

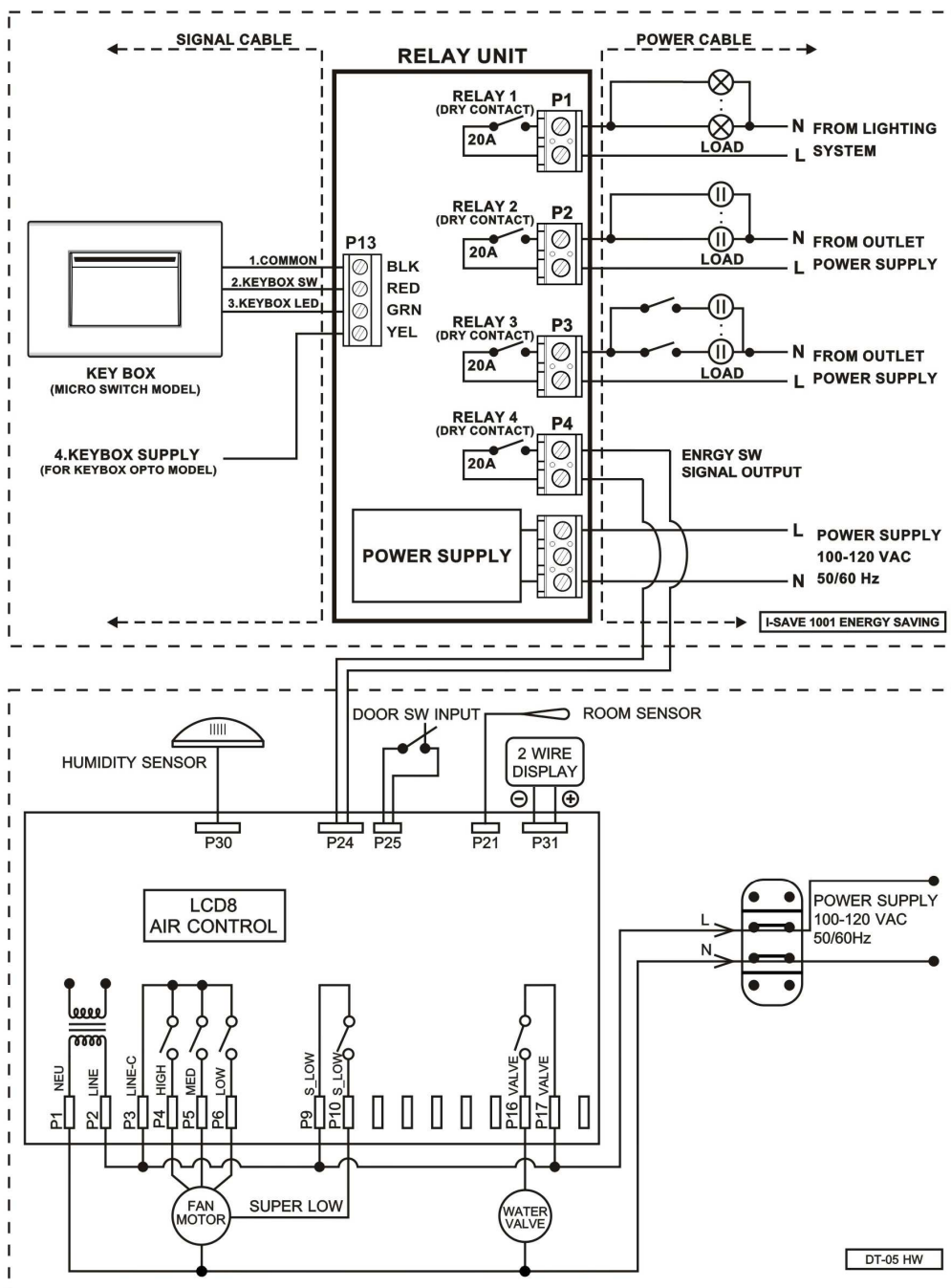
**The Hotel's Solution For Energy Saving, Comfort and Convenience.**

**1. GENERAL**

This document is regarding the details of DT-05HW and I-SAVE1001.

- DT-05HW is the Digital thermostat & Humidistat for air conditioning system.
- I-SAVE1001 is an energy saving device used in the hotel's guestroom.

The system offers a full package of Energy saving system with the Air conditioner controller which has the dehumidifier's function.



The system consists of two major equipments

a) i-SAVE 1001 Energy saving which consists of

- **Relay unit** : which is a microprocessor controlled device used to control the lighting, outlets and air conditioner. It provides the following relays



- Relay 1 : 20 A (resistive load), 115 Vac for lighting.
- Relay 2 : 20 A (resistive load), 115 Vac for outlets.
- Relay 3 : 20 A (resistive load), 115 Vac for outlets.
- Relay 4 : provides dry contact signal to DT- 05HW.

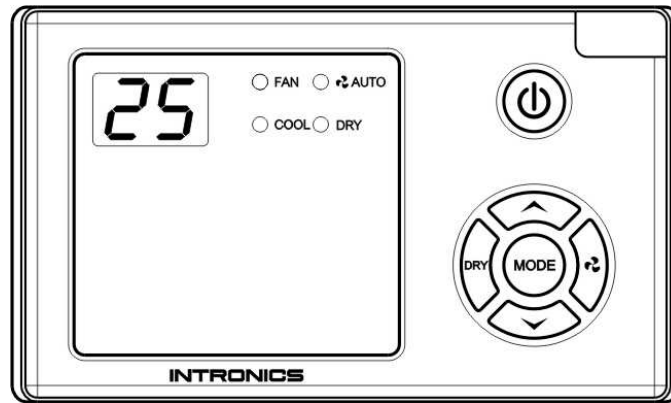
**Note** : For the specific outlets (such as for refrigerator) that the power can not be cut off, these outlets shall be connected directly to the power supply.

- **Key box** : is used for the insertion of the Key card.

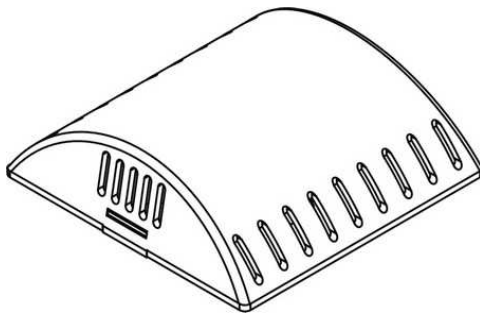


b) DT-05HW Digital thermostat & Humidistat for air conditioning system. It consists of

- Main unit
- Display unit connecting to Main unit via 2 core cable (not supplied)
- Humidity sensor module
- 40 CM Digital input cable with connector on one side connecting between DT-05HW's main unit & Energy switch.
- 40 CM Door sensor input cable
- 1.5 M cable with connector on both side connecting between DT-05HW's main unit & Humidity sensor module.



Display unit (Cool only)



Humidity sensor module



40 CM Digital input cable



40 CM Door switch input cable



1.5 M cable between Main unit & Humidity sensor module

## 2. i-SAVE 1001 FEATURES

- 2.1 Energy savings :** When the Key card is pulled out from the Key box, after a predetermined delay time (see Section 2.2) i-SAVE 1001 will
- cut off the power supplied to the lighting & outlets.
  - provides NC contact to DT-05 HW unit so that the air conditioner will be put in Energy saving mode (see Section 3.6).

If the Key card is inserted into the Key box, the system will

- supply power to the lighting & outlets.
- Provides NO contact to DT-05HW unit so that the air conditioner operates as per normal condition.


**Note :** If the air conditioner is turned off, it will remain off.

- 2.2 Delay time setting :** The factory setting for delay time is 30 seconds. To set for 60 seconds is to take off Jumper at OP2 on i-SAVE 1001 relay unit.


### 3. DT- 05HW FEATURES

The following features can be operated by the buttons on the Display unit.

#### 3.1 Power on/off


Press  button to turn on/off the air conditioner. When turn on, it will operate according to the setting shown on the display unit.

#### 3.2 Fan


Press  button to select the fan speed (high, medium, low or auto). The 7 segment display shows the status.



#### Auto fan mode

When the fan is put in auto fan mode (  AUTO LED is lit), the speed will be varied according to the difference between the room and setting temperatures.

- If the difference is 3°C or more, the speed is high.
- If the difference is 2°C, the speed is medium.
- If the difference is 1°C or less, the speed is low.

**Note :** In Dry operating mode, the  button can not be used.

#### 3.3 Dry operating mode (Dehumidifier)

If the humidity sensor module is installed, press DRY button to operate the system as Dehumidifier, DRY LED on the Display will be lit. On this mode, the system will operate as follows:

- Fan runs at super low speed.
- If Humidity  $\geq$  Rh<sub>set</sub> + 5%, the water valve is operated.
- If Humidity  $\leq$  Rh<sub>set</sub> - 5%, the water valve is stopped. Fan will operate according to the options.
  - a) Fan stops 3 minutes and then operates with 15 sec. ON & 2 minutes OFF duty cycle, or
  - b) Fan operates with the same sequence as valve relay (Take off Jumper OP1 for this option).

Rh<sub>set</sub> can be selected in a range of 40 – 70% with 5% increment (see Section 4.4).



- Note :**
- If the humidity sensor module is not installed, DRY button can not be used.
  - If the humidity sensor module is disconnected (open circuit), the system will operate at the previous operating mode.

#### 3.4 Operating mode

By pressing the MODE button, the air conditioner can be put in 2 operating modes (fan, cool) for Cool only version.







The operating mode status is shown by the LEDs on the Display unit.


**Fan :** The system will operate as Fan only. In this mode  and  buttons can not be used.

**Cool :** The system will operate as Cooling unit. When T<sub>room</sub>  $\leq$  T<sub>set</sub>, the system will operate as Dehumidifier. (see Section 3.3).

### 3.5 Temperature setting

Press  or  button to set the temperature in a range of 58 - 88°F with 1°F incremental (or 15 – 30°C with 1°C incremental). However the minimum temperature can be set (see Section 4.5).  and  buttons can not be used in Dry operating mode.

### 3.6 Energy savings mode

DT – 05HW provides Digital input which receives signal from Energy switch. If Key card is inserted in the box, the system operates as normal. If Key card is pulled out from the box, Display will show  instead of the room temperature, and

- DT – 05 HW will remain OFF if at that moment the system is OFF.
- If at that moment the system is ON, it will be put into Energy savings mode which has 2 options (see Section 4.2).
  - a) Dehumidifier option : the system will operate as Dehumidifier (see Section 3.3)
  - b) Set back temp. option : the system will operate as Air conditioning unit with Set back temperature and low fan speed. Set back temperature can be changed (see Section 4.3).

**Note :** - In energy saving mode, fan will be off whenever water valve stopped to save energy.  
- If the humidity sensor module is disconnected (open circuit), the system will automatically operate with set back temp. option. Dry LED will be blinking as the alarm.  
- In case the Motion sensor is used instead of Energy switch, the system will enter into Energy savings mode after the Motion sensor detects no movement for 2 minutes. At this moment if Set back temp. option is selected, the system will cool down the room until the setting temperature is reached. Then it will enter into Energy savings mode.









### 3.7 Door Switch

DT – 05HW provides an input to receive signal from Door switch. If the door is closed, the system operates as normal. If the door is open more than 1 minute then DT – 05HW stops fan.

The fan will start again in 5 seconds after the door is closed.

## 4. PROGRAMMING







### 4.1 °C / °F display

- Press MODE +  buttons and hold for 2 seconds, Display shows  in blinking.
- Press  button to enter into this program.
- Press  or  button to select  or  display.
- Press  button to move to next program.

**Note :** Factory setting °F display.

### 4.2 Selection of Dehumidifier / Set back temperature in Energy savings mode





While Display shows  in blinking,

- Press  button to enter into this program.
- Press  or  button, Display shows
  -  if Dehumidifier is selected.
  -  if Set back temperature is selected.
- Press  button to move to next program.

**Note :** Factory setting is Set back temperature.

## 4.3 Setting of Set back temperature in Energy saving mode





While Display shows **P3** in blinking,

- Press  button to enter into this program.
- Press  or  button to select the Set back temperature at 80/82/84/86/88°F (or 27/28/29/30/31°C).
- Press  button to move to next program.

**Note** : Factory setting is 80°F.

## 4.4 Setting of RH





While Display shows **P4** in blinking,

- Press  button to enter into this program.
- Press  or  button to select RH in a range of 40-70% with 5% increment.
- Press  button to move to next program.

**Note** : Factory setting is 60%.

## 4.5 Setting of minimum temperature

While Display shows **P5** in blinking,

- Press  button to enter into this program.
- Press  or  button to select the minimum temp. setting at 58/60/62/64/66/68/70/72°F (or 15/16/17/18/19/20/21/22°C).
- Press  button to move to next program.

**Note** : Factory setting is 70°F.

**Remark** : The system will exit from the Programming mode if MODE button is pressed or no button is pressed within 30 seconds.

## 5. SYSTEM FEATURES

### 5.1 Watchdog

There is a watchdog circuit to watch the operation of the microprocessor. If it is malfunctioned, this circuit will reset the microprocessor automatically.

### 5.2 Non-volatile memory

The system keeps all parameters such as on/off status, fan speed, etc. in its non-volatile memory. If there is a power interruption and back to normal, the control will automatically resume its operation with the same parameters.

If there is any change in the parameter, it will be saved in the non-volatile memory 5 seconds later.

### 5.3 Sensor Error

When the room sensor is failed (open/short circuit), the cooling/heating valve relay will be turned on and off with 5 minutes cycle operation. The Display shows **rE** in blinking.

## 5.4 Self diagnostic

There is a self diagnostic built in the system. When there is any error, the following LEDs will be blinking to show the error status.

Description	Display status
Humidity sensor error	LED DRY BLINKS
Room sensor error	7 segment shows $rE$
Energy save mode	7 segment shows - -

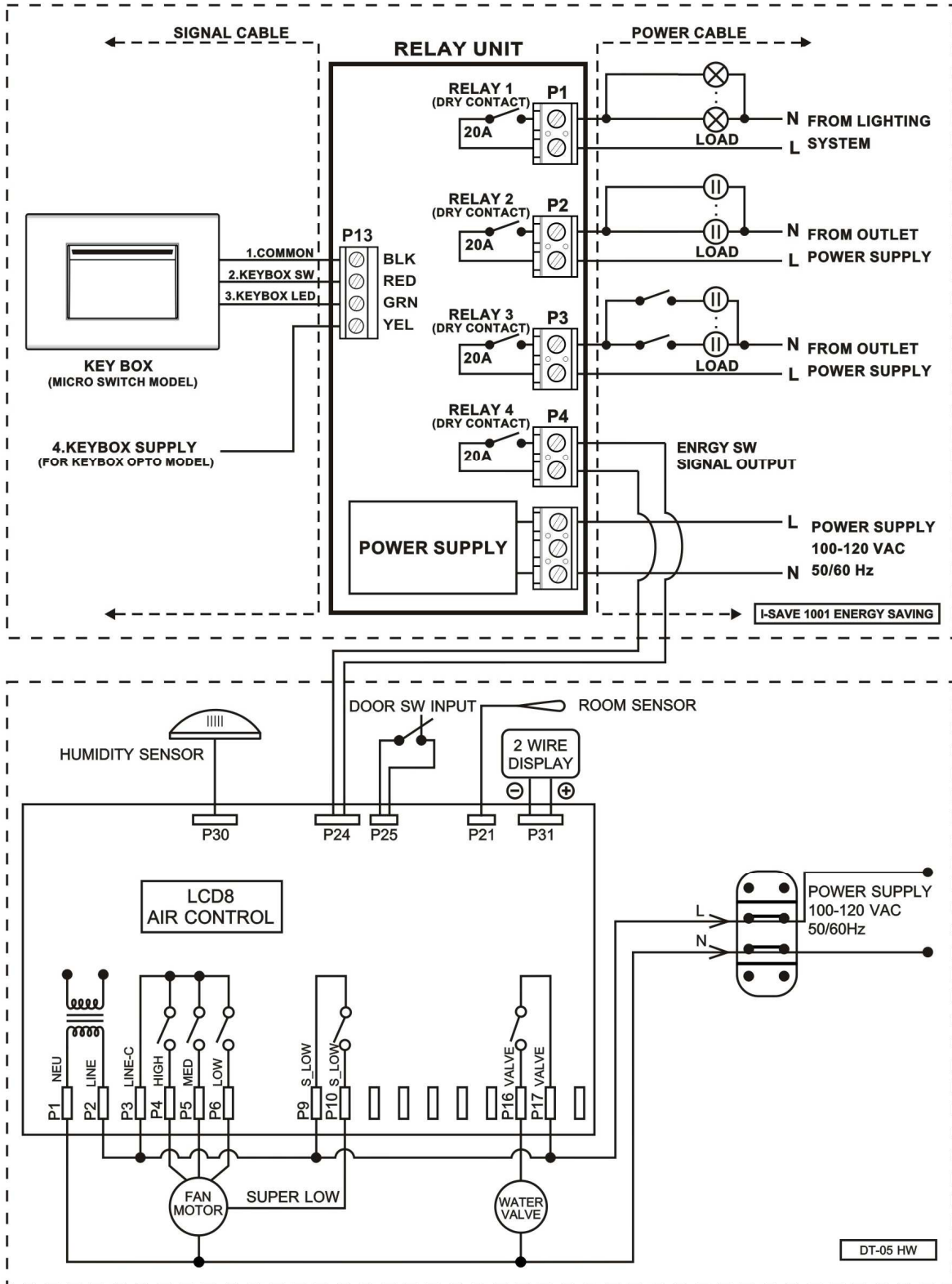
## 5.5 Options

The following options can be selected by the jumpers.

Jumper	Status	Description
OP1	Installed	In Dry mode when Humidity $\geq Rh_{set} - 5\%$ , Fan stops 3 minutes and then operates with 15 Second on – 2 Minutes off duty cycle
	Not installed	In Dry mode when Humidity $\geq Rh_{set} - 5\%$ , Fan stops
OP2	Installed	In case of Energy switch (key card & key box) is connected at digital input connector (P24).
	Not installed	In case of Motion detector is connected at digital input connector (P24).
OP3	Installed	To select NO contact type input (Energy switch provides open contact to DT05-HW's input if Keycard is pulled out from the box).
	Not installed	To select NC contact type input (Energy switch provides close contact to DT05-HW's input if Keycard is pulled out from the box).
OP4	Installed	To select Door switch with NO contact (Door switch provides open contact to DT05-HW's input if door is opened).
	Not installed	To select Door switch with NC contact (Door switch provides close contact to DT05-HW's input if door is opened).

**Note :** Factory settings are with the above jumpers installed.

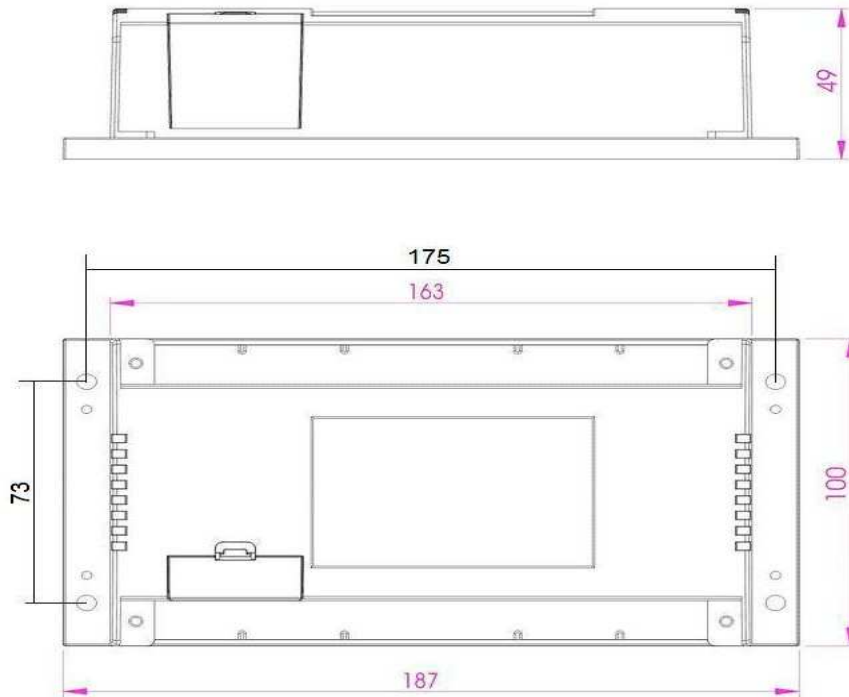
**6. WIRING DIAGRAM (For DT-05HW and I-Save 1001)**





## 7. DIMENSION

### 7.1 Main DT-05HW and I-SAVE 1001



### 7.2 Display DT-05HW

