

T6861-F Large LCD Digital Thermostat

230 VAC , Floating output

2-pipe fan coil control

Data sheet



Application

T6861-F digital thermostats are designed for application of 3-speed fan and floating valves in fan coil system.

Including:

2-pipe cool only/heat only/manual changeover

Ventilation mode

Manual or automatic 3-speed fan control
floating valve control

Fan speed can be selected to automatic or manual 3-speed control mode.

In ventilation mode, fan only support manual speed control.

Features

- Super modern appearance design, suitable for office, hotel and residential building
- Horizontal and vertical model available for variant application
- Slim design, direct installation on 86 size box
- Stylish and elegant blue/green backlight with white
- 2-pipe integrated into one unit with easy configuration
- Big LCD display with English and icons
- Easy to install and set-up
- Time on/off function
- Selectable room temperature or setpoint temperature display
- Manual or automatic fan speed selection
- Remote sensor function
- Adjustment of display room temperature
- Temperature unit either °C or °F
- User setting can be kept when power off
- Freezing protection function available
- Lock or unlock keys or part of keys in Installer Set-up
- Heat and cool setpoint limitation for energy saving

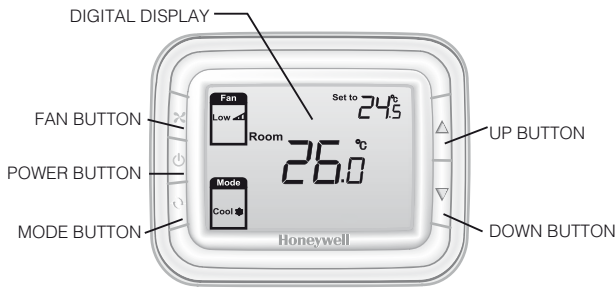
Model summary

| Model | Horizontal/ Vertical | Backlight | Color Ring | Time on/off | 2-pipe/ 4-pipe | Power supply (V) | Remote sensor | Ventilation | Manual/ Automatic Fan | Remote Setback |
|-------------|-------------------------|-----------|------------|----------------|-------------------|---------------------|------------------|-------------|--------------------------|-------------------|
| T6861H2WB-F | Horizontal | Blue | White | Y | 2 | 230 | Y | Y | Y | N |
| T6861V2WB-F | Vertical | Blue | White | Y | 2 | 230 | Y | Y | Y | N |
| T6861H2WG-F | Horizontal | Green | White | Y | 2 | 230 | Y | Y | Y | N |
| T6861V2WG-F | Vertical | Green | White | Y | 2 | 230 | Y | Y | Y | N |

Note: Horizontal models are taken as samples for display, operation and installation pictures shown in below parts.

Mechanical design

Thermostat appearance

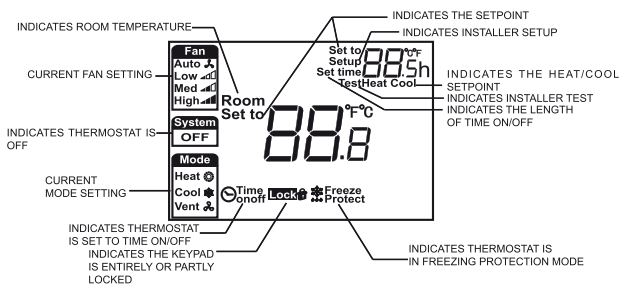


Fan Operation

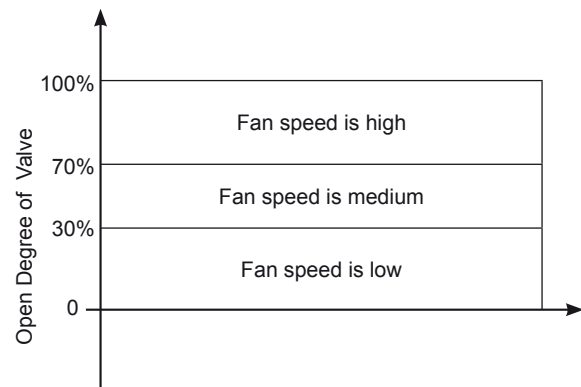


PRESS THE FAN BUTTON TO SELECT LOW, MED, HIGH OR AUTO

LCD display



Fan can be selected as manual or automatic 3-speed operation. In Manual mode, the fan is switched to the selected speed via control output Gh, Gm, Gl. While in automatic mode, fan speed depends on the difference between room temperature and setpoint. When room temperature reaches setpoint, valve will be closed and meanwhile, fan will be closed either.



Fan speed ramping control algorithm

Function

Floating Valve control

Thermostat acquires the room temperature via its integrated sensor or external temperature sensor and maintains the setpoint by delivering floating valve control commands 3-position outputs.



PRESS THE MODE BUTTON TO SELECT HEAT, COOL, AUTO OR VENT

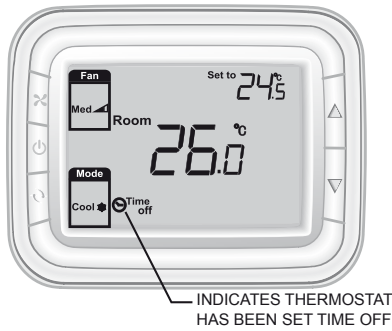
Temperature display

The displayed temperature can be set to acquired room temperature or setpoint. The setting can be made during Installer Set-Up process.

Time on/off

If the thermostat is off, hold power button for 3 seconds, system will be time on mode. If the thermostat is on, hold power button for 3 seconds, system will be time off mode.

The setting range is from 0 to 12 hours. The step is 0.5 hour with the default time is 0.



Backlight

Any key press will activate the backlight. Backlights will timeout 8 seconds after last key press. When in Installer Set-up and Installer test mode, the backlight will timeout 60 seconds after last key press.

Keypad lock

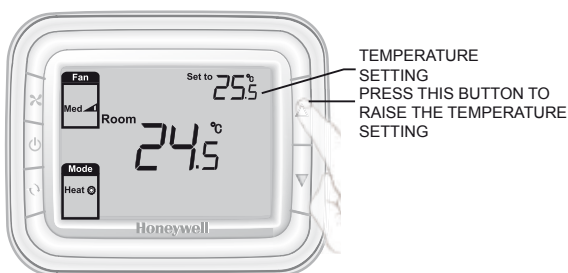
Keypad lock can be set in ISU with default status is all keys available. You may change into mode button locked out, Fan and mode buttons locked out and All buttons locked out by changing the ISU.

Operating modes

The following operating modes are available:

Comfort mode

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



Ventilation mode

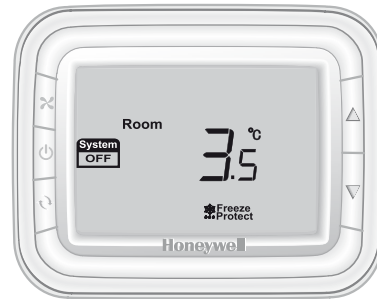
Press mode button to enter ventilation mode. In ventilation mode, no output for floating valve while the fan will operate according to selected fan speed.

Remote temperature sensor

T6861 provides control either depending on the acquired room temperature or depends on the return air temperature. The model of remote temperature sensor is (NTC20K).

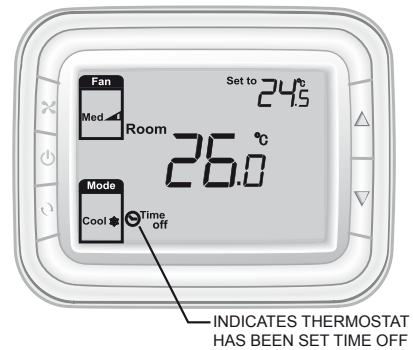
Freezing protection mode

Freezing protection can be selected as disabled (default) or enabled. In freezing protection mode (no such mode in cool only application), when thermostat is in OFF mode while the acquired temperature is below 6°C, the thermostat will start heat mode until the temperature rises to 8°C or the thermostat is turned on.



On/off mode

Pressing power button can switch between on and off mode.



Technical specification

| | |
|--------------------------|--|
| Power supply | 230 (+10%, -10%) VAC |
| Frequency | 50Hz |
| Control algorithm | PI, floating output |
| Accuracy | +/-1°C at 21°C |
| Rating capacity | For 230V power supply: 10(2)A for fan load, 3(1)A for valve |
| Cycle times | 100,000 times |
| Setpoint range | 10~32°C |
| Display range | 0~37°C |
| Installation | Installed on 86×86mm junction box or 3×3 inch. |
| Protection Class | IP20 |
| Environmental Conditions | Operation temperature -18~49°C Shipping temperature -35~65°C Relative humidity 5~90%, noncondensing |

Terminal Designations

| Terminal | Description |
|----------|--------------------------|
| L | Line voltage Power |
| Ch/Cc | Valve close |
| W/Y | Valve open |
| N | Line voltage ground |
| Gl | Low speed fan relay |
| Gm | Medium speed fan relay |
| Gh | High speed fan relay |
| Sc | Ground for remote sensor |
| Rs | Remote sensor |

Application 3: 2 pipes 1 stage Heat or 1 stage Cool MCO wiring diagram

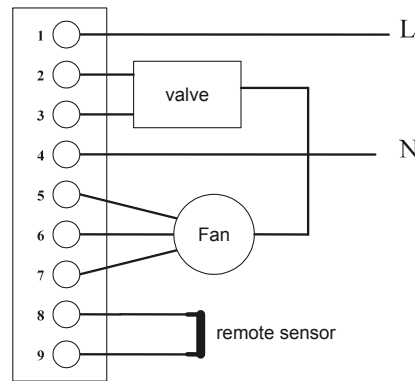


Figure 0-3 Typical wiring for 3-wire control in 2 pipes 1H1C

Wiring diagram

Application 1: 2 pipes heat only wiring diagram

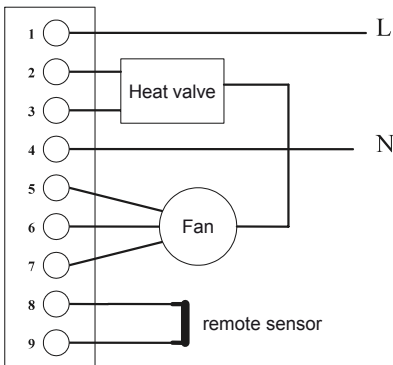


Figure 0-1 Typical wiring for 3-wire control in 2 pipe heating only

Application 2: 2 pipes Cool only wiring diagram

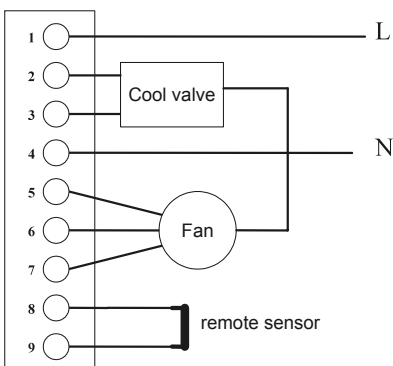
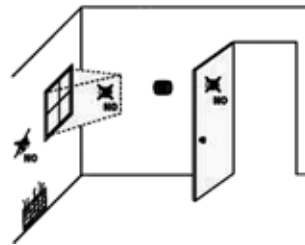


Figure 0-2 Typical wiring for 3-wire control in 2 pipe cooling only

Installation & Commissioning

Install the thermostat about 5 feet (1.5m) above the floor in an area with good air circulation at average temperature.

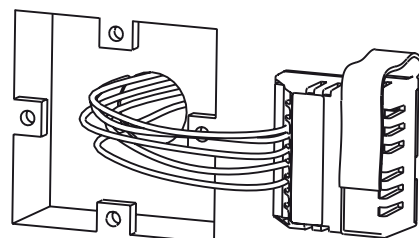


Do not install in locations where the thermostat can be affected by:

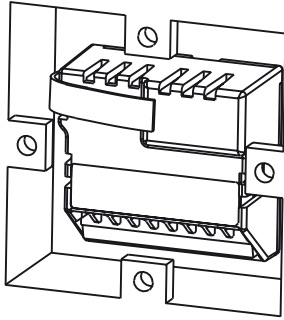
- Drafts or dead spots behind doors and in corners
- Hot or cold air from ducts
- Sunlight or radiant heat from appliances
- Concealed pipes or chimneys
- Unheated/uncooled areas such as an outside wall

1 Pull wires through wire hole.

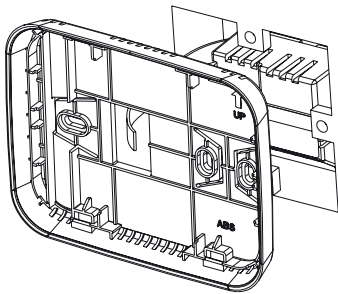
Loosen screw terminals, insert wires into terminal Block, then retighten screws.



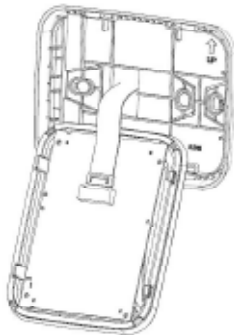
2 Push the Power box into the junction box.



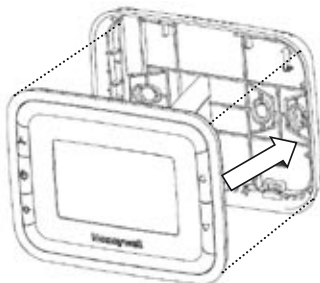
3 Place Back cover over junction box, insert and tighten mounting screws.



4 Insert the cable into connector on circuit board of thermostat.

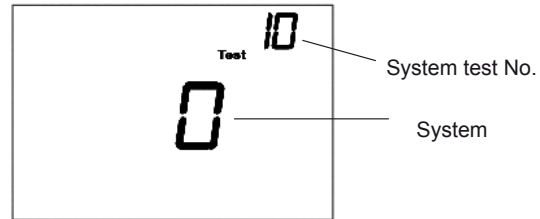


5 Align the 4 tabs on the Back cover with corresponding slots on the back of the thermostat, and then push it until the thermostat snaps in place.



Installer system test

After completing the installer setup above, press the button again to begin a system test
Follow the procedure below to test the heating and cooling and fan system.



Press and hold \blacktriangle and \blacktriangledown buttons 3 seconds to enter test mode.

Press \blacktriangle or \blacktriangledown button to change system status.

Press \blacklozenge button to advance to next test number.

Press \blacktriangle and \blacktriangledown button hold to terminate system test at any time.

System Test System Status

10 Valve open degree

0 Stop

1 Open

2 Close

40 Fan 0 Fan off

1 Low speed Fan on

2 Medium speed Fan on

3 High speed Fan on

70 Thermostat information (for reference only)

71 Software revision number (major revisions)

72 Software revision number (minor revisions)

73 Configuration identification code (major)

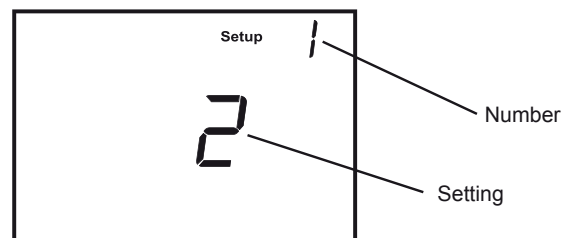
74 Configuration identification code (minor)

75 Production configuration date code (week)

76 Production configuration date code (year)

Installer Set-Up (ISU) setting

Press \blacktriangle and \blacklozenge simultaneously for 3 seconds to enter ISU as below:



Press \blacktriangle or \blacktriangledown to change settings

Press \blacklozenge to advance to next function

Press \blacktriangle and hold \blacklozenge and buttons 3 seconds to exit and save settings

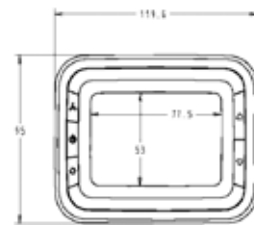
Setup Function Settings & Options

| ISU Code | Description | Possible Options |
|----------|--------------------------------|---|
| 1 | System Type | 0 Heat only |
| | | 1 Cool only |
| | | 2 Two pipes 1H1C manual (Default) |
| 3 | Floating Actuator Running Time | 24 (120 seconds Default) Range 6~32 (30~160 seconds) |
| 5 | Remote Sensor | 0 Onboard Sensor (Default) |
| | | 1 Remote sensor (NTC20K, T7770A1006) |
| 9 | Temperature Scale | 0 °F |
| | | 1 °C (Default) |
| 10 | Fan Control Type | 0 Auto Only |
| | | 1 Constant Only |
| | | 2 Both (Default) |
| 18 | Display Temperature Adjustment | -2 °C (-4 °F) |
| | | -1.5 °C (-3 °F) |
| | | -1 °C (-2 °F) |
| | | -0.5 °C (-1 °F) |
| | | 0 °C (0 °F) (Default) |
| | | 0.5 °C (1 °F) |
| | | 1 °C (2 °F) |
| | | 1.5 °C (3 °F) |
| | | 2 °C (4 °F) |
| 19 | Temperature Display Mode | 0 Display Room Temperature |
| | | 1 Display Set point |
| | | 2 Display Both (Default) |
| 20 | Heating Range Stops | 10-32 °C Default 32 °C (50-90 °F Default 90 °F) |
| 21 | Cooling Range Stops | 10-32 °C Default 10 °C (50-90 °F Default 50 °F) |
| 22 | Keypad Lockout | 0 All keys are available (Default) |
| | | 1 System button is Locked out |
| | | 2 Fan and System button are Locked out |
| | | 3 All buttons are locked out |
| 27 | Freeze Protection | 0 Disabled |
| | | 1 Enabled |

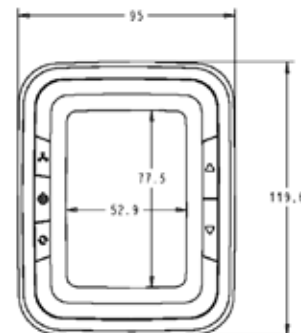
Troubleshooting Tips

| If... | Then... |
|-------------------------------------|---|
| Valve doesn't open | <ul style="list-style-type: none"> ◆ Press Up and Down button and hold them about 3s. ◆ Press Mode button to adjust the item to "10", and Press the Up button to modify the value to "2". ◆ Check the actuator. It must turn on slowly. ◆ Check the valve, if it still doesn't open, please call your supplier. |
| The fan doesn't work. | <ul style="list-style-type: none"> ◆ Check whether the Fan mode is set to Auto ◆ Check whether valve is open |
| The Mode button doesn't work. | <ul style="list-style-type: none"> ◆ Check whether the keypad is locked or not. ◆ Check whether the thermostat is off. |
| The Fan button doesn't work. | <ul style="list-style-type: none"> ◆ Check whether the keypad is locked or not. ◆ Check whether the thermostat is off. |
| The Up or Down button doesn't work. | <ul style="list-style-type: none"> ◆ Check whether the keypad is locked or not. ◆ Check whether the thermostat is off. |

Dimension



Horizontal model



Vertical model