

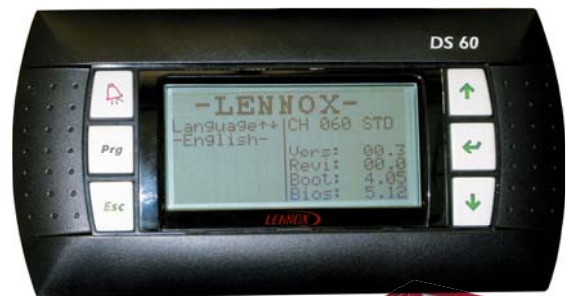


CLIMATIC™ 60

User manual



ECOLEAN™
NEOSYS™ Air cooled chiller



CLIMATIC™ 60

AIR COOLED CHILLER

CONTROL MANUAL

Ref : CL60-AC CHILLER-IOM-0512-E

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CLIMATIC™ 60 CONTROLLER

The new generation of microprocessor based control, CLIMATIC™ 60 may be fitted to the LENNOX chiller range. It inherits 20 years of technology and field operating experience from its predecessors the CLIMATIC™ 1, CLIMATIC™ 2 and CLIMATIC™ 50. LENNOX has found the latest hardware technology available on the market place and developed software specifically designed for chiller applications, maximising the LENNOX unit's efficiency and performance.

COMPATIBILITY

This documentation is compatible with the chiller programs:

- NEOSYS / ECOLEAN ranges from software version CH060 STD - Vers. 2 - Rev 0.0.

WARNING

Any parameter modification should be carried out by trained and licensed competent technician. Before start-up or restart of a unit controlled by the CLIMATIC™ 60, it is mandatory to check adequacy between CLIMATIC™ 60 and the unit with its options. In case of wrong parameters, the inputs / outputs connections 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.

DS60 MENU

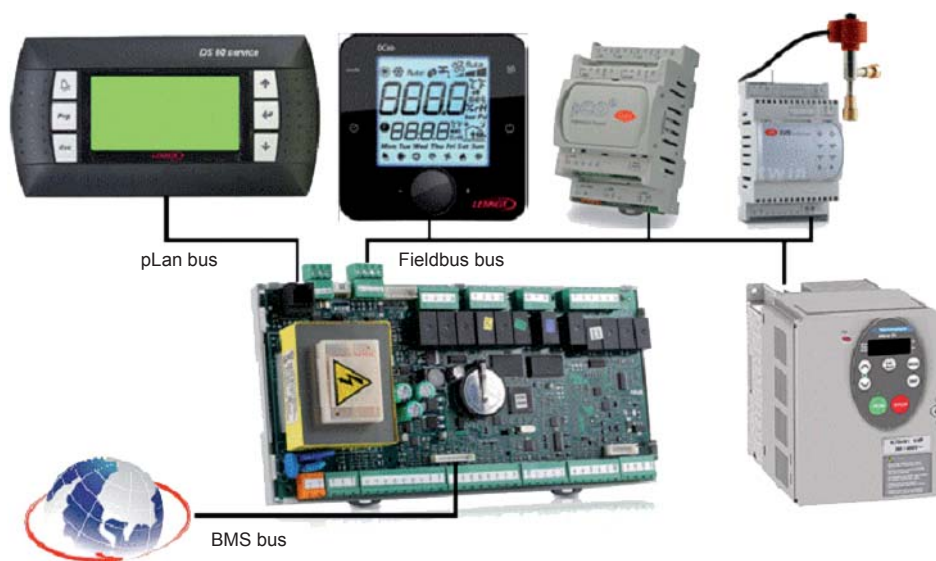
Throughout the document, all parameters and set points which are explained are given with their address menu where they will be visible on the display DS60.

Example, the customer set point explained in the AIR MANAGEMENT § is indicated with the reference (2222), meaning that this set point may be changed at the address (2222) with the display DS60.

The full list of parameters and set point is given at the end of the document.

Only the addresses of parameters accessible at the «User» level (2xxx) are identified in the document - Set point accessible at the «Expert» level (3xxx) with password are mentioned only if they are not accessible at the «User» level

OVERVIEW



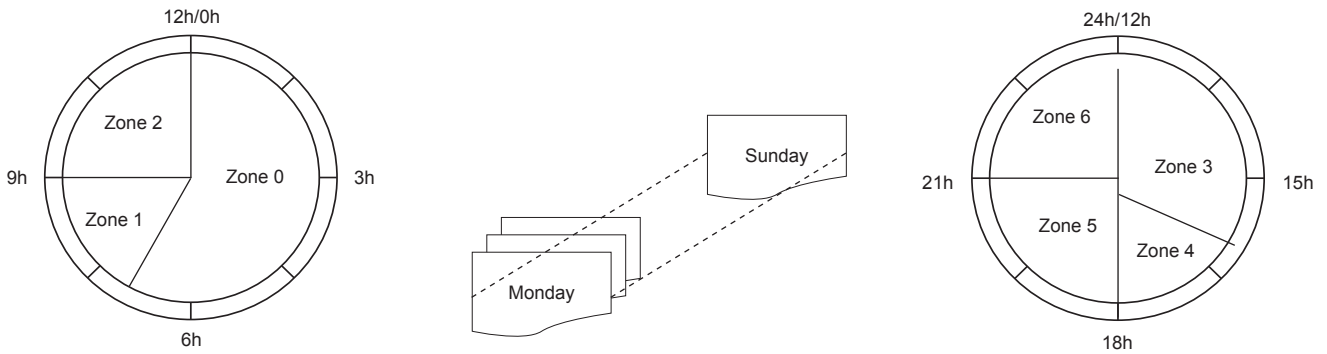
SCHEDULING ZONE

Function

The CLIMATIC™ 60 is provided by a real time clock which offers solutions to specify a weekly schedule.

Description

The CLIMATIC™ 60 schedule manages up to 7 different clock zones per day from 00h00 to 24h00 and from Monday to Sunday. The zone can start at different time each day of the week in order to optimise the operating of the unit.



Settings

The different settings to adjust the scheduling zone are available in the menu:

- (2131): Number of zone desired,

- (2141): Start time of zone 0 set to 00h00 to start each day

- (2142): starts time of zone 1 adjustable every day from Monday to Sunday

- (2143): starts time of zone 2 adjustable every day from Monday to Sunday

- (2144): starts time of zone 3 adjustable every day from Monday to Sunday

- (2145): starts time of zone 4 adjustable every day from Monday to Sunday

- (2146): starts time of zone 5 adjustable every day from Monday to Sunday

- (2147): starts time of zone 6 adjustable every day from Monday to Sunday

Note: the visibility of the settings (2141) to (2147) depend on the settings (2131). The zones not used are hidden.

The following factory setting is applied

- Zone 0 00h00 Monday to Sunday
- Zone 1 06h00 Monday to Sunday
- Zone 2 22h00 Monday to Sunday

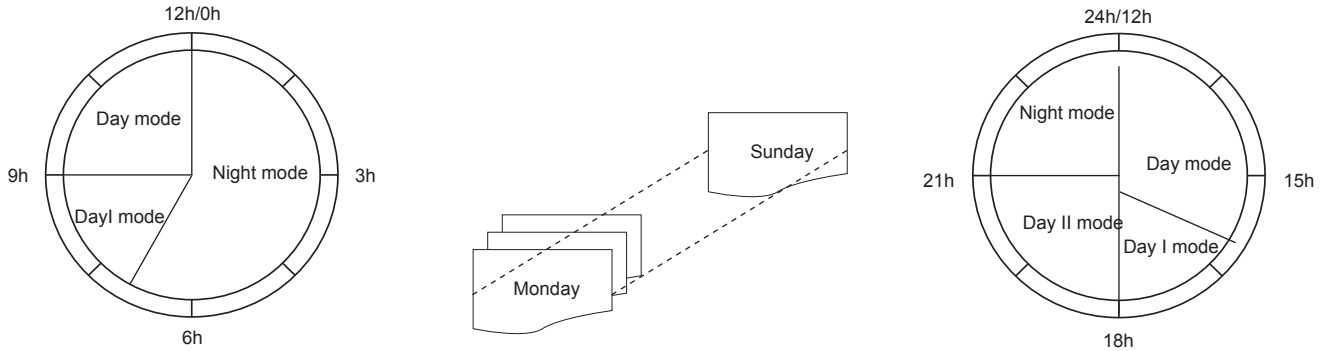
SCHEDULING MODE

Function

The CLIMATIC™ 60 is able to control different modes for each zone in order to optimise the operating of the unit.

Description

The CLIMATIC™ 60 can manage up to 4 different modes. - Night / Day / Day I / Day II



Settings

The different settings to adjust the scheduling mode are available in the menu:

(2132): Number of mode desired

(2151): mode used during the period of zone 0 adjustable every day from Monday to Sunday

(2152): mode used during the period of zone 1 adjustable every day from Monday to Sunday

(2153): mode used during the period of zone 2 adjustable every day from Monday to Sunday

(2154): mode used during the period of zone 3 adjustable every day from Monday to Sunday

(2155): mode used during the period of zone 4 adjustable every day from Monday to Sunday

(2156): mode used during the period of zone 5 adjustable every day from Monday to Sunday

(2157): mode used during the period of zone 6 adjustable every day from Monday to Sunday

Note: the visibility of the settings (2151) to (2157) depend on the settings (2132). The modes not used are hidden.

The following factory setting is applied

- Day Mode on Zone 0 from Monday to Sunday
- Day Mode on Zone 1 from Monday to Sunday
- Day Mode on Zone 2 from Monday to Sunday

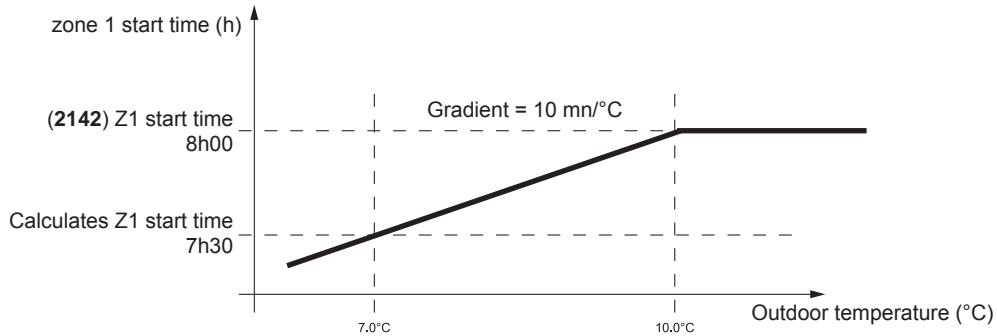
SCHEDULING ZONE ANTICIPATION

Function

The CLIMATIC™ 60 allows the start up of the unit before the pre-specified hour of the first zone (zone 1) of the day.

Description

This function is able to start the unit in zone 1 earlier if the outdoor temperature is under a specify threshold. The typical application is to start the unit in heating mode if the weather is too cold compare to the actual season.



Example:

(2142): zone 1 start time: 8h00,

(2161): outside air temperature threshold to activate function: 10.0°C,

(2162): gradient (slope): 10 mn/°C.

In this example the foot is set to the value 10.0°C, which means zone 1 will always start at 8h00 if the outside air temperature is higher than 10.0°C. If the outside air temperature is less than 10.0°C zone 1 will start according to the selected gradient and the difference between the foot value and the actual outside air temperature ($10.0 - 7.0 = 3.0 \times 10 = 30$ min). Then, the new start time for zone 1 is 7h30.

Settings

The different settings to adjust the anticipation are available in the menu:

(2161): outside air temperature threshold to activate function

(2162): gradient (slope)

COMPRESSOR

Function

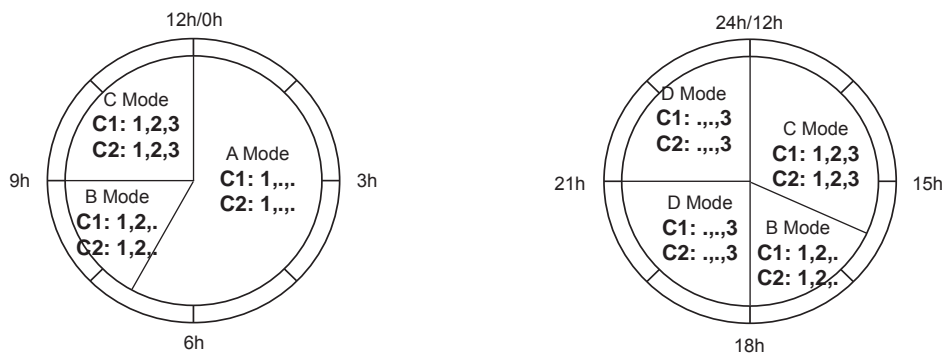
The CLIMATIC™ 60 manages the compressor(s) according to the outlet temperature demand and engages the number of compressor calculated to reach the water set point.

Description

The CLIMATIC™ 60 offers possibilities to disable some compressor(s) on the circuit. Note this opportunity can also be done by dry contact (Refer to the “Free input/output” paragraph).

Setting (3421)	Compressor on circuit (case of 3 compressors)
NO	
1, ., .	
., 2, .	
1, 2, .	
., ., 3	
1, ., 3	
., 2, 3	
1, 2, 3	

The compressors allowed to run can be pre-specified according to the scheduling and can take different values for each schedule mode (Night, Day, Day I, Day II, BMS).



Moreover, the circuit priority can be specified (for units with 2 circuits)

“Auto”:

The CLIMATIC™ 60 decides the priority of the circuit which starts first. Note that the priority may be swapped only when all the compressors are stopped in order to optimise the operating hours of the two circuits.

“Priority C1”:

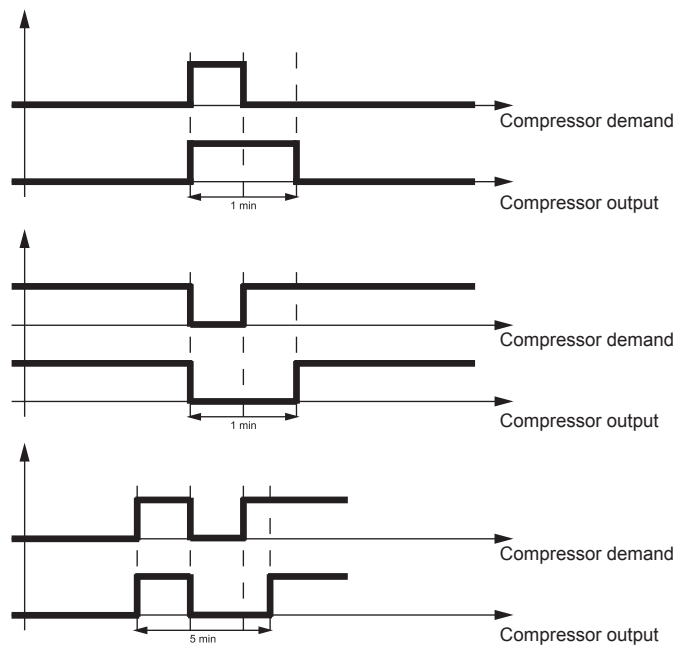
The priority is fixed to circuit 1, which means circuit 1 starts first and stops the last.

“Priority C2”:

The priority is fixed to circuit 2, which means circuit 2 starts first and stops the last.

The compressor is subject to various operating time in order to prevent from damage operating.

- The minimum ON time of the compressor is fixed to 1 minute,
- The minimum OFF time of the compressor is fixed to 1 minute,
- The minimum between 2 starts of the same compressor is fixed to 5 minutes.

**Settings**

The different settings to configure the compressors are available in the menu:

(3431): Enable of the compressor(s) on circuit 1

(3432): Enable of the compressor(s) on circuit 2

(3435): Priority of the circuit rotation.

CONDENSER FAN

Function

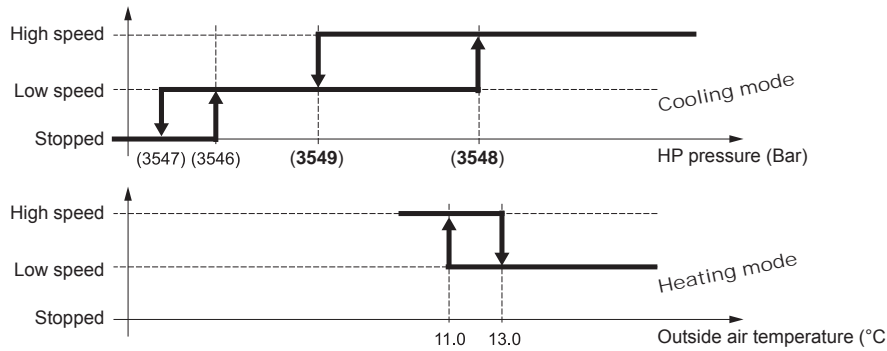
The CLIMATIC™ 60 is used to maintain the high pressure as stable as possible in order to increase the performance of the unit.

Description

The CLIMATIC™ 60 has 2 different fan managements according to the type of unit:

ECOLEAN™ (without fan speed inverter)

The CLIMATIC™ 60 manages 2 speeds on the fan (low and high speed).

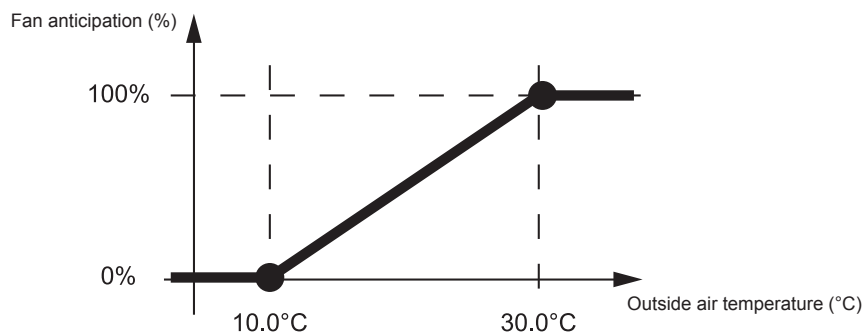


NEOSYS™ standard unit (standard version without fan speed inverter)

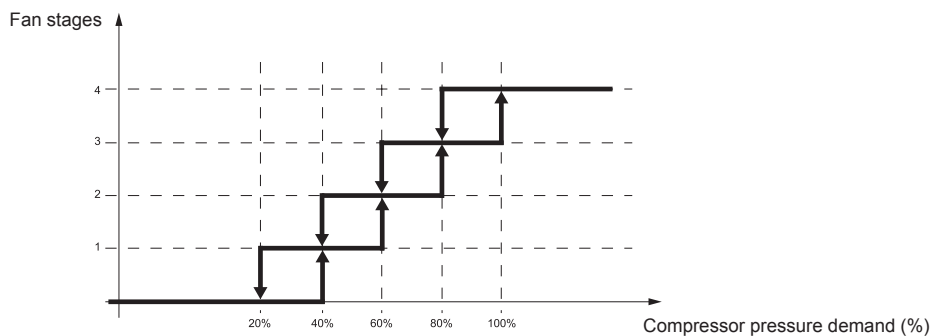
The condensing temperature is reached according to the set point selected in the menu (3545).

The fans are managed individually except for the fans which are common for the two circuits.

In order to optimise the reactivity of the system at the startup of the circuit, an anticipation of the fan(s) is forced during the first 30s according to the outside air temperature.

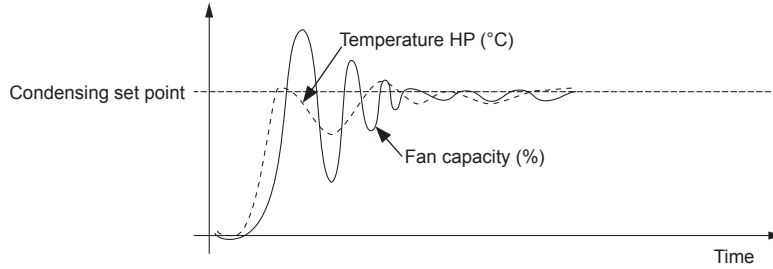


Example: Case of unit with 4 condenser fans.

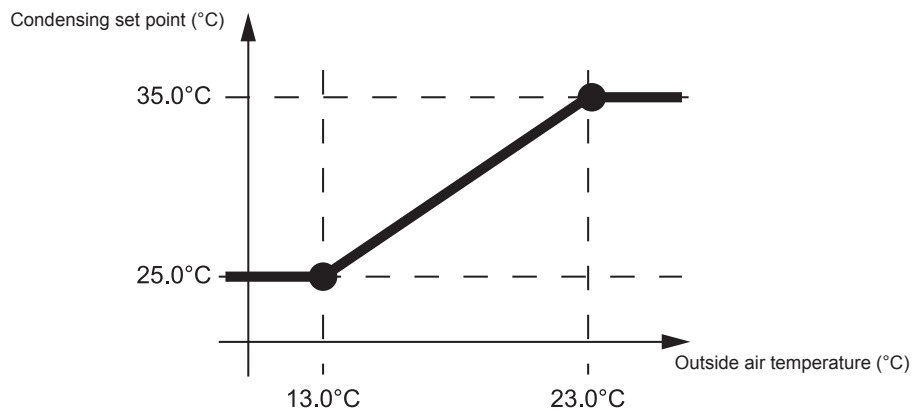


ECOLEAN™ NEOSYS™ (with fan speed inverter)

A fan inverter controlled by a PID algorithm is used to adjust the fans speed variation. Fan's startup anticipation is forced as for the NEOSYS™ standard unit.



In order to optimise the performance of the unit, the condensing temperature is set according to outside air temperature and tries to maintain a delta of 12°C (only for unit with electronic expansion valve).



Note: this functionality can be disabled if the selected setting (3545) is different from the factory value. In this case the condensing set point is the new selected value.

Settings

The different settings to adjust the condensing control are available in the menu:

- (3545): Condensing set point temperature.

FAN SMART ACOUSTIC SYSTEM™

Function

The CLIMATIC™ 60 controls the fan speed limited 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.

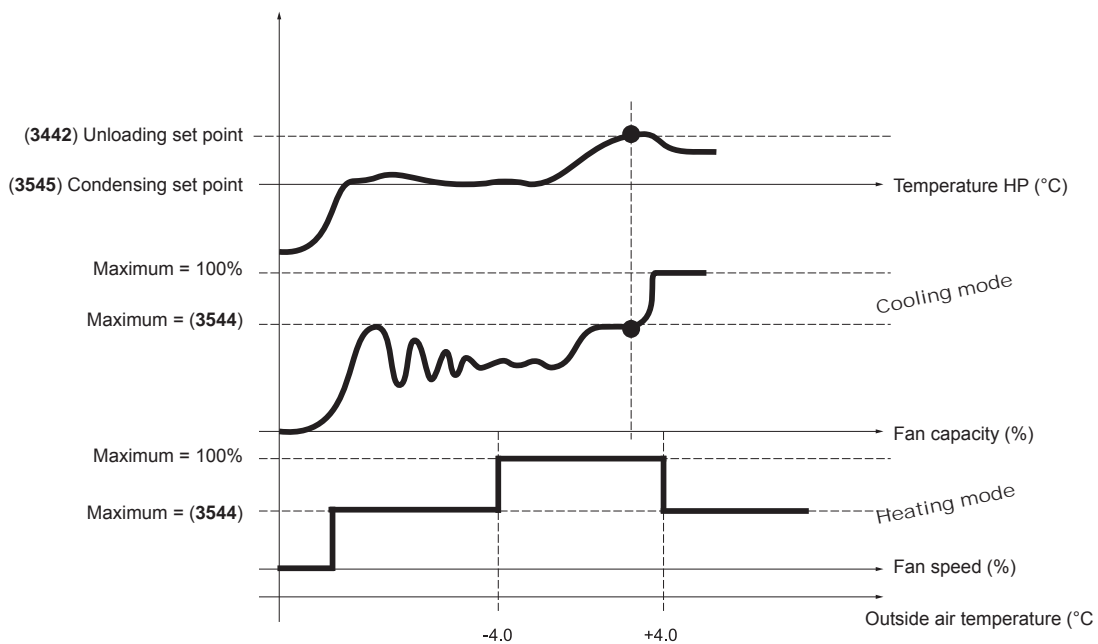
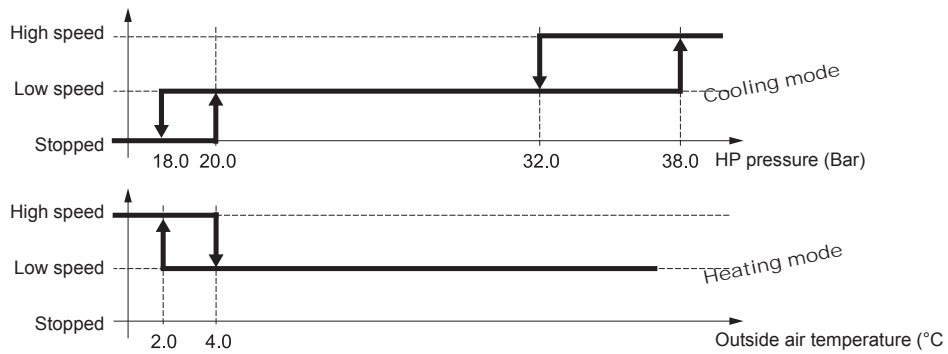
Description

The maximum sound level and the fan strategies can be adjusted according to the schedule mode in order to benefit from the different modes “Auto”, “Auto Quiet” and “Quiet” operation as well as in heating or cooling mode.

The acoustic mode offers 2 possibilities to manage the condenser fan:

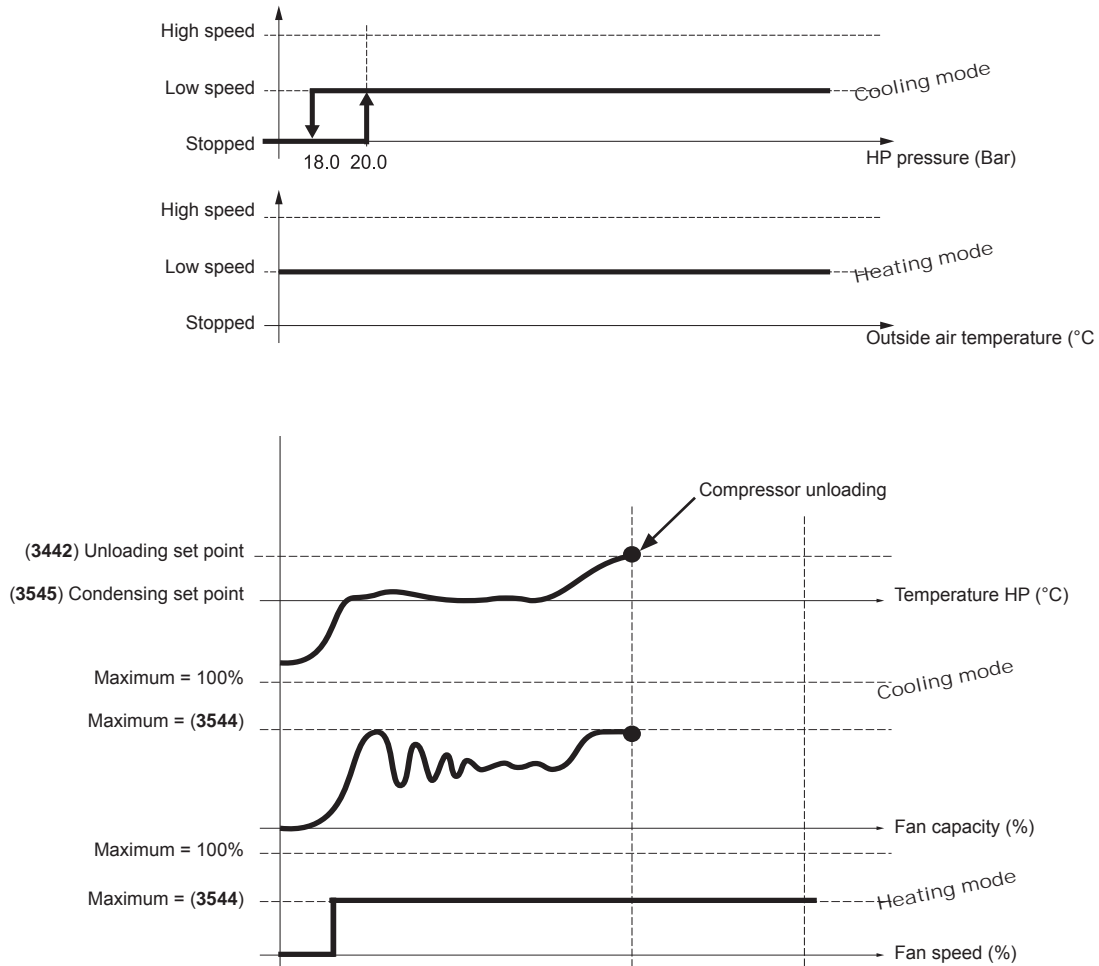
“Auto Quiet”

In this mode, the fan capacity is limited according to the desired sound level. For fan using low / high speed, the high speed is locked. In case of condensing temperature too high, the CLIMATIC™ 60 unlocks the limit or the high speed to prevent from unloading compressor.

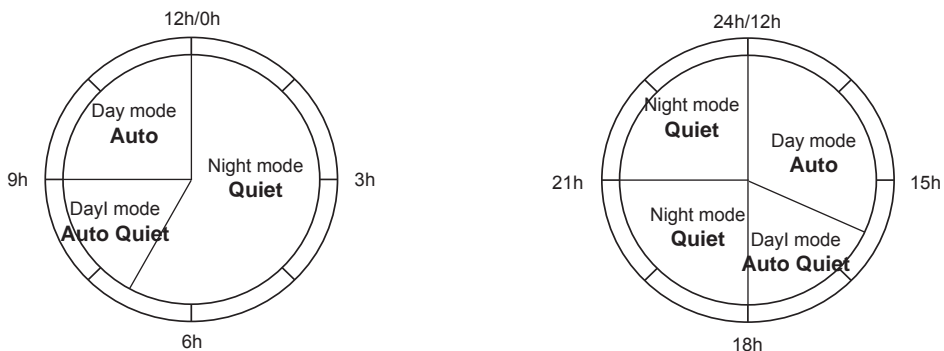


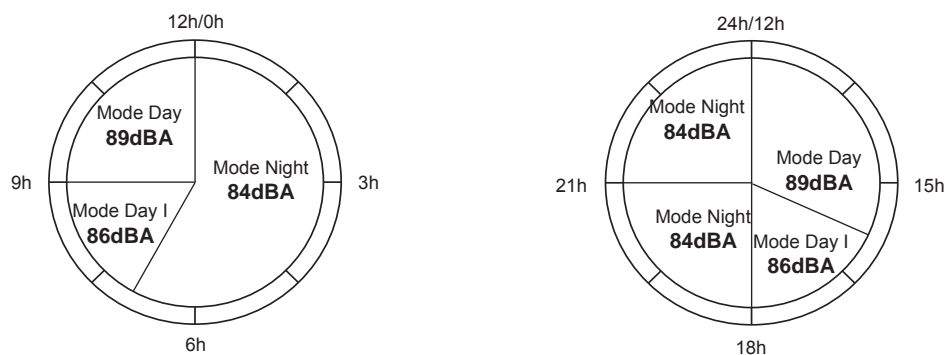
“Quiet”

This mode is similar to the “Auto Quiet” mode except that the fan speed limit or the high speed is never unlocked. In case of condensing temperature too high, the CLIMATIC™ 60 will unload a compressor to prevent from high pressure security.



The Smart Acoustic System™ can be adjusted according to the scheduling and can take different values for each schedule mode (Night, Day, Day I, Day II, BMS).





Settings

The different settings to adjust the acoustic mode are available in the menu:

(3543): Acoustic mode

(3544): Maximum sound level noise (except for fan with low / high speed)

WATER EVAPORATOR

Function

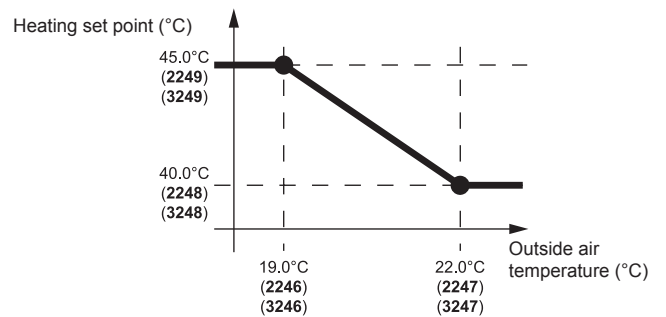
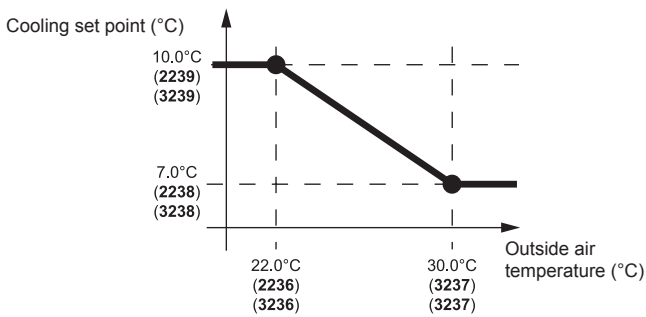
The CLIMATIC™ 60 controls the chilled or heat temperature according to the specified set point. The desired set point can be set by different solutions.

Description

The CLIMATIC™ 60 offers various possibilities to specify the water evaporator set point.

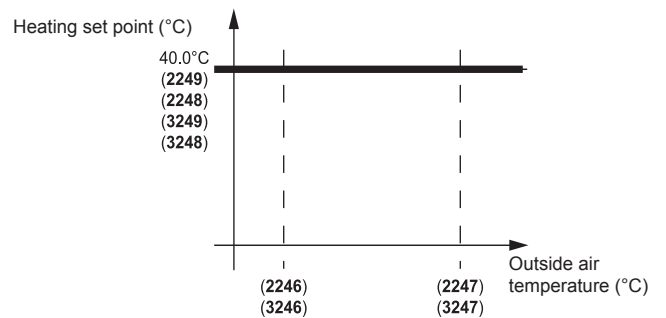
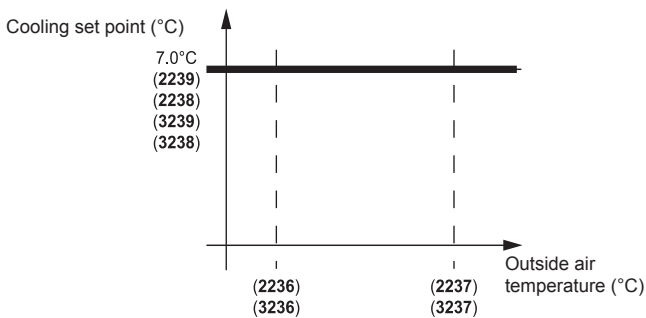
Dynamic value

The CLIMATIC™ 60 determines the appropriate water set point according to the outside temperature in order to optimise the energy consumption. This method requires to pre-define 2 different water set points corresponding to 2 outside temperatures.

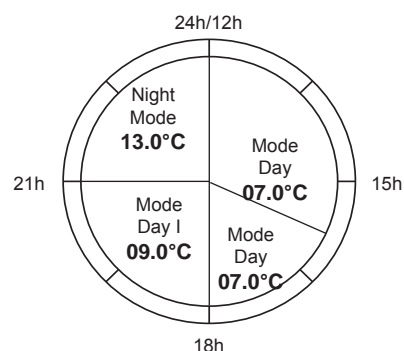
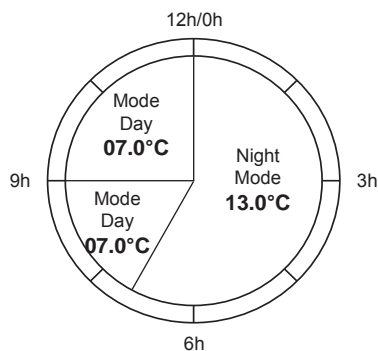


Fix value

In this case the outside temperature has no effect on the water set point and the two set points must be set at the same value.

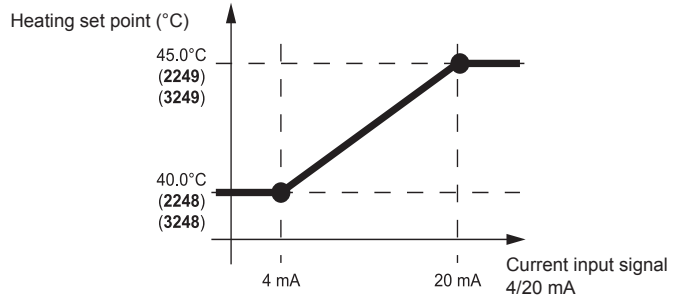
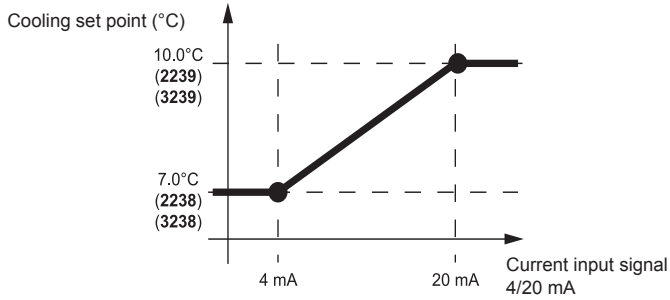


The cooling and heating set points can be pre-specified according to the scheduling and can take different mode for each schedule mode (Night, Day, Day I, Day II, and BMS)



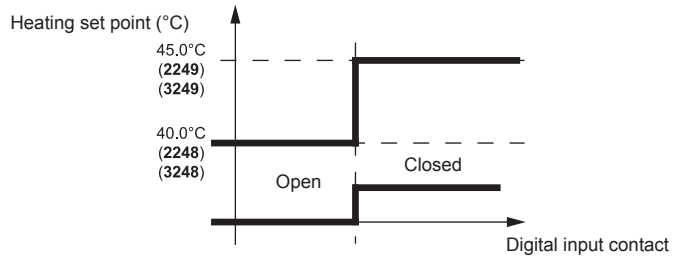
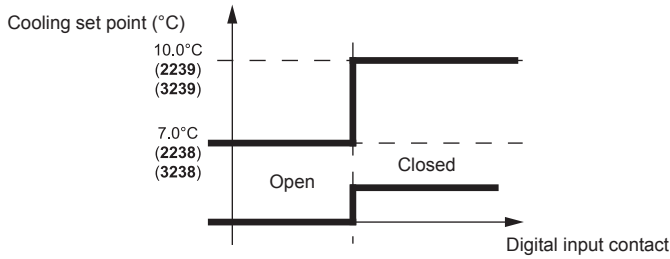
External current 4/20mA signal

In this case the actual set point is calculated according to the analog input current. Menus (2238), (2239), (2248) et (2249) defined water temperature set points according to signals 4mA and 20mA



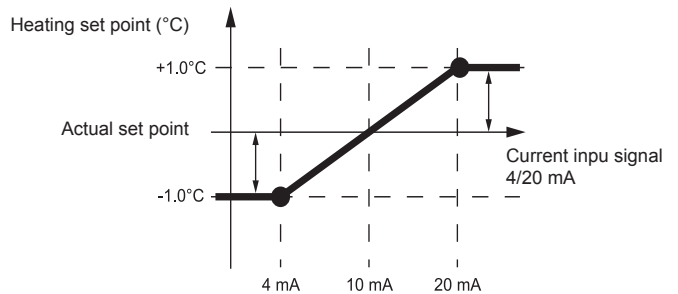
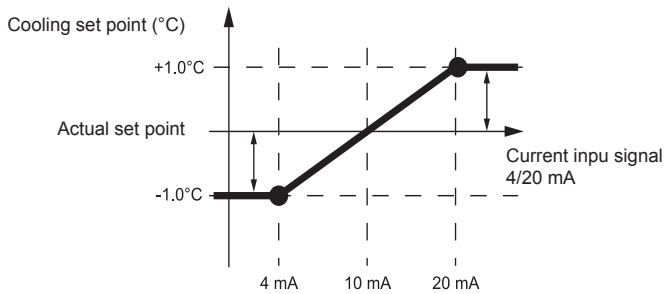
Second external set point

In this case the actual set point is specified by one of the two set points. The final set point depends on the status of the digital dry contact allocated to this function.



External current 4/20 mA offset

In this case the set point is set by one of the previous solution and can be adjusted with an offset of +/- 1.0°C.



DC60 terminal

The water set point is adjustable directly by the DC60. If the read set point is different from the one calculated by the BM60, the new set point is set by the DC60 during the actual zone. Each time the zone is changing, the DC60 set point is overwritten by the CLIMATIC™60 set point.

BMS value

The CLIMATIC™ 60 receives the water set point from the BMS. Refers to the “BMS” paragraph for more details.

Settings

The different settings to adjust the water evaporator set points are available in the menu:

Cooling mode

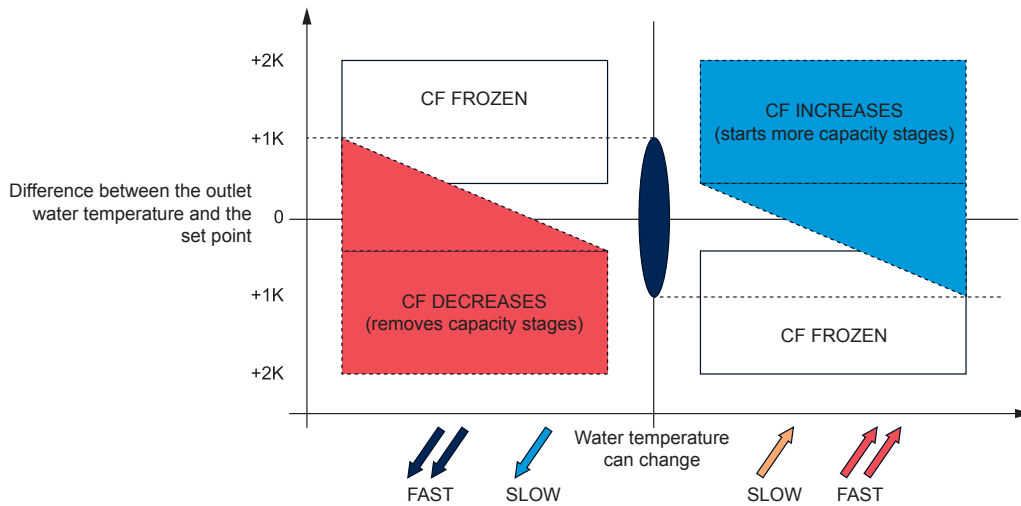
- (2236) : minimum outside air temperature corresponding to the water evaporator set point (2238) (used only for dynamic set point),
- (2237) : maximum outside air temperature corresponding to the water evaporator set point (2239) (used only for dynamic set point),
- (2238) :
 - * Dynamic set point: desired water evaporator temperature set point corresponding to outside air temperature (2236)
 - * Fix set point: desired water evaporator temperature set point.
 - * External current 4/20 mA signal: water evaporator temperature set point corresponding to a current signal of 4 mA.
 - * Second external set point: first water evaporator temperature set point corresponding to an opened dry contact.
- (2239) :
 - * Dynamic set point: desired water evaporator temperature set point corresponding to outside air temperature (2237),
 - * Fix set point: desired water evaporator temperature set point.
 - * External current 4/20 mA signal: water evaporator temperature set point corresponding to a current signal of 20 mA.
 - * Second external set point: second water evaporator temperature set point corresponding to a closed dry contact.

Heating mode

- (2246) : minimum outside air temperature corresponding to the water evaporator set point (3248) (used only for dynamic set point),
- (2247) : maximum outside air temperature corresponding to the water evaporator set point (3249) (used only for dynamic set point),
- (2248) :
 - * Dynamic set point: desired water evaporator temperature set point corresponding to outside air temperature (2246),
 - * Fix set point: desired water evaporator temperature set point.
 - * External current 4/20mA signal: water evaporator temperature set point corresponding to a current signal of 4 mA.
 - * First external set point: first water evaporator temperature set point corresponding to an opened dry contact.
- (2249) :
 - * Dynamic set point: desired water evaporator temperature set point corresponding to outside air temperature (2247),
 - * Fix set point: desired water evaporator temperature set point.
 - * External current 4/20mA signal: water evaporator temperature set point corresponding to a current signal of 20 mA.
 - * Second external set point: second water evaporator temperature set point corresponding to a closed dry contact.

Control

The CLIMATIC™ 60 adjusts and holds 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. The controller constantly calculates 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.



In order to anticipate, the reference point is recalculated each time the difference between air temperature and set point reaches a minimum or a maximum. Moreover the inlet temperature is used to limit the capacity factor to prevent from too slow reactivity of outlet capacity factor of the unit.

Example:

- Unit EAC 2104: cooling capacity: 210KW with:
 - * C1.Cp1 = 19.2%,
 - * C1.Cp2 = 30.8%,
 - * C2.Cp1 = 19.2%,
 - * C2.Cp2 = 30.8%.
- Maximum delta T° (inlet - outlet) at full load: setting (3261) = 5.0°C.
- Outlet water evaporator temperature set point: setting (3238) = (3239) = 7.0°C.

Stage	Minimum inlet temp. (°C)	Maximum capacity factor (%)	Expression	Compressor ON circuit 1	Compressor ON circuit 2
0	0	0	0		
1	8.54	30.8	$7.0 + 30.8 \cdot 5.0 / 100$		
2	10.80	61.6	$7.0 + 2 \cdot 30.8 \cdot 5.0 / 100$		
3	11.04	80.8	$7.0 + (19.2 + 2 \cdot 30.8) \cdot 5.0 / 100$		
4	12.00	100.0	$7.0 + 2 \cdot (19.2 + 30.8) \cdot 5.0 / 100$		

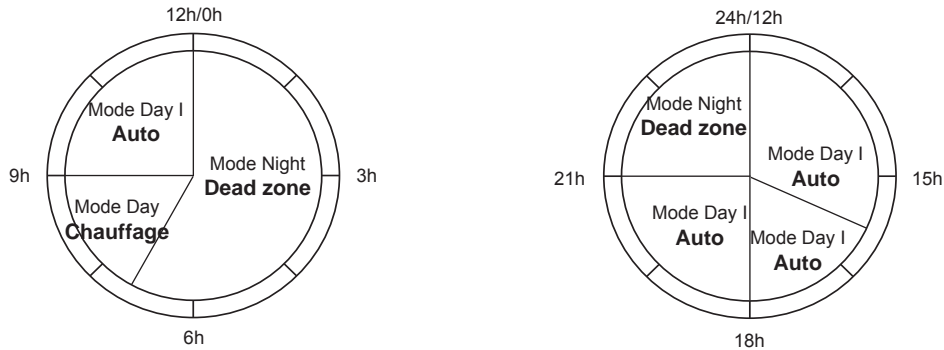
CHANGEOVER HEATING/COOLING MODE

Function

The CLIMATIC™ 60 controls the changeover mode (for reversible units only) to specify the appropriate demand on heat or chilled water production.

Description

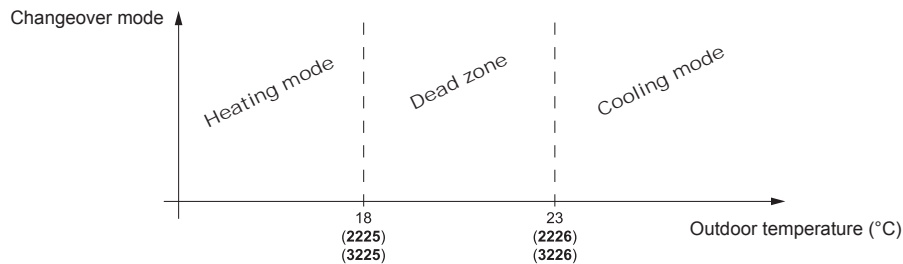
The changeover can also be pre-specified according to the scheduling and can take different mode for each schedule mode (Night, Day, Day I, Day II, BMS).



The changeover mode can be set by different solutions:

Automatically:

The CLIMATIC™ 60 determines the appropriate production of water according to the outside temperature and moves automatically the unit from cooling to heating mode and heating to cooling mode.



If the outside temperature is below the setting value (2225) or (3225), the unit will operate as a heat pump.
 If the outside temperature is over the setting value (2226) or (3226), the unit will operate as a chiller.

Manually:

The changeover mode is forced for each schedule mode. The various modes available are “Cool” mode, “Heat” mode or “Dead zone”. In this case the outside temperature has not effect on the changeover mode.

Remotely:

The changeover mode is set according to a remote dry contact connect on a free custom digital input. In this case the unit swaps in cooling or heating mode according to the status of the digital input. Please refer to the paragraph “Free Input / Output” for more details.

Terminal DC60:

The changeover mode (cool / heat) can be modified by the terminal DC60 by pressing the “mode” button.



When the “Auto” mode is selected, icon “Cool” or “Heat” or “no icon” is displayed to signal the current operating mode. Due to communication delay, after pressing the “mode” button it is advised to wait few seconds to refresh of the icon on the display. After the unit start-up, the “mode” button pressure is ignored during a few seconds.

Settings

The different settings to adjust the changeover mode are available in the menu:

- **(2224)** : changeover mode (Cool, Heat, Auto, Dead zone) for each schedule mode (Night, Day, Day I, Day II, and BMS).
- **(2225)** : minimum outside temperature to swap to heating mode. (only if **(2224)** = “Auto”).
- **(2226)** : maximum outside temperature to swap to cooling mode. (only if **(2224)** = “Auto”).

COIL DEFROST

Function

The CLIMATIC™ 60 manages defrost procedure to avoid ice on the evaporator coil in heating pump mode (winter season).

Description

To avoid the icing of the external air exchanger during winter operating, it's necessary to reverse the refrigerant cycle. There are 2 defrost mode:

- cyclic mode,
- dynamic mode (not available in the software CH060 vers.2 - rev.0.0).

The defrost procedure is activated if the following conditions are met during 1 minute:

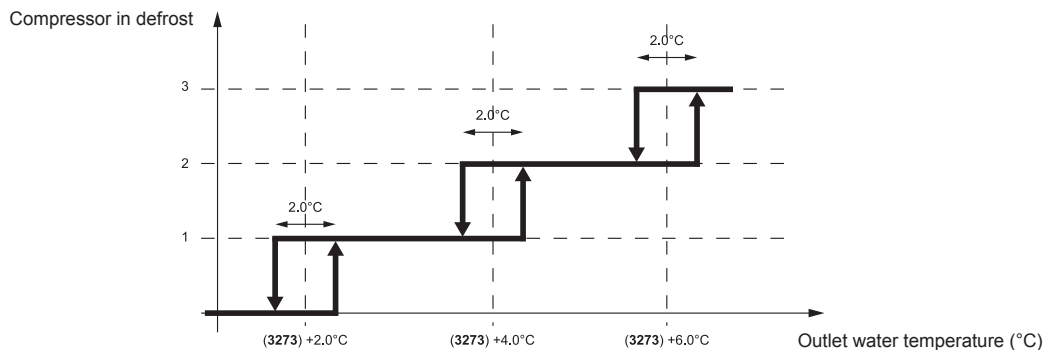
- the outside air temperature is \leq (3562),
- one of the compressor(s) on the circuit has been running for a time \geq (3564) since the last defrost,
- the saturation temperature is \leq (3563).

The defrost procedure is characterized by the following steps:

1. start electrical heater during 2 min (chiller with electrical heater only),
2. stop the compressors on the concerned circuit,
3. wait for 5 s
4. reverse the 4WV
5. start all compressors on the circuit (if the outlet T° is not too low),
6. start all condenser fans when the HP \geq 50.0°C,
7. stop all condenser fans when the HP \leq 42.0°C,
8. repeat the steps 6. to 7. 3 times
9. stop the compressors of the circuit,
10. wait for 1 min to equalise the pressure in the circuit,
11. start the fans 30s to dry the condensenser
12. end of procedure; restart the unit in heating mode.
13. reverse the reversing valve after 5 s if $\Delta P > 2$ bar.

Note

- In case of alarm on the circuit during the defrost procedure, the defrosting is cancelled.
- If the HP pressure doesn't reach 50°C after 6 min, during the step 6, the defrost procedure is cancelled.
- During the step 4 the compressor(s) could not start in order to not decrease too much the water temperature of the system.



Settings

The different settings to adjust the defrosting procedure are available in the menu:

- (3561): defrost mode (cyclic, dynamic),
- (3562): minimum of outside air temperature to enable defrost procedure,
- (3563): critical saturation temperature to enable defrost procedure
- (3564): minimum of interval time to enable defrost procedure.

FREE COOLING

Function

The freecooling option ensures to reduce the electrical consumption using the outside air temperature to produce cool water.

Description

The freecooling uses water coil with helicoids fans controled by the CLIMATIC™ 60. The freecooling has a higher priority face to the compressors. Once the freecooling capacity is over 95% for 2 min, the compressors can be engaged if necessary in order to reach the cooling set point. If the freecooling capacity decreases below 90%, the capacity factor of the compressor(s) capacity is locked to give the priority to the freecooling.

The freecooling is enabled if the following conditions are met:

- the unit is ready (On/Off, water flow, none alarm, etc..),
- the freecooling fan driver is operating (none alarm)
- outside temperature < (Inlet temperature – 3°C).

Settings

The setting to configure the freecooling option is available in the menu:

(3166): Configuration of the freecooling option.

ELECTRONIC EXPANSION VALVE

Function

The electronic expansion valve (EEV) option offers higher efficient control of the superheating temperature.

Description

The electronic expansion valve is driven by an external board (Electronic Valve Driver - EVD) which includes a PID algorithm to control the superheating. The EVD is linked to the CLIMATIC™ 60 to send data like capacity, step, pressure, temperature.

Settings

The setting to adjust superheat temperature option is available in the menu:

(2224): Superheat set point.

Note: the modification of the superheating set point is taken in account at the next startup of the circuit.

ELECTRICAL HEATER

Function

The electrical heater option is an additional heating capacity to help the heat pump to reach the set point during hard winter period.

Description

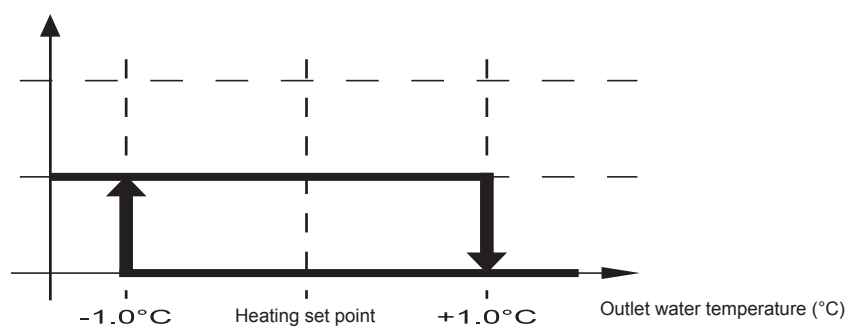
The electrical heater option has 2 uses:

Antifreeze heater

In this case, the heater is used to prevent the evaporator water from antifreeze. The heater is activated when the low alarm temperature appears in cooling mode or when the safety low temperature is reached in heating mode.

Auxiliary heater

The heater is activated when the water temperature is far from the set point and the compressor(s) are fully running. In this case, the heater is used to help the compressors to reach the heating set point.



Settings

The setting to configure the electrical heater is available in the menu:

(3165): Configuration of the electrical heater.

POWER FACTOR CORRECTOR

Function

The power factor correction is an additional capacitor bank to compensate the apparent power energy.

Description

The CLIMATIC™ 60 controls the status of the circuit breaker to inform (generate an alarm) in case of short circuit in the capacitor bank.

Settings

The setting to configure the power factor correction is available in the menu:

(3168): Configuration of the power factor correction..

PUMP EVAPORATOR MANAGEMENT

Function

The CLIMATIC™ 60 offers in option a solution to manage a single or double evaporator pump(s).

Description

In case of double pumps, the CLIMATIC™ 60 can manage various possibilities of pumps operating.

Priority to pump 1

The CLIMATIC™ 60 specifies the priority to pump 1 to start first. Pump 2 is used only as a backup pump and will start only if pump 1 is in alarm. Pump 1 is kept ON as soon as the machine is enabled.

Auto priority to pump 1

Same configuration as previous case, except that the pump will be stopped in case of dead zone changeover (winter / summer).

Priority to pump 2

The CLIMATIC™ 60 specifies the priority to pump 2 to start first. Pump 1 is used only as backup pump and will start only if pump 2 is in alarm. Pump 2 is kept ON as soon as the machine is enabled.

Auto priority to pump 2

Same configuration as previous case, except that the pump will be stopped in case of dead zone changeover (winter / summer).

No priority

The CLIMATIC™ 60 specifies automatically the priority of the pump according to the operating hour counter. The first pump to start will be the one which has the less number of hours of operation. In order to equalize the number of hours the unit is stopped every tuesday at 02 am to re-specify the priority.

Note: the total operating hour are displayed on the DC60 Advanced on 2 numbers in the menus **(2314)** and **(2315)** (pump n°1).

Example:

(2314) = 0123,

(2315) = 4567,

Total Hour = **(2314)***10000 + **(2315)** = 01234567 hours.

No auto priority

Same configuration as No priority, except that the pump will be stopped in case of dead zone changeover (winter / summer).

Settings

The different settings to adjust the pump mode are available in the menu and may be adjusted according to the mode (Night, Day, Day I, Day II, BMS):

(3341): Pump(s) rotation type

PUMP EVAPORATOR FLOW CONTROL

Function

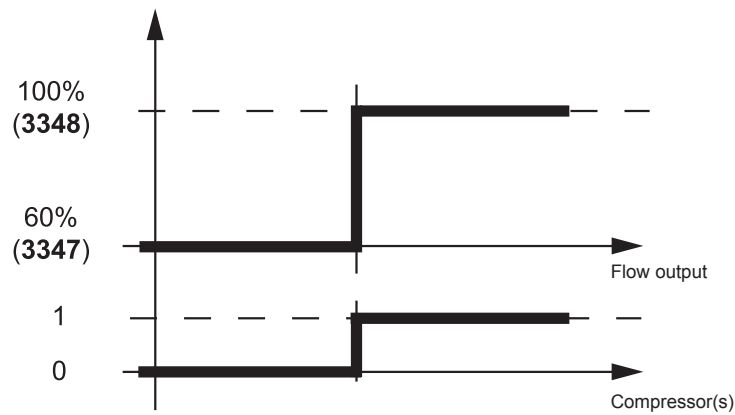
The CLIMATIC™ 60 offers the possibility to have a flow control in option.

Description

There are up to 4 modes to manage the evaporator water flow.

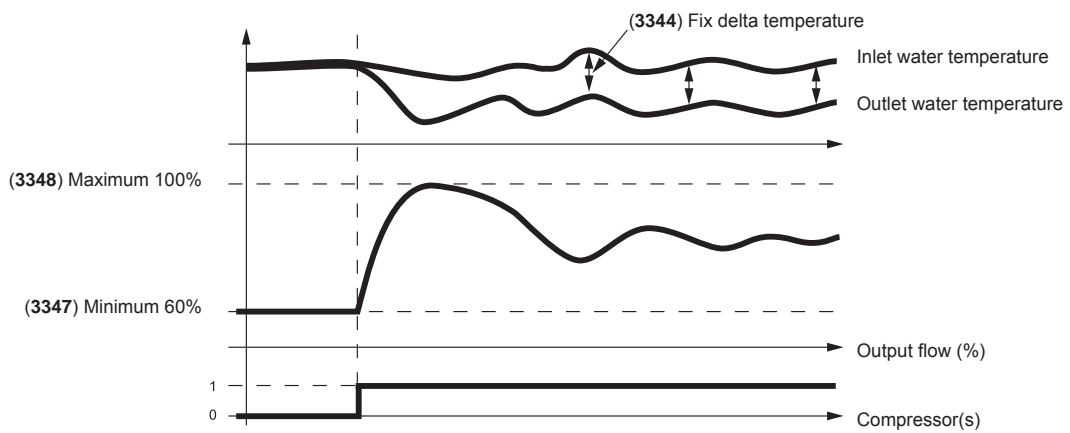
Fix speed

The CLIMATIC™ 60 maintains a fix flow according to the maximum desired speed. The flow is set to the minimum desired flow only when no compressor is running.



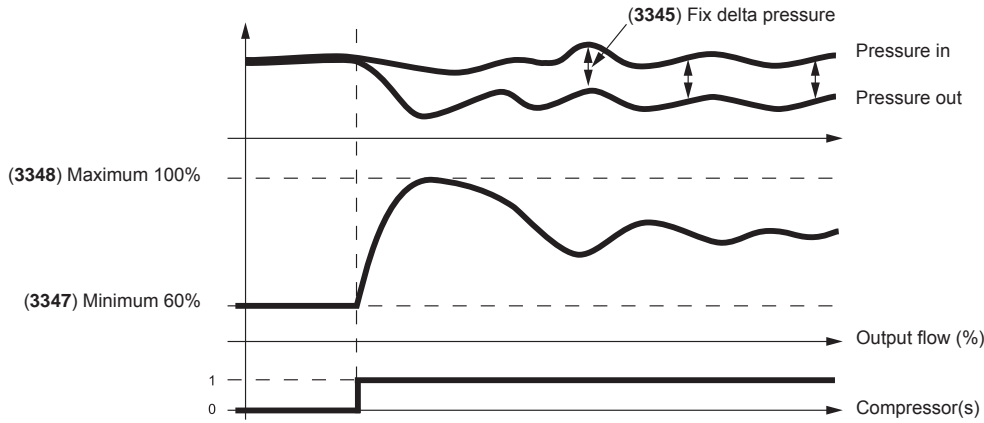
Fix delta of temperature

The CLIMATIC™ 60 maintains a fix delta of temperature according to inlet and outlet temperature probe on the evaporator. The desired delta of temperature is customized in the menu (3344).



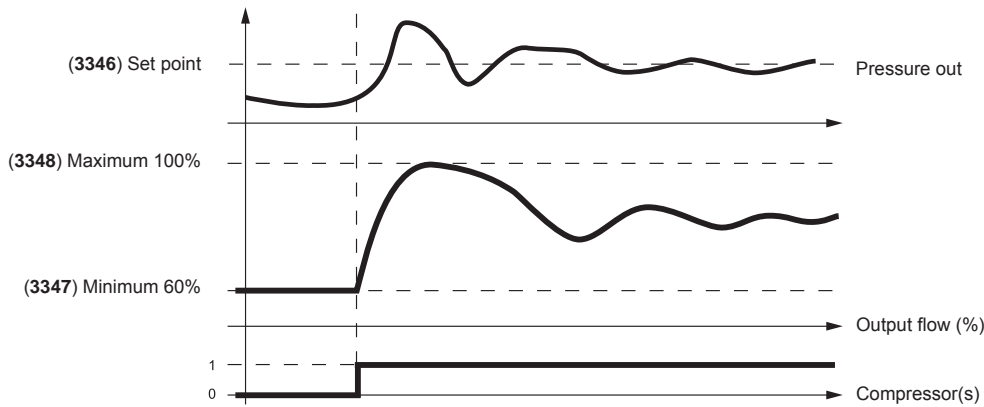
Fix delta of pressure

The CLIMATIC™ 60 maintains a fix delta of pressure according to the transducers (in and out) on the pump. The desired delta of pressure is customized in the menu (3345).



Fix output pressure

The CLIMATIC™ 60 maintains a fix output pressure according to the output transducer on the pump. The desired output pressure is customized in the menu (3346).



Settings

The different settings to adjust the flow control are available in the menu:

(3343): Type of flow control

(3344): Desired delta of temperature on the water evaporator (outlet - inlet)

(3345): Desired delta of pressure on the water pump (outlet - inlet)

(3346): Desired output pressure on the water pump (Out),

(3347): Minimum flow on the water evaporator

(3348): Maximum flow on the water evaporator

PUMP CONDENSER MANAGEMENT

Function

The CLIMATIC™ 60 offers in option a solution to manage a single or double condenser pump(s).

Description

In case of double pumps the CLIMATIC™ 60 can manage various possibilities of operating of the pumps.

Priority to pump 1

The CLIMATIC™ 60 specifies the priority to pump 1 to start first. Pump 2 is used only as backup pump and will start only if pump 1 is in alarm. Pump 1 is kept ON as soon as the unit is enabled.

Auto priority to pump 1

Same configuration as case 1, except that the pump will be stopped in case of dead zone changeover (winter / summer).

Priority to pump 2

The CLIMATIC™ 60 specifies the priority to pump 2 to start first. Pump 1 is used only as backup pump and will start only if pump 2 is in alarm. Pump 2 is kept as soon as the unit is enabled.

Auto priority to pump 2

Same configuration as case 3, except that the pump will be stopped in case of dead zone changeover (winter / summer).

No priority

The CLIMATIC™ 60 specifies automatically the priority of the pump according the operating hour counter. The first pump to start will be the one which has the less number of hours of operation. In order to equalize the number of hours the unit is stopped every tuesday at 02 am to re-specify the priority.

Note: The total operating hour are displayed on the DC60 Advanced on 2 numbers in the menus **(2344)** and **(2345)** (Pump N°1).

Example:

(2344) = 0123,

(2345) = 4567,

Total hour = **(2344)***10000 + **(2345)** = 01234567 hours.

No auto priority

Same configuration as case 5, except that the pump will be stopped in case of dead zone changeover (winter / summer).

Settings

The different settings to adjust the pump mode are available in the menu and may be adjusted according to the mode (Night, Day, Day I, Day II, BMS):

(3381): Pump(s) type of rotation

PUMP CONDENSER FLOW CONTROL

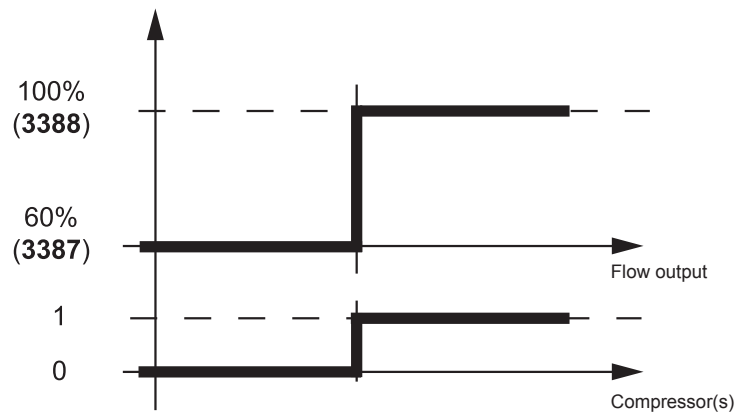
Function

The CLIMATIC™ 60 offers the possibility to have flow control in option.

Description

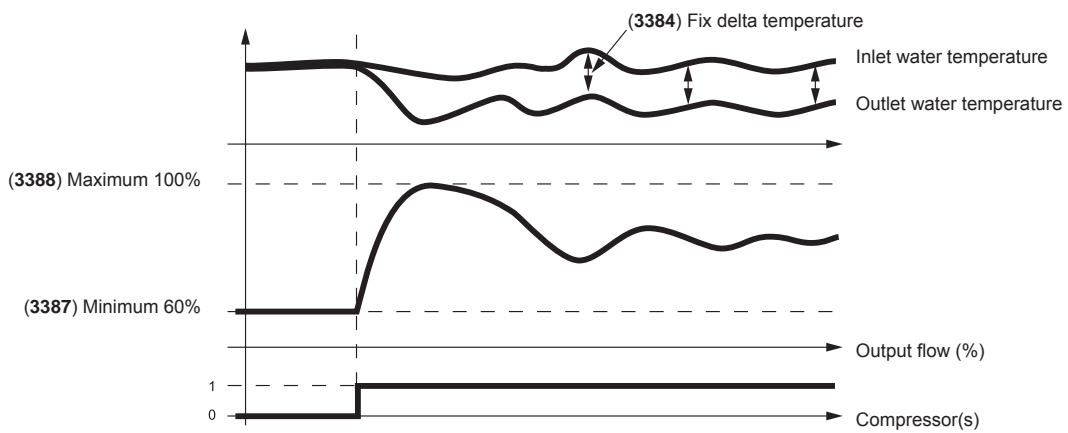
Fix flow

The CLIMATIC™ 60 maintains a fix flow according to the maximum desired speed. The flow is set to the minimum desired flow only when no compressor is running.



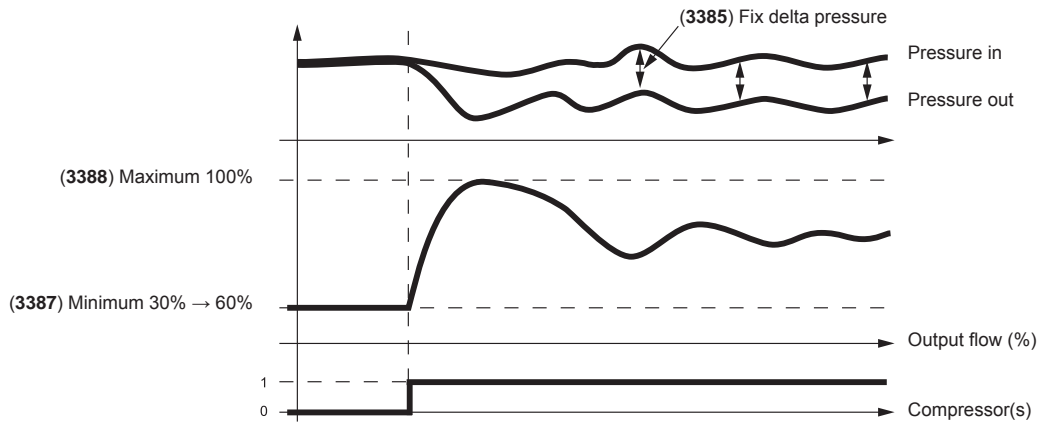
Fix delta of temperature

The CLIMATIC™ 60 maintains a fix delta of temperature according to the inlet and outlet temperature probe on the condenser. The desired delta of temperature is customized in the menu (3384).



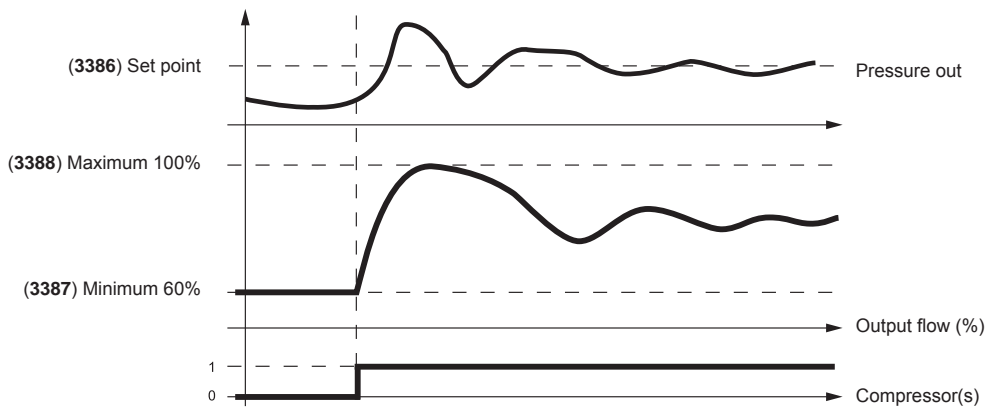
Fix delta of pressure

The CLIMATIC™ 60 maintains a fix delta of pressure according to the transducers (in and out) on the pump. The desired delta of pressure is customized in the menu (3385).



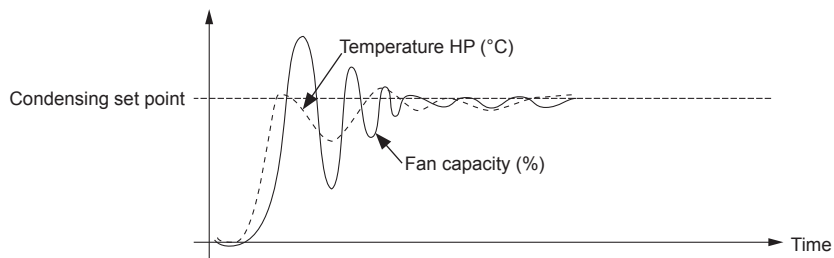
Fix output pressure

The CLIMATIC™ 60 maintains a fix output pressure according to the output transducer on the pump. The desired output pressure is customized in the menu (3386).



Fix condensing temperature

The CLIMATIC™ 60 maintains a fix condensing temperature according to the outlet probe on the condenser. The condensing set point is customized in the menu (3545) - this function is not activate in soft V2.0.0.



Settings

The different settings to adjust the flow control are available in the menu:

- (3383): Type of flow control

- (3384): Desired delta of temperature on the water condenser (outlet - inlet)

- (3385): Desired delta of pressure on the water pump (outlet - inlet)

- (3386): Desired output pressure on the water pump (outlet),

- (3387): Minimum flow on the water condenser

- (3388): Maximum flow on the water condenser

FREE INPUT/OUTPUT

Function

The CLIMATIC™ 60 has free input / output on the main board BM60 and the expansion board BE60 to offer different possibilities to customize input / output for remote control of the unit.

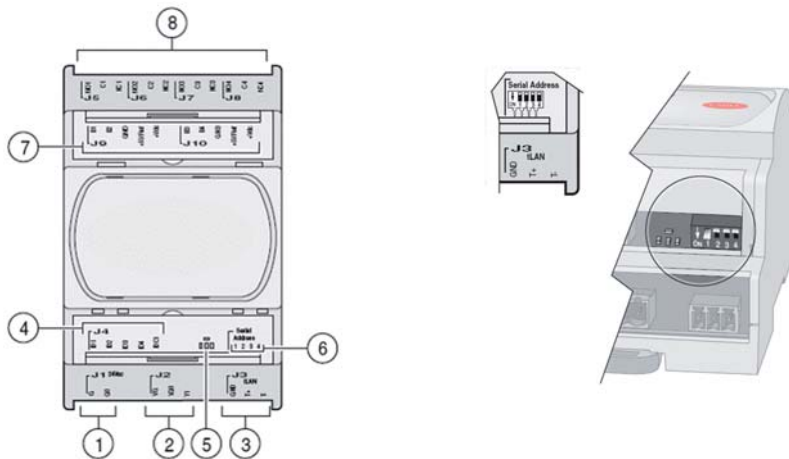
Description

The free customized input / output number is:

- 2 free input contacts (normally opened) on BM60,
- 1 free output contact (normally opened) on BM60,
- 4 free input contacts (normally opened) on BE60,
- 4 free contacts (normally opened) output on BE60,
- 4 free analog inputs on BE60.

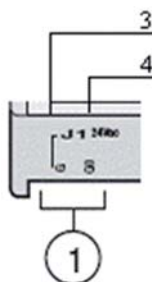
The expansion board BE60 is an additional board fixed on DIN rail. The description of the various connectors is:

1. Power supply of the board,
2. Analog output 0/10V: not used,
3. Network bus to the CLIMATIC™ 60 BM60,
4. 4 digital inputs: dry contacts only,
5. LED status of the network bus,
6. Serial address dip-switch of the network bus,
7. 4 analog inputs configurable by pair B1-B2 and B3-B4,
8. 4 digital outputs: dry contacts only.



Power supply

The expansion board BE60 is powered in 24Vac, +/-15%, 50-60Hz, Pmax=6W.

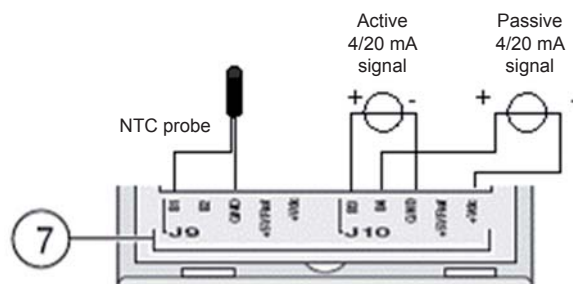


Analog input

The 4 analog inputs can be used as NTC probe (-50T90 °C; R/T 10 KΩ at 25 °C) or 4/20mA (Impedance = 100Ω) current signal. They are configurable by pair B1-B2 and B3-B4. The configuration of the type of the input is automatically set by the CLIMATIC™ 60.

The analog input can be configured to be used as one of these items:

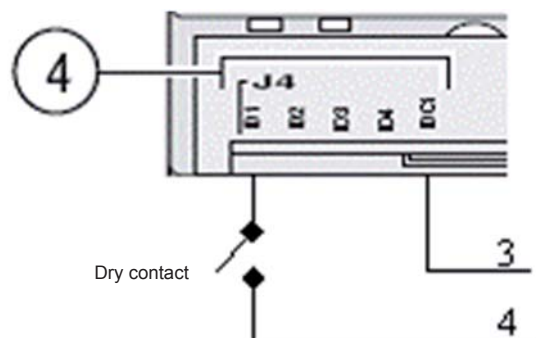
- 0. not set,
- 1. desired water set point,
- 2. desired offset set point,
- 3. free NTC probe.



Digital input

The 4 digital inputs must be used with dry contacts according to the following example. The digital input can be configured to be used as one of these items:

- 0. not set,
- 1. remote On/Off,
- 2. remote reset alarm,
- 3. swap to second water set point,
- 4. force the cooling mode,
- 5. force the heating mode,
- 6. force the dead zone mode,
- 7. force the defrost delay (10 min),
- 8. disable circuit 1 (all compressors),
- 9. disable circuit 2 (all compressors),
- 10. disable circuit 1 (compressor 1),
- 11. disable circuit 1 (compressor 2),
- 12. disable circuit 1 (compressor 3),
- 13. disable circuit 2 (compressor 1),
- 14. disable circuit 2 (compressor 2),
- 15. disable circuit 2 (compressor 3),
- 16. force Day II mode,
- 17. force Day I mode,
- 18. force Day mode,
- 19. force Night mode,
- 20. force BMS mode,
- 21. electrical heaters status,
- 22. free digital input.



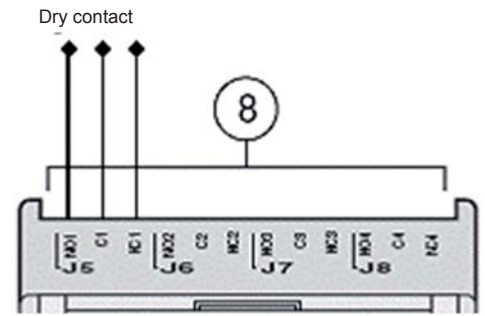
Example of remote changeover configuration

(3141) BM.Id4=Heating.
 (3224) Mode=Cooling (Night, Day, Day I, Day II, and BMS)
 When BM.Id4 is open the unit works in cooling mode, while when it's closed the unit works in heating mode.

Digital output

The 4 digital outputs are dry contacts and the maximum commutable power is 2000VA, 250Vac. The digital output can be configured to be used as one of these items:

- 0. not set,
- 1. general alarm (alarm minor),
- 2. general fault (alarm major),
- 3. general alarm on circuit 1,
- 4. general alarm on circuit 2,
- 5. general alarm on condenser,
- 6. general alarm on evaporator pump(s),
- 7. flow evaporator alarm,
- 8. unit enable,
- 9. unit available (ready to start),
- 10. unit running (one compressor ON),
- 11. unit running 100% (all compressor(s) ON),
- 12. unit operating in cooling mode,
- 13. unit operating in heating mode,
- 14. unit operating in dead zone mode,
- 15. unit operating in zone 0
- 16. unit operating in zone 1,
- 17. unit operating in zone 2,
- 18. unit operating in zone 3,
- 19. unit operating in zone 4,
- 20. unit operating in zone 5,
- 21. unit operating in zone 6,
- 22. unit operating in mode Day II,
- 23. unit operating in mode Day I,
- 24. unit operating in mode Day,
- 25. unit operating in mode Night,
- 26. unit operating in mode BMS,
- 27. output for additional electrical heater 1,
- 28. output for additional electrical heater 2,
- 29. output for additional electrical heater 3,
- 30. output for additional electrical heater 4,
- 31. Unit on Defrost operation
- 32. free digital output.



Settings

The different settings to configure the custom I/O are available in the menu:

- (3131): setting for the digital output on the connector BM60-J14-NO7,
- (3132): setting for the digital output on the connector BE60-J5-NO1,
- (3133): setting for the digital output on the connector BE60-J6-NO2,
- (3134): setting for the digital output on the connector BE60-J7-NO3,
- (3135): setting for the digital output on the connector BE60-J8-NO4.

- (3141): setting for the digital input on the connector BM60-J4-ID4,
- (3142): setting for the digital input on the connector BM60-J4-ID7,
- (3143): setting for the digital input on the connector BE60-J4-ID1,
- (3144): setting for the digital input on the connector BE60-J4-ID2,
- (3145): setting for the digital input on the connector BE60-J4-ID3,
- (3146): setting for the digital input on the connector BE60-J4-ID4.

- (3151): setting for the analog input on the connector BE60-J9-B1,
- (3152): setting for the analog input on the connector BE60-J9-B2,
- (3153): setting for the analog input on the connector BE60-J10-B3,
- (3154): setting for the analog input on the connector BE60-J10-B4.

Note: in case of communication loss between BE60 and BM60, the expansion board inputs / outputs keeps the previous status before this communication loss.

ON / OFF CONTROL

Function

There are various ways to start up the unit: manually or automatically.

Description

There are up to 4 ways to start / stop the unit with the CLIMATIC™ 60:

- The unit can be turned ON or OFF manually by the terminals DC60 Advanced or DS60 in the menu **(2111)** or DC60 .
- A remote contact can also be connected directly to the electrical box to switch the unit ON or OFF. The switch status is displayed in the menu **(2112)**.
- The startup of the unit can be configured according to a scheduling in the menu **(2113)**.
- The BMS can write directly in the general ON/OFF to start / stop the unit.

Note: the unit is considered as “ON” if only all settings **(2111)**, **(2112)**, **(2113)** are set to ON.

Settings

The different settings to start up are available in the menu:

(2111): General ON /OFF,

(2112): Remote ON /OFF,

(2113): Schedule ON /OFF.

REAL TIME CLOCK

Function

The CLIMATIC™ 60 board includes a real time clock which permits a schedule programming and alarm events recording.

Description

The clock is updated by terminal DC60 Advanced or DC60 or DS60 or BMS. Moreover, the time change is automatically updated for winter (last Sunday of October at 3h00) and summer (last Sunday of March at 2h00). This functionality can be disabled in menu **(2126)**.

To update the clock by BMS, a flag must be set to 1 before sending the new date.

Note: if the DS60 is connected, the clock can't be updated by the DC60.

Settings

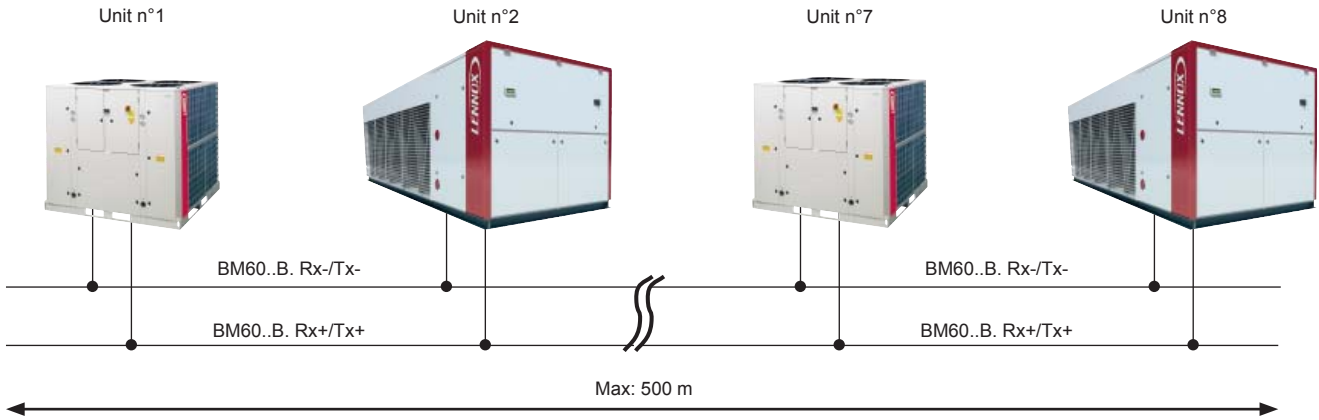
The different settings to adjust the clock are available in the menu:

(2121):	Clock hour,
(2122):	Clock minute,
(2123):	Clock day (of the month),
(2124):	Clock month,
(2125):	Clock year,
(2126):	Automatic clock update.

MASTER / SLAVE

Function

The CLIMATIC™ 60 offers possibilities to connect up to 8 units to allow relationship between each unit in order to perform the system.



The pLAN bus is connected to CLIMATIC™ 60 on the J8 connector of board BM60. A star connection is not recommended. For an optimum operation it is advised to connect a maximum of two cables per unit. The cable length should not exceed 500 m and you must use a 2 pairs with general shield like LiYCY-P (0.34 mm²).

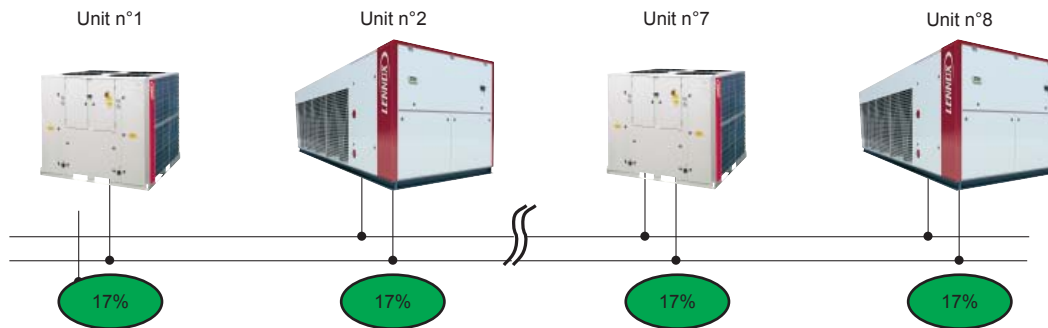
Description

There are 2 different modes to manage the units (“Cascade” & “Backup”)

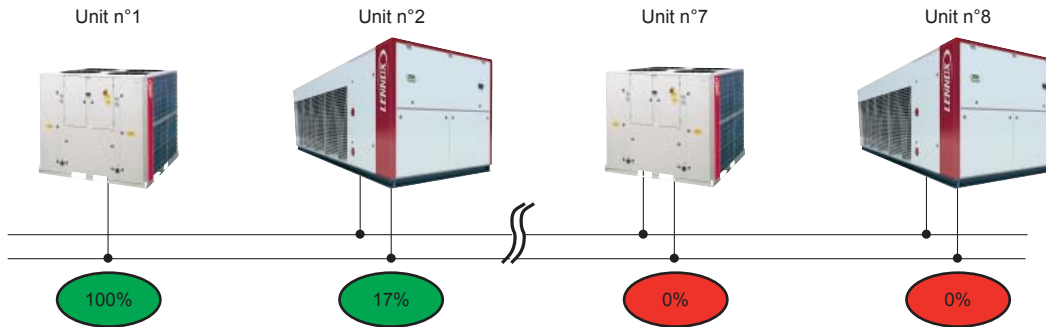
The cascade mode:

The cascade mode is used to engage additional cooling / heating capacity in order to reach the water set point. This master/slave operating includes 2 modes:

- **Twin mode:** the units work simultaneously in order to equalize the number of compressors stages to perform the capacity of the unit. The control manages only the capacity increase. The stage(s) decrease is controlled individually by each unit. The power factor capacity power is also controlled individually on each unit according to its demand. In case of evaporator pumps management, all pumps are started.

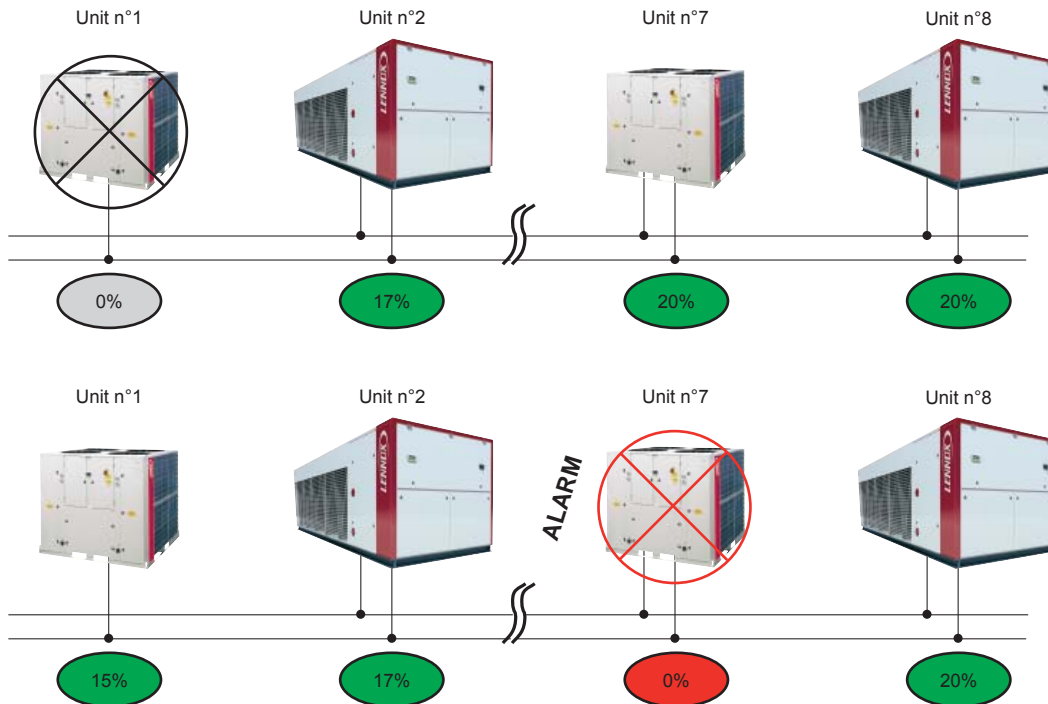


- **Chain mode:** the units starts one after the other in serial sequence. In case of evaporator pump(s) in the unit, the pump(s) is engaged according to the demand of the system.



The backup mode

Used to help the system in case of alarm(s) on the unit running. The unit in standby will start only if one of the other unit(s) running is in alarm. In this case the unit in alarm will be stopped and replace by the one which was in standby.



The CLIMATIC™ 60 manages also the rotation between the declared units . In “Cascade” mode, that means that the first unit to start will change every week. In “Rol.Backup” mode, the unit in “Backup” is swapped every week.

Example:

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 →....

The selectd unit in standby is the one which has the higher critical(s) alarm(s). In case of disconnection of the slave(s) unit(s) (@pLAN = 2 → 8) from the master unit (@pLAN = 1) on the pLAN bus, the disconnected unit will operate alone.

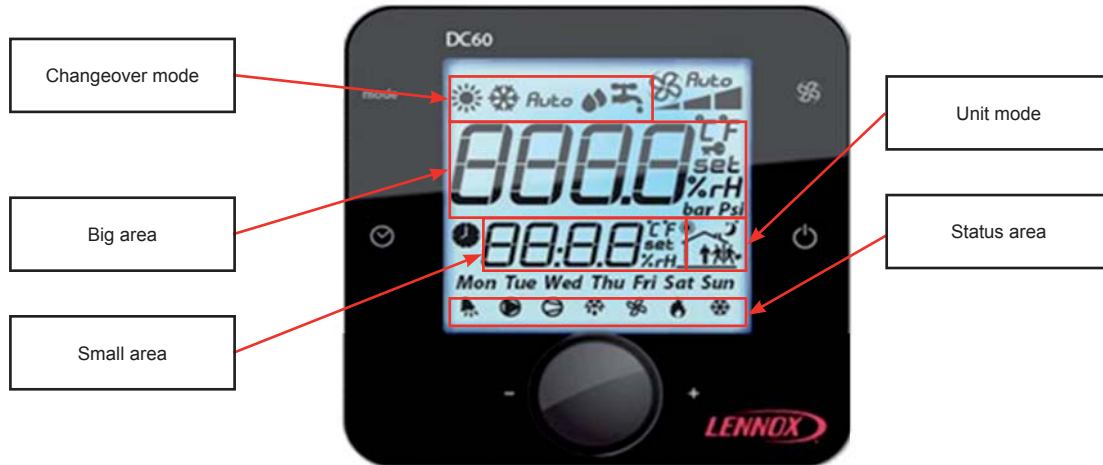
DC60 DISPLAY

Function

The DC60 display is customized for the user to show a global operating overview of the unit and allow access to some settings. In case of remote display, the cable length should not exceed 30 m.

Description

The DC60 terminal displays various status of the unit and offers the possibility to override the initial operating of the unit. Use the wheel button to display the data desired in the big area. The small area specifies the type of the data displayed.



Set point "SET":

Specify the evaporator water set point calculated by CLIMATIC™ 60. The set point can be modified directly by the DC60. Note that the selected value will automatically be overwritten by CLIMATIC™ 60 when the actual zone will change (Z0 → Z6) if a scheduling has been defined.

Unit number "UNIT":

Specify the Unit number.

Outlet temperature "OUT":

Specify the evaporator water outlet temperature.

Inlet temperature "IN"

Specify the water evaporator inlet temperature.

Outside temperature "Air"

Specify the outside air temperature.

Alarm code "AL-"

Specify the active alarm(s) code(s).

Low pressure "LP-1"

Specify the low pressure of circuit 1.

High pressure "HP-1"

Specify the high pressure of circuit 1.

Low pressure "LP-2"

Specify the low pressure of circuit 2.

High pressure "HP-2"

Specify the high pressure of circuit 2.

Schedule zone 'Sche'

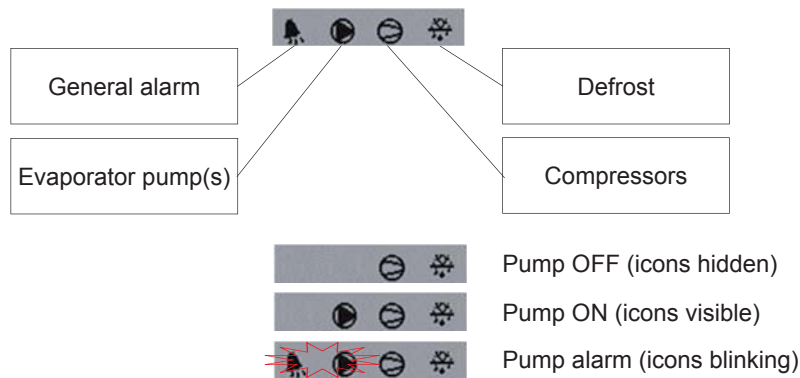
Specify the actual schedule zone.

Schedule zone

Specify the schedule operating zone.



The DC60 terminal also displays the status of the main component of the unit in the status area. The icons can take different appearance according to the status of the component.



Settings

The CLIMATIC™ 60 offers possibilities of override operations.

On/Off

When the “power” button is pressed during few seconds, the unit is ordered to start or stop. When the unit is “OFF”, the clock is displayed.

Changeover mode

The changeover mode (cool / heat) can be modified through the DC60 terminal by pressing the “mode” button.



When the “Auto” mode is selected, icon “Cool” or “Heat” or “no icon” is displayed to signal the current operating mode. Due to communication delay, after pressing the “mode” button it is advised to wait few seconds to refresh of the icon on the display. After the unit start-up, the “mode” button pressure is ignored during a few seconds.

Clock: Time setting:

- Press the “clock” button during few seconds. When the hour is blinking, turn the wheel button to select the desired hour and validate by pressing the wheel button. Once the hour is validated, repeat the procedure for the minute and the weekday.

Installation Note.

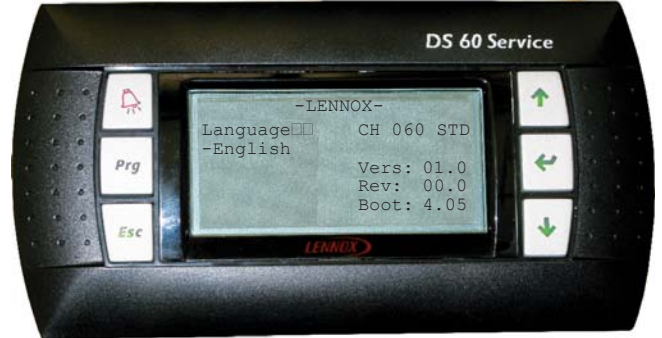
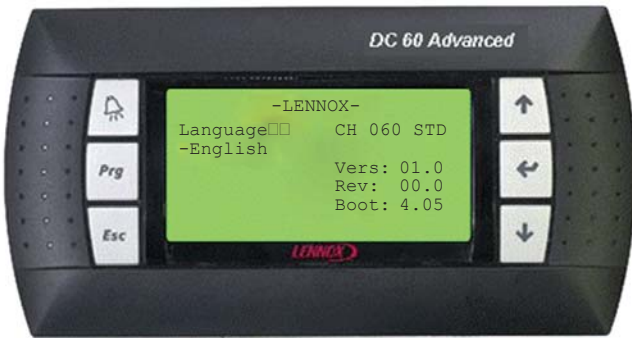
The remote display DC60 must be installed in the fieldbus and its connection must be in serial with the other Fieldbus devices (star connection are not permitted).

If the remote display DC60 is the furthest device on the Fieldbus from the unit, a 120Ω resistance must be connected between its + and – terminals (for further information, please refer to the unit electrical diagram)

"DC60 ADVANCED" DISPLAY OR "DS60 SERVICE" DISPLAY

Function

- the "DC60 Advanced" is the display mounted on the NEOSYS™ units and available as an option for the ECOLEAN™.
- the "DS60 Service" is a plug and play display designed for maintenance and expert service people who want to access to advanced functionalities.



Description

The terminal address is automatically set by the CLIMATIC™ 60 when connected. The address can yet be assigned manually to establish the communication with the CLIMATIC™ 60. The procedure to configure the DC60 Advanced / DS60 is:

- Press the buttons “↓”, “↑”, “←” keys at the same time during 5 seconds,
- Use the “←” key to move the cursor on the address number,
- Use the “↓”, “↑” keys to select the value “11 → 18” for the "DC60 Advanced" and 32 for the DS60 (or DS50) and confirm with the “←” key (the cursor go directly to the next data).



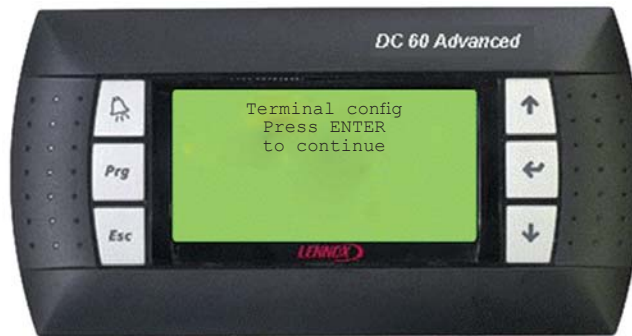
- For a DC60 Advanced" select the address according to the following table

UNIT NUMBER	DC60 ADVANCED ADDRESS
1	11
2	12
3	13
4	14
5	15
6	16
7	17
8	18

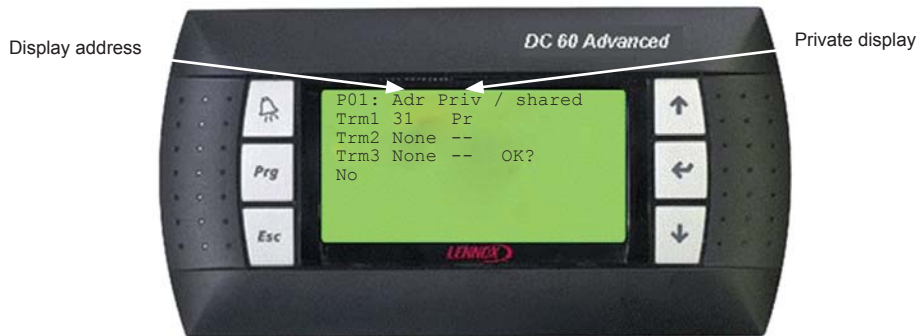
- If the address has been modified, the next screen is displayed. Otherwise restart step 1.



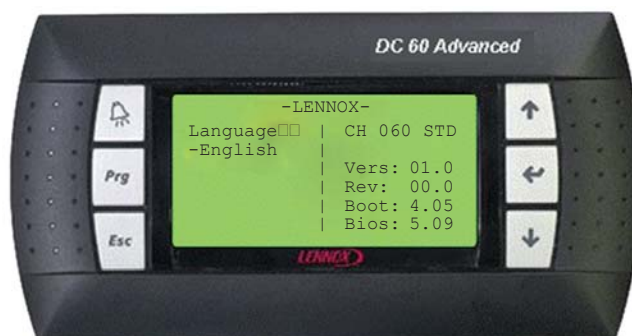
- Use the “↓”, “↑” keys to select the desired address of CLIMATIC™ 60. CLIMATIC™ 60 address must be at the address “1” except if there is several units linked. The next screen is displayed.



- Press the “←” key to go to the next step.
- The following screen describes the used connection type. Set the display as a Private “Pr” terminal. The other terminals (Trm2 and Trm3) are not used. So their addresses must be adjusted to “None”. Finally confirm the modifications, swapp the text “No” to “Yes” and validate with the “←” key.

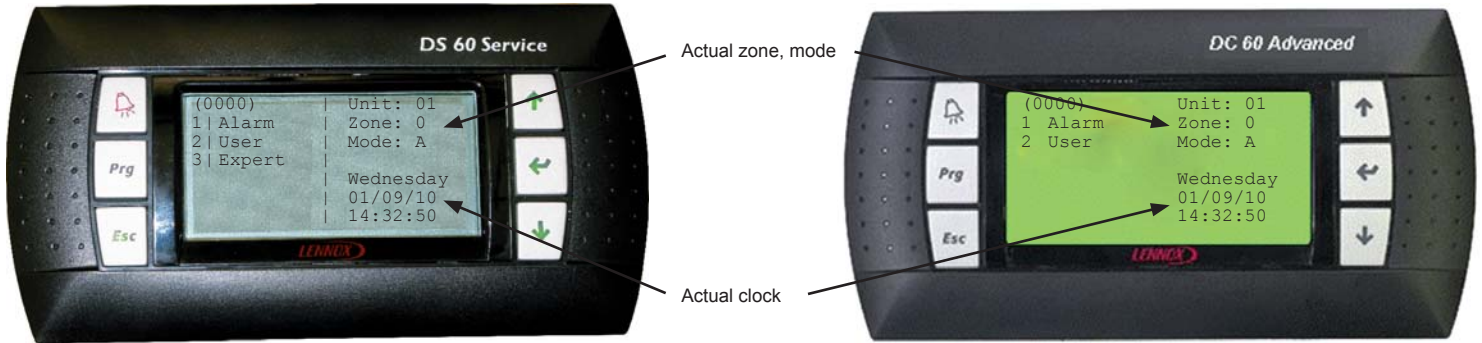


After a star up, the first screen contains the main information about the CLIMATIC™ 60's software.

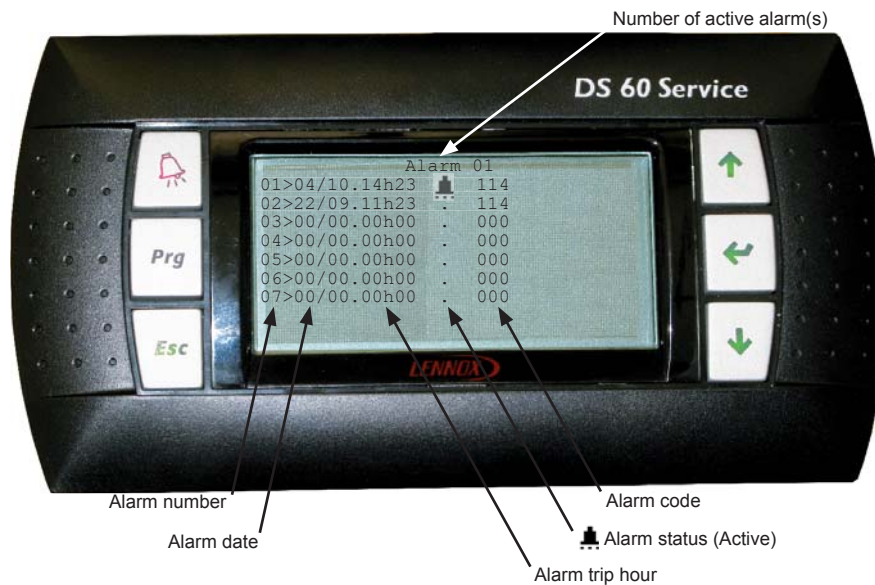


The DC60 Advanced / DS60 is organised in 3 menus:

- **(1000)**: alarms history,
- **(2000)**: user menus for maintenance people,
- **(3000)**: (Only for DS60) Expert menus for service people (restricted area).



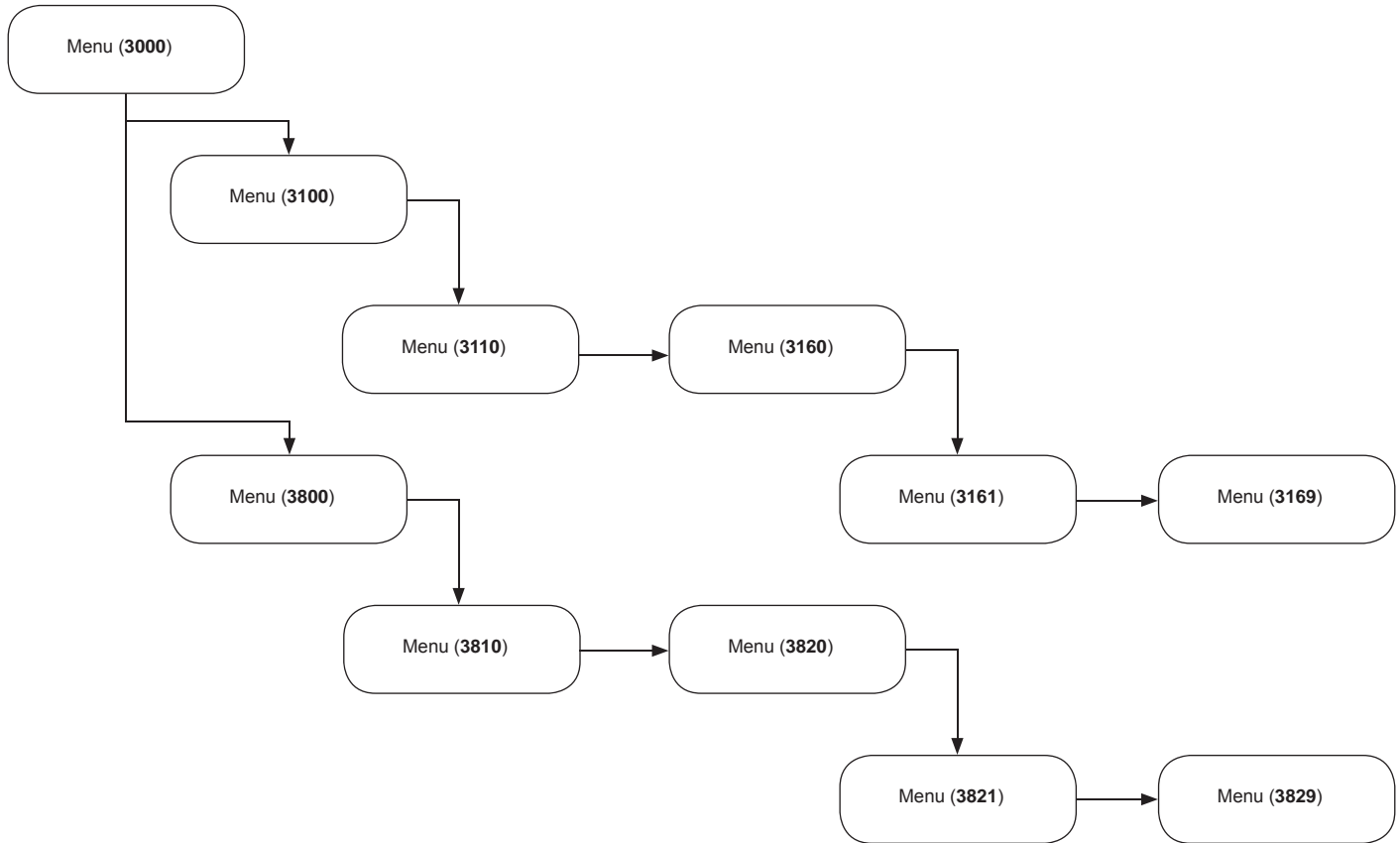
To access to alarms history, press the “ALARM” key when you are in the main menu (0000). The CLIMATIC™ 60 saves up to the last 32 alarms. An active alarm is signaled by the symbol “Alarm” whereas an alarm inactive is symbolized by the “.”
 To reset the current active alarm(s) press the “ALARM” key.



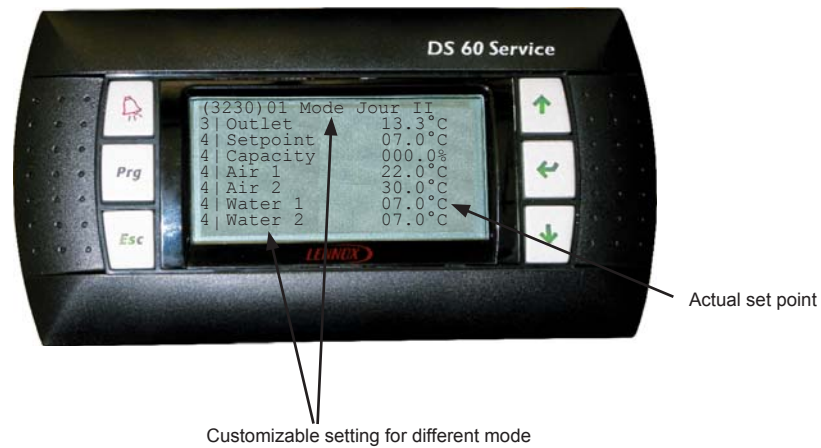
The menus are organized in an arborescence tree with submenus as per the scheme hereunder. The actual menu is identified by a 4 digit number between brackets displayed in the top left corner of the screen.

The complete menu list is detailed in the appendix at the end of the document:

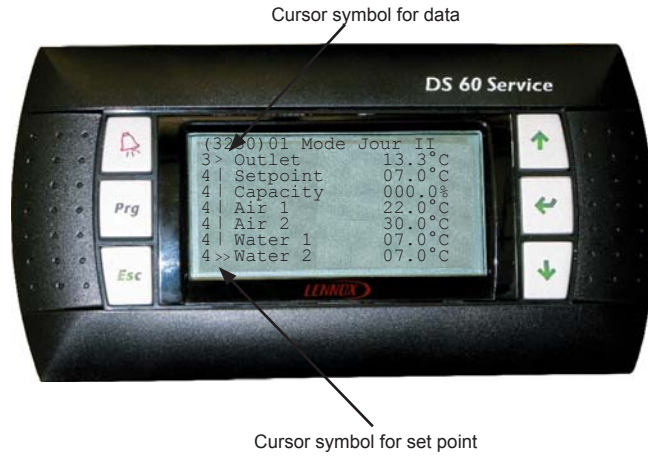
- Description of each menu
- Explanation of each menu code digit.
- Type of information in the menu - Read (R), Write (W), Possibility to write in different schedule zone (Z)
- Min / Factory / Max values



The “↓” and “↑” keys are used to move the cursor on the desired item. Then use the “←” key to enter in the selected submenu. To escape a menu use "ESC" the key.



The submenus contains 2 types of data: the read only data (like a temperature probe for example) and the read/write setpoints (like the cooling water setpoint for example). The data are identified by a cursor symbol “>” whereas the setpoint are identify by a symbol “>>”.



To modify a setting, move the cursor on the desired item and press the “←” key. A new screen displays information concerning this set point. To modify it, use the “↓” and “↑” keys and validate by pressing the “←” key. If the setting is customizable according to the schedule mode, press the “PRG” key to select different value for the Day, Day I, Day II & Night modes.



⌘: to quickly increment or decrement the setting, hold the “↓” or “↑” keys during few time.

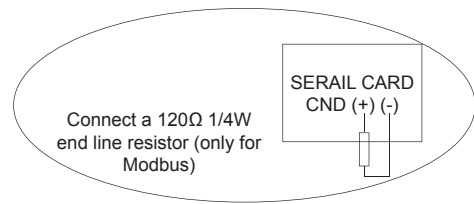
BMS

Function

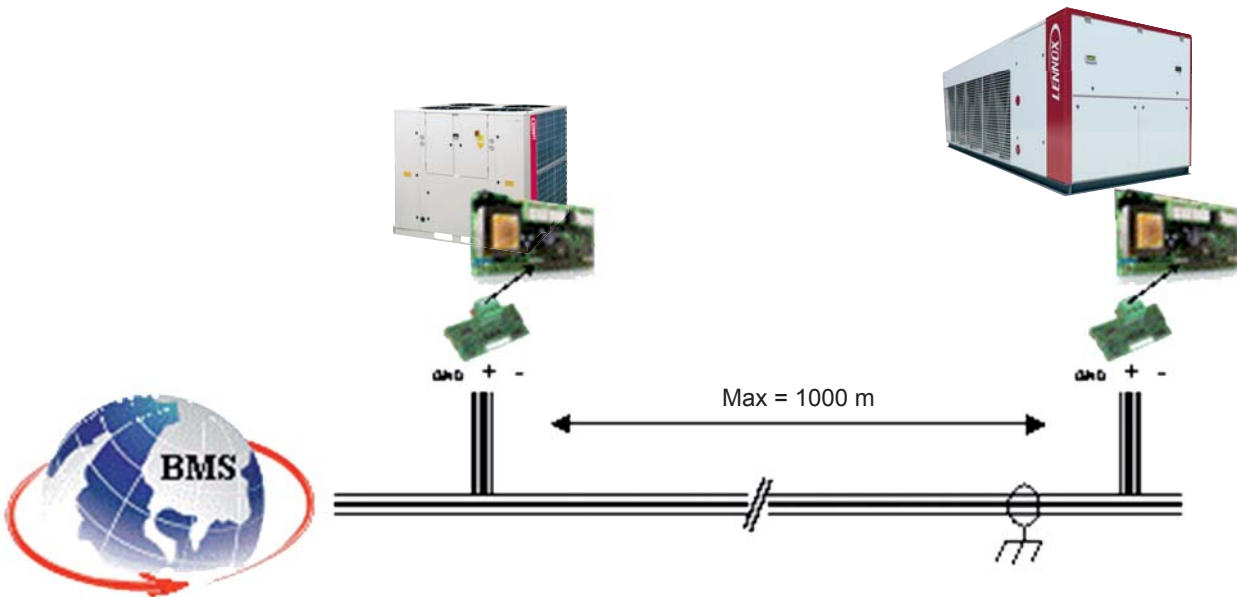
BMS (building management systems) are systems for the integrated management of all the technological functions of a building, including access control, safety, fire detection, lighting, intelligent elevators, and air-conditioning. The resulting advantages of such solutions are simpler and more efficient management of the building from a single control station, reduction in running costs, possibility of statistical analysis of all data, immediate identification and response to faults and alarms. This amply justify the little extra cost of the air-conditioning unit BMS connectable. Today not only the quality and the reliability of the instruments are important, but also the degree of external connectivity they can offer.

Description

The communication bus is connected on CLIMATIC™ 60's serial card board on the BM60. A star connection is not allowed, for an optimum operation, it is advised to connect a maximum of two cables per unit. In case of RS485 bus, a resistance of 120Ω 1/4W can be connected on the last unit between the terminals + and -.



The connection must be carried out by the following cable: length up to 1000 m: LiYCY-P (0.34 mm²), 2 pairs with general shield.



The CLIMATIC™ 60 offers different possibilities of BMS protocol:

- Modbus RTU,
- Trend,
- Bacnet,
- Lon Works.

Modbus is a serial communications protocol published by Modicon in 1979, and has become a standard communications protocol in industry. It is now the most commonly available method to connect industrial electronic devices.

Controllers communicate using a master–slave technic, in which only one device (master) can initiate transactions (called ‘queries’). The other devices (slaves) answer by supplying the requested data to the master, or by taking the action requested in the query.

LENNOX units implement Modbus slave protocol with the following settings:

Serial Line	RS485 (EIA/ TIA - 485 Standard)
Transmission Mode	RTU (Remote Terminal Unit)
Baudrate	1200→19200 Bauds
Data bits	8 bits
Parity	None
Stop bits	2 bit

Settings

The different settings to configure the BMS are available in the menu:

(3826): address of the unit (bus id)

(3827): choice of type of protocol

(3828): choice of speed of bus

(3184): watchdog counter

«Watchdog» functionality with CLIMATIC 60.

As the CLIMATIC 60 is passive on the bus, it cannot detect a communication failure with BMS; if any, the Roof-top would continue to operate with the last setting sent by the BMS before the failure whatever they were.

In order to avoid this scenario and tell regularly the CLIMATIC 60 that it is still connected to the BMS, the BMS system has to send regularly to the adress 01h a number above 0.

On its side the CLIMATIC 60 is decreasing the adress 01H value of 5 units every 5 seconds. If the adress 01H reach 0, the climatic 60 consider the communication as lost and switch to stand alone mode.

Example, the BMS is sending the value 1000 to the adress 01h, after 200s if the BMS has not sent anything else, the value will reach 0, the CLIMATIC 60 will consider the communication as lost and the unit will regulate with its own parameters.

Modbus, BACnet, Trend, Carel

Please see the different corresponding tables in the appendix 1.

LonWorks

Please see the different corresponding tables in the appendix 2.

ALARMS

CODE	DESCRIPTION
1	Water Evaporator,Flow Switch,Cut Off
2	Water Condenser, Flow Switch, Cut Off
7	Buffer Tank,Water Level,Low
8	Buffer Tank,Water Level,High
9	Unit Power Supply
10	Unit,Electrical Heater,Electrical Failure
21	Water Evaporator,Water T°,Outlet Too High
22	Water Evaporator,Water T°,Outlet Too Low
23	Water Evaporator,Water T°,Inlet Too High
24	Water Evaporator,Water T°,Inlet Too Low
25	Water Condenser,Water T°,Outlet Too High
26	Water Condenser,Water T°,Outlet Too Low
27	Water Condenser,Water T°,Inlet Too High
28	Water Condenser,Water T°,Inlet Too Low
34	Electrical Box T°,Air T°,Too High
40	Pump Evaporator,Flow Switch,Cut Off
41	Pump Evaporator,Pump N° 1,Electrical Failure
42	Pump Evaporator,Pump N° 2,Electrical Failure
43	Pump Condenser,Pump N° 1,Electrical Failure
44	Pump Condenser,Pump N° 2,Electrical Failure
45	Pump Evaporator,In Pressure ,Faulty Sensor
46	Pump Evaporator,OUT Pressure ,Faulty Sensor
47	Pump Condenser,In Pressure ,Faulty Sensor
48	Pump Condenser,OUT Pressure ,Faulty Sensor
49	Pump Evaporator,Inverter,Electrical Failure
50	Pump Condenser,Inverter,Electrical Failure
54	Freecooling Fan,Inverter circuit breaker,Electrical Failure
55	Freecooling Fan,Inverter,Electrical Failure
58	Recovery,Water Inlet T°,Faulty Probe
59	Recovery,Water Outlet T°,Faulty Probe
60	EEV driver, link failure
61	BM, Master, Failure
62	BM, Slave 2, Failure
63	BM, Slave 3, Failure
64	BM, Slave 4, Failure
65	BM, Slave 5, Failure
66	BM, Slave 6, Failure
67	BM, Slave 7, Failure
68	BM, Slave 8, Failure
69	Energy meter, link failure
70	BE.1, Communication Bus
71	BE.2, Communication Bus
72	BE.3, Communication Bus
73	Pump Evaporator,Inverter,Failure Link
74	Pump Condenser,Inverter,Failure Link
75	Circuit 1, Condenser Fan, Inverter, Communication Bus
76	Circuit 2, Condenser Fan, Inverter, Communication Bus
77	Circuit 1/2, Condenser Fan, Inverter, Communication Bus
78	Freecooling Fan,Inverter,Failure Link
79	DC Display,DC60 N°1,Failure Link
80	DC Display,DC60 N°2,Failure Link

CODE	DESCRIPTION
81	Water Evaporator,Water Inlet T°,Faulty Probe
83	Outside Temperature, Faulty Probe
85	Water Evaporator,Water Outlet T°,Faulty Probe
89	Electrical Box T°,Air T°,Faulty Probe
90	Water Freecooling,Inlet T°,Faulty Probe
97	EVD board, EEPROM failure
98	Real Time Clock, Failure
102	Circuit 1, Condenser Fan, Failure
103	Circuit 1, Condenser Fan, Inverter circuit breaker, Failure
104	Circuit 1, Condenser Fan, Inverter Failure
105	Circuit 1/2, Condenser Fan Motor,Electrical Failure
106	Circuit 1/2, Condenser Fan, Inverter circuit breaker, Failure
107	Circuit 1/2, Condenser Fan, Inverter Failure
108	Unit,Power Factor CosPhi,Electrical Failure
110	Circuit 1, Refrigerant Leak, Detected
111	Circuit 1 Compressor 1,Discharge T°,Overheating
112	Circuit 1,Discharge T° Compressor 2,Overheating
113	Circuit 1,Discharge T° Compressor 3,Overheating
114	Circuit 1, Compressor, Electrical Failure
115	Circuit 1, High Pressure, Cut Off
116	Circuit 1, Reversing Valve, Blocked
117	Circuit 1, Low Pressure, Cut Off
118	Circuit 1,Water Evaporator,Risk Of Frosting
121	Circuit 1, High Superheat
122	Circuit 1, Low Superheat
123	Circuit 1, High Subcooling
124	Circuit 1, Low Subcooling
127	Circuit 1, MOP, Maximum Operating Pressure
128	Circuit 1, LOP, Low Operating Pressure
129	Circuit 1, High Condensing Temperature
131	Circuit 1,EEV Valve,Not Closed
132	Circuit 1, Expansion Valve, Motor
141	Circuit 1, High Pressure, Faulty Sensor
142	Circuit 1, Low Pressure, Faulty Sensor
143	Circuit 1, Liquid Temperature, Faulty Probe
144	Circuit 1, Suction Temperature, Faulty Probe
145	Circuit 1,Discharge T° Compressor 1,Faulty Probe
146	Circuit 1,Discharge T° Compressor 2,Faulty Probe
147	Circuit 1,Discharge T° Compressor 3,Faulty Probe
148	Circuit 1,Water Condenser Inlet T°,Faulty Probe
149	Circuit 1,Water Condenser Outlet T°,Faulty Probe
202	Circuit 2, Condenser Fan, Failure
203	Circuit 2, Condenser Fan, Inverter circuit breaker, Failure
204	Circuit 2, Condenser Fan, Inverter Failure
210	Circuit 2, Leak Refrigerant, Detected
211	Circuit 2,Discharge T° Compressor 1, Overheating
212	Circuit 2,Discharge T° Compressor 2, Overheating
213	Circuit 2,Discharge T° Compressor 3, Overheating
214	Circuit 2, Compressor, Electrical Failure
215	Circuit 2, High Pressure, Cut Off
216	Circuit 2, Reversing Valve, Blocked

CODE	DESCRIPTION
217	Circuit 2, Low Pressure, Cut Off
218	Circuit 2,Evaporator, Risk Of Frosting
219	Circuit 2,Low Condensing T°
221	Circuit 2, High Superheat
222	Circuit 2, Low Superheat
223	Circuit 2, High Subcooling
224	Circuit 2, Low Subcooling
227	Circuit 2, MOP, Maximum Operating Pressure
228	Circuit 2, LOP, Low Operating Pressure
229	Circuit 2, High Condensing Temperature
231	Circuit 2,EEV, Valve Not Closed
232	Circuit 2, Expansion Valve, Motor
241	Circuit 2, High Pressure, Faulty Sensor
242	Circuit 2, Low Pressure, Faulty Sensor
243	Circuit 2, Liquid Temperature, Faulty Probe
244	Circuit 2, Suction Temperature, Faulty Probe
245	Circuit 2,Discharge T°, Compressor 1, Faulty Probe
246	Circuit 2,Discharge T°, Compressor 2, Faulty Probe
247	Circuit 2,Discharge T°, Compressor 3, Faulty Probe
248	Circuit 2,Water Condensing Inlet T°, Faulty Probe
249	Circuit 2,Water Condensing Outlet T°, Faulty Probe

**ALARM 001:
WATER EVAPORATOR, FLOW SWITCH CUT OFF****Description**

The flow switch has detected a low water flow rate in the evaporator heat exchanger for more than 5 seconds whereas the unit was enable.

Action

Immediate shut down of the complete unit.

Reset

Once the flow has been detected for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with the pump control wiring,
- Problem with the flow switch wiring,
- Dirty or clogged water filter,
- Wrong setting of the flow switch.

Remedies

- Check the pump(s) connections,
- Check the flow switch connections,
- Clean the water filter,
- Check the flow switch settings.

**ALARM 002:
WATER CONDENSER, FLOW SWITCH CUT OFF****Description**

The flow switch has detected a low water flow rate in the condenser heat exchanger for more than 5 seconds whereas the unit was enabling.

Action

Immediate shut down of the complete unit.

Reset

Once the flow has been detected for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with the pump control wiring,
- Problem with the flow switch wiring,
- Dirty or clogged water filter,
- Wrong setting of the flow switch,

Remedies

- Check the pump connections,
- Check the flow switch connections,
- Clean the water filter,
- Check the flow switch settings.

**ALARM 021, 022, 023, 024:
WATER EVAPORATOR, OUT OF RANGE****Description**

The water evaporator temperature (inlet or outlet) measured by the probe is outside of the permitted range for more than 5 mn. This operating range can vary according to the presence or not of glycol with the chilled water.

- Alarm 021: the outlet water temperature is higher than the safety limit setting (**3274**) in heating mode,
- Alarm 022: the outlet water temperature is lower than the safety limit setting (**3271**) in cooling mode,
- Alarm 023: the inlet water temperature is higher than the safety limit setting (**3272**) in cooling mode,
- Alarm 024: the inlet water temperature is lower than the safety limit setting (**3273**) in heating mode.

Action

Immediate shut down of the complete unit.

Reset

The alarm is automatically deleted once the temperature has reached the permitted operating range for 2 min. After a change over mode (cool / heat), these alarms are disabled during 15 min.

Possible cause(s)

- Temperature probe failed
- Problem with wiring of probe.

Remedies

- Replace probe
- Check the connections of the probe.

**ALARM 025, 026, 027, 028:
WATER CONDENSER, OUT OF RANGE****Description**

The water condenser temperature (Inlet or Outlet) measured by the probe is outside of the permitted range for more than 5mn.

- Alarm 025: the outlet water temperature is higher than the safety limit setting (**3574**) in heating mode,
- Alarm 026: the outlet water temperature is lower than the safety limit setting (**3571**) in cooling mode,
- Alarm 027: the inlet water temperature is higher than the safety limit setting (**3572**) in cooling mode,
- Alarm 028: the inlet water temperature is lower than the safety limit setting (**3573**) in heating mode.

Action

Immediate shut down of the complete unit. The alarm is signalling 5 min after if the condenser temperature is still out of range.

Reset

The alarm is automatically deleted once the temperature has reached the permitted operating range for 2 min. After a change over mode, these alarms are reset during 15 min.

Possible cause(s)

- Problem with wiring of probe,
- Temperature probe failed.

Remedies

- Check the connections of the probe,
- Replace probe.

ALARM 034: ELECTRICAL BOX, AIR TEMPERATURE TOO HIGH

Description

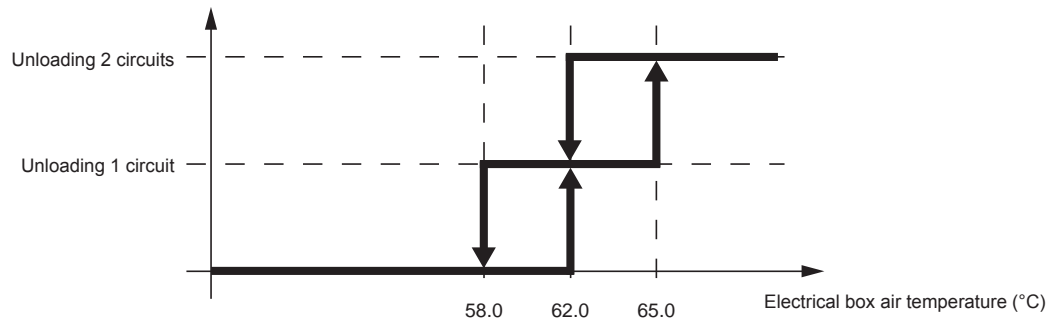
The air temperature measured by the probe placed in the electrical box is too high. This alarm is managed only on NEOSYS™ units.

Action

If the inside temperature is higher than 62.0°C for at least 5 min, one circuit is stopped.

If the inside temperature is higher than 65.0°C, for at least 5 min, the two circuits are stopped.

The alarm is signalling if one of the two limits is reached.



Reset

The trip is automatically cleared once the temperature has reached the permitted operating range for 2 min (58.0°C).

Possible cause(s)

- Temperature probe failed,
- Problem with wiring of probe,
- Inside air fan blower not operating,
- Inside air fan thermostat not operating or wrong adjusted.

Remedies

- Replace probe,
- Check the connections of the probe,
- Check the air fan blower,
- Check the air fan thermostat.

**ALARM 041, 042:
PUMP EVAPORATOR, ELECTRICAL FAILURE****Description**

The thermal magnetic circuit breaker protection of the evaporator pump 1 or 2 has tripped for 5 s, whereas the pump was in demand for at least 5 s.

- Alarm 41: thermal magnetic circuit breaker protection of the pump 1,
- Alarm 42: thermal magnetic circuit breaker protection of the pump 2.

ActionCase of single pump:

- Immediate shut down of the pump and the unit.
- The alarm is signalling.

Case of double pump:

- Immediate shut down of the current pump and the compressor(s).
- Time delay of 30 s,
- Start the second pump if possible (refers to the "PUMP EVAPORATOR MANAGEMENT" paragraph)
- The alarm is signalling.

Reset

These alarms are manually reset.

Possible cause(s)

- Problem with wiring connection,
- Circuit breaker wrong adjusted.

Remedies

- Check the pump(s) connections,
- Adjust the circuit breaker.

**ALARM 043, 044:
PUMP CONDENSER, ELECTRICAL FAILURE****Description**

The thermal magnetic circuit breaker protection of the condenser pump 1 or 2 has tripped for 5 s, whereas the pump was in demand for at least 5 s.

- Alarm 43: thermal magnetic circuit breaker protection of the pump 1,
- Alarm 44: thermal magnetic circuit breaker protection of the pump 2.

ActionCase of single pump:

- Immediate shut down of the pump and the unit.
- The alarm is signalling.

Case of double pump:

- Immediate shut down of the current pump and the compressor(s).
- Time delay of 30 s,
- Start the second pump if possible (refers to the "PUMP CONDENSER MANAGEMENT" paragraph)
- The alarm is signalling.

Reset

These alarms are manually reset.

Possible cause(s)

- Problem with wiring connection,
- Circuit breaker wrong adjusted.

Remedies

- Check the pump(s) connections,
- Adjust the circuit breaker.

**ALARM 045, 046:
PUMP EVAPORATOR, FAULTY PRESSURE SENSOR****Description**

The evaporator water pressure (in or out) measured by the sensor is outside of the permitted range. This alarm is managed only if the “evaporator variable flow” option is selected.

- Alarm 45: water evaporator pressure sensor IN faulty,
- Alarm 46: water evaporator pressure sensor OUT faulty.

Action

- Immediate shut down of the pump and the unit.
- The alarm is signalling.

Reset

Once the CLIMATIC™ 60 has read correct pressure values for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with wiring connection (sensor in short circuit or disconnected),
- Sensor damaged.

Remedies

- Check the wiring connections,
- Replace the sensor.

**ALARM 047, 048:
PUMP CONDENSER, FAULTY PRESSURE SENSOR****Description**

The water pressure of the condenser pump (in or out) measured by the sensor is outside of the permitted range. This alarm is managed only when the condenser variable flow option is selected.

- Alarm 47: water condenser pressure sensor IN faulty,
- Alarm 48: water condenser pressure sensor OUT faulty.

Action

- Immediate shut down of the pump and the unit.
- The alarm is signalling.

Reset

Once the CLIMATIC™ 60 has read correct pressure values for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with wiring connection (sensor in short circuit or disconnected),
- Sensor damaged.

Remedies

- Check the wiring connections,
- Replace the sensor.

ALARM 061, 062, 063, 064, 065, 066, 067, 068: CLIMATIC BOARD LINK, FAILURE

Description

The link between the master / slave CLIMATIC™ 60 boards is faulty.

- Alarm 61: master CLIMATIC™ 60 n°1 board disconnected,
- Alarm 62 → 68: slave CLIMATIC™ 60 board n°2 → 8 disconnected.

Action

- Swap immediately the unit in stand alone mode.
- The alarm is signalling.

Reset

Once the communication is re-established for 30 s, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with wiring connection,
- CLIMATIC™ 60 board power off,
- CLIMATIC™ 60 board damaged.

Remedies

- Check the wiring connections,
- Check the power of CLIMATIC™ 60 board,
- Replace the CLIMATIC™ 60 board.

ALARM 070: REAL TIME CLOCK BOARD, FAILURE

Description

The real time clock board of the CLIMATIC™ 60 doesn't work. The battery is out of order or wrongly placed.

Action

The alarm is signalling.

Reset

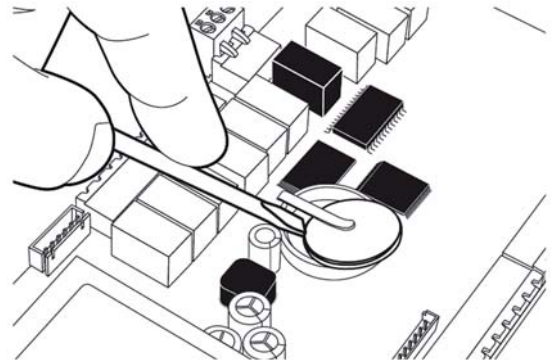
The alarm is manually reset.

Possible cause(s)

- Battery level too low,
- CLIMATIC™ 60 board damaged.

Remedies

- Replace the battery (do not dispose of the product in a municipal waste; it must be disposed of through specialist waste disposal centres),
- Replace the CLIMATIC™ 60 board.



ALARM 071, 072: EXPANSION BOARD LINK, FAILURE

Description

The link between the expansion board(s) 1 or 2 and the CLIMATIC™ 60 is disconnected.

- Alarm 71: the expansion board N°1 is disconnected from the CLIMATIC™ 60,
- Alarm 72: the expansion board N°2 is disconnected from the CLIMATIC™ 60.

Action

- Immediate shut down of the unit.
- The alarm is signalling.

Reset

Once the communication is re-established for 30 s, the alarm is automatically deleted. Up to 6 trips can occur during a day. The five first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 6th one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with wiring connection,
- Wrong expansion board address,
- Expansion board damaged.

Remedies

- Check the wiring connections,
- Check the expansion board address (refer to the "FREE INPUT / OUTPUT" paragraph),
- Replace the expansion board.

ALARM 073, 074, 075, 076, 077, 078: INVERTER LINK, FAILURE

Description

The link between the inverter and the CLIMATIC™ 60 has been disconnected for 5 s.

- Alarm 073: the evaporator pump inverter is disconnected from the CLIMATIC™ 60,
- Alarm 074: the condenser pump inverter is disconnected from the CLIMATIC™ 60,
- Alarm 075: the condenser fan inverter of circuit 1 is disconnected from the CLIMATIC™ 60,
- Alarm 076: the condenser fan inverter of circuit 2 is disconnected from the CLIMATIC™ 60,
- Alarm 077: the condenser fan inverter of circuit 1/2 is disconnected from the CLIMATIC™ 60,
- Alarm 078: the condenser fan inverter of the freecooling is disconnected from the CLIMATIC™ 60.

Action

- Alarm 073: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 074: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 075: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 076: immediate shut down of ircuit 2. The alarm is signalling,
- Alarm 077: doesn't stop circuit 1 or 2. The alarm is signalling,
- Alarm 078: doesn't stop the unit. The alarm is signalling.

Reset

Once the communication is re-established for 30 s, the alarm is automatically deleted. Up to 6 trips can occur during a day. The five first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 6th one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with wiring connection,
- Wrong inverter address,
- Inverter damaged.

Remedies

- Check the wiring connections,
- Check the inverter address,
- Replace the inverter.

ALARM 081, 083, 085, 089, 090, 141, 142, 143, 144, 145, 146, 148, 149, 241, 242, 243, 244, 245, 246, 248, 249: PROBE & SENSOR, FAULTY

Description

The temperature probe or pressure sensor measured by the CLIMATIC™ 60 or other expansion boards is incorrect. The device may be disconnected or in short circuit for 5 s.

- Alarm 081: the inlet water evaporator temperature probe value is incorrect,
- Alarm 083: the outside air temperature probe value is incorrect,
- Alarm 085: the outlet water evaporator temperature probe value is incorrect,
- Alarm 089: the inside electrical box air temperature probe value is incorrect,
- Alarm 090: the inlet freecooling water temperature probe value is incorrect,
- Alarm 141: the high pressure sensor value on circuit 1 is incorrect,
- Alarm 142: the low pressure sensor value on circuit 1 is incorrect,
- Alarm 143: the liquid temperature probe value on circuit 1 is incorrect,
- Alarm 144: the suction temperature probe value on circuit 1 is incorrect,
- Alarm 145: the discharge temperature probe value on circuit 1 – compressor 1 is incorrect,
- Alarm 146: the discharge temperature probe value on circuit 1 – compressor 2 is incorrect,
- Alarm 148: the inlet water condenser temperature probe value on circuit 1 is incorrect,
- Alarm 149: the outlet water condenser temperature probe value on circuit 1 is incorrect,
- Alarm 241: the high pressure sensor value on circuit 2 is incorrect,
- Alarm 242: the low pressure sensor value on circuit 2 is incorrect,
- Alarm 243: the liquid temperature probe value on circuit 2 is incorrect,
- Alarm 244: the suction temperature probe value on circuit 2 is incorrect,
- Alarm 245: the discharge temperature probe value on circuit 2 – compressor 1 is incorrect,
- Alarm 246: the discharge temperature probe value on circuit 2 – compressor 2 is incorrect,
- Alarm 248: the inlet water condenser temperature probe value on circuit 2 is incorrect,
- Alarm 249: the outlet water condenser temperature probe value on circuit 2 is incorrect.

Action

- Alarm 081: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 083: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 085: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 089: doesn't stop the unit. The alarm is signalling,
- Alarm 090: doesn't stop the unit. The alarm is signalling.
- Alarm 141: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 142: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 143: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 144: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 145: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 146: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 148: immediate shut down of circuits 1 and 2, only if there is one condenser for both circuits,
- Alarm 149: immediate shut down of circuits 1 and 2, only if there is one condenser for both circuits,
- Alarm 241: immediate shut down of circuit 2. The alarm is signalling,
- Alarm 242: immediate shut down of circuit 2. The alarm is signalling,
- Alarm 243: immediate shut down of circuit 2. The alarm is signalling,
- Alarm 244: immediate shut down of circuit 2. The alarm is signalling,
- Alarm 245: immediate shut down of circuit 2. The alarm is signalling,
- Alarm 246: immediate shut down of circuit 2. The alarm is signalling,
- Alarm 248: immediate shut down of circuit 2. The alarm is signalling,
- Alarm 249: immediate shut down of circuit 2. The alarm is signalling,

Reset

Once the data read is coherent for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with wiring connection,
- Probe or sensor damaged.

Remedies

- Check the wiring connections,
- Replace the probe or sensor.

**ALARM 102, 105, 202:
CONDENSER FAN, ELECTRICAL FAILURE****Description**

The thermal motor protection of the condenser fan has detected an over temperature for 5 s, while the fan motor was in demand for at least 5 s.

- Alarm 102: thermal motor protection of the condenser fan on circuit 1,
- Alarm 105: thermal motor protection of the condenser fan on circuit 1/2,
- Alarm 202: thermal motor protection of the condenser fan on circuit 2.

Action

- Alarm 102: immediate shut down of the circuit 1. The alarm is signalling,
- Alarm 104: immediate shut down of the common fans of the circuits 1 & 2. The two circuits still running with the rest of the fans available. The alarm is signalling,
- Alarm 202: immediate shut down of the circuit 2. The alarm is signalling.

Reset

Once the data read is coherent for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Wrong air flow operating,
- Problem with wiring connection,
- Fan motor damaged.

Remedies

- Check the air system,
- Check the connection,
- Replace the fan motor.

**ALARM 049, 050, 054, 055, 103, 104, 106, 107, 203, 204:
PUMP OR FAN INVERTER, FAILURE****Description**

The CLIMATIC™ 60 has detected an alarm on the pump or the fan inverter or on the inverter circuit breaker.

- Alarm 049: inverter failure of the evaporator pump,
- Alarm 050: inverter failure of the condenser pump,
- Alarm 054: inverter circuit breaker failure of the freecooling fan,
- Alarm 055: inverter failure of the freecooling fan,
- Alarm 103: inverter circuit breaker failure of the condenser fan on circuit 1,
- Alarm 104: inverter failure of the condenser fan on circuit 1,
- Alarm 106: inverter circuit breaker failure of the condenser fan on circuit 1/2,
- Alarm 107: inverter failure of the condenser fan on circuit 1/2,
- Alarm 203: inverter circuit breaker failure of the condenser fan on circuit 2.
- Alarm 204: inverter failure of the condenser fan on circuit 2.

Action

- Alarm 049: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 050: immediate shut down of the complete unit. The alarm is signalling,
- Alarm 054, 055: immediate shut down of the freecooling fan. The alarm is signalling,
- Alarm 103, 104: immediate shut down of circuit 1. The alarm is signalling,
- Alarm 106, 107: immediate shut down of circuits 1/2. The alarm is signalling,
- Alarm 203, 204: immediate shut down of circuit 2. The alarm is signalling.

Reset

The alarm is manually reset.

Possible cause(s)

- Problem with wiring connection,
- Pump or fan damaged,
- Inverter damaged.

Remedies

- Check the inverter connection,
- Replace the pump or fan,
- Replace the inverter.

**ALARM 108:
POWER FACTOR CORRECTION, ELECTRICAL FAILURE****Description**

The thermal magnetic circuit breaker protection of the capacitors (cos phi) has tripped for 5 s.

Action

The alarm is signalling.

Reset

The alarm is manually reset.

Possible cause(s)

- Problem with wiring connection,
- Circuit breaker wrongly adjusted.

Remedies

- Check the capacitor connection,
- Adjust the circuit breaker.

**ALARM 111, 112, 211, 212:
DISCHARGE TEMPERATURE COMPRESSOR, OVERHEATING****Description**

The CLIMATIC™ 60 has detected an overheating discharge temperature on the compressor.

- Alarm 111: overheating discharge temperature on circuit 1 – compressor 1,
- Alarm 112: overheating discharge temperature on circuit 1 – compressor 2,
- Alarm 211: overheating discharge temperature on circuit 2 – compressor 1,
- Alarm 212: overheating discharge temperature on circuit 2 – compressor 2.

Action

Immediate shut down of the compressor. The alarm is signalling.

Reset

Once the discharge temperature has reached a permitted operating range for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour. The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem of refrigerant capacity,
- Compressor damage.

Remedies

- Check the frigorific operating,
- Replace the compressor.

**ALARM 114, 214:
COMPRESSOR, ELECTRICAL FAILURE****Description**

The thermal magnetic circuit breaker protection or the thermal motor protection of the compressor has tripped.

- Alarm 114: thermal magnetic circuit breaker open on circuit 1,
- Alarm 214: thermal magnetic circuit breaker open on circuit 2.

Action

Immediate shut down of the complete circuit. The alarm is signalling.

Reset

The alarm is manually reset.

Possible cause(s)

- Problem with wiring connection,
- Circuit breaker wrongly adjusted,
- Compressor damage.

Remedies

- Check the wiring connection,
- Adjust the circuit breaker,
- Replace the compressor.

**ALARM 115, 215:
HIGH PRESSURE, CUT OFF****Description**

The high pressure switch has trip for 5 s while a compressor was running for 10 s.

- Alarm 115: high pressure cut off on circuit 1,
- Alarm 215: high pressure cut off on circuit 2.

Action

Immediate shut down of the complete circuit. The alarm is signalling.

Reset

Once the circuit has been stopped for 30 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with wiring connection,
- Coil condenser dirty,
- Fan condenser not operating.

Remedies

- Check the wiring connection,
- Clean the coil condenser,
- Check the fan operating.

**ALARM 116, 216:
REVERSING VALVE, BLOCKED****Description**

The CLIMATIC™ 60 hasn't measured a difference of pressure of 1 bars for 5 s, while a compressor was running for 60 s.

- Alarm 116: reversing valve blocked on circuit 1,
- Alarm 216: reversing valve blocked on circuit 2.

Action

Immediate shut down of the complete circuit. The alarm is signalling.

Reset

Once the circuit has been stopped for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem with wiring connection,
- Problem of reversing valve.
- Issue with the compressor(s) ASTP protection. the compresseur does not compress anymore

Remedies

- Check the wiring connection,
- Replace the reversing valve
- Check the good compressor operation.

**ALARM 117, 217:
LOW PRESSURE, CUT OFF****Description**

The suction temperature calculated by the LP pressure sensor is lower than the permitted threshold. The temperature has reached -27.0°C (1 minute delayed in heating mode) while a compressor was running for 30 s. The alarm is disable during 1 minute if the defrost procedure is running. In any case if the LP temperature reaches -37.0°C, the circuit is stopped immediately without time delay.

- Alarm 117: suction temperature too low on circuit 1,
- Alarm 217: suction temperature too low on circuit 2.

Action

Immediate shut down of the complete circuit. The alarm is signalling.

Reset

Once the circuit has been stopped for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem of refrigerant capacity.
- Problem with the TXV

Remedies

- Check the frigorific operating
- Replace the TXV.

**ALARM 118, 218:
WATER EVAPORATOR, RISK OF FROSTING****Description**

The suction pressure measured by the LP sensor is too low and may pose a risk for the water evaporator. These alarms are disabled if the unit has electronic expansion valve (EEV) or if the glycol rate is greater than 45%. The LP pressure has reached the limit specified in the setting (3441) for 2 minutes while a compressor was running for at least 2 minutes. This alarm is disabled during 1 minute when a compressor start or stop or during the defrost procedure.

- Alarm 118: risk of frosting the water evaporator by circuit 1,
- Alarm 218: risk of frosting the water evaporator by circuit 2.

Action

Immediate shut down of the complete circuit. The alarm is signalling.

Reset

Once the suction pressure is higher than the setting (3441) for 2 minutes, the alarm is automatically deleted. Up to 3 trips can occur during a day. The two first trips don't give the alarm alert except if the fault is not automatically reset within one hour.

The 3rd one - or the previous one if they remains for more than an hour - activates the fault alert, is saved in the alarm history and must be manually reset.

The alarm counter is reset every day at 6 am.

Possible cause(s)

- Problem of refrigerant capacity
- Problem with the expansion valve.

Remedies

- Check the frigorific operating,
- Replace the expansion valve.

**ALARM 121, 122, 221, 222:
EVAPORATOR, TEMPERATURE SUPERHEAT OUT OF RANGE****Description**

The CLIMATIC™ 60 has detected anormal superheating temperature on the circuit.

- Alarm 121: superheat temperature too high on circuit 1,
- Alarm 122: superheat temperature too low on circuit 1,
- Alarm 221: superheat temperature too high on circuit 2,
- Alarm 222: superheat temperature too low on tcircuit 2.

Action

The circuit is still running. The alarm is signalling only if a DS60 is connected.

Reset

The alarm is automatically reset.

Possible cause(s)

- Problem of refrigerant capacity
- Problem with the expansion valve.

Remedies

- Check the frigorific operating,
- Replace the expansion valve.

**ALARM 123, 124, 223, 224:
CONDENSER, TEMPERATURE SUBCOOLING OUT OF RANGE****Description**

The CLIMATIC™ 60 has detected anormal subcooling temperature on the circuit.

- Alarm 123: subcooling temperature too high on circuit 1,
- Alarm 124: subcooling temperature too low on circuit 1,
- Alarm 223: subcooling temperature too high on circuit 2,
- Alarm 224: subcooling temperature too low on circuit 2.

Action

The circuit is still running. The alarm is signalling.

Reset

The alarm is manually reset.

Possible cause(s)

- Problem of refrigerant capacity
- Problem with the expansion valve.

Remedies

- Check the frigorific operating,
- Replace the expansion valve.

**ALARM 127, 227, 327:
MAXIMUM OPERATING PRESSURE (MOP), FAULTY****ALARM 128, 228, 328:
LOW OPERATING PRESSURE (LOP), FAULTY****Description**

The suction pressure measured by the CLIMATIC™ 60 is outside a permitted range.

- Alarm n27: Max operating pressure on circuit n,
- Alarm n28: Low operating pressure on circuit n,

Action

These alarms are only reported: it had no effect on compressors.

Reset

The alarm is automatically deleted if the pressure is correct. This trip is saved in the alarm history only if the DS60 is connected or if 999 faults were activated during one day.

The daily counter is automatically reset every day at 11 am. The 999th trip is locked and must be manually reset.

Possible cause(s)

- Problem of refrigerant capacity

Remedies

- Check the frigorific system operation

**ALARM 129, 229:
CONDENSING TEMPERATURE, TOO HIGH****Description**

The condensing temperature measured by the CLIMATIC™ 60 is too high.

- Alarm 129: high condensing temperature on circuit 1,
- Alarm 229: high condensing temperature on circuit 2.

Action

Immediate shut down of one of the compressor on the circuit (the small one in uneven circuit, or the one which has the higher counter time for even circuit). The alarm is signalling.

Reset

Once the condensing temperature has been enough decrease for 2 minutes, the alarm is automatically reset.

Possible cause(s)

- Problem with wiring connection,
- Coil condenser dirty,
- Fan condenser not operating,
- Outside air temperature too high.

Remedies

- Check the wiring connection,
- Clean the coil condenser,
- Check the fan operating.

CLIMATIC™ 60

AIR COOLED CHILLER

APPENDIX

Ref : CL60-AC CHILLER_Appendix-IOM-0512-E

BMS

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APPENDIX 1

ModBus, BACnet, Trend, Carel PROTOCOLS

@ADDRESS	FORMAT	R/W	DESCRIPTION	MIN	STD	MAX
0						
1	Integer	R/W	bms, watchdog counter	0	0	32000
2	Integer	R/W	unit, general on/off, start & stop, set point	0	22,0	1
3	Integer	R/W	unit, reset alarms, set point	0	19,0	1
4	Integer	R/W	Setpoint update clock	0	20,0	1
5	Integer	R/W	clock, hour setting	0	35,0	23
6	Integer	R/W	clock, minute setting	0	15,0	60
7	Integer	R/W	clock, day setting	1	0,0	31
8	Integer	R/W	clock, month setting	1	100,0	12
9	Integer	R/W	clock, year setting	1	0,0	99
10	Integer	R/W	power meter, value for reset memory	0	100,0	1
11	Integer	R/W	Setpoint override evaporator water setpoint	0	0,0	20
12	Integer	R/W	control, bms day, set point of cooling mode	7	~	20
13	Integer	R/W	control, bms day, set point of heating mode	20	~	50
14	Integer	R/W	Setpoint override dead zone mode	0	0	1
15	Integer	R/W	Setpoint override mode BMS	0	~	1
16	Integer	R/W	Setpoint override mode Night	0	~	1
17	Integer	R/W	Setpoint disable compressor(s) circuit 1	0	~	1
18	Integer	R/W	Setpoint disable circuit 1 compressor 1	0	~	1
19	Integer	R/W	Setpoint disable circuit 1 compressor 2	0	~	1
20	Integer	R/W	Setpoint disable circuit 1 compressor 3	0	-99,9	1
21	Integer	R/W	Setpoint disable compressor(s) circuit 2	0	0,0	1
22	Integer	R/W	Setpoint disable circuit 2 compressor 1	0	-99,9	1
23	Integer	R/W	Setpoint disable circuit 2 compressor 2	0	0,0	1
24	Integer	R/W	Setpoint disable circuit 2 compressor 3	0	0	1
25	Integer	R/W	remote control, activation of bm j14 no7	0	0,0	1
26	Integer	R/W	remote control, activation of be-1 j5 no1	0	~	1
27	Integer	R/W	remote control, activation of be-1 j6 no2	0	~	1
28	Integer	R/W	remote control, activation of be-1 j7 no3	0	~	1
29	Integer	R/W	remote control, activation of be-1 j8 no4	0	~	1
30	Integer	R/W	[BMS] Emulation water evaporator T°inlet	-40	~	80
31	Integer	R/W	[BMS] Emulation water evaporator T°outlet	-40	~	80
32	Integer	R/W	[BMS] Emulation outside air T°	-40	~	80
33	Integer	R/W	[BMS] Setpoint water evaporator cool	7	~	20
34	Integer	R/W	[BMS] Setpoint water evaporator heat	20	20,5	50
35	Integer	R/W	[BMS] Setpoint changover cool / heat (1=Cooling; 2=Heating; 3=Auto; 4=DeadZone)	1	~	4
36	Integer	R/W	[D] Setpoint changover cool / heat	1	~	4
37	Integer	R/W	[D] Cooling dynamic setpoint outside air T°1	-10	~	30
38	Integer	R/W	[D] Cooling dynamic setpoint outside air T°2	-10	~	30
39	Integer	R/W	[D] Cooling dynamic setpoint water evaporator T°1	7	~	20
40	Integer	R/W	[D] Cooling dynamic setpoint water evaporator T°2	7	~	20
41	Integer	R/W	[D] Heating dynamic setpoint outside air T°1	-10	~	30
42	Integer	R/W	[D] Heating dynamic setpoint outside air T°2	-10	~	30
43	Integer	R/W	[D] Heating dynamic setpoint water evaporator T°1	20	~	50
44	Integer	R/W	[D] Heating dynamic setpoint water evaporator T°2	20	~	50
45	Integer	R/W	[BMS] Setpoint enable compressor(s) circuit 1	0	~	8
46	Integer	R/W	[BMS] Setpoint enable compressor(s) circuit 2	0	~	8
47	Integer	R/W	[D] Setpoint enable compressor(s) circuit 1	0	~	8
48	Integer	R/W	[D] Setpoint enable compressor(s) circuit 2	0	~	8
49	Integer	R/W	[BMS] Setpoint water evaporator pump(s) mode	0	~	7
50	Integer	R/W	[D] Setpoint water evaporator pump(s) mode	0	~	7
51	Integer	R/W	[BMS] Setpoint water condenser pump(s) mode	0	~	7
52	Integer	R/W	[D] Setpoint water condenser pump(s) mode	0	~	7
53	Integer	R/W	[BMS] Setpoint fan condenser mode	0	~	2
54	Integer	R/W	[D] Setpoint fan condenser mode	0	~	2
55	Integer	R/W	[BMS] Setpoint accoustic noise level	***	~	***
56	Integer	R/W	[D] Setpoint accoustic noise level	***	~	***
100	Integer	R	Rolling alarm code	0	1	32767

APPENDIX 1

ModBus, BACnet, Trend, Carel PROTOCOLS

@ADDRESS	FORMAT	R/W	DESCRIPTION	MIN	STD	MAX
101	Integer	R	Alarm code 01 Bit00: Alarm code 61, Bit01: Alarm code 62, Bit02: Alarm code 63, Bit03: Alarm code 64, Bit04: Alarm code 65, Bit05: Alarm code 66, Bit06: Alarm code 67, Bit07: Alarm code 68, Bit08: Alarm code 70, Bit09: Alarm code 71, Bit10: Alarm code 72, Bit11: Alarm code 79, Bit12: Alarm code 80, Bit13: Alarm code 60, Bit14: Alarm code 69, Bit15: Not used.	0	0	32767
102	Integer	R	Alarm code 02 Bit00: Alarm code 98, Bit01: Alarm code 97, Bit02: Alarm code 89, Bit03: Alarm code 34, Bit04: Alarm code 83, Bit05: Not used, Bit06: Not used, Bit07: Not used, Bit08: Not used, Bit09: Not used, Bit10: Not used, Bit11: Not used, Bit12: Not used, Bit13: Not used, Bit14: Not used, Bit15: Not used.	0	0	32767
103	Integer	R	Alarm code 03 Bit00: Alarm code 81, Bit01: Alarm code 85, Bit02: Alarm code 23, Bit03: Alarm code 24, Bit04: Alarm code 21, Bit05: Alarm code 22, Bit06: Alarm code 40, Bit07: Alarm code 40, Bit08: Alarm code 1, Bit09: Not used, Bit10: Not used, Bit11: Not used, Bit12: Not used, Bit13: Not used, Bit14: Not used, Bit15: Not used.	0	0	32767
104	Integer	R	Not Used	0	0	32767
105	Integer	R	Alarm code 05 Bit00: Alarm code 41, Bit01: Alarm code 42, Bit02: Alarm code 45, Bit03: Alarm code 46, Bit04: Alarm code 49, Bit05: Alarm code 73, Bit06: Not Used, Bit07: Not Used, Bit08: Alarm code 43, Bit09: Alarm code 44, Bit10: Alarm code 47, Bit11: Alarm code 48, Bit12: Alarm code 50, Bit13: Alarm code 74, Bit14: Not used, Bit15: Not used.	0	0	32767

APPENDIX 1

ModBus, BACnet, Trend, Carel PROTOCOLS

@ADDRESS	FORMAT	R/W	DESCRIPTION	MIN	STD	MAX
106	Integer	R	Alarm code 06 Bit00: Alarm code 108, Bit01: Alarm code 90, Bit02: Alarm code 54, Bit03: Alarm code 78, Bit04: Alarm code 10, Bit05: Not Used, Bit06: Not Used, Bit07: Not Used, Bit08: Not Used, Bit09: Not Used, Bit10: Not Used, Bit11: Not Used, Bit12: Not Used, Bit13: Not Used, Bit14: Not used, Bit15: Not used.	0	0	32767
107	Integer	R	Alarm code 07 Bit00: Alarm code 141, Bit01: Alarm code 142, Bit02: Alarm code 143, Bit03: Alarm code 144, Bit04: Alarm code 145, Bit05: Alarm code 146, Bit06: Alarm code 115, Bit07: Alarm code 117, Bit08: Alarm code 117, Bit09: Alarm code 118, Bit10: Alarm code 110, Bit11: Alarm code 123, Bit12: Alarm code 124, Bit13: Alarm code 121, Bit14: Alarm code 122, Bit15: Alarm code 111/112/113.	0	0	32767
108	Integer	R	Alarm code 08 Bit00: Alarm code 116, Bit01: Alarm code 114, Bit02: Alarm code 129, Bit03: Alarm code 102, Bit04: Alarm code 103, Bit05: Alarm code 104, Bit06: Alarm code 75, Bit07: Alarm code 132, Bit08: Alarm code 131, Bit09: Alarm code 117, Bit10: Alarm code 127, Bit11: Alarm general circuit 1, Bit12: Not Used, Bit13: Not Used, Bit14: Not used, Bit15: Not used.	0	0	32767
109	Integer	R	Alarm code 09 Bit00: Alarm code 241, Bit01: Alarm code 242, Bit02: Alarm code 243, Bit03: Alarm code 244, Bit04: Alarm code 245, Bit05: Alarm code 246, Bit06: Alarm code 215, Bit07: Alarm code 217, Bit08: Alarm code 217, Bit09: Alarm code 218, Bit10: Alarm code 210, Bit11: Alarm code 223, Bit12: Alarm code 224, Bit13: Alarm code 221, Bit14: Alarm code 222, Bit15: Alarm code 211/112/113.	0	0	32767

APPENDIX 1

ModBus, BACnet, Trend, Carel PROTOCOLS

@ADDRESS	FORMAT	R/W	DESCRIPTION	MIN	STD	MAX
110	Integer	R	Alarm code 10 Bit00: Alarm code 216, Bit01: Alarm code 214, Bit02: Alarm code 229, Bit03: Alarm code 202, Bit04: Alarm code 203, Bit05: Alarm code 204, Bit06: Alarm code 75, Bit07: Alarm code 232, Bit08: Alarm code 231, Bit09: Alarm code 217, Bit10: Alarm code 227, Bit11: Alarm general circuit 2, Bit12: Not Used, Bit13: Not Used, Bit14: Not used, Bit15: Not used.	0	0	32767
111	Integer	R	Alarm code 11 Bit00: Alarm code 105, Bit01: Alarm code 106, Bit02: Alarm code 107, Bit03: Alarm code 77, Bit04: Not Used, Bit05: Not Used, Bit06: Not Used, Bit07: Not Used, Bit08: Not Used, Bit09: Not Used, Bit10: Not Used, Bit11: Not Used, Bit12: Not Used, Bit13: Not Used, Bit14: Not used, Bit15: Not used.	0	0	32767
112	Integer	R	power meter, value of the active power	0	0	32767
113	Integer	R	power meter, value of the reactive power	0	0	32767
114	Integer	R	power meter, value of the power factor	0	0	32767
115	Integer	R	power meter, value (weight low) of the active energy	0	0	32767
116	Integer	R	power meter, value (weight high) of the real energy	0	0	32767
117	Integer	R	power meter, value (weight low) of the reactive energy	0	0	32767
118	Integer	R	power meter, value (weight high) of the reactive energy	0	0	32767
119	Integer	R	remote control, value of the signal, be-1 b1, temperature	-100	0	100
120	Integer	R	remote control, value of the signal, be-1 b2, temperature	-100	0	100
121	Integer	R	remote control, value of the signal, be-1 b3, temperature	-100	0	100
122	Integer	R	remote control, value of the signal, be-1 b4, temperature	-100	0	100
123	Integer	R	control, value of the outside temperature	-100	0	100
124	Integer	R	Water evaporator T°inlet	-100	0	100
125	Integer	R	Water evaporator T°outlet	-100	0	100
126	Integer	R	Water evaporator setpoint applied in cooling	-100	0	100
127	Integer	R	Water evaporator setpoint applied in heating	-100	0	100
128	Integer	R	Output alarm / fault	0	0	1
129	Integer	R	Output evaporator pump 1	0	0	1
130	Integer	R	Output evaporator pump 2	0	0	1
131	Integer	R	Output condenser pump 1	0	0	1
132	Integer	R	Output condenser pump 2	0	0	1
133	Integer	R	circuit 1 compressor 1, state	0	~	1
134	Integer	R	circuit 1 compressor 2, state	0	~	1
135	Integer	R	circuit 1 compressor 3, state	0	~	1
136	Integer	R	circuit 2 compressor 1, state	0	~	1
137	Integer	R	circuit 2 compressor 2, state	0	~	1
138	Integer	R	circuit 2 compressor 3, state	0	~	1
139	Integer	R	circuit 1, state of the reversing valve (heating mode)	0	~	1
140	Integer	R	circuit 2, state of the reversing valve (heating mode)	0	~	1
141	Integer	R	Status condenser fan circuit 1	0	~	1
142	Integer	R	Status condenser fan circuit 2	0	~	1
143	Integer	R	Output electrical heater	0	~	1
144	Integer	R	electrical heaters, state of 1st stage	0	~	1
145	Integer	R	electrical heaters, state of 2nd stage	0	~	1

APPENDIX 1

ModBus, BACnet, Trend, Carel PROTOCOLS

@ADDRESS	FORMAT	R/W	DESCRIPTION	MIN	STD	MAX
146	Integer	R	electrical heaters, state of 3rd stage	0	~	1
147	Integer	R	electrical heaters, state of 4th stage	0	~	1
148	Integer	R	remote control, state of the dry contact, bm id4	0	~	1
149	Integer	R	remote control, state of the dry contact, bm id7	0	~	1
150	Integer	R	remote control, state of the dry contact, be-1 id1	0	~	1
151	Integer	R	remote control, state of the dry contact, be-1 id2	0	~	1
152	Integer	R	remote control, state of the dry contact, be-1 id3	0	~	1
153	Integer	R	remote control, state of the dry contact, be-1 id4	0	~	1
154	Integer	R	control, state of cooling mode	0	~	1
155	Integer	R	control, state of heating mode	0	~	1
156	Integer	R	control, state of dead zone	0	~	1
157	Integer	R	unit, state of the general on/off	0,0	22,0	1,0
158	Integer	R	Status unit available	0,0	12,0	1,0
159	Integer	R	Status unit running (compressor(s) ON)	0,0	38,0	1,0
160	Integer	R	Status unit full running (100%)	0,0	26,0	1,0
161	Integer	R	Water evaporator actual flow meter	0,0	19,0	32767,0
162	Integer	R	Evaporator pump 1, count value (weight low) of operating time	0,0	-20,0	9999,0
163	Integer	R	Evaporator pump 1, count value (weight high) of operating time	0,0	26,0	9999,0
164	Integer	R	Evaporator pump 2, count value (weight low) of operating time	0,0	20,0	9999,0
165	Integer	R	Evaporator pump 2, count value (weight high) of operating time	0,0	12,0	9999,0
166	Integer	R	Condensor pump 1, count value (weight low) of operating time	0,0	-20,0	9999,0
167	Integer	R	Condensor pump 1, count value (weight high) of operating time	0,0	-20,0	9999,0
168	Integer	R	Condensor pump 2, count value (weight low) of operating time	0,0	10,0	9999,0
169	Integer	R	Condensor pump 2, count value (weight high) of operating time	0	0	9999
170	Integer	R	circuit 1 compressor 1, count value (weight low) of operating time	0	0	9999
171	Integer	R	circuit 1 compressor 1, count value (weight high) of operating time	0,0	10,0	9999,0
172	Integer	R	circuit 1 compressor 2, count value (weight low) of operating time	0	0	9999
173	Integer	R	circuit 1 compressor 2, count value (weight high) of operating time	0	0	9999
174	Integer	R	circuit 1 compressor 3, count value (weight low) of operating time	0,0	999,9	9999,0
175	Integer	R	circuit 1 compressor 3, count value (weight high) of operating time	0,0	~	9999,0
176	Integer	R	circuit 2 compressor 1, count value (weight low) of operating time	0,0	~	9999,0
177	Integer	R	circuit 2 compressor 1, count value (weight high) of operating time	0,0	~	9999,0
178	Integer	R	circuit 2 compressor 2, count value (weight low) of operating time	0,0	~	9999,0
179	Integer	R	circuit 2 compressor 2, count value (weight high) of operating time	0,0	~	9999,0
180	Integer	R	circuit 2 compressor 3, count value (weight low) of operating time	0	1	9999
181	Integer	R	circuit 2 compressor 3, count value (weight high) of operating time	0,0	~	9999,0

APPENDIX 2
LonWorks PROTOCOL

NV_Name	R/W	NV_Code	DESCRIPTION	MIN	STD	MAX
Sp_Bms_Watchdog_Time	R/W	8	bms, watchdog counter	0	0	32000
Sp_Unit_OnOff	R/W	8	unit, general on/off, start & stop, set point	0	0	1
Sp_Unit_Alarm_Reset	R/W	8	unit, reset alarms, set point	0	0	1
Sp_Power_Meter_Cnt_Clr	R/W	8	power meter, value for reset memory	0	0	1
Sp_Bms_Water_Sp	R/W	105	Setpoint override evaporator water setpoint	7,0	7,0	20
Sp_Bms_ChangeOver_Cool	R/W	8	control, bms day, set point of cooling mode	0,0	7,0	1
Sp_Bms_ChangeOver_Heat	R/W	8	control, bms day, set point of heating mode	0,0	45,0	1
Sp_Bms_ChangeOver_Dead_Zone	R/W	8	Setpoint override dead zone mode	0,0	0,0	1
Sp_Bms_Schedule_Mode_Bms	R/W	8	Setpoint override mode BMS	0,0	0,0	1
Sp_Bms_Schedule_Mode_D	R/W	8	Setpoint override mode Night	0	0	1
Sp_Evap_Water_Cool_Bms_1	R/W	105	[BMS] Setpoint water evaporator cool	7,0	0,0	20
Sp_Evap_Water_Heat_Bms_1	R/W	105	[BMS] Setpoint water evaporator heat	20,0	0,0	50
Sp_Cond_Fan_Acoustic_Mode_BMS	R/W	8	[BMS] Setpoint fan condenser mode	0,0	0,0	2
Sp_Cond_Fan_Acoustic_Mode_MD	R/W	8	[D] Setpoint fan condenser mode	0,0	0,0	2
Sp_Cond_Fan_Acoustic_Noise_BMS	R/W	8	[BMS] Setpoint accoustic noise level	***	0,0	***
Sp_Cond_Fan_Acoustic_Noise_MD	R/W	8	[D] Setpoint accoustic noise level	***	0,0	***
Alm_Rol_Code	R	8	Rolling alarm code	0,0	0,0	32767
BMS_Alarm_Code_01	R	8	Alarm code 01 Bit00: Alarm code 61, Bit01: Alarm code 62, Bit02: Alarm code 63, Bit03: Alarm code 64, Bit04: Alarm code 65, Bit05: Alarm code 66, Bit06: Alarm code 67, Bit07: Alarm code 68, Bit08: Alarm code 70, Bit09: Alarm code 71, Bit10: Alarm code 72, Bit11: Alarm code 79, Bit12: Alarm code 80, Bit13: Alarm code 60, Bit14: Alarm code 69, Bit15: Not used.	0,0	0,0	32767
BMS_Alarm_Code_02	R	8	Alarm code 02 Bit00: Alarm code 98, Bit01: Alarm code 97, Bit02: Alarm code 89, Bit03: Alarm code 34, Bit04: Alarm code 83, Bit05: Not used, Bit06: Not used, Bit07: Not used, Bit08: Not used, Bit09: Not used, Bit10: Not used, Bit11: Not used, Bit12: Not used, Bit13: Not used, Bit14: Not used, Bit15: Not used.	0,0	0,0	32767
BMS_Alarm_Code_03	R	8	Alarm code 03 Bit00: Alarm code 81, Bit01: Alarm code 85, Bit02: Alarm code 23, Bit03: Alarm code 24, Bit04: Alarm code 21, Bit05: Alarm code 22, Bit06: Alarm code 40, Bit07: Alarm code 40, Bit08: Alarm code 1, Bit09: Not used, Bit10: Not used, Bit11: Not used, Bit12: Not used, Bit13: Not used, Bit14: Not used, Bit15: Not used.	0,0	0,0	32767
BMS_Alarm_Code_04	R	8	Not Used	0	0	32767

APPENDIX 2
LonWorks PROTOCOL

NV_Name	R/W	NV_Code	DESCRIPTION	MIN	STD	MAX
BMS_Alarm_Code_05	R	8	Alarm code 05 Bit00: Alarm code 41, Bit01: Alarm code 42, Bit02: Alarm code 45, Bit03: Alarm code 46, Bit04: Alarm code 49, Bit05: Alarm code 73, Bit06: Not Used, Bit07: Not Used, Bit08: Alarm code 43, Bit09: Alarm code 44, Bit10: Alarm code 47, Bit11: Alarm code 48, Bit12: Alarm code 50, Bit13: Alarm code 74, Bit14: Not used, Bit15: Not used.	0	0	32767
BMS_Alarm_Code_06	R	8	Alarm code 06 Bit00: Alarm code 108, Bit01: Alarm code 90, Bit02: Alarm code 54, Bit03: Alarm code 78, Bit04: Alarm code 10, Bit05: Not Used, Bit06: Not Used, Bit07: Not Used, Bit08: Not Used, Bit09: Not Used, Bit10: Not Used, Bit11: Not Used, Bit12: Not Used, Bit13: Not Used, Bit14: Not used, Bit15: Not used.	0	0	32767
BMS_Alarm_Code_07	R	8	Alarm code 07 Bit00: Alarm code 141, Bit01: Alarm code 142, Bit02: Alarm code 143, Bit03: Alarm code 144, Bit04: Alarm code 145, Bit05: Alarm code 146, Bit06: Alarm code 115, Bit07: Alarm code 117, Bit08: Alarm code 117, Bit09: Alarm code 118, Bit10: Alarm code 110, Bit11: Alarm code 123, Bit12: Alarm code 124, Bit13: Alarm code 121, Bit14: Alarm code 122, Bit15: Alarm code 111/112/113.	0,0	0,0	32767
BMS_Alarm_Code_08	R	8	Alarm code 08 Bit00: Alarm code 116, Bit01: Alarm code 114, Bit02: Alarm code 129, Bit03: Alarm code 102, Bit04: Alarm code 103, Bit05: Alarm code 104, Bit06: Alarm code 75, Bit07: Alarm code 132, Bit08: Alarm code 131, Bit09: Alarm code 117, Bit10: Alarm code 127, Bit11: Alarm general circuit 1, Bit12: Not Used, Bit13: Not Used, Bit14: Not used, Bit15: Not used.	0	0	32767
BMS_Alarm_Code_09	R	8	Alarm code 09 Bit00: Alarm code 241, Bit01: Alarm code 242, Bit02: Alarm code 243, Bit03: Alarm code 244, Bit04: Alarm code 245, Bit05: Alarm code 246, Bit06: Alarm code 215, Bit07: Alarm code 217, Bit08: Alarm code 217, Bit09: Alarm code 218, Bit10: Alarm code 210, Bit11: Alarm code 223, Bit12: Alarm code 224, Bit13: Alarm code 221, Bit14: Alarm code 222, Bit15: Alarm code 211/112/113.	0	0	32767

APPENDIX 2
LonWorks PROTOCOL

NV_Name	R/W	NV_Code	DESCRIPTION	MIN	STD	MAX
BMS_Alarm_Code_10	R	8	Alarm code 10 Bit00: Alarm code 216, Bit01: Alarm code 214, Bit02: Alarm code 229, Bit03: Alarm code 202, Bit04: Alarm code 203, Bit05: Alarm code 204, Bit06: Alarm code 75, Bit07: Alarm code 232, Bit08: Alarm code 231, Bit09: Alarm code 217, Bit10: Alarm code 227, Bit11: Alarm general circuit 2, Bit12: Not Used, Bit13: Not Used, Bit14: Not used, Bit15: Not used.	0	0	32767
BMS_Alarm_Code_11	R	8	Alarm code 11 Bit00: Alarm code 105, Bit01: Alarm code 106, Bit02: Alarm code 107, Bit03: Alarm code 77, Bit04: Not Used, Bit05: Not Used, Bit06: Not Used, Bit07: Not Used, Bit08: Not Used, Bit09: Not Used, Bit10: Not Used, Bit11: Not Used, Bit12: Not Used, Bit13: Not Used, Bit14: Not used, Bit15: Not used.	0	0	32767
PMC_Power_P	R	8	power meter, value of the active power	0	0	32767
PMC_Power_Q	R	8	power meter, value of the reactive power	0	0	32767
PMC_Power_FP	R	8	power meter, value of the power factor	0	0	32767
PMC_Energy_P_L	R	8	power meter, value (weight low) of the active energy	0	0	32767
PMC_Energy_P_H	R	8	power meter, value (weight high) of the real energy	0,0	0,0	32767
PMC_Energy_Q_L	R	8	power meter, value (weight low) of the reactive energy	0,0	0,0	32767
PMC_Energy_Q_H	R	8	power meter, value (weight high) of the reactive energy	0,0	0,0	32767
Air_T_Outside	R	105	control, value of the outside temperature	-99,9	0,0	100
Evap_T_Inlet	R	105	Water evaporator T ^{inlet}	-99,9	0,0	100
Evap_T_Outlet	R	105	Water evaporator T ^{outlet}	-99,9	0,0	100
Evap_T_Water_Sp_Cool	R	105	Water evaporator setpoint applied in cooling	7,0	0,0	20
Evap_T_Water_Sp_Heat	R	105	Water evaporator setpoint applied in heating	20,0	0,0	50

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
1111	alarm historic	Alarm	***	***	Historical				
2111	general on/off, start & stop unit, set point	User	Unit	General	On/Off	R/W	0 *		1
2112	start & stop unit, state of customized dry contact				On/Off iD	R	0 *		1
2113	schedule on/off				On/Off Mode	R/W/Z	0	1	1
2114	reset alarms, state of customized dry contact				Reset Alarm	R/W	0	0	1
2115	electrical box temperature				Box T β	R	-50 *		105
2116	general status of the unit				Status	R	List	*	*
2121	hour clock setting	User	Unit	Clock	Hour	R/W	0 *		23
2122	minute clock setting				Minute	R/W	0 *		59
2123	day clock setting				Day	R/W	1 *		31
2124	month clock setting				Month	R/W	1 *		12
2125	year clock setting				Year	R/W	1 *		99
2126	automatic change of summer/winter hour				Win/Sum	R/W	0	1	1
2131	setting of the number of zone	User	Unit	Schedule	Nbr Zone	R/W	1	3	6
2132	setting of the number of mode				Nbr Mode	R/W	1	1	4
2133	actual day of the week				Weekday	R	1 *		7
2134	actual day of the month				Day	R	1 *		31
2135	actual year				Year	R	1 *		99
2136	actual hour				Hour	R	0 *		23
2137	actual minute				Minute	R	1 *		59
2138	Actual Zone				Zone	R	0 *		6
2139	Actual Mode				Mode	R	1 *		5
2141	start time for zone 0, always 00h00	User	Unit	Schedule Time	Time Z0	R/W	0	24	24
2142	start time for zone 1, set point				Time Z1	R/W	0	24	24
2143	start time for zone 2, set point				Time Z2	R/W	0	24	24
2144	start time for zone 3, set point				Time Z3	R/W	0	24	24
2145	start time for zone 4, set point				Time Z4	R/W	0	24	24
2146	start time for zone 5, set point				Time Z5	R/W	0	24	24
2147	start time for zone 6, set point				Time Z6	R/W	0	24	24
2151	mode for zone 0, set point	User	Unit	Schedule Mode	Mode Z0	R/W	1	1	5
2152	mode for zone 1, set point				Mode Z1	R/W	1	1	5
2153	mode for zone 2, set point				Mode Z2	R/W	1	1	5
2154	mode for zone 3, set point				Mode Z3	R/W	1	1	5
2155	mode for zone 4, set point				Mode Z4	R/W	1	1	5
2156	mode for zone 5, set point				Mode Z5	R/W	1	1	5
2157	mode for zone 6, set point				Mode Z6	R/W	1	1	5
2161	outside air temperature threshold to activate function	User	Unit	Anticipation	Onset	R/W	-10	10	20
2162	gradient (slope)				Slope	R/W	0	0	100
2171	state of the relay, bm n7	User	Unit	Cust. Relay	Bm-N7	R			
2172	state of the relay, be-1 n1				Be.1-N1	R			
2173	state of the relay, be-1 n2				Be.1-N2	R			
2174	state of the relay, be-1 n3				Be.1-N3	R			
2175	state of the relay, be-1 n4				Be.1-N4	R			
2181	state of the dry contact, bm id4	User	Unit	Cust. Switch	Bm-iD4	R			
2182	state of the dry contact, bm id7				Bm-iD7	R			
2183	state of the dry contact, be-1 id1				Be.1-iD1	R			
2184	state of the dry contact, be-1 id2				Be.1-iD2	R			
2185	state of the dry contact, be-1 id3				Be.1-iD3	R			
2186	state of the dry contact, be-1 id4				Be.1-iD4	R			

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max	
2191	value of the signal, be-1 b1	User	Unit	Cust. Signal	Be.1-B1	R				
2192	value of the signal, be-1 b2				Be.1-B2	R				
2193	value of the signal, be-1 b3				Be.1-B3	R				
2194	value of the signal, be-1 b4				Be.1-B4	R				
2211	evaporator inlet probe temperature	User	Water	General	Inlet	R	-50 *		105	
2212	evaporator inlet reference temperature				Inlet Ref.	R	-50 *		105	
2213	evaporator outlet probe temperature				Outlet	R	-50 *		105	
2214	evaporator outlet reference temperature				Outlet Ref.	R	-50 *		105	
2215	evaporator delta temperature (inlet-outlet)				Delta T β	R	0 *		105	
2216	evaporator set point				Setpoint	R	-10 *		50	
2217	evaporator capacity				Capacity	R	0 *		100	
2218	evaporator flow switch				Flow	R	0 *		1	
2221	changeover status	User	Water	Changeover	Status	R	* *	* *		
2222	outside air probe temperature				Outside	R	-50 *		105	
2223	outside air reference temperature				Outside Ref.	R	-50 *		105	
2224	changeover mode				Mode	R/W	0	0	4	
2225	winter air temperature to swap in heating mode				Air T β Winter	R/W	-10	18	30	
2226	summer air temperature to swap in cooling mode				Air T β Summer	R/W	19	23	30	
2231	evaporator status	User	Water	Cooling	Status	R	* *	* *		
2232	evaporator inlet reference temperature				Inlet	R	-50 *		105	
2233	evaporator outlet reference temperature				Outlet	R	-50 *		105	
2234	evaporator set point				Setpoint	R	-10 *		50	
2235	evaporator cooling capacity				Capacity	R	0 *		100	
2236	outside air set point x1 in cool				Air Slope 1	R/W/Z	-11	22	50	
2237	outside air set point x2 in cool				Air Slope 2	R/W/Z	-11	30	50	
2238	evaporator set point y1 in cool				Water 1	R/W/Z	19	7	20	
2239	evaporator set point y2 in cool	Water 2	R/W/Z	19	7	20				
2241	evaporator status	User	Water	Heating	Status	R	* *	* *		
2242	evaporator inlet reference temperature				Inlet	R	-50 *		105	
2243	evaporator outlet reference temperature				Outlet	R	-50 *		105	
2244	evaporator set point				Setpoint	R	-10 *		50	
2245	evaporator cooling capacity				Capacity	R	0 *		100	
2246	outside air set point x1 in heat				Air Slope 1	R/W/Z	-11	22	50	
2247	outside air set point x2 in heat				Air Slope 2	R/W/Z	-11	30	50	
2248	evaporator set point y1 in heat				Water 1	R/W/Z	40	45	50	
2249	evaporator set point y2 in heat	Water 2	R/W/Z	40	45	50				
2251	external evaporator set point	User	Water	Custom	Sp 4/20mA	R	4 *		20	
2252	external offset evaporator set point				Sp +/-1 β C	R	-1 *		1	
2253	second set point switch status				Sp N β 2	R	0 *		1	
2311	states of management	User	Pump	Evaporator P1	Status	R	List	* *		
2312	evaporator pump 1 input				State iD	R	0 *		1	
2313	state of the relay				Relay	R	0 *		1	
2314	count value of operating time (msb)				Hour H	R	0 *		9999	
2315	count value of operating time (lsb)				Hour L	R	0 *		9999	
2316	evaporator flow switch				Flow	R	0 *		1	

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2321	states of management	User	Pump	Evaporator P2	Status	R	List	*	*
2322	evaporator pump 2 input				State iD	R	0	*	1
2323	state of the relay				Relay	R	0	*	1
2324	count value of operating time (msb)				Hour H	R	0	*	9999
2325	count value of operating time (lsb)				Hour L	R	0	*	9999
2326	calculated value of air flow or evaporator flow switch				Flow	R	0	*	1
2331	evaporator inlet temperature	User	Pump	Evaporator Flow	T.Inlet	R	-50	*	105
2332	evaporator outlet temperature				T.Outlet	R	-50	*	105
2333	evaporator pressure in				P.Inlet	R	0	*	6
2334	evaporator pressure out				P.Out	R	0	*	6
2335	evaporator delta temperature				Delta dT	R	0	*	20
2336	evaporator delta pressure				Delta dP	R	0	*	6
2337	evaporator flow capacity				Capacity	R	0	*	100
2338	evaporator flow meter				Flow	R	0	*	100
2339	evaporator flow switch				Flow	R	0	*	1
2341	states of management				User	Pump	Condenser P1	Status	R
2342	state of the auxiliary contact	State iD	R	0				*	1
2343	state of the relay	Relay	R	0				*	1
2344	count value of operating time (msb)	Hour H	R	0				*	9999
2345	count value of operating time (lsb)	Hour L	R	0				*	9999
2346	condenser flow switch	Flow	R	0				*	100
2351	states of management	User	Pump	Condenser P2	Status	R	List	*	*
2352	state of the auxiliary contact				State iD	R	0	*	1
2353	state of the relay				Relay	R	0	*	1
2354	count value of operating time (msb)				Hour H	R	0	*	9999
2355	count value of operating time (lsb)				Hour L	R	0	*	9999
2356	condenser flow switch				Flow	R	0	*	100
2361	condenser temperature inlet	User	Pump	Condenser Flow	T.Inlet	R	-50	*	105
2362	condenser temperature outlet				T.Outlet	R	-50	*	105
2363	condenser pressure inlet				P.Inlet	R	0	*	6
2364	condenser pressure outlet				P.Out	R	0	*	6
2365	condenser delta temperature				Delta dT	R	0	*	105
2366	condenser delta pressure				Delta dP	R	0	*	6
2367	condenser flow capacity				Capacity	R	0	*	100
2368	condenser flow meter				Flow	R	0	*	100
2369	condenser flow switch				Flow	R	0	*	1
2411	value of the condensing pressure				User	Compressor	Circuit 1	P.HP	R
2412	value of the condensing temperature	T.HP	R	-50				*	105
2413	value of the liquid temperature	Liquid	R	-50				*	105
2414	value of the evaporating pressure	P.LP	R	-50				*	105
2415	value of the evaporating temperature	T.LP	R	-50				*	105
2416	value of the suction temperature	T.Suction	R	-50				*	105
2417	discharge temperature 1	Discharge 1	R	-50				*	150
2418	discharge temperature 2	Discharge 2	R	-50				*	150

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2421	state of configuration	User	Compressor	Circ.1 Comp.1	Config.	R	*	*	*
2422	states of management				Status	R	List	*	*
2423	state of the auxiliary contact				State iD	R	0	*	1
2424	state of the relay				Relay	R	0	*	1
2425	count value of operating time (msb)				Time H	R	0	*	9999
2426	count value of operating time (lsb)				Time L	R	0	*	9999
2427	start counter high (msb) example : 456				Start H	R	0	*	9999
2428	start counter low (lsb) example 123				Start L	R	0	*	9999
2431	state of configuration	User	Compressor	Circ.1 Comp.2	Config.	R	*	*	*
2432	states of management				Status	R	List	*	*
2433	state of the auxiliary contact				State iD	R	0	*	1
2434	state of the relay				Relay	R	0	*	1
2435	count value of operating time (msb)				Time H	R	0	*	9999
2436	count value of operating time (lsb)				Time L	R	0	*	9999
2437	start counter high (msb) example : 456				Start H	R	0	*	9999
2438	start counter low (lsb) example 123				Start L	R	0	*	9999
2441	state of configuration	User	Compressor	Circ.1 Comp.3	Config.	R	*	*	*
2442	states of management				Status	R	List	*	*
2443	state of the auxiliary contact				State iD	R	0	*	1
2444	state of the relay				Relay	R	0	*	1
2445	count value of operating time (msb)				Time H	R	0	*	9999
2446	count value of operating time (lsb)				Time L	R	0	*	9999
2447	start counter high (msb) example : 456				Start H	R	0	*	9999
2448	start counter low (lsb) example 123				Start L	R	0	*	9999
2451	value of the condensing pressure	User	Compressor	Circuit 2	P.HP	R	-50	*	105
2452	value of the condensing temperature				T.HP	R	-50	*	105
2453	value of the liquid temperature				Liquid	R	-50	*	105
2454	value of the evaporating pressure				P.LP	R	-50	*	105
2455	value of the evaporating temperature				T.LP	R	-50	*	105
2456	value of the suction temperature				T.Suction	R	-50	*	105
2457	discharge temperature 1				Discharge 1	R	-50	*	150
2458	discharge temperature 2				Discharge 2	R	-50	*	150
2461	state of configuration	User	Compressor	Circ.2 Comp.1	Config.	R	*	*	*
2462	states of management				Status	R	List	*	*
2463	state of the auxiliary contact				State iD	R	0	*	1
2464	state of the relay				Relay	R	0	*	1
2465	count value of operating time (msb)				Time H	R	0	*	9999
2466	count value of operating time (lsb)				Time L	R	0	*	9999
2467	start counter high (msb) example : 456				Start H	R	0	*	9999
2468	start counter low (lsb) example 123				Start L	R	0	*	9999
2471	state of configuration	User	Compressor	Circ.2 Comp.2	Config	R	*	*	*
2472	states of management				Status	R	List	*	*
2473	state of the auxiliary contact				State iD	R	0	*	1
2474	state of the relay				Relay	R	0	*	1
2475	count value of operating time (msb)				Time H	R	0	*	9999
2476	count value of operating time (lsb)				Time L	R	0	*	9999
2477	start counter high (msb) example : 456				Start H	R	0	*	9999
2478	start counter low (lsb) example 123				Start L	R	0	*	9999

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2481	state of configuration	User	Compressor	Circ.2 Comp.3	Config	R	*	*	*
2482	states of management				Status	R	List	*	*
2483	state of the auxiliary contact				State iD	R	0	*	1
2484	state of the relay				Relay	R	0	*	1
2485	count value of operating time (msb)				Time H	R	0	*	9999
2486	count value of operating time (lsb)				Time L	R	0	*	9999
2487	start counter high (msb) example : 456				Start H	R	0	*	9999
2488	start counter low (lsb) example 123				Start L	R	0	*	9999
2491	safety high pressure switch circuit 1				User	Compressor	Others	HP iD C1	R
2492	safety high pressure switch circuit 2	HP iD C2	R	0*				*	1
2493	reversing valve circuit 1	R.Valve 1	R	0*				*	1
2494	reversing valve circuit 2	R.Valve 2	R	0*				*	1
2511	state of configuration	User	Condenser	Circuit 1	Config.	R	*	*	*
2512	states of management				Status	R	List	*	*
2513	state of the auxiliary contact				State iD	R	0	*	1
2514	value of the condensing temperature				Condensing	R	-50	*	67
2515	condensing temperature set point				Setpoint	R	25	*	45
2516	condensing fan capacity				Capacity	R	0	*	100
2517	condensing fan low speed				Speed Low	R	0	*	1
2518	condensing fan high speed				Speed High	R	0	*	1
2521	state of configuration				User	Condenser	Circuit 2	Config.	R
2522	states of management	Status	R	List				*	*
2523	state of the auxiliary contact	State iD	R	0*				*	1
2524	value of the condensing temperature	Condensing	R	-50*				*	67
2525	condensing temperature set point	Setpoint	R	25*				*	45
2526	condensing fan capacity	Capacity	R	0*				*	100
2527	condensing fan low speed	Speed Low	R	0*				*	1
2528	condensing fan high speed	Speed High	R	0*				*	1
2531	state of configuration	User	Condenser	Circuit 1/2				Config	R
2532	states of management				Status	R	List	*	*
2533	state of the auxiliary contact				State iD	R	0	*	1
2534	condensing fan capacity				Capacity	R	0	*	100
2541	Outside air temperature	User	Condenser	Fan	Outside	R	-50*	*	105
2542	condenser fan capacity maximum				Capacity Max	R	0*	*	100
2543	condenser unloading temperature				Unloading	R/W	50*	*	65
2544	condenser fan accoustic mode				Mode	R/WZ	0	0	2
2545	condenser fan accoustic noise				Noise	R/WZ	82*	*	94
2551	condenser inlet temperature circuit 1	User	Condenser	Water	Inlet C1	R	-50	*	105
2552	condenser outlet temperature circuit 1				Outlet C1	R	-50	*	105
2553	condenser inlet temperature circuit 2				Inlet C2	R	-50	*	105
2554	condenser outlet temperature circuit 2				Outlet C2	R	-50	*	105

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2611	state of configuration	User	Expansion Valve	Circuit 1	Config.	R	*	*	*
2612	states of management				Status	R	List	*	*
2613	value of the evaporating pressure				Saturated	R	0	*	20
2614	value of the evaporating temperature				Saturated	R	-4	*	35
2615	value of the suction temperature				Suction	R	-50	*	105
2616	value of superheat				S.Heat	R	0	*	105
2617	set point of superheat				Setpoint	R	5	*	15
2618	opening percentage calculated for the valve				Capacity	R	0	*	100
2619	opening steps calculated for the valve				Step	R	0	*	ETS50 =
2621	state of configuration				User	Expansion Valve	Circuit 2	Config	R
2622	states of management	Status	R	List				*	*
2623	value of the evaporating pressure	Saturated	R	0				*	20
2624	value of the evaporating temperature	Saturated	R	-4				*	35
2625	value of the suction temperature	Suction	R	-50				*	105
2626	value of superheat	Superheat	R	0				*	105
2627	set point of superheat	Setpoint	R	5				*	15
2628	opening percentage calculated for the valve	Capacity	R	0				*	100
2629	opening steps calculated for the valve	Step	R	0				*	ETS50 =
2711	state of configuration	User	Option	Freecooling				Config.	R
2712	states of management				Status	R	List	*	*
2713	input of the freecooling				State iD	R	0	*	1
2714	freecooling valve				Valve	R	0	*	1
2715	outside air temperature				Outside	R	-50	*	105
2716	inlet coil water temperature				Inlet	R	-50	*	105
2717	inlet coil water reference temperature				Inlet Ref.	R	-50	*	105
2718	outlet coil water temperature				Outlet	R	-50	*	105
2719	freecooling capacity				Capacity	R	0	*	100
2721	state of configuration				User	Option	FP Correct	Config.	R
2722	states of management	Status	R	List				*	*
2723	state of the auxiliary contact	State iD	R	0				*	1
2731	state of configuration	User	Option	Heater Elec	Config.	R	*	*	*
2732	states of management				Status	R	List	*	*
2733	evaporator outlet temperature				Outlet	R	-50	*	105
2734	electrical heater capacity				Capacity	R	0	*	100
2735	electrical heater input				State iD	R	0	*	1
2736	electrical heater output 1				Output 1	R	0	*	1
2737	electrical heater output 2				Output 2	R	0	*	1
2738	electrical heater output 3				Output 3	R	0	*	1
2739	electrical heater output 4				Output 4	R	0	*	1
2741	state of configuration				User	Option	Power Meter	Config.	R
2742	value of the real power	Real Pw	R	2				*	3
2743	value of the reactive power	Reac.Pw	R	3				*	4
2744	value of the power factor	P-Factor	R	4				*	5
2745	value of the active energy (msb)	Activ.E H	R	5				*	6
2746	value of the active energy (lsb)	Activ.E L	R	6				*	7
2747	value of the reactive energy (msb)	Reac.E H	R	7				*	8
2748	value of the reactive energy (lsb)	Reac.E L	R	8				*	9

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
2811	state of configuration	User	Link	Master/Slaves	Config.	R	*	*	*
2812	states of management				Status	R	List	*	*
2813	address of the unit (bus id)				Address	R	1	*	8
2814	outside air reference temperature				Outside	R	-50	*	105
2815	evaporator inlet reference temperature				Inlet	R	-50	*	105
2816	evaporator outlet reference temperature				Outlet	R	-50	*	105
2817	unit number priority to start				Priority	R	1	*	8
2818	unit number in standby				Standby	R	1	*	8
2819	unit number to start next				Next Start	R	1	*	8
2821	states of management				User	Link	Bms	Status	R
2822	outside air reference temperature	Outside	R	-50				*	105
2823	evaporator inlet reference temperature	Inlet	R	-50				*	105
2824	evaporator outlet reference temperature	Outlet	R	-50				*	105
2825	watchdog timer	Watchdog	R/W	1				*	8
2826	address of the unit (bus id)	Address	R/W	1				*	8
2827	setting of the protocol type	Type	R/W	0				0	7
2828	configuration of communication bus speed	Baud	R/W	0				0	2

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3111	general on/off	Expert	Unit	General	On/Off	R/W	0	0	1
3112	remote on/off				On/Off iD	R/W	0	*	1
3113	enable				On/Off Mode	R/W/Z	0	1	1
3114	Lennox technician				Test	R/W	0	0	10
3115	reset the active alarm(s)				Reset Alarm	R/W	0	0	1
3116	clear the historic of alarm(s)				Clear Alarm	R/W	0	0	1
3117	electrical box temperature				Box Tß	R	-50	*	105
3118	general status of the unit				Status	R	List	*	*
3121	unit range configuration	Expert	Unit	Configuration	Range	R/W	0	0	8
3122	unit size configuration				Size	R/W	List	*	*
3123	unit capacity configuration				Capacity	R/W	0	*	100
3124	glycol rate configuration				Glycol	R/W	0	0	50
3125	restore the settings parameters				Restore	R/W	0	0	5
3131	configuration of the free output bm.no7	Expert	Unit	Cust. Relay	Bm-N7	R/W			
3132	configuration of the free output be.no1				Be.1-N1	R/W			
3133	configuration of the free output be.no2				Be.1-N2	R/W			
3134	configuration of the free output be.no3				Be.1-N3	R/W			
3135	configuration of the free output be.no4				Be.1-N4	R/W			
3141	configuration of the free input bm.id4	Expert	Unit	Cust. Switch	Bm-iD4	R/W			
3142	configuration of the free input bm.id7				Bm-iD7	R/W			
3143	configuration of the free input be.id1				Be.1-iD1	R/W			
3144	configuration of the free input be.id2				Be.1-iD2	R/W			
3145	configuration of the free input be.id3				Be.1-iD3	R/W			
3146	configuration of the free input be.id4	Be.1-iD4	R/W						
3151	configuration of the free input be.b1	Expert	Unit	Cust. Signal	Be.1-B1	R/W			
3152	configuration of the free input be.b2				Be.1-B2	R/W			
3153	configuration of the free input be.b3				Be.1-B3	R/W			
3154	configuration of the free input be.b4				Be.1-B4	R/W			
3161	evaporator pump(s) configuration	Expert	Unit	Option	Pump Evap.	R/W	0	*	*
3162	condenser pump(s) configuration				Pump Cond.	R/W	0	*	*
3163	Display(s) configuration				Display	R/W	0	0	3
3164	electronic expansion valve configuration				EEV Driver	R/W	0	0	1
3165	power meter configuration				Heater Elec	R/W	0	0	1
3166	electrical heater configuration				Freecooling	R/W	0	0	1
3167	inverter for condenser fan configuration				Fan %	R/W	0	0	1
3168	power factor correction configuration				Power Factor	R/W	0	0	1
3169	power meter configuration				Power meter	R/W	0	0	1
3211	evaporator inlet probe temperature	Expert	Water	Temperature	Inlet	R	-50	*	105
3212	evaporator inlet reference temperature				Inlet Ref	R	-50	*	105
3213	evaporator outlet probe temperature				Outlet	R	-50	*	105
3214	evaporator outlet reference temperature				Outlet Ref	R	-50	*	105
3215	evaporator delta temperature (inlet-outlet)				Delta Tß	R	0	*	105
3216	evaporator set point				Setpoint	R	-10	*	50
3217	evaporator capacity				Capacity	R	0	*	100
3218	evaporator flow switch				Flow	R	0	*	1

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3221	changeover status	Expert	Water	Changeover	Status	R	List	*	*
3222	outside air probe temperature				Outside	R	-50	*	105
3223	outside air reference temperature				Outside Ref.	R	-50	*	105
3224	changeover mode				Mode	R/W/Z			
3225	winter air temperature to swap in heating mode				AirTβWinter	R/W	-10	18	30
3226	summer air temperature to swap in cooling mode				AirTβSummer	R/W	19	23	30
3231	evaporator status	Expert	Water	Cooling	Status	R	List	*	*
3232	evaporator inlet reference temperature				Inlet	R	-50	*	105
3233	evaporator outlet reference temperature				Outlet	R	-50	*	105
3234	evaporator set point				Setpoint	R	-10	*	50
3235	evaporator cooling capacity				Capacity	R	0	*	100
3236	outside air set point x1 in cool				Air Slope 1	R/W/Z	-11	22	50
3237	outside air set point x2 in cool				Air Slope 2	R/W/Z	-11	30	50
3238	evaporator set point y1 in cool				Water 1	R/W/Z	19	7	20
3239	evaporator set point y2 in cool				Water 2	R/W/Z	19	7	20
3241	evaporator status				Expert	Water	Heating	Status	R
3242	evaporator inlet reference temperature	Inlet	R	-50				*	105
3243	evaporator outlet reference temperature	Outlet	R	-50				*	105
3244	evaporator set point	Setpoint	R	-10				*	50
3245	evaporator heating capacity	Capacity	R	0				*	100
3246	outside air set point x1 in heat	Air Slope 1	R/W/Z	-11				22	50
3247	outside air set point x2 in heat	Air Slope 2	R/W/Z	-11				30	50
3248	evaporator set point y1 in heat	Water 1	R/W/Z	40				45	50
3249	evaporator set point y2 in heat	Water 2	R/W/Z	40				45	50
3251	external evaporator set point	Expert	Water	Custom				Sp 4/20mA	R
3252	external offset evaporator set point				Sp +/-1BC	R	-1	*	1
3253	second set point switch status				Sp Nβ2	R	0	*	1
3261	evaporator cooling delta temperature	Expert	Water	Control	Cool dTβ	R/W	1	5	20
3262	evaporator heating delta temperature				Heat dTβ	R/W	1	5	20
3263	evaporator water reactivity				Reactivity	R/W	1	15	120
3271	evaporator cooling low safety temperature	Expert	Water	Safety	Cool Low	R/W	3	5	55
3272	evaporator cooling high safety temperature				Cool High	R/W	19	55	55
3273	evaporator heating low safety temperature				Heat Low	R/W	3	5	55
3274	evaporator heating high safety temperature				Heat High	R/W	19	55	55
3311	evaporator pump 1 status	Expert	Pump	Evaporator P1	Status	R	List	*	*
3312	evaporator pump 1 input				State iD	R	0	*	1
3313	evaporator pump 1 output				Output	R	0	*	1
3314	count value of operating time (msb)				Hour H	R	0	*	9999
3315	count value of operating time (lsb)				Hour L	R	0	*	9999
3316	evaporator flow switch				Flow	R	0	*	1
3321	evaporator pump 2 status	Expert	Pump	Evaporator P2	Status	R	List	*	*
3322	evaporator pump 2 input				State iD	R	0	*	1
3323	evaporator pump 2 output				Output	R	0	*	1
3324	count value of operating time (msb)				Hour H	R	0	*	9999
3325	count value of operating time (lsb)				Hour L	R	0	*	9999
3326	evaporator flow switch				Flow	R	0	*	1

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3331	evaporator inlet temperature	Expert	Pump	Evaporator Flow	T.In	R	-50	*	105
3332	evaporator outlet temperature				T.Out	R	-50	*	105
3333	evaporator pressure in				P.In	R	0	*	6
3334	evaporator pressure out				P.Out	R	0	*	6
3335	evaporator delta temperature				Delta dT	R	0	*	105
3336	evaporator delta pressure				Delta dP	R	0	*	6
3337	evaporator flow capacity				Capacity	R	0	*	100
3338	evaporator flow meter				Flow	R	0	*	100
3339	evaporator flow switch				Flow	R	0	*	1
3341	evaporator pump(s) enable				Expert	Pump	Evaporator Control	Priority	R/W/Z
3342	evaporator pump(s) reset counter	Reset	R/W	0				0	2
3343	evaporator pump(s) operating mode	Mode	R/W	0				0	4
3344	evaporator variable flow delta temperature	Delta dT	R/W	2				*	10
3345	evaporator variable flow delta pressure	Delta dP	R/W	1				1	6
3346	evaporator variable flow output pressure	P.Out	R/W	0,5				1	6
3347	evaporator variable flow minimum	Flow Min	R/W	60				60	100
3348	evaporator variable flow maximum	Flow Max	R/W	60				100	100
3351	condenser pump 1 status	Expert	Pump	Condenser P1				Status	R
3352	condenser pump 1 input				State iD	R	0	*	1
3353	condenser pump 1 output				Output	R	0	*	1
3354	count value of operating time (msb)				Hour H	R	0	*	9999
3355	count value of operating time (lsb)				Hour L	R	0	*	9999
3356	condenser flow switch				Flow	R	0	*	100
3361	condenser pump 2 status				Expert	Pump	Condenser P2	Status	R
3362	condenser pump 2 input	State iD	R	0				*	1
3363	condenser pump 2 output	Output	R	0				*	1
3364	count value of operating time (msb)	Hour H	R	0				*	9999
3365	count value of operating time (lsb)	Hour L	R	0				*	9999
3366	condenser flow switch	Flow	R	0				*	100
3371	condenser temperature inlet	Expert	Pump	Condenser Flow				T.In	R
3372	condenser temperature outlet				T.Out	R	-50	*	105
3373	condenser pressure inlet				P.In	R	0	*	6
3374	condenser pressure outlet				P.Out	R	0	*	6
3375	condenser delta temperature				Delta dT	R	0	*	105
3376	condenser delta pressure				Delta dP	R	0	*	6
3377	condenser flow capacity				Capacity	R	0	*	100
3378	condenser flow meter				Flow	R	0	*	100
3379	condenser flow switch				Flow	R	0	*	1
3381	condenser pump(s) enable				Expert	Pump	Condenser Control	Priority	R/W/Z
3382	condenser pump(s) reset counter	Reset	R/W	0				0	2
3383	condenser pump(s) operating mode	Mode	R/W	0				0	4
3384	condenser variable flow delta temperature	Delta dT	R/W	2				*	10
3385	condenser variable flow delta pressure	Delta dP	R/W	1				1	6
3386	condenser variable flow output pressure	P.Out	R/W	0,5				1	6
3387	condenser variable flow minimum	Flow Min	R/W	60				60	100
3388	condenser variable flow maximum	Flow Max	R/W	60				100	100

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3411	value of the condensing pressure	Expert	Compressor	Circuit 1	P.HP	R	-50	*	105
3412	value of the condensing temperature				T.HP	R	-50	*	105
3413	value of the liquid temperature				Liquid	R	-50	*	105
3414	value of the evaporating pressure				P.LP	R	-50	*	105
3415	value of the evaporating temperature				T.LP	R	-50	*	105
3416	suction temperature circuit 1				T.Suction	R	-50	*	105
3417	discharge temperature 1 circuit 1				Discharge 1	R	-50	*	150
3418	discharge temperature 2 circuit 1				Discharge 2	R	-50	*	150
3421	value of the condensing pressure	Expert	Compressor	Circuit 2	P.HP	R	-50	*	105
3422	value of the condensing temperature				T.HP	R	-50	*	105
3423	value of the liquid temperature				Liquid	R	-50	*	105
3424	value of the evaporating pressure				P.LP	R	-50	*	105
3425	value of the evaporating temperature				T.LP	R	-50	*	105
3426	suction temperature circuit 2				T.Suction	R	-50	*	105
3427	discharge temperature 1 circuit 2				Discharge 1	R	-50	*	150
3428	discharge temperature 2 circuit 2				Discharge 2	R	-50	*	150
3431	compressor(s) enable circuit 1	Expert	Compressor	Enable	Enable C1	R/W/Z	0	0	7
3432	compressor(s) enable circuit 2				Enable C2	R/W/Z	0	0	7
3433	compressor(s) reset counter circuit 1				Clear C1	R/W	0	0	7
3434	compressor(s) reset counter circuit 2				Clear C2	R/W	0	0	7
3435	compressor(s) circuit priority				Priority	R/W	0	0	3
3441	evaporator saturation safety temperature				Saturation	R/W	-6	-6	5
3442	condenser unloading safety temperature	Expert	Compressor	Safety	Unloading	R/W	50	63	65
3443	compressor discharge safety temperature				Discharge	R/W	90	120	150
3511	configuration condenser circuit 1	Expert	Condenser	Circuit 1	Config	R	*	*	*
3512	status condenser circuit 1				Status	R	List	*	*
3513	input condenser circuit 1				State iD	R	0	*	1
3514	condensing temperature circuit 1				Condensing	R	-50	*	67
3515	condensing temperature set point				Setpoint	R	25	*	45
3516	condensing fan capacity circuit 1				Capacity	R	0	*	100
3517	condensing fan low speed circuit 1				Speed Low	R	0	*	1
3518	condensing fan high speed circuit 1				Speed High	R	0	*	1
3521	configuration condenser circuit 2	Expert	Condenser	Circuit 2	Config	R	*	*	*
3522	status condenser circuit 2				Status	R	List	*	*
3523	input condenser circuit 2				State iD	R	0	*	1
3524	condensing temperature circuit 2				Condensing	R	-50	*	67
3525	condensing temperature set point				Setpoint	R	25	*	45
3526	condensing fan capacity circuit 2				Capacity	R	0	*	100
3527	condensing fan low speed circuit 2				Speed Low	R	0	*	1
3528	condensing fan high speed circuit 2				Speed High	R	0	*	1
3531	configuration condenser circuit 1&2	Expert	Condenser	Circuit 1/2	Config	R	*	*	*
3532	status condenser circuit 1&2				Status	R	List	*	*
3533	input condenser circuit 1&2				State iD	R	0	*	1
3534	condensing fan capacity circuit 1&2				Capacity	R	0	*	100

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3541	condenser fan capacity maximum	Expert	Condenser	Fan	Capacity Max	R	0	*	100
3542	condenser unloading temperature				Unloading	R	50	*	65
3543	condenser fan accoustic mode				Mode	R/W	0	0	2
3544	condenser fan accoustic noise				Noise	R/W	82	*	94
3545	condenser fan set point				Setpoint	R/W	35	40	45
3546	condenser fan set point low speed on				Speed L.On	R/W	30	46	60
3547	condenser fan set point low speed off				Speed L.Off	R/W	30	38	60
3548	condenser fan set point high speed on				Speed H.On	R/W	30	58	60
3549	condenser fan set point high speed off				Speed H.Off	R/W	30	49	60
3551	condenser inlet temperature circuit 1	Expert	Condenser	Water	Inlet C1	R	-50	*	105
3552	condenser outlet temperature circuit 1				Outlet C1	R	-50	*	105
3553	condenser inlet temperature circuit 2				Inlet C2	R	-50	*	105
3554	condenser outlet temperature circuit 2				Outlet C2	R	-50	*	105
3561	defrost mode	Expert	Condenser	Defrost	Mode	R	0	0	1
3562	outside air defrost temperature				Outside	R	8	16	22
3563	evaporator saturation defrost temperature				Saturation	R	-10	1,7	10
3564	defrost frequency delay				Freq	R	30	45	90
3565	Ratio for dynamic management C1				dLP C1	R/W	-50	*	105
3566	Ratio for dynamic management C1				dLP C2	R/W	-50	*	105
3567	Circuit 1 counter between defrost				Counter C1	R/W	30	*	90
3568	Circuit 1 counter between defrost				Counter C2	R/W	30	*	90
3571	condenser cooling low safety temperature				Safety Low	R/W	3	5	55
3572	condenser cooling high safety temperature	Safety High	R/W	19	55	55			
3573	condenser heating low safety temperature	*	R/W	3	5	55			
3574	condenser heating high safety temperature	*	R/W	19	55	55			
3611	state of configuration	Expert	Expansion Valve	Circuit 1	Config	R	*	*	*
3612	states of management				Status	R	List	*	*
3613	value of the evaporating pressure				Saturated	R	0	*	20
3614	value of the evaporating temperature				Saturated	R	-4	*	35
3615	value of the suction temperature				Suction	R	-50	*	105
3616	value of superheat				Superheat	R	0	*	105
3617	set point of superheat				Setpoint	R	5	*	15
3618	opening percentage calculated for the valve				Capacity	R	0	*	100
3619	opening steps calculated for the valve				Step	R	0	*	2625
3621	state of configuration	Expert	Expansion Valve	Circuit 2	Config	R	*	*	*
3622	states of management				Status	R	List	*	*
3623	value of the evaporating pressure				Saturated	R	0	*	20
3624	value of the evaporating temperature				Saturated	R	-4	*	35
3625	value of the suction temperature				Suction	R	-50	*	105
3626	value of superheat				Superheat	R	0	*	105
3627	set point of superheat				Setpoint	R	5	*	15
3628	opening percentage calculated for the valve				Capacity	R	0	*	100
3629	opening steps calculated for the valve				Step	R	0	*	2625
3631	set point of superheat	Expert	Expansion Valve	Control	Superheat	R/W	5	*	15

Menu	Description	4th digit	3rd digit	2nd digit	1st digit	R/W/Z	Min	Std	Max
3711	configuration of the freecooling	Expert	Option	Freecooling	Config	R	*	*	*
3712	status of freecooling				Status	R	List	*	*
3713	input of the freecooling				State iD	R	0	*	1
3714	freecooling valve				Valve	R	0	*	1
3715	outside air temperature				Outside	R	-50	*	105
3716	inlet coil water temperature				Inlet	R	-50	*	105
3717	inlet coil water reference temperature				Inlet Ref.	R	-50	*	105
3718	outlet coil water temperature				Outlet	R	-50	*	105
3719	freecooling capacity				Capacity	R	0	*	100
3721	configuration of the power factor correction	Expert	Option	FP Correct	Config	R	*	*	*
3722	status of the power factor correction				Status	R	List	*	*
3723	input of the power factor correction				State iD	R	0	*	1
3731	configuration of the electrical heater	Expert	Option	Heater Elec	Config	R	*	*	*
3732	status of the electrical heater				Status	R	List	*	*
3733	evaporator outlet temperature				Outlet	R	-50	*	105
3734	electrical heater capacity				Capacity	R	0	*	100
3735	electrical heater input				State iD	R	0	*	1
3736	electrical heater output 1				Output 1	R	0	*	1
3737	electrical heater output 2				Output 2	R	0	*	1
3738	electrical heater output 3				Output 3	R	0	*	1
3739	electrical heater output 4				Output 4	R	0	*	1
3741	configuration of the power meter	Expert	Option	Power Meter	Config	R	*	*	*
3742	value of the real power				Real Pw	R	0	*	99999
3743	value of the reactive power				Reac.Pw	R	0	*	99999
3744	value of the power factor				P-Factor	R	0	*	99999
3745	value of the active energy (msb)				Activ.E H	R	0	*	99999
3746	value of the active energy (lsb)				Activ.E L	R	0	*	99999
3747	value of the reactive energy (msb)				Reac.E H	R	0	*	99999
3748	value of the reactive energy (lsb)				Reac.E L	R	0	*	99999
3749	reset all counter				Clear Counter	R/W	0	0	1
3811	status of the master/slave link	Expert	Link	Master/Slaves	Status	R	List	*	*
3812	outside air reference temperature				Outside	R	-50	*	105
3813	evaporator inlet reference temperature				Inlet	R	-50	*	105
3814	evaporator outlet reference temperature				Outlet	R	-50	*	105
3815	address of the board				Adress	R/W	1	*	8
3816	number of units linked				Number	R/W	1	*	8
3817	master/slave configuration				Type	R/W	0	0	7
3818	outside air temperature configuration				T&Air	R/W	0	0	2
3819	evaporator water temperature configuration				T&Water	R/W	0	0	2
3821	status of the BMS	Expert	Link	BMS	Status	R	List	*	*
3822	outside air BMS temperature				Outside	R	-50	*	105
3823	evaporator inlet BMS temperature				Inlet	R	-50	*	105
3824	evaporator outlet BMS temperature				Outlet	R	-50	*	105
3825	watchdog timer				Watchdog	R/W	0	*	32000
3826	identification number configuration				Id	R/W	1	*	199
3827	BMS protocol configuration				Protocol	R/W	0	0	6
3828	BMS bauderate configuration				Baud.	R/W	0	0	4



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