



VT7600E Series
RTU Terminal Equipment Controller with IAQ
Control

Installation Guide

For Commercial HVAC Applications

January 17th. 2012 / 028-0363-R1

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INSTALLATION

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

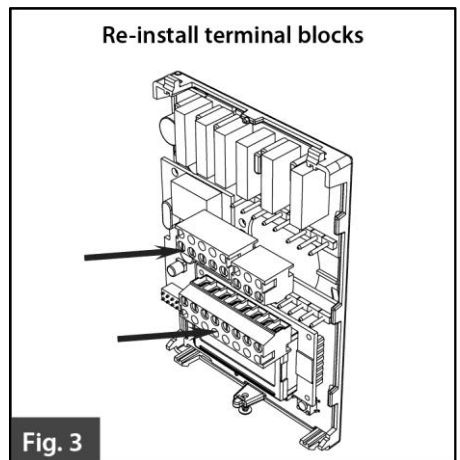
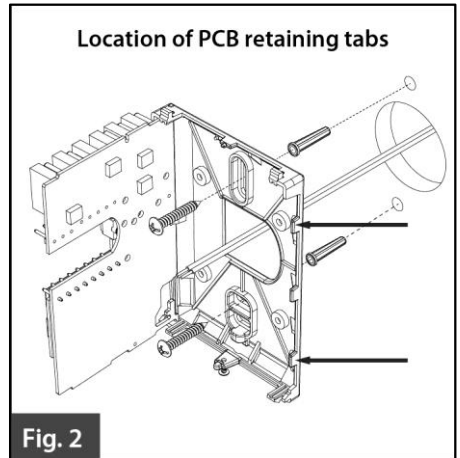
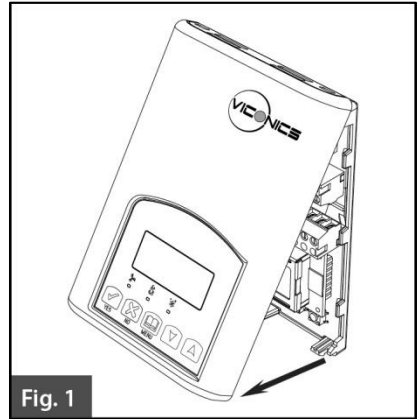
- Open unit by pulling on the bottom side of Terminal Equipment Controller (fig. 1).
- Remove wiring terminals from sticker.
- Please read the FCC ID and IC label installed in the cover upon removal of cover for the wireless products.

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 base in the proper orientation. Arrow on base should be facing 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.
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.



- When 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 improper wiring may permanently damage the Terminal Equipment Controller or the equipment.
- All VT7000 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 or installer or 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 VT76X6E series uses a Viconics proprietary adaptive logic algorithm to control the space temperature. This algorithm controls the heating or 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 thermostats.

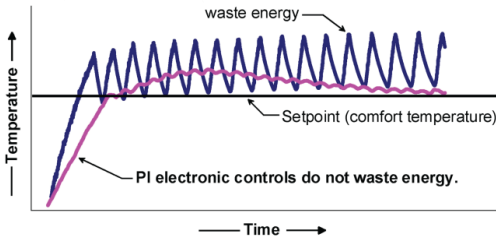


Fig.2 - On-Off mechanical control vs. PI electronic control.

Features overview

- 7 day schedule models, 2 or 4 events.
- CO₂ control logic based on fresh air volume or fresh air damper position.
- Fresh air damper output for building CO₂ level control.
- Gas, oil or electric system compatibility.
- Remote outdoor sensing capability for added flexibility.
 - System mode heating and cooling lockout.
- Remote discharge air sensor input for monitoring and control purpose.
 - System efficiency feedback.
 - Discharge high limit heating lockout.
 - Discharge low limit cooling lockout.
- Remote return air sensor input that replaces internal on board sensor.
 - System efficiency feedback.
- Password protected configuration menu and lockable keypads for security.
- Automatic smart fan operation saves energy during unoccupied periods.
- Non volatile EEPROM memory prevents loss of parameters during power shortage.
- 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.

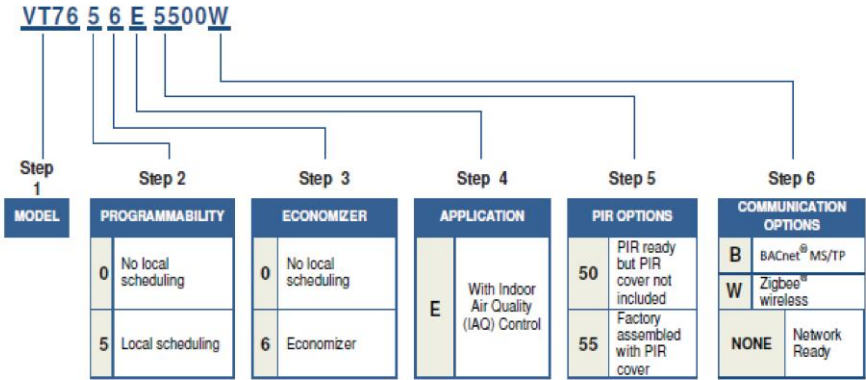
Easy configuration and self-binding operation

- Easy configuration without using any special software or additional tools.
- Can be used as stand-alone or with BACnet™ MS-TP supervision controller for monitoring purposed.
- Truly scalable in terms of supported number of zones and RTU units.

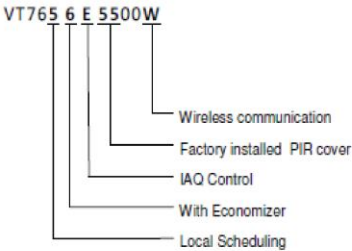
MODEL CHART

Product Selector

Please refer to the following matrix when ordering:



EXAMPLE:



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

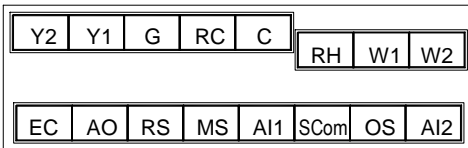
- All Viconics VT7600 series Terminal Equipment Controllers are designed for stand-alone (Network Ready) operation.
- They can be fully integrated into your choice of automation systems using the available communication adapter options.
- If required, stand-alone (Network Ready) Terminal Equipment Controllers can be field retrofitted with the following communication adapters:
 - VCM7600N5000B, Terminal Equipment Controller BACnet™ MS-TP® communication adapter.
 - VCM7600N5000W Terminal Equipment Controller wireless Zigbee™ communication adapter.

TERMINAL, IDENTIFICATION AND FUNCTION

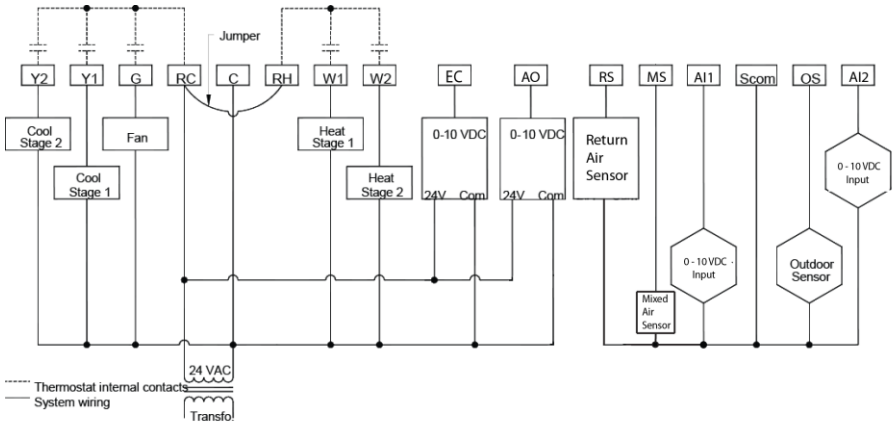
| Terminal Use | Terminal Identification | Description |
|-------------------------|-------------------------|---|
| 1 – Cool 2 | Y2 | Output for cooling / compressor stage number 2. |
| 2 – Cool 1 | Y1 | Output for cooling / compressor stage number 1. |
| 3 - Fan | G | Output for the fan. |
| 4 - 24 V ~ Hot | RC | Power supply of thermostat, hot side (Delivered from the RTU). |
| 5 - 0 V ~ Com | C | Power supply of thermostat, common side. Also used as reference for the analog BPD output when used (Delivered from the RTU). |
| 6 – Heat Switch Leg | RH | 24 VAC switched leg for the heating stages. <ul style="list-style-type: none"> • If heating stages are part of RTU, install a jumper across RC & RH. • If heating stages are part of separate equipment with a different power supply, feed external switched power leg through RH without installing a jumper across RC & RH. |
| 7 – Heat 1 | W1 | Output for heating stage number 1. |
| 8 – Heat 2 | W2 | Output for heating stage number 2. |
| 9 – Economizer Output | EC | 0-10 VDC analog fresh air damper / economizer output. |
| 10 – Analog Heat Output | AO | 0-10 VDC analog heating output. |
| 11 – RS | RS | Return air temperature sensor input. Used when communication is lost. If remote sensor fails, thermostat will use its on-board sensor to control. |
| 12 – MS | MS | Discharge air temperature sensor input |
| 13 – AI1 | AI1 | 0-10 VDC analog input for CO ₂ transmitter |
| 14 – Scom | Scom | Reference input for AI, RS, OS and DS |
| 15 – OS | OS | Outside air temperature sensor input |
| 16 –AI2 | AI2 | 0-10 VDC analog input for airflow transmitter |

Screw terminal arrangement and wiring

Controller Terminals



TYPICAL APPLICATIONS



Main outputs wiring

Wiring notes:

- Note 1: If the same power source is used for the heating stages, install jumper across RC & RH. Maximum current is 2.0 amps.
- Note 2: Economizer and all analog outputs and inputs use a half bridge rectifier. Reference of the control signal is the common of the power supply of the Terminal Equipment Controller. (Terminal C).
- Note 3: 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 4: 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.

Remote sensor accessories

| Model no. | Description |
|------------|---------------------------------|
| S2020E1000 | Outdoor temperature sensor |
| S2060A1000 | Averaging temperature sensor |
| S2000D1000 | Duct mounted temperature sensor |

Remote mount temperature sensors use 10K NTC thermistor.

Temperature vs. Resistance Chart for 10 Kohm NTC Thermistor

($R_{25^{\circ}\text{C}} = 10\text{K}\Omega \pm 3\%$ - $B_{25/85^{\circ}\text{C}} = 3975\text{K} \pm 1.5\%$)

| °C | °F | Kohm | °C | °F | Kohm | °C | °F | Kohm | °C | °F | Kohm | °C | °F | 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 |

S2000D1000; remote duct mounted temperature sensor c/w 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 sensing.



Fig.10 – Remote Duct Mounted Temperature Sensor

S2060A1000; remote averaging duct mounted temperature sensor c/w 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.
- Supply air temperature averaging sensor for economizer models with the sensor in the mixing plenum.

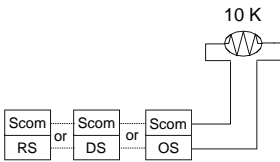
S2020E1000; outdoor air temperature sensor

This sensor can be used for:

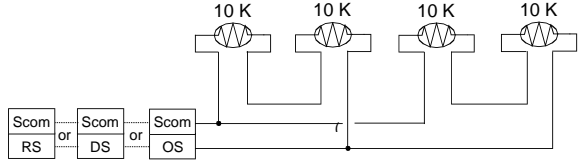
- Outside air temperature sensing with the sensor installed directly exposed to the elements.
- Sensor uses a water resistant NEMA 4 ABS enclosure for outdoor applications.

WIRING S2000D1000, S2060A1000 and S2020E1000

Remote wiring 1 sensor



Remote wiring 4 sensors



CONFIGURING AND STATUS DISPLAY INSTRUCTIONS

Status display

The Terminal Equipment Controller features a two-line, eight-character display. There is a low 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 current status of the system.

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

Manual scrolling 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:

| CLOCK STATUS | SYSTEM MODE | SCHEDULE STATUS | OUTDOOR TEMPERATURE | ALARMS |
|-----------------------|------------------|------------------|-------------------------|-------------------------|
| Monday 12:00 AM | Sys mode auto | Occupied | Outdoor x.x °C or °F | Frost ON |
| | Sys mode off | Occupied hold | | SetClock |
| | Sys mode heat | Unoccup | | DAS alarm |
| | Sys mode cool | | | FA Alarm |
| | | | | High CO ₂ |

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:




Sequence of manual-scroll status display:

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.

| Clock Status | System Mode | Schedule Status | Outdoor Temperature | Alarms (if detected) |
|--------------------|------------------|-----------------|--------------------------|----------------------|
| Monday 12:00 AM | Sys Mode Off | Occupied | Outdoor xx.x °C or °F | Frost ON |
| | Sys Mode Auto | Unoccupied | | SetClock |
| | Sys Mode Cool | Override | | DAS Alarm |
| | Sys Mode Heat | | | FA Alarm |
| | | | | High CO ₂ |

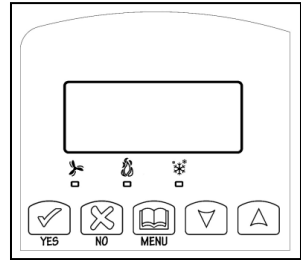
| | |
|----------------------------|---|
| Frost ON | Indicates that the heating is energized by the low limit frost protection room temperature setpoint 5.6 °C (42 °F). |
| SetClock | Indicates that the clock needs to be reset. There has been a power failure which has lasted longer than 6 hours. |
| DAS Alarm | Indicates that the discharge air temperature is either too low or too high. |
| FA Alarm | Indicates that the Fresh Air Level is either too low or too high. |
| High CO₂ | Indicates that the CO ₂ Level value is higher than the Max CO ₂ parameter value. |

USER INTERFACE

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

User configuring instructions menu

The VT76X6E series of controllers feature an intuitive, menu-driven, back-lit LCD display that walks users and installers through the configuring steps, making the configuring process extremely simple. This menu is typically accessed by the user to set the parameters such as the clock time set, the schedule time events and the system mode.








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 controller.

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

Each of the sections in the menu is accessed and configured using 5 keys on the controller cover. The priority for the alarms is as follows:

Local keypad interface

| | |
|--|---|
|  | The YES key is used to confirm a selection, to move onto the next menu item and to manually scroll through the displayed information. |
|  | 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. |
|  | 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 automatically after 45 seconds.

Sequence of user menu:

| | | | |
|------------------------------------|--------------------------------|------------------------------|--------------------------|
| Override Resume | System mode setting | Schedules setting | Clock setting |
| Override schd Y/N | Sys mode set Y/N | Schedule set Y/N | Clock set Y/N |
| Appears only in unoccupied mode | | | |
| Cancel ovrd Y/N | | | |
| Appears only in override mode | | | |

A) Override an unoccupied period

**Override
schd Y/N**

This menu will appear only when the Terminal Equipment Controller is in unoccupied mode.

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 |

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 & 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 |
| | 72 °F | 70 °F | 80 °F | 62 °F |
| Monday | 7.00 AM | | 6.00 PM | |
| Tuesday | 7.00 AM | | 6.00 PM | |
| Wednesday | 7.00 AM | | 6.00 PM | |
| Thursday | 7.00 AM | | 6.00 PM | |
| Friday | 7.00 AM | | 6.00 PM | |
| Saturday | 12.00 PM * | | 12.00 PM * | |
| Sunday | 12.00 PM * | | 12.00 PM * | |

| Daily Occupancy |
|-----------------|
| Day time only |
| Day time only |
| Day time only |
| Day time only |
| Day time only |
| Unoccupied |
| 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 |
| | 72 °F | 70 °F | 80 °F | 62 °F |
| Monday | 8.00 AM | | 5.00 PM | |
| Tuesday | 8.00 AM | | 5.00 PM | |
| Wednesday | 8.00 AM | | 5.00 PM | |
| Thursday | 8.00 AM | | 5.00 PM | |
| Friday | 8.00 AM | | 5.00 PM | |
| Saturday | 12.00 AM ** | | 11.59 PM ** | |
| Sunday | 12.00 AM ** | | 11.59 PM ** | |

| Daily Occupancy |
|-----------------|
| Day time only |
| Day time only |
| Day time only |
| Day time only |
| Day time only |
| Occupied |
| 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 & 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 | | Daily Occupancy |
|------------------|--------------------|--------------|--------------------|--------------|--------------------|---------------|--------------------|---------------|-----------------------|
| | Setpoint | Occupied | Unoccupied | Unoccupied | Occupied | Unoccupied | Occupied | Unoccupied | |
| | Cool 72°F | Heat 70°F | Cool 80°F | Heat 62°F | Cool 72°F | Heat 70 °F | Cool 80°F | Heat 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 | | Daily Occupancy |
|------------------|--------------------|--------------|--------------------|--------------|--------------------|--------------|--------------------|--------------|-----------------------|
| | Setpoint | Occupied | Unoccupied | Unoccupied | Occupied | Unoccupied | Occupied | Unoccupied | |
| | Cool 72°F | Heat 70°F | Cool 80°F | Heat 62°F | Cool 72°F | Heat 70°F | Cool 80°F | Heat 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

| CONFIGURATION PARAMETERS DEFAULT VALUE | SIGNIFICANCE AND ADJUSTMENTS |
|--|--|
| <p>PswrdSet Configuration parameters menu access password Default value = 0 No password prompted</p> | <p>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</p> |
| <p>Com addr Thermostat networking address Default value = 254 Range is: 0 to 254</p> | <p>Conditional parameter to BACnet MS-TP models (VT76xxX5x00B) Conditional parameter to Wireless models (VT76xxX5x00W) This parameter will only appear when a BACnet or wireless network adapter is present. If the thermostat is installed as a stand-alone unit or with an Echelon adapter, this parameter will not be used or displayed</p> <ul style="list-style-type: none"> - For BACnet MS-TP models valid range to use is from 1 to 127. Default value of 254 disables BACnet communication for the thermostat. - For wireless models valid range is 0 to 254 with a maximum of 30 thermostat per VWG |
| <p>PAN ID Personal Area Network Identification Default value = 0 Range is: 0 to 1000</p> | <p>Conditional parameter to Wireless models (VT76xxX5x00W) 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</p> <p>This parameter (Personal Area Network Identification) is used to link specific Terminal Equipment Controllers to a single specific Viconics 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).</p> <p>The default value of 0 is NOT a valid PAN ID.</p> |

| | |
|---|---|
| <p>Channel Channel selection Default value = 10 Range is: 10 to 26</p> | <p>Conditional parameter to Wireless models (VT76xxX5x00W)</p> <p>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</p> <p>This parameter (Channel) is used to link specific Terminal Equipment Controllers to specific Viconics 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).</p> <p><i>Viconics recommends using only the usage of channels 15 and 25 only.</i></p> <p>The default value of 10 is NOT a valid channel. The valid range of available channel is from 11 to 26</p> |
| <p>A11 Analog input no.1 configuration Default value = None</p> | <p>None, No function will be associated with the input CO₂, the 0-10VDC input value is used as a 0-2000ppm CO₂ level: 0 VDC = 0ppm 10VDC = 2000ppm</p> |
| <p>FA Range FA range upper limit value Default value = 0 CFM</p> | <p>Sets the upper limit of the CFM range. This parameter should be set based on the rooftop unit size. If set to 0 CFM, the fresh air damper control will be based on the Min/Max CO₂ and Min/Max Pos values. See Damper Position section for more details.</p> <p>0 to 20 000 CFM (0 to 9438 L/s), 10 or 100 increments</p> |
| <p>MenuScro Menu scroll Default value = On = Scroll active</p> | <p>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.</p> <p>On = Scroll active Off = Scroll not active</p> |
| <p>Lockout Keypad lockout levels Default value = 0 No lock</p> | <p>0 = No lock 1 = Low level 2 = High level</p> |

| 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 (2 °C) | | | Minimum occupied & unoccupied cooling setpoint adjustment. Cooling setpoint range is: 54 to 100 °F (12.0 to 37.5 °C) | | | | | |

| <p>Pband Proportional Band setting Default value 2 = 2.0 °F (0.6 °C)</p> | <p>Adjust the proportional band used by the Terminal Equipment Controller PI control loop.</p> <p> 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.</p> <table border="1" data-bbox="497 428 902 683"> <thead> <tr> <th>Value</th> <th>F scale Pband</th> <th>C scale Pband</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>2 F</td> <td>1.1 C</td> </tr> <tr> <td>3</td> <td>3 F</td> <td>1.7 C</td> </tr> <tr> <td>4</td> <td>4 F</td> <td>2.2 C</td> </tr> <tr> <td>5</td> <td>5 F</td> <td>2.8 C</td> </tr> <tr> <td>6</td> <td>6 F</td> <td>3.3 C</td> </tr> <tr> <td>7</td> <td>7 F</td> <td>3.9 C</td> </tr> <tr> <td>8</td> <td>8 F</td> <td>4.4 C</td> </tr> </tbody> </table> | 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 |
|--|---|---------------|---------------|---------------|---|-----|-------|---|-----|-------|---|-----|-------|---|-----|-------|---|-----|-------|---|-----|-------|---|-----|-------|
| 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 | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Anticycle Minimum on/off operation time for stages Default value = 2 minutes</p> | <p>Minimum On/Off operation time of cooling & heating stages.</p> <p>IMPORTANT, <i>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.</i> 0, 1, 2, 3, 4 & 5 minutes</p> <p>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.</p> | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Heat cph Heating stages cycles per hour Default value = 4 C.P.H.</p> <p>Only valid if HT Type is set to Staged</p> | <p>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.</p> <p>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.</p> <p>For multi stage models, heat cph applies to W1 & W2 For heat pump models, heat cph applies to W1 only (Emergency heat)</p> | | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|--|---|
| <p>cool cph Cooling stages cycles per hour Default value = 4 C.P.H.</p> | <p>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.</p> <p>For multi stage models, cool cph applies to Y1 & Y2</p> <p>For heat pump models, cool cph applies to Y1 & Y2 in cooling and heating independently of the reversing valve position</p> |
| <p>deadband Minimum deadband Default value = 2.0 °F (1.1 °C)</p> | <p>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)</p> |
| <p>fan cont Fan control Default value = On</p> | <p>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. <i>ON OR OFF</i></p> <p>For multi stage models, fan control applies to W1 & W2</p> <p>For heat pump models, fan control applies to W1 only (Emergency heat)</p> |
| <p>fan del Fan delay Default value = Off</p> | <p>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</p> |
| <p>ToccTime Temporary occupancy time Default value = 3 hours</p> | <p>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 the menu. 0,1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12 hours</p> |
| <p>Cal RS Room air temperature sensor calibration Default value = 0.0 °F or °C</p> | <p>Offset that can be added/subtracted to actual displayed room temperature ± 5.0 °F (± 2.5 °C)</p> |

| | |
|---|--|
| <p>Cal OS Outside air temperature sensor calibration Default value = 0.0 °F or °C</p> | <p>Offset that can be added/subtracted to actual displayed outside air temperature ± 5.0 °F (± 2.5 °C)</p> |
| <p>H stage Number of heating stages. Default value = 2 stages</p> | <p>Will revert the operation of 2 stages thermostat to single stage operation or to modulating 0 to 10Vdc heating output:</p> <p>0 = 0-10Vdc analog heating output (AO) 1 = 1 heating stage (W1) 2 = 2 heating stages (W1 & W2)</p> |
| <p>C stage Number of cooling stages Default value = 2 stages</p> | <p>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</p> |
| <p>H lock Outside air temperature heating lockout Default value = 120 °F (49 °C)</p> | <p>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)</p> |
| <p>C lock Outside air temperature mechanical cooling lockout. Default value = -40 °F (-40 °C)</p> | <p>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)</p> |
| <p>Unocc TM Unoccupied Timer value Default 0.5 hours</p> | <p>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.</p> <p>Range is: 0.5 to 24.0 hours in 0.5 hour increments</p> |

| | |
|--|---|
| <p>2/4event Number of events configuration Default value = 2 event</p> | <p>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</p> |
| <p>Prog rec Progressive recovery enabled Default value = Off Progressive recovery is automatically disabled if DI 1 and / or DI 2 are configured remote NSB</p> | <p>Off, = no progressive recovery The occupied schedule time is the time at which the system will restart.</p> <p>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.</p> <p>In any case, the latest a system will restart is 10 minutes prior to the occupied period time.</p> |
| <p>Min SH Only valid if HT Type is set to Analog Minimum supply heat temperature setpoint Default value = 64 °F (18 °C)</p> | <p>Sets the minimum supply heat to be maintained by the controller during occupied periods (Occupied or Temporary Override). From 50 °F up to 72 °F (10 °C up to 22 °C) (increments: 0.5° or 5°)</p> |
| <p>Chngstpt Changeover setpoint Default value = 55 °F (13.0 °C)</p> | <p>In <i>Cooling</i> mode. The outside air temperature value at which the cooling will be switched over from mechanical (compressor) to free cooling (economizer) 14 to 70 °F (-10.0 to 21.0 °C)</p> |

| | |
|---|--|
| <p>C mech Mechanical cooling allowed Default value = Off</p> | <p>In <i>Cooling</i> mode.</p> <p>Allows the operation of the mechanical cooling if the free cooling (economizer) cannot maintain the cooling setpoint.</p> <p>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.</p> <p>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.</p> <p>Off or On</p> |
| <p>mix stpt Mixed air setpoint Default value = 55 °F (13.0 °C)</p> | <p>Free cooling mixed air setpoint when economizer mode is enabled.</p> <p>50 to 90 °F (10.0 to 32.0 °C)</p> |
| <p>SH lock Only valid if HT Type is set to Analog Outside air temperature supply heat lockout Default value = 32 °F (0 °C)</p> | <p>Disables heating operation based on outdoor air temperature.</p> <p>From -15 °F up to 120 °F (-26 °C up to 49 °C) (increments: 5° or 50°)</p> |
| <p>Dis HL Discharge air temperature high limit Default: 120°</p> | <p>Discharge air high temperature value at which the heating stages will be locked out.</p> <p>70°F to 150°F (21°C to 65°C) (increments: 0.5° or 5°)</p> |
| <p>Dis LL Discharge air temperature low limit Default: 45°F</p> | <p>Discharge air low temperature value at which the cooling stages will be locked out.</p> <p>35 to 65°F (2.0°C to 19.0°C) (increments: 0.5° or 5°)</p> |

| | |
|--|--|
| <p>Min Pos</p> <p>Minimum Fresh Air Damper/Economizer Position</p> <p>Default value = 0%</p> | <p>Minimum fresh air damper position. Effective only in Occupied mode (Fan is ON). This value is also used to determine the fresh air damper position based on the Min/Max CO₂ and Min/Max Pos values set. See Fresh Air Damper Position section for more details.</p> <p>0% to 100%, 1 or 10 increments</p> |
| <p>Max Pos</p> <p>Maximum Fresh Air Damper/Economizer Position</p> <p>Default value = 100%</p> | <p>Maximum fresh air damper position. Effective only in Occupied mode (Fan is ON). This value is used to determine the fresh air damper position based on the Min/Max CO₂ and Min/Max Pos values set. See Fresh Air Damper Position section for more details.</p> <p>0% to 100%, 1 or 10 increments</p> |
| <p>Min FA</p> <p>Minimum Fresh Air Value</p> <p>Default value = 0 CFM</p> | <p>Minimum fresh air required. Effective only in Occupied mode (Fan is ON). This value is used to determine the fresh air damper position based on the Min/Max CO₂ and Min/Max FA values (if FA Range is set to other than 0 CFM). See Fresh Air Damper Position section for more details.</p> <p>0 to 20 000 CFM (0 to 9438 L/s) (the value set cannot exceed the value of FA Range parameter), 10 or 100 increments</p> |
| <p>Max FA</p> <p>Maximum Fresh Air Value</p> <p>Default value = 0 CFM</p> | <p>Maximum fresh air allowed. Effective only in Occupied mode (Fan is ON). This value is used to determine the fresh air damper position based on the Min/Max CO₂ and Min/Max FA values set (if FA Range is set to other than 0 CFM). See Fresh Air Damper Position section for more details.</p> <p>0 to 20 000 CFM (0 to 9438 L/s) (the value set cannot exceed the value of FA Range parameter), 10 or 100 increments</p> |
| <p>Min CO₂</p> <p>Minimum CO₂ Level</p> <p>Default value = 800 ppm</p> | <p>Minimum CO₂ Level required. Effective only in Occupied mode (Fan is ON). This value is used to determine the fresh air damper position based on the Min/Max CO₂ and Min/Max Pos values set. See Fresh Air Damper Position section for more details.</p> <p>0 to 2000 ppm, 10 or 100 increments</p> |

| | |
|---|---|
| <p>Max CO₂</p> <p>Maximum CO₂ Level</p> <p>Default value = 1200 ppm</p> | <p>Maximum CO₂ Level allowed. Effective only in Occupied mode (Fan is ON). This value is used to determine the fresh air damper position based on the Min/Max CO₂ and Min/Max Pos values set. See Fresh Air Damper Position section for more details.</p> <p>0 to 2000 ppm, 10 or 100 increments</p> |
| <p>MS dis</p> <p>Display mixed air temperature, only if sensor is installed.</p> | <p>Used as diagnostic / service help to troubleshoot and diagnose economizer operation.</p> |
| <p>CO₂ Level</p> <p>Display CO₂ Level, only if a CO₂ transmitter is installed at AI1 input.</p> | <p>Used as diagnostic / service help to troubleshoot and diagnose IAQ control operation</p> |

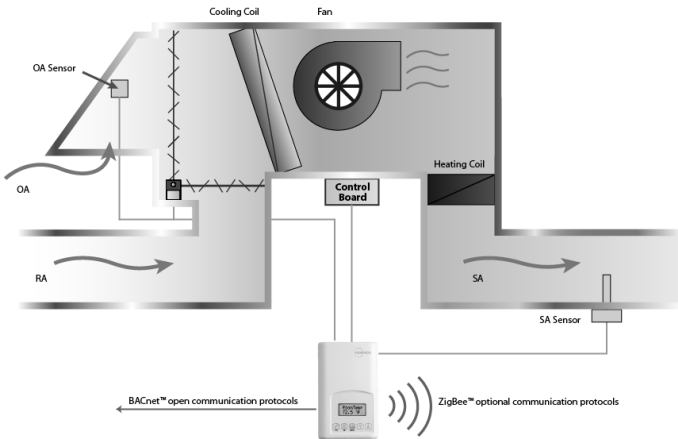
FRESH AIR DAMPER CONTROL SEQUENCES

The fresh air damper can be controlled through more than one sequence to achieve different control strategies such as free cooling (economizer mode), minimum fresh air control and CO₂ level control. Here are the control sequences available:

Note: For the sequences mentioned below, the following conditions must be met in order for the sequences to be performed as stated:

- **Max Pos parameter value must be greater than Min Pos Parameter value.**
- **Mac CO₂ parameter value must be greater than Min CO₂ Parameter value.**
- **Max FA parameter value must be greater than Min FA Parameter value.**

Economizer Control Mode Only

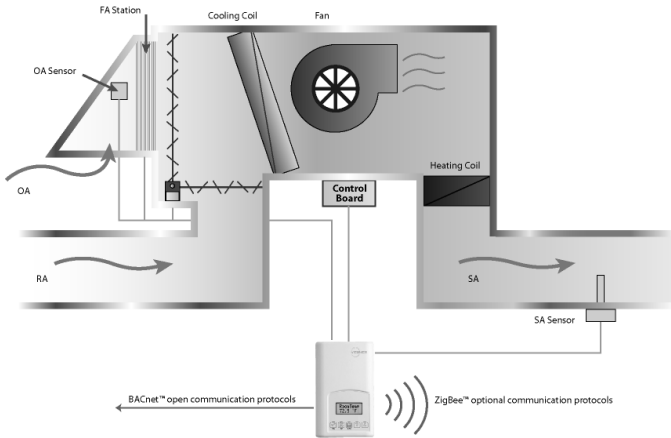


If the fresh air damper is to be used only for free cooling purposes (economizer mode, without fresh air measurement station or CO₂ control), only the Min Pos parameter and the free cooling sequence will be active.

- **The FA Range parameter should be set to 0 CFM. (Default Value = 0 CFM)**
- **Set the Chngstpt parameter to desired value which free cooling is enabled. (Default Value = 55°F)**

If the outside air temperature is greater than the changeover setpoint, then normal mechanical cooling will be used. If the outside air temperature is less than or equal to the changeover setpoint, then free cooling will be enabled and mechanical cooling stages will be locked out.

Economizer Mode and Fresh Air Measurement Station



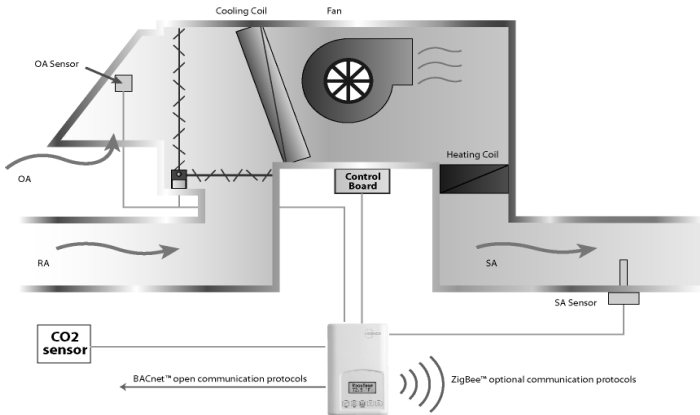
If the fresh air damper is to be used for both free cooling and minimum fresh air volume control (economizer mode and fresh air measurement station, but without CO₂ level control), only the Min FA parameter and the free cooling sequence will be active.

- **The FA Range parameter should be set to a value higher than 0 CFM (0 CFM disables the fresh air control).**
- **Min FA (minimum fresh air) parameter should be set to the desired level.**

The FA Range parameter value should be set to the maximum capacity of the fresh air measurement station. Therefore the relationship between air volumes and input signals can be established. For example, if the fresh air station capacity is 10000 CFM, set FA Range to 10000.

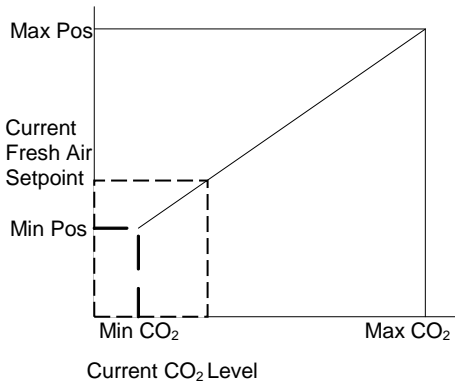
This will set the relationship of **0 VDC = 0 CFM** and **10VDC = 10000 CFM**.

Economizer Mode and CO₂ Level Control



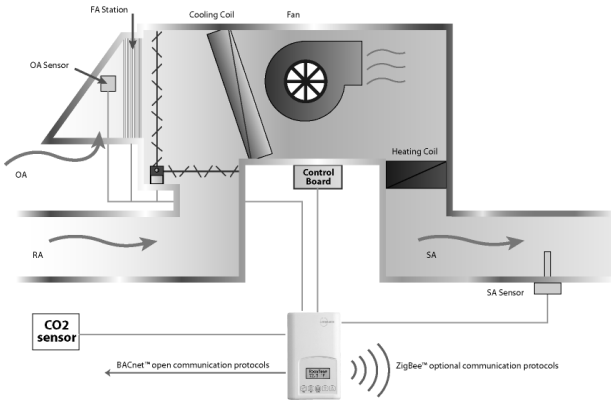
If the fresh air damper is to be used for both free cooling and CO₂ level control (economizer mode and CO₂ level control, but without fresh air measurement station), only the Min Pos, Max Pos, Min CO₂ and Max CO₂ parameters as well as the free cooling sequence will be active.

- **The FA Range parameter should be set to 0 CFM.**
- **Set AI1 parameter to CO₂ (0 VDC = 0ppm ; 10VDC = 2000ppm)**
- **Min Pos, Max Pos, Min CO₂ and Max CO₂ parameters should be set according to the required setting.**



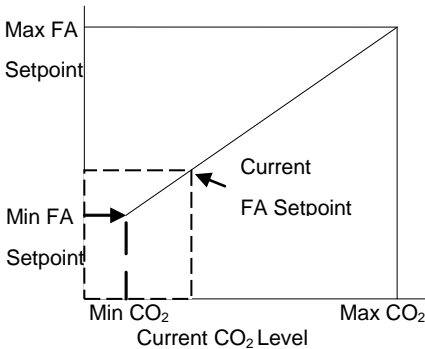
The highest value between free cooling demand output and interpolation output for the fresh air setpoint will be the output to the fresh air damper.

Economizer Mode, CO₂ Level Control and Fresh Air Measurement Station



If the fresh air damper is to be used for both free cooling and CO₂ level control with a fresh air measurement station, only the Min FA, Max FA, Min CO₂ and Max CO₂ parameters as well as the free cooling sequence will be active.

- **The FA Range parameter should be set to something other than 0 CFM.**
- **Use an air flow transmitter to read fresh air level with AI2 input (0-5 VDC input)**
- **Min FA, Max FA, Min CO₂ and Max CO₂ parameters should be set according to the required setting.**



The highest value between free cooling demand output and interpolation output for the fresh air setpoint based on the CO₂ level will be the output to the fresh air damper

SPECIFICATIONS

Terminal Equipment Controller power

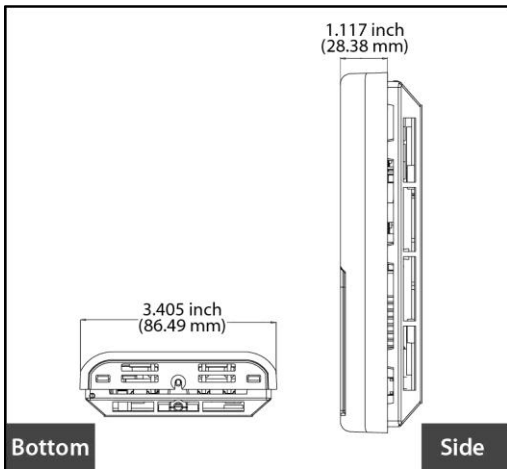
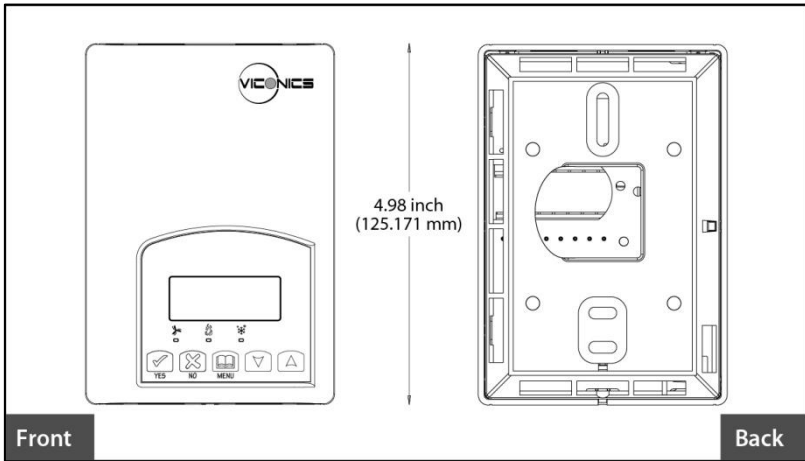
| | |
|---|---|
| requirements: | 19-30 VAC 50 or 60 Hz; 2 VA Class 2 |
| Operating conditions: | 0 °C to 50 °C (32 °F to 122 °F) 0% to 95% R.H. non-condensing |
| Storage conditions: | -30 °C to 50 °C (-22 °F to 122 °F) 0% to 95% R.H. non-condensing |
| Sensor: | Local 10 K NTC thermistor |
| Resolution: | ± 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 outputs: 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 temp. display range: | Factory default: Cooling & Heating: 1.8 °C (3.2 °F)-(Adjustable). |
| CO₂ and airflow analog inputs: | 0 to 10 VDC input across Scom, AI1 and AI2. |
| Analog heat & economizer analog outputs rating: | 0-10VDC into 2KW resistance min. |
| Analog heat & 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 2004/108/EC (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 B, Class (US) |

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 UNDESIRE OPERATION



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

DRAWING & DIMENSIONS



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