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

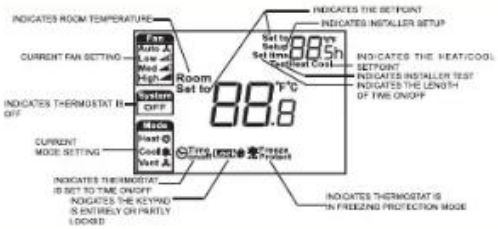
Note: Horizontal models are taken as samples for display, operation and installation pictures shown in below parts.

Mechanical design

Thermostat appearnce



LCD display



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.



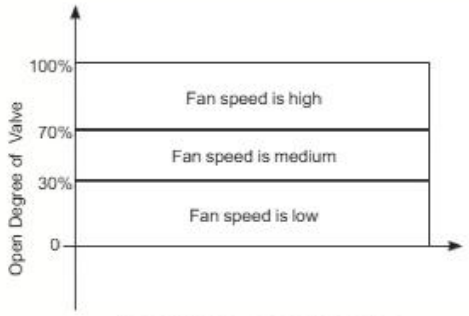
PRESS THE MODE BUTTON TO SELECT HEAT, COOL, AUTO OR VENT

Fan Operation



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

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.



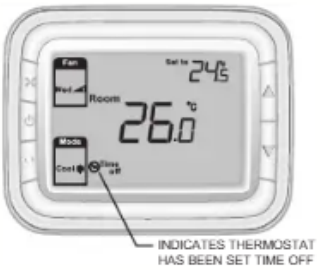
Fan speed ramping control algorithm

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.

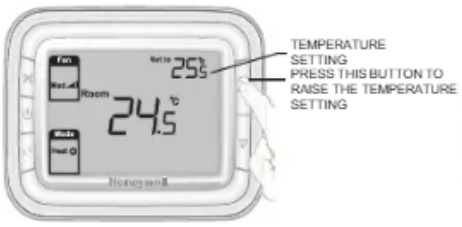


Backlight
Any key press will activate the backlight. Backlights will timeout 8 seconds after last key press. When in Installer Set-up and Installer test mode, the backlight will timeout 60 seconds after last key press.

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

Wiring diagram

Application 1: 2 pipes heat only wiring diagram

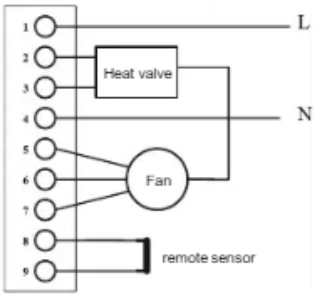


Figure 0-1 Typical wiring for 3-wire control in 2 pipe heating only

Application 2: 2 pipes Cool only wiring diagram

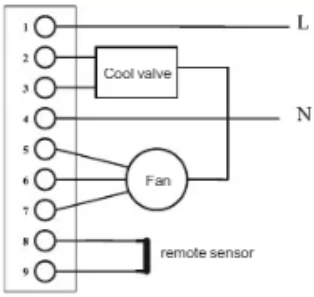


Figure 0-2 Typical wiring for 3-wire control in 2 pipe cooling only

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

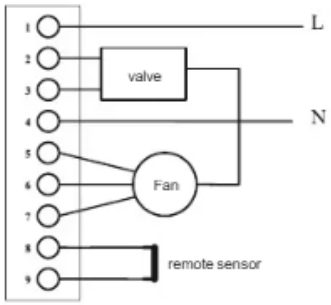
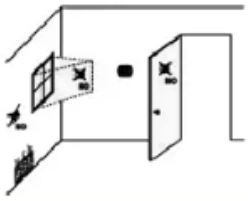


Figure 0-3 Typical wiring for 3-wire control in 2 pipes 1H1C

Installation & Commissioning

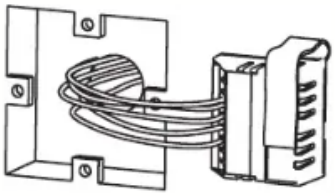
Install the thermostat about 5 feet (1.5m) above the floor in an area with good air circulation at average temperature.



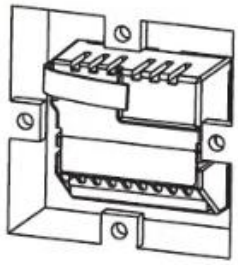
Do not install in locations where the thermostat can be affected by:

- 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

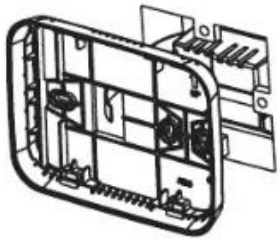
1 Pull wires through wire hole.
Loosen screw terminals, insert wires into terminal Block, then retighten screws.



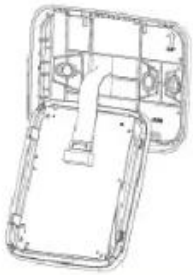
2 Push the Power box into the junction box.



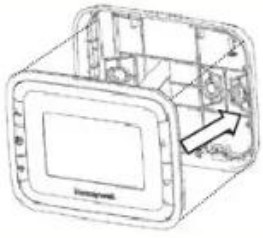
3 Place Back cover over junction box, insert and tighten mounting screws.



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

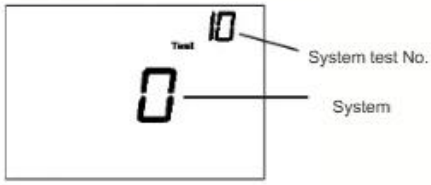


5 Align the 4 tabs on the Back cover with corresponding slots on the back of the thermostat, and then push it until the thermostat snaps in place.



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 ▲ and ▼ buttons 3 seconds to enter test mode.
Press ▲ or ▼ button to change system status.
Press ↻ button to advance to next test number.
Press ▲ and ▼ button hold to terminate system test at any time.

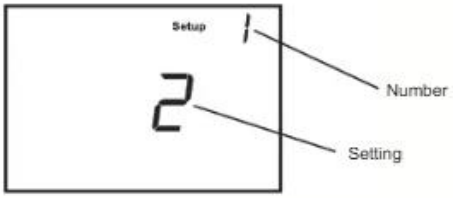
System Test System Status
10 Valve open degree
- 0 Stop
- 1 Open
- 2 Close

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 ▲ and ↻ simultaneously for 3 seconds to enter ISU as below:



Press ▲ or ▼ to change settings
Press ↻ to advance to next function
Press ▲ and hold ↻ and buttons 3 seconds to exit and save settings

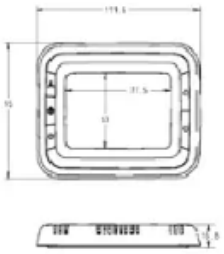
Setup Function Settings & Options

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

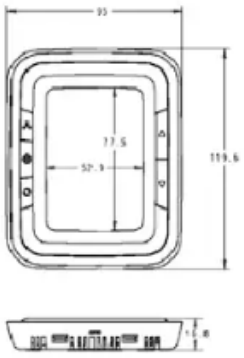
Troubleshooting Tips

If…	Then…
Valve doesn't open	♦ 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.	♦ Check whether the Fan mode is set to Auto ♦ Check whether valve is open
The Mode button doesn't work.	♦ Check whether the keypad is locked or not. ♦ Check whether the thermostat is off.
The Fan button doesn't work.	♦ Check whether the keypad is locked or not. ♦ Check whether the thermostat is off.
The Up or Down button doesn't work.	♦ Check whether the keypad is locked or not. ♦ Check whether the thermostat is off.

Dimension



Horizontal model



Vertical model