



Add contractor logo here

Add supplier logo here



**Support:**  
 Distributor Phone # **Insert Info**  
 Contractor Phone # **Insert Info**  
 Verasys Tech Support (866) 663-6105  
 be-verasyssupport@jci.com

**Warranty:** 3 Year Limited Warranty  
<https://www.johnsoncontrols.com/-/media/jci/be/united-states/legal/warranty/files/jci-3y-warranty-final-11202018.pdf?la=en&hash=DD21C45A73770C636ED6088662E78EB0ACD02FC9>

**Drawings:**

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**Disclosure:**

The following drawings & parts quote is our best interpretation of the parts needed based on the information given for this specific project. It is your (the contractor's) responsibility to verify that the parts quoted meet the requirements (ex. quantities needed, parts required) and specifications of the project being quoted. If additional or different parts are needed in order to complete the project or meet the specification; please reach out to the distributor listed on your quote to address the issues before using this quote to bid to your customer. **ADDITIONAL OR DIFFERENT PARTS MAY RESULT IN A PRICE DIFFERENCE.**

|               |                   |                 |                      |                  |                |    |                    |                 |  |  |  |
|---------------|-------------------|-----------------|----------------------|------------------|----------------|----|--------------------|-----------------|--|--|--|
| Drawing Title |                   |                 |                      |                  |                |    |                    |                 |  |  |  |
| <b>COVER</b>  |                   |                 |                      |                  |                |    |                    |                 |  |  |  |
|               | REFERENCE DRAWING | NO.             | REVISION-LOCATION    | ECN              | DATE           | BY |                    |                 |  |  |  |
|               | Sales Engineer    | Project Manager | Application Engineer | By Steve Nichols | DATE 8-12-2022 | BY | DATE               |                 |  |  |  |
| Project Title | <b>SMART COBP</b> |                 |                      |                  |                |    | Branch Information | CONTRACT NUMBER |  |  |  |
|               |                   |                 |                      |                  |                |    | DRAWING NUMBER     |                 |  |  |  |
|               |                   |                 |                      |                  |                |    | <b>1</b>           |                 |  |  |  |

### Verasys Bill of Materials

| System               | Function               | JCI Part No     | Description  | Qty |
|----------------------|------------------------|-----------------|--|-----|
| Network              | Smart Building Hub     | LC-SBH200-0S    | Verasys Smart Building Hub   | 1   |
| Network              | Communication Wire     | CBL-22/3-FC-PLN | System/Zone Bus Cable 22-3C Shielded Plenum Wire                         | 1   |
| Network              | Communication Wire     | CBL-22/2P-SAPLN | Sensor Bus Cable 22-2P Shielded Plenum Wire                              | 1   |
| MZ- Zone Coordinator | Zone Coordinator       | LC-VZCPNL-0     | Verasys Zoning Coordinator for VAV and COBP applications (Panel Version) | 1   |
| MZ- Zone Coordinator | Zone Power             | PSH300A         | 480/277/240/120V to 24V XFR, 3 Circuits 100VA each (Power for 18 Boxes)  | 1   |
| MZ - Smart Equipment | COMM CARD              | SE-COM1001-0    | Smart Equipment BACnet Communications Card                               | 12  |
| MZ - COBP Zones      | NS Sensor              | NSB8BTN240-0    | TEMP, DISPLAY, SETPOINT, WHITE, LOGO                                     | 12  |
| MZ - COBP Zones      | Controller             | LC-ZEC310-0     | Field Installed, Zone Damper Controller No Damper                        | 12  |
| MZ- Bypass Damper    | Controller             | LC-BYP200-0     | Field Installed, Bypass Damper Controller No Damper                      | 1   |
| MZ- Bypass Damper    | Static Pressure Sensor | DPT2640-005D    | Low Differential Pressure Transducer 0-5 in WC, 0-5VDC                   | 1   |
| MZ- Bypass Damper    | Static Pressure Probe  | FTG18A-600R     | Duct Static Pressure Probe (Need 1 Per Sensor)                           | 1   |

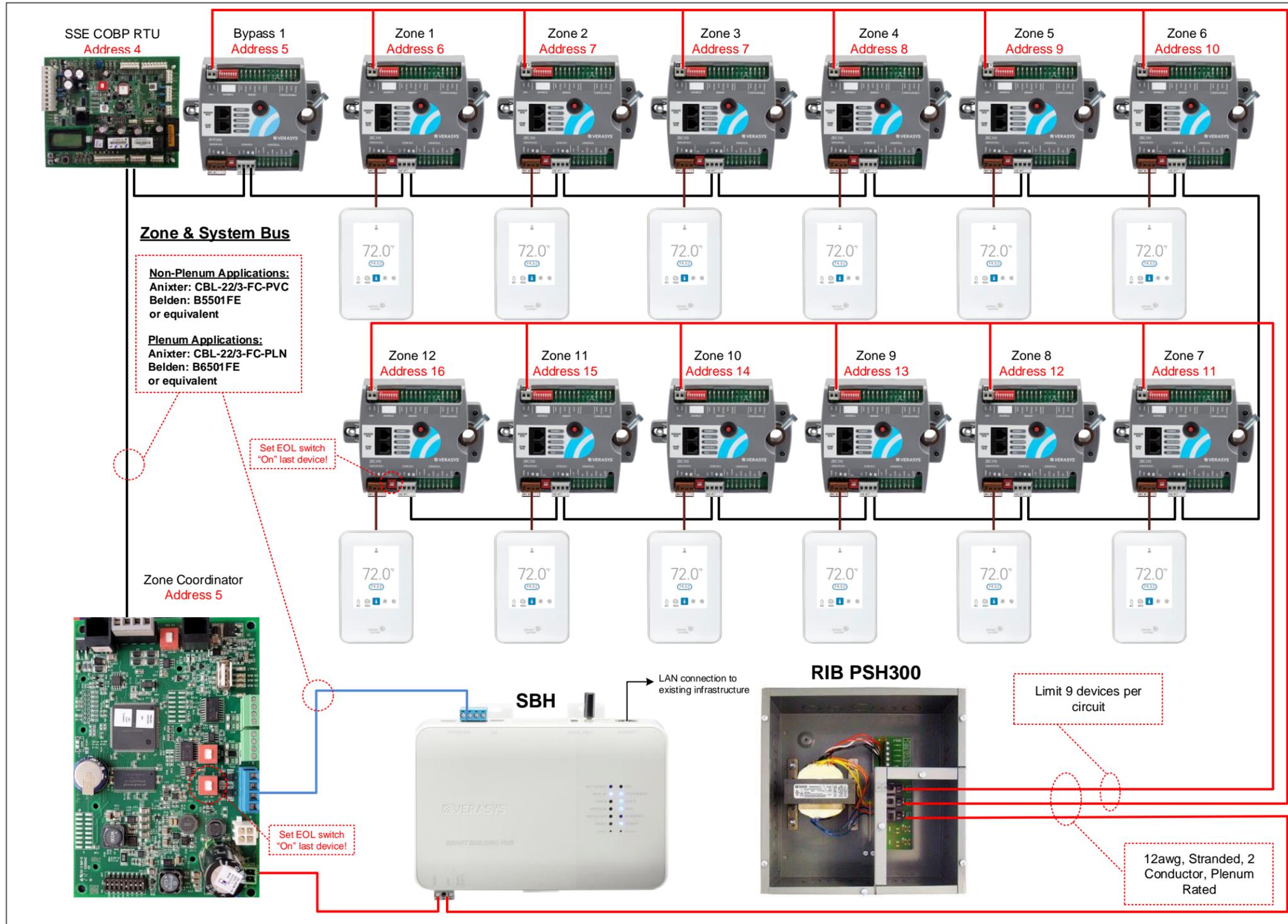
This is a sample of the parts I'd use for a 12 zone COBP job

Copy & Paste Bill of Material from the Project Estimation Tool

\* add a 12awg 2 conductor stranded wire 1k foot roll of wire to your estimate for power to the controllers

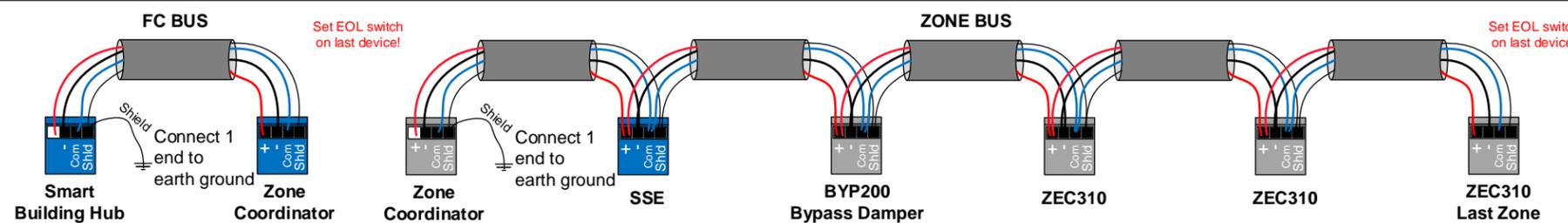
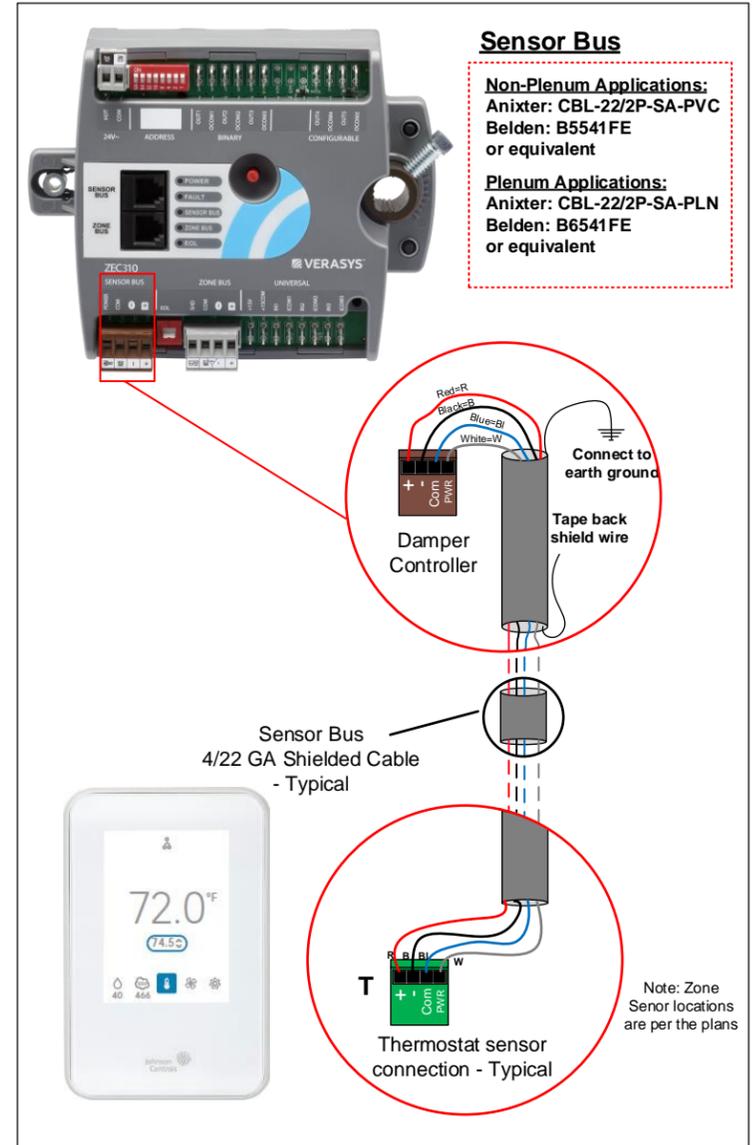
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|-------------------------|--|---|--|----------------------|--|-----------------|--|----------|--|
| Drawing Title           |  |   |  |                      |  |                 |  |          |  |
| <b>BILL OF MATERIAL</b> |  |   |  |                      |  |                 |  |          |  |
| REFERENCE DRAWING       |  | NO.   |  | REVISION-LOCATION    |  | ECN             |  | DATE     |  |
| Sales Engineer          |  | Project Manager   |  | Application Engineer |  | DRAWN           |  | APPROVED |  |
|                         |  |   |  | By Steve Nichols     |  | DATE 8-12-2022  |  | BY DATE  |  |
| Project Title           |  | SMART COBP  |  | Branch Information   |  | CONTRACT NUMBER |  |          |  |
|                         |  |  |  |                      |  | DRAWING NUMBER  |  | <b>2</b> |  |

# System Riser



## Additional Notes

- The system bus and zone bus trunk wiring is shown as a guide.
- The controllers on the system bus can be in a different order but you still must follow the rules for end of line (EOL).
  - The controllers for the zone bus must go to the appropriate zone coordinator but can in a different order but you still must follow the rules for end of line (EOL).

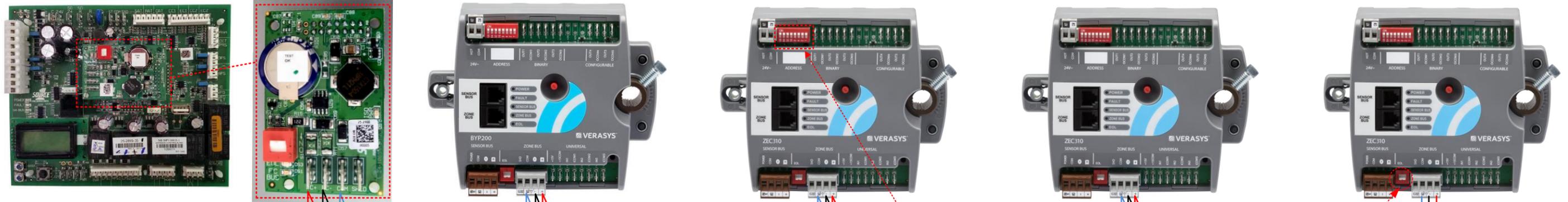


Drawing Title  
**RISER DETAIL**

Project Title  
**SMART COBP**

|                   |                 |                      |                 |                |                |
|-------------------|-----------------|----------------------|-----------------|----------------|----------------|
| REFERENCE DRAWING | NO.             | REVISION-LOCATION    | ECN             | DATE           | BY             |
| Sales Engineer    | Project Manager | Application Engineer | Steve Nichols   | DATE 8-12-2022 | BY DATE        |
| VERASYS           |                 |                      | CONTRACT NUMBER |                | DRAWING NUMBER |
|                   |                 |                      |                 |                | <b>3</b>       |

# Verasys Zone Coordinator



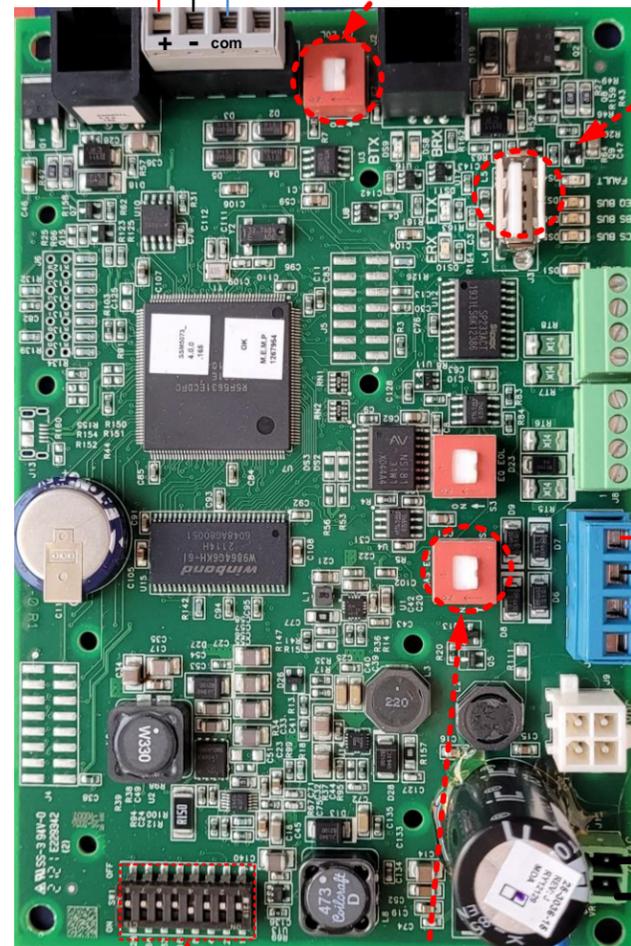
SEE RISER DRAWING FOR ZONE BUS WIRING. ORDER OF DEVICES WILL BE DIFFERENT FROM JOB TO JOB. BUS NEEDS TO BE DAISY CHAINED AND THE END OF THE LINE DEVICES NEED TO HAVE THEIR EOL SWITCHES SET TO ON.

THIS BUS CONNECTS TO THE ZEC310, BY200 AND ZEC410 CONTROLLERS PLUS THE ASSOCIATED UNIT CONTROLS ONLY. MAX OF 32 CONTROLLERS ON THIS BUS.

SEE RISER DRAWING & SET EOL TO ON IF VZC100 IS THE END OF THE LINE ON THE ZONE BUS

EACH CONTROLLER NEEDS A UNIQUE ADDRESS. SEE RISER DRAWING FOR CONTROLLER ADDRESS

ON THE LAST DEVICE SET THE EOL TO "ON"



USB PORT IS USED FOR UPDATING FIRMWARE



**Tech Tip:** To upgrade firmware on the VZC download it from the [verasyscontrols.com](http://verasyscontrols.com) website. This firmware will also load new firmware on all the controllers connected to the Zone Bus. This update will take awhile depending on how many controllers are connected.



**Tech Tip:** If you change a dipswitch while the device is powered you will need to do a power cycle for the new address to show up.



**Tech Tip:** Get the VZC communicating with the SBH first. Then add a controller at a time. It can take a long time for devices to show up under the VZC. You may even need to do a power cycle on the VZC to force it to look for new controllers.

SEE RISER DRAWING FOR SYSTEM BUS WIRING

24VAC  
24VAC

EACH CONTROLLER NEEDS A UNIQUE ADDRESS. SEE RISER FOR VZC ADDRESS

SEE RISER SCHEDULE SET EOL TO ON IF VZC100 IS THE END OF THE LINE ON THE SYSTEM BUS



**SCHEDULING:** THE ZONE COORDINATOR WILL HOLD A SCHEDULE FOR THE UNIT AND ASSOCIATED ZONES. WHEN THE SCHEDULE IS OCCUPIED THE UNIT AND ZONES ASSOCIATED TO THE COORDINATOR WILL BE INDEXED TO OCCUPIED. WHEN THIS SCHEDULE IS SET TO UNOCCUPIED THE UNIT AND THE ZONES WILL BE SET TO UNOCCUPIED.

**SYSTEM TYPE:** THRU THE INTERFACE IN ZONE COORDINATOR THE COORDINATOR CAN BE SET TO CONTROL A VAV SYSTEM OR A CHANGE OVER BYPASS SYSTEM DEPENDING UPON SELECTION THE UNIT AND ZONE WILL OPERATE AS FOLLOWS.

**VAV SYSTEM:** WHEN SET TO VAV, THE UNIT WILL CONTROL TO THE DISCHARGE AIR TEMPERATURE SETPOINT WHICH IS RESET BASED ON A REPRESENTATIVE ZONE. IF THIS FEATURE IS DISABLED THE UNIT WILL CONTROL TO A FIXED DISCHARGE AIR TEMPERATURE. IN ADDITION TO TEMPERATURE THE UNIT WILL CONTROL THE PRESSURE WHICH MAYBE RESET BASED ON THE DAMPER OF THE ZONE CALLING FOR THE MOST COOLING. IT TOO MAYBE DISABLED AND A FIXED SETPOINT CAN BE SET. THE VAV BOXES WILL CONTROL EACH ZONE TO THE ZONE SETPOINT USING THE UNITS COOLING FOR COOLING AND THE BOX HEAT FOR REHEAT (IF AVAILABLE).

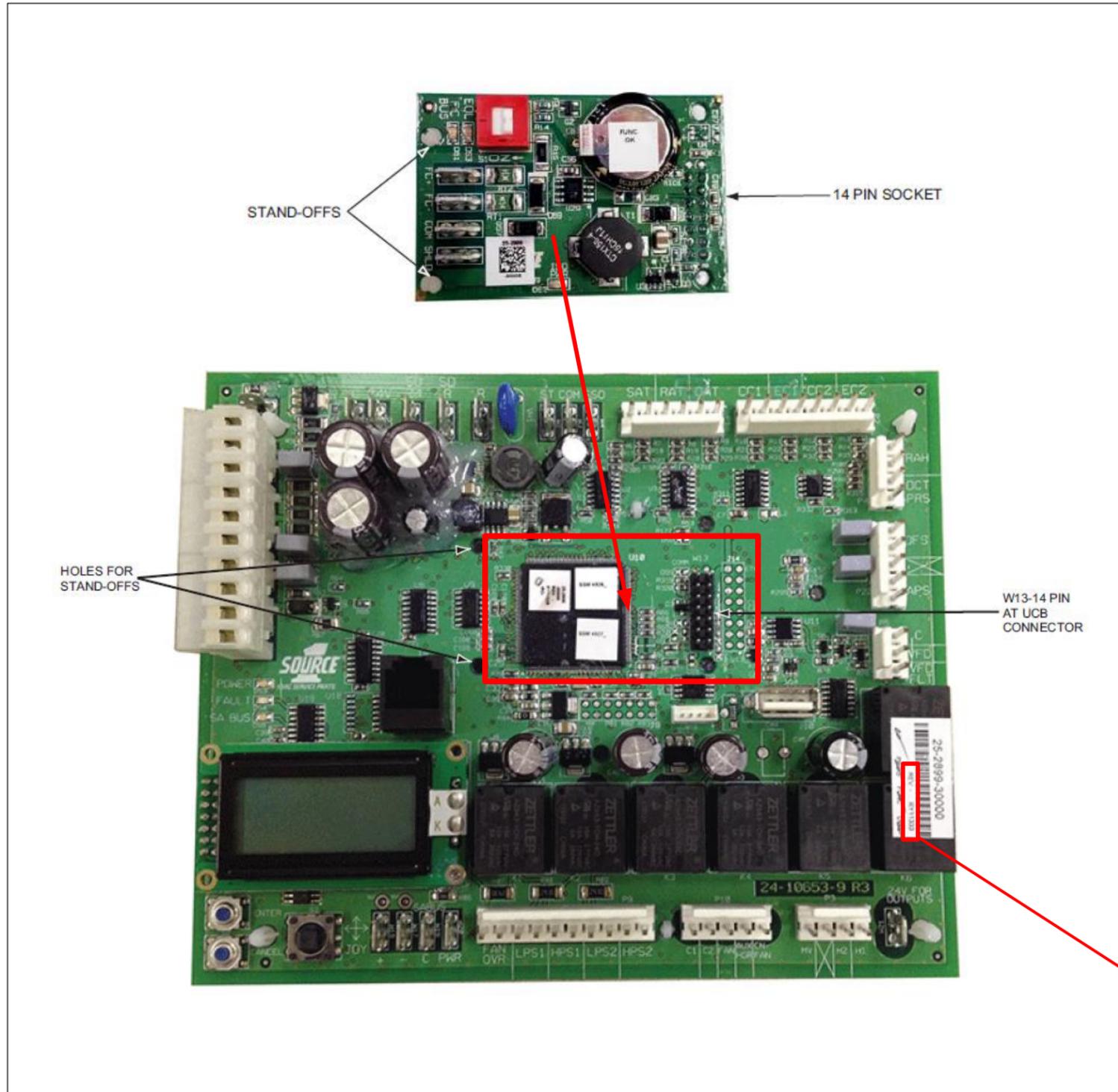
**CHANGE OVER BYPASS SYSTEM:** WHEN SET TO CHANGE OVER BYPASS, THE UNIT WILL CONTROL THE DISCHARGE AIR TO PROVIDE EITHER HEATING OR COOLING DEPENDING UPON THE VOTE OF THE ZONES. THE USER WILL HAVE THE ABILITY TO DECLARE WHICH ZONE CAN VOTE AND HOW MUCH VOTING POWER THEY WILL HAVE. THE PRESSURE IN THE DUCT WILL BE CONTROLLED BY THE BYPASS DAMPER CONTROLLER. EACH ZONE DAMPER WILL INDEPENDANTLY CONTROL TO HEATING OR COOLING DEPENDING UPON THE DISCHARGE OF THE UNIT. IF THE ZONE IS CONTROLLED BY A VAV BOX THE ZONE MAYBE ABLE TO PROVIDE HEATING WHEN THE DISCHARGE IS COOLING. WHEN THE UNIT IS OFF THE BYPASS DAMPER WILL INDEX TO 50%.

THIS IS A SIMPLIFIED SEQUENCE FOR HOW THE VAV AND CHANGE OVER BYPASS SYSTEM WILL WORK. FOR MORE DETAILED INFORMATION SEE THE VERASYS USER MANUAL.

|                   |                 |                      |               |                 |           |    |      |  |  |
|-------------------|-----------------|----------------------|---------------|-----------------|-----------|----|------|--|--|
| Drawing Title     |                 |                      |               |                 |           |    |      |  |  |
| VZC DETAIL        |                 |                      |               |                 |           |    |      |  |  |
| REFERENCE DRAWING | NO.             | REVISION-LOCATION    |               | ECN             | DATE      | BY |      |  |  |
| Sales Engineer    | Project Manager | Application Engineer | Steve Nichols | DATE            | 8-12-2022 | BY | DATE |  |  |
| Project Title     |                 | SMART COBP           |               | CONTRACT NUMBER |           |    |      |  |  |
|                   |                 | DRAWING NUMBER       |               | 4               |           |    |      |  |  |



## SSE Detail



### Installation:

1. Power down the Unit Control Board (UCB).
2. Ensure that no power source is connected to the unit.
3. Align the SE-COM1001 (14 Slot) socket with the 14 pins at W13 on the UCB.
4. Carefully insert the socket into the pins on the UCB as shown.
5. Align the support pins on the SE-COM1001 with the holes on the UCB.
6. Carefully seat the pins on the board.
7. After the SE-COM1001 board is attached to the UCB, connect the BACnet (FC) bus to FC+, FC-, COM, & SHLD on the SE-COM1001.
8. After connecting the BACnet (FC) bus to the SE-COM1001, power the unit up & wait for the controller to become operational.

### Setting up the UCB to talk to Verasys:

1. Set the communication protocol to be used (**LCD MENU -> CONTROLLER -> NETWORK -> FCBUSMODE**) Choices are as follows:
  - A. **Wired Field Bus=BACNET MS/TP** (Default)
  - B. Wireless=Not Used
  - C. Modbus Fiedl Bus=Modbus RTU
  - D. N2 Slave Fiedl Bus=JCI N2
  - E. Ethernet Field Bus
2. Set the board address (**LCD MENU -> CONTROLLER -> NETWORK -> ADDRESS**)
  - A. Default=4 (Set to matching address from page 3 Riser Diagram). The board address must be unique on the FC bus or communication errors will occur.
3. Verify that current firmware is on both the UCB & the SBH. If pages aren't loading or missing data it's usually a firmware mismatch. The number below the barcode will help determine if the UCB has 4mb or 8mb of memory. Units 2017 or older typically have 4mb & cannot be upgraded to the current firmware & loading it will brick the UCB. You can choose to add a new UCB or just control the unit with a VAC. **REV. O-G=4mb board \ Rev. H=8mb board**

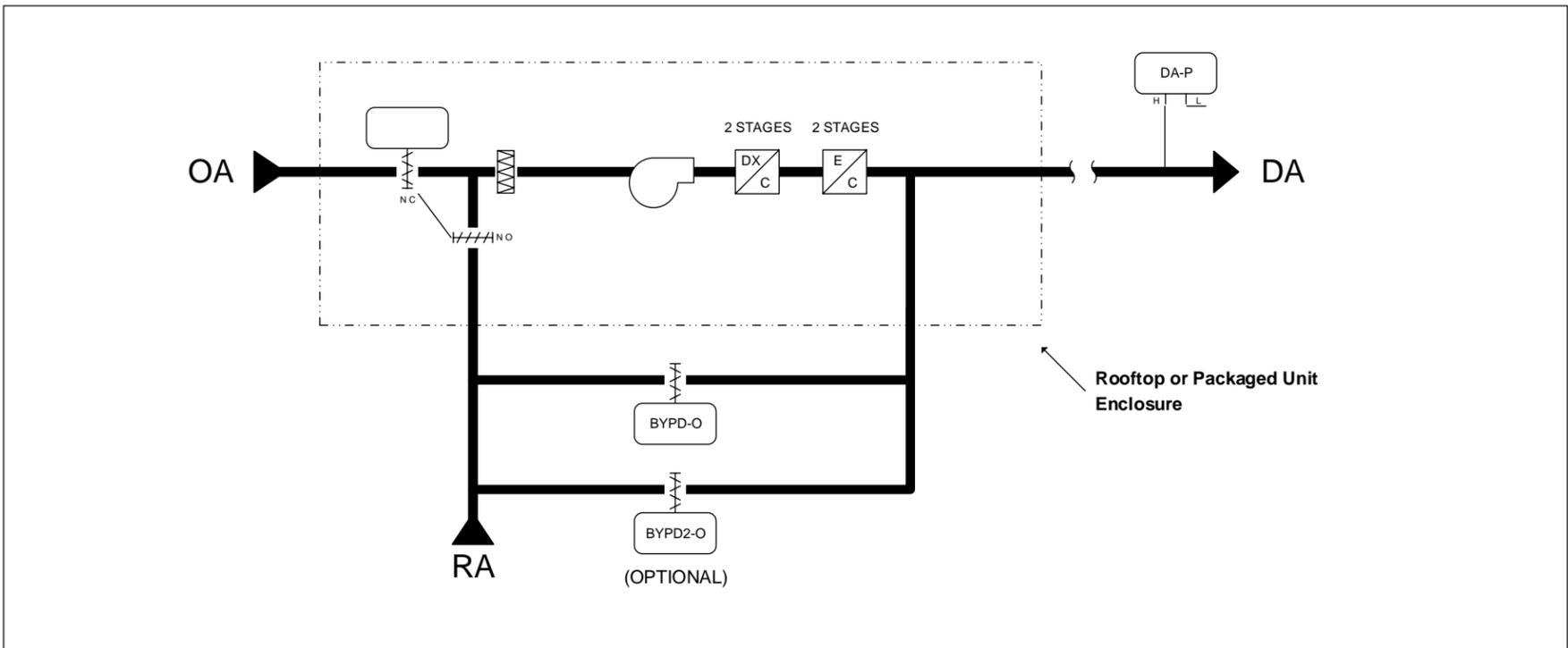
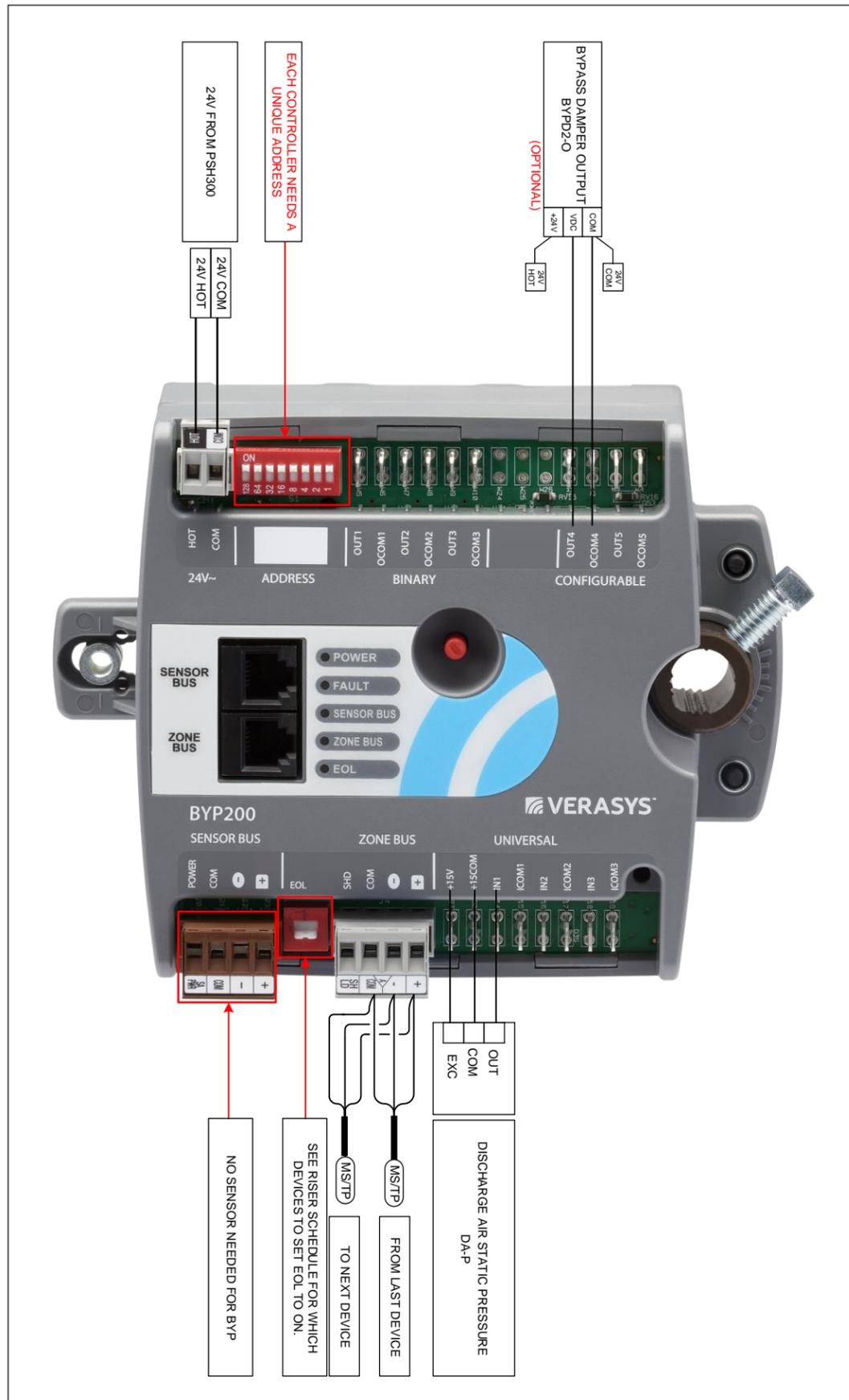
For best performance on MS/TP bus applications, use 22 AWG stranded, 3-Wire, twisted in a shielded cable with proper shield grounding. Other wire gauges & non-shielded cable may provide acceptable bus performance in many applications, especially applications that have short cable runs & low ambient inductive noise levels. It is also good practice to switch on EOL on the last device on a BACnet bus.

|               |  |                    |  |                   |  |                      |  |       |  |
|---------------|--|--------------------|--|-------------------|--|----------------------|--|-------|--|
| Drawing Title |  |                    |  |                   |  |                      |  |       |  |
| SSE DETAIL    |  |                    |  |                   |  |                      |  |       |  |
| Project Title |  | NO.                |  | REVISION-LOCATION |  | ECN                  |  | DATE  |  |
| SMART COBP    |  | Sales Engineer     |  | Project Manager   |  | Application Engineer |  | DRAWN |  |
|               |  | By Steve           |  | DATE 8-12-2022    |  | BY                   |  | DATE  |  |
|               |  | Branch Information |  | CONTRACT NUMBER   |  | DRAWING NUMBER       |  | 5     |  |

**VERASYS**



**BYP200 Bypass Damper Controller for COBP**



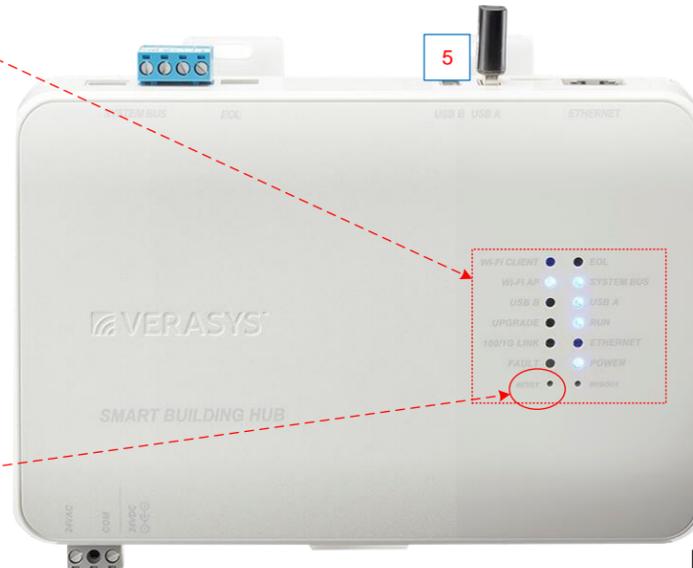
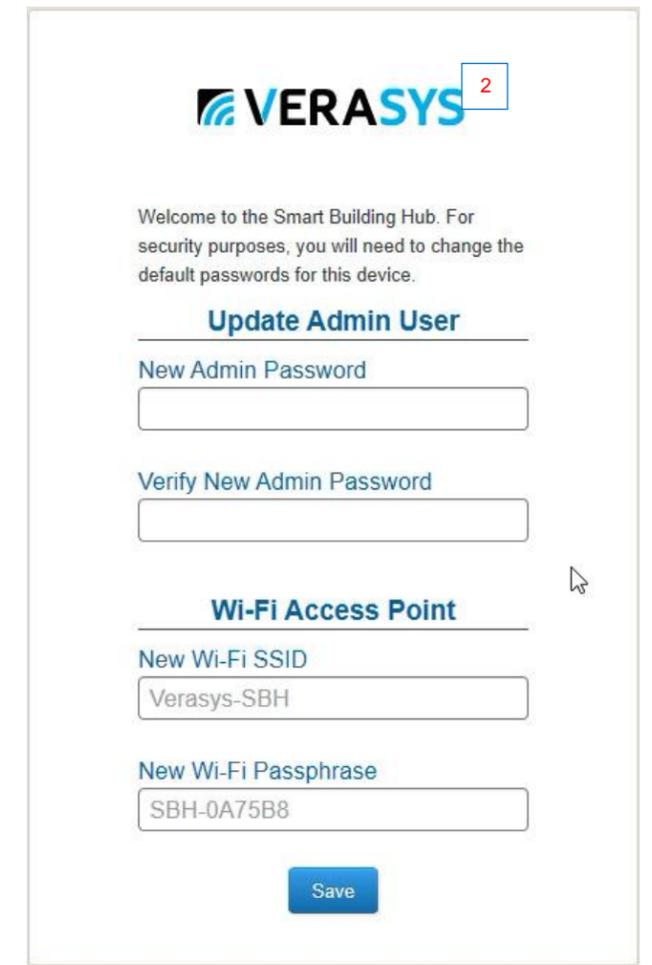
**OCCUPIED MODE:** THE BYPASS DAMPER CONTROLLER WILL MONITOR THE DUCT STATIC PRESSURE. ON A RISE IN STATIC PRESSURE ABOVE SETPOINT, THE BYPASS DAMPER WILL OPEN TO DECREASE PRESSURE. ON A DROP IN STATIC PRESSURE BELOW SETPOINT, THE BYPASS DAMPER WILL MODULATE CLOSED TO INCREASE PRESSURE.

**UNOCCUPIED MODE:** WHEN THE SINGLE PACKAGED UNIT IS INDEXED OFF, THE BYPASS DAMPER WILL BE INDEXED TO 50%. IF THE SINGLE PACKAGED UNIT IS INDEXED ON, THE BYPASS DAMPER WILL CONTROL AS PER THE OCCUPIED MODE SEQUENCE.

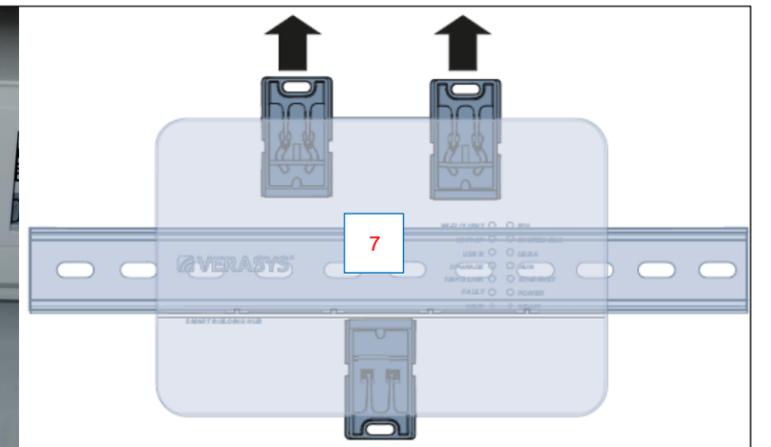
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|-------------------|-----------------|----------------------|--------------------|------|-----------|----|----------------|-----------------|--|
| Drawing Title     |                 |                      |                    |      |           |    |                |                 |  |
| <b>BYP WIRING</b> |                 |                      |                    |      |           |    |                |                 |  |
| Project Title     |                 |                      |                    |      |           |    |                |                 |  |
| <b>SMART COBP</b> |                 |                      |                    |      |           |    |                |                 |  |
| REFERENCE DRAWING | NO.             | REVISION-LOCATION    | ECN                | DATE | BY        |    |                |                 |  |
| Sales Engineer    | Project Manager | Application Engineer | Branch Information | DATE | 8-12-2022 | BY | DATE           | CONTRACT NUMBER |  |
|                   |                 |                      |                    |      |           |    | DRAWING NUMBER |                 |  |
|                   |                 |                      |                    |      |           |    | <b>7</b>       |                 |  |

# SBH Detail

| LED Name     | Color          | Normal   | Descriptions/Other Conditions  |
|--------------|----------------|--|--|
| Power        | Blue or Purple | On steady  | <b>Off</b> = No power<br><b>On Purple</b> = Power is supplied by primary voltage<br><b>On Blue</b> = OS booted and power is supplied by primary voltage  |
| Fault        | Red            | Off  | <b>Off</b> = No faults/normal operation<br><b>On steady</b> = Missing hardware, missing software, operating system has not yet been initialized, or reset is in progress<br><b>Slow flicker then fast flicker</b> = Reset button is being pressed<br><b>Medium flicker</b> (2 blinks per second) = Startup sequence<br><b>Fast flicker</b> (5 blinks per second) = Fault |
| Ethernet     | Blue           | Flicker with activity  | <b>Off</b> = Receiving data<br><b>On steady</b> = Transmitting data<br><b>Flicker</b> = Data transmission  |
| 100/1G Link  | Blue           | On steady  | <b>Off</b> = no network connection<br><b>On steady</b> = network is connected  |
| Run          | Blue           | On steady  | <b>Off</b> = No power or waiting for processes to start<br><b>On steady</b> = OS and all monitored processes have started and the device is ready to use   |
| Upgrade      | Blue           | On steady  | <b>Off</b> = No upgrade in progress<br><b>On steady</b> = upgrade in progress  |
| USB A        | Blue           | On when a device is connected  | <b>Off</b> = No device is connected<br><b>On steady</b> = a device is connected  |
| USB B        | Blue           | On when a device is connected  | <b>Off</b> = No device is connected<br><b>On steady</b> = A device is connected  |
| System Bus   | Blue           | Flicker with activity  | <b>Off</b> = Not receiving data<br><b>On steady</b> = Transmitting data<br><b>Flicker</b> = Data transmission  |
| Wi-Fi AP     | Yellow         | Flicker with activity  | <b>Off</b> = No Wi-Fi adapter connected<br><b>On steady</b> = A device is connected to the Wi-Fi Network of the SBH<br><b>Flicker</b> = Wifi adapter is connected but no devices are connected   |
| EOL          | Yellow         | On if the device is the end of the line<br>Off if it is in the middle of the bus | <b>Off</b> = EOL not switched on<br><b>On steady</b> = EOL is switched on  |
| Wi-Fi Client | Yellow         | Not Used   | Not Used - This will be used at a future date  |



| Reset Function                         | Reset Operation <sup>1</sup>   |
|--|--|
| Reset the Wi-Fi and Ethernet Settings  | <ol style="list-style-type: none"> <li>Press and hold the <b>RESET</b> button for two seconds. The <b>FAULT</b> LED displays slow flicker behavior.</li> <li>Release the <b>RESET</b> button within three seconds. The <b>FAULT</b> LED continues slow flicker behavior.</li> <li>Within five seconds, press the <b>RESET</b> button again, and then immediately release it to confirm that you want to reset Wi-Fi and Ethernet settings. If you do not press the reset button to confirm within five seconds, the reset operation is canceled.</li> </ol> <p><b>Result:</b> You have reset the Wi-Fi SSID and passphrase and Ethernet settings to factory defaults. The LEDs stop flickering for two seconds, then the LEDs return to normal operation, based on the current state of the device.</p>  |
| Reset to Factory Defaults <sup>2</sup> | <ol style="list-style-type: none"> <li>Press and hold the <b>RESET</b> button for six seconds. After two seconds, the <b>FAULT</b> LED displays slow flicker behavior. This changes to fast flicker behavior after an additional four seconds of holding the <b>RESET</b> button.</li> <li>Release the <b>RESET</b> button within three seconds of seeing fast flicker behavior. The <b>FAULT</b> LED continues fast flicker behavior.</li> <li>Within five seconds, press the <b>RESET</b> button again, and then immediately release it to confirm that you want to reset to factory defaults. If you do not press the <b>RESET</b> button to confirm within five seconds, the reset operation is canceled.</li> </ol> <p><b>Result:</b> You have reset all unit settings to factory defaults. The LEDs stop flashing for two seconds, then the LEDs return to normal operation, based on the current state of the device.</p> |



- 1** Every SBH comes with a Quick Start Guide that gives you the login information
- 2** When you first login into the SBH it will prompt you to change the default login (**SAVE THIS NEW LOGIN INFO**)
- 3** If you forget or lose the login information follow the info above
- 4** If you don't have the Quick Start Guide & need the default login use the following...  
Verasys-SBH  
SBH-XXXXXX (last 6 digits of your mac address on the back of the SBH)  
Admin  
SBH-XXXXXX (last 6 digits of your mac address on the back of the SBH)
- 5** The Wi-Fi dongle can be used in either USB port
- 6** The SBH can be powered by a 24vdc, 50w, Class II power supply or you can use a 24vac, 75va Class II transformer
- 7** The SBH can be mounted on denrail or screwed down using the standoffs

|                   |  |                 |  |                      |  |                |  |          |  |
|-------------------|--|-----------------|--|----------------------|--|----------------|--|----------|--|
| Drawing Title     |  |                 |  |                      |  |                |  |          |  |
| <b>SBH DETAIL</b> |  |                 |  |                      |  |                |  |          |  |
| Project Title     |  | NO.             |  | REVISION-LOCATION    |  | ECN            |  | DATE     |  |
| <b>SMART COBP</b> |  |                 |  |                      |  |                |  |          |  |
| Sales Engineer    |  | Project Manager |  | Application Engineer |  | DRAWN          |  | APPROVED |  |
|                   |  |                 |  | By Steve Nichols     |  | DATE 8-12-2022 |  | BY DATE  |  |
| CONTRACT NUMBER   |  | DRAWING NUMBER  |  | 8                    |  |                |  |          |  |

# SBH Quick Install Guide

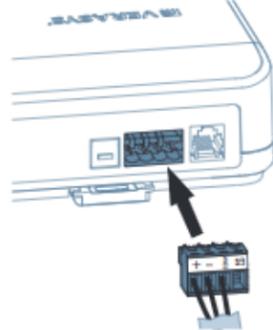
## 1. Connect the Smart Building Hub to Equipment

The Smart Building Hub (SBH) permanently connects to the Verasys™ system using the 4-terminal System bus port. Wire the system bus communications to the blue, 4-terminal connector and plug it into the port.

**Note:** If this device is at the end of a line, set the end of the line switch to on.

**Note:** The RJ-12 jack next to the 4-terminal block can be used as a temporary connection to the System bus using the RJ-12 cable supplied with the SBH.

Figure 1: Connecting the SBH



- a. Wire your cable to the supplied four-pin adapter as illustrated.
- b. Plug the Wi-Fi adapter that comes with the SBH into either of the USB ports.
- c. Connect the RJ45 Ethernet port to the building Ethernet network as instructed by the building IT department. The Ethernet must be plugged into the device if you choose the (optional) Ethernet setup in step 6.
- d. Connect power to the Smart Building Hub. Once power is supplied to the SBH, the **WiFi AP** LED flashes to indicate that the device is initializing. When the **Fault** LED turns off, the **WiFi AP** LED flashes, and the **RUN** LED is on, you can connect the SBH using the built-in Wifi access point.

Figure 2: SBH LED Map

|              |   |            |   |
|--------------|---|------------|---|
| WI-FI CLIENT | ● | EOL        | ● |
| WI-FI AP     | ● | SYSTEM BUS | ● |
| USB B        | ● | USB A      | ● |
| UPGRADE      | ● | RUN        | ● |
| 100/1G LINK  | ● | ETHERNET   | ● |
| FAULT        | ● | POWER      | ● |
| RESET        | ● | REBOOT     | ● |

## 2. Connect to the Smart Building Hub Wi-Fi access point

The SBH can be configured over Wi-Fi using a mobile device or laptop.

- a. In your Wi-Fi enabled device, access the Wi-Fi settings and select the Verasys-SBH access point name.
- b. Connect to the SBH Wi-Fi network using the supplied credentials from the beginning of this guide.

## 3. Open a Web Browser

- a. Navigate to the following URL: [www.smartbuildinghub.com](http://www.smartbuildinghub.com), to open the SBH browser interface.

**Note:** The SBH ships with a private smartbuildinghub.com SSL certificate installed to ensure secure communication with the SBH. However, this certificate does not indicate that it is trusted in a browser. If you wish to install your own certificate, refer to the *Smart Building Hub Network and IT Guidance Technical Bulletin (LIT-12012324)* for more information.

## 4. Log in to the Smart Building Hub

- a. Use the default Admin login credentials from the beginning of this guide.
- b. Read and accept the SBH license agreement.

## 5. Change Passwords and SSID

The first time you log into the SBH, the **Change Password and Passphrase** web page appears. You must change the Admin password, Wi-Fi passphrase, and the SSID.

**IMPORTANT:** After you change the Wi-Fi passphrase or SSID, the web server restarts and you must rejoin the SBH Wi-Fi network using the new passphrase. On some mobile devices, you must select and forget the original SBH Wi-Fi network before rejoining the network with the new passphrase. A laptop running Microsoft Windows is a device that behaves this way.

- a. In the **New Admin Password** field, enter a new password.
- b. In the **Verify New Admin Password** field, enter the same new password.
- c. In the **New Wi-Fi SSID** field, enter the new Wi-Fi SSID.
- d. In the **New Wi-Fi Passphrase** field, enter the new Wi-Fi Passphrase.
- e. Click the **Save** button.

Navigate to the following URL: [www.smartbuildinghub.com](http://www.smartbuildinghub.com), to open the SBH browser interface.

**Note:** The SBH ships with a private smartbuildinghub.com SSL

certificate installed to ensure secure communication with the SBH. However, this certificate does not indicate that it is trusted in a browser. If you wish to install your own certificate, refer to the *Smart Building Hub Network and IT Guidance Technical Bulletin (LIT-12012324)* for more information.

Navigate to the following URL: [www.smartbuildinghub.com](http://www.smartbuildinghub.com), to open the SBH browser interface.

**Note:** The SBH ships with a private smartbuildinghub.com SSL certificate installed to ensure secure communication with the SBH. However, this certificate does not indicate that it is trusted in a browser. If you wish to install your own certificate, refer to the *Smart Building Hub Network and IT Guidance Technical Bulletin (LIT-12012324)* for more information.

## 6. Ethernet Setup (Optional)

This step describes how to access the SBH over an Ethernet network.

- a. In the SBH UI, navigate to **Settings > Ethernet**.
- b. On the **Ethernet** drop-down list, select **On** to enable the SBH Ethernet port.
- c. Click the **Save** button.
- d. Take note of the address in the IP Address field. By default, the SBH is configured to dynamically receive an IP address from your network using DHCP.  
**Note:** If the IP Address does not appear, refresh the screen.
- e. Enter the IP address from the previous step. You now have access to the SBH over an Ethernet network. Refer to the *Smart Building Hub Network and IT Guidance Technical Bulletin (LIT-12012324)* for more options.

## 7. Use the Smart Building Hub

Select a device from the equipment list and use the web pages from the SBH to view, commission, and configure devices as needed.

**IMPORTANT:** Save this guide. It contains your default user name and password information. This information may be needed to reset your Smart Building Hub to factory defaults.

## Technical Specifications

### Smart Building Hub

|                                |   |
|--------------------------------|---|
| Power Consumption              | 38W maximum   |
| Ambient Temperature Conditions | Operating: 0 to 50°C (32 to 122°F)<br>Operating Survival: -30 to 60°C (-22 to 140°F)<br>Non-Operating: -40 to 70°C (-40 to 158°F) |
| Ambient Humidity Conditions    | Storage: 5 to 95% RH 30°C (86°F) maximum dew point conditions<br>Operating: 10-90% RH, 30°C (86°F) maximum dew point conditions   |

|                                |  |                 |  |                      |  |                |  |                 |  |
|--------------------------------|--|-----------------|--|----------------------|--|----------------|--|-----------------|--|
| Drawing Title                  |  |                 |  |                      |  |                |  |                 |  |
| <b>SBH QUICK INSTALL GUIDE</b> |  |                 |  |                      |  |                |  |                 |  |
| REFERENCE DRAWING              |  | NO.             |  | REVISION-LOCATION    |  | ECN            |  | DATE            |  |
| Sales Engineer                 |  | Project Manager |  | Application Engineer |  | DRAWN          |  | APPROVED        |  |
|                                |  |                 |  | By Steve Nichols     |  | DATE 8-12-2022 |  | BY DATE         |  |
| Project Title                  |  |                 |  |                      |  |                |  | CONTRACT NUMBER |  |
| <b>SMART COBP</b>              |  |                 |  |                      |  |                |  |                 |  |
|                                |  |                 |  |                      |  |                |  | DRAWING NUMBER  |  |
|                                |  |                 |  |                      |  |                |  | <b>9</b>        |  |



# Smart Building Internet Settings

Choose a device...

Settings

Wi-Fi Access Point

Backup

Restore

Profiles

Clone

**Ethernet**

Load Shedding

Global Shutdown

System Settings

Verasys Enterprise

BACnet Settings

BBMD

SSL

Alarm Notifications

Software Updates

Administration

Custom Logo

SETTINGS
ETHERNET

**Ethernet**

3 On

Hostname: SBH00108D0A7F56

Domain Name Suffix: \_\_\_\_\_

Ethernet Mac Address: 00:10:8d:0a:7f:56

Auto DHCP: 4 Off

---

**IP Address**

5 Get From I.T. Group

**Subnet Mask**

6 Get From I.T. Group

**Default Gateway**

7 Get From I.T. Group

**Auto DNS**

Off

**Primary DNS Server**

8 8.8.8.8

**Secondary DNS Server**

9 8.8.4.4

**Enable Proxy**

No

Note: Smart Building Hub must be connected to an external power source for Ethernet to function.

Cancel 10 Save

**Setting up Internet Access:**

- Reach out to the customers I.T. group & get the following... a "Static IP Address", "Subnet Mask", "Default Gateway", & "Primary & a Secondary DNS Server"
- Log into the SBH, click on "Settings" then "Ethernet" & change "Auto DHCP" to "Off"
- Add the info you got from the IT group into the SBH & make sure there's a network cable plugged into the SBH & the customers internet.
- Turn off your wifi. Open Chrome or Safari & type in the ip address. This should bring you to the Verasys login page...if not you may need to log into the customers VPN. (Call customer I.T. people up for VPN access) & repeat Step 4.

Get This Info From Customer I.T. Group or I.S.P. Then Write Info Here:

After you set up the SBH write down login info here

Static IP Address: \_\_\_\_\_

Subnet Mask: \_\_\_\_\_

Default Gateway: \_\_\_\_\_

Primary DNS Server: \_\_\_\_\_

Secondary DNS Server: \_\_\_\_\_

Email Host: \_\_\_\_\_

Email Port: \_\_\_\_\_

Mail Server User Name: \_\_\_\_\_

Mail Server Password: \_\_\_\_\_

VPN Address: \_\_\_\_\_

VPN User: \_\_\_\_\_

VPN Password: \_\_\_\_\_

SSID: \_\_\_\_\_

Wi-Fi Password: \_\_\_\_\_

User Name: \_\_\_\_\_

User Password: \_\_\_\_\_

|                              |  |   |  |                 |  |                      |  |          |  |
|------------------------------|--|---|--|-----------------|--|----------------------|--|----------|--|
| Drawing Title                |  |   |  |                 |  |                      |  |          |  |
| <b>SBH INTERNET SETTINGS</b> |  |   |  |                 |  |                      |  |          |  |
| Project Title                |  | REFERENCE DRAWING   |  | NO.             |  | REVISION-LOCATION    |  | ECN      |  |
| <b>SMART COBP</b>            |  | Sales Engineer  |  | Project Manager |  | Application Engineer |  | DRAWN    |  |
|                              |  | By Steve Nichols  |  | DATE 8-12-2022  |  | BY                   |  | APPROVED |  |
|                              |  | Branch Information  |  | CONTRACT NUMBER |  | DRAWING NUMBER       |  |          |  |
|                              |  |  |  |                 |  | <b>10</b>            |  |          |  |

Global Shutdown

System Settings

Verasys Enterprise

BACnet Settings

BBMD

SSL

**1 Alarm Notifications**

Software Updates

**13 Administration**

Custom Logo

Audit Log

Diagnostics




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All rights reserved. [Legal](#)  
Patents: <https://jciapat.com>  
SW Version: 4.1.0.37  
OS Version: 20181004182348  
Dictionary Version: 8.0.0.3797

ORE Up SOCKET Up

**SETTINGS**  
**ALARM NOTIFICATIONS**

Enabled

**2** On

Use SSL/TLS

**3** Yes

Host  
Ex: mail.server.com

**4** mail.server.com

Port

**5** 80

Locale  
Notification emails will be sent using this locale

**6** English

From Email Address  
Notification emails will come from this address

**7** This can be any email address

Site Name

**8** Best to make this the name of the building

Username

**9**

Set Password

Cancel **10** Save

Test Email Address  
Address to send test email to

**11** Enter the name of your email to verify it works

**12** Send Test Email

Note: To get text & email alerts you need to be connected to the internet & set up a user for each person who needs to get alerts. Follow Steps 1-23

**Setting Up Text & Email Alerts:**  
-Reach out to the customers I.T. group & get the following... a mail server "Host", "Port #"

**Setting Up Text & Email Alerts:**  
-Reach out to the customers I.T. group & get the following... Mail Server "User Name" & "Password"

**Adding Text Alerts:**

AT&T [phone#nodashes@txt.att.net](mailto:phone#nodashes@txt.att.net)

Verizon [phone#nodashes@vtext.com](mailto:phone#nodashes@vtext.com)

T-Mobile [phone#nodashes@tmomail.net](mailto:phone#nodashes@tmomail.net)

Sprint [phone#nodashes@messaging.sprintpcs.com](mailto:phone#nodashes@messaging.sprintpcs.com)

Cricket [phone#nodashes@mms.cricketwireless.net](mailto:phone#nodashes@mms.cricketwireless.net)

Virgin [phone#nodashes@vmobl.com](mailto:phone#nodashes@vmobl.com)

Tracfone [phone#nodashes@mmst5.tracfone.com](mailto:phone#nodashes@mmst5.tracfone.com)

Metro PCS [phone#nodashes@mymetropcs.com](mailto:phone#nodashes@mymetropcs.com)

Boost [phone#nodashes@myboostmobile.com](mailto:phone#nodashes@myboostmobile.com)

If your cell carrier is not displayed go to Google & search for their text address

**14** Add New User

**ADMINISTRATION**  
**ADD USER**

Name

**15** Brad Pitt

Username  
No spaces

**16** Brad

Password  
Must contain 8 or more characters, 1 lowercase letter, 1 uppercase letter, 1 number

**17** .....

Verify Password

**18** .....

Role

**19** Admin

Alarm Notification Level

**20** Service Priority

Email Address 1

**21** bradley.pitt@hollywood.com

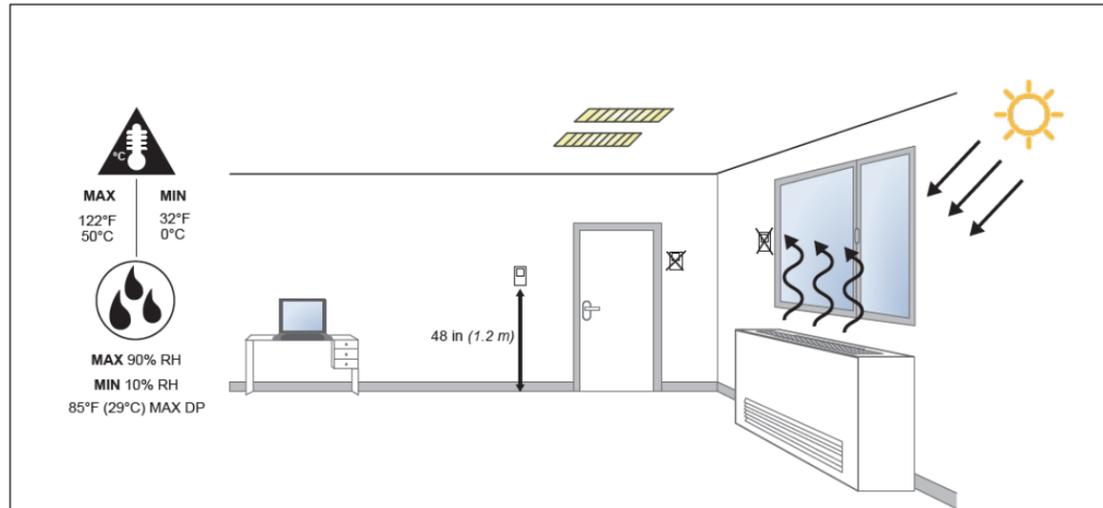
Email Address 2

**22** 8038675309@txt.att.net

Cancel **23** Save

|                               |                 |                      |                  |                |    |      |                 |  |  |
|-------------------------------|-----------------|----------------------|------------------|----------------|----|------|-----------------|--|--|
| Drawing Title                 |                 |                      |                  |                |    |      |                 |  |  |
| <b>SBH ALARMS &amp; USERS</b> |                 |                      |                  |                |    |      |                 |  |  |
| Project Title                 |                 |                      |                  |                |    |      |                 |  |  |
| <b>SMART COBP</b>             |                 |                      |                  |                |    |      |                 |  |  |
| REFERENCE DRAWING             | NO.             | REVISION-LOCATION    | ECN              | DATE           | BY |      |                 |  |  |
| Sales Engineer                | Project Manager | Application Engineer | By Steve Nichols | DATE 8-12-2022 | BY | DATE | CONTRACT NUMBER |  |  |
| DRAWING NUMBER                |                 |                      |                  |                |    |      | <b>11</b>       |  |  |

# NS8000 SENSOR DETAIL



- Note:**
- Locate the network sensor away from steam or water pipes, warm air stacks, unconditioned areas (not heated or cooled), or sources of electrical interference.
  - Height requirements may vary depending on the site.
  - Network sensors without CO<sub>2</sub> sensing are shock and vibration resistant, but not shock and vibration proof. Be careful not to drop the unit or mount it where it could be exposed to excessive vibration. Dropping a CO<sub>2</sub> network sensor may result in readings outside of the specified accuracy tolerance.

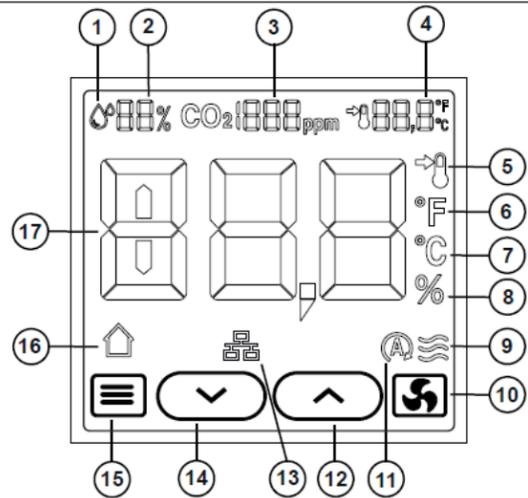


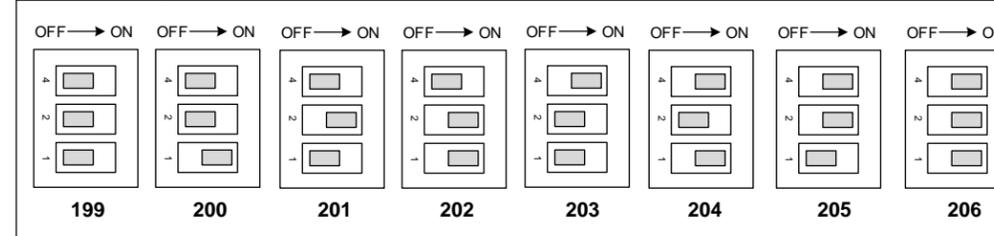
Table 1: Display icons

| Icon | Description   |
|------|---|
| 1    | Humidity indicator icon   |
| 2    | Humidity measurement  |
| 3    | CO <sub>2</sub> measurement   |
| 4    | Configurable setpoint or current temperature                          |
| 5    | Setpoint indicator icon   |
| 6    | Fahrenheit icon   |
| 7    | Celsius icon  |
| 8    | Percent relative humidity icon  |
| 9    | Fan speed bars  |
| 10   | Fan icon  |
| 11   | Automatic fan speed icon  |
| 12   | Up adjustment or navigation icon                                      |
| 13   | SA bus online indicator   |
| 14   | Down adjustment or navigation icon                                    |
| 15   | Menu or enter icon  |
| 16   | Occupancy indicator   |
| 17   | Default display value (setpoint, zone temperature, relative humidity) |

- To change the display from °C to °F hold down
- Once you connect the NS to a controller that is connected to a SBH it will hold it's parameters when there's a power cycle
- The NS8000 uses a dipswitch to address it
- If the sensor is the only one on the bus there is no need to change the default address of 199
- You can have a max of 8 NS sensors on the sensor bus that can be daisy chained for averaging. You can use addresses (199-206) You do not need to do additional steps it will average automatically.
- Each averaging sensor will display it's local temp not the average. While looking at the SBH for that SA bus it will display the average. If you want to see the individual averaging sensor temp click on the **controller>details>netsensor plug and play**.
- This is a 4 wire bus & will not work on 3 wires. Use 18awg to 22awg
- In a retrofit application existing stat wire maybe used as long as you have 4 conductors
- If you are using a sensor with CO2 it's lifespan is 10 years under standard operating conditions
- If you are using a sensor with PIR it can work up to 26ft with clear line of site
- You can add a MAP tool on the bottom of the sensor to access the devices on the bus
- You have the option to terminate to the sensor with a modular jack or screw terminals



Dipswitch Settings



**Tech Tip:**

In order for an NS8000 sensor to work properly you need to be running 4.1 firmware or newer.

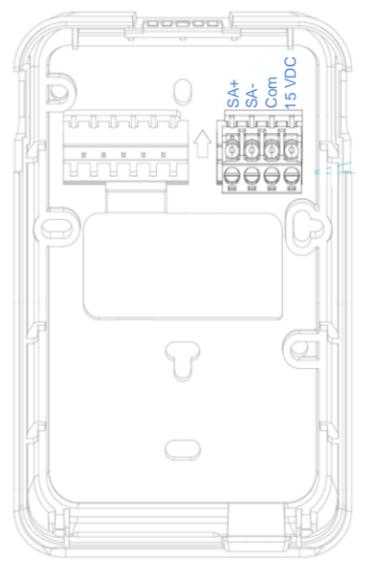
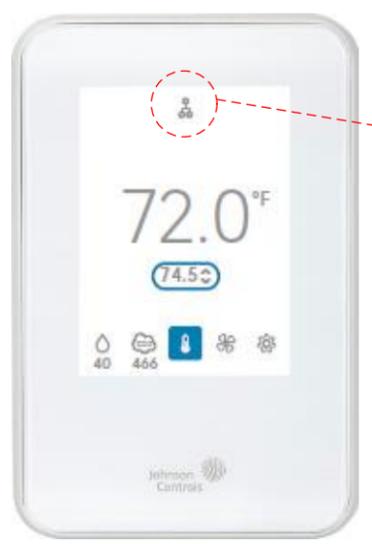


|                   |                 |                      |  |               |           |      |  |          |  |
|-------------------|-----------------|----------------------|--|---------------|-----------|------|--|----------|--|
| Drawing Title     |                 |                      |  |               |           |      |  |          |  |
| NS8000 DETAIL     |                 |                      |  |               |           |      |  |          |  |
| Project Title     |                 |                      |  |               |           |      |  |          |  |
| SMART COBP        |                 |                      |  |               |           |      |  |          |  |
| REFERENCE DRAWING | NO.             | REVISION-LOCATION    |  | ECN           | DATE      | BY   |  |          |  |
| Sales Engineer    | Project Manager | Application Engineer |  | Steve Nichols | 8-12-2022 | DATE |  | APPROVED |  |
| CONTRACT NUMBER   |                 |                      |  |               |           |      |  |          |  |
| DRAWING NUMBER    |                 |                      |  |               |           |      |  |          |  |
| 12                |                 |                      |  |               |           |      |  |          |  |



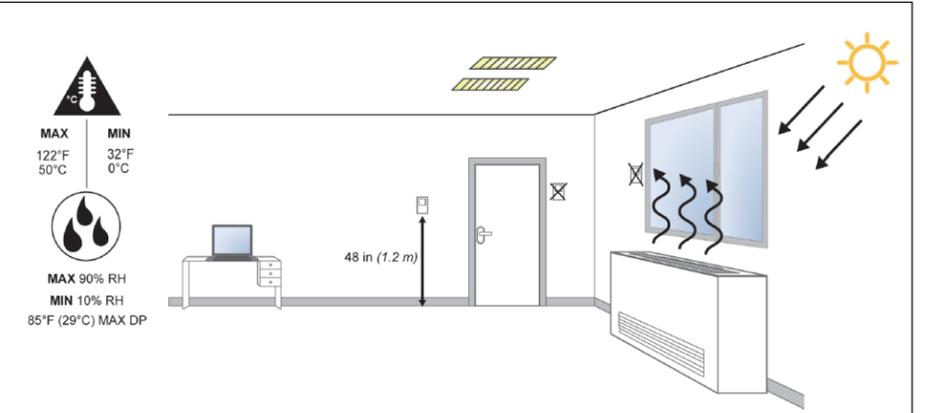
# NS8000 Color Sensor Detail

|  |                                    |
|--|------------------------------------|
|  | Up Arrow-Cannot Hide Icon          |
|  | Down Arrow-Cannot Hide Icon        |
|  | Background Light-Cannot Hide Icon  |
|  | Background Dark-Cannot Hide Icon   |
|  | Brightness Bar-Cannot Hide Icon    |
|  | Brightness-Cannot Hide Icon        |
|  | Cancel-Cannot Hide Icon            |
|  | Checkmark-Cannot Hide Icon         |
|  | Fan Speed-Can Hide Icon            |
|  | Fan Auto-Can Hide Icon             |
|  | Fan Speed Bars-Can Hide Icon       |
|  | Relative Humidity-Can Hide Icon    |
|  | CO2-Can Hide Icon                  |
|  | Occupancy-Can Hide Icon            |
|  | Setpoint-Can Hide Icon             |
|  | Occupancy-Cannot Hide Icon         |
|  | Setpoint-Cannot Hide Icon          |
|  | Settings-Can Hide Icon             |
|  | Settings Lock-Can Hide Icon        |
|  | Temperature-Cannot Hide Icon       |
|  | Settings Enabled-Cannot Hide Icon  |
|  | Settings Disabled-Cannot Hide Icon |
|  | Error-Cannot Hide Icon             |
|  | Page Indicator-Cannot Hide Icon    |
|  | Scroll Arrows-Cannot Hide Icon     |
|  | Timeout-Cannot Hide Icon           |
|  | Screen Dim-Cannot Hide Icon        |
|  | Screen Off-Cannot Hide Icon        |



- Once you connect the NS to a controller that is connected to a SBH it will hold it's parameters when there's a power cycle
- To change the address hold the network icon for 3 seconds, then hold the "SA Bus" for 3 seconds then use the arrow & save
- If the sensor is the only one on the bus there is no need to change the default address
- You can have a max of 8 NS sensors on the sensor bus that can be daisy chained for averaging. You can use addresses (199-206) You do not need to do additional steps it will average automatically.
- Each averaging sensor will display it's local temp not the average. While looking at the SBH for that SA bus it will display the average. If you want to see the individual averaging sensor temp click on the **controller>details>netsensor plug and play.**
- This is a 4 wire bus & will not work on 3 wires. Use 18awg to 22awg
- In a retrofit application existing stat wire maybe used as long as you have 4 conductors
- If you are using a sensor with CO2 it's lifespan is 10 years under standard operating conditions
- If you are using a sensor with PIR it can work up to 26ft with clear line of site
- You can add a MAP tool on the bottom of the sensor to access the devices on the bus
- You have the option to terminate to the sensor with a modular jack or screw terminals
- To change the set point range log into the **Smart Building Hub, Devices**, click on the controller your stat is attached to & go to **Setpoints**,
- To lock out the color screen see the installation guide in the link below
- To hide icons on the color display refer to the installation guide in the link below

<https://docs.johnsoncontrols.com/bas//Johnson-Controls/en-US/Vertical-Wallbox-Mounted-or-Surface-Mounted-NS8000-Series-Network-Sensors-Graphical-Display-Models-Installation-Guide/D>



Locate sensor away from steam, water pipes, warm air stacks, unconditioned areas (not heated or cooled), sources of electrical interference, or on walls that radiate the temperature from the outside (you can use a thermal barrier)

Make sure to plug conduit coming from an unconditioned space to keep cold or warm air from being pushed down conduit to the back of the sensor

Height requirements may vary depending on the site & ADA requirements

Network sensors without CO 2sensing are shock & vibration resistant, but not shock & vibration proof. Be careful not to drop the unit or mount it where it could be exposed to excessive vibration. Dropping CO2 network sensor may result in reading outside of the specified accuracy tolerance

| Display Text | Economizer Fault Condition       | Possible Problem  |
|--------------|----------------------------------|---|
| E0           | Air Temp Sensor Failure or Fault | Problem with one of the air temperature sensors. Check outdoor air, return air, or supply air sensors       |
| E1           | Not economizing when it should   | The economizer is not using outdoor air when it should  |
| E2           | Economizing when it should not   | The economizer is allowing outdoor air inside when the conditions are not suitable for economizer operation |
| E3           | Damper not modulating            | The economizer damper is not able to modulate properly, Check damper, linkage to actuator, or the actuator  |
| E4           | Excess outdoor air               | The economizer is allowing excess air inside  |

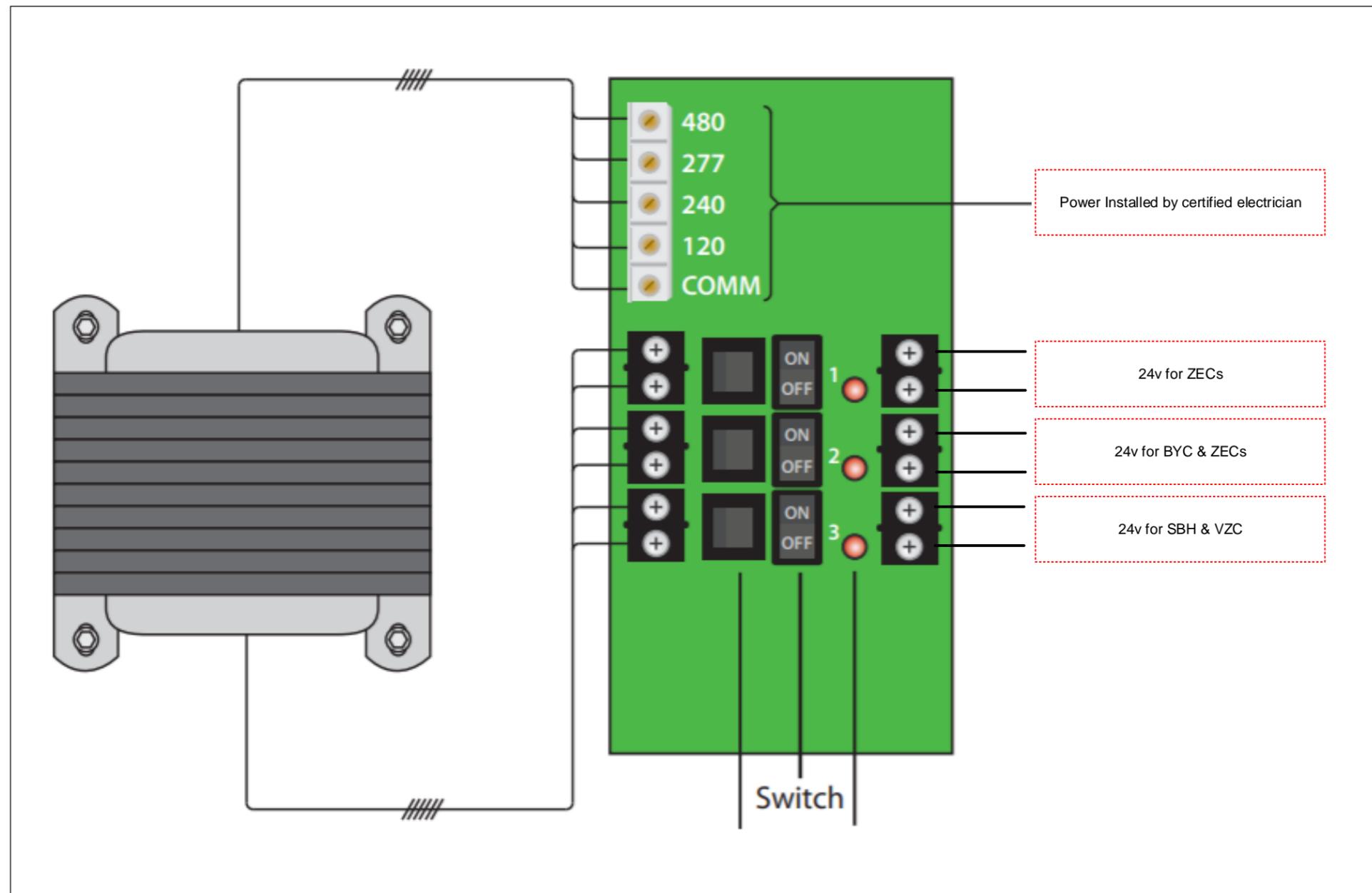
**Tech Tip:**  In order for an NS8000 CO2 sensor to work properly your SSE card needs to be running 4.0.1 firmware or higher. SSE cards with 4mb or 3.0 firmware will not work with 4.0.1 firmware. An SSE card needs at least 8mb to run the 4.0.1 firmware & pretty much any SSE card made before 2017 only has 4mb of memory.



|                     |  |          |  |                   |  |                    |  |                 |  |
|---------------------|--|----------|--|-------------------|--|--------------------|--|-----------------|--|
| Drawing Title       |  |          |  |                   |  |                    |  |                 |  |
| NS8000 COLOR DETAIL |  |          |  |                   |  |                    |  |                 |  |
| Project Title       |  | NO.      |  | REVISION-LOCATION |  | ECN                |  | BY              |  |
| SMART COBP          |  |          |  |                   |  |                    |  |                 |  |
|                     |  | DRAWN    |  | DATE              |  | APPROVED           |  | DATE            |  |
|                     |  | By Steve |  | 8-12-2022         |  | By                 |  | DATE            |  |
|                     |  | Nichols  |  |                   |  | Branch Information |  | CONTRACT NUMBER |  |
|                     |  |          |  |                   |  |                    |  |                 |  |
|                     |  |          |  |                   |  |                    |  | DRAWING NUMBER  |  |
|                     |  |          |  |                   |  |                    |  | 12              |  |

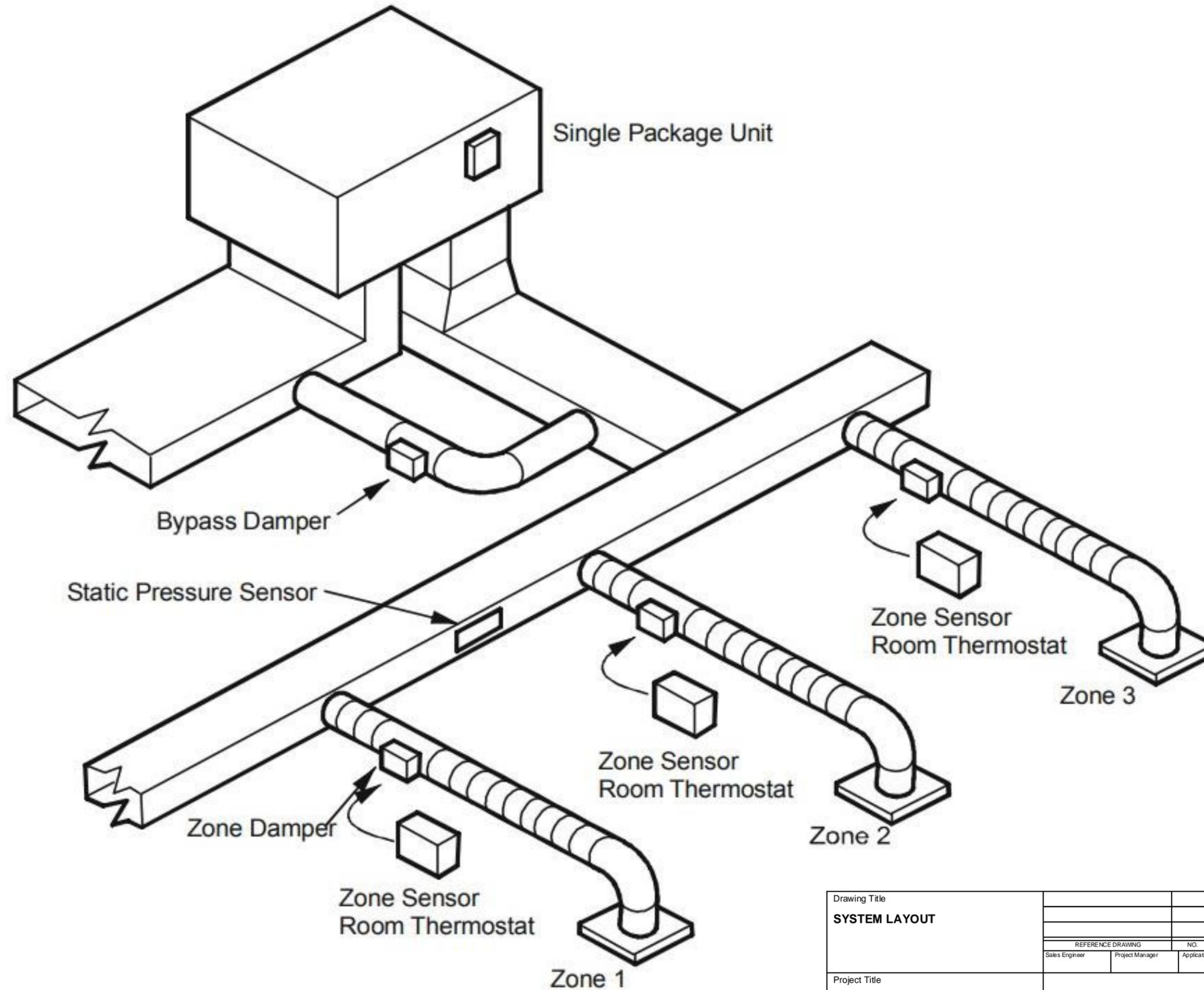


**RIB PSH300 Detail**



|                      |                 |                      |                  |                 |    |  |  |  |  |
|----------------------|-----------------|----------------------|------------------|-----------------|----|--|--|--|--|
| Drawing Title        |                 |                      |                  |                 |    |  |  |  |  |
| <b>PSH300 DETAIL</b> |                 |                      |                  |                 |    |  |  |  |  |
| Project Title        |                 |                      |                  |                 |    |  |  |  |  |
| <b>SMART COBP</b>    |                 |                      |                  |                 |    |  |  |  |  |
| REFERENCE DRAWING    | NO.             | REVISION-LOCATION    | ECN              | DATE            | BY |  |  |  |  |
| Sales Engineer       | Project Manager | Application Engineer | Steve<br>Nichols | 8-12-2022       |    |  |  |  |  |
| Contract Number      |                 | Branch Information   |                  | CONTRACT NUMBER |    |  |  |  |  |
|                      |                 | VERASYS™             |                  | DRAWING NUMBER  |    |  |  |  |  |
|                      |                 |                      |                  | <b>13</b>       |    |  |  |  |  |

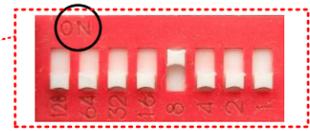
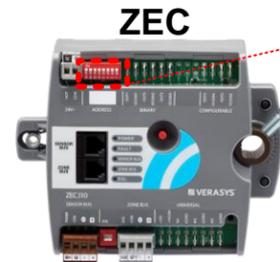
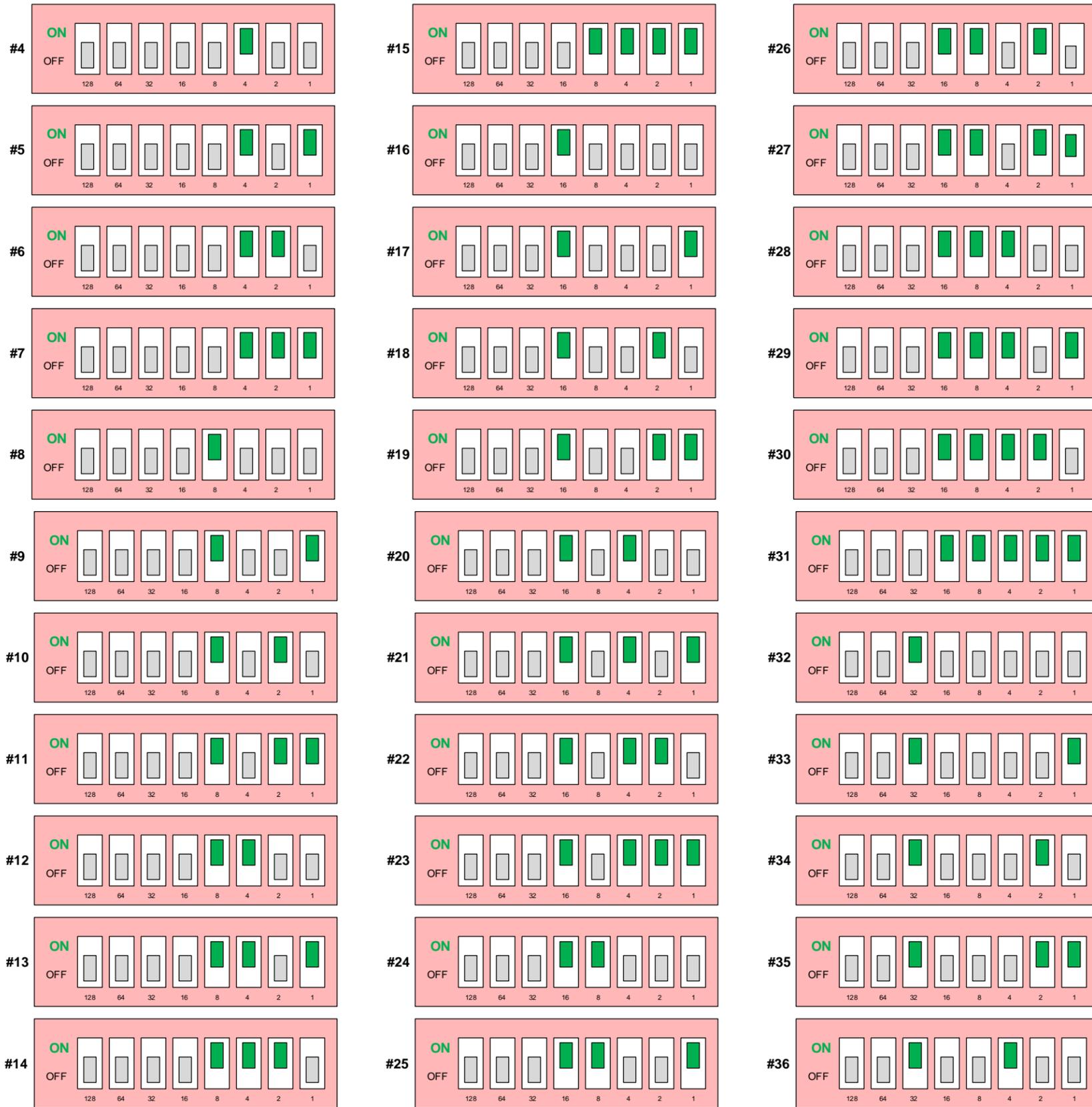
**COBP Layout**



|                      |                 |                      |                  |                |    |           |  |  |  |
|----------------------|-----------------|----------------------|------------------|----------------|----|-----------|--|--|--|
| Drawing Title        |                 |                      |                  |                |    |           |  |  |  |
| <b>SYSTEM LAYOUT</b> |                 |                      |                  |                |    |           |  |  |  |
| Project Title        |                 |                      |                  |                |    |           |  |  |  |
| <b>SMART COBP</b>    |                 |                      |                  |                |    |           |  |  |  |
| REFERENCE DRAWING    | NO.             | REVISION-LOCATION    | ECN              | DATE           | BY |           |  |  |  |
| Sales Engineer       | Project Manager | Application Engineer | By Steve Nichols | DATE 8-12-2022 | BY | DATE      |  |  |  |
| Contract Number      |                 |                      |                  |                |    |           |  |  |  |
|                      |                 |                      |                  |                |    |           |  |  |  |
| DRAWING NUMBER       |                 |                      |                  |                |    |           |  |  |  |
|                      |                 |                      |                  |                |    | <b>14</b> |  |  |  |



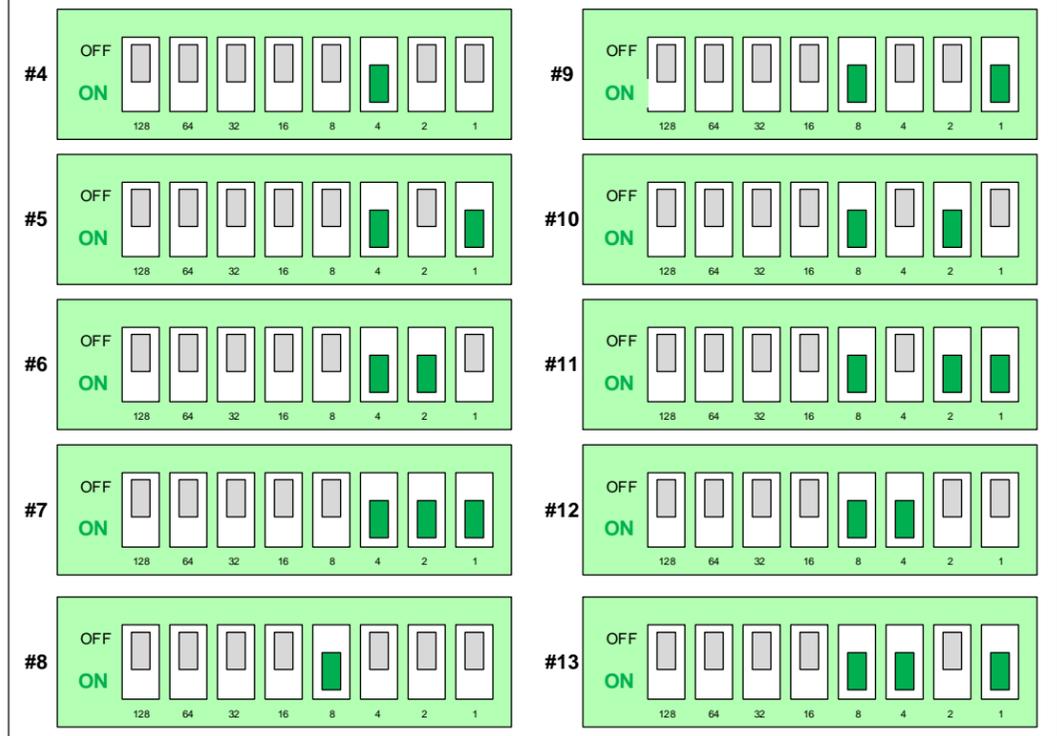
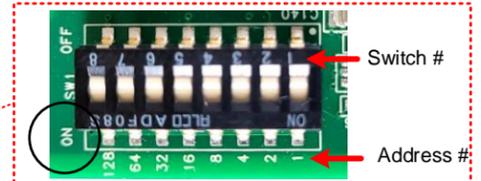
# Dip Switch Addresses



**Tech Tip:** If you change a dipswitch while the ZEC is powered you will need to do a power cycle for it to change.



## VZC

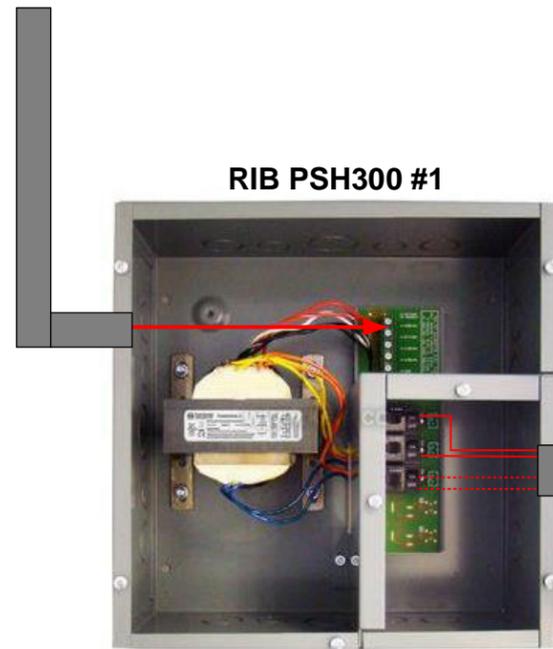


|                          |                 |                      |  |                 |                |                |  |           |  |
|--------------------------|-----------------|----------------------|--|-----------------|----------------|----------------|--|-----------|--|
| Drawing Title            |                 |                      |  |                 |                |                |  |           |  |
| <b>ADDRESSING DETAIL</b> |                 |                      |  |                 |                |                |  |           |  |
| REFERENCE DRAWING        | NO.             | REVISION-LOCATION    |  | ECN             | DATE           | BY             |  |           |  |
| Sales Engineer           | Project Manager | Application Engineer |  | Steve Nichols   | DATE 8-12-2022 | BY             |  | DATE      |  |
| Project Title            |                 | Branch Information   |  | CONTRACT NUMBER |                | DRAWING NUMBER |  |           |  |
| <b>SMART COBP</b>        |                 |                      |  |                 |                |                |  | <b>15</b> |  |

# Verasys Enclosure

**Tech Tip:**  High voltage wire & comm wire should never be in the same conduit or zipped tied together

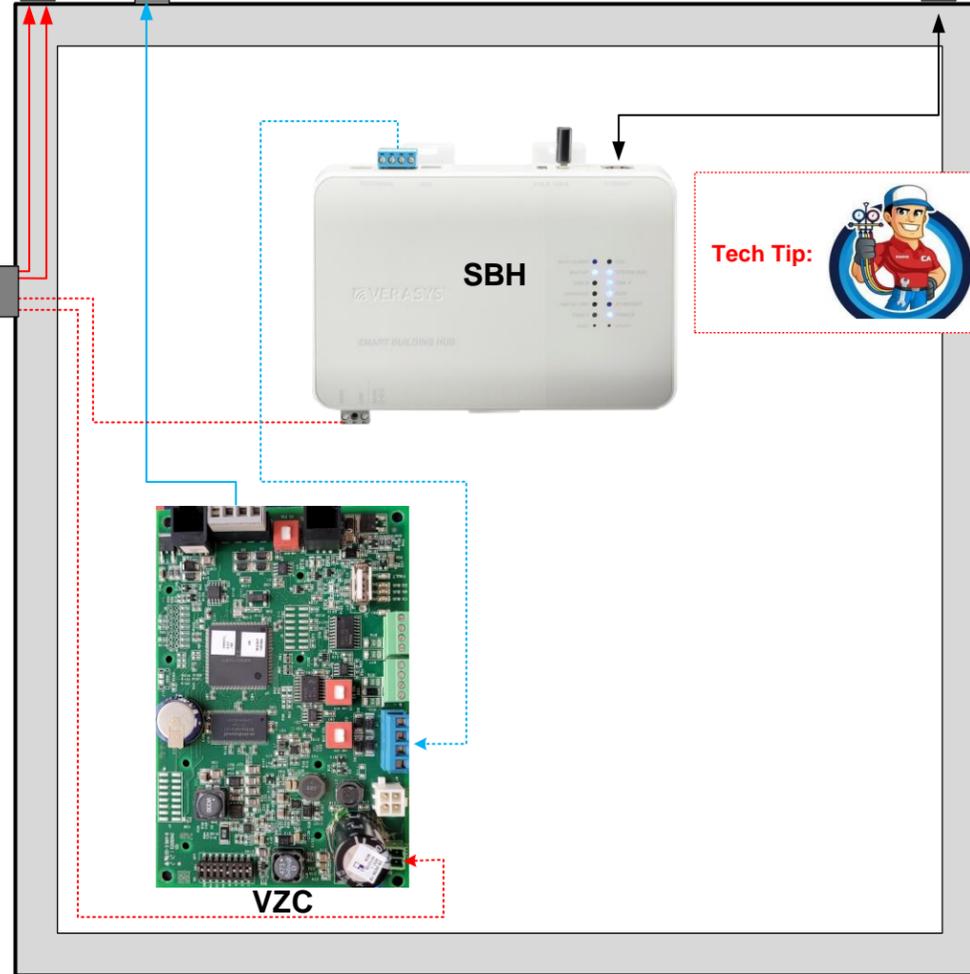
120vac  
Installed by electrician



Installed By HVAC  
Contractor

24v Zone Bus

HVAC Contractor provides panel enclosure



HVAC Contractor  
works with I.T.  
Group

1) Network  
cable

**Tech Tip:**  Install SBH & connect to internet before job starts. See pages 8-11

|   |                 |                      |                  |           |    |                 |  |  |  |
|---|-----------------|----------------------|------------------|-----------|----|-----------------|--|--|--|
| Drawing Title   |                 |                      |                  |           |    |                 |  |  |  |
| <b>ENCLOSURE</b>  |                 |                      |                  |           |    |                 |  |  |  |
| Project Title   |                 |                      |                  |           |    |                 |  |  |  |
| <b>SMART COBP</b>   |                 |                      |                  |           |    |                 |  |  |  |
| REFERENCE DRAWING   | NO.             | REVISION-LOCATION    | ECN              | DATE      | BY |                 |  |  |  |
| Sales Engineer  | Project Manager | Application Engineer | Steve<br>Nichols | 8-12-2022 |    |                 |  |  |  |
| Branch Information  |                 |                      |                  |           |    | CONTRACT NUMBER |  |  |  |
|  |                 |                      |                  |           |    | DRAWING NUMBER  |  |  |  |
|   |                 |                      |                  |           |    | <b>16</b>       |  |  |  |

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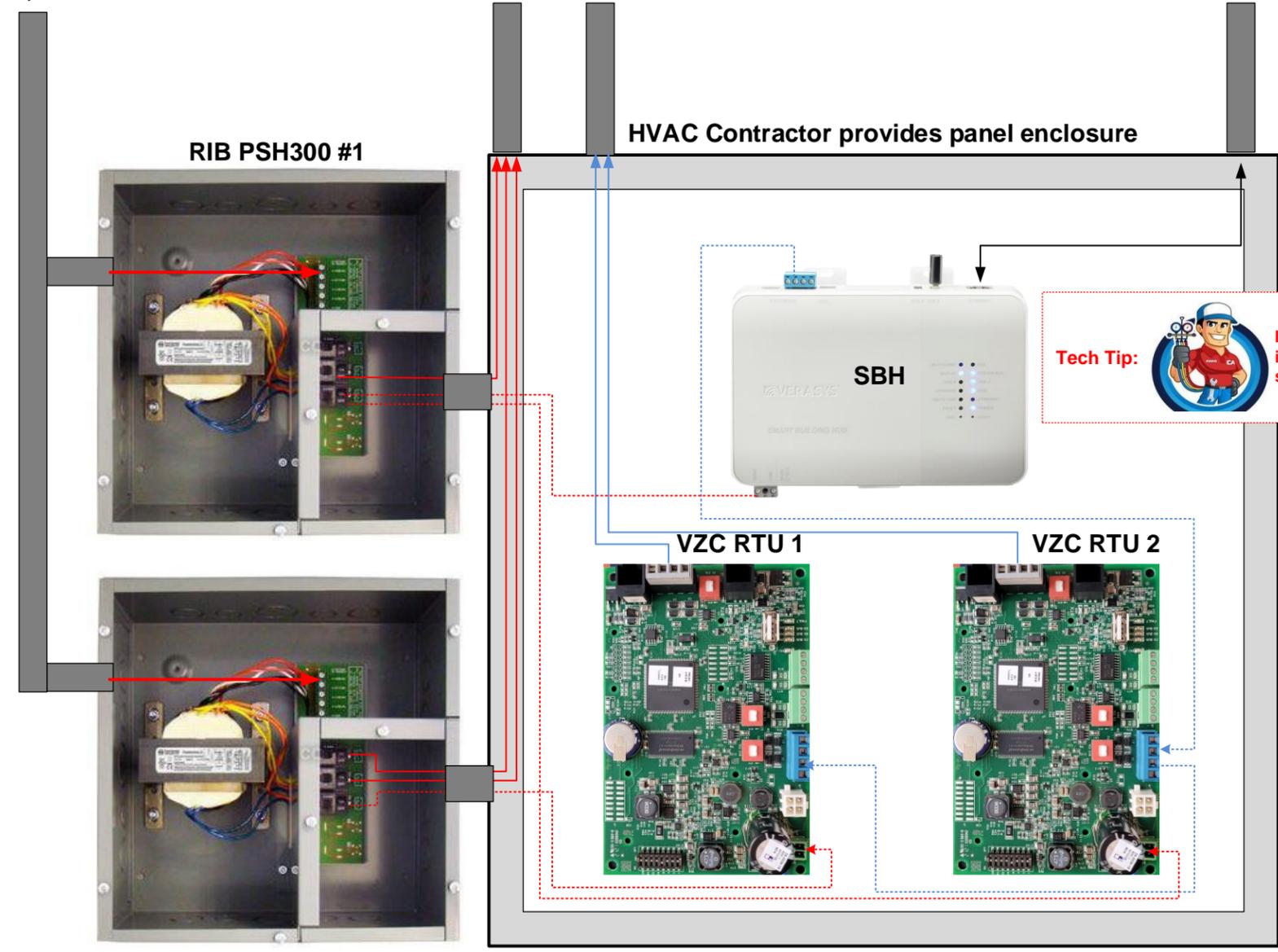
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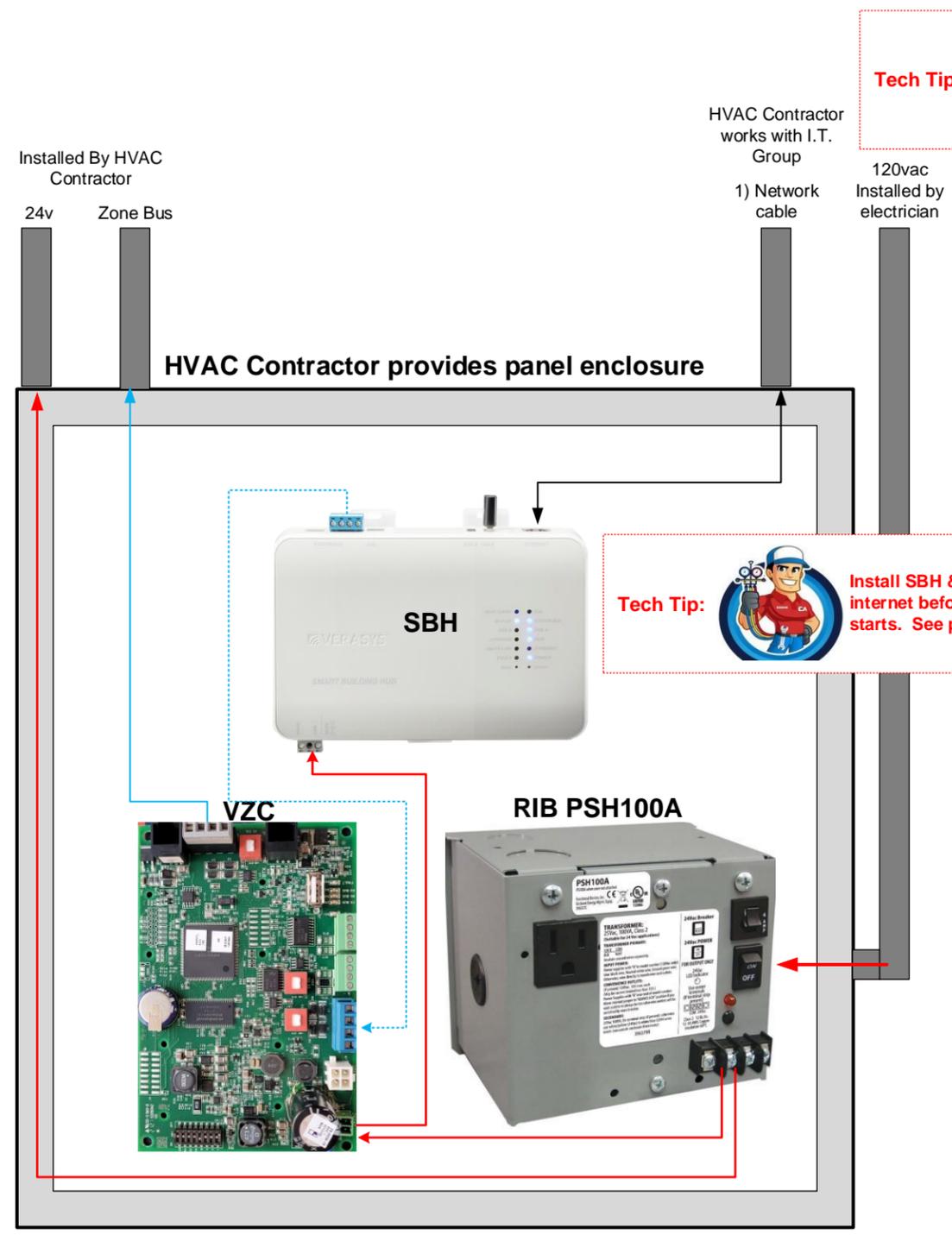
**Tech Tip:**  Install SBH & connect to internet before job starts. See page 13-16

RIB PSH300 #2

|                   |                 |                      |  |                 |                |          |  |  |  |
|-------------------|-----------------|----------------------|--|-----------------|----------------|----------|--|--|--|
| Drawing Title     |                 |                      |  |                 |                |          |  |  |  |
| ENCLOSURE         |                 |                      |  |                 |                |          |  |  |  |
| Project Title     |                 |                      |  |                 |                |          |  |  |  |
| SMART COBP        |                 |                      |  |                 |                |          |  |  |  |
| REFERENCE DRAWING | NO.             | REVISION-LOCATION    |  | ECN             | DATE           | BY       |  |  |  |
| Sales Engineer    | Project Manager | Application Engineer |  | By Steve        | DATE 8-12-2022 | APPROVED |  |  |  |
|                   |                 | Branch Information   |  | CONTRACT NUMBER |                |          |  |  |  |
|                   |                 | DRAWING NUMBER       |  |                 |                |          |  |  |  |
|                   |                 | 16                   |  |                 |                |          |  |  |  |



# Verasys Enclosure



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**Tech Tip:**  Install SBH & connect to internet before job starts. See page 8-11

|                    |                 |                      |  |       |           |         |  |           |  |
|--------------------|-----------------|----------------------|--|-------|-----------|---------|--|-----------|--|
| Drawing Title      |                 |                      |  |       |           |         |  |           |  |
| <b>ENCLOSURE</b>   |                 |                      |  |       |           |         |  |           |  |
| Project Title      |                 |                      |  |       |           |         |  |           |  |
| <b>SMART COBP</b>  |                 |                      |  |       |           |         |  |           |  |
| REFERENCE DRAWING  | NO.             | REVISION-LOCATION    |  | ECN   | DATE      | BY      |  |           |  |
| Sales Engineer     | Project Manager | Application Engineer |  | Steve | 8-12-2022 | Nichols |  |           |  |
| Branch Information |                 | CONTRACT NUMBER      |  |       |           |         |  |           |  |
| DRAWING NUMBER     |                 |                      |  |       |           |         |  |           |  |
|                    |                 |                      |  |       |           |         |  | <b>16</b> |  |



**Standard Installation Procedures**

- Step 1: At your office pull out all the controllers & wire them up to the SBH referring to pages 3 & 4. **(do not apply power yet)**
- Step 2: Address the VZC, BYPs, ZECs according to Page 3 Riser Diagram & label each.
- Step 3: Power up & log into your SBH & verify firmware & update if needed. *(watch YouTube video)*
- Step 4: Power up VZC & verify it shows up in the SBH device list with the proper address. *(watch YouTube video)*
- Step 5: Power up BYP200 & verify it shows up under the VZC on the SBH. *(watch YouTube video)*
- Step 6: Power up each ZEC310 & Verify they show up under the VZC.
- Step 7: Back on the SBH give each controller a descriptor under “Devices” “Edit Device Details”. (Write a descriptor as if you showed up on job after the install & don’t know where anything is)

Step 8: Log into each ZEC 310 & configure as needed giving each a vote (0-4) *(watch YouTube video)*

On the VZC select  Edit Zone Group 1,2,3,& 4 Schedules however you want

On the ZEC510 select  select a group

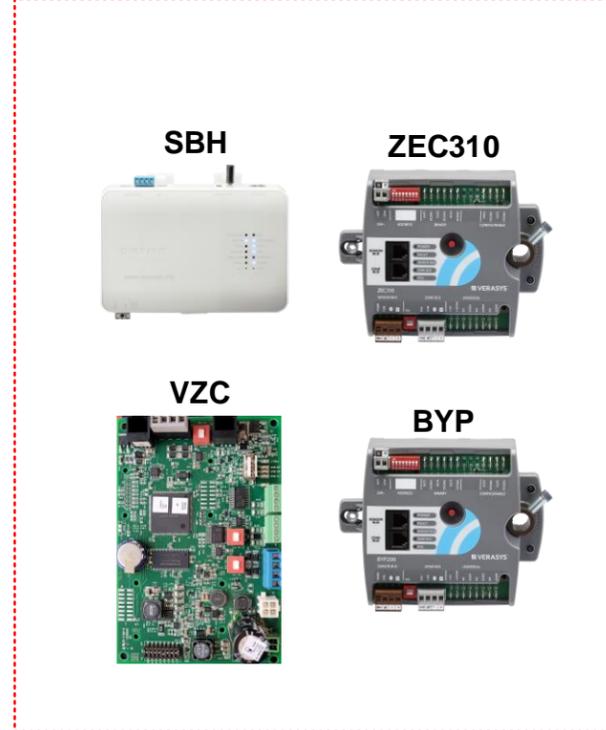
- Step 9: Create 4 schedules for your VZC. (Each VZC is capable of having up to 4 schedules)
- Step 10: Attach 1 of the 4 schedules to each ZEC310.
- Step 11: Verify the firmware is current on the VZC & update if needed. (When you update the VZC it will also update all the controllers on the Zone Bus)
- Step 12: If you have a 2<sup>nd</sup> VZC repeat steps 2-11.

- Step 13: At the jobsite Install PSH power supply. See page 3, 13, & 16. **Have licensed Electrician terminate high voltage to power supply.**
- Step 14: Install SBH & apply power to it from PSH. Get SBH connected to internet. See pages 8-11.
- Step 15: Install VZC next to SBH, terminate BACnet bus from VZC to SBH, power up VZC, & verify it shows up on SBH. See pages 4 & 16.
- Step 16: Pull BACNet wire from VZC to all the controllers (strip but don’t terminate wires yet). See pages 3 & 4.
- Step 17: While pulling the BACnet wire pull a 2 conductor 16awg power bus to all controllers. See page 3.
- Step 18: Check all wires you just pulled for ground faults before you apply power or terminate BACnet bus.
- Step 19: Verify if each SSE has an SE-COM1001-0 comm card & install if needed. See page 5.
- Step 20: Verify the firmware on each SSE & make sure it has 4.2.1.6 or newer & update if needed. See page 5.
- Step 21: Address each SSE with a unique BACnet Address. See page 5

- Step 22: Configure SSE. See page 5
- Step 23: Terminate BACnet 22\3 wire to the SSE & verify ti show up on the SBH under the VZC.
- Step 24: Install the BYP200 on the bypass damper & terminate BACnet wire & verify it shows up on the SBH under the VZC.
- Step 25: Install Discharge Air Static Pressure Sensor & terminate to BYP200. See page 7.
- Step 26: Install ZEC310s on each of the zone dampers & terminate BACnet wires & verify each shows up on the SBH. See page 6.
- Step 27: Unless there’s existing stat wire from controller to wall\zone sensor pull a 4 conductor wire. See pages 3 & 6.
- Step 28: On SA bus wires check for ground faults. Terminate the SA bus to controller & wall module. See page 3 & 6.
- Step 29: Test each ZEC310.
- Step 30: Cause a trouble condition & verify email & text alerts are sent.

- Step 31: Add login info (IP Address, User, & Password) to these drawings on Page 10.
- Step 32: Redline these drawings & then print a new set to leave at the SBH & email a copy to end user.

**PDF YouTube Links**



|                               |  |   |  |                      |  |                 |  |          |  |
|-------------------------------|--|---|--|----------------------|--|-----------------|--|----------|--|
| Drawing Title                 |  |   |  |                      |  |                 |  |          |  |
| Standard Installation Details |  |   |  |                      |  |                 |  |          |  |
| REFERENCE DRAWING             |  | NO.   |  | REVISION-LOCATION    |  | ECN             |  | DATE BY  |  |
| Sales Engineer                |  | Project Manager   |  | Application Engineer |  | DRAWN           |  | APPROVED |  |
|                               |  |   |  | By Steve Nichols     |  | DATE 7-11-2022  |  | BY DATE  |  |
| Project Title                 |  | 3rd Party COBP  |  | Branch Information   |  | CONTRACT NUMBER |  |          |  |
|                               |  |  |  |                      |  | DRAWING NUMBER  |  | 17       |  |

**Definitions:**

**Actuator**-A controlled piece of hardware that rotates to open & close valves or dampers  
**AHU**-Air Handling Unit. Typically heat supplied by a boiler & cool water supplied by a chiller  
**BACnet IP**-BACnet communication over the internet  
**BACnet MS\TP**-Master-Slave/Token Passing. 3 wire communication bus  
**BACnet**-A data communication protocol for building automation & control networks  
**BAS**-Building Automation System.  
**BBMD**-BACnet/IP Broadcast Management Device. Not used unless your using BACnet/IP  
**BYP200**-Bypass Damper Controller used for COBP.  
**CO2**-Carbon Dioxide. Our bodies breathe in Oxygen & breath out CO2.  
**COBP**-Change Over Bypass may also be called VVT. A type of zoning for your building using a bypass damper & zone dampers. Each zone gets a vote & the VZC determines the order of attention for each zone.  
**DHCP**-When a router or gateway assigns an address to each device plugged into it (Can change with power cycle)  
**Differential Pressure**-The difference in pressure between 2 given points. (like a VAV box or a filter)  
**DNS**-Domain Name System. Similar to a phone book for the internet.  
**DVC or DCV**-Demand Ventilation Control. A method to add fresh air in a room using CO2 sensors.  
**ECM**-Electronically Commutated Controller. A DC powered motor that can vary the speed & torque.  
**Ethernet**-A system for connecting a number of computers or controllers to form a local area network.  
**FC**-BACnet ms\tp bus. Verasys can have up to 100 devices on this bus or 10 VZCs.  
**Gateway**-The network hardware that routes information in your building.  
**ISP**-Internet Service Provider. (Comcast, Century Link, Cox,....)  
**LAN**-Local Area Network. A collection of devices connected together in one physical location, such as a building, office, or home.  
**MA**-Mixed Air. Where outside air & return air from the building mix.  
**OA**-Outside Air. Fresh air from outside the building.  
**RA**-Return Air. Air from the building coming back into the duct work to be reused or cycled outside.  
**RTU**-Rooftop Unit. A packaged unit that contains heating & cooling.  
**SA**-Sensor Bus. Verasys can have 8 devices on this bus. It has to have 4 wires. 2 for power & 2 for data.  
**SA**-Supply Air. May also be referred to as Discharge Air. This is the conditioned air from the RTU or AHU going into the space  
**SBH**-Smart Building Hub. The internet hub for Verasys.  
**SMART**-A software layer on many JCI products that allows them to be a plug & play device with Verasys.  
**SSE**-Simplicity Smart Equipment. Many York RTU\AHU\Chillers, Coleman, Lux Air, Tempmaster, Quantech Chillers have the SSE card installed. This makes them a SMART plug & play device with Verasys.  
**SSL**-Secure Sockets Layer. A computing protocol that ensures the security of data sent via the internet by using encryption.  
**Static I.P. Address**- Similar to a phone number but on the internet. (Fixed) Used to access the SBH.  
**Subnet**-A method used to separate a network in a building. BAS should be on it's own Subnet.  
**TEC**-BACnet Stat for 3rd Party RTU, Heat Pumps, Unit Heaters, & Splits. Has a built in economizer. Can't control VFDs.  
**TLS**-Transport Layer Security. A security protocol designed to facilitate privacy and data security for communications over the Internet.  
**VAC**-RTU Controller for 3rd Party Units. Can also be used for IOM, Lighting, Boiler, Chiller, & Sideloop applications.  
**VAV**-Variable Air Volume. A type of zoning for your building using VAV boxes & a VFD. RTU is usually cooling only.  
**VEC**-RTU Controller for Zoning. There are multiple apps you can install on the VEC. (Heat Pump, Mod Heat Mod Cool, Mod Heat Stage Cool, Stage Heat Mod Cool, Stage Heat Stage Cool)  
**VFD**-Variable Frequency Drive. Hardware that allows you to vary the speed of a fan or pump. Great for saving energy!  
**VPN**-Virtual Private Network. A layer of internet security end user typically use requiring you to have a login to access their network.  
**VZC**-Verasys Zone Coordinator. Verasys can have up to 10 VZCs on the FC System bus.  
**ZA**-Zone Bus. Verasys can have up 33 controllers on this bus. 32 zones & 1 controller for RTU.  
**ZEC310**-Damper Controller used for COBP.  
**ZEC510**-VAV Box Controller. Can be used as stand alone zone control.

**The Gotchas:**

- #1-Current firmware is loaded at the factory. However we don't know how long a part will sit before installation. On every job update all hardware to current firmware versions.
  - #2-Identify what kind of system this is? SMART, 3<sup>rd</sup> Party, CV, VAV, VVT, Boiler, Chiller, Lighting, Power Monitoring? This will determine what parts & apps you need.
  - #2-Is the RTU or AHU motor an ECM? (variable speed motor...no need for a VFD)
  - #3-Is the fan motor single phase? (VFDs typically don't work on single phase)
  - #4-Does the OA Damper have an existing actuator & if so can you re-use it?
  - #5-Does the existing actuator even work?
  - #6-How does the actuator mount & will we need mounting hardware to mount a new actuator?
  - #7-How are you going to run the BACnet wire & how much do you need?
  - #8-Where will everything mount in RTU or AHU?
  - #9-Do the RTUs already have DCV & VFD's?
  - #10-Where am I going to mount the SBH & can I get internet access?
  - #11-Have you read the spec & have you reviewed the notes in the drawings?
  - #12-Can the RTU or AHU be used for VAV? Does it have a VFD or differential pressure?
  - #13-Is there already a BACnet Com card on the SSE board?
  - #14-Does the SSE board have 8mb of memory? If not it will lock up the board if you load the Verasys firmware on it.
  - #16-Make sure your power supply can handle the number of controllers you have on this job.
- Suggestion:** When bidding a job get pictures of the RTU TAG, nameplate on the fan motor, the inside of the RTU where equipment will mount, OA damper & how it mounts. If the RTU has an SSE card then take a detailed picture of the board & barcode on it to determine if it will work with Verasys. This is also a good time to meet with the I.T. group to see if you can be on their network. If they say "yes" then ask for: Static IP Address, Subnet Mask, Default Gateway, & Primary & a Secondary DNS Server. If they say "no" talk to the end user about getting internet from a local ISP. There's even a cellular option we could recommend for Verasys.

**Helpful Links:**

- <http://www.verasyscontrols.com/resources/training-and-education>
- <http://www.verasyscontrols.com/resources/technical-literature-and-documentation#installation>

|                   |   |                 |                      |       |           |               |                    |                 |  |  |
|-------------------|---|-----------------|----------------------|-------|-----------|---------------|--------------------|-----------------|--|--|
| Drawing Title     |   |                 |                      |       |           |               |                    |                 |  |  |
| <b>APPENDIX</b>   |   |                 |                      |       |           |               |                    |                 |  |  |
|                   |   |                 |                      |       |           |               |                    |                 |  |  |
|                   |   |                 |                      |       |           |               |                    |                 |  |  |
|                   | REFERENCE DRAWING   | NO.             | REVISION-LOCATION    | ECN   | DATE      | BY            |                    |                 |  |  |
|                   | Sales Engineer  | Project Manager | Application Engineer | Drawn | DATE      | BY            | DATE               |                 |  |  |
|                   |   |                 |                      |       | 8-12-2022 | Steve Nichols |                    |                 |  |  |
| Project Title     |   |                 |                      |       |           |               | Branch Information | CONTRACT NUMBER |  |  |
| <b>SMART COBP</b> |   |                 |                      |       |           |               |                    |                 |  |  |
|                   |  |                 |                      |       |           |               | DRAWING NUMBER     |                 |  |  |
|                   |   |                 |                      |       |           |               | <b>18</b>          |                 |  |  |