PIR Ready SE7600 Series
**With & Without Local Schedule
Terminal Equipment Controllers**

Installation Guide
For Commercial HVAC Applications

CONTENTS

INSTALLATION

Remove the security screw on the bottom of Terminal Equipment Controller cover.

- Open unit by pulling on the bottom side of Terminal Equipment Controller (fig. 1).
- Remove wiring terminals from sticker.
- Please read the FCC ID and IC label installed in the cover upon removal of cover for the wireless products.

Location
1. Should not be installed on an outside wall.
2. Must be installed away from any direct heat source.
3. Should not be installed near an air discharge grill.
4. Should not be affected by direct sun radiation.
5. Nothing should restrict vertical air circulation to the Terminal Equipment Controller.

Installation
1. Swing open the Terminal Equipment Controller PCB to the left by pressing the PCB locking tabs (fig. 2).
2. Pull out cables 6" out from the wall.
3. Wall surface must be flat and clean.
4. Insert cable in the central hole of the base.
5. Align the base and mark the location of the two mounting holes on the wall. Install proper side of base up.
6. Install anchors in the wall.
7. Insert screws in mounting holes on each side of the base (fig. 2).
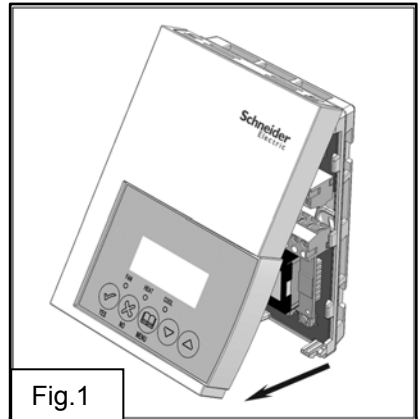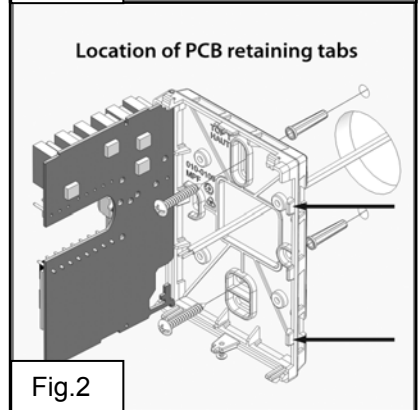8. Gently swing back the circuit board on the base and push on it until the tabs lock it.

Fig.1

Location of PCB retaining tabs

Fig.2
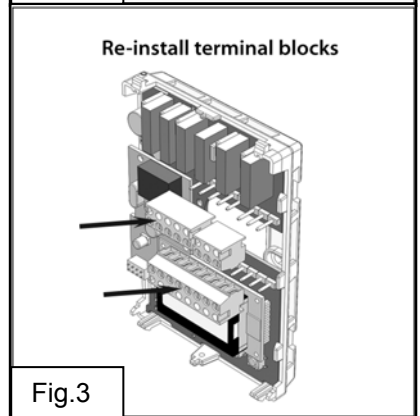
Re-install terminal blocks

Fig.3

9. Strip each wire 1/4 inch from end.
10. Insert each wire according to wiring diagram.
11. Gently push excess wiring back into hole (fig. 3).
12. Re-Install wiring terminals in their correct locations (fig. 3).
13. Re-install the cover (top side first) and gently push extra wire length back into the hole in the wall.
14. Install security screw.

- If replacing an existing Terminal Equipment Controller, label the wires before removal of the Terminal Equipment Controller.
- Electronic controls are static sensitive devices. Discharge yourself properly before manipulating and installing the Terminal Equipment Controller.
- A short circuit or wrong wiring may permanently damage the Terminal Equipment Controller or the equipment.
- All SE7000 series Terminal Equipment Controllers are designed for use as operating controls only and are not safety devices. These instruments have undergone rigorous tests and verification prior to shipping to ensure proper and reliable operation in the field. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user / installer / electrical system designer to incorporate safety devices (such as relays, flow switch, thermal protections, etc…) and/or an alarm system to protect the entire system against such catastrophic failures. Tampering with the devices or unintended application of the devices will result in a void of warranty.

THEORY OF OPERATION

The SE7600 uses a Schneider-Electric proprietary adaptive logic algorithm to control the space temperature. This algorithm controls the heating and air conditioning system to minimize overshoot while still providing comfort. It provides exceptional accuracy due to its unique PI time proportioning control algorithm, which virtually eliminates temperature offset associated with traditional, differential-based On-Off Terminal Equipment Controllers.
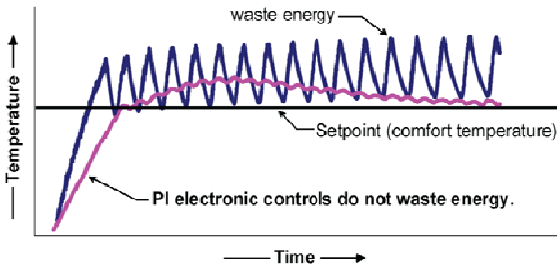

Fig.2 - On-Off mechanical control vs PI electronic control.

Features overview

- 7 day schedule models, 2 or 4 events
- Gas, oil or electric system compatibility for all type of applications
- Remote indoor averaging sensing capability
- Temperature averaging with 2, 3, 4, 9 or 16 sensors
- Remote outdoor sensing capability for added flexibility
- System mode lock out
- Heat pump balance point settings

Remote discharge air sensor input for monitoring purpose

- System efficiency feedback
- Lockable keypads for tamper proofing. No need for Terminal Equipment Controller guards
- Automatic frost protection to prevents costly freeze damage
- Anti short cycle and minimum On-Off run time protection. Reduces wear and maximizes life span of mechanical equipment.
- 2 configurable digital inputs for added flexibility. Each input can be configured as the following:
  - **None:** No function will be associated with the input
  - **Service:** a backlit flashing **Service** alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is energized. It can be tied in to the AC unit control card, which provides an alarm in case of malfunction.
  - **Filter:** a backlit flashing **Filter** alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is energized. It can be tied to a differential pressure switch that monitor filters
  - **Rem NSB:** remote NSB timer clock input. Will disable the internal scheduling of the Terminal Equipment Controller. The scheduling will now be set as per the digital input. The menu part related to scheduling is disabled and no longer accessible. It provides low cost setback operation via occupancy sensor or from a dry contact
  - **RemOVR:** temporary occupancy contact. Disables all override menu function of the Terminal Equipment Controller. . The override function is now controlled by a manual remote momentarily closed contact. When configured in this mode, the input operates in a toggle mode.
  - With this function enabled it is now possible to toggle between unoccupied & occupied setpoints for the amount of time set by parameter (TOccTime) temporary occupancy time.
  - **Fan lock:** used in conjunction with a local air flow sensor connected to the input. Locks out the Terminal Equipment Controller heating and cooling action and displays a local alarm if no air flow is detected 10 seconds after the fan (G terminal) is energized.
- Configurable smart fan operation saves energy during night mode
- Non volatile EEPROM memory prevents loss of parameters during power shortage
- Built in default profile set-up for easier start up and commissioning
- Configurable SPST output relay on Scheduling models for lighting, exhaust fan or fresh air control

- 6 hour typical reserve time for clock in case of power loss
- 0 to 10 VDC economizer output for more retrofit opportunities
- Built in dry bulb economizer logic using outdoor temperature sensor
- Input for supply or mixed air temperature sensor

Heat pump model specific features
- Selectable single or dual stage compressor stages
- High balance point:
- Locks out auxiliary heating when outside air temperature is above this value
- Low balance point:
- Locks out heat pump compressor operation when outside air temperature is below this value
- Comfort or economy mode:
- In economy mode, heat pump use is maximized before turning On auxiliary heating
- Compressor or auxiliary interlock:
- Adds flexibility by locking out heat pump operation during auxiliary heating to prevent high pressure trip when the coil is downstream of the auxiliary heat source.

MODEL CHART

Product Matrix Selector For The SE7600 Series Staging and Heat Pump Controllers

Please refer to the following matrix when ordering controllers:

SE76 5 2 H 5545W

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
MODEL	PROGRAMMABILITY	ECONOMIZER / HUMIDITY CONTROL	APPLICATION	PIR OPTIONS	COMMUNICATION OPTIONS

Step 2 — PROGRAMMABILITY
- **0** No local scheduling / Non programmable
- **5** Local scheduling / programmable

Step 3 — ECONOMIZER / HUMIDITY CONTROL
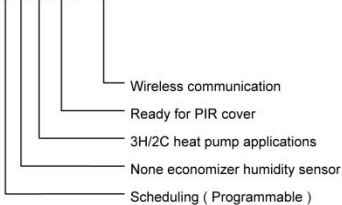- **0** No local scheduling / Non programmable
- **2** Local scheduling / programmable
- **5** With economizer No local scheduling / Non programmable
- **6** With economizer Local scheduling / programmable
- **7** With Humidification / Dehumidification control

Step 4 — APPLICATION
- **A** 1H / 1C rooftop unit applications
- **B** 2H / 2C rooftop unit applications
- **H** 3H / 2C heat pump applications

Step 5 — PIR OPTIONS
- **50** PIR ready but PIR cover not included
- **55** Factory assembled with PIR cover

Step 6 — COMMUNICATION OPTIONS
- **B** BACnet MS/TP
- **E** Echelon
- **W** Zigbee wireless
- **NONE** Network Ready

EXAMPLE:

SE76 5 2 H 5045W
- Wireless communication
- Ready for PIR cover
- 3H/2C heat pump applications
- None economizer humidity sensor
- Scheduling (Programmable)

Please note, not all combinations and variants are available. Refer to the Viconics price list for a complete selection listing of all available models.

Network ready

- All Schneider-Electric SE7600 series Terminal Equipment Controllers are designed for stand-alone (Network Ready) operation.
- They can be fully integrated into your choice of automation systems using the available communication adapter options.
- If required, stand-alone (Network Ready) Terminal Equipment Controllers can be field retrofitted with the following communication adapters:

- o VCM7600V5045B, Terminal Equipment Controller BACnet® MS-TP® communication adapter.
- o VCM7600V5045E, Terminal Equipment Controller Echelon® Lontalk® communication adapter.
- o VCM7000V5045W Terminal Equipment Controller wireless Zigbee® communication adapter.

TERMINAL, IDENTIFICATION AND FUNCTION
Wiring

Part Number	Multistage				1H / 1C		Part Number	Heat Pump	
	SE7656B	SE7605B	SE7652B	SE7600B	SE7652A	SE7600A		SE7652H	SE7600H
Schedule	Yes	No	Yes	No	Yes	No	Schedule	Yes	No
Top left terminal block							**Top left terminal block**		
Y2	X	X	X	X			Y2	X	X
Y1	X	X	X	X	X	X	Y1	X	X
G	X	X	X	X	X	X	G	X	X
RC	X	X	X	X	X	X	RC	X	X
C	X	X	X	X	X	X	C	X	X
Top right terminal							**Top right terminal block**		
RH	X	X	X	X	X	X	RH	X	X
W1	X	X	X	X	X	X	W1	X	X
W2	X	X	X	X			O/B	X	X
Bottom terminal block							**Bottom terminal block**		
Econo	X	X							
Aux	X	X	X	X	X	X	Aux	X	X
DI1	X	X	X	X	X	X	DI1	X	X
DI2	X	X	X	X	X	X	DI2	X	X
RS	X	X	X	X	X	X	RS	X	X
Scom	X	X	X	X	X	X	Scom	X	X
OS	X	X	X	X	X	X	OS	X	X
MS	X	X	X	X	X	X	MS	X	X

Screw terminal arrangement

5 pole left top connector

Y2	Y1	G	RC	C

3 pole left top connector

RH	W1	W2 O/B
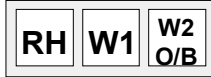
8 pole bottom connector

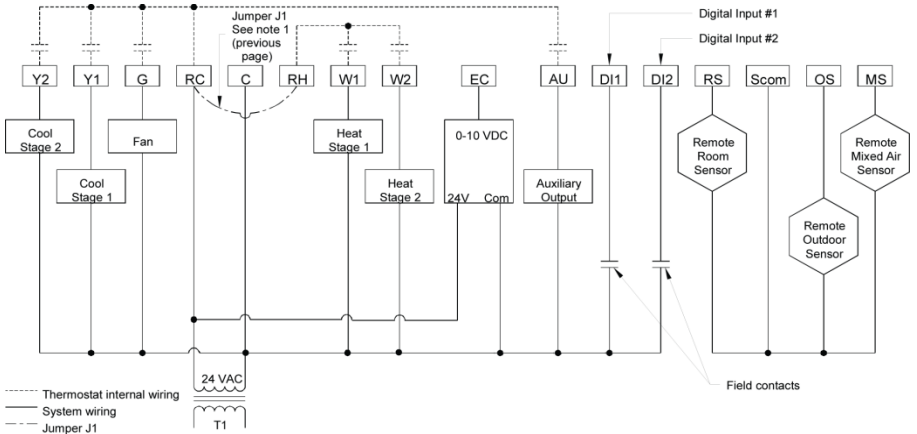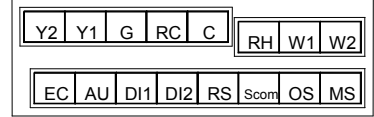| EC	AU	D1	D2	RS	Scom	OS	MS
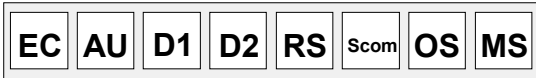
Main outputs wiring

Wiring notes:

Note 1: If the same power source is used for the heating stages, install jumper across RC and RH. Maximum current is 2.0 amps.

Note 2: If auxiliary output is used to toggle occupancy of the electronic control card inside the equipment, configure the relay parameter (Aux cont) to the N.O. setting. A second relay can be added for additional functionality of the occupancy output.

Note 3: Economizer output uses a half bridge rectifier. Reference of the control signal is the common of the power supply of the Terminal Equipment Controller. (Terminal C)

Note 4: Electromechanical contacts are to be used with the digital inputs. Electronic triacs cannot be used as mean of switching for the input. The switched leg to the input for the input to activate is terminal C (common)

Note 5: The transformer of the unit provides power to the t Terminal Equipment Controller and the additional loads that will be wired to the Terminal Equipment Controller.
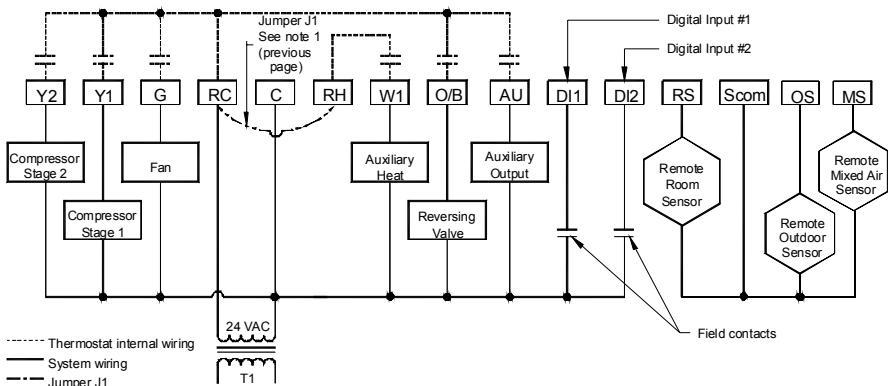
TYPICAL APPLICATIONS

SE7656B5X45(X)
2 Heat / 2 Cool / Economizer / With Schedule

Controller Terminals - SE7656B5x45

SE7652H5X45(X)
Heat pump Without Schedule

Controller Terminals - VT7652H5x00

| Y2 | Y1 | G | RC | C | | RH | W1 | O/B |

| AU | DI1 | DI2 | RS | Scom | OS | MS |

Jumper J1
See note 1
(previous page)

Digital Input #1

Digital Input #2

| Y2 | Y1 | G | RC | C | RH | W1 | O/B | AU | DI1 | DI2 | RS | Scom | OS | MS |

Compressor Stage 2

Fan

Compressor Stage 1

Auxiliary Heat

Auxiliary Output

Reversing Valve

Remote Room Sensor

Remote Outdoor Sensor

Remote Mixed Air Sensor

Field contacts

- - - - Thermostat internal wiring
——— System wiring
—·—·— Jumper J1

24 VAC

T1

Remote sensor accessories

MODEL NO.	DESCRIPTION
S3010W1000	Wall mounted temperature sensor
S3020W1000	Wall mounted temperature sensor+override button and occupancy status

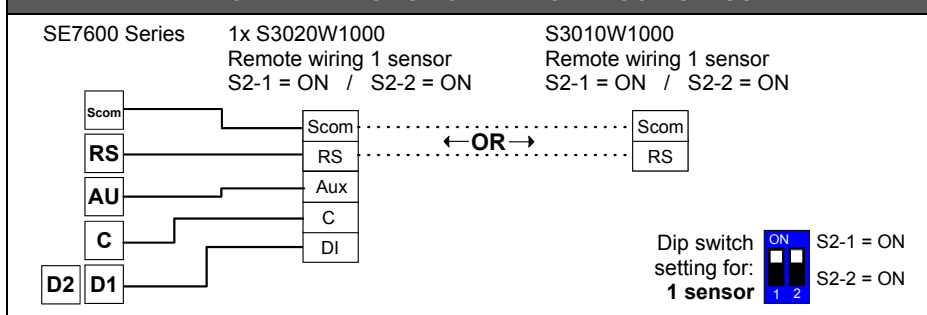**Remote mount temperature sensors use 10K NTC thermistor.**

This sensor can be used for:
- Various averaging combinations
- Optional occupancy led
- Optional override key

Wall mounted sensor

WIRING EXAMPLE OF SINGLE REMOTE ROOM SENSOR:

SE7600 Series   1x S3020W1000   S3010W1000
Remote wiring 1 sensor   Remote wiring 1 sensor
S2-1 = ON / S2-2 = ON   S2-1 = ON / S2-2 = ON

Scom

RS

AU

C

D2 D1

Scom   ····························· Scom

RS   ····· ←OR→ ············· RS

Aux

C

DI

Dip switch setting for: **1 sensor**   ON   S2-1 = ON   S2-2 = ON   1 2
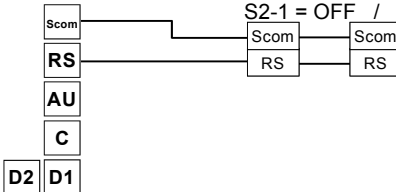
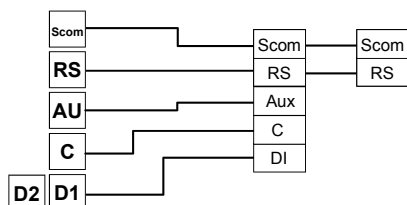**WIRING EXAMPLES OF 2 REMOTE ROOM SENSORS FOR AVERAGING APPLICATIONS:**

SE7600 Series 2x S3020W1000
Remote wiring 2 sensors
S2-1 = OFF / S2-2 = ON
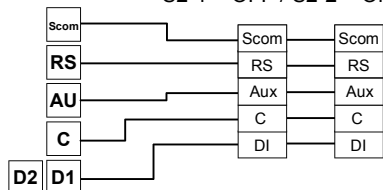
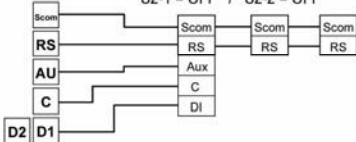SE7600 Series 2x S3010W1000
Remote wiring 2 sensors
S2-1 = OFF / S2-2 =

SE7600 Series 1x S3010W1000 and 1x S3020W1000
Remote wiring 2 sensors
S2-1 = OFF / S2-2 = ON

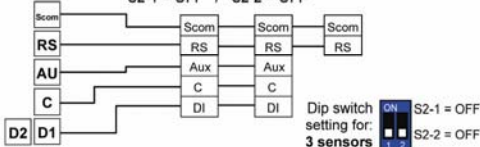**Notes for averaging applications:**

- S3010W1000 and S3020W1000 can be mixed matched.
- S3010W1000 and S3020W1000 are to be wired in parallel.
- Respect the dip switch setting in each remote sensor.

WIRING EXAMPLES OF 3 REMOTE ROOM SENSORS FOR AVERAGING APPLICATIONS:

VT7600 Series 2x S3010W1000 and 1x S3020W1000
Remote wiring 3 sensors
S2-1 = OFF / S2-2 = OFF

VT7600 Series 1x S3010W1000 and 2x S3020W1000
Remote wiring 3 sensors
S2-1 = OFF / S2-2 = OFF

Dip switch setting for: **3 sensors** — S2-1 = OFF / S2-2 = OFF

Temperature vs. resistance chart for 10 Kohm NTC thermistor

ºC	ºF	Kohm	ºC	ºF	Kohm	ºC	ºF	Kohm	ºC	ºF	Kohm	ºC	ºF	Kohm
-40	-40	324.3197	-20	-4	94.5149	0	32	32.1910	20	68	12.4601	40	104	5.3467
-39	-38	303.6427	-19	-2	89.2521	1	34	30.6120	21	70	11.9177	41	106	5.1373
-38	-36	284.4189	-18	0	84.3147	2	36	29.1197	22	72	11.4018	42	108	4.9373
-37	-35	266.5373	-17	1	79.6808	3	37	27.7088	23	73	10.9112	43	109	4.7460
-36	-33	249.8958	-16	3	75.3299	4	39	26.3744	24	75	10.4443	44	111	4.5631
-35	-31	234.4009	-15	5	71.2430	5	41	25.1119	25	77	10.0000	45	113	4.3881

-34	-29	219.9666	-14	7	67.4028	6	43	23.9172	26	79	9.5754	46	115	4.2208
-33	-27	206.5140	-13	9	63.7928	7	45	22.7861	27	81	9.1711	47	117	4.0607
-32	-26	193.9703	-12	10	60.3980	8	46	21.7151	28	82	8.7860	48	118	3.9074
-31	-24	182.2686	-11	12	57.2044	9	48	20.7004	29	84	8.4190	49	120	3.7607
-30	-22	171.3474	-10	14	54.1988	10	50	19.7390	30	86	8.0694	50	122	3.6202
-29	-20	161.1499	-9	16	51.3692	11	52	18.8277	31	88	7.7360	51	124	3.4857
-28	-18	151.6239	-8	18	48.7042	12	54	17.9636	32	90	7.4182	52	126	3.3568
-27	-17	142.7211	-7	19	46.1933	13	55	17.1440	33	91	7.1150	53	127	3.2333
-26	-15	134.3971	-6	21	43.8268	14	57	16.3665	34	93	6.8259	54	129	3.1150
-25	-13	126.6109	-5	23	41.5956	15	59	15.6286	35	95	6.5499	55	131	3.0016
-24	-11	119.3244	-4	25	39.4921	16	61	14.9280	36	97	6.2866	56	133	2.8928
-23	-9	112.5028	-3	27	37.5056	17	63	14.2629	37	99	6.0351	57	135	2.7886
-22	-8	106.1135	-2	28	35.6316	18	64	13.6310	38	100	5.7950	58	136	2.6886
-21	-6	100.1268	-1	30	33.8622	19	66	13.0307	39	102	5.5657	59	138	2.5926

S3010W1000 remote wall mounted temperature sensor, dip switch location

Location of dip
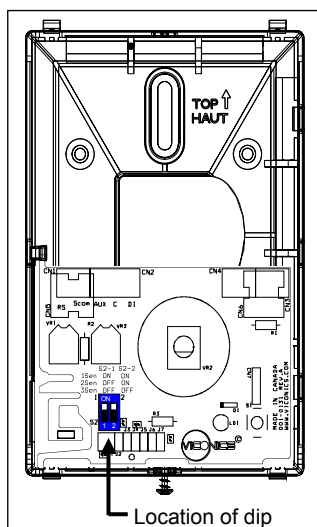
S2000D1000, remote duct mounted temperature sensor complete with junction box.

This sensor can be used for:
- Remote return air temperature sensing with the sensor mounted on the return air duct.
- Outside air temperature sensing with the sensor installed in the fresh air plenum.
- Supply air temperature sensor

S2060A1000, remote averaging duct mounted temperature sensor complete with junction box.

This sensor can be used for:
- Remote averaging return air temperature sensing with the sensor mounted on the return air duct.
- Outside air temperature averaging sensing with the sensor installed in the fresh air plenum.
- Mixed air temperature averaging sensor for economizer models with the sensor in the mixing plenum.
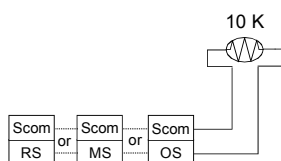
S2020E1000, outdoor air temperature sensor
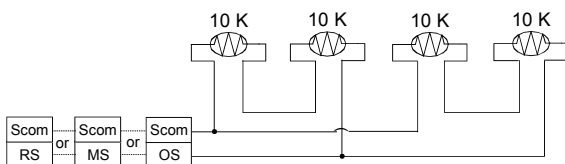
This sensor can be used for:
- Outside air temperature sensing with the sensor installed directly exposed to the elements.
- Sensor uses a water resistant NEMA 4 ABS enclosure for outdoor applications.

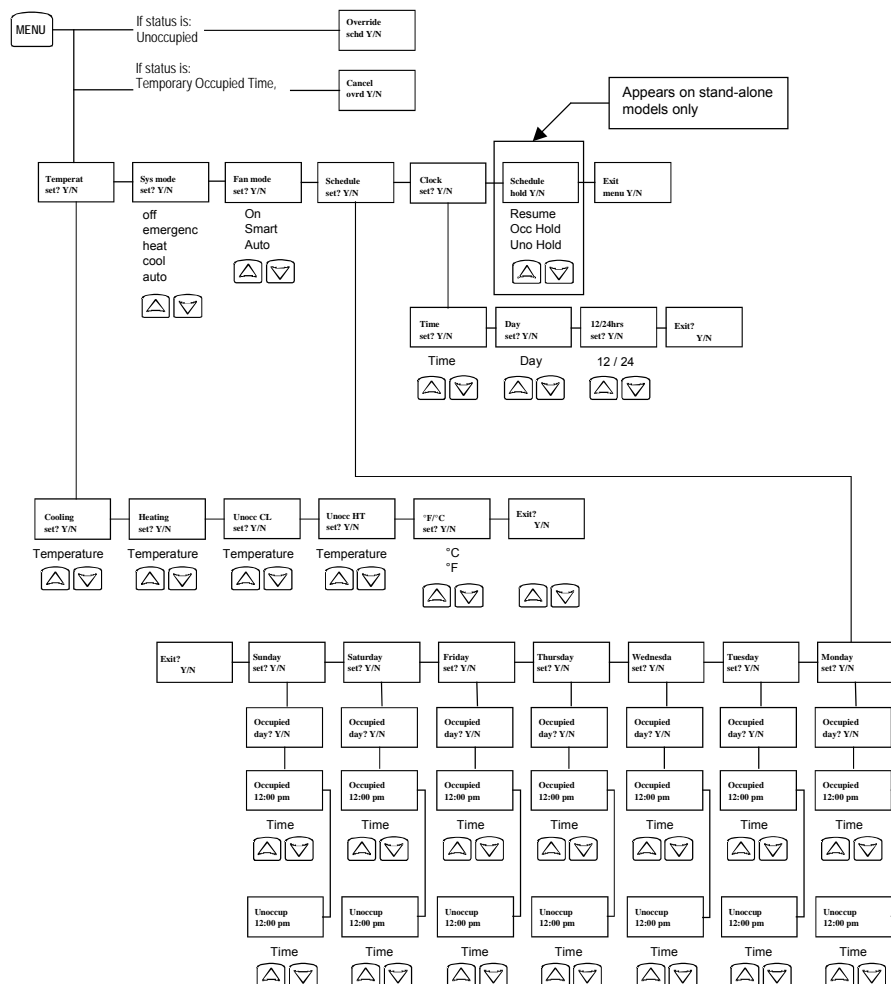| WIRING S2000D1000, S2060A1000 AND S2020E1000 |
|---|

Remote wiring 1 sensor   Remote wiring 4 sensors

User menu flow chart:

<u>NOTE:</u> Prompts may not all be present depending on model selected

MENU

If status is:
Unoccupied

Override schd Y/N

If status is:
Temporary Occupied Time,

Cancel ovrd Y/N

Appears on stand-alone models only

Temperat set? Y/N

Sys mode set? Y/N
off
emergenc
heat
cool
auto
△ ▽

Fan mode set? Y/N
On
Smart
Auto
△ ▽

Schedule set? Y/N

Clock set? Y/N

Schedule hold Y/N
Resume
Occ Hold
Uno Hold
△ ▽

Exit menu Y/N

Time set? Y/N
Time
△ ▽

Day set? Y/N
Day
△ ▽

12/24hrs set? Y/N
12 / 24
△ ▽

Exit? Y/N

Cooling set? Y/N
Temperature
△ ▽

Heating set? Y/N
Temperature
△ ▽

Unocc CL set? Y/N
Temperature
△ ▽

Unocc HT set? Y/N
Temperature
△ ▽

°F/°C set? Y/N
°C
°F
△ ▽   △ ▽

Exit? Y/N

Exit? Y/N

Sunday set? Y/N

Saturday set? Y/N

Friday set? Y/N

Thursday set? Y/N

Wednesda set? Y/N

Tuesday set? Y/N

Monday set? Y/N

Occupied day? Y/N

Occupied day? Y/N

Occupied day? Y/N

Occupied day? Y/N

Occupied day? Y/N

Occupied day? Y/N

Occupied day? Y/N

Occupied 12:00 pm
Time
△ ▽

Occupied 12:00 pm
Time
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Occupied 12:00 pm
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CONFIGURING AND STATUS DISPLAY INSTRUCTIONS

Status display

The Terminal Equipment Controller features a two-line, eight-character display. There is a low level backlight level that is always active and can only be seen at night.

When left unattended, the Terminal Equipment Controller has an auto scrolling display that shows the actual status of the system.

Each item is scrolled one by one with the back lighting in low level mode. Pressing any key will cause the back light to come on to high level.

Manual scroll of each menu item is achieved by pressing the Yes (scroll) key repetitively. The last item viewed will be shown on the display for 30 seconds before returning to automatic scrolling. Temperature is automatically updated when scrolling is held.

Sequence of auto-scroll status display:

ROOM TEMPERATURE	CLOCK STATUS	SYSTEM MODE	SCHEDULE STATUS	OUTDOOR TEMPERATURE	ALARMS
x.x °C or °F XX % RH	Monday 12:00 AM	Sys mode auto	Occupied	Outdoor x.x °C or°F	Service
		Sys mode off	Occupied hold		Frost ON
		Sys mode heat	Unoccup		SetClock
		Sys mode cool			Filter
		Sys mode emergency			Fan lock

Outdoor air temperature
▪ Outdoor air temperature display is only enabled when outdoor air temperature sensor is connected.
- A maximum range status display of 50 °C (122 °F) indicates a shorted sensor. Associated functions, such as mode lockouts and economizer function are automatically disabled.
- A minimum range status -40 °C (-40 °F) is not displayed and indicates a opened sensor or a sensor not connected. Associated functions, such as mode lockouts and economizer function are automatically disabled.

Alarms
- If alarms are detected, they will automatically be displayed at the end of the status display scroll.
- During an alarm message display, the back lit screen will light up at the same time as the message and shut off during the rest of the status display.
- Two alarms maximum can appear at any given time.
- The priority for the alarms is as follows:

Frost ON	Indicates that the heating is energized by the low limit frost protection room

	temperature setpoint 5.6 °C (42 °F)
SetClock	Indicates that the clock needs to be reset. There has been a power failure which has lasted longer than 6 hours
Service	Indicates that there is a service alarm as per one of the configurable digital input (DI1 or DI2)
Filter	Indicates that the filters are dirty as per one of the configurable digital input (DI1 or DI2)
Fan lock	Indicates that the heating and cooling action are locked out due to a defective fan operation

Three status LEDs on the Terminal Equipment Controller cover are used to indicate the status of the fan, a call for heat, or a call for cooling.

When any of the **fan** is **ON**, the **FAN LED will illuminate**	FAN ○
When **heating** is **ON**, the **HEAT LED will illuminate**	HEAT ○
When **cooling** is **ON**, the **COOL LED will illuminate**	COOL ○

LED OPERATION	HEATPUMP MODELS SE76XXH	MULTISTAGE AND SINGLE STAGE MODELS SE7600A, SE7652A, SE7600B & SE7652B	MULTISTAGE ECONOMIZER MODELS SE7605B & SE7656B
Fan LED on	When G Fan terminal operates	When G Fan terminal operates	When G Fan terminal operates
Heating LED on	When Y1 and or W1 terminal(s) operate in heating mode	When W1 terminal operate in heating mode	When W1 terminal operate in heating mode
Cooling LED on	When Y1 terminal operate in cooling mode	When Y1 terminal operate in cooling mode	When Y1 terminal operate in cooling mode and or economizer output is in function

USER INTERFACE

User configuring instructions menu

The SE7600 series of Terminal Equipment Controller feature an intuitive, menu-driven, back-lit LCD display that walks users through the configuring steps, making the configuring process extremely simple. This menu is typically accessed by the user to set the parameters such as temperature and time events, system mode, fan mode, etc.

It is possible to bring up the user menu at any time by depressing the MENU key. The status display automatically resumes after exiting the user-configuring menu.
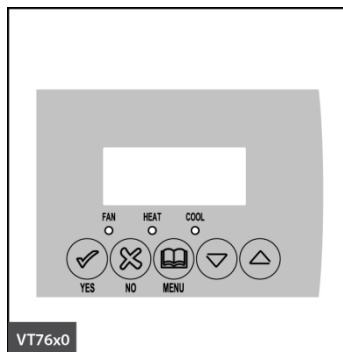
If the user pauses at any given time during configuring, Auto Help text is displayed to help and guide the user through the usage and configuring of the Terminal Equipment Controller.

Ex.:	Press yes key to change cooling temperature setpoint
	Use the up or down arrow to adjust cooling setpoint

Local keypad interface

Each of the sections in the menu is accessed and configured using 5 keys on the Terminal Equipment Controller cover.

The priority for the alarms is as follows:

YES	The YES key is used to confirm a selection, to move onto the next menu item and to manually scroll through the displayed information.
NO	The NO key is used when you do not desire a parameter change, and to advance to the next menu item. Can also be used to toggle between heating and cooling setpoints.
MENU	The MENU key is used to access the Main User Menu or exit the menu.
▽	The down arrow key is used to decrease temperature setpoint and to adjust the desired values when configuring the Terminal Equipment Controller.
△	The up arrow key is used to increase temperature setpoint and to adjust the desired values when configuring the Terminal Equipment Controller.

When left unattended for 45 seconds, the display will resume automatic status display scrolling.

To turn on the back light, press any key on the front panel. The back lit display will turn off when the Terminal Equipment Controller is left unattended for 45 seconds

Sequence of user menu:

OVERRIDE RESUME	TEMPERATURE SETPOINTS	SYSTEM MODE SETTING	FAN MODE SETTING	SCHEDULES SETTING	CLOCK SETTING	SCHEDULE HOLD
Override schd Y/N	Temperat Set Y/N	Sys mode set Y/N	Fan mode set Y/N	Schedule set Y/N	Clock set Y/N	Schedule hold Y/N
Appears only in unoccupied mode						Appears only on stand-alone (Network Ready) models
Cancel ovrd Y/N Appears only in override mode						

Occupied setpoints adjustments

There is a default profile set in the Terminal Equipment Controller from the factory.

This enables the Terminal Equipment Controller to operate as a non-scheduling unit in day mode operation at start up.

DEFAULT TEMPERATURE SETPOINTS:	DEFAULT MODES:
Occupied cooling setpoint = 24 °C (75 °F)	System mode = Auto
Occupied heating setpoint = 22 °C (72 °F)	Fan mode = Smart (for models with a communication module or scheduling network ready models)
Unoccupied cooling setpoint = 28 °C (82°F)	Fan mode = Auto (for non-scheduling network ready models)

Unoccupied heating setpoint = 18 °C (65°F)		**DEFAULT SCHEDULES:**
Fahrenheit scale		Monday through Sunday
Setpoint type = permanent		Occupied time is: 12 00 AM
		Unoccupied time is: 11:59 PM

There will be a 1 minute unoccupied period every night at 11:59 PM with this default configuration.

A) Override an unoccupied period

Override
schd Y/N

This menu will appear only when the Terminal Equipment Controller is in unoccupied mode. The unoccupied mode is enabled either by the internal timer scheduling or by a remote NSB contact via DI1 or DI2.

If DI1 or DI2 is configured to operate as a remote temporary override contact, this menu will be disabled.

Answering yes to this prompt will cause the Terminal Equipment Controller to go into occupied mode for an amount of time equal to the parameter "TOccTime" (1 to 12 hours).

B) Resume regular scheduling

Cancel
ovrd Y/N

This menu does not appear in regular operation. It will appear only when the Terminal Equipment Controller is in Unoccupied override mode.
Answering "Yes" to this question will cause the Terminal Equipment Controller to resume the regular setpoints & scheduling.

C) Temperature setpoints

Permanent setpoint changes

Temperat
set   Y/N

This menu permits the adjustment of all permanent temperature setpoints (occupied and unoccupied) as well as the desired temperature units (°F or °C). Permanent setpoints are written to RAM and EEPROM.

COOLING SETPOINT OCCUPIED MODE	HEATING SETPOINT OCCUPIED MODE	COOLING SETPOINT UNOCCUPIED MODE	HEATING SETPOINT UNOCCUPIED MODE	°F OR °C DISPLAY SETTING

Cooling set? Y/N	No next → Yes down ↓	Heating set? Y/N	No next → Yes down ↓	Unocc CL set? Y/N	No next → Yes down ↓	Unocc HT set? Y/N	No next → Yes down ↓	°F or °C set? Y/N	No next → Yes down ↓
			Use ▲▼ keys to set value, Yes key to confirm						
Cooling 70.0 °F	Use ▲▼ To set value	Heating 68.00 °F	Use ▲▼ To set value	Unocc CL 80.0 °F	Use ▲▼ To set value	Unocc HT 60.0 °F	Use ▲▼ To set value	Units °F	Use ▲▼ To set value

Temporary setpoint changes

Temporary setpoints can be modified through the Up arrow key (▲) and the Down arrow keys (▼).
User will be prompted with the present mode (Heating or Cooling) of the Terminal Equipment Controller and its setpoint.
The Up (▲) arrow key will increment the setpoint by 0.5 degree (F or C).
The Down (▼) arrow key will decrement the setpoint by 0.5 degree (F or C).
Press the Yes key to accept the new setpoint.

Local changes to the heating or cooling setpoints made by the user directly using the up or down arrow are temporary.
They will remain effective for the duration specified by ToccTime.
Setpoints will revert back to their default value after internal timer ToccTime expires.
If a permanent change to the setpoints is required, use the **Temperat set ?** menu

D) System mode setting

Sys mode
set   Y/N

This menu is accessed to set system mode operation
Use ▲▼ to set value, Yes key to confirm

Sys mode auto	**Automatic mode** Automatic changeover mode between heating and cooling operation
Sys mode cooling	**Cooling mode** Cooling operation mode only
Sys mode heating	**Heating mode** Heating operation mode only
Sys mode emergency	**Emergency heat mode** (heat pump models only) Forced auxiliary heat operation mode only
Sys mode off	**Off mode** Normal cooling or heating operation disabled If enabled in installer parameters, only the automatic heating frost protection at 50 °F (10 °C) is enabled

E) Fan mode setting

Fan mode
set   Y/N

This section of the menu is permits the setting of the fan mode operation.
Use ▲ ▼ to set value, Yes key to confirm

Fan mode On	**On fan mode** Fan is on continuously, even when system mode is OFF.
Fan mode Auto	**Automatic fan mode** Fan cycles on a call for heating or cooling for both occupied & unoccupied periods.
Fan mode Smart	**Smart fan mode** During occupied periods, fan is on continuously. In unoccupied mode, fan cycles on a call for heating or cooling. This selection is available on all models with a communication module, on all stand-alone (Network Ready) scheduling models or if DI1 or DI2 is set to RemNSB on stand-alone non-scheduling models.

F) Schedule set (2 events)

Scheduling can have 2 or 4 events per day. This is set in the configuration menu as per parameter (2/4event)

Schedule set   Y/N

This section of the menu permits the user to set the whether 2 or 4 events is needed.
Each day can be tailored to specific schedules if needed.

- 2 events can be scheduled per day.
- Occupied and unoccupied periods can be set for each day.

MONDAY TIMER SCHEDULE SET		TUESDAY TIMER SCHEDULE SET		WEDNESDAY TIMER SCHEDULE SET		OTHER DAYS ARE IDENTICAL
Monday set? Y/N	No next → Yes down ↓	Tuesday set? Y/N	No next → Yes down ↓	Wednesda set? Y/N	No next → Yes down ↓	Selects the day to be scheduled or modified
Yes key to access day scheduling, No key to jump to next day						
Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Yes = Daily schedules will be accessed No = Unoccupied mode all day
Yes key to access day scheduling, No key to jump to next day						
		Copy Y/N Previous	Yes next → No down ↓	Copy Y/N Previous	Yes next → No down ↓	Yes = Will copy previous day schedule No = Daily schedules will be accessed
Yes key to copy previous day, No key to set new time value for each day						
Occupied 00:00 AM	Use ▲ ▼ To set value	Occupied 00:00 AM	Use ▲ ▼ To set value	Occupied 00:00 AM	Use ▲ ▼ To set value	Sets Event # 1 Occupied time Will activate occupied setpoints
Use ▲ ▼ to set value, Yes key to confirm						

Unoccup 00:00 AM	Use ▲▼ To set value	Unoccup 00:00 AM	Use ▲▼ To set value	Unoccup 00:00 AM	Use ▲▼ To set value	Sets Event # 2 Unoccupied time Will activate unoccupied setpoints

Use ▲▼ to set value, Yes key to confirm

Typical examples of a 2 event office schedule:

Ex. #1 Office building closed all weekend

Event	Period #1 - Event #1		Period #1 - Event #2			
	Occupied		**Unoccupied**			
Setpoint	**Cool**	**Heat**	**Cool**	**Heat**		**Daily**
	72 °F	70 °F	80 °F	62 °F		**Occupancy**
Monday	7.00 AM		6.00 PM			Day time only
Tuesday	7.00 AM		6.00 PM			Day time only
Wednesday	7.00 AM		6.00 PM			Day time only
Thursday	7.00 AM		6.00 PM			Day time only
Friday	7.00 AM		6.00 PM			Day time only
Saturday	12.00 PM *		12.00 PM *			Unoccupied
Sunday	12.00 PM *		12.00 PM *			Unoccupied

* Scheduling consecutive events to the same time will cause the Terminal Equipment Controller to choose the last event as the time at which it will set its schedule. In the above example, the Terminal Equipment Controller will control to the unoccupied set point until 7:00 AM Monday.

Ex. #2 Commercial building which is occupied all weekend

Event	Period #1 - Event #1		Period #1 - Event #2			
	Occupied		**Unoccupied**			
Setpoint	**Cool**	**Heat**	**Cool**	**Heat**		**Daily Occupancy**
	72 °F	70 °F	80 °F	62 °F		
Monday	8.00 AM		5.00 PM			Day time only
Tuesday	8.00 AM		5.00 PM			Day time only
Wednesday	8.00 AM		5.00 PM			Day time only
Thursday	8.00 AM		5.00 PM			Day time only
Friday	8.00 AM		5.00 PM			Day time only
Saturday	12.00 AM **		11.59 PM **			Occupied
Sunday	12.00 AM **		11.59 PM **			Occupied

** To schedule a day as occupied for 24 hours, set that day occupied time to 12:00 AM
  and Unoccupied time to 11:59 PM There will be a 1 minute unoccupied period every
  night at 11:59 PM with this schedule configuration.

Note: 12:00 PM = Noon
         12:00 AM = Midnight

G) Schedule set (4 events)

Schedule
set   Y/N

This section of the menu permits the user to set the whether 2 or 4 events is needed. Each
day can be tailored to specific schedules if needed.

- 4 events can be scheduled per day.
- Occupied and Unoccupied periods can be set for each day.
- Scheduling the 3rd. & 4th. Events to the same time will cancel the last period.

Monday timer Schedule set		Tuesday timer Schedule set		Wednesday timer Schedule set		Other days are identical
Monday set? Y/N	No next → Yes down ↓	Tuesday set? Y/N	No next → Yes down ↓	Wednesda set? Y/N	No next → Yes down ↓	Selects the day to be scheduled or modified
Yes key to access day scheduling, No key to jump to next day						
Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Occupied Day? Y/N	No next → Yes down ↓	Yes = Daily schedules will be accessed No = Unoccupied mode all day
Yes key to access day scheduling, No key to jump to next day						
		Copy Y/N Previous	Yes next → No down ↓	Copy Y/N Previous	Yes next → No down ↓	Yes = Will copy previous day schedule No = Daily schedules will be accessed
Yes key to copy previous day, No key to set new time value for each day						
Occupied 00:00 AM	Use ▲▼ To set value	Occupied 00:00 AM	Use ▲▼ To set value	Occupied 00:00 AM	Use ▲▼ To set value	Sets Event # 1 Occupied time Will activate occupied setpoints
Use ▲▼ to set value, Yes key to confirm						
Unoccup 00:00 AM	Use ▲▼ To set value	Unoccup 00:00 AM	Use ▲▼ To set value	Unoccup 00:00 AM	Use ▲▼ To set value	Sets Event # 2 Unoccupied time Will activate unoccupied setpoints
Use ▲▼ to set value, Yes key to confirm						
Occupie2 00:00 AM	Use ▲▼ To set value	Occupie2 00:00 AM	Use ▲▼ To set value	Occupie2 00:00 AM	Use ▲▼ To set value	Sets Event # 3 Occupied time Will activate occupied setpoints
Use ▲▼ to set value, Yes key to confirm						
Unoccup2 00:00 AM	Use ▲▼ To set value	Unoccup2 00:00 AM	Use ▲▼ To set value	Unoccup2 00:00 AM	Use ▲▼ To set value	Sets Event # 4 Unoccupied time Will activate unoccupied setpoints
Use ▲▼ to set value, Yes key to confirm						

Ex. #1 Four event retail establishment schedule

Event	Period 1 - Event 1		Period 1 - Event 2		Period 2 - Event 3		Period 2 - Event 4		
Setpoint	Occupied		Unoccupied		Occupied		Unoccupied		
	Cool	Heat	Cool	Heat	Cool	Heat	Cool	Heat	Daily Occupancy
	72°F	70°F	80°F	62°F	72°F	70 °F	80°F	62 °F	
Monday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Tuesday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Wednesday	7.00 AM		5.00 PM		12.00 PM *		12.00 PM *		Day time only
Thursday	7.00 AM		5.00 PM		7.00 PM		10.30 PM		Day/evening time only
Friday	7.00 AM		5.00 PM		7.00 PM		10.30 PM		Day/evening time only
Saturday	12.00 PM *		12.00 PM *		12.00 PM *		12.00 PM *		Unoccupied
Sunday	12.00 PM *		12.00 PM *		12.00 PM *		12.00 PM *		Unoccupied

* Scheduling events to the same time will cancel the last period and leave the Terminal Equipment Controller in unoccupied mode

Ex. #2 Residential

Event	Period 1 - Event 1		Period 1 - Event 2		Period 2 - Event 3		Period 2 - Event 4		
Setpoint	Occupied		Unoccupied		Occupied		Unoccupied		
	Cool	Heat	Cool	Heat	Cool	Heat	Cool	Heat	**Daily Occupancy**
	72°F	70°F	80°F	62°F	72°F	70°F	80°F	62°F	
Monday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Tuesday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Wednesday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Thursday	6:00 AM		8:00 AM		4:00 PM		10:00 PM		Day/evening time only
Friday	6:00 AM		8:00 AM		4:00 PM		11:30 PM		Day/evening time only
Saturday	8:00 AM *		8:00 AM *		8:00 AM *		11:59 PM *		Day time only
Sunday	12:00 AM *		12:00 AM *		12:00 AM *		11:59 PM *		Occupied all day

* Scheduling consecutive events to the same time will cause the Terminal Equipment Controller to choose the last event as the time at which it will set its schedule. In the above example for Saturday, the Terminal Equipment Controller will control to the occupied set point from 8:00 AM until 11:59 PM. Since it is desired to be in occupied mode throughout the night, then it is necessary to schedule the first event on Sunday at 12:00 AM. The Terminal Equipment Controller will force a one minute unoccupied period for a one minute period (between 11:59 PM and 12:00 AM on Saturday).

H) Clock/Day Settings

```
Clock
set   Y/N
```

This section of the menu permits the user to set the time and day.

Time setting		Day setting		Time format setting	
Time set? Y/N	No next → Yes down ↓	**Day set? Y/N**	No next → Yes down ↓	**12/24hrs set? Y/N**	No = exit Yes down ↓
Time 0:00	Use ▲▼ To set value	**Day Monday**	Use ▲▼ To set value	**12/24hrs 12 hrs**	Use ▲▼ To set value

J) Schedule hold

```
Schedule
hold  Y/N
```

• This menu will only appear on stand-alone (Network Ready) Terminal Equipment Controller, i.e. without a BACnet® Echelon® module.

- This section of the menu permits the user to set a permanent schedule hold, which bypasses the internal Terminal Equipment Controller scheduling.
- The permanent schedule hold function is typically used for non-scheduled events that extend for various periods of time.
- Enabling a permanent occupied or permanent unoccupied schedule hold will cancel any active override.
- The use of temporary setpoints during permanent hold is permitted. The duration of the temporary setpoint is as set per the TOccTime parameter. Ex. 3 hours

Use ▲▼ to set value, yes key to confirm

Schedule resume	Resume regular scheduling cancels the permanent hold and re-enables the regular scheduling as set per internal schedule or as per remote NSB via one of the DI's configured as remote NSB. This action can also by accomplished by using the Resume menu. Any temporary setpoint that are active will be left active for the duration of the period as set per the TOccTime parameter.
Schedule occ hold	Hold permanent occupied forces the Terminal Equipment Controller into a permanent occupied mode using the occupied setpoints. All timed scheduling functions are by-passed. The PERMANENT OCCUPIED status will appear in the automatic status scroll. To resume to regular scheduling, user must scroll to the Schedule Hold menu and select the Schedule resume option.
Schedule uno hold	Hold permanent unoccupied forces the Terminal Equipment Controller into a permanent unoccupied mode using the unoccupied setpoints. All timed scheduling functions are by-passed. The PERMANENT UNOCCUPIED status will appear in the automatic status scroll. To resume to regular scheduling, user must scroll to the Schedule Hold menu and select the Schedule resume option.

INSTALLER CONFIGURATION PARAMETER MENU

- Configuration can be done through the network or locally at the Terminal Equipment Controller.
- To enter configuration, press and hold the middle button "Menu" for 8 seconds
- If a password lockout is active, "Password" is prompted. Enter password value using the "up" and "down" arrows and press "Yes" to gain access to all configuration properties of the Terminal Equipment Controller. A wrong password entered will prevent local access to the configuration menu.
- Once in the configuration menu, press the "No" button repetitively to scroll between all the available parameters.
- When the desired parameter is displayed, press "Yes" to adjust it to the desired value using "up" and "down" arrows. Once set, press "Yes" to scroll to the next parameter.

CONFIGURATION PARAMETERS DEFAULT VALUE	SIGNIFICANCE AND ADJUSTMENTS
PswrdSet Configuration parameters menu access password Default value = **0** No password prompted	This parameter sets a password access to prevent unauthorized access to the configuration menu parameters. A default value of "0" will not prompt a password or lock the access to the configuration menu. Range is: 0 to 1000
Com Addr Terminal Equipment Terminal Equipment Controller networking address Default value = **254** Range is: 0 to 254	**Conditional parameter to BACnet™ MS-TP models (SE76xxX5x45B)** **Conditional parameter to Wireless models (SE76xxX5x45W)** This parameter will only appear when a BACnet® or wireless network adapter is present. If the Terminal Equipment Controller is installed as a stand-alone (Network Ready) unit or with an Echelon® adapter, this parameter will not be used or displayed -For BACnet® MS-TP models, the valid range to is from 1 to 127. Default value of 254 disables BACnet® communication for the Terminal Equipment Controller. For wireless models valid range is 0 to 254 with a maximum of 30 Terminal Equipment Controllers per VWG

PAN ID Personal Area Network Identification Default value = **0** Range is: 0 to 1000	**Conditional parameter to Wireless models (SE76xxX5x45W)** This parameter will only appear when a wireless network adapter is present. If the Terminal Equipment Controller is installed as a stand-alone (Network Ready) unit or with a BACnet® or Echelon® adapter, this parameter will not be used or displayed This parameter (Personal Area Network Identification) is used to link specific Terminal Equipment Controllers to a single specific Schneider-Electric wireless gateway (VWG) For every Terminal Equipment Controller reporting to a gateway (maximum of 30 Terminal Equipment Controllers per gateway), be sure you set the SAME PAN ID value both at the gateway and the Terminal Equipment Controller(s). The default value of 0 is NOT a valid PAN ID.
Channel Channel selection Default value = **10** Range is: **10 to 26**	**Conditional parameter to Wireless models (SE76xxX5x45W)** This parameter will only appear when a wireless network adapter is present. If the Terminal Equipment Controller is installed as a stand-alone (Network Ready) unit or with a BACnet® or Echelon® adapter, this parameter will not be used or displayed This parameter (Channel) is used to link specific Terminal Equipment Controllers to specific Schneider-Electric wireless gateway(s) (VWG) For every Terminal Equipment Controller reporting to a gateway (maximum of 30 Terminal Equipment Controllers per gateway), be sure you set the SAME channel value both at the gateway and the Terminal Equipment Controller(s). ***Schneider-Electric recommends using only the usage of channels 15 and 25 only.*** The default value of 10 is ***NOT*** a valid channel. The valid range of available channel is from 11 to 26

Get From Terminal Equipment Controller Get From another device configuration utility Default value = **0** Range is: 0 to 254	**Conditional parameter to Wireless models** **SE76xxX5x45W** Entering a MAC address enables an automatic routine that automatically fetches all the required configuration properties of the current device from another already configured device and copies the same required configured property values. If a value other than the default value of 255 is entered, user will then be prompted to exit the Configuration Menu thus leaving all other parameter configuration to be copied from the referenced Terminal Equipment Controller MAC address. Ex.: If you are currently configuring MAC12 and the settings <u>matches exactly</u> the settings of ZN MAC5, then enter 5 as the current parameter value. ▪ If the process is successful and all required configuration properties have been copied, the value will revert back to 255 ▪ If the process is *NOT* successful and all required configuration properties have NOT been copied (either the reference device is *NOT* the same model number or is offline or does not exists) the value will revert back to 254 to indicate the failure of the process **Leaving the Get From parameter to 255 means that every configuration parameters will be set manually.**

DI 1 Digital input no.1 configuration Open contact input = function not energized Closed contact input = function energized Default Value = **None**	**(None) :** No function will be associated with the input **(Rem NSB):** remote NSB timer clock input. Will disable the internal scheduling of the Terminal Equipment Controller. The scheduling will now be set as per the digital input. The time is still displayed as information, but the menu part related to scheduling is disabled and no longer accessible. Open contact = occupied setpoints Closed contacts = unoccupied setpoints **(RemOVR):** Temporary override remote contact. Disables all override menu function of the Terminal Equipment Controller. The override function is now controlled by a manual remote momentarily closed contact. When configured in this mode, the input operates in a toggle mode. With this function enabled it is now possible to toggle between unoccupied & occupied setpoints for the amount of time set by parameter (TOccTime) temporary occupancy time. When Override is enabled, an Override status message will be displayed **(Filter):** a back-lit flashing Filter alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is energized **(Service):** a back-lit flashing Service alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is energized **(Fan lock):** a back-lit flashing Fan lock alarm will be displayed on the Terminal Equipment Controller LCD screen when the input is not energized. Used in conjunction with a local airflow sensor connected to the input. Locks out the Terminal Equipment Controller heating and cooling action if no airflow is detected 10 seconds after the fan (G terminal) is energized. Open contact = no airflow Closed contacts = airflow present
DI 2 Digital input no. 2 configuration Default value = **None**	Same as above. It is possible to configure both inputs to have the same function.

MenuScro Menu scroll Default value = **On = Scroll active**	Removes the scrolling display and only present the room temperature/humidity to the user. With this option enabled, no status is given of mode, schedule and outdoor temperature. **On = Scroll active** **Off = Scroll not active**
lockout Keypad lockout levels Default value = **0 No lock**	0 = No lock 1 = Low level 2 = High level

USER KEY FUNCTIONS								
LEVEL	Resume/ Override scheduling	Permanent Occupied and Unoccupied Setpoints	Temporary setpoints using arrows	System mode setting	Fan mode setting	Schedules setting	Clock setting	Permanent hold
0	🔓	🔓	🔓	🔓	🔓	🔓	🔓	🔓
1	🔓	🔒	🔓	🔒	🔒	🔒	🔓	🔒
2	🔒	🔒	🔒	🔒	🔒	🔒	🔓	🔒

pwr del Power-up delay Default value = **10 seconds**	On initial power up of the Terminal Equipment Controller (each time 24 Vac power supply is removed & re-applied) there is a delay before any operation is authorized (fan, cooling or heating). This can be used to sequence start up multiple units / Terminal Equipment Controller in one location. **10 to 120 seconds**
Frost pr Frost protection enabled Default value = **Off**	**Off:** no room frost protection **On:** room frost protection enabled in all system mode at: 42 °F (5.6 °C) Frost protection is enabled even in system **Off** mode **Off or On** On **heat pump** models the system mode will be forced to EMERGENCY mode if frost protection is activated

heat max Maximum heating setpoint limit Default value = **90 °F (32 °C)**	Maximum occupied & unoccupied heating setpoint adjustment. Heating setpoint range is: **40 to 90 °F (4.5 to 32.0 °C)**
cool min Minimum cooling setpoint limit Default value = **54 °F (12 °C)**	Minimum occupied & unoccupied cooling setpoint adjustment. Cooling setpoint range is: **54 to 100 °F (12.0 to 37.5 °C)**
Pband Proportional Band setting Default value **2 = 2.0 °F (0.6 °C)**	Adjust the proportional band used by the Terminal Equipment Controller PI control loop. Note that the default value of 2.0 °F (1.1 °C) gives satisfactory operation in most normal installation cases. The use of a superior proportional band different than the factory one is normally warranted in applications where the Terminal Equipment Controller location is problematic and leads to unwanted cycling of the unit. A typical example is a wall mounted unit where the Terminal Equipment Controller is installed between the return and supply air feeds and is directly influenced by the supply air stream of the unit. See table below.
Anticycle Minimum On-Off operation time for stages Default value = **2 minutes**	Minimum On-Off operation time of cooling & heating stages. *IMPORTANT, anti-short cycling can be set to 0 minutes for equipment that posses their own anti cycling timer. Do <u>not</u> use this value unless the equipment is equipped with such internal timer. Failure to do so can damage the equipment.* **0, 1, 2, 3, 4 & 5 minutes** Anti-short cycling can be set to 0 minutes for equipment that posses their own anti cycling timer. Do not use that value unless the equipment is equipped with such internal timer. Failure to do so can damage the equipment.

Value	F scale Pband	C scale Pband
2	2 F	1.1 C
3	3 F	1.7 C
4	4 F	2.2 C
5	5 F	2.8 C
6	6 F	3.3 C
7	7 F	3.9 C
8	8 F	4.4 C

Heat cph Heating stages cycles per hour Default value = **4 C.P.H.**	Will set the maximum number of heating stage cycles per hour under normal control operation. It represents the maximum number of cycles that the equipment will turn ON and OFF in one hour. Note that a higher C.P.H will represent a higher accuracy of control at the expense of wearing mechanical components faster. **3, 4, 5, 6,7 & 8 C.P.H.** **For multi stage models, heat cph applies to W1 & W2** **For heat pump models, heat cph applies to W1 only (Emergency heat)**
cool cph Cooling stages cycles per hour Default value = **4 C.P.H.**	Will set the maximum number of cooling stage cycles per hour under normal control operation. It represents the maximum number of cycles that the equipment will turned on and off in one hour. Note that a higher C.P.H will represent a higher accuracy of control at the expense of wearing mechanical components faster. **3 or 4 C.P.H.** **For multi stage models, cool cph applies to Y1 & Y2** **For heat pump models, cool cph applies to Y1 & Y2 in cooling and heating independently of the reversing valve position**
deadband Minimum deadband Default value = **2.0 °F (1.1 °C)**	Minimum deadband value between the heating and cooling setpoints. If modified, it will be applied only when any of the setpoints are modified. **2, 3 or 4 °F (1.0 to 2.0 °C)**
fan cont Fan control Default value = **On**	Fan control in heating mode. When selecting **On**; the Terminal Equipment Controller in all cases will always control the fan (terminal G). Valid for On or Auto fan mode When selecting **Off**; the fan (terminal G), when heating stages (terminals W1 & W2) are solicited, will not be energized. The fan in this case will be controlled by the equipment fan limit control. Valid only for Auto fan mode. On fan mode will leave the fan always on. *ON OR OFF* **For multi stage models, fan control applies to W1 & W2** **For heat pump models, fan control applies to W1 only (Emergency heat)**

fan del Fan delay Default value = **Off**	Fan delay extends fan operation by 60 seconds after the call for heating or cooling ends. Valid only for Auto fan mode. "On" fan mode will leave the fan always on. **Off or On**
ToccTime Temporary occupancy time Default value = **3 hours**	Temporary occupancy time with occupied mode setpoints when override function is enabled When the Terminal Equipment Controller is in unoccupied mode, function is enabled with either the menu or DI1 or DI2 configured as remote override input. **0,1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12 hours**
Cal RS Room air temperature sensor calibration Default value = **0.0 °F or °C**	Offset that can be added/subtracted to actual displayed room temperature **± 5.0 °F (± 2.5 °C)**
Cal OS Outside air temperature sensor calibration Default value = **0.0 °F or °C**	Offset that can be added/subtracted to actual displayed outside air temperature **± 5.0 °F (± 2.5 °C)**
H stage Number of heating stages. Applicable to 2 stage models only Default value = **2 stages**	Will revert the operation of 2 stages Terminal Equipment Controller to single stage operation only when the second heating step is not needed. **1 or 2 stages** **For heat pump models, H stage is limited to 1 stage only (W1 – Aux. Heat)**

C stage or HP stage Number of cooling stages 2 stages model only Default value = **2 stages**	Will revert the operation of 2 stage Terminal Equipment Controller to single stage operation only when the second cooling step is not needed. **1 or 2 stages** **For heat pump models, HP stage selects the number of compressor stages**
H lock Outside air temperature heating lockout Default value = **120 °F (49 °C)**	Disables heating stage operation based on outdoor air temperature. Function will only be enabled if OS (outside air temperature sensor) is connected. **From -15 °F up to 120 °F (-26 °C up to 49 °C)**
C lock Outside air temperature mechanical cooling lockout. Default value = **-40 °F (-40 °C)**	Disables cooling stage operation based on outdoor air temperature. On economizer model, free cooling will not be disabled by this function. Function will only be enabled if OS (outside air temperature sensor) is connected. **From -40 °F up to 95 °F (-40 °C up to 35 °C)**
Unocc TM Unoccupied Timer value Default **0.5 hours**	Time delay between the moment where the Terminal Equipment Controller toggles from occupied to unoccupied after the last movement has been detected by the PIR. Range is: **0.5 to 24.0 hours** in 0.5 hour increments
2/4event Number of events configuration Default value = **2 event**	**2 events**, will set up scheduling for the following Event 1 is for Occupied setpoints Event 2 is for Unoccupied setpoints **4 events**, will set up scheduling for the following Event 1 is for Occupied setpoints Event 2 is for Unoccupied setpoints Event 3 is for Occupied setpoints Event 4 is for Unoccupied setpoints

aux cont Auxiliary contact configuration Default value = **N.O. normally open**	This contact can be used to energize peripheral devices such as: lighting equipment, exhaust fans, economizers, etc. This contact will operate in parallel with the internal occupied/unoccupied schedule of the Terminal Equipment Controller or the remote NSB contact if DI1 or DI2 is used. When the system is in **OFF mode**, the contact will remain in its unoccupied status independently of the occupied / unoccupied schedule.

Configured	**Contact occupied status**	**Contact unoccupied status**
N.O.	Closed	Opened
N.C.	opened	Closed

Prog rec Progressive recovery enabled Default value = **Off** Progressive recovery is automatically disabled if DI 1 and / or DI 2 are configured remote NSB	**Off**, = no progressive recovery The occupied schedule time is the time at which the system will restart. **On**, = progressive recovery active. The occupied schedule time is the time at which the desired occupied temperature will be attained. The Terminal Equipment Controller will automatically optimize the equipment start time. In any case, the latest a system will restart is 10 minutes prior to the occupied period time.
	Heat Pump models only
High bp High balance point Default value = **90 °F (32.0 °C)** Function will only be enabled if OS (outside air temperature sensor) is connected.	In *Heating or Auto mode*, it is the outside air temperature value at which the auxiliary heat will be cut off. Above that value, only the heat pump will be used to maintain the heating setpoint **34 to 90 °F (1.0 to 32.0 °C)**
Low bp Low balance point Default value = **-12 °F (-24 °C)** Function will only be enabled if OS (outside air temperature sensor) is connected.	In *Heating, Cooling or Auto mode*, it is the outside air temperature value at which the heat pump operation will be cut off. Below that value, only the auxiliary heat will be used to maintain the heating setpoint **-40 to 30 °F (-40 to -1.0 °C)**

Comf/eco Comfort or economy mode Default value = **Comfort**	Sets the operation and interaction mode of the heat pump with the auxiliary heat. **Comfort mode**. In *Heating mode.* If the heat pump is not able to satisfy the heating setpoint, the auxiliary heat will be energized to satisfy the same heating setpoint. **Economy mode**. In *Heating mode.* If the heat pump is not able to satisfy the heating setpoint, the auxiliary heat will be energized to satisfy only when the temperature has dropped 2.0 °F (1.1 °C) below the heating setpoint. Selecting economy mode will add a deadband between the heatpump & auxiliary heat in heating mode. The actual temperature maintained will be lower than the true heating setpoint to maximize the heat pump operation. When the outdoor air temperature drops below the *low balance point,* the deadband will be eliminated and the auxiliary heat will maintain the true heating setpoint alone. **Economy mode**. In *Emergency mode.* If *Emergency heat mode* is selected, the setpoint maintained, will be the heating setpoint.
Re valve Reversing valve operation O/B Default value = **O**	Heat pump reversing valve operation **O** will energize the valve in cooling operation. **B** will energize the valve in heating operation *O OR B*
comp/aux Compressor/auxiliary interlock Default value = **Off**	Sets the operation and interaction mode of the heat pump with the auxiliary heat. **Interlock Off**. In *Heating mode.* If the heat pump is not able to satisfy the heating setpoint, the auxiliary heat will be energized at the same time as the heat pump stage. Typically applies when the air handler heat pump coil is installed before the auxiliary heat. (all electric systems) **Interlock On**. In *Heating mode.* If the heat pump is not able to satisfy the heating setpoint, the auxiliary heat will be energized and the heat pump will be cut off. Typically applies when the air handler heat pump coil is installed after the auxiliary heat. (add on systems) There is a 2 minute delay to restart the heat pump, when the auxiliary heat is shut down **Off or On**

Notes for Heat Pump models: When the outside air sensor is not connected or is shorted, the Terminal Equipment Controller bypasses the heating / cooling lockouts and the low / high balance points. Also Heat Pump model when set in Emergency system mode bypasses heating lockout and permits auxiliary heating whenever a heating demand occurs.

chngstpt	In *Cooling* mode.
Changeover setpoint	The outside air temperature value at which the cooling will be switched over from mechanical (compressor) to free cooling (economizer)
Default value = **55 °F (13.0 °C)**	**14 to 70 °F (-10.0 to 21.0 °C)**

min pos	Outside air damper minimum position.
Minimum position	Will be active only when fan is on (G terminal) and the internal or remote scheduling is in occupied mode.
Default value = **0%**	When internal or remote scheduling is in unoccupied mode and/or fan is off, minimum position will be set to 0%

0 to 100 % = 0 to 10 VDC output range

Outside air percentage	0%	5%	10%	15%	20%	25%	30%
Setting for 0-10 VDC	0%	5%	10%	15%	20%	25%	30%
Setting for 2-10 VDC	0 to 20%	24%	28%	32%	36%	40%	44%

C mech	In *Cooling* mode.
Mechanical cooling allowed	Allows the operation of the mechanical cooling if the free cooling (economizer) cannot maintain the cooling setpoint.
Default value = **Off**	**Off** Typically applies when the MS (mixed air temperature sensor) is installed after the mechanical cooling refrigeration coils. In this case, mechanical cooling will never operate at the same time as free cooling.
	On Typically applies when the MS (mixed air temperature sensor) is installed before the mechanical cooling refrigeration coils in the mixing plenum. In this case, mechanical cooling is allowed when the free cooling (economizer operation) cannot maintain the cooling setpoint.
	Off or On

mix stpt	Free cooling mixed air setpoint when economizer mode is enabled.
Mixed air setpoint	**50 to 90 °F (10.0 to 32.0 °C)**
Default value = **55 °F (13.0 °C)**	

MS dis	Used as diagnostic / service help to troubleshoot and diagnose economizer operation.
Display mixed air temperature	

TROUBLESHOOTING GUIDE
All models

Symptom	Possible Cause	Corrective Action
No display on the Terminal Equipment Controller	Absent or incorrect supply voltage	1. Check power supply voltage between C & RC to be from 19-30 VAC 2. Check for tripped fuse or circuit breaker
	Overloaded power transformer	Verify that the transformer used is powerful enough (enough VA's) to supply all controlled devices including the Terminal Equipment Controller
Keyboard menu does not access all functions	Keyboard locked	Change configuration parameter LOCKOUT to value "0" to access all levels of the menu
Temperature setpoints revert to original value after a certain time period	Temporary setpoint option selected	1. The Terminal Equipment Controller needs to be in Permanent setpoint mode for the new setpoint to be kept and memory and used all the time 2. Go to the Set temperature menu. 3. The last prompt is setpoint type. Set it to Permanent setpoint
Terminal Equipment Controller will not call for heating	Wrong mode selected	Select heating mode
	Terminal Equipment Controller in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the Terminal Equipment Controller Occupied heating setpoint

	Anticycle delay active	Wait, the anticycling period will end and the equipment will start
	Heating setpoint is satisfied	Raise the Heating setpoint
	Heating lockout attained	1. Mode is locked out based on outside air temperature 2. Change configuration parameter H Lock to value 120 °F (49 °C) to by-pass lockout
	Wiring error	1. Start the Fan by forcing the Fan ON mode 2. Put a jumper across terminals RH & W1. The heating should come ON. If it does not, verify wiring and check if a jumper is required between RC & RH
Terminal Equipment Controller will not call for cooling	Wrong mode selected	Select cooling mode
	Terminal Equipment Controller in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the Terminal Equipment Controller Occupied cooling setpoint
	Anticycle delay active	Wait, the anticycling period will end and the equipment will start
	Cooling setpoint is satisfied	Lower the cooling setpoint
	Cooling lockout attained	1. Mode is locked out based on outside air temperature 2. Change configuration parameter C Lock to value -40 °F (-40 °C) to by-pass lockout
	Wiring error	1. Start the Fan by forcing the Fan ON mode 2. Put a jumper across terminals RC & Y1. The cooling should come ON. If it does not, verify wiring
The Terminal Equipment Controller will not turn on the fan	Wrong mode selected	1. Start the Fan by forcing the Fan ON mode 2. Put a jumper across terminals RC & G. The fan should come ON. If it does not, verify wiring
	Wiring error	
Digital display shows missing digits or erratic segments	Defective display	Replace Terminal Equipment Controller

Heat pump models

Symptom	Possible Cause	Corrective Action
Auxiliary heat does not operate	Wrong mode selected	Select emergency heat mode
	Terminal Equipment Controller in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the Terminal Equipment Controller Occupied heating setpoint
	Anticycle delay active	Wait, the anticycling period will end and the equipment will start
	Heating setpoint is satisfied	Raise the Heating setpoint
	High Balance point attained	1. Mode is locked out based on outside air temperature 2. Change configuration parameter High BP to value 90 °F (32 °C) to by-pass lockout
	Heating lockout attained	1. Mode is locked out based on outside air temperature 2. Change configuration parameter H Lock to value 120 °F (49 °C) to by-pass lockout
	Wiring error	1. Start the Fan by forcing the Fan ON mode 2. Put a jumper across terminals RH & W1. The heating should come ON. If it does not, verify wiring and check if a jumper is required between RC & RH

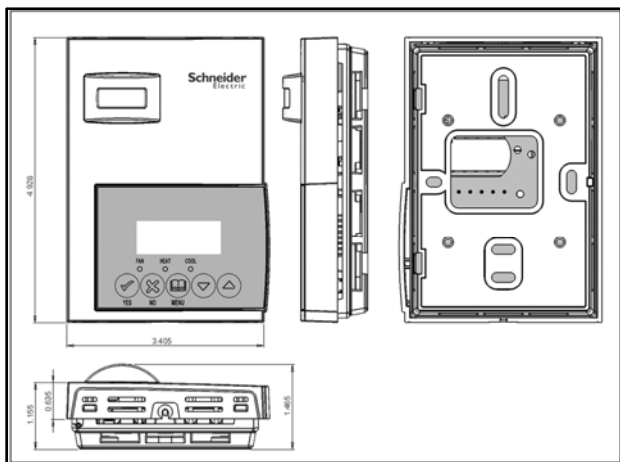| Heat pump does not operate in heating mode	Wrong mode selected	Select heating mode
	Terminal Equipment Controller in Unoccupied mode	Select Occupied Hold in Schedule hold or Override to force the Terminal Equipment Controller Occupied heating setpoint
	Anticycle delay active	Wait, the anticycling period will end and the equipment will start
	Heating setpoint is satisfied	Raise the Heating setpoint
	Low Balance point attained	1. Mode is locked out based on outside air temperature 2. Change configuration parameter Low BP to value -12 °F (-24 °C) to by-pass lockout
	Heating lockout attained	1. Mode is locked out based on outside air temperature 2. Change configuration parameter H Lock to value 120 °F (49 °C) to by-pass lockout
	Wiring error	1. Start the Fan by forcing the Fan ON mode 2. Put a jumper across terminals RH & W1. The heating should come ON. If it does not, verify wiring and check if a jumper is required between RC & RH
	Wrong reversing valve configuration	1. Wrong selection of parameter Re Valve 2. Select O will energize the valve in cooling operation. Valve is normally heat. 3. Select B will energize the valve in heating operation. Valve is normally cool.

SPECIFICATIONS

Terminal Equipment Controller power requirements:	19-30 VAC 50 or 60 Hz; 2 VA Class 2
Operating conditions:	0 °C to 50 °C (32 °F to 122 °F) 0% to 95% R.H. non-condensing
Storage conditions:	-30 °C to 50 °C (-22 °F to 122 °F) 0% to 95% R.H. non-condensing
Temperature sensor:	Local 10 K NTC thermistor
Temperate sensor resolution:	± 0.1 °C (± 0.2 °F)
Temperature control accuracy:	± 0.5 ° C (± 0.9 °F) @ 21 °C (70 °F) typical calibrated
Contact output rating	Relay output: 30 VAC, 1 Amp. Maximum, 3 Amp. In-rush.
Occ, Stand-By and Unocc cooling setpoint range:	12.0 to 37.5 °C (54 to 100 °F)
Occ, Stand-By and Unocc heating setpoint range:	4.5 °C to 32 °C (40 °F to 90 °F)
Room and outdoor air temperature display range:	-40 °C to 50 °C (-40 °F to 122 °F)
Proportional band for room temperature control:	Cooling & Heating: Default: 1.1°C (2°F)
Digital inputs:	Dry contact across terminal DI1, DI2
Economizer analog output rating	0 to 10 VDC into 2KΩ resistance min
Economizer analog output accuracy:	± 3% typical
Wire gauge:	18 gauge maximum, 22 gauge
Approximate shipping weight:	0.75 lb (0.34 kg)
Agency Approvals all models:	**UL:** UL 873 (US) and CSA C22.2 No. 24 (Canada), File E27734 with CCN XAPX (US) and XAPX7 (Canada) **Industry Canada:** ICES-003 (Canada)
Agency Approvals all models:	**FCC:** Compliant to CFR 47, Part 15, Subpart B, Class A (US) **CE :** EMC Directive 89/336/EEC (Europe Union) **C-Tick:** AS/NZS CISPR 22 Compliant (Australia / New Zealand) Supplier Code Number N10696
Agency Approvals Wireless models:	**FCC:** Compliant to: Part 15, Subpart C

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION

Please check with your local government for instruction on disposal of this product

DRAWING & DIMENSIONS