VT7600E Series

User Interface Guide

January 10ᵗʰ 2017 / 028-6112-00

CONTENTS

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. • If heating stages are part or 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
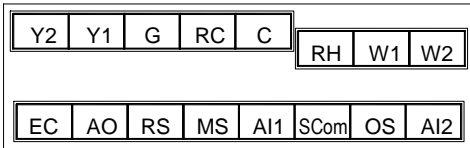
Typical Applications
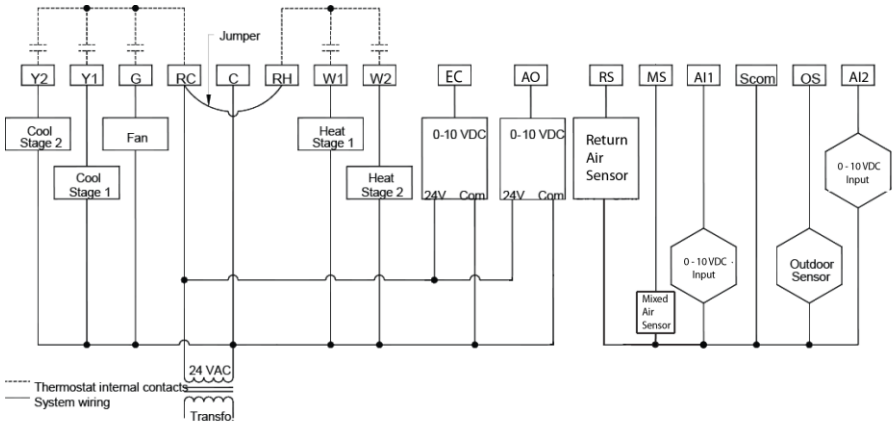
Main outputs wiring

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

$(R_{25°C} = 10K\Omega\pm3\% - B_{25/85°C} = 3975K\pm1.5\%)$

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

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.
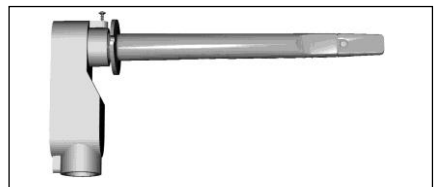- Supply air temperature sensing.

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
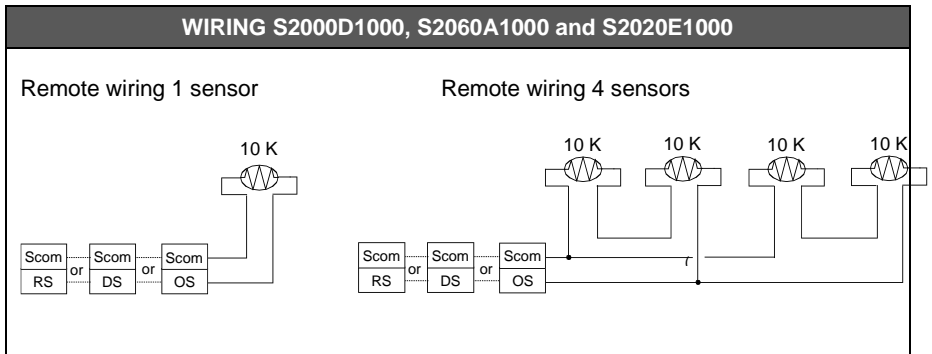
CONFIGURING AND STATUS DISPLAY INSTRUCTIONS

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 CO_2	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.
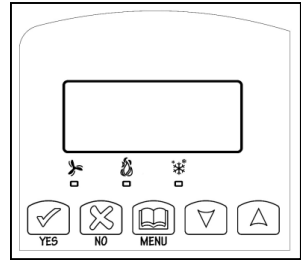
It is possible to bring up the user menu at any time by depressing the MENU key. The status display automatically resumes after exiting the user-configuring menu.

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

☑ 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 automatically after 45 seconds.

Sequence of user menu:

Override Resume	System mode setting	Schedules setting	Clock setting
Override schd Y/N Appears only in unoccupied mode	**Sys mode set Y/N**	**Schedule set Y/N**	**Clock set Y/N**
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			Daily Occupancy
Setpoint	Cool 72 °F	Heat 70 °F	Cool 80 °F	Heat 62 °F		
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			Daily Occupancy
Setpoint	Cool 72 °F	Heat 70 °F	Cool 80 °F	Heat 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 & 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**		**Daily Occupancy**
	Cool	**Heat**	**Cool**	**Heat**	**Cool**	**Heat**	**Cool**	**Heat**	
	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**		**Daily Occupancy**
	Cool	**Heat**	**Cool**	**Heat**	**Cool**	**Heat**	**Cool**	**Heat**	
	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

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 Thermostat networking address Default value = **254** Range is: **0 to 254**	**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 - 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
PAN ID Personal Area Network Identification Default value = **0** Range is: 0 to 1000	**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 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). 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 (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 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). ***Viconics 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
AI1 Analog input no.1 configuration Default value = **None**	**None**, No function will be associated with the input CO_2, the 0-10VDC input value is used as a 0-2000ppm CO_2 level: 0 VDC = 0ppm 10VDC = 2000ppm
FA Range FA range upper limit value Default value = **0 CFM**	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 CO_2 and Min/Max Pos values. See Damper Position section for more details. **0 to 20 000 CFM (0 to 9438 L/s), 10 or 100 increments**
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 (2 °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.

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

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 not 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.
Heat cph Heating stages cycles per hour Default value = **4 C.P.H.** **Only valid if HT Type is set to Staged**	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 the menu. **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. Default value = **2 stages**	Will revert the operation of 2 stages thermostat to single stage operation or to modulating 0 to 10Vdc heating output: **0 = 0-10Vdc analog heating output (AO)** **1 = 1 heating stage (W1)** **2 = 2 heating stages (W1 & W2)**
C stage Number of cooling stages 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**
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
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.
Min SH **Only valid if HT Type is set to Analog** Minimum supply heat temperature setpoint Default value = **64 °F (18 °C)**	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°)
Chngstpt Changeover setpoint Default value = **55 °F (13.0 °C)**	In *Cooling* 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)**

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

Min Pos Minimum Fresh Air Damper/Economizer Position Default value = **0%**	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 CO_2 and Min/Max Pos values set. See Fresh Air Damper Position section for more details. **0% to 100%, 1 or 10 increments**
Max Pos Maximum Fresh Air Damper/Economizer Position Default value = **100%**	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 CO_2 and Min/Max Pos values set. See Fresh Air Damper Position section for more details. **0% to 100%, 1 or 10 increments**
Min FA Minimum Fresh Air Value Default value = **0 CFM**	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 CO_2 and Min/Max FA values (if FA Range is set to other than 0 CFM). See Fresh Air Damper Position section for more details. **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**
Max FA Maximum Fresh Air Value Default value = **0 CFM**	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 CO_2 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. **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**
Min CO₂ Minimum CO_2 Level Default value = **800 ppm**	Minimum CO_2 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 CO_2 and Min/Max Pos values set. See Fresh Air Damper Position section for more details. **0 to 2000 ppm, 10 or 100 increments**

Max CO$_2$ Maximum CO$_2$ Level Default value = **1200 ppm**	Maximum CO$_2$ 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 CO$_2$ and Min/Max Pos values set. See Fresh Air Damper Position section for more details. **0 to 2000 ppm, 10 or 100 increments**
MS dis Display mixed air temperature, only if sensor is installed.	Used as diagnostic / service help to troubleshoot and diagnose economizer operation.
CO$_2$ **Level** Display CO$_2$ Level, only if a CO$_2$ transmitter is installed at AI1 input.	Used as diagnostic / service help to troubleshoot and diagnose IAQ control operation

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 CO_2 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 CO_2 parameter value must be greater than Min CO_2 Parameter value.**
- **Max FA parameter value must be greater than Min FA Parameter value.**

Economizer Control Mode Only
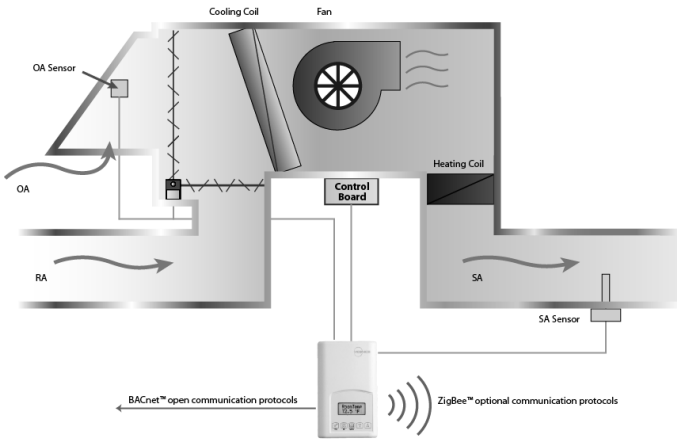
If the fresh air damper is to be used only for free cooling purposes (economizer mode, without fresh air measurement station or CO_2 control), only the Min Pos parameter and the free cooling sequence will be active.
- **The FA Range parameter should be set to 0 CFM. (Default Value = 0 CFM)**
- **Set 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.
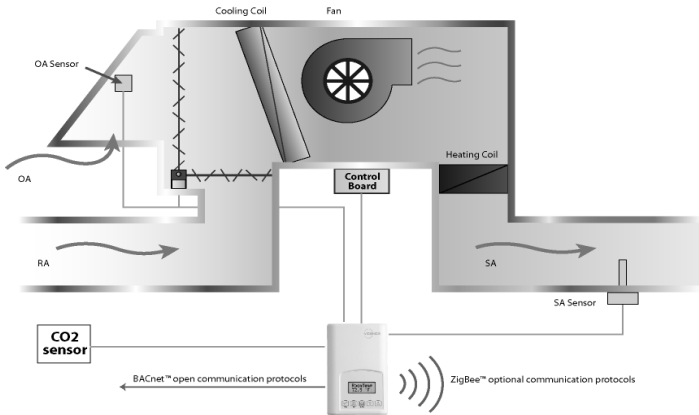
Economizer Mode and Fresh Air Measurement Station
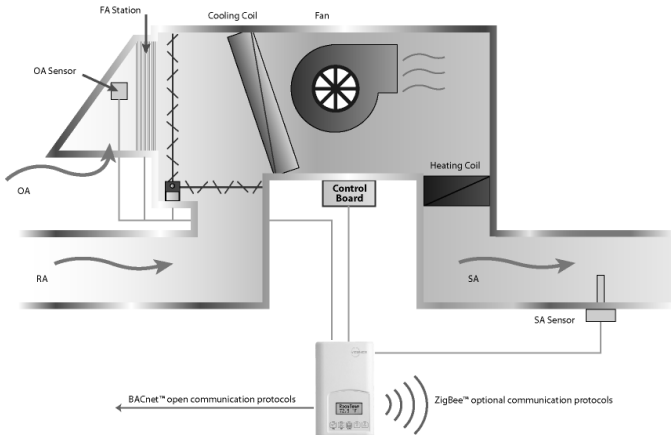
If the fresh air damper is to be used for both free cooling and minimum fresh air volume control (economizer mode and fresh air measurement station, but without CO_2 level control), only the Min FA parameter and the free cooling sequence will be active.

- **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.
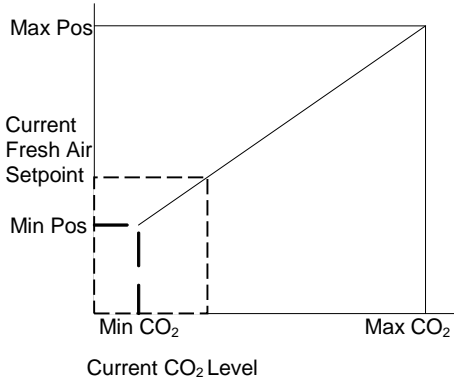
This will set the relationship of **0 VDC = 0 CFM** and **10VDC = 10000 CFM.**
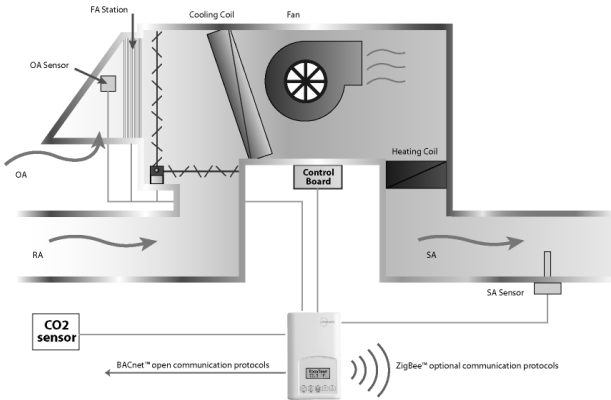
If the fresh air damper is to be used for both free cooling and CO_2 level control (economizer mode and CO_2 level control, but without fresh air measurement station), only the Min Pos, Max Pos, Min CO_2 and Max CO_2 parameters as well as the free cooling sequence will be active.

- **The FA Range parameter should be set to 0 CFM.**
- **Set AI1 parameter to CO_2 (0 VDC = 0ppm ; 10VDC = 2000ppm)**
- **Min Pos, Max Pos, Min CO_2 and Max CO_2 parameters should be set according to the required setting.**
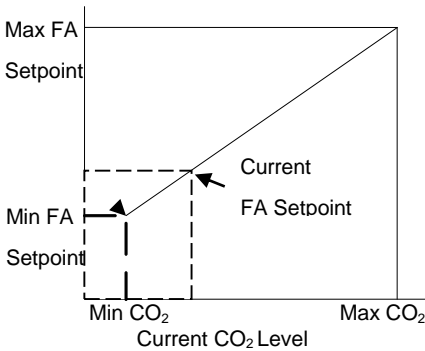

The highest value between free cooling demand output and interpolation output for the fresh air setpoint will be the output to the fresh air damper.

If the fresh air damper is to be used for both free cooling and CO_2 level control with a fresh air measurement station, only the Min FA, Max FA, Min CO_2 and Max CO_2 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 CO_2 and Max CO_2 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

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