

# Smart Air Control Valve

User Guide

Connecting People with Intelligent Building Solutions

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## CHAPTER 1 Introduction to the Smart Air Control Valve Application

Distech Controls' Smart Air Control Valve (SACV) is a highly accurate, fully dynamic, pre-assembled air control valve solution. It has a superior turndown ratio and measures airflows as low as a few CFM. With this low airflow design, the same Smart Air Control Valve model can be used to control the airflow required for various applications and at a much wider range of space occupancy levels.

The Smart Air Control Valve is factory-programmed for commercial single duct airflow control using Distech Controls' EC-*gfx*Program. This graphical programming interface enables visual assembly using building blocks and the design of custom programs that control Building Automation Systems.

To save time and to take full advantage of the SACV application graphics, simply create a URL hyperlink from any BMS graphical interface to easily access the pre-existing graphics.

#### **SACV** Application Configuration

The SACV program can be configured easily and seamlessly using Builder by simply selecting the project requirements from the on-screen options. See *Using Builder to Customize the SACV Application* and the <u>Builder User Guide</u> for more information.

The SACV controls airflow through the use of ECY-VAV controllers that are BTL listed as BACnet Building Controller (B-BC). For more information regarding the characteristics or product specifications of the Smart Air Control Valve, refer to the <u>Smart Air Control Valve Spec Sheet</u>.

## About This User Guide

#### Purpose of the User Guide

This user guide is intended to provide information and instruct a user to configure an SACV controller from its preloaded applications using Builder and its Graphical Web Interface. However, this guide is not designed to instruct the user on how to use an SACV controller. For information on this controller, refer to the following documents, which are available on the Distech Controls Documentation and Resources Portal:

- Smart Air Control Valve Spec Sheet,
- Smart Air Control Valve Installation Guide,
- ECLYPSE User Guide,
- <u>EC-gfxProgram User Guide</u>

#### **Intended Audience**

This user guide is intended for system designers, integrators, and field technicians who have experience with control systems. It is recommended that anyone engineering, programming and configuring the controllers specified in this user guide have prior training in using these controllers.

## CHAPTER 2 Using Builder to Customize the SACV Application

The SACV's preloaded application can easily be configured from Builder, Distech Controls' cloudbased programming solution. Builder enables you to build dynamic modular HVAC applications for EC-*gfx*Program simply by selecting your options from the SACV equipment page. You can then download the corresponding EC-*gfx*Program applications, sequence of operations, equipment drawings, testing plans and points lists.

## Logging in to Builder

Navigate to the Builder website by going to *https://builder.distech-controls.com* and click the Login button to sign into your account. If you do not have an account, click **Create an Account**.



## **Configuring Your Equipment**

The Builder Home screen will typically have a list of equipment types or room configurations that come pre-organized and grouped according to required specifications. The systems on the Distech Controls Library tab are maintained by Distech Controls and are available to all users. There may be additional Library tabs (not shown here) that are maintained by your company administrators.

Clicking on a Library tab changes the content of the navigation tree.

The content of the tree will change over time as Distech Controls or your administrator edits and adds content.

The Language and Units specified in your user profile will determine the language and units of the projects you compile and export with Builder. For more information, refer to the <u>Builder End-User</u> <u>Guide</u>.

| My Profile - Distech Controls           |
|---|
| First Name                              |
| John                                    |
| Last Name                               |
| Smith                                   |
| Email<br>iadornato@distech-controls.com |
| Role                                    |
| User                                    |
| Initials                                |
| S R                                     |
| Language                                |
| English V                               |
| Units                                   |
| US 🗸                                    |
| Hide drawing types                      |
| AutoCAD (Dwg)                           |
| Visio                                   |
| Save                                    |
| Organizations -                         |
| Distech Controls [Active]               |

Figure 1: Language and Unit options in Builder user profile

- 1. Navigate to the SACV equipment 1 to configure your controller.
- 2. Click the *i*con to edit the name of the equipment to suit your naming convention. This name will be the filename of the corresponding .zip file that will contain your controller application at the end of this procedure.
- Select the options that apply to your project. As some options are selected, other options may appear or disappear as a function of what was chosen. Required fields are highlighted in red and must be filled in before compiling a project. If needed, the **Reset** button will clear all equipment selections.

| Parameter      | Description   |
|----------------|---|
|                | Select the VAV controller model required for this application.                |
| Controllers    | <b>NOTE:</b> The SACV is only compatible with the ECY-VAV controller.         |
| Equipment Type | Select the SACV model.  |
| System Type    | Indicate whether the SACV system is for Cooling only or with Reheat.          |
| Compliance     | Indicate whether the SACV project must be compliant with ASHRAE Guideline 36. |

| Parameter   | Description   |
|---|---|
| AutoCAD Drawings <ul> <li>Flow Diagram</li> </ul> | Indicate whether the Flow Diagram and Sequence of Operation should be included in the project package, and in which format. |
| Sequence of Operation                             | Click the gear icon to edit the Output Options for each drawing file.   |
| Room Temperature                                  | Select the Type and Model of the temperature sensor connected to the SACV.  |
| EC-Multi-Sensor                                   | Select the model of the EC-Multi-Sensor, if any, connected to the SACV.   |
| Sensor Setpoint Type                              | Select the Setpoint type used to control the temperature in the project.  |
| Discharge Temperature                             | Select the type of the discharge temperature sensor, if any.  |
| Duct Inlet  | Select the type of variable, if any, that will be used in the EC-<br><i>gfx</i> Program code for the Duct Inlet.            |
| Shedding  | Select the type of variable, if any, that will be used in the EC-<br><i>gfx</i> Program code for Shedding.                  |
| ECLYPSE Commissioning Solution                    | Indicate whether the Auto-Commissioning block should be included in the EC- <i>gfx</i> Program code.                        |
| Hardware Inputs                                   | Select the options for which Hardware Input blocks should be included in the EC- <i>gfx</i> Program code.                   |
|   | Indicate whether VAV Performance Assessment should be enabled for the project.  |
| VAV Penormance Assessment                         | For more information, see the <u>ECY-VAV Preloaded</u><br>Applications User Guide.  |

4. Once finished, click the **Compile** button.

| Builder                      |                  |   |                      |                    |   | Distech Controls 🗸 | DA |
|------------------------------|------------------|---|----------------------|--------------------|---|--------------------|----|
| 🍞 Compiler                   | Distech Controls |   |                      |                    |   |                    |    |
| Compiler Q Product Selection | United Controls  | Smart Air Control Valve Comparative Drawings+Graphics Controllers Ecy-Vav  Equipment Type Round 12 Inch Pitot Tube System Type Bingle Duct Cooling Only Compilance None None Allure Communicating Sensors UNTOUCH Color | Controller Name Sucv | UNTOUCH-CH V       |   |                    |    |
|                              |                  | EC-Multi-Sensor None Sensor Setpoint Type Single Setpoint   |                      |                    |   |                    |    |
| ←ı                           |                  |   |                      | Reset Next Compile | 4 |                    |    |

Figure 2: SACV Builder page (not all options are visible)

5. While the project is compiling, you will be presented with a pop-up screen displaying the results. If this pop-up window is closed during compilation, or after compiling, it can be re-opened by clicking the **Results** button on the equipment page. The results can show three tabs, one with a points list, one with the sequence of operation, and one with the testing procedure. The **Points List** tab will appear blank until the compilation is completed successfully. The **Sequence of Operations** and **Testing Procedures** tabs will display their content or will be hidden if no content has been made available for this system. To download a .ZIP file with the results along with the corresponding EC-*gfx*-Program application, click the **Download Controller** button.

If there was an error compiling the project, see the next section.

| Builder            |  |  |   |      |      |   |             |  |      |         |                    |           | (     | Distech Controls 🗸 | <b>.</b> | DA |
|--------------------|--|--|---|------|------|---|-------------|--|------|---------|--------------------|-----------|-------|--------------------|----------|----|
| Compiler           | Compiled Smart Air   | Control Valve  |   |      |      |   |             |  |      |         |                    |           |       |                    | ×        |    |
| Q Product Selectio | Points BACnet 0  | bjects Sequence of C   | peration Testing Procedures                   |      |      |   |             |  |      |         |                    |           |       |                    |          |    |
|                    | Project Name<br>Masserend System<br>Model Number<br>Model Name<br>Modele Description<br>Modele Description<br>Modele Model<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>Notate<br>No | Smart Air Control Valve<br>US<br>ECV-VAV<br>SACV<br>IO Module<br>VAV 4UI-4D0-200<br>TomtName<br>DischargeTemp<br>DischargeTemp<br>Actuator & Offerential Pro | PointDescription Discharge Temperature Sensor | Al 6 | AO 1 |   | 00 SI<br>R1 | ignilfype<br>TD & Themistors/10K Type II |      |         |                    |           | Ciose | (5<br>Duranteur    | ) .      |    |
| ←ı                 |  |  | ungeoupone                                    | 1    | 1    | - | J           | Reset                                    | Next | Results | ownload Controller | Compile a | gain  |                    |          |    |

Figure 3: SACV project compilation results (points will vary depending on the selected options)

## **Recompiling a Project**

If you wish to make a change to your project, you will be presented with a few more options on the configuration screen. You can also click the **Results** button to return to the previously compiled project summary screen.

- 1. From the configuration screen you will be able to individually change and modify your original project configuration as needed, or click the **Reset** button to clear all values.
- 2. Once finished, click the **Compile Again** button. A warning dialog box will be displayed when you Compile Again. If the user chooses to proceed with the new compilation, any previous results will be lost if they have not been already downloaded.

| 🗙 Builder           |   |  | Distech Controls 🐱 | DA |
|---------------------|---|--|--------------------|----|
| 🎲 Compiler          | Distech Controls  |  |                    |    |
| Q Product Selection | <ul> <li>Air Handling Unit</li> <li>Central Plant</li> <li>Heat Pump Unit</li> <li>Moof Top Unit</li> </ul>   | Smart Air Control Valve 🖍 (1.2.24060)  |                    | Î  |
|                     | <ul> <li>Terminal Units</li> <li>Chilted Beam</li> <li>Fan Coll Unit</li> <li>Smart Air Control Vale</li> <li>Variable Air Volume</li> <li>Water Source Heat Pump</li> <li>Zone Unit</li> </ul> | Controllers Controller Name EcvVarv  SaCv Equipment Type Round 12 Inch Pitot Tube System Type Single Duct Cooling Only Compliance  |                    |    |
| 4                   |   | None        Room Temperature     Allure Communicating Sensors     Allure (NITOUCH       MUTOUCH Color        Base:        Co-Multi-Sensor        None        Sensor Selpoint Type        Imgis Setorit | 2                  |    |
| ←ı                  |   | Sensor Serpont Type Single Setpoint V Reset Next Results Comple again Comple again   | 2                  |    |



### **About Compilation Results**

#### One-Hour Limit

After a completed compilation, the results and associated download will only be available for one hour. After one hour, you will be prompted with an error message if you try to navigate within that page and you must start over.

#### **Page Navigation**

The results of the compilation are only available as long as that equipment page is displayed. If you choose another Equipment to configure, you will be presented with a warning that you will lose the results if you navigate away from the page. A popup is displayed that warns you of this and prompts you if you want to stay on the current page or not.

| Warning   | ×      |
|---|--------|
| The current compilation results will be lost. Do you want to leave the page anyway? |        |
|   | Yes No |

#### **Downloading Your Compilation**

Once your compilation has been downloaded, the .ZIP file will contain:

- A CompileLog.txt file that logged the EC-gfxProgram compilation process for error troubleshooting
- A Sequence of Operations and Testing Procedure in .RTF format if the equipment included them
- An EC-*gfx*Program application if compilation was successful. If a Sequence of Operation was included with the equipment, it will automatically become the first page of the application.
- An Excel file replicating the Points List tab information displayed after a successful compilation
- A .CSV file of the Points List tab information in a normalized format
- An equipment drawing file in your specified format (.DWG, .VSDX, .PDF)

## CHAPTER 3 Loading the SACV project on the controller

The SACV uses an advanced EC-*gfx*Program control block for air flow calculations. This block is found in the Smart Air Control Valve toolbox, which is included in the SACV project package output by Builder.

#### NOTE

To ensure the full functionality of the SACV unit, always use the version of the Smart Air Control Valve toolbox found in the package output by Builder prior to starting EC-*gfx*Program and running the SACV application code.

## **General Information**

For the SACV block to be available in EC-*gfx*Program, the SACV toolbox needs to be installed. Once installed, the block will be available for use in the Toolbox Code Library of EC-*gfx*Program.

To install the SACV toolbox:

1. Locate the .zip file downloaded from Builder in your computer's **Downloads** folder and extract its content.

| 🕹 l 🖸 📙 👳 l  | Extract                 | Downloads  |   |  | - 0  | ×   |   |  |       |
|--|-------------------------|--|---|--|--|---|---|--|-------|
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| Creative Cloud Files  Creative Cloud Files  Creative Cloud Files  This PC  This PC  Desistop  Counnents  Coun  |                         | Open with<br>Give access to<br>Retrote pervicus versions<br>Send to<br>Cut<br>Copy<br>Create shortcut<br>Delete<br>Resame<br>Promotier | <ul> <li>← → × ↑ ▲ → This PC</li> <li>→ S<sup>2</sup> Quick access</li> <li>⊕ Documents</li> <li>♦ Documents</li> <li>₩ Pictures</li> </ul> | * Downloads > Si<br>#<br>#<br>#<br>#           | CV Name Teolboxes Configuration Points.cv SACV Sequence of Operation.nf SACV Service of Security Security SACV Security Procedures.nf SACVates   | ✓      ✓      ζ     Zate modified     S/26/2023 2-47 PM   | Search SACV     Type     File folder     Text Document     Microsoft Excel C     Rich Text Format     GFX File     Microsoft Excel W  | Size<br>1 K8<br>2 K8<br>11 K8<br>11 K8<br>472 K8<br>15 K8          |       |
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Figure 4: Extracting the output folder content (file name and content may vary based on your selection in Builder)

2. Copy the *Smart Air Control Valve.dll* file found in the **SACV\Toolboxes** folder and paste it in the C: \Users\UserName\Documents\Distech Controls\EC-gfxProgram\Toolboxes\Design folder. If you are prompted to replace the file, click **Yes**.



#### WARNING

If you have the Productivity Enhancement Tools installed on your computer, you must delete the *Smart Air Control Valve.dll* file from the **Design** and **Runtime** folders located in C: \Users\UserName\Documents\Distech Controls\EC-*gfx*Program\Toolboxes\. If you do not delete this file from this location, you will have two different versions of the SACV toolbox in your EC-*gfx*Program Code Library.

| Search in all toolboxes<br>Smart Air Control Valve (<br>Rectangle IMP<br>SACV 10x15 Rect PT IMP<br>SACV 10x21 Rect PT IMP<br>SACV 10x21 Rect PT IMP<br>SACV 10x15 Rect PT SI<br>SACV 10x21 Rect PT SI<br>SACV 12RD OR IMP<br>SACV 16RD OR IMP<br>SACV 8RD OR IMP<br>SACV 8RD OR IMP<br>SACV 8RD OR SI<br>SACV 12RD OR SI<br>SACV 12RD OR SI<br>SACV 16RD OR SI   | × |
|---|---|
| Smart Air Control Valve       (         Rectangle IMP       SACV 10x15 Rect PT IMP         SACV 10x21 Rect PT IMP         SACV 10x21 Rect PT IMP         SACV 10x15 Rect PT SI         SACV 10x21 Rect PT SI         SACV 12RD OR IMP         SACV 16RD OR IMP         SACV 8RD OR IMP         SACV 12RD OR SI         SACV 12RD OR SI         SACV 12RD OR SI         SACV 16RD OR SI         SACV 16RD OR SI         SACV 16RD PT SI  |   |
| <ul> <li>Rectangle IMP</li> <li>SACV 10x15 Rect PT IMP</li> <li>SACV 10x21 Rect PT IMP</li> <li>SACV 10x21 Rect PT IMP</li> <li>SACV 10x15 Rect PT SI</li> <li>SACV 10x15 Rect PT SI</li> <li>SACV 10x21 Rect PT SI</li> <li>SACV 12RD OR IMP</li> <li>SACV 16RD OR IMP</li> <li>SACV 8RD OR IMP</li> <li>SACV 8RD OR IMP</li> <li>SACV 8RD OR IMP</li> <li>SACV 12RD OR SI</li> <li>SACV 12RD OR SI</li> <li>SACV 16RD OR SI</li> <li>SACV 16RD PT SI</li> </ul>  | Ð |
| <ul> <li>SACV 10x15 Rect PT IMP</li> <li>SACV 10x21 Rect PT IMP</li> <li>Rectangle Metric</li> <li>SACV 10x15 Rect PT SI</li> <li>SACV 10x21 Rect PT SI</li> <li>SACV 10x21 Rect PT SI</li> <li>Round IMP</li> <li>SACV 12RD OR IMP</li> <li>SACV 12RD PT IMP</li> <li>SACV 16RD OR IMP</li> <li>SACV 8RD OR IMP</li> <li>SACV 8RD PT IMP</li> <li>SACV 8RD PT IMP</li> <li>SACV 12RD OR SI</li> <li>SACV 16RD OR SI</li> <li>SACV 16RD PT SI</li> </ul>  |   |
| <ul> <li>SACV 10x21 Rect PT IMP</li> <li>Rectangle Metric</li> <li>SACV 10x15 Rect PT SI</li> <li>SACV 10x21 Rect PT SI</li> <li>SACV 10x21 Rect PT SI</li> <li>Round IMP</li> <li>SACV 12RD OR IMP</li> <li>SACV 12RD PT IMP</li> <li>SACV 16RD OR IMP</li> <li>SACV 8RD OR IMP</li> <li>SACV 8RD OR IMP</li> <li>SACV 8RD PT IMP</li> <li>SACV 8RD PT IMP</li> <li>SACV 12RD OR SI</li> <li>SACV 16RD OR SI</li> <li>SACV 16RD OR SI</li> <li>SACV 16RD OR SI</li> <li>SACV 16RD PT SI</li> </ul>   |   |
| Rectangle Metric     SACV 10x15 Rect PT SI     SACV 10x21 Rect PT SI     SACV 10x21 Rect PT SI     SACV 12RD OR IMP     SACV 12RD OR IMP     SACV 16RD OR IMP     SACV 16RD OR IMP     SACV 8RD OR IMP     SACV 8RD PT IMP     SACV 8RD PT IMP     SACV 12RD OR SI     SACV 12RD OR SI     SACV 16RD OR SI     SACV 16RD PT SI     SACV 16RD PT SI  |   |
| SACV 10x15 Rect PT SI         SACV 10x21 Rect PT SI         SACV 10x21 Rect PT SI         SACV 12RD OR IMP         SACV 12RD OR IMP         SACV 16RD OR IMP         SACV 8RD OR IMP         SACV 8RD OR IMP         SACV 12RD OR SI         SACV 12RD OR SI         SACV 12RD PT SI         SACV 12RD PT SI  |   |
| SACV 10x21 Rect PT SI  Round IMP  SACV 12RD OR IMP  SACV 12RD PT IMP  SACV 16RD OR IMP  SACV 16RD PT IMP  SACV 8RD OR IMP  SACV 8RD PT IMP  SACV 8RD PT IMP  SACV 12RD OR SI SACV 12RD OR SI SACV 16RD OR SI SACV 16RD PT SI SACV 16RD PT SI SACV 16RD PT SI  |   |
| Round IMP     SACV 12RD OR IMP     SACV 12RD PT IMP     SACV 16RD PT IMP     SACV 16RD PT IMP     SACV 8RD OR IMP     SACV 8RD PT IMP     SACV 8RD PT IMP     SACV 12RD OR SI     SACV 12RD PT SI     SACV 16RD PT SI     SACV 16RD PT SI     SACV 16RD PT SI   |   |
| SACV 12RD OR IMP         SACV 12RD PT IMP         SACV 16RD OR IMP         SACV 16RD PT IMP         SACV 8RD OR IMP         SACV 8RD PT IMP         SACV 12RD PT IMP         SACV 12RD OR IMP         SACV 12RD OR IMP         SACV 12RD OR SI         SACV 12RD PT SI         SACV 16RD PT SI         SACV 16RD PT SI         SACV 16RD PT SI         SACV 16RD PT SI  |   |
| SACV 12RD PT IMP<br>SACV 16RD OR IMP<br>SACV 16RD PT IMP<br>SACV 8RD OR IMP<br>SACV 8RD PT IMP<br>SACV 8RD PT IMP<br>Reund Metric<br>SACV 12RD OR SI<br>SACV 12RD OR SI<br>SACV 16RD OR SI<br>SACV 16RD OR SI   |   |
| SACV 16RD OR IMP         SACV 16RD PT IMP         SACV 8RD OR IMP         SACV 8RD PT IMP         SACV 8RD PT IMP         SACV 12RD PT IMP         SACV 12RD OR SI         SACV 16RD PT SI  |   |
| SACV 16RD PT IMP SACV 8RD OR IMP SACV 8RD PT IMP Result of the second s |   |
| SACV 8RD OR IMP SACV 8RD PT IMP A Round Metric SACV 12RD OR SI SACV 12RD PT SI SACV 16RD OR SI SACV 16RD PT SI SACV 16RD PT SI  |   |
| SACV 8RD PT IMP  Round Metric  SACV 12RD OR SI SACV 12RD PT SI SACV 16RD OR SI SACV 16RD PT SI SACV 16RD PT SI  |   |
| Round Metric     SACV 12RD OR SI     SACV 12RD PT SI     SACV 16RD OR SI     SACV 16RD PT SI  |   |
| SACV 12RD OR SI         SACV 12RD PT SI         SACV 16RD OR SI         SACV 16RD PT SI   |   |
| SACV 12RD PT SI           Image: SACV 16RD OR SI           SACV 16RD PT SI  |   |
| BR SACV 16RD OR SI  |   |
| BE SACV 16RD PT SI  |   |
|   |   |
| BE SACV 8RD OR SI   |   |
| BE SACV 8RD PT SI   |   |

Figure 5: The SACV toolbox in EC-gfxProgram



Figure 6: EC-gfxProgram code with SACV toolbox installed

For more information on how to add or remove toolboxes in EC-gfxProgram, refer to the *Toolbox Builder Tool* section of the <u>EC-gfxProgram User Guide</u>.

### Loading the Application Code on the Controller

The SACV is shipped with a generic factory-programmed SACV application. For additional options, Builder and EC-gfxProgram should be used to generate the new code and upload it to the controller, respectively.

1. You can open EC-gfxProgram for the SACV controller through XpressNetwork Utility or through the controller's web interface.

Refer to the Smart Air Control Valve Installation Guide for more information on how to connect to the controller.



Figure 7: Accessing EC-gfxProgram from XpressNetwork Utility





Figure 8: Accessing EC-gfxProgram from the controller's Web interface

2. In EC-gfxProgram, open the File menu and select Import > Import from File.



- 3. In the file browser, navigate to the unzipped Builder output folder and select the *.gfx* project file. Click **OK**.
- 4. If you want to save the code that was previously in the project, click **Yes** when prompted. Otherwise, click **No**.

The custom SACV code from Builder will replace the existing code in EC-gfxProgram.

- 5. Click the Synchronize button to access the Project Synchronization window.
- Select Download to device and check all Synchronization Options and click Next.
   See the <u>EC-gfxProgram User Guide</u> for more information on project synchronization options.

| P | Project Synchronization ? X        |  |     | ×   |
|---|------------------------------------|--|-----|-----|
|   | Synchronization<br>Select the comp | onents you want to synchronize   |     |     |
|   | Selection<br>Progress<br>Results   | Synchronization Mode   Download to device  Upload from device  Download to multiple devices  Upload from multiple devices  |     |     |
|   | Finish                             | Synchronization Options         Project's Configuration         Force ECLYPSE Designer data tree override         Send schedule's configuration         Reinitialize non-controller specific values         Reinitialize controller specific values         Reinitialize controller specific configurations (Network objects, EnOcean)         Reinitialize persistency         Clear object's values and overrides         Compile code and send it to device         Reboot controller |     |     |
|   |                                    | < Back Next >  | Can | cel |

Figure 9: Project Synchronization window

7. Allow the Synchronization process to complete, click Next and then Finish.

## Troubleshooting

If the controller is being serviced by a computer without the proper version of the SACV toolbox installed, the EC-*gfx*Program code will break and will resemble the example below. If this is the case, please update to the most recent version of the SACV toolbox and restart EC-*gfx*Program. Once updated, the block will now be available in the toolbox and the existing code will be functional.

|      | Message  | Location  |
|------|--|---|
| 😵 1  | Unable to find object type "HVACmfg.SmartAirControlValve.SACV10x15RectPTIMP" in toolbox "Smart Air Control Valve". | AirFlowCtrl/SACV Flow Calculation/SACV 10x15 Inch Rect PT |
| 😵 2  | Unable to find object type "HVACmfg.SmartAirControlValve.SACV10x21RectPTIMP" in toolbox "Smart Air Control Valve". | AirFlowCtrl/SACV Flow Calculation/SACV 10x21 Inch Rect PT |
| 😵 3  | Unable to find object type "HVACmfg.SmartAirControlValve.SACV12RDORIMP" in toolbox "Smart Air Control Valve".      | AirFlowCtrl/SACV Flow Calculation/SACV 12 Inch Round OR   |
| 😵 4  | Unable to find object type "HVACmfg.SmartAirControlValve.SACV12RDPTIMP" in toolbox "Smart Air Control Valve".      | AirFlowCtrl/SACV Flow Calculation/SACV 12 Inch Round PT   |
| 😵 5  | Unable to find object type "HVACmfg.SmartAirControlValve.SACV16RDORIMP" in toolbox "Smart Air Control Valve".      | AirFlowCtrl/SACV Flow Calculation/SACV 16 Inch Round OR   |
| 86   | Unable to find object type "HVACmfg.SmartAirControlValve.SACV16RDPTIMP" in toolbox "Smart Air Control Valve".      | AirFlowCtrl/SACV Flow Calculation/SACV 16 Inch Round PT   |
| 87   | Unable to find object type "HVACmfg.SmartAirControlValve.SACV8RDORIMP" in toolbox "Smart Air Control Valve".       | AirFlowCtrl/SACV Flow Calculation/SACV 8 Inch Round OR    |
| 😵 8  | Unable to find object type "HVACmfg.SmartAirControlValve.SACV8RDPTIMP" in toolbox "Smart Air Control Valve".       | AirFlowCtrl/SACV Flow Calculation/SACV 8 Inch Round PT    |
|      |  |   |
|      |  |   |
|      |  |   |
|      |  |   |
|      |  |   |
| _    |  |   |
| AirF | Flow Reading   |   |
|      | Č.   |   |
|      |  |   |
|      |  |   |
|      | oZeroCalib Differential Pressure   | 7 SACV 12 Inch Round PT                                   |
| 000  | Output DoZero Output   |   |
|      | Number   |   |
|      |  |   |
|      |  |   |
|      | ResetDoZeroCalib   |   |
|      | BVNumber   |   |
|      |  |   |

Figure 10: EC-gfxProgram without the SACV toolbox installed or an out of date version

## CHAPTER 4 Using the SACV Graphical Web Interface

This chapter explains how to use the SACV Graphical Web Interface. Various aspects of the interface are explained, including configuring the SACV settings, and working trends and alarms.

## Accessing the SACV Graphical Web Interface

There are two ways to access the SACV Graphical Web Interface:

- In a Web browser, enter the following address: https://< SACV IP address > /eclypse/envysion/viewer.html?proj=SACV\_53BE&path=Index.dg5. When prompted, enter your credentials to log into the controller.
- On the SACV controller's configuration Web Interface, click the **Designer** button and select the SACV project in the pop-up list. Click **OK**.

Make sure that the URL of the Designer loading page includes "**&path=Index.dg5**" at the end. If it does not, add it and reload the page.

| ΞCL                      | YPSE                                |                                 |   | 名 admin          |
|--------------------------|-------------------------------------|---------------------------------|---|------------------|
| ්ය<br>Home               | Device Inform                       | ation                           |   |                  |
| <i>~</i>                 | Controller Name<br>ECY-VAV_Lend_J25 | BACnet Device Instance<br>88025 |   |                  |
| Network                  | Host Id                             |                                 |   |                  |
| 扫                        | ECYVAV-EC59F119-E                   | 734-514C-A9E4-C4D98878052C      | ē   |                  |
| BACnet                   | MAC Address (eth0)                  |                                 |   |                  |
| of terror                | CC:33:31:76:A6:8F                   |                                 | 6   |                  |
| Oද<br>□<br>Users         | Time Date<br>05:09 PM 05/31         | /2023                           |   |                  |
| र्ट्रेट<br>System        |                                     |                                 |   |                  |
|                          | Public Ip Address                   |                                 |   |                  |
| $\bigcirc$               | 207.253.3.19                        |                                 | C   |                  |
| loT                      | 👁 Connected to Int                  | ternet                          |   |                  |
| P<br>BLE Room<br>Devices | Applications                        |                                 |   |                  |
|                          | EC-gfxProgram                       | Designer                        |   |                  |
| Figure                   | 11: The Desian                      | er button on the Home           | page of the SACV's configuration web interface ca | n be used to ac- |

Figure 11: The Designer button on the Home page of the SACV's configuration web interface can be used to access the Graphical Web Interface

The SACV Graphical Web Interface, similar to the figure below, opens when accessing Designer for an SACV controller.



Figure 12: SACV Graphical Web Interface (System Page view)

#### Note

Rectangular SACV models that are equipped with hydronic reheat coils include a BTU/h calculation to estimate the energy transfer and consumption through the unit.

For more information regarding the different ways to access the configuration Web Interface, refer to the <u>Smart Air Control Valve Installation Guide</u>.

## Configuring the SACV

The SACV's space setpoints can be set from the configuration group of tables in the **Configuration** page. This page can easily be accessed from the SACV navigation menu located at the left of the system view page.

Each parameter can be easily set by clicking the vertical three-dot menu on the right of each point.

| DISTECH       |   |  |                                  | A           | D |
|---------------|---|--|----------------------------------|-------------|---|
| System        | Temperature Setpoint  |  | Flow Setpoint                    |             |   |
| Configuration | Unoccupied Cool Setpoint  | 80.0 °F                                      | Cooling Minimum Flow Setpoint    | 100.0 cfm 🚦 |   |
| Alarms        | Standby Cool Setpoint   | 78.0 °F                                      | Heating Minimum Flow Setpoint    | 100.0 cfm   |   |
| ÷             | Occupied Cool Setpoint  | 75.0 °F                                      | Cooling Maximum Flow Setpoint    | 500.0 cfm   |   |
| Trends        | Occupied Heat Setpoint  | 71.0 °F                                      | Heating Maximum Flow Setpoint    | 300.0 cfm   |   |
|               | Standby Heat Setpoint   | 68.0 °F                                      | Standby Minimum Flow Setpoint    | 50.0 cfm    |   |
|               | Unoccupied Heat Setpoint  | 66.0 °F                                      | Unoccupied Minimum Flow Setpoint | 0.0 cfm     |   |
|               | Room Flow Calibration  Balancing Override  Room Offset At Minimum Flow  Room Offset At Maximum Flow | Normal Operation :<br>0.0 cfm :<br>0.0 cfm : |                                  |             |   |
|               | Room Flow     SACV Flow   | 0.0 cfm :                                    |                                  |             |   |
| ←ı            |   |  |                                  |             |   |

### Configuring the Temperature Setpoints

The Temperature Setpoint table in the **Configuration** page contains the heating and cooling setpoints for the unoccupied, standby and occupied modes.

| Temperature Setpoint     |         |
|--------------------------|---------|
| Unoccupied Cool Setpoint | 80.0 °F |
| Standby Cool Setpoint    | 78.0 °F |
| Occupied Cool Setpoint   | 75.0 °F |
| Occupied Heat Setpoint   | 71.0 °F |
| Standby Heat Setpoint    | 68.0 °F |
| Unoccupied Heat Setpoint | 66.0 °F |

| Setpoints         | Description  |
|-------------------|--|
| (heating/cooling) |  |
| Unoccupied        | The limits between which the temperature is to be maintained by the controller when it is in Unoccupied mode. If the temperature passes these limits, the system reacts to bring the temperature back within these limits. In Unoccupied mode, the space temperature is usually allowed a larger amount of variance than in Occupied mode, thereby lowering operating costs. |
| Occupied          | The limits between which the temperature is to be maintained by the controller when it is in Occupied mode. This temperature range should be comfortable to building occupants.  |
| Standby           | The limits between which the temperature is to be maintained by the controller when it is in Standby mode. In Standby mode, the temperature is usually allowed a larger amount of variance than in Occupied mode. Still, it is maintained at a value close enough to the occupied setpoints so that it can be varied quickly for occupancy.                                  |

## Calibrating the SACV Room Flow

The SACV room airflow balancing can be performed from the **Flow Setpoints** and **Room Flow Calibration** tables in the **Configuration** page. This page can easily be accessed from the SACV navigation menu located on the left of the system view page.

Each parameter can be easily set by clicking the vertical three-dot menu on the right of each point.

#### Configuring the Flow Setpoints

| Flow Setpoint                    |           |
|----------------------------------|-----------|
| Cooling Minimum Flow Setpoint    | 100.0 cfm |
| Heating Minimum Flow Setpoint    | 100.0 cfm |
| Cooling Maximum Flow Setpoint    | 500.0 cfm |
| Heating Maximum Flow Setpoint    | 300.0 cfm |
| Standby Minimum Flow Setpoint    | 50.0 cfm  |
| Unoccupied Minimum Flow Setpoint | 0.0 cfm   |

| Parameter          | Description                                      |
|--------------------|--|
| Cooling Minimum    | Minimum cooling flow setpoint                    |
| Heating Minimum    | Minimum flow setpoint when duct heater is active |
| Cooling Maximum    | Maximum cooling flow setpoint                    |
| Heating Maximum    | Maximum flow setpoint during heating mode        |
| Standby Minimum    | Minimum flow setpoint during standby mode        |
| Unoccupied Minimum | Minimum flow setpoint during unoccupied mode     |

#### Performing SACV Airflow Calibration

The SACV's airflow calibration can be set from the Room Flow Calibration table Configuration page

| Room Flow Calibration       |                  |
|-----------------------------|------------------|
| Balancing Override          | Normal Operation |
| Room Offset At Minimum Flow | 0.0 cfm          |
| Room Offset At Maximum Flow | 0.0 cfm          |
| Room Flow                   | 0.0 cfm          |
| SACV Flow                   | 0.0 cfm          |

| Parameter                   | Description   |
|-----------------------------|---|
| Balancing Override          | The balancing override setting. Different values can be selected: normal, minimum flow, minimum flow heat, minimum flow cool, maximum flow cool, maximum flow cool, maximum flow, 80% maximum flow, 85% maximum flow, 90% maximum flow, 95% maximum flow, damper full open, damper full close, and damper initialization. |
| Room Offset At Minimum Flow | The offset to account for duct leakage when the SACV is operating at minimum flow.  |
| Room Offset At Maximum Flow | The offset to account for duct leakage when the SACV is operating at maximum flow.  |
| Room Flow                   | The actual flow (in cfm) in the room.   |
| SACV Flow                   | The flow reading for the SACV controller.   |

The following steps outline the procedure for performing field adjustments on an SACV controller to account for any duct leakage:

- 1. Set the SACV's Balancing Override setting to GoToMinFlow.
- Using a flow hood, measure the actual airflow and compare the reading with the SACV Flow value. NOTE: Before taking any airflow measurements, make sure the flow hood has been properly calibrated using an appropriate method, such as the Traverse method.
- Set the Room Offset at Minimum Flow based on the difference between the flow hood reading and the SACV Flow value (Room Offset = Room Flow – SACV Flow). Room offset values can be positive or negative.
- 4. Set the SACV's Balancing Override setting to GoToMaxFlowCool.
- 5. Using a flow hood, measure the actual airflow and compare the reading with the **SACV Flow** value.
- 6. Set the **Room Offset at Maximum Flow** based on the difference between the flow hood reading and the **SACV Flow** value.
- 7. Using a flow hood, validate that the **Room Flow** value is now equal to the flow hood reading.

## Working with Alarms

The **Alarm Console** allows you to view and acknowledge active alarms. The alarm information is presented in different columns as shown in the figure below. The total amount of alarms and unacknowledged alarms are available at a glance at the top right corner of the **Alarm Console** window. More alarm information can be displayed by moving the cursor over the question mark symbol next to each alarm.



Figure 13: Alarm Console

#### Show/Hide Alarm Data Columns

The **Column Display** menu in the **Alarm Console** is used to show or hide additional columns of alarm data. Use the checkbox to select or deselect data columns.



Figure 14: Show/hide data columns

| Column             | Information Displayed  |
|--------------------|--|
| Ack Required       | True or False to indicate whether or not an acknowledgement is required for this alarm.  |
| Ack State          | "Acked" or "Unacked" to indicate whether the alarm has been acknowledged or Not.   |
| Ack Time           | Time that the alarm was acknowledged (if applicable).  |
| Count              | The number of alarms for the given source. The table lists old alarms too, hence the count.  |
| From State         | State of the object prior to the occurrence of the event that initiated this notification.   |
| Message Text       | Text message pertaining to the alarm.  |
| Notification Class | Notification class of the event.   |
| Priority           | Priority number of the alarm.  |
| Status             | The alarm is active and unacknowledged.<br>The alarm was acknowledged but is still active.<br>The alarm was acknowledged and is no longer active.<br>The alarm was not acknowledged but is no longer active. |
| Timestamp          | Time and date when alarm event occurred.   |
| Source             | Alarm source name.   |
| To State           | State of the object after the occurrence of the event that initiated this notification.  |
| User               | Name of the user that acknowledged the alarm.  |

#### **Filter Options**

The **Filter Options** menu in the **Alarm Console** is used to sort the alarms in such a way as to hide or unhide certain alarms from the list. This filter action only affects which alarms to display, it does not edit any alarm information.

| * |
|---|
| ~ |
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| ~ |
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|   |
|   |
|   |
|   |

#### Figure 15: Filter options

The following filter options are available.

| Column             | Information Displayed   |
|--------------------|---|
| Date Range         | Display the alarms that match the selected date range: All, Today, This Week, This Month, or This Year. |
| State              | Display only the alarms that are acknowledged, unacknowledged, or both.                                 |
| Priority           | Display the alarms that match the selected alarm priority: Low, Medium, High, or All priorities.        |
| Notification Class | Display the alarms that match the selected notification class.  |

## Working with Trends

The SACV Graphical Web Interface allows you to view the available trends by plotting the data of the selected trends on a chart, along the x and y axes. When **Trends** is selected from the main menu, the **Trend Builder** is displayed. A list of available trends is provided. You can select a color for each trend that you wish to plot on the graph to facilitate the viewing of many trends at the same time. You can search for a particular trend from a long list of trends, by typing the trend name in the filter field provided just above the list of available trends.



Figure 16: Trend Builder

The **Trend Builder** provides additional functions such as selecting different filter options such as selecting a time range, default intervals, and typing text in a filter field.



Figure 17: Trend builder filter options

| Option                      | Description  |
|-----------------------------|--|
| Time range                  | Select a time parameter option from the list (today, last week, etc.)  |
| Interval                    | Select a default interval of time that is used to determine what and how data is presented in your trend chart. For example, an interval value of 1 hour will present data at a granularity level of every one hour, while an interval value of 15 minutes will show data for every 15 minutes of logged data. |
| Additional interval periods | In addition, you can also select other interval options such Avg (average value for the selected interval period), Min or Max (minimum or maximum value for the selected interval period), Sum (total of the values in the selected interval period), etc.   |

