SIEMENS

Room Automation Station

DXR2 Fume Hood (HvacLgt16)

Start-up Procedures

A6V11173155
2017-08-29

Building Technologies

Table of Contents

Security best practices

Network setup must avoid direct connection from Internet to the end device.

- Implement Port Security to disallow the connection and network participation of any unauthorized laptop/device to a switch.

- Unauthorized access should be prevented by physical security measures. Meaning, access to the devices (controllers) must be limited only to people who require it. Equipment can further be monitored via CCTV.

- When possible, physically segment control systems from non-control systems. Apply the concept of Least Privilege to minimize the impact in case of a compromise of user credentials.

- Ensure that complex and strong passwords are required. Furthermore, ensure that administrator passwords are at least 12 characters long for users with administrative privileges and at least 8 characters long for non-administrative users.

- Ensure that the same username/password credentials are unique for each site within the country/office.

- Ensure that users each have their own individual unique login accounts. User accounts must not be shared.

- Configure account lockout settings (Threshold, Observation Windows, Duration) to protect the system from password guessing or brute force attacks.

- Ensure that accounts are removed within a reasonable time when users no longer work at the site.

- Ensure that firmware is downloaded only from legitimate / known locations.

Cyber security disclaimer

Siemens products and solutions provide security functions to ensure the secure operation of building comfort, fire safety, security management and physical security systems. The security functions on these products and solutions are important components of a comprehensive security concept.

It is, however, necessary to implement and maintain a comprehensive, state-of-the-art security concept that is customized to individual security needs. Such a security concept may result in additional site-specific preventive action to ensure that the building comfort, fire safety, security management or physical security system for your site are operated in a secure manner. These measures may include, but are not limited to, separating networks, physically protecting system components, user awareness programs, defense in depth, etc.

For additional information on building technology security and our offerings, contact your Siemens sales or project department. We strongly recommend customers to follow our security advisories, which provide information on the latest security threats, patches and other mitigation measures.

http://www.siemens.com/cert/en/cert-security-advisories.htm

Before You Begin

⚠ CAUTION

Requirement for FhSpEh12 *

(Fume hood exhaust air setpoint 12, exhaust level)

If FhSpEh12 is selected for new template configuration,
DO NOT change the following parameters, they must be left at default:
• SpAirFlMinReq (Minimum exhaust airflow setpoint)
• SpEmgPrg (Emergency purge setpoint)
• SpEhFire (Fire exhaust setpoint)

*FhSpEh12 from CET library V6.1_ABT2.1, on DXR firmware 02.10.31.xxx and earlier.

Standard templates use FhSpEh11 and are not affected.

User Knowledge

ABT Site has two online help systems:
- ABT Site online help
- Application online help

ABT-Site online help is the “tool” help - how to create projects, load templates etc. To access, click the Help button.
Application online help describes functions and features of the application types and templates loaded in the ABT-Site Library. To access, see **Application selection** in ABT-Site Help. This topic has information explaining when and how to access the Application help.

Prerequisites

- ABT Site installed.
- Working knowledge of ABT Site features and functionality.
- Users should be trained and knowledgeable regarding the technical principles and concepts of Desigo Room Automation (RA) including the Room/segment concept.

Design Engineer

Best practice

- Application templates with any configuration changes are completed by the Design Engineer prior to handoff.
- Parameter default values have been entered for each DXR2 automation station to minimize technician online setup time.

ABT Site Project Data

If following the recommended ABT project workflow for start-up, make sure that you have received the required ABT Site project data. This will include:

- ABT Site project requires User name and Password (both are case sensitive).
- Common project settings including user profiles.
- Engineered DXR2 automation stations.
- Application templates with any configuration changes are completed by the Design Engineer prior to handoff.
- Checkout reports.

ABT Site project data
Project data must be completed using ABT Site (ABT-Site license required).

ABT-Site library with standard or custom templates/types must be installed so that changes applied during commissioning can be backed up following start-up.

Job Site

Prerequisites at the job site

- Electrical tested and available.
- Automation stations installed and pass Basic Sanity test (LED steady green).
- All needed mechanical documentation (plans and specifications) are available.

Equipment

Required equipment depends on the connection method and type of automation station.

Connection Method	Automation Station
Room operator unit	USB-KNX Interface (Siemens OCI702 stock number S55800-Y101)
USB	USB cable (A/B)
Ethernet IP connection (DXR2.E only)	- LAN cable - If necessary: USB to Ethernet adaptor

Navigating ABT-SSA

Prerequisites

- Users are trained and knowledgeable with ABT Site and comfortable with the online help systems.
- ABT-Site is loaded, licensed and running.
- See topics under the “Online” book in the Help.

To get to the properties of an object, click on the properties icon  .

After clicking the properties icon, click the filter button  , to filter out most of the properties / parameters that don’t typically need to be checked. (the filter button is a toggle – you can reverse your choice by clicking it a second time).

Common data point icons

ABT-Site uses icons to visually identify the different types of points in the DXR automation station.

When online and viewing points in the DXR automation station, some items will have icons and some will not.
If an item has an icon next to it, it means the item is a BACnet object.
Items without icons are properties or parameters of an object.

Icon	Description	BACnet object type
	Input value	AI, BI, BlsIn, LgtIn, MI
	Output value	AO, BO, BlsOut, EmgLgt, LgtAOut, LgtBOut, MO
	Calculated value	ACalcVal, BCalcVal, MCalcVal, PrphDev
	Process value	APrcVal, BPrcVal, MPrcVal
	Configuration value	ACnfVal, BCnfVal, MCnfVal, UCnfVal
	Application function	FuncView: Functional view "parent" object that contains (owns) or references other objects.

For a complete list, open ABT-Site help and go to **ABT-SSA > User interface overview > Online icons**.

Setting up the Automation Station

Establishing a Connection to the Automation Station

▷ The proper equipment is physically connected.

▷ In ABT Site, the desired project is open.

1. In the **Start-up** component, **Set up connection** task, select one of the following connection method tabs:
   - **Room unit connection**
   - **USB**
   - **Ethernet**
2. Do one of the following:
   - If using a room unit connection, click **Connect** and proceed to next section.
   - If using a USB or Ethernet connection, continue with the remaining steps.
3. Under **Target selection**, select the **Device type** you want to work with:
   - **IP device** (for DXR2.E automation station)
   - **MS/TP device** (for DXR2.M automation station)

Note
The **Device type** you want to work with does not have to be the same automation station that you are using to connect to the network.

4. Select IP address.
5. Select the desired **Network interface** from the drop-down list (use "Network connections…" if needed).
6. Click **Connect**.
   ⇨ The connection is established.

Configure and Load Pre-engineered Automation Stations (Recommended workflow)

⚠ CAUTION

Recommended workflow
You must use this workflow if your job requires custom application templates defined by the Design Engineer.

The following steps show how to configure and load pre-engineered Automation stations (AS). You can also use engineered serial numbers or configure / load multiple devices in parallel. See **Startup** in ABT Site Help for detailed information on these topics. These workflow(s) are more efficient than manual configuration.

If you choose to manually configure the automation stations, skip the following and proceed to Manual Configuration [➞ 11].

1. (Connection to DXR is established)
   In the **Startup** component, **Configure and download** task, the connected AS is automatically discovered and displayed under **Discovered devices**.
   ⇨ In some cases with an Ethernet connection or IP device, you may need to click **Discover** and wait a few moments before the connected AS displays. To extend discovery to other automation stations, ensure "All devices" is selected in the Discover drop-down menu.

Note
For MS/TP device connected through a room unit, discovery is limited to the local network (the network that the automation station is connected to).

2. Under the **Engineered devices** list, expand the building(s) and floor(s) to display the automation stations. Select the device to be loaded.
3. Under the **Discovered devices** list, select the device to be configured and loaded. Make sure the equipment ID of the discovered device matches the equipment ID of the engineered device. They must be the same.
4. Select **Assign > Device network configuration**.
5. Wait 15 seconds for the update to finish and the **Message** column to show **Configured**.
   ⇨ The communication settings of the automation station are now configured. At this point, the **Status** column will show **Download required** indicating that no application parameters have been loaded.
6. Select **Assign > Application configuration** to load application parameters.
   ⇨ When the **Status** column displays **Operational** (up to 4 - 5 minutes for slower connections) the automation station is ready to **Go online**.
7. If connected through a room unit, do the following after 4 - 5 minutes to refresh the Discovered devices list: Click **Clear table**, and then click **Discover**. Repeat if necessary until **Status** column displays **Operational**.
8. Repeat steps 4 through 8 for other automation stations as needed.
9. When ready, proceed to Verify Configuration Settings [→ 12].

Manual Configuration

This procedure assumes the DXR has not been previously configured.

1. (Connection to DXR is established)

   In the **Startup** component, **Configure and download** task, click the icon for **Discovered devices** pane ( ).

   ⇨ The connected AS is automatically discovered and displayed under **Discovered devices**. In some cases with an Ethernet connection or IP device, you may need to click **Discover** and wait a few moments before the connected AS displays.

Note
For MS/TP device connected through a room unit, discovery is limited to the local network (the network that the automation station is connected to).

2. Under the **Discovered devices** list, right click on the AS to be configured and select **Manually configure**.
3. Complete the configuration details and click **Configure**.
4. Wait 15 seconds for the update to finish and the **Message** column to show **Configured**.

   ⇨ The communication settings of the automation station are now configured. At this point, the **Status** column will show **Download required** indicating that no application parameters have been loaded.

5. Select **Go online**.
6. Enter the default user name and password and click **Login**.

   ⇨ You are prompted for Old password, New password, and Confirm new password.

7. After confirming the new password, wait for the screen to load and then select the desired **application type** by clicking the icon to the left of the description. Note the engineering units (see caution note).

CAUTION

Engineering Units MUST be correct

It is crucial to select the correct application type – **this includes engineering units**. The example above shows US engineering units (**UsUn**). Select the type and engineering units you need.

8. Select one of the pre-loaded application templates by click the following, in order:
   a. **Select application**
   b. The **Select** button
   c. The desired template, and then click **OK**.

   Note:
   If the entire template name is not visible, hover your cursor over the truncated name to display a pop-up with the full template name. See the table at the end of this section for correct (full) template names.
9. To activate the selected application, click the **Command** arrow and then select **Activate** from the drop-down list.
   ⇨ The DXR takes time to process the command and restart. Before continuing, wait until the screen changes and **APPLICATION** displays at the top of the list. (the top parameter displays a status of **Operational**)

   When finished, click the menu icon  (upper left) and select **Application**.

Box type	Number	Description	AS hardware
Fume Hood	16741	Fume Hood Vertical Sash Configuration with Modulating Damper	DXR2.E17C…
	16742	Fume Hood Vertical Sash Configuration with Venturi air valve	

Verify Configuration Settings

(Optional)

This step, if done, is part of the recommended workflow and **follows Configure and Load Pre-engineered Automation Stations**.

The following should be verified. See "Reports (component)" in the Help prior to going online with the automation station.

- MAC address
- Instance number
- Network number
- Baud rate (Link speed) → Network port

Note
How to create reports is covered in ABT Site Help; search for "creating reports" using the search function in the Help.

Sash Setup and Calibration

The following sections explain how to set up different types of fume hoods. Use the appropriate section for your type(s) of fume hood.

Prerequisites

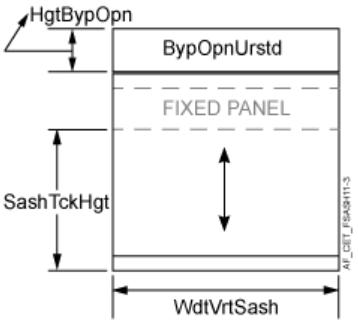
⇨ on-site, online with ABT-Site at fume hood controller after loading template

Single Vertical & External Sash (FhSash11)

Step 1

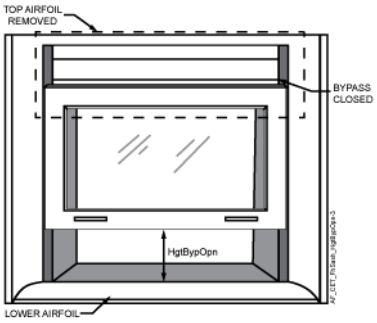
Measure and enter dimensions for the following parameters.

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC
	Click properties to the right of **Fume hood sash**, and then click filter at the upper right.

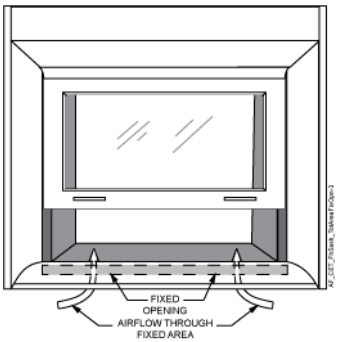


Parameter	Access path and instructions
Width of vertical sash	Measure the width of the sash in inches (cm). Set Width of vertical sash (WdtVrtSash) to this value.
Sash track height	Fully open the sash. If there is not a fixed panel in the plane of the sash opening that is lower than the bottom of the sash, leave Sash track height (SashTckHgt) at the default (0 inches (cm)). If there is a fixed panel in the plane of the sash opening that is lower than the bottom of the sash, measure the distance from the bottom of the sash opening to the bottom of the fixed panel in inches (cm). Set Sash track height (SashTckHgt) to this value.
Height of bypass opening	Open the sash until the top edge of the sash is aligned with the top edge of the bypass area, closing the bypass area. Measure the height of the sash opening in inches (cm). Set Height of bypass opening (HgtBypOpn) to this value.
Unrestricted bypass opening	If there is no restriction on the bypass, leave Unrestricted bypass opening (BypOpnUrstd) at the default (100%). If the bypass area has an airflow restrictor covering the open area, such as a perforated grille or louvers, estimate the open percentage of the bypass area. Set Unrestricted bypass opening (BypOpnUrstd) to the appropriate value.

Parameter	Access path and instructions
Total area of fixed openings	Measure the fixed area of the fume hood in square feet (m2). Any fume hood leakage must be accounted for in this measurement. Set Total area of fixed openings (TotAreaFixOpn) to this value. **NOTE:** The fixed area of the fume hood is an area that remains open regardless of sash position or movement and affects the face velocity. For example, most fume hoods have an intake gap under the lower airfoil and above the cabinet of the fume hood (typically a 1 inch (2.5 cm) gap). Also include 1% of the maximum open face area in this calculation for other open areas, such as the space between the sash and the track, and leakage. It may be necessary to adjust the parameter later if the face velocity seems inaccurate at low sash openings.



Bypass area.



Fixed area.

Step 2

Calibrate the sash sensor (verify values in table then complete steps).

NOTE: The full travel of the sash must be used during calibration.

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC > Fume hood sash
	Click properties to the right of **Fume hood sash 1 position**, AND then click filter in the upper right.

NOTE: Confirm the following default settings of the sash sensor AI properties. With the AI configured this way, the present value indicates the sensor resistance in ohms; resistance readings are necessary for sash sensor calibration.

Parameter	Access path and instructions
Process value 1	Set Process value 1 = **0**.
Signal value 1	Set Signal value 1 = **0**.
Process value 2	Set Process value 2 = **10,000**.
Signal value 2	Set Signal value 2 = **10,000**.

1. With Process and Signal values set, fully close the sash.
2. Record (do not change) the present value reading of **Fume hood sash 1 position** as **SV1**.

3. Measure the distance from the bottom of the sash opening to the bottom of the sash in inches (cm). Record as **PV1**. Should be at or very near 0.
4. Raise sash to maximum height.
5. Record the present value reading of **Fume hood sash 1 position** as **SV2**.
6. Measure the distance from the bottom of the sash opening to the bottom of the sash in inches (cm). Record as as **PV2**.
7. Set the following:
   - Process value 1 = PV1
   - Signal value 1 = SV1
   - Process value 2 = PV2
   - Signal Value 2 = SV2.

Step 3

Confirm function of sash sensor.

Parameter	Access path
Fume hood sash 1 position	Application > List view > Room segment > HVAC > Fume hood sash

1. Close the sash fully, verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is close to 0.
2. Open the sash half way, verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is equal to the current measured value.
3. Open the sash fully, and verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is at the maximum set during calibration.

Step 4

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC > Fume hood sash

1. Close sash, read **Fume hood face area**; value represents fixed area + area of bypass opening.
2. Open fully, read **Fume hood face area**; value represents fixed area + area of sash opening.
3. Close partly, read **Fume hood face area**; value represents fixed area + current area of sash opening.
4. Enter the fail safe area setting (parameter **Area on sensor failure**) as indicated in project submittal. (see below)
5. If the hood has additional movable sashes connected through an external face area calculator, set Fume hood external face area = True. (see below)

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC
	Click properties to the right of **Fume hood sash**, then click filter in the upper right.

Parameter	Access path and instructions
Area on sensor failure	Enter the fail safe area setting as indicated in the project submittal.
Fume hood external face area	If the hood has additional movable sashes connected through an external face area calculator, set **Fume hood external face area** = True

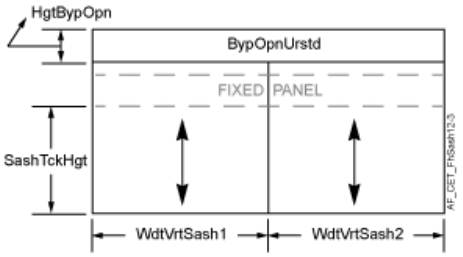
Sash sensor calibration is complete. Proceed ot *Air flow limits*.

Dual Vertical & External Sash (FhSash12)

Step 1

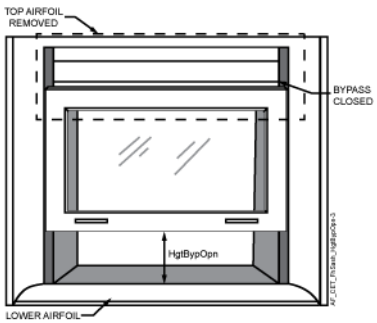
Measure and enter dimensions for the following parameters.

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC
	Click properties to the right of **Fume hood sash**, then click filter in the upper right.

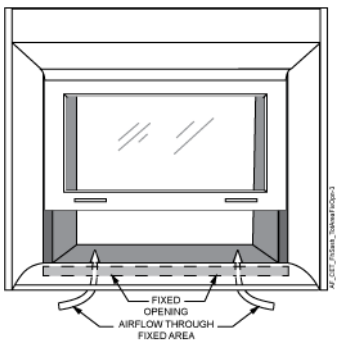


Parameter	Access path and instructions
Width of vertical sash 1	Measure the width of the sash in inches (cm). Set Width of vertical sash 1 (WdtVrtSash1) to this value.
Width of vertical sash 2	Measure the width of the sash in inches (cm). Set Width of vertical sash 2 (WdtVrtSash2) to this value.
Sash track height	Fully open the sash. If there is not a fixed panel in the plane of the sash opening that is lower than the bottom of the sash, leave Sash track height (SashTckHgt) at the default (0 inches (cm)). If there is a fixed panel in the plane of the sash opening that is lower than the bottom of the sash, measure the distance from the bottom of the sash opening to the bottom of the fixed panel in inches (cm). Set Sash track height (SashTckHgt) to this value.
Height of bypass opening	Open the sash until the top edge of the sash is aligned with the top edge of the bypass area, closing the bypass area. Measure the height of the sash opening in inches (cm). Set Height of bypass opening (HgtBypOpn) to this value.

Parameter	Access path and instructions
Unrestricted bypass opening	If there is no restriction on the bypass, leave Unrestricted bypass opening (BypOpnUrstd) at the default (100%). If the bypass area has an airflow restrictor covering the open area, such as a perforated grille or louvers, estimate the open percentage of the bypass area. Set Unrestricted bypass opening (BypOpnUrstd) to the appropriate value.
Total area of fixed openings	Measure the fixed area of the fume hood in square feet (m2). Any fume hood leakage must be accounted for in this measurement. Set Total area of fixed openings (TotAreaFixOpn) to this value. **NOTE:** The fixed area of the fume hood is an area that remains open regardless of sash position or movement and affects the face velocity. For example, most fume hoods have an intake gap under the lower airfoil and above the cabinet of the fume hood (typically a 1 inch (2.5 cm) gap). Also include 1% of the maximum open face area in this calculation for other open areas, such as the space between the sash and the track, and leakage. It may be necessary to adjust the parameter later if the face velocity seems inaccurate at low sash openings.



Bypass area.



Fixed area.

Step 2

Calibrate the sash sensor (verify values in table and then complete steps).

NOTE: The full travel of the sash must be used during calibration.

Parameter	Access path
Fume hood sash 1 position / Fume hood sash 2 position	Application > List view > Room segment > HVAC > Fume hood sash
	Click properties to the right of **Fume hood sash 1 position / Fume hood sash 2 position**, then click filter in the upper right.

NOTE: Confirm the following default settings of the sash sensor AI properties. With the AI configured this way, the present value indicates the sensor resistance in ohms; resistance readings are necessary for sash sensor calibration.

Parameter	Access path and instructions
Fume hood sash 1 position	
Process value 1	Set Process value 1 = **0**.
Signal value 1	Set Signal value 1 = **0**.
Process value 2	Set Process value 2 = **10,000**.
Signal value 2	Set Signal value 2 = **10,000**. (Setting values as shown makes the AI read in Ohms)
Fume hood sash 2 position	
Process value 1	Set Process value 1 = **0**.
Signal value 1	Set Signal value 1 = **0**.
Process value 2	Set Process value 2 = **10,000**.
Signal value 2	Set Signal value 2 = **10,000**. (Setting values as shown makes the AI read in Ohms)

1. With Process and Signal values set, fully close sash 1.
2. Record (do not change) the present value reading of **Fume hood sash 1 position** as **SV1**.
3. Measure the distance from the bottom of the sash opening to the bottom of the sash in inches (cm). Record as **PV1**. Should be at or very near 0.
4. Raise sash to maximum height.
5. Record the present value reading of **Fume hood sash 1 position** as **SV2**.
6. Measure the distance from the bottom of the sash opening to the bottom of the sash in inches (cm). Record as **PV2**.
7. Set the following:
   - Process value 1 = PV1
   - Signal value 1 = SV1
   - Process value 2 = PV2
   - Signal Value 2 = SV2.
8. Repeat Steps 1 through 5 for **Fume hood sash 2 position**.

Step 3

Confirm the function of the sash sensor.

Parameter	Access path
Fume hood sash 1 position	Application > List view > Room segment > HVAC > Fume hood sash
Fume hood sash 2 position	

1. Close the sash fully, verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is close to 0.
2. Open the sash half way, verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is equal to the current measured value.

3. Open the sash fully, verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is at the maximum set during calibration.
4. Repeat steps 1 through 3 for **Fume hood sash 2 position**.

Step 4

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC > Fume hood sash

1. Close both sashes, read **Fume hood face area**; value represents fixed area plus area of bypass opening.
2. Open both sashes fully , read **Fume hood face area**; value represents fixed area plus area of sash opening.
3. Close both sashes partly, read **Fume hood face area**; value represents fixed area + current area of sash opening.
4. Enter the fail safe area setting (parameter **Area on sensor failure**) as indicated in project submittal. (see below)
5. If the hood has additional movable sashes connected through an external face area calculator, set Fume hood external face area = True. (see below)

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC

Parameter	Access path and instructions
	Click properties to the right of **Fume hood sash**, then click filter  in the upper right.
Area on sensor failure	Enter the fail safe area setting as indicated in project submittal.
Fume hood external face area	If the hood has additional movable sashes connected through an external face area calculator, set **Fume hood external face area** = True

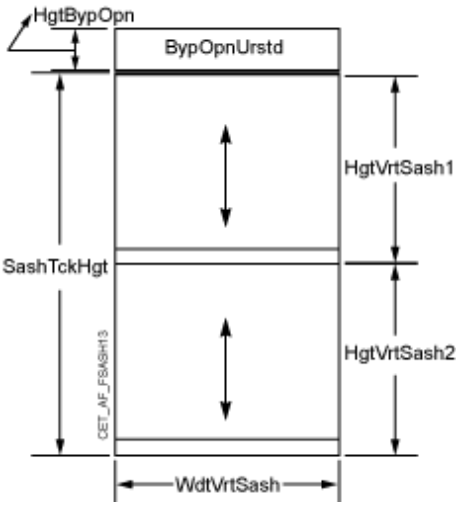
Sash sensor calibration is complete. Proceed ot *Air flow limits*.

Walk-in & External Sash (FhSash13)

Step 1

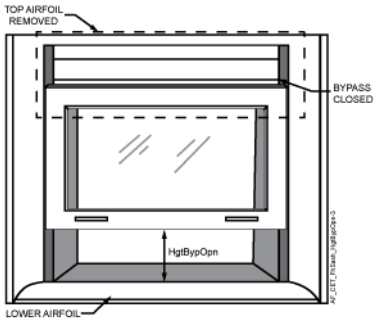
Measure and enter dimensions for the following parameters.

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC
	Click properties to the right of **Fume hood sash**, then click filter in the upper right.

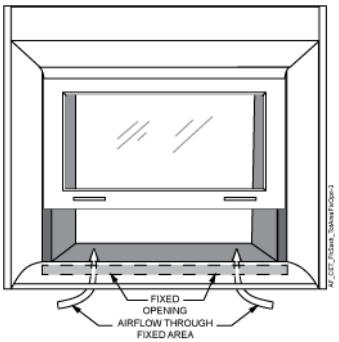


Parameter	Access path and instructions
Width of vertical sash	Measure the width of the sash in inches (cm). Set Width of vertical sash 1 (WdtVrtSash1) to this value.
Sash track height	Fully open both sashes. Measure the distance from the bottom of the sash opening to the bottom of the lowest sash in inches (cm). Set Sash track height (SashTckHgt) to this value.
Height of vertical sash 1	Measure the height of the vertical sash 1 in inches (cm). Set Height of vertical sash 1.
Height of vertical sash 2	Measure the height of the vertical sash 2 in inches (cm). Set Height of vertical sash 2.
Height of bypass opening	Open the sash until the top edge of the sash is aligned with the top edge of the bypass area, closing the bypass area. Measure the height of the sash opening in inches (cm). Set Height of bypass opening (HgtBypOpn) to this value.
Unrestricted bypass opening	If there is no restriction on the bypass, leave Unrestricted bypass opening (BypOpnUrstd) at the default (100%). If the bypass area has an airflow restrictor covering the open area, such as a perforated grille or louvers, estimate the open percentage of the bypass area. Set Unrestricted bypass opening (BypOpnUrstd) to the appropriate value.

Parameter	Access path and instructions
Total area of fixed openings	Measure the fixed area of the fume hood in square feet (m2). Any fume hood leakage must be accounted for in this measurement. Set Total area of fixed openings (TotAreaFixOpn) to this value. **NOTE:** The fixed area of the fume hood is an area that remains open regardless of sash position or movement and affects the face velocity. For example, most fume hoods have an intake gap under the lower airfoil and above the cabinet of the fume hood (typically a 1 inch (2.5 cm) gap). Also include 1% of the maximum open face area in this calculation for other open areas, such as the space between the sash and the track, and leakage. It may be necessary to adjust the parameter later if the face velocity seems inaccurate at low sash openings.



Bypass area.



Fixed area.

Step 2

Calibrate the sash sensor (verify values in table and then complete steps).

NOTE: The full travel of the sash must be used during calibration.

Parameter	Access path
Fume hood sash 1 position / Fume hood sash 2 position	Application > List view > Room segment > HVAC > Fume hood sash
	Click properties to the right of **Fume hood sash 1 position / Fume hood sash 2 position**, then click filter in the upper right.

NOTE: Confirm the following default settings of the sash sensor AI properties. With the AI configured this way, the present value indicates the sensor resistance in ohms; resistance readings are necessary for sash sensor calibration.

Parameter	Access path and instructions
Fume hood sash 1 position	
Process value 1	Set Process value 1 = **0**.
Signal value 1	Set Signal value 1 = **0**.
Process value 2	Set Process value 2 = **10,000**.
Signal value 2	Set Signal value 2 = **10,000**. (Setting values as shown makes the AI read in Ohms)

Parameter	Access path and instructions
Fume hood sash 2 position	
Process value 1	Set Process value 1 = **0**.
Signal value 1	Set Signal value 1 = **0**.
Process value 2	Set Process value 2 = **10,000**.
Signal value 2	Set Signal value 2 = **10,000**. (Setting values as shown makes the AI read in Ohms)

1. With Process and Signal values set, fully close sash 1.
2. Record (do not change) the present value reading of **Fume hood sash 1 position** as **SV1**.
3. Measure the distance from the bottom of the sash opening to the bottom of the sash in inches (cm). Record as **PV1**. Should be at or very near 0.
4. Raise sash to maximum height.
5. Record the present value reading of **Fume hood sash 1 position** as **SV2**.
6. Measure the distance from the bottom of the sash opening to the bottom of the sash in inches (cm). Record as **PV2**.
7. Set the following:
   - Process value 1 = PV1
   - Signal value 1 = SV1
   - Process value 2 = PV2
   - Signal Value 2 = SV2.
8. Repeat Steps 1 through 5 for **Fume hood sash 2 position**.

Step 3

Confirm the function of the sash sensor.

Parameter	Access path
Fume hood sash 1 position	Application > List view > Room segment > HVAC > Fume hood sash
Fume hood sash 2 position	

1. Close the sash fully, verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is close to 0.
2. Open the sash half way, verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is equal to the current measured value.
3. Open the sash fully, verify the value displayed at **Fume hood sash 1 position** (FhSash1Pos) is at the maximum set during calibration.
4. Repeat steps 1 through 3 for **Fume hood sash 2 position**.

Step 4

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC > Fume hood sash

1. Close both sashes, read **Fume hood face area**; value represents fixed area plus area of bypass opening.
2. Open both sashes fully , read **Fume hood face area**; value represents fixed area plus area of sash opening.
3. Close both sashes partly, read **Fume hood face area**; value represents fixed area + current area of sash opening.
4. Enter the fail safe area setting (parameter **Area on sensor failure**) as indicated in project submittal. (see below)
5. If the hood has additional movable sashes connected through an external face area calculator, set Fume hood external face area = True. (see below)

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC

Parameter	Access path and instructions
	Click properties to the right of **Fume hood sash**, then click filter  in the upper right.
Area on sensor failure	Enter the fail safe area setting as indicated in project submittal.
Fume hood external face area	If the hood has additional movable sashes connected through an external face area calculator, set **Fume hood external face area** = True

Sash sensor calibration is complete. Proceed ot *Air flow limits*.

External only (FhSash14)

Step 1

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC > Fume hood sash

1. Close sash, read **Fume hood face area**; value should match the face area in the face area calculator.
2. Open fully, read **Fume hood face area**; value should match the face area in the face area calculator.
3. Close partly, read **Fume hood face area**; value should match the face area in the face area calculator.
4. Enter the fail safe area setting (parameter **Area on sensor failure**) as indicated in project submittal. (see below)

Parameter	Access path
Fume hood face area	Application > List view > Room segment > HVAC
	Click properties to the right of **Fume hood sash**, then click filter  at the upper right.

Parameter	Access path and instructions
Area on sensor failure	Enter the fail safe area setting as indicated in project submittal.

Airflow Limits (min & max flow)

Enter the fume hood airflow limits.

Parameter	Access path
Exhaust air VAV maximum air volume flow VavEhAirFlMax (EH VOL MAX)	Application > List view > Room segment > HVAC > Exhaust air VAV (scroll to bottom of list)
Exhaust air VAV minimum air volume flow VavEhAirFlMin (EH VOL MIN)	

For the engineer who prepares the submittal: Considerations when preparing submittal are as follows. Values for minimum and maximum fume hood exhaust flow may be found in project specifications.

EH VOL MAX

- Exhaust flow sensor range: do not set max flow higher than close to the highest value the flow sensor can read. (about 2000 fpm x duct area when using the DXA airflow pressure sensor)
- Mechanical system capacity: ducts and fans are sized for some maximum flow rate, which can constrain the flow at individual hoods.
- Velocity, pressure loss and noise in the duct: if possible use a design value for the maximum velocity (consider approximately 2000 fpm).
- Design sash opening: In some organizations, the airflow does not increase when sash is opened above a selected design setting. This depends on approval by a lab workers representative / safety officer.

EH VOL MIN

- Lowest flow rate reliably measured by the exhaust airflow sensor.
- Flow rate needed to dilute and remove flammable contaminants. Someone responsible for safety in the laboratories should set this value. Previously published until 2012 AIHA limit for combustion: 25 cfm per square foot of fume hood bench. At this airflow level, the system is likely to consume more energy than intended.
- 2012 Laboratory Ventilation Standard lists 7 considerations. Some are outside the responsibility of the BAS provider. Referring client to the Standard can be a constructive step.
  - Control of ignition sources within the hood
  - Design of the hood and the hazards used inside
  - Potential for corrosion in the hood
  - Effect on discharge velocity at the exhaust stack
  - Number of hoods in the room
  - Effect on pressurization of the room
  - Operating range of the flow controllers for the hood and room

The Exhaust air VAV minimum air volume flow may be a good starting point for discussion with the client. Seek guidance from the customer.

Emergency purge function

Leave default values in place unless project documents specify special setting per fume hood.

Parameter	Access path
Emergency purge setpoint	Application > List view > Room segment > HVAC
	Click properties to the right of **Fume hood exhaust air setpoint**, then click filter  in the upper right.

Parameter	Access path and instructions
Emergency purge setpoint	Set Emergency purge setpoint (SpEmgPrg) to a value of 0 through 250%; default value is 150%. This percentage, multiplied by the normal exhaust setpoint, is used to set the fume hood to a safe operating level after switch delay to emergency setpoint of the emergency purge sequence. **NOTE**: If emergency purge setpoint is set to a value less than 100%, the exhaust flow will be reduced during the emergency purge sequence.
Emergency purge configuration	Used to simulate an Emergency Max button on the P88 ODP. Example: If EmgPrgCnf = setpoint 3 and the operator selects setpoint 3 from the ODP the value in SP3 will be ignored and the fume hood will react the same as if the emergency purge button was pressed on the P87 ODP. **NOTE:** QMX3.P87 ODP has a dedicated Emergency Max button. This parameter has no affect on the button and can be left at default.

Parameter	Access path
Switch delay after emergency to emergency setpoint	Application > List view > Room segment
	Click properties to the right of **HVAC**, then click filter  in the upper right.

Parameter	Access path and instructions
Switch delay after emergency to emergency setpoint	(SwiDlySpEmg) The time after the damper will stay 100% open after emergency purge is activated. If the value is set to 0 the emergency purge setpoint is used immediately.

Special Alarm Parameters

Leave default values in place unless project documents specify special settings per hood.

If the documents specify alarms for low flow only, then set both of the high airflow warning parameters to 500% to disable high flow alarms (High air volume flow warning limit and High air volume flow alarm limit).

Parameter	Access path
Fume hood face area	Application > List view > Room segment
	Click properties to the right of **HVAC**, then click filter  in the upper right.

Parameter	Access path and instructions
Low air volume flow warning limit	These limits are defined as a percentage of the controlled setpoint, meaning that the alarm limits will be closer as the exhaust setpoint decreases. The default values are 135% and 85% respectively. These points may be adjusted to meet customer requirements.
High air volume flow warning limit	
High air volume flow alarm limit	These limits are defined as a percentage of the controlled setpoint, meaning that the alarm limits will be closer as exhaust setpoint decreases. The default values are 150% and 70% respectively. These points may be adjusted to meet customer requirements.
Switch-on delay for alarms	

Special ODP Operations

Leave default values in place unless project documents specify that the hood user can adjust air flow levels by pressing buttons on the panel. In particular, do not enable the “Off” setting without explicit direction from the client or his representative. The customer is responsible for training lab workers on the intended use of the flow settings. This may include instruction from the BAS provider.

Parameter	Access path
	Application > List view > Room segment > Operator display panel device
	Click properties to the right of **Fume hood sash**, then click filter  at the upper right.

QMX3.P87

Parameter	Access path and instructions
BckLgtTio	The amount of time that the backlight stays on after an operation. If there is no activity for the defined amount of time, the backlight turns off. Range: 00:03 through 120:00
BckLgtBrgt	Defines the brightness of the backlight during active use. Range: 0 through 100
EnKeyBeep	Defines whether pressing a key should be accompanied by a short beep. Yes: A short beep sounds when a key is pressed. No: There is no sound when a key is pressed.

Parameter	Access path and instructions
TiTxtDsply	Defines the scrolling rate for text displayed in Area 1 of the screen. After the display time has elapsed, new text displays in Area 1 of the screen. Range: 5 through 30
TiSptDsply	Defines the amount of time that the setpoint value displays. After the display time has elapsed, an average value displays. Range: 5 through 30
AflUnSI	Defines the SI units used when displaying airflow values. This field is not active if US units are selected for the overall device (ActiveUnitSet).
EnAutoPos	Yes: Enables Key_8 to be used to activate the sash positioning device. The **close the sash** icon appears next to Key_8. No: Key_8 has no function. The **close the sash** icon does not display next to Key_8.
EnFhOpLgt	Yes: Enables Key_4 to be used as a light switch. The **light bulb** icon appears next to Key_4. No: Key_4 has no function. The**'light bulb** icon does not display next to Key_4.
EnOpGrnLf	Defines behavior of the Green leaf LED. Yes: The Green leaf LED indicates if the conditions for the energy efficiency state are fulfilled and the user can reset the application to energy efficient parameter values. No: The Green leaf LED does not indicate if the conditions for the energy efficiency state are fulfilled and the user cannot reset the application to energy efficient parameter values.
EnFhOpMOff	Defines if the user is allowed to set fume hood operation to off. Yes: The user is allowed to set fume hood operation to off. No: The user is not allowed to set fume hood operation to off.
EnFhOpMAuto	Defines if the user is allowed to set fume hood operation to auto mode. Yes: The user is allowed to set fume hood operation to auto mode. No: The user is not allowed to set fume hood operation to auto mode.
EnFhOpMLow	Defines if the user is allowed to set fume hood operation to low. Yes: The user is allowed to set fume hood operation to low. No: The user is not allowed to set fume hood operation to low.
EnFhOpMMe	Defines if the user is allowed to set fume hood operation to medium. Yes: The user is allowed to set fume hood operation to medium. No: The user is not allowed to set fume hood operation to medium.
EnFhOpMHigh	Defines if the user is allowed to set fume hood operation to high. Yes: The user is allowed to set fume hood operation to high. No: The user is not allowed to set fume hood operation to high.

QMX3.P88

Parameter	Access path and instructions
BckLgtTio	The amount of time that the backlight stays on after an operation. If there is no activity for the defined amount of time, the backlight turns off. Range: 00:03 through 120:00
BckLgtBrgt	Defines the brightness of the backlight during active use. Range: 0 through 100
TioDefPage	Defines the amount of time a page displays after a button press. If there is no activity for the defined amount of time, the screen switches to the default page. Range: 3 through 300
TioUserOp	Defines the amount of time a page displays after a button press. If there is no activity for the defined amount of time, the screen switches to the default page. Range: 2 through 20
TiAlmDsply	Defines the alternation period that the display will switch between an alarm icon and the fume hood mode. If this parameter is set to 0, the display does not alternate between the alarm icon and the fume hood mode. In this case, the user must press the i-Button to view an alarm. Range: 5 through 30
TiSptDsply	Defines the amount of time that the setpoint value displays. After the display time has elapsed, an average value displays. Range: 5 through 30
InfoPage1…5	Defines the HVAC operating value to display on the first page of the LED screen. The user can scroll through the pages in sequential order; any pages set Inactive, do not display. • Inactive page • Air volume flow, present value • Air volume flow, setpoint • Velocity, present value • Velocity, setpoint • Differential pressure
AflUnSI	Defines the SI units used when displaying airflow values. This field is not active if US units are selected for the overall device (ActiveUnitSet). l/s: liters per second
EnBtnMMan	Defines Key_1 behavior: Yes: Enables Key_1 (hand button) to be used to override a scheduled occupancy change. No: Key_1 (hand button) has no function.
EnFhOpLgt	Defines Key_4 behavior: Yes: Enables Key_4 to be used as a light switch. The **light bulb** icon appears next to Key_4. No: Key_4 has no function. The **light bulb**icon does not display next to Key_4.
EnOpGrnLf	Defines behavior of the Green leaf LED. Yes: The Green leaf LED indicates if the conditions for the energy efficiency state are fulfilled and the user can reset the application to energy efficient parameter values. No: The "Green leaf" LED does not indicate if the conditions for the energy efficiency state are fulfilled and the user cannot reset the application to energy efficient parameter values.
EnFhOpMOff	Defines if the user is allowed to set fume hood operation to off. Yes: The user is allowed to set fume hood operation to off. No: The user is not allowed to set fume hood operation to off.

Parameter	Access path and instructions
EnFhOpMAuto	Defines if the user is allowed to set fume hood operation to auto mode. Yes: The user is allowed to set fume hood operation to auto mode. No: The user is not allowed to set fume hood operation to auto mode.
EnFhOpMLow	Defines if the user is allowed to set fume hood operation to low. Yes: The user is allowed to set fume hood operation to low. No: The user is not allowed to set fume hood operation to low.
EnFhOpMMe	" defines if the user is allowed to set fume hood operation to medium. Yes: The user is allowed to set fume hood operation to medium. No: The user is not allowed to set fume hood operation to medium.
EnFhOpMHigh	Defines if the user is allowed to set fume hood operation to high. Yes: The user is allowed to set fume hood operation to high. No: The user is not allowed to set fume hood operation to high.

Steps to Tune Performance

Step 1

Flow sensing, flow sensor location in duct

With steady duct pressure and damper in fixed position, observe the value of measured airflow. Evaluate the size of fluctuations in Exhaust air VAV air volume flow. Is flow stable enough to use?

Parameter	Access path
Exhaust air VAV air volume flow	Application > List view > Room segment > HVAC > Exhaust air VAV

⚠ CAUTION

Sensor location in duct

If **Exhaust air VAV air volume flow** fluctuates unevenly and sporadically the airflow sensor in the duct may have been installed incorrectly or in a bad location.
The measured airflow must be stable and acceptable before continuing with tuning steps.

Step 2

Flow sensing, air balance process

Determine duct area and flow coefficient.

Parameter	Access path
Exhaust air VAV duct shape	Application > List view > Room segment > HVAC > Exhaust air VAV

Verify/set duct area

1. Scroll down to **Exhaust air VAV duct shape**. Set Exhaust air VAV duct shape by selecting from the following options and set the related parameters:
   - Round (Set **Exhaust air VAV dimension A**)
   - Oval (Set **Exhaust air VAV dimension A** and **Exhaust air VAV dimension B**)
   - Rectangular (Set **Exhaust air VAV dimension A** and **Exhaust air VAV dimension B**)
   - Direct entry (Set **Exhaust air VAV duct area**)
     Note: When setting a value less than 1, enter a leading zero and decimal (like 0.566)

⚠ CAUTION

Duct area is calculated by the application. To manually enter a different value, you must first set the duct shape object **(Exhaust air VAV duct shape)** to Direct entry and then manually enter the desired duct area value in the duct area object **(Exhaust air VAV duct area).**

Balancing procedure:

1. Set **Exhaust air VAV balancing mode**. Select from the following options
   - Max.exhaust - Maximum Exhaust
   - Min.exhaust – Minimum Exhaust
   - Manual - (Set **Fume hood exhaust manual air volume flow setpoint** to the desired airflow setpoint)
2. Set **Exhaust air VAV balancing command** to **Balancing**. The airflow setpoint is set to the appropriate value based on the Exhaust air VAV balancing mode, the Exhaust air VAV balancing state is set to Balancing and the control program will be overridden for balancing operation.
3. Allow time to let airflows stabilize. The automation station will modulate dampers to achieve the defined airflow setpoint.
4. Measure airflow externally.
5. Set **Exhaust air VAV air volume flow at hood** with the value determined from the previous step. The control program will calculate and update **Exhaust air VAV calc. flow coefficient**.
6. Set **Exhaust air VAV balancing command** to **Calibrate**. The newly updated value of **Exhaust air VAV calc. flow coefficient** is used to set the new value for **Exhaust air VAV flow coefficient**, and all Recorded parameters will be updated.
   (*Optional*): To view Exhaust air VAV calc. flow coefficient, you must first navigate to **Favorite recorded balancing values** then scroll to the end.
7. (*Optional*) - Repeat parts 4 through 6 if the calculated airflow does not meet the specified accuracy.
8. (*Optional*) - Set **Exhaust air VAV balancing mode** to a different mode and repeat parts 2 through 6 if required to confirm accuracy at a different airflow setpoint. Only one value of flow coefficient is retained. It is used throughout the flow sensing range.
9. Set **Exhaust air VAV balancing command** to **Balanced**. The Exhaust air VAV balancing state is set to Balanced and the control program will return to normal operation.

If the balancer should verify face velocity, then adjust parameters as necessary to bring DXR reading close to air balancer’s value. This may include parameters for the sash sensing AF and also a Face velocity sensing AF.

For fume hood AFs with a face velocity AI consider adjusting the Signal value 1, 2 and Process value 1, 2 parameters as needed to bring the DXR reading close to air balancer’s value.

Step 3

Flow control for damper

⚠ CAUTION

Customer Specifications and On-Site Tuning

You should expect to adjust the tuning parameters on-site to achieve performance that meets the customer's expectations and specifications.

Tune the airflow control loop for quick and stable response that meets the customer's expectations and specifications. Use the parameter settings in the table as a starting point. Instructions for adjusting tuning parameters can be found in technical principals.

Change the VAV airflow setpoint (**Exhaust air VAV setp.for air vol.flow**) and observe performance over a range of realistic operating conditions. The following table provides the path to access the VAV airflow setpoint.

Parameter	Access path
Exhaust air VAV air flow controller	Application > List view > Room segment > HVAC > Exhaust air VAV
	Click properties to the right of **Exhaust air VAV air flow controller**, then click filter in the upper right.

Parameter	Access path and instructions
Gain	Gain = The higher of air flow nominal and VAV max exhaust air flow / Measured Airflow with damper fully open (usually about 1.0 %/%)
Integral action-time Tn	Actuator stroke time / 2 (usually about 1sec; fast actuating GNP191.1P has a stroke time of 2s)
Derivative action-time Tv	0[s]
Rise time from 0 to 100%	2.0[s]
Fall time from 100 to 0%	2.0[s]
Neutral zone	0.3%

Step 4

FhSpEh13 only (For hoods with a face velocity sensor and a face velocity control loop)

Face velocity loop tuning for measured face velocity signal

After observing operation of the exhaust flow control loop, evaluate the stability of measured velocity signal at constant flow. Make sure the response time is not too long and/or never settles out. Check the high and low openings. Open sash far enough so that velocity is in the intended control range.

If the measured velocity fluctuates too much, increase the filter time constant (Face velocity attenuation filter). Values in the range of 1 to 5 seconds might be appropriate. Access path is Application > List view > Room segment > HVAC… > properties icon (" ⋮ ") for Fume hood exhaust air setpoint.

- Measured velocity signal: **Fume hood face velocity**
- Occupied and unoccupied face velocity setpoints (for setting different flow speeds):

Fume hood occupied face velocity setpoint and **Fume hood unoccupied face velocity setpoint**

For FhSpEh13, use the parameter settings in the table as a starting point for tuning.

Parameter	Access path
Fume hood face velocity	Application > List view > Room segment > HVAC > Fume hood exhaust air setpoint
	Click properties ⋮ to the right of **Face velocity controller**, then click filter in the upper right.

Parameter	Access path and instructions
Gain	see note
Integral action-time Tn	see note
Derivative action-time Tv	0[s]
Rise time from 0 to 100%	2.0[s]
Fall time from 100 to 0%	2.0[s]
Neutral zone	

Note

Gain = (100% / FV setpoint) * (Min flow / Scaling flow)

Tn = Face velocity attenuation filter + Flow control loop time

Step 5

Configure numeric display sensitivity of ODP

NOTE: You can skip this step if ODP does not display numerical values for face velocity and/or air volume flow.

After adjusting parameters and achieving intended performance, configure the data resolution of ODP.

Parameter	Access path
Fume hood operator display panel interface	Application > List view > Room segment > HVAC
	Click properties to the right of **Fume hood operator display panel interface**, then click filter  in the upper right.

Parameter	Access path and instructions
Display resolution for face velocity	This value is used as a COV limit for face velocity readings displayed at the ODP only; it has no affect on the control sequence. The default is 5 fpm (non-template value 3.9 fpm), values displayed will be in increments of 5 based on setpoint (for example, if setpoint is 80, displayed values would be 80, 85, 90, 95, 100, etc.). If the actual filtered fpm is 84, 85 will be displayed. Configure along with **Display weight** to meet customer expectations.
Display weight	If ODP fluctuates excessively, decrease the display weight, to slow the response of the display. Default is 100%. Do not set higher. Values above 70% have little filtering effect. Values in the range 20% to 50% are likely to filter effectively. Configure along with **Display resolution for face velocity**.
Display resolution for exhaust air volume	This value is used as a COV limit for face velocity readings displayed at the ODP only; it has no affect on the control sequence. The default is 10 cfm (non-template value 2.9 cfm), values displayed will be in increments of 5 based on setpoint (for example, if setpoint is 80, displayed values would be 80, 85, 90, 95, 100, etc.). If the actual filtered cfm is 84, 85 will be displayed.

Venturi Calibration

A manual modification of the venturi calibration table may be needed due to:

- No airflow sensor.
- Adding calibration point(s) below the parameter setting for minimum duct velocity, **AirVMinCtlClb** (Minimum air velocity for control and venturi calibration).
- Correcting the table of a failed calibration.
- Optimizing the table of a successful calibration.

Before performing a venturi calibration, the following must be completed or verified:

- Air balancing is complete and flow coefficient is set.
- The settings for Rise and Fall time must match the physical run time of the actuator. **Rise time from 0 to 100%** and **Fall time from 100 to 0%** are properties of the loop controller object; for example, “Supply air VAV air flow controller”. (This is especially critical if slow floating actuators are used).
- Airflow setpoint is not zero – air system is operational.

The following examples are for a venturi supply box / air valve but the procedures are identical for extract box or fume hood. The only difference is that object names vary to match the box type. (“Su” for supply boxes, “Ex” for extract boxes, “Eh” for fume hoods)

- Vntr**Su**ClbSta - Supply air venturi valve calibration state (supply box)
- Vntr**Ex**ClbSta - Extract air venturi valve calibration state (extract box)
- Vntr**Eh**ClbSta - Exhaust venturi valve calibration state (fume hood)

VntrSuClbSta (for a venturi supply box) in the following examples.

Manual calibration

▷ You are in ABT Site, online with the automation station.

▷ You have selected **List view > Room segment > Supply air VAV**

1. Locate **Supply air venturi valve calibration state** (VntrSuClbSta) and open the properties.
2. Enter airflows from smallest to largest in **Inactive air flow**.
3. Enter corresponding actuator positions in Inactive valve position.
4. Return to **Supply air VAV**.
5. Locate **Supply air venturi valve calibration command** (VntrSuClbCmd).
6. Set Venturi valve calibration command to **Apply**.
7. One of the following occurs:

- If manual entries are accepted, the values in Inactive air flow and Inactive valve position are copied into **Active air flow** and **Active valve position**, and **VntrSuClbSta** is set to **Calibrated**.
- If manual entries are not accepted, **VntrSuClbSta** is set to **Failed calibration**. You must open the properties and check **Calibration error** for the cause of failure.

Automated calibration

▷ You are in ABT Site, online with the automation station.

▷ You have selected **List view > Room segment > Supply air VAV**

1. Locate **Supply air venturi valve calibration command** (VntrSuClbCmd)
2. Set Venturi valve calibration command to **Calibrate**.
   A pop-up message may notify that the calibration procedure may take some time. Click **OK** to close the message.
3. To monitor progress, access the properties of **Supply air venturi valve calibration state** and go to **Remaining calibration time** (this is an estimated time).
4. One of the following occurs:

- If calibration is successful, **VntrSuClbSta** is set to **Calibrated**.
- If calibration is not successful, VntrSuClbSta is set to **Failed calibration**. You must open the properties and check **Calibration error** for the cause of failure. The values from a failed calibration are stored in **Inactive air flow** and **Inactive valve position**.

To correct an airflow reading in the inactive table, command the damper to the failed position, read VavSuAirFl and enter this value at the proper position in Inactive air flow.

To add airflow readings that have duct velocities below the configuration property Minimum air velocity for control and venturi calibration, do the following:

1. Command the damper to the desired position.
2. Measure the airflow following standard air balance procedures.
3. Enter both the airflow value and the position into **Inactive air flow** and **Inactive valve position**.
4. Repeat these steps as needed.

After manual entries have been made to Inactive air flow or Inactive valve position, do the following:

1. Locate **Supply air venturi valve calibration command** (VntrSuClbCmd).
2. Set Venturi valve calibration command to **Apply**.
3. One of the following occurs:

- If manual entries are accepted, the values in Inative air flow and Inactive valve position are copied into Active air flow and Active valve position, and VntrSuClbSta is set to **Calibrated**.
- If manual entries are not accepted, VntrSuClbSta is set to **Failed calibration**. You must open the properties and check **Calibration error** for the cause of failure.

Appendix A

Data Point Icons

Datapoint icons represent BACnet objects associated with buildings, floors, and rooms.

In ABT-SSA, datapoint icons appear to the left of objects in the favorites tables. Clicking an icon exposes the object's parameters if any exist.

Indicator	Description	BACnet object type
Structured view objects		
	Building	AreaView (Bldg)
	Floor	AreaView (Floor)
	Room	AreaView (R)
	Room segment	AreaView (RSegm)
	Favorite view	FvrView
	Other special View Node Objects	ColView, DevView, InfraView, yyy(xxx)
Value objects		
	Input value	AI, BI, BlsIn, LgtIn, MI
	Output value	AO, BO, BlsOut, EmgLgt, LgtAOut, LgtBOut, MO
	Calculated value	ACalcVal, BCalcVal, MCalcVal, PrphDev
	Process value	APrcVal, BPrcVal, MPrcVal
	Configuration value	ACnfVal, BCnfVal, MCnfVal, UCnfVal
	Trigger value	MTrgVal
Centralized command grouping objects		
	Command object	CmdObj
	Central function	AreaView (CenFnct)
	Group master	GrpMaster
	Group member	GrpMbr
	Application function	FuncView
Structured view objects		

Indicator	Description	BACnet object type
	Network view	NwkView
	Scheduler	Schedule
	Calendar	Calendar
System objects		
	Automation station	ASView
	Controller	Controller
Alarm and trend objects		
	Common Event Enrollment	CmnEvtEnr, EvtEnr, DevAlert
	Trend log	TrndLogS
	Other special Objects	AppCnf, CmnEvt, DevObj, FileObj, FldBusMgmt, NotifClass, NwkPortIP, NwkPortMSTP, Pgm
System function objects		
	Diagnostics	Diag
	Event log	EvtLog

Issued by
Siemens Industry, Inc.
Building Technologies Division
1000 Deerfield Pkwy
Buffalo Grove IL 60089
+1 847-215-1000