

VT8300 Series Installation Guide

24 Vac Low Voltage

Commercial and Hotel/Lodging HVAC Fan Coil Applications



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INSTALLATION

Preparation

- Remove the security screw (if any) on the bottom of the Terminal Equipment Controller cover.
- Open unit by pulling on bottom side of the Terminal Equipment Controller (Fig. 1).
- Read FCC ID and IC label installed in cover before installing any wireless product.
- Ensure correct side of base faces up.

Location

1. Do not install on outside wall.
2. Do not install in areas with direct heat source.
3. Do not install near any air discharge grill.
4. Do not install in areas exposed to direct sunlight.
5. Ensure Controller has sufficient air circulation.
6. Ensure wall surface is flat and clean.

Installation

1. Pull cables 15 cm (6") out from wall.
2. Align base and mark location of two mounting holes on wall.
3. Install anchors in wall.
4. Insert cable in central hole of base.
5. Insert screws in mounting holes on each side of base.
6. Strip each wire 1/4" (0.6 cm) from end.
7. Insert each wire and screw according to wiring chart.
8. Gently push excess wiring back into hole.
9. Gently align cover to top of base and snap in place from bottom.
10. Install security screw.

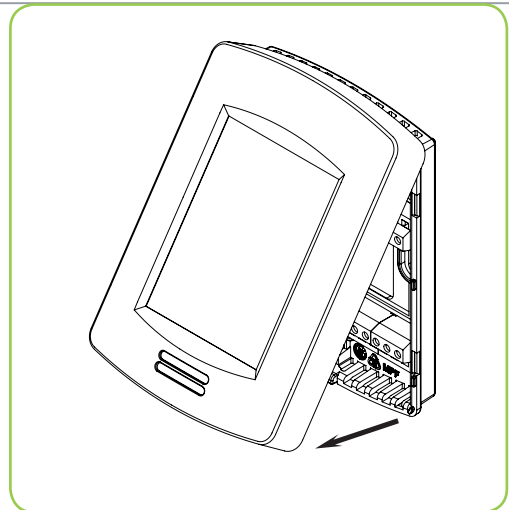


Figure-1 Open the cover

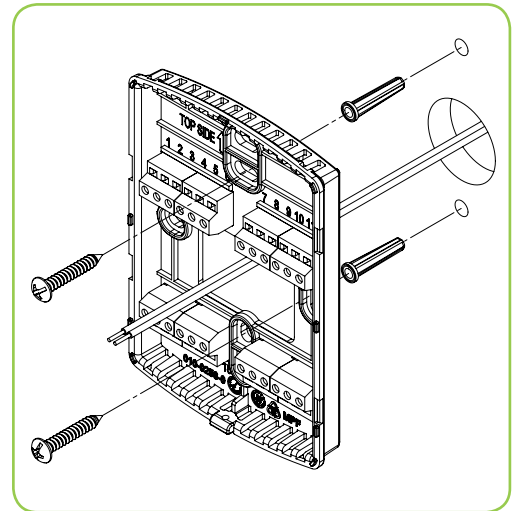


Figure-2 Install the base

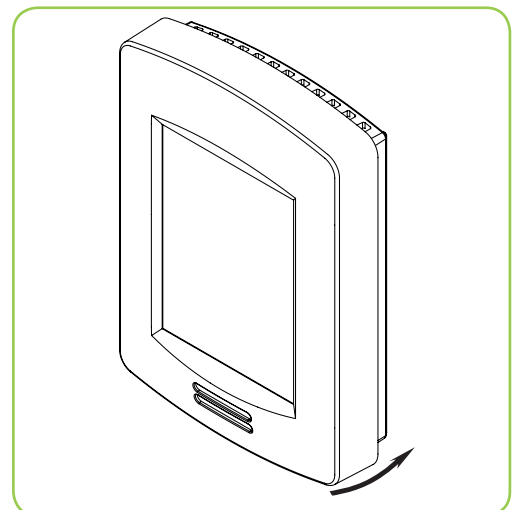


Figure-3 Reinstall cover



- If replacing an existing Line Voltage FCU Controller, label wires before removal of Controller.
- Electronic controls are static sensitive devices. Discharge yourself correctly before manipulating and installing Controller.
- A short circuit or wrong wiring may permanently damage Controller or equipment.
- All VT8300 ® 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 (40cm) from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

CONFIGURABLE BI/UI UNIVERSAL INPUTS OVERVIEW

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

1. **(None):** No function will be associated with the input
2. **(Rem NSB):** remote NSB timer clock input. The scheduling will now be 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. Application information and examples are available on document: APP-PIR-VT8xxx. 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 Terminal Equipment 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 Terminal Equipment 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

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

1. **(None):** No function will be associated with the input
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 will remain permanently in occupied mode until the door contact switch opens momentarily. The Terminal Equipment 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. **(RemOVR):** temporary occupancy remote override contact. This function disables the central button override function on the Terminal Equipment 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. It is now possible to toggle between unoccupied & occupied setpoints for the amount of time set by parameter (TOccTime) temporary occupancy time.

4. **(Filter):** a Filter alarm short text message will be displayed on the Terminal Equipment Controller screen when the input is energized. It can be tied to a differential pressure switch that monitor filters

Contact opened = No alarm

Contact closed = Alarm displayed

5. **(Service):** a Service alarm short text message will be displayed on the Terminal Equipment Controller screen when the input is energized. It can be tied in to the AC unit control card, which provides an alarm in case of malfunction.

Contact opened = No alarm

Contact closed = Alarm displayed

Universal input #19 can be configured for the following functions:

1. **(None):** No function will be associated with the input
2. **(COC/NH) Change over dry contact.**
Normally Heat: Used for hot / cold air / water change over switching in 2 pipe systems.

Contact closed = Cold air/water present

Contact opened = Hot air/water present

Only used and valid if system is setup as 2.0. Parameter (Out1Conf) set as 2.0.

3. **(COC/NC) Change over dry contact.**
Normally Cool: Used for hot / cold air / water change over switching in 2 pipe systems.

Contact closed = Hot air/water present

Contact opened = Cold air/water present

Only used and valid if system is setup as 2.0. Parameter (Out1Conf) set as 2.0.

4. **(COS) Change over analog sensor:** Used for hot / cold air / water change over switching in 2 pipe systems.

Only used and valid if system is setup as 2.0. Parameter (Out1Conf) set as 2.0.

If temperature is > 77 °F = Hot air / water present

If temperature is < 75 °F = Cold air / water present

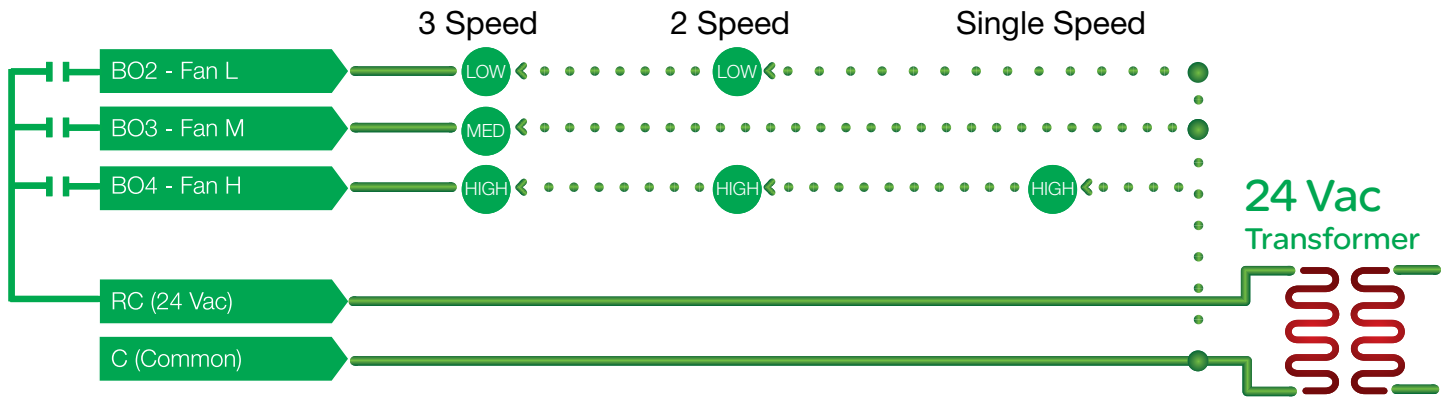
TERMINAL IDENTIFICATION & FUNCTION

Terminal identification

VT83xxU Description / Application	Used in applications		
	2 & 4 Pipe Control Type = On/Off	2 & 4 Pipe Control Type = Floating	2 & 4 Pipe Control Type = Analog
Internal Temperature	X	X	X
Internal Humidity	Model Dependent	Model Dependent	Model Dependent
1- BO1	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>
2- BO2	Fan-L	Fan-L	Fan-L
3- BO3	Fan-M	Fan-M	Fan-M
4- BO4	Fan-H	Fan-H	Fan-H
5- RC / 24 V~ Hot	24 V~ Hot	24 V~ Hot	24 V~ Hot
6- C / 24 V~ Com	24 V~ Com	24 V~ Com	24 V~ Com
7- RH	Aux Heat	Aux Heat	Aux Heat
8- BO8	Aux Heat	Aux Heat	Aux Heat
9- UO9	Normally Close Cool Valve	Close Cool Valve	<i>Not used</i>
10- UO10	Normally Close Heat Valve	Close Heat Valve	<i>Not used</i>
11- UO11	Normally Open Cool Valve	Open Cool Valve	Analog Heat valve
12- UO12	Normally Open Heat Valve	Open Heat Valve	Analog Cool Valve
13- RS485 +	BACnet MS-TP +	BACnet MS-TP +	BACnet MS-TP +
14- RS485 -	BACnet MS-TP -	BACnet MS-TP -	BACnet MS-TP -
15- RS485 Ref	BACnet MS-TP Ref	BACnet MS-TP Ref	BACnet MS-TP Ref
16- UI16	UI16 Function	UI16 Function	UI16 Function
17- UI17	UI17 Function	UI17 Function	UI17 Function
18- Common	Common	Common	Common
19- UI19	UI19 Function	UI19 Function	UI19 Function
20- UI20	Remote Room Sensor	Remote Room Sensor	Remote Room Sensor
21- Common	Common	Common	Common
22- UI22	Remote Supply Sensor	Remote Supply Sensor	Remote Supply Sensor
23- UI23	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>
24- UI24	<i>Not used</i>	<i>Not used</i>	<i>Not used</i>

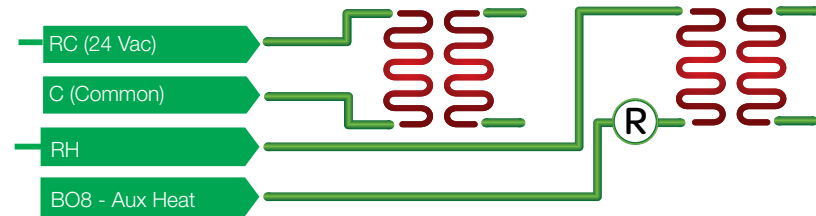
Wiring

Power & Fan (All Models)

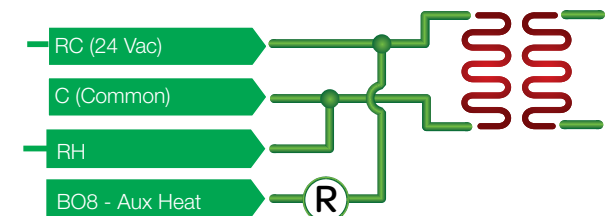


BO8 Auxilliary output wiring

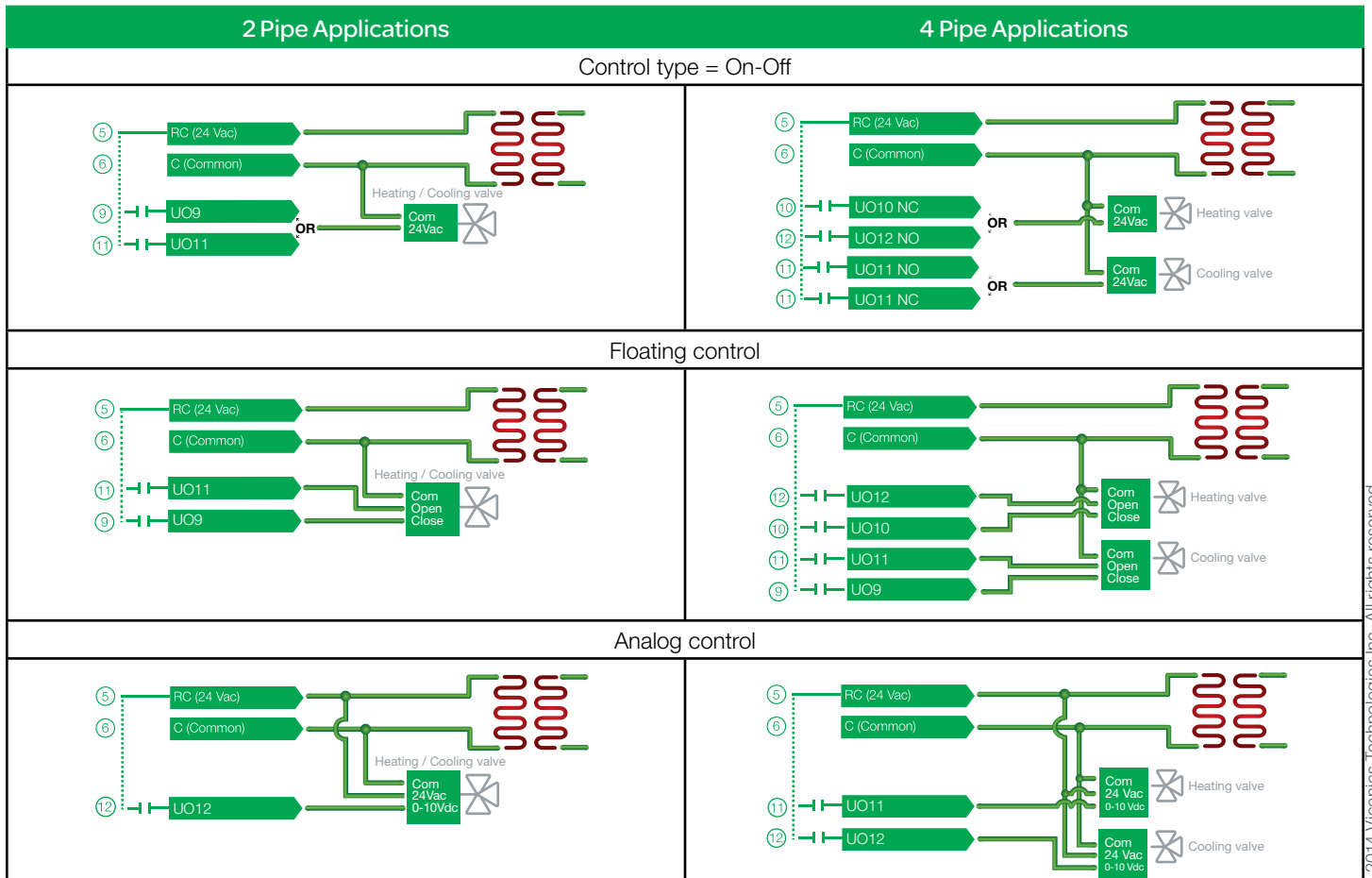
Dry contact to end device 24 V~ maximum



24 Vac power to relay



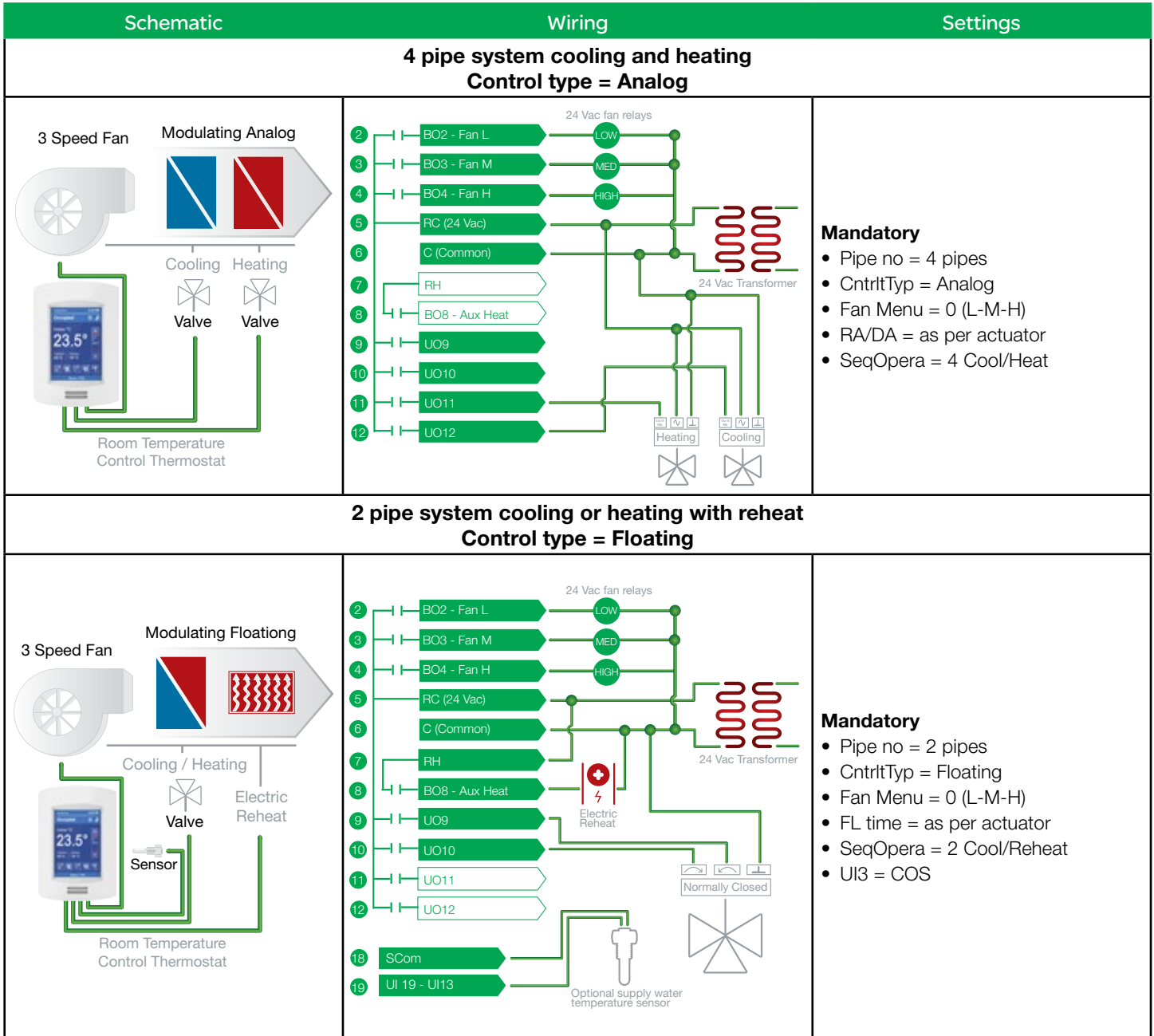
Main outputs wiring



TYPICAL APPLICATIONS

Schematic	Wiring	Settings
2 pipe system cooling and/or heating Control type = On / Off		
<p>3 Speed Fan</p> <p>Normally Closed On/Off</p> <p>Cooling / Heating</p> <p>Valve</p> <p>Sensor</p> <p>Room Temperature Control Thermostat</p>	<p>24 Vac fan relays</p> <p>2 BO2 - Fan L</p> <p>3 BO3 - Fan M</p> <p>4 BO4 - Fan H</p> <p>5 RC (24 Vac)</p> <p>6 C (Common)</p> <p>7 RH</p> <p>8 BO8 - Aux Heat</p> <p>9 UO9 NC</p> <p>10 UO10</p> <p>11 UO11</p> <p>12 UO12</p> <p>18 SCom</p> <p>19 UI 19 - UI13</p> <p>24 Vac Transformer</p> <p>Optional supply water temperature sensor</p>	<p>Mandatory</p> <ul style="list-style-type: none"> • Pipe no = 2 pipes • CntrltTyp = On/Off • Fan Menu = 0 (L-M-H) • FL time = N/A <p>If cooling only set::</p> <ul style="list-style-type: none"> • SeqOpera = 0 Cooling only <p>If heating only set:</p> <ul style="list-style-type: none"> • SeqOpera = 1 Heating only <p>If heat / cool auto-changeover with a local water temperature sensor set:</p> <ul style="list-style-type: none"> • SeqOpera = 0 Cooling only • UI3 = COS
2 pipe system cooling and/or heating Control type = Floating		
<p>3 Speed Fan</p> <p>Modulating Floating</p> <p>Cooling / Heating</p> <p>Valve</p> <p>Sensor</p> <p>Room Temperature Control Thermostat</p>	<p>24 Vac fan relays</p> <p>2 BO2 - Fan L</p> <p>3 BO3 - Fan M</p> <p>4 BO4 - Fan H</p> <p>5 RC (24 Vac)</p> <p>6 C (Common)</p> <p>7 RH</p> <p>8 BO8 - Aux Heat</p> <p>9 UO9</p> <p>10 UO10</p> <p>11 UO11</p> <p>12 UO12</p> <p>18 SCom</p> <p>19 UI 19 - UI13</p> <p>24 Vac Transformer</p> <p>Optional supply water temperature sensor</p>	<p>Mandatory</p> <ul style="list-style-type: none"> • Pipe no = 2 pipes • CntrltTyp = Floating • Fan Menu = 0 (L-M-H) • FL time = as per actuator <p>If cooling only set:</p> <ul style="list-style-type: none"> • SeqOpera = 0 Cooling only <p>If heating only set:</p> <ul style="list-style-type: none"> • SeqOpera = 1 Heating only <p>If heat / cool auto-changeover with a local water temperature sensor set:</p> <ul style="list-style-type: none"> • SeqOpera = 0 Cooling only • UI3 = COS

Schematic	Wiring	Settings
2 pipe system cooling and/or heating Control type = Analog		
		<p>Mandatory</p> <ul style="list-style-type: none"> • Pipe no = 2 pipes • CntrlTyp = Analog • Fan Menu = 0 (L-M-H) • RA/DA = as per actuator <p>If cooling only set:</p> <ul style="list-style-type: none"> • SeqOpera = 0 Cooling only <p>If heating only set:</p> <ul style="list-style-type: none"> • SeqOpera = 1 Heating only <p>If heat / cool auto-changeover with a local water temperature sensor set:</p> <ul style="list-style-type: none"> • SeqOpera = 0 Cooling only • UI3 = COS
4 pipe system cooling and heating Control type = On / Off		
		<p>Mandatory</p> <ul style="list-style-type: none"> • Pipe no = 4 pipes • CntrlTyp = On/Off • Fan Menu = 0 (L-M-H) • SeqOpera = 4 Cool/Heat
4 pipe system cooling and heating Control type = Floating		
		<p>Mandatory</p> <ul style="list-style-type: none"> • Pipe no = 4 pipes • CntrlTyp = Floating • Fan Menu = 0 (L-M-H) • FL time = as per actuator • SeqOpera = 4 Cool/Heat



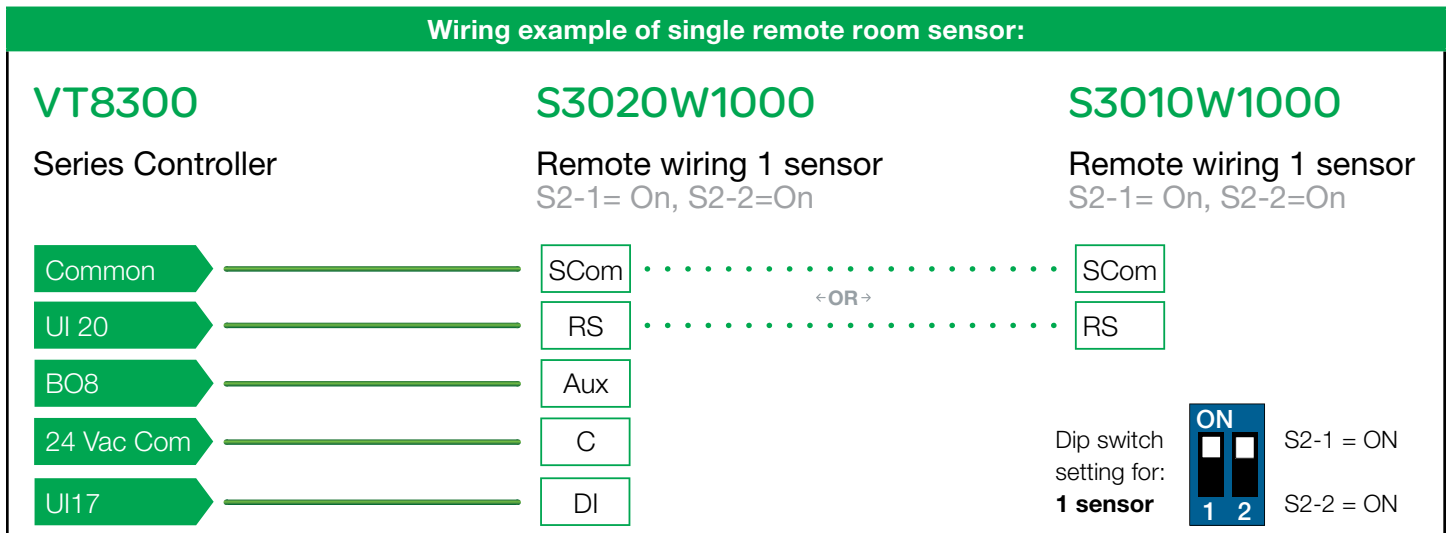
REMOTE SENSOR ACCESSORIES

Model no.	Description
S3010W1000	Wall mounted temperature sensor
S3020W1000	Wall mounted temperature sensor with override button and occupancy status LED

The VT8300 room controller is compatible with remote mount temperature sensors using 10K type 2 NTC thermistors.

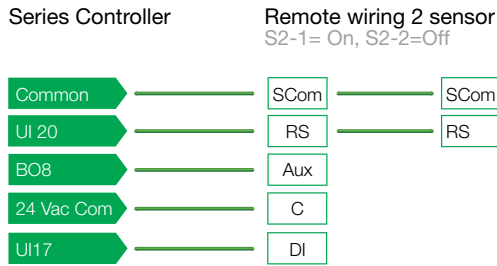
Note:
If one or multiple sensor(s) is/are connected into the RS terminal, the internal temperature sensor is automatically disabled. Disconnecting the sensor(s) in the RS terminal will re-activate the internal sensor.

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

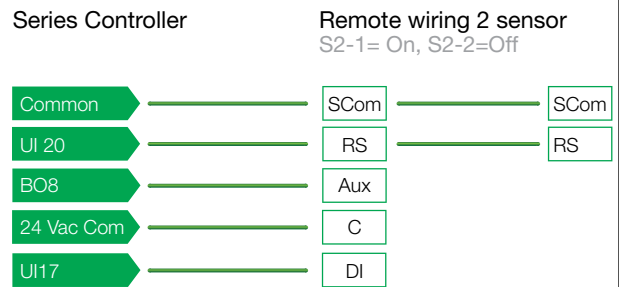


Wiring examples of 2 remote room sensors for averaging applications:

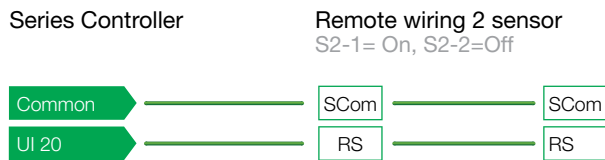
VT8300 1x S3010W1000 & 1x S3020W1000



VT8300 2 x S3020W1000

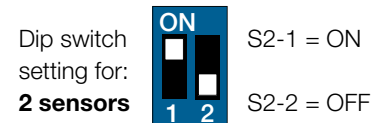


VT8300 2 x S3010W1000



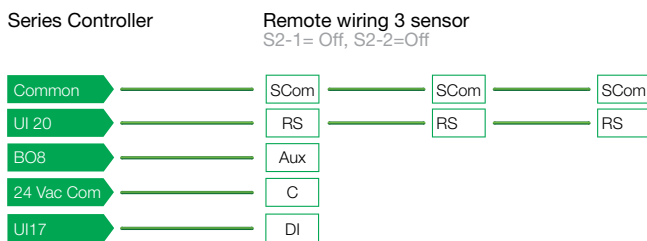
Notes for averaging applications:

- 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.

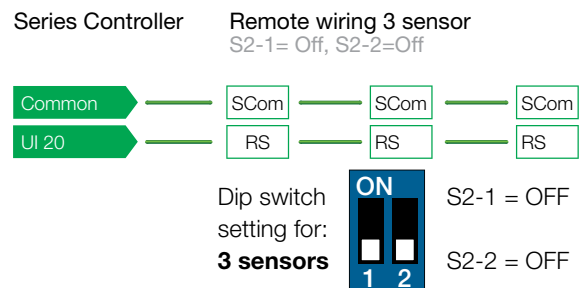


Wiring examples of 3 remote room sensors for averaging applications:

VT8300 2 x S3010W1000 & 1x S3020W1000



VT8300 3 x S3010W1000

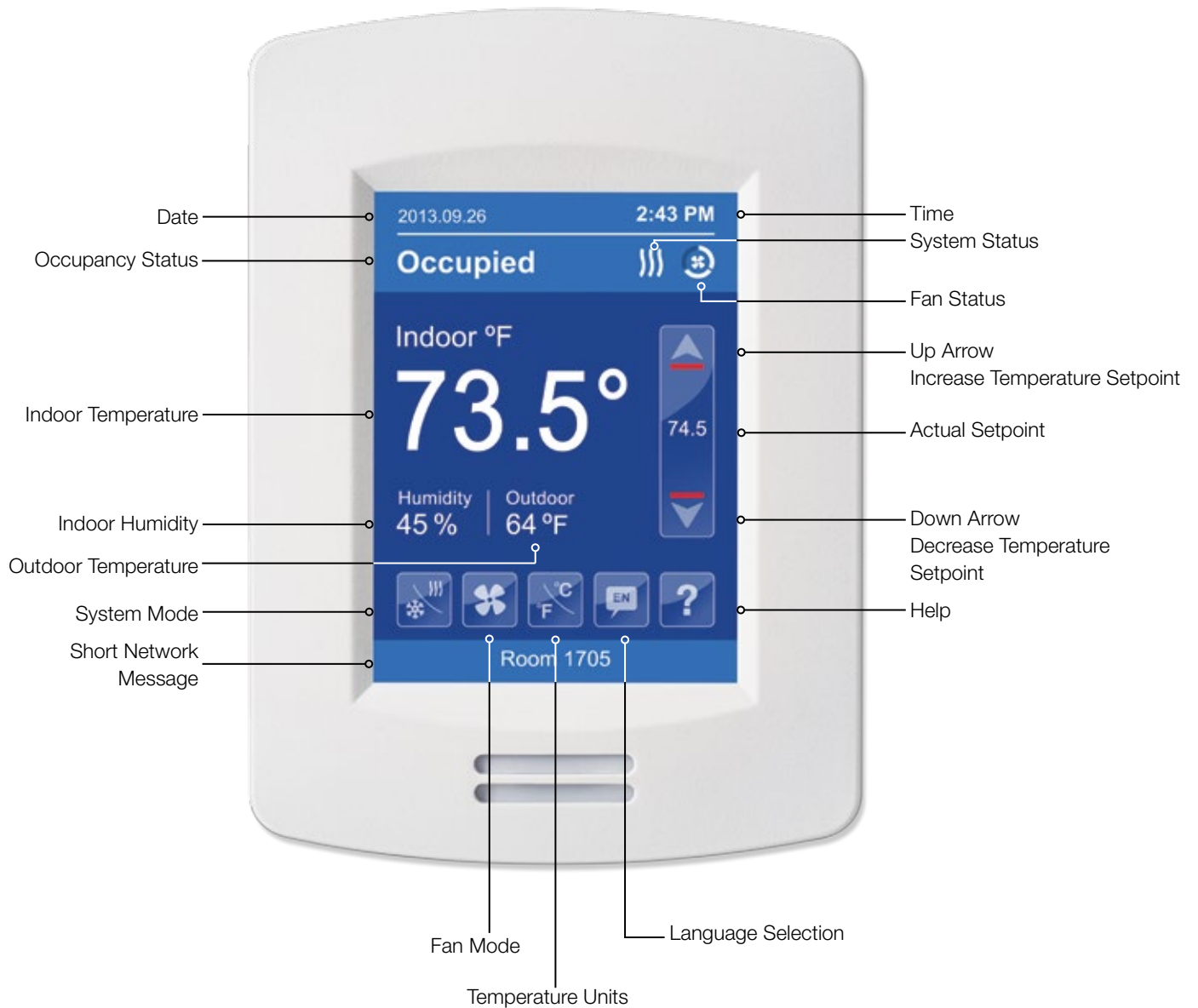


Temperature vs. resistance chart for 10 Kohm NTC thermistor (R25°C = 10KΩ±3%, B25/85°C = 3975K±1.5%)

°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

Hospitality User Interface Shown



Note: User HMI is configurable and allows display functions such as Date, Time, Humidity, Outdoor Temperature, Setpoint, and others to be enabled or disabled by setting various parameters.

HOW TO ENTER SET-UP SCREEN

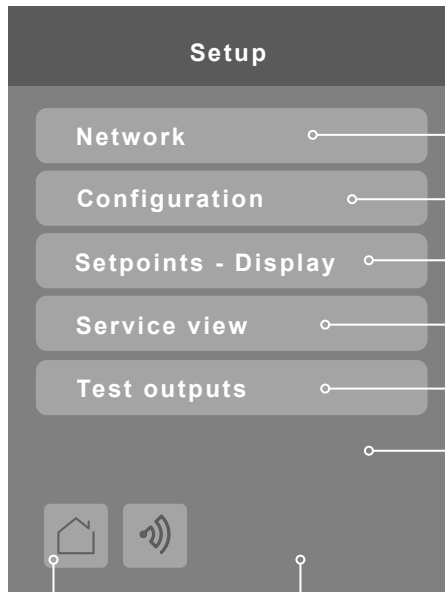


Touch and hold this point for 3 seconds to enter set-up mode

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 following document:
VT8300 Series
Terminal Equipment Controller
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
- 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:

