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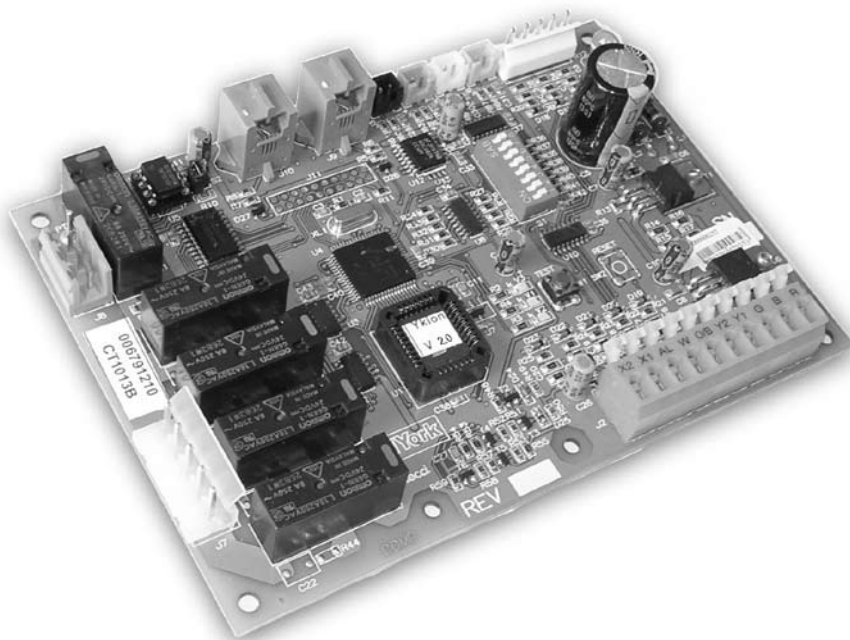
# YKlon Version 3.0

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Ref.: N-27692 1007

## Technical Information:

- Specifications
- Operation





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## Elements of the Unit

The list of sensors and actuators is divided into various categories. The following table lists the elements of the unit:

<b>Actuators</b>	<i>Compressors</i>	On cool only units, these generate cooling. On heat pump units, these generate cool and heat.
	<i>Indoor fan</i>	Circulates air through the indoor coil, diverting it to the impulse section.
	<i>Outdoor fans</i>	Circulate air through the outdoor coil. Depending upon the setup of SW3, varies operation of the outdoor fan in cool mode in accordance with outdoor temperature.
	<i>4-way valve (pump)</i>	Changes operating cycle of the unit (cool-heat).
<b>Temperature probes</b>	<i>Suction</i>	This temperature probe is located in the compressor suction section.
	<i>Outdoor</i>	This temperature probe is located outdoors.
	<i>Liquid</i>	This temperature probe is located in the liquid line of the outdoor coil.
	<i>Discharge</i>	This temperature probe is located at the compressor discharge.
	<i>Impulse</i>	This temperature probe is located in the air impulse.
<b>Protection</b>	<i>Fan heat switch</i>	Indicates that indoor fan protection is in operation.
	<i>High pressure switch</i>	Indicates that unit high pressure is out of limits, or that outdoor fan or compressor module protection is operative.
	<i>Low pressure switch</i>	Indicates that unit low pressure is out of limits.
<b>Accessories</b>	<i>Compressor 2 and presence sensor</i>	Adds a presence input and another compressor stage to the unit.
	<i>Compressor 3</i>	Adds another compressor stage to the unit.
	<i>Electric heaters*</i>	For backup of heat source (up to 4 stages).
	<i>Gas burners*</i>	For backup of heat source (up to 4 stages).
	<i>Hot water coil*</i>	For backup of heat source.
	<i>Economiser, return fan and air quality sensor</i>	Allows generating cool by modulating the outdoor air intake damper and indoor air renewal. This fan increases air extraction capacity.
	<i>Motor-driven damper</i>	Allows setting air renewal.
	<i>Smoke and high temperature detector</i>	Detects the presence of smoke in the room and high impulse temperatures.
<i>Dirty filter detector</i>	Detects the need to change the filters.	

\* Incompatible with each other. There can be one type of backup heat source only.

## Push-buttons and LEDs

There is a Test push-button on the main electronic board that has various functions, depending upon how it is pressed:

- Operates as a LonWorks service pin. When pressed it sends the Neuron ID through the LonWorks network.
- Also shortens certain timings and resets any failure detected if pressed until the green LED goes on.
- Also identifies optional accessories and probes connected to the board when pressed and held until the red LED goes on.

There are three signalling LED diodes:

- The green LED indicates whether equipment operation is correct and the presence of any incident. When the equipment is operating correctly, this LED flashes at a frequency of 1.43 Hz (0.70 sec.).
- The red LED indicates failures. If no failure is present, this LED remains permanently off. It also goes on when tracking the setup of accessories.
- The yellow LED operates as a LonWorks service LED, and also indicates a compressor timing is operative by flashing.

If both the red and green LEDs remain on permanently, this means the board setup must be reloaded.

Can go through communication only when decommissioning.

All accessories have a green LED that flashes when communications are received. This means they are being identified correctly. If this LED remains on permanently, this means the accessory is powered but not identified correctly, or communications are not reaching it.

The economiser also has a yellow LED that indicates whether outdoor air is favourable (LED on), and a push-button that, along with the potentiometer, can memorize minimum renewal (see Economiser Operation).

The hot water coil also has a yellow LED that indicates whether water temperature is favourable (LED on constantly), or whether the coil is in antifreeze operation (LED flashing).

## Setup

Each time the electronic board is powered with 24 VAC, a system check is carried out with the following operations:

1. Reading of microswitches.
2. Identification of communication transceiver.
3. The existence of communication with the thermostat.
4. Check and enable all memorized accessories.

The first two operations are not carried out at any other time. The third will be retried once every minute, should communication not be achieved. The fourth is also carried out upon resetting a failure and when accessories are memorized.

## Microswitches

These will be read after powering with 24 VAC, and the lever will operate depending upon its position.

If SW1 and SW2 are set to OFF, this indicates that setup is carried out remotely, by communication.

The microswitches establish the following setups:

Number	State	Meaning
1 / 2	OFF/OFF	Ignore SW. Programmed by communication
	ON/OFF	Defrost time 30'
	OFF/ON	Defrost time 60'
	ON/ON	Defrost time 90'
3	ON	Crossed coils
	OFF	Independent coils
4	ON	Compressor delay 2'
	OFF	Compressor delay 5'
5	ON	Selection cool only
	OFF	Selection heat pump
6	ON	4-way valve operative in heat
	OFF	4-way valve operative in cool
7	ON	Thermostat with signal B
	OFF	Thermostat with signal O
8	ON	Fan operative during defrost
	OFF	Fan inoperative during defrost

## Transceiver ID

After powering, the installed transceiver will be identified, and communication parameters will be adapted. If the ID is unknown, an incident is indicated. If an SMX transceiver is used, the green LED on the board flashes at 0.8 Hz (1.25 sec.) to indicate it has been identified by the board.

## Accessories and probes

Accessories are used to support extended operation of the unit.

These accessories can be either factory-installed or installed at job site. Power supply to the unit should be disconnected always. Then install the accessory and necessary elements and reconnect power supply once again.

To carry out a search and setup of accessories, press the test button for over three seconds, until the red LED goes on. When carrying out the search and setup process, the red LED on the board goes on and remains on until this operation is completed. Once it goes off, the board will use the accessories found.

This search will also determine which optional probes are connected to the board. An incident will be given if any of these optional probes detected in the setup process has an invalid value.

In the case of the impulse probe, it may be installed on connector J6 of the second compressor board, on J6 of the Economiser board or on J6 of the hot water coil board. The search will first attempt to identify it in the second compressor but, if not found, it will go on to the economiser or the hot water coil.

The outdoor probe can be connected to J6 on the first com-

pressor board, or on J3 of the economiser board. Whenever the economiser accessory is installed, the system searches for the outdoor probe in the economiser, as a first option. This search and setup process is also carried out automatically after updating the YKlon communications program. The following table shows probe setup.

Probe	PUMP		COOL	
	Obligatory	Optional	Obligatory	Optional
Discharge	X		X	
Liquid	X		X	
Outdoor	X		X	
Suction	X		X	
Impulse		X		X
Return		X		X
Water intake		X		X
Outdoor economiser		X		X

The unit will be assembled with a Discharge, Liquid and Suction probe per compressor.

## Communication with the thermostat

The YKlon program will attempt to operate with the thermostat through communication. If this communication is lost, it can operate on the signals from the thermostat relays. If there is no communication with the thermostat, we will attempt a new communication once per minute. If we communicate with the thermostat, thermostat operation will change to operation by communication. If not, we will continue accepting signals from the relays.

The YKlon board can detect and communicate with a DPC-1 or a DPC-1R thermostat.

## Operation

The heat or cool unit is controlled by means of a resident software in the YKlon board. This system operates in one way or another, depending upon the position of the microswitches on the main board. The control algorithm also varies in accordance with the accessories detected by the board and installed on the unit.

## General information

No on/off operation of any power supply device should ever coincide with the on/off operation of other devices on the unit. The time between same is established at 1 second (MAQTION\_OFF). See Operating Parameters herein.

After a reset or a power supply failure, the first time the electronic board activates a device there should be a time delay before it is addressed to the network. This avoids simultaneous start ups of all units after a power supply failure.

All inputs must be filtered to avoid detecting transitory condi-

tions of the signals.

The following sequence will be followed for start up of a compressor: 4-way valve (if it is to be activated), outdoor fan, indoor fan and compressor. The off cycle will be as follows: compressor, outdoor fan, 4-way valve (if activated), and indoor fan.

Upon activation of the heat signals from the thermostat on cool only units (SW5 set to ON), the auxiliary heat stages, if installed, should start.

## Call manager

The call manager code determines which stages will become operative to compensate the demand or call.

The call manager will alternate activation of the compressors and electric heaters, to have all in operation the same number of operating hours.

The decision of which stages are to start will be carried out in combination with the thermostat, which can control 2 cool and 3 heat stages. Once all stages of the control thermostat are operative, the call manager will determine the start up of other stages in accordance with whether there is communication with the thermostat or not. If there is no communication with the thermostat, one more stage will activate every 10 minutes. If there is communication with the thermostat, the activation time of the additional stages will depend upon the temperature differential between the room and the set point programmed.

Temperature differential	Activation time of the next stage (minutes)
<1	12.5
1	10
2	5
3	3.3
4	2.5
5	2
6	1.6

Stages will start turning off when the thermostat deactivates one of its stages, turning off all stages the call manager activated as additional.

The activation sequence of these stages will depend upon a list of enabled stages by priority. Priority is established as follows:

- The compressors with less operating hours will have greater priority. A compressor can be inhibited if in a defrost cycle, has an alarm or a timed start up.
- The economiser will always have priority over the compressors (for cool) and will be enabled as long as the outdoor temperature is favourable for reaching the set point.
- The hot water coil can be selected with a jumper (see Operation of Accessories) if this coil also has more or less priority over the compressors. It will be operative to produce heat only when the water temperature is within limits.

- The electric heaters will have less priority than the compressors, and are sequenced in accordance with operating hours. They will activate for heating if the corresponding heat switch has not been enabled.
- The gas stages will not be sequenced. Stage 1 will always be of greater priority. With gas, the compressors produce cool only.

If impulse temperature is over 55° C, we will turn off one stage immediately, and the other stages and the other stages as well at a rate of one every 5 minutes until the temperature drops to below 55° C.

## Operation of main elements

### Indoor fan

Operation can be either continuous or automatic. In the automatic mode it activates only when there is a call for cool or heat. For continuous operation, set this function on the thermostat. This mode is determined by signal G of the thermostat, unless the heat switch has failed. In this case, it will turn off.

If the thermostat is in communication, it will activate if the fan is in continuous mode.

Whenever any heat, cool or auxiliary heat stage is in operation, the indoor fan will also be in operation. When any stage goes off and there is no other call, the fan will time 60 sec. (RESTIEVAC\_CAL) before turning off, so as to eliminate residual heat or cool.

The indoor fan may activate if there is an air quality sensor and it calls for air renewal (see Economiser, air quality sensor and return air fan operation).

This continuous fan mode also activates if the thermostat calls for heat and the unit cannot produce heat with any of the heat stages. In this case, the economiser damper remains closed.

If the thermostat calls for heat with the fan in auto mode, and heat cannot be produced with any of the heat stages, the indoor fan goes off.

If there is no alternative way to produce heat during defrost, the indoor fan activates if SW8 is set to ON. If not, it turns off.

### Outdoor fan

The outdoor fan starts up 4 seconds (MAQTIVXT\_CMP) before the compressor (except in defrost, when DFRTIVEX starts up 10 seconds before defrost is completed). It turns off after the compressor becomes inoperative.

On crossed coil units (SW3 at ON and SW5 at ON), fan 2 on the gas discharge side (electric box) will start first. The next fan will start when the outdoor temperature is above 19° C (VXTTPBATX\_ON), or the outdoor probe is either open or short-circuited. If the outdoor temperature is below 16° C (VXTTPBATX\_OFF), the second fan becomes inoperative. When a fan is to become inoperative, it is always fan 1 on the compressor side.

### Four-way valve

When SW6 of the control board is set to ON, the four-way valve will activate when the thermostat calls for heat. And it

deactivates when a defrost cycle is carried out.

If SW6 is set to OFF, this valve operates inversely; that is to say, it activates in cool and, therefore, also activates during a defrost cycle.

If the thermostat is in OFF mode, the valve deactivates, independent of SW6.

The four-way valve will activate only when the corresponding compressor can be activated. Upon deactivating the stage, the compressor is also deactivated, as well as the 4-way valve 60 seconds (V4VTICMP) later.

If a high pressure switch failure is detected, the compressor will turn off first, followed by the valve 60 seconds later.

## Compressor

One, two or three stages can be controlled.

When the compressor is to be activated, an order will be given to start the outdoor fan first and then the compressor. Neither the compressor nor the outdoor fan will start until after a minimum 2 or 5-minute (CMPTION) off time, so as to avoid successive start ups. The CMPTION time can be set by means of the microswitches.

On units with more than one stage, the compressor with less operating hours starts first. The remaining compressors will activate in accordance with the demand or call. There should be a 5-second (MAQTICMP\_CMP) delay time between start ups of the compressors.

When one of the compressors is to be turned off, it is the one with the most operating hours.

In heat cycle, if the outdoor temperature is below -10° C (CMPTPEXT\_OFF) the compressor is deactivated and an incident is indicated. It will restart when the outdoor temperature rises above -8° C (CMPTPEXT\_ON).

## Defrost

Defrost is carried out in heat pump operation only.

## Start

The following conditions must exist:

- The compressor is in operation.
- The liquid probe temperature is below -3° C (DFRTPINICIO) during 3 minutes (DFRTICONF), or during 5 minutes (DFRTICONF2) if the outdoor temperature is below or equal to -5° C (DFRTPEXT).
- The time since the last 30, 60 or 90-second (TIDES) defrost has expired. Can be set by SW1 and SW2.

## Operation

At the beginning of the defrost cycle, the following operations are to be carried out:

- Set the 4-way valve to cool mode.
- Turn the outdoor fan off.
- The stage is disenabled. The call manager will determine whether another starts or not.
- Do not turn off the compressor that is carrying out the defrost cycle during this cycle, even if the thermostat so indicates.
- The indoor fan will deactivate if there is no stage that can produce heat and microswitch 8 is set to OFF.



## End

This cycle will continue until any of the following conditions are present:

- Liquid temperature above 13° C (DFRTPFIN\_HI) during 2 seconds (DFRTIFIN\_HI).
- Liquid temperature above 5° C (DFRTPFIN\_ME) during 30 seconds (DFRTIFIN\_ME).
- Liquid temperature above 2° C (DFRTPFIN\_LO) during 2 minutes (DFRTIFIN\_LO).
- Time from the start of the defrost is over 10 minutes (DFRTIMAX).
- A failure signal of the high pressure switch is given.

## Operation

Once the defrost cycle is completed:

- Start the outdoor fan and wait 10 seconds (DFRTIVEX).
- Set the 4-way valve to heat.
- Enable the compressor. The call manager will determine whether it remains in operation or not.

To eliminate drops of water from the coil, the outdoor fan remains operative for 1 minute (DFRTISECADO), even if there is no demand.

On units with more than one stage, simultaneous defrost of two stages cannot be carried out. One remains in standby until the other becomes inoperative.

If there is a call for starting one compressor only, and a defrost cycle is to be carried out by this compressor, the next compressor is activated. At the end of the defrost cycle the compressor carrying out the defrost becomes inoperative, the outdoor fan remains operative to dry the coil, and the other compressor remains in operation as long as there is a demand.

## Operation of accessories

### Second and third compressors

These accessories allow controlling the second and third compressors. Operation is described in the compressor section herein.

### Presence detector

If no presence is detected, only the DPC-1 thermostat will set the Unoccupied set points.

If the thermostat is any other than DPC-1, only operation of the economiser in cool mode is allowed.

The presence detector input is Pin 1 of the J1 connector on the second compressor board. If open, the room is unoccupied. This case will indicate an incident. Always closed by default.

### Electric auxiliary heat

This program can control up to four electric heating stages. They become operative as determined by the call manager.

Whenever the electric heating is in operation, the indoor fan is also operative.

### Gas auxiliary heat

This program can control up to four gas heating stages. They

become operative as determined by the call manager.

The second stage cannot start if the first stage is inoperative.

The same applies to the third and fourth stages.

A failure of alarm 1 turns the entire gas heating system off. A failure of alarm 2 would turn off stages two and four (if present).

Whenever the gas heating is in operation, the indoor fan is also operative.

Gas stage control is carried out with 1 or 2 accessories, depending upon whether 2 or 4 gas stages are to be controlled.

Units with only two gas stages can have one or two burner controls. If this accessory is to activate 2 controls, this will be indicated by placing a jumping at J1.

If a failure arises during the start up of a burner, a reset signal is activated for 1 second and the alarm is reset. The number of resets of an alarm during start up is limited to 5. From this point on, the control system generates an alarm on the thermostat display or the YKlon board, blocking the gas stage. The demand is not deactivated until the thermostat stops calling for heat.

## Hot water coil auxiliary heat

Used to generate heat. If conditions are favourable, the valve is modulated in accordance with the impulse probe in an attempt to achieve maximum impulse temperature, but without exceeding 50° C (BACTPIMP\_MAX).

Up to four hot water coil stages can be controlled. Start ups will be in compliance with the call manager and will be limited by the impulse temperature (30, 40, 45 and 50° C).

Whenever the water heating is in operation, the indoor fan will be operative as well.

The installation of this accessory includes a minimum air impulse temperature protection of 15° C. This avoids the discomfort that can be created when the renewal percentage is very high, with low outdoor temperatures, and the indoor fan is in continuous operation. If there is a call for cool, the water coil valve closes.

Favourable conditions exist when the water temperature is above 30° C (BACTPH2O\_MIN), 5 minutes (BACTIH2O\_MIN) after the valve has opened. Once the system is in operation, these favourable conditions are checked constantly.

If unfavourable conditions are detected and there is a demand, 20 minutes (BACTIRTR) will be timed and favourable conditions checked once again.

If opening is greater than 20% (BACPCPMP\_ON), the pump relay is activated. If opening is less than 5% (BACPCPMP\_OFF), the relay is deactivated.

When water temperature is below 3° C (BACTPDFR\_ON), the pump and the valve become operative to protect the hot water accumulator and coil from freezing, until the water temperature rises to over 6° C (BACTPDFR\_OFF). This protection will remain active as long as the fan is inoperative, even if the unit is turned off or in lock-out.

Whenever hot water coil heating is in operation (circulation pump on, and favourable temperature), the indoor fan will also be operative.

A potentiometer on the control board allows manual modulation of the valve for checking operation. The valve will reset to its operational setting after 30 seconds (MAQTIMAN), which

is the value that indicates the maximum operating time of the unit in manual mode, or when the test button is pressed.

The yellow LED of the electronic module flashes if water temperature is below 3° C (BACTPDFR\_ON). If conditions are favourable, this LED will remain on permanently.

If jumper S2 on the board is activated, the hot water coil will have priority over the compressors. This is adequate for installations with very economical hot water.

The water temperature probe will be connected to connector J13.

## **Economiser, return air fan and air quality detector**

Allows generating cool by modulating the outdoor air intake damper. If conditions are favourable, the damper is modulated to

lower the impulse temperature as much as possible, but without going below 11.5° C (ECOTPIMP\_MIN).

In temperature mode, favourable conditions exist when the outdoor temperature is below 20° C (ECOTPEXT\_MAXLOW) and also below the return air temperature.

In enthalpy mode, favourable conditions exist when the outdoor enthalpy is below the return enthalpy by 5% (ECOPCENT\_OK) minimum, and the outdoor temperature is below 20° C. For operation in enthalpy mode, a jumper must be installed at S2 and the outdoor probe B17 (connector J3) must be disconnected, but do not disconnect the return probe B15 (connector J13). By default, ENTALP jumper S2 is open. Selection NTC probes.

A potentiometer on the economiser board allows manual modulation of the damper to check operation. The damper will reset to the operational setting after 30 seconds (MAQTIMAN), which value indicates maximum operational time of the unit in manual mode.

The damper will remain open a proportional period of time for air renewal, as long as the indoor fan is in operation. Said minimum percentage can be set by means of the potentiometer or through the communications network. To set same with the potentiometer, adjust same to obtain the desired minimum opening, and then press intro for 3 seconds to save this value. The factory default value is 10% (ECOPCAPE\_DEF).

In the winter cycle, if the thermostat calls for heat and no heat stage can be activated, the damper will remain closed with the indoor fan off if in auto mode, or the indoor fan on if in continuous mode.

In the case of an indoor fan failure, the damper will close completely.

The yellow LED on the board will go on when conditions are favourable.

The function of the return extractor is to increase room air extraction capacity. If the outdoor air damper is open beyond 30% (ERTPCON), this discharge is activated.

The J18 input is for connecting an air quality detector. If this signal is activated (contact closed), the damper opens to the memorized minimum and the indoor fan goes on, increasing this opening with a 5% minimum (CO2PCECO\_UP) gradient, as long as the sensor is generating the signal. When the sensor no longer generates this signal, the dampers go back to their previous settings.

The dampers always open whenever the impulse temperature

limits of 30° C (CO2TPMAX) and 15° C (CO2TPMIN) are not exceeded. Should a heat or cool stage be activated, reset the economiser damper to minimum.

Operation of the air quality sensor will be as described as long as the thermostat is not set to OFF (with communication), or for 20 minutes after deactivating the last stage (without communication).

By default, jumper J19 is open to select economiser operation. If it closes, motor-driven damper operation is selected. In this operating mode the damper opens to the memorised minimum which, in this case, will be maximum opening. When this option is selected, the economiser is not considered as a call for cool and, therefore, if there is a call for cool, the compressors go on.

By default, jumper J20 is open to select outdoor damper closed with high temperature and smoke alarm. If this jumper closes, outdoor damper open with high temperature and smoke alarm is selected. In both cases, everything is turned off with the exception of the second case in which a signal for the extraction fan is generated.

If the impulse temperature is below 14° C and the outdoor temperature is below 10° C, no further compressors start for cooling.

In the economiser mode, if the suction temperature is below 0° C and any compressor is operating in cool mode, the damper closes and reopens when the suction temperature rises to over 4° C.

## **Smoke and temperature detector**

Two accessories are available: Smoke detector and high temperature detector. Both use the same accessory board. If both accessories are installed, just one control plate is required. Locate both smoke and temperature control closed contacts in series at the intake of the accessory board. When either contact opens, the unit is shut down and an alarm is generated. The accessory board output relay closes.

## **Dirty filter detector**

Indicates the need to change filters. When this input is detected (contact closed), the output is activated and this is indicated on the thermostat with communication until a reset of the failure/incident is carried out.

## **Malfunctions**

There are two types of malfunctions: incidents that do not turn the unit off, and failures or lock-outs, that do turn the unit off.

## **Causes**

### **Operation**

#### **Indoor fan heat switch**

Activation locks the entire unit out and a failure of the indoor fan heat switch is indicated.

#### **High pressure switch (or outdoor fan heat switch, or compressor heat switch)**

Activation locks out the compressor and the outdoor fan. A high pressure switch failure is given. On crossed coil units,

outdoor fan 2, on the electric box side, should activate. Should both fans require starting, they will both start despite low pressure switch activation of either one.

This does not indicate a failure if activated during defrost cycle, although it is rendered as ended and the high pressure switch failure is inhibited during 30 seconds (PHITIINH).

#### Low pressure switch

Activation locks out the compressor and outdoor fan. A low pressure switch failure is indicated. Upon compressor start up the pressure switch is inhibited during 2 minutes (PLOTIINH). Activation is ignored during a defrost cycle.

#### Electric heating heat switch (accessory)

Activation locks out the electric heating and indicates an incident. If this incident occurs more than 3 times in one hour (RESNOTERMIC), an electric heater heat switch failure is given, the electric heater is inhibited and turned off, the lock-out relay is activated, and this failure is added to the failure log.

#### Gas failure (accessory)

Activation locks out the gas heating and indicates a failure. The gas heating cannot be restarted until this signal disappears.

The number of resets of an alarm upon start up is limited to 5.

#### Failure of the economiser, return air fan and air quality sensor

If the air quality sensor signal is activated, an air quality call incident will be given.

If the enthalpy sensors are activated (jumper at S2) and one of the probes fails - since the unit works on the differential between the two probes - the unit switches to the conventional operating mode and indicates an incident.

If the return air probe fails, an incident will also be given.

#### Hot water coil (accessory)

If any unfavourable conditions are detected, an incident will be given. And when these conditions are favourable, this incident is cancelled.

When water temperature is below 3° C (BACTPDFR\_ON), an incident is given and then cancelled once the cause disappears.

If a short circuit or open circuit of any of the probes is detected, an incident will be given, the stage will be inhibited and the antifreeze cycle will begin to protect the water circuit, as long as no other stage is in operation.

#### Dirty filters

Activation of same signals an incident.

#### Thermostat DPC-1

##### Errors of thermostat with relays (without communication)

If signal Y is given without signal G, or if signal Y1 or Y2 is given without signal G, the unit acts as if signal G were

activated. An incident of signal Y1 or Y2 without signal G is given.

If signal W is given without signal G, the unit acts as if signal G were activated. An incident of signal W without signal G is given.

If signal W is given without signal B, the unit acts as if signal B were indicating heat mode. An incident of signal W without signal B is given.

If signal Y2 is given without signal Y1, the unit acts as if signal Y1 were activated and an incident of signal Y2 without signal Y1 is given.

#### Protection

##### Defrost protection

If 3 defrosts (DFRNOMAX) occur consecutively after completion of the 10 minute timing (DFRTIMAX), a repeated defrost incident is given. This incident is cleared when the defrost cycle is completed in compliance with another condition other than the maximum period of time.

##### Temperature protection

- If the outdoor temperature is below -10° C (CMPTPEXT\_OFF), the compressor is locked out. A low outdoor temperature incident (in heat mode only) is indicated. This incident is cleared when the outdoor temperature rises to over -8° C (CMPTPEXT\_ON).
- If the discharge temperature is above 130° C (DISTPAVR), the compressor and outdoor fan are locked out. An exceeded discharge temperature failure is indicated.
- If with the compressor in operation for 10 minutes (DISTIREC), or 5 minutes (DISTIREC\_DFR) if coming from the defrost operation, the discharge temperature does not rise above 35° C (DISTPREC\_HEAT) in cool mode, or 50° C (DISTPREC\_COOL) in cool mode, a non-recovery of the discharge temperature incident is indicated.
- If the suction probe temperature is below -4° C (CMPTPASP\_LO\_3) and the compressor has been in operation for over 10 minutes (CMPTIASP\_LO), the compressor and outdoor fan are locked out. This same condition can also arise if the suction probe temperature is below -25° C (CMPTPASP\_LO\_1). After the SW4 (CMPTION) time period is over, the compressor restarts. If this occurs 3 times (CMPNOTP\_ASP\_LO) for 50 minutes (CMPTIASP\_LO\_NO), a repeated start ups in cool failure is indicated, and the compressor cannot restart.
- If a water coil is installed and the water temperature is not above 30° C (BACTPH2O\_MIN) after 5 minutes (BACTI2O\_MIN), the valve closes and the coil is inhibited until the next start up. This will be attempted every 20 minutes (BACTIRTR) and an incident will be given indicating that the water coil temperature is not recuperating.
- If the impulse temperature is above 55° C (TEMP\_MAX\_IMP), a high impulse temperature incident is given and heat stages will be deactivated until this problem is resolved.
- If the impulse temperature is above 80° C (TEMP\_IMP\_AVR), the unit is locked out and a smoke or high temperature detection is given.
- If there is a call for gas and there is no failure, and impulse temperature is below 25° C (TEMP\_MIN\_IMP), an incident of low impulse temperature with call for gas is given.

## Probes

### Open or short circuit of the liquid outdoor or indoor probe

An incident of the corresponding probe is given if the value detected is below  $-33.5^{\circ}\text{C}$  (NTCTPABIERTA), or above  $93.5^{\circ}\text{C}$  (NTCTPCORTO). If this incident occurs in the liquid probe in heat mode, repeated defrost cycles are carried out with a maximum duration of 10 minutes or detection of high pressure switch signal input.

In the case of crossed coils, if an error is detected in the outdoor probe, both fans go on.

### Open or short circuit of the discharge probe

A discharge probe incident is indicated if this value is below  $-20^{\circ}\text{C}$  (DISTPABIERTA), or over  $150^{\circ}\text{C}$  (DISTPCORTO).

### Open or short circuit of the accessory probes

A discharge probe incident is indicated if this value is below  $-33.5^{\circ}\text{C}$  (NTCTPABIERTA), or above  $93.5^{\circ}\text{C}$  (NTCTPCORTO).

## Accessories

The accessories can be in three different conditions:

- Connected without being memorized.
- Connected, memorized and operational.
- Memorized but not operational (inhibited).

In the latter case, an inhibited accessory incident is indicated.

This implies that communication failures have been detected and, consequently, the accessory will be inhibited and its outputs deactivated.

## Signalling

The signalling or indication of failures is carried out on two levels. One for incidents and another for lock-outs.

### Incidents

Incidents do not lock the unit out and are signalled by the green LED on the electronic board. If no incident is present, this LED flashes at a frequency of 1.43 Hz.

When an incident occurs, the LED flashes in three sequences. The

first indicates the compressor affected: one flash for stage 1, two flashes for stage 2, 4 flashes for stage 3 and four flashes for others, followed by a short pause. Then the type of incident is indicated, followed by another short pause. Then the incident detected is indicated, followed by a long pause, and the sequence is repeated as long as the incident is present.

The incidents are reset once the cause of these disappears.

In the case of more than one incident, only the one with the highest priority, and not reset, will be indicated. As these are reset, the other existing and not reset incidents will be indicated one by one.

**Table of incidents**

Flashes		Type	Incident
1, 2 or 3	1	1	Discharge probe open or short circuited
		2	Liquid probe open or short circuited
		3	Suction probe open or short circuited
	2	1	Repeated defrost cycles
		2	Discharge temperature does not recuperate
	4	1	1
2			Return probe open or short circuited
3			Outdoor probe open or short circuited
4			Water probe open or short circuited
5			Error in enthalpy probes
2		1	Signal Y1 or Y2 without G
		2	Signal W without signal B
		3	Signal W without signal G
		4	Signal Y2 without signal Y1
3		1	Heat switch of heater 1
		2	Heat switch of heater 2
		3	Heat switch of heater 3
		4	Heat switch of heater 4
4		1	Water coil temperature not recuperating
		2	Outdoor temperature too low
		3	Water coil in defrost cycle
		4	Impulse temperature above 55° C
		5	Impulse temperature below 25° C with gas
5		1	Transceiver ID unknown
		2	At least one accessory not found
		3	Call for air quality
		4	Dirty filters
		5	Presence sensor set to unoccupied
		6	Suction temperatures < 0° C with economiser

## Failures

Failures or lock-outs turn the unit off.

These are indicated by the red LED on the board and by means of the thermostat. A relay on the board is also activated. If no failure is present, this LED remains off permanently.

When a failure occurs, this LED flashes in two sequences. The first indicates the affected compressor: One flash for stage 1, two flashes for stage 2, 4 flashes for stage 3 and four flashes for accessories, followed by a short pause. Then the type of incident is indicated, followed by another short pause. Then the incident detected is indicated, followed by a long pause, and the sequence is repeated.

In the case of more than one incident, only the one with the highest priority and not reset will be indicated.

The last 9 failures should be saved in the non-volatile memory. Before saving the failure in the memory, a check will be run to make sure the previously saved failure is different. If both are the same, nothing will be saved.

The following table shows possible failures:

**Table of failures**

Flashes		Meaning
1, 2 or 3	1	Discharge temperature exceeded
	2	High pressure switch, outdoor fan heat switch or compressor module heat switch
	3	Low pressure switch
	4	Indoor fan heat switch
	5	Repeated start ups in cool or suction temperature at -25° C
4	1	Failure of gas control 1 or heater 1
	2	Failure of gas control 2 or heater 2
	3	Stage failure of heater 3
	4	Stage failure of heater 4
	5	Failure of economiser or HW coil (impulse, outdoor, return, water probe)
	6	Detection of smoke or high temperature, accessories. Impulse temperature over 80° C.

## Resetting

Incidents, with certain exceptions, do not require resetting. They reset once the cause disappears.

The following incidents require resetting, and are reset in the same way at the alarms:

- Inhibited accessory.
- Repeated defrosts (also resets if a defrost is terminated in a normal way).
- Electric heating heat switch.

Alarms can be reset as follows:

- By setting the thermostat to the OFF mode, if communication with the thermostat has been implemented.
- By pressing the test button on the electronic board.
- By disconnecting and reconnecting power supply to the electronic board.
- By means of the communication bus.

We must point out that resetting the board by setting the thermostat to OFF cannot be done more than 3 times (AVR-NOREAR-MES) a day.

# Operating Parameters

## Local

The local operating parameter values are defined in the table below:

Parameter	Description	Value
AVRNOREARMES	No. of resets by thermostat set to OFF in one day	3
BACPCPMP_OFF	Opening to turn off water pump	5 %
BACPCPMP_ON	Opening to start water pump	20 %
BACTIH2O_MIN	Standby timing for min. water temp.	5 min.
BACTIRTR	Timing for conditions check reattempt	20 min.
BACTPDFR_OFF	Deactivation temp. of antifreeze protection	6°C
BACTPDFR_ON	Activation temp. of antifreeze protection	3°C
BACTPH2O_MIN	Minimum water temperature	30°C
BACTPIMP_MAX	Maximum impulse temp. for hot water coil	50°C
CMNOTP_ASP_LO	Times the compressor must go off to give an error	3
CMPTIASP_LO	Suction probe timing	10 min.
CMPTIASP_LO_NO	Period when times are counted	50 min.
CMPTION	Compressor delay (ON = 2' and OFF = 5')	As per SW 4
CMPTPASP_LO_1	Suction temp. in cool to turn compressor off	-25°C
CMPTPASP_LO_3	Suction temp. repeated starts in cool	-4°C
CMPTPEXT_OFF	Outdoor temp. at which compressor turns off	-10°C
CMPTPEXT_ON	Outdoor temp. at which compressor turns on	-8°C
CO2PCECO_UP	Opening gradient for air quality	5 %/min.
CO2TPMAX	Max. impulse temperature	30°C
CO2TPMIN	Min. impulse temperature	15°C
DFRNOMAX	Max. number of consecutive defrost cycles	3
DFRTICONF	Defrost confirmation time	3 min.
DFRTICONF2	Defrost confirmation time in cold outdoor temp.	5 min
DFRTIDEF	Time between defrosts by default	30 min.
DFRTIFIN_HI	Time for end of defrost cycle	2 sec.
DFRTIFIN_ME	Time for end of defrost cycle	30 sec.
DFRTIFIN_LO	Time for end of defrost cycle	2 min.
DFRTIMAX	Max. defrost time	10 min.
DFRTISECADO	Coil drying time	1 min.
DFRTPEXT	Outdoor temp. for applying DFRCONF2	-5°C
DFRTIVEX	Time before defrost end to activate outdoor fan	10 sec.
DFRTPFIN_HI	Defrost end temperature	13°C
DFRTPFIN_ME	Defrost end temperature	5°C
DFRTPFIN_LO	Defrost end temperature	2°C
DFRTPINICIO	Defrost start temperature	-3°C
DISTIREC	Max. time temp. recovery	10 min.
DISTIREC_DFR	Time temp. recovery after a defrost	5 min.
DISTPABIERTA	Discharge temp. to consider probe open	-20°C
DISTPAVR	Failure due to discharge temp.	130°C
DISTPCORTO	Discharge temp. to consider short circuit	150°C
DISTPREC_HEAT	Recovery temp. in winter (heat)	35°C
DISTPREC_COOL	Recovery temp. in summer (cool)	50°C
ECOPCAPE_DEF	Min. opening value of damper by default	10%
ECOPCDelta	Minimum economiser increment	1,25%
ECOPCENT_OK	Enthalpy % for favourable conditions	5 %

Parameter	Description	Value
ECOTPEXT_MAXLOW	Economiser is operative below this temperature	20 °C
ECOTPEXT_MAXHIGH	Economiser not operative above this temperature	22 °C
ECOTPHIST	Hysteresis for ECOTPIMP_MIN	0.5
ECOTPIMP_MIN	Min. impulse temp. for economiser	11.5°C
ERTPCON	Opening % to start air extractor	30%
GASTION_OFF	Gas stage delay	0 min.
GOODINPUTCNT	Number of equal read outs to give a DS2406 entry as correct	5
MAQTICMP_CMP	Delay between compressor start ups	5 sec.
MAQTIMAN	Time economiser and valve operate in manual mode	30 sec.
MAQTION_OFF	Time between ON or OFF cycles	1 sec.
MAQTIVXT_CMP	Time between outdoor fan and compressor start up	4 sec.
MAX_LOG_AVERIAS	Number of failures saved	9
NTCTPABIERTA	Probe temp. to consider short circuit	-33.5°C
NTCTPCORTO	Temp. to consider probe open or non-existent	93.5°C
PHITIINH	Save time high pressure switch	30 sec.
PLOTIINH	Save time low pressure switch	2 min.
POTPCSENSE	Min. potentiometer movement to consider same as a change	4 LSB
RESNOTERMIC	No. of times heat switch can trigger in one hour	3
RESTIEVAC_CAL	Residual heat and cool evacuation time	60 sec.
RESTION_OFF	Electric heater delay	0 min.
T_INIGAS	Times gas burner resets automatically	5
T_REC_TEMP	Time for impulse temp. to go over 25° C in gas stage	10 min.
TASP_ECOFF	Suction temp. below which the economiser closes	0 °C
TASP_ECOON	Suction temp. at which the economiser opens again	4 °C
TEMP_IMP_AVR	Impulse temp. to turn unit off and indicate failure	80°C
TEMP_MAX_IMP	Impulse temp. to start to turn stages off	55°C
TEMP_MIN_IMP	Min. impulse temp. with gas	25°C
TEXTHABILCOMP1	If impulse temp. is <14° C and outdoor temp. is >10° C. compressors disabled	10 °C
TEXTHABILCOMP2	If impulse temp. is <14° C and outdoor temp. is >12° C. compressors activate	12 °C
TIDES	Time between defrosts as per SW1 and SW2	30',60',90'
TIMPHABILCOMP	If impulse temp. is <14° C and outdoor temp. is <10° C. only economiser is operative	14 °C
TMP_ACT_ECO	Time for economiser activation	1 sec.
TMP_PAS_A_OFF	Minutes to go to OFF after turning stages off. during which a call for air quality can be activated	20 min.
TRMTIDEMANDA	Sampling time of call calculation	10 min.
TRMTPHIST	Set point hysteresis	0.25 °C
V4VTICMP	v4v change delay time after compressor goes off	60 sec.
VXTPBATX_OFF	Fan 2 off with crossed coil. Fan No. 1 compressor side	16°C
VXTPBATX_ON	Fan 2 on with crossed coil. Fan No. 1 compressor side	19°C

Pressing the service button briefly will temporarily change the following parameters to the values appearing in the Test column.

Parameter	Description	Value	Test
CMPTION	Compressor delay	As per SW 4	10 sec.
DFRTICONF	Defrost confirmation time	3 min.	10 sec.
DFRTIMAX	Max. defrost time	10 min.	30 sec.
DFRTISECADO	Coil drying time	1 min.	1 sec.
MAQTIMAN	Time in manual mode	30 s.	2 sec.



## Network

The operating parameter values related to the communications network are defined in the following table:

Parameter	Description	Value
DFRTIDEF	Time between defrosts by default	30 min.
NETTIRCV_HRTBT	Update receiving rate by default	2 min.
NETTISEND_HRTBT	Update sending rate by default	30 sec.
NETTISEND_MIN	Min. time of sending variables	1 sec.
TRMTPCOOL_MAX	Max. set point in cool	45°C
TRMTPCOOL_MIN	Min. set point in cool	5°C
TRMTPHEAT_MAX	Max. set point in heat	40°C
TRMTPHEAT_MIN	Min. set point in heat	3°C
TRMTPNCI_MAX	Max. value for nciSetpoint	35°C
TRMTPNCI_MIN	Min. value for nciSetpoint	10°C
TRMTPNCI_OC_COOL	Default day set point in cool	23°C
TRMTPNCI_OC_HEAT	Default day set point in heat	21°C
TRMTPNCI_ST_COOL	Default night set point in cool	25°C
TRMTPNCI_ST_HEAT	Default night set point in heat	19°C
TRMTPNCI_UN_COOL	Default unoccupied set point in cool	28°C
TRMTPNCI_UN_HEAT	Default unoccupied set point in heat	16°C
TRMTPOFFSET_MAX	Max. temp. offset (nviSetptOffset)	3°C

## Temperature tables

The following tables indicate the ratio between temperature, resistance, voltage and the converting value obtained for the liquid, suction, outdoor, water, impulse and return probes.

Temperature (°C)	Resistance (Ohms)	Voltage (V)
-40	328400	0.1478
-39	310260	0.1561
-38	292120	0.1655
-37	273980	0.1761
-36	255840	0.1881
-35	237700	0.2019
-34	224940	0.2128
-33	212180	0.2250
-32	199420	0.2388
-31	186660	0.2542
-30	173900	0.2719
-29	164820	0.2860
-28	155740	0.3017
-27	146660	0.3192
-26	137580	0.3388
-25	128500	0.3610
-24	121101	0.3814
-23	114172	0.4027
-22	107681	0.4249
-21	101597	0.4480
-20	95893	0.4722
-19	90543	0.4973
-18	85523	0.5234
-17	80811	0.5506
-16	76386	0.5788
-15	72229	0.6081
-14	68322	0.6384
-13	64650	0.6698
-12	61196	0.7023
-11	57947	0.7359
-10	54890	0.7705
-9	52011	0.8063
-8	49300	0.8432
-7	46746	0.8811
-6	44339	0.9201
-5	42069	0.9603
-4	39929	1.0014
-3	37910	1.0436
-2	36004	1.0869
-1	34205	1.1311
0	32506	1.1763
1	30902	1.2224
2	29385	1.2695
3	27952	1.3175
4	26596	1.3663
5	25314	1.4159
6	24101	1.4662

Temperature (°C)	Resistance (Ohms)	Voltage (V)
7	22952	1.5174
8	21865	1.5691
9	20836	1.6215
10	19860	1.6745
11	18936	1.7280
12	18060	1.7819
13	17229	1.8363
14	16441	1.8910
15	15694	1.9460
16	14984	2.0013
17	14311	2.0567
18	13671	2.1123
19	13064	2.1679
20	12487	2.2235
21	11938	2.2792
22	11417	2.3346
23	10921	2.3899
24	10449	2.4451
25	10001	2.4999
26	9574	2.5544
27	9167	2.6087
28	8780	2.6624
29	8412	2.7156
30	8060	2.7685
31	7726	2.8207
32	7407	2.8724
33	7103	2.9235
34	6813	2.9739
35	6536	3.0237
36	6272	3.0728
37	6020	3.1211
38	5780	3.1686
39	5550	3.2154
40	5331	3.2614
41	5122	3.3064
42	4921	3.3510
43	4730	3.3944
44	4547	3.4371
45	4373	3.4787
46	4205	3.5199
47	4046	3.5597
48	3893	3.5989
49	3746	3.6374
50	3606	3.6748
51	3472	3.7114
52	3343	3.7473
53	3220	3.7821
54	3102	3.8162
55	2989	3.8494
56	2881	3.8817
57	2777	3.9133
58	2677	3.9442

Temperature (°C)	Resistance (Ohms)	Voltage (V)
59	2582	3.9739
60	2490	4.0032
61	2402	4.0316
62	2318	4.0591
63	2237	4.0860
64	2159	4.1122
65	2085	4.1374
66	2013	4.1622
67	1944	4.1862
68	1878	4.2095
69	1814	4.2323
70	1753	4.2542
71	1694	4.2757
72	1638	4.2963
73	1583	4.3167
74	1531	4.3361
75	1481	4.3550
76	1433	4.3733
77	1386	4.3914
78	1341	4.4088
79	1298	4.4256
80	1256	4.4421
81	1216	4.4579
82	1178	4.4731
83	1141	4.4879
84	1105	4.5025
85	1070	4.5167
86	1037	4.5302
87	1005	4.5434
88	974	4.5562
89	944	4.5687
90	915	4.5809
91	888	4.5922
92	861	4.6036
93	853	4.6070
94	810	4.6253
95	786	4.6356
96	763	4.6455
97	740	4.6555
98	719	4.6646
99	698	4.6738
100	677	4.6830
101	658	4.6913
102	639	4.6997
103	621	4.7077
104	603	4.7156

Temperatures (°C)	Resistance (Ohms)	Voltage (V)
105	586	4.7232
106	569	4.7308
107	553	4.7380
108	538	4.7447
109	523	4.7515
110	509	4.7578
111	495	4.7642
112	481	4.7705
113	468	4.7765
114	455	4.7824
115	443	4.7879
116	431	4.7934
117	419	4.7989
118	408	4.8040
119	397	4.8091
120	387	4.8137
121	377	4.8183
122	367	4.8230
123	357	4.8277
124	348	4.8319
125	339	4.8361
126	330	4.8403
127	322	4.8440
128	314	4.8478
129	306	4.8515
130	298	4.8553
131	291	4.8586
132	283	4.8624
133	276	4.8657
134	270	4.8685
135	263	4.8719
136	256	4.8752
137	250	4.8780
138	244	4.8809
139	238	4.8838
140	232	4.8866
141	226.8	4.8891
142	221.6	4.8916
143	216.4	4.8941
144	211.2	4.8966
145	206	4.8991
146	201.4	4.9013
147	196.8	4.9035
148	192.2	4.9057
149	187.6	4.9079
150	183	4.9101

The following tables indicate the ratio between temperature, resistance, voltage and the converting value obtained for the discharge probe.

Temperature (°C)	Resistance (Ohms)	Voltage (V)
-40	328400	0.0152
-39	310260	0.0161
-38	292120	0.0171
-37	273980	0.0182
-36	255840	0.0195
-35	237700	0.0209
-34	224940	0.0221
-33	212180	0.0235
-32	199420	0.0249
-31	186660	0.0266
-30	173900	0.0286
-29	164820	0.0302
-28	155740	0.0319
-27	146660	0.0339
-26	137580	0.0361
-25	128500	0.0386
-24	121101	0.0409
-23	114172	0.0434
-22	107681	0.0460
-21	101597	0.0487
-20	95893	0.0516
-19	90543	0.0546
-18	85523	0.0578
-17	80811	0.0611
-16	76386	0.0646
-15	72229	0.0683
-14	68322	0.0721
-13	64650	0.0762
-12	61196	0.0804
-11	57947	0.0848
-10	54890	0.0895
-9	52011	0.0943
-8	49300	0.0994
-7	46746	0.1047
-6	44339	0.1103
-5	42069	0.1161
-4	39929	0.1222
-3	37910	0.1285
-2	36004	0.1351
-1	34205	0.1420
0	32506	0.1492
1	30902	0.1567
2	29385	0.1646
3	27952	0.1727
4	26596	0.1812
5	25314	0.1900
6	24101	0.1992
7	22952	0.2088
8	21865	0.2187

Temperature (°C)	Resistance (Ohms)	Voltage (V)
9	20836	0.2290
10	19860	0.2397
11	18936	0.2508
12	18060	0.2623
13	17229	0.2743
14	16441	0.2867
15	15694	0.2995
16	14984	0.3128
17	14311	0.3266
18	13671	0.3408
19	13064	0.3555
20	12487	0.3707
21	11938	0.3865
22	11417	0.4027
23	10921	0.4194
24	10449	0.4367
25	10001	0.4545
26	9574	0.4729
27	9167	0.4918
28	8780	0.5112
29	8412	0.5312
30	8060	0.5519
31	7726	0.5730
32	7407	0.5947
33	7103	0.6171
34	6813	0.6400
35	6536	0.6635
36	6272	0.6876
37	6020	0.7123
38	5780	0.7375
39	5550	0.7634
40	5331	0.7898
41	5122	0.8167
42	4921	0.8445
43	4730	0.8726
44	4547	0.9014
45	4373	0.9306
46	4205	0.9606
47	4046	0.9909
48	3893	1.0219
49	3746	1.0535
50	3606	1.0855
51	3472	1.1181
52	3343	1.1513
53	3220	1.1848
54	3102	1.2189
55	2989	1.2534
56	2881	1.2883
57	2777	1.3238
58	2677	1.3598
59	2582	1.3959
60	2490	1.4327

Temperature (°C)	Resistance (Ohms)	Voltage (V)
61	2402	1.4697
62	2318	1.5069
63	2237	1.5446
64	2159	1.5828
65	2085	1.6207
66	2013	1.6595
67	1944	1.6984
68	1878	1.7373
69	1814	1.7768
70	1753	1.8162
71	1694	1.8560
72	1638	1.8954
73	1583	1.9357
74	1531	1.9755
75	1481	2.0153
76	1433	2.0551
77	1386	2.0956
78	1341	2.1358
79	1298	2.1758
80	1256	2.2163
81	1216	2.2563
82	1178	2.2957
83	1141	2.3354
84	1105	2.3753
85	1070	2.4155
86	1037	2.4546
87	1005	2.4938
88	974	2.5329
89	944	2.5720
90	915	2.6110
91	888	2.6483
92	861	2.6867
93	853	2.6983
94	810	2.7624
95	786	2.7996
96	763	2.8361
97	740	2.8736
98	719	2.9087
99	698	2.9446
100	677	2.9815
101	658	3.0157
102	639	3.0506
103	621	3.0845
104	603	3.1192
105	586	3.1526

Temperature (°C)	Resistance (Ohms)	Voltage (V)
106	569	3.1867
107	553	3.2196
108	538	3.2510
109	523	3.2830
110	509	3.3135
111	495	3.3445
112	481	3.3761
113	468	3.4060
114	455	3.4364
115	443	3.4650
116	431	3.4941
117	419	3.5236
118	408	3.5511
119	397	3.5791
120	387	3.6049
121	377	3.6311
122	367	3.6576
123	357	3.6846
124	348	3.7092
125	339	3.7341
126	330	3.7594
127	322	3.7821
128	314	3.8052
129	306	3.8285
130	298	3.8521
131	291	3.8730
132	283	3.8971
133	276	3.9185
134	270	3.9370
135	263	3.9588
136	256	3.9809
137	250	4.0000
138	244	4.0193
139	238	4.0388
140	232	4.0584
141	226.8	4.0756
142	221.6	4.0930
143	216.4	4.1105
144	211.2	4.1281
145	206	4.1459
146	201.4	4.1618
147	196.8	4.1778
148	192.2	4.1939
149	187.6	4.2102
150	183	4.2265

## YKlink Communications

YKlink is software for controlling air conditioning units of the YKlon range developed by Clima Roca York.

This system allows monitoring the different units of an installation locally, through the corporate network and, if applicable, over the Internet.

The system has a set of background processes that detect alarms and control operating periods, without the need of user intervention.

The operating periods, as well as the operating set points can be defined on the PC and the PC will be responsible for their application during connection to the system (Centralized Model); or the operating configurations can be created on the PC and transmitted to the thermostats of the units so that these can activate/deactivate the machines (Distributed Model).

## YKtool

The YKtool unit is a portable diagnostic and test system for air conditioning units based on the YKlon system, that allows viewing the main variables of the system and offers the possibility of activating the different stages in the alternative modes.

## Log of Program Versions

Version 1.0: Original version.

Version 1.1: Minor operating corrections.

Version 2.0: List of corrections.

- Modification of activation and deactivation sequence of the 4-way valve.
- Roof Top D51C-D51G (180, 300). Eliminate alternation of outdoor fans.
- The option of pressing the test button to con-

figure the board is eliminated.

- Automatic detection of the YKtool.
- Outdoor probe connected to the economiser board.
- Automatic adjustment of the economiser to avoid a low suction failure if no LAK is present.
- No compressor start up in cool mode if economiser is installed and the impulse temperature is below 12° C.
- Hot water coil antifreeze protection always active.
- Option of mounting impulse probe on the economiser or hot water coil.
- Initial time for checking high pressure switch, 5 seconds. Avoids compressor protection mode error.

Version 3.0: List of corrections.

- Do not deactivate the gas call relay until the thermostat stops requesting same. Maintain gas failure.
- TRMTIDEMANDA variable before 5 minutes.
- Water coil control in 4 stages, as per thermostat calls.
- Impulse protection 15° C with hot water coil accessory.
- Elimination of defrost ending condition by liquid temperature <-25° C. Eliminate DFRT-PLIQ\_END variable.
- Modify minimum outdoor temperature operating limits in heat mode. CMPTPEXT\_OFF variable before -18° C, CMPTPEEXT\_ON variable before -15° C.
- BACPCPMP\_ON variable before 30%.





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