VERASYS VEC100 Generic RTU Heat Pump Controller User Guide

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Contents

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) heat pump 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 the VEC100 Generic RTU Heat Pump Controller Application Note (12013452).

Options available	Possible values
Number of Heat Pump Stages In stalled	0 to 2
Supplemental Heat Installed	• State 0: No • State 1: Yes
Economizer Installed	• State 0: the economizer is not available. • State 1: the economizer is available.
Air Proving Switch Setup	• State 0: fan status device • State 1: duct static pressure sensor • State 2: none
Runtime Equalization	• State 0: heat pump activation is not based on runtime. • State 1: heat pump activation is based on runtime.
Rooftop Controller Type	• State 0: changeover bypass • State 1: VAV
Cancel ASCD Timers	• State 0: false • State 1: true
Demand Ventilation Feature	• State 0: demand ventilation is off. • State 1: demand ventilation is on.
Reversing Valve Config	• State 0: on for heating • State 1: on for cooling
Condensate Alarm	• State 0: the condensate alarm does not shut down the system. • State 1: the condensate alarm shuts down the whole system.

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.

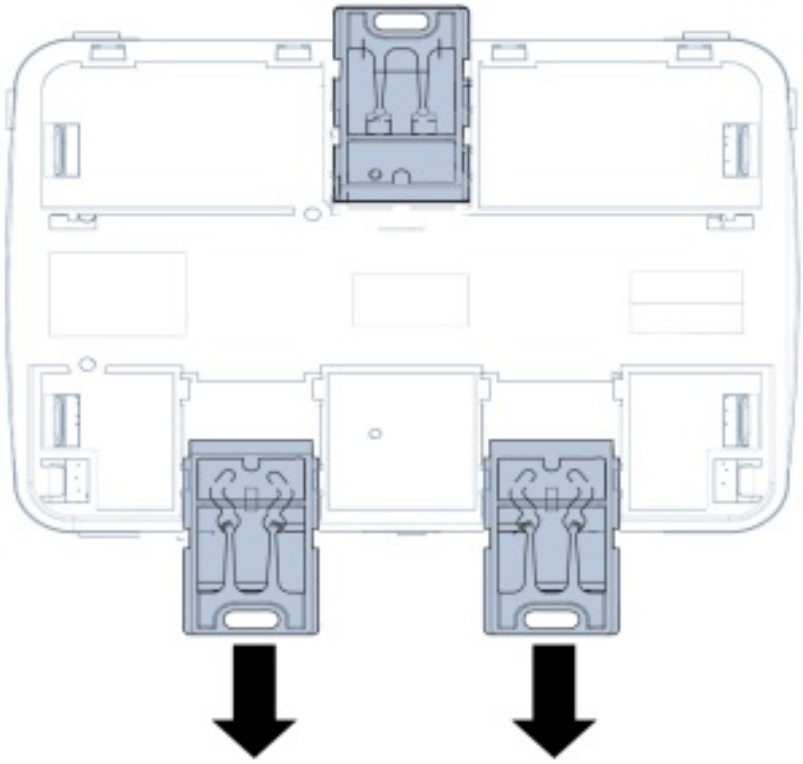


Figure 1: Pull down lower mounting clips

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

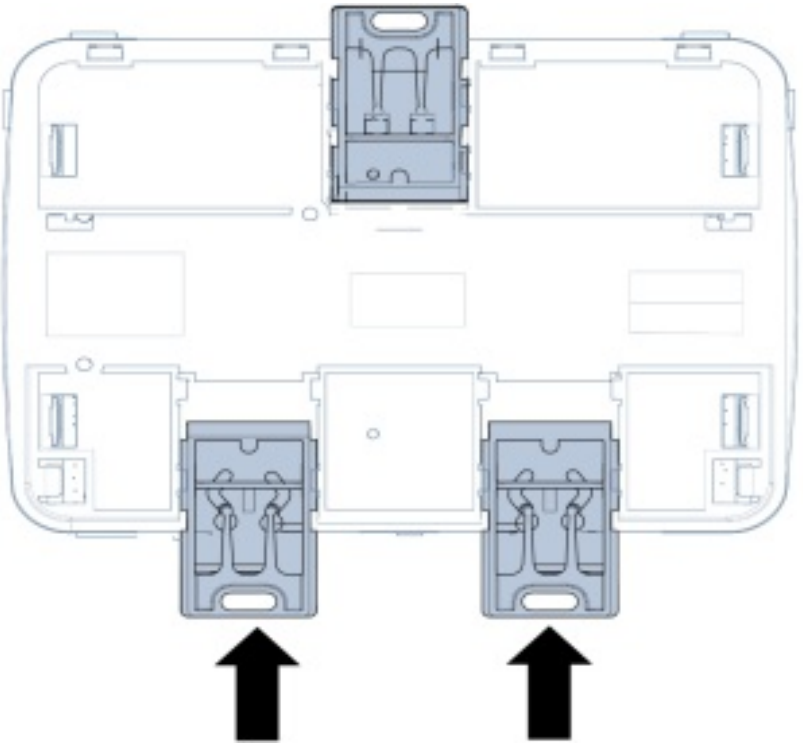


Figure 2: Push up lower mounting clips

Wiring the controller

Zone bus terminal block

The zone bus terminal block is a grey, removable, 4- terminal 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 3-wire twisted, shielded cable as shown in the following figure.

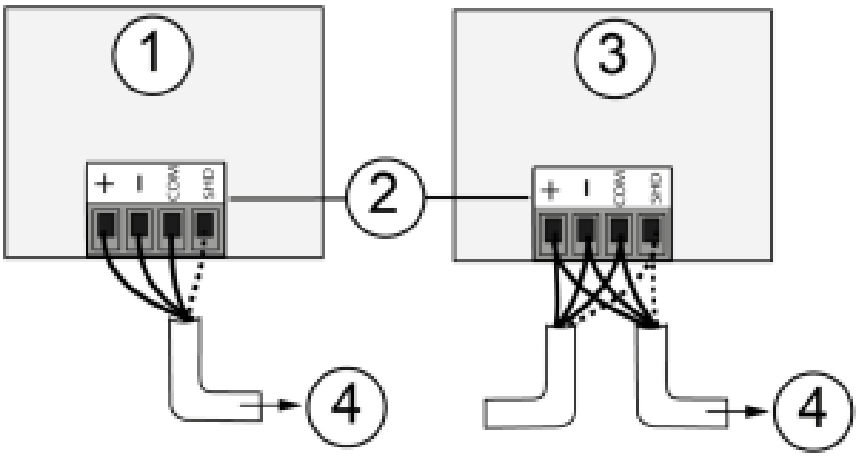


Figure 3: Zone bus terminal block wiring

1	Terminating device on the zone bus
2	Zone bus terminal block plugs
3	Daisy-chained device on a zone bus segment
4	Connects to the next device on the zone bus.

Table 2: Zone bus daisy chaining configuration

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

Sensor bus terminal block

The sensor bus terminal block is a brown, removable, 4- terminal plug that fits into a board-mounted jack. Wire the removable sensor bus terminal block plugs on the lower port of the dual stacked connector to the controller, and other sensor bus devices in a daisy-chain configuration using a 4-wire twisted, shielded cable as shown in the following figure.

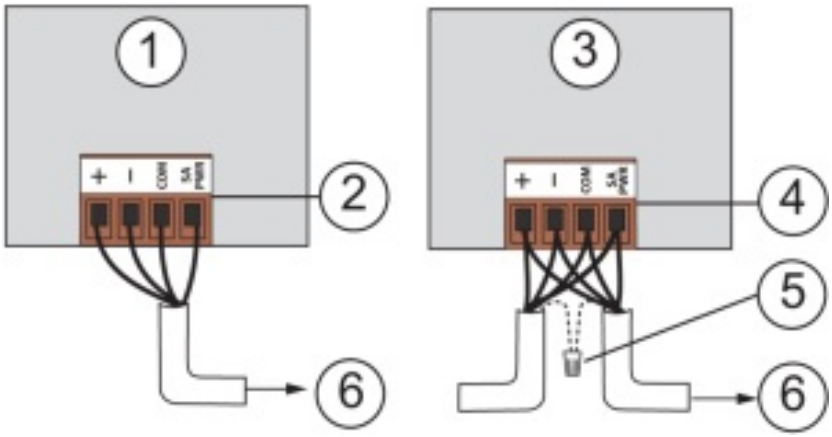


Figure 4: Sensor bus terminal block wiring

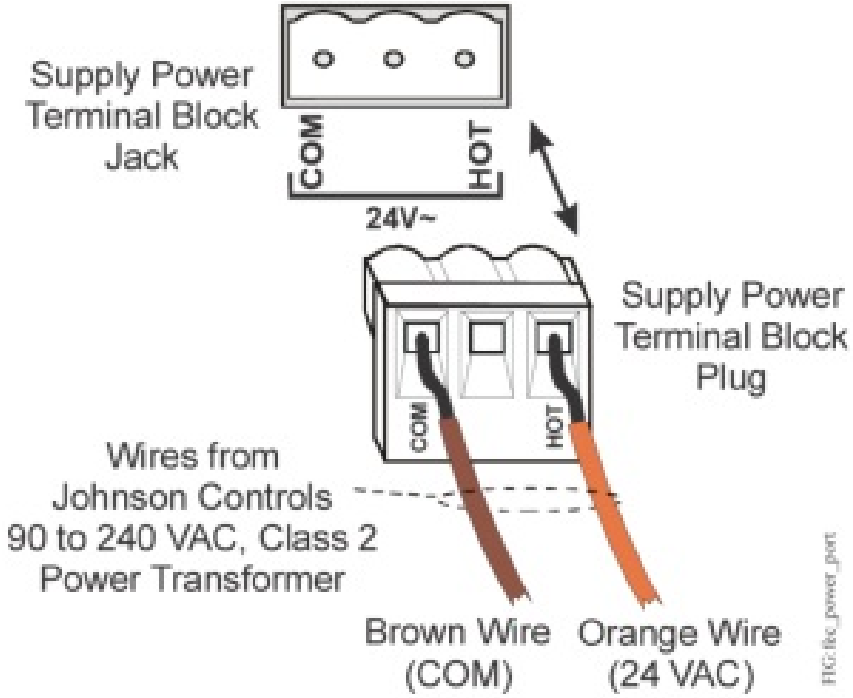
1	Terminating device on the sensor bus
2	Sensor bus terminal block plug on the terminating device
3	Daisy-chained device on a sensor bus segment
4	Sensor bus terminal block plug on the daisy-chained device
5	Cable shield connection
6	Connects to the next device on the sensor bus.

Table 3: Sensor bus daisy chaining configuration

Note: The PWR terminal supplies 15 VDC. The PWR terminal can be used to connect (daisy chain) the 15 VDC power leads on the sensor bus.

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.
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 heat pump application, complete the following steps:

1. Go to **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-Heat Pump_xxxx.pkg

   ⓘ **Note:** Ensure that the USB drive is formatted as FAT or FAT32.
4. Insert the USB drive into the USB port on the VEC.
5. If the download does not start immediately, then in 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

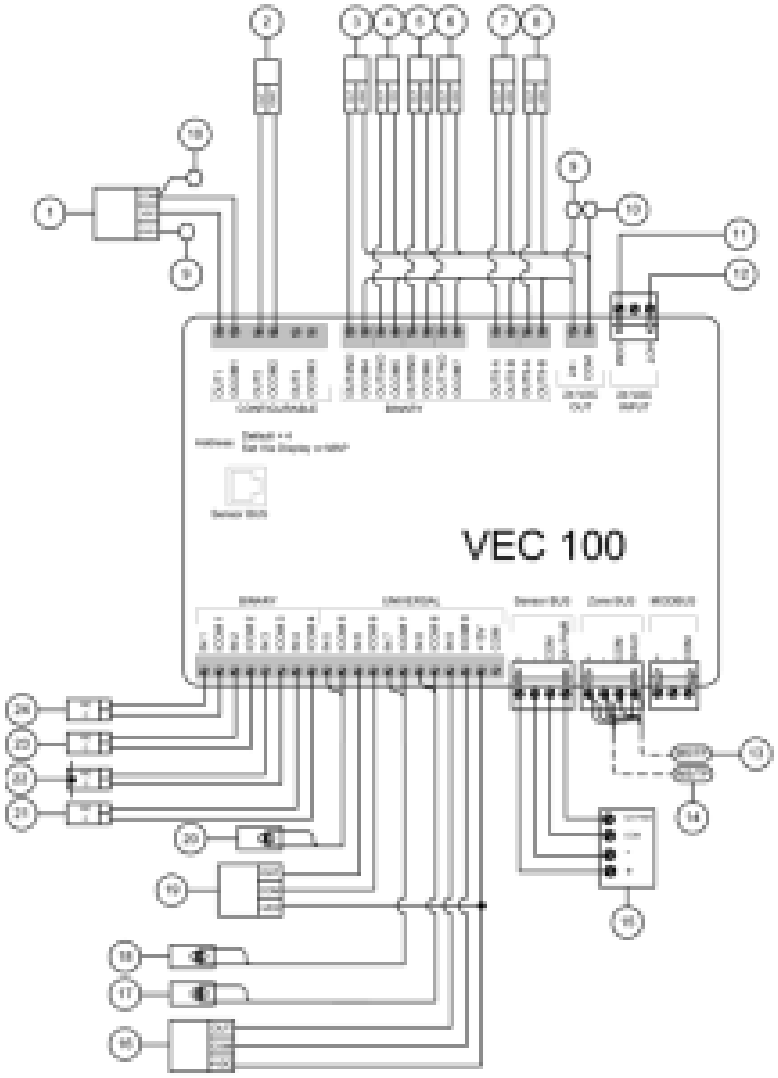


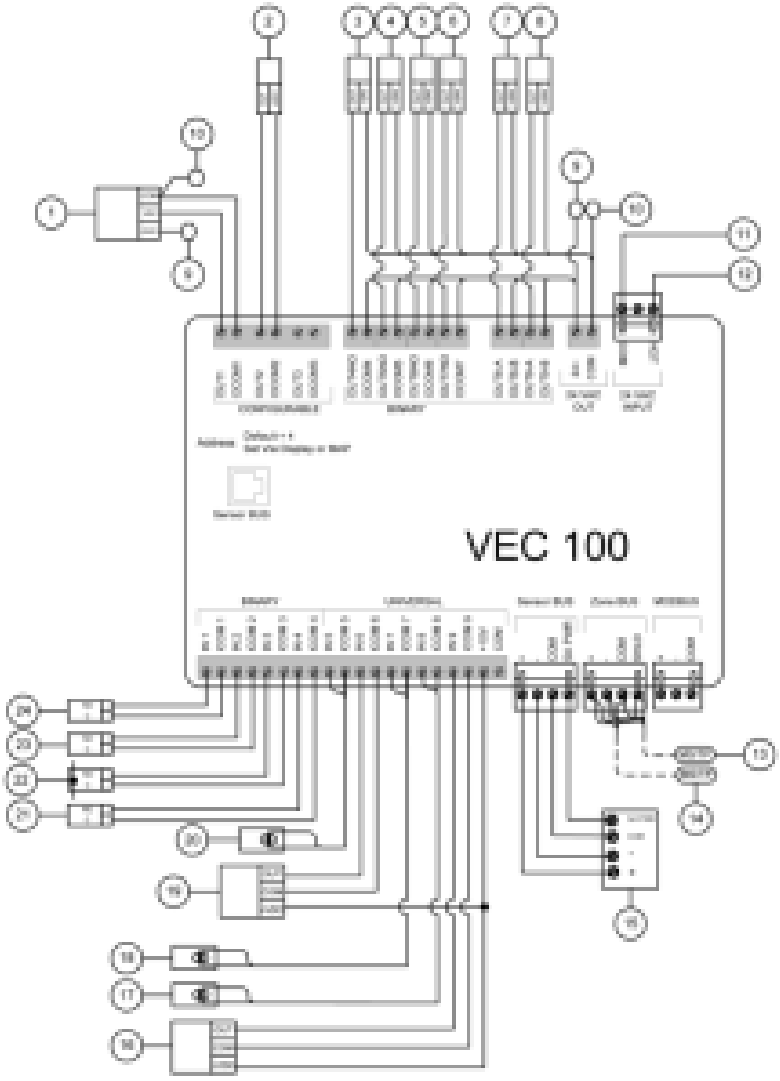
Figure 6: Changeover bypass wiring diagram – VEC100

Number	Description	Object name (if given)
1	Economizer Damper Output (optional)	MAD-O
2	Supply fan output (to fan VFD)	SF-O
3	Supply fan command (to fan VFD)	SF-C
4	Compressor stage 1 command	COMP1-C
5	Reversing valve 1 command	REV1-C
6	Compressor stage 2 command	COMP2-C
7	Reversing valve 2 command	REV2-C
8	Supplemental heat command	SUPHTG-C
9	24 V HOT to damper motor	n/a
10	24 V COM to damper motor	n/a
11	24 V COM	n/a
12	24 V HOT	n/a
13	From last device	n/a
14	To next device	n/a
15	Zone humidity sensor – monitor only (optional)	ZN-H
16	Return air CO2 **Range:** 0 ppm to 2,000 ppm, 0 VDC to 10 VDC	RA-CO2

Number	Description	Object name (if given)
17	Return air temperature sensor	RA-T
18	Outside air temperature sensor **Note:** This is a required sensor if the VEC100 controls the economiz er. Position the sensor in a shaded area on the north side of the build ing.	OA-T
19	Discharge air static pressure sensor **Range:** 0 in. W.C. to 5 in. W.C., 0 VDC to 5 VDC	DA-P
20	Discharge air temperature sensor	DA-T
21	Condensate alarm	COND-A
22	Supply fan status (air proving switch, optional)	SF-S
23	Purge input (optional)	PURGE-S
24	Filter status (optional)	FILTER-S

Table 4: Changeover bypass wiring diagram

VAV wiring diagram



Number	Description	Object name (if given)
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6	Compressor stage 2 command	COMP2-C
7	Reversing valve 2 command	REV2-C
8	Supplemental heat command	SUPHTG-C
9	24 V HOT to damper motor	n/a
10	24 V COM to damper motor	n/a
11	24 V COM	n/a
12	24 V HOT	n/a
13	From last device	n/a
14	To next device	n/a
15	Zone humidity sensor – monitor only (optional)	ZN-H
16	Return air CO2 **Range:** 0 ppm to 2,000 ppm, 0 VDC to 10 VDC	RA-CO2

Number	Description	Object name (if given)
17	Return air temperature sensor	RA-T
18	Outside air temperature sensor **Note:** This is a required sensor if the VEC100 controls the economiz er. Position the sensor in a shaded area on the north side of the build ing.	OA-T
19	Discharge air static pressure sensor **Range:** 0 in. W.C. to 5 in. W.C., 0 VDC to 5 VDC	DA-P
20	Discharge air temperature sensor	DA-T
21	Condensate alarm	COND-A
22	Supply fan status (air proving switch, optional)	SF-S
23	Purge input (optional)	PURGE-S
24	Filter status (optional)	FILTER-S

Table 5: VAV wiring diagram

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.

Object or parameter	Description	Adjustable	Defaults	Enum set or range
Number of Heat Pump Stages Installed	Sets the number of heat pump stages installed.	Adjustable	2	0 to 2
Supplemental Heat Installed	Sets whether supplemental heating is installed.	Adjustable	No	0 = No 1 = Yes
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
Runtime Equalization	Enables the device based on runtime.	Adjustable	No	0 = No 1 = Yes
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
Reversing Valve Config	Sets the reversing valve for heating or cooling	Adjustable	On for Clg	0 = On For Htg 1 = On For Clg
Condensate Alarm	If you set this parameter to **Yes**, the condensate alarm shuts down the whole system.	Adjustable	No	0 = No 1 = Yes

Table 6: Details : Service : Factory

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Software terms

Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable end-user license, open-source software information, and other terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

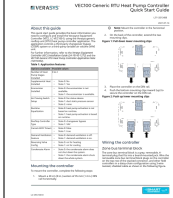
Single point of contact

APAC	Europe	NA/SA
JOHNSON CONTROLS	JOHNSON CONTROLS	JOHNSON CONTROLS
C/O CONTROLS PRODUCT MANAGEMENT	WESTENDHOF 3 45143 ES SEN	507 E MICHIGAN ST MILW AUKEE WI 53202
NO. 32 CHANGJIJANG RD NEW DISTRICT	GERMANY	USA
WUXI JIANGSU PROVINCE 214028		
CHINA		

Contact information

Contact your local branch office: www.johnsoncontrols.com/locations
Contact Johnson Controls: www.johnsoncontrols.com/contact-us

Documents / Resources

	[VERASYS VEC100 Generic RTU Heat Pump Controller](#) [pdf] User Guide VEC100 Generic RTU Heat Pump Controller, VEC100, Generic RTU Heat Pump Controller