

# TF228WNM/U

# COMMUNICATING FAN

# COIL THERMOSTAT

- RS485 interface in Modbus RTU slave mode
- Memorized time off
- Cycle Per Hour (CPH)
- Random startup
- Room temperature or setpoint temperature display selectable
- Manual or automatic fan speed selectable
- Temperature units in either °C or °F
- User setting can be stored with power loss
- Freeze protection available
- Four keypad lock options
- Heating and cooling setpoint limitation



## Technical Specification

Physical Layer	EIA485
Protocol	Modbus RTU
Baud rate	4800/9600(Default)/19200
Parity	None
Error Checking Mechanisms	CRC
Rated Power & Frequency	220/230VAC, 50/60Hz
Power consumption	<2
Control	PI, On/off out
Accuracy	±1°C at 21°
Auto Cycle times	100,000 times
Manual Cycle times	10,000 times
Protection class	IP20
Set point range	10 ~ 32°C
Monitor range	0 ~ +37°C
Ambient operating limits	0 ~ +49°C

## General

The TF228WNM/U communicating thermostat is designed for a 3-speed fan and a motorized valve control in fan coil system. The typical application including:

- 2-pipe cool only/heat only/manual changeover
- Ventilation mode
- Manual or automatic 3-speed fan control
- Water valve control

The TF228WNM/U is available in Modbus RTU protocol and can be easily integrated into building automation system.

Ambient storage limits	30 ~ +60°C
Set point range	5~90% RH, non-condensing
shock class Electronic control software class	Class A
Rated Impulse Voltage:	2500V
Maximum Temperature for relay wiring	155°C
Wire sectional area (Recommendation)	1.0-1.5mm <sup>2</sup>
1A	when the load is inductance The valve need have overtravel-limit organ to turn off The load.

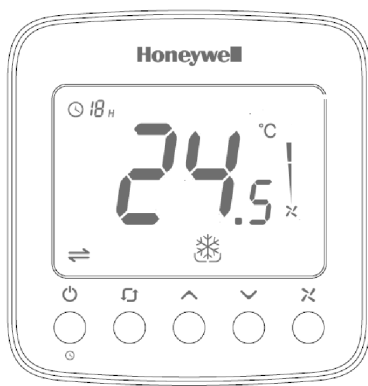
Pollution Degree	2
Action Type:	1
4(3)A	Applied altitude up to 2000m above sea level Working current for the whole product
4A	When the load of the thermostat is resistance
3A	When the load of the thermostat is inductance. For Fan Load
4A	When the load of the thermostat is resistance
2A	when the load is inductance For Valve load
2A:	when the load is resistance

### Model summary

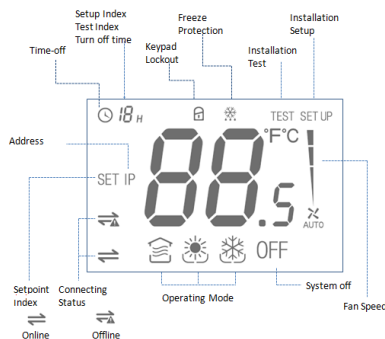
Model Number	Backlight	Application	Ventilation Mode	Automatic Fan	Power Supply
TF228WN-C	White	2 pipes FCU	Y	Y	220/230 VAC; 50/60Hz

## Product Design

Thermostat appearance



## LCD Display



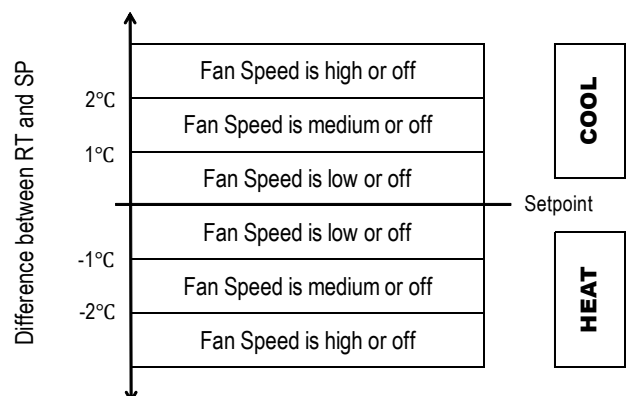
## Function

### Valve Control

Thermostat measures the room temperature via integrated 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), FM (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 mean-while.



## Temperature Display

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

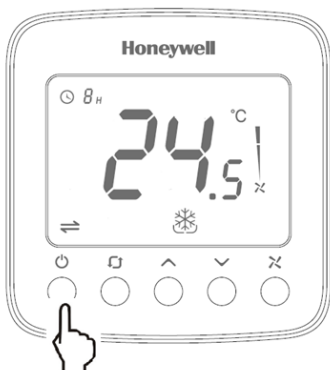
## Cycle Per Hour (CPH)

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 value can be changed in the ISU. The default value is 4 for heating and 3 for cooling.

## 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.



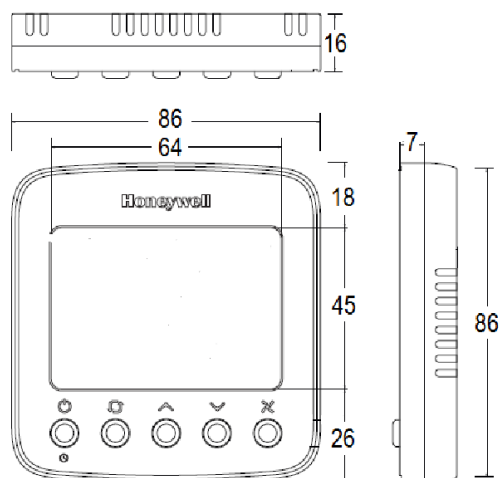
## Backlight

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 available”. Keypad lock can be optioned to “mode button locked”, “Fan and mode buttons locked”, “all buttons (except power button) locked” and “all but-tons locked”.

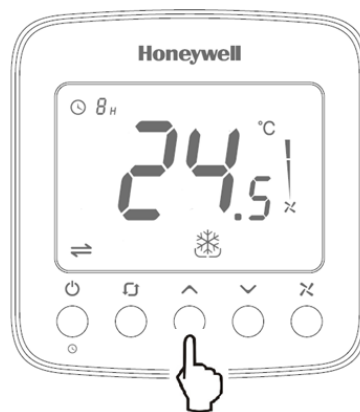
## Dimensions (mm)



## Operating Mode

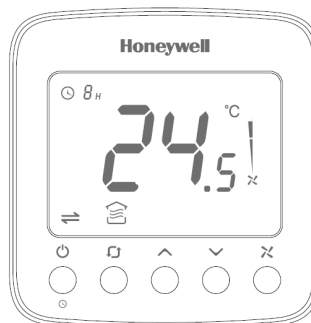
### Comfort Mode

In comfort mode, the setpoint can be changed by pressing up and down button. Applications include cool only, heat only and manual heat/cool changeover.



### 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.



## ISU (Installation Setup)

Press and hold the “mode” and the “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
0	Address	1~64 <b>1(Default)</b>
1	System Type	0 Heat only 1 Cool only <b>2 Two pipes heating/cooling manual (Default)</b>
2	Temp. Scale	0 °F <b>1 °C(Default)</b>
3	Fan control Type	0 Auto only 1 manual only (3 speed: Low→Med→High→Low) <b>2 users can choose auto or manual (Default)</b>
4	CPH value (heat)	1-12 <b>4 (Default)</b>
5	CPH value (cool)	1-6 <b>3 (Default)</b>
6	Display Temp. adjustment	-2~2°C, 0.5°C. Default 0°C (-4~4°F, 1°F. Default 0°F)
7	Temp. Display	<b>0 room temp. (Default)</b> 1 set point
8	Heating Range Stops	10~32°C. Default 32°C (50~90°F. Default 90°F)
9	Cooling Range Stops	10~32°C Default 10°C (50~90°F. Default 50°F)
10	Sequence Dead band for four pipes	<b>0 All keys are available (Default)</b> 1 system button locked out 2 Fan and system button locked out 3 All button locked out except power button 4 All button are locked
11	Freeze Protection	0 Disabled 1 Enable (Default)
12	Power Recovery status	<b>0 room temp. (Default)</b> 1 set point

## Communicating Parameter Setting

When the thermostat is integrated into building automation system, you can make configuration refer below list.

Addr Reg-isters	Configura-tion parameters	Significance and adjustment	Prop-erties
01	System type	0-OFF;1-ON	R/W
02	Room Temp	Room temperature	R
03	Temp. Scale*	0-°F ; 1-°C	R/W
04	Setpoint*	Set temperature value	R/W
03	Fan Status*	0-Low speed ; 1-Med speed ; 2-High speed ; 3-Auto	R/W
06	System Mode*	0-Ventilation ; 1-Heat ; 2-Cool	R/W
07	Valve status	0-closed;1-open	R
08	Error Code	0-None ; 1-Sensor 2-EEprom ; 3-Sensor+EEprom	R
09	Baud rate	<b>0-9600 (Default)</b> ; 1-4800 ; 2-19200	R/W
11	Address*	1~64 <b>1( Default )</b>	R/W
12	System Type*	0-Heat only;1-cool only; <b>2-Two pipes heating/cooling manual (Default)</b>	R
13	Fan Control Type*	0-Auto ; 1-Manual ; <b>2-Auto+Manual (Default)</b>	R/W
14	CPH (Heat)*	1-12 <b>4(Default)</b>	R/W
15	CPH (Cool)*	1-6 <b>3(Default)</b>	R/W
16	Display Temp adjustment	0~8(-2~2°C) step 1(0.5°C) <b>4(Default)</b> 0~8(-4~4°F) step 1 (1 °F) <b>4 (Default)</b>	R/W
17	Temp. Display*	<b>0- room temp. (Default)</b> ;1-set point	R/W
18	Heating Range Stops*	100~320 (10~32°C) step5 (0.5°C) <b>320(Default)</b> 500~900 (50~90°F)step10 (1°F ) <b>900(Default)</b>	R/W

19	Cooling Range stops*	100~320 (10~32°C) step5(0.5°C)100 <b>(Default)</b> 500~900 (50~90°F) step10(1°F) <b>500</b> <b>(Default)</b>	R/W
20	Keypad lockout *	<b>0- All keys are available (Default);</b> 1- system button locked out;2- Fan and system button locked out;3- All button locked out except power button;4- All button are locked	R/W
21	Freeze Protection*	0- Disabled ; <b>1- Enable (Default)</b>	R/W
22	Power Recovery status*	0- OFF ; <b>1 Previous status (Default)</b>	R/W
29	Turn off time*	0~12; step 1 Unit: hour	R/W
30	Remain time to turn off	0~12; step 1 Unit : hour	R

Note: The parameters marked with"\*" can be changed either in ISU on site or modbus.

Terminal Designations		
Item	Terminal	Description
1	N	220/230Vac Neutral
2	L	220/230Vac Line
3	vO	Heating / Cooling valve open
4	vC	Heating / Cooling valve close
5	FH	High speed fan
6	FM	Medium speed fan
7	FL	Low speed fan
8	D+	RS 485+
9	D-	RS 485-

## Wiring

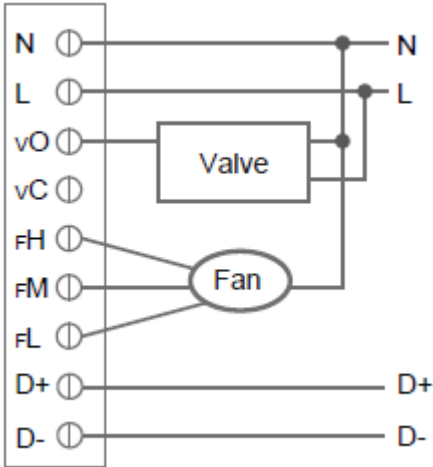


Fig. 2. Honeywell VC4013/VN4013/VS4016 Wiring

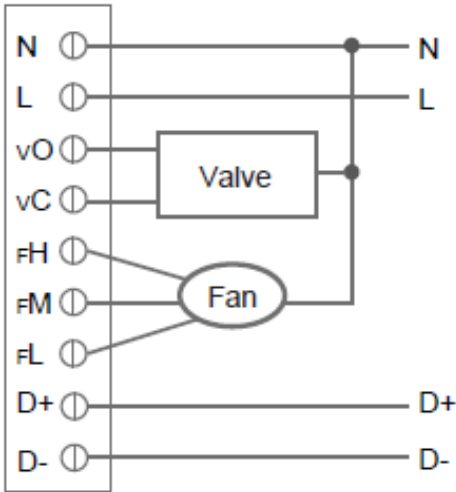


Fig. 3. Honeywell VC6013/VN6013 Wiring

## Terminal Designations

If...	Then...
Heating system does not turn on.	<ul style="list-style-type: none"> <li>• Set the mode to Heat by pressing the Mode button.</li> <li>• Check that the heat temperature setting is set above the room temperature and "Heat On" shows solidly in the display.</li> <li>• Wait five minutes for the heating system to respond.</li> </ul>
Cooling system does not turn on.	<ul style="list-style-type: none"> <li>• Check whether the Fan mode is set to Auto</li> <li>• Check whether the heating or cooling system works.</li> </ul>
The Fan button doesn't work.	<ul style="list-style-type: none"> <li>• Check whether the keypad is locked or not.</li> <li>• Check whether the system is working in Energy saving mode.</li> <li>• Check whether the thermostat is off.</li> </ul>
The Mode button doesn't work.	<ul style="list-style-type: none"> <li>• Check whether the keypad is locked or not.</li> <li>• Check whether the system is working in Energy saving mode.</li> <li>• Check whether the thermostat is off.</li> </ul>
The Fan button doesn't work.	<ul style="list-style-type: none"> <li>• Check whether the keypad is locked or not.</li> <li>• Check whether the system is working in Energy saving mode.</li> <li>• Check whether the thermostat is off.</li> </ul>
The fan doesn't work.	<ul style="list-style-type: none"> <li>• Check whether the Fan mode is set to Auto</li> <li>• Check whether the heating or cooling system works..</li> </ul>

### For more information,

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