

# VT8600 Series Installation Guide

Rooftop Unit, Heat Pump and Indoor Air Quality Controller



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## INSTALLATION

### Location

- Do not install on outside wall.
- 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 air circulation.
- Ensure wall surface is flat and clean.

### Installation

1. Remove security screw (if any) on bottom of Room Controller cover.
2. Open unit by pulling on bottom side of Room Controller (Figure 1).
3. Read FCC ID and IC label installed in cover before installing any wireless product.
4. Ensure correct side of base faces up.
5. Pull cables 6in ( 15cm ) out from wall.
6. Align base and mark location of two mounting holes on wall (Figure 2).
7. Install anchors in wall.
8. Insert cable in central hole of base.
9. Insert screws in mounting holes on each side of base.
10. Strip each wire 1/4in ( 0.6cm) from end.
11. Insert each wire and screw according to wiring chart (next page).
12. Gently push excess wiring back into hole.
13. Gently align cover to top of base and snap in place from bottom (Figure 3).
14. Install security screw.

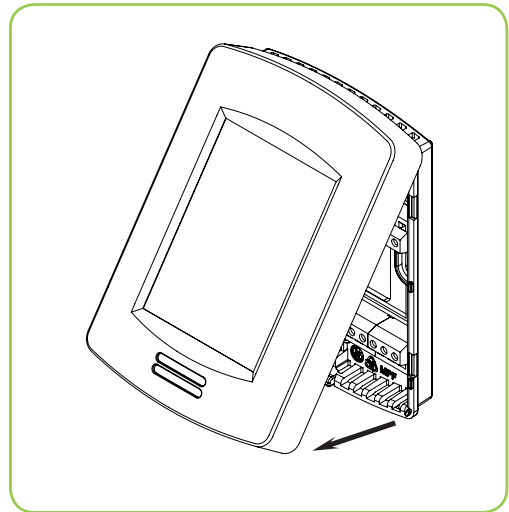


Figure-1 Open cover

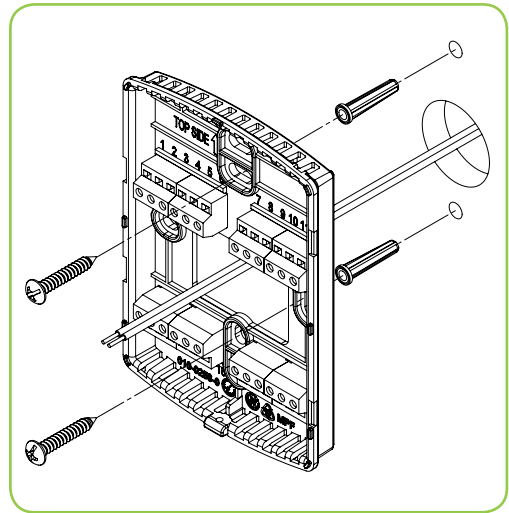


Figure-2 Install base



- 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 Controller or equipment.
- All VT8600 series controls are designed for use as operating controls only and are not safety devices. Tampering with the devices or unintended application of the devices will result in a void of warranty.
- This device must be installed to provide a separation distance of at least 8in (20cm) from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

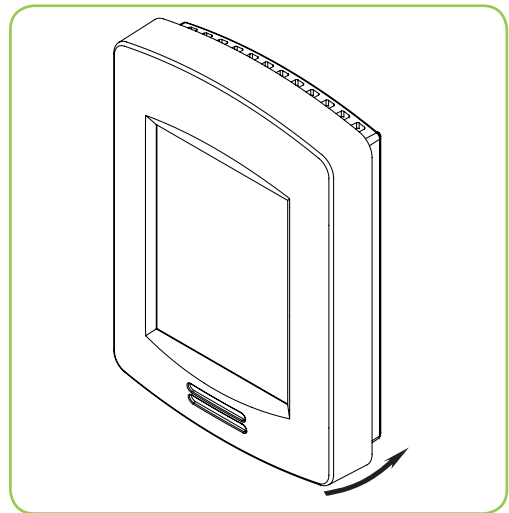


Figure-3 Reinstall cover

## CONFIGURABLE BI/UI UNIVERSAL INPUTS OVERVIEW

### Universal input #16 can be configured for the following binary functions:

1. **(None):** No function associated with the input
2. **(Rem NSB):** remote NSB timer clock input. The scheduling is set as per the binary input. It provides low cost setback operation via a dry contact.  
 Contact opened = Occupied  
 Contact closed = Unoccupied
3. **(Motion NO) and (Motion NC):** Advanced PIR occupancy functions using a normally open (NO) or normally closed (NC) remote PIR motion sensor. Occupancy mode is now set as per applied PIR function and configuration. This document will provide the installers and system designers with detailed examples on applications, parameter configuration information, sequence of operation, troubleshooting and diagnostic help required for the proper usage of the onboard PIR sensor.
4. **(Window) EMS:** Forces the system to disable any current heating or cooling action by the Room Controller. The mode stays the same and the current setpoints are the same occupied setpoints. Only the outputs are disabled. There is a Door/Window alarm displayed on the Room Controller to indicate to the local tenant that the door/window needs to be closed for cooling or heating to resume. Use NC contact.  
 Contact opened = System disabled with local Window alarm  
 Contact closed = System enabled
5. **(Fan lock):** a Fan lock alarm short text message shows on the Room Controller screen when the input is not energized. Used in conjunction with a local airflow sensor connected to the input. Locks out the Room Controller heating and cooling action if no airflow is detected 10 seconds after the fan ( G terminal ) is energized.  
 Contact opened = no airflow  
 Contact closed = airflow present

### Universal input #17 can be configured for the following binary functions:

1. **(None):** No function associated with the input. Input can be used for remote network monitoring.
2. **(Door Dry) Door contact & Motion detector:** This configuration is only functional if binary input #1 is set to Motion NO or Motion NC or an onboard PIR sensor is used. With this sequence enabled, the occupancy is now dictated through those 2 inputs. Any motion detected will set the zone to occupied status. The zone remains permanently in occupied mode until the door contact switch opens momentarily. The Room Controller will then go in stand-by mode. If more movements are detected, the occupied mode will resume. While the door is opened, any movements detected by the remote PIR sensor or the onboard PIR sensor will be ignored. Use a Normally Closed contact switching device.  
 Contact opened = Door opened  
 Contact closed = Door closed
3. **(Override):** Temporary override remote contact. Disables all override menu function of the Room Controller. The override function is now controlled by a manual remote momentarily closed contact. When configured in this mode, the input operates in a toggle mode. With this function enabled it is now possible to toggle between unoccupied & occupied setpoints for the amount of time set by parameter (TOccTime) temporary occupancy time. When Override is enabled, an Override status message will be displayed
4. **(Filter):** a Filter alarm short text message shows on the Room Controller screen when the input is energized
5. **(Service):** a Service alarm short text message shows on the Room Controller screen when the input is energized

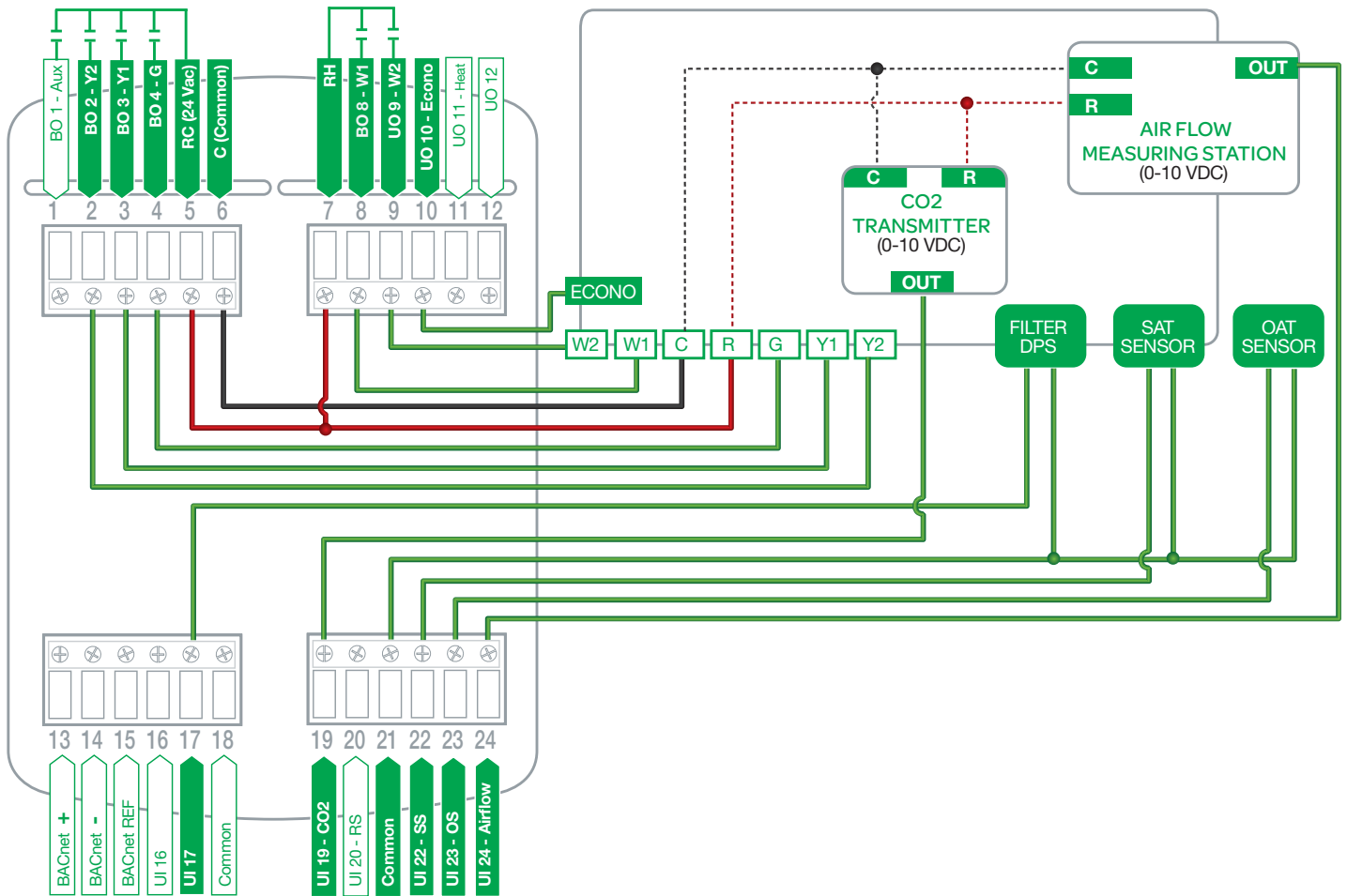
## TERMINAL IDENTIFICATION & FUNCTION

### Terminal identification

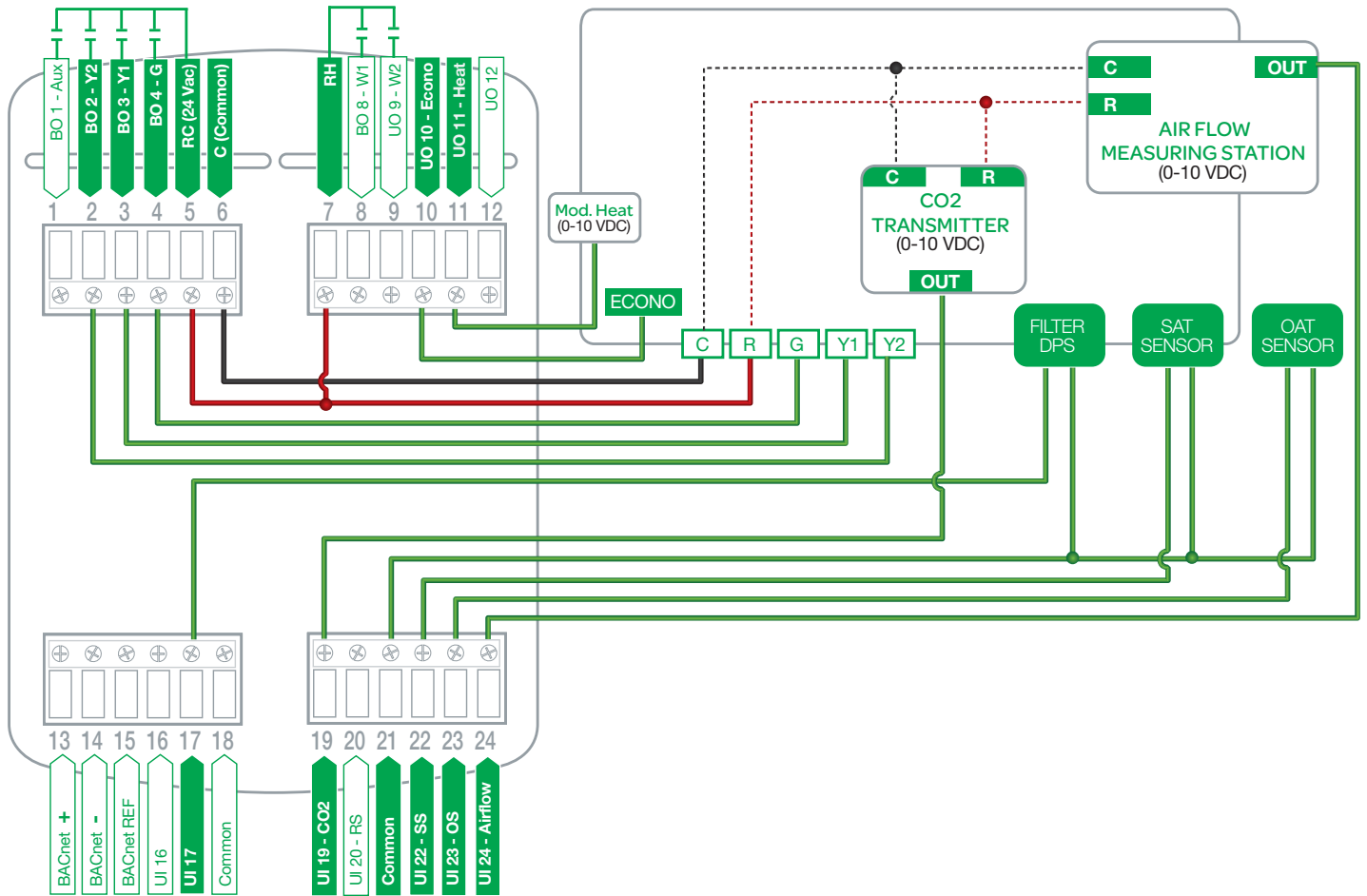
VT86xxU Description / Application	Used in applications
	<b>IAQ, HP &amp; RTU</b>
<b>Internal Temperature</b>	<b>X</b>
<b>1- BO1</b>	<i>Aux</i>
<b>2- BO2</b>	Y2
<b>3- BO3</b>	Y1
<b>4- BO4</b>	G
<b>5- RC</b>	RC (24 Vac)
<b>6- C</b>	Common
<b>7- RH</b>	RH
<b>8- BO8</b>	W1
<b>9- UO9</b>	W2 / OB
<b>10- UO10</b>	Econo (0-10 Vdc)
<b>11- UO11</b>	Heat (0-10 Vdc)
<b>12- UO12</b>	UO12 (Optional 0-10 Vdc output, can be set from BACnet)
<b>13- RS485 +</b>	BACnet (+)
<b>14- RS485 -</b>	BACnet (-)
<b>15- RS485 Ref</b>	BACnet Ref.
<b>16- UI16</b>	UI16 (multifunction input)
<b>17- UI17</b>	UI17 (multifunction input)
<b>18 Scom</b>	Common
<b>19- UI19</b>	CO2 (0-10 Vdc input)
<b>20- UI20</b>	RS (Remote sensor input 10K thermistor)
<b>21 Scom</b>	Common
<b>22- UI22</b>	SS (Supply sensor input 10K thermistor)
<b>23- UI23</b>	OS (Outside sensor input 10K thermistor)
<b>24- UI24</b>	Airflow (0-10 Vdc input)

TYPICAL APPLICATIONS

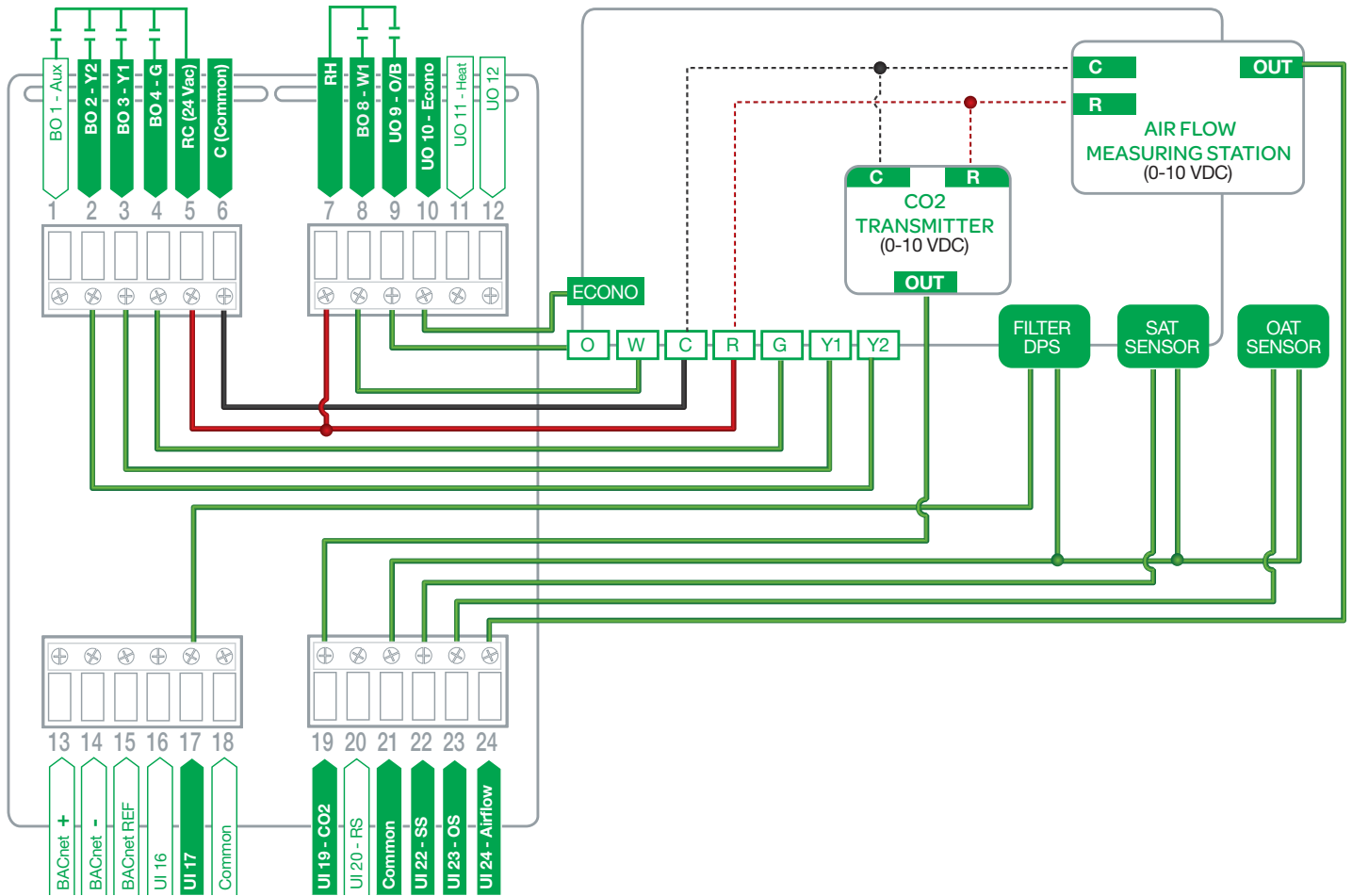
**VT8600** RTU: 2 Heating Stages / 2 Cooling Stages



**VT8600** RTU: 2 Cooling Stages / Modulating Heat



**VT8600** HPU: 2 Compressors, Auxiliary Heat and Economizer



REMOTE SENSOR ACCESSORIES

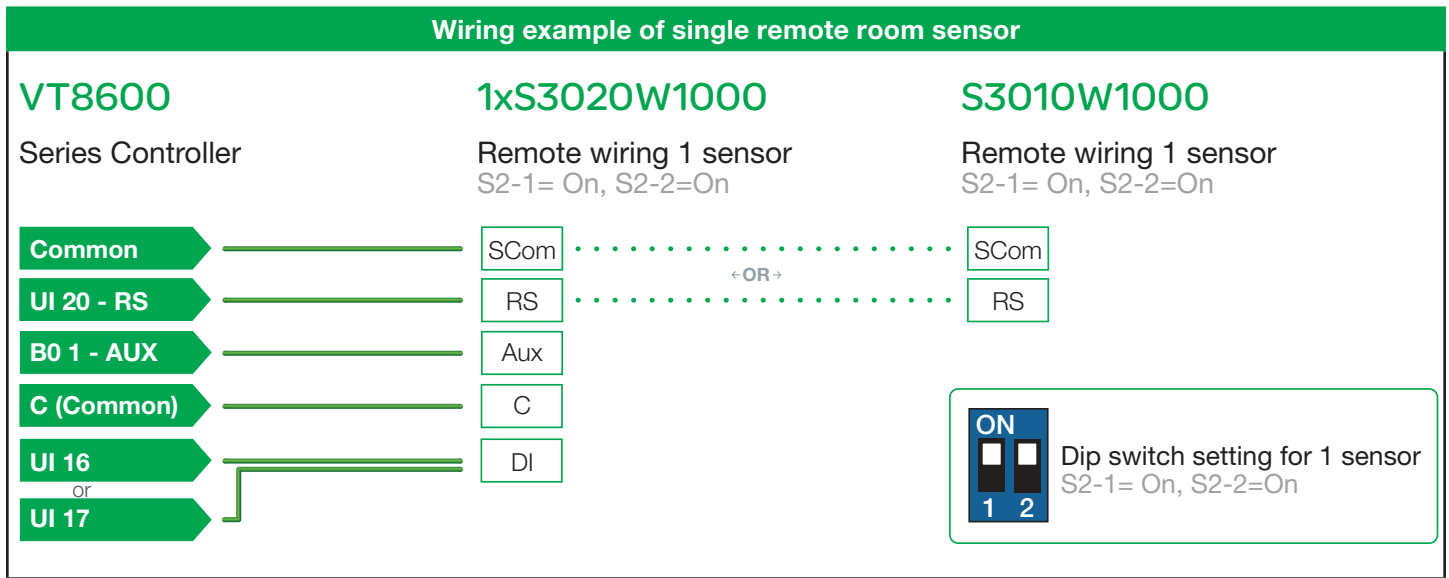
Model Number	Description
S3010W1000	Wall mounted temperature sensor
S3020W1000	Wall mounted temperature sensor with override button and occupancy status LED

**Note:**  
 If one or multiple sensor(s) is/are connected into the RS terminal, the internal temperature sensor is automatically disabled. Disconnecting the sensor(s) in RS terminal will re-activate the internal sensor.

Remote mount temperature sensors inputs use 10K type 2 NTC thermistors.

**Features:**

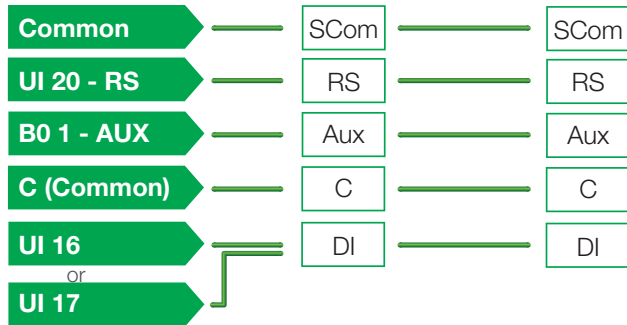
- Each sensor can be configured for various averaging combinations
- Optional occupancy led
- Optional override key



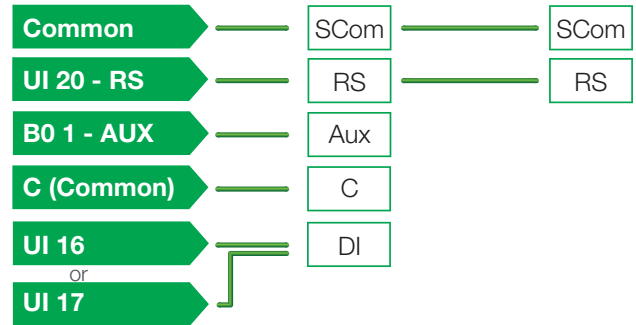


Wiring examples of 2 remote room sensors for averaging applications

**VT8600**      **2xS3020W1000**  
 Series Controller      Remote wiring 2 sensors  
 S2-1= Off, S2-2=On

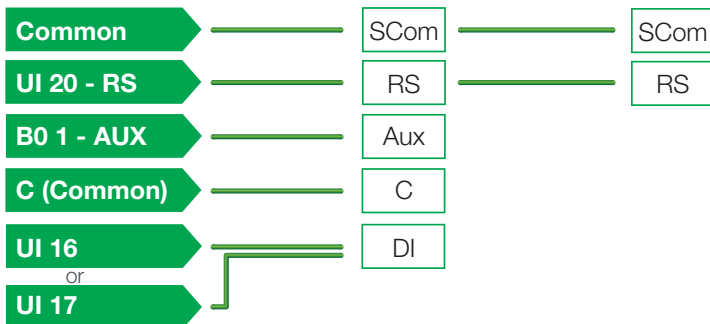


**VT8600**      **2xS3010W1000**  
 Series Controller      Remote wiring 2 sensors  
 S2-1= Off, S2-2=On



**VT8600**      **1xS3010W1000 and 1x2xS3020W1000**

Series Controller      Remote wiring 2 sensors  
 S2-1= Off, S2-2=On



**Note for averaging applications:**

S3010W1000 and S3020W1000 can be mixed matched.

S3010W1000 and S3020W1000 are to be wired in parallel.

Respect the Dip switch setting in each remote sensor.

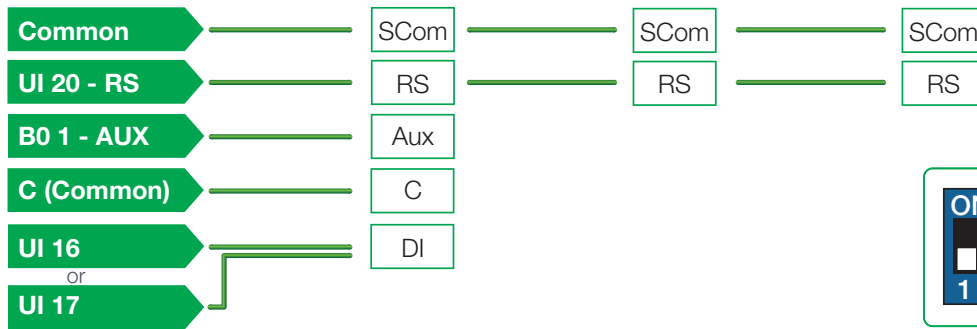


Dip switch setting for 2 sensors  
 S2-1= Off, S2-2=On

Wiring examples of 3 remote room sensors for averaging applications

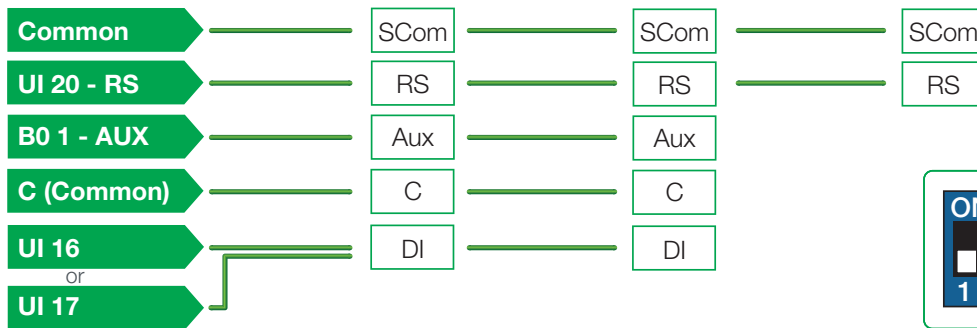
**VT8600 2xS3010W1000 and 1xS3020W1000**

Series Controller Remote wiring 3 sensors  
S2-1= Off, S2-2=On



**VT8600 1xS3010W1000 and 2xS3020W1000**

Series Controller Remote wiring 3 sensors  
S2-1= Off, S2-2=On



Temperature vs. resistance chart for 10 Kohm NTC thermistor (R25°C = 10KΩ±3%, B25/85°C = 3975K±1.5%)

°C	°F	Kohm	°C	°F	Kohm	°C	°F	Kohm	°C	°F	Kohm	°C	°F	Kohm
-40	-40	324.3197	-20	-4	94.5149	0	32	32.1910	20	68	12.4601	40	104	5.3467
-35	-31	234.4009	-15	5	71.2430	5	41	25.1119	25	77	10.0000	45	113	4.3881
-30	-22	171.3474	-10	14	54.1988	10	50	19.7390	30	86	8.0694	50	122	3.6202
-25	-13	126.6109	-5	23	41.5956	15	59	15.6286	35	95	6.5499	55	131	3.0016

HOME SCREEN DISPLAY

Typical Hospitality User Interface Shown



**Note:** User HMI is configurable and allows display functions such as Outdoor Temperature, Setpoint, and other buttons to be enabled or disabled by setting various parameters in the setup screens.

### HOW TO ENTER SET-UP SCREEN

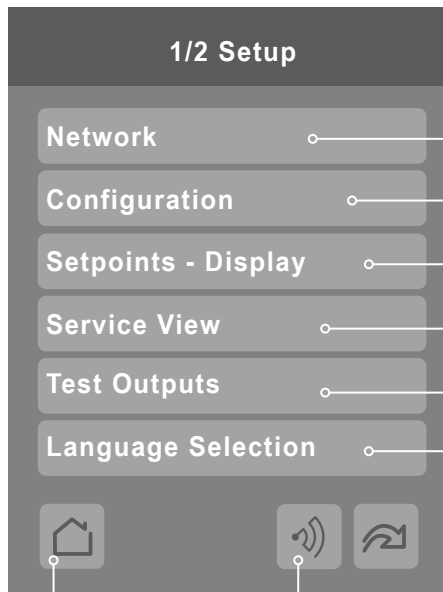


Touch and hold this point for 3 seconds to enter set-up mode

**Note:** If a configuration/installer password is activated to prevent unauthorised access to the configuration menu parameters, a password entry prompt shows to prevent access to device configuration components.

For more information on using and configuring the functions of the HMI, refer to the **VT8600 Series User Interface Guide**

### SET-UP SCREEN DISPLAY



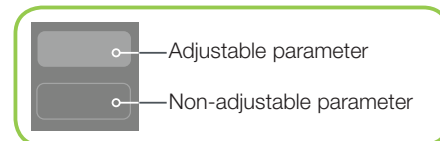
**Note:** The "Network" button does not show if no BACnet® or ZigBee® card is installed.

- Network — Enter BACnet® & ZigBee® network settings
- Configuration — Enter parameter configuration menu
- Setpoints - Display — Enter setpoint & display settings
- Service View — Enter status and service view
- Test Outputs — Enter output testing mode
- Language Selection — Enter language selection

**Return to home screen**

**Discover Mode** The Controller becomes discoverable on the wireless ZigBee® network for 1 minute (this button is hidden if ZigBee® settings are not configured)

#### General Note:



### APPENDIX A TERMINAL CORRESPONDANCE

The terminals of an VT8600 are identified diifferently and have a wider range of possible functions compared to those of any of the VT7000 series Room Controllers. There is a direct correspondance of functions between the terminals of the VT7000 series and the VT8600 series. Consult the table below to verify the appropriate terminal when replacing a VT7000 Room Controller with a VT8600 Room Controller.

VT7000		VT8600	
Terminal name	Terminal ID	Terminal name	Terminal ID
Binary Input 1	BI1	Universal Input 16	UI16
Binary Input 2	BI2	Universal Input 17	UI17
Universal Input 3	UI3	Universal Input 19	UI19
Sensor Common	Scom	Terminal 18 Common	COM
Remote Sensor	RS	Universal Input 20	UI20 - RS
Sensor Common	Scom	Terminal 21 Common	COM
Mix/Supply Sensor	MS	Universal Input 22	UI22 - SS

### APPENDIX B POWER OUTAGE CLOCK RESET

In the event of a power outage, VT8600 Room Controllers will retain the correct time as long as the duration of the power outage is not prolonged. Depending on the duration of the power outage, the Room Controller's internal clock may need to be updated or reset completely. The following table gives an indication of the expected clock performance after a power outage.

Outage duration	Room Controller behaviour
0 - 24 hours	Clock functions are normal
24 - 36 hours	Clock accuracy not guaranteed, time may need to be adjusted
36 - 72 hours	Clock no longer increments and must be adjusted when power is restored
72+ hours	Clock functions are fully reset, and must be reinitialized as per a new installation