	°C			
						2112	INLET	°C			
						2113	OUTLET	°C			
						2114	OFFSET	°C			
					RESERVED	2115	WAT/COND	°C			
						2116	ELEC.BOX	°C			
				2120	CIRCUIT 1	2121	T°SUPERHEAT	°C			
						2122	T°COND	°C			
						2123	T°SATU	°C			
						2124	T°SUCT	°C			
						2125	P.COND	Bar			
						2126	P.SATU	Bar			
						2127	T°DISCH.11	°C			
						2128	T°DISCH.12	°C			
				2130	CIRCUIT 2	2131	T°SUPERHEAT	°C			
						2132	T°COND	°C			
						2133	T°SATU	°C			
						2134	T°SUCT	°C			
						2135	P.COND	Bar			
						2136	P.SATU	Bar			
						2137	T°DISCH.21	°C			
						2138	T°DISCH.22	°C			
				2140	OTHER	2141	SW ON/OFF	OFF/ON			
						2142	SW FLOW	OFF/ON			
						2143	SW RESET	OFF/ON			
						2144	SW INOC	OFF/ON			
				2150	OUT CUSTOM	2151	BE50.1	OFF/ON			
						2152	BE50.2	OFF/ON			
						2153	BE50.3	OFF/ON			
						2154	BE50.4	OFF/ON			
				2160	IN CUSTOM	2161	BM50.1	OFF/ON			
						2162	BM50.2	OFF/ON			
						2163	BE50.1	OFF/ON			
						2164	BE50.2	OFF/ON			
						2165	BE50.3	OFF/ON			
						2166	BE50.4	OFF/ON			
				2170	IN % CUSTOM	2171	BE50.1	°C / mA			
						2172	BE50.2	'°C / mA			
						2173	BE50.3	'°C / mA			
						2174	BE50.4	'°C / mA			
		2200	CONTROL	2210	COOL WATER	2211	RSP COOL	°C			
						2212	CAPA.COOL	%			
						2213	OFFSET	°C			
						2214	SW 2° SP	OFF/ON			
				2220	HEAT WATER	2221	RSP HEAT	°C			
						2222	CAPA.HEAT	%			
						2223	OFFSET	°C			
						2224	SW 2° SP	OFF/ON			
		2300	COMPRESSOR	2310	CIRC.1.COMP.1	2311	CONFIG.	List			
						2312	STATUS	List			
						2313	SW STATE	OFF/ON			
						2314	SW RELAY	OFF/ON			
						2315	SW HP	OFF/ON			
						2316	SW LP	OFF/ON			
						2317	VALVE	OFF/ON			
						2318	RUN TIME	Hour			

Menu	Item	Menu	Item	Menu	Item	Menu	Item	UNIT	MIN	MAX	FACTORY
				2320	CIRC.1.COMP.2	2321	CONFIG.	List			
						2322	STATUS	List			
						2323	SW STATE	OFF/ON			
						2324	SW RELAY	OFF/ON			
						2325	SW HP	OFF/ON			
						2326	SW LP	OFF/ON			
						2327	VALVE	OFF/ON			
						2328	RUN TIME	Hour			
				2330	CIRC.1.COMP.3	2331	CONFIG.	List			
						2332	STATUS	List			
						2333	SW STATE	OFF/ON			
						2334	SW RELAY	OFF/ON			
						2335	SW HP	OFF/ON			
						2336	SW LP	OFF/ON			
						2337	VALVE	OFF/ON			
						2338	RUN TIME	Hour			
				2340	CIRC.2.COMP.1	2341	CONFIG.	List			
						2342	STATUS	List			
						2343	SW STATE	OFF/ON			
						2344	SW RELAY	OFF/ON			
						2345	SW HP	OFF/ON			
						2346	SW LP	OFF/ON			
						2347	VALVE	OFF/ON			
						2348	RUN TIME	Hour			
				2350	CIRC.2.COMP.2	2351	CONFIG.	List			
						2352	STATUS	List			
						2353	SW STATE	OFF/ON			
						2354	SW RELAY	OFF/ON			
						2355	SW HP	OFF/ON			
						2356	SW LP	OFF/ON			
						2357	VALVE	OFF/ON			
						2358	RUN TIME	Hour			
				2360	CIRC.2.COMP.3	2361	CONFIG.	List			
						2362	STATUS	List			
						2363	SW STATE	OFF/ON			
						2364	SW RELAY	OFF/ON			
						2365	SW HP	OFF/ON			
						2366	SW LP	OFF/ON			
						2367	VALVE	OFF/ON			
						2368	RUN TIME	Hour			
		2400	EEV	2410	CIRCUIT 1	2411	CONFIG.	List			
						2412	STATUS	OFF/ON			
						2413	POSITION	---			
				2420	CIRCUIT 2	2421	CONFIG.	List			
						2422	STATUS	OFF/ON			
						2423	POSITION	---			
		2500	FAN	2510	CIRCUIT 1	2511	CONFIG.	List			
						2512	STATUS	List			
						2513	SW STATE	OFF/ON			
						2514	MODE	List			
						2515	VALUE	°C			
						2516	MAXIMUM	%			
						2517	CAPACITY	%			
				2520	CIRCUIT 2	2521	CONFIG.	List			
						2522	STATUS	List			
						2523	SW STATE	OFF/ON			
						2524	MODE	List			
						2525	VALUE	°C			
						2526	MAXIMUM	%			
						2527	CAPACITY	%			
		2600	OPTION	2610	COOL	2611	CONFIG.	List			
					PUMP	2612	STATUS 1	List			

Menu	Item	Menu	Item	Menu	Item	Menu	Item	UNIT	MIN	MAX	FACTORY
						2613	STATUS 2	List			
						2614	SW STATE	OFF/ON			
						2615	SW RELAY 1	OFF/ON			
						2616	SW RELAY 2	OFF/ON			
						2617	RUN TIME 1	H			
						2618	RUN TIME 2	H			
3000	SETTING	3100	GENERAL	3110	ORDER	3111	ON/OFF	OFF/ON	OFF	ON	OFF
						3112	RUN	OFF/ON	OFF	ON	ON
						3113	RESET ALARM	NO/YES	NO	YES	NO
						3114	RESUME	NO/YES	NO	YES	NO
						3115	TEST	List	0	3	0
				3120	CLOCK	3121	HOUR	H	0	23	---
						3122	MINUTE	Min	0	59	---
						3123	DAY	---	1	31	---
						3124	MONTH	---	1	12	---
						3125	YEAR	---	0	99	---
						3126	WIN/SUM	NO/YES	NO	YES	YES
		3200	SCHEDULE	3210	TIME	3211	START INOC	H	24	0	0
						3212	START Z.A	H	24	0	0
						3213	START Z.B	H	24	0	0
						3214	START Z.C	H	24	0	0
				3220	ANTICIPATION	3221	FOOT	°C	-10	20	10
						3222	GRADIENT	m/°C	0	100	0
		3300	CONTROL	3310	CHANGE OVER	3311	MODE	List	0	3*	0*
						3312	WINTER	°C	-19	50	19
						3313	SUMMER	°C	20	50	22
				3320	COOL WATER	3321	SP WAT.1	°C	5*	17	7
						3322	SP WAT.2	°C	5*	17	7
						3323	SP OUT 1	°C	-10	50	22
						3324	SP OUT 2	°C	-10	50	30
						3325	CONTROL	°C	1	20	5
						3326	I	Sec	1	120	30
				3330	HEAT WATER	3331	SP WAT.1	°C	17	40	50
						3332	SP WAT.2	°C	17	40	50
						3333	SP OUT 1	°C	-10	50	19
						3334	SP OUT 2	°C	-10	50	0
						3335	CONTROL	°C	1	20	10
						3336	I	Sec	1	120	30
				3340	SAFETY	3341	COOL LOW	°C	3*	55	5
						3342	COOL HIGH	°C	5*	55	53
						3343	HEAT LOW	°C	3*	55	5
						3344	HEAT HIGH	°C	5*	55	55
		3400	COMPRESSOR	3410	CIRCUIT	3411	ENABLE C1	List	0	7*	7*
						3412	ENABLE C2	List	0	7*	7*
						3413	ROTATION CIR.	List	0	2	0
				3420	SAFETY	3421	T°SATU.	°C	-3*	5	-3*
						3422	T°COND.	°C	50	65	60
						3423	T°DISCHARGE	°C	90	150	110
		3500	EEV	3510	CONTROL	3511	SUPERHEAT	°C	5	15	5
		3600	FAN	3610	CONTROL	3611	MODE	List	0	2	0
						3612	LOW NOISE	dBa	*	*	*
						3613	P	---	1	500	200
						3614	I	Sec	0	360	10
						3615	D	Sec	0	120	3
						3616	T°COND.	°C	35	45	40
				3620	DEFROST	3621	MODE	List	0	1	0
						3622	T°OUTSIDE	°C	8	22	16
						3623	T°COIL	°C	-10	10	1,7
						3624	TIME LIMIT	Min	30	90	45
						3625	TIME FC	Sec	5	600	60
		3700	OPTION	3710	COOL PUMP	3711	MODE	List	0	4*	4*
		3800	CONFIG.	3810	UNIT	3811	RANGE	List	0	2	0

Menu	Item	Menu	Item	Menu	Item	Menu	Item	UNIT	MIN	MAX	FACTORY
						3812	SIZE	List	0	14	0
						3813	EEV	List	0	16	0
				3820	OPTION	3821	PUMP	List	0	2	0
						3822	GLYCOL	%	0	50	0
						3823	FREECOOLING	NO/YES	0	1	0
						3824	RECOVERY	-	-	-	-
						3825	PF CORRECT.	NO/YES	0	1	0
				3830	OUT CUSTOM	3831	BE50.1	List	0	17	0
						3832	BE50.2	List	0	17	0
						3833	BE50.3	List	0	17	0
						3834	BE50.4	List	0	17	0
				3840	IN CUSTOM	3841	BM50.1	List	0	18	0
						3842	BM50.2	List	0	18	0
						3843	BE50.1	List	0	18	0
						3844	BE50.2	List	0	18	0
						3845	BE50.3	List	0	18	0
						3846	BE50.4	List	0	18	0
				3850	IN % CUSTOM	3851	BE50.1	List	0	3	0
						3852	BE50.2	List	0	3	0
						3853	BE50.3	List	0	3	0
						3854	BE50.4	List	0	3	0
				3860	GENERAL	3861	STANDARD SP	NO/YES	0	1	0
		3900	COM	3910	MASTER/SLAVE	3911	ID	---			
						3912	NUMBER	---	1	4	1
						3913	TYPE	List	0	3	0
						3913	OUTLET	List	0	2	0
						3914	OUTSIDE	List	0	2	0
				3920	BMS	3921	ID	---	1	199	1
						3922	TYPE	---	1	7	1
						3923	BAUDRATE	List	0	4	0
						3924	WATCHDOG	List	0	999	0
						3925	BMS INOC.	OFF/ON	0	1	0

(*) The Min, Max and Factory values can vary according to the configuration of the unit (Menus (38xx)).

CLIMATIC™50 Input/Output Mapping

BM50 – Main board

Climatic 50 Base Board											
DI			**DO**			**AI**			**AO**		
J5.ID1	C.1	Comp.State	J12.NO1	C.1	Comp.11	J2.B1	C.1	High Pressure	J4.Y1	C.1	Fan
J5.ID2	C.1	Security HP	J12.NO2	C.1	Comp.12	J2.B2	C.1	Low Pressure ***	J4.Y2	C.2	Fan
J5.ID3	C.1	Fans State	J12.NO3	C.1	Comp.13	J2.B3	C.2	High Pressure	J4.Y3		
J5.ID4	C.2	Comp.State	J13.NO4	C.2	Comp.21	J2.B4	C.2	Low Pressure ***	J4.Y4		
J5.ID5	C.2	Security HP	J13.NO5	C.2	Comp.22	J3.B5	Unit	T°Evap.Inlet			
J5.ID6	C.2	Fans State	J13.NO6	C.2	Comp.23	J3.B6	Unit	T°Evap.Outlet			
J5.ID7	Unit	Remote ON/OFF	J14.NO7	C.1/2	FanCom	J6.B7					
J5.ID8	Unit	Reset Alarm	J15.NO8 J15.NC8	C.1	V4V,V2V*	J6.B8	Unit	Outside T°			
J7.ID9	Unit	Flow Switch	J16.NO9	Unit	Pump 1						
J7.ID10	Unit	Pump State	J16.NO10	Unit	Pump 2						
J7.ID11	C.1/2	Fans State	J16.NO11	Unit	Bottle*						
J7.ID12	Unit	Cosφ**	J17.NO12 J17.NC12	C.2	V4V,V2V*						
J8.ID13	BM50	Custom 1	J18.NO13 J18.NC13	Unit	Alarm						
J8.ID14	BM50	Custom 2									

Climatic 50 Expansion Board									
DI			**DO**			**AI**			**AO**
J4.ID1	BE50	Custom 1	J5.NO1 J5.NC1		Custom 1	J9.B1	C.1	Disch.T°Comp.11 Custom 1	J4.Y1
J4.ID2	BE50	Custom 2	J6.NO2 J6.NC2		Custom 2	J9.B2	C.1	Disch.T°Comp.12 Custom 2	
J4.ID3	BE50	Custom 3	J7.NO3 J7.NC3		Custom 3	J10.B3	C.2	Disch.T°Comp.21 Custom 3	
J4.ID4	BE50	Custom 4	J8.NO4 J8.NC4		Custom 4	J10.B4	C.2	Disch.T°Comp.22 Custom 4	

(*):
V4V = Reversing valve for heat pump unit only.
V2V = Liquid valve for chiller unit without electronic expansion valve.

(**):
Option “Power factor Correction”.

(***):
If not electronic expansion valve.

BMS Adresses Table: ModBus, BacNet, Trend, Carel

LOGICAL DATA

@ (hexa)	@ (deci)	R/W	Unit	Description	DS50	UNIT
01H	**1**	R/W	0/1	[On/Off] General On/Off of the unit [Off] Unit OFF - [On] Unit ON	**3111**	**STD**
02H	**2**	R/W	0/1	[Reset] Discharges the safety measures of the unit	**3113**	**STD**
03H	**3**	R/W	0/1	[BMS] BMS On/Off of the unit [Off] Unit OFF - [On] Unit ON	**3112 BMS**	**STD**
04H	**4**	R/W	0/1	*not used*		**STD**
05H	**5**	R/W	0/1	[BMS] Activation of the Inoccupation mode : [Off] Occupation mode - [On] Inoccupation mode	**3925 Unoc**	**STD**
06H	**6**	R	0/1	*not used*		**STD**
07H	**7**	R	0/1	*not used*		**STD**
08H	**8**	R	0/1	*not used*		**STD**
09H	**9**	R	0/1	*not used*		**STD**
0AH	**10**	R	0/1	*not used*		**STD**
0BH	**11**	R	0/1	*not used*		**STD**
0CH	**12**	R	0/1	*not used*		**STD**
0DH	**13**	R	0/1	*not used*		**STD**
0EH	**14**	R	0/1	*not used*		**STD**
0FH	**15**	R	0/1	*not used*		**STD**
10H	**16**	R/W	0/1	[Clock] Read / Update the internal clock board of the BM50 [OFF] Read hour & minute - [ON] Write hour & minute	**…**	**STD**
11H	**17**	R	0/1	*not used*		**STD**
12H	**18**	R/W	0/1	[Dry contact] Digital Output, Free 1, BE50-J5-NO1	**2151**	**STD**
13H	**19**	R/W	0/1	[Dry contact] Digital Output, Free 2, BE50-J6-NO2	**2152**	**STD**
14H	**20**	R/W	0/1	[Dry contact] Digital Output, Free 3, BE50-J7-NO3	**2153**	**STD**
15H	**21**	R/W	0/1	[Dry contact] Digital Output, Free 4, BE50-J8-NO4	**2154**	**STD**
16H	**22**	R	0/1	*not used*		**STD**
17H	**23**	R	0/1	*not used*		**STD**
18H	**24**	R	0/1	*not used*		**STD**
19H	**25**	R	0/1	*not used*		**STD**
1AH	**26**	R	0/1	*not used*		**STD**
1BH	**27**	R	0/1	*not used*		**STD**
1CH	**28**	R	0/1	*not used*		**STD**
1DH	**29**	R	0/1	*not used*		**STD**
1EH	**30**	R	0/1	*not used*		**STD**
1FH	**31**	R	0/1	*not used*		**STD**
20H	**32**	R	0/1	*not used*		**STD**
21H	**33**	R	0/1	[Alarm] General alarm		**STD**
22H	**34**	R	0/1	[On/Off] Pump, 1	**2615**	**STD**
23H	**35**	R	0/1	[On/Off] Pump, 2	**2616**	**STD**
24H	**36**	R	0/1	[On/Off] Compressor 1, Circuit 1	**2316**	**STD**
25H	**37**	R	0/1	[On/Off] Compressor 2, Circuit 1	**2326**	**STD**
26H	**38**	R	0/1	[On/Off] Compressor 3, Circuit 1	**2336**	**STD**
27H	**39**	R	0/1	[On/Off] Compressor, Heat pump, Circuit 1	**2317**	**STD**
28H	**40**	R	0/1	[On/Off] Compressor 1, Circuit 2	**2346**	**STD**
29H	**41**	R	0/1	[On/Off] Compressor 2, Circuit 2	**2356**	**STD**

2AH	**42**	R	0/1	[On/Off] Compressor 3, Circuit 2	**2366**	**STD**
2BH	**43**	R	0/1	[On/Off] Compressor, Heat pump, Circuit 2	**2347**	**STD**
2CH	**44**	R	0/1	*not used*		**STD**
2DH	**45**	R	0/1	*not used*		**STD**
2EH	**46**	R	0/1	*not used*		**STD**
2FH	**47**	R	0/1	*not used*		**STD**
30H	**48**	R	0/1	*not used*		**STD**
31H	**49**	R	0/1	[Dry contact] Digital Input, Free 1, BM50-J8-ID13	**2161**	**STD**
32H	**50**	R	0/1	[Dry contact] Digital Input, Free 2, BM50-J8-ID14	**2162**	**STD**
33H	**51**	R	0/1	[Dry contact] Digital Input, Free 1, BE50-J4-ID1	**2163**	**STD**
34H	**52**	R	0/1	[Dry contact] Digital Input, Free 2, BE50-J4-ID2	**2164**	**STD**
35H	**53**	R	0/1	[Dry contact] Digital Input, Free 3, BE50-J4-ID3	**2165**	**STD**
36H	**54**	R	0/1	[Dry contact] Digital Input, Free 4, BE50-J4-ID4	**2166**	**STD**
37H	**55**	R	0/1			**STD**
38H	**56**	R	0/1			**STD**
39H	**57**	R	0/1			**STD**
3AH	**58**	R	0/1			**STD**
3BH	**59**	R	0/1			**STD**
3CH	**60**	R	0/1			**STD**
3DH	**61**	R	0/1			**STD**
3EH	**62**	R	0/1	[Water] Cool Mode Operating		**STD**
3FH	**63**	R	0/1	*not used*		**STD**
40H	**64**	R	0/1	[Water] Heat Mode Operating		**STD**
41H	**65**	R/W	0/1	[On/Off] General On/Off of the unit [Off] Unit OFF - [On] Unit ON	**3111**	**TWN**
42H	**66**	R/W	0/1	[Reset] Discharges the safety measures of the unit	**3113**	**TWN**
43H	**67**	R/W	0/1	[BMS] BMS On/Off of the unit [Off] Unit OFF - [On] Unit ON	**3112 BMS**	**TWN**
44H	**68**	R/W	0/1	*not used*		**TWN**
45H	**69**	R/W	0/1	[BMS] Activation of the Inoccupation mode : [Off] Occupation mode - [On] Inoccupation mode	**3925 Unoc**	**TWN**
46H	**70**	R	0/1	*not used*		**TWN**
47H	**71**	R	0/1	*not used*		**TWN**
48H	**72**	R	0/1	*not used*		**TWN**
49H	**73**	R	0/1	*not used*		**TWN**
4AH	**74**	R	0/1	*not used*		**TWN**
4BH	**75**	R	0/1	*not used*		**TWN**
4CH	**76**	R	0/1	*not used*		**TWN**
4DH	**77**	R	0/1	*not used*		**TWN**
4EH	**78**	R	0/1	*not used*		**TWN**
4FH	**79**	R	0/1	*not used*		**TWN**
50H	**80**	R/W	0/1	[Clock] Read / Update the internal clock board of the BM50 [OFF] Read hour & minute - [ON] Write hour & minute	**...**	**TWN**
51H	**81**	R	0/1	*not used*		**TWN**
52H	**82**	R/W	0/1	[Dry contact] Digital Output, Free 1, BE50-J5-NO1	**2151**	**TWN**
53H	**83**	R/W	0/1	[Dry contact] Digital Output, Free 2, BE50-J6-NO2	**2152**	**TWN**
54H	**84**	R/W	0/1	[Dry contact] Digital Output, Free 3, BE50-J7-NO3	**2153**	**TWN**
55H	**85**	R/W	0/1	[Dry contact] Digital Output, Free 4, BE50-J8-NO4	**2154**	**TWN**
56H	**86**	R	0/1	*not used*		**TWN**

57H	**87**	R	0/1	*not used*		**TWN**
58H	**88**	R	0/1	*not used*		**TWN**
59H	**89**	R	0/1	*not used*		**TWN**
5AH	**90**	R	0/1	*not used*		**TWN**
5BH	**91**	R	0/1	*not used*		**TWN**
5CH	**92**	R	0/1	*not used*		**TWN**
5DH	**93**	R	0/1	*not used*		**TWN**
5EH	**94**	R	0/1	*not used*		**TWN**
5FH	**95**	R	0/1	*not used*		**TWN**
60H	**96**	R	0/1	*not used*		**TWN**
61H	**97**	R	0/1	[Alarm] General alarm		**TWN**
62H	**98**	R	0/1	[On/Off] Pump, 1	**2615**	**TWN**
63H	**99**	R	0/1	[On/Off] Pump, 2	**2616**	**TWN**
64H	**100**	R	0/1	[On/Off] Compressor 1, Circuit 1	**2316**	**TWN**
65H	**101**	R	0/1	[On/Off] Compressor 2, Circuit 1	**2326**	**TWN**
66H	**102**	R	0/1	[On/Off] Compressor 3, Circuit 1	**2336**	**TWN**
67H	**103**	R	0/1	[On/Off] Compressor, Heat pump, Circuit 1	**2317**	**TWN**
68H	**104**	R	0/1	[On/Off] Compressor 1, Circuit 2	**2346**	**TWN**
69H	**105**	R	0/1	[On/Off] Compressor 2, Circuit 2	**2356**	**TWN**
6AH	**106**	R	0/1	[On/Off] Compressor 3, Circuit 2	**2366**	**TWN**
6BH	**107**	R	0/1	[On/Off] Compressor, Heat pump, Circuit 2	**2347**	**TWN**
6CH	**108**	R	0/1	*not used*		**TWN**
6DH	**109**	R	0/1	*not used*		**TWN**
6EH	**110**	R	0/1	*not used*		**TWN**
6FH	**111**	R	0/1	*not used*		**TWN**
70H	**112**	R	0/1	*not used*		**TWN**
71H	**113**	R	0/1	[Dry contact] Digital Input, Free 1, BM50-J8-ID13	**2161**	**TWN**
72H	**114**	R	0/1	[Dry contact] Digital Input, Free 2, BM50-J8-ID14	**2162**	**TWN**
73H	**115**	R	0/1	[Dry contact] Digital Input, Free 1, BE50-J4-ID1	**2163**	**TWN**
74H	**116**	R	0/1	[Dry contact] Digital Input, Free 2, BE50-J4-ID2	**2164**	**TWN**
75H	**117**	R	0/1	[Dry contact] Digital Input, Free 3, BE50-J4-ID3	**2165**	**TWN**
76H	**118**	R	0/1	[Dry contact] Digital Input, Free 4, BE50-J4-ID4	**2166**	**TWN**
77H	**119**	R	0/1			**TWN**
78H	**120**	R	0/1			**TWN**
79H	**121**	R	0/1			**TWN**
7AH	**122**	R	0/1			**TWN**
7BH	**123**	R	0/1			**TWN**
7CH	**124**	R	0/1			**TWN**
7DH	**125**	R	0/1			**TWN**
7EH	**126**	R	0/1	[Water] Cool Mode Operating		**TWN**
7FH	**127**	R	0/1	*not used*		**TWN**
80H	**128**	R	0/1	[Water] Heat Mode Operating		**TWN**

ANALOGIC DATA

@ (hexa)	@ (deci)	R/W	Unit	Description	DS50	UNIT
01H	**1**	R/W	1 = 1 s	[BMS] Activation of the control by a computer or an automat. Mode BMS is activated if this value is different from zero. This value is decreased every second.	**3934**	**STD**
02H	**2**	R/W	1 = 1	[Unit] without pump: 0=Started; 1=Stopped [Unit] with pump: 1=Stopped; 2:P1 Only; 3=P2 Only; 4=P1-N P2-S; 5=P2-N P1-S; 6=P1/P2 by clock	**3711 BMS**	**STD**
03H	**3**	R/W	1 = 1	[Unit] Change-over: 0=Cool. Only; 1=Heat. Only; 2=Auto. Pump; 3=Auto. No Pump	**3311 BMS**	**STD**
04H	**4**	R	1 = 1	*not used*		**STD**
05H	**5**	R/W	10 = 1.0°c	[Occupation][Water SP] Required water temperature in °C Cooling set point.	**3321 BMS**	**STD**
06H	**6**	R/W	10 = 1.0°c	[Occupation][Water SP] Required water temperature in °C Heating set point.	**3331 BMS**	**STD**
07H	**7**	R/W	10 = 1.0°c	[Inoccupation][Water SP] Required water temperature in °C Cooling set point.	**3321 Uno**	**STD**
08H	**8**	R/W	10 = 1.0°c	[Inoccupation][Water SP] Required water temperature in °C Heating set point.	**3331 Uno**	**STD**
09H	**9**	R		*not used*		**STD**
0AH	**10**	R		*not used*		**STD**
0BH	**11**	R		*not used*		**STD**
0CH	**12**	R/W	1 = 1h	[Clock] Hour	**3121**	**STD**
0DH	**13**	R/W	1 = 1m	[Clock] Minute	**3122**	**STD**
0EH	**14**	R/W	1 = 1	[Clock] Day of the month	**3123**	**STD**
0FH	**15**	R/W	1 = 1	[Clock] Month	**3124**	**STD**
10H	**16**	R/W	1 = 2001	[Clock] Year	**3125**	**STD**
11H	**17**	R/W	10 = 1.0°c	[BMS] Outlet temperature coming from the BMS.		**STD**
12H	**18**	R/W		*not used*		**STD**
13H	**19**	R/W	10 = 1.0°c	[BMS] Outdoor temperature coming from the BMS.		**STD**
14H	**20**	R/W		*not used*		**STD**
15H	**21**	R/W		*not used*		**STD**
16H	**22**	R/W		*not used*		**STD**
17H	**23**	R/W		*not used*		**STD**
18H	**24**	R/W		*not used*		**STD**
19H	**25**	R/W		*not used*		**STD**
1AH	**26**	R/W		*not used*		**STD**
1BH	**27**	R/W		*not used*		**STD**
1CH	**28**	R/W		*not used*		**STD**
1DH	**29**	R/W		*not used*		**STD**
1EH	**30**	R/W		*not used*		**STD**
1FH	**31**	R/W		*not used*		**STD**
20H	**32**	R/W		*not used*		**STD**
21H	**33**	R	1 = 1	[Alarm] Code Error	**…**	**STD**
22H	**34**	R	10 = 1.0°c	[Temperature] Inlet, Water	**2112**	**STD**
23H	**35**	R	10 = 1.0°c	[Temperature] Outdoor, Air	**2111**	**STD**
24H	**36**	R	10 = 1.0°c	[Temperature] Outlet, Water	**2113**	**STD**
25H	**37**	R	10 = 1.0b	[Temperature] High, Circuit 1	**2122**	**STD**
26H	**38**	R	10 = 1.0b	[Temperature] Low, Circuit 1	**2123**	**STD**

27H	**39**	R	10 = 1.0b	[Temperature] High, Circuit 2	**2132**	**STD**
28H	**40**	R	10 = 1.0b	[Temperature] Low, Circuit 2	**2133**	**STD**
29H	**41**	R	10 = 1.0b	[EEV] Saturated evaporation temperature, Circuit 1	**2124**	**STD**
2AH	**42**	R	10 = 1.0b	[EEV] Saturated evaporation temperature, Circuit 2	**2134**	**STD**
2BH	**43**	R	10 = 1.0b	*not used*		**STD**
2CH	**44**	R	10 = 1.0b	*not used*		**STD**
2DH	**45**	R	1 = 1%	[% of opening] Fan, Modulation, Circuit 1	**2517**	**STD**
2EH	**46**	R	1 = 1%	[% of opening] Fan, Modulation, Circuit 2	**2527**	**STD**
2FH	**47**	R	1 = 1%	*not used*		**STD**
30H	**48**	R	1 = 1%	*not used*		**STD**
31H	**49**	R	10 = 1.0°c	[Temperature] Temperature, Free 1, BE50-J9-B1	**2171**	**STD**
32H	**50**	R	10 = 1.0°c	[Temperature] Temperature, Free 2, BE50-J9-B2	**2172**	**STD**
33H	**51**	R	10 = 1.0°c	[Temperature] Temperature, Free 3, BE50-J10-B3	**2173**	**STD**
34H	**52**	R	10 = 1.0°c	[Temperature] Temperature, Free 4, BE50-J10-B4	**2174**	**STD**
35H	**53**	R	1 = 1	*not used*		**STD**
36H	**54**	R	1 = 1	*not used*		**STD**
37H	**55**	R	1 = 1	*not used*		**STD**
38H	**56**	R	1 = 1	*not used*		**STD**
39H	**57**	R	10 = 1.0°c	[EEV] Current superheating value, Circuit 1	**2121**	**STD**
3AH	**58**	R	10 = 1.0°c	[EEV] Current superheating value, Circuit 2	**2131**	**STD**
3BH	**59**	R	10 = 1.0°c	*not used*		**STD**
3CH	**60**	R	10 = 1.0°c	*not used*		**STD**
3DH	**61**	R	10 = 1.0°c	*not used*		**STD**
3EH	**62**	R	10 = 1.0°c	*not used*		**STD**
3FH	**63**	R	10 = 1.0	[Alarm] bit.0 = Flow switch bit.1 = High Temperature, Outlet bit.2 = Low Temperature, Inlet bit.3 = Low Temperature, Outlet bit.4 = High Temperature, Inlet bit.5 = Pump, 1 bit.6 = Pump, 2 bit.7 = Real Time Clock bit.8 = BE50 bit.9 = *not used* bit.10 = Probes & Sensors bit.11 = Fans, Condenser, Circuit 1 bit.12 = Fans, Condenser, Circuit 2 bit.13 = Fans, Condenser, Circuit 3 bit.14 = *not used* bit.15 = *not used*		**STD**
40H	**64**	R	10 = 1.0	[Alarm] bit.0 = Compressor, Circuit 1, Electric Protection bit.1 = Compressor, Circuit 1, High Pressure bit.2 = Compressor, Circuit 1, Low Pressure or Freeze protection bit.3 = Compressor, Circuit 2, Electric Protection bit.4 = Compressor, Circuit 2, High Pressure bit.5 = Compressor, Circuit 2, Low Pressure or Freeze protection bit.6 = *not used* bit.7 = *not used* bit.8 = *not used* bit.9 = *not used* bit.10 = *not used* bit.11 = *not used* bit.12 = Compressor, Circuit 1, Electronic Expansion Valve bit.13 = Compressor, Circuit 2, Electronic Expansion Valve bit.14 = *not used* bit.15 = *not used*		**STD**
41H	**65**	R/W	1 = 1 s	[BMS] Activation of the control by a computer or an automat. Mode BMS is activated if this value is different from zero. This value is decreased every second.	**3934**	**TWN**

42H	**66**	R/W	1 = 1	[Unit] without pump: 0=Started; 1=Stopped [Unit] with pump: 1=Stopped; 2:P1 Only; 3=P2 Only; 4=P1-N P2-S; 5=P2-N P1-S; 6=P1/P2 by clock	**3711 BMS**	**TWN**
43H	**67**	R/W	1 = 1	[Unit] Change-over: 0=Cool. Only; 1=Heat. Only; 2=Auto. Pump; 3=Auto. No Pump	**3311 BMS**	**TWN**
44H	**68**	R	1 = 1	*not used*		**TWN**
45H	**69**	R/W	10 = 1.0°c	[Occupation][Water SP] Required water temperature in °C Cooling set point.	**3321 BMS**	**TWN**
46H	**70**	R/W	10 = 1.0°c	[Occupation][Water SP] Required water temperature in °C Heating set point.	**3331 BMS**	**TWN**
47H	**71**	R/W	10 = 1.0°c	[Inoccupation][Water SP] Required water temperature in °C Cooling set point.	**3321 Uno**	**TWN**
48H	**72**	R/W	10 = 1.0°c	[Inoccupation][Water SP] Required water temperature in °C Heating set point.	**3331 Uno**	**TWN**
49H	**73**	R		*not used*		**TWN**
4AH	**74**	R		*not used*		**TWN**
4BH	**75**	R		*not used*		**TWN**
4CH	**76**	R/W	1 = 1h	[Clock] Hour	**3121**	**TWN**
4DH	**77**	R/W	1 = 1m	[Clock] Minute	**3122**	**TWN**
4EH	**78**	R/W	1 = 1	[Clock] Day of the month	**3123**	**TWN**
4FH	**79**	R/W	1 = 1	[Clock] Month	**3124**	**TWN**
50H	**80**	R/W	1 = 2001	[Clock] Year	**3125**	**TWN**
51H	**81**	R/W	10 = 1.0°c	[BMS] Outlet temperature coming from the BMS.		**TWN**
52H	**82**	R/W		*not used*		**TWN**
53H	**83**	R/W	10 = 1.0°c	[BMS] Outdoor temperature coming from the BMS.		**TWN**
54H	**84**	R/W		*not used*		**TWN**
55H	**85**	R/W		*not used*		**TWN**
56H	**86**	R/W		*not used*		**TWN**
57H	**87**	R/W		*not used*		**TWN**
58H	**88**	R/W		*not used*		**TWN**
59H	**89**	R/W		*not used*		**TWN**
5AH	**90**	R/W		*not used*		**TWN**
5BH	**91**	R/W		*not used*		**TWN**
5CH	**92**	R/W		*not used*		**TWN**
5DH	**93**	R/W		*not used*		**TWN**
5EH	**94**	R/W		*not used*		**TWN**
5FH	**95**	R/W		*not used*		**TWN**
60H	**96**	R/W		*not used*		**TWN**
61H	**97**	R	1 = 1	[Alarm] Code Error	**...**	**TWN**
62H	**98**	R	10 = 1.0°c	[Temperature] Inlet, Water	**2112**	**TWN**
63H	**99**	R	10 = 1.0°c	[Temperature] Outdoor, Air	**2111**	**TWN**
64H	**100**	R	10 = 1.0°c	[Temperature] Outlet, Water	**2113**	**TWN**
65H	**101**	R	10 = 1.0b	[Temperature] High, Circuit 1	**2122**	**TWN**
66H	**102**	R	10 = 1.0b	[Temperature] Low, Circuit 1	**2123**	**TWN**
67H	**103**	R	10 = 1.0b	[Temperature] High, Circuit 2	**2132**	**TWN**
68H	**104**	R	10 = 1.0b	[Temperature] Low, Circuit 2	**2133**	**TWN**
69H	**105**	R	10 = 1.0b	[EEV] Saturated evaporation temperature, Circuit 1	**2124**	**TWN**
6AH	**106**	R	10 = 1.0b	[EEV] Saturated evaporation temperature, Circuit 2	**2134**	**TWN**
6BH	**107**	R	10 = 1.0b	*not used*		**TWN**
6CH	**108**	R	10 = 1.0b	*not used*		**TWN**
6DH	**109**	R	1 = 1%	[% of opening] Fan, Modulation, Circuit 1	**2517**	**TWN**

6EH	**110**	R	1 = 1%	[% of opening] Fan, Modulation, Circuit 2	**2527**	**TWN**
6FH	**111**	R	1 = 1%	*not used*		**TWN**
70H	**112**	R	1 = 1%	*not used*		**TWN**
71H	**113**	R	10 = 1.0°c	[Temperature] Temperature, Free 1, BE50-J9-B1	**2171**	**TWN**
72H	**114**	R	10 = 1.0°c	[Temperature] Temperature, Free 2, BE50-J9-B2	**2172**	**TWN**
73H	**115**	R	10 = 1.0°c	[Temperature] Temperature, Free 3, BE50-J10-B3	**2173**	**TWN**
74H	**116**	R	10 = 1.0°c	[Temperature] Temperature, Free 4, BE50-J10-B4	**2174**	**TWN**
75H	**117**	R	1 = 1	*not used*		**TWN**
76H	**118**	R	1 = 1	*not used*		**TWN**
77H	**119**	R	1 = 1	*not used*		**TWN**
78H	**120**	R	1 = 1	*not used*		**TWN**
79H	**121**	R	10 = 1.0°c	[EEV] Current superheating value, Circuit 1	**2121**	**TWN**
7AH	**122**	R	10 = 1.0°c	[EEV] Current superheating value, Circuit 2	**2131**	**TWN**
7BH	**123**	R	10 = 1.0°c	*not used*		**TWN**
7CH	**124**	R	10 = 1.0°c	*not used*		**TWN**
7DH	**125**	R	10 = 1.0°c	*not used*		**TWN**
7EH	**126**	R	10 = 1.0°c	*not used*		**TWN**
7FH	**127**	R	10 = 1.0	[Alarm] bit.0 = Flow switch bit.1 = High Temperature, Outlet bit.2 = Low Temperature, Inlet bit.3 = Low Temperature, Outlet bit.4 = High Temperature, Inlet bit.5 = Pump, 1 bit.6 = Pump, 2 bit.7 = Real Time Clock bit.8 = BE50 bit.9 = *not used* bit.10 = Probes & Sensors bit.11 = Fans, Condenser, Circuit 1 bit.12 = Fans, Condenser, Circuit 2 bit.13 = Fans, Condenser, Circuit 3 bit.14 = *not used* bit.15 = *not used*		**TWN**
80H	**128**	R	10 = 1.0	[Alarm] bit.0 = Compressor, Circuit 1, Electric Protection bit.1 = Compressor, Circuit 1, High Pressure bit.2 = Compressor, Circuit 1, Low Pressure or Freeze protection bit.3 = Compressor, Circuit 2, Electric Protection bit.4 = Compressor, Circuit 2, High Pressure bit.5 = Compressor, Circuit 2, Low Pressure or Freeze protection bit.6 = *not used* bit.7 = *not used* bit.8 = *not used* bit.9 = *not used* bit.10 = *not used* bit.11 = *not used* bit.12 = Compressor, Circuit 1, Electronic Expansion Valve bit.13 = Compressor, Circuit 2, Electronic Expansion Valve bit.14 = *not used* bit.15 = *not used*		**TWN**

BMS Adresses Table: Lon Works

LOGICAL DATA

Type	Index BM50	Name NV	Type NV	Direction	Index	Description	DS50	UNIT
DGT	1	I_Sp_On_Unit	95	input	415	[On / Off] Unit	3111	STD
DGT	1	O_Sp_On_Unit	95	output	415			STD
DGT	2	I_Sp_Reset	95	input	416	[Reset] Discharges the safety measures of the unit	3113	STD
DGT	2	O_Sp_Reset	95	output	416			STD
DGT	3	I_Sp_Unoc	95	input	417	[BMS] Activation of the Inoccupation mode [Off] occupation mode - [On] inoccupation mode	3925	STD
DGT	3	O_Sp_Unoc	95	output	417			STD
DGT	17	O_Od_Alarm	95	output	431	[Alarm] General	1000	STD
DGT	18	O_Od_Pump_1	95	output	432	[On/Off] Pump, 1	2615	STD
DGT	19	O_Od_Pump_2	95	output	433	[On/Off] Pump, 2	2616	STD
DGT	20	O_Od_Comp_11	95	output	434	[On/Off] Compressor 1, Circuit 1	2316	STD
DGT	21	O_Od_Comp_21	95	output	435	[On/Off] Compressor 2, Circuit 1	2326	STD
DGT	22	O_Od_Comp_13	95	output	436	[On/Off] Compressor 3, Circuit 1	2336	STD
DGT	23	O_Od_CompHPump_1	95	output	437	[On/Off] Compressor, Heat pump, Circuit 1	2317	STD
DGT	24	O_Od_Comp_12	95	output	438	[On/Off] Compressor 1, Circuit 2	2346	STD
DGT	25	O_Od_Comp_22	95	output	439	[On/Off] Compressor 2, Circuit 2	2356	STD
DGT	26	O_Od_Comp_23	95	output	440	[On/Off] Compressor 3, Circuit 2	2366	STD
DGT	27	O_Od_CompHPump_2	95	output	441	[On/Off] Compressor, Heat pump, Circuit 2	2347	STD
DGT	17	O_Od_Alarm	95	output	431	[Alarm] General	1000	TWN
DGT	18	O_Od_Pump_1	95	output	432	[On/Off] Pump, 1	2615	TWN
DGT	19	O_Od_Pump_2	95	output	433	[On/Off] Pump, 2	2616	TWN
DGT	20	O_Od_Comp_11	95	output	434	[On/Off] Compressor 1, Circuit 1	2316	TWN
DGT	21	O_Od_Comp_21	95	output	435	[On/Off] Compressor 2, Circuit 1	2326	TWN
DGT	22	O_Od_Comp_13	95	output	436	[On/Off] Compressor 3, Circuit 1	2336	TWN
DGT	23	O_Od_CompHPump_1	95	output	437	[On/Off] Compressor, Heat pump, Circuit 1	2317	TWN
DGT	24	O_Od_Comp_12	95	output	438	[On/Off] Compressor 1, Circuit 2	2346	TWN
DGT	25	O_Od_Comp_22	95	output	439	[On/Off] Compressor 2, Circuit 2	2356	TWN
DGT	26	O_Od_Comp_23	95	output	440	[On/Off] Compressor 3, Circuit 2	2366	TWN
DGT	27	O_Od_CompHPump_2	95	output	441	[On/Off] Compressor, Heat pump, Circuit 2	2347	TWN

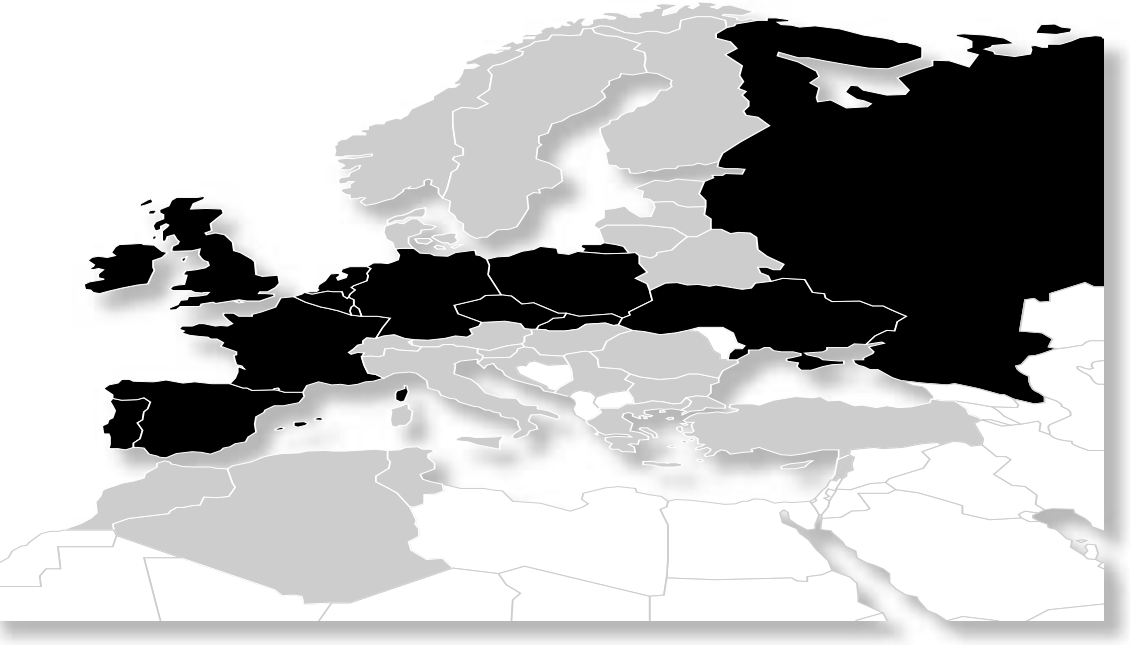
ANALOGIC DATA

Type	Index BM50	Name NV	Type NV	Direction	Index	Description	DS50	UNIT
ANL	1	I_Sp_WCool_1_BMS	105	input	1	[Occupation][Water SP] Required water temperature in °C Cooling set point	**3321 BMS**	**STD**
ANL	1	O_Sp_WCool_1_BMS	105	output	1			**STD**
ANL	2	I_Sp_WHeat_1_BMS	105	input	2	[Occupation][Water SP] Required water temperature in °C Heating set point	**3331 BMS**	**STD**
ANL	2	O_Sp_WHeat_1_BMS	105	output	2			**STD**
ANL	3	I_Sp_WCool_1_Uno	105	input	3	[Inoccupation][Water SP] Required water temperature in °C Cooling set point	**3321 Uno**	**STD**
ANL	3	O_Sp_WCool_1_Uno	105	output	3			**STD**
ANL	4	I_Sp_WHeat_1_Uno	105	input	4	[Inoccupation][Water SP] Required water temperature in °C Heating set point	**3331 Uno**	**STD**
ANL	4	O_Sp_WHeat_1_Uno	105	output	4			**STD**
ANL	17	O_Ia_TEEG	105	output	17	[Temperature] Inlet, Water	**2112**	**STD**
ANL	18	O_T_Outside	105	output	18	[Temperature] Outdoor, Air	**2111**	**STD**
ANL	19	O_Ia_TSEG	105	output	19	[Temperature] Outlet, Water	**2113**	**STD**
ANL	20	O_Ia_P_HP_1	105	output	20	[Pressure] High, Circuit 1 (Bar)	**2125**	**STD**
ANL	21	O_Ia_P_BP_1	105	output	21	[Pressure] Low, Circuit 1 (Bar)	**2126**	**STD**
ANL	22	O_Ia_P_HP_2	105	output	22	[Pressure] High, Circuit 2 (Bar)	**2135**	**STD**
ANL	23	O_Ia_P_BP_2	105	output	23	[Pressure] Low, Circuit 2 (Bar)	**2136**	**STD**
ANL	24	O_Ia_P_HP_1	105	output	20	[Pressure] High, Circuit 1 (Bar)	**2125**	**TWN**
ANL	25	O_Ia_P_BP_1	105	output	21	[Pressure] Low, Circuit 1 (Bar)	**2126**	**TWN**
ANL	26	O_Ia_P_HP_2	105	output	22	[Pressure] High, Circuit 2 (Bar)	**2135**	**TWN**
ANL	27	O_Ia_P_BP_2	105	output	23	[Pressure] Low, Circuit 2 (Bar)	**2136**	**TWN**

INTEGER DATA

Type	Index	Name NV	Type NV	Direction	Index	Description	DS50	UNIT
INT	1	I_Sp_BMS_Dog	8	input	208	[BMS] Activation of the control by a computer or an automat - mode BMS is activated if this value is different from zero, This value is decreased every second	**3934**	**STD**
INT	1	O_Sp_BMS_Dog	8	output	208			**STD**
INT	2	I_Sp_RunUnit_BMS	8	input	209	[Unit] without pump: 0=Started; 1=Stopped [Unit] with pump: 1=Stopped; 2:P1 Only; 3=P2 Only; 4=P1-N P2-S; 5=P2-N P1-S; 6=P1/P2 by clock	**3711 (BMS)**	**STD**
INT	2	O_Sp_RunUnit_BMS	8	output	209			**STD**
INT	3	I_Sp_ChOver_BMS	8	input	210	[Unit] Change-over: 0=Cool. Only; 1=Heat. Only; 2=Auto. Pump; 3=Auto. No Pump	**3311 BMS**	**STD**
INT	3	O_Sp_ChOver_BMS	8	output	210			**STD**
INT	4	I_Sp_Rotat_BMS	8	input	211	[Unit] Activation of the circuits: 0=C1 Only; 1=C2 Only; 2=C1/C2 by clock	**3411 (BMS)**	**STD**
INT	4	O_Sp_Rotat_BMS	8	output	211			**STD**
INT	17	O_Error_Codes	8	output	224	[Alarm] Code Error	**1000**	**STD**
INT	18	O_Error_Codes	8	output	224	[Alarm] Code Error	**1000**	**TWN**
INT	19	*not used*	81	output	226	*not used*		
INT	20	O_Error_Bits_1	8	output	229	[Alarm] bit.0 = Flow switch bit.1 = High Temperature, Outlet bit.2 = Low Temperature, Inlet bit.3 = Low Temperature, Outlet bit.4 = High Temperature, Inlet bit.5 = Pump, 1 bit.6 = Pump, 2 bit.7 = Real Time Clock bit.8 = BE50 bit.9 = *not used* bit.10 = Probes & Sensors bit.11 = Fans, Condenser, Circuit 1 bit.12 = Fans, Condenser, Circuit 2 bit.13 = Fans, Condenser, Circuit 3 bit.14 = *not used* bit.15 = *not used*		**TWN**
INT	21	O_Error_Bits_2	8	output	230	[Alarm]		**TWN**

						bit.0 = Compressor, Circuit 1, Electric Protection bit.1 = Compressor, Circuit 1, High Pressure bit.2 = Compressor, Circuit 1, Low Pressure or Freeze protection bit.3 = Compressor, Circuit 2, Electric Protection bit.4 = Compressor, Circuit 2, High Pressure bit.5 = Compressor, Circuit 2, Low Pressure or Freeze protection bit.6 = *not used* bit.7 = *not used* bit.8 = *not used* bit.9 = *not used* bit.10 = *not used* bit.11 = *not used* bit.12 = Compressor, Circuit 1, Electronic Expansion Valve bit.13 = Compressor, Circuit 2, Electronic Expansion Valve bit.14 = *not used* bit.15 = *not used*		
INT	22	O_Error_Bits_1	8	output	229	[Alarm] bit.0 = Flow switch bit.1 = High Temperature, Outlet bit.2 = Low Temperature, Inlet bit.3 = Low Temperature, Outlet bit.4 = High Temperature, Inlet bit.5 = Pump, 1 bit.6 = Pump, 2 bit.7 = Real Time Clock bit.8 = BE50 bit.9 = *not used* bit.10 = Probes & Sensors bit.11 = Fans, Condenser, Circuit 1 bit.12 = Fans, Condenser, Circuit 2 bit.13 = Fans, Condenser, Circuit 3 bit.14 = *not used* bit.15 = *not used*		**STD**
INT	23	O_Error_Bits_2	8	output	230	[Alarm] bit.0 = Compressor, Circuit 1, Electric Protection bit.1 = Compressor, Circuit 1, High Pressure bit.2 = Compressor, Circuit 1, Low Pressure or Freeze protection bit.3 = Compressor, Circuit 2, Electric Protection bit.4 = Compressor, Circuit 2, High Pressure bit.5 = Compressor, Circuit 2, Low Pressure or Freeze protection bit.6 = *not used* bit.7 = *not used* bit.8 = *not used* bit.9 = *not used* bit.10 = *not used* bit.11 = *not used* bit.12 = Compressor, Circuit 1, Electronic Expansion Valve bit.13 = Compressor, Circuit 2, Electronic Expansion Valve bit.14 = *not used* bit.15 = *not used*		**STD**



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