JOY
Electronic Fan Coil Thermostat (Flush mounting)

thermokon®
Sensortechnik GmbH

Data Sheet

Subject to technical alteration
Issue date: 05.04.2016

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 a modern design with a 2,5" LCD and a touch-sensitive surface, 3 time program options each with 4 time periods options.

Security Advice – Caution

The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

CAUTION! Risk of electric shock due to live components within the enclosure, especially devices with mains voltage supply (usually between 90..265 V).

Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

Notes on Disposal

As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

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 is the smaller the deviations limited in time are.

Technical Data

Measuring values	temperature
Output switch contact	5x normally open contacts (2x heating/cooling, 3x fan speed)
	240 V load max. 3 A
Power supply	85..260 V ~
Power consumption	max. 2 VA (260 V ~)
Measuring range temperature	0..+50 °C
Accuracy temperature	±1 °C (typ. at 21 °C)
Inputs	input for NTC 10 K or change-over sensor
	digital input for floating contact
	input for change-over (230 V ~)
Control functions	setpoint adjustment +0..+50 °C
Display	LCD 2,5", 240x160 px, blue backlighting
Functions	integrated 2-point-/ 3-point-controllers
Enclosure	PC, scratch-resistant acrylic glass
Protection	IP30 according to EN 60529
Connection electrical	terminal block max. 1,5 mm²
Inputs	terminal block max. 1.0 mm²
Ambient condition	0..+50 °C, max. 95% rH non-condensing
Weight	195 g
Mounting	flush mounted with standard EU box (Ø=55 mm)

Connection Plan
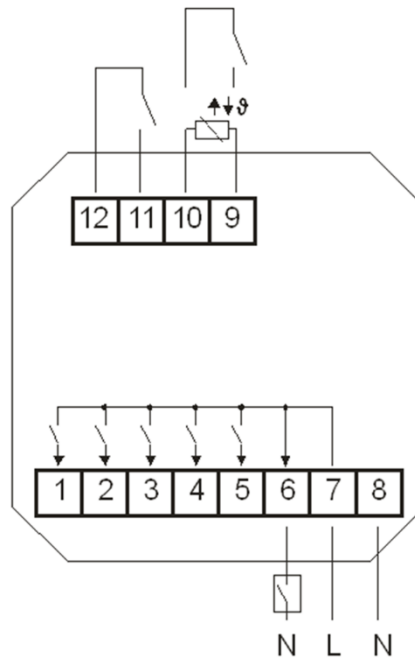
1	Fan Speed 3	7	L
2	Fan Speed 2	8	N
3	Fan Speed 1	9	input 1/universal/floating
4	Cooling	10	
5	Heating	11	input 2/digital/floating
6	230 V digital input (Change-Over)	12	

Function Description

Buttons

With the power-button (5), the device can be turned on and off.

Buttons on the touch-surface, fan speed and setpoint adjustment.

The Fan speed can be set by the Buttons UP (1) and DOWN (2). 10 seconds without any interaction, the display returns back to main screen.

While pressing of these buttons, the white LED of the Power-button (5) lights up for visual feedback.

Controller

For cooling and heating mode the room thermostat has an integrated 2 point-/3 point controller. In Automatic mode the Fan speed is overriden by the main controller.

Parameter	Value (default)*
Hysteresis	± 0,5 °C
Fan speed 1 ON	0,0 °C
Fan speed 2 ON	1,5 °C
Fan speed 3 ON	3,0 °C
Dead zone Heating/Cooling	2,0 °C
Dead zone Heating/Cooling ECO-mode	10 °C
Min. set point	0,0 °C
Max. set point	50 °C
Standby set point decrease (unoccupied)	-2,0 °C
Frost protection	7,0 °C
Heat protection	35 °C
Step width	0,5 °C
Set point adjustment	± 3 °C

*changes on request

Main screen/ Value display

The Display shows the measured value of the internal sensor.

Header   **Value display**
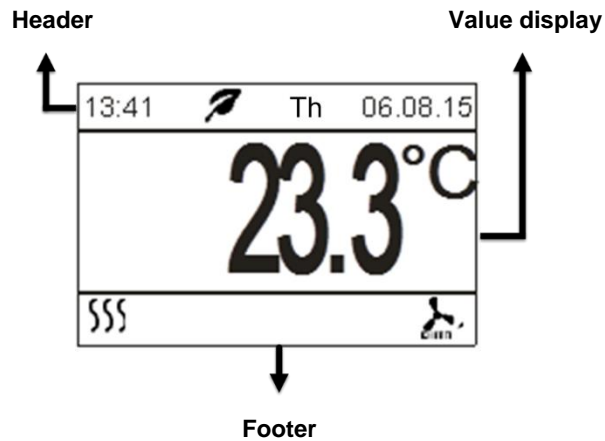
Footer

Header

Current date and time will be displayed in the header. If enabled, ECO-mode status is indicated via symbol 🍃 .

Footer

Depending upon the heating or cooling mode, occupancy or window contact status, the corresponding symbols will be shown in the footer. The symbol "active timechannel" will be shown only if active.
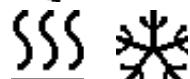
Symbols

Occupancy
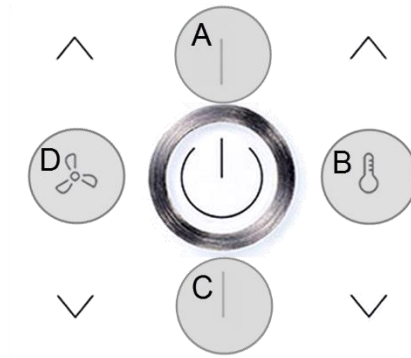
Window contact/dewpoint
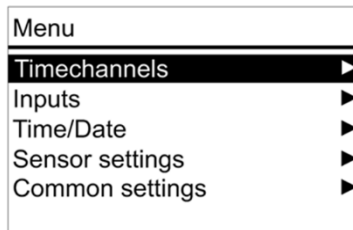
Heating/Cooling

Fan Speed

Active timechannel

Configuration

Buttons

The configuration menu is activated by simultaneously pressing the buttons "up" (A), "left" (D) and "right" (B) for at least 3 seconds.

Menu navigation through the menu is performed by pressing the buttons on the touch-surface "up" (A), "down" (C), "left" (D), "right" (B) the power button. Choose the desired parameter and press "right" (B) to open up the submenu.

The menu will default after 30 seconds if no button is pressed. To exit the menu select the header line and press "left" (D)

Time channels

Set point and timer can be set in this menu. Three different time channels with four periods of time are available. The Time channels are prioritised. Channel 3 has the highest priority.


Choose the time channel and press "right" to enter the submenu. It is possible to select the total week as well as individual days

The selected parameter will be marked with the symbol ✓

To edit the parameter of the selected timer, choose "section" and press "right".

ECO-mode is also available in the menu "section", when selecting the dead zone increase from 2 °C to 10 °C. The adjustable dead zone between the activation of heating or cooling modes enables an optimisation between comfort and energy saving.

The dead zone between heating and cooling in the ECO-mode will be set to the configured deadband range (see common settings). (default 10.0 K)
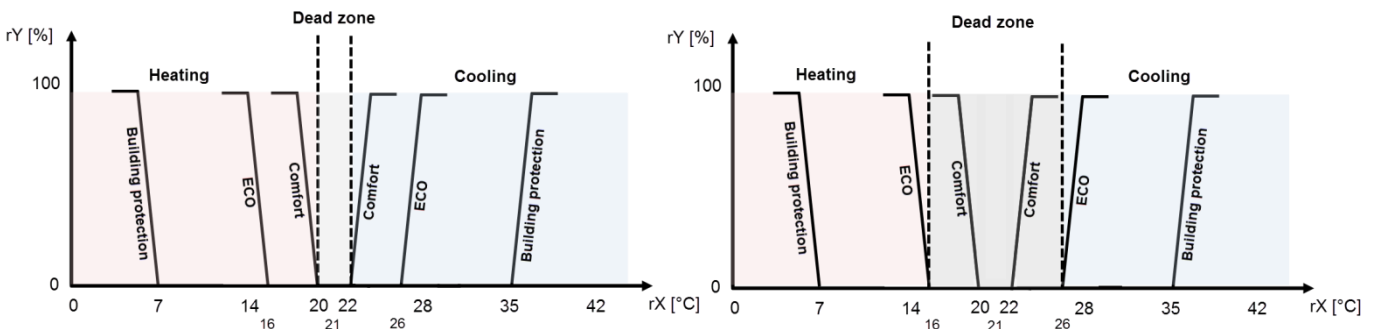
Inputs

Up to 3 inputs are configurable for functions such as windows contact, dew point, occupancy, change-over or external sensor option.

Overview of possible combinations

Input 3 (Clamp 6 and 8)	Input 2 (Clamp 11 and 12)	Input 1 (Clamp 9 and 10)
Change-Over DI	Window contact	Sensor
		Window contact
		Dewpoint sensor
		Occupancy sensor
	Dewpoint sensor	Sensor
		Window contact
		Dewpoint sensor
		Occupancy sensor
	Occupancy sensor	Window contact
		Dew point sensor
Not used	Change-Over DI	Sensor
		Window contact
		Dewpoint sensor
		Occupancy sensor
	Window contact	Sensor
		Change-Over DI
		Change-Over Sensor
		Windows contact
		Dewpoint sensor
		Occupancy sensor
	Dewpoint sensor	Sensor
		Change-Over DI
		Change-Over Sensor
		Window contact
		Dewpoint sensor
		Occupancy sensor
	Occupancy sensor	Sensor
		Change-Over DI
		Change-Over Sensor
		Window contact
		Dewpoint sensor

Sensor

The value of an external sensor will be shown if connected and configured accordingly. The roomthermostat controls in this case according to the external sensor.

Change-Over DI

Which controller is active depends on the state of the Change-Over contact. (Factory default: contact open heating controller active, contact closed cooling controller active,)

Change-Over Sensor

If a change-over input is configured, the heater relay output (clamp 5) is used for heating and cooling (2-wire mode: 19 °C cooling controller active, 30 °C heating controller active)

Window contact/Energy shut off

When window contact is enabled via the digital input, the reference will switch to a setback set point (Heat SP/Cool SP).

Dewpoint

An active dewpoint contact locks the cooling controller.

Occupancy

If occupancy-function is active, the symbol will be displayed automatically. In state of "unoccupied" the heating set point is reduced by 2K or the cooling set point raised by 2K.

Time/Date

Time, Date and display format can be configured in the menu settings. The room thermostat is equipped with a real-time clock so that it automatically adjusts for daylight-saving time. This function can be disabled in the datetime settings.
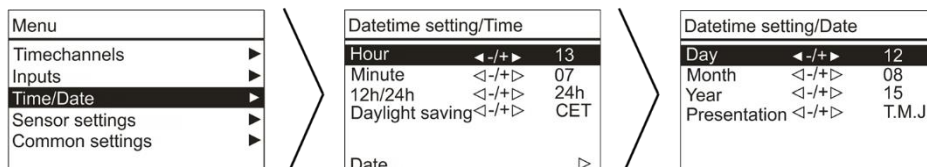
Sensor settings

Available with temperature offset correction of the integrated temperature value.

The temperature display can also be changed from °C to °F.

Common settings

The common settings include the brightness of the background lighting and the LED

Valve protection, prevents the valves becoming ceased when they are switched off for pro long periods.

If the valve protection function is activated, a valve-check is carried out every Friday at 11:00 am for the heating valve and 11:15 am for the cooling valve. The corresponding valve is triggered for 5 minutes, if not activated the last 96 hours. The deadzone can be adjusted (default 10.0 K, see timechannels). The room thermostat has 3 outputs for fan control with up to 3 fan stages. The amount of fan stages are configurable.
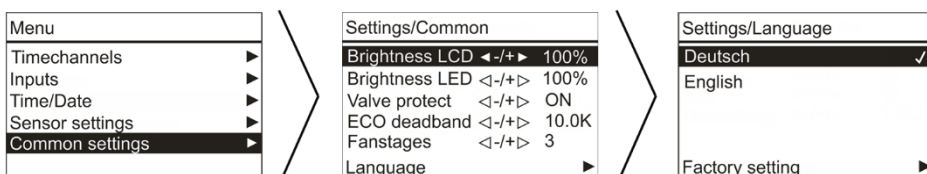
Factory settings

By selecting "Factory setting", the room thermostat will be reset and restore the device to factory default settings.

SD-Card

Micro SD cards can be used to upload a new application or a new device configuration. With the corresponding PC configuration tool a configuration file can be created and uploaded via SD card.

Boot Loader

Because of an integrated bootloader a new application (update, upgrade) can be uploaded by means of a SD card. To insert the SD card, the upper part must be removed. If the boot loader is activated, the ring illumination blinks in a 1s cycle, while display is not triggered! After recognition of a SD card with a valid application the update process is started. Now, ring illumination blinks in a 300ms cycle. After a successful update process (Duration circa 2-3 minutes!) the new application is started automatically. Afterwards, SD card shall be removed!

Dimensions (mm)
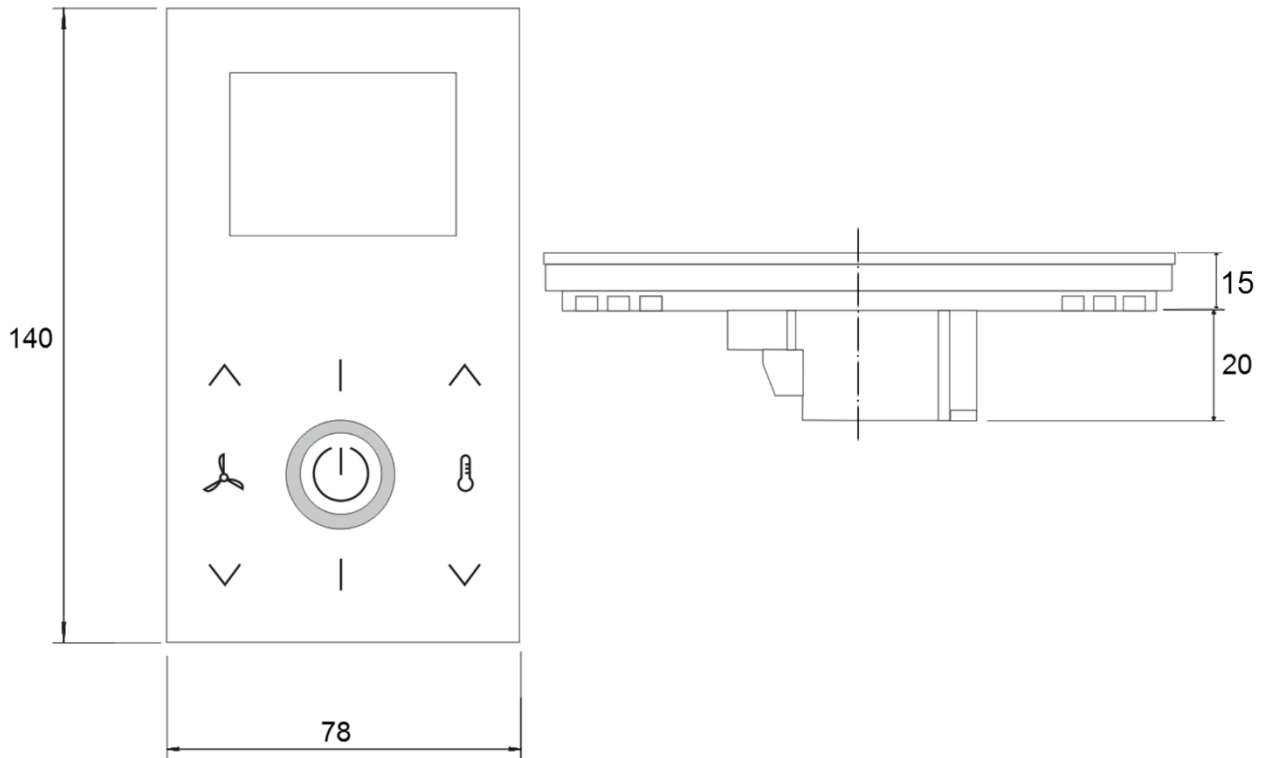
Accessories (optional)

IR remote control JOY

Item No. 613798