7000 and 8000 Room Controllers

VC3000 Relay Pack Installation Guide

Line Voltage Switching Relay Pack for use with Line Voltage Fan Coil Unit (FCU) Room Controllers

The VC3000 is a relay pack for line-voltage fan coil units. The device is used with VTR73XX/VTR83X0 and SER73XX/SER83X0 Room Controllers as a two-component retrofit option.

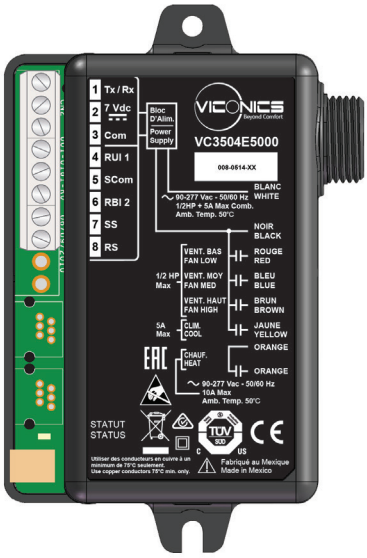


TABLE OF CONTENTS

Schneider Electric

Version 15

SAFETY INFORMATION

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

BEFORE YOU BEGIN

Loss of Control

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and over travel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of anticipated transmission delays or failures of the link.[1]
- Each implementation of equipment utilizing communication links must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

1 For additional information about anticipated transmission delays or failures of the link, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application , Installation, and Maintenance of Solid State Control* or its equivalent

Electrostatic Discharge

NOTICE

STATIC SENSITIVE COMPONENTS

Circuit boards and option cards can be damaged by static electricity. Observe the electrostatic precautions below when handling controller circuit boards or testing components.

Failure to follow these instructions can result in equipment damage.

Observe the following precautions for handling static-sensitive components:

- Keep static-producing material such as plastic, upholstery, and carpeting out of the immediate work area.
- Store static-sensitive components in protective packaging when they are not installed in the drive.
- When handling a static-sensitive component, wear a conductive wrist strap connected to the component or drive through a minimum of 1 megohm resistance.
- Avoid touching exposed conductors and components leads with skin or clothing.

Installation

NOTICE

INSTALLATION

- The VTR73XX/VTR83X0 and SER73XX/SER83X0 Room Controllers are only to be used in conjunction with the VC3000 line voltage switching relay pack. Together they are used as operating controls for high voltage fan coil units.
- The system must be installed correctly by a qualified technician.
- If replacing an existing Room Controller, label wires before removal of Controller.
- Electronic controls are static sensitive devices. Discharge yourself correctly before manipulating and installing Room Controller.
- A short circuit or wrong wiring may permanently damage Room Controller or equipment.
- All Room Controllers are designed for use as operating controls only and are not safety devices. These instruments have undergone rigorous tests and verification prior to shipping to ensure proper and reliable operation in the field. Whenever a control failure could lead to personal injury and/or loss of property, it becomes the responsibility of the user/installer/electrical system designer to incorporate safety devices such as relays, flow switches, thermal protections, and/or an alarm system to protect the entire system against any catastrophic failures. Tampering with the devices or unintended application of the devices will result in a void of warranty.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- These devices are not serviceable and must be returned to the supplier for any repair.
- A switch or circuit breaker must be installed. It must be suitably located, easily reached, and marked as the disconnecting device.
- This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- This device must be installed to provide a separation distance of at least 8in (20cm) from all persons and must not be located or operating in conjunction with any other antenna or transmitter.
- Refer to the Room Controller User Interface Guide for information on how to configure the Room Controller.

Failure to follow these instructions can result in equipment damage.

Location

NOTICE

LOCATION

- Do not install on an exterior wall.
- Do not install behind a door.
- Do not install in areas with direct heat source.
- Do not install near any air discharge grill.
- Do not install in areas exposed to direct sunlight.
- Ensure Room Controller has sufficient natural air circulation.
- Ensure wall surface is flat and clean.
- Ensure external thermal sensor wirings are away from noisy electrical sources.
- Install 1.3 to 1.5 meter (52 to 60 inches) above the floor.
- Perform preventive maintenance on the damper and Variable Air Volume (VAV) box, according to the supplier documentation.

Failure to follow these instructions can result in equipment damage.

Cleaning the Room Controller

NOTICE

CLEANING THE ROOM CONTROLLER

- Use a soft, pre-moistened lint-free cloth for cleaning.
- Avoid getting moisture in openings.
- Do not spray anything directly on the Room Controller or use compressed air.
- Do not use caustic/corrosive products, ammonia, solvents or any cleaning product containing alcohol or grit.
- Never use tools directly on the touchscreen.
- Never use paint on the Room Controller.
- Do not drop or crush the Room Controller, or allow it to come into contact with liquids.
- Do not use a damaged device (such as one with a cracked screen).

Failure to comply with these recommendations will result in damage to the unit and void the manufacturer's warranty.

IMPORTANT SYMBOLS

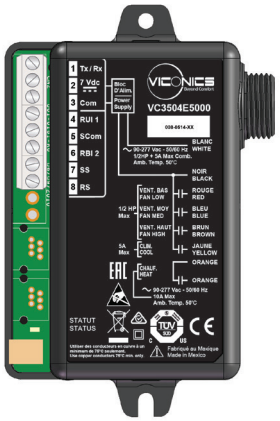
Products marked with this symbol state that the manuals must be consulted in all cases to any hazards.

Alternating Current

Direct Current

Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION

VTR73XX/VTR83X0 or SER73XX/SER83X0 Room Controller



VC3000 Relay Pack

WARNINGS

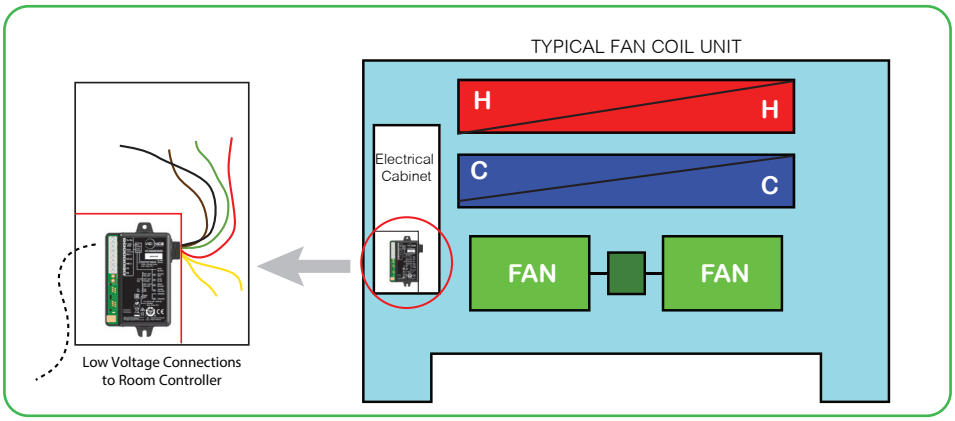
All wiring must conform to the regulations of local and national electrical codes.
Read the following instructions carefully before proceeding with the installation. Failure to follow the instructions could damage the product or cause a hazardous condition. Installation must be performed by a qualified service technician or electrician. Disconnect the power supply before installing in order to prevent electrical shock.

INSTALLATION

There are three separate cases for installing the VC3000 Relay Pack. Case 3 is dependent on local codes and requires a 4 inch x 4 inch junction box.

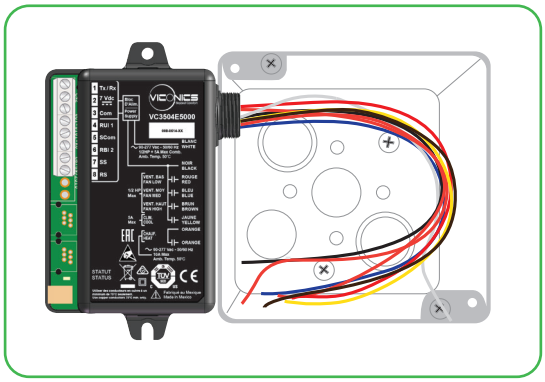
Case 1: Install Device inside Electrical Cabinet of Fan Coil Unit

1. Use plastic mounting tabs to secure unit to inside of electrical enclosure with screws.
2. Cut one or both plastic mounting tabs if space is needed inside enclosure.
3. Install low or high-voltage metal separator (if required).
4. Do not exceed the maximum rated temperature of unit (50 °C/122 °F).



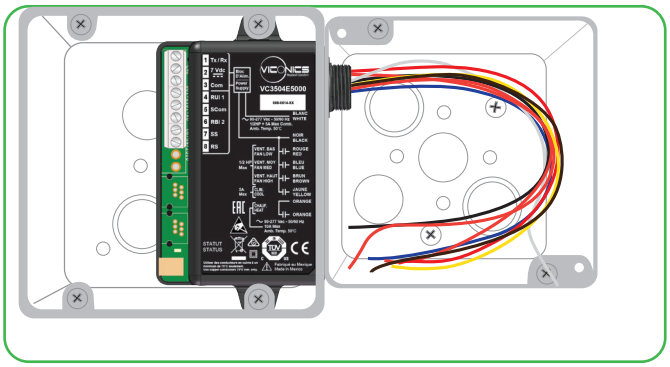
Case 2: Install Outside of Junction Box or Electrical Cabinet

1. Using supplied lock nut, secure Relay Pack to either electrical junction box or electrical cabinet of fan coil unit.



Case 3: Install in Enclosed Low Voltage Junction Box

1. Cut one or both plastic mounting tabs if space is needed inside enclosure.
2. Using supplied lock nut, secure Relay Pack inside junction box to either main electrical junction box or electrical cabinet of the fan coil unit.



WARNINGS

Replacing Old Fan Coil Controller

If replacing old line voltage fan coil Room Controller, label wires before removal of old Room Controller.

Proper Installation and Use

VC3000 Relay Packs can only be used as operating controls. If installed incorrectly, the device may fail or cause injury or loss of property. It is the responsibility of the end user to ensure the device is correctly installed by a certified professional, and proper safety precautions have been taken to prevent failures.

COMMUNICATION WIRING

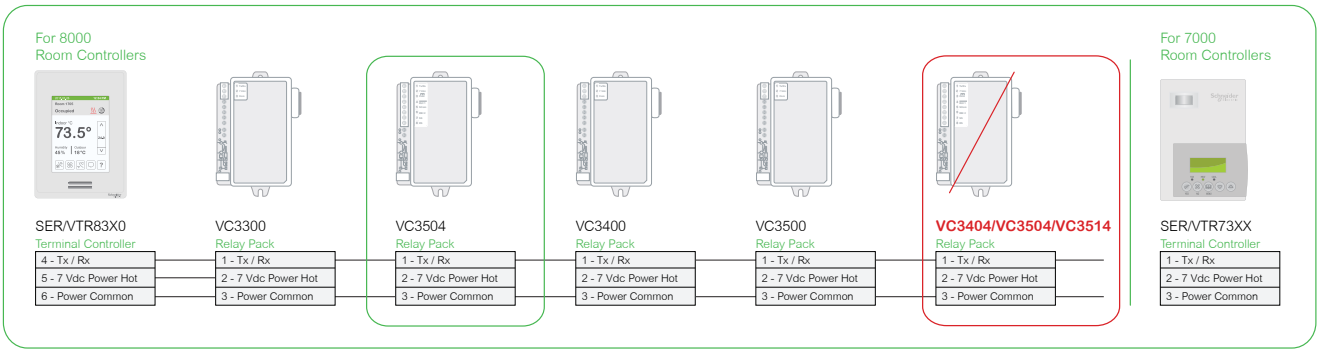
Only **ONE** Relay Pack with remote monitoring inputs (VC3404, VC3504 or VC3514) can be used for a single Room Controller. All other Relay Packs must be **without** remote monitoring inputs (VC3300, VC3400 or VC3500). A maximum of 10 Relay Packs can be used for a single Room Controller. The Relay Packs can be arranged in any order.

From Room Controller to the first Relay Pack:

- Uses existing or new field wires
- A minimum of 3 wires are required
- Solid or Stranded, Shield is not necessary
- Distance between the two units must not exceed 15 m (49 ft)
- Wire gauge depends on available distance:
  - <= 10 m (33 ft): AWG 16-18 (1.31 - 0.823 mm²)
  - > 10 m (33 ft): AWG 16 (1.31 mm²)

From the first Relay Pack to all other Relay Packs:

- Uses existing or new field wires
- 2 required wires AWG 16-18 (1.31 - 0.823 mm²):
  - Tx/Rx (1)
  - Power Common (3)
- Solid or Stranded, Shield is not necessary

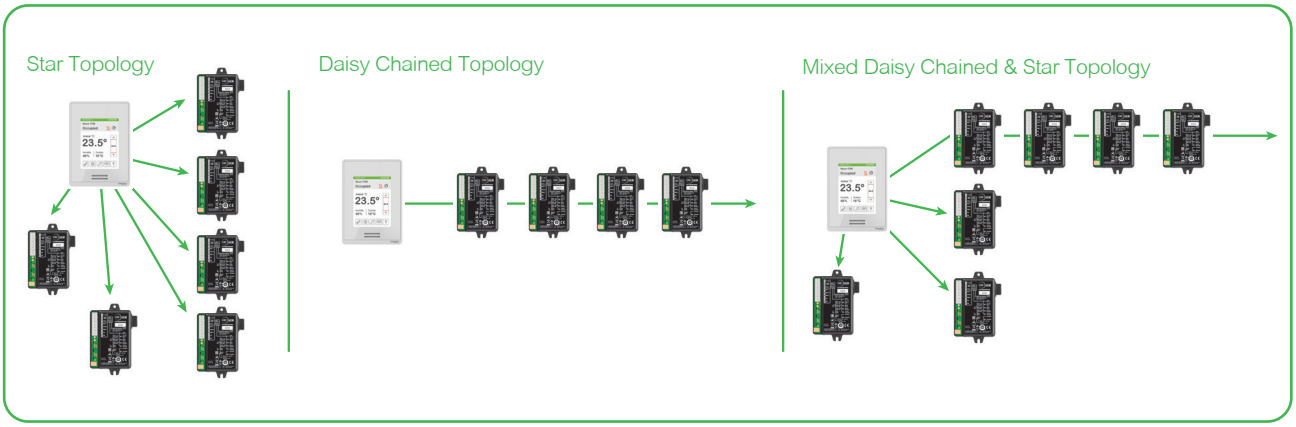


Warning:

- Only one VC3404E5000, VC3504E5000 or VC3514E5000 Relay Pack with remote monitoring inputs can be used for a single Room Controller.

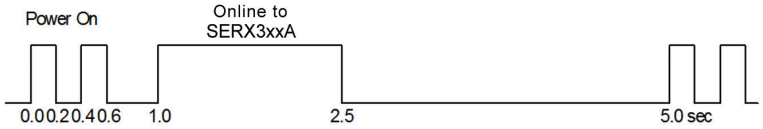
NETWORK WIRING TOPOLOGY

The Room Controller to Relay Pack communication wiring can use any network wiring topology as required or based on the topology of existing wires.



VC3000 LED OPERATION

LED Status	Cause	Countermeasure
2 short blinks	No communication between Room Controller and Relay Pack. The Relay Pack resumes its output to no communication active status.	Check communication wiring and/or power cycle to controllers
2 short blinks and one long blink	Normal communication between Room Controller and Relay Pack.	No action required



On/off LED vs. time (normal operation)

WIRE REMOTE INPUTS TO VC3404, VC3504 AND VC3514

Remote RUI1 Input by Configuration

- None (monitoring only)
- Local changeover sensor (10K type2 COS)
- Local changeover contact (COC NO or COC NC)
- Service alarm (Service)
- Filter Alarm (Filter)

Remote RBI 2 Input by Configuration

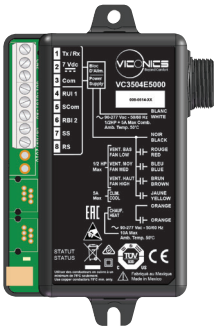
- None (monitoring only)
- Service alarm (Service)
- Filter Alarm (Filter)

S5 Supply Sensor

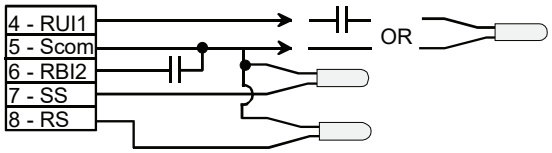
- 10K type2 monitoring only
- Auto detected

RS Return Air Sensor

- 10K type2 main temperature control
- Auto detected (bypasses Room Controller internal sensor)



VC3404 or VC3504 Relay Pack



Warning:

- Only one VC3404E5000, VC3504E5000 or VC3514E5000 Relay Pack with remote monitoring inputs can be used for a single Room Controller.

MODEL CHART

Part #	VC3500E5000	VC3504E5000	VC3514E5000	VC3400E5000	VC3404E5000	VC3300E5000
Applications	2 pipes 2 pipes with reheat 4 pipes	2 pipes 2 pipes with reheat 4 pipes	2 pipes 2 pipes with reheat 4 pipes	2 pipes 2 pipes with modulating pulsed reheat	2 pipes 2 pipes with modulating pulsed reheat	Fan control only
Fan control	Up to 3 speed	Up to 3 speed	Up to 3 speed	Up to 3 speed	Up to 3 speed	Up to 3 speed
Monitoring inputs	None	4 FCU remote inputs	4 FCU remote inputs	None	4 FCU remote inputs	None
Control types	On-Off line switched valve output control - 1 heat / cool output - 1 cool output - 3 fan outputs	On-Off line switched valve output control - 1 heat / cool output - 1 cool output - 3 fan outputs	On-Off line switched valve output control - 1 heat / cool output - 1 cool output - 3 fan outputs - Occupancy output (7VDC)	On-Off line switched valve output control - 1 heat / cool output - 1 Modulating pulsed Vdc output for SSR electric reheat control - 3 fan outputs	On-Off line switched valve output control - 1 heat / cool output - 1 Modulating pulsed Vdc output for SSR electric reheat control - 3 fan outputs	Fan control only - 3 fan outputs

Ordering Information Notes:

- Please refer to the applicable Application Guide for related information on VTR73XX/VTR83X0 and SER73XX/SER83X0 Room Controllers and VC3000 Relay Pack arrangements and possible combinations.
- More than one Relay Pack can be used for a single Room Controller.
- Only one VC3404E5000, VC3504E5000 or VC3514E5000 Relay Pack with remote monitoring inputs can be used for a single RoomController.

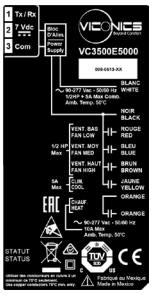
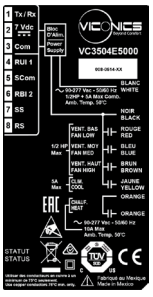
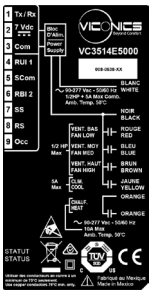
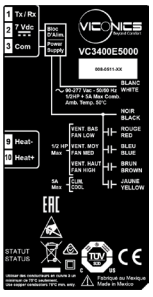
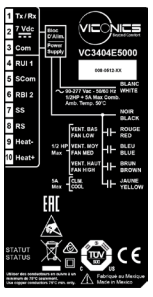
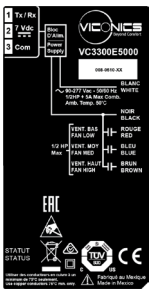
Ordering examples:

- A VC3500E5000 is for a 90 to 277 Vac powered, FCU-mounted Relay Pack with the following outputs:
  - Three 90 to 277 Vac switching fan relay outputs
  - Two 90 to 277 Vac switching valve relay outputs
- A VC3504E5000 is for a 90 to 277 Vac powered, FCU-mounted Relay Pack with the following inputs and outputs:
  - One configurable universal input
  - One configurable binary input
  - One dedicated discharge air temperature monitoring input
  - One dedicated return air temperature control input
  - Three 90 to 277 Vac switching fan relay outputs
  - Two 90 to 277 Vac switching valve relay outputs
- A VC3300E5000 is for a 90 to 277 Vac powered FCU-mounted Relay Pack with the following outputs:
  - Three 90 to 277 Vac switching fan relay outputs

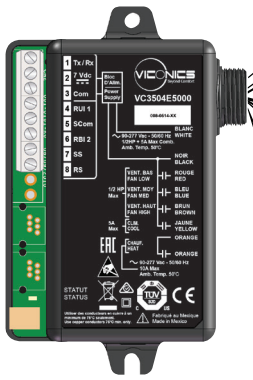
Warning:

- Only one VC3404E5000, VC3504E5000 or VC3514E5000 Relay Pack with remote monitoring inputs can be used for a single Room Controller.

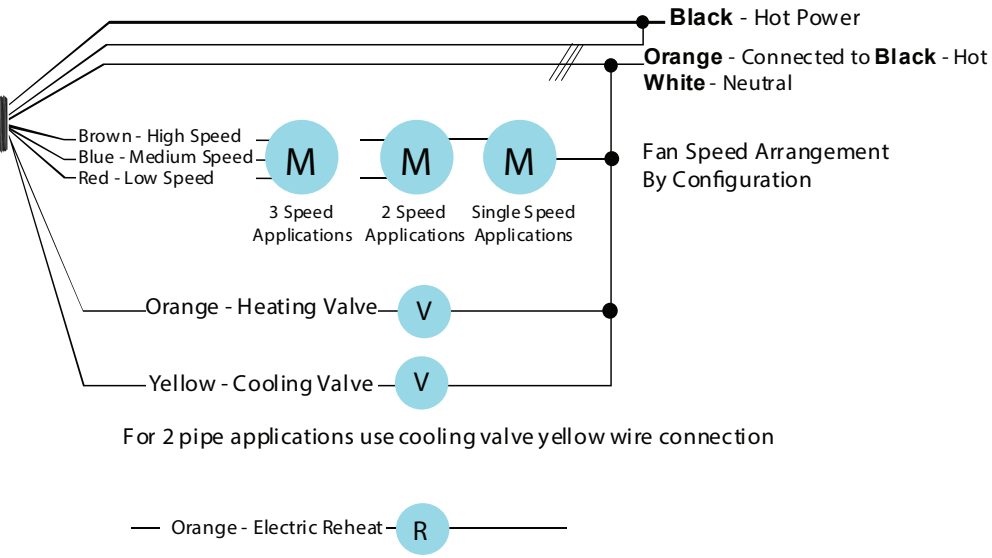
TERMINALS, WIRE IDENTIFICATION AND RATINGS

Part #	VC3500E5000	VC3504E5000	VC3514E5000	VC3400E5000	VC3404E5000	VC3300E5000
Low Voltage Terminals	No local inputs	Low voltage inputs	Low voltage inputs	No local inputs	Low voltage inputs	No local inputs
1	1- Tx/Rx	1- Tx/Rx	1- Tx/Rx	1- Tx/Rx	1- Tx/Rx	1- Tx/Rx
2	2- 7 VDC	2- 7 VDC	2- 7 VDC	2- 7 VDC	2- 7 VDC	2- 7 VDC
3	3- Com	3- Com	3- Com	3- Com	3- Com	3- Com
4		4- RUI 1	4- RUI 1		4- RUI 1	
5		5- Scom	5- Scom		5- Scom	
6		6- RBI 2	6- RBI 2		6- RBI 2	
7		7- SS	7- SS		7- SS	
8		8- RS	8- RS		8- RS	
9			9- Occ	9- Heat -	9- Heat -	
10				10- Heat +	10- Heat +	
LINE VOLTAGE CONNECTIONS						
Power Supply	Power supply: - 90 to 277 VAC (universal all models) - Black Hot L1 Power VAC (Switches: Brown, Blue, Red, and Yellow) - White neutral power VAC					
Fan line voltage contact Wire connection ½ HP Maximum	3 Fan Speed Control Wires Brown, Blue, Red	3 Fan Speed Control Wires Brown, Blue, Red	3 Fan Speed Control Wires Brown, Blue, Red	3 Fan Speed Control Wires Brown, Blue, Red	3 Fan Speed Control Wires Brown, Blue, Red	3 Fan Speed Control Wires Brown, Blue, Red
Valve line voltage contact output Yellow wire connection 10A maximum	4 Pipes Cool output Or 2 Pipes Heat / Cool output	4 Pipes Cool output Or 2 Pipes Heat / Cool output	4 Pipes Cool output Or 2 Pipes Heat / Cool output	2 Pipes Heat / Cool output	2 Pipes Heat / Cool output	N/A
Valve line voltage isolated contact output 2 x Orange wires connection10A maximum	4 Pipes Heat output Or 2 Pipes reheat output	4 Pipes Heat output Or 2 Pipes reheat output	4 Pipes Heat output Or 2 Pipes reheat output	N/A	N/A	N/A
						

RELAY PACK WIRING



VC3504
Relay Pack



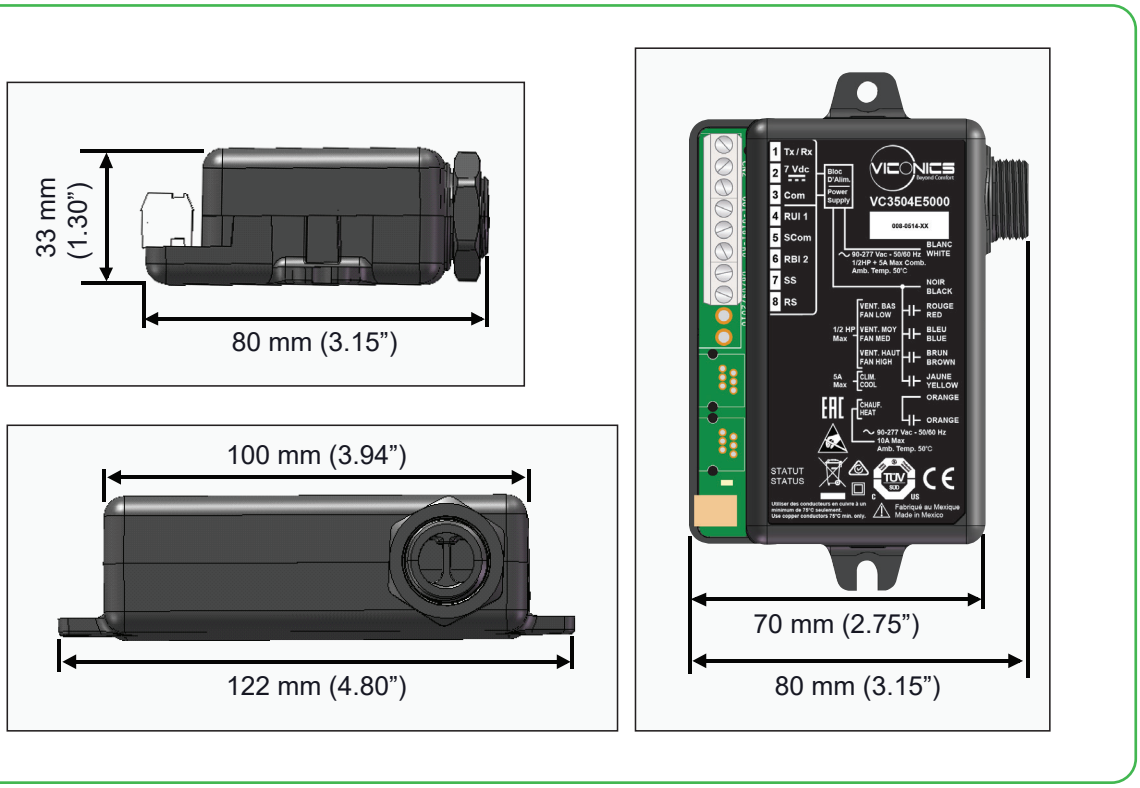
For 2 pipe applications use cooling valve yellow wire connection

For electric reheat applications where current draw is above 10 A use a line powered coil pilot duty relay or contactor for the heating element in place of the heating valve.

SPECIFICATIONS

Power Supply	90 to 277 VAC universal, 50-60 Hz
Output ratings	Heat Valve: (Orange wires): 10 Amps @ 277 VAC maximum Cool Valve: (Yellow wire): 5 Amps @ 277 VAC maximum Fan: (red, blue, brown wire(s)): 1/2 HP @ 277 VAC maximum
Operating conditions	0 °C to 50 °C (32 °F ro 122 °F), 0% to 95% RH non-condensing
Approximate shipping weight:	0.34kg (0.75lb)
Agency Approvals all models	cTUVus: UL 873 (US) and CSA C22.2 No. 24 (Canada) CE LVD 2014/35/EU (Europe Union) CE EMC 2014/30/EU (Europe Union) FCC Part 15, Subpart B Wireless Models: CE RTTE 2014/53/EU FCC Part 15, Subpart C RSS 210
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.	
Please check with your local government for instruction on disposal of this product.	

DIMENSIONS



CALIFORNIA PROPOSITION 65 WARNING STATEMENT FOR CALIFORNIA RESIDENTS

⚠ **WARNING**: This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm, and Bisphenol A (BPA), which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.