

# IADC

## Intelligent Air Damper Control



**RT4D**

English

Français



**UM IADC-N.1GBF**

Date : **May / Mai 2007**

Supersedes / Annule et remplace : **None / Aucun**





**CONTROL MANUAL**

NOTICE DE REGULATION

REGELUNGSHANDBUCH

MANUALE DI REGOLAZIONE

INSTRUCCIONES DE REGULACIÓN

English

Français

Deutsch

Italiano

Español

# CONTENTS

<b>GENERAL DESCRIPTION</b> .....	<b>3</b>
<b>INPUTS/OUTPUTS DESCRIPTION</b> .....	<b>4</b>
DIGITAL INPUTS .....	4
ANALOGUE INPUTS.....	4
DIGITAL OUTPUTS .....	4
ANALOGUE OUTPUTS.....	4
<b>UNIT ON/OFF</b> .....	<b>5</b>
REMOTE ON/OFF .....	5
ON/OFF BY SUPERVISOR (OR BMS: BUILDING MANAGEMENT SYSTEM) .....	5
<b>COMPRESSOR CONTROL</b> .....	<b>6</b>
COMPRESSOR CYCLING .....	6
<b>MAIN FAN CONTROL</b> .....	<b>6</b>
<b>EXHAUST AIR FANS CONTROL</b> .....	<b>7</b>
AUTO-TUNING FOR THE MANAGEMENT OF THE EXHAUST AIR FANS .....	8
AUTO-TUNING CYCLE PROCEDURE.....	8
<b>ROOM AIR TEMPERATURE CONTROL</b> .....	<b>11</b>
SUMMER/WINTER SWITCHING.....	11
SELECTION OF AUTOMATIC MODE CONTROL.....	11
SELECTION OF DIGITAL MODE CONTROL.....	11
SELECTION OF OPERATING MODE CONTROL BY SERIAL LINE .....	11
SUMMER TEMPERATURE, ROOM AMBIENT .....	11
WINTER TEMPERATURE ROOM AMBIENT .....	12
<b>DEFROST CYCLE</b> .....	<b>13</b>
DEFROST START CONDITIONS.....	13
CONTROL DURING DEFROST.....	13
DEFROST END-CONDITIONS.....	13
<b>RECYCLING AIR DURING MORNING- OR FIRST START OF THE RT4D</b> .....	<b>15</b>
<b>FREE-COOLING AND FREE-HEATING</b> .....	<b>15</b>
TEMPERATURE (SENSIBLE ONLY) OR ENTHALPY FREE-COOLING.....	15
MINIMUM OUTDOOR AIR FOR HYGIENIC VENTILATION OF THE BUILDING .....	16
OUTDOOR AIR DAMPER .....	16
<b>HOT WATER COIL WITH THREE WAY VALVE</b> .....	<b>17</b>
<b>ROOM AIR QUALITY</b> .....	<b>17</b>
<b>DISCHARGE AIR TEMPERATURE CONTROL (LOW AND HIGH LIMIT)</b> .....	<b>18</b>
<b>ANTIFREEZE PROTECTION</b> .....	<b>18</b>
<b>SMOKE ALARM</b> .....	<b>19</b>
<b>ALARM MANAGEMENT</b> .....	<b>19</b>
<b>USER KEYBOARD AND SETTING</b> .....	<b>19</b>
THE KEYBOARD BASIC COMMANDS .....	20
SETTING THE TEMPERATURE, ENTHALPY AND HUMIDITY SET POINT. ....	20
REAL TIME CLOCK PROGRAMMING.....	20



**POWER SUPPLY MUST BE  
SWITCHED OFF  
BEFORE STARTING TO  
WORK IN THE ELECTRIC  
CONTROL BOX**

## **GENERAL DESCRIPTION**

The **RT4D** is a double flux system with two blowers, combined with 4 air dampers.

The functions energy-recovering and free-cooling of the **RT4D** save compressor energy.

The **IADC** of the **RT4D** is programmed at the factory. It manages all the functions of the **RT4D**, such as Heating and auxiliary heating, cooling, free-cooling, minimum ventilation, heat-pump and defrosts, monitoring outdoor and indoor air temperatures, day-night, week programming, constant return air volume, and more. The **IADC** communicates with an external supervision via MODBUS or LON protocol. A User-Interface embedded on the **IADC** permit an easy dialog with the **IADC**. The **RT4D** unit is fully tested at the factory before shipment.

**INPUTS/OUTPUTS DESCRIPTION****DIGITAL INPUTS**

N°	Description
ID1	Unit On/Off
ID2	Summer/Winter switch
ID3	Smoke alarm
ID4	Air differential pressure switch
ID5	Thermal overload exhaust fan/supply blower
ID6	Thermal overload compressors circuit 1
ID7	Low pressure switch circuit 1
ID8	High pressure switch circuit 1
ID9	Thermal overload compressors circuit 2
ID10	Low pressure switch circuit 2
ID11	High pressure switch circuit 2
ID12	Humidifier alarm

**ANALOGUE INPUTS**

N°	Description
B1	Air differential pressure (4-20mA)
B2	High pressure circuit 1 (4-20mA/0-5V)
B3	Outdoor air temperature (NTC) /
B4	Return air temperature (NTC)
B5	Supply air temperature (NTC)
B6	High pressure circuit 2 (4-20mA/0-5V)
B7	Return air humidity (4-20mA)
B8	Outdoor air humidity (4-20mA)/ CO2 Value (0-10Vdc)

**DIGITAL OUTPUTS**

N°	Description
NO1	Compressor 1
NO2	Compressor 2
NO3	Reversing valve circuit 1
NO4	1st stage heater control
NO5	2nd stage heater control
NO6	Defrosting start circuit 1
NO7	exhaust fan/supply blower
NO8	General alarm
NO9	Compressor 3
NO10	Compressor 4
NO11	Reversing valve circuit 2
NO12	Defrosting start circuit 2

**ANALOGUE OUTPUTS**

N°	Description
Y1	Speed control outdoor fan
Y2	Condensation signal control for circuit 1
Y3	Condensation signal control for circuit 2 / Hot Water modulating valve
Y4	Modulating Outdoor air damper

## UNIT ON/OFF

The unit can be switched ON/OFF, by priority order, as follow:

- From the manual selection at the **IADC**- or at the remote User-Interface.
- From remote ON/OFF digital input (ID5) (if active).
- The serial control of the Supervision (such control cannot interfere with the User-Interface. The keyboard of the User-Interface has priority over the Supervision ).

ON and OFF mode at the keyboard will appear on the display as "LOCAL ON / LOCAL OFF".

### REMOTE ON/OFF

The unit is ON if the following conditions are encountered:

- If the digital input is active
- If the dry contact is closed

The unit is OFF if the contact is open.

The digital control takes priority over any other ON/OFF control (manual by keyboard and serial by Supervision).  
ON and OFF mode at the keyboard appear on the display as "REMOTE ON / REMOTE OFF".

### ON/OFF BY SUPERVISOR (OR BMS: BUILDING MANAGEMENT SYSTEM)

The signal is sent to the **IADC** by setting a dedicated digital variable.

The Supervisor cannot interfere with the keyboard. The keyboard control takes priority over the supervision

Example:

if the **RT4D** is turned OFF by Supervision, the keyboard (either local or remote) can start the **RT4D**.

The **RT4D** will stay OFF as long as the **IADC** receives an OFF order from the Supervision. Such order will also switch the manual control on the keyboard to the OFF position.

If the **RT4D** is turned ON by Supervision, the OFF command at the keyboard (either local or remote) will turn the machine OFF.

The machine will stay ON as long as the **IADC** receives an ON order from Supervision. Such order will also switch the manual control on the keyboard to the ON position.

## COMPRESSOR CONTROL

The number of compressors and circuits depends on unit configuration.

### COMPRESSOR CYCLING

Compressors ON/ OFF is controlled by the room air temperature.

The compressors rotation is managed according to the circuits (in the case of a 2-circuits configuration) and the compressors status.

The compressor cycling is driven by different delays.

It can be re-programmed at the **IADC** in the field.

The time delays include:

- Minimum compressor OFF-time: it makes sure that the compressor stays OFF for a while before it is switched ON again.
- Time lag between the starts of different compressors: this time ensures that the said time is taken before other compressors can switch ON (limits current peaks).
- Time lag between starts of a compressor: this time ensures that, once a compressor has been started, the said time is taken before this compressor starts again (limits demands per hour).
- Compressor start-up delay after main blower has been started (delay due to open the air dampers and permit air flow)
- Time delay to start the compressors after inverting a cycle on a defrost.
- Time delay to start the compressors after inverting a cycle at the end of a defrost.
- Low pressure time delay before starting of the first compressor .

## MAIN FAN CONTROL

The possible configurations of the fans are as follows:

- **RT4D** with one Main Supply- and one Exhaust-air fan (controlled by one fan relay signal )
- **RT4D** with dual Main Supply- and dual Exhaust-air fans

The Main Supply- and Exhaust air blowers will operate in accordance with the ON / OFF mode of the unit.

Once the unit is turned ON at the User-Interface, from the Supervision, or through the digital ON input at the **IADC**, the Main Supply- and the Exhaust Blower relay will be activated at the same time.

After the blowers have been turned ON, and according to the demand from the ambient temperature, the compressors will start only accordingly to the safety time programmed.



## EXHAUST AIR FANS CONTROL

For the control of the exhaust air fans, pulling the air from the building through the outdoor coil, the **IADC** uses the following sensor and analogue output.:

- The air differential pressure transducer (B1) installed in the return air duct (field connect by the installer).
- The electronic speed **IADC** (Y1) of the exhaust air fans.

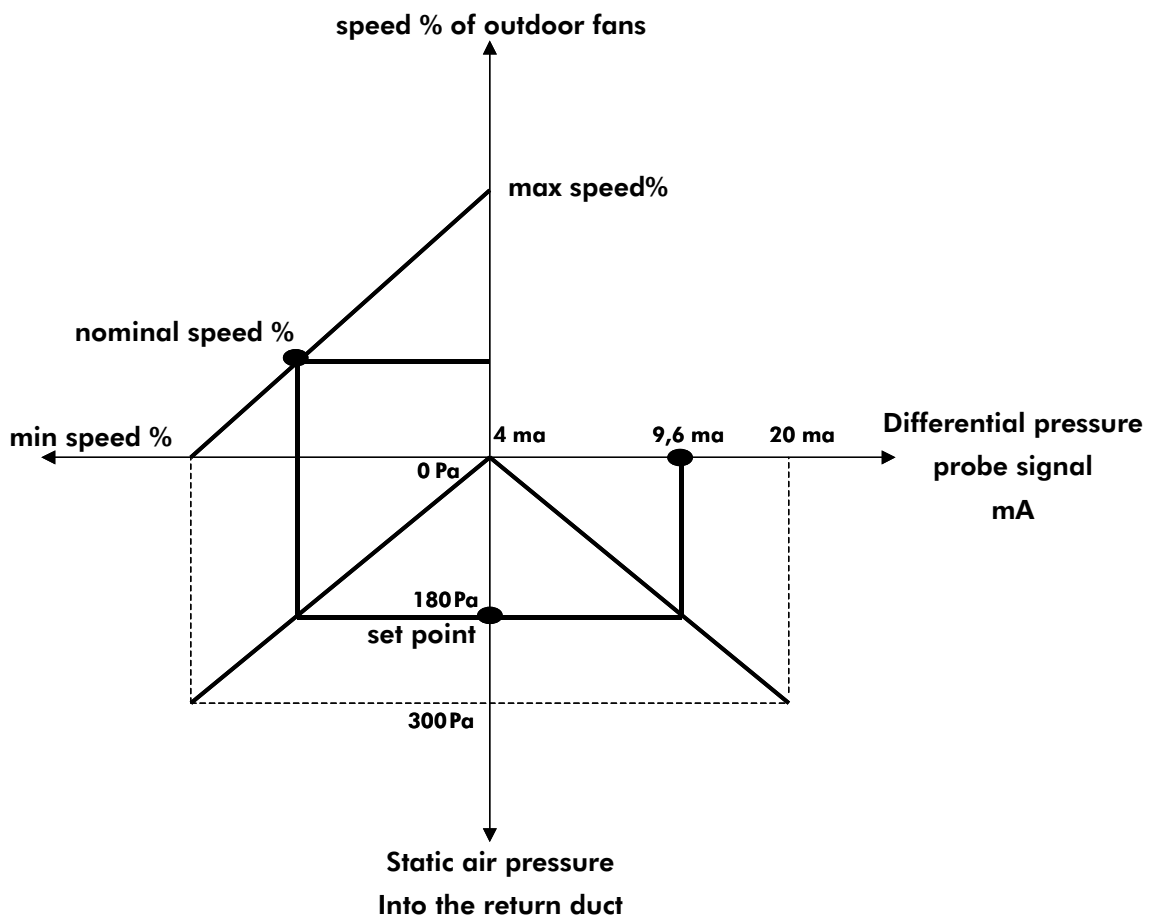
The parameters necessary to configure the management of the exhaust fans are:

- Set point of static air pressure in the return air duct from the building : for example 180 Pa
- Initial value of the pressure scale : for example 0 Pa
- Final value of the pressure scale: for example 300 Pa
- Minimum speed of the exhaust air fans (at initial value of the pressure scale): for example 35%
- Maximum speed of the exhaust air fans (at final value of the the pressure scale): 85% for example

Referring to the value of the parameters listed above, the output signal for the exhaust fans increases or decreases the speed of the fans compared to the static pressure in the return duct.

In this way, the return air flow from the building remains constant independently of the air damper position (recycling air, partial outdoor air or total free-cooling condition).

### CONTROL DIAGRAM OF THE EXHAUST AIR FANS



## AUTO-TUNING FOR THE MANAGEMENT OF THE EXHAUST AIR FANS

At the start-up of the **RT4D**, it is possible to adjust the parameters for the exhaust air fans automatically. When the **RT4D** is OFF, enter in the maintenance menu, select the parameter "Auto-tuning fans". Set it to YES.

When the auto-tuning procedure is finished, the parameter changes automatically to NO.

The other parameters of the exhaust air fans will be written automatically at the new value recorded in the return air duct during the auto-tuning.

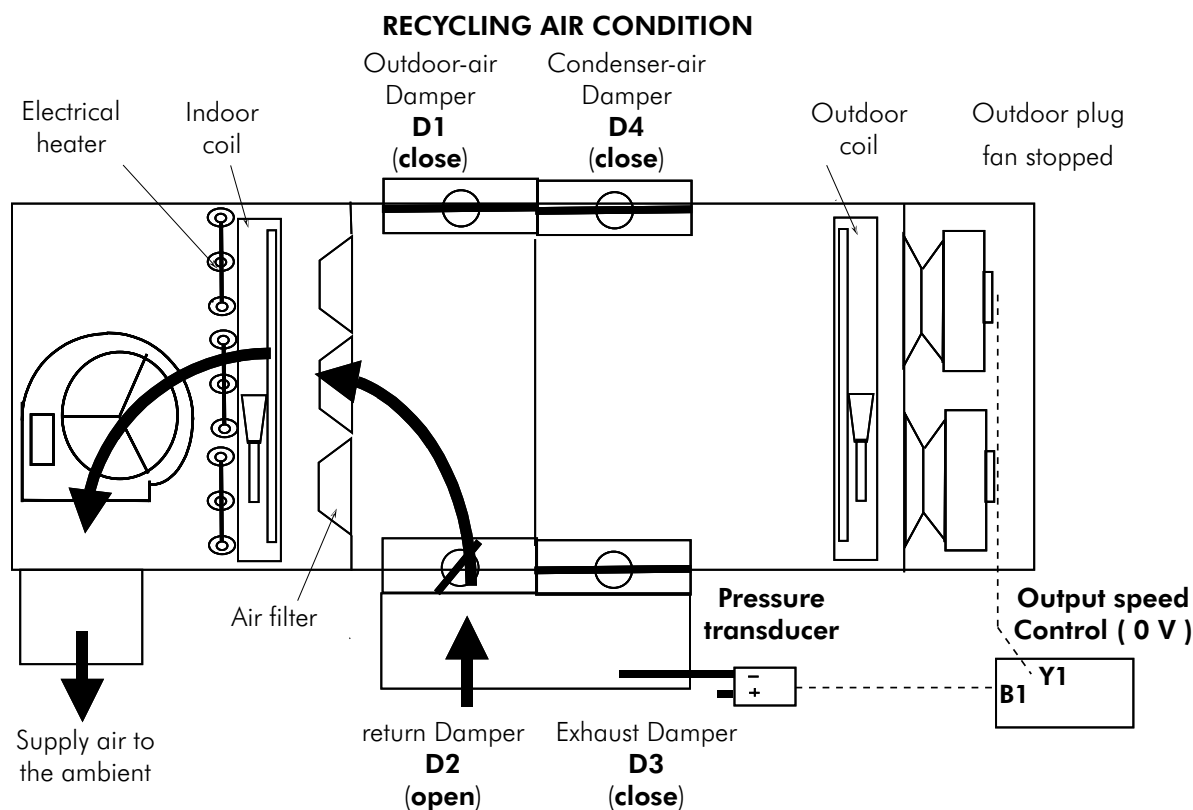
### AUTO-TUNING CYCLE PROCEDURE

Set the parameter "Auto-tuning fans control" in maintenance menu' at YES to start the procedure.

In the display appears:

- the value of the actual static pressure (Pa)
- the differential pressure transducer (B1)
- the value of speed % of the exhaust fans (Y1).

**1st. step.** Check the static pressure in the return air duct connected to the **RT4D** during the recycling air operation.



In this phase the Main supply blower is ON, the exhaust air fans are OFF and all the analogue outputs are forced to zero value.

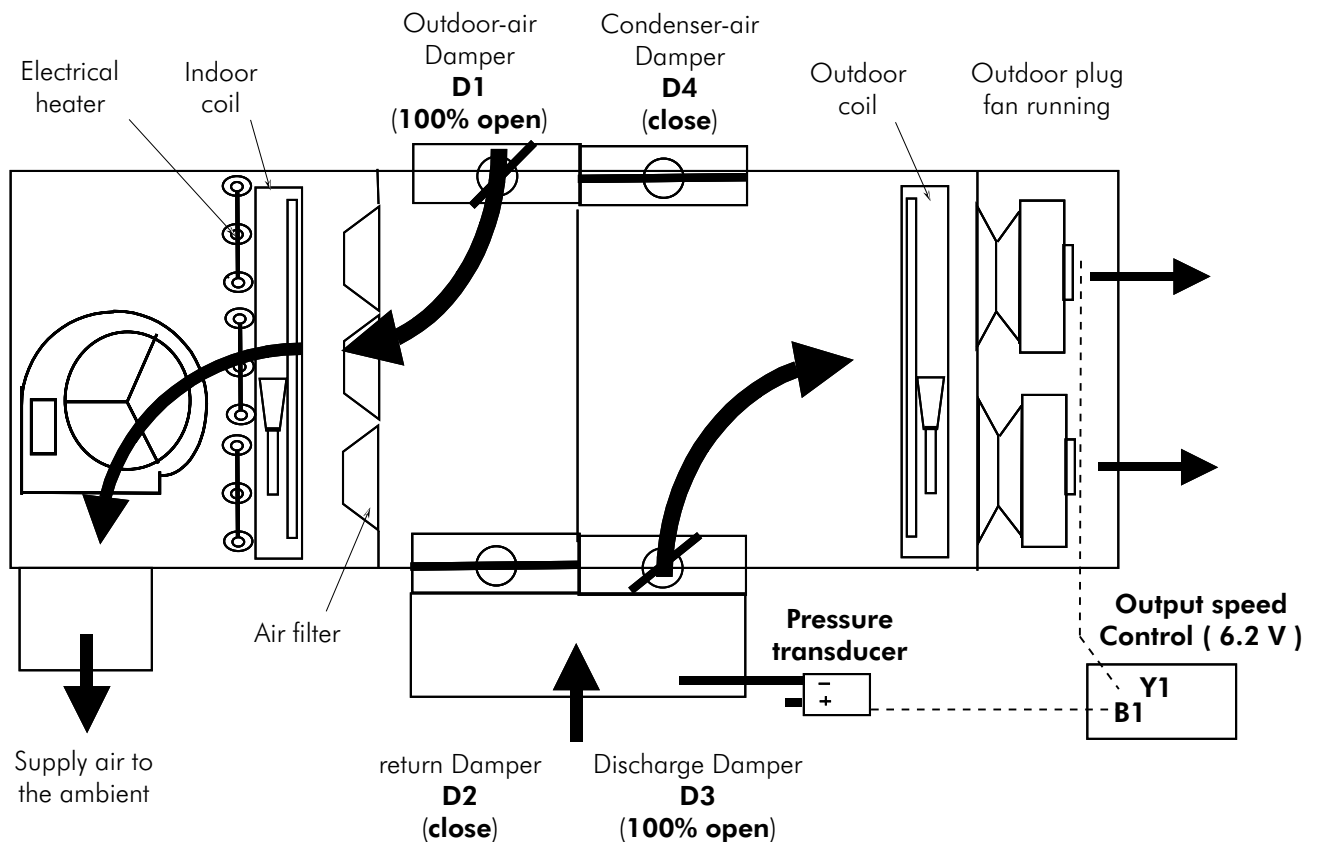
In this way the **RT4D** operates in recycling air only (outdoor dampers **D1+D3+D4** closed) and remains in this situation during the setting time of the parameter auto-tuning (expressed in second). This period is necessary to obtain a stable value of the static pressure in the return air duct.

When the time of auto-tuning is finished, the **IADC** writes automatically the actual value of the static pressure recorded, and it becomes the set point parameter of the return air static pressure.

Example: set point of the air static pressure = 180 Pa

**2nd. step** Checking the static pressure in the return duct during the total free-cooling condition (100% of outdoor air **D2 + D4** closed).

### TOTAL FREE-COOLING CONDITION



In this step of the auto-tuning procedure, the outdoor air damper is opened up to 100%. The exhaust air fans control speed management will be activated to maintain the air pressure in the return duct stable at the set-point. For example, first step of the auto-tuning 180 Pa.

The analogue output Y1 (exhaust fans speed **IADC**) increases from zero to the value necessary to obtain the air pressure set-point (for example 62% of the max. speed).

In this step we can have three conditions :

- **Normal condition:** the static pressure in the return duct increases and arrives at the set-point without problem. The auto-tuning step 2. is finished.
- **Alarm condition with display message: Alarm – pressure set point lower.** This situation can occur when the value of the set-point pressure in the return air duct is lower than the value recorded by the differential pressure transducer at the minimum speed of the exhaust fans. In this case we need to reduce the value of the parameter “minimum speed %”.
- **Alarm condition with display message: Alarm – pressure set point higher.** This situation can occur when the value of the set-point pressure in the return air duct is higher than the value recorded by the differential pressure transducer at the maximum speed of the exhaust fans. In this case we need to verify the correct installation and size of the return air duct.

When the step 2. of the auto-tuning is completed, we are sure that the air flow leaving the building and pressure in the building remain constant during the free-cooling management.

**3rd. step.** Check the static pressure in the return air duct during the total free-cooling period (100% outdoor air **D1** to the building) with the condenser air damper (**D4**) open.

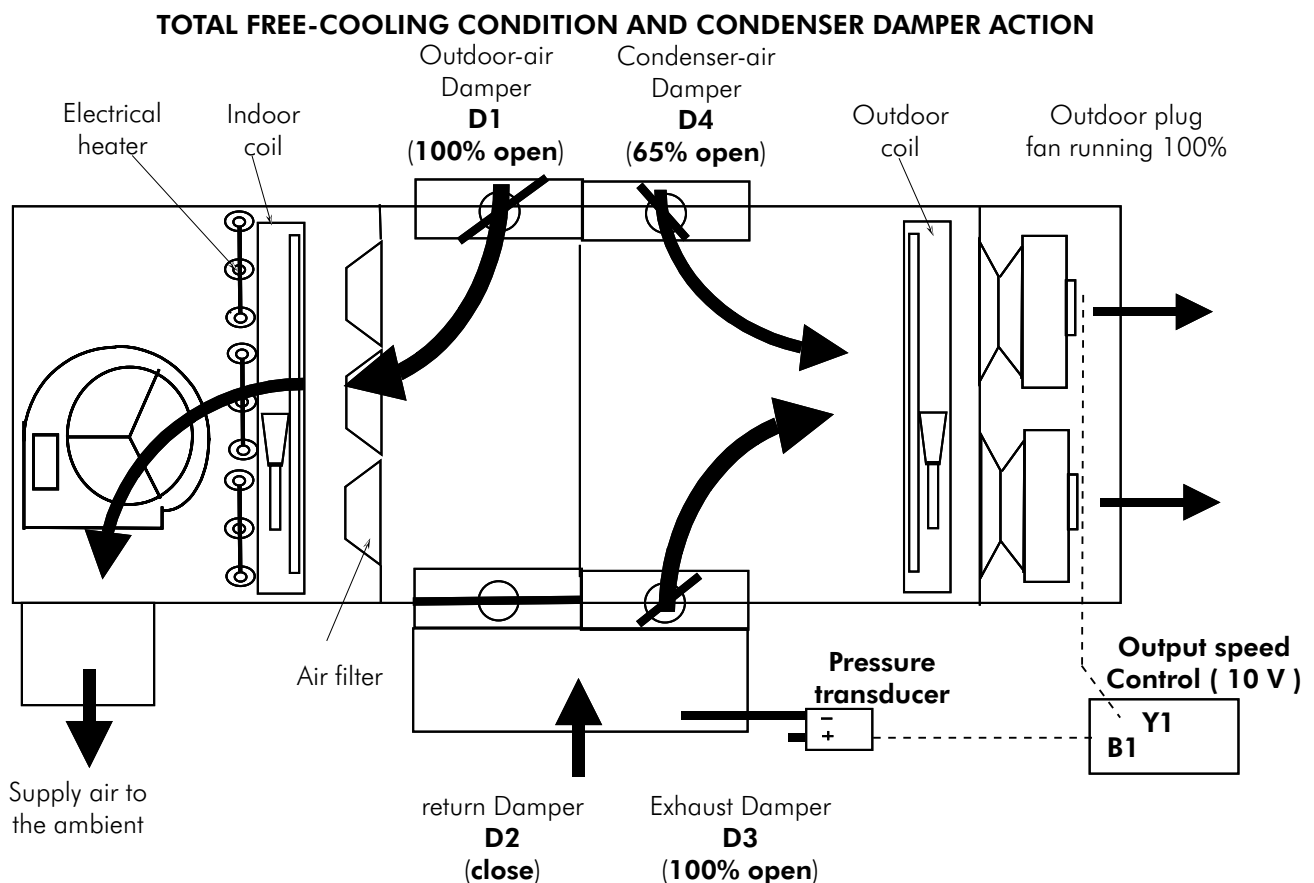
When the compressors are working on cooling or heating, the outdoor coils are supplied with outdoor air through the second outdoor air damper (the condenser air damper **D4**).

The condenser air damper (**D4**) is controlled by the analogue output Y2 and Y3.

The condensing or evaporating pressure of the refrigerant circuit is monitored by a pressure transducer (B2,B6).

When the compressors are ON, the opening of the condenser air damper (**D4**) can be reduced by the value of the air static pressure in the return air duct and thus, decrease the exhaust airflow from the building, which would be a problem for the occupants.

The step 3. of the auto-tuning prevents from this problem during the ON compressors period.



In this step of the auto-tuning the analogue output Y1 increases up to 100% of its value. The exhaust air fans are at maximum speed.

The analogue output Y2 and Y3 concerning the condenser damper (**D4**) are increased from zero (damper close) to the value which does not permit to return air static pressure to decrease from the set point ( for example 65% of the damper opening).

The two new values of the analogue outputs Y2 and Y3 are written automatically by the **IADC** with the following parameters:

- Max. signal of condenser air damper (**D4**) of circuits 1 and 2 = record value at. step 3 (ex. 65%)

When the step 3 of the auto-tuning is completed, the adjustment is finished and the **RT4D** returns in the OFF condition automatically, with the following message in the display:

"Auto-tuning procedure completed ---> OK"

## ROOM AIR TEMPERATURE CONTROL

### SUMMER/WINTER SWITCHING

Summer- / Winter mode can be selected:

- At the **IADC**- or remote keyboard (manually)
- From remote switching via digital input
- By the Supervision
- Automatic Summer / Winter mode must be programmed. In such case, the automatic control takes priority over any other form of control.

### SELECTION OF AUTOMATIC MODE CONTROL

The automatic selection of the Summer / Winter mode must be programmed with parameters.

The unit switches from summer to winter mode or vice versa depending on the room air temperature.

At the same time, it will respect the programmed time delay to reverse the refrigerant cycle valve and the compressors

The automatic control takes priority over any other form of control.

### SELECTION OF DIGITAL MODE CONTROL

It must be programmed.

The remote selection of the Winter- or Summer mode, can be done with a digital input ID2 when this function is programmed at the **IADC**.

- Contact open: summer mode
- Contact closed: winter mode

The digital function is indicated in the display by the label :

"Remote Summer condition / Remote Winter condition".

The digital input Summer / Winter condition has the priority over the keyboard manual switch.

### SELECTION OF OPERATING MODE CONTROL BY SERIAL LINE

This method uses the software variable value by transmitting a serial data line with a dedicated program.

The Winter/Summer software variable value does not take priority over any other type of operating mode control (digital or keyboard).

### SUMMER TEMPERATURE, ROOM AMBIENT

The air ambient temperature can be regulated by a proportional (P) or proportional + integral (PI) action according to the specific application.

With the proportional action (P) the Room Ambient temperature operates on the differential zone selected by the user. It is proportional to the distance between the return air temperature and the set point.

With the proportional + integral action (PI) the Room Ambient Temperature includes a time factor. A time constant (the parameter is  $T_0$  in second) will determinate the speed in which the **IADC** performs the actions (less seconds ----> higher speed). The usual time constant is  $T_0 = 600$  sec.

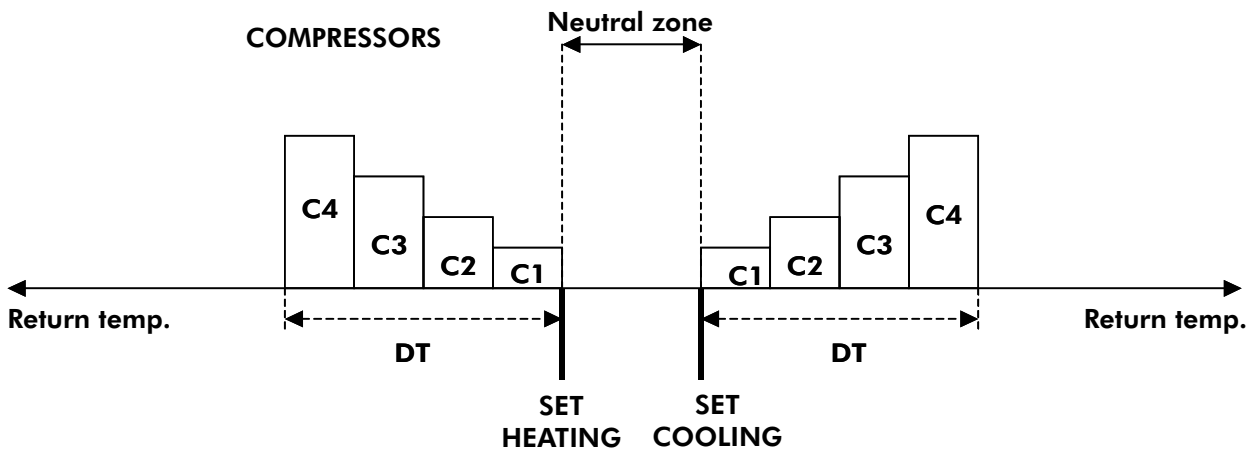
The modulating hot water valve or the additional electric heater can be activated during the summer condition only on dehumidification mode or to protect from freezing.

### WINTER TEMPERATURE ROOM AMBIENT

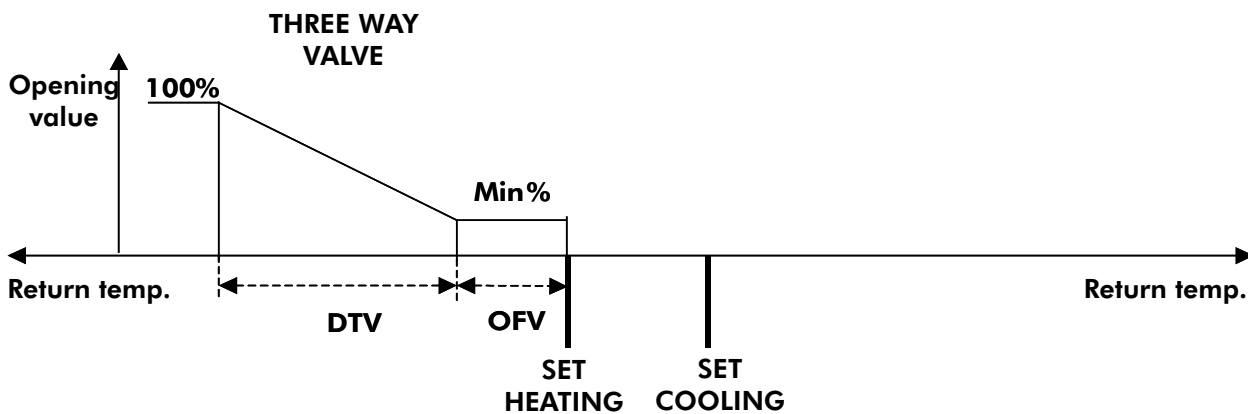
In the winter condition the Room ambient stages are:

#### ROOM AMBIENT CONTROL DIAGRAM

➤ Compressors operate in the heat pump mode;

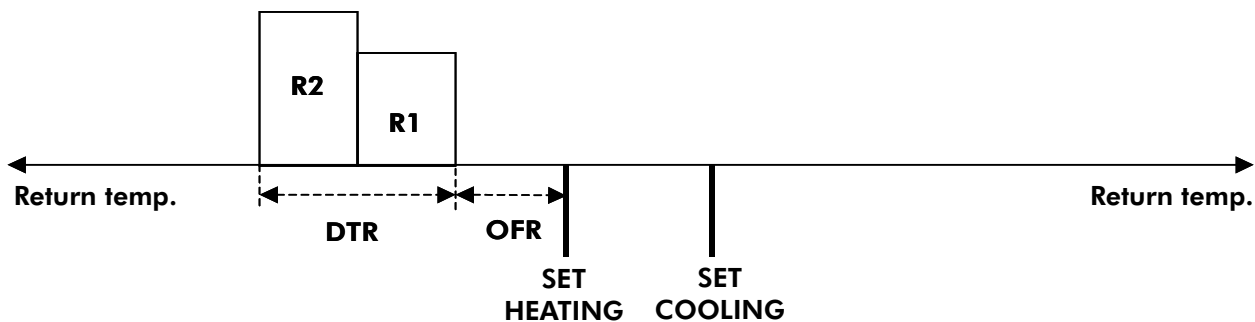


➤ The 3 way hot water valve Modulates (0 -10 Vdc. signal);



➤ 2 additional step of electric heaters operates.

#### ADDITIONAL HEATERS



When the **RT4D** is OFF, only the 3 way hot water valve can be activated for antifreeze safety control of the hot water coil (antifreeze thermostat activates the **RT4D** in OFF position).

## DEFROST CYCLE

The defrost is activated in the heating mode only.

The defrost starts according to the evaporating pressure during the heating mode. The parameters listed below are programmed.

### DEFROST START CONDITIONS.

The starting of the defrost cycle depends set point of the "pressure start defrost parameter".

When the sensor detects an evaporating pressure below the set point, the defrost waits for:

- a cumulated time delay > (defrost time delay parameter expressed in minute) before the defrost cycle starts.

The timer will stop (but it cannot be reset) if the evaporating pressure rises above the set point or the compressors is switched off.

The timer will re-set to zero when the defrost cycle is completed, or the unit is turned OFF, or the operating mode is changed to cooling.

The 2 circuits (depending on unit size) can not defrost at the same time.

### CONTROL DURING DEFROST.

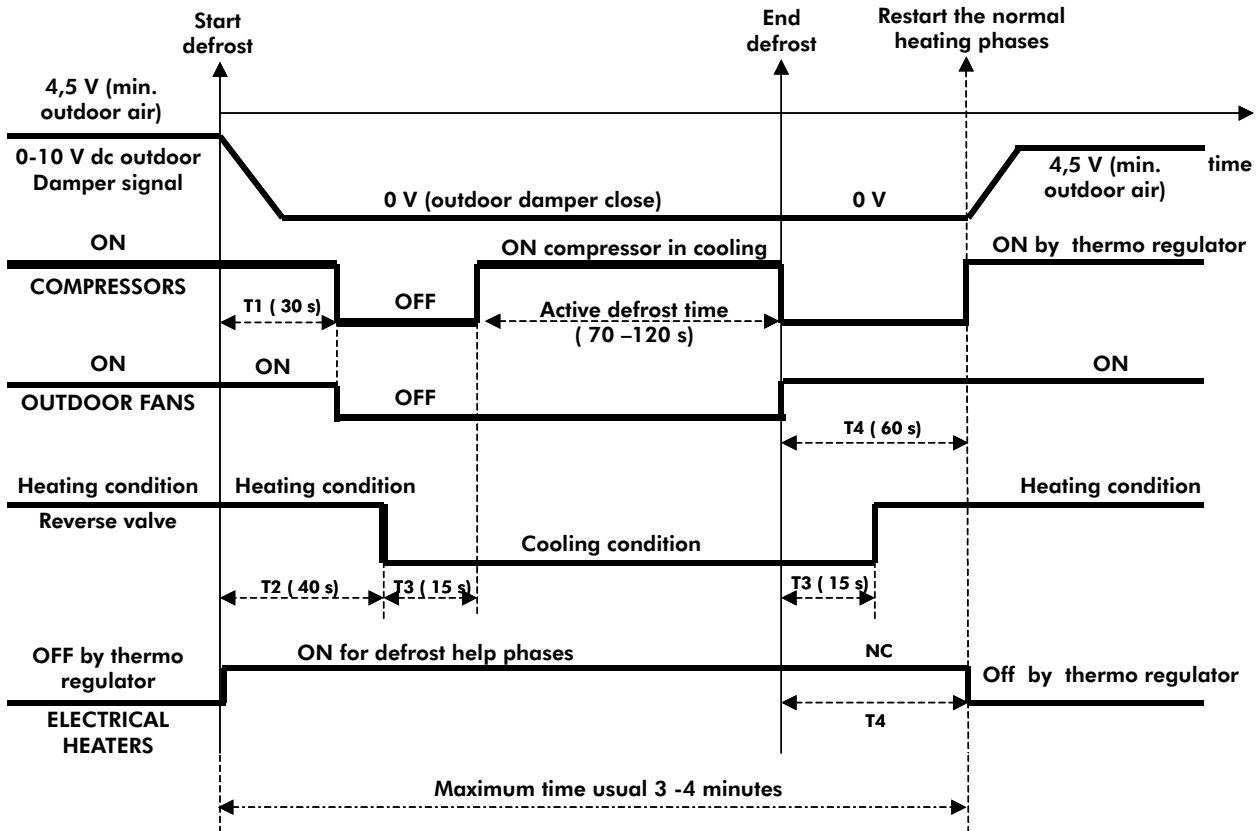
The reversing valve in the defrosting circuit will reverse to cooling. The compressors are turned on to full power in the defrosting circuit. During the defrost cycle, the outdoor fans will be OFF. At the end of the defrost cycle, the outdoor fans will operate at full speed for a certain time to remove water from the outdoor coil as quickly as possible.

### DEFROST END-CONDITIONS.

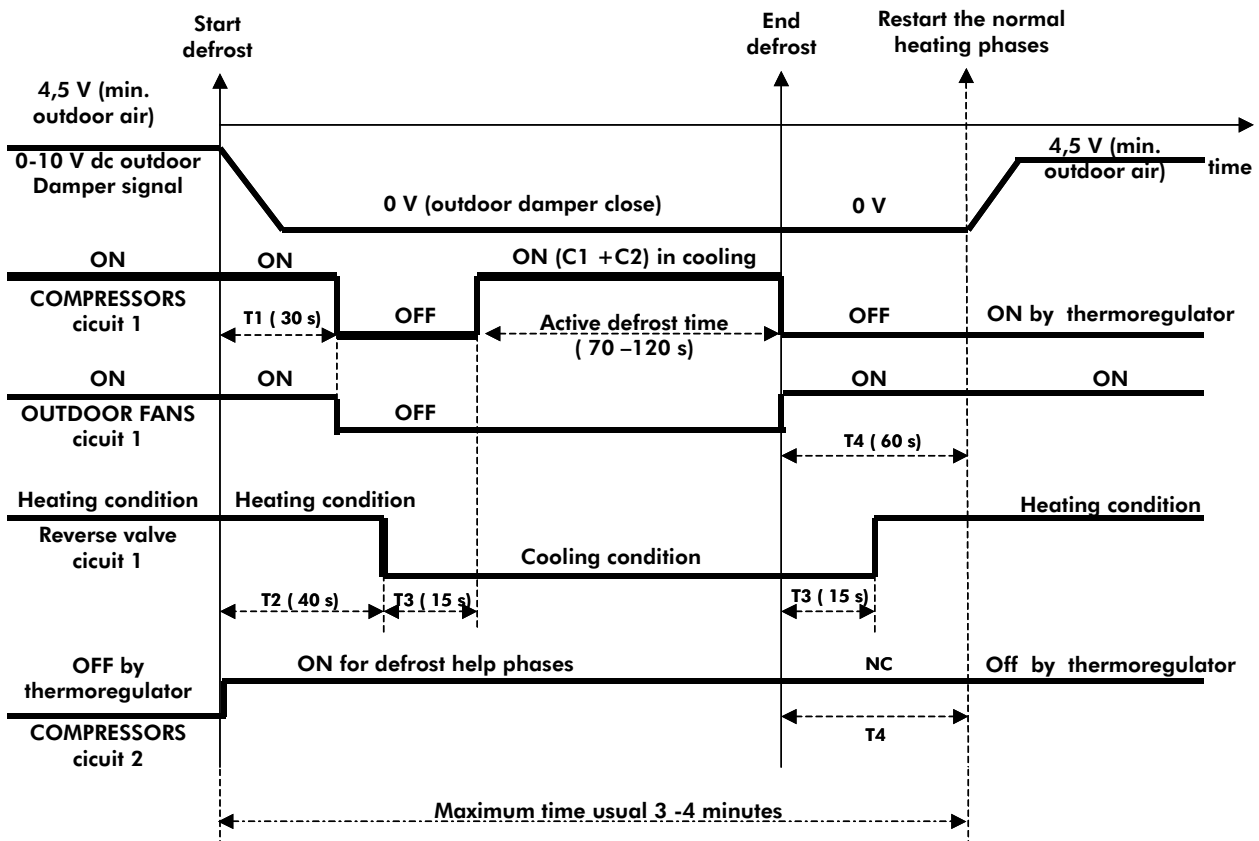
The end of the defrost cycle may be determined by the follow conditions:

- when the condensing pressure rises above the value of "end defrost pressure parameter".
- when the duration of the defrost cycle exceeds the value of "time out defrost parameter".
- when during the defrost cycle an alarm condition appears.

### DEFROST DIAGRAM FOR RT4D WITH ONE REFRIGERANT CIRCUIT



### DEFROST DIAGRAM FOR RT4D WITH 2 INDEPENDENT CIRCUITS





## RECYCLING AIR DURING MORNING- OR FIRST START OF THE RT4D.

When the **RT4D** switches to ON position (the command can come from the User Interface, the digital control or the Supervision) and if the parameter Recycling Start-Up is set on YES, the **RT4D** will start in the cooling or heating mode with the outdoor air damper closed. This condition remains activated until the return air temperature reaches the set-point at the **IADC**.

After this action, the **RT4D** operates at the minimum of outdoor air ventilation or free-cooling.

## FREE-COOLING AND FREE-HEATING

### TEMPERATURE (SENSIBLE ONLY) OR ENTHALPY FREE-COOLING

The free-cooling mode is activated during the Summer operation.

If the outside temperature conditions are not favourable, the free-cooling and/or the free-heating mode are not activated and the compressors work normally.

The summer freecooling is allowed only if:

- The Outside temperature < (return temperature –  $\Delta T$  summer)

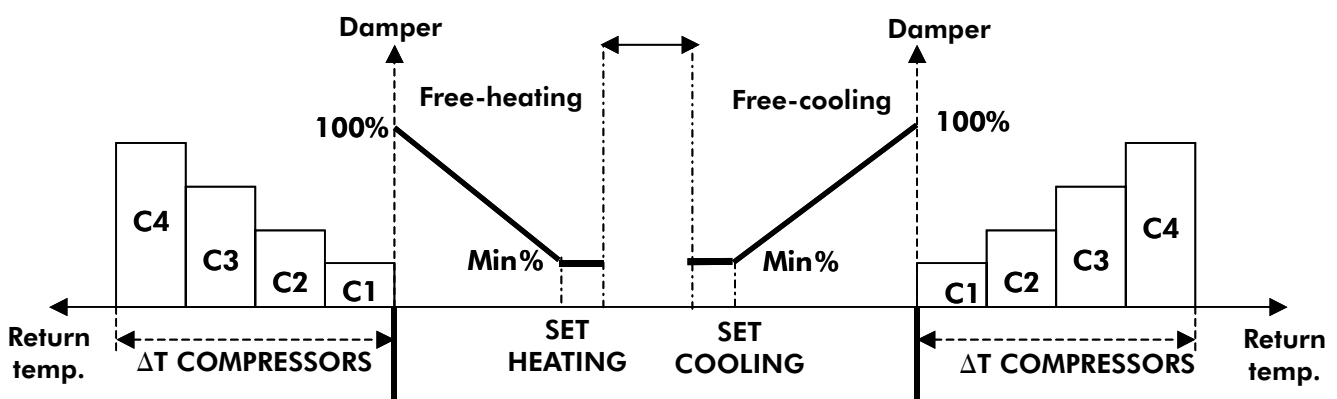
The outside temperature is favourable to activate the free-heating when:

- The Outside temperature > (return temperature –  $\Delta T$  winter)

The same functions are relevant for the enthalpic free-cooling. In this case, the **IADC** must be connected and configured with the temperature and humidity sensors (ambient and outdoor).

The outdoor air damper (**D1**) modulates across the entire band of the temperature differential. The return air temperature increase or decrease, above or below the set-point, the compressors will be started (partial free-cooling or partial free-heating ).

To prevent the introduction of unpleasant outdoor air when the temperature differs too much from the ambient temperature, a maximum value of the difference can be programmed. If exceeded, it annulates the free-cooling or the free-heating mode.

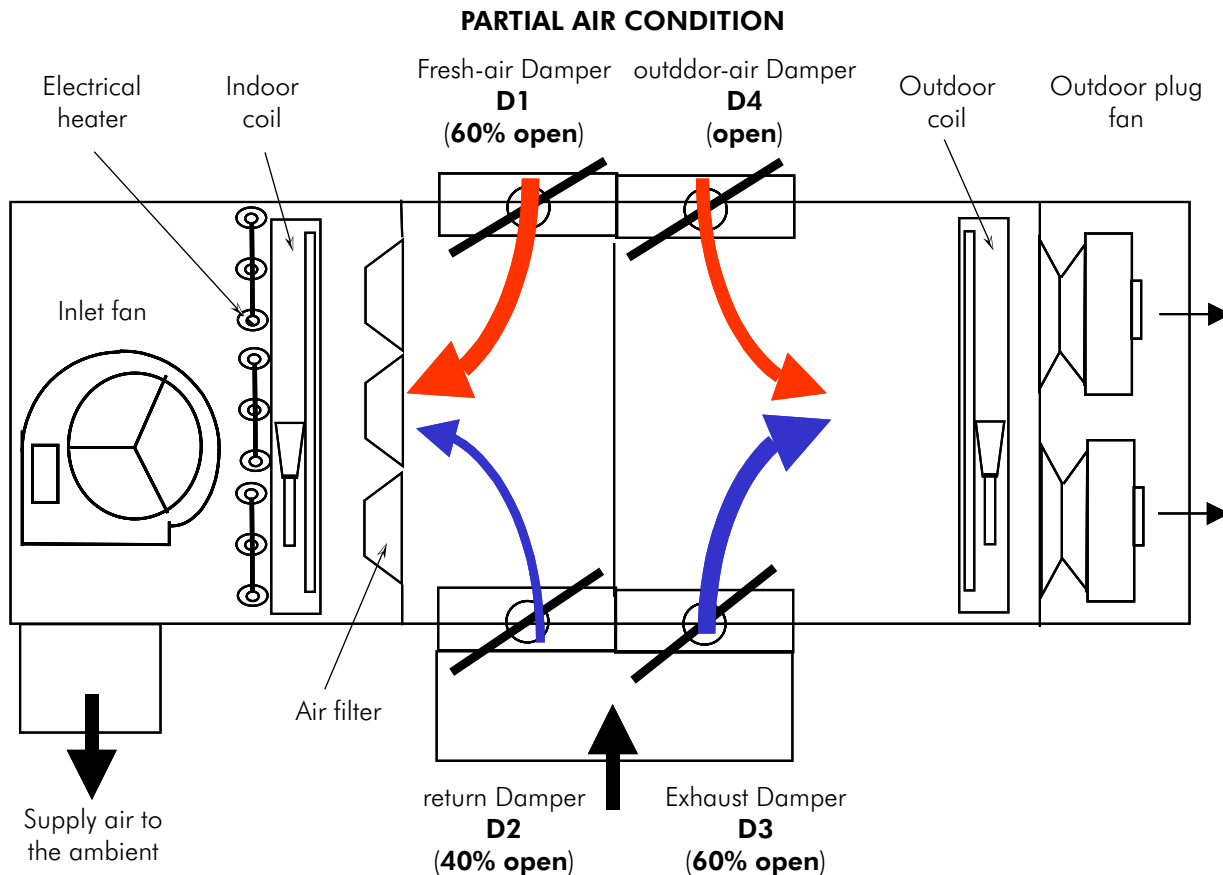


When the unit stops, the outdoor air damper (**D1**) is closed.

When the **RT4D** is running, the free-cooling or the free-heating mode will be annulated during an antifreeze protection of the hot-water coil or during the defrost cycle.

### MINIMUM OUTDOOR AIR FOR HYGIENIC VENTILATION OF THE BUILDING

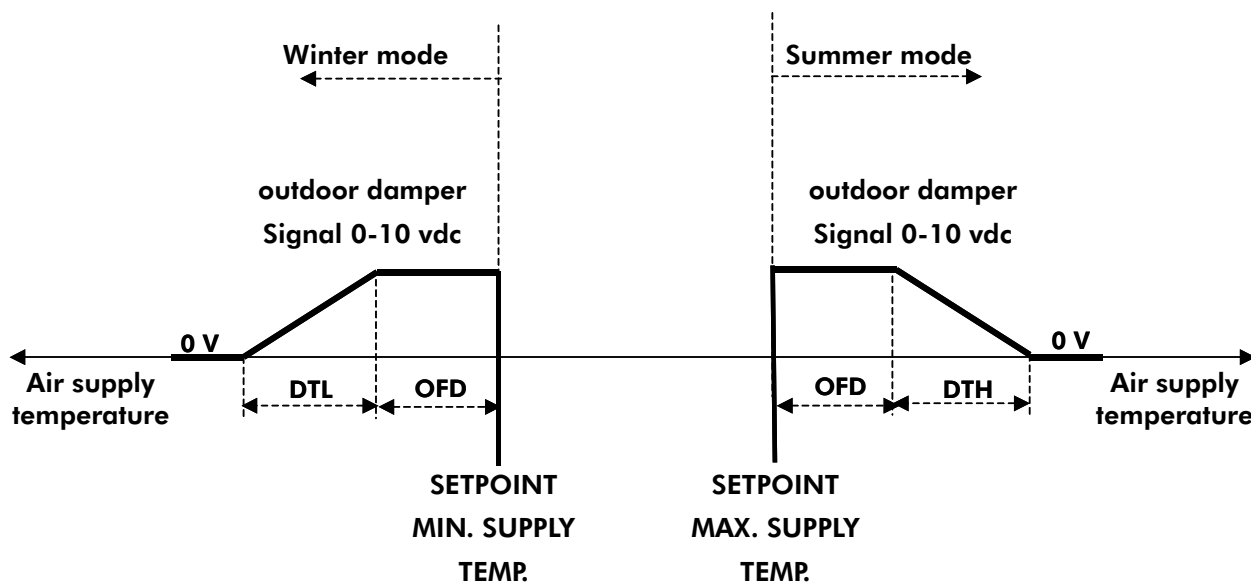
A minimum outdoor air volume can be fixed. During the normal operation of the unit the outdoor air damper (D1) remains open at the minimum value to improve the ambient quality air. The exhaust air (D3) damper will open at the same quantity.



### OUTDOOR AIR DAMPER

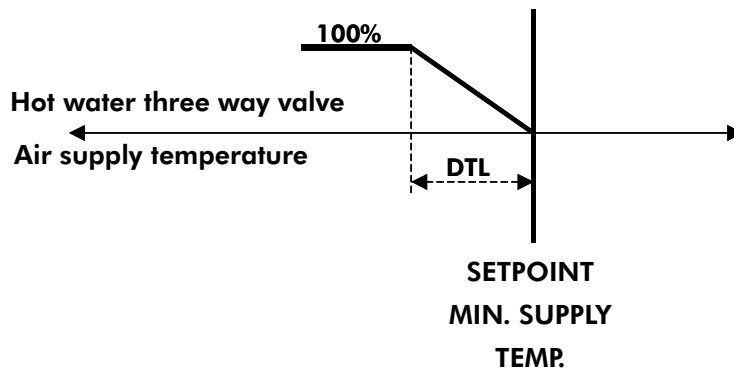
During the winter operation if the auxiliary heat is not sufficient to guarantee the control of the minimum temperature in the supply air, the IADC will close the outdoor air damper (D1) and reduce the ventilation rate automatically. If the supply air temperature falls below the minimum supply temperature set point, the outdoor damper (D1) modulates across the entire amplitude to increase the value of the supply air temperature.

During summer operation the IADC monitors the supply air temperature. If the value increases above the maximum supply temperature set point, the outdoor damper (D1 + D4) modulates across the entire amplitude to maintain the supply air temperature below this set point.



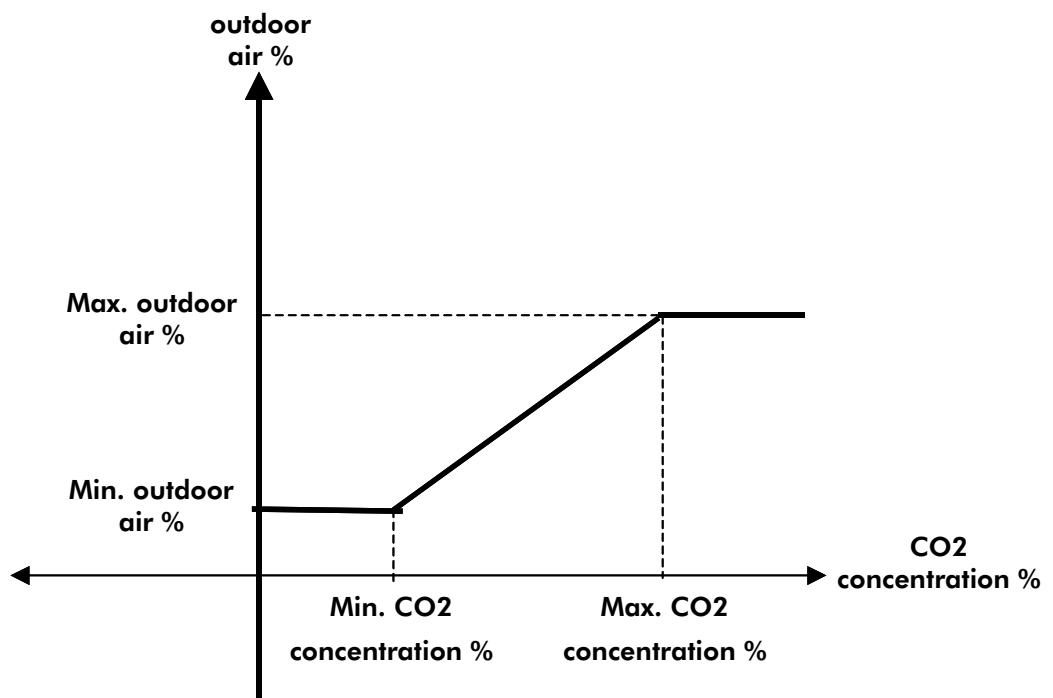
## HOT WATER COIL WITH THREE WAY VALVE

When the supply air temperature falls down to the Minimum winter supply air temperature, the three way valve opens across the entire amplitude of the differential DTL, to increase the supply temperature.



## ROOM AIR QUALITY

Room air quality control opens the external damper to increase the percentage of fresh air when the room air is too much polluted compared to the IAQ (Indoor Air Quality) sensor setpoint.



When the unit is OFF, the outdoor air damper (**D1**) is closed. The indoor air quality control is active during the summer and the winter operation mode.

## DISCHARGE AIR TEMPERATURE CONTROL (LOW AND HIGH LIMIT)

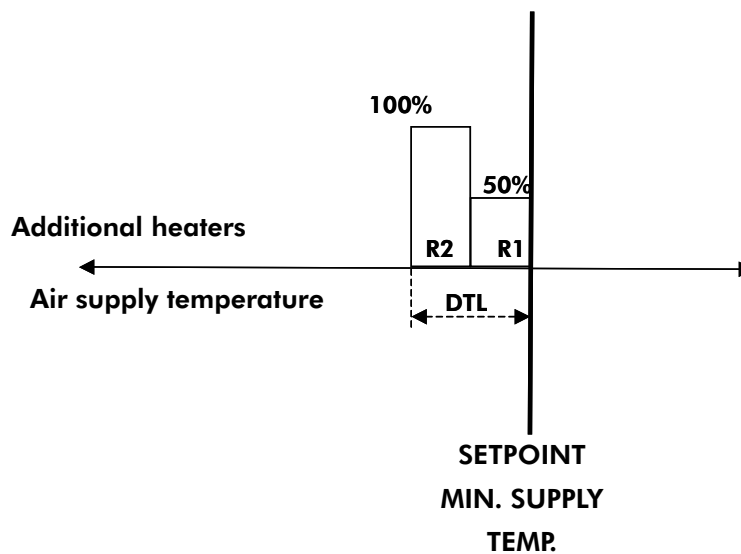
During winter operation if the value of the supply air temperature falls down the "setpoint of minimum supply temperature" imposed by a parameter, the **RT4D** will increase the supply temperature by:

- Activating the additional electrical heaters stages.
- Gas heater
- Modulating hot water coil

This function can be activated during the compressors OFF period:

- by the room ambient temperature
- when a percentage of outdoor air in winter is necessary
- during the defrost cycle.

### WINTER CONDITIONS – DISCHARGE TEMPERATURE CONTROL WITH 2 STAGES HEATER



The parameters programmed to activate the auxiliary heater are:

- minimum discharge air temperature in winter (factory value = 16 °C)
- Differential temperature low temperature control (factory value  $\Delta TL = 3^\circ K$ )

## ANTIFREEZE PROTECTION

The antifreeze protection is active:

- when the unit operates;
- when the unit is OFF (the **RT4D** must have the main power ON);
- During the winter and summer operation mode.

The antifreeze protection depends of the minimum supply air temperature and antifreeze protection set point.

When the supply air temperature drops below the antifreeze set point, the compressors and the main supply air blower stop. In the same time the output signal Y3 of the hot water valve is forced to 100% and the outdoor air dampers (**D1 + D4**) will be closed.


## SMOKE ALARM

When the unit is ON and the digital input ID3 (smoke alarm) is closed, the **RT4D** switches OFF by in smoke alarm condition.

The **RT4D** action can be configured as follow.

- Smoke alarm -----> damper closed
  - In this situation the unit is stopped, the exhaust air fans are OFF and all the dampers will be closed. The display keyboard reports the message SMOKE ALARM.
- Smoke alarm -----> damper (**D1 + D3**)open
  - In this situation the unit is stopped, the exhaust fans in ON and the exhaust air damper (**D3**)will be opened at 100%. The display keyboard reports the message SMOKE ALARM.

## ALARM MANAGEMENT

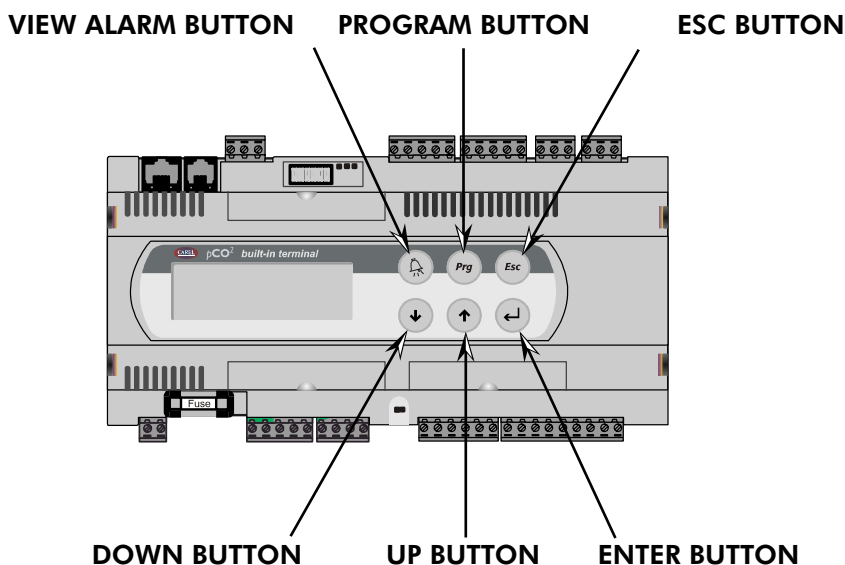
When one alarm condition appears in the **RT4D** a buzzer signal is activated and the alarm message is displayed by pressing the button alarm .

If no alarm is present the message displayed is:



## USER KEYBOARD AND SETTING

The **IADC** is equipped with an alphanumeric display. It is also possible to have an additional remote wall-mounted graphic display with key-pad. Both User-Interfaces can operate at the same time



## THE KEYBOARD BASIC COMMANDS

### SETTING THE TEMPERATURE, ENTHALPY AND HUMIDITY SET POINT.

Modification of the temperature set point is possible using the keyboard by the menu' without password. Press the Prg button, with the down button to scroll the menu' until the set point temperature mask. In this mask you can find the value of the summer and winter set point temperature.

To change the value press the ENTER button, modify by the UP or DOWN and confirm with ENTER.

For the enthalpy or humidity set point modification, with the UP or Down buttons scroll the mask to select the respective parameters. The procedure it is the same as the setpoint temperature modification.

### REAL TIME CLOCK PROGRAMMING

The microprocessor system is equipped with a real time clock programming board with electric autonomy supply.

Using the keyboard by pressing the Prg button, with the down button to scroll the mask until the CLOCK menu'. In this mask you can program the clock. Year, hours, minutes and day of the week are selected by pressing ENTER button repeatedly, modified using UP or DOWN button and confirmed by pressing the ENTER button again.

The time bands are the intervals of time into which a 24 hours day is divided.

Into the daily time band is possible to select a start-up hour of the unit and the turned OFF hour.

Into the weekly time band can be setting for each of the 7 day of the week if the unit can operate or needs to remain in standby condition.

The same setting can be possible for a summer or winter temperature setpoint value. In this way the setpoint is automatically changed at the value selected inside at the daily time band.





*As part of our ongoing product improvement programme, our products are subject to change without prior notice. Non contractual photos.*

*Dans un souci d'amélioration constante, nos produits peuvent être modifiés sans préavis. Photos non contractuelles.*



**ACE Industrie**  
Route de Verneuil  
27570 Tillières-sur-Avre  
France

☎ : +33 (0)2 32 60 61 00

☎ : +33 (0)2 32 32 55 13