



Installation, Start-Up, and Operating Instructions

Part Number 33CS250-RE

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IMPORTANT: Read entire instructions before starting the installation.

SAFETY CONSIDERATIONS

Read and follow manufacturer instructions carefully. Follow all local electrical codes during installation. All wiring must conform to local and national electrical codes. Improper wiring or installation may damage thermostat.

Recognize safety information. This is the safety alert symbol . When the safety alert symbol is present on equipment or in the instruction manual, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies a hazard which could result in personal injury or death. CAUTION is used to identify unsafe practices which would result in minor personal injury or property damage.

GENERAL

The receiver is wired to the HVAC unit and controls unit operation. A wall mounted or hand-held transmitter sends its signal to the receiver installed near or inside the HVAC unit. Each paired transmitter and receiver can be given a separate house code number for multiple thermostat applications. Up to 4 transmitters can send information to 1 receiver device.

IMPORTANT: The transmitter and receiver are factory configured with a house code of 0. If more than one set of wireless transmitters and receivers are used in the same location, the house codes must be different for the thermostats to communicate properly.

INSTALLATION

Receiver Location — The receiver should be mounted inside the HVAC unit or on a wall near the HVAC unit where the antenna can be fully extended. The receiver does not contain a sensor; therefore no special placement due to temperature is required. See Fig. 1 for receiver dimensions. The antenna must be located outside of the HVAC unit and cannot be surrounded by sheet metal.

Install Receiver (Wall Mounted)

WARNING

Before installing receiver, turn off all power to the unit. There may be more than one power disconnect. Electrical shock can cause injury or death.

1. Turn off all power to unit.
2. If an existing thermostat is being replaced:
 - a. Remove existing thermostat from the wall.
 - b. Disconnect wires from existing thermostat. Do not allow wires to fall back into the wall. As each wire is disconnected, record wire color and terminal connection.
 - c. Discard or recycle old thermostat.
NOTE: Mercury is a hazardous waste and must be disposed of properly.
3. Remove the receiver cover from wall plate (mounting base) to expose mounting holes. See Fig. 2.
4. Route thermostat wires through large hole in mounting base. Remove outer sheath from wires for added flexibility. Standard solid or multi-conductor thermostat wire should be used from the receiver to the unit. Size and length considerations are as follows: for a maximum run length of 36 ft, use 22 AWG (American Wire Gauge) wire; for a maximum run length of 100 ft, use 18 AWG wire.
5. Level mounting base against wall and mark wall through the 2 mounting holes in base.
6. Drill two $\frac{3}{16}$ -in. mounting holes in wall where marked.

CAUTION

Be careful not to drill into wiring in wall. Electrical shock could result.

7. Secure mounting base to wall with 2 screws and anchors provided. Ensure all wires exit through hole in mounting base.

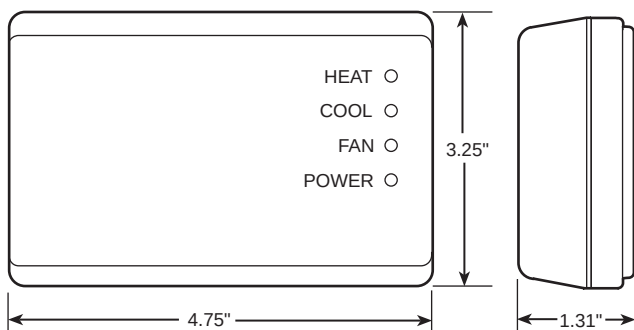
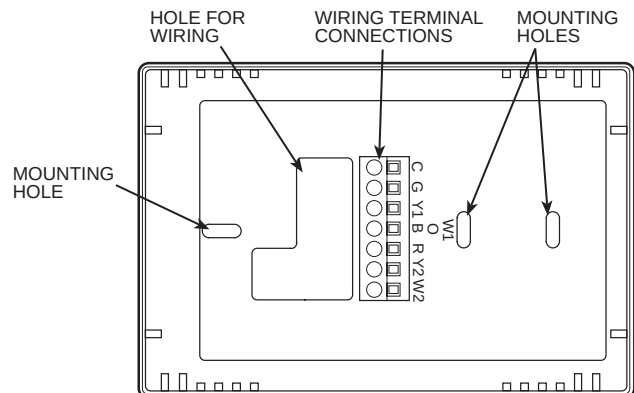


Fig. 1 — Receiver Dimensions



NOTE: Wiring terminal connections for dry contact switch (CK1, CK2) are located on the receiver circuit board.

Fig. 2 — Receiver Mounting

Install Receiver (Mounted in Unit)

⚠ WARNING

Before installing receiver, turn off all power to the unit. There may be more than one power disconnect. Electrical shock can cause injury or death.

⚠ CAUTION

The minimum and maximum temperature operating limits for the receiver are 41 to 104 F (5 to 40 C). Do not install the receiver outside (mounted in the unit) if the temperature limits will be exceeded. Damage to equipment may result. Install the receiver indoors if the temperature limits will be exceeded.

1. Turn off all power to unit.
2. Remove the receiver cover from wall plate (mounting base) to expose mounting holes. See Fig. 2. Thermostat wiring should be in unit control box.
3. Route thermostat wires through large hole in mounting base. Remove outer sheath from wires for added flexibility. Standard solid or multi-conductor thermostat wire should be used from the receiver to the unit. Size and length considerations are as follows: for a maximum run length of 36 ft, use 22 AWG (American Wire Gauge) wire; for a maximum run length of 100 ft, use 18 AWG wire.
4. Level mounting base against mounting location in unit and mark sheet metal through the 2 mounting holes in base.

⚠ WARNING

Be careful when drilling holes in sheet metal. Damage to unit or coil may result. Do not drill in areas where coil or drain pan damage may occur.

5. Drill two $\frac{3}{16}$ -in. mounting holes in sheet metal where marked.
6. Secure mounting base to sheet metal with 2 screws provided. Ensure all wires exit through hole in mounting base.
7. Adjust wire length and routing to allow proper closure of the receiver. Strip each wire at the end no more than $\frac{1}{4}$ -in. to prevent adjacent wires from shorting together. Match and connect wires to terminals on the receiver. See Fig. 2-8 and Table 1.

⚠ CAUTION

Improper wiring or installation may cause damage to the receiver. Check to ensure wiring is correct before proceeding with installation.

8. Adjust wire length and routing to allow proper closure of the receiver. Strip each wire at the end no more than $\frac{1}{4}$ -in. to prevent adjacent wires from shorting together. Match and connect wires to terminals on the receiver. See Fig. 2-8 and Table 1.

⚠ CAUTION

Improper wiring or installation may cause damage to the receiver. Check to ensure wiring is correct before proceeding with installation.

9. Extend the receiver antenna into the wall. Make sure the antenna is fully extended to properly receive the signal from the transmitter. See Fig. 9.
10. Push excess wiring into wall. Seal hole in wall to prevent drafts.
11. Re-attach receiver cover to back plate.
12. Turn on power to unit.

8. Extend the receiver antenna outside of unit. Make sure the antenna is fully extended to properly receive the signal from the transmitter.
9. Re-attach receiver cover to back plate.
10. Turn on power to unit.

Table 1 — Receiver Wiring Terminations

EXISTING WIRE DESIGNATION	FUNCTION	TERMINAL CONNECTION
G or F	Fan	G
Y1, Y, or C	Cooling	Y1
W1, W, or H	Heating	W1, O, B
Rh, R, M, Vr, or A	Power (24 v)	R
C	Common	C*
O/B	Reversing Valve	W1, O, B†
Y2	Second Stage Cooling	Y2
W2	Second Stage Heating	W2
CK1	Dry Contact Switch	CK1
CK2	Dry Contact Ground	CK2

*Terminal C may not be used in all applications.

†Used on Heat Pump applications only.

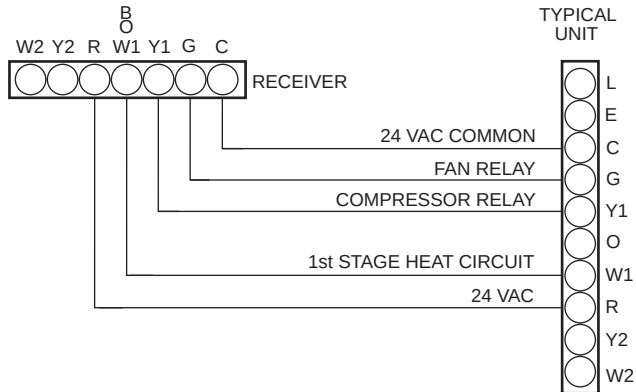


Fig. 3 — Typical Wiring, Single-Stage Cooling and Heating (5-Wire)

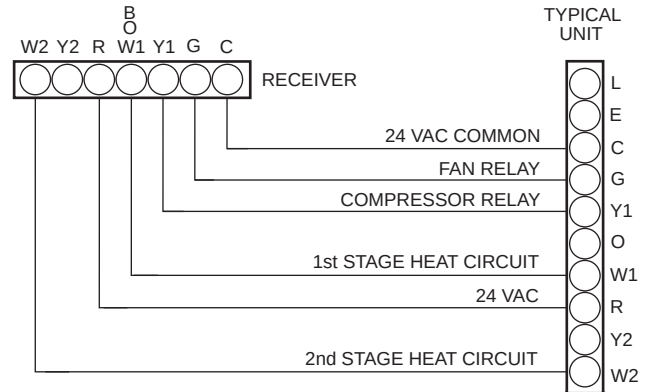


Fig. 6 — Typical Wiring, Single-Stage Cooling, Two-Stage Heating

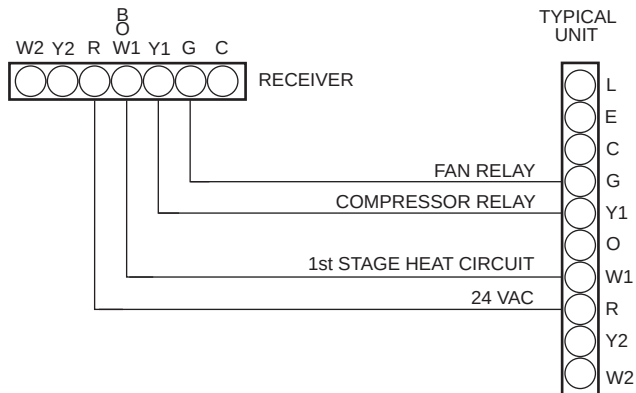


Fig. 4 — Typical Wiring, Single-Stage Cooling and Heating (4-Wire)

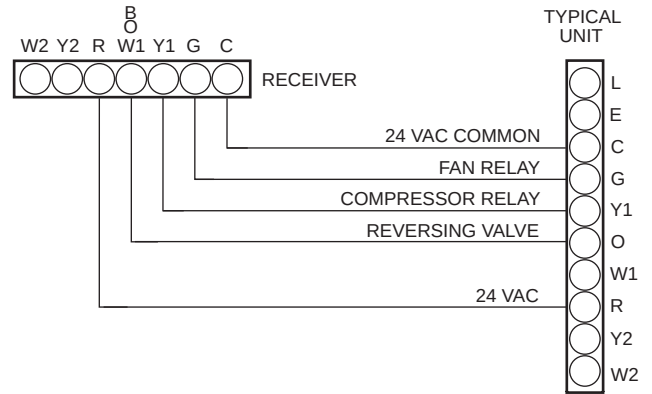


Fig. 7 — Typical Wiring, Heat Pump, Single-Stage Cooling and Heating

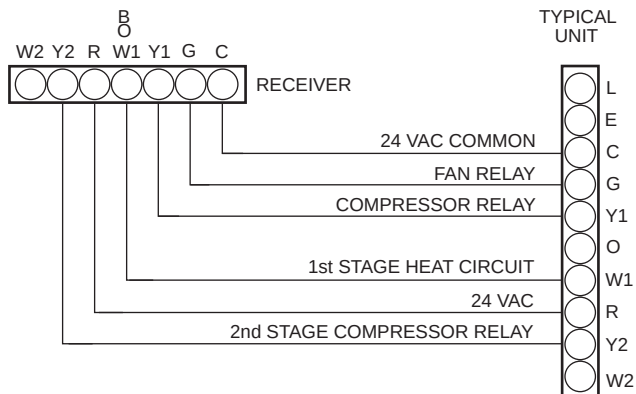


Fig. 5 — Typical Wiring, Two-Stage Cooling, Single-Stage Heating

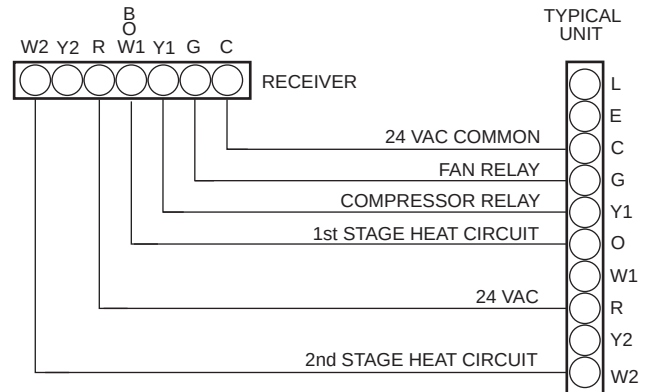
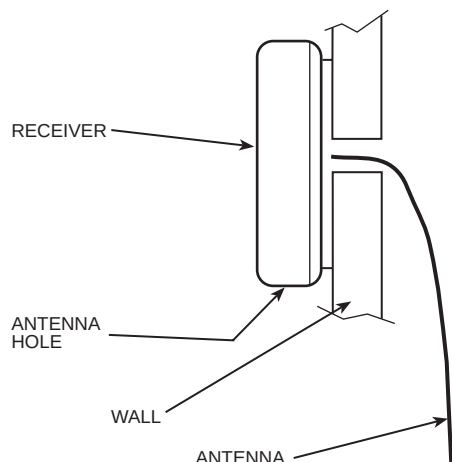


Fig. 8 — Typical Wiring, Heat Pump with Auxiliary Heat, Single-Stage Cooling and Two-Stage Heating



NOTE: If antenna cannot be extended inside wall, be sure to extend antenna outside wall through hole in bottom of receiver housing. If a receiver is located inside of an HVAC unit (outdoors), the antenna must be located outside of the sheet metal cabinet.

Fig. 9 — Antenna Placement

Set Receiver Configuration — The following receiver configuration settings are set with the receiver DIP switches: electric heat, heat pump operation, O/B reversing valve, and house code. See Fig. 10.

HOUSE CODE — The receiver must be configured to the same unit house code as the transmitter. Each paired transmitter and receiver can be given a separate house code for multiple thermostat applications. Up to 4 transmitters can send information to 1 receiver device. The default house code is 0.

IMPORTANT: The transmitter and receiver are factory configured with a house code number of 0. If more than one set of wireless transmitters and receivers are used near each other (typically within 500 ft, less if obstructed) which are controlling different HVAC devices, the unit IDs must be different for the thermostats to communicate properly.

The receiver house code is set through the DIP switch settings in the receiver. See Fig. 10. To change the house code, flip the first 6 DIP switches to the correct location (ON or OFF). Use a small screwdriver or pen to flip the DIP switches. The factory setting is 0 (all DIP switches OFF). See Table 2.

NOTE: The house code must also be changed at the transmitter in the advanced set up. See the transmitter installation instruction for information on configuring the transmitter.

HOUSE CODE AND UNIT ID NUMBER OPERATION — The house code is used by the transmitter and receiver to identify that they are used together. If more than one transmitter is used, all transmitters must have the same house code number as the receiver. If separate receivers and transmitters for different equipment are used near each other, they should be configured with different house codes.

NOTE: More than one receiver can be used on jobs where the furnace and air conditioner are not wired together. Two separate receivers can be used with one wired to the furnace and one wired to the air conditioner, which can both be controlled by the same transmitter. These receivers must have the same house code.

If more than one transmitter (up to 4) is used with a single receiver, the transmitters must be given different Unit ID Numbers. Only the transmitter with Unit ID Number 1 may have a programmed schedule or be configured. All configuration parameters are taken from the transmitter with Unit ID Number 1. Transmitters with Unit ID Numbers 2, 3, and 4 cannot be programmed or configured (except for set points).

When more than one transmitter is used, the receiver will only accept commands from the transmitter that was last used (button pressed). All other set points and modes from other transmitters are ignored. If the transmitter with Unit ID Number 1 has a schedule and is in Program On mode, the receiver will revert back to following the programmed schedule when a time period change occurs, even if the transmitter with Unit ID Number 1 is not the current commanding transmitter.

ELECTRIC HEAT OPERATION — The receiver is not set up for electric heat operation. To configure the receiver for electric heat operation, flip the DIP switch marked EH to the ON position with a small screwdriver or pen. See Fig. 10.

HEAT PUMP OPERATION — The receiver is not set up for heat pump operation. To configure the receiver for heat pump operation, flip the DIP switch marked HP to the ON position with a small screwdriver or pen. See Fig. 10.

IMPORTANT: Some commercial heat pumps require that the heat pump option be configured to OFF. Refer to the base unit installation instructions for more information.

REVERSING VALVE OPERATION (O/B) — The polarity of the reversing valve can be set when the receiver is used with a heat pump. Polarity is configured through the “O/B” DIP switch on the receiver. See Fig. 10. When the DIP switch is set to OFF, the receiver will be configured for “O” reversing valve polarity. When the DIP switch is set to ON, the receiver will be configured for “B” reversing valve polarity. The default setting (DIP switch set to OFF) is “O” polarity. When configured to “O,” the 4-way valve will be energized in the Cooling mode. When configured to “B,” the 4-way valve will be energized in the Heating mode.

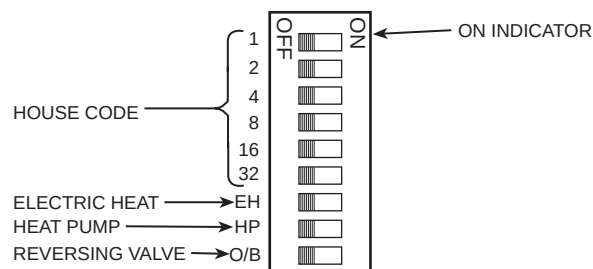
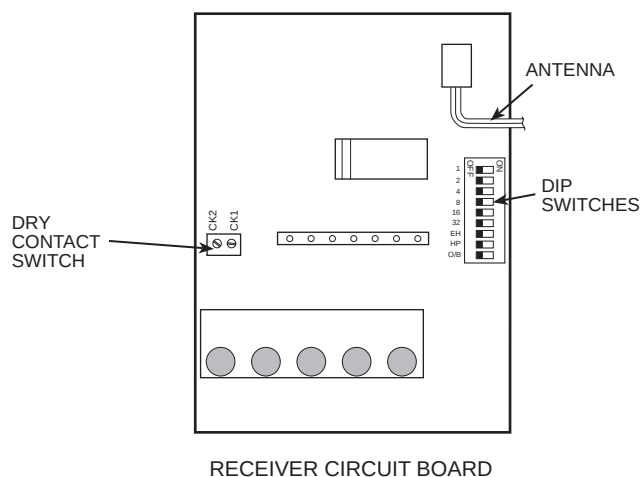


Fig. 10 — DIP Switch Location

Table 2 — House Code DIP Switch Positions

HOUSE CODE	DIP SWITCH					
	1	2	4	8	16	32
0	Off	Off	Off	Off	Off	Off
1	On	Off	Off	Off	Off	Off
2	Off	On	Off	Off	Off	Off
3	On	On	Off	Off	Off	Off
4	Off	Off	On	Off	Off	Off
5	On	Off	On	Off	Off	Off
6	Off	On	On	Off	Off	Off
7	On	On	On	Off	Off	Off
8	Off	Off	Off	On	Off	Off
9	On	Off	Off	On	Off	Off
10	Off	On	Off	On	Off	Off
11	On	On	Off	On	Off	Off
12	Off	Off	On	On	Off	Off
13	On	Off	On	On	Off	Off
14	Off	On	On	On	Off	Off
15	On	On	On	On	Off	Off
16	Off	Off	Off	Off	On	Off
17	On	Off	Off	Off	On	Off
18	Off	On	Off	Off	On	Off
19	On	On	Off	Off	On	Off
20	Off	Off	On	Off	On	Off
21	On	Off	On	Off	On	Off
22	Off	On	On	Off	On	Off
23	On	On	On	Off	On	Off
24	Off	Off	Off	On	On	Off
25	On	Off	Off	On	On	Off
26	Off	On	Off	On	On	Off
27	On	On	Off	On	On	Off
28	Off	Off	On	On	On	Off
29	On	Off	On	On	On	Off
30	Off	On	On	On	On	Off
31	On	On	On	On	On	Off
32	Off	Off	Off	Off	Off	On
33	On	Off	Off	Off	Off	On
34	Off	On	Off	Off	Off	On
35	On	On	Off	Off	Off	On
36	Off	Off	On	Off	Off	On
37	On	Off	On	Off	Off	On
38	Off	On	On	Off	Off	On
39	On	On	On	Off	Off	On
40	Off	Off	Off	On	Off	On
41	On	Off	Off	On	Off	On
42	Off	On	Off	On	Off	On
43	On	On	Off	On	Off	On
44	Off	Off	On	On	Off	On
45	On	Off	On	On	Off	On
46	Off	On	On	On	Off	On
47	On	On	On	On	Off	On
48	Off	Off	Off	Off	On	On
49	On	Off	Off	Off	On	On
50	Off	On	Off	Off	On	On

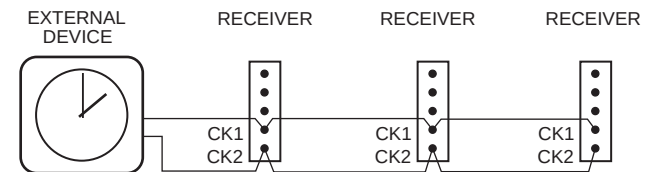
Table 2 — House Code DIP Switch Positions (cont)

HOUSE CODE	DIP SWITCH					
	1	2	4	8	16	32
51	On	On	Off	Off	On	On
52	Off	Off	On	Off	On	On
53	On	Off	On	Off	On	On
54	Off	On	On	Off	On	On
55	On	On	On	Off	On	On
56	Off	Off	Off	On	On	On
57	On	Off	Off	On	On	On
58	Off	On	Off	On	On	On
59	On	On	Off	On	On	On
60	Off	Off	On	On	On	On
61	On	Off	On	On	On	On
62	Off	On	On	On	On	On
63	On	On	On	On	On	On

Check Receiver Operation — To check receiver operation, perform the following procedure:

1. Press the Mode button repeatedly on the transmitter until the Heat icon appears on the display. The thermostat is now in Heating mode.
2. Press the UP ARROW button until the heating set point is 10 F higher than the current room temperature. Heating and fan should be energized and the heat and fan indicators will be lit on the receiver.
3. Press the Mode button repeatedly on the transmitter until the Cool icon appears on the display. The thermostat is now in Cooling mode.
4. Press the DOWN ARROW on the transmitter button until the cooling set point is 10 F lower than the current room temperature. Cooling and fan should be energized and the cool and fan indicators on the receiver will be lit.
5. If heating, cooling, or fan operation do not energize, check wiring and consult Troubleshooting section.

Dry Contact Switch/External Control — A dry contact switch is provided to allow an external device to force the receiver into Unoccupied mode. The display of the transmitter will not change to Unoccupied mode. The external device is wired to contacts CK1 and CK2. See Fig. 11.



NOTE: Do not cross wiring.

Fig. 11 — Dry Contact Switch Wiring

Final Checklist

1. Put away tools and instruments. Clean up debris and packaging.

2. Review Owner's Guide with occupant or owner.
3. Leave Owner's Guide with occupant or owner.

TROUBLESHOOTING

PROBLEM	SOLUTION
Cooling will not energize.	Select COOL mode on transmitter. Decrease cooling set point to 10 degrees below room temperature. Check for 24 vac at Y1 terminal of receiver. If present, transmitter and receiver are operating correctly and problem is with wiring or equipment. If 24 vac is not present, check for correct house code. Check battery in transmitter. Check for Compressor Cycle per Hour Limit. Cooling may be locked out.
Heating will not energize.	Select HEAT mode on transmitter. Increase heating set point to 10 degrees above room temperature. Check for 24 vac at W1/O/B terminal of receiver. If present, transmitter and receiver are operating correctly and problem is with wiring or equipment. If 24 vac is not present, check for correct house code. If house code correct, replace the thermostat.
When using 4 wires (R,G,W,Y), the air conditioning equipment tries repeatedly to turn on, but cannot.	There is not enough power available. Connect a 270 ohm, 10 watt power resistor at the air conditioning equipment between terminals W and C.
When controlling a heat pump, heat comes on during cooling cycle.	Configure receiver for heat pump operation.
When calling for cooling, both heating and cooling are energized.	The receiver is configured for a heat pump. Configure the receiver for non-heat pump operation.
When controlling a commercial heat pump unit, unit runs in reverse or heating is always on.	Some commercial heat pumps require that Heat Pump option is turned OFF. Refer to the base unit installation instructions.

