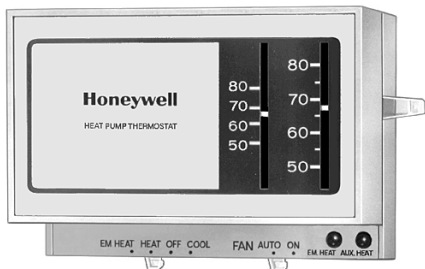


CT70

Heat Pump Thermostat Wiring Guide



HOW TO USE THIS GUIDE

Before you disconnect the wires and remove your existing thermostat, be sure this new thermostat, see the CT70 wiring hookup diagram, will replace it and that you understand how you will reconnect the wiring. To do that, proceed as follows:

Step 1

Find the manufacturer of your heat pump in the Table of Contents, and turn to the appropriate page.

Step 2

Expose the wiring on your existing thermostat (the subbase) and check that the terminals on your existing thermostat coincide with the terminals shown in the second column (Existing thermostat wiring).

If they do, read and follow the installation instructions provided with the thermostat.

If they do not, call Honeywell Customer Assistance toll free at 1-800-468-1502, Monday-Friday, 7:00 a.m. - 5:30 p.m. Central time, to be sure you can safely use this thermostat to control your heat pump.

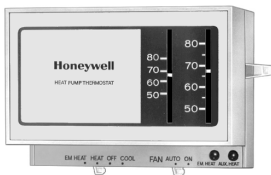
Before you call, please have the following information available: thermostat model number and date code, heat pump model number and manufacturer, and number of wires connected to the thermostat. The date code is usually stamped on the back of the thermostat and is a four-digit number; for example, 9346.

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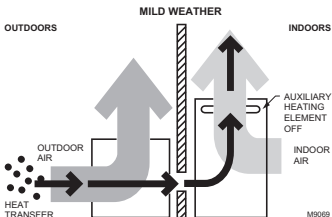
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HEAT PUMPS ARE DIFFERENT

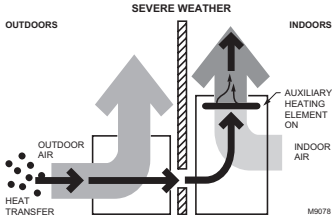
Heat pump systems usually have a supplemental, Second Stage heating system that operates only when necessary. This heat pump thermostat is designed to minimize more expensive second-stage operation, indicated by the green AUX. HEAT light on your thermostat.



HEAT PUMPS ARE TWO SYSTEMS IN ONE



In mild weather, virtually all of the demand for heat in buildings can be met by the heat pump compressor. This First Stage process of moving heat indoors is very economical. As the air becomes colder outside, the first stage may be unable to deliver enough heat to maintain the desired comfort level in the building.



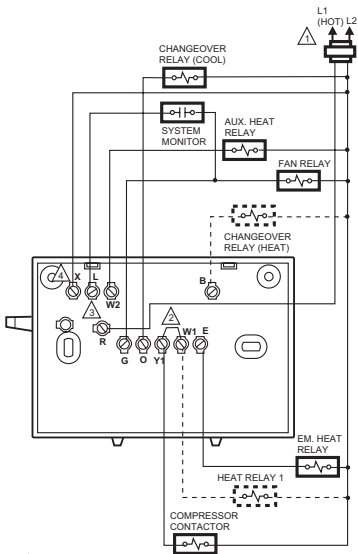
During high heat demand, the thermostat will call for additional Second Stage power from the auxiliary heat system. This auxiliary heat is commonly electric resistance heat and is two to three times more expensive to operate than the compressor. If you have specific questions concerning the operation of your heat pump, please contact the equipment manufacturer.

DEFINITIONS OF TERMINAL FUNCTIONS

Each terminal of the CT70 controls a different heat pump function. Here is a list of the possible heat pump functions:

Function	Definition
FIRST STG. HEAT:	When this terminal is activated, the heat pump is on and heating the living space.
AUXILIARY HEAT:	When this terminal is activated, the auxiliary heating source is on because the heat pump is unable to meet the heating demand of the living space.
FIRST STG. COOL:	When this terminal is activated, the heat pump is on and cooling the living space.
COMPRESSOR:	When this terminal is activated, the heat pump is on and either heating or cooling the living space, depending on the system switch position.
C/O VALVE HEAT:	Heating Changeover Valve. This terminal is activated when the system switch is in the HEAT position. It provides changeover in heat pumps that change over in heating.
C/O VALVE COOL:	Cooling Changeover Valve. This terminal is activated when the system switch is in the COOL position. It provides changeover in heat pumps that change over in cooling.
EM. HEAT:	Emergency Heat. This terminal is activated when the system switch is in the EM. HT position. In this situation, the heat pump is not activated.

FAN:	When this terminal is activated, the fan is on. With the fan switch in the auto position, the fan cycles on and off with the heat pump. With the fan switch in the ON position, the fan is on continuously.
MULTIPLE AUX. HEAT LOADS:	This terminal is activated when additional auxiliary heat loads are required. Because the CT70 only has provisions for one auxiliary heat load, these loads must be connected to the AUXILIARY HEAT terminal.
OUTDOOR SENSOR:	This terminal is not connected to the CT70. On your original thermostat, this terminal was activated by an outdoor sensor that controlled the auxiliary heat source.
OUTDOOR STAT:	Outdoor Thermostat. This terminal is activated when the system switch is in the EM. HT. position. The outdoor thermostat controls the amount of auxiliary heat that is activated.
POWER:	This terminal connects to the power side of the 24-volt transformer.
COMMON:	This terminal connects to the common side of the 24-volt transformer.
SYSTEM MONITOR:	Some heat pumps have the ability to indicate when the heat pump is malfunctioning. When this occurs, this terminal is activated and the EM. HT. LED is activated.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 REMOVE W1-Y1 JUMPER WHEN HEAT RELAY 1 IS USED.
- 3 WHEN L TERMINAL IS CONNECTED TO SYSTEM MONITOR, EM. HEAT. LED ALSO INDICATES COMPRESSOR MALFUNCTION.
- 4 X TERMINAL MUST BE CONNECTED FOR PROPER OPERATION.

M8504

Typical wiring hookup of CT70 with jumper intact.

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	X1 or C	X ²
POWER	R or RC or RH ¹	R
COMPRESSOR	Y or Y1	Y1
1ST STG. HEAT	W1	W1 ³
AUX. HEAT	W2	W2
FAN	G	G
C/O VALVE HEAT	B or W	B
C/O VALVE COOL	O	O
EM. HEAT	E	E
SYSTEM MONITOR	—	L



















- 1** Jumper these two terminals if both are present
- 2** This terminal must be connected to transformer common.
- 3** Remove this factory-installed jumper for independent stage 1 heat and cool connection.

BARD/JANITROL/TAPPAN/WILLIAMSON

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	C or X1 or X ¹	X ¹
POWER	RH or RC or R	R
COMPRESSOR	Y	Y1
1ST STG. HEAT	—	W1 ²
AUX. HEAT	W2	W2
FAN	G	G
C/O VALVE HEAT	⁴ B or W1	B
C/O VALVE COOL	⁴ O	O
SYSTEM MONITOR	L	L
EM. HEAT	E	E
MULTIPLE AUX. HEAT LOADS ³	W3	³

- ¹ This terminal must be connected to transformer common.
- ² Leave factory-installed jumper in place.
- ³ Connect multiple second stage heating loads to W2 terminals.
- ⁴ Thermostat is connected to either O or B terminal, but not both.

ARCOAIRE/SNYDER GENERAL/COMFORTMAKER

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON		
POWER		
COMPRESSOR		
1ST STG. HEAT	—	
AUX. HEAT		
FAN		
C/O VALVE HEAT	—	
C/O VALVE COOL		
SYSTEM MONITOR		
EM. HEAT		

❶ This terminal must be connected to transformer common.

❷ Leave factory-installed jumper in place.

B.D.P. (BRYANT-DAY/NIGHT-PAYNE)

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	C1 or X1 or C ¹	X ¹
POWER	R	R
COMPRESSOR	W1 or Y	Y1 ²
1 ST STG. HEAT	—	W1
AUX. HEAT	W2	W2
FAN	G	G
C/O VALVE HEAT	B	B
C/O VALVE COOL	Y1 or O	O ³
SYSTEM MONITOR	L or F	L
EM. HEAT	X or E	E
MULTIPLE AUX. HEAT LOADS ³	W3	—
DEFROST	P	P

- ¹ This terminal must be connected to transformer common.
- ² Leave factory-installed jumper in place.
- ³ Connect multiple second stage heating loads to W2 terminals.

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	C ¹	X ¹
POWER	R	R
COMPRESSOR	Y	Y1
1ST STG. HEAT	—	W1 ²
AUX. HEAT	W1 or W2	W2
FAN	G	G
C/O VALVE HEAT	—	B
C/O VALVE COOL	O	O
SYSTEM MONITOR	F or L	L
EM. HEAT	E	E

¹ This terminal must be connected to transformer common.

² Leave factory-installed jumper in place.

FRIEDRICH

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	X or C or X1 ¹	X ¹
POWER	RH or RC	R
COMPRESSOR	Y2 or Y	Y1 ²
1 ST STG. HEAT	W1	W1 ²
AUX. HEAT	W2	W2
FAN	G	G
C/O VALVE HEAT	B	B
C/O VALVE COOL	O or Y1	O
SYSTEM MONITOR	L	L
EM. HEAT	E or X2	E
	W3 or U ³	—

- ¹ This terminal must be connected to transformer common.
- ² Leave factory-installed jumper in place.
- ³ Tape off the end of the wire. Jumper is not required on this thermostat (CT70).

HEIL QUAKER/WHIRLPOOL/TEMPSTAR

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	C or B	X ¹
POWER	R	R
COMPRESSOR	Y	Y1
1ST STG. HEAT	—	W1 ²
AUX. HEAT	W	W2
FAN	G	G
C/O VALVE HEAT	B	B
C/O VALVE COOL	O	O
SYSTEM MONITOR	—	L
EM. HEAT	X	E

¹ This terminal must be connected to transformer common.

² Leave factory-installed jumper in place.

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	Y or X	X ¹
POWER	BL or V/VR	R
1ST STG. HEAT (COMP)	R or M	W1
1ST STG. COOL	—	Y1 ²
2ND STG. HEAT	O or Y	W2
FAN	Y or F	G
C/O VALVE HEAT	—	B
C/O VALVE COOL	BK or R	O
SYSTEM MONITOR	—	L
EM. HEAT	E	E

¹ This terminal must be connected to transformer common.

² Leave factory-installed jumper in place.

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	X ¹	X ¹
POWER	R	R
COMPRESSOR	Y	Y1
1 ST STG. HEAT	—	W1 ²
AUX. HEAT	W2	W2
FAN	G	G
C/O VALVE HEAT	B	B
C/O VALVE COOL	O	O
SYSTEM MONITOR	L	L
EM. HEAT	E	E

¹ This terminal must be connected to transformer common.

² Leave factory-installed jumper in place.

TRANE/AMERICAN STANDARD

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	B ¹	X ¹
POWER	R	R
1ST STG. HEAT	Y	W1 Y1 ²
AUX. HEAT	W1 or W	W2
FAN	G	G
C/O VALVE HEAT	—	B
C/O VALVE COOL	O	O
SYSTEM MONITOR	F or L	L
OUTDOOR SENSOR	T	³
OUTDOOR STAT	W2 or X2	E

- ¹ This terminal must be connected to transformer common.
- ² Leave factory-installed jumper in place.
- ³ Tape off end. CT70 replaces outdoor reset with improved zero droop performance.

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	X or B	X ¹
POWER	R	R
COMPRESSOR	Y	Y1
1 ST STG. HEAT		W1 ³
AUX. HEAT	W or W2	W2
FAN	G	G
C/O VALVE HEAT	H	B
C/O VALVE COOL	O	O
SYSTEM MONITOR	X or L ⁴	L
EM. HEAT	E ⁴	E
MULTIPLE AUX. HEAT LOADS	W3 ⁴	²

- ¹ This terminal must be connected to transformer common.
- ² Connect multiple second stage heating loads to W2 terminals.
- ³ Leave factory-installed jumper in place.
- ⁴ If present on original equipment.

YORK/BORG WARNER

Wiring terminal function	Existing thermostat wiring	New thermostat wiring
COMMON	B or X2	X ¹
POWER	R	R
1ST STG. HEAT	W1	W1
AUX. HEAT	W2	W2
FAN	G	G
1ST STG. COOL	Y1	Y1 ²
C/O VALVE HEAT	—	B
C/O VALVE COOL	—	O
SYSTEM MONITOR	—	L
EM. HEAT	E	E

¹ This terminal must be connected to transformer common.

² Remove factory-installed jumper.

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