DEK05

FAN COIL THERMOSTAT

TECHNICAL SPECIFICATIONS

FEATURES

- **2 - pipes or 4 - pipes fan coil applications**
- **Proportional + integral control**
- **Heating/ cooling sequence and aux- heating with an electrical heater.**
- **Electrical heater/ cooling sequence**
- **Ventilation only**
- **Manual or automatic summer/ winter switching**
- **Automatic 3-speeds fan control or manual override**
- **Selectable valve actuators: ON- OFF, PWM**
- **Actuator voltage: 230 Vac**
- **Digital inputs: water thermostat, S/ W changover, economy, window**
- **Analogue inputs: remote room temperature, supply water temperature**
- **Power supply: 230 Vac, 50 Hz**
- **CE certification**

GENERAL

DEK05 microprocessor controls are designed to control heating and/or cooling fan coil applications. DEK05 controls heating and/or cooling valve, fan speeds, and the electrical heater (where applied), in 2-pipes and 4-pipes fan coils applications.

Table 1. Model number:

Model	Description
DEK05	2 or 4 pipes thermostat

DESCRIPTION

A pleasant and modern line makes DEK05 ideal for living quarter applications, in particular offices and hotels.
In all versions the control feature is Proportional + Integral (P+I), and guarantees an accurate temperature control in all operating conditions.
The thermostat is suitable to be mounted inside a fan-coil or on the wall. x.
In 2-pipes plants the summer/winter switching can be activated by a centralized contact, or by a water temperature thermostat or sensor, installed on the pipe near the fan coil.
There are two pre-set room control levels: Comfort, Economy, and Standby to which two temperature levels are linked; the selection can be made through the room unit or the digital inputs.
The sensor for the temperature control is located inside the room unit and is excluded if a remote sensor installed at the fan coil air intake is connected. l.
Commands available: set-point knob, fan speed knob, pushbutton for mode setting; pushbutton for summer/winter switching.
CE certification.

INPUTS AND OUTPUTS

Digital Inputs

PRESENCE or TIME PROGRAM:

the open contact indicates a presence in the room (room occupied) and the set point switches from economy to comfort. This input can also be used for the time program function from an external time program.

WINDOW:

the active contact (open or closed according to the parameter configuration) indicates that the window is open and causes the valve(s) to close and the fan to stop (energy saving function). The anti-freeze protection function is automatically activated (4° C).

SUMMER/ WINTER CHANGEOVER:

It is obtained by using either the water sensor input, or the dedicated digital input .

In the first case the closed contact indicates warm water, with a temperature that exceeds the preset value and the consequent switching to the winter mode.

As alternative ,the thermostat can be connected to the water temperature analog input ..

In the second case the operating logic is the opposite:closed contact means Summer operation..

WATER THERMOSTAT:

It is installed at the water outlet, i.e., at the exit of the heat presence with a temperature that exceeds the preset value, and which allows the fan to operate. The program disables this thermostat consent function during the summer operation.

Analogue Inputs

RETURN AIR TEMPERATURE SENSOR

This sensor has priority over the room unit sensor, which is not taken into consideration by the thermostat. The sensor is positioned at the air intake of the fan coil and is used as alternative to the sensor installed on the thermostat.

WATER TEMPERATURE SENSOR:

This sensor can be set to either switch the summer/winter mode, or to enable the fan function or both functions.

A) Summer/winter switching. The probe is positioned at the water intake and measures its temperature: when a water temperature, below the limit value set in Parameter 14, is detected then this enables the summer function mode; when a water temperature, above the limit set in Parameter 15, is detected then this enables the winter function mode. By intermediate water temperatures the thermostat stays OFF.

B) Enabling fan function. By 2 and 4-pipe fan coils the probe is installed on the return pipe, at the exit of the heating system and enables the fan function. Also in this case Parameters 14 and 15 indicate the temperatures that enable the fan to start.

C) Probe set to enable both functions: by 2-pipe plants the probe is positioned at the intake, detects the water temperature, and determines the summer or winter function mode. The fan function consent during the winter operating mode is given with a configurable delay time set in Parameter 24.

Analogue and digital outputs

FAN:

Fan speed control, from one to three speeds. A 230 Vac output, 50 Hz .Max 1.2 (1)A.

HEATING VALVE:

choice of a 230 Vac, 0.4 A command module for maximum four on-off electrothermic actuators.

COOLING VALVE:

choice of a 230 Vac, 0.4 A command module for maximum four on-off electrothermic actuators.

ELECTRICAL HEATER:

Auxiliary- heating: (connection to the auxiliary output), with on-off command, in sequence with the heating valve. A 230 Vac, 50 Hz, 0.4 A output

TECHNICAL FEATURES				
Control range	13…30 °C		ü	
Power supply	230 Vac, 50/60 Hz		ü	
Ambient temperature	Max 50°C,90% R.U%		ü	
Outputs (heat and cold water)	On-Off		ü	
	Thermal		ü	
	PWM		ü	
Selector or Keys				
Temperature levels	Comfort / Economy / Standby	Pushbutton	ü	
Seasons	Summer/Winter	Pushbutton	ü	
Fan	Auto-0-1-2-3	5-position selector knob	ü	
Set point	Relative Temperature: +/- 5 °C	Knob	ü	
Analog Inputs			ü	
Room Temperature	Air intake probe (remote)	NTC10K	ü	
Water Temperature	Contact or immersion probe	NTC10K	ü	
Digital Inputs				
	Consent thermostat/summer-winter switching/anti-condensation pump		ü	
	Window opening		ü	
	Presence/timed program		ü	
Proportional band	Selectable from 1 to 5 °C		ü	
Dead Zone	From 0 to 4 °C		ü	
Applications	Fan only		ü	
	2-pipe system with/without electrical resistance		ü	
	4-pipe system with/without electrical resistance		ü	
Housing	Single housing		ü	
Zones	Maximum 5 Fan Coils		ü	
	1 room unit for 5 fan coils in parallel		ü	
Automatic valve commands			ü	
Protection	IP30			
Working temperature	0-45°C			
Stock temperature	-10-+50°C			
R.H% limits	20-80%(non condensing			

Table 2:technical features

OPERATIONS

Setting parameter 3,permits to modify the fan coil operations as follows:

-2 pipes fan coil with or without auxiliary electric heater.Electric heater operates in sequence to the heat output if room temperature drops below set point value minus proportional band value.

S/W changeover can be activated with: -pushbutton on the front cover

-Thermostat or centralized contact connected to terminal

-Water temperature sensor connected to terminal

-4 pipes fan coil with or without auxiliary electric heater. Electric heater operates in sequence to the heat output if room temperature drops below set point value minus proportional band value.

-2 pipes fan coil with floor heating:the floor heating actuator/valve is connected to the auxiliary output and is immediately activated when the room temperature drops below the set point value.The fan coil actuator valve is activated at set point value minus the value of parameter 18.In summer,the operations are reversed.

-2 pipes fan coil with auxiliary ouput in sequence:the auxiliary output is activated either in winter or on summer at set point value minus or plus the value of parameter 18.

-2 pipes fan coil with auxiliary electric heater activated in sequence to heating output in winter and in a sequence heating-cooling in summer.

1 st LEVEL PARAMETER TABLE

In the table below the parameters are described that can be directly modified from the controller key pad.

SEL0 KNOB POSITION	PARAMETER No.	PARAMETER TO BE SET	PARAMETER DESCRIPTION	Selector Position SEL 1 AUTO DEFAULT VALUE	Selector Position SEL 1 OFF	Selector Position SEL 1 1	Selector Position SEL 1 2	Selector Position SEL 1 3
10	**1**	**COMFORT SET POINT HEATING**	Configuring the WINTER set point value	20	19	18	21	22
12	**2**	**DEAD BAND**	Defines the Dead Band for S/W changeover	4	3	2	1	0
14	**3**	**TYPE OF** PLANT	Type of plant	2-PIPES	4 PIPES	2 PIPES H/C WITH AUX HEAT AS PRiMARY	2 PIPES H/C WITH AUX HEAT AS SECONDARY	2 PIPES H/C WITH EL.HEAT AS PRIMARY IN SUMMER
16	**4**	**FAN**	Defines the fan operating mode in the dead band	CYCLED	CONTINUOUS	THERMAL IN WINTER / CONTINUOUS IN SUMMER	THERMAL IN SUMMER / CONTINUOUS IN WINTER	
18	**5**	**TYPE OF OUTPUT**	Defines the type of regulation at output 1	ON-OFF	PWM			
20	**6**	**WINDOW CONTACT**	Defines if the window contact is n. o. or n. c.	ACTIVE = WINDOW CLOSED=CONTACT OPEN	ACTIVE = WINDOW CLOSED=CONTACT CLOSED			
22	**7**	**DE-STRATIFICATION**	Enable or disable the destratification operation	DISABLED	ENABLED			
24	**8**	**WATER TEMPERATURE PROBE FUNCTION**	Selecting the NTC probe function for the water temperature	WITHOUT SENSOR	SUMMER / WINTER CHANGOVER	FAN ENABLING	SUMMER / WINTER SWITCHING + FAN ENABLING	
26	**9**	**SUMMER / WINTER SWITCHING**	Selecting summer to winter switching	Centralized or by NTC sensor	Manual	AUTO,from the room unit (4 PIPES)		
28	**10**	**PROBE READING OFFSET**	Modifies the room sensor reading	0	+ 1°C	- 1°C	+ 2°C	- 2°C
30	**11**	**RESET**	Resetting the DEFAULT values or the Filter hours		Setting the filter hours to zero		Resetting the default parameters	

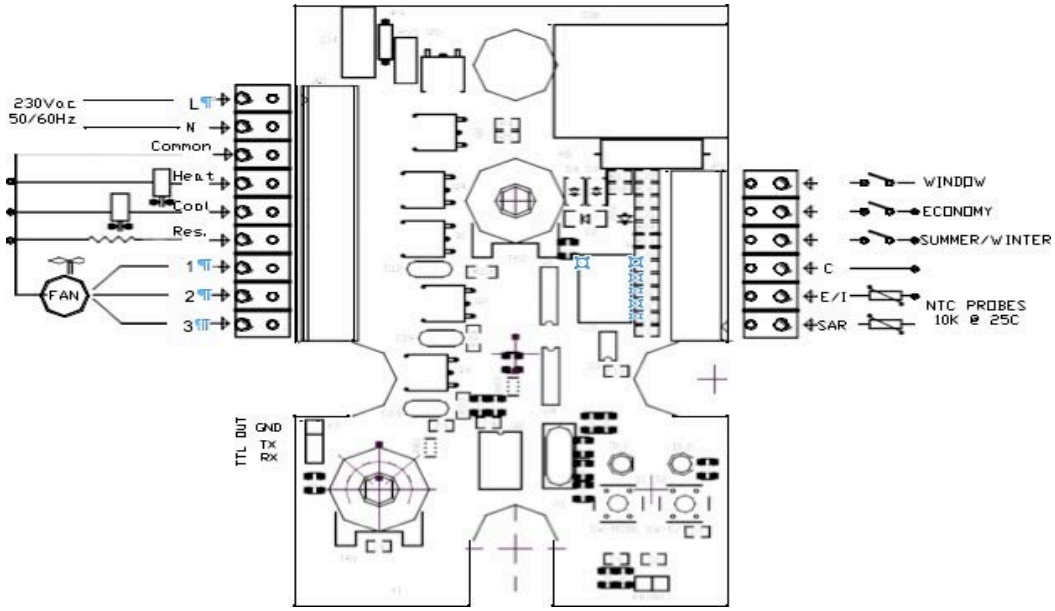
Other parameters that are listed in the following table, can be modified with factory software, though the TTL port.

2 nd LEVEL PARAMETER TABLE

These parameters can be only changed in the factory.

PARAMETER No.	PARAMETER TO BE CONFIGURED	PARAMETER DESCRIPTION	DEFAULT VALUE	RANGE	NOTES
12	**PROPORTIONAL BAND ° C**	Defines the temperature range in which the P+I action is carried out	**2**	**1 - 5**	
13	**ECONOMY SET BACK**	Defines the value to be added to the summer set point and subtracted from the winter set point when Economy mode is active	**6**	**5 - 10**	
14	**WINTER CHANGEOVER TEMP.**	Set the water temperature above which the system switches to the winter mode or enables the fan	**38**	**20-60°C**	
15	**SUMMER CHANGEOVER TEMP.**	Set the water temperature below which the system switches to the summer mode	**15**	**5-25°C**	
16	**FROST PROTECTION**	Use to select the temperature at which the anti-frost function starts	**4**	**0-10°C**	
17	**FILTER HOURS (300 HOURS x K)**	Use to select the number of operating hours after which filter maintenance should be carried out	**6**	**0=Disabled 1-20**	**X300H**
18	**°K DEVIATION FOR AUX OUTPUT**	Set the degree temperature value for aux output enabling	**0,5°K**	**0-10°K**	
19	**DE-STRATIFICATION FAN OFF TIME**	Use to select the time between de-stratification fan cycles – NB: Only applies if De-Stratification is ENABLED in ISU 8	**15**	**1-60min**	
20	**DE-STRATIFICATION FAN ON TIME**	Use to select the fan ON-time during the de-stratification cycle – only applies if ISU 8 is ENABLED	**1**	**1-10min**	
21	**FAN DELAY IN HEATING**	Use to select the fan start delay after opening the heating valve	**120**	**0-300sec**	
22	**VALVE EXERCISE**	Enables or disables valve exercise function	**DISABLED**	**ENABLE/DISABLED**	
23	**FAN START DELAY WITH PRIMARY ELECTRIC HEATER**	Use to select the fan start delay after switching on the electric resistance heater when it is the primary heat source	**0**	**0-60sec**	
24	**FAN START DELAY WITH PRIMARY ELECTRIC HEATER**	Use to select the fan start delay after switching on the electric resistance heater when it is the primary heat source	**1**	**1-10min**	
25	**1st FAN SPEED ACTIVATION**	Define the value of the proportional band at which the 1st fan speed is activated	**0%**	**0 – 100%**	
26	**2ND FAN SPEED ACTIVATION**	Define the value of the proportional band at which the 2nd fan speed is activated	**50**	**0 – 100%**	
27	**3RD FAN SPEED ACTIVATION**	Define the value of the proportional band at which the 2nd fan speed is activated	**90**	**0 – 100%**	
28	**ANTI OSCLLATION TIME FOR AUXILIARY OUTPUT**	Define the ON time of the auxiliary output after set point satisfied	**60**	**0 - 1000sec**	

ELECTRICAL CONNECTIONS



DIMENSIONS