SYGNIX

Programable Touch Screen Thermostat Controller

Submittals and Technical Specifications

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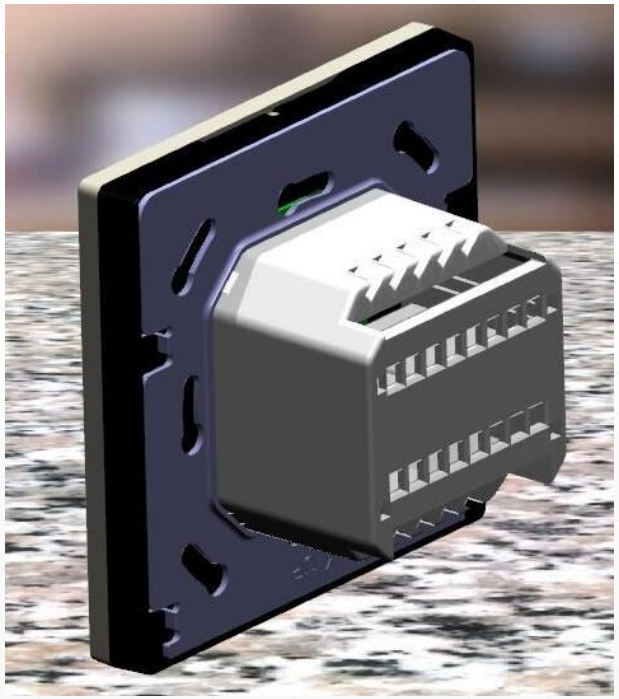
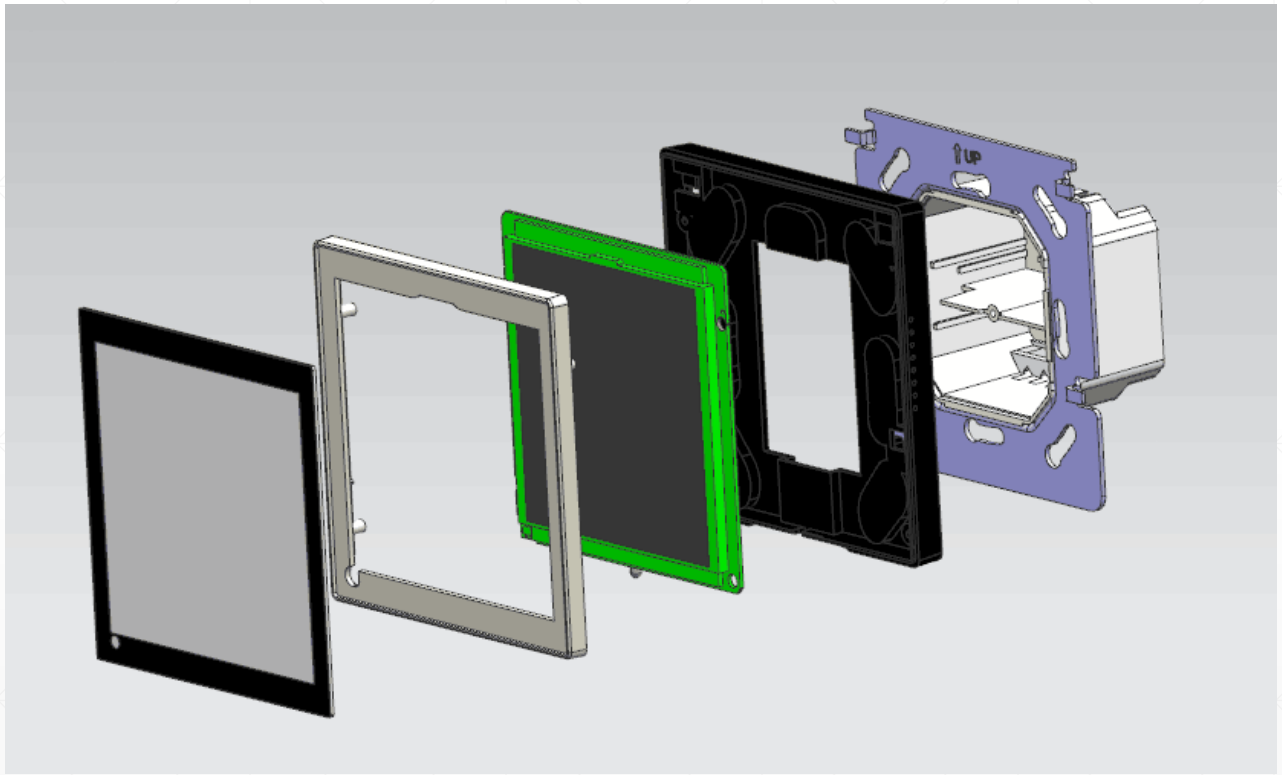
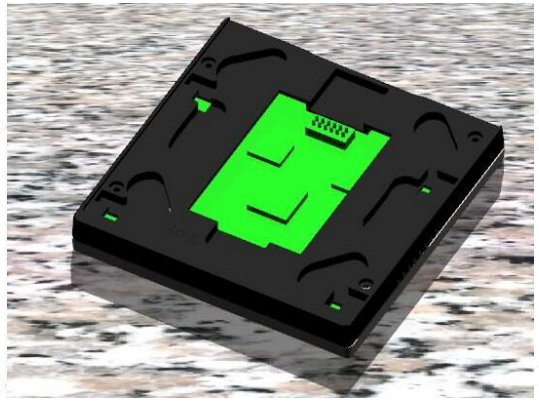
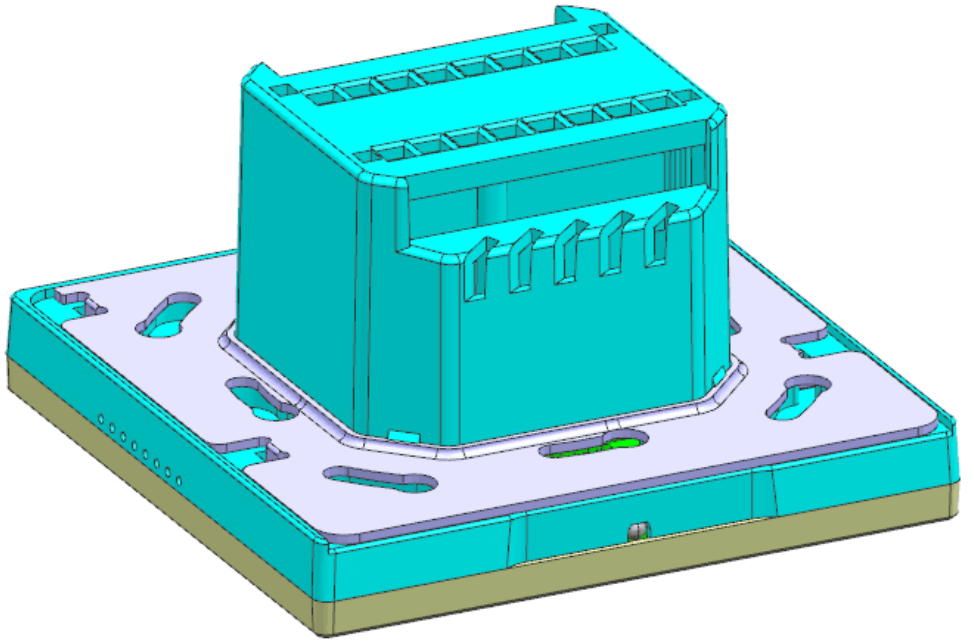
Electronic Fan Coil Thermostat with Touch Display
LCF Touch Controller Serial Modbus



Construction and Exploded Views







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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 or powered proportional valve and powered thermal valve actuators with PWM control.
- 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.
- All parameters are stored within an EEPROM (electrically erasable programmable ROM), ensuring no data loss if the Thermostat is powered off.

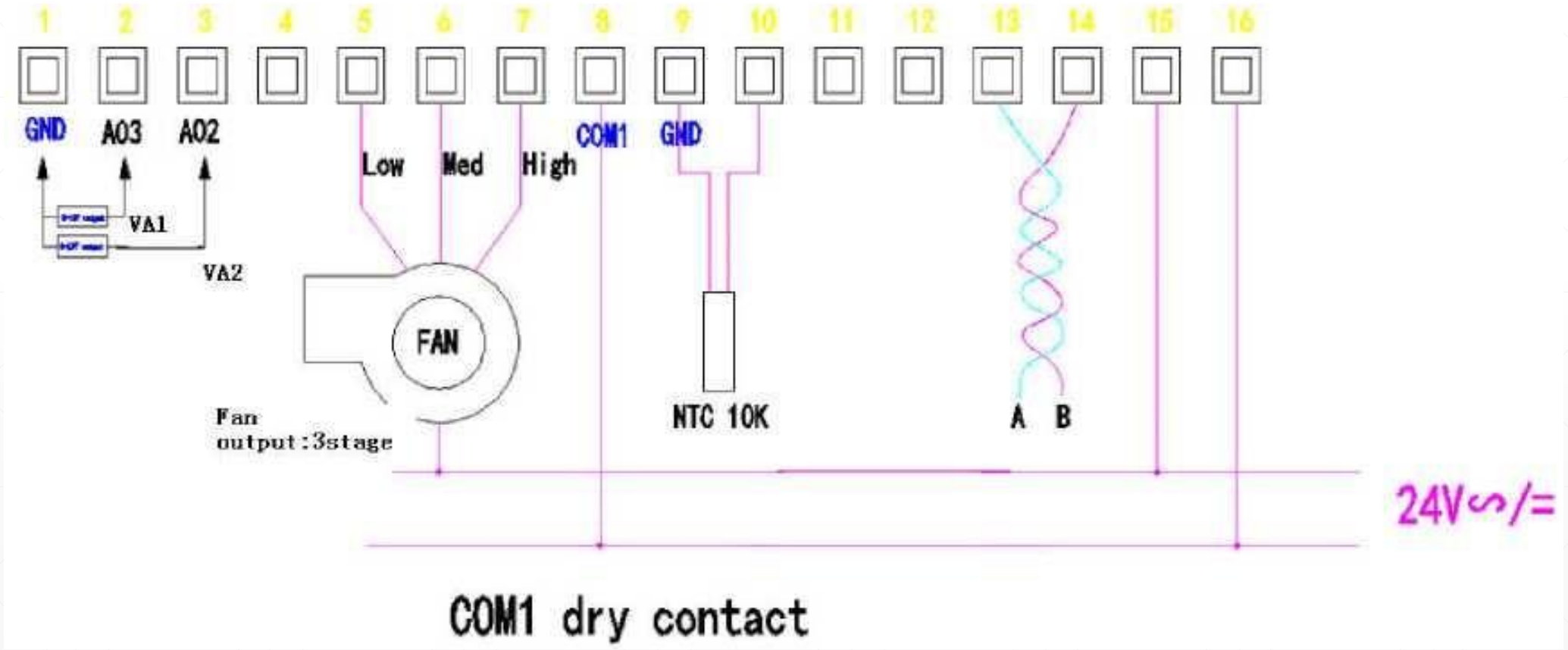
Technical Data

Measured Parameter	Temperature
Output switch contact	5x normally open contact, 2x Heating/Cooling AO output, 3x Fan Coil DO output
Network Communication	RS485 Modbus
Power supply	24V AC / DC ~- (±10%)
Power consumption	0,9 VA (24 V ~)
Measuring range	0..+50 °C
Measurement Accuracy	±1 °C (typ. at 21 °C)

Technical Data

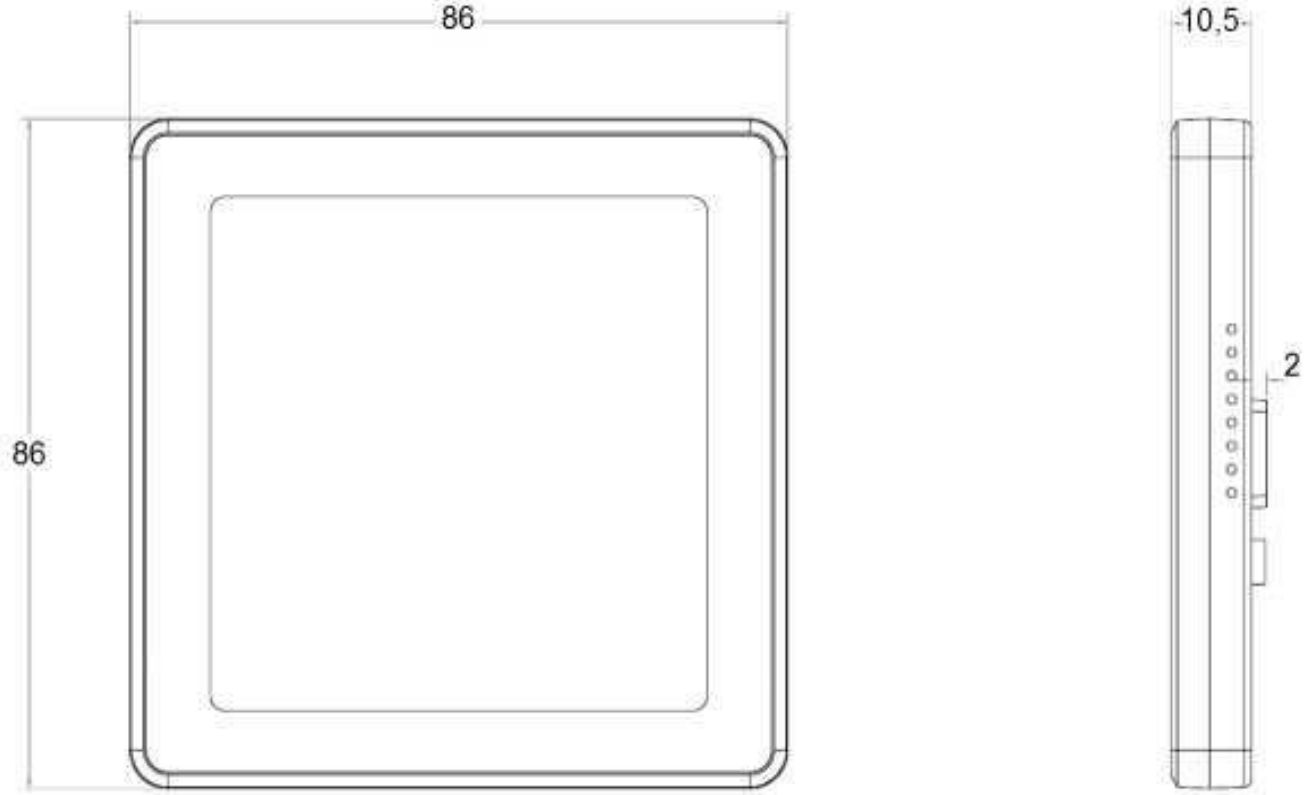
Inputs	Inputs for change-over sensor (NTC 10 K)
Control functions	Setpoint adjustment +1..+50 °C
Display	LCD-module with Touch and LED-illumination
Enclosure	ABS, Fire-proof
Protection	IP20 according to EN 60529
Connection electrical	Terminal block max. 1,5 mm²
Ambient condition	-10..+50 °C, max. 95% RH non-condensing
Weight	240g
Mounting	flush mounted with standard EU box (Ø=55 mm)
Approvals	UL and CE

Electrical Schematic – 4 pipe Fan Coil



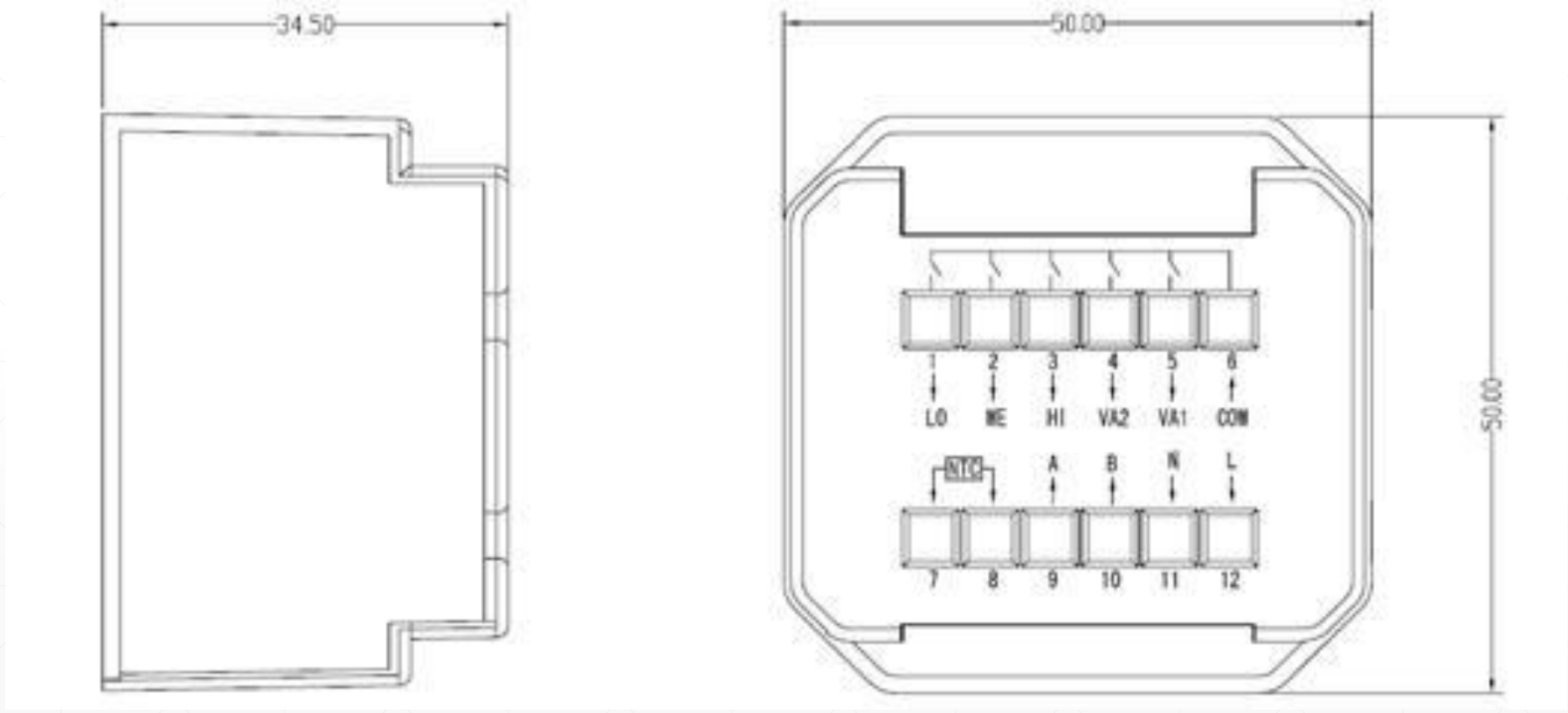
Dimensions

Display unit



Dimensions

Power Board



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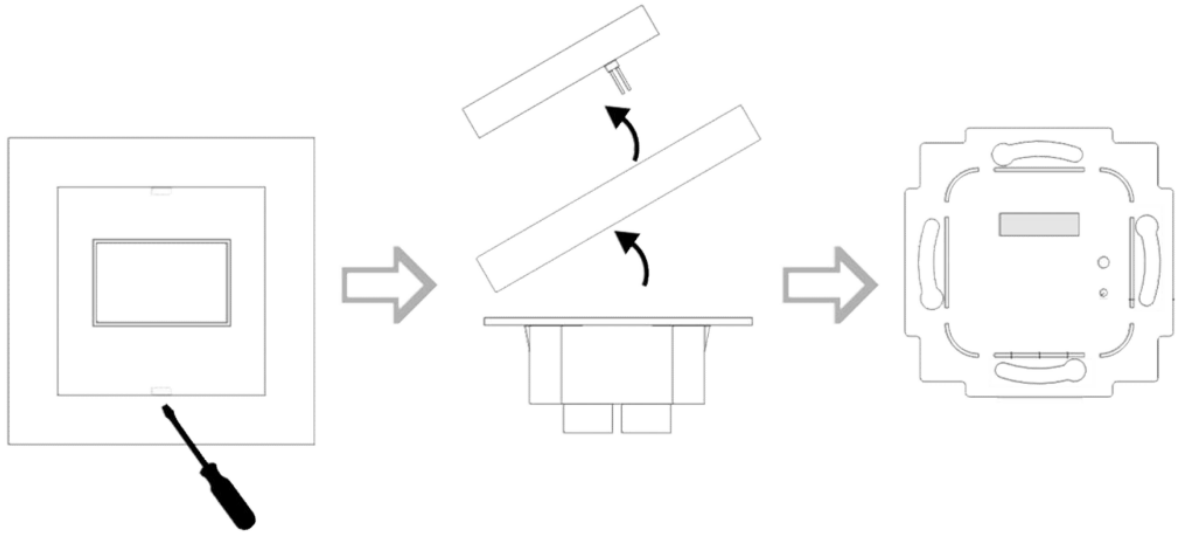
Mounting



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

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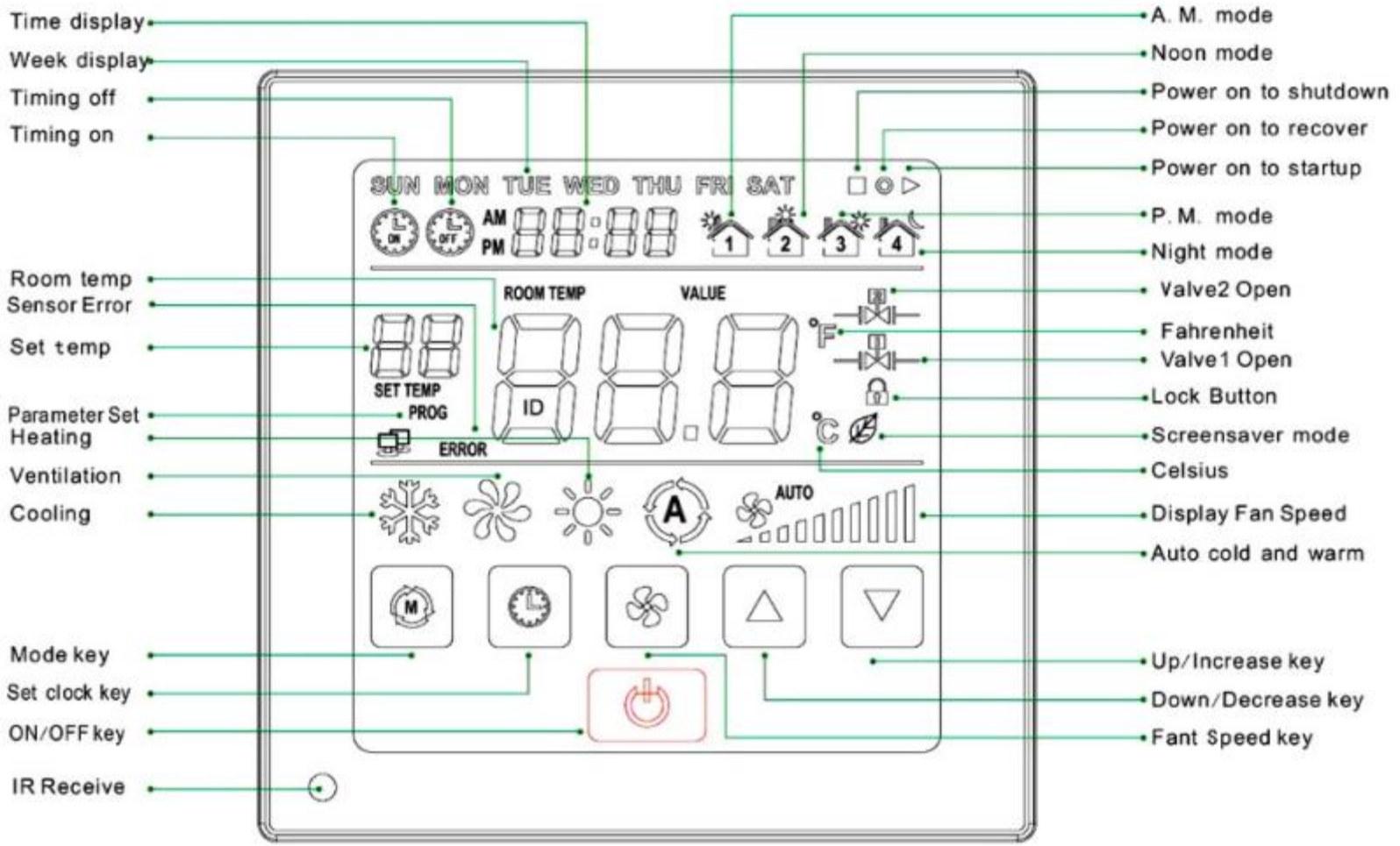
Keypad Interface



Features and Functions

2 Pipe System

Operation without a change-over 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 change-over 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 a change-over sensor

By using an change-over 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.

Features and Functions

Operation in 4-pipe system

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.

Temperature offset correction

The internal sensor will be affected by the thermostat’s self heating output. As a consequence it would display a higher room temperature than the actual average indoor temperature.
System has a calibration parameter to correct the temperature offset to a resolution 0.1°C.

Features and Functions

Mode selection

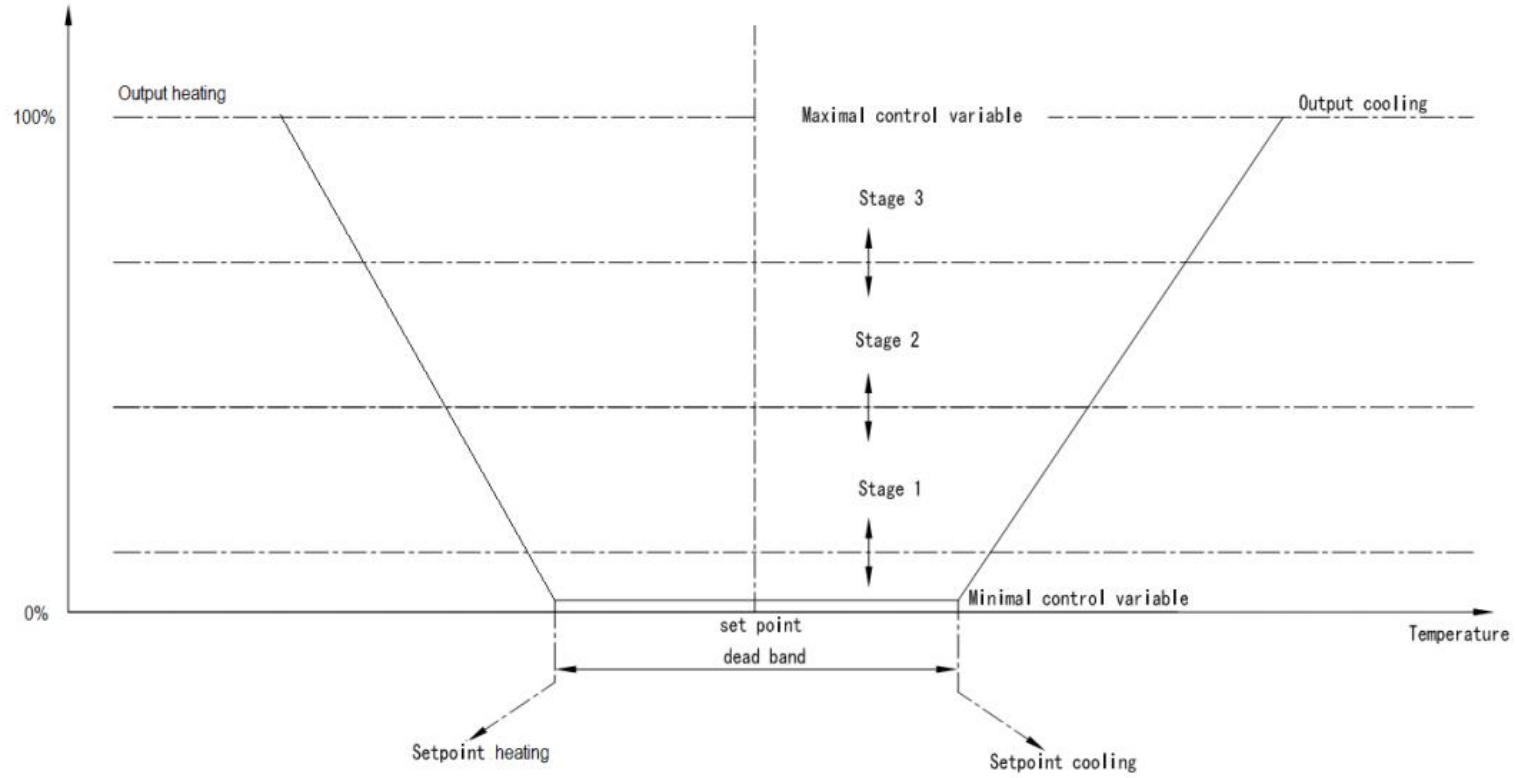
Manual Mode: 2-pipe-System: Cooling → Ventilating → Heating
Manual mode: 4-pipe -System: Cooling → Ventilating → Heating → Auto mode (only when the parameter is set

AUTO-Mode: The mode will be selected automatically

Features and Functions

Heating/cooling mode logic

The control logic is based PI loop as represented by the diagram below



Features and Functions

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”.

Auto mode: ΔT ≤ 1°C □ Low
1 °C < ΔT < 3 °C □ Med
ΔT ≥ 3 °C □ Hi

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.

Features and Functions

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.

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.

Features and Functions

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 Setup

Features and Functions

Timer Setup

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

One day is split into 4 periods.
The user can set temperature for every period individually.
Time zones can be setup

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.

Individual passwords setting

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Programable Parameters

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	0=Germany 1- English	1

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Programable Parameters

12	Temperature format	0- °C 1- °F	0
13	Selection Fan Coil:	2- 2-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
20	Parity	0-no parity 1-odd parity 2-even parity	0
21	Summer/winter time	0-fordibben 1-allow	1
22	Individual password setting	001-999	260
23	Minimal Control Variable	0= 0.0V... 40 = 4.0V	0
24	Maximal Control Variable	60= 6.0V... 100 = 10.0V,	100
25	Xp	0=0… 100 (0…10.0K)	4
26	Tn	0=0……100	21

Communication Parameters – Modbus RTU

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 stop2stops (optional)

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Communication Parameters – Modbus RTU Function and Registers

Input Register

Trim variable	Description of the variable	Read - Write	unit	variants	Register	Functioncode	
30001	return air temperature	Read -only	0.1℃	0-500(0x01F4), for example:245 and 24.5℃	0x0000	0x04	
30002	fan status	Read -only	NC	0=stop,2=low,4=medium,8=High	0x0001	0x04	
30003	VA1 status	Read -only	NC	0=stop, 1=run	0x0002	0x04	
30004	VA2 status	Read-only	NC	0=stop ,1=run	0x0003	0x04	
30006	working status	Read -only	NC	0=stop，1=run	0x0005	0x04	
30007	failure status	Read -only	NC	0:failure-free， 1:room temperature sensor alarm	0x0006	0x04	
30008	fan coil type	Read -only	NC	2:cool&heat 2pipe,	0x0007	0x04	
30009	version	Read -only	NC	1010(0x03F2)-9999(0x270F),for example:1110(0x0456) and communciation protocol version V1.3, software version V1.1	0x0008	0x04	
30010	External temp sensor	Read-only	NC	0-00-500(0x01F4),e,g:245=24.5℃	0x0009	0x04	

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Communication Parameters – Modbus RTU Function and Registers

Holding Register:

Trim variable	Description of the variable	Read - Write	unit	variants	Register	Functioncode	
40001	mode	Read / Write	NC	1=cool,4=fan,8=heat,16=auto	0x0000	0x000F	
40002	fan speed	Read / Write	NC	2=low,4=medium,8=high,128=auto	0x0001	0x03,00x06,0x10	
40003	temperature	Read / Write	0.1℃	1-500(0x01F4),for example:265 and 26.5℃	0x0002	0x03,00x06,0x10	
40004	on/off	Read / Write	NC	0=stop，1=run	0x0003	0x03,00x06,0x10	
40005	temperature lower limit	Read / Write	1℃	1-50(0x0032) default=16℃	0x0004	0x03,00x06,0x10	
40006	temperature upper limit	Read / Write	1℃	1-50(0x0032) default=30℃	0x0005	0x03,00x06,0x10	
40007	Power failure	Read / Write	NC	0-keep off power on，1-Memo while the power failure, 2-switch on while power on Default=0	0x0006	0x03,00x06,0x10	
40008	Key-lock	Read / Write	NC	0-unlocked, 1-lock on/off, 2-lock mode, 3-lock clock, 4-lock fan speed, 5- lock temp setting, 6- lock all the keystrokes Default=0	0x0007	0x03,00x06,0x10	
40009	Backlight delay	Read/Write	s	10-150s，default=15s	0x0008	0x03,00x06,0x10	
40010	shift temperature setting under cooling	Read /Write	1℃	12-24，default=19℃	0x0009	0x03,00x06,0x10	

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Communication Parameters – Modbus RTU Function and Registers

40011	shift temperature setting under heating	Read /Write	1℃	25-45，default=30℃	0x000A	0x03,00x06,0x10	
40012	Fan coil type	Read /Write	NC	2=cooling&heating 2-pipe	0x000B	0x03,00x06,0x10	
40013	7day 4periods programmable	Read /Write	NC	0=forbidden,1=allowed ,default=0	0x000C	0x03,00x06,0x10	
40014	time of the first temperature zone	Read /Write	NC	hour:min,BCD code data format e,g:08:30=0x0830	0x000D	0x03,00x06,0x10	
40015	temperature setting of the first temperature zone	Read /Write	1℃	16-30，default=25℃	0x000E	0x03,00x06,0x10	
40016	time of the second temperature zone	Read /Write	NC	hour:min, BCD code data format e,g:14:00=0x1400	0x000F	0x03,00x06,0x10	
40017	temperature setting of the second temperature zone	Read /Write	1℃	16-30，default=26℃	0x0010	0x03,00x06,0x10	
40018	time of the third temperature zone	Read /Write	NC	hour:min,e,g:20:00=0x1400	0x0011	0x03,00x06,0x10	
40019	temperature setting of the third temperature zone	Read /Write	1℃	16-30，default=27℃	0x0012	0x03,00x06,0x10	
40020	time of the fourth temperature zone	Read /Write	NC	hour:min, BCD code data format e,g:02:00=0x0200	0x0013	0x03,00x06,0x10	
40021	temperature setting of the fourth temperature zone	Read /Write	1℃	16-30，default=28℃	0x0014	0x03,00x06,0x10	
40022	Individual passwords setting	Read /Write	NC	001-999，defaul=260	0x0015	0x03,00x06,0x10	
40023	Summer/winter time	Read /Write	NC	0=forbidden,1=allowed ,default=1	0x0016	0x03,00x06,0x10	
40024	system time-- year	Read /Write	NC	2000-2099，default=2015	0x0017	0x03,00x06,0x10	
40025	system time--month	Read /Write	NC	01-12	0x0018	0x03,00x06,0x10	
40026	system time--day	Read /Write	NC	01-31	0x0019	0x03,00x06,0x10	
40027	system time-hour	Read /Write	NC	00-23	0x001A	0x03,00x06,0x10	
40028	system time-minutes	Read /Write	NC	00-59	0x001B	0x03,00x06,0x10	
40029	system time--seconds	Read /Write	NC	00-59	0x001C	0x03,00x06,0x10	
40030	system week	Read /Write	NC	1=Sun ,2=Mon ,3=Tue ,4=Wed 5=Thu 6=Fri 7=Sat	0x001D	0x03,00x06,0x10	

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Communication Parameters – Modbus RTU Function and Registers

Coil Register

Trim variable	Description of the variable	Read - Write	unit	variants	Register	Functioncode	
10001	working status	Read -only	NC	0=stop，1=run	0x0000	0x01	
10002	failure status	Read -only	NC	0:Non，1:failure	0x0001	0x01	
10003	VA1 status	Read -only	NC	0=stop，1=run	0x0002	0x01	
10004	VA2 status	Read -only	NC	0=stop，1=run	0x0003	0x01	
10005	electrical heating status	Read -only	NC	0=stop，1=run(this function under cooling+electr-heater is available	0x0004	0x01	
10006	low speed status	Read -only	NC	0=stop，1=run	0x0005	0x01	
10007	Medium speed status	Read -only	NC	0=stop，1=run	0x0006	0x01	
10008	high speed status	Read -only	NC	0=stop，1=run	0x0007	0x01	

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