

# VEC100 Generic RTU Controller Staged Heating and Modulated Cooling User Guide

[Home](#) » [VERASYS](#) » VEC100 Generic RTU Controller Staged Heating and Modulated Cooling User Guide 



VEC100 Generic RTU Controller, Staged Heating  
and Modulated Cooling Quick Start Guide  
LIT-12013487  
2021-07-14

## Contents

- [1 About this guide](#)
- [2 Mounting the controller](#)
- [3 Wiring the controller](#)
- [4 Configuring sensors](#)
- [5 Updating the VEC](#)
- [6 COBP wiring diagram](#)
- [7 VAV wiring diagram](#)
- [8 Commissioning the system](#)
- [9 Software terms](#)
- [10 Contact information](#)
- [11 Documents / Resources](#)
- [12 Related Posts](#)

## About this guide

This quick start guide provides the basic information you need to configure and install the Verasys® Equipment Controller (VEC), LC-VEC100-0, using the Verasys generic rooftop unit (RTU) staged heating and modulated cooling controller application. The application controls a third-party changeover bypass (COBP) system or a third-party variable air volume (VAV) unit. For further information, refer to the Verasys Equipment Controller (VEC) Installation Guide (24-10143-1272) and

**Table 1: Application features**

Options available	Possible values
Number of Heating Stages Installed	0 to 2
Cooling Valve	<ul style="list-style-type: none"><li>• State 0: not installed</li><li>• State 1: water coil</li></ul>
Economizer Installed	<ul style="list-style-type: none"><li>• State 0: the economizer is not available.</li><li>• State 1: the economizer is available.</li></ul>
Air Proving Switch Setup	<ul style="list-style-type: none"><li>• State 0: fan status device</li><li>• State 1: duct static pressure sensor</li><li>• State 2: none</li></ul>
Rooftop Controller Type	<ul style="list-style-type: none"><li>• State 0: changeover bypass</li><li>• State 1: VAV</li></ul>
Cancel ASCD Timers	<ul style="list-style-type: none"><li>• State 0: false</li><li>• State 1: true</li></ul>
Demand Ventilation Feature	<ul style="list-style-type: none"><li>• State 0: demand ventilation is off.</li><li>• State 1: demand ventilation is on.</li></ul>

## Mounting the controller

To mount the controller, complete the following steps:

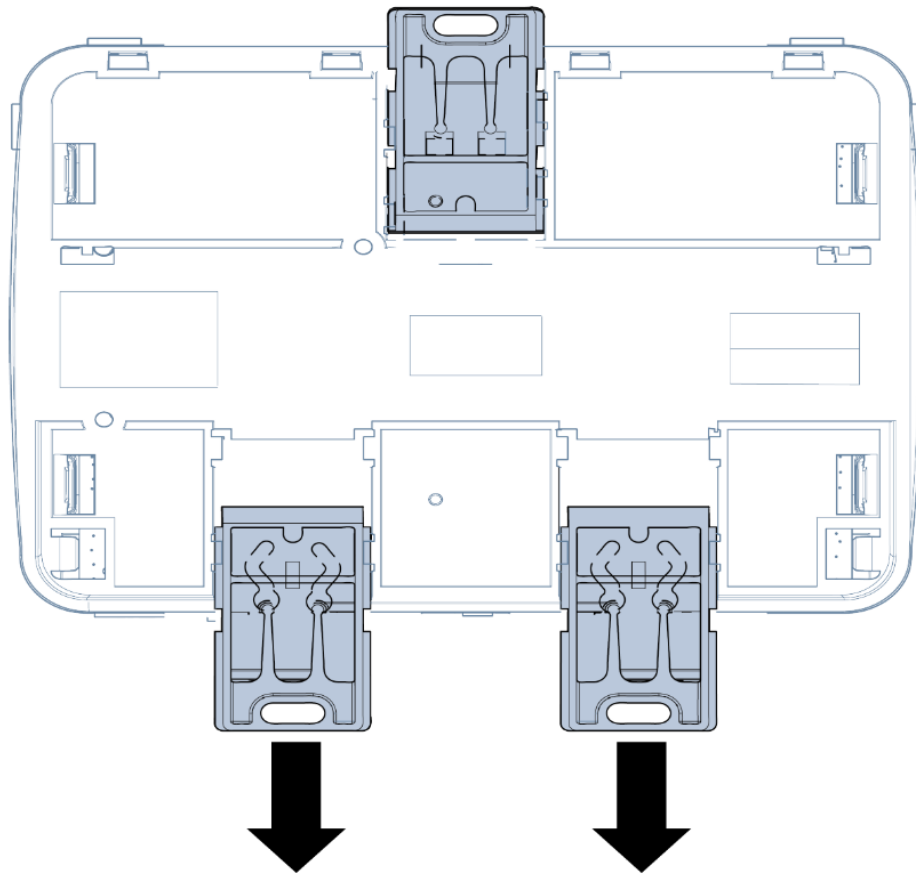
1. Mount a 20 cm (8 in.) section of 35 mm (1.3 in.) DIN rail horizontally.



**Note:** Mount the controller in the horizontal position.

2. On the back of the controller, extend the two mounting clips.

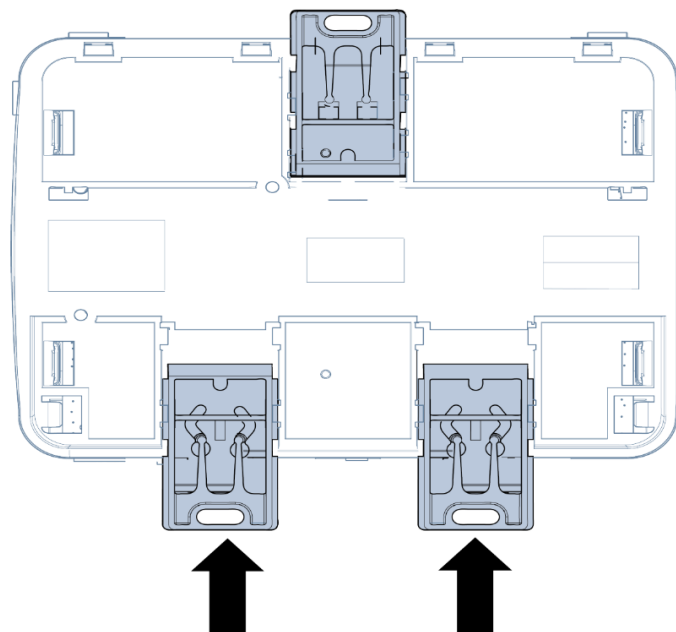
**Figure 1: Pull down lower mounting clips**



3. Place the controller on the DIN rail.

4. Push the bottom mounting clips inward (up) to secure the controller on the DIN rail.

**Figure 2: Push up lower mounting clips**

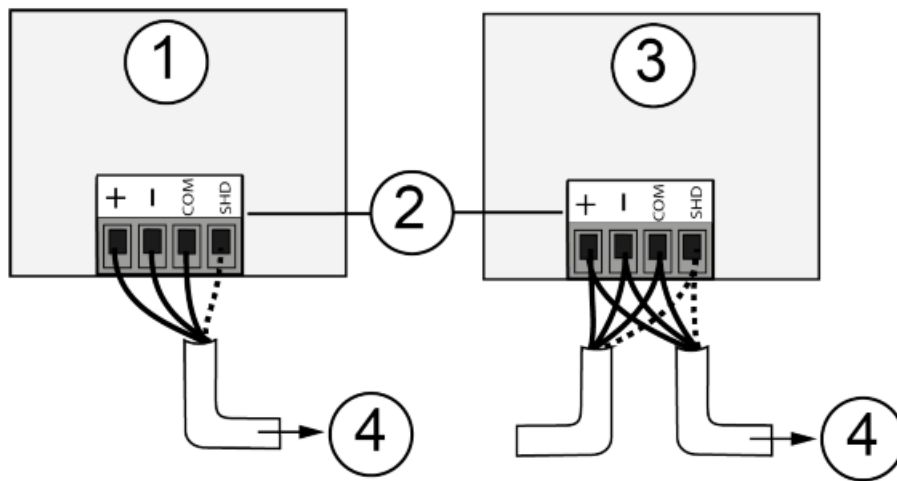


## Wiring the controller

### Zone bus terminal block

The zone bus terminal block is a grey, removable, 4terminal plug that fits into a board-mounted jack. Wire the removable zone bus terminal block plugs on the controller on the top row of the stacked connector, and other field controllers in a daisy-chain configuration using a 3-wire twisted, shielded cable as shown in the following figure.

**Figure 3: Zone bus terminal block wiring**



**Table 2: Zone bus daisy-chaining configuration**

1	Terminating device on the sensor bus
2	Sensor bus terminal block plug on the terminating device
3	Daisy-chained device on a sensor bus segment
4	Sensor bus terminal block plug on the daisy-chained device
5	Cable shield connection
6	Connects to the next device on the sensor bus.

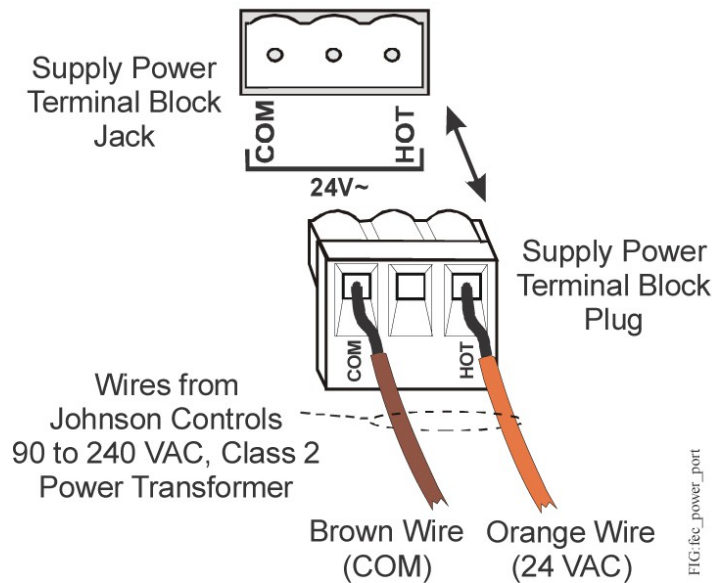
**Note:** The zone bus shield (SHD) terminal is isolated and can be used to connect (daisy chain) the shields for zone bus wiring.

### Supply power terminal block

The 24 VAC supply power terminal block is a gray, removable, 3-terminal plug that fits into a board-mounted jack on the top right of the controller. Wire the 24 VAC supply power wires from the transformer to the HOT and COM terminals on the terminal plug, as shown in the following figure. The middle terminal on the supply power terminal block is not used.

**Figure 5: 24 VAC Supply Power Terminal Block**

Disconnect supply power to controller by unplugging  
Supply Power Plug from Supply Power Jack.



**Note:** The supply power wire colors may be different on transformers from other manufacturers. Refer to the transformer manufacturer's instructions and the project installation drawings for wiring details.

Setting the VEC address using the local display

To set the VEC address using the local display, complete the following steps:

1. To access the menu, press the **ENT** (Enter) button.
2. Navigate to the **Controller** menu with the up and down arrows, and press the **ENT** button.
3. In the **Controller** menu, navigate to Network and press the **ENT** button.
4. In the Network Parameters section, navigate to Address and press the **ENT** button. The display shows the default address value.
5. Press the **ENT** button. The address blinks.
6. Use the up or down arrow to increase or decrease the address to the value you want. Press the **ENT** button. The address stops blinking and the display shows the old address.
7. Press either the up or down arrow. The screen refreshes to the new address.
8. Press ESC (Escape) repeatedly, until you return to the main screen. Ensure that the main screen shows that the system is operational.

## Configuring sensors

To configure the installed sensors, complete the following steps:

1. Navigate to the Details menu.
2. Navigate to the Service menu and select the Inputs section.
3. Select the installed sensors using the drop-down menus for each parameter.

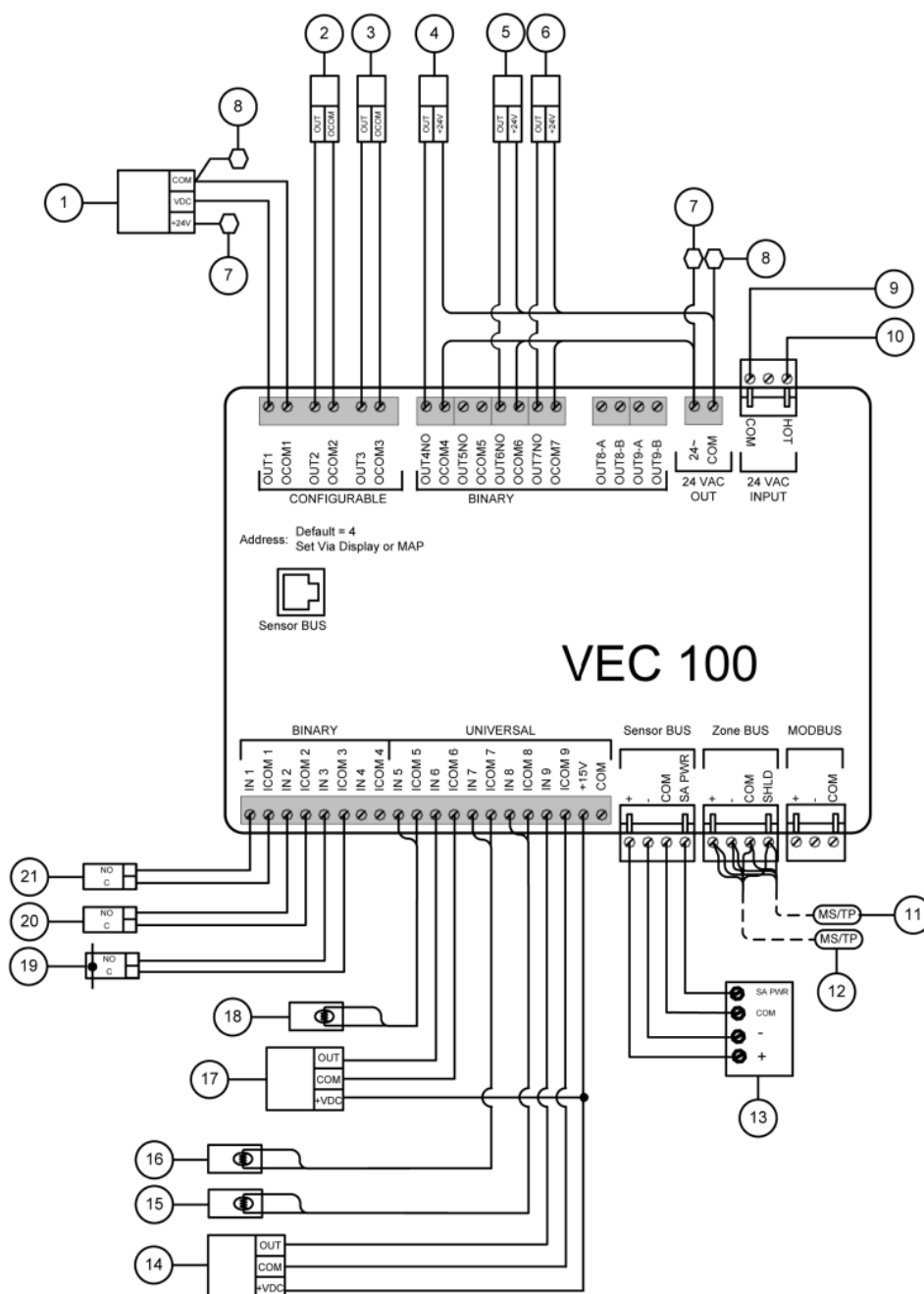
## Updating the VEC

To update the VEC with the staged heating and modulated cooling application, complete the following steps:

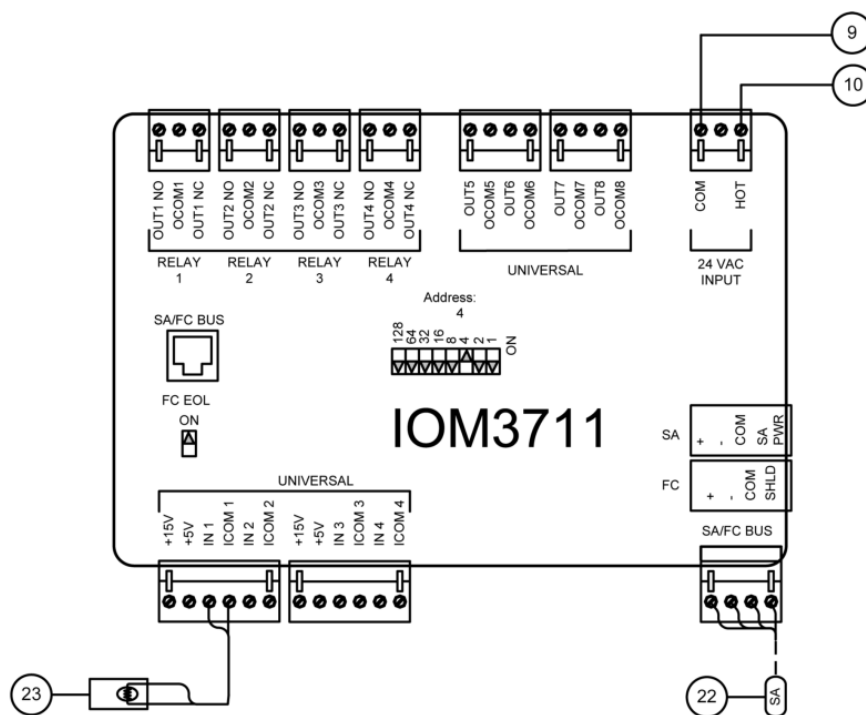
1. Go to [verasyscontrols.com](https://verasyscontrols.com), and log in with your credentials.
2. **Navigate to Product Information & Support > Device Updates.**
3. Download the package file for the application to the root folder of a USB 2.0 drive. The package file name is the following: VEC100-StgHTGModCLG\_xxxx.pkg  
**Note:** Ensure that the USB drive is formatted exFAT or FAT32.
4. Insert the USB drive into the USB port on the VEC.
5. If the download does not start immediately, then the controller's local display, select the Update and Load Firmware option, then choose the package file on the USB drive, and press Enter.
6. When the application update finishes, use the Verasys Smart Building Hub (SBH) or the local display to configure the controller.

## COBP wiring diagram

Figure 6: Changeover bypass wiring diagram – VEC100



**Figure 7: Changeover bypass wiring diagram – IOM3711**



**Table 4: Changeover bypass wiring diagram**

Number	Description	Object name (if given)
1	Economizer Damper Output (optional)	MAD-O
2	Supply fan output (to fan VFD)	SF-O
3	Cooling valve output	CLG-O
4	Supply fan command (to fan VFD)	SF-C
5	Heating stage 1 command	HTG1-C
6	Heating stage 2 command	HTG2-C
7	24 V HOT to damper motor	

8	24 V COM to damper motor	n/a
9	24 V COM	n/a
10	24 V HOT	n/a
11	From last device	n/a
12	To next device	n/a
13	Zone humidity sensor – monitor only (optional)	ZN-H
14	Return air CO2 Range: 0 ppm to 2,000 ppm, 0 VDC to 10 VDC	RA-CO2
15	Return air temperature sensor	RA-T

**Table 4: Changeover bypass wiring diagram**



Number	Description	Object name (if given)
16	<p>Outside air temperature sensor</p> <p><b>i</b> <b>Note:</b> This is a required sensor if the VEC100 controls the economizer. Position the sensor in a shaded area on the north side of the building.</p>	OA-T
17	<p>Discharge air static pressure sensor</p> <p>Range: 0 in. W.C. to 5 in. W.C., 0 VDC to 5 VDC</p>	DA-P
18	Discharge air temperature sensor	DA-T
19	Supply fan status (air proving switch, optional)	SF-S
20	Purge input (optional)	PURGE-S
21	Filter status (optional)	FILTER-S
22	From the last SA device	n/a
23	<p>Mixed air temperature sensor</p> <p><b>i</b> <b>Note:</b> You must have a mixed air sensor if the VEC100 controls the economizer for low limit control.</p>	MA-T

## VAV wiring diagram

**Figure 8: VAV wiring diagram – VEC100**

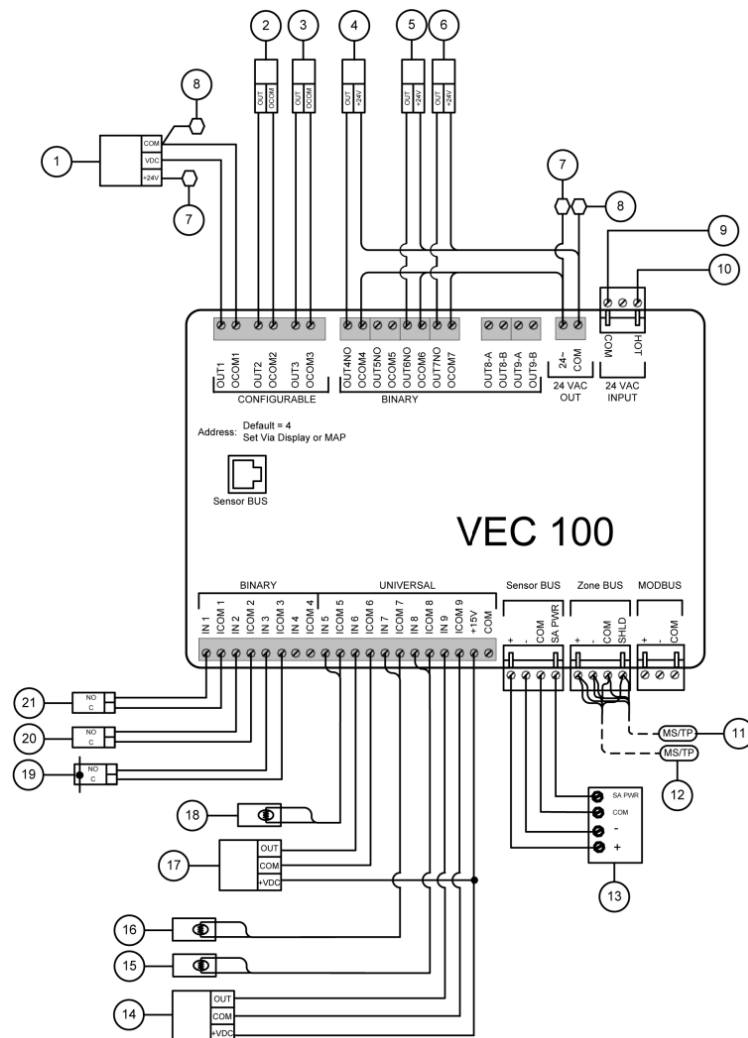


Figure 9: VAV wiring diagram – IOM3711

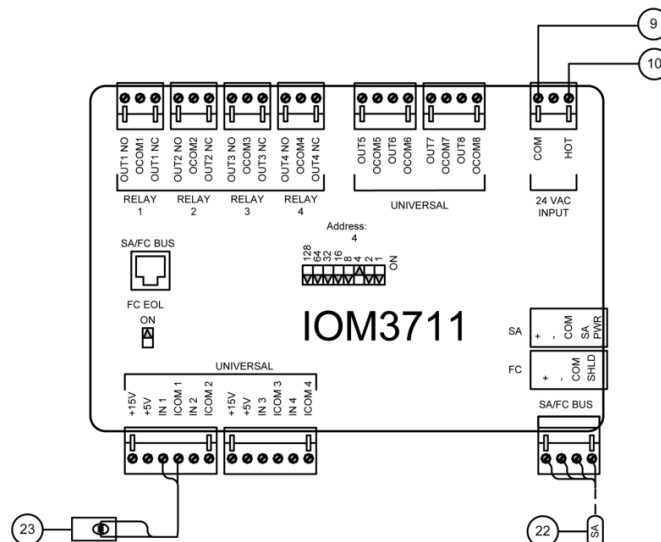




Table 5: VAV wiring diagram

Number	Description	Object name (if given)
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1	Economizer Damper Output (optional)	MAD-O
2	Supply fan output (to fan VFD)	SF-O
3	Cooling valve output	CLG-O
4	Supply fan command (to fan VFD)	SF-C
5	Heating stage 1 command	HTG1-C
6	Heating stage 2 command	HTG2-C
7	24 V HOT to damper motor	n/a
8	24 V COM to damper motor	n/a
9	24 V COM	n/a
10	24 V HOT	n/a
11	From last device	n/a
12	To next device	n/a
13	Zone humidity sensor – monitor only (optional)	ZN-H
14	Return air CO2 Range: 0 ppm to 2,000 ppm, 0 VDC to 10 VDC	RA-CO2

15	Return air temperature sensor	RA-T
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**Table 5: VAV wiring diagram**

Number	Description	Object name (if given)
16	<p>Outside air temperature sensor</p> <p> <b>Note:</b> This is a required sensor if the VEC100 controls the economizer. Position the sensor in a shaded area on the north side of the building.</p>	OA-T
17	<p>Discharge air static pressure sensor</p> <p>Range: 0 in. W.C. to 5 in. W.C., 0 VDC to 5 VDC</p>	DA-P
18	Discharge air temperature sensor	DA-T
19	Supply fan status (air proving switch, optional)	SF-S
20	Purge input (optional)	PURGE-S
21	Filter status (optional)	FILTER-S
22	From last SA device	n/a
23	<p>Mixed air temperature sensor</p> <p> <b>Note:</b> You must have a mixed air sensor if the VEC100 controls the economizer for low limit control.</p>	MA-T

## Commissioning the system

To activate the outputs and verify system operation, navigate to the Commissioning menu, change Start Commissioning to Trigger, and adjust outputs individually. The following table describes the **Details > Service > Factory** menu options.

**Table 6: Details : Service: Factory**

Object or parameter	Description	Adjustable	Defaults	Enum set or range
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Cooling Valve	Sets the installation of the cooling valve.	Adjustable	Not Installed	0 = Not Installed 1 = Water Coil
Number of Heating Stages Installed	Sets the number of heating stages installed.	Adjustable	2	0 to 2
Economizer Installed	Sets whether the economizer is installed.	Adjustable	No	0 = No 1 = Yes
Air Proving Switch Setup	Selects the type of setup for airflow proof.	Adjustable	None	0 = Fan Status Device 1 = Duct Static Pressure Sensor 2 = None
OAT Cooling Lockout Temperature	Sets the temperature at which outside cooling lockout occurs.	Adjustable	50°F (10°C)	0°F to 100°F (-18°C to 38°C)
Economizer Minimum Position Setpoint	Sets the minimum outside air damper position.	Adjustable	20%	0% to 100%
Rooftop Controller Type	Sets the controller type to changeover bypass or VAV.	Adjustable	Changeover Bypass	0 = Changeover Bypass 1 = VAV
Variable Speed Drive	Sets whether the VEC100 controls a VFD fan instead of a bypass damper when the rooftop controller type is set to changeover bypass.	Adjustable	False	0 = False 1 = True

Supply Air Temperature Alarm Offset	If SAT is not in this value range, the SAT alarm delay starts. Examples: If the supply air setpoint is 55°F and this is set to 5°F, then the supply air must be under 60°F, or the delay timer starts. If the supply air setpoint is 110°F and this is set to 5°F then the supply air must be above 105°F, or the delay timer starts.	Adjustable	5 delta °F (2.78 delta °C)	0 delta °F to 25 delta °F (0 delta °C to 14 delta °C)
Supply Air Temperature Alarm Delay	Sets the amount of time that must pass before the SAT alarm occurs.	Adjustable	20 min	0 min to 120 min
Cancel ASCD Timers	Resets the minimum on and off timers.	Adjustable	False	0 = False 1 = True
Demand Ventilation Feature	Enables or disables the demand ventilation feature.	Adjustable	Off	0 = Off 1 = On

#### Product warranty

This product is covered by a limited warranty, details of which can be found at [www.johnsoncontrols.com/buildingswarranty](http://www.johnsoncontrols.com/buildingswarranty).  
Contact Johnson Controls: [www.johnsoncontrols.com/contact-us](http://www.johnsoncontrols.com/contact-us)

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#### Single point of contact

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#### Contact information

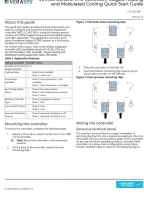
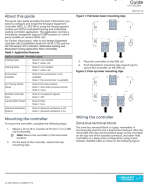
Contact your local branch office:

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## Documents / Resources

	<p><a href="#">VERASYS VEC100 Generic RTU Controller Staged Heating and Modulated Cooling</a> [pdf] User Guide VEC100 Generic RTU Controller Staged Heating and Modulated Cooling, VEC100, Generic RTU Controller Staged Heating and Modulated Cooling</p>
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