Installation, Service, and Troubleshooting Instructions

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GENERAL

Single zone products are popular and cost effective in air-conditioning systems for many small to medium sized commercial buildings.

The Carrier Comfort System TEMP System is designed to be compatible with the full line of Carrier single-zone heating and cooling units.

The TEMP System is a communicating network of thermostats designed to keep comfort at a maximum and maintenance at a minimum. To coordinate the operation of multiple units, the TEMP System programmable thermostats are interfaced through a communication bus. The communication bus is a simple, 3-wire, shielded cable installed between the thermostats. One thermostat is equipped with an electronic timeclock that can broadcast time to all other thermostats. Each thermostat can be programmed for its own individual occupied and unoccupied times and temperature.

The Carrier TEMP System consists of more than one thermostat networked together and can be expanded to meet whatever number of single zone systems are required.

The TEMP System thermostat maintains proper temperatures by controlling the on and off times of the HVAC equipment.

Each thermostat is responsible for controlling the temperature conditions in its space. Each thermostat will maintain its own independent occupied/unoccupied time schedule and heating/cooling set points. This allows multiple TEMP System thermostats to maintain different temperature ranges at different times.

NOTE: The Comfort System TEMP system thermostat is not compatible with a TEMP Generation II Enhanced or Pre-Enhanced device. The Carrier Comfort system will not support Enhanced or Pre-Enhanced devices.

TEMP System Components — The Carrier TEMP System consists of one or more thermostats that communicate by way of a communication bus. Each thermostat controls a relay pack which, in turn controls the HVAC unit.

Each thermostat can be connected to others to provide communication between thermostats. Only one thermostat per system is required to have a timeclock that will broadcast time to the rest of the system.

TEMP SYSTEM THERMOSTAT — The 33CSTMT-01 (with timeclock) and 33CSTM--01 (without timeclock) TEMP System Thermostats have the following features:

- controls temperature to user defined set points
- maintains 7 days a week occupied/unoccupied schedule
- eliminates external timeclocks, manual override timer, night low limit thermostat, battery backup or unit time guard
- operates with 3 system switches for supply air fan and the unit heating and cooling stages.

TIMECLOCK — The electronic timeclock is built into the 33CSTMT-01 thermostat and displays hours, AM or PM, and the day of the week.

RELAY PACK — The Relay Pack has the following features:

- serves as interface between thermostat, HVAC unit, and any external sensors
- powered by 24 vac/10 va, supplies thermostat with 10 vdc.

INSTALLATION

Thermostat Placement — Begin the thermostat installation by determining where the thermostat will be located. In most cases, this will be pre-determined by the building plans.

The thermostat should be located on an interior wall, about 5 ft from the ground. The thermostat should be located away from direct sunlight, drafts, or interior heat sources which may influence temperature readings.

The thermostat may also be mounted in a remote location with the use of an optional remote room sensor.

Refer to the mounting instructions provided with the TEMP system thermostat for more information on wall installation. The thermostat may also be mounted in a remote location with the use of an optional remote room sensor. See Fig. 1 for dimensions of TEMP system thermostat with timeclock. See Fig. 2 for dimensions of TEMP system thermostat without timeclock.

Wiring Requirements — The wiring requirements for the TEMP System are:

THERMOSTAT TO THERMOSTAT NETWORK — Wiring must be 18 gage, 3-conductor, shielded, stranded wire, color coded (RED, BLACK, and GREEN), plenum rated if required, and long enough to run from thermostat to thermostat in daisy-chain configuration. At one end of the daisy-chain, the shield must be connected to the chassis ground. The other end must be taped back. Between the ends, the shield must be wire-nutted together. Tape the shield after it has been wire-nutted.

⚠ CAUTION

Do not ground the shielded wire in more than one location. If the shield is grounded in 2 or more locations, an electrical charge may form around the wire and disrupt thermostat communication.

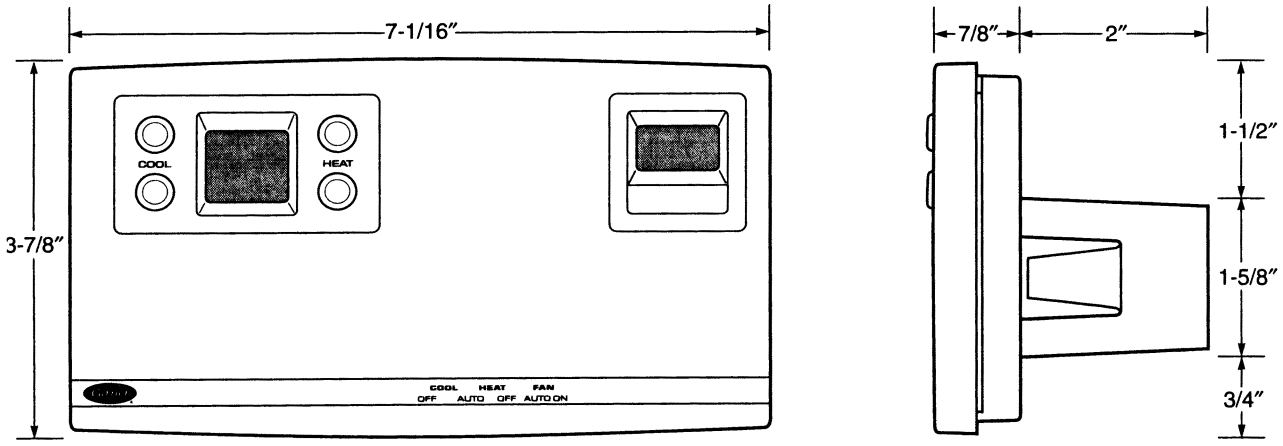
THERMOSTAT TO RELAY PACK — Wiring must be 18 gage, 5-conductor, shielded, stranded wire, color coded (RED, WHITE, BLUE, YELLOW, and GREEN), plenum rated if required, and long enough to run from thermostat to relay pack.

RELAY PACK TO HVAC UNIT — Wiring must be 6-, 7-, or 8-conductor wire, depending on HVAC unit, and sized to run from relay pack to the wiring terminals of the HVAC unit. A separate transformer should be used. Do not use the unit transformer.

NOTE: Do not run the thermostat network and the control wire in the same conduit for more than 5 ft. Never run wires near any cable carrying AC voltage. For further wiring information, consult the local Carrier distributor.

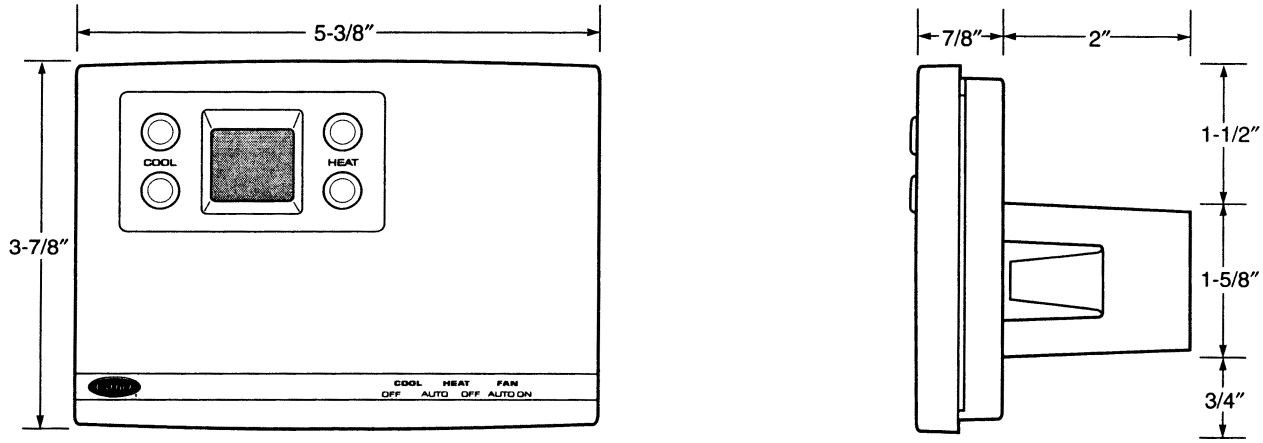
Power required to each relay pack is 24 vac/ 10 va. Typical wiring is 18 gage thermostat wire (standard or plenum cable). Power to the relay pack may be wired to the HVAC unit transformer if of sufficient va capacity. The maximum load of a relay contact is 24 vac, 1 amp. A short in the field wiring or HVAC unit will cause non-warranty damage to the relay board. Test before attaching to relay pack.

Call the local Carrier representative if more information is needed about wiring the TEMP System thermostat.



FRONT VIEW SIDE VIEW

Fig. 1 — TEMP System Thermostat with Timeclock



FRONT VIEW SIDE VIEW

Fig. 2 — TEMP System Thermostat without Timeclock

Relay Pack Installation — The relay pack should be installed in the HVAC unit control box if climate or space conditions allow. If the temperature range of 32 to 150 F may be exceeded (at a relative non-condensing humidity of less than 95%), then the relay pack should be installed at another location such as a plenum space or utility room.

NOTE: Factory-installed relay packs are available for some Carrier rooftop units. Refer to the Apollo control installation instructions for information on the placement of the factory-installed Apollo control in the rooftop unit.

Wiring Connections

WIRE RELAY PACK TO THERMOSTAT — Wire each thermostat to its respective relay pack as shown in Fig. 3. Wiring connections should be made at the wiring connector board of the thermostat.

⚠ WARNING

Electric shock can cause injury or death. Ensure power to the transformer has been disconnected before wiring.

WIRE RELAY PACK TO HVAC UNIT — Wire the relay pack to the HVAC unit as shown in Fig. 4 or 5. Refer to Fig. 4 for TEMP System relay packs. Refer to Fig. 5 for TEMP System relay packs with auxiliary relay. All wiring and the relay pack should be kept a minimum of 12 in. away from any cables carrying AC current. For more information refer to the installation instructions included with each relay pack.

WIRE SENSORS TO RELAY PACK — Wire the sensors to the relay pack. See Fig. 3.

NOTE: Humidity Sensor and Fan Status Switch cannot be wired to the same relay pack.

Indoor-Air Quality Sensor Installation — An indoor-air quality (IAQ) sensor is designed for use with the Carrier Comfort system. The sensor has a range of 0 to 5000 ppm of CO_2. The factory setting is 1000 ppm. This set point is adjustable only through software. An isolated power supply of 16 to 24 vac is supplied with the sensor, with a 300 mA average and a 500 mA peak. The IAQ sensors are available in 3 models: Wall Mount with LED (light-emitting diode), Wall Mount, and Duct Mount.

The wall-mounted sensors are mounted within the occupied space. They read the CO_2 levels at their location. The Wall Mount with LED sensor will display the current reading on the LED display screen on the sensor.

When the IAQ sensor is used in TEMP system applications, it is usually wall-mounted and wired to the relay pack.

TEMP SYSTEM IAQ SENSOR WIRING — Wire the dry contact relay output from the sensor (connections 3 and 4) to terminals 6 and 7 of the relay pack. Recommended gage of wire is 14, stranded.

Wire the 2 wires from the isolated 16 to 24 vac power supply to the power input side of the sensor (connections 1 and 5). Recommended gage of wire is 14, stranded. The green/red LED on the sensor shows steady green during normal operation.

Configure the options associated with the sensor. Refer to the IAQ Sensor section on page 14.

Provide Power To Relay Pack — After the wiring has been completed, provide power to the relay pack. Once power has been provided to the relay pack, the relay pack will provide power to the thermostat. The heating or cooling set points will appear on the thermostat display screen. The thermostat is now ready to be programmed. If the display is blank or blinking, recheck the wiring connections between the thermostat and relay pack. There should be a steady 10 vdc between the red and white connections.

CONFIGURATION

Configuration can be done either manually with the set point buttons on the TEMP system thermostat, or by computer with the Carrier network access software through the system network. Refer to each specific section in this manual for detailed instructions on configuring the TEMP system thermostat options. Refer to the software manual for network software configuration.

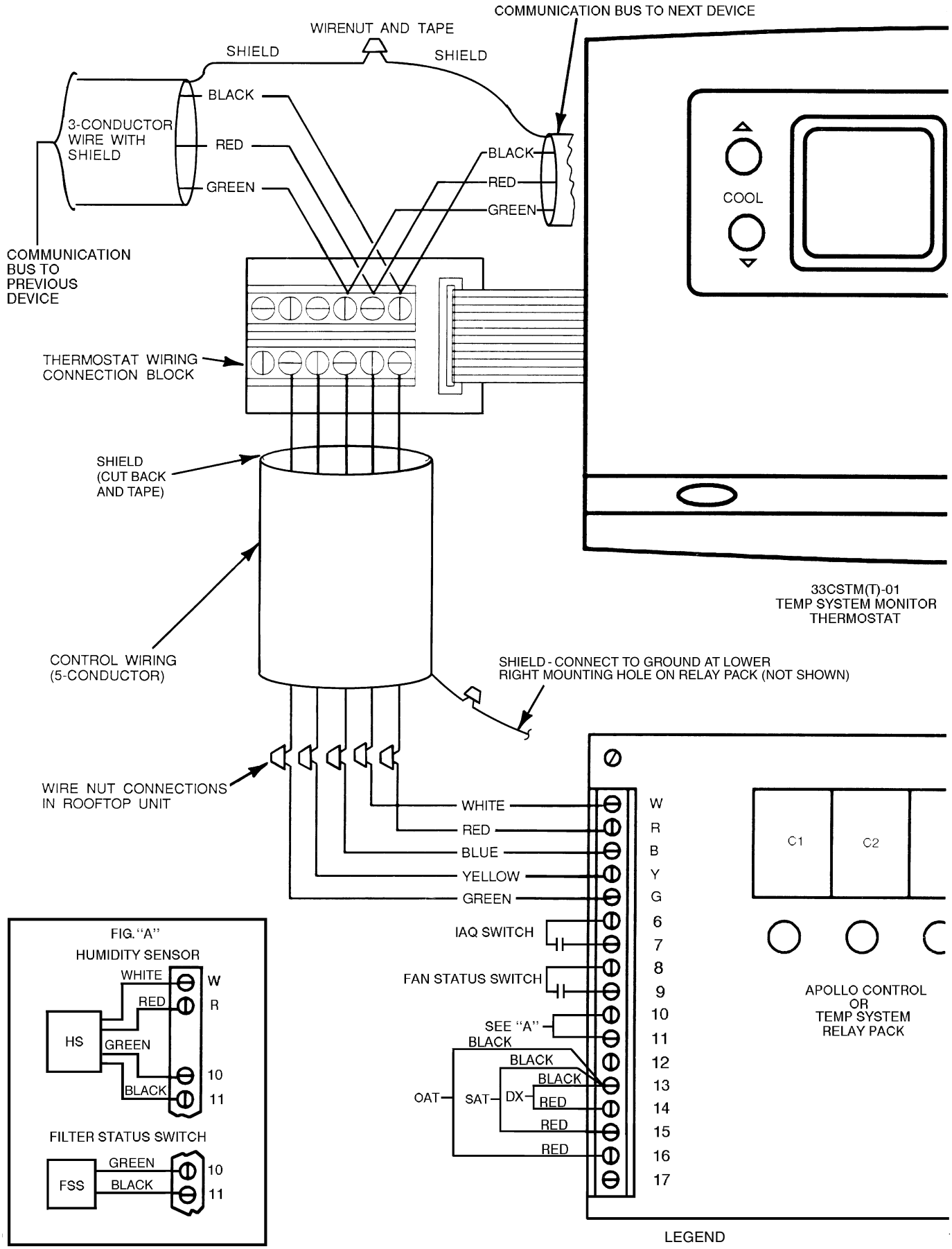
A special start-up category of options (category 8.0) has been designated as the start-up category. This category contains options that must be configured correctly before the TEMP system thermostat will operate. After installation, configure the start-up (8.0) category first. The start-up category will automatically be displayed when programming mode is accessed, after the thermostat is powered up for the first time, or when the device address is set to 0.

Manual Configuration — To manually configure the TEMP system thermostat, press both upper or both lower set point buttons simultaneously. See Fig. 6 and 7. The configuration screen will display the current category in the lower right corner (numbered from 1 to 14). Press the left upper or lower set point buttons to access the different configuration categories. Press the select (right lower set point) button to accept the current category for modification. The word "option" will be displayed, along with the current option number. The escape (right upper set point) button can be used to return to the category screen. The categories will loop around when scrolling from 14 back to 1.

The left upper and lower set point buttons are used to toggle through the options of each category. The word "option," the option number, and the current data stored in the option are displayed on the screen. See Table 1 for categories and options. When the desired option is shown on the screen, press the select button. The configurable data will flash. The left set point buttons are used to toggle or change the data values. When the desired setting is shown press the enter button to store the change. To exit without saving changes, press both upper or both lower set point buttons or press the escape button. If no buttons are pressed while in programming mode for 3 minutes, the TEMP system thermostat will reset back to the normal display.

Each option is discussed in detail in this manual. Refer to the correct section for more information.

Computer Configuration — To configure the TEMP system thermostat with an IBM compatible computer, Carrier network access software must be used.



NOTE: Humidity Sensor and Filter Status Switch cannot be wired at the same time.

LEGEND

DX	— Direct Expansion Coil Sensor	**IAQ**	— Indoor-Air Quality Sensor
FSS	— Filter Status Sensor	**OAT**	— Outdoor-Air Temperature Sensor
HS	— Humidity Sensor	**SAT**	— Supply-Air Temperature Sensor

Fig. 3 — TEMP System Wiring

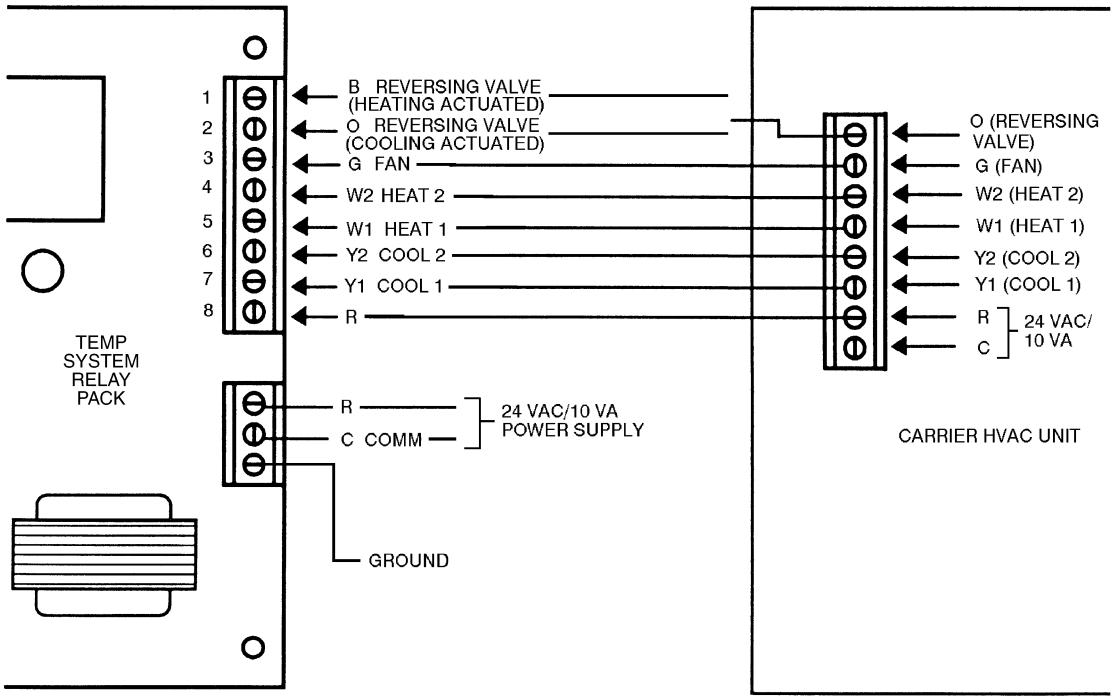


Fig. 4 — Relay Pack Wiring without Auxiliary Relay (TSR-01)

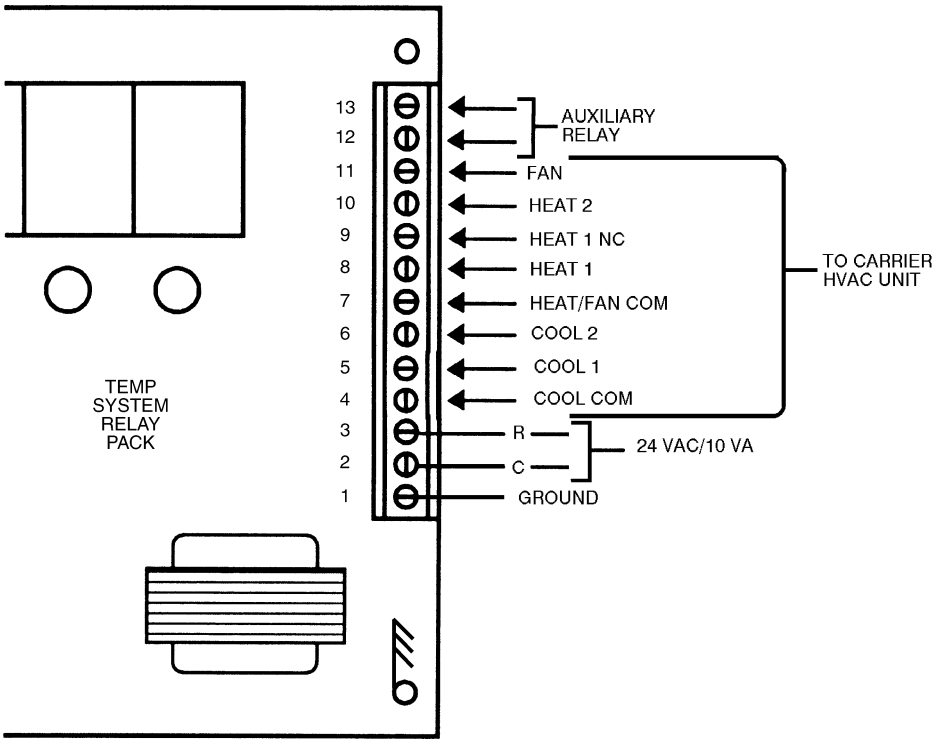


Fig. 5 — Relay Pack Wiring with Auxiliary Relay (33CSUCE-06)

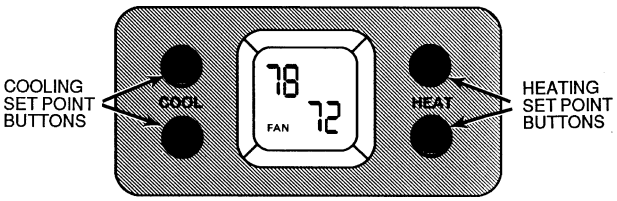


Fig. 6 — TEMP System Thermostat Display Screen

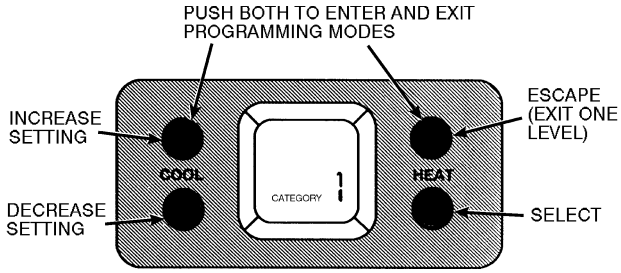


Fig. 7 — TEMP System Thermostat Configuration Buttons

Table 1 — TEMP System Thermostat Categories and Options

OPTION	DESCRIPTION	DEFAULT	MINIMUM	MAXIMUM
CATEGORY 1.0 SET POINTS				
1.1	Cooling Set Point Low Limit (F)	68	50	99
1.2	Heating Set Point High Limit (F)	75	50	99
1.3	Unoccupied Cooling Set Point (F)	80	50	99
1.4	Unoccupied Heating Set Point (F)	65	50	99
1.5	Rotating Display	OFF	OFF	ON
1.6	Fahrenheit Temperature Display	ON	OFF	ON
CATEGORY 2.0 OCCUPANCY SCHEDULE				
2.1-2.8	Occupancy Period 1-8 Days Active Start Time Stop Time	 MTWTF 06:00 AM 06:00 PM	 NONE 12:00 AM 12:00 AM	 MTWTFSSH 11:59 PM 11:59 PM
2.9	Schedule Number	0	0	99
2.10	Override Time Limit (Hours)	1	0	4
CATEGORY 3.0 DAMPER				
No configuration required.				
CATEGORY 4.0 HVAC EQUIPMENT				
4.1	Fan Operation For Heat	ON	OFF	ON
4.2	Time Guard Between Modes	ON	OFF	ON
4.3	Time Guard Override	OFF	OFF	ON
4.4	LAT (Leaving-Air Temperature) Monitoring	ON	OFF	ON
4.5	First Stage Cooling Temperature Limit (F)	45	40	45
4.6	Second Stage Cooling Temperature Limit (F)	50	45	50
4.7	First Stage Heating Temperature Limit (F)	110	110	180
4.8	Second Stage Heating Temperature Limit (F)	105	105	160
4.9	Auxiliary Relay (0 — No Control, 1 — Occupied Schedule, 2 — IAQ, 3 — Reversing Valve, 4 — Economizer)	0	0	4
4.10	Optimize Staging	ON	OFF	ON
4.11	Cooling Temperature Lockout	OFF	OFF	ON
4.12	Cooling Lockout Set Point (F)	40	10	80
4.13	Heating Temperature Lockout	OFF	OFF	ON
4.14	Heating Lockout Set Point (F)	60	10	80
4.15	Minimum Heat Run Time (Minutes)	3	1	30
4.16	Minimum Cool Run Time (Minutes)	3	1	30
4.17	Pre-Occupancy Purge	OFF	OFF	ON
4.18	Fan Switch Control (0 — Use Fan Switch Position, 1 — Fan Switch ON, 2 — Fan Switch AUTO)	0	0	2
4.19	Cool Switch Control (0 — Use Cool Switch Position, 1 — Cool Switch AUTO, 2 — Cool Switch OFF)	0	0	2
4.20	Heat Switch Control (0 — Use Heat Switch Position, 1 — Heat Switch AUTO, 2 — Heat Switch OFF)	0	0	2
CATEGORY 5.0 SENSORS				
5.1	Room Sensor (1 — Local Room Sensor, 2 — Remote Room Sensor, 3 — Average Local Sensor and Remote Room Sensor)	1	1	3
5.2	Zone Temperature Sensor Calibration (F)	Zone Temp.	30	180
5.3	Remote Room Sensor Calibration (F)	Room Temp.	30	180
5.4	Supply-Air Temperature Sensor	OFF	OFF	ON
5.5	Supply-Air Temperature Sensor Calibration (F)	Duct Temp.	30	180
5.6	DX Coil Temperature Sensor	OFF	OFF	ON
5.7	DX Coil Temperature Sensor Calibration (F)	Coil Temp.	30	180
5.8	Outdoor-Air Temperature Sensor (OAT)	OFF	OFF	ON
5.9	Outdoor-Air Temperature Sensor Calibration (F)	Outdoor Temp.	–40	150

Table 1 — TEMP System Thermostat Categories and Options (cont)

OPTION	DESCRIPTION	DEFAULT	MINIMUM	MAXIMUM
5.10	Fan Status Switch	OFF	OFF	ON
5.11	Humidity Sensor/Filter Status (0 — No Sensor, 1 — Indoor Humidity Sensor, 2 — Filter Status Switch)	0	0	2
5.12	Humidity Sensor Calibration	Indoor Humidity	0	100
CATEGORY 6.0 SUPPLEMENTAL HEAT				
No configuration needed.				
CATEGORY 7.0 DIAGNOSTICS/METERING				
7.1	Error Code Display	OFF	OFF	ON
7.2	Communication Check	OFF	OFF	ON
7.3	Alternate Information	OFF	OFF	ON
7.4	Comfort Trend Demand (1/10° F)	0	0	25.5
7.5	Comfort Trend Time Limit (Minute)	2	2	255
7.6	HVAC Usage Meter	OFF	OFF	ON
7.7	Override Usage Meter	OFF	OFF	ON
7.8	HVAC Override Usage Meter	OFF	OFF	ON
7.9	Heating Mode Error Set Point (F)	0	0	140
7.10	Cooling Mode Error Set point (F)	140	0	140
7.11	Unit Reset	OFF	OFF	ON
CATEGORY 8.0 START-UP				
8.1	Device Element Address	0	0	239
8.2	Security Level (1 — All Programming Allowed, 2 — Programming of Occupancy Schedules and Set Points Only, 3 — Programming of Set Points Only, 4 — No Programming Allowed)	1	1	4
8.3	Device Bus Number	0	0	239
CATEGORY 9.0 BROADCAST/DAYLIGHT SAVINGS TIME				
9.1	Broadcast Acknowledger	OFF	OFF	ON
9.2	Global Schedule Broadcast	OFF	OFF	ON
9.3	Network Time Request	OFF	OFF	ON
9.4	Receive Network Time	ON	OFF	ON
9.5	Network Time Broadcast	OFF	OFF	ON
9.6	Daylight Savings Time Start Month	4	1	12
9.7	Daylight Savings Time Start Week	1	1	5
9.8	Daylight Savings Time Start Day	7	1	7
9.9	Daylight Savings Time Added Minutes	60	0	90
9.10	Daylight Savings Time Stop Month	10	1	12
9.11	Daylight Savings Time Stop Week	5	1	5
9.12	Daylight Savings Time Stop Day	7	1	7
9.13	Daylight Savings Time Subtracted Minutes	60	0	90
CATEGORY 10.0 HOLIDAY SCHEDULES				
10.1-10.18	Holiday Schedule 1-18 Holiday Start Month Start Day Duration (Days)	 0 0 0	 0 0 0	 12 31 99
CATEGORY 11.0 ALARM				
11.1	Equipment Priority	7	0	7
11.2	Communication Failure Retry Time (Minutes)	10	1	240
11.3	Re-Alarm Time (Minutes)	30	1	255
CATEGORY 12.0 OPTIMAL START				
12.1	Optimal Start Time Limit (Hrs)	4	0	4
CATEGORY 13.0 LOADSHED				
13.1	Demand Limit Group Number	0	0	16
CATEGORY 14.0 INDOOR-AIR QUALITY (IAQ)				
14.1	System Indoor Air Quality Sensor	OFF	OFF	ON
14.2	Indoor-Air Quality Economizer Delay (Minutes)	10	5	30
14.3	Indoor-Air Quality Maximum Space Temperature Reset (F)	2	0	10
14.4	Indoor-Air Quality Humidity Lockout Set Point	0	0	100
14.5	Indoor-Air Quality Low Temperature Lockout (F) (OAT)	45	0	110
14.6	Indoor-Air Quality High Temperature Lockout (F) (OAT)	80	0	110
14.7	Indoor-Air Quality Alarm Delay (Minutes)	0	0	240

TEMP SYSTEM THERMOSTAT DISPLAY

The TEMP system thermostat is capable of different display modes. The user can decide which display mode the TEMP system thermostat will operate in. Information is displayed on the TEMP system thermostat LCD screen. In normal operating mode, the system status display is shown.

System Status Display — System status display is shown during normal operation. The display cycles between the heating and cooling set points and the room temperature when the Rotating Display option is ON. When the Rotating Display option is OFF, the thermostat will only display the heating and cooling set points.

When the fan relay of the relay pack is energized, the word FAN will be displayed on the TEMP system thermostat screen.

When cooling relay is energized, the word COOL will be displayed on the TEMP system thermostat screen. When heating relay is energized, the word HEAT will be displayed on the TEMP system thermostat screen.

NOTE: The TEMP system thermostat only controls the relay pack. There is no feedback between the heating/ cooling equipment and the relay pack.

When the second stage of heating or cooling is entered, a decimal point is displayed between the current heating and cooling set points.

If a data variable is forced by control software or data transfer, then an "F" will be displayed on the screen during Alternate Information display.

The display will show "UFLO" when a sensor is reading out of the normal operating range. This would indicate that either the sensor is malfunctioning or is out of calibration. If the sensor is a pressure sensor, the pressure may be too low or too high to read.

If error code display is turned on and the zone is participating in IAQ, then the display will show "IA9" to reflect IAQ mode. It will also display normal errors.

More information can be shown by using the Alternate Information Display function. The status of each element below the address of the TEMP system thermostat can be seen by activating a Communication Check.

Rotating Display — The Rotating Display option controls what information is shown on the display screen during normal operation. When Rotating Display is ON, the heating and cooling set points and the zone temperature are displayed. When Rotating Display is OFF, only the heating and cooling set points are shown. The Rotating Display option is configured in category 1, option 5.

Electronic Timeclock — The TEMP system thermostat may be equipped with an electronic timeclock. The timeclock is used for operation of the TEMP system thermostat unoccupied/occupied time periods. The timeclock is also used for broadcast to other devices on the network.

To set the clock, remove the thermostat cover. On the right side of the TEMP system thermostat, a select and an adjust button are provided under the timeclock. Press the select button. The minutes setting on the clock will flash. Press the adjust button until the correct minutes are shown. Press the select button. The hour setting will flash. Press the adjust button until the correct hour is shown (including AM and PM). Press the select button again and the day of the week will flash. Press the adjust button until the correct day is shown. Press the select button to return to normal timeclock operation. Re-install the thermostat cover.

NOTE: If the TEMP system thermostat receives time from a network device, the TEMP system thermostat time will revert back to network time after the transmission.

Alternate Information Display — Allows the TEMP system thermostat to display additional information. Simultaneously press the cooling or heating set point buttons, and the TEMP system thermostat will display a sequence of information. The information displayed is determined by the configuration setting of Alternate Information. The display can be frozen by pushing any set point button during the display sequence.

The Alternate Information option can be set to ON or OFF. To configure, set category to 7 and option to 3. Use the left set point buttons to toggle the option ON or OFF.

When Alternate Information is ON and the Alternate Information Display mode is activated, the TEMP system thermostat will display the following information (if available) in this order:

- (1) zone temperature
- (2) time of day
- (3) security level
- (4) duct temperature
- (5) outside-air temperature
- (6) outside-air relative humidity
- (7) indoor-air relative humidity
- (8) DX (direct expansion) coil temperature
- (9) filter status (digital input)
- (10) fan status (digital input)
- (11) IAQ status (digital input)

The information is shown on the top half of the display screen. The number of the sequence (1-11) is shown in the bottom right corner to help distinguish what is being displayed. The numbering is not shown when the Alternate Information option is turned OFF.

When Alternate Information is OFF and the Information Display mode is activated, the TEMP system thermostat will display the following information (if available) in this order:

- zone temperature
- time of day
- security level

Display Freeze — The Display Freeze function is enabled when the Alternate Information option is ON. After Information Display is activated, press any set point button to freeze the display on the information shown when the set point button was pressed. Press a set point button to resume the Information Display sequence.

NOTE: Normal operation of the TEMP system thermostat is not affected by the Display Freeze or Information Display operations.

START-UP

The start-up category for configuration contains important communication, security, and operation information which the TEMP system thermostat will need to operate correctly.

NOTE: The start-up category will display first when program mode is activated, on initial power up to the thermostat or when the device address is set to 0.

Device Address — Communication with the TEMP system thermostat is accomplished via the network. The TEMP system thermostat utilizes the network to:

- to receive data from the associated TEMP system thermostats on the network
- receive configuration via software

The Device Address option allows the TEMP system thermostat to establish an identity on the Carrier network for transmitting and receiving information. The device address is set in category 8, option 1. The factory setting is 0. Use the left set point buttons to raise and lower the device address until the correct address is shown on the TEMP system thermostat.

Device Bus Number — There can be secondary busses connected to a single primary bus. On the primary bus, each secondary bus has an address. When the TEMP system primary thermostat resides on a secondary bus, the bus address must be entered into the Device Bus Number configuration. The default is 0. Acceptable values range from 0 to 239. The Device Bus Number is set in category 8, option 3. The primary network device bus number is always 0.

Secondary network buses can be added by using a network bridge module. This secondary bus has a bus number equal to the device address of the bridge module. Any thermostats on this secondary bus must have their device bus number set equal to the device address of the bridge module.

Device Access Security Level — The device access security level is used to limit access to the TEMP system thermostat functions by unauthorized personnel. The device access security level is configured in category 8, option 2. The factory setting is 1. The range of acceptable access security levels is 1 to 4.

Access security level 1 allows full programming of the TEMP system thermostat. Access security level 2 allows programming of occupied set points, occupancy schedules, and holiday schedules. Access security level 3 allows programming of occupied heating and cooling set points only. Access security level 4 allows no programming.

⚠ CAUTION

Do not leave device access security level option at 1 after configuration is complete. Untrained or unauthorized users may change set points or other important information.

If the access security level is changed from 1, the access security level cannot be changed back in the normal method because programming is not allowed. To reconfigure the access security level of the TEMP system thermostat, activate the information display (simultaneously press both heating or both cooling buttons). When the information display shows the access security level (display number 3), press any button to freeze the display. Then press both upper or both lower set point buttons to enter the programming mode. Reconfigure category 8, option 2 to the desired access security level.

COMMUNICATIONS

Information Broadcast — The TEMP system thermostat broadcasts global information on the network. Global information is available to each device on the network.

If the TEMP system thermostat is equipped with an electronic timeclock, the time, day of the week, and year can be broadcast to the network. Network time is broadcast 2 times per day (1 AM and 1 PM).

When the Outside-Air Temperature Sensor option (5.8) is set to ON, outside-air temperature is broadcast to the network every 15 minutes.

NOTE: If the TEMP system thermostat has a timeclock, and is set up as the network time broadcaster, one of the other TEMP system thermostats must be a time requester. This will request time once every minute. This will ensure that the other devices on the network will receive time once a minute.

Communication Check — When the Communication Check is activated, the TEMP system thermostat verifies that it can communicate with each device addressed below its own address. To activate a Communication Check, set the category to 7 and the option to 2. Press a left set point button to toggle the option to ON. When the TEMP system thermostat has completed the system scan, the Communication Check is automatically deactivated.

During a Communication Check, the TEMP system thermostat scans consecutive device addresses starting with the device address one less than the TEMP system thermostat address. The TEMP system thermostat will continue to scan until address 1 is reached.

The following information is displayed during a Communication Check:

- the device address being scanned
- device type
- if the device has any error

Refer to Table 2 for the Communication Check system designations.

Table 2 — Communication Check System Designations

DEVICE TYPE*	DESCRIPTION
0	No Device Found
1	VVT® Monitor Thermostat
2	Bypass Controller
3	Zone Controller
4	TEMP System Monitor Thermostat
5	Other CCN Device

*If an "E" is shown in front of the device type designation, the device at that address has an error.

The 3-digit number in the upper left-hand corner indicates the device address currently being scanned. The device type and error status designations are located in the lower right-hand corner of the display.

OCCUPIED MODE OPERATION

Occupied mode is the time period when the TEMP system thermostat maintains the occupied set point temperatures. Occupied time periods are configured to define the TEMP system thermostat occupancy schedule of the zone. See the Unoccupied Mode Operation section on page 11 for more information on selection of time schedules.

During the occupied mode, the occupied set points:

- can be fully adjusted throughout the occupied set point range
- can be limited to maximum heating and minimum cooling values within the occupied set point range

Occupied Set Points — The occupied set points establish the range of acceptable temperatures for the zone during a given time period. The heating and cooling temperatures are maintained in the zone controlled by the TEMP system thermostat during the occupied mode. The range of allowable temperatures is 50 to 99 F for heating and cooling (dependent on the occupied set point limits).

The left set point buttons control the cooling set point. Press the top set point button to raise the set point. Press the bottom set point button to lower the set point. The cooling set point is displayed in the top left corner of the TEMP system thermostat screen.

The right set point buttons control the heating set point. Press the top set point button to raise the set point. Press the bottom set point button to lower the set point. The heating set point is displayed in the bottom right corner of the TEMP system thermostat screen.

The TEMP system thermostat will continuously display the occupied set points unless it is in unoccupied mode or display freeze has been activated or Rotating Display has been enabled.

Occupied Set Point Limiting — The occupied set point limits establish the maximum allowable heating set point and the minimum allowable cooling set point. The range of allowable temperature limits is 50 to 99 F for heating and cooling.

The Cooling Set Point Low Limit is set in category 1, option 1. The left set point buttons control the cooling set point limit. Press the top set point button to raise the set point limit. Press the bottom set point button to lower the set point limit. The cooling set point limit is displayed in the top of the TEMP system thermostat screen. The default value is 68 F.

The Heating Set Point High Limit is set in category 1, option 2. The left set point buttons control the heating set point limit. Press the top set point button to raise the set point limit. Press the bottom set point button to lower the set point limit. The heating set point limit is displayed in the TEMP system thermostat screen. The default value is 75.

By limiting the occupied set points to a defined range, the heating and cooling system will operate within desired parameters. The occupied system will minimize extended unit cycles to heat or cool a zone.

TEMPERATURE DISPLAY — Temperature sensor information is displayed by the TEMP system thermostat in increments of 1/10° F. Temperature and units are displayed in the top of the display. The temperature scale can be set to either Fahrenheit or Celsius units.

To enable the Fahrenheit Temperature Display option, set the category to 1 and the option to 6. Use the left set point buttons to toggle the option ON or OFF. ON will display temperature in Fahrenheit. OFF will display temperature in Celsius.

NOTE: Absolute temperatures (temperatures not measured by devices) are always in Fahrenheit, irrespective of the setting of the Fahrenheit Temperature Display option.

UNOCCUPIED MODE OPERATION

Unoccupied mode is the time period when the TEMP system thermostat maintains the unoccupied set point temperatures. Unoccupied time periods follow the schedule of the TEMP system thermostat zone. Unoccupied time periods allow for lower heating temperature set points and higher cooling temperature set points to conserve energy and money when the zone is unoccupied.

The TEMP system thermostat unoccupied time periods may be controlled:

- locally by the TEMP system thermostat, which will follow its own programmed unoccupied and occupied time periods
- through communication from another device on the network, which will send the TEMP system thermostat an unoccupied schedule.

During local control the unoccupied/occupied programs can be locked to prevent unauthorized or unintentional changes. When the TEMP system thermostat is in a time period designated for unoccupied mode operation, zone occupants can temporarily override unoccupied operation to the occupied mode. During unoccupied override, the TEMP system thermostat will maintain configured occupied conditions. At the end of the override period, the TEMP system thermostat will automatically return to unoccupied mode operation.

When the TEMP system thermostat is operating in unoccupied mode, the unoccupied set points will be displayed on the TEMP system thermostat screen.

Unoccupied Set Points — The unoccupied set points establish the heating and cooling temperatures maintained in the zone controlled by the TEMP system thermostat during the unoccupied mode. The range of allowable temperatures is 50 to 99 F for heating or cooling.

To configure the unoccupied cooling set point, enter category 1, option 3. The left set point buttons control the unoccupied cooling set point. Press the top set point button to raise the set point. Press the bottom set point button to lower the set point. The unoccupied cooling set point is displayed in the top left corner of the TEMP system thermostat screen. The default value is 80 F.

To configure the unoccupied heating set point, enter category 1, option 4. The left set point buttons control the unoccupied cooling set point. Press the top set point button to raise the set point. Press the bottom set point button to lower the set point. The unoccupied heating set point is displayed in the top left corner of the TEMP system thermostat screen. The default value is 65.

Occupancy Schedules — The occupancy schedule establishes the time periods when the TEMP system thermostat operates in the occupied or unoccupied mode.

The unoccupied/occupied program has an individual 7-day programming schedule with 8 time periods. Unoccupied/occupied ON/OFF times are entered on the minute. The start of an ON time is the beginning of the occupied mode. The start of an OFF time is the beginning of the unoccupied mode.

NOTE: If an ON time and an OFF time are set for the same hour, the TEMP system thermostat operates in unoccupied mode for that entire day.

The Unoccupied/Occupied program of the TEMP system thermostat can be configured locally using program mode.

The TEMP system thermostat will follow the holiday time schedule on days that are configured as holidays in the Holiday Configuration tables. If a local occupancy schedule is being used, then the local holiday configuration will be used. Occupancy schedules received from the network already have holiday information included.

PROGRAMMING SCHEDULES USING SOFTWARE — The occupancy time schedule consists of 8 periods. From the network access software each period may be configured. Three configuration options are set from the software: Occupied From, Occupied To, and Days of the Week the schedule is in effect. Eight different days are recognized: Monday through Sunday, and Holiday.

OCCUPANCY SCHEDULE MODE — The unoccupied/occupied program can be directly configured at the TEMP system thermostat. Press both upper (or lower) set point buttons at the same time to enter into the program mode. The occupancy schedule is in category 2, options 1 through 8. Option 1 is occupied period 1. Option 2 is occupied period 2. The options continue to option 8 which is occupancy period 8.

The procedure is different than programming other options. When category 2 is shown on the display screen, press the select (lower right) button. The display will show option 1. This will show the start time for option 1 only. To modify the start time for option 1, press select. Only the start time is modified. To modify to the stop time for option 1 press the upper left set point button. Instead of displaying option 2, the stop time for option 1 will be shown. Press the select button to modify the stop time. To modify the days of the week that the occupancy period will be active, use the upper left set point button to advance to the next option. Instead of showing option 2, the screen will display the active days for the occupied schedule. Each occupied period (options 2.1 through 2.8) will have three different screens associated with it: start time, stop time, and active days.

Start Time — When the select button is pressed from the first option screen, the hours number will flash. The hours are modified through the left set point buttons. The AM/PM modifier will automatically switch when scrolling through the times. To change the minutes, press the select button again. The minutes numbers will flash. Use the left set point buttons to modify the minutes. Press select again to save the current time and return to the options screen, or press escape to exit without saving changes.

Stop Time — When the select button is pressed from the second option screen, the hours number will flash. The hours are modified through the left set point buttons. The AM/PM modifier will automatically switch when scrolling through the times. To change the minutes, press the select button again. The minutes numbers will flash. Use the left set point buttons to modify the minutes. Press select again to save the current time and return to the options screen, or press escape to exit without saving changes.

Active Days — When the select button is pressed from the third option screen, the active days will be shown and the first day, M (Monday) will be blinking. Use the left set point buttons to turn the day ON or OFF. Use the select button to scroll through the possible active days. The programmable days are: M (Monday), T (Tuesday), W (Wednesday), TH (Thursday), F (Friday), SA (Saturday), SU (Sunday), and H (Holiday).

Schedule Number — If Schedule Number option is set to 0, the TEMP system thermostat will always be in occupied mode. If Schedule Number option is set to 1-64, the TEMP system thermostat will follow the unoccupied/occupied programs stored in memory. If Schedule Number option is set to 65-99, the TEMP system thermostat will follow the unoccupied/occupied programs specified in the global schedule located elsewhere on the network, unless the Broadcast Global Schedules option is ON. In this case, the TEMP system thermostat will be the network schedule broadcaster. The TEMP system thermostat will broadcast and follow the schedule stored in its memory. If a global schedule is configured and there is not a device broadcasting a global schedule, then the TEMP system thermostat will run in unoccupied mode.

To configure the Schedule Number option, configure category 2, option 9. Use the left set point buttons to toggle the option until the correct number is shown. The range of acceptable values is 0 to 99. The default value is 0.

Unoccupied Override — Unoccupied Override temporarily overrides the unoccupied mode at the TEMP system thermostat, allowing the zone to maintain occupied set points. To activate unoccupied override, press the lower cooling or upper heating set point button. The unoccupied display will be replaced with the normal display. Once initiated, unoccupied override remains in effect until the end of the Unoccupied Override Time Limit, or the start of the occupied mode.

INITIATING UNOCCUPIED OVERRIDE FROM A REMOTE ROOM SENSOR — A timed override can also be initiated from a remote room sensor using a momentary pushbutton switch. The switch must have gold plated contacts and be wired in series with the negative leg of the remote room sensor. See Fig. 8. When the button is held in between 1 and 5 seconds, the controller schedule will enter the Occupied mode. Remote override cannot be applied to a conroller that uses multiple remote sensors or the on-board space sensor.

To disable unoccupied override, configure the Unoccupied Override Time Limit to 0 hours.

UNOCCUPIED OVERRIDE TIME LIMIT — The Override Time Limit establishes the amount of time the TEMP system thermostat operates in the occupied mode when unoccupied override is activated. To set the option, configure category 2, option 10. The number of hours will be displayed. Press the upper set point buttons to raise the time limit. Press the lower set point buttons to lower the time limit. The range is 0 to 4 hours in 1-hour increments. To disable unoccupied override, configure the time limit to 0 hours. The default value is 1 hour.

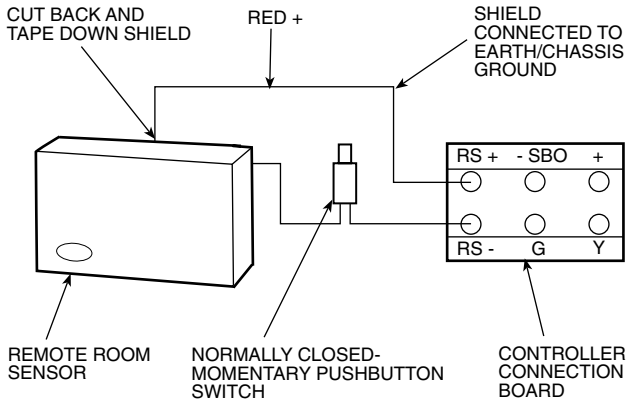


Fig. 8 — Wiring Diagram for Remote Unoccupied Override

Optimal Start — During initial operation, the TEMP system thermostat will track the time it takes to bring the system out of unoccupied mode and into occupied mode. The TEMP system thermostat will store the recovery rate for heating and cooling separately. Optimal Start will energize heating or cooling before the end of the unoccupied mode, so the system will be within occupied mode set points when the occupied time period begins.

When the Optimal Start Time Limit option is configured to any value besides zero, the TEMP system thermostat will calculate the number of minutes it must subtract from the start of the occupied period to recover the system before the occupied period begins. The range is from 0 to 4 hours. This only limits the time before the occupied period the optimal start will activate. A zero disables the optimal start function.

When the Optimal Start Time Limit option is configured to zero, the TEMP system thermostat will not use Optimal Start.

OPTIMAL START TIME LIMIT — The Optimal Start Time Limit setting is the maximum amount of time the TEMP system thermostat will start the system before the occupied period begins when Optimal Start is enabled.

To configure the Optimal Start Time Limit option, set category 12, option 1. Use the left set point buttons to increase or decrease the display. The range of allowable values is 0 to 4 hours. The default value is 4.

SENSORS

The TEMP system thermostat utilizes information from the following sensors to control the associated TEMP system:

- zone temperature
- duct (supply air) temperature
- DX coil temperature
- outside-air temperature
- relative humidity
- fan/filter status
- IAQ status switch

When necessary, sensor calibration can be performed at the TEMP system thermostat with the appropriate tools.

Zone Temperature Sensor — The TEMP system thermostat measures zone temperature through a solid-state temperature sensor located on the printed circuit board. See Fig. 9. The sensor measures temperature with a range of 30 to 180 F with $^1/_{10}$ degree resolution.

ZONE TEMPERATURE SENSOR CALIBRATION — To calibrate the zone temperature sensor, configure category 5,

option 2. The temperature reading of the sensor will be displayed. Compare the reading to an accurate thermometer. Use the left upper or lower set point buttons to raise or lower the temperature reading (by tenths of a degree) until the desired calibrated temperature is shown. The range of possible temperatures is 30 to 180 F.

Zone Temperature Monitoring — The TEMP system thermostat uses sensors to monitor the temperature in the zone.

The TEMP system thermostat can do one of the following:

- use the local zone temperature sensor for temperature information
- use its remote room sensor(s) (field installed) for temperature information
- average the temperatures it receives from its local room temperature sensor and remote room sensor for temperature information.

To configure the room sensor, set category 5, option 1. When the Room Sensor option is set to 1, the TEMP system thermostat will use the local zone temperature sensor for temperature information. When the Room Sensor option is set to 2, the TEMP system thermostat uses its remote room sensor(s) (field installed) for temperature information. When the Room Sensor option is set to 3, the TEMP system thermostat averages the temperatures it receives from its local room temperature sensor and remote room sensor for temperature information.

Remote Room Temperature Sensor — The TEMP system thermostat can measure zone temperature through a solid-state temperature sensor located at a remote location up to 1000 ft from the TEMP system thermostat. The sensor measures temperature with a range of 30 to 180 F with $^1/_{10}$-degree resolution. The remote room temperature sensor is connected to the TEMP system thermostat through the wiring connector board. See Fig. 10. Up to 4 remote room sensors can be used. When more than 1 remote room sensor is used, the temperatures are averaged.

All sensors must be wired in parallel. When adding remote room sensors, a field-supplied 9.2 K ohm resistor must be added to the connector block for each sensor. See Fig. 10.

REMOTE ROOM TEMPERATURE SENSOR CALIBRATION — To calibrate the remote room temperature sensor, configure category 5, option 3. The temperature reading of the sensor will be displayed. Compare the reading to an accurate thermometer. Use the left upper or lower set point buttons to raise or lower the temperature reading (by tenths of a degree) until the desired calibrated temperature is shown. The range of possible temperatures is 30 to 180 F.

SET-BACK OVERRIDE — Whenever the set-back override (SBO) contacts are closed the TEMP thermostat will proceed in Occupied mode. When the SBO contacts open the TEMP thermostat will continue to follow the local occupancy schedule it is programmed to follow. The SBO dry contacts are field-supplied. See Fig. 10.

NOTE: The set-back override (SBO) contacts will only override the TEMP thermostat's local occupancy schedule and will not interrupt any devices following a global schedule unless the thermostat is the Global Schedule Broadcaster.

Duct Temperature Sensor — The TEMP system thermostat measures supply-air temperature through a solid-state temperature sensor. The sensor can be located up to 1000 ft from the TEMP system thermostat in the supply air duct. The sensor measures temperature with a range of 30 to 180 F with $^1/_{10}$-degree resolution. See Fig. 3 for sensor wiring. The TEMP system thermostat must be configured to use the duct temperature sensor.

To configure the Duct Temperature Sensor option, configure category 5, option 4. Set the option to ON if using a duct temperature sensor. Set the option to OFF, if not using a duct temperature sensor. The default is OFF.

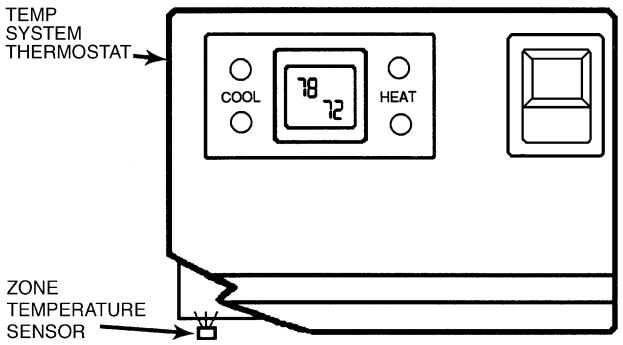
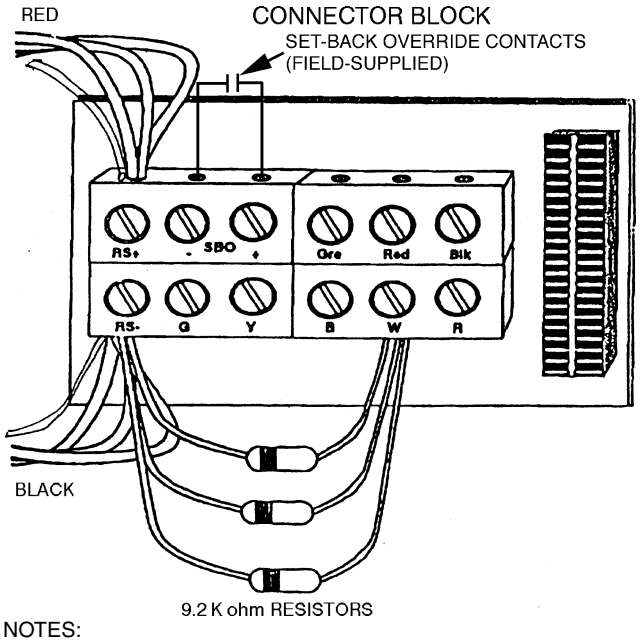


Fig. 9 — Zone Temperature Sensor Location



NOTES:
1. Four (4) is the maximum number of Remote Room Sensors considered as standard.
2. For each additional sensor (2 or more total) a resistor must be added. Resistors are wired in parallel between terminals RS– and W on the thermostat terminal block.
3. Example shown is for 4 Remote Room Sensors.
4. The SBO contacts, when closed, cause the thermostat to operate in the Occupied mode. When the SBO contacts open, the thermostat returns to the internal schedule.

Fig. 10 — Remote Room Sensor Wiring

DUCT TEMPERATURE SENSOR CALIBRATION — To calibrate the duct (supply air) temperature sensor, configure category 5, option 5. The temperature reading of the sensor will be displayed. Use an accurate thermometer to compare temperature readings. Use the left upper or lower set point buttons to raise or lower the temperature reading (by tenths of a degree) until the desired calibrated temperature is shown. The range of possible temperatures is 30 to 180 F.

DX (Direct Expansion) Coil Temperature Sensor — The TEMP system thermostat measures DX coil temperature through a solid-state temperature sensor. The sensor can be located up to 1000 ft from the single zone relay pack. The sensor measures temperature with a range of 30 to 180 F with $^1/_{10}$ degree resolution.

The temperature sensor is interfaced through the relay pack. See Fig. 3.

When the DX Coil Temperature Sensor option is set to ON, the TEMP system thermostat will use information from the temperature sensor for high and low temperature limits. The high limits for this sensor are fixed at 105 F for second stage and 110 F for first stage. The low limits are configured in category 4, options 5 and 6.

When the DX Coil Temperature Sensor option is set to OFF, the TEMP system thermostat will not use information from the temperature sensor for high and low temperature limits.

To configure the DX Coil Temperature Sensor option, configure category 5, option 6. Use the left set point buttons to toggle the option ON and OFF. The default value is OFF.

DX COIL TEMPERATURE SENSOR CALIBRATION — To calibrate the DX coil temperature sensor, Configure category 5, option 7. Obtain a correct temperature reading with an accurate thermometer. Use the left set point buttons to raise or lower the temperature until the desired reading is shown. The range of possible temperatures is 30 to 180 F.

Outside-Air Temperature Sensor — The TEMP system thermostat measures outside-air temperature through a solid-state temperature sensor. The sensor can be located up to 1000 ft from the single zone relay pack. The sensor measures temperature with a range of –40 to 150 F with $^1/_{10}$-degree resolution.

The temperature sensor is interfaced through the single zone relay pack. See Fig. 3.

When the Outside-Air Temperature Sensor option is set to ON, the TEMP system thermostat will measure outside-air temperature and broadcast the outside-air temperature information on the network.

When the Outside-Air Temperature Sensor option is set to OFF, the TEMP system thermostat can receive outside-air information broadcast from another device on the network. A communication bus must have only one outdoor-air sensor.

To configure the Outside-Air Temperature Sensor option, configure category 5, option 8. Use the left set point buttons to toggle the option ON and OFF. The default value is OFF.

OUTSIDE-AIR TEMPERATURE SENSOR CALIBRATION — To calibrate the outside-air temperature sensor, configure category 5, option 9. Obtain a correct temperature reading with an accurate thermometer. The range of possible temperatures is –40 to 150 F. Use the left set point buttons to raise or lower the temperature until the desired temperature is shown.

Indoor-Air Humidity Sensor — The TEMP system thermostat measures relative humidity through a solid-state humidity sensor. The sensor can be located up to 1000 ft from the single zone relay pack. The sensor measures humidity with a range of 0 to 100%.

The humidity sensor is interfaced through the single zone relay pack. See Fig. 3.

When the Indoor-Air Humidity Sensor option is set to ON, the TEMP system thermostat will measure relative humidity and broadcast the relative humidity information on the network.

When the Indoor-Air Humidity Sensor option is set to OFF, the TEMP system thermostat can receive relative humidity information broadcast from another device on the network.

To configure the Indoor-Air Humidity Sensor option, configure category 5, option 11. Use the left set point buttons to toggle the display. When the option is set to 0, neither the humidity sensor nor the filter status sensor is used. When the option is set to 1, a humidity sensor is used. When the option is set to 2, a filter status sensor is used. The default is 0.

NOTE: The humidity sensor and the filter status sensor cannot be used at the same time.

INDOOR-AIR HUMIDITY SENSOR CALIBRATION — To calibrate the indoor-air humidity sensor, configure category 5, option 12. Obtain a correct humidity reading with an accurate psychrometer. The range of possible humidity readings is 0 to 100%. Use the left set point buttons to raise or lower the reading until the desired humidity is shown.

Indoor-Air Quality Sensor — The Comfort IAQ feature allows the Carrier Comfort system to interface with the economizer on the HVAC equipment and maintain the quality of indoor air within acceptable limits. An IAQ sensor (CO_2) is used to monitor the IAQ levels in a zone.

When the CO_2 level exceeds the preset level (factory configuration is 1000 ppm and user software is required to change set point), the sensor signals the indoor-fan motor to run. If the auxiliary relay is user-configured to participate in IAQ, the auxiliary relay will energize. If the auxiliary relay is wired to the economizer, the IAQ uses the IAQ Economizer Delay for the first IAQ mode of the day. The indoor fan circulates the air throughout the occupied space. At the end of the 5 to 30 minutes, if the CO_2 level still exceeds the set point, the economizer damper opens. This forces fresh outside air to enter the space. When the IAQ level drops below the IAQ set point, the economizer returns to its standard operating mode. The IAQ sensor contacts open for $4^1/_2$ minutes to end IAQ mode.

When the system is bringing in additional outside air, the thermostat is reset 0 to 10° F (field-configured) above or below the original set point to allow the outside air to circulate before the heating or cooling mode is initiated.

When the IAQ mode brings in fresh outdoor air, the space temperature and humidity will rise or fall depending on the outside-air temperature and humidity. The IAQ Temperature and Humidity Lockout Set Points limit the air to be brought into the zone to satisfy IAQ requirements upon start of IAQ mode.

IAQ SENSOR CALIBRATION — IAQ sensor calibration can only be done with special calibration software which must be purchased. Call a local Carrier representative for more information about this product.

IAQ SENSOR — To configure the IAQ sensor option, set category 14, option 1. When the option is configured ON, the TEMP system thermostat will use information from the system IAQ sensor. When the option is configured OFF, the IAQ sensor is not used. The default is OFF.

IAQ ECONOMIZER DELAY — The IAQ Economizer Delay option controls how long the indoor fan will run before the economizer is energized once in IAQ mode. To configure the IAQ Economizer Delay option, set category 14, option 2. The number of minutes will be shown. The range of acceptable values is 5 to 30 minutes in 1-minute increments. Use the left set point buttons to set the time limit to the desired value. The default value is 10 minutes.

IAQ MAXIMUM SPACE TEMPERATURE RESET —When the IAQ mode brings in fresh outdoor air, the space temperature will rise or fall depending on the outside-air temperature. The IAQ Maximum Space Temperature Reset is the maximum amount of deviance from the set point that a zone will allow to satisfy IAQ requirements. The IAQ Maximum Space Temperature option will keep the HVAC equipment from entering heating or cooling unless the temperature change is greater than the set point. The option is configured in category 14, option 3. The set point can be configured from 0 to 10° F. The default value is 2° F.

IAQ HUMIDITY LOCKOUT SET POINT — When the IAQ mode brings in fresh outdoor air, the space humidity will rise or fall depending on the outside air humidity. The IAQ Humidity Lockout Set Point is the maximum outdoor air humidity reading at which a zone will allow air to be brought into the zone to satisfy IAQ requirements. The IAQ Humidity Lockout

Set Point option will keep the IAQ mode from beginning unless the outdoor humidity is below acceptable levels. The option is configured in category 14, option 4. The set point can be configured from 0 to 100. The default value is 0. The system relative humidity is broadcast by a device (comfort controller) on the network.

IAQ LOW TEMPERATURE LOCKOUT — When the IAQ mode brings in fresh outdoor air, the space temperature will rise or fall depending on the outside-air temperature. The IAQ Low Temperature Lockout Set Point is the minimum outdoor-air temperature reading at which a zone will allow air to be brought into the zone to satisfy IAQ requirements. The IAQ Low Temperature Lockout Set Point option will keep the IAQ mode from beginning unless the outdoor temperature is above the set point. The option is configured in category 14, option 5. The set point can be configured from 0 to 110 F. The default value is 45 F.

IAQ HIGH TEMPERATURE LOCKOUT — When the IAQ mode brings in fresh outdoor air, the space temperature will rise or fall depending on the outside air temperature. The IAQ High Temperature Lockout Set Point is the maximum outdoor-air temperature reading at which a zone will allow air to be brought into the zone to satisfy IAQ requirements. The IAQ High Temperature Lockout Set Point option will keep the IAQ mode from beginning unless the outdoor temperature is below the set point levels. The option is configured in category 14, option 6. The set point can be configured from 0 to 110 F. The default value is 80 F.

IAQ ALARM DELAY — The IAQ Alarm Delay option controls how long the TEMP system thermostat will wait before issuing an IAQ alarm. To configure the IAQ Alarm Delay option, set category 14, option 7. The number of minutes will be shown. The range of acceptable values is 0 to 240 minutes in 1-minute increments. Use the left set point buttons to set the time limit to the desired value. The default value is 0 minutes.

Fan/Filter Status Switch — The fan/filter status switch can be configured to signal when the system fan is operating or monitor the HVAC equipment filter and send a dirty filter alarm.

NOTE: The humidity sensor and fan/filter status sensor cannot be wired at the same time, only one sensor can be used.

To configure to monitor thermostat to use a fan/filter status switch, set category 5, option 11. A value of 0 configures the system for no sensor. A value of 1 configures the system for an indoor humidity sensor. A value of 2 configures the system for a fan/filter status switch. The default is 0.

Category 5, option 10 configures whether the fan status or filter status capability of the sensor is used. Set the option to ON for a fan status switch. Set the option to OFF for a filter status switch. The default is OFF.

Refer to the fan/filter status installation instructions for more information.

CONTROL OF HEATING AND COOLING EQUIPMENT

The system heating and cooling equipment is operated by the TEMP system thermostat in response to the zone conditions. The TEMP system thermostat uses the System Mode to determine the zone requirements of the system.

The TEMP system thermostat can control the heating or cooling stages of the equipment and an economizer (if applicable).

During equipment operation, zone temperature conditions can be improving, staying the same, or becoming worse. The TEMP system thermostat can analyze conditions to determine the equipment staging.

To protect the equipment, the TEMP system thermostat utilizes a time guard function to prevent excessive equipment cycling. To prevent excessive temperatures, the TEMP system thermostat can deenergize stages of equipment operation based on a comparison of supply-air temperatures to system operating limits which will turn off equipment. The TEMP system thermostat can also lockout heating or cooling based on outside-air temperature.

Heating/Cooling Equipment Interface — The heating/cooling equipment is interfaced to the TEMP system thermostat through a single zone relay pack.

Through the relay pack, the TEMP system thermostat is able to control:

- 2 stages of cooling
- 2 stages of heating
- fan operation
- reversing valve operation/ auxiliary relay operation

System Switches — The system switches are located on the bottom of the TEMP system thermostat. The system switches control the system mode function. See Fig. 11. The system switches can be set to a fixed position (locked) through configuration and can also be controlled from the network through software.

SYSTEM HEAT SWITCH — The TEMP system thermostat heat switch has 2 settings. When the heat switch is set to OFF, the TEMP system thermostat cannot select system heat mode. When the heat switch is set to AUTO, the TEMP system thermostat is able to select system heat mode.

To control the heat switch setting, configure category 4, option 20. This range is from 0 to 2. When the option is set to 0, the thermostat will use the setting of its mechanical cool switch. When the option is set to 1, the thermostat will perform as if the heat switch is set to AUTO (regardless of the mechanical heat switch setting). When the option is set to 2, the thermostat will perform is if the heat switch is set to OFF (regardless of the mechanical heat switch setting). The setting of 0 is the default setting.

SYSTEM COOL SWITCH — The TEMP system thermostat cool switch has 2 settings. When the cool switch is set to OFF, the TEMP system thermostat cannot select system cool mode. When the cool switch is set to AUTO, the TEMP system thermostat is able to select system cool mode.

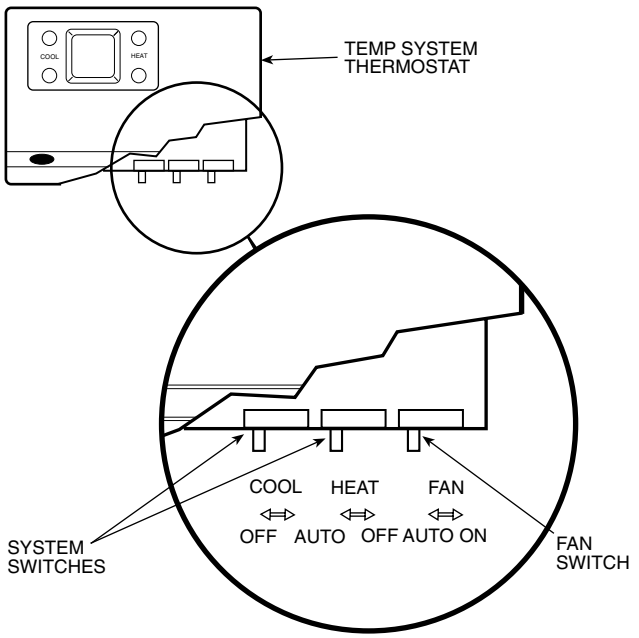


Fig. 11 — System Switch Locations

To control the cool switch setting, configure category 4, option 19. These range is from 0 to 2. When the option is set to 0, the thermostat will use the setting of the mechanical cool switch. When the option is set to 1, the thermostat will perform as if the cool switch is set to AUTO (regardless of the mechanical cool switch setting). When the option is set to 2, the thermostat will perform is if the cool switch is set to OFF (regardless of the mechanical cool switch setting). The setting of 0, is the default setting.

Fan Switch — The fan switch is located on the bottom of the TEMP system thermostat. The fan switch controls the system fan operation. See Fig. 11.

When the fan switch is set to ON, the TEMP system thermostat energizes the fan relay continuously when the TEMP system thermostat is in occupied mode. The fan does not operate in unoccupied mode.

NOTE: When the TEMP system thermostat is in unoccupied override mode, the fan operates as if it is in occupied mode.

When the fan switch is set to AUTO, the TEMP system thermostat energizes the fan relay only during the system heating or system cooling modes.

To control the fan switch setting, configure category 4, option 18. These range is from 0 to 2. When the option is set to 0, the thermostat will use the setting of its mechanical fan switch. When the option is set to 1, the thermostat will perform as if the fan switch is set to ON (regardless of the mechanical fan switch setting). When the option is set to 2, the thermostat will perform is if the fan switch is set to AUTO (regardless of the mechanical fan switch setting). The setting of 0 is the default setting.

Fan Operation For Heat — When the Fan Operation For Heat option is set to OFF and the fan switch is set to AUTO, the fan relay is energized by the TEMP system thermostat only during a system cooling mode. During a system heating mode, the heating/cooling equipment is responsible for fan operation.

When the Fan Operation For Heat option is set to ON and the fan switch is set to AUTO, the fan relay is energized by the TEMP system thermostat during system heating and cooling modes.

To configure the Fan Operation For Heat option, set category 4, option 1. Use the left set point buttons to toggle the option ON and OFF.

Zone Caller — If the TEMP system thermostat has sufficient zone demand to energize the heating/cooling equipment, it is a zone caller. A zone cooling caller has a demand of 1.5° F or greater for cooling. A zone heating caller has a demand of 1.5° F or greater for heating.

System Mode — System mode is the operation configuration the TEMP system thermostat uses to determine the operation of the system and heating/cooling.

For a TEMP system, the TEMP system thermostat checks its own zone demand. If the TEMP system thermostat is a cooling caller, system cooling mode is selected. If the TEMP system thermostat is a heating caller, system heating mode is selected.

The TEMP system thermostat releases a system heating or cooling mode when:

- the zone demand is satisfied to 0.5° F.
- both first and second stage heating or cooling temperature limits are exceeded when the zone is no longer a zone caller.
- the Heating or Cooling Temperature Lockouts option is set to ON and the outside-air temperature exceeds the lockout temperature set point.

Equipment Operation — The TEMP system thermostat operation of the heating, cooling, and reversing valve relays is determined by the zone demand. The Auxiliary Relay option configures the TEMP system thermostat for equipment operation.

During a system mode, a stage of heating or cooling cannot be energized in less than 3 minutes after the previous stage has been energized. Once a heating or cooling stage has been energized, it remains on until system heating or cooling mode is released or trips due to a limit being exceeded. The reversing valve relay, energized or deenergized, remains constant until a change of system modes.

AUXILIARY RELAY — The Auxiliary Relay option configures the way the auxiliary relay will be controlled by the TEMP system thermostat. When the option is set to 0, the TEMP system thermostat will not control the auxiliary relay. When the option is set to 1, the TEMP system thermostat will control the auxiliary relay based on the occupancy schedule. When the option is set to 2, the TEMP system thermostat will control the auxiliary relay under IAQ control. When the option is set to 3, the TEMP system thermostat will control the auxiliary relay as a reversing valve in a heat pump system based on system heating or cooling modes. When the option is set to 4, the TEMP system thermostat will control the auxiliary relay to enable or disable economizer control. The Auxiliary Relay option is set in category 4, option 9. The default is 0.

EQUIPMENT OPERATION DURING A SYSTEM COOLING MODE — The TEMP system thermostat utilizes the relay pack to energize the reversing valve relay (if option 4.9 is set to 3) when the system cooling mode is selected. The first stage of cooling is energized 30 seconds after system cooling mode is selected. When the reference zone cooling demand is 2.0° F or greater, the second stage of cooling is energized or optimized staging is followed. The second stage of cooling is released when demand drops below 1.0° F. The first stage of cooling is deenergized when the system cooling mode is released.

EQUIPMENT OPERATION DURING A SYSTEM HEATING MODE — The TEMP system thermostat utilizes the relay pack to deenergize the reversing valve relay (if option 4.9 is set to 3) when the system heating mode is selected. The first stage of heating is energized 30 seconds after system heating mode is selected. When the reference zone heating demand is 2.0° F or greater, the second stage of heating is energized or optimized staging is followed. The second stage of heating is released when demand drops below 1.0° F. The first stage of heating is deenergized when the system heating mode is released.

Equipment Operation With Economizer Control — The TEMP system thermostat operation of the heating, cooling, and economizer relays is determined by the system mode, the reference zone demand, and the outdoor-air temperature. The Auxiliary Relay option must be set to 4 to configure the TEMP system thermostat for equipment operation with economizer control.

During a system mode, a stage of heating or cooling cannot be energized in less than 3 minutes after the previous stage has been energized. Once a heating or cooling stage has been energized, it remains on until system heating or cooling mode is released.

EQUIPMENT OPERATION DURING A SYSTEM COOLING MODE

Outside-Air Temperature Greater Than 65 F — The TEMP system thermostat utilizes the relay pack to energize the first stage of cooling after system cooling mode is selected. When the reference zone cooling demand is 2.0° F or greater, the second stage of cooling is energized or optimized staging is followed. The second stage of cooling is released when demand drops below 1.0° F. The first stage of cooling is deenergized when the system cooling mode is released.

Outside-Air Temperature Greater Than or Equal to 55 and Less Than or Equal to 65 F — The TEMP system thermostat utilizes the relay pack to energize the outside air economizer after system cooling mode is selected. When the reference zone cooling demand is 2.0° F or greater, the first stage of cooling is energized or optimized staging is followed. The second stage of cooling is energized when the reference zone cooling demand is 2.5° F or greater and the first stage of cooling is energized. The second stage of cooling is released when demand drops below 1.0° F. The economizer relay and the first stage of cooling are deenergized when the system cooling mode is released.

Outside-Air Temperature Below 55 F — The TEMP system thermostat utilizes the relay pack to energize the outside air economizer after system cooling mode is selected. When the reference zone cooling demand is 2.0° F or greater, the first stage of cooling is energized or optimized staging is followed. The first stage of cooling cannot be energized until 5 minutes after the economizer relay has been energized. The second stage of cooling is energized when the reference zone cooling demand is 2.5° F or greater and the first stage of cooling is energized. The second stage of cooling is released when demand drops below 1.0° F. The economizer relay and the first stage of cooling is deenergized when the system cooling mode is released.

EQUIPMENT OPERATION DURING A SYSTEM HEATING MODE — The TEMP system thermostat utilizes the relay pack to energize the first stage of heating after system heating mode is selected. When the reference zone heating demand is 2.0° F or greater, the second stage of heating is energized or optimized staging is followed. The second stage of heating is released when demand drops below 1.0° F. The first stage of heating is deenergized when the system heating mode is released.

Optimize Staging — The Optimize Staging function establishes a pattern for the changing temperature conditions of the reference zone. If the zone temperature conditions are improving, the TEMP system thermostat will not energize the second stage of heating or cooling.

When the Optimize Staging option is configured to ON, the TEMP system thermostat energizes the second stage heating or cooling only if the zone temperature trend has not improved for a 6-minute time limit. The 6-minute limit is reset if conditions begin to improve.

When the Optimize Staging option is configured to OFF, the TEMP system thermostat energizes the second stage heating or cooling normally.

To configure the Optimize Staging option, set category 4, option 10. Use the left set point buttons to toggle the option ON and OFF. The default is ON.

By preventing unnecessary use of the second stage heating or cooling, the Optimize Staging option allows the heating/cooling equipment to operate more economically without sacrificing individual zone comfort.

When zone temperature conditions exceed the desired occupied level, if first stage heating or cooling is able to improve the occupied level, second stage heating or cooling is not required.

The TEMP system thermostat uses Optimized Staging to follow zone conditions and determine when use of first stage is improving zone conditions. If zone conditions are not improving, or are becoming worse, the TEMP system thermostat will energize the second stage of heating or cooling.

System Status Display — The TEMP system thermostat indicates the system mode and equipment operation by displaying system annunciators. FAN is displayed when the TEMP system thermostat energizes the fan relay. COOL is displayed when the TEMP system thermostat energizes a cooling relay. HEAT is displayed when the TEMP system thermostat energizes a heating relay. When a second stage of heating or cooling is energized, a decimal point is displayed between the set points.

System Time Guards — The TEMP system thermostat has different system time limits (time guards) which prevent an individual system heating or cooling mode from being selected after the system mode has been released or after the TEMP system thermostat receives power.

HIGH/LOW TEMPERATURE LIMIT TIME GUARD — This feature functions to keep the HVAC equipment operating to reduce equipment cycling. By monitoring the supply-air temperatures, the TEMP system thermostat can adjust operation to prevent tripping of the heating/cooling temperature limits.

When the supply-air temperature exceeds the first or second stage Heating or Cooling Temperature Limit the corresponding stage of heating or cooling is disabled.

If the TEMP system thermostat is in a system mode, it will reenergize the appropriate stages of heating or cooling when 10 minutes have passed and the supply-air temperature is no longer exceeding the first or second stage Heating or Cooling Temperature Limit.

During equipment operation, when a limit is exceeded, the following relays are deenergized:

- Second Stage Limit. The second stage relay (H2 or C2) is deenergized.
- First Stage Limit. The first stage relay (H1 or C1) is deenergized.

When the LAT (leaving-air temperature) Monitoring option is set to ON, the TEMP system thermostat maintains system heating and cooling supply-air temperature limits and enables the LAT algorithm.

When the LAT Monitoring option is set to OFF, the TEMP system thermostat will not maintain heating and cooling supply-air temperature limits and the LAT algorithm is disabled.

To configure the LAT Monitoring option, set category 4, option 4. Use the left set point buttons to toggle the option ON and OFF. The default is ON.

First Stage Cooling Temperature Limit — If the duct entering-air temperature drops below the First Stage Cooling Temperature Limit and the LAT Monitoring function is ON, the TEMP system thermostat will deenergize first stage cooling.

To configure the First Stage Cooling Temperature Limit option, set category 4, option 5. Use the left set point buttons to raise or lower the set point until the desired temperature is shown. The range of acceptable values is 40 to 45 F, in one degree increments. The default is 45 F.

NOTE: The first stage limit cannot be set higher than the second stage limit.

Second Stage Cooling Temperature Limit — If the duct entering-air temperature drops below the Second Stage Cooling Temperature Limit and the LAT Monitoring function is ON, the TEMP system thermostat will deenergize second stage cooling.

To configure the Second Stage Cooling Temperature Limit option, set category 4, option 6. Use the left set point buttons to raise or lower the set point until the desired temperature is shown. The range of acceptable values is 45 to 50 F, in one degree increments. The default is 50 F.

First Stage Heating Temperature Limit — If the duct entering-air temperature rises above the First Stage Heating Temperature Limit and the LAT Monitoring function is ON, the TEMP system thermostat will deenergize first stage heating.

To configure the First Stage Heating Temperature Limit option, set category 4, option 7. Use the left set point buttons to raise or lower the set point until the desired temperature is shown. The range of acceptable values is 110 to 180 F, in one degree increments. The default is 110 F.

Second Stage Heating Temperature Limit — If the duct entering-air temperature rises above the Second Stage Heating Temperature Limit and the LAT Monitoring function is ON, the TEMP system thermostat will deenergize second stage heating.

To configure the Second Stage Heating Temperature Limit option, set category 4, option 8. Use the left set point buttons to raise or lower the set point until the desired temperature is shown. The range of acceptable values is 105 to 160 F, in one degree increments. The default is 105 F.

High/Low Temperature Limit Display — When a Heating or Cooling Temperature Limit is exceeded the TEMP system thermostat flashes the appropriate system annunciators.

COOL flashes when a Low Temperature Limit is exceeded. HEAT flashes when a High Temperature Limit is exceeded. An SE11 alarm will be issued.

HEATING AND COOLING TIME GUARD — When the Time Guard Between Modes option is ON, the TEMP system thermostat cannot change system modes until the heating/ cooling time guard period has expired. The heating and cooling time guard is 5 minutes.

When the Time Guard Between Modes option is OFF, the TEMP system thermostat cannot change system modes until a 30-second time delay has expired.

To configure the Time Guard Between Modes option, set category 4, option 2. Use the left set point buttons to toggle the option ON and OFF. The default is ON.

UNOCCUPIED TIME GUARD — The Unoccupied Time Guard determines how long the TEMP system thermostat will wait before starting the heating/cooling equipment when the TEMP system thermostat goes from unoccupied to occupied mode. The length of the time guard is 0 to 189 seconds (determined by the first 6 bits of the address of the heating/ cooling equipment). This keeps the equipment from starting simultaneously which keeps peak energy usage down.

TIME GUARD OVERRIDE — When the Time Guard Override option is set to ON, the TEMP system thermostat heating/ cooling time guard and Unoccupied Time Guard are reset to 30 seconds.

NOTE: When the Time Guard Override option is used, the TEMP system thermostat will automatically reset the Time Guard Override to OFF.

When the Time Guard Override option is set to OFF, the heating/cooling time guard and Unoccupied Time Guard determine the time guard length based on the TEMP system thermostat device address.

To configure the Time Guard Override option, set category 4, option 3. Use the left set point buttons to toggle the option ON and OFF. The Time Guard Override option will return to OFF when the override is complete. The default is OFF.

POWER-UP TIME GUARD — The power-up time guard determines how long the TEMP system thermostat will wait before starting the heating/cooling equipment when the TEMP system thermostat is powered up. The length of the time guard is 5 minutes plus 0 to 189 seconds (determined by the first 6 bits of the address of the heating/cooling equipment). This keeps the equipment from starting simultaneously which keeps peak energy usage down.

Temperature Lockouts — Heating and cooling lockout temperatures can be configured to lock out the system mode based on the outside-air temperature. When the Heating Temperature Lockouts option is set to ON, and the outside-air temperature exceeds the Heating Lockout Temperature Set Point, the TEMP system thermostat will not select a system Heating Mode. If the system is currently in the system heating mode, the TEMP system thermostat will complete the current system mode.

NOTE: In order to use lockout temperatures the TEMP system thermostat must have an outdoor-air sensor wired to the relay pack, or must be receiving outdoor-air temperature over the network.

When the Cooling Temperature Lockouts option is set to ON, and the outside-air temperature drops below the Cooling Lockout Temperature Set Point, the TEMP system thermostat will not select a system Cooling Mode. If the system is currently in the system cooling mode, the TEMP system thermostat will complete the current system mode.

When either the Cooling or Heating Temperature Lockout options are set to OFF, the System Heating and Cooling Mode Lockout functions are disabled.

To configure the Cooling Temperature Lockout option, set category 4, option 11. Use the left set point buttons to toggle the option ON and OFF. The default is OFF.

To configure the Heating Temperature Lockout option, set category 4, option 13. Use the left set point buttons to toggle the option ON and OFF. The default is OFF.

Heating Lockout Temperature Set Point — The Heating Lockout Temperature Set Point establishes the system outside-air trip temperature for the Temperature Lockouts and the Supplemental Heat Lockout.

To disable the TEMP system thermostat heating lockout functions, set the Heating Lockout option to OFF.

To configure the Heating Lockout Temperature Set Point, set category 4, option 14. The range of values is 10 to 80 F in 5° F increments. Use the left set point buttons to increase or decrease the set point. The default is 60 F.

Cooling Lockout Temperature Set Point — The Cooling Lockout Temperature Set Point establishes the system outside air trip temperature for the Temperature Lockouts function.

To disable the TEMP system thermostat cooling lockout functions, set the Cooling Lockout option to OFF.

To configure the Cooling Lockout Temperature Set Point, set category 4, option 12. The range of values is 10 to 80 F in 5° F increments. Use the left set point buttons to increase or decrease the set point. The default is 40 F.

Pre-Occupancy Purge — When the Pre-Occupancy purge option is set to ON, the TEMP system thermostat will open the economizer and start the indoor-fan motor to send fresh air into the zone 60 minutes before the occupied mode is programmed to start. If the Auxiliary Relay is configured for economizer control, the auxiliary relay will be energized.

When the Pre-Occupancy Purge option is set to OFF, the purge will not occur.

NOTE: The Pre-Occupancy Purge will not work if the monitor thermostat is configured to receive a global schedule.

To program the Pre-Occupancy Purge option, configure category 4, option 17. Use the left set point buttons to toggle the option ON or OFF. The default is OFF.

METERING

The TEMP system thermostat has zone metering capabilities. The available functions allow the TEMP system thermostat to meter zone usage in 3 ways:

- usage of the heating/cooling equipment to maintain zone temperature conditions (amount of time the zone demand matches the System Mode).
- usage of the zone in addition to the normal occupied schedule (amount of time the zone is in Unoccupied Override).
- amount of time zone demand matches system mode during the unoccupied override.

HVAC Usage Meter — The TEMP system thermostat has a HVAC usage meter that can accumulate up to 32,767 minutes (about 22 days) of HVAC usage. Through communication, the amount of time accumulated in the meter can be accessed, recorded, and reset to zero. Once the maximum amount of time has been accumulated, the TEMP system thermostat stops metering and a Meter Full Error occurs.

To configure the HVAC Usage Meter option, set category 7, option 6. Use the left set point buttons to configure the option ON or OFF. The default is OFF.

To disable the HVAC Usage Meter, set the option to OFF. No metering occurs.

Override Usage Meter — When the Override Usage Meter option is set to ON, the meter will record the minutes the zone is in unoccupied override mode. When the Override Usage Meter option is set to OFF, zone metering for this mode will not occur. The override usage meter can accumulate up to 32,767 minutes (about 22 days) of override usage.

To configure the Override Usage Meter option, set category 7, option 7. Use the left set point buttons to configure the option ON or OFF. The default is OFF.

To disable the Override Usage Meter, set the option to OFF. No metering occurs.

HVAC Override Usage Meter — When the HVAC Override Usage Meter option is set to ON, the meter will record the minutes the zone demand matches the system mode in unoccupied override mode. When the HVAC Override Usage Meter option is set to OFF, zone metering for this mode will not occur. The HVAC override usage meter can accumulate up to 32,767 minutes (about 22 days) of HVAC override usage.

To configure the HVAC Override Usage Meter option, set category 7, option 8. Use the left set point buttons to configure the option ON or OFF. The default is OFF.

To disable the HVAC Override Usage Meter, set the option to OFF. No metering occurs.

DIAGNOSTICS

The TEMP system thermostat has diagnostic capabilities for components, and zone and system information.

Diagnostic problems, called errors or alarms, are divided into 3 categories: Hardware Failure (HF) errors, Storage Failure (SF) errors, and System Errors (SE). The TEMP system Thermostat tracks the operating conditions in the zone.

Error Code Display — An error code representing the TEMP system SE, SF, and HF diagnostic functions can be displayed to indicate which error has been declared. The 2 letters located in the bottom of the display represent the type of error. The 3 numbers located in the top of the display identify the specific error.

When the Error Code Display option is ON, an error code will be displayed when the associated error occurs. Any previous error codes that occurred when the Error Code Display was configured OFF will be displayed.

When an error is cleared, any errors remaining in the thermostat will be displayed sequentially until all errors are cleared.

When the Error Code Display option is set to OFF, no error codes will be displayed by the TEMP system thermostat.

To configure the Error Code Display option, set category 7, option 1. Use the left set point buttons to toggle the setting to ON or OFF. The default is OFF.

System Errors (SE) — System Errors are shown in Table 3.

COMFORT TREND ERROR (SPACE TEMPERATURE ALARM) (SE01) — A Comfort Trend error is a system error that provides information on the ability of the system to maintain temperature conditions in its reference zone.

When the reference zone demand exceeds the Comfort Trend Demand Set Point, the TEMP system thermostat begins tracking the Temperature Trend of the zone.

Table 3 — System Errors

ERROR CODE	SYSTEM ERROR DESCRIPTION	ALARM PRIORITY LEVEL
SE01	Comfort Trend (Space Temperature)	2
SE02	HVAC Usage Meter Full	4
SE03	Override Usage Meter Full	4
SE04	HVAC Override Usage Meter Full	4
SE06	Cannot Detect Indoor Fan ON	2
SE07	Heat Mode Error	2
SE08	Cool Mode Error	2
SE09	Dirty Filter Error	4
SE10	IAQ Error	2
SE11	High/Low Temperature Limit Exceeded	2
SE12	Cannot Detect Indoor Fan OFF	2
SE13	Stuck Gas Valve	1

The TEMP system thermostat declares a Comfort Trend Error for the zone when the Temperature Trend is continuously zero (zone temperature conditions are not improving) or positive (zone temperature conditions are becoming worse) for the entire Comfort Trend Time Limit.

To clear a Comfort Trend Error, use the Unit Reset function. The Unit Reset function is in category 7, option 11. The default is OFF. Use the left set point buttons to set the option to ON. The TEMP system thermostat will reset all errors.

By indicating when zone heating or cooling set points cannot be satisfied, a Comfort Trend Error helps identify zone problems.

When the system is commissioned, this information can be used by the installing contractor to recognize zone airflow or supply-air temperature problems in the system.

During system operation, Comfort Trend Errors can be continuously monitored for the servicing contractor by a local network access device to determine when system or equipment problems are affecting zone comfort.

To troubleshoot a Comfort Trend Error:

1. Check the quantity of airflow into the TEMP system thermostat zone.
   a. Check the ductwork running to the TEMP system thermostat zone. Loose connections or poorly insulated duct can result in reduced air volume or temperatures causing the TEMP system thermostat zone not to satisfy within the Comfort Trend Time Limit.
   b. After the previous steps have been completed, the performance of the supply air fan should be checked. During full load situations, the fan must produce an adequate quantity of supply air at the necessary static pressure to meet the zone design requirements. Reset the TEMP system thermostat transparent error register.
2. Check the temperature of airflow into the zone. If the temperature is above the zone design conditions during system cooling mode, or below design conditions during system heating mode, the operation of the equipment should be checked. Reset the TEMP system thermostat transparent error register.

Comfort Trend Demand Set Point — The Comfort Trend Demand Set point establishes the minimum zone demand level that must exist in the reference zone before it can declare a Comfort Trend Error.

The Comfort Trend Demand set point is configured in category 7, option 4. Use the left set point buttons to raise or lower the set point. The range of values is 0 to 25.5° F in $^1/_{10}$° F increments. The default is 0° F.

Comfort Trend Time Limit — The Comfort Trend Time Limit establishes the continuous amount of time that must elapse before the TEMP system thermostat can declare a Comfort Trend Error.

The Comfort Trend Time Limit set point is configured from category 7, option 5. The range of values is 0 to 255 minutes in 1-minute increments. The default is 0 minutes.

METER FULL ERROR (SE02,03,04) — System Errors SE02, SE03, and SE04 indicate when a zone meter is full.

NOTE: During a meter full error, the full usage meter stops recording and retains its maximum value until cleared.

To clear an SE02, SE03, or SE04 error, reset the full meter through communications and use the Unit Reset function. The Unit Reset function is in category 7, option 11. The default is OFF. Use the left set point buttons to set the option to ON. The TEMP system thermostat will reset all errors.

CANNOT DETECT INDOOR FAN ON (SE06) — The TEMP system thermostat will declare an SE06 if the FAN relay is energized, but the fan status switch is sending an OFF status.

To clear a system error, use the Unit Reset function. The Unit Reset function is in category 7, option 11. The default is OFF. Use the left set point buttons to set the option to ON. The TEMP system thermostat will reset all errors.

To troubleshoot the error, check the operation and wiring of the system fan.

SUPPLY-AIR TEMPERATURE (HEAT OR COOL MODE) ERROR (SE07, SE08) — A Supply-Air Temperature error is a system error that indicates inadequate supply-air temperature during a system heating or cooling mode. An SE07 (Heat Mode Error) will occur when the supply-air temperature is not adequate for heating. An SE08 (Cool Mode Error) will occur when the supply-air temperature is not adequate for cooling.

A heat or cool mode error occurs when the temperature at every supply-air temperature sensor associated with the TEMP system thermostat system exceeds an operating mode set point continuously for 10 minutes. During a system cooling mode, an SE08 error occurs when the supply-air temperature is higher than the Cooling Mode Error Set Point. During a system heating mode, an SE07 error occurs when the supply-air temperature is lower than the Heating Mode Error Set Point.

To clear a system error, use the Unit Reset function. The Unit Reset function is in category 7, option 11. The default is OFF. Use the left set point buttons to set the option to ON. The TEMP system thermostat will reset all errors.

To disable the error, set the Cooling Mode Error Set Point to 0 F and the Heating Mode Error Set Point to 140 F.

To clear the error, check the operation of the system heating and cooling equipment.

1. Check the economizer operation. The economizer could be allowing more outside air into the system than the equipment was designed to use.
2. The HVAC equipment has internal controls that can automatically shutdown the heating or cooling capacity based on operating limits. When this occurs, the TEMP system thermostat relay pack remains energized, but the equipment cannot provide conditioned air to the zones.
3. Check the capacity of the HVAC equipment to handle the building load. If the equipment is undersized, it may not be able to provide supply air that is either warm enough or cold enough to meet the system need during design conditions.
4. Reset the TEMP system thermostat error register.

Heating Mode Error Set Point — The Heating Mode Error Set Point establishes the supply-air temperature during a system heating mode. To configure the option, set category 7, option 9. Use the left set point button to raise or lower the temperature until the desired set point value is shown. The range of acceptable values is 0 to 140 F in 1° F increments. The default is 0° F.

Cooling Mode Error Set Point — The Cooling Mode Error Set Point establishes the supply-air temperature during a system cooling mode. To configure the option, set category 7, option 10. Use the left set point button to raise or lower the temperature until the desired set point value is shown. The range of acceptable values is 0 to 140 F in 1° F increments. The default is 140 F.

DIRTY FILTER ERROR (SE09) — The Dirty Filter Error will occur when the filter status switch sends an ON (dirty) signal to the TEMP system thermostat. The filter status switch compares the pressure on both sides of the filter. If the pressure difference rises above the factory-defined set point, an SE09 error will occur.

To clear a system error, use the Unit Reset function. The Unit Reset function is in category 7, option 11. The default is OFF. Use the left set point buttons to set the option to ON. The TEMP system thermostat will reset all errors.

To troubleshoot the error, clean the filter and check the operation of the system fan. Check the positioning of the filter sensor tubes. They should be unobstructed and in the correct location. Refer to the fan/filter status installation instructions for more information.

INDOOR-AIR QUALITY ERROR (SE10) — When the CO_2 level exceeds the preset level, the sensor signals the TEMP system thermostat. The TEMP system thermostat will wait until the IAQ Alarm Delay option (category 14, option 7) has expired, then it will issue an SE10. The system (if configured) will bring in fresh outdoor air to meet IAQ requirements. If the IAQ Alarm Delay, is not set to give the system enough time to correct IAQ problems, the SE10 will be issued every time the IAQ mode is entered.

If the lockouts prevent IAQ mode from operating, the system will not enter IAQ mode. These lockouts are user-configured and measure outdoor humidity (category 14, option 4), and outdoor temperature (category 14, options 5 and 6).

To clear a system error, use the Unit Reset function. The Unit Reset function is in category 7, option 11. The default is OFF. Use the left set point buttons to set the option to ON. The TEMP system thermostat will reset all errors.

HIGH/LOW TEMPERATURE LIMIT EXCEEDED (SE11)

Heating Mode — An alarm is issued when any supply air sensor in the system is above the first or second stage heating temperature limits (depending on what stages are active).

Cooling Mode — An alarm is issued when any supply air sensor in the system is above the first or second stage cooling temperature limits (depending on what stages are active).

Refer to the High/Low Temperature Limit Time Guard section on page 17 for more information.

Heat/Cool Mode Alarms are cleared from the system in 2 ways:

- Cycle power to the thermostat OFF, then ON.
- Reset the unit thermostat. Initiate a reset by switching the Unit Reset to the ON configuration (Category 7, Option 11).

CANNOT DETECT INDOOR FAN OFF (SE12) — The TEMP system thermostat will declare an SE12 if the FAN relay is deenergized, but the fan status switch is sending an ON status.

To clear a system error, use the Unit Reset function. The Unit Reset function is in category 7, option 11. The default is OFF. Use the left set point buttons to set the option to ON The TEMP system thermostat will reset all errors.

To troubleshoot the error, check the operation and wiring of the system fan.

STUCK GAS VALVE (SE13) — The Stuck Gas Valve sequence is used to allow the system to properly react to a failure mode of the HVAC unit when the gas valve becomes stuck in the open position. When this condition exists, the unit is unable to shut off the heat. To minimize this problem, the internal limit switch trips causing the indoor fan to turn on and remain on until the gas is manually shut off and the heat exchanger cools to normal temperatures.

Without this feature, a VVT® system operating normally would close each of its zone dampers as space conditions warmed to set point. This causes the heated air to be recirculated back through the unit, further aggravating the overheating problem. This allows space temperatures in the building to rise to higher than normal temperature levels. However, this sequence reduces the temperature build-up in the unit and keeps the heat exchanger operating within temperatures to prevent failure.

During No System Mode — If the duct temperature rises to greater than 175 F, the indoor fan is started. The fan will remain on if that temperature does not drop below 150 F after 3 minutes. The bypass damper will be closed, and all zone dampers will open to their maximum position. A Stuck Gas Valve alarm (SE13) will be initiated.

During a Cooling Mode — If the duct temperature does not drop below 100 F within 10 minutes, the cooling mode will be dropped for 10 minutes. The "No System Mode" logic will test for this condition.

During a Heating Mode — No action is required in this mode.

The alarm can be cleared or erased from the system in 2 ways:

- Cycle power to the thermostat off, then on.
- Initiate a reset by switching the Unit Reset option to the ON configuration (category 7, option 11).

Storage Failure (SF) Errors — A Storage Failure error is an error that corresponds to invalid information.

When an SF Error occurs, the TEMP system thermostat replaces the invalid data in memory with factory selected default values and the invalid information is not used to determine system mode.

To clear an SF Error, enter the correct data at the TEMP system thermostat by reconfiguring the associated options. See Table 4 for a description of Storage Failure Errors.

EXAMPLE OF CLEARING AN SF ERROR — The TEMP system thermostat displays a SF39 error. Look up SF39 in Table 4. The affected configuration is Temperature Lockouts. The default value is OFF. The desired setting is ON.

To clear the SF39 error manually, reconfigure the Temperature Lockouts option. The SF39 error should be cleared.

NOTE: If the SF error cannot be cleared, replace the TEMP system thermostat and configure the new thermostat to match desired settings.

Table 4 — Storage Failure (SF) Errors

ERROR	INFORMATION AFFECTED	DEFAULT VALUE(S)
SF01	Occupied Cooling Set Point	72
SF02	Occupied Heating Set Point	68
SF03	Cooling Set Point Low Limit	68
SF04	Heating Set Point High Limit	75
SF05	Unoccupied Cooling Set Point	80
SF06	Unoccupied Heating Set Point	65
SF07	Rotating Display	OFF
SF08	Fahrenheit Temperature Display	ON
SF09	Occupancy Period 1	MTWTHF 6:00AM-6:00PM
SF10	Occupancy Period 2	–
SF11	Occupancy Period 3	–
SF12	Occupancy Period 4	–
SF13	Occupancy Period 5	–
SF14	Occupancy Period 6	–
SF15	Occupancy Period 7	–

LEGEND

DX — Direct Expansion
IAQ — Indoor-Air Quality
LAT — Leaving-Air Temperature

NOTE: Table 4 continues on page 22.

Table 4 — Storage Failure (SF) Errors (cont)

ERROR	INFORMATION AFFECTED	DEFAULT VALUE(S)
SF16	Occupancy Period 8	–
SF17	Schedule Number	0
SF18	Override Time Limit	1
SF28	Fan Operation For Heat	ON
SF30	Time Guard Between Modes	ON
SF32	LAT Monitoring	ON
SF33	First Stage Cooling Temperature Limit	45
SF34	Second Stage Cooling Temperature Limit	50
SF35	First Stage Heating Temperature Limit	110
SF36	Second Stage Heating Temperature Limit	105
SF37	Auxiliary Relay	0
SF38	Optimize Staging	ON
SF39	Temperature Lockouts	OFF
SF40	Heating Lockout Set Point	60
SF41	Cooling Lockout Set Point	40
SF44	Minimum Heat Run Time	3
SF45	Pre-Occupancy Purge	OFF
SF46	Zone Temperature Sensor Calibration	Factory Calibrated
SF47	Remote Room Sensor Calibration	Factory Calibrated
SF48	Duct Temperature Sensor Calibration	Factory Calibrated
SF50	Fan Status Switch	OFF
SF51	Room Sensor	1
SF53	DX Coil Temperature Sensor	OFF
SF54	DX Coil Temperature Sensor Calibration	Factory Calibrated
SF55	Outdoor-Air Temperature Sensor	OFF
SF56	Outdoor-Air Temperature Sensor Calibration	Factory Calibrated
SF61	Alarm System Name	Network Configured
SF65	Error Code Display	OFF
SF67	Alternate Information	OFF
SF68	Comfort Trend Demand	0
SF69	Comfort Trend Time Limit	2
SF70	HVAC Usage Meter Data	OFF
SF71	Override Usage Meter Data	OFF
SF73	Heat Mode Error Set Point	0
SF74	Cool Mode Error Set Point	140
SF75	Device Element Address	0
SF76	Security Level	1
SF77	Device Bus Number	0
SF79	Network Time Broadcast	OFF
SF80	Network Time Request	OFF
SF81	Receive Network Time	ON
SF82	Broadcast Acknowledger	OFF
SF83	Global Schedule Broadcast	OFF
SF84	Daylight Savings Time	ON
SF85	Holiday Schedules	0
SF86	Equipment Priority	7
SF87	Communication Failure Retry Time	10
SF88	Re-Alarm Time	30
SF89	IAQ System	ON
SF90	Optimal Start Time Limit	4
SF92	Demand Limit Group Number	0
SF93	Local IAQ Sensor	OFF
SF94	IAQ Economizer Delay	10
SF95	IAQ Maximum Space Temperature Reset	2 F
SF96	Humidity Sensor/Filter Switch	0
SF97	Humidity Sensor Calibration	Factory Calibrated
SF98	Alarm Routing Control	Network Configured (11000000)
SF100	HVAC Meter Enable	ON
SF101	Override Meter Enable	ON
SF102	HVAC Override Meter Enable	ON
SF104	HVAC Override Meter Data	OFF
SF106	System Fan Control	0
SF107	System Cool Control	0
SF108	System Heat Control	0

LEGEND

DX — Direct Expansion
IAQ — Indoor-Air Quality
LAT — Leaving-Air Temperature

Hardware Failure (HF) Errors — A Hardware Failure (HF) error is an error that corresponds to a hardware failure at the TEMP system thermostat, associated sensors, or zone damper.

To clear an HF Error, the component responsible for initiating the HF Error must be adjusted, repaired, or replaced. See Table 5 for a description of HF errors.

Table 5 — Hardware Failure Errors

ERROR	PROBLEM	ALARM PRIORITY
HF03	Zone Temperature Sensor Out of Range	2
HF04	Remote Room Sensor Out of Range	2
HF05	Duct Temperature Sensor Out of Range	2
HF06	Hardware NOVRAM Failure	2
HF07	Hardware Analog/Digital Failure	2
HF09	DX Coil Sensor Out of Range	2
HF10	Outdoor-Air Temperature Sensor Out of Range	2
HF11	Humidity Sensor Out of Range	2

ZONE TEMPERATURE SENSOR OUT OF RANGE — An HF03 error is issued when the zone temperature sensor is reading below 30 F or greater than 180 F. The zone temperature sensor can be recalibrated. The HF03 error will automatically clear when the sensor reading is back within the allowable range.

To check the zone temperature sensor:

1. Check that the zone temperature sensor is physically intact on the TEMP system thermostat printed circuit board. Ensure the sensor is not shorted against the TEMP system thermostat printed circuit board.
2. If using a remote room temperature sensor, check for proper wiring connections (red to +, black to -). Check for other wiring running parallel to and less than 12 in. from the remote room sensor wiring. Avoid running AC, control, or communication bus wiring near the remote room sensor wiring. Maintain a minimum separation of 12 in. or more between other wiring and remote room sensor wiring.
3. Check the zone temperature sensor calibration. Calibrate the sensor by manual calibration at the TEMP system thermostat using the Zone Temperature Sensor Calibration function (category 5, option 2) and an accurate thermometer. Measure the temperature at the TEMP system thermostat zone temperature sensor location using the accurate thermometer. Wait for the reading to stabilize. Using the set point buttons, increase or decrease the temperature display to match the reading of the thermometer.

REMOTE ROOM SENSOR OUT OF RANGE — An HF04 error is issued when the remote room temperature sensor is reading below 30 F or greater than 180 F. The remote room temperature sensor can be recalibrated. The HF04 error will automatically clear when the sensor reading is back within the allowable range.

To check the remote room sensor:

1. Check that the remote room sensor wiring and connections to the circuit board are physically intact. Ensure the 5-conductor control wiring running between the relay pack and the TEMP system thermostat is not run near AC, control, or communication bus wiring. Maintain a minimum separation of 12 in. or more between other wiring and remote room sensor wiring.
2. Check the remote room sensor calibration. Calibrate the sensor by manual calibration at the TEMP system thermostat using the Remote Room Sensor Calibration function (category 5, option 3) and an accurate thermometer. Measure the temperature at the remote room temperature sensor location using the accurate thermometer. Wait for the reading to stabilize. Using the set point buttons, increase or decrease the temperature display to match the reading of the thermometer.

DUCT TEMPERATURE SENSOR OUT OF RANGE — An HF05 error is issued when the duct temperature sensor is reading below 30 F or greater than 180 F. The duct temperature sensor can be recalibrated. The HF05 error will automatically clear when the sensor reading is back within the allowable range.

To check the duct temperature sensor:

1. Check that the duct temperature sensor wiring and connections to the relay board are physically intact. Ensure the 5-conductor control wiring running between the relay pack and the TEMP system thermostat is not run near AC, control, or communication bus wiring. Maintain a minimum separation of 12 in. or more between other wiring and remote room sensor wiring.
2. Check the duct temperature sensor calibration. Calibrate the sensor by manual calibration at the TEMP system thermostat using the Duct Temperature Sensor Calibration function (category 5, option 5) and an accurate thermometer. Measure the temperature at the duct temperature sensor location using the accurate thermometer. Wait for the reading to stabilize. Using the set point buttons, increase or decrease the temperature display to match the reading of the thermometer.

HARDWARE NOVRAM FAILURE — An HF06 error is issued when the TEMP system thermostat detects a problem in its non-volatile memory. If the TEMP system thermostat is able to correct the problem, the error will clear in approximately 10 minutes. If the condition persists, the TEMP system thermostat must be replaced.

HARDWARE A/D FAILURE — An HF07 error is issued when the TEMP system thermostat detects a problem with its analog/digital converter circuitry. If the TEMP system thermostat is able to correct the problem, the error will clear in approximately 10 minutes. If the condition persists, the TEMP system thermostat must be replaced.

DX COIL TEMPERATURE SENSOR OUT OF RANGE — An HF09 error is issued when the DX coil temperature sensor is reading below 30 F or greater than 180 F. The DX coil temperature sensor can be recalibrated. The HF09 error will automatically clear when the sensor reading is back within the allowable range.

To check the DX coil temperature sensor:

1. Check that the DX coil temperature sensor wiring and connections to the circuit board are physically intact. Ensure the 5-conductor control wiring running between the sensor, relay pack, and the TEMP system thermostat is not run near AC, control, or communication bus wiring. Maintain a minimum separation of 12 in. or more between other wiring and remote room sensor wiring.
2. Check the DX coil temperature sensor calibration. Calibrate the sensor by manual calibration at the TEMP system thermostat using the DX Coil Temperature Sensor Calibration function (category 5, option 7) and an accurate thermometer. Measure the temperature at the DX coil temperature sensor location using the accurate thermometer. Wait for the reading to stabilize. Using the set point buttons, increase or decrease the temperature display to match the reading of the thermometer.

OUTDOOR-AIR TEMPERATURE SENSOR OUT OF RANGE — An HF10 error is issued when the outdoor-air temperature sensor is reading below –40 F or greater than 150 F. The outdoor air temperature sensor can be recalibrated. The HF10 error will automatically clear when the sensor reading is back within the allowable range.

To check the outdoor-air temperature sensor:

1. Check that the outdoor-air temperature sensor wiring and connections to the circuit board are physically intact. Ensure the 5-conductor control wiring running between the relay pack and the TEMP system thermostat is not run near AC, control, or communication bus wiring. Maintain a minimum separation of 12 in. or more between other wiring and remote room sensor wiring.
2. Check the outdoor-air temperature sensor calibration. Calibrate the sensor by manual calibration at the TEMP system thermostat using the Outdoor-Air Temperature Sensor Calibration function (category 5, option 9) and an accurate thermometer. Measure the temperature at the outdoor-air temperature sensor location using the accurate thermometer. Wait for the reading to stabilize. Using the set point buttons, increase or decrease the temperature display to match the reading of the thermometer.

HUMIDITY SENSOR OUT OF RANGE — An HF11 error is issued when the humidity sensor is reading below 0% or greater than 100%. The humidity sensor can be recalibrated. The HF11 error will automatically clear when the sensor reading is back within the allowable range.

To check the humidity sensor:

1. Check if the humidity sensor wiring and connections to the circuit board are physically intact. Ensure the 5-conductor control wiring running between the relay pack and the TEMP system thermostat is not run near AC, control, or communication bus wiring. Maintain a minimum separation of 12 in. or more between other wiring and remote room sensor wiring.
2. Check the humidity sensor calibration. Calibrate the sensor by manual calibration at the TEMP system thermostat using the Humidity Sensor Calibration function (category 5, option 12) and an accurate psychrometer. Measure the humidity at the humidity sensor location using the accurate psychrometer. Wait for the reading to stabilize. Using the set point buttons, increase or decrease the humidity display to match the reading of the psychrometer.

TEMP System Thermostat Reset — The TEMP system thermostat constantly verifies operation and the information it utilizes. When it finds a fault in a specified area, the TEMP system thermostat resets.

The TEMP system thermostat will reset when it finds fault in the inability of the microprocessor to properly operate the programs used by the TEMP system thermostat causes an improper response to zone and system conditions.

Each piece of information received by the TEMP system thermostat is verified to eliminate the use of incorrect data. Each portion of information stored by the TEMP system thermostat is verified to eliminate the use of incorrect data. If incorrect data is found the TEMP system thermostat will reset and replace the incorrect data with the default value.

When possible, system communication and data storage faults are corrected by the TEMP system thermostat. When corrections cannot be made the information is regarded as invalid and not utilized.

BROADCAST/DAYLIGHT SAVINGS TIME

As a part of the Carrier Comfort system, on the network, the TEMP system thermostat can send and receive broadcasts.

For the system to function correctly, the following devices must be configured as described below:

- one TEMP system thermostat must have a timeclock and be a network time broadcaster unless time is received from a different network device (comfort controller). More than one timeclock on a network is allowed
- there must be only one TEMP system thermostat configured as a network time requester
- one and only one network device must be configured as the broadcast acknowledger per bus
- all other devices should be configured to receive network time

Network Time Broadcast — When the Network Time Broadcast option is set to ON, the TEMP system thermostat (if equipped with a timeclock) will broadcast CCN time and date on the network 2 times a day.

When the Network Time Broadcast option is set to OFF, the TEMP system thermostat will not broadcast time and date.

To set the option, configure category 9, option 5. Use the left set point buttons to toggle the option ON or OFF. The default is OFF.

NOTE: The TEMP system thermostat must have its own timeclock to broadcast network time, otherwise all network devices will not function correctly.

Network Time Request — When the Network Time Request option is set to ON, the TEMP system thermostat will request CCN time and date from the network once every 30 seconds. If there are multiple TEMP system thermostats on a network there must be at least one TEMP system thermostat requesting time.

When the Network Time Request option is set to OFF, the TEMP system thermostat will not request time and date.

To set the option, configure category 9, option 3. Use the left set point buttons to toggle the option ON or OFF. The default is OFF.

Receive Network Time — When the Receive Network Time option is set to ON, the TEMP system thermostat will accept a broadcast of CCN time and date from the network.

When the Receive Network Time option is set to OFF, the TEMP system thermostat will not accept a CCN time and date broadcast.

To set the option, configure category 9, option 4. Use the left set point buttons to toggle the option ON or OFF. The default is ON.

Broadcast Acknowledger — When the Broadcast Acknowledger option is set to ON, the TEMP system thermostat will acknowledge any CCN broadcast. Every primary and secondary bus must have only one broadcast acknowledger.

When the Broadcast Acknowledger option is set to OFF, the TEMP system thermostat will not acknowledge a CCN broadcast.

To set the option, configure category 9, option 1. Use the left set point buttons to toggle the option ON or OFF. The default is OFF.

NOTE: Broadcast Acknowledgement works best when configured in a Zone Controller, TEMP system thermostat, or any other CCN device which can be configured as a broadcast acknowledger. Avoid using a monitor thermostat when possible.

Global Schedule Broadcast — When the Global Schedule Broadcast is set to ON, the TEMP system thermostat will broadcast its occupancy schedule to the CCN (network). The schedule number will be used to define the number of the occupancy table broadcasted. Global schedules are occupancy schedules 65 to 99.

NOTE: Unoccupied Override will not work if the TEMP system thermostat is following a global schedule.

When the Global Schedule Broadcast is set to OFF, the TEMP system thermostat will not broadcast its occupancy schedule.

To set the option, configure category 9, option 2. Use the left set point buttons to toggle the option ON or OFF. The default is OFF.

NOTE: If using Global Schedule Broadcast, then Schedule Number (category 2, option 9) must be set to a value between 65 and 99.

Daylight Savings Time — The TEMP system thermostat supports daylight savings time. The start date and stop dates are entered by the user and the time is automatically adjusted forward and backward at the configured times. The modified date and time is sent to other network devices if the TEMP system thermostat is a Network Time Broadcast Device.

Only the time broadcaster can do a daylight savings broadcast. If other TEMP system thermostats are on the network, and they are configured not to receive network time, these TEMP system thermostats will not support daylight savings time functions.

DAYLIGHT SAVINGS TIME START MONTH — The Daylight Savings Time Start Month tells the TEMP system thermostat which month to move its internal clock forward for daylight savings time. To set the month, configure category 9, option 6. Use the left set point buttons to raise or lower the value. January is 1, February is 2, and so on. The range of values is 1 to 12. The default is 4.

DAYLIGHT SAVINGS TIME START WEEK — The Daylight Savings Time Start Week tells the TEMP system thermostat which week to move its internal clock forward for daylight savings time. To set the week, configure category 9, option 7. Use the left set point buttons to raise or lower the value. The first week of the month is 1, the second week of the month is 2, and so on. The last week of the month (in 4 or 5 week months) is always 5. The range of values is 1 to 5. The default is 1.

DAYLIGHT SAVINGS TIME START DAY — The Daylight Savings Time Start Day tells the TEMP system thermostat which day to move its internal clock forward for daylight savings time. To set the day, configure category 9, option 8. Use the left set point buttons to raise or lower the value. The first day of the week is 1 (Monday), the second day of the week is 2 (Tuesday), and so on. The range of values is 1 to 7. The default is 7 (Sunday).

DAYLIGHT SAVINGS TIME MINUTES TO ADD — The Daylight Savings Time Minutes To Add option tells the TEMP system thermostat how many minutes to move the clock forward for daylight savings time. To set the number of minutes, configure category 9, option 9. Use the left set point buttons to raise or lower the value. The range of values is 0 to 90 minutes. The default is 60 minutes.

DAYLIGHT SAVINGS TIME STOP MONTH — The Daylight Savings Time Stop Month tells the TEMP system thermostat which month to move its internal clock back for the end of daylight savings time. To set the month, configure category 9, option 10. Use the left set point buttons to raise or lower the value. January is 1, February is 2, and so on. The range of values is 1 to 12. The default is 10.

DAYLIGHT SAVINGS TIME STOP WEEK — The Daylight Savings Time Stop Week tells the TEMP system thermostat which week to move its internal clock back for the end of daylight savings time. To set the week, configure category 9, option 11. Use the left set point buttons to raise or lower the value. The first week of the month is 1, the second week of the month is 2, and so on. The last week of the month (in 4 or 5 week months) is always 5. The range of values is 1 to 5. The default is 5.

DAYLIGHT SAVINGS TIME STOP DAY — The Daylight Savings Time Stop Day tells the TEMP system thermostat which day to move its internal clock back for the end of daylight savings time. To set the day, configure category 9, option 12. Use the left set point buttons to raise or lower the value. The first day of the week is 1 (Monday), the second day of the week is 2 (Tuesday), and so on. The range of values is 1 to 7. The default is 7 (Sunday).

DAYLIGHT SAVINGS TIME MINUTES TO SUBTRACT — The Daylight Savings Time Minutes To Subtract option tell the TEMP system thermostat how many minutes to move the clock back at the end of daylight savings time. To set the number of minutes, configure category 9, option 13. Use the left set point buttons to raise or lower the value. The range of values is 0 to 90 minutes. The default is 60 minutes.

HOLIDAY SCHEDULES

The TEMP system thermostat supports holiday scheduling. Eighteen different holidays can be user-defined. Each holiday has a start date (month and day) and a duration. When a user-defined holiday occurs, the TEMP system thermostat follows the holiday schedule defined in the occupancy periods.

To define a holiday, toggle to category 10. Each option (holiday schedule) has 2 screens. The first option screen shows the month and day. The second option screen shows the duration. The default values are 0 for each schedule. Press the enter button on the first screen to modify the month and day. The month will flash. Use the left set point buttons to scroll through the months. January is 1. February is 2, and so on. The range of acceptable values is 0 to 12. Set the month to 0 to disable the holiday schedule.

Once the month has been selected, press the enter button. The day will flash. Use the left set point buttons to scroll through the days. The range of acceptable values is 0 to 31. Set the day to 0 to disable the holiday schedule. Press enter again to return to the option selection screen. Toggle to the second screen of option 10.1 by pressing the upper left set point button. Press the enter button. The duration will flash. The duration is the number of days the holiday schedule will be active. The range of acceptable values is 0 to 99. Set the value to 0 to disable the holiday schedule.

Options 10.1 through 10.18 are configured in the same manner.

NOTE: If the network time broadcaster has a configured holiday schedule, it will broadcast that the day is a holiday for other CCN devices. The Comfort System thermostats will ignore this information. In order to broadcast a global holiday, a global schedule broadcast must be used (schedules 65 to 99).

ALARM OPTIONS

The alarms options of the TEMP system thermostat are responsible for transmitting alarms on the CCN (Carrier Comfort Network). A specified device (such as the Building Supervisor) on the CCN records the alarm messages from all devices and uses this data to produce alarm messages. The TEMP system thermostat detects successful transmission of the alarm and will retry if there is a communication failure. If the alarm persists, the TEMP system thermostat will re-issue the alarm after the expiration of the re-alarm time.

Equipment Priority — The Equipment Priority function tells the error recording device the priority of the device that is sending the alarm. The priority determines which alarms are shown first and which alarms are deleted when the alarm memory is full. To set the option, configure category 11, option 1. The range is 0 to 7, where 7 is the highest priority. The default value is 7 (TEMP system thermostat priority).

⚠ CAUTION

It is recommended that this value not be changed. Equipment damage can occur if low priority values are given to high priority alarms.

Communication Failure Retry Time — The Communication Failure Retry Time option configures how long the TEMP system thermostat will wait before re-sending an alarm that was not received by a device. The option is configured in category 11, option 2. The range of acceptable values is 1 to 240 minutes. The default is 10 minutes.

Re-Alarm Time — The Re-Alarm Time option configures how long the TEMP system thermostat will wait before re-sending an alarm after the alarm message has been received by a device. When the condition returns to normal, the alarm will no longer be sent. The option is configured in category 11, option 3. The range of acceptable values is 1 to 255 minutes. The default is 30 minutes. A value of 255 disables the function.

Alarm Routing Control — The Alarm Routing Control option determines which devices on the CCN will receive and process the alarm information. This option cannot be configured from the TEMP system thermostat. The default value is 11000000. A value of 10000000 sends alarms to the Building Supervisor. A value of 01000000 sends alarms to the auto-dial gateway. A value of 00010000 sends alarms to the printer interface. A value of 00000000 disables all alarms going out on the CCN. The option is configured through Carrier network access software.

Alarm System Name — The Alarm System Name option identifies the alarm system on the CCN. This option cannot be configured from the TEMP system thermostat. The default name is 33CSVM. The option is configured through Carrier network access software.

LOADSHED

The Loadshed module is a device on the network that monitors system electrical energy usage. A field-supplied wattmeter is required. The Loadshed module can be programmed to send out Redline and Loadshed commands to devices on the network when energy usage nears user-defined set points. The devices are specified by group number. The Redline and Loadshed commands cause the TEMP system thermostat to turn off some or all stages of heating or cooling. When the energy usage drops below a defined level the Loadshed module releases the command. The Demand Limit Group Number option defines which group the TEMP system thermostat will be in.

When the Loadshed sends a Redline command to the TEMP system thermostat, the TEMP system thermostat will turn off second stage heating or cooling operation if the second stage is currently operating and not allow second stage heating or cooling to come on.

When the Loadshed sends a Loadshed command to the TEMP system thermostat, the TEMP system thermostat will turn off first and second stage heating or cooling operation if the first or second stages are currently operating and not allow heating or cooling to come on.

To configure the Demand Limit Group Number option, set category 13, option 1. The range of values is 0 to 16. If the option is set to 0, the TEMP system thermostat will not be part of the Loadshed group operation. If the option is set from 1 to 16, the TEMP system thermostat will receive Loadshed commands for that group. The default is 0. For more information, refer to the Loadshed configuration manual.

ALARM TROUBLESHOOTING

This section describes the major alarm types that are available within the system. The alarm types are: space temperature alarm (comfort trend), discharge-air temperature alarm, fan status alarm, filter status alert, IAQ status alarm, and stuck gas valve alarm.

The section describes each alarm in detail: what controllers it works with; the sensors required for the alarm to be activated; and how the alarm is configured, disabled, and normalized. The description provides information on how the alarm is applied and the necessary hardware required for proper operation.

Space Temperature Alarm (Comfort Trend) — See Table 6 for Space Temperature Alarm Specifications.

Table 6 — Space Temperature Alarm

FUNCTION	DESCRIPTION
Controllers	TEMP System Thermostat
Sensor Required	None (Space Temperature Sensor is in Thermostat)
Sensor Wiring	None, Sensor Integral to Thermostat
Input	Comfort Trend Demand Comfort Trend Time Limit
Output	SE01 Comfort Trend Error (Space Temperature Alarm)
Category/Option	7.4 (Comfort Trend Demand) 7.5 (Comfort Trend Time Limit)
Configuration Values	7.4 — Range 0° F to 25.5 F 7.5 — Range 0 to 255 minutes
Configuration Increments	7.4 - 0.1° F 7.5 - 1 minute
Associated Functions	None

OPERATION — A space temperature (Comfort Trend) alarm indicates when the system is unable to maintain space temperature comfort conditions. Space temperature alarms are an indication that the HVAC system operation has difficulty maintaining zone space temperature. The temperature demand of the space or zone is the difference between the set point (either heating or cooling) and actual space temperature of the zone.

When the demand of the zone exceeds the Comfort Trend Demand value (category 7, option 4), the thermostat begins to calculate the temperature trend of the zone. The temperature trend is simply the ‘‘real time’’ ability of the space to lower or reduce the temperature demand of the space. The time is measured during the period when the temperature trend does not show improvement, or indicates conditions between set point and space temperature are getting worse. When the length of time measured reaches the Comfort Trend Time Limit value, a Space Temperature alarm is initiated.

CONFIGURATION TO ACTIVATE ALARM — To activate a space temperature alarm, configure the Comfort Trend Demand set point to any value except 0. Configure the Comfort Trend Time Limit set point.

CONFIGURATION TO NORMALIZEALARM — The space temperature alarm will automatically clear when the system can properly condition the space. To remove any alarms, follow the procedure to clear the alarm from the thermostat and network using manual reset.

CONFIGURATION EXAMPLE

Occupied Space Cooling Set Point:	72 F
Occupied Space Heating Set Point:	68 F
Comfort Trend Demand:	4.5 F
Comfort Trend Time Limit:	7 minutes

The system is operating normally without alarm during the cooling mode. The trend of the space temperature indicates that the system is unable to keep the space within set points, and space temperature rises to 76.5 degrees F. The trend of the space temperature is not improving, and temperature conditions are getting worse for at least seven minutes. At that time, a space temperature (Comfort Trend) alarm (SE01) is initiated. The alarm will automatically clear when the system can properly maintain space temperature conditions within the space.

The alarm is removed using the manual reset. The system will not return to normal without being reset.

CLEARING THE ALARM FROM THE THERMOSTAT — Space temperature alarms can be cleared or ''erased'' from the system in 3 ways:

- Cycle power to the thermostat OFF, then ON.
- Reset the Unit Thermostat. Initiate a reset by switching the Unit Reset option to the ON configuration (category 7, option 11).
- Switch the configuration value for Comfort Trend Demand or the Comfort Trend Time Limit to zero, then back to an acceptable range (category 7, options 4 or 5).

Discharge-Air Temperature Alarm (Heat/Cool Mode Error) — See Table 7 for Discharge-Air Temperature alarm specifications.

Table 7 — Discharge Air Temperature Alarm

FUNCTION	DESCRIPTION
Controllers	TEMP system Thermostat
Sensor Required	Duct Temperature Sensor
Sensor Wiring	Wires to Terminal 13 and 15
Input	Unit Discharge Air Temperature
Output	SE07 Heat Mode Alarm, SE08 Cool Mode Alarm
Category/Option	7.9 (Heat Mode Error Alarm Set Point) 7.10 (Cool Mode Error Alarm Set Point)
Configuration Values	Heating: Min 0, Max 140 Cooling: Min 0, Max 140
Configuration Increments	1° F
Associated Functions	None

OPERATION

Heating Mode — Alarm is issued when unit discharge temperature is not above the heating mode error set point.

Cooling Mode — Alarm is issued when unit discharge temperature is not below the cooling mode error set point.

CONFIGURATION TO ACTIVATE ALARM — To activate alarm, configure error set points for Heat/Cool mode (0 to 140 F). An automatic 10-minute warm-up/cool-down period is initiated before any temperature checking begins.

CONFIGURATION TO NORMALIZE ALARM — When unit discharge temperature rises above the heat mode error set point, the heat mode alarm is normalized. When unit discharge temperature drops below the cool mode error set point, the cool mode alarm is normalized.

For example, the Heating/Cooling Mode Error set points are 90 and 55 F. During a heat mode, after 10-minute heating period, if discharge temperature does not increase above 90 F, a heat mode error is generated. After discharge temperature increases to above 90 F, the alarm is normalized.

During cooling mode, after a 10-minute cooling period, if discharge temperature does not drop to below 55 F, a cool mode error is generated. After the discharge temperature decreases to below 55 F, the alarm is normalized.

CLEARING THE ALARM FROM THE THERMOSTAT — Heat/Cool Mode Alarms are cleared or ''erased'' from the system in 2 ways:

- Cycle power to the thermostat OFF, then ON.
- Reset the unit thermostat. Initiate a reset by switching the Unit Reset to the ON configuration (category 7, option 11).

Fan Status Alarm — Refer to Table 8 for Fan Status Alarm specifications.

Table 8 — Fan Status Alarm

FUNCTION	DESCRIPTION
Controllers	TEMP system Thermostat
Sensor Required	Airflow, Digital Input
Sensor Wiring	Terminals 8 and 9 of 33CSUCE-06 Relay Pack
Input	Open contacts at sensor from lack of airflow
Output	Alarm SE06, Cannot Detect Fan On Alarm SE12, Cannot Detect Fan Off
Category/Option	5.10 (Fan Status)
Configuration Values	Default OFF, Min OFF, Max ON
Configuration Increments	None
Associated Functions	Fan Operation for Heat (Category 4, Option 1)

OPERATION

The detecting or verifying fan is running. The fan relay is on or Heat 1 relay is on.

When the TEMP system thermostat indicates commanded state of FAN (relay) is on, but flow switch indicates no airflow after 30-second time delay (sensor contacts still open), an alarm condition is initiated (heat or cool or ventilation mode).

When the TEMP system thermostat indicates commanded state of HEAT 1 (relay) is on, but flow switch indicates no airflow after 120-second delay time (sensor contacts still open), an alarm condition is initiated. This delay time allows for units having internal control of heat, versus thermostat control of heat.

When an alarm condition is initiated:

- system mode (either heat or cool) is dropped
- alarm SE06, Cannot Detect Fan ON, is issued
- A manual reset is required to reset the alarm

Detecting or Verifying Fan is OFF. Fan Relay is OFF and Heat 1 Relay OFF — When the TEMP system thermostat indicates commanded state of FAN (relay) is OFF, but flow switch indicates that airflow still exists after 240-second delay time from fan off command (sensor contacts still closed), an alarm condition is initiated.

When alarm condition is initiated:

- the TEMP system thermostat will continue to operate the system. This allows future calls for heat or cool to be initiated.
- alarm SE12, Cannot Detect Fan OFF, is issued
- a manual reset is required to reset the alarm

CONFIGURATION TO ACTIVATE ALARM — To activate the alarm, configure the Fan Status Switch option (category 5, option 10) to ON. Leave the Fan Operation For Heat option (category 4, option 1) ON.

CONFIGURATION TO NORMALIZE ALARM — To normalize the alarm, no is configuration required. Follow the procedure to clear the alarm below.

CONFIGURATION EXAMPLE — The Fan Status Switch option (category 5, option 10) is set to ON.

At the start of a cooling mode, the fan relay is switched on by the TEMP system thermostat. Fan operation is initiated and the fan has 30 seconds to generate sufficient airflow to close the normally-open fan-status flow switch. If the sensor contacts are closed within 30 seconds, the system operates normally and no Fan Status alarm is generated. If, however, the sensor contacts are not closed within 30 seconds, an alarm is generated. The thermostat display will not indicate ''fan'' until fan operation is verified by the fan-status flow switch.

The alarm will cause the system to shut down. No cooling, heating, or ventilation is available until a reset of the system is initiated.

In a heat mode, the same sequence is followed, except that the delay time is increased to 120 seconds. If the Fan Operation for Heat option (category 4, option 1) is configured OFF, no alarm is generated in the heat mode.

CLEARING THE ALARM FROM THE THERMOSTAT — Fan status alarms are cleared or erased from the system in 3 ways using a manual reset:

- Cycle power to the thermostat off, then on.
- Initiate a reset by switching the Unit Reset option to the ON configuration (category 7, option 11).
- Switch the configuration value for the Fan Status Switch option to OFF then ON (category 5, option 10).

Filter Status Alert — Refer to Table 9 for Filter Status alert specifications.

Table 9 — Filter Status Alert

FUNCTION	DESCRIPTION
Controllers	TEMP System Thermostat
Sensor Required	Filter, 33CSFS--01, Digital Input
Sensor Wiring	Terminals 10 and 11 of 33CSUCE-06 Relay Pack
Input	Closed contacts from high pressure drop
Output	Alarm (SE09), Dirty Filter
Category/Option	5.11 (Humidity Sensor/Filter Status Switch)
Configuration Values	Default 0, Min 0, Max 2 to activate
Configuration Increments	None
Associated Functions	None

OPERATION — This alert is used to indicate the status of the filters in the HVAC unit. The Dirty Filter alert indicates a high pressure drop across the filters, caused by collection of excessive particles and debris on the filter media.

Pressure drop across the filters in the unit increases until it reaches the Filter Status sensor's set point. This causes the contacts of the sensor to close. The contact closure of the sensor is detected by a discrete input. If the contacts remain closed for 10 minutes, a Dirty Filter alert is initiated.

A manual reset is required to clear this alert.

CONFIGURATION TO ACTIVATE ALERT — To activate the alert, configure the Humidity Sensor/Fan Filter Switch option (category 5, option 11) to position 2. The TEMP system thermostat will use the sensor as a Filter Status Switch.

CONFIGURATION TO NORMALIZE ALERT — An SE09 alarm (alert) will not stop operation of the system. A manual reset is required to clear this alert.

CONFIGURATION EXAMPLE — The Filter Status sensor will close contacts (alert) when differential pressure increases from zero (clean filter, no restriction, or pressure drop across filter) to the sensor set point (dirty filter with restriction across filter). The Humidity Sensor/Fan Filter Switch option (category 5, option 11) is set to the value of 2 to specify the filter status switch.

During operation of the unit over a period of time, an SE09 error is declared. This indicates that the differential pressure across the filters has increased beyond the set point value of the sensor. The Alternate Information ''Dirty Filter Status'' (category 7, option 3, information item 9) will read ON, also indicating a dirty filter.

After the dirty filters are changed, the Dirty Filter Status must be manually reset. The system then returns to normal operation and will not alert until the differential pressure set point of the Filter Status sensor is again reached.

CLEARING THE ALERT FROM THE THERMOSTAT — Dirty Filter Alerts are cleared or erased from the system in 3 ways using a manual reset:

- Cycle power to the thermostat off, then on.
- Initiate a reset by switching the Unit Reset option to the ON configuration (category 7, option 11).
- Switch the configuration value for Fan Status Switch option to OFF then ON (category 5, option 10)

Indoor-Air Quality Status Alarm — Refer to Table 10 for IAQ alarm specifications.

Table 10 — IAQ (Indoor-Air Quality) Status Alarm

FUNCTION	DESCRIPTION
Controllers	TEMP System Thermostat, Zone Controller, Bypass Controller
Sensor Required	IAQ (CO_2) Sensor
Sensor Wiring	Pins 6 and 7 of Relay Board
Input	Closed contact when level exceeded.
Output	SE10
Category/Option	14.1 (IAQ Sensor)
Configuration Values	14.1 — ON
Configuration Increments	Not Applicable
Associated Functions	None

LEGEND

IAQ — Indoor-Air Quality

OPERATION — When the CO_2 level exceeds the preset level, the sensor signals the TEMP system thermostat. The TEMP system thermostat will wait until the IAQ Alarm Delay option (category 14, option 7) has expired, then it will issue an SE10. The system (if configured) will bring in fresh outdoor air to meet IAQ requirements.

When the CO_2 level exceeds the preset level (factory configuration is 1000 ppm and cannot be changed without optional software), the sensor signals the TEMP system thermostat. The TEMP system thermostat energizes the indoor-fan motor (if not already running) for 5 to 30 minutes (field-configured). If the Auxiliary Relay has been configured for IAQ operation, the TEMP system thermostat energizes the relay. This is intended for use with an economizer, but can be wired to an exhaust fan or HRV (Heat Recovery Ventilator). If used with an economizer, the economizer moves to the minimum position and the indoor fan circulates the air throughout the occupied space.

The TEMP system has 3 lockout features which will prevent IAQ mode if the outdoor humidity is too high or the outdoor temperature is too high or too low. When the TEMP system thermostat energizes the auxiliary relay, it energizes the system fan.

At the end of the 5 to 30 minutes, if the CO_2 level still exceeds the set point, the indoor fan will stay energized. The economizer damper opens. This forces fresh outside air to enter the zone with deficient IAQ. When the IAQ level drops below the IAQ set point, the economizer returns to its standard operating mode.

When the system is bringing in additional outside air, the thermostat is reset 0 to 10° F (field-configured) above and below the original set point to allow the outside air to circulate before the heating or cooling mode is initiated. The TEMP system thermostat will display status when the system is in this mode.

CLEARING THE ALARM — To clear a system error, use the Unit Reset function. The Unit Reset function is in category 7, option 11. The default is OFF. Use the left set point buttons to set the option to ON. The TEMP system thermostat will reset all errors.

Stuck Gas Valve Alarm — Refer to Table 11 for Stuck Gas Valve alarm specifications.

Table 11 — Stuck Gas Valve Alarm

FUNCTION	DESCRIPTION
Controllers	TEMP System Thermostat
Sensor Required	N/A
Sensor Wiring	N/A
Input	Duct Temperature Sensor
Output	SE13, Stuck Gas Valve Alarm
Category/Option	None
Configuration Values	None
Configuration Increments	None
Associated Functions	None

OPERATION — The Stuck Gas Valve sequence is used to allow the system to properly react to a failure mode of the HVAC unit when the gas valve becomes stuck in the open position. When this condition exists, the unit is unable to shut off the heat. To minimize this problem, the internal limit switch trips causing the indoor fan to turn on and remain on until the gas is manually shut off and the heat exchanger cools to normal temperatures.

During No System Mode — If the duct temperature rises to greater than 175 F, the indoor fan is started. The fan will remain on if that temperature does not drop below 150 F after 3 minutes. A Stuck Gas Valve alarm (SE13) will be initiated.

During a Cooling Mode — If the duct temperature does not drop below 80 F within 10 minutes, the cooling mode will be dropped for 10 minutes. The "No System Mode" logic will test for this condition.

During a Heating Mode — No action is required in this mode.

CONFIGURATION TO ACTIVATE ALARM — No configuration is needed to activate this alarm.

CONFIGURATION TO NORMALIZE ALARM — To remove this alarm, follow the procedure to clear the alarm from the thermostat and network using manual reset.

CLEARING THE ALARM FROM THE THERMOSTAT — The alarm can be cleared or erased from the system in 2 ways:
- Cycle power to the thermostat off, then on.
- Initiate a reset by switching the Unit Reset option to the ON configuration (category 7, option 11).

NETWORK ACCESSIBLE VARIABLES

When using network access software, the following tables can be accessed. The variables in the tables can be read, written, or forced to a certain value. The TEMP system thermostat point display table is shown in Table 12. Other network software access tables are shown in Table 13.

Table 12 — TEMP System Thermostat Point Display Table

VARIABLE DESCRIPTION	POINT NAME	READ/WRITE CAPABILITY
Zone Temperature	ZT	YES
Duct Temperature	DT	YES
Outside-Air Temperature	OAT	YES
Zone Demand	ZDMD	READ ONLY
Demand Type	DMDTYPE	READ ONLY
Controller Set Point	SETPOINT	READ ONLY
Occupied	OCC	YES
System Cool Stage 1	C1	READ ONLY
System Cool Stage 2	C2	READ ONLY
System Heat Stage 1	H1	READ ONLY
System Heat Stage 2	H2	READ ONLY
System Fan	FN	YES*
Auxiliary Relay	AUX	YES†
System Fan Status	FANS	YES
DX Coil Temperature	DX	YES
Filter Status	FILS	YES
TEMP IAQ Sensor	IAQLOG	YES
Zone In IAQ Status	ZONEIAQ	READ ONLY
Indoor Rel. Humidity	RH	YES
Outdoor Rel. Humidity	OARH	READ ONLY
HVAC Usage Meter (Mtr)	UMHVAC	YES
Override (Ovrd) Usage Mtr	UMUO	YES
HVAC Ovrd Usage Mtr	UMUOSM	YES

LEGEND

DX — Direct Expansion
IAQ — Indoor-Air Quality

*Forcing the system fan will cause any energized system stages to turn off.

†If Auxiliary Relay is configured as 0 or 1, the point can be forced with no other effect. Other configurations will cause the system stages and fan to turn off.

Table 13 — Network Software Access Table Names

TABLE DESCRIPTION	TABLE NAME
Points Display Table	ZONESTAT
Set Point Table	SETPOINT
Config Table 1	CONFIG1
Config Table 2	CONFIG2
Maintenance Table 1	ALARMLOG
Maintenance Table 2	OCCPC01E
Optimal Start Table	AOSSDEFC
Service Table 1	SERVICE1
Service Table 2	SERVICE2
Service Table 3	SERVICE3
Alarm POC Table	ALARMDEF
Alarm Text Table	ALARMS01
Broadcast POC Table	BRODEFS
Broadcast Table	BROCASTS
Occupancy POC Table	OCCDEFM
Occupancy Supervisory Table	OCCPC01S
Holiday POC Table	HOLIDEF
Holiday Schedule 1	HOLDY01S
Holiday Schedule 2	HOLDY02S
Holiday Schedule 3	HOLDY03S
Holiday Schedule 4	HOLDY04S
Holiday Schedule 5	HOLDY05S
Holiday Schedule 6	HOLDY06S
Holiday Schedule 7	HOLDY07S
Holiday Schedule 8	HOLDY08S
Holiday Schedule 9	HOLDY09S
Holiday Schedule 10	HOLDY10S
Holiday Schedule 11	HOLDY11S
Holiday Schedule 12	HOLDY12S
Holiday Schedule 13	HOLDY13S
Holiday Schedule 14	HOLDY14S
Holiday Schedule 15	HOLDY15S
Holiday Schedule 16	HOLDY16S
Holiday Schedule 17	HOLDY17S
Holiday Schedule 18	HOLDY18S
Time/Date Table	TIME
Device ID Table	CCS_MON

LEGEND

POC — Product Outboard Control

TROUBLESHOOTING PROCEDURES

The most common operating problems and types of errors associated with the TEMP system thermostat are:

- Operating Problems. No display or flashing displays occur when the TEMP system thermostat is not receiving rated power or has miswired connections.
- Equipment Operating Problems. The TEMP system thermostat does not select a system mode, does not energize the associated unit, or does not energize the second stage of the unit.
- Hardware Failure (HF) Errors. These errors occur when the TEMP system thermostat detects a problem with one of its own components or associated device.
- Storage Failure (SF) Errors. These errors occur when the TEMP system thermostat detects and replaces faulty data contained within memory with factory selected default values.
- System Errors (SE). These errors occur when the TEMP system thermostat detects a system or zone operating problem.

Operating problems other than those listed above may be related to the network.

General Operating Problems

NO DISPLAY — If the TEMP system thermostat display remains blank after 24 vac power has been applied to the relay pack, it is an indication that power is not reaching the TEMP system thermostat.

At the relay pack, check that adequate power is being supplied from the power transformer. Acceptable voltage range is 22 to 30 vac. The va requirements are 10 va for a single zone relay pack.

Check the wiring between the 24 vac transformer and the relay pack or replace the transformer as necessary.

At the TEMP system thermostat wiring connector board, with the TEMP system thermostat connected, check for approximately 10 vdc (steady) across the red and white wires from the relay pack.

Check the continuity of the 5-conductor wire running between the TEMP system thermostat wiring connector board and the relay pack.

Check that the TEMP system thermostat ribbon cable is properly seated in the wiring connector board. Disconnect, then reconnect the ribbon cable from the connector board. If the TEMP system thermostat display remains blank after the ribbon cable is reconnected, use the check the TEMP system thermostat wiring connector block and ribbon cable. Replace the wiring block or TEMP system thermostat if required.

BLINKING DISPLAY — If the TEMP system thermostat display shows 4 rotating zeros that either blink on and off, or that are constantly displayed, it is an indication the TEMP system thermostat is continuously going through the power-up sequence and cannot enter normal operating mode.

Check for any of the following conditions that would cause the display to blink or constantly display 4 zeros:

- Low voltage from the 10 va for the single zone relay pack transformer. Acceptable voltage range is 22 to 30 vac.
- The yellow or blue wire from the single zone relay pack to the TEMP system thermostat wiring connector board is broken or disconnected.
- The TEMP system thermostat ribbon cable is improperly installed or defective.
- The TEMP system thermostat wiring connector board is defective. Check ribbon cable and wiring connector block.
- The TEMP system thermostat or single zone relay pack is defective.

BLINKING HEAT OR COOL ANNUNCIATOR — If the HEAT or COOL annunciator of the TEMP system thermostat display continuously blinks, it is an indication that the TEMP system thermostat has detected that one of the High/Low Temperature Limits has been exceeded.

The TEMP system thermostat uses information from the supply air temperature sensor and the DX coil temperature sensor for maintaining limits.

To return the blinking display to normal:

1. The display will return to normal when the supply air temperature returns to within the limits of the current system operating mode. Refer to the System Time Guards section on page 17 for more information.
2. If the TEMP system thermostat does not utilize a DX coil sensor, but the DX Coil Temperature Sensor option has been configured to ON, the annunciator will blink. Reconfigure the DX Coil Sensor option.
3. Check the TEMP system thermostat supply-air temperature sensor or DX coil temperature sensor to see if the sensor is wired incorrectly or defective.

Equipment Operation Problems — The TEMP system thermostat is designed to energize constant volume heating and cooling equipment to satisfy the system comfort requirements.

When the TEMP system thermostat fails to pick a system mode, or fails to energize the heating or cooling equipment when expected, the problem usually involves the configurable options of the TEMP system thermostat.

If the TEMP system thermostat selects a system mode, but the heating or cooling equipment fails to energize, the problem may be with the relay pack.

TEMP SYSTEM THERMOSTAT FAILS TO SELECT SYSTEM MODE — When the TEMP system thermostat fails to select a system mode, check the items that influence the TEMP system thermostat to select system mode.

1. The zone must be 1.5° F or more from set point.
2. The TEMPsystem thermostat system switches (FAN, COOL, HEAT) must be set to AUTO or ON to operate.
3. Ensure that the TEMP system thermostat Heating and Cooling Time Guard has had time to expire. If the Time Guard Between Modes option (category 4, option 2) has been configured ON, the system will not operate until time guard has expired. Time guard delay occurs after power up, reset, or system mode has been released. Length of the time guard is (2.6 seconds x TEMP system thermostat device address) + 5 minutes.

   If the Time Guard Between Modes option is configured OFF, the length of the time guard is approximately 1.5 minutes.

   The Time Guard Override option may be used to override the time guard to 30 seconds for one cycle. To activate the override, toggle category 4, option 3, ON and then OFF.
4. Check the configuration of the TEMP system thermostat System Heating Mode Lockout, Heating Lockout Temperature Set Point, and Cooling Lockout Temperature Set Point options. Based on the outside-air temperature, the TEMP system thermostat can lock out either system cooling or heating modes.

TEMP SYSTEM THERMOSTAT FAILS TO ENERGIZE SECOND STAGE — When the TEMP system thermostat fails to energize the second stage of the heating or cooling equipment, check the items that affect the decision of the TEMP system thermostat to energize the second stage of heating or cooling.

1. When a system mode is selected and the reference zone demand is equal to or greater than 8° F, the TEMP system thermostat Energy Saver Lockout function automatically disables the second stage operation of the unit for approximately 20 minutes. This function saves energy by allowing the first stage of the heating or cooling unit to satisfy the system load at times of low thermal load (morning cool down or warm up).
2. When the TEMP system thermostat Comfort Trend Staging function (category 7, options 4 and 5) is configured to a value other than zero, the TEMP system thermostat will energize the second stage of heating or cooling only after it determines that the reference zone demand is not being met by the first stage of heating or cooling.

   If the Comfort Trend Staging function is configured off, the TEMP system thermostat will energize the second stage 3 minutes after the first stage, if the demand of the reference zone is equal to or greater than 2° F.
3. Check the TEMP system thermostat display for a flashing HEAT or COOL annunciator. A blinking annunciator indicates a supply-air temperature problem.

ANNUNCIATOR DISPLAYED BUT EQUIPMENT NOT ENERGIZED — The TEMP system thermostat HEAT or COOL annunciator is ON, but the heating or cooling equipment is not energized.

Check the TEMP system thermostat Auxiliary Relay option (category 4, option 9). If the TEMP system thermostat is configured to operate an economizer, the TEMP system thermostat will enable the economizer for first stage cooling when the outside-air temperature is less than 64.9 F.

Check the LEDs on the relay pack controlled by the TEMP system thermostat. Perform the correct procedure.

LED Not Lit — The TEMP system thermostat HEAT or COOL annunciator is ON but the LED on the relay pack is not lit. With the relay pack plugged in, check the voltages across the relay pack input connector plug. Voltages should read approximately 4 to 6 vdc (steady) between the black wire and the appropriate relay pack input wire. If not, replace relay pack.

LED Is Lit — The TEMP system thermostat HEAT annunciator is ON, the LED on the relay pack is lit, but the corresponding equipment stage is not energized.

1. Check the AC voltage across the relay board common (red) and any deenergized relay (H1 or C1). The voltage should read 24 vac. If not, check for wiring error.
2. Check the AC voltage across the relay board common (red) and any indicated energized relay board output (FAN). The voltage should read near zero (<1 vac). If 24 vac is read, check for bad relay board.
3. Check the AC voltage across a suspected contactor coil. The voltage should read 24 vac. If not, check the contactor coil wiring.
4. Other possibilities are: bad contactor, defective equipment, or no unit power.

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