LCF Touch Modbus

Electronic Fan Coil Thermostat with Touch Display (Flush mounting)

thermokon
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Datasheet

Application

Modern design flush mounting fan coil room thermostat, used for individual control of temperature in commercial, industrial and residential buildings. It is tailored for two-pipe and four-pipe fan coil units with two-wire electric valves. The device combines digital technology with a large LCD touch screen display, which enables the single room controller to be used intuitively. Integrated 7 day time clock with 4 time programs.

Security Advice – Caution

The installation and assembly of electrical equipment must be performed by a skilled electrician.

The modules must not be used in any relation with equipment that threatens, directly or indirectly, human health or life or with applications that can result in danger for people, animals or assets.

Before connecting devices with electrical power supply the installation must be isolated from the power source!

Notes on Disposal

The product is considered electrical and electronic waste and must be disposed accordingly.
Special treatment for specific components may be legally binding or ecologically sensible. The local and current applicable legislation must be followed.

Electrical Connection

The devices are powered by mains voltage (normally between 90 and 265 V). Please follow the technical data instructions on how to correctly power each device.

With regards to passive sensors with 2-wire conductor versions, the wire resistance of the supply wire has to be considered. If necessary the wire resistance should be compensated by the heat gain from the electronics. Due to self-heating, the wire current affects the measurement accuracy. So it should not exceed 1 mA.

The ambient temperature of the transducer electronics should be kept constant.
The transducers must be operated at a constant supply voltage (±0,2 V). When turning the supply voltage on/off, onsite power surges must be avoided.

When using lengthy wiring (depending on the cross section used) the supply may be compromised due to a voltage drop at the common GND-wire (caused by the voltage current and the line resistance). In this case, 2 GND-wires must be wired to the sensor - one for supply voltage and one for the measuring current.

Remarks to Room Sensors

Location and Accuracy of Room Sensors

The room sensor should be mounted in a suitable location for measuring accurate room temperature. The accuracy of the temperature measurement also depends directly on the temperature dynamics of the wall. It is important, that the back plate is completely flush to the wall so that the circulation of air occurs through the vents in the cover. Otherwise, deviations in temperature measurement will occur due to uncontrolled air circulation. Also the temperature sensor should not be covered by furniture or similar devices. Mounting next to doors (due to draught) or windows (due to colder outside wall) should be avoided.

The temperature dynamics of the wall will influence the temperature measurement. Various wall types (brick, concrete, dividing and hollow brickwork) all have different behaviours with regards to thermal variations.
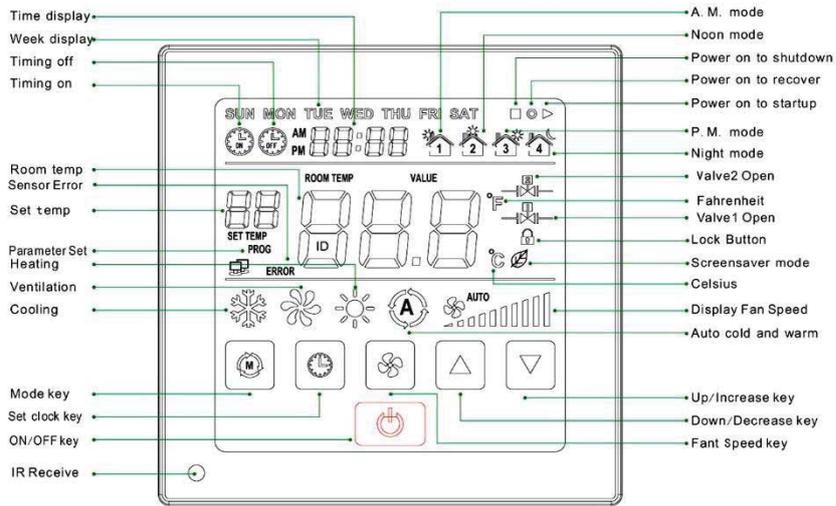
Surface and Flush Mounting

The temperature dynamics of the wall influence the measurement result of the sensor. Various wall types (brick, concrete, dividing and hollow brickwork) have different behaviours with regard to thermal variations. A solid concrete wall responds to thermal fluctuations within a room in a much slower way than a light-weight structure wall. Room temperature sensors installed in flush boxes have a longer response time to thermal variations. In extreme cases they detect the radiant heat of the wall even if the air temperature in the room is lower for example. The quicker the dynamics of the wall (temperature acceptance of the wall) or the longer the selected inquiry interval of the temperature sensor, the smaller the deviations limited in time are.

Technical Data

Power supply:	90..265 V ~ 50/60 Hz
Power consumption:	<0,9 W
Temperature sensor:	NTC 10 K
Set point adjustment:	+1..+50 °C (default +16..+30 °C)
Accuracy:	±1 °C
Display:	LCD touch screen
Material:	ABS, scratch-resistant acrylic
Output:	Heating/cooling: Relay 250 V ~ / 30 V =, 5 A Fan stage: Relay 250 V ~ / 30 V =, 5 A Output Modbus

Cable entry:	from the rear
Clamps:	Terminal screw max 1,5 mm²
Protection:	IP20 according to EN 60529
Working condition:	-10..50 °C, 5..95% rF non cond.
Storage temperature:	-25..65 °C
Dimensions (LxWxD):	86x86x15,5 mm
Weight:	160 g

Display

Time display
Week display
Timing off
Timing on

Room temp
Sensor Error
Set temp
Parameter Set
Heating
Ventilation
Cooling

Mode key
Set clock key
ON/OFF key
IR Receive

A. M. mode
Noon mode
Power on to shutdown
Power on to recover
Power on to startup
P. M. mode
Night mode
Valve2 Open
Fahrenheit
Valve1 Open
Lock Button
Screensaver mode
Celsius
Display Fan Speed
Auto cold and warm
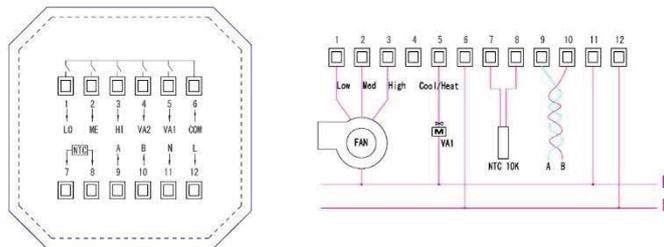Up/Increase key
Down/Decrease key
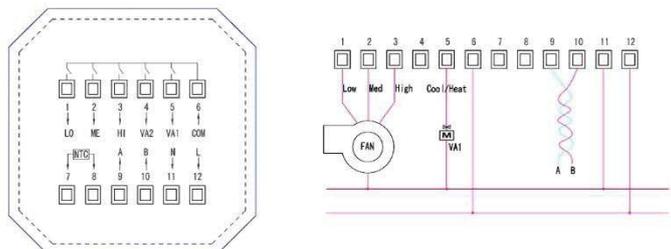Fant Speed key

Terminal Connection Plan
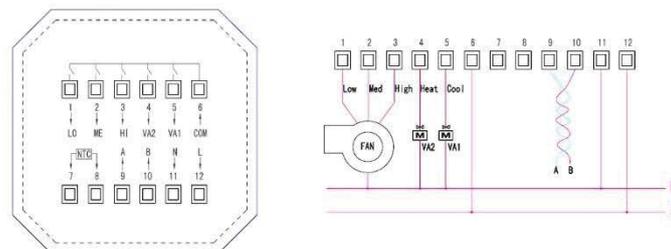

ATTENTION: 90..265 V

LCF Touch Modbus – Auto mode wiring diagram for 2-pipe fan coil:

LCF Touch Modbus – Manual mode wiring diagram for 2-pipe fan coil:

LCF Touch Modbus – Manual mode wiring diagram for 4-pipe fan coil:

Installation

For installing or repairing, please make sure the power for the thermostat has been turned off.

Insert the screw driver in the plastic teeth of the thermostat. Turn the screwdriver clockwise and the front cover and base plate will be separated.

Please follow the wiring diagram to connect the wires.

Fix the thermostat base plate to the wall by using the four screw holes with a distance between the axes of 60mm.

Fasten base plate and front cover. Do not press the panel in order to protect LCD.

Commissioning

Operation in 2-pipe system (parameter No. 13 set to 2):

When using an external sensor, the thermostat can detect whether the fluid is convenient for cooling or for heating:

- Operation without external sensor:
  In the 2-pipe system, a fluid can be used only for cooling or only for heating depending on the temperature of the fluid. When no external sensor is used, heating, cooling and ventilating mode have to be selected manually using MODE settings (depending on the desired action of the heating/cooling system).

- Operation with an external sensor:
  By using an external sensor, the system recognizes, whether the fluid has the necessary temperature for cooling or for heating. The heating or cooling control sequence will be automatically selected. When temperature is ≤+19 °C, cooling mode is activated; when the temperature is ≥+30 °C, the heating mode is active.
  MODE key has no function in this case.

Operation in 4-pipe system (parameter No. 13 set to 4):

The thermostat switches automatically between cooling and heating. A time delay between cooling/heating mode changes is implemented to ensure safe and eco-friendly operation. Parameter No.14 has to be set to 1 to enable the device for operating in auto mode.

Mode selection:

Manual Mode:	2-pipe-System:	Cooling → Ventilating → Heating
	4-pipe-System:	Cooling → Ventilating → Heating → Auto mode (only when parameter No. 14 is set to 1!)
AUTO Mode:	The cooling or heating sequence will be automatically detected.	

Fan Coil system selection:

Setting parameter No. 13, the selection of the fan coil system has to be done. 2-pipe or 4-pipe systems can be selected.

Fan Stage selection:

In Cooling, Heating or Auto mode, following fan stages can be selected: Low → Med → Hi → Auto

In Ventilation mode, following fan stages can be selected: Low → Med → Hi

Ventilation mode can be deactivated by setting parameter No. 15 to "0".

Display °C or °F:

Display of the units °C or °F can be selected using parameter No. 12. Fahrenheit temperature display range is 32..99 °F, °C temperature display range is 0..50 °C. Factory default is °C.

Note: Under Parameter No.1 the temperature offset can be adjusted. This feature should be used if the temperature at the mounting place of the Room Thermostat is not accurate to the average room temperature.

Temperature Room Temperature set point selection:

By pressing "▲" or "▼" button, the room temperature set point can be adjusted. °C Range is 16..30 °C, Fahrenheit temperature range is 60..86 °F.

By using Parameter No. 4 and No. 5, the set point ranges can be adjusted.

Fan stage/Valve control selection:

Under Fan operation "INDEPENDENT", the fan will always operate according to the selected or automatically assigned fan stage; under Fan operation "DEPENDENT", the fan will be tuned off in case the valve is closed. If the valve is open, the fan will operate according to the selected or automatically assigned fan stage.

By using parameter No. 16, the "INDEPENDENT" or "DEPENDENT" mode can be selected.

Key lock selection (No. 2), power failure selection (No. 3), screen save mode (No. 6) can be set by Parameters.

Also in parameter No. 7 you are able to read the LCD display status.

Sensor failure alarm:

If the temperature sensor is out of range, the thermostat will switch off the fan and close the valve, error code "E01" will be shown.

Language selection

You can change the display language with parameter No. 11.

Set time format

With parameter No. 8 the time format to 12h or 24h can be defined.

Time setting

Press the "🕐" button, to set the time. The changing parameter is blinking, press "▲"or"▼"-button to set:
Order: Week→hour→minute→Timer on→Timer off→week→hour→…
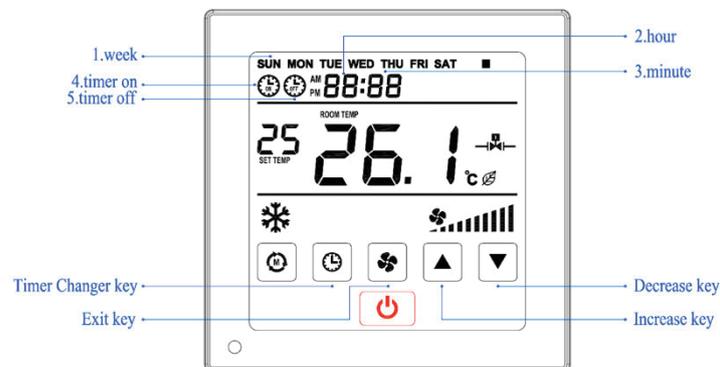
Set timer

Press the "🕐"-button, the parameter to be changed is flashing, the timer will be set on or off.

Finish: Timer on, LCD display 🕐 ;

Finish: Timer off, LCD display 🕐 ;

To delete timer on/off, press the "🕐" button, the parameter to be changed is flashing. Then select "🕐" or "🕐", set the time like the following image to leave the timer mode: " AM PM – –:– – " .
The system saves the user settings to set the timer on / off automatically.

Selection timer on / off

The timer on/off has 2 options to be selected: single action or rule.

To set, please look up parameter No. 9 in the parameter table.
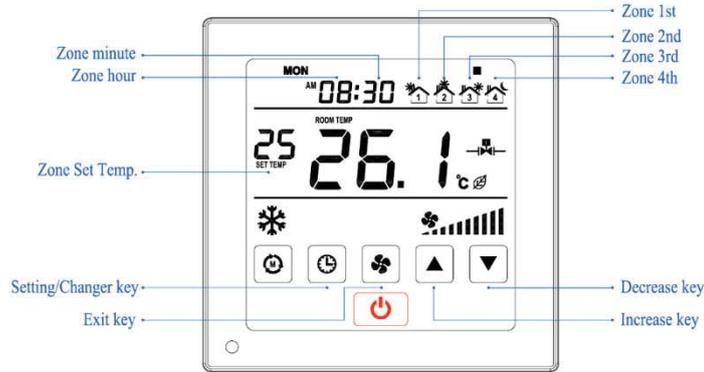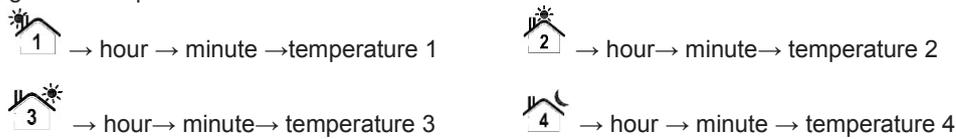7 days 4 periods programmable timer
One day is split into 4 periods. The user can set temperature for every period individually.
To set the time zones, please look up parameter No. 10 in the parameter table.
If the user has set a set temperature during operation, the current period runs with the last set temperature. The next period will adopt the changed settings.

Please follow the instructions below:

Press the " ⏰ ." button for more than 5 seconds, The parameter to be changed is flashing. Now you can set the 4 programmable periods.

1 → hour → minute →temperature 1   **2** → hour→ minute→ temperature 2

3 → hour→ minute→ temperature 3   **4** → hour → minute → temperature 4

Parameters:

⊛ = MODE button

In order to change the parameters, please press the MODE button for more than 5 seconds. Please follow figure below. If you are asked to enter the password, use "▲"or "▼" key to enter each digit of the password. Press MODE button to switch to the next digit.
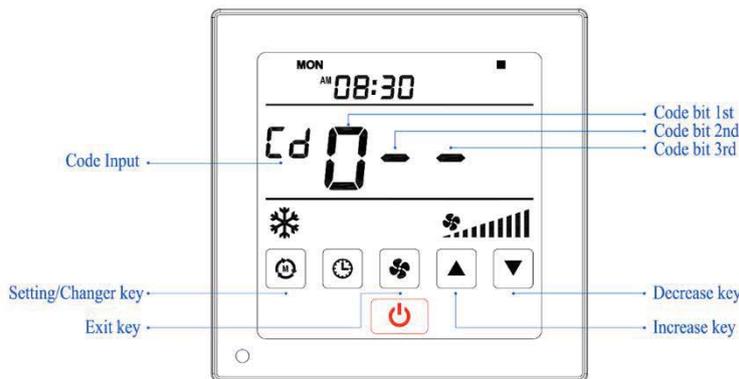
The standard password is 260.

If the password has been entered correctly, you will see the parameter settings screen as below shown:
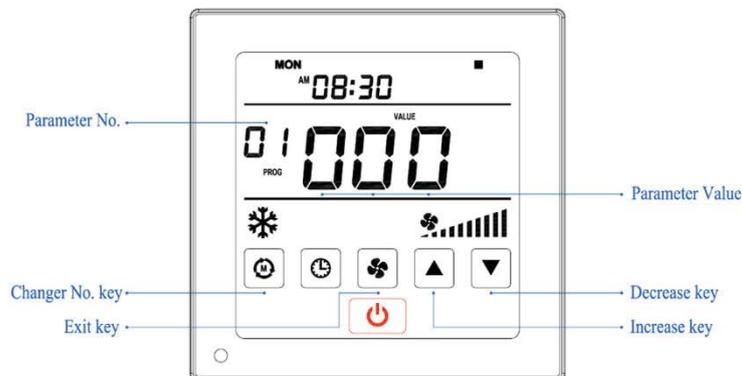
Press the MODE button to select the parameter you would like to change. Then use "▲" or "▼" to change the parameter. Please refer to the parameter table on the following page 7:

No.	Name of parameter	Parameter definition	Factory default
1	Temperature offset:	Range -20..+20 K	0
2	Key-lock:	0- unlocked 1- lock on / off 2- lock mode 3- lock clock 4- lock fan speed 5- lock temperature setting 6- lock all keystrokes	0
3	Power failure:	0- stay power off 1- restore last status before power failure 2- turn power on after power failure	0
4	Upper temperature limit:	Range: +1..+50 °C / +34..99 °F	30 °C / 86 °F
5	Lower temperature limit:	Range: +1..+50 °C / +34..99 °F	16 °C / 60 °F
6	LCD backlight delay:	10..150 seconds	20 seconds
7	Screensaver mode:	0- display on / off 1- room temperature and on / off 2- display clock, room temperature and on / off 3- display all status	0
8	Time format:	12- 12 hours 24- 24 hours	12
9	Timer on / off:	0- once 1- loop	0
10	7 days, 4 periods programmable:	0- forbidden 1- allowed	0
11	Display language:	1- English	1
12	Temperature format:	0- °C 1- °F	0
13	Selection Fan Coil:	2- 2-pipe Fan Coil 4- 4-pipe Fan Coil	2
14	Auto cooling & heating modus:	0- deactivated 1- activated	0
15	Fan modus:	0- deactivated 1- activated	1
16	Selection fan on / off:	0- independent 1- dependent	0
17	Temporarily not defined		0
18	Communication:	ID.1.. ID.247	1
19	Baud rate:	1- 4800 bps; 2- 9600 bps; 3- 19200 bps; 4- 38400 bps	2

All parameters are stored within an EEPROM (electrically erasable programmable ROM), ensuring no data loss if the Thermostat is powered off.

Communication Modbus

For configuration of the Modbus communication, please look up parameter No. 18 in the parameter table.

Communication-section	1..247
Factory default:	1
Address 0:	broadcast address
Communication-Interface:	RS485
Communication-Protocol:	Modbus-RTU
Baud Rate:	4800 bps / 9600 bps / 19200 bps / 38400 bps (optional)
Factory default:	9600 bps
Parity:	no parity / odd parity / straight parity (optional)
Factory default:	no parity
Data:	8 bit
Stop:	1 bit

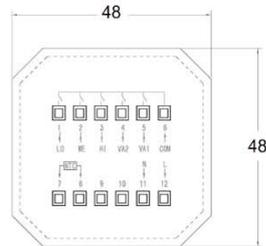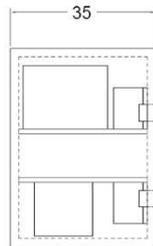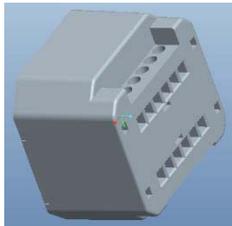## Modbus register

To be filled

Dimensions (mm)

Display unit:
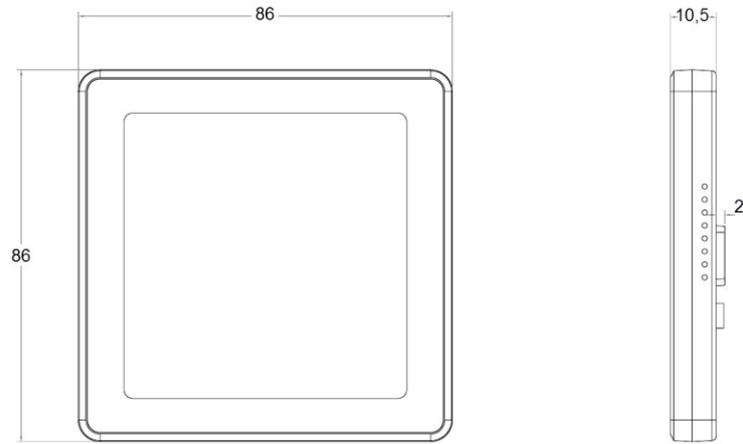
Base plate:

Optional Accessories

Screws Ø3x18 WA   2 pieces

C E

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EU Konformitätserklärung
EU Declaration of Conformity

Wir, Thermokon Sensortechnik GmbH
We, Thermokon Sensortechnik GmbH

erklären, dass die Produkte
declare, that the products

Thermostat LCF Touch

mit den Anforderungen der folgenden Normen oder normativen Dokumenten übereinstimmen
fulfil the requirements of the following standards or other normative documents

2014/30/EU Elektromagnetische Verträglichkeit
2014/30/EU Electromagnetic compatibility

Standards / *Standards*
EN 60730-1 (2012), EN 61000-6-1 (2007), EN 61000-6-3 (2011)

Richtlinie
Directive

2006/95/EG Niederspannungsrichtlinie
2006/95/EG Low Voltage Directive

Standards / *Standards*
EN 60730-1 (2012)

Richtlinie
Directive

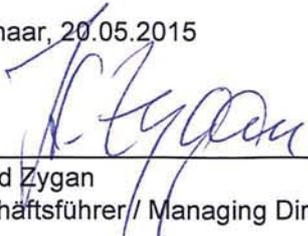2001/95/EG Produktsicherheit
2001/95/EC Product safety

Standards / *Standards*
EN 60730-1 (2012)

Richtlinie
Directive

2011/65/EU RoHS
2011/65/EU RoHS

Standards / *Standards*
EN 50581 (2013)

Mittenaar, 20.05.2015

Harald Zygan
Geschäftsführer / Managing Director