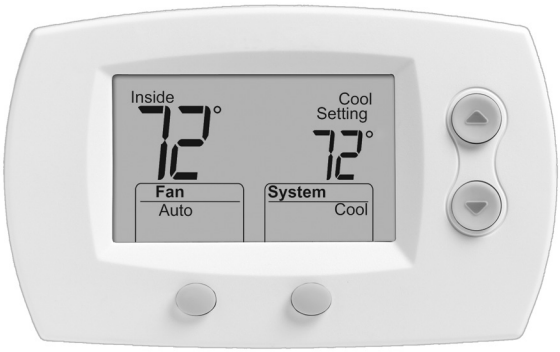


Installation Guide

FocusPRO® TH5000 Series

Non-Programmable Digital Thermostat

This manual covers the following models

- TH5110D: For 1 Heat/1 Cool systems
- TH5220D: For up to 2 Heat/2 Cool systems
- TH5320U: For up to 3 Heat/2 Cool systems

(Remove battery holder to find model number)

System Types

- Gas, oil, or electric heat with air conditioning
- Warm air, hot water, high-efficiency furnaces, heat pumps, steam, gravity
- Heat only — two-wire systems, three-wire zone valves (Series 20), and normally open zone valves
- Heat only with fan
- Cool only
- 750 mV heating systems

Must be installed by a trained, experienced technician

Read these instructions carefully. Failure to follow these instructions can damage the product or cause a hazardous condition.

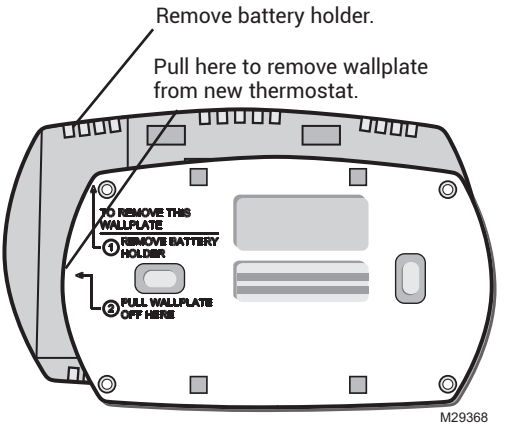
Need Help?

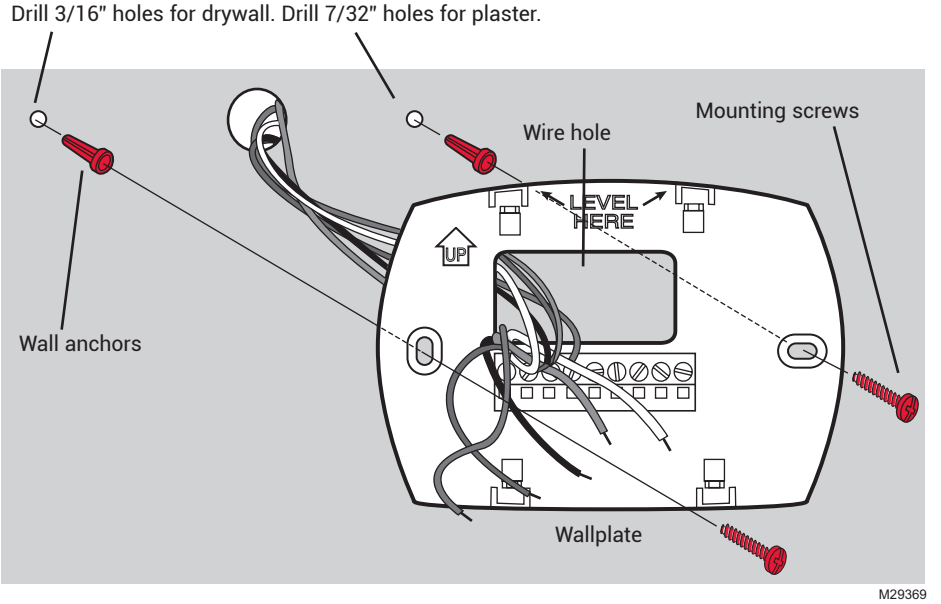
For assistance with this product please visit http://customer.resideo.com or call Customer Care toll-free at 1-800-468-1502

Wallplate installation

1. Separate wallplate from thermostat.
2. Mount wallplate as shown below.

It's easier to grasp the wallplate and remove it after completely removing the battery holder.





CAUTION: ELECTRICAL HAZARD

Can cause electrical shock or equipment damage. Disconnect power before beginning installation.

MERCURY NOTICE

If this product is replacing a control that contains mercury in a sealed tube, do not place the old control in the trash. Contact your local waste management authority for instructions regarding recycling and proper disposal.

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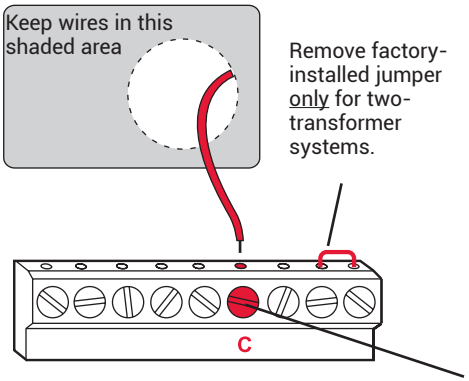
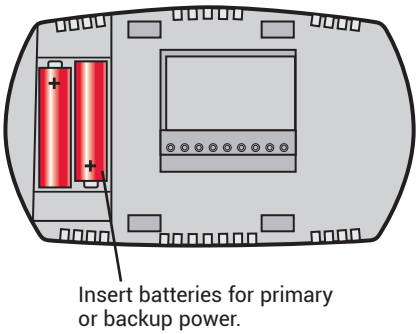
Power options





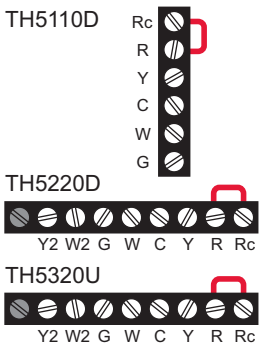
Wiring

Terminal designations

Shaded areas below apply only to **TH5320U/TH5220D** or as otherwise noted.

Conventional Terminals:

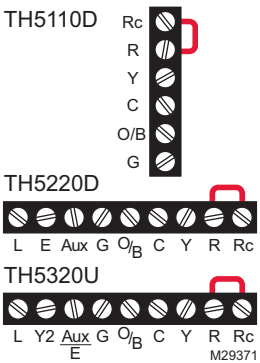
Rc	24VAC power from cooling transformer
R	24VAC power from heating transformer
W	Heat relay (stage 1)
W2	Heat relay (stage 2)
Y	Compressor contactor (stage 1)
Y2	Compressor contactor (stage 2)
G	Fan relay
C	24VAC common. For 2 transformer systems, use common wire from cooling transformer.



Heat Pump Terminals:

Rc	24VAC power from cooling transformer
R	24VAC power from heating transformer
O/B	Changeover valve
Y	Compressor contactor
Y2	Compressor contactor (stage 2) -**TH5320U** only
G	Fan relay
Aux	Auxiliary heat relay*
E	Emergency heat relay*
L	Sends output when set to Em. Heat
C	24VAC common

*Aux and E terminals combined on **TH5320U** only.



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Wiring

Wiring guide – conventional systems

Shaded areas below apply only to **TH5320U/TH5220D** or as otherwise noted.

1H/1C System *(1 transformer)*

Rc	Power [1]
R	[R+Rc joined by jumper]
Y	Compressor contactor
C	24VAC common [3]
W	Heat relay
G	Fan relay

Heat-only System

Rc	Power [1]
R	[R+Rc joined by jumper]
C	24VAC common [3]
W	Heat relay

Heat-only System *(Series 20)* [5]

Rc	[R+Rc joined by jumper]
R	Series 20 valve terminal “R” [1]
Y	Series 20 valve terminal “W”
C	24VAC common [3]
W	Series 20 valve terminal “B”

Heat-only System *(normally open zone valve)* [5]

Rc	[R+Rc joined by jumper]
R	Power [1]
Y	Normally open zone valve
C	24VAC common [3]

1H/1C System *(2 transformers)*

Rc	Power (cooling transformer) [1, 2]
R	Power (heating transformer) [1, 2]
Y	Compressor contactor
C	24VAC common [3, 4]
W	Heat relay
G	Fan relay

Heat-only System with Fan

Rc	Power [1]
R	[R+Rc joined by jumper]
C	24VAC common [3]
W	Heat relay
G	Fan relay

Cool-only System

Rc	Power [1]
R	[R+Rc joined by jumper]
Y	Compressor contactor
C	24VAC common [3]
G	Fan relay

2H/2C System *(1 transformer)* [6]

Rc	Power [1]
R	[R+Rc joined by jumper]
Y	Compressor contactor (stage 1)
C	24VAC common [3]
W	Heat relay (stage 1)
G	Fan relay
W2	Heat relay (stage 2)
Y2	Compressor contactor (stage 2)

2H/2C System *(2 transformers)* [6]

Rc	Power (cooling transformer) [1, 2]
R	Power (heating transformer) [1, 2]
Y	Compressor contactor (stage 1)
C	24VAC common [3, 4]
W	Heat relay (stage 1)
G	Fan relay
W2	Heat relay (stage 2)
Y2	Compressor contactor (stage 2)

See [notes] below

NOTES

Wire specifications:
Use 18- to 22-gauge thermostat wire. Shielded cable is not required.

[1] Power supply. Provide disconnect means and overload protection as required.

[2] Remove jumper for 2-transformer systems.

[3] Optional 24VAC common connection.

[4] Common connection must come from cooling transformer.

[5] In Installer Setup, set system type to Heat Only.

[6] In Installer Setup, set system type to 2Heat/2Cool Conventional.

[7] In Installer Setup, set changeover valve to O or B.

[8] In Installer Setup, set system type to 2Heat/1Cool Heat Pump.

[9] In Installer Setup, set system type to 2Heat/2Cool Heat Pump.

[10] In Installer Setup, set system type to 3Heat/2Cool Heat Pump.

[11] L terminal sends a continuous output when thermostat is set to Em. Heat. Connect to zoning panels to switch the panel to Emergency Heat.

[12] Install field jumper between Aux and E if there is no emergency heat relay.

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Wiring

Wiring guide – heat pump systems

Shaded areas below apply only to **TH5320U/TH5220D** or as otherwise noted.

1H/1C Heat Pump System

M29381

Rc	Power [1]
R	[R+Rc joined by jumper]
Y	Compressor contactor
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay

2H/1C Heat Pump System *(TH5220D only)* [8]

M29382

Rc	Power [1]
R	[R+Rc joined by jumper]
Y	Compressor contactor
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay
Aux	Auxiliary heat relay [12]
E	Emergency heat relay [12]
L	Sends output when set to Em. Heat [11]

2H/1C Heat Pump System *(TH5320U only)* [8]

M29383

Rc	Power [1]
R	[R+Rc joined by jumper]
Y	Compressor contactor
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay
Aux/E	Auxiliary/Emergency heat relay
L	Sends output when set to Em. Heat [11]

2H/2C Heat Pump System *(TH5320U only)* [9]

M29384

Rc	Power [1]
R	[R+Rc joined by jumper]
Y	Compressor contactor (stage 1)
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay
Y2	Compressor contactor (stage 2)
L	Sends output when set to Em. Heat [11]

3H/2C Heat Pump System *(TH5320U only)* [10]

M29385

Rc	Power [1]
R	[R+Rc joined by jumper]
Y	Compressor contactor (stage 1)
C	24VAC common [3]
O/B	Changeover valve [7]
G	Fan relay
Aux/E	Auxiliary/Emergency heat relay
Y2	Compressor contactor (stage 2)
L	Sends output when set to Em. Heat [11]

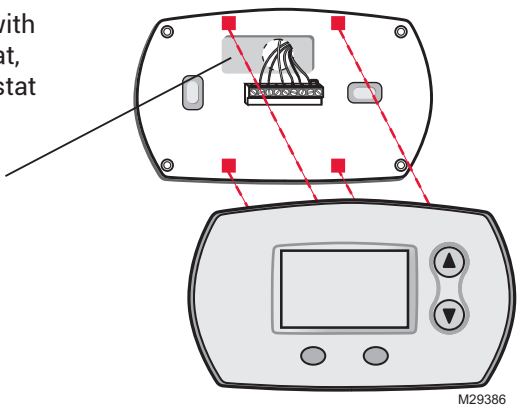
See [notes] on page 4.

Thermostat mounting

Align the 4 tabs on the wallplate with slots on the back of the thermostat, then push gently until the thermostat snaps in place.

Push excess wire back into the wall opening.

Plug wall opening with non-flammable insulation.


M29386

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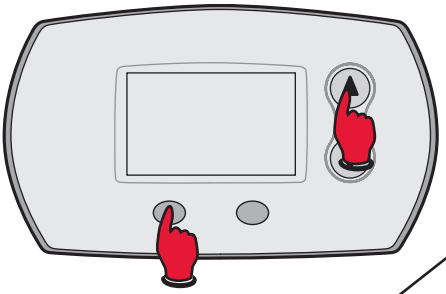
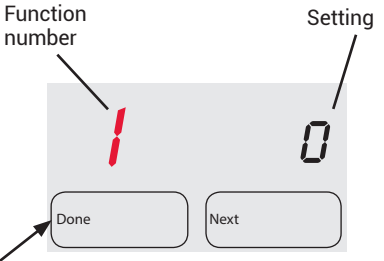
Installer setup

Follow the procedure below to configure the thermostat to match the installed heating/cooling system, and customize feature operation as desired.



To begin, press and hold the ▲ and FAN buttons until the display changes.



Press ▲ or ▼ to change settings.
Press NEXT to advance to the next function.
Press DONE to exit and save settings.

Setup function Settings & options (factory default in bold)

Shaded areas below apply only to **TH5320U/TH5220D** or as otherwise noted.

1	**System type**	**0**	**1 heat/1 cool conventional**
		1	1 heat/1 cool heat pump (no aux. heat)
		2	Heat only — 2-wire systems, 3-wire zone valves (Series 20), and normally open zone valves
		3	Heat only with fan
		4	Cool only
		5	2 heat/1 cool heat pump (with aux. heat)
		6	2 heat/2 cool conventional
		7	2 heat/1 cool conventional
		8	1 heat/2 cool conventional
		9	2 heat/2 cool heat pump (no aux. heat) - **TH5320U** only
		10	3 heat/2 cool heat pump (with aux. heat) - **TH5320U** only
2	**Changeover valve (O/B terminal)**	**0**	**Changeover valve (O/B terminal energized in cooling)**
		1	Changeover valve (O/B terminal energized in heating)
3	**Fan control (heating)**	**0**	**Gas or oil furnace – equipment controls fan in heating**
		1	Electric furnace — thermostat controls fan in heating
5	**Stage 1 heat cycle rate (CPH: cycles/hour)***	**5**	**For gas or oil furnaces of less than 90% efficiency**
		1	For steam or gravity systems
		3	For hot water systems & furnaces of over 90% efficiency
		9	For electric furnaces
6	**Stage 2 heat cycle rate/Auxiliary heat cycle rate (CPH)***	**5**	**For gas or oil furnaces of less than 90% efficiency**
		1	For steam or gravity systems
		3	For hot water systems & furnaces of over 90% efficiency
		9	For electric furnaces
7	**Auxiliary heat cycle rate (CPH)*** **Only TH5320U for 3H/2C Heat Pumps**	**5**	**For gas or oil furnaces of less than 90% efficiency**
		1	For steam or gravity systems
		3	For hot water systems & furnaces of over 90% efficiency
		9	For electric furnaces
8	**Emergency heat cycle rate (CPH)***	**9**	**For electric emergency heat**
		1	For steam or gravity systems
		3	For hot water systems & furnaces of over 90% efficiency
		5	For gas or oil furnaces of less than 90% efficiency

*[Other cycle rate options: 2, 4, 6, 7, 8, 10, 11 or 12 CPH]

Continued on next page

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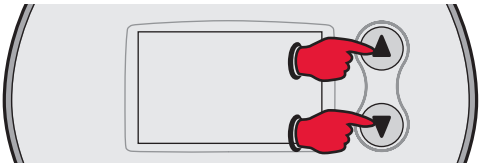
Installer setup

Setup function Settings & options (factory default in bold)

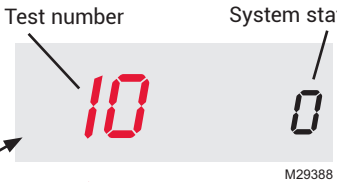
Shaded areas below apply only to **TH5320U/TH5220D** or as otherwise noted.

9	**Stage 1 compressor cycle rate (CPH)**	**3**	**Recommended for most compressors** [Other cycle rate options: 1, 2, 4, 5 or 6 CPH]
10	**Stage 2 compressor cycle rate (CPH)**	**3**	**Recommended for most compressors** [Other cycle rate options: 1, 2, 4, 5 or 6 CPH]
12	**Manual/Auto changeover**	**0** 1 2	**Manual changeover (Heat/Cool/Off)** Auto changeover (Heat/Cool/Auto/Off) Auto changeover only (Auto)
14	**Temperature display**	**0** 1	**Fahrenheit** Celsius
15	**Compressor protection**	**5**	**Five-minute compressor off time** [Other options: 0, 1, 2, 3 or 4-minute off time]
26	**Auxiliary heat control**	**0** 1	**Comfort **See page 8** Economy
27	**Heat temperature range stops**	**90**	**Max. heat temperature setting is 90 °F (32 °C)** [Other options: 40 °F to 89 °F (4.5 °C to 31.5 °C)]
28	**Cool temperature range stops**	**50**	**Min. cool temperature setting is 50 °F (10 °C)** [Other options: 51 °F to 99 °F (10.5 °C to 37 °C)]

Installer system test



To begin, press and hold the ▲ and ▼ buttons until the display changes



Press ▲ / ▼ to turn system on/off.
Press NEXT to advance to next test.
Press DONE to terminate system test.

System test		System status	
Shaded areas below apply only to **TH5320U/TH5220D** or as otherwise noted.			
10	**Heating system**	0	Heat and fan turn off.
		1	Stage 1 heat turns on. Fan turns on if Setup Function 1 is set to 1, 5, 9 or 10 OR Setup Function 3 is set to 1 **See page 6
		2	Stage 2 heat turns on
		3	Stage 3 heat turns on - **TH5320U** only
20	**Emergency heating system**	0	Heat and fan turn off
		1	Heat and fan turn on
		2	Stage 2 heat turns on (auxiliary heat) - **TH5220D** only
30	**Cooling system**	0	Compressor and fan turn off
		1	Compressor and fan turn on
		2	Stage 2 compressor turns on
40	**Fan system**	0	Fan turns off
		1	Fan turns on

CAUTION: Compressor protection is bypassed during testing. To prevent equipment damage, avoid cycling the compressor quickly

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Special function

Auxiliary heat control (Setup Function 26):

- **Comfort Setting:** The thermostat will prioritize comfort over economy depending on heat pump performance, load conditions and whether the thermostat is calling for the heat pump. Raising the temperature just a few degrees will often activate the auxiliary heat.
- **Economy Setting:** The thermostat will attempt to reach the temperature setting without activating the auxiliary heat. The thermostat will wait to activate the auxiliary heat depending on heat pump performance, load conditions and how many degrees the temperature setting is changed.

Accessories & replacement parts

Please contact your distributor to order replacement parts.

Part Description	Part Number	Use With
Battery holder	50000951-001	TH5110D
Battery holder	50007072-001	TH5320U/TH5220D
Cover plate assembly*	50001137-001	TH5110D
Cover plate assembly*	50002883-001	TH5320U/TH5220D/TH5110D
12 pack of small cover plates*	50007297-001	TH5110D
12 pack of medium cover plates*	50007298-001	TH5320U/TH5220D/TH5110D

*Use to cover marks left by old thermostats.

Specifications

Temperature Ranges
- Heat: 40° to 90°F (4.5° to 32°C)
- Cool: 50° to 99°F (10° to 37°C)

Operating Ambient Temperature
- 32° to 120°F (0° to 48.9°C)

Shipping Temperature
- -20° to 120°F (-28.9° to 48.9°C)

Operating Relative Humidity
- 5% to 90% (non-condensing)

Physical Dimensions

TH5220D
- 3-9/16" H x 5-13/16" W x 1-1/2" D
  91 mm H x 147 mm W x 38 mm D

TH5110D
- 3-7/16" H x 4-1/2" W x 1-5/16" D
  86 mm H x 114 mm W x 33 mm D

Electrical Ratings

Terminal	Voltage (50/60Hz)	Running Current
W Heating	20-30 Vac	0.02-1.0 A
(Powerpile)	750 mV DC	100 mA DC
W2 (Aux) Heating	20-30 Vac	0.02-0.5 A
Y Cooling	20-30 Vac	0.02-1.0 A
Y2 Cooling	20-30 Vac	0.02-1.0 A
G Fan	20-30 Vac	0.02-0.5 A
O/B Changeover	20-30 Vac	0.02-0.5 A
E Emergency heat	20-30 Vac	0.02-1.0 A
L Output	20-30 Vac	0.02-0.5 A

FCC statement at: https://customer.resideo.com/en-US/support/residential/codes-and-standards/FCC15105/Pages/default.aspx

CAUTION: ELECTRONIC WASTE NOTICE.
The product should not be disposed of with other household waste. Check for the nearest authorized collection centers or authorized recyclers. The correct disposal of end-of-life equipment will help prevent negative consequences for the environment and human health.

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