



TH428WPN-C Digital Thermostat

220/230VAC FCU and UFH 2 in 1 Control

DATASHEET



Features

- Memorized time off
- Cycle Per Hour (CPH)
- Remote temperature sensor optional
- LCD display with simple interface
- Room temperature or setpoint temperature display selectable
- Manual or automatic fan speed selectable
- Temperature scale in either °C or °F
- User setting can be stored when power loss
- Freeze protection function available
- Keypad lock options
- Heating and cooling setpoint limitation
- FCU valve ON/OFF and UFH valve ON/OFF control

General

The TH428WPN-C digital thermostat is designed for under floor heating valve control and 3-speed fan and valve control in a fan coil system, including:

- Under Floor Heating Mode
- Fan Coil Unit Heating Mode
- Fan Coil Unit Cooling Mode
- Ventilation Mode
- Away Mode
- Sleep Mode

Besides the basic controls, TH428WPN-C provides **Random Start-up Function** to maintain power grid stability.

In addition, Honeywell Home **Memorized Time Off Function** can automatically turn off the thermostat to save energy.

Specifications

Power supply:	220/230 VAC, 50/60Hz
Control:	PI, On/Off output
Accuracy:	±1°C at 21°C
Auto cycle times:	100,000 times
Manual cycle times:	10,000 times
Protection class:	IP20
Set point range:	10 ~ 32°C
Display range:	0 ~ 37°C
Ambient operating limits:	0 ~ 49°C
Ambient storage limits:	-30 ~ 60°C
Humidity limits:	5~90% RH, non-condensing
Remote temperature sensor:	NTC20K
Action type:	1
Pollution degree:	2
Protection against electric shock class:	Class II
Electronic control software class:	Class A
Rated Impulse Voltage:	2500V
Maximum temperature:	150°C
Relay wiring	
Wire selectional area	
(Recommendation)	1.0 ~1.5 mm ²
Applied altitude up to 2000m above sea	
Level Rating Capacity	
Working current for the whole product:	4(3)A
4A: When the load of the thermostat is resistance	
3A: When the load of the thermostat is inductance	
For Fan current 4(2)A	
4A: When the load of the thermostat is resistance	
2A: When the load of the thermostat is inductance	
For valve load 2(1) A	
2A: when the load is resistance;1A: when the load is inductance	
The valve need have overtravel-limit organ to turn off the load.	

Mode selection

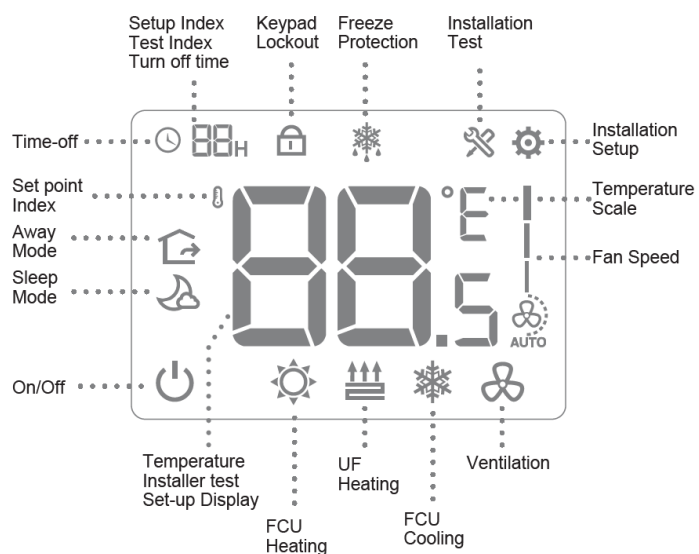
Product Type	Thermostat (with UFH control)	TH						
Application	UFH and FCU, 2 in 1		4					
Power Supply	220/230 Vac, 50/60Hz			2				
Valve Control	On/Off				8			
Housing Color	White					WP		
Backlight Color	White						N	
Certification	CE certification							-C

Product Design

Thermostat Appearance



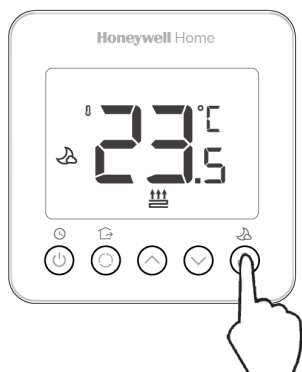
LCD Display



Operating Mode

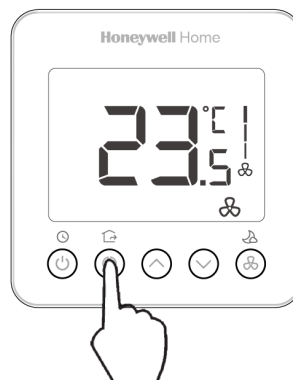
Sleep Mode

In the UF Heating mode, press and hold the "Fan" button for 3s to enter the sleep mode, and press any key to exit the sleep mode. After the sleep mode is activated, the set point will decrease by about 2°C every two hours, after 6 hours, the set point will increase by about 2°C every two hours. After 8 hours, the sleep mode will end.



Ventilation Mode

Press "mode" button to enter "ventilation" mode. In "ventilation" mode, no output for valve while the fan will operate at selected fan speed.



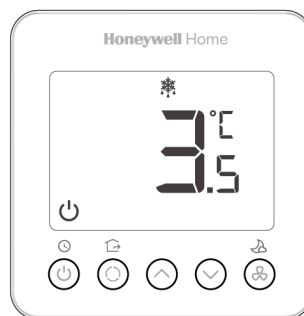
Away Mode

Press and hold the "Mode" button for 3s to enter the Away Mode, and press any button to exit the Away Mode. After the Away Mode is activated, the set point will change to the Away Mode heating/cooling setting.



Freeze Protection Mode

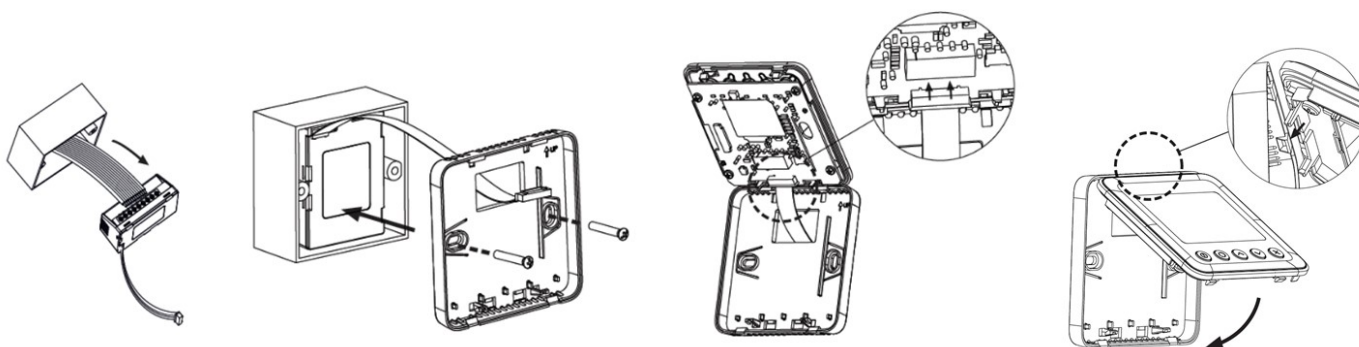
Freeze protection can be selected as disabled or enabled (default) in the ISU. In freeze protection mode (only in heating applications), when thermostat is off and the temperature is below 6°C, the thermostat will activate heating mode until the temperature rises to 8°C.



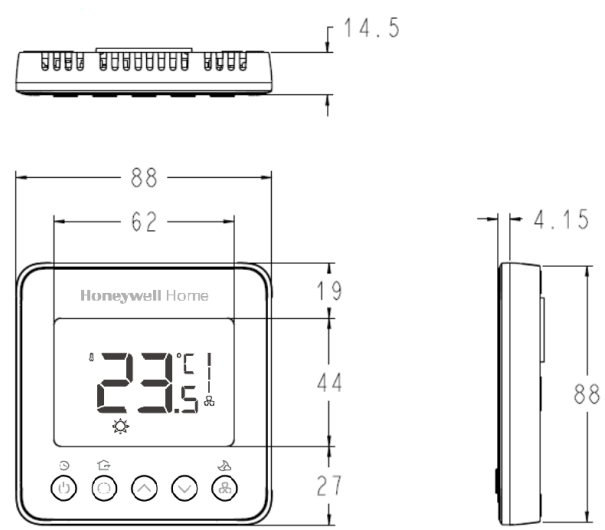
Installation and Wiring



Must be installed by a trained and experienced installer. Make sure that this product is installed in a safe area. The screw must be locked tightly to avoid wire break off from the terminal. The wire should not be tangled and stuck between front case assembly and back case.



Dimension (mm)



Function

Valve Control

Thermostat measures the room temperature via integrated sensor or remote temperature sensor and maintains the setpoint by delivering on/off valve control command outputs. The fan setting can be selected as manual or automatic 3 speed operation. When in “manual” mode, the fan is switched to the selected speed via control output FH (high), F (Medium) , FL (Low). While in “automatic” mode, fan speed depends on the difference between room temperature and setpoint. When room temperature reaches the setpoint, the valve will be closed, and the fan will be closed in the meanwhile.

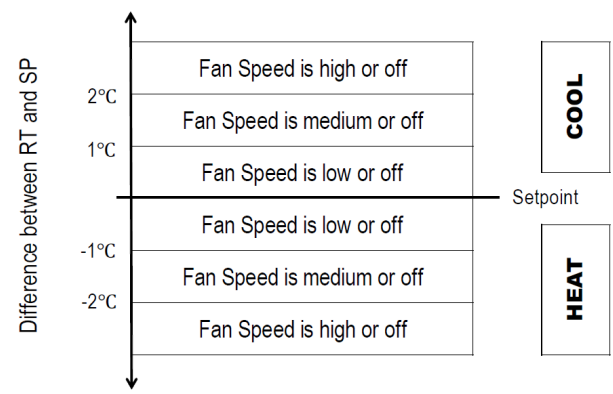
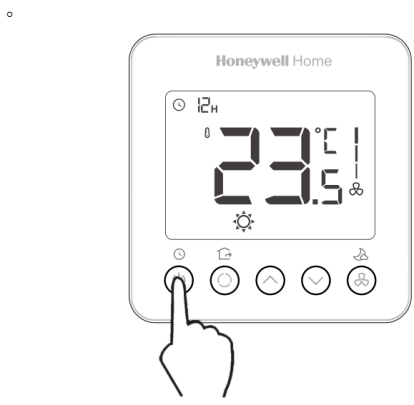


Fig. 1. Fan Speed Ramping Control Algorithm

Memorized Time Off

The time off feature will automatically turn off the thermostat after a selectable amount of time. To change the time setting, press and hold the power button for more than 3 seconds and press “up” and “down” button to change the value when the thermostat is working.

NOTE: The setting range is from 0 to 12 hours. The step is 1 hour, and the default value is 0.



Backlight

To turn on the backlight, press any key. The backlight will timeout 8 seconds after the last key is pressed. When in ISU and Installation test mode, the backlight will timeout 60 seconds after the last key is pressed.

Keypad Lockout

Keypad lockout can be set in ISU and the default status is “All keys are available”. Keypad lock can be optioned to “system button locked out”, “Fan and system buttons locked out”, “all buttons (except power button) locked out” and “all buttons are-locked”.

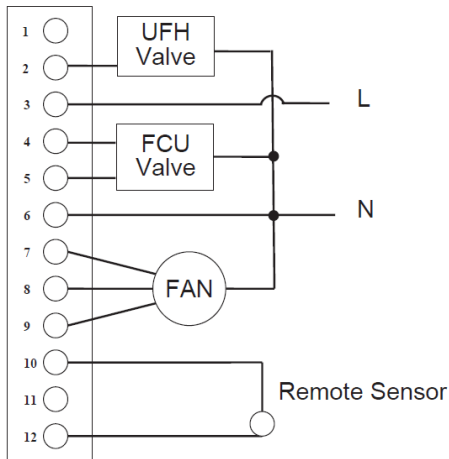
Temperature Display

The displayed temperature can be set to room temperature or setpoint. The setting can be changed during ISU (Installation Set Up) process.

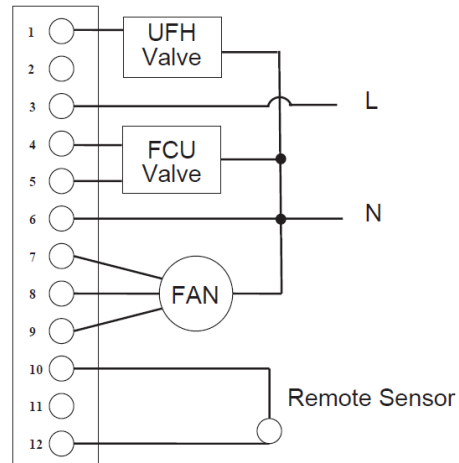
Cycle Per Hour (CPH)

In order to achieve more accurate temperature control, the CPH function enables the thermostat to open the valve several times per hour as the room temperature gets close to the setpoint. The CPH is 1 per hour for UFH, 4 per hour for FCU heating and 3 per hour for FCU cooling.

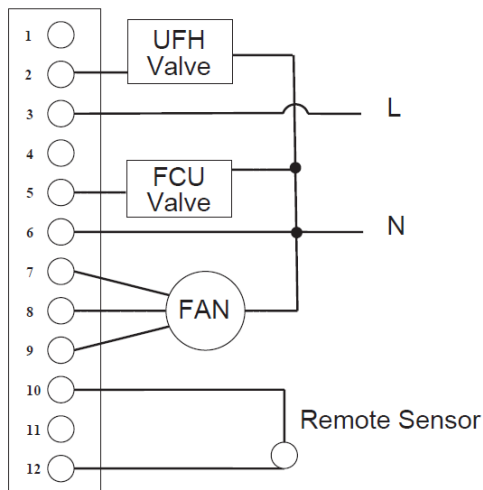
Wiring Diagram



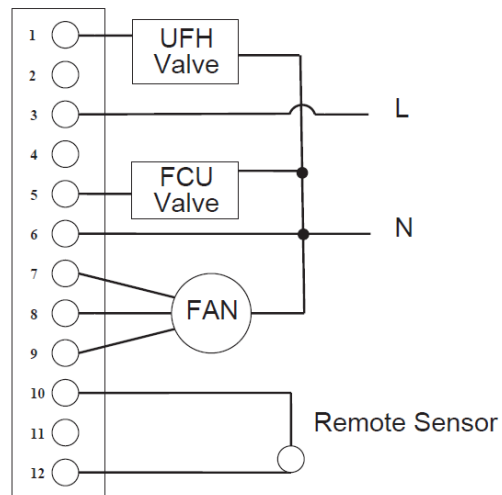
Application 1: Typical wiring for FCU ON/OFF control(VC6013)+UFH NC Mode



Application 2: Typical wiring for FCU ON/OFF control(VC6013)+UFH NO Mode



Application 3: Typical wiring for FCU ON/OFF control(VC4013)+UFH NC Mode



Application 4: Typical wiring for FCU ON/OFF control(VC4013)+UFH NO Mode

Terminal Designations

NO.	Terminal	Description
1	vC2	UFH Valve Close
2	vO2	UFH Valve Open
3	L	Live
4	vC	FCU Valve Close
5	vO	FCU Valve Open
6	N	Neutral
7	FH	High Speed Fan On
8	FM	Medium Speed Fan On
9	FL	Low Speed Fan On
10	Sc	Ground for Remote Sensor
11		
12	Rs	Remote Temperature Sensor

ISU (Installation Setup)

Press and hold the “mode” and “up” buttons together for more than 3 seconds to enter or exit ISU. Change the ISU code by pressing the “mode” button and then change the option setting by pressing the “up” and “down” button refer to the following introduction.

ISU Code	Description	Possible Options
2	Remote Sensor	0 Onboard Sensor (Default)
		1 Remote Sensor (NTC20K)
3	Temperature Scale	0 °F
		1 C (Default)
4	Fan Control Type	0 Auto Only
		1 Manual Only
		2 Auto + Manual (Default)
8	Display Temperature Adjustment	-4.5°C-4.5°C, step 0.5°C. Default 0°C (-9°F-9°F, step 1°F. Default 0°F)
9	Temperature Display Mode	0 Display room temperature (Default)
		1 Display setpoint
10	Heating Range Stops	10-32°C. Default 32°C (50-90°F. Default 90°F)
11	Cooling Range Stops	10-32°C Default 10°C (50-90°F. Default 50°F)

ISU Code	Description	Possible Options
12	Keypad Lockout	0 All keys are available (Default)
		1 System Button locked out
		2 Fan and System buttons locked out
		3 All buttons locked out except power button
		4 All buttons are locked
14	Away Mode Heating Setpoint	10-21°C. Default 14°C (50-70°F. Default 57°F)
15	Away Mode Cooling Setpoint	22-32°C. Default 26°C (72-90°F. Default 79°F)
16	Freeze Protection	0 Disable
		1 Enable (Default)
17	Power Recovery Status	0 OFF
		1 Previous status (Default)
19	Fan Mode in Away Mode	0 Run as Low fan speed when ISU_4=2 (Default)
		1 Run as Low fan speed when ISU_4=2

IT (Installation Test)

Press and hold the “up” and “down” button for 3s to enter and exit the IT mode.

IT Code	Description	Options
11	VO valve output	0 valve close
		1 valve open
12	VO2 valve output	0 valve close
		1 valve open
13	Fan output	0 Fan open
		1 Low fan speed on
		2 Medium fan speed on
		3 Hight fan speed on
16	Software information	
17	Software Version Number	Major Version
18	Software Version Number	Minor Version
19	Software Identification Code	Identification Code for E-Lab

Subject to Change without notice.



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Country of origin: China

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