Honeywell Home

TF228WN-C Digital Thermostat

220/230VAC,Fan Coil Control

SPECIFICATION DATA

General

The TF228WN-C digital thermostat is designed for 3-speed fan and valve control in a fan coil system, including:

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

Besides the basic controls, TF228WN-C featuring **CPH (Cycle Per Hour)** better maintains the room temperature to the setpoint and **memorized time off function** can automatically turn off the thermostat to save energy.

In addition, Honeywell Home **Random start-up function** would help to maintain power grid stability.
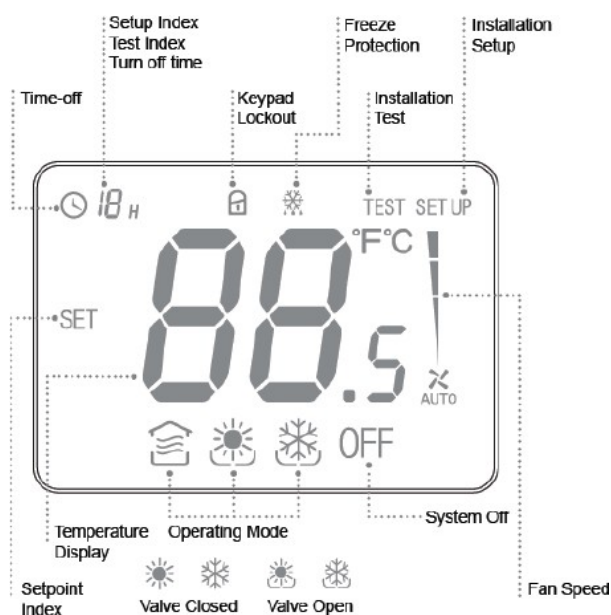
Features

- **Memorized time off**
- **Cycle Per Hour (CPH)**
- **Random startup**
- **LCD display with simple user interface**
- **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**
- **Independent installation on 86 size box**

Specifications

Power supply	220/230VAC, 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
Monitor range	0 ~ 37°C
Ambient operating limits	0~ +49°C
Ambient storage limits	-30 ~ +60°C
Humidity limits	5~90% RH, non-condensing
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 for relay wiring	155°C
Wire sectional area (Recommendation)	1 0-1.5mm^2

Applied altitude up to 2000m above sea level
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 Load
4A: when the load is resistance
2A: when the load is inductance
For Valve load
2A: when the load is resistance
1A: when the load is inductance
The valve need have overtravel-limit organ to turn off
The load.

CE

Model Selection

Model Number	Backlight	Application	Ventilation Mode	Automatic Fan
TF228WN-C	White	2 pipes FCU	Y	Y

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 meanwhile.
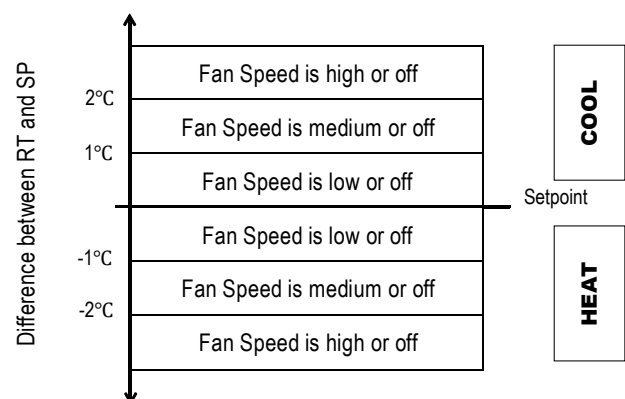

Fig. 1. Fan Speed Ramping Control Algorithm

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 se-point.

The value can be changed in the ISU, but the default values are 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 buttons locked".
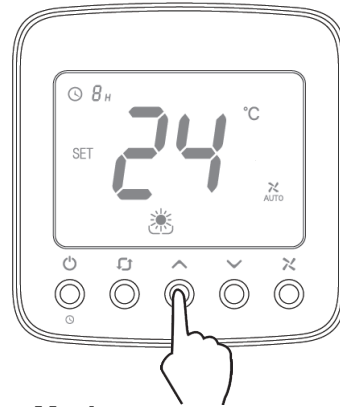
Dimensions (mm)
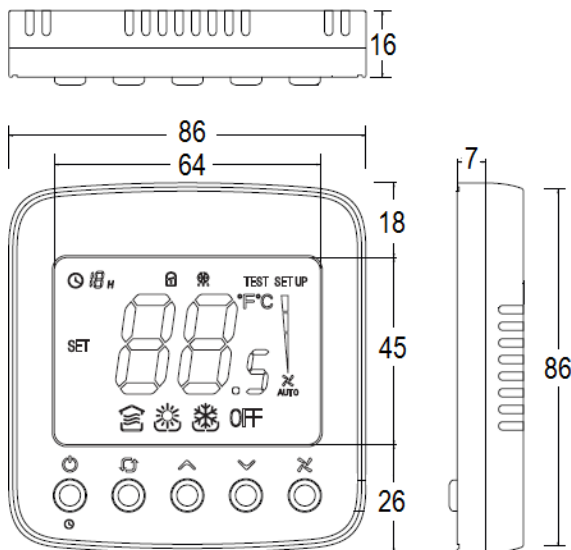
Operating Mode

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.

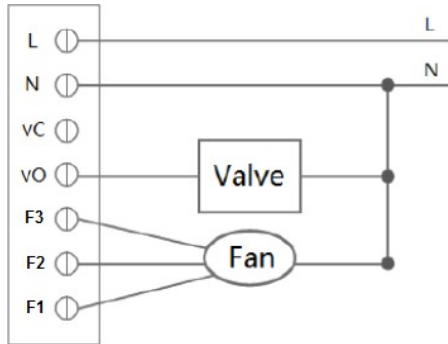## Freeze Protection Mode

Freeze protection can be selected as disabled (default) or enabled 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 .**

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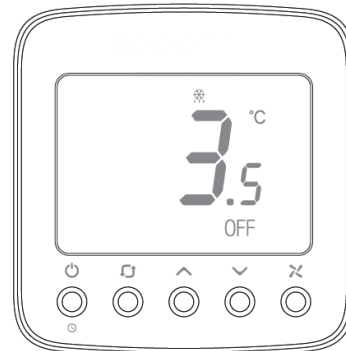
Wiring

Fig. 2. Honeywell Home VC4013/VN4013/VS4016 Wiring
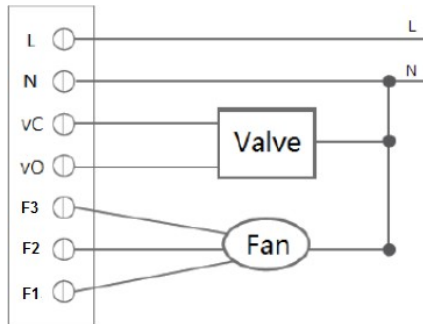
Fig. 3. Honeywell Home VC6013/VN6013 Wiring

Terminal Designations

Item	Terminal	Description
1	L	220/230VAC,Live wire
2	N	Neutral wire
3	vC	Heating / Cooling valve close
4	vO	Heating / Cooling valve open
5	F3	High speed fan
6	F2	Medium speed fan
7	F1	Low speed fan

Trouble Shooting Tips

If	Then...
Heating system does not respond	• Set the mode to heating by pressing the mode button • Make sure the temperature is set above the room temperature. • Make sure "heat on" icon shows on the display • Wait 5 minutes for the system to respond
Cooling system does not respond	• Set the mode to cooling by press-ing the mode button • Make sure the temperature is set below the room temperature • Make sure "cool on" icon shows on the display • Wait 5 minutes for the system to respond
The fan doesn't work	• Make sure fan mode isn't set to auto • Check heating or cooling system works well.
The mode or fan button doesn't work	• Make sure keypad is unlocked. • Check that thermostat is on.
The up or down button doesn't work	• Make sure keypad is unlocked. • Make sure the system doesn't work in ventilation mode • Check that thermostat is on.
The system turns off automatically	• Make sure the memorized time off value isn't set to "0".

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User Manual

TF228WN Digital Thermostat

Quick Start Guide

Thermostat Appearance

Operating Your Thermostat

Power On/Off

Time Off

- Press ⏻ to switch on/off thermostat. When in off mode, OFF icon will display.

- Press 🕐 could set the automatical turn off time when the thermostat is working.

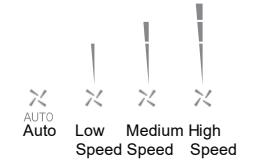- Press ∧ and hold for more than 3s. After timer icon flashes, press ∧ or ∨ to set turn off time, then press 🕐 button to exit.

Temperature Setting

∧ ∨

In ❄ or ☀ mode, press ∧ or ∨ to set the target room temperature.

Operating Mode

Ventilation   Heating   Cooling

Fan Speed

AUTO Auto   Low Speed   Medium Speed   High Speed

LCD Display

Setup Index
Test Index
Turn off time

Freeze Protection

Installation Setup

Time-off

Keypad Lockout

Installation Test

Temperature Display

Operating Mode

System Off

Setpoint Index   Valve Closed   Valve Open   Fan Speed
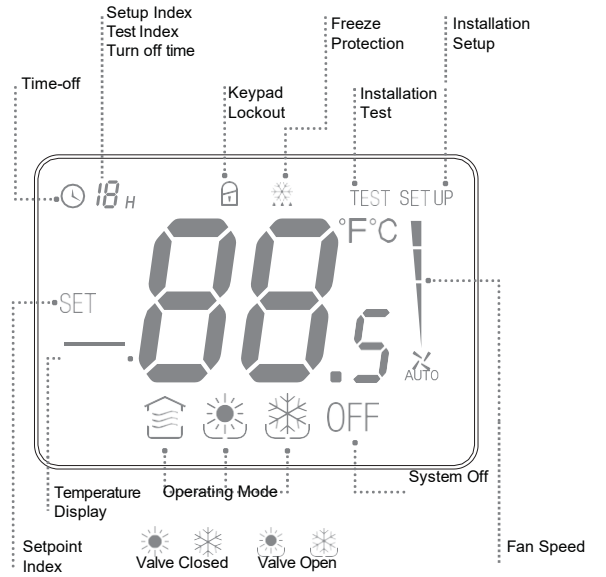
Trouble Shooting Tips

If....	Then....
Doesn't work	Set the mode to ☀ (heating mode) by press. Make sure the temperature is set above the room temperature. Make sure ☀ shows on the display. Wait 5 minutes for the system to respond.
Doesn't work	Set the mode to ❄ (cooling mode) by press. Make sure the temperature is set below the room temperature. Make sure ❄ shows on the display. Wait 5 minutes for the system to respond.
Doesn't work	Make sure keypad is unlocked. Check that thermostat is on.
Doesn't work	Make sure keypad is unlocked. Make sure the system isn't in ☀ mode. Check that thermostat is on.
The system turns off automatically	Make sure the memorized time off value isn't set to "0".

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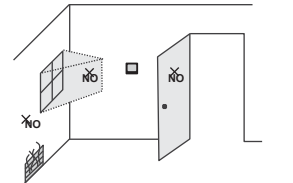
Installation Guide

Must be installed by a trained and experienced installer

Read instruction carefully. Failure to follow instruction will damage the product or cause a hazardous condition.

Caution: ELECTRICAL HAZARD can cause electrical shock or equipment damage. Disconnect power before installation, reparation and detachment.

Installation Tips

TF228WN is designed for standard 75x75x5mm wall mounting box installation. Install the thermostat about 5 feet (1.5m) above the floor in an area with good air circulation at average temperature.

**Do not install in locations where the thermostat can be affected by:**

Dead spots behind doors and in corners

Hot or cold air from ducts

Sunlight or radiant heat from appliances

Concealed pipes or chimneys

Terminal Designations

Terminal	Description
L	220VAC live wire
N	220VAC neutral wire
vC	Heating / Cooling valve close
vO	Heating / Cooling valve open
FH	High speed fan
FM	Medium speed fan
FL	Low speed fan

* The temperature of mounting box and wall should be in the operating temperature range.

Wiring Diagram 1

Honeywell Home VC4013/VN4013 VS4016 Wiring
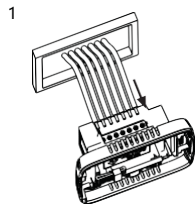
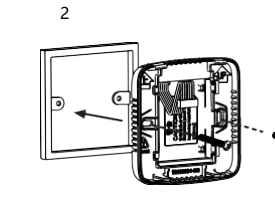# Wiring Diagram 2

Honeywell Home VC6013/VN6013 Wiring
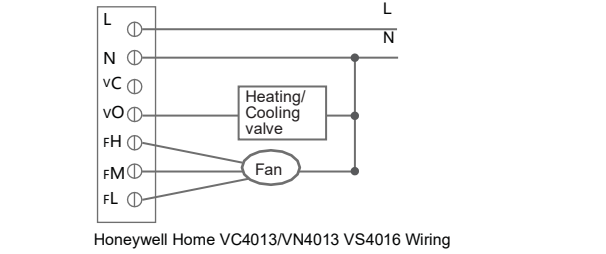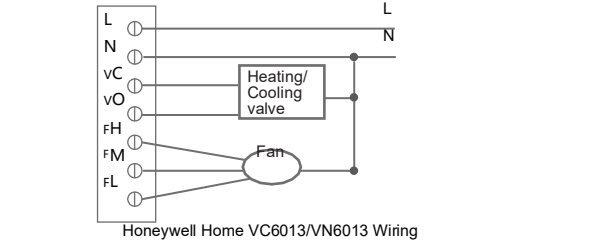
Wiring and Installation
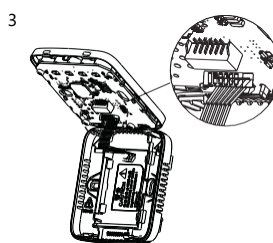

The screw must be locked tightly to avoid wire break off from the terminal.

Installation Setup

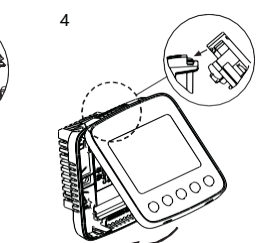Enter or Exit Installation Setup Mode

ISU Code	Description	Possible Options ∧ ∨	
1	System Type	0 Heat only	
		1 Cool only	
		2 Two pipes heating/cooling(Default)	
2	Temperature Scale	0 °F	
		1 °C (Default)	
3	Fan Control Type	0 Auto only	
		1 Constant only	
		2 Both(Default)	
4	CPH Value (heating)	1-12 **4(Default)**	
5	CPH Value (cooling)	1-6 **3(Default)**	

ISU Code	Description	Possible Options ∧ ∨
6	Temperature Display Adjustment	-2 °C- 2 °C, 0.5 °C, **Default 0 °C** (-4 °F- 4 °F, 1 °F, **Default 0 °F**)
7	Temperature Display Options	**0 Display room temperature (Default)**
		1 Display set point
8	Heating Range Stop	10-32 °C **Default 32 °C** (50-90 °F **Default 90 °F**)
9	Cooling Range Stop	10-32 °C **Default 10 °C** (50-90 °F **Default 50 °F**)
10	Keypad Lockout	**0 All keys are available(Default)**
		1 System button is locked
		2 Fan and System button are locked
		3 All buttons are locked except power button
		4 All buttons are locked
11	Freeze Protection	**0 Disabled (Default)**
		1 Enabled