

Room Controller

VT8600 Rooftop Unit, Heat Pump, and Indoor Air Quality Controller

Technical Cut Sheet

Programmable and application specific room controller with customizable screen colors. The VT8600 room controller is a rooftop, heat pump, and indoor air quality controller suitable for commercial and high end hospitality markets.



VT8600 RTU HP IAQ Room Controller Features



The perfect balance between simplicity and sophistication. Select from a wide variety of configurable screen colors to match decor. Display your own logo and custom messages on screen to reinforce your brand and provide a more enjoyable occupant experience.

Introduction

Smart energy management has never been easier than with the VT8600 Room Controllers for Rooftop Units, Indoor Air Quality, and Heat Pump applications. Designed for new construction and retrofit projects, the Room Controllers dramatically decrease project delivery costs by reducing installation, configuration and commissioning time. No complex software or tools are required to customize functionality to meet your applications requirements. The Room Controllers provide all the advanced features and monitoring functions required by modern building automation systems in a simple compact enclosure.

Application-specific and programmable

The VT8600 Room Controllers are both application-specific AND programmable. This enables the modification of pre-configured control sequences, or the creation of entirely new control sequences for HVAC, lighting and other applications. The VT8600 Room Controllers provide exceptional control of staged heating and cooling equipment such as packaged roof-top units. Their configurable control sequences, economizer, and scheduler functionalities deliver all the flexibility necessary for optimal indoor air quality applications.

Touch screen with customizable user experience

The touch screen of the VT8600 Room Controller offers a customizable user experience with selection of languages, temperature scales, buttons, and screen colors. Using the Uploader VT8000 tool, it also supports the upload of an image or logo that becomes the default standby screen of the device. Custom messages can also be displayed on-screen using BACnet® objects when the VT8600 is integrated via a BACnet MS/TP system.

Optional passive infrared motion (PIR) sensor

All models can be equipped with a discrete optional Passive Infrared (PIR) motion sensor. With the embedded sensor, the VT8600 Room Controller uses advanced occupancy routines to generate automatic energy savings during occupied and unoccupied periods without sacrificing occupant comfort.



AT A GLANCE

Custom design

- Color touch screen interface
- 5 selectable screen colors schemes
- Supports the upload of a custom standby screen
- Supports the display of custom messages when integrated via BACnet MS/TP
- English, French, Spanish, Chinese, Russian and other selectable languages
- Interchange between °C/°F
- Universal inputs and outputs including:

- CO2 sensor input
- Fresh air station input

- Configurable Economizer
- Configurable Scheduler

Options and accessories

- On-board occupancy sensor (optional)
- RH sensor with dehumidification control (optional)
- Can be used with ZigBee Pro wireless sensors
- Free downloadable Uploader VT8000 tool for the upload of Lua Scripts, standby screen images, and firmware upgrades, using a USB/Micro-USB cable

Integration

- Multiple options for integration to Building Management Systems (BMS)

VT8600 RTU HP IAQ Room Controller Features

Product highlights

- Suitable for both commercial and hospitality markets and systems
- Customizable color digital touch screen interface with multi-language support
- Fully programmable control sequences using scripting
- On board configuration interface utility
- Configurable sequence of operations
- Configurable Economizer
- Configurable Scheduler
- Change of value (COV) function for BMS integration
- Universal inputs and outputs including a CO2 sensor input and Fresh air station input
- Optional PIR occupancy sensor
- Advanced occupancy functions for commercial and lodging applications
- Optional wireless motion sensors, door and window switches (with optional ZigBee Pro® card) available

Supported networking protocols

- BACnet MS/TP (B) (standard on all models)
- ZigBee Pro wireless mesh network (P) (optional with communication module purchased separately)

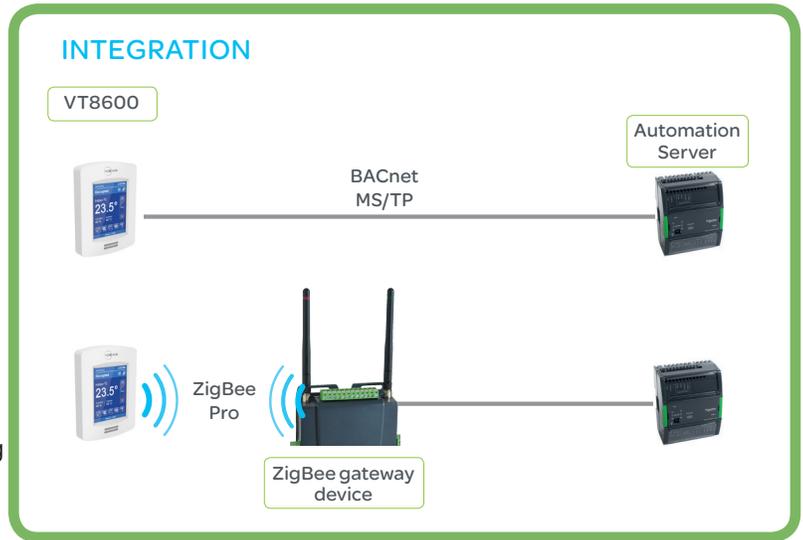
Integration to BMS systems

VT8600 can be integrated with Building Management Systems (BMS)

- Direct wired integration to BACnet MS/TP
- ZigBee Pro integration to ZigBee gateway device
- ZigBee gateway device integration to BACnet IP, oBIX and EWS

Architects and designers can match their decor

- Five screen colors are selectable through the interface
- Customizable standby screens and messages



- > 5 configurable screen color schemes



VT8600 RTU HP IAQ Room Controller Features

Programming the VT8600 with Lua

The VT8600 Room Controllers are programmable using the open programming language Lua. Although BMS often use open protocols and standards, their Program BACnet objects and scripting features remain proprietary and incompatible with third party devices. The VT8600 Room Controllers use of an open language enables interoperability with all systems.

Programming with BMS Integration

When integrated into a BACnet MS/TP BMS, the VT8600 offers 10 Program BACnet objects able to contain 480 characters each. No special software, license or tool is required.

- BACnet MS/TP integration into BMS
- 10 Program BACnet objects (Lua scripts)
- Each object can contain 480 characters max

Programming without Integration

When there is no BACnet MS/TP integration, a Lua script can be uploaded directly into the VT8600 unit using the Uploader VT8000 tool. Unlike the 10 PG objects used when the unit is integrated via BACnet MS/TP, there is only one script, which can contain up to 16KB.

- No BACnet MS/TP integration
- 1 Lua script of 16KB max
- Uploader VT8000 tool allows upload of scripts

Applications for HVAC and Beyond

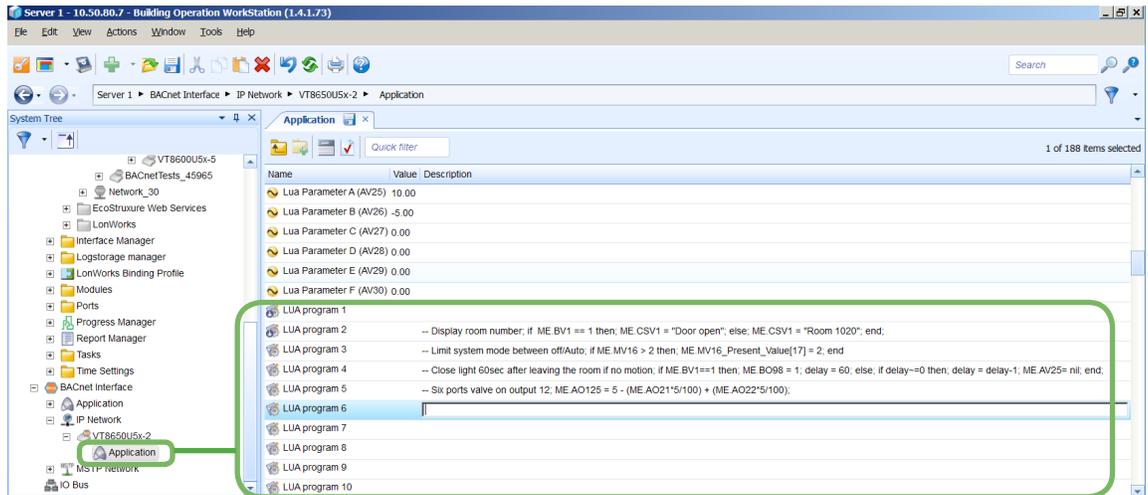
Programming can be used to go beyond the pre-configured control sequences of the VT8600 to create customized HVAC applications. It can also be used to comply with specific project requirements and manage other applications, such as lighting and other equipment.

Using Lua scripts also enables you to take advantage of the extra inputs and outputs of the VT8600 to manage other devices, such as sensors and relays.

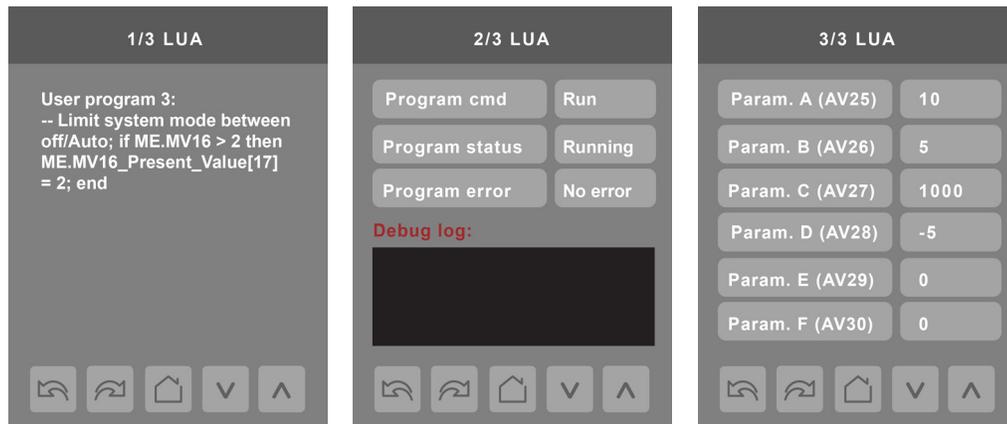
Uploader VT8000

Lua scripts, standby screen images and firmware upgrades can be loaded into the VT8600 using the Uploader VT8000 tool and a USB/Micro-USB cable.

> PG objects of the VT8600 viewed through a BMS



> PG objects of the VT8600 viewed through its touch-screen display



VT8600 RTU HP IAQ Room Controller Features

Roof Top Units

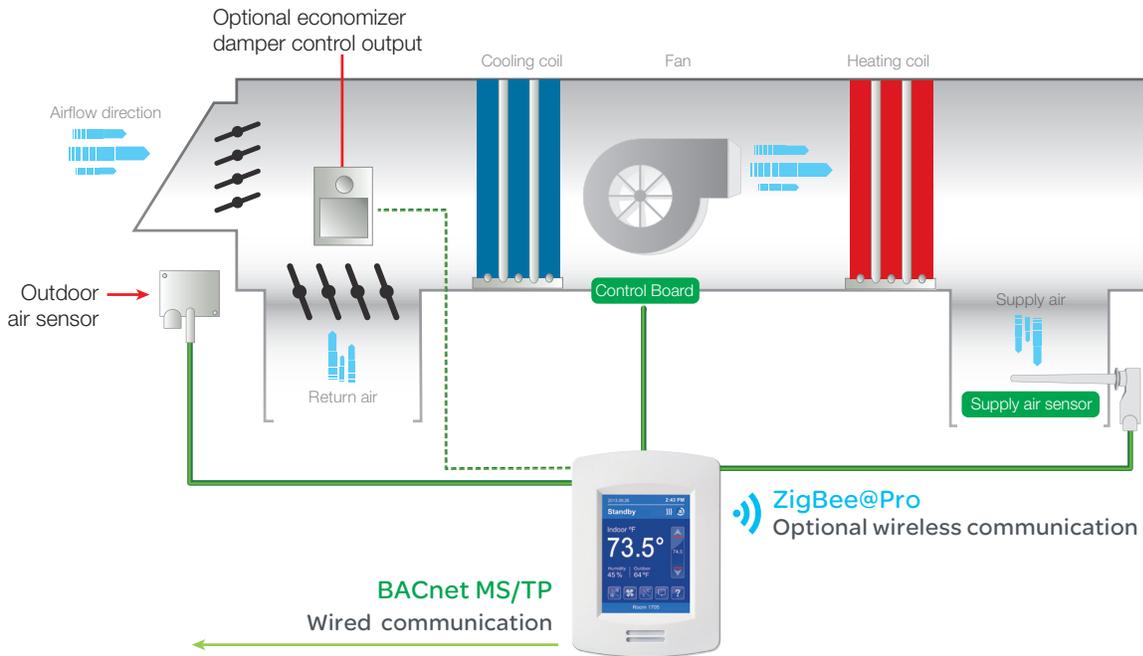
The VT8600 can be configured to manage the following types of staged equipment:

- 1 Heating stage / 1 Cooling stage
- 2 Heating stages / 2 Cooling stages
- Modulating heat / 2 Cooling stages

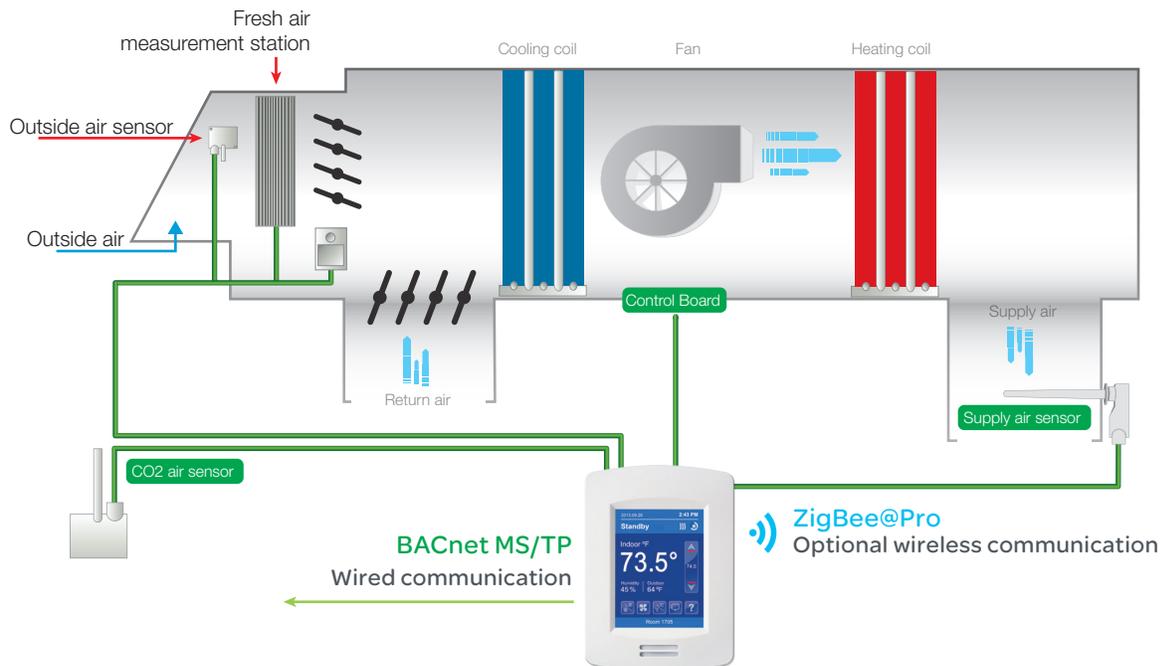
Indoor Air Quality

Indoor air quality is becoming a major concern to businesses, building managers, tenants, and employees because of its direct impact on the comfort, well-being, and productivity of the building's occupants. The VT8600, along with a CO2 sensor, is a cost-effective solution capable of controlling economiser free cooling, and demand-based ventilation strategies, while also providing a fresh air measurement input. When integrated to a BMS, the Room Controller can monitor and verify the CO2 and fresh air levels, ensuring optimal air quality and energy efficiency.

TYPICAL ROOFTOP UNIT APPLICATION



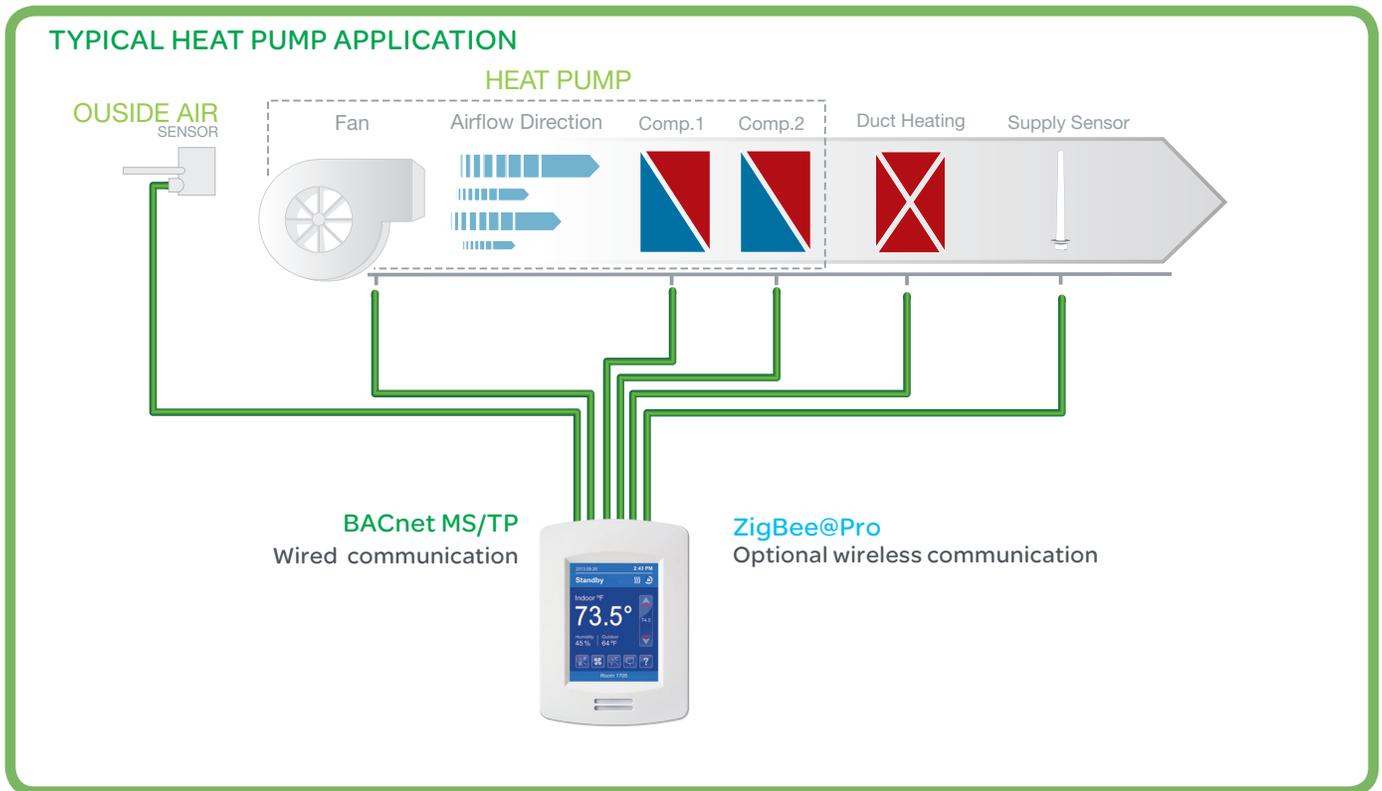
TYPICAL INDOOR AIR QUALITY APPLICATION



VT8600 RTU HP IAQ Room Controller Features

Heat Pump

- Selectable single or dual stage compressor stages.
- High balance point: Locks out auxiliary heating when outside air temperature is above this value.
- Low balance point: Locks out heat pump compressor operation when outside air temperature is below this value.
- Comfort/economy mode: In economy mode, heat pump use is maximized before turning On auxiliary heating.
- Compressor/auxiliary interlock: Adds flexibility by locking out heat pump operation during auxiliary heating to prevent high pressure trip when the coil is downstream of the auxiliary heat source.



VT8600 RTU HP IAQ Room Controller Specifications

Specifications

VT8600

Dimensions

12cm/4.72in (H) x 8.6cm/3.38in (W) x 2.5cm/1in (D)

Power Requirements

Input: 24Vac \pm 15%, 50/60Hz

Device consumption: 6 VA

Maximum rating: 100 VA, 4.17 A

Output Ratings

Maximum total output: 94 VA

Relay rating: 28 Vac 50/60Hz, 1.0 Amp., in-rush = 3.0 Amps; pins 1, 2, 3, 4, 5, 8, 9

Digital optomos output rating: 28 Vac 50/60Hz, 0.3 Amp., in-rush = 1.5 Amps; pins 9, 10, 11, 12

Analog: 0 - 10 Vdc in 2 kilo-ohm resistance minimum load (maximum 5 mA); pins 9, 10, 11, 12

Operating Conditions

0 °C - 50 °C (32 °F - 122 °F)

0% - 95% R.H. non-condensing

Storage Conditions

-30 °C - 50 °C (-22 °F - 122 °F)

0% - 95% R.H. non-condensing

Temperature Sensor

Local 10 K NTC type 2 thermistor

Temperature Sensor Resolution

± 0.1 °C (± 0.2 °F)

Temperature Control Accuracy

± 0.5 °C (± 0.9 °F) @ 21 °C (70 °F) typical calibrated

Humidity Sensor and Calibration

Single point calibrated bulk polymer type sensor

Humidity Sensor Precision

Reading range from 10-90 % R.H. non-condensing

10 to 20% precision: 10%

20% to 80% precision: 5%

80% to 90% precision: 10%

Humidity Sensor Stability

Less than 1.0 % yearly (typical drift)

Dehumidification Setpoint Range

30% - 95% R.H.

Occ, Stand-By and Unocc Cooling Setpoint Range

12.0 - 37.5 °C (54 - 100 °F)

Occ, Stand-By and Unocc Heating Setpoint Range

4.5 °C - 32 °C (40 °F - 90 °F)

Room and Outdoor Air Temperature Display Range

-40 °C - 50 °C (-40 °F - 122 °F)

Proportional Band for Room Temperature control

Cooling and Heating: Default: 1.8°C (3.2°F)

Analog Inputs

Modulating 0-10 vdc across UI19 to Common

Binary Inputs

Dry contact across terminals UI16, UI17 and UI19 to Common

Remote Temperature Sensor Requirements

10 K NTC type 2 thermistor

Wire Gauge

Power supply: 18 gauge or larger,

Communications: 24 gauge or larger

Approximate Shipping Weight

0.34 kg (0.75 lb)

Safety Standards All Models

LVD Directive 2006/95/EC

EN 60950-1:2006/A2:2013UL 873

CSA C22.2 No. 24-93

EMC Standards All Models

EMC Directive 2004/108/EC

IEC 61326-1:2005

FCC 15 Subpart B

ICES-003

Radio Standards (Wireless Models)

R&TTE Directive 1999/5/EC

ETSI EN 300 328 V1.8.1

ETSI EN 301 489-1 V1.9.2

ETSI EN 301 328 V1.8.1

FCC 15 Subpart C

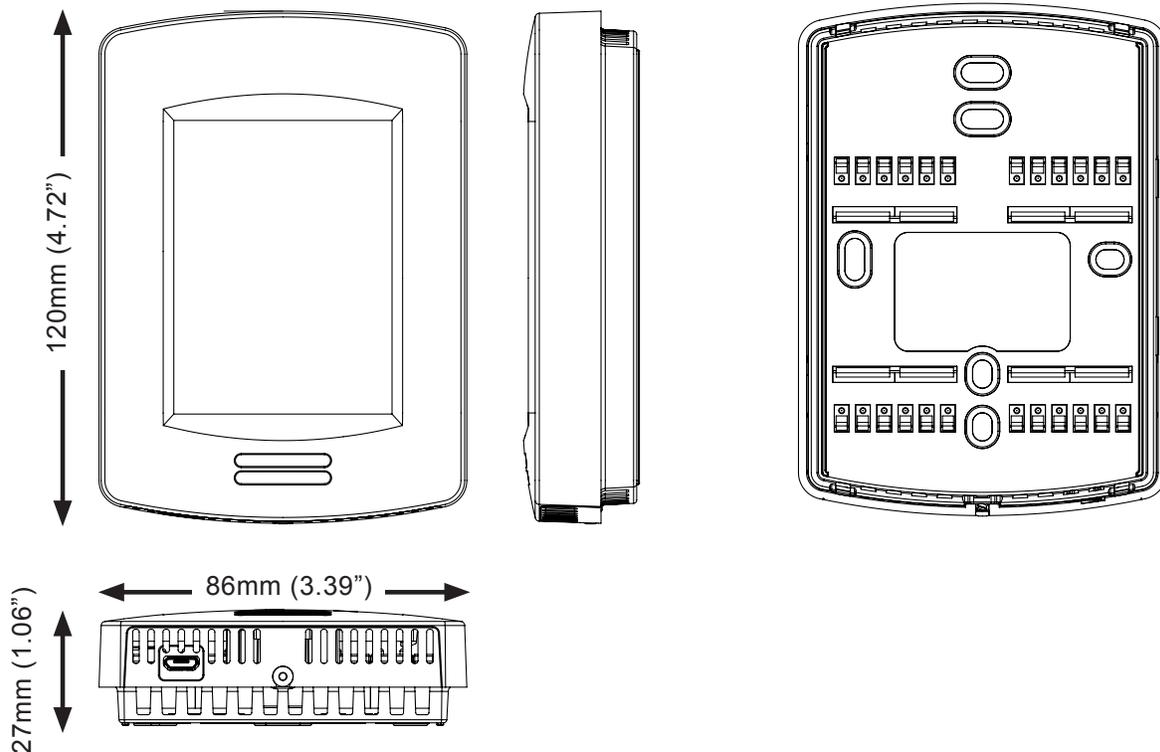
RSS 210

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 UNDESIRE OPERATION.



Check with your local government for instruction on disposal of these products.

Dimensions



VT8600 RTU HP IAQ Room Controller Ordering Information

Ordering information

VT86 **5** **0** **U** **5** **5** **00** **B**

RH sensor and control

-00 = No RH sensor or control
 -50 = RH sensor with dehumidification control

Compatibility

-U = Universal outputs

PIR motion sensor

-0 = No PIR
 -5 = PIR on board

Network

-B = BACnet® MS/TP
 (ZigBee Pro communication module available separately)

ZigBee® Pro communication module (ordered separately)
 VCM8000V5000P

Part numbers

VT8600

Part numbers

Part numbers	RH sensor & control	PIR motion sensor
VT8600U5000B		
VT8650U5000B	x	
VT8600U5500B		x
VT8650U5500B	x	x

Part numbers

Communication modules

Consult respective datasheets for the latest available part numbers and features