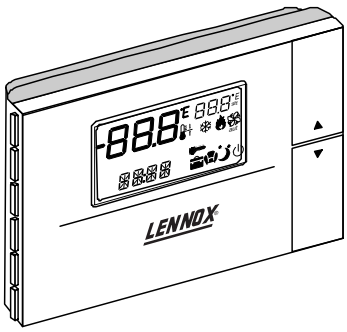
INSTALLATION AND OPERATION MANUAL



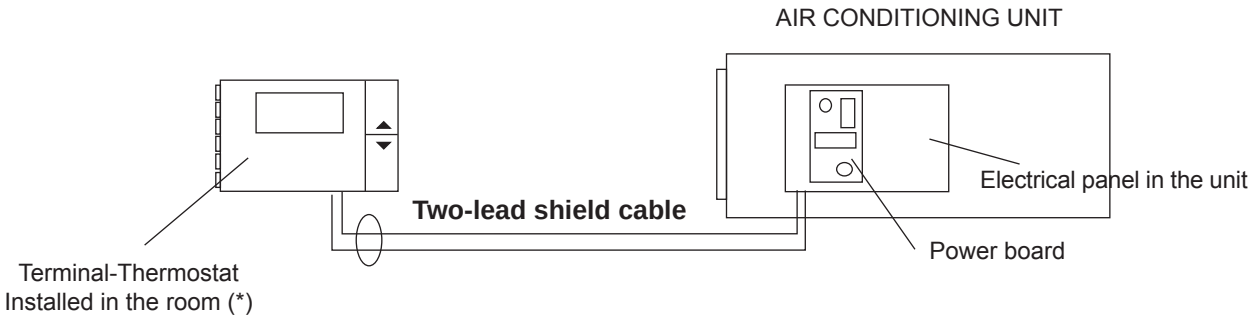
PROVIDING GLOBAL SYSTEM SOLUTIONS

CONTROLS
A 122 C / A 123 H

TABLE OF CONTENTS

GENERAL DESCRIPTION

This electronic control is organised into two integrated systems: a terminal, installed in the room, and a power board for managing the actuators in the electrical panel. The terminal is connected to the power board using a two-lead cable, thus greatly simplifying installation.

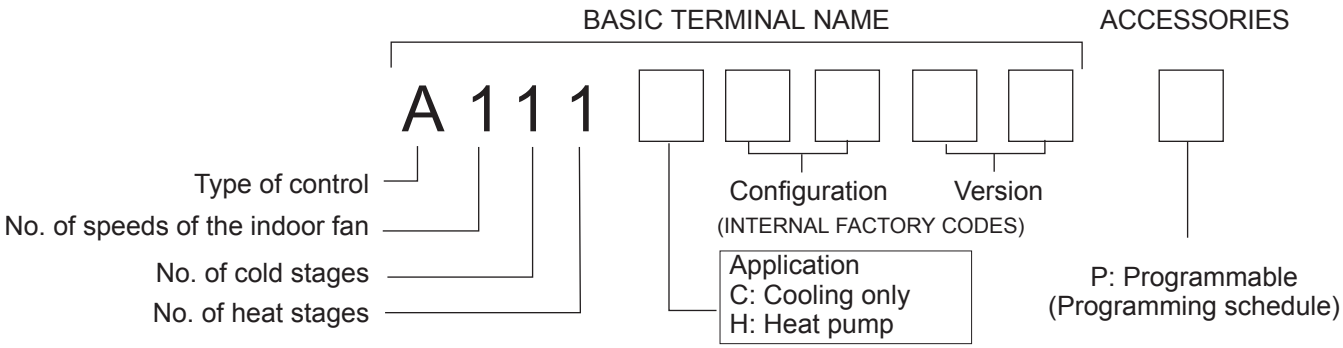


(*)If any other remote sensor are requested as an option, the terminal-thermostat can be installed in a different place from the room to be aconditioned

IMPORTANT

Since this type of control panel is factory-configured for each application, an identification code located on the control panel of the terminal itself has been given to each panel.
Any query or request for a replacement of the control panel must be accompanied by this identification code.

IDENTIFICATION CODE FOR THE TERMINAL-THERMOSTAT



Your new LENNOX Thermostat has been designed to provide accurate control and display of room temperature. In addition, it will also display all relevant information pertaining to your system. The clearly marked buttons and informative display make it extremely easy to understand and simple to use. Please take a few moments to read the brief instructions and familiarize yourself with the various functions in order to obtain maximum benefit from this truly unique electronic control.

TERMINAL-THERMOSTAT INSTALLATION

For correct installation the following warnings must be heeded:

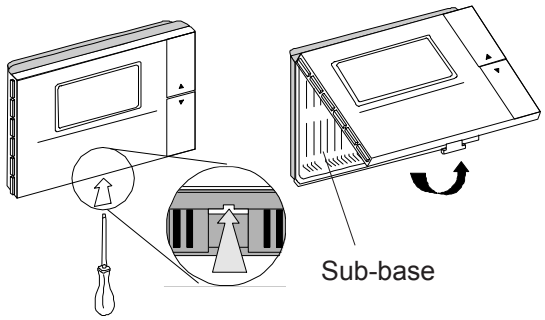
- Always disconnect the power supply before performing any operations on the board during assembly, maintenance or replacement.
- The terminal should be fastened to the wall vertically, allowing for air to circulate through the instrument's vent-holes, in order to detect the correct ambient temperature
- Avoid places where the measurement of the ambient temperature by the internal sensor may be altered, such as outside walls, near doors leading outside, in direct sunlight, etc.

Terminal installation

The installation procedure is as following:

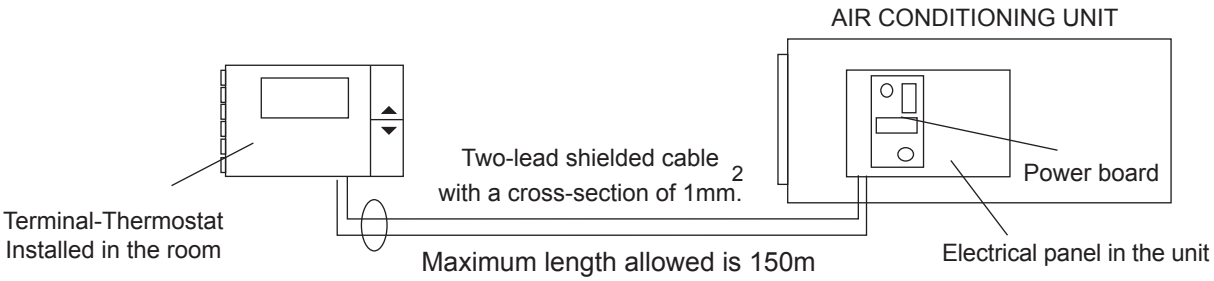
1º To detach the front panel of the terminal from the rear shell, place a flat-heat screwdriver in the slot in the centre of the bottom of the box and release the locking flap

2º Raise the front panel using a “hinge” movement, using the upper edge of the instrument as the pivot and raising the lower edge



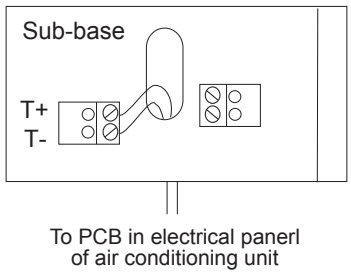
3º To fasten the rear part of the box to the wall, place the hole in the centre of the box over the cables for the control of the instrument which come out of the wall. The placement of the mounting holes has been designed to allow the instrument to be fixed onto a box conforming to standards CEI C.431 - IEC 670. If this is not available, use the mounting holes on the shell as a guide for drilling holes into the wall and then use the screw and plug kit supplied.

The cables for connection to the power board must be kept separate from other cables, using an individual cable channel; and use shielded cables, with a cross-section of 1mm^2.



4ºConnect the cables to the terminals on the rear shell of the box, as indicated in, and in electrical diagram.

When making the connection to the power board special attention must be paid to the polarity; the T+ terminal must be connected to the T+ terminal on the power board; similarly for the T- terminal (in case the cables are connected in the opposite order the instrument will not be bamaged).



5º Finally, close the instrument, moving the front panel onto the rear shell with a “hinge” movement, in the opposite way as used for opening. First the long side of the front panel near the display is snapped onto the rear shell, then the opposite side, being careful that the terminal pins slide into their corresponding female terminals.

USER INTERFACE DESCRIPTION

THE CONTROL IS ACTIVE 5 SECONDS FROM THE TIME
UNIT IS ELECTRICALLY SUPPLIED.

FUNCTIONS OF THE BUTTONS

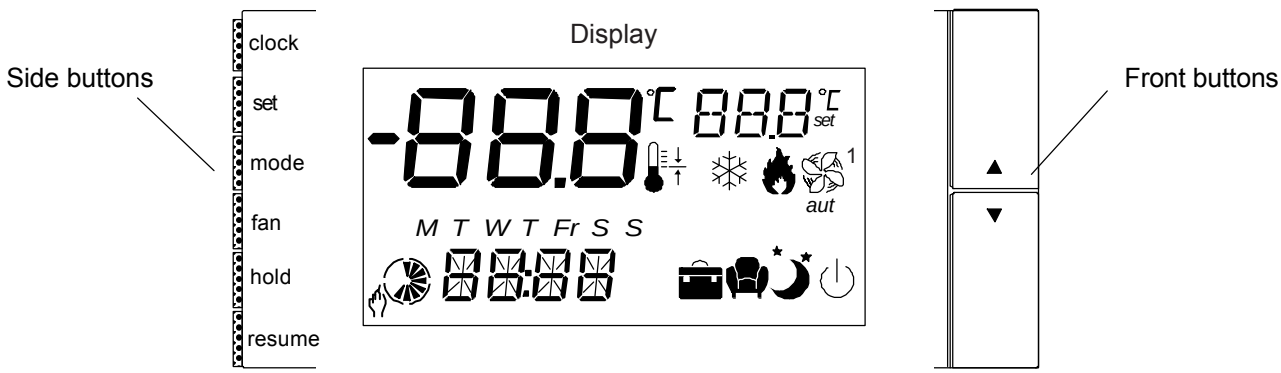
FRONT BUTTONS
These are placed on the front panel of the instrument. These allow the immediate setting of the desired temperature (set-point), and with them the parameters could be modified.

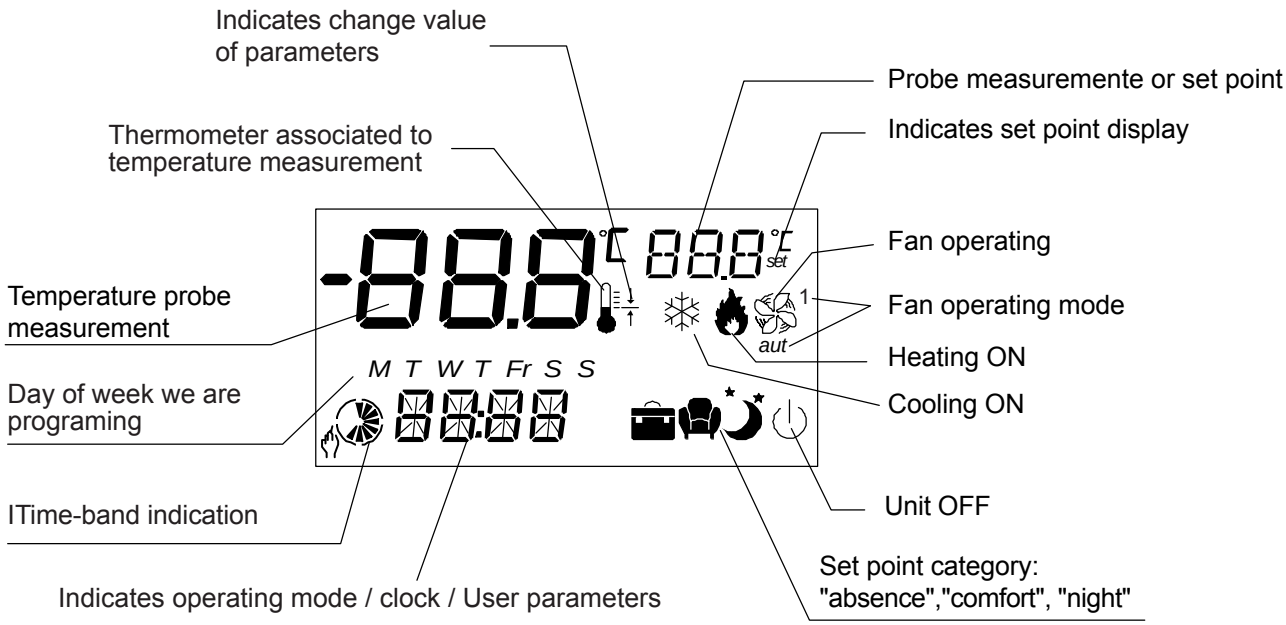
While unit is ON:

Pressing simultaneously the front buttons, the display will show up the software version for five seconds

Pressing simultaneously the front buttons for one second, the display will show up the set point where room temperature was showed before.

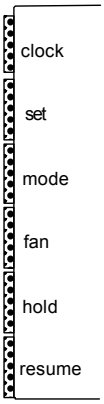
SIDE BUTTONS
These buttons allow access to all the other functions of the control.





SELECTING UNIT OPERATTING MODE AND SET-POINT TEMPERATURE

A) SELECTING THE UNIT'S OPERATING MODE



The operating mode is always indicated on the display
Pressing the **mode** button repeatedly the possible operating modes for the model of machine selected are scrolled through:

COOL: The unit is working on cooling mode, when compressor is working ❄ symbol will appear on the display

HEAT: The unit is working on heating mode, when compressor or electrical heater are working symbol will appear on the display

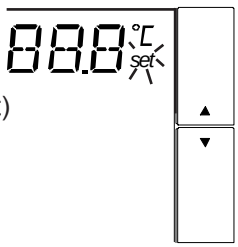
AUTO: The system automatically switches from cooling to heating mode, depending on the position of the ambient temperature in respect to the set-point.

FAN: Fan control only; When fan is working the symbol will appear

OFF: The thermostat does not perform the regulationen, the symbol appear on the display

The operating mode selected is active 5 seconds from setting, when the respective sign stops flashing.

B) SELECTING DESIRED ROOM TEMPERATURE (SET-POINT)



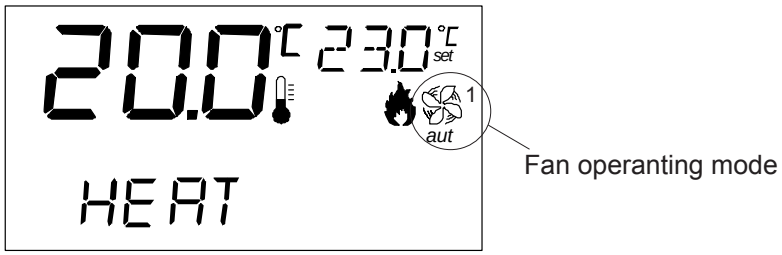
If unit is working, the ▲ *or* ▼ *buttons* allow to select the desired room temperature (set-point)
The button ▲ allow the increase of the current set-point 0.5ºC
The button ▼ allow the decrease of the current set-point 0.5ºC

C) SELECTING THE FAN OPERATING MODE

To be able to select a fan operating mode, cool, heat or auto unit's operating mode must be selectted
Pressing FAN button scrolls through the following modes: FAN CONSTANTLY ON, or AUTO

AUTO:
Fan on and off together with the compressor, the symbol *aut* lights up for 5 seconds

FAN CONSTANTLY ON
Fan is continuous ON, the symbol *1* lights up for 5 seconds



SELECTING THE TEMPERATURE SET POINT CATEGORY

After COOL, HEAT or AUTO, operating mode have been selected, pressing set button select the set point category.

There are 3 possible set-point categories available

1- Comfort set-point (indicated by the symbol):
Is the reference room desired temperature (set-point), used for the rest of the categories

2-Brief absence set-point (indicated by the symbol):
Typically used when the room is not occupied for a sort period of time

3- Night-time set-point (indicated by the symbol) :
The room is occupied yet a lower level of comfort is required

The default set-point values for the various categories are:

CATEGORY		SET COOL	SET HEAT
	COMFORT	Desired room temperature (set-point 23ºC)	Desired room temperature (set-point 23ºC)
	BRIEF	Increase 4ºC the set point selected on comfort category	Decrease 4ºC the set point selected on comfort category
	NIGHT	Increase 2ºC the set point selected on comfort category	Decrease 2ºC the set point selected on comfort category

How to change the desired temperature (set-point) for the differente categories?

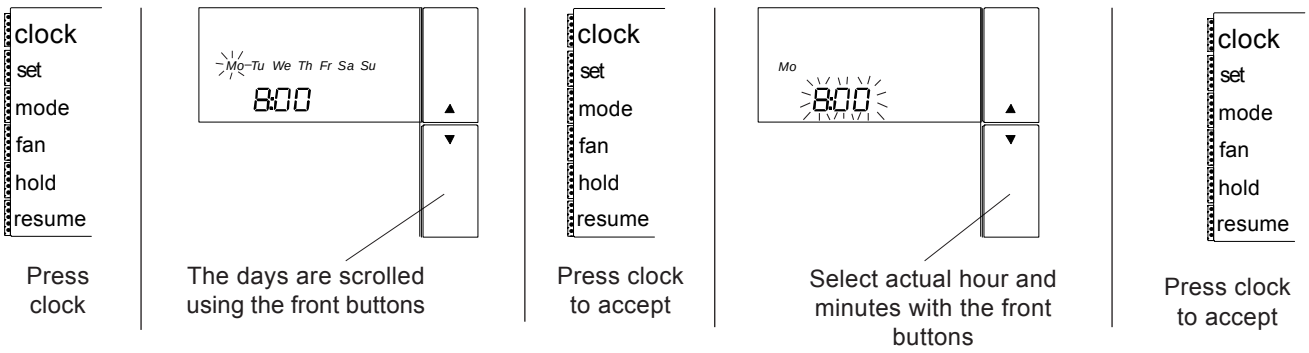
Pressing the SET button in manual operating mode select comfort category . During the time the symbol is flashing and pressing the front button ▲ and ▼ changes the currently set-point used by the control. This is the set-point reference for the rest of the categories:
Following the same steps we can selected the categories: breif absence or night , and with the front buttons ▲ and ▼ assign the value between 0ºC to 10ºC for each category, wich means the degrees encrease or decrease from the comfort category set point .

CLOCK AND TIME BANDS (AS AN OPTION)

This electronic control with clock fuction, is a programmable terminal (programming the time bands).
With this terminal set-point desired can be setted for 24 hours a day, during the seven days a week.
This clock and time-bands terminal, is supplied as an optional, therefore it must be especifically requested if needed
.

Proceed as follow to program the time bands:

1º Set the actual time, to make one, when terminal is installed for the first time.



There are 6 possible time bands, indicated respectively by the letters t1-t2-t3-t4-t5-t6. The bands may be at different times for each day of the week and at different set-points, yet must be chosen from the three categories previously programmed.

EXAMPLE:
The table below shows an example of time bands clock for a week.

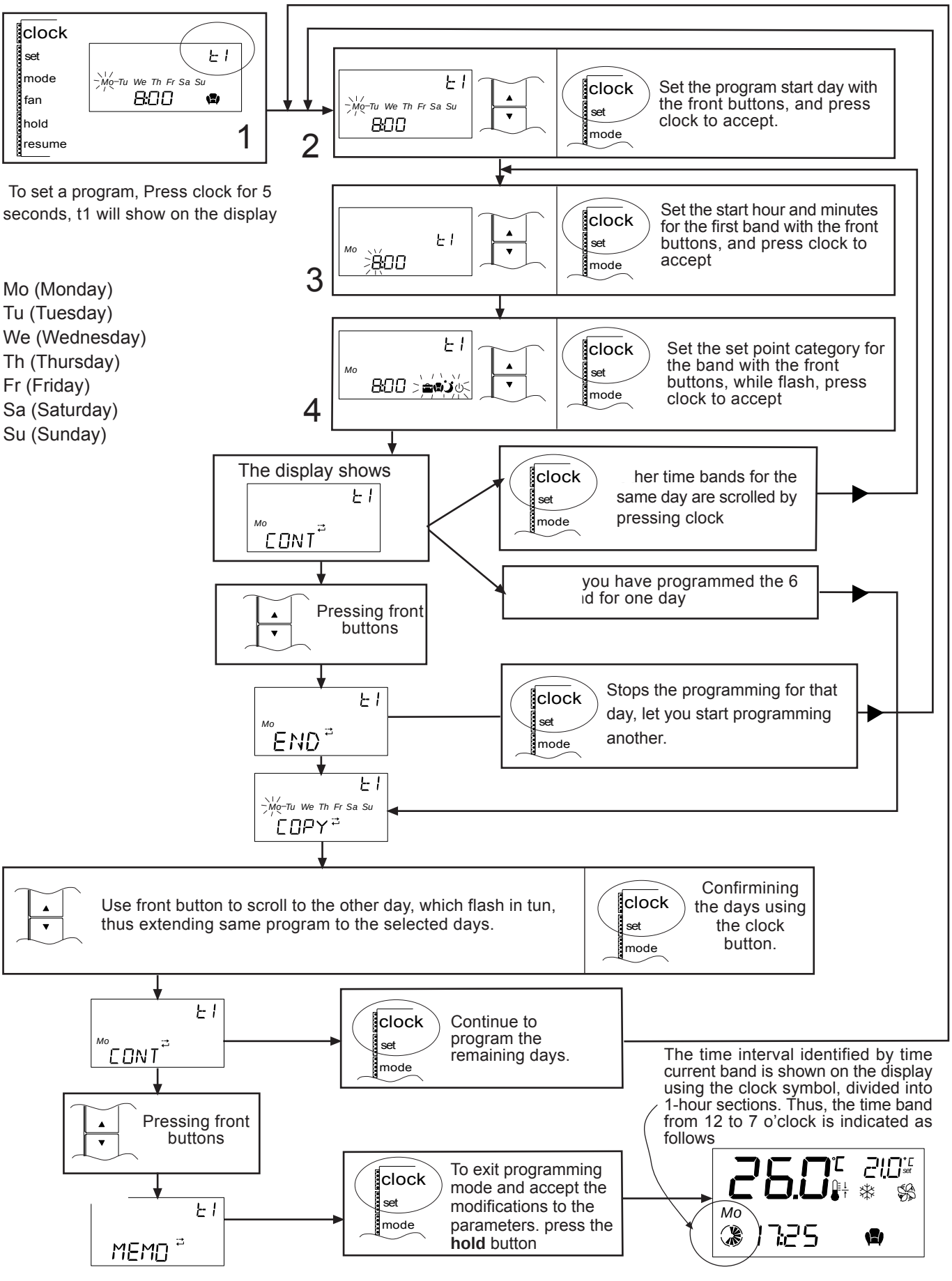
	Mo (Monday)	Tu (Tuesday)	We (Wednesday)	Th (Thursday)	Fr (Friday)	Sa (Saturday)	Su (Sunday)
t1	8:00	8:00	8:00	8:00	8:00	8:00	8:00
t2	14:00	14:00	14:00	14:00	14:00	22:00	22:00
t3	16:00	16:00	16:00	16:00	16:00	---	---
t4	18:00	18:00	18:00	18:00	18:00	---	---
t5	20:00	20:00	20:00	20:00	20:00	---	---
t6	22:00	22:00	22:00	22:00	22:00	---	---

Ussing the table below, to design your own programming scheduale.

	Mo (Monday)	Tu (Tuesday)	We (Wednesday)	Th (Thursday)	Fr (Friday)	Sa (Saturday)	Su (Sunday)
t1							
t2							
t3							
t4							
t5							
t6							

CLOCK AND TIME BANDS PROGRAMMING

PROGRAMMING PROCESS

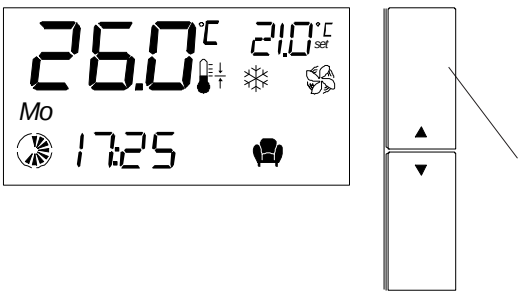


CLOCK AND TIME BANDS PROGRAMMING

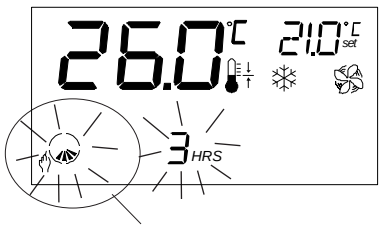
After all time bands have been programed and unit it is working on any of them, there are two ways to change the desired set-point for the time-band currently on:

A) Change the desired set-point of the current time-band during three hours.

The desired set-point can be changed, using the front buttons, and will maintain the change for three hours. Press **resume** button to return to time band operation before lapse the three hour.



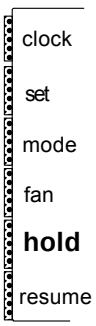
Change set-point
using the front buttons



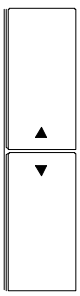
Shows the time band during the set point will be setted.

After lapse three hours, returns to time band operation.

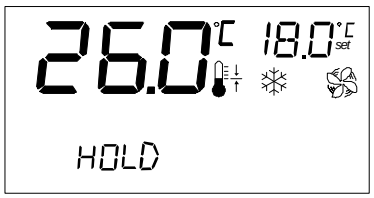
B) Change the desired set-point of the current time-band during time setted for the change.



Press hold



Change set-point
using the front buttons

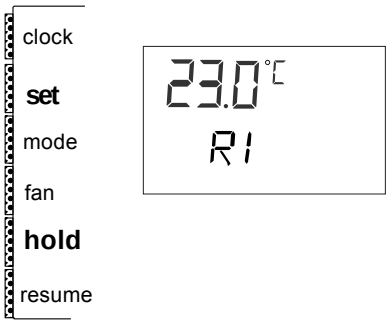
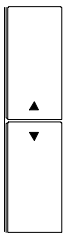
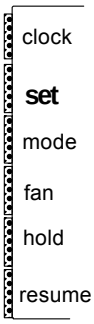
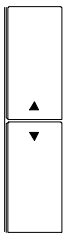
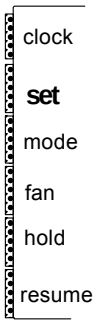


The set-point will be maintain, until resume button is pressing to return to time band operation

PROGRAMMING THE PARAMETERS

All modifications on the operating unit parameters, must be carried out by qualified personnel. Un unadecuate programming of the parameters may cause damage to the unit. And consecuently the lost of garantee to the unit.

Procced as follow, to reach to the operating parameters of the unit:

Step 1	Step 2	Step3	Step 4	Step 5
				
Pressing simultaneous both **set** and **hold** buttons, the display shows the first of the unit operating parameters.	The parameters are scrolled using the front buttons	The modifications are accepted by pressing **set** again	Parameters allow a change during they are flashing.	Pressig **set** to accept modifications

To continue modifying other operating parameters follow steps 2-3-4.

To exit programming mode and accept the modifications to the parameters, press the **hold** button.

To exit programming mode, and NOT accept the modifications to the parameters, press the resume button, or wait for 1 minute of inactivity (the final 15 seconds are signalled by the flashing of the characters on the display)

PROGRAMMING

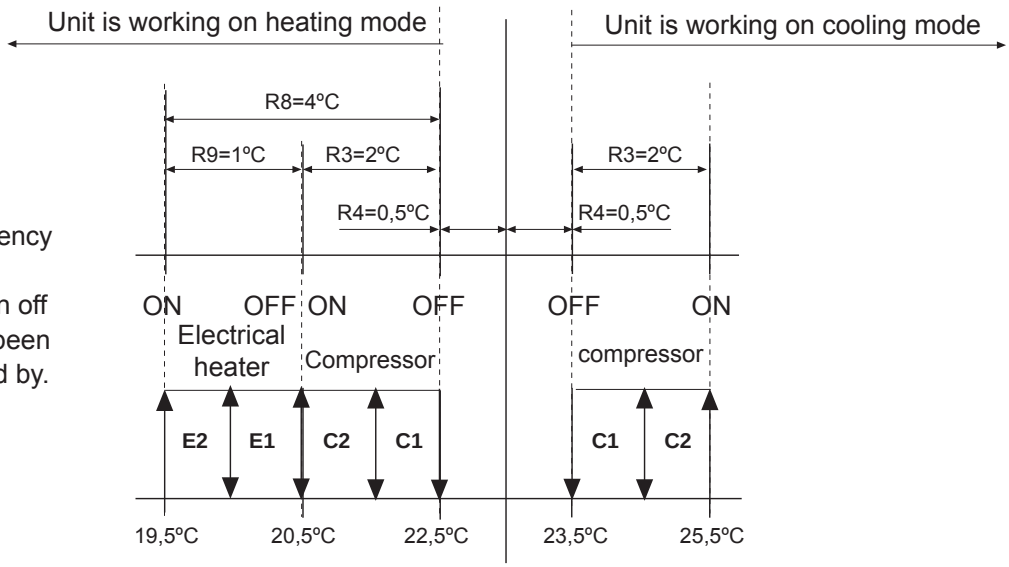
The table below gives the following information for each parameter.

COD: The code which appears on the display
The field variation for the parameters, □
MIN: Maximum value for the parameter □
MAX:Minimum value for the parameter
UNIT: The unit of measure used.□
C=Centigrade, F=Fahrenheit, s= seconds, min=minutes, h=hours, Khrs=hoursx1000
VAR.: Mínimum variation allowed
DEF: The default value, factory set.

COD	DESCRIPTION	VALUES MIN	VALUES MAX	UNIT	VAR.	DEF
S4	Regulation probe calibration. Value to be added to/subtracted fromthe value measured by the temperature probe used for the regulation	-12	12	C/F	0.5	0
S6	Input digital filter, filter for analoge inputs, S6=1 the faster.	1	15	---	1	1
S7	Unit for measure temperature S7=0 the temperatue is visualized on ºC S7=1 the temperatue is visualized ºF	0	1	---	1	0
S8	Indicates the presence or an external or internal temperature probe	0	1	---	1	0
R1	Shows the current value on which temperature regulation is based (set-point)	---	---	C	---	23
R3	Temperature differential cool/heat	2.0	20	C/F	0.5/1	2
R4	Temperature dead zone	0	10	C/F	0.5/1	0,5
R8	Auxiliary element set-point offset	0	50	C/F	0.5/1	4
R9	Auxiliary element differential	1	22	C/F	0.5/1	1

HOW REGULATION PARAMETERS WORK? :
Through R1, R3, R4, R8, R9 parameters we set the temperature for which compressor and electrical heater will turn on, as figure shows.

The unit has automátic secuency change, therefore the compresssors turn on or turn off depeds on which one have been more time operating or stand by.



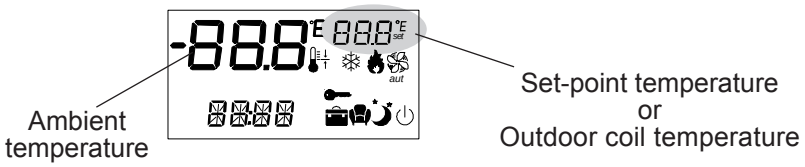
Desired temperature (Set Point) R1=23ºC

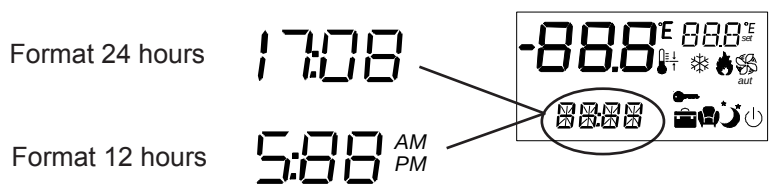
MODIFICATION SET POINT VALUE
To modify the set-point value, see page 5 on this manual

PROGRAMMING

COD	DESCRIPTION	VALUES		UNIT	VAR.	DEF
		MIN	MAX			
C5 C9	Hour-counter compressors. Indicates the number of compressors operating hours. When 19.900 working hours have been reached, the parameter start counting again .	0	19,9	Khrs	---	---
F3	Hour-counter inner fan. Indicates the number of inner fan operating hours. When 19.900 working hours have been reached, the parameter start counting again .	0	19,9	Khrs	---	---
F4	Supply fan operating hours threshold. Establishes the number of inner fan operating hours beyond which the maintenance intervention signal (alarm thf) is activated. F4= 0 ; Disables this function, alarm will no be visualized. F4 values from 1 to 10, number of hours x 1000, of inner fan operating hours	0	10,0	---	0,1	0

Parameters F3/F4 allow setting a number of inner fan operating hours after which the display shows the alarm code thf, which means air filter should be change.
Therefore parameter F4 should be change, establising the number of fan operating hours X1000 beyond wich the maitenence signal thf is activate.

H7	Establishes what is displayed on the field in the top right of the display H7= 1 Shows the value of the current set-point. H7= 2 Shows outdoor coil temperature.  	1	2	---	---	1
H9	Only for terminal with clock (as an option). Establishes the hour display format H9 =0 THE FORMAT IS 24 HOURS H9 =1 THE FORMAT IS 12 HOURS	0	1	---	1	0



DEFROST MANAGEMENT

The defrost process is activated during heating mode in the heat pump units, when the outside temperature is very low and the coil of the external heat exchanger could be frozen.
To melt the ice defrost function will turn on, and brings about the inversion of the reverse cycle valve from heating mode to defrost function.

DEFROST CYCLE SECUENCE:
During defrost cycle, the compressor will turn off then the inversion of the reverse cyle (from heating mode to defrost function, turn off outside fan, inner fan keeps going on.

START DEFROST CYCLE
The defrost cycle begins when outdoor temperature is below -2,2ºC.

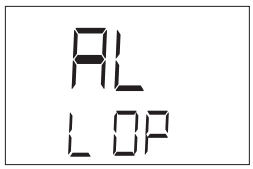
END DEFROST CYCLE
The defrost cycle ends when ocondensation pressure reach to 24 bar

DELAY BETWEEN TWO DEFROST REQUESTS
Time between to defrost cycles is 33 minutes, both circuits have independent defrost cycles, and never at the same time.
Therefore while one circuit is on defrost operating period, the other circuit is not operating.

ALARM CODES

La unidad se autoprotege mediente dispositivos de seguridad. Cuando alguno de estos dispositivos detecta una anomalía, lo indica en el display del terminal-termostato con el fin de avisar al usuario-instalador.
The activation of an alarma brings about:
- The display od the alarm code and the letters "AL", alternating with the display of the temperature
- The blocking of some or all the outputs, depending on the type of alarm.

When more than one alarm is actuvated at the same time, the display automatically scrolls through the active alarms.



VIS (Visualization) :Indicates the type of alarm shows on the display.
RE (Reset) : Type of reset: To enable the alarms:
AUT: AUTOMATIC RESET: Some alrams are automatically reset, when the cause is no longer present, they disappear from the display.
MAN: MANUAL RESET: Pressing RESUME button, for more than 5 seconds.
If the alarm conditions have been removed, the instrument returns to the normal operation and the alarma relayis de-energised. If on the other hand, the alarm conditions persist, the situation in progress remains, then call for technical service.

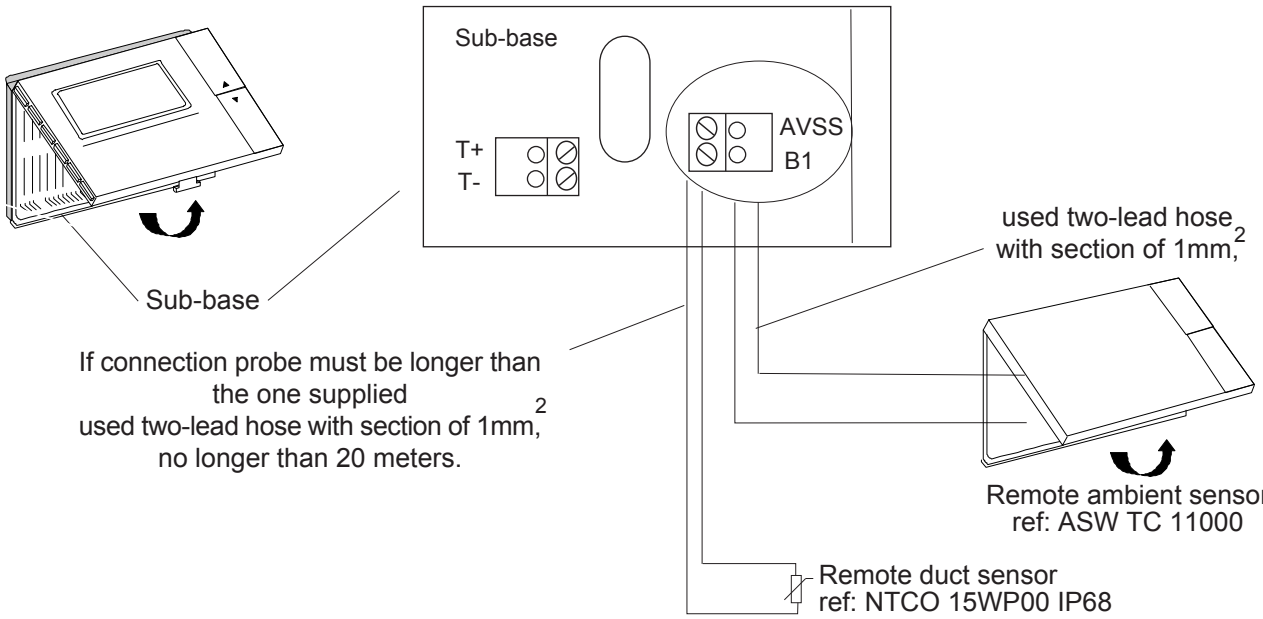
VIS.	DESCRIPTION	EFECTS	ACTION	RE
HR F	The number of operating hours of the supply fan exceeds the maintenence threshold set by parameter F4, air filter should be changed	Alarm visualization	To reset parameter F3, press the "set" button, simultaneously with ▲ and ▼ front buttons	MAN.
HI T	Indicates that unit is working at high indoor temperatures	Alarm visualization	The unit can operates on this situation only for sort periods of time. If this situation remains the same longer, turn off the unit.	MAN
LO T	Indicates that unit is working at high indoor temperatures			
E ID	This alarm may indicate the following problems: - High or low presostat protection - Compressor/s electrical protection/s - Inner fan/s electrical protection/s	Unit will stop	Select OFF as a unit's operating mode and then select ON again, if the problem persists, call for technical service.	MAN
th f	Alarm, inner fan protection	Unit will stop	Pressing the "RESUME" button during 5 seconds, until alarm desapeares, if the alarm shows up again call for technical service.	MAN
ES R	Terminal does not receives data comunication from the power board	Unit will stop	Turn off power supply and turn on again. If the problem persists, call for technical service	AUT
ES T	Power board does not receives data comunication from the terminal			
E 1	Ambient temperature regulation probe error	Unit will stop	Check the position of jumper J2, especificated on page.15	AUT
E 3	Outdoor coil temperature probe error	Unit will stop	Check probe connections. Call for technical service.	AUT

REMOTES SENSORS (AS AN OPTION)

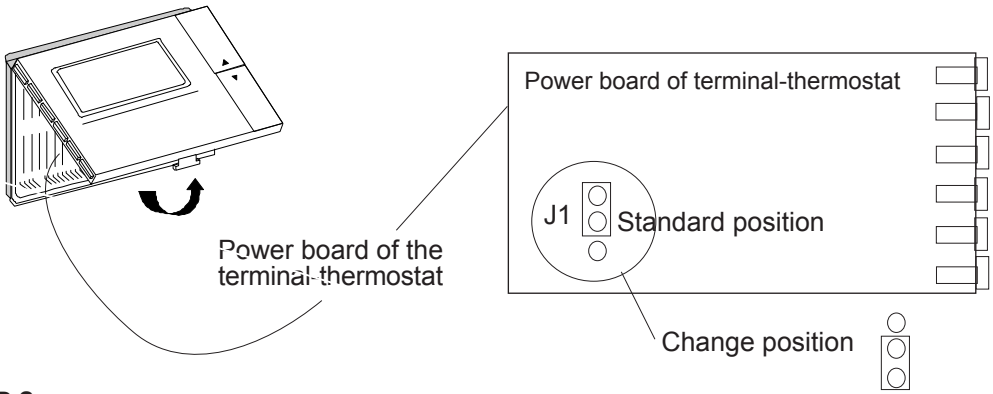
As an option, there are available two types of remotes sensors:
- **REMOTE DUCT SENSOR: The sensor should be located at the suction duct** , recording the room temperature continously.
- **REMOTE AMBIENT SENSOR: The sensor should be located at the room which has to be conditioned**

Both shoudl be used when the therminal-thermostat can be located on a positon where, the ambient temperature could not be measure with accuracy Example: High ceiling rooms, or terminal-thermostat on a place different from the room to be aconditioned.

To install them proceed as follow:
STEP 1:
Conect the probe to AVSS y B1 terminal located on the sub-base of the terminal-thermostat..



STEP 2:
Remove the jumper J1, located on the power board of the terminal-thermostat, follow the electrical diagram supplied with the unit.



STEP 3:
Change parameter S8 to 1.

STEP 4:
(Only for the opcional remote duct sensor)
Select CONT as the fan operating mode, in order to the room temperature will be detected continously, the display shows the symbol. 1
See page. 5 of this manual to select the fan operating mode.

POWER BOARD OF THE SYSTEM AT THE ELECTRICAL BOX OF THE AIR-CONDITIONING UNIT

Power supply: 24V ac+10%-15% 50/60Hz

- The board features a signalling green LED which flashes when unit is electrically supplied.
- The centre of the board also houses a jumper J3, which must be setted on the position showed in the electrical diagram supplied with the unit (between ID COM and INT).

When the jumper is positioned in any other position, the display shows several alarms, check this jumper when this is repeatted.

- El control protege los diferentes elementos del sistema, temporizando algunos arranques y paradas. Esto puede producir que ante una modificación en el control la actuación en la unidad puede llegar a tardar hasta 5 min. Tenga esto en cuenta a la hora de realizar el mantenimiento.

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Al mismo tiempo, incluyen indicaciones importantes para evitar posibles accidentes y daños graves antes de su puesta en marcha y durante su funcionamiento y para conseguir que su instalación funcione de manera segura y sin averías. Lea atentamente las normas de uso antes de poner en funcionamiento la instalación, familiarícese con el funcionamiento y el manejo de la instalación y siga escrupulosamente las indicaciones que se le hacen. A este respecto, queremos destacar la importancia de estar correctamente formado en el manejo de la instalación. Es indispensable que estas normas de uso se conserven en lugar determinado cerca de la instalación.

Al igual que otras instalaciones, esta instalación necesita un mantenimiento regular. Esta parte está destinada a su personal técnico y de servicio y a los empleados responsables.

Si desea formular alguna pregunta o recibir información adicional sobre algún punto específico relacionado con su instalación, no dude en ponerse en contacto con nosotros.

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