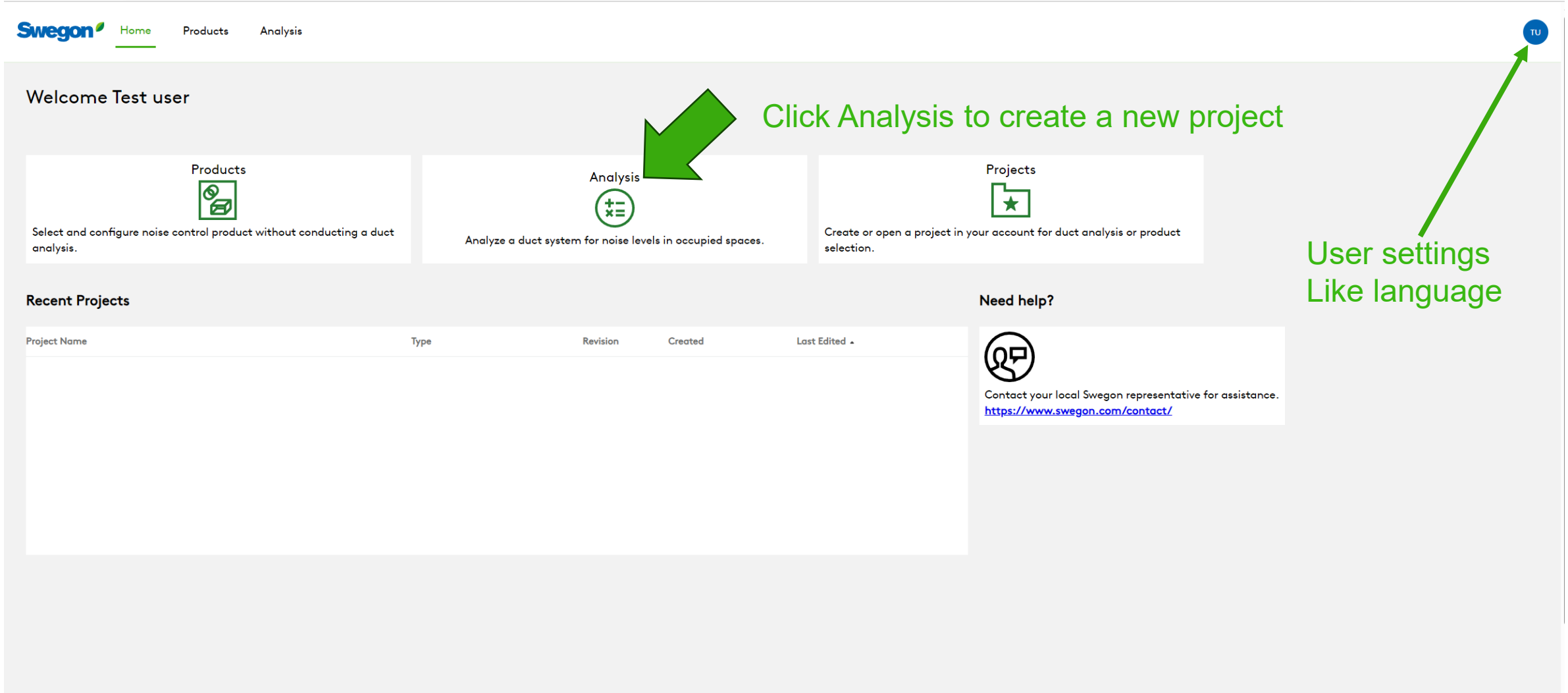
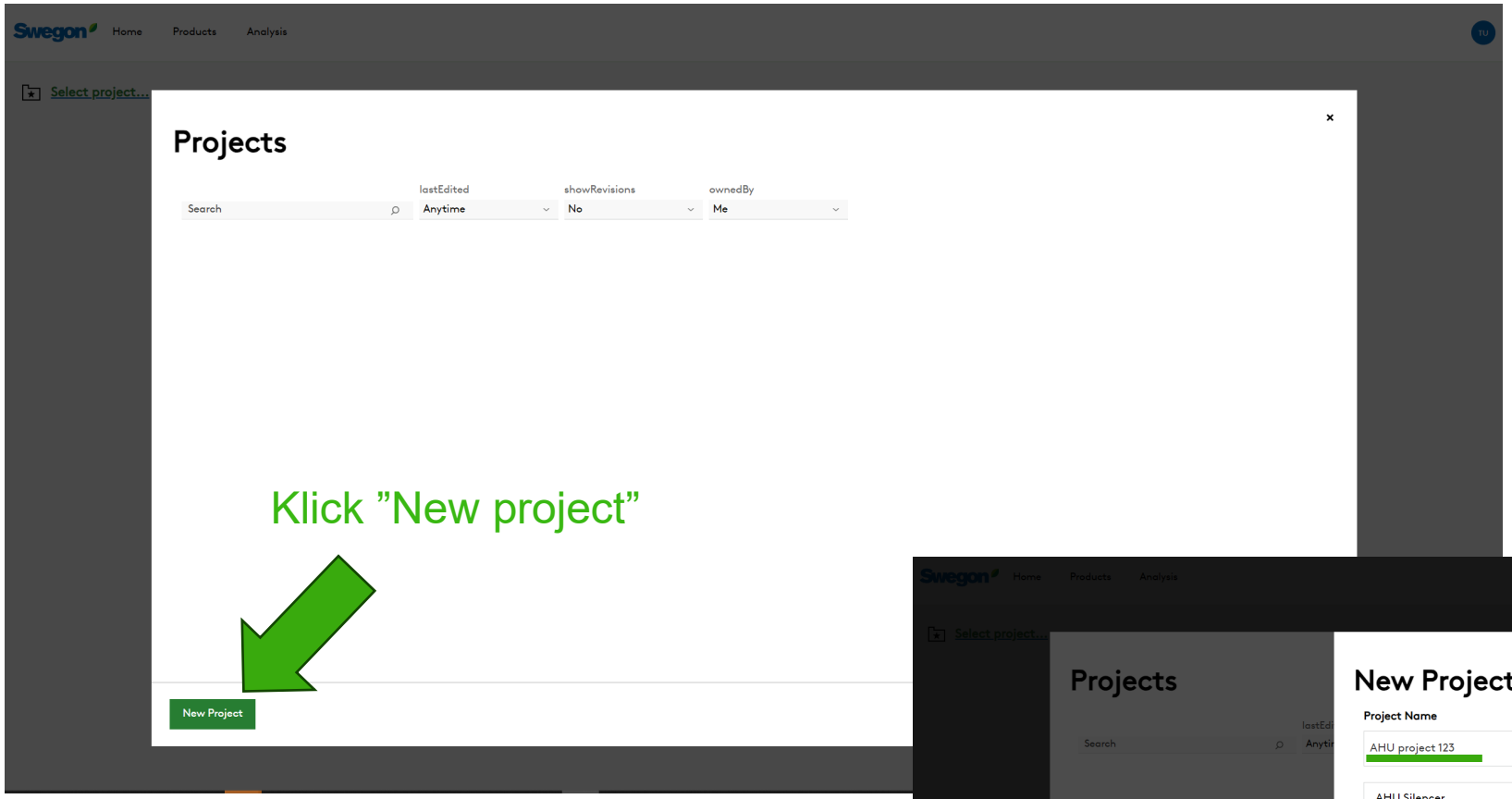
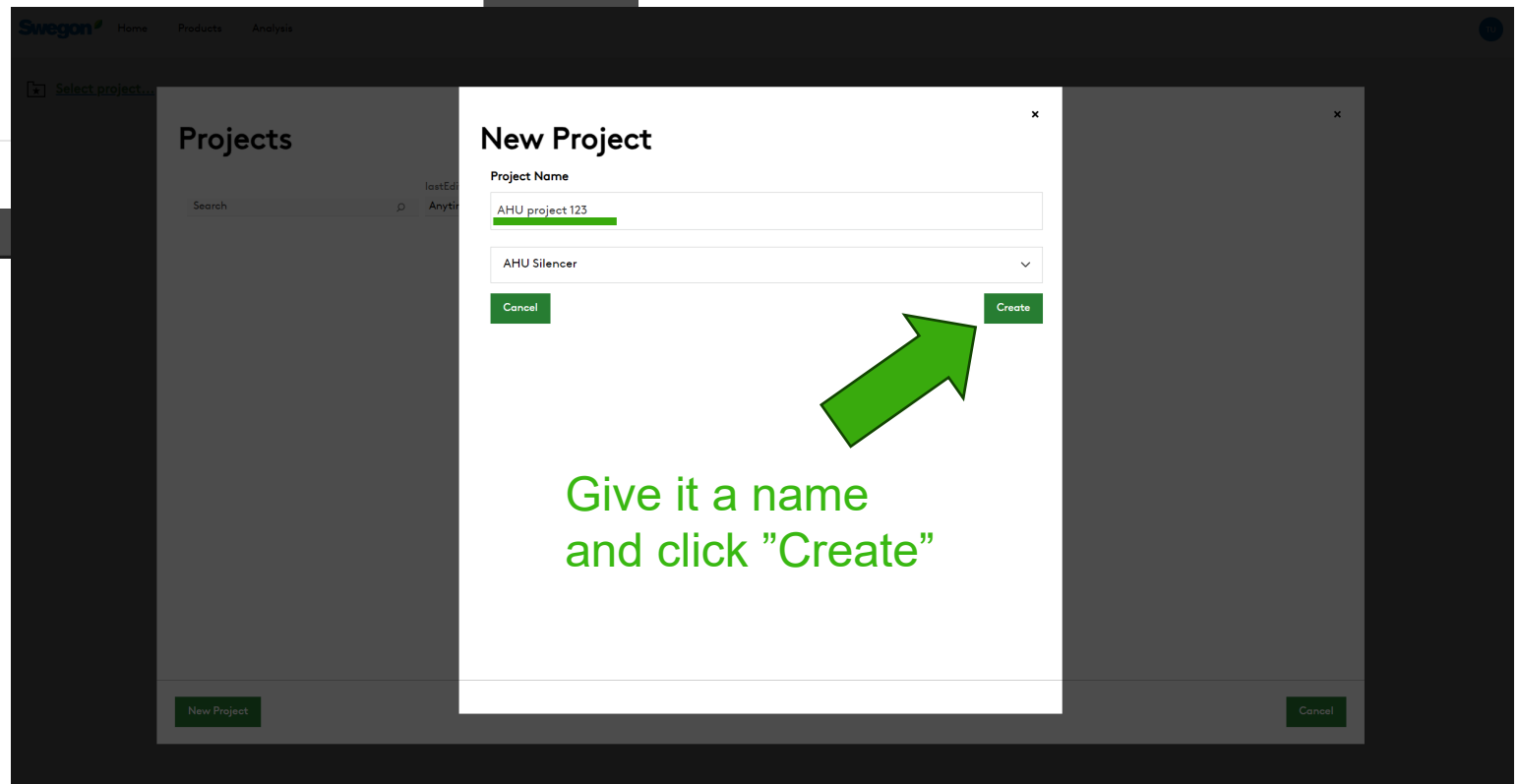
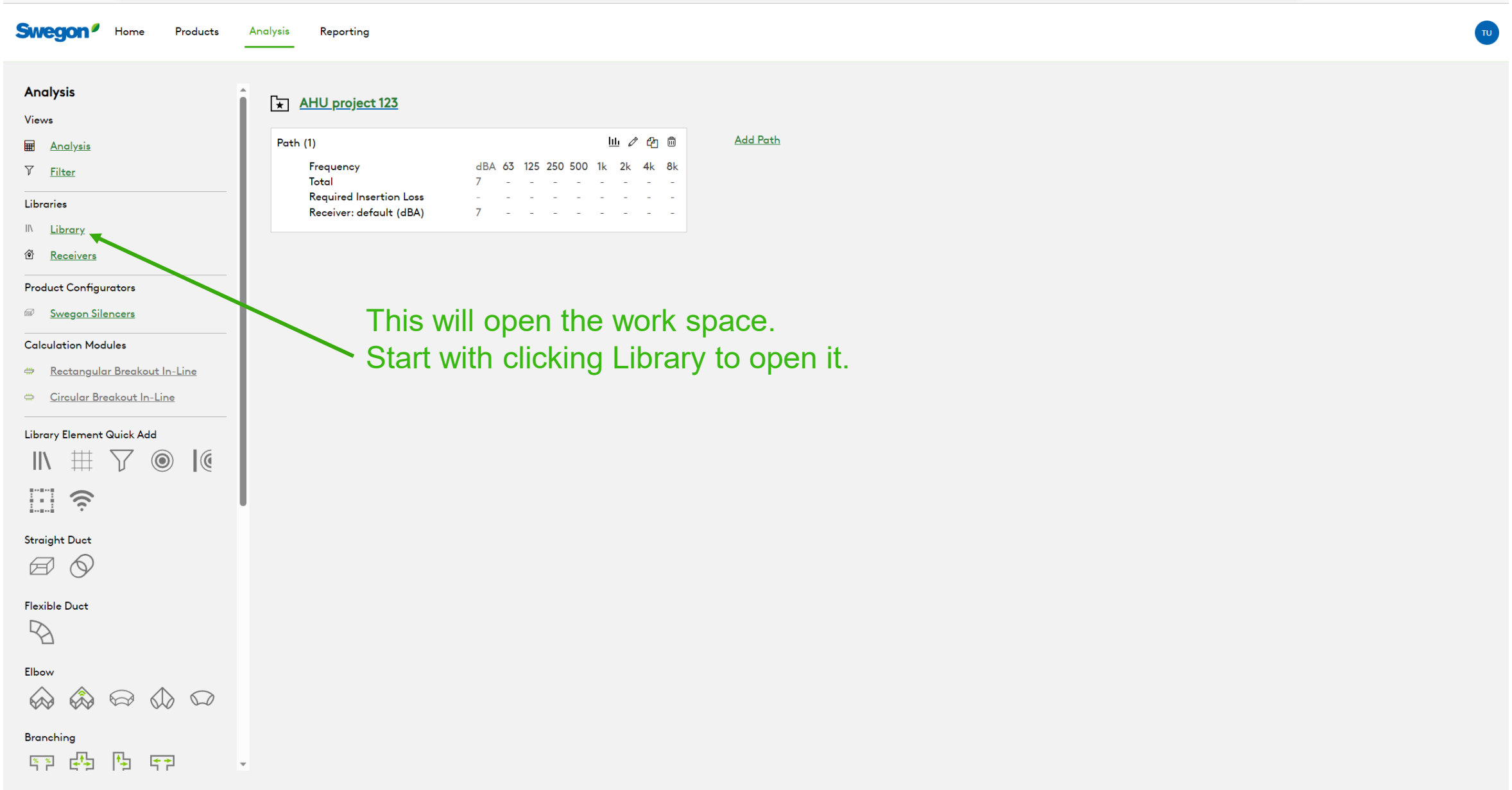
Swegon

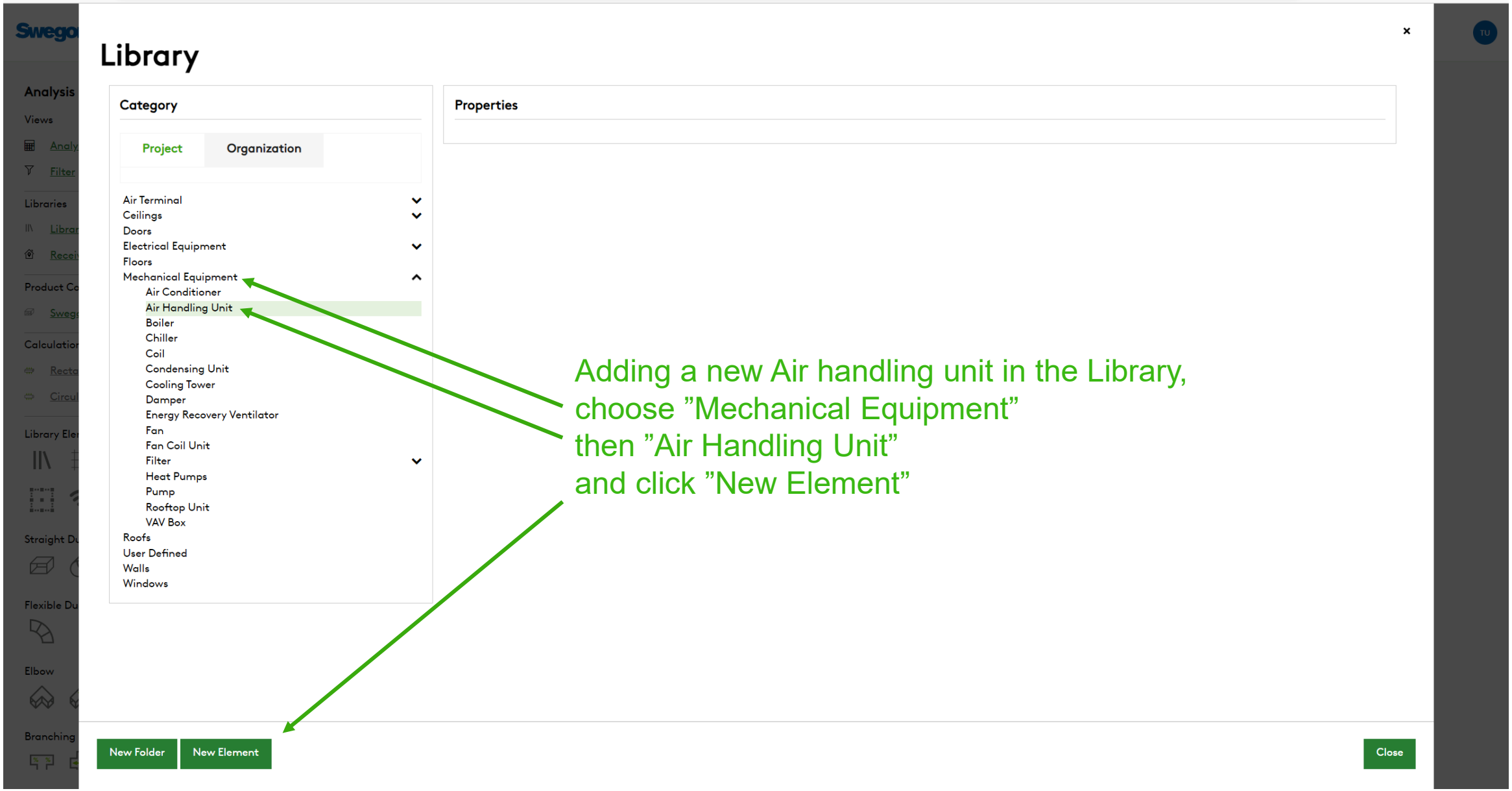
Making an outdoor project calculation with Acoustic Design Analysis

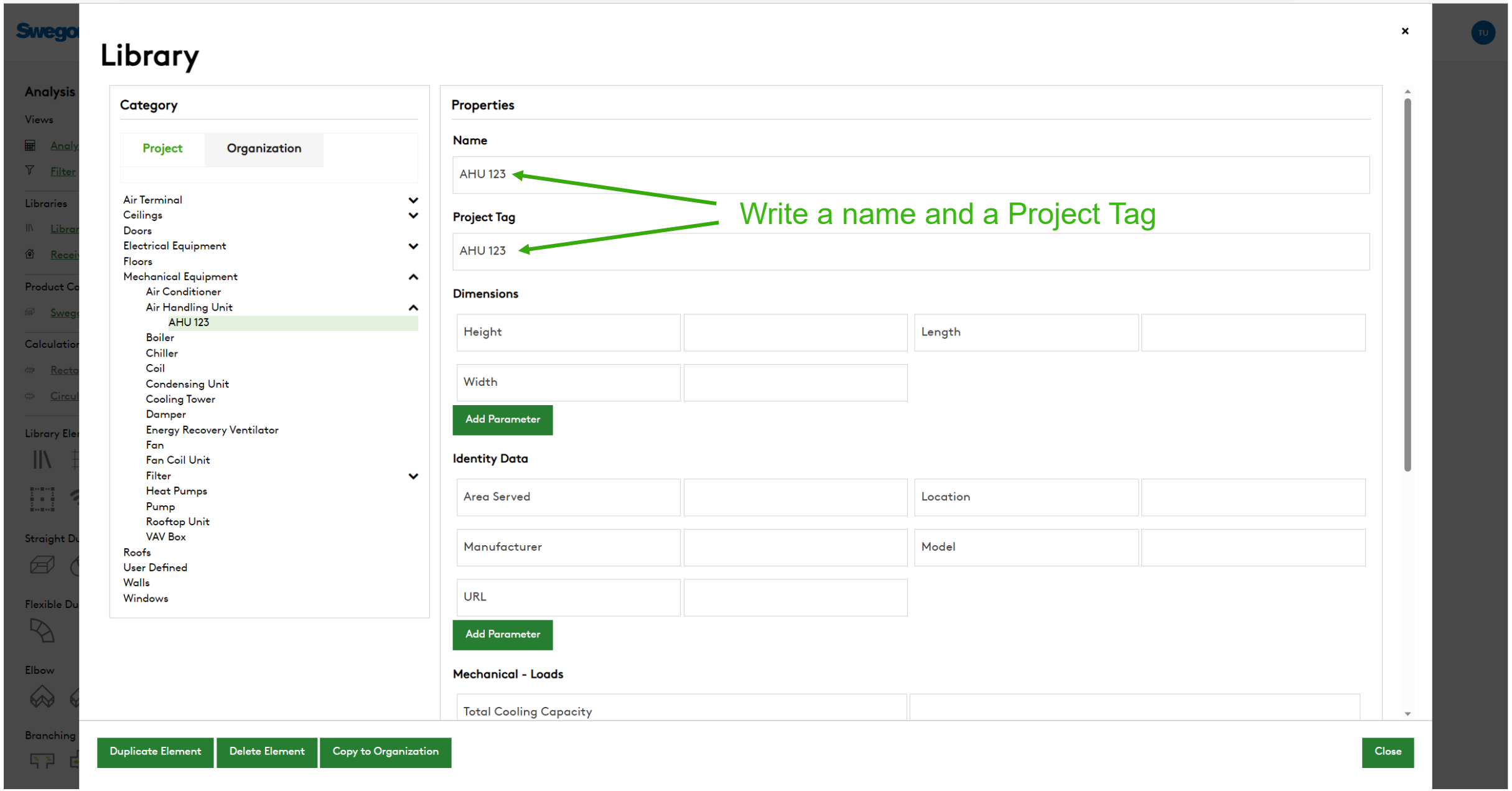

Swegon
Home
Products
Analysis
TU
Welcome Test user
Click Analysis to create a new project
Products
Select and configure noise control product without conducting a duct analysis.
Analysis
Analyze a duct system for noise levels in occupied spaces.
Projects
Create or open a project in your account for duct analysis or product selection.
User settings
Like language
Recent Projects
Project Name
Type
Revision
Created
Last Edited
Need help?
Contact your local Swegon representative for assistance.
https://www.swegon.com/contact/

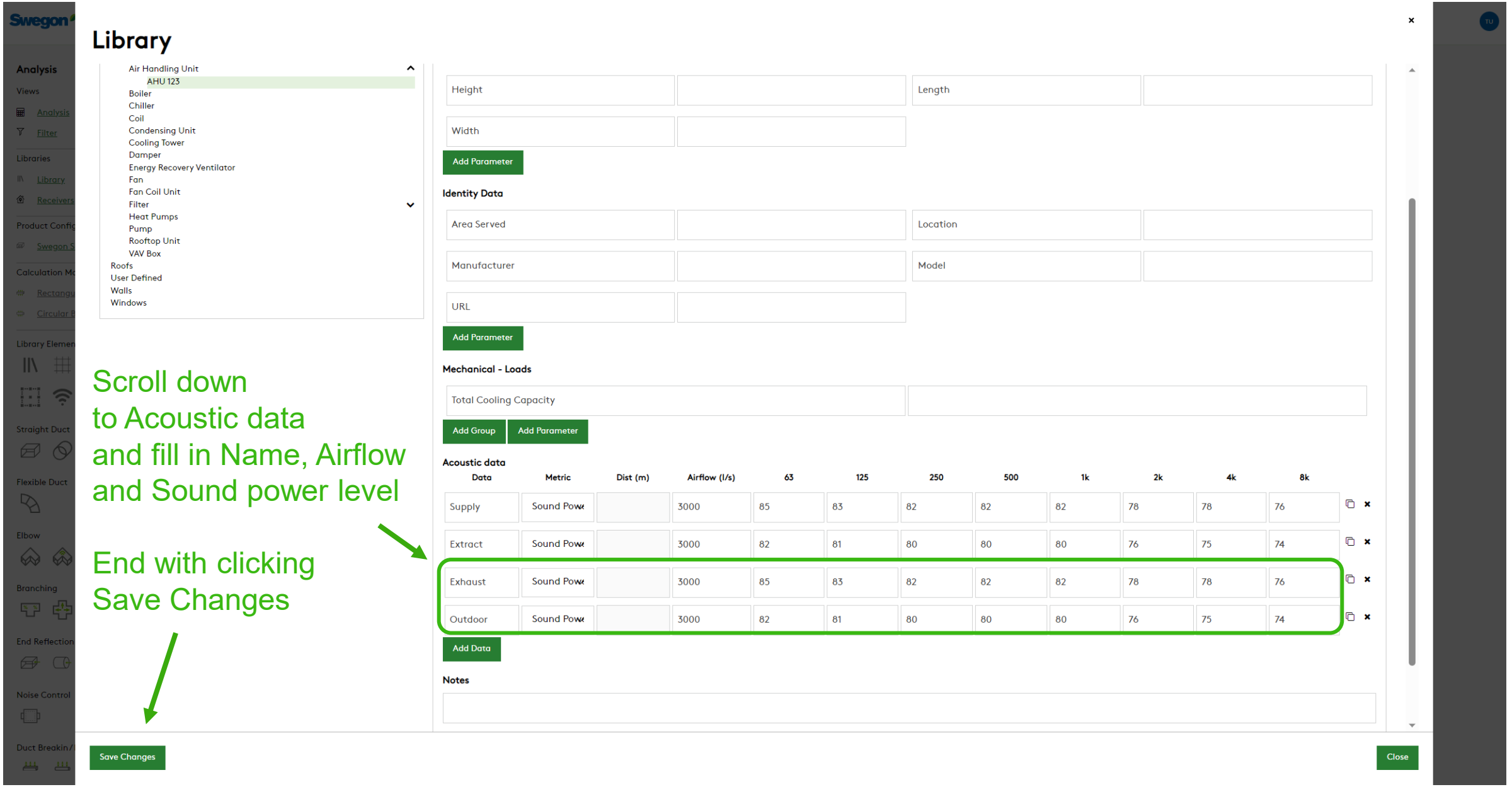

Swegon
Home
Products
Analysis
Select project...
Projects
lastEdited
showRevisions
ownedBy
Search
Anytime
No
Me
Klick ”New project”
New Project


Swegon
Home
Products
Analysis
Select project...
Projects
Search
New Project
Project Name
AHU project 123
AHU Silencer
Cancel
Create
Give it a name
and click ”Create”
New Project
Cancel


Swegon
Home
Products
Analysis
Reporting
TU
Analysis
Views
Analysis
Filter
Libraries
Library
Receivers
Product Configurators
Swegon Silencers
Calculation Modules
Rectangular Breakout In-Line
Circular Breakout In-Line
Library Element Quick Add
Straight Duct
Flexible Duct
Elbow
Branching
AHU project 123
Path (1)
Add Path
Frequency dBA 63 125 250 500 1k 2k 4k 8k
Total 7 - - - - - - - -
Required Insertion Loss - - - - - - - - -
Receiver: default (dBA) 7 - - - - - - - -
This will open the work space.
Start with clicking Library to open it.

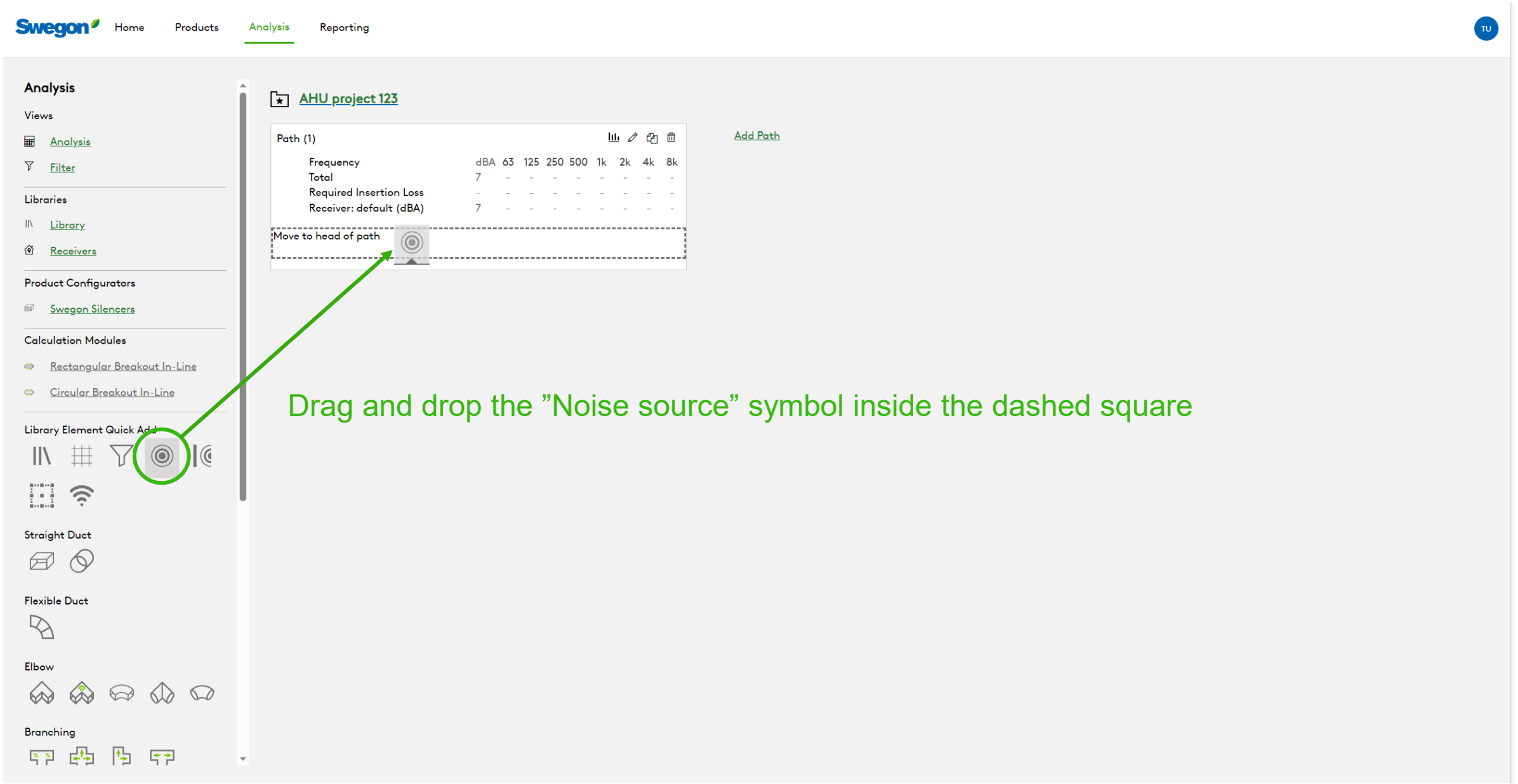

Library
Category
Project
Organization
Air Terminal
Ceilings
Doors
Electrical Equipment
Floors
Mechanical Equipment
Air Conditioner
Air Handling Unit
Boiler
Chiller
Coil
Condensing Unit
Cooling Tower
Damper
Energy Recovery Ventilator
Fan
Fan Coil Unit
Filter
Heat Pumps
Pump
Rooftop Unit
VAV Box
Roofs
User Defined
Walls
Windows
Properties
Adding a new Air handling unit in the Library,
choose ”Mechanical Equipment”
then ”Air Handling Unit”
and click ”New Element”
New Folder
New Element
Close

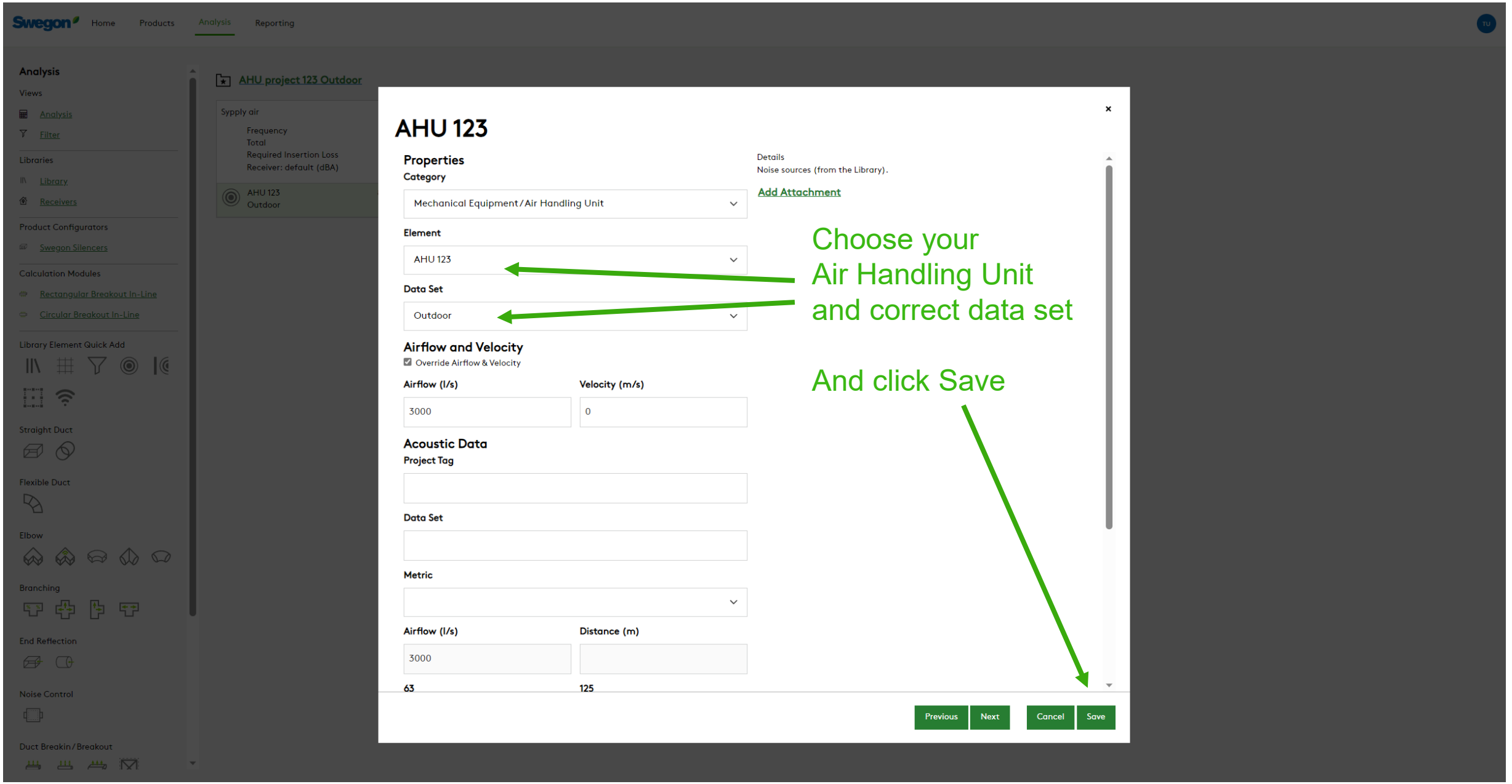

Library
Category
Project
Organization
Air Terminal
Ceilings
Doors
Electrical Equipment
Floors
Mechanical Equipment
Air Conditioner
Air Handling Unit
AHU 123
Boiler
Chiller
Coil
Condensing Unit
Cooling Tower
Damper
Energy Recovery Ventilator
Fan
Fan Coil Unit
Filter
Heat Pumps
Pump
Rooftop Unit
VAV Box
Roofs
User Defined
Walls
Windows
Properties
Name
AHU 123
Project Tag
AHU 123
Write a name and a Project Tag
Dimensions
Height
Length
Width
Add Parameter
Identity Data
Area Served
Location
Manufacturer
Model
URL
Add Parameter
Mechanical - Loads
Total Cooling Capacity
Duplicate Element
Delete Element
Copy to Organization
Close



Scroll down
to Acoustic data
and fill in Name, Airflow
and Sound power level

End with clicking
Save Changes


Swegon
Home
Products
Analysis
Reporting
TU
Analysis
Views
Analysis
Filter
Libraries
Library
Receivers
Product Configurators
Swegon Silencers
Calculation Modules
Rectangular Breakout In-Line
Circular Breakout In-Line
Library Element Quick Add
Straight Duct
Flexible Duct
Elbow
Branching
AHU project 123
Path (1)
Add Path
Frequency dBA 63 125 250 500 1k 2k 4k 8k
Total 7 - - - - - - - -
Required Insertion Loss - - - - - - - - -
Receiver: default (dBA) 7 - - - - - - - -
Move to head of path
Drag and drop the ”Noise source” symbol inside the dashed square


Swegon
Home
Products
Analysis
Reporting
Analysis
Views
Analysis
Filter
Libraries
Library
Receivers
Product Configurators
Swegon Silencers
Calculation Modules
Rectangular Breakout In-Line
Circular Breakout In-Line
Library Element Quick Add
Straight Duct
Flexible Duct
Elbow
Branching
End Reflection
Noise Control
Duct Breakin / Breakout
AHU project 123 Outdoor
Sypply air
Frequency
Total
Required Insertion Loss
Receiver: default (dBA)
AHU 123
Outdoor
AHU 123
Properties
Category
Mechanical Equipment / Air Handling Unit
Element
AHU 123
Data Set
Outdoor
Airflow and Velocity
Override Airflow & Velocity
Airflow (l/s)
3000
Velocity (m/s)
0
Acoustic Data
Project Tag
Data Set
Metric
Airflow (l/s)
3000
Distance (m)
63
125
Details
Noise sources (from the Library).
Add Attachment
Choose your
Air Handling Unit
and correct data set
And click Save
Previous
Next
Cancel
Save

Swegon

Swegon Home Products Analysis Reporting TU

Analysis

Views

- Analysis
- Filter

Libraries

- Library
- Receivers

Product Configurators

- Swegon Silencers

Calculation Modules

- Rectangular Breakout In-Line
- Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

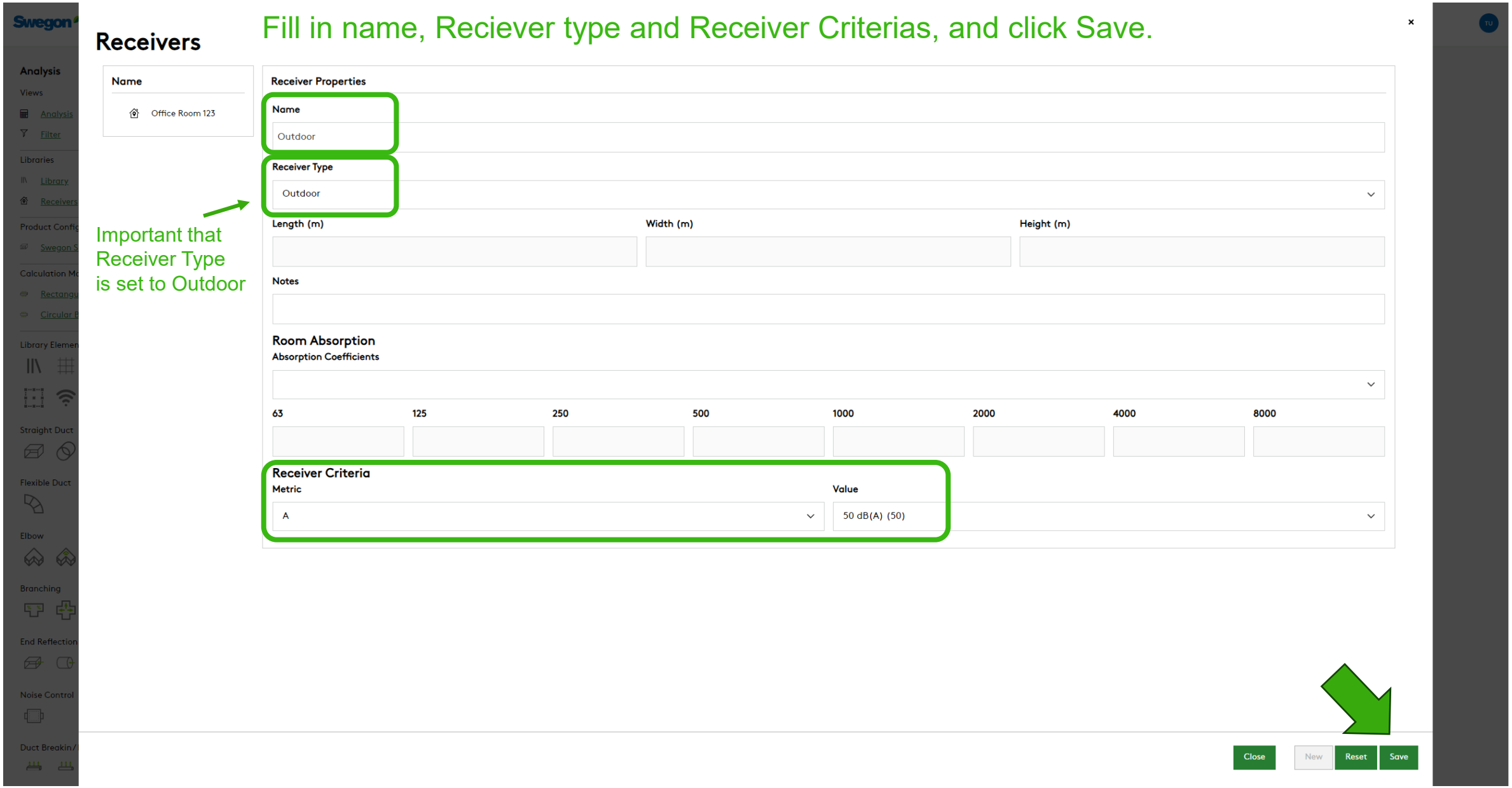
AHU project 123

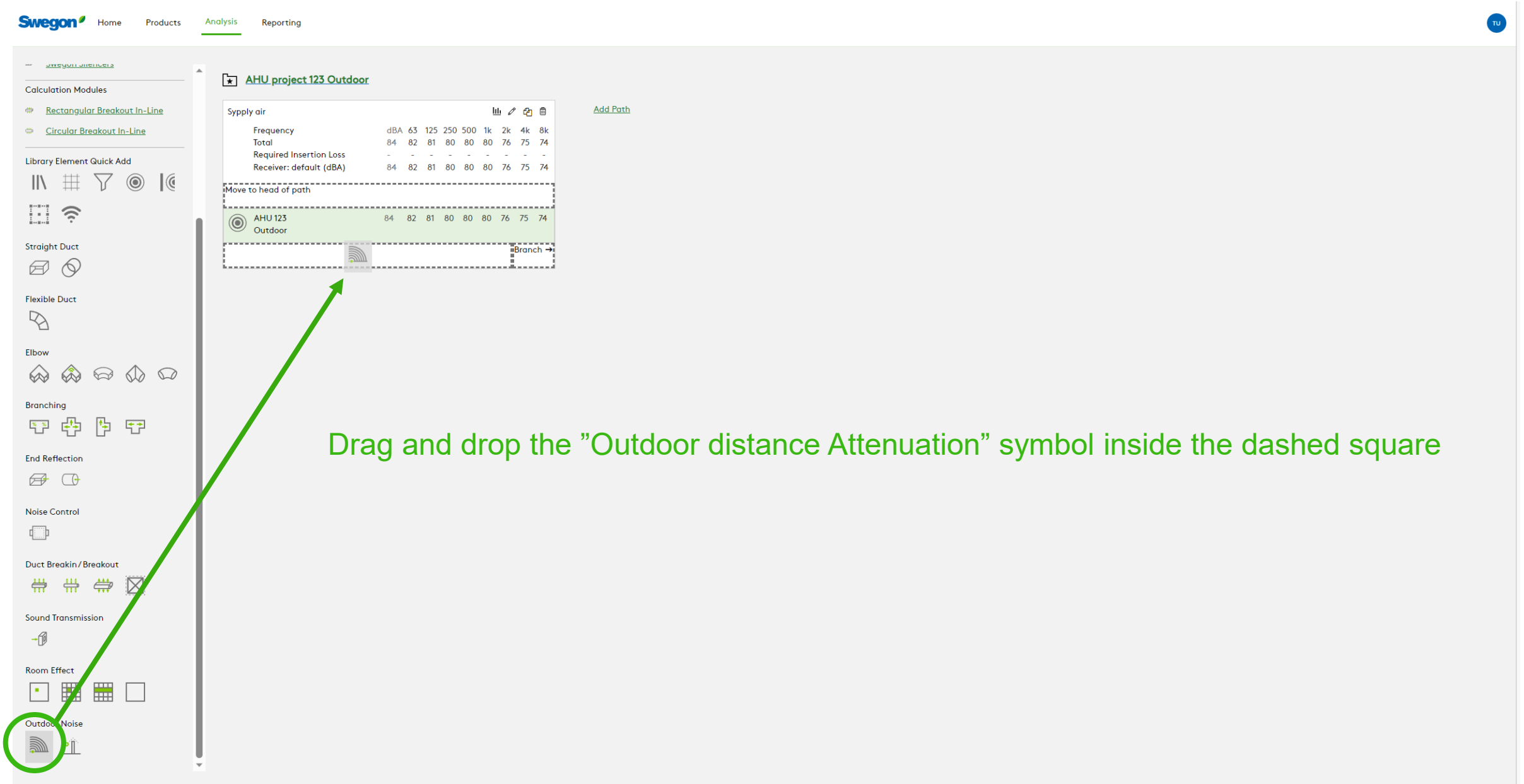
Path (1)

Add Path

Frequency	dBA	63	125	250	500	1k	2k	4k	8k
Total	87	85	83	82	82	82	78	78	76
Required Insertion Loss	-	-	-	-	-	-	-	-	-
Receiver: default (dBA)	87	85	83	82	82	82	78	78	76
AHU 123 Supply	87	85	83	82	82	82	78	78	76

Add your receiver by clicking ”Receivers”


Receivers
Fill in name, Reciever type and Receiver Criterias, and click Save.
Name
Office Room 123
Receiver Properties
Name
Outdoor
Receiver Type
Outdoor
Length (m)
Width (m)
Height (m)
Notes
Room Absorption
Absorption Coefficients
63
125
250
500
1000
2000
4000
8000
Receiver Criteria
Metric
A
Value
50 dB(A) (50)
Important that Receiver Type is set to Outdoor
Close
New
Reset
Save


Swegon
Home
Products
Analysis
Reporting
TU
Calculation Modules
Rectangular Breakout In-Line
Circular Breakout In-Line
Library Element Quick Add
Straight Duct
Flexible Duct
Elbow
Branching
End Reflection
Noise Control
Duct Breakin / Breakout
Sound Transmission
Room Effect
Outdoor Noise
AHU project 123 Outdoor
Sypply air
Frequency dBA 63 125 250 500 1k 2k 4k 8k
Total 84 82 81 80 80 80 76 75 74
Required Insertion Loss
Receiver: default (dBA) 84 82 81 80 80 80 76 75 74
Add Path
Move to head of path
AHU 123
Outdoor
84 82 81 80 80 80 76 75 74
Branch
Drag and drop the ”Outdoor distance Attenuation” symbol inside the dashed square

Swegon

Swegon Home Products Analysis Reporting

Calculation Modules
Rectangular Breakout In-Line
Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

Noise Control

Duct Breakin / Breakout

Sound Transmission

Room Effect

Outdoor Noise

AHU project 123 Outdoor

Sypply air
Frequency
Total
Required Insertion Loss
Receiver: Outdoor (50 dB(A))

AHU 123
Outdoor

Outdoor Distance Attenuation
5m Distance

Outdoor Distance Attenuation

Choose your Receiver, Directivity Factor and Receiver distance Click Save

Edit properties

Details

Receiver name

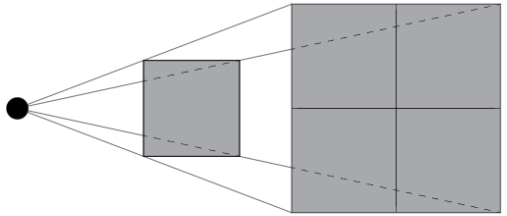
Outdoor

Directivity Factor

2

Receiver Distance (m)

5



Airflow and Velocity

Override Airflow & Velocity

Airflow (l/s)

3000

Velocity (m/s)

0

(You can read about directivity factors by clicking this link)

Additional Resources

Calculation References

2015 ASHRAE Applications Handbook, Chapter 48, Noise and Vibration Control

Add Attachment

Previous Next Cancel Save

Swegon Silencers

Calculation Modules

Rectangular Breakout In-Line

Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

Noise Control

Duct Breakin / Breakout

Sound Transmission

Room Effect

Outdoor Noise

AHU project 123 Outdoor

Sypply air

	dBA	63	125	250	500	1k	2k	4k	8k
Frequency									
Total	62	60	59	58	58	58	54	53	52
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	62	60	59	58	58	58	54	53	52
AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
Outdoor Distance Attenuation 5m Distance	62	-22	-22	-22	-22	-22	-22	-22	-22

Add Path

Build your duct system between the Noise Source and the Receiver
by draging and dropping elements from the Library Elements Quick Add

Swegon

Swegon Home Products Analysis Reporting TU

Libraries

Library

Receivers

Product Configurators

Swegon Silencers

Calculation Modules

Rectangular Breakout In-Line

Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

Noise Control

Duct Breakin / Breakout

AHU project 123 Outdoor

Add Path

Sypply air	dBA	63	125	250	500	1k	2k	4k	8k
Frequency									
Total	62	58	58	57	58	58	54	53	52
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	62	58	58	57	58	58	54	53	52
AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
Rectangular Duct 1600mm × 800mm × 3m	84	-2	-1	-1	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	62	-22	-22	-22	-22	-22	-22	-22	-22

Branch

Drag and drop the ”End reflection loss” symbol inside the dashed square

Swegon Home Products Analysis Reporting

Libraries
Library
Receivers
Product Configurators
Swegon Silencers
Calculation Modules
Rectangular Breakout In-Line
Circular Breakout In-Line
Library Element Quick Add
Straight Duct
Flexible Duct
Elbow
Branching
End Reflection
Noise Control
Duct Breakin / Breakout

AHU project 123 Ou

Sypply air
Frequency
Total
Required Insertion Loss
Receiver: Outdoor (50
AHU 123
Outdoor
Rectangular Duct
1600mm × 800mm × 3
Rectangular - End Refl
Loss
1600mm × 800mm (Flu
Outdoor Distance Atte
5m Distance

Rectangular - End Reflection Loss

Write your dimensions for the hole in the fasade

Properties

Width (mm)	Height (mm)
1600	800

Duct Termination

Flush

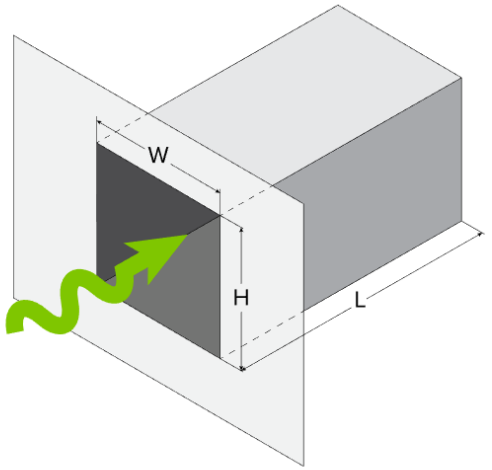
Airflow and Velocity

Override Airflow & Velocity

Airflow (l/s)	Velocity (m/s)
3000	2

T

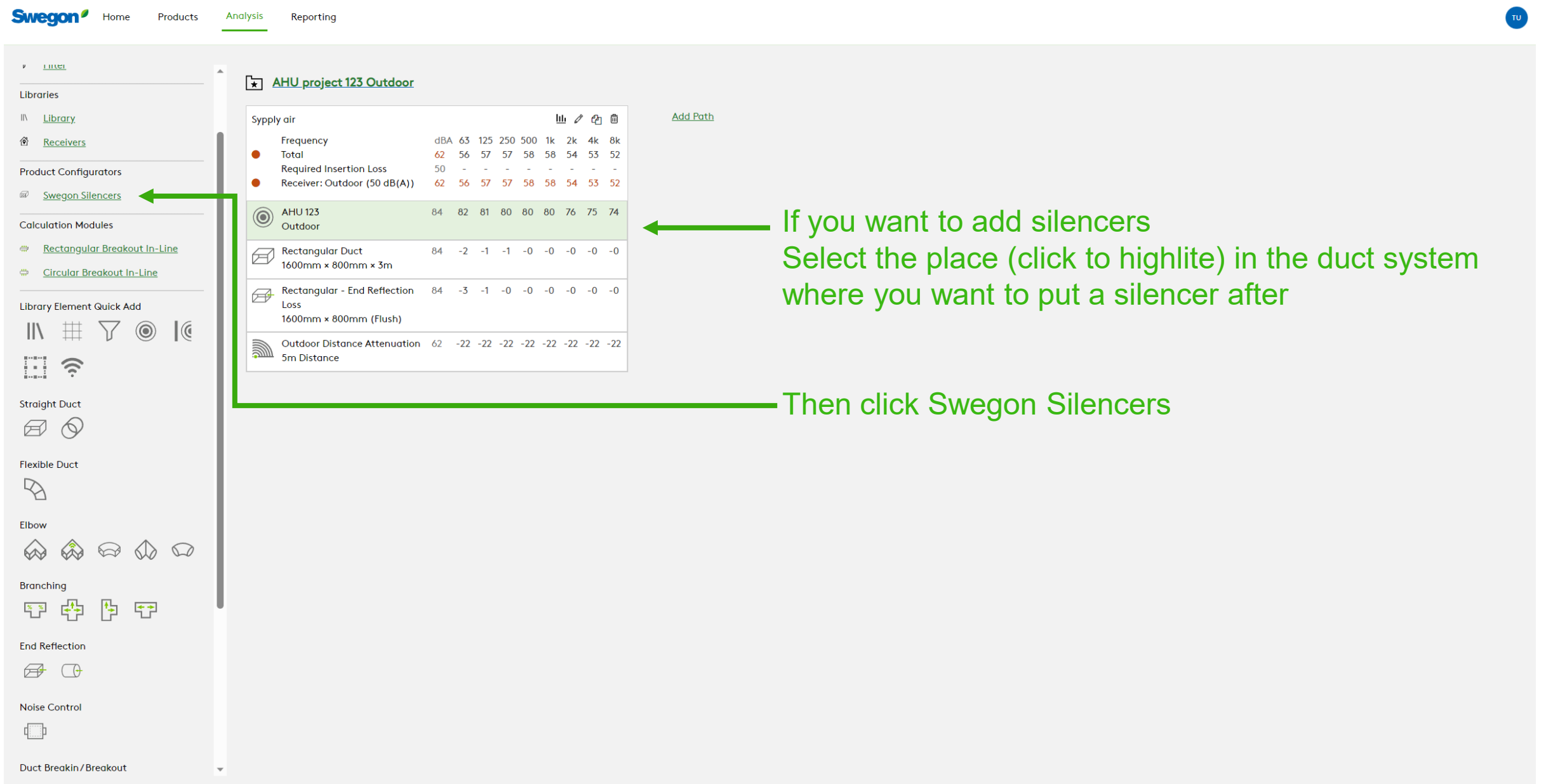
Details



When low-frequency energy sound waves encounter the end of a duct that is terminated into a large room, some of the incident sound energy is reflected back into the duct.
Additional Resources
ASHRAE Research Projects
ASHRAE RP-1314
Calculation References
2015 ASHRAE Applications Handbook, Chapter 48, Noise and Vibration Control

Add Attachment

Previous Next Close


Swegon
Home
Products
Analysis
Reporting
TU
Libraries
Library
Receivers
Product Configurators
Swegon Silencers
Calculation Modules
Rectangular Breakout In-Line
Circular Breakout In-Line
Library Element Quick Add
Straight Duct
Flexible Duct
Elbow
Branching
End Reflection
Noise Control
Duct Breakin / Breakout
AHU project 123 Outdoor
Sypply air
Frequency dBA 63 125 250 500 1k 2k 4k 8k
Total 62 56 57 57 58 58 54 53 52
Required Insertion Loss 50 - - - - - - - -
Receiver: Outdoor (50 dB(A)) 62 56 57 57 58 58 54 53 52
AHU 123 Outdoor 84 82 81 80 80 80 76 75 74
Rectangular Duct 1600mm × 800mm × 3m 84 -2 -1 -1 -0 -0 -0 -0 -0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush) 84 -3 -1 -0 -0 -0 -0 -0 -0
Outdoor Distance Attenuation 5m Distance 62 -22 -22 -22 -22 -22 -22 -22 -22
Add Path
If you want to add silencers
Select the place (click to highlite) in the duct system
where you want to put a silencer after
Then click Swegon Silencers

Silencer Selection

Write a Tag and Choose Shape and dimensions
Choose a silencer from the list (click to highlite) and click Create

Identity

Tag: Silencer 1

Quantity: 1

Dimensions & Airflow

Shape: Rectangular

Duct Width: 1600 mm

Duct Height: 800 mm

Max Length: 1250 mm

Override Airflow & Velocity

Silencer Flow Rate: 3000 l/s

Velocity: 2.34 m/s

Maximum Pressure Drop: 87.18 Pa

System Effects

Silencer Inlet Condition: Ideal Outlet Conditions - 3 to 4 diameters of straight duct

Diameter from Silencer

Transition Length

Override Required Inserti...

Required Insertion Loss

Frequency	dBA	63	125	250	500	1k	2k	4k	8k
Sound Before Attenuator	84	82	81	80	80	80	76	75	74
Required Insertion Loss	**50**	-	-	-	-	-	-	-	-
Calculated Insertion Loss		-	-	-	-	-	-	-	-
Safety Factor		0	0	0	0	0	0	0	0

Silencer Selection

					Octave Midband Frequency, Hz							
Model	**L**	**PD**	**w/SE**	**A**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
CALMO a-1611-1600-800-650	650	6	6		5	10	15	23	27	27	15	10
Generated Noise					28	28	24	22	19	16	15	13
End Result				44	51	47	42	35	31	27	38	42
FACILE a-1610-1600-800-750	750	11	11		3	7	12	18	26	25	15	11
Generated Noise					20	20	16	14	11	<10	<10	<10
End Result				4	53	50	45	40	32	29	38	41
CALMO a-1622-1600-800-1250	1250	3	3		4	9	16	21	25	18	11	11
Generated Noise					11	11	<10	<10	<10	<10	<10	<10
End Result				46	52	48	41	37	33	36	42	41
CADENZA a-1627-1600-800-1250	1250	7	7		5	11	18	27	32	22	13	12
Generated Noise					17	17	13	11	<10	<10	<10	<10
End Result				44	51	46	39	31	26	32	40	40
CALMO a-1621-1600-800-1250	1250	7	7		7	15	24	39	45	40	23	17
Generated Noise					28	28	24	22	19	16	15	13
End Result				37	49	42	33	19	13	14	30	35
CADENZA a-1628-1600-800-1250	1250	9	9		7	12	21	33	39	33	18	14

Options

Unisunlated Cleaning Cover: None

Fire-Resistant Insulated Cleaning Cover: None

- [ ] Insulated 50mm Stone Wool
- [ ] Perforated Sheet Metal Lining
- [ ] Flange Connection

Resources

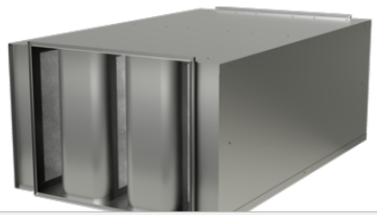
Product Sheet
Attenuator with recessed connection for rectangular ducts

Brochure
Acoustics Overview

Instruction
Installation, commissioning, maintenance

Quality
Approval 2706/92, Duct insulation
Building product declaration

Image



Pressure drop

Sound Level at Receiver with this silencer

Cancel Create

Swegon

Swegon Home Products Analysis Reporting TU

To copy the path, click ”duplicate this path” button

Libraries
- Library
- Receivers

Product Configurators
- Swegon Silencers

Calculation Modules
- Rectangular Breakout In-Line
- Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

Noise Control

Duct Breakin / Breakout

AHU project 123 Outdoor

Add Path

Sypply air

	dBA	63	125	250	500	1k	2k	4k	8k
Frequency									
Total	44	51	47	42	35	31	27	38	42
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	44	51	47	42	35	31	27	38	42
AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
Silencer 1 CALMO a-1611-1600-800-650	67	-5	-10	-15	-23	-27	-27	-15	-10
		28	28	24	22	19	16	15	13
Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	44	-22	-22	-22	-22	-22	-22	-22	-22

Swegon

Swegon Home Products Analysis Reporting TU

Now you have a copy of the first path

Libraries

Library

Receivers

Product Configurators

Swegon Silencers

Calculation Modules

Rectangular Breakout In-Line

Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

Noise Control

Duct Breakin / Breakout

AHU project 123 Outdoor

Sypply air

	Frequency	dBA	63	125	250	500	1k	2k	4k	8k
●	Total	44	51	47	42	35	31	27	38	42
	Required Insertion Loss	50	-	-	-	-	-	-	-	-
●	Receiver: Outdoor (50 dB(A))	47	54	50	45	38	34	30	41	45
	AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
	Silencer 1 CALMO a-1611-1600-800-650	67	-5 28	-10 28	-15 24	-23 22	-27 19	-27 16	-15 15	-10 13
	Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
	Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
	Outdoor Distance Attenuation 5m Distance	44	-22	-22	-22	-22	-22	-22	-22	-22

Sypply air (Copy)

	Frequency	dBA	63	125	250	500	1k	2k	4k	8k
●	Total	44	51	47	42	35	31	27	38	42
	Required Insertion Loss	50	-	-	-	-	-	-	-	-
●	Receiver: Outdoor (50 dB(A))	47	54	50	45	38	34	30	41	45
	AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
	Silencer 1 CALMO a-1611-1600-800-650	67	-5 28	-10 28	-15 24	-23 22	-27 19	-27 16	-15 15	-10 13
	Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
	Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
	Outdoor Distance Attenuation 5m Distance	44	-22	-22	-22	-22	-22	-22	-22	-22

Add Path

Swegon

Swegon Home Products Analysis Reporting TU

Change name by clicking Edit button

Save name here

Filter

Libraries

Library

Receivers

Product Configurators

Swegon Silencers

Calculation Modules

Rectangular Breakout In-Line

Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

Noise Control

Duct Breakin / Breakout

AHU project 123 Outdoor

Outdoor Air

Frequency	dBA	63	125	250	500	1k	2k	4k	8k
Total	44	51	47	42	35	31	27	38	42
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	47	54	50	45	38	34	30	41	45
AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
Silencer 1 CALMO a-1611-1600-800-650	67	-5	-10	-15	-23	-27	-27	-15	-10
		28	28	24	22	19	16	15	13
Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	44	-22	-22	-22	-22	-22	-22	-22	-22

Exhaust Air

Frequency	dBA	63	125	250	500	1k	2k	4k	8k
Total	44	51	47	42	35	31	27	38	42
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	47	54	50	45	38	34	30	41	45
AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
Silencer 1 CALMO a-1611-1600-800-650	67	-5	-10	-15	-23	-27	-27	-15	-10
		28	28	24	22	19	16	15	13
Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	44	-22	-22	-22	-22	-22	-22	-22	-22

Add Path

Swegon

Swegon Home Products Analysis Reporting TU

Filter

Libraries

Library

Receivers

Product Configurators

Swegon Silencers

Calculation Modules

Rectangular Breakout In-Line

Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

Noise Control

Duct Breakin / Breakout

AHU project 123 Outdoor

Outdoor Air

	dBA	63	125	250	500	1k	2k	4k	8k
Total	44	51	47	42	35	31	27	38	42
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	49	55	51	46	39	35	31	43	46
AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
Silencer 1 CALMO a-1611-1600-800-650	67	-5	-10	-15	-23	-27	-27	-15	-10
		28	28	24	22	19	16	15	13
Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	44	-22	-22	-22	-22	-22	-22	-22	-22

Exhaust Air

	dBA	63	125	250	500	1k	2k	4k	8k
Total	47	54	49	44					
Required Insertion Loss	50	-	-	-					
Receiver: Outdoor (50 dB(A))	49	55	51	46					
AHU 123 Exhaust	87	85	83	82					
Silencer 1 CALMO a-1611-1600-800-650	69	-5	-10	-15					
		28	28	24					
Rectangular Duct 1600mm × 800mm × 3m	69	-2	-1	-1					
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	69	-3	-1	-0					
Outdoor Distance Attenuation 5m Distance	47	-22	-22	-22					

Add Path

Click on the Sound Source to change data Set

AHU 123

Properties

Category

Mechanical Equipment/Air Handling Unit

Element

AHU 123

Data Set

Exhaust

Select data set...
Supply
Extract
Exhaust
Outdoor

3000 0

Acoustic Data

Project Tag

Data Set

Metric

Details
Noise sources (from the Library).

Add Attachment

Previous Next Close

Green is Outdoor air sound pressure level

Blue is Exhaust air sound pressure level

Orange is total sound pressure level (Outdoor+Exhaust)

Swegon

Swegon Home Products Analysis Reporting TU

Analysis

Views

- Analysis
- Filter

Libraries

- Library
- Receivers

Product Configurators

- Swegon Silencers

Calculation Modules

- Rectangular Breakout In-Line
- Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

AHU project 123 Outdoor

Add Path

Outdoor Air

	63	125	250	500	1k	2k	4k	8k
Frequency								
Total	51	47	42	35	31	27	38	42
Required Insertion Loss	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	55	51	46	39	35	31	43	46
AHU 123 Outdoor	82	81	80	80	80	76	75	74
Silencer 1 CALMO a-1611-1600-800-650	-5	-10	-15	-23	-27	-27	-15	-10
	28	28	24	22	19	16	15	13
Rectangular Duct 1600mm × 800mm × 3m	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	-3	-1	-0	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	-22	-22	-22	-22	-22	-22	-22	-22

Exhaust Air

	63	125	250	500	1k	2k	4k	8k
Frequency								
Total	54	49	44	37	33	29	41	44
Required Insertion Loss	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	55	51	46	39	35	31	43	46
AHU 123 Exhaust	85	83	82	82	82	78	78	76
Silencer 1 CALMO a-1611-1600-800-650	-5	-10	-15	-23	-27	-27	-15	-10
	28	28	24	22	19	16	15	13
Rectangular Duct 1600mm × 800mm × 3m	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	-3	-1	-0	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	-22	-22	-22	-22	-22	-22	-22	-22

Swegon

Swegon | Home | Products | Analysis | Reporting

Calculation Summary
Silencer Schedule
Silencer Submittal

Print out result by hovering over Reporting and click Calculation summary

TU

Analysis

Views

- Analysis
- Filter

Libraries

- Library
- Receivers

Product Configurators

- Swegon Silencers

Calculation Modules

- Rectangular Breakout In-Line
- Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

AHU project 123 Outdoor

Outdoor Air

	Frequency	dBA	63	125	250	500	1k	2k	4k	8k
●	Total	44	51	47	42	35	31	27	38	42
	Required Insertion Loss	50	-	-	-	-	-	-	-	-
●	Receiver: Outdoor (50 dB(A))	49	55	51	46	39	35	31	43	46
	AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
	Silencer 1 CALMO a-1611-1600-800-650	67	-5 28	-10 28	-15 24	-23 22	-27 19	-27 16	-15 15	-10 13
	Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
	Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
	Outdoor Distance Attenuation 5m Distance	44	-22	-22	-22	-22	-22	-22	-22	-22

Exhaust Air

	Frequency	dBA	63	125	250	500	1k	2k	4k	8k
●	Total	47	54	49	44	37	33	29	41	44
	Required Insertion Loss	50	-	-	-	-	-	-	-	-
●	Receiver: Outdoor (50 dB(A))	49	55	51	46	39	35	31	43	46
	AHU 123 Exhaust	87	85	83	82	82	82	78	78	76
	Silencer 1 CALMO a-1611-1600-800-650	69	-5 28	-10 28	-15 24	-23 22	-27 19	-27 16	-15 15	-10 13
	Rectangular Duct 1600mm × 800mm × 3m	69	-2	-1	-1	-0	-0	-0	-0	-0
	Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	69	-3	-1	-0	-0	-0	-0	-0	-0
	Outdoor Distance Attenuation 5m Distance	47	-22	-22	-22	-22	-22	-22	-22	-22

Add Path

Report shows Outdoor air path, Exhaust air path and Summed level to receiver in a diagram.

Calculation Summary

Project: AHU project 123 Outdoor

Outdoor noise calculation

PathName: Outdoor Air

Duct detail	Airl/s		63	125	250	500	1k	2k	4k	8k	dB(A)
AHU 123	3000	Ld	-	-	-	-	-	-	-	-	
Data set: Outdoor; Metric: Sound Power Level		Lw	82	81	80	80	80	76	75	74	
Silencer 1	3000	Ld	-5	-10	-15	-23	-27	-27	-15	-10	
Model: CALMO a-1611-1600-800-650; Size (W x H): 1600mm x 800mm; Length: 650mm; Velocity: 2m/s; Pressure Drop: 6Pa		Lw	28	28	24	22	19	16	15	13	
Rectangular Duct	3000	Ld	-2	-1	-1	-0	-0	-0	-0	-0	
Size (W x H): 1600mm x 800mm; Length: 3m		Lw	-	-	-	-	-	-	-	-	
Rectangular: End Reflection Loss	3000	Ld	-3	-1	-0	-0	-0	-0	-0	-0	
Size (W x H): 1600mm x 800mm; Duct Termination: Flush		Lw	-	-	-	-	-	-	-	-	
Outdoor Distance Attenuation	3000	Ld	-22	-22	-22	-22	-22	-22	-22	-22	
Source to Receiver Distance: 5m; Directivity Factor: 2		Lw	-	-	-	-	-	-	-	-	
Demand		Lk	71	62	54	49	45	42	40	39	50
Level		Lp	51	47	42	35	31	27	38	42	44
Damping requirement		Ld	-	-	-	-	-	-	-	3	

Calculation Summary

Project: AHU project 123 Outdoor

Outdoor noise calculation

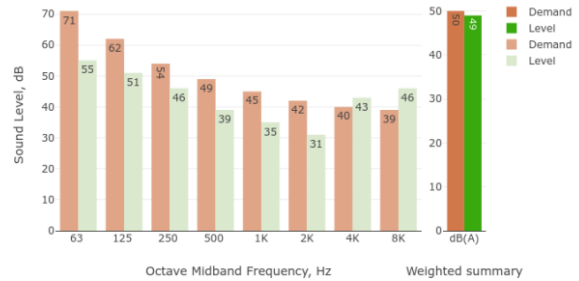
PathName: Exhaust Air

Duct detail	Airl/s		63	125	250	500	1k	2k	4k	8k	dB(A)
AHU 123	3000	Ld	-	-	-	-	-	-	-	-	
Data set: Exhaust; Metric: Sound Power Level		Lw	85	83	82	82	82	78	78	76	
Silencer 1	3000	Ld	-5	-10	-15	-23	-27	-27	-15	-10	
Model: CALMO a-1611-1600-800-650; Size (W x H): 1600mm x 800mm; Length: 650mm; Velocity: 2m/s; Pressure Drop: 6Pa		Lw	28	28	24	22	19	16	15	13	
Rectangular Duct	3000	Ld	-2	-1	-1	-0	-0	-0	-0	-0	
Size (W x H): 1600mm x 800mm; Length: 3m		Lw	-	-	-	-	-	-	-	-	
Rectangular: End Reflection Loss	3000	Ld	-3	-1	-0	-0	-0	-0	-0	-0	
Size (W x H): 1600mm x 800mm; Duct Termination: Flush		Lw	-	-	-	-	-	-	-	-	
Outdoor Distance Attenuation	3000	Ld	-22	-22	-22	-22	-22	-22	-22	-22	
Source to Receiver Distance: 5m; Directivity Factor: 2		Lw	-	-	-	-	-	-	-	-	
Demand		Lk	71	62	54	49	45	42	40	39	50
Level		Lp	54	49	44	37	33	29	41	44	47
Damping requirement		Ld	-	-	-	-	-	-	1	5	

Calculation Summary

Project: AHU project 123 Outdoor

Summed sound level to receiver (Outdoor)



Swegon

Swegon Home Products Analysis Reporting TU

Calculation Summary
Silencer Schedule
Silencer Submittal

Print out silencer info by hovering over Reporting and click Silencer Submittal

Analysis

Views
- Analysis
- Filter

Libraries
- Library
- Receivers

Product Configurators
- Swegon Silencers

Calculation Modules
- Rectangular Breakout In-Line
- Circular Breakout In-Line

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

AHU project 123 Outdoor

Outdoor Air

	dBA	63	125	250	500	1k	2k	4k	8k
Frequency									
Total	44	51	47	42	35	31	27	38	42
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	49	55	51	46	39	35	31	43	46
AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
Silencer 1 CALMO a-1611-1600-800-650	67	-5 28	-10 28	-15 24	-23 22	-27 19	-27 16	-15 15	-10 13
Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	44	-22	-22	-22	-22	-22	-22	-22	-22

Exhaust Air

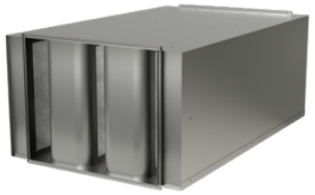
	dBA	63	125	250	500	1k	2k	4k	8k
Frequency									
Total	47	54	49	44	37	33	29	41	44
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	49	55	51	46	39	35	31	43	46
AHU 123 Exhaust	87	85	83	82	82	82	78	78	76
Silencer 1 CALMO a-1611-1600-800-650	69	-5 28	-10 28	-15 24	-23 22	-27 19	-27 16	-15 15	-10 13
Rectangular Duct 1600mm × 800mm × 3m	69	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	69	-3	-1	-0	-0	-0	-0	-0	-0
Outdoor Distance Attenuation 5m Distance	47	-22	-22	-22	-22	-22	-22	-22	-22

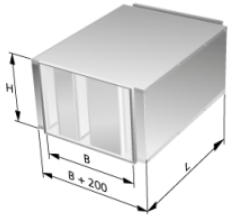
Add Path

Silencer Submittal

Project: AHU project 123 Outdoor

CALMO a-1611-1600-800-650





Path
Outdoor Air

Position
Silencer 1

Quick facts
- Included in the MagiCAD database
- Excellent aerodynamic characteristics
- Available with cleaning cover
- Available in an insulated version with 50 mm thick fire-resistant stone wool
- Connection sizes ranging from 400x300 to 2200x2200
- Remarkably space-saving rectangular sound attenuator
- Extremely low pressure drop via tapered acoustic baffle surfaces
- Type-approved, environmentally friendly sound attenuating material, ISOVER Cleantec® PLUS
- ISOVER Cleantec® PLUS is cleanable using a wet method.

General
- The CALMO is, due to its unique design with connections facing the side baffles, suitable for use both in ducts and in direct connection to ventilation units.

Dimensions

Width, B	1600mm
Height, H	800mm
Length, L	650mm
Weight	67kg

Data

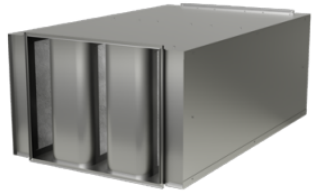
Inlet	Ideal Outlet Conditions - 3 to 4 diameters of straight duct
Outlet	Ideal Outlet Conditions - 3 to 4 diameters of straight duct
Air flowl/s	3000
Velocity(m/s)	2
Pressure drop(Pa)	6

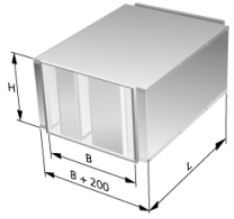
Frequency band	63	125	250	500	1k	2k	4k	8k	Sum db(A)
Lw before attenuator	78	79	79	80	80	76	75	74	84
Attenuation (Ld)	5	10	15	23	27	27	15	10	
Sound generation (Lw)	28	28	24	22	19	16	15	13	
Lw after attenuator	73	69	64	57	53	49	60	64	66

Silencer Submittal

Project: AHU project 123 Outdoor

CALMO a-1611-1600-800-650





Path
Exhaust Air

Position
Silencer 1

Quick facts
- Included in the MagiCAD database
- Excellent aerodynamic characteristics
- Available with cleaning cover
- Available in an insulated version with 50 mm thick fire-resistant stone wool
- Connection sizes ranging from 400x300 to 2200x2200
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General
- The CALMO is, due to its unique design with connections facing the side baffles, suitable for use both in ducts and in direct connection to ventilation units.

Dimensions

Width, B	1600mm
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Data

Inlet	Ideal Outlet Conditions - 3 to 4 diameters of straight duct
Outlet	Ideal Outlet Conditions - 3 to 4 diameters of straight duct
Air flowl/s	3000
Velocity(m/s)	2
Pressure drop(Pa)	6

Frequency band	63	125	250	500	1k	2k	4k	8k	Sum db(A)
Lw before attenuator	81	81	81	82	82	78	78	76	86
Attenuation (Ld)	5	10	15	23	27	27	15	10	
Sound generation (Lw)	28	28	24	22	19	16	15	13	
Lw after attenuator	76	71	66	59	55	51	63	66	69

Tips and Tricks

Using a Noise Barrier in an outdoor calculation

Swegon Home Products Analysis Reporting

Library Element Quick Add

Straight Duct

Flexible Duct

Elbow

Branching

End Reflection

Noise Control

Duct Breakin / Breakout

Sound Transmission

Room Effect

Outdoor N...

AHU project 123 Outdoor

Outdoor Air

	dBA	63	125	250	500	1k	2k	4k	8k
Frequency									
Total	30	43	37	29	20	16	12	23	27
Required Insertion Loss	50	-	-	-	-	-	-	-	-
Receiver: Outdoor (50 dB(A))	47	54	49	44	37	33	29	41	44
AHU 123 Outdoor	84	82	81	80	80	80	76	75	74
Silencer 1 CALMO a-1611-1600-800-650	67	-5	-10	-15	-23	-27	-27	-15	-10
		28	28	24	22	19	16	15	13
Rectangular Duct 1600mm × 800mm × 3m	66	-2	-1	-1	-0	-0	-0	-0	-0
Rectangular - End Reflection Loss 1600mm × 800mm (Flush)	66	-3	-1	-0	-0	-0	-0	-0	-0
Noise Barrier 3m Barrier Height	52	-8	-10	-13	-15	-15	-15	-15	-15
Outdoor Distance Attenuation 5m Distance	30	-22	-22	-22	-22	-22	-22	-22	-22

Noise Barrier

Edit properties

Source to Receiver (m): 5

Source to Barrier (m): 3

Receiver Height (m): 1.5

Barrier Height (m): 3

Ideal Barrier?

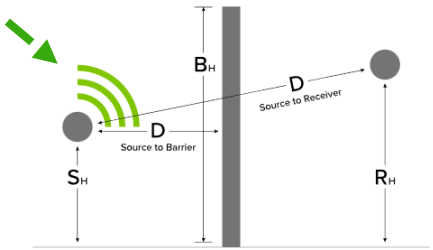
Airflow and Velocity

Override Airflow & Velocity

Airflow (l/s): 3000

Velocity (m/s): 2

Details



Additional Resources

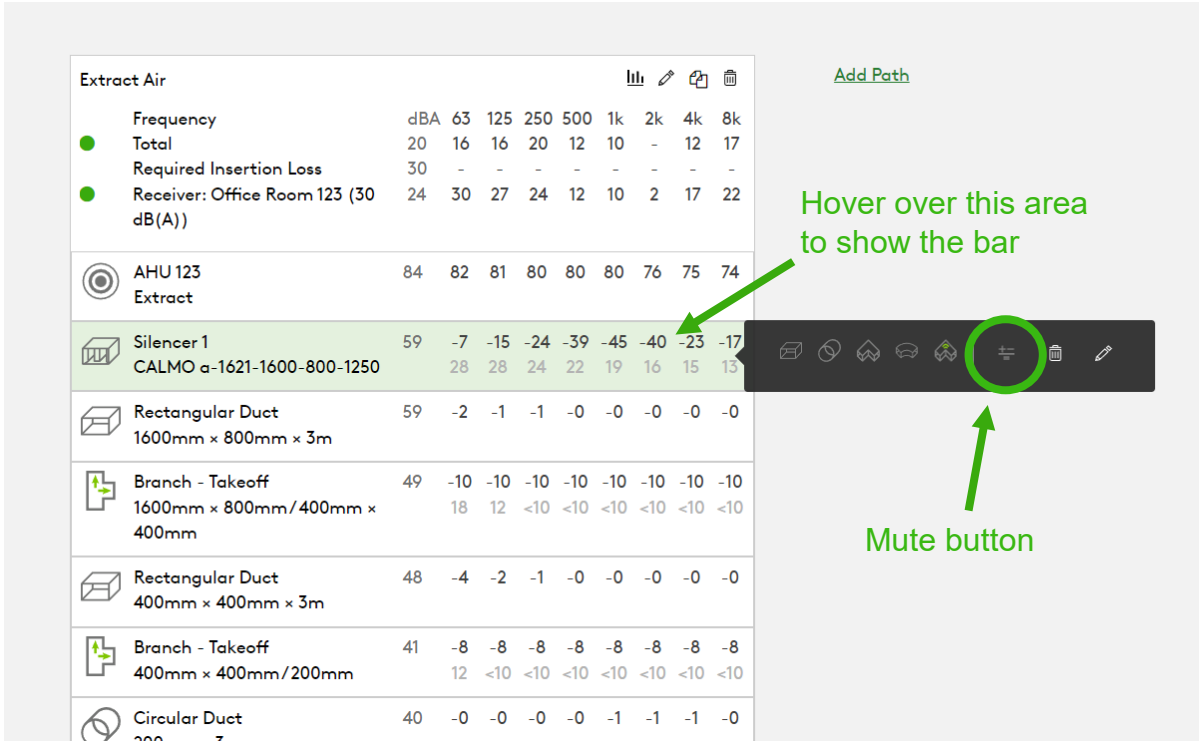
Calculation References

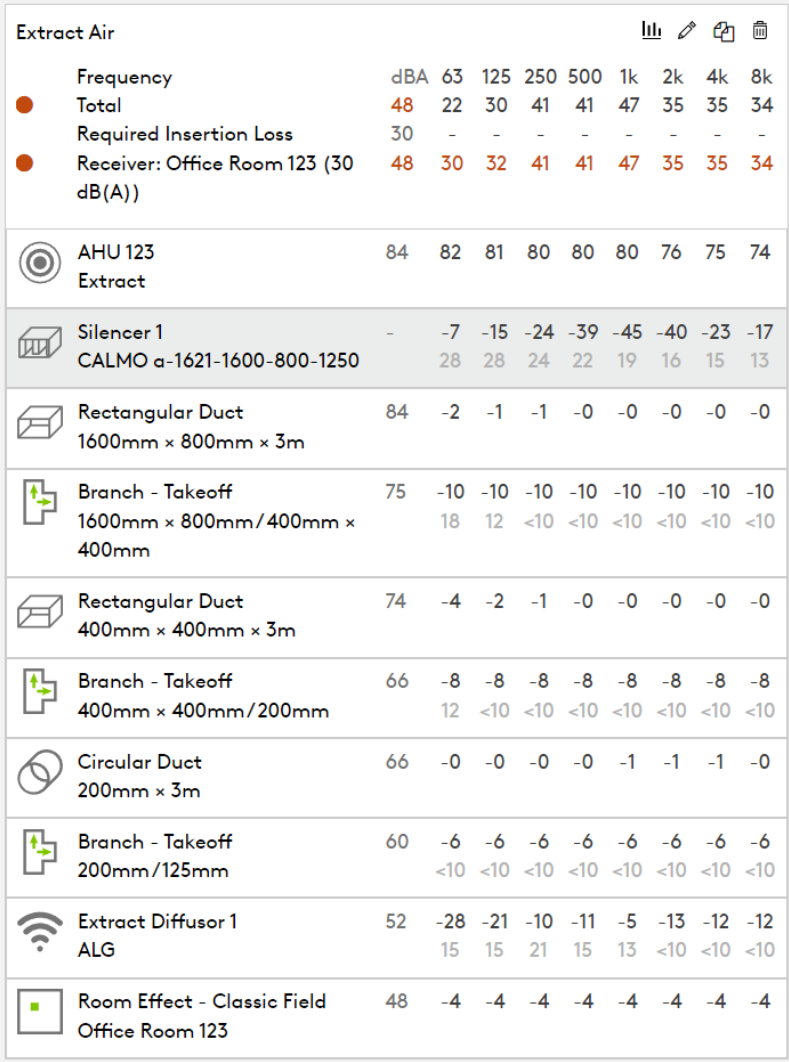
Industrial Noise and Vibration Control

Add Attachment

Previous Next Cancel Save

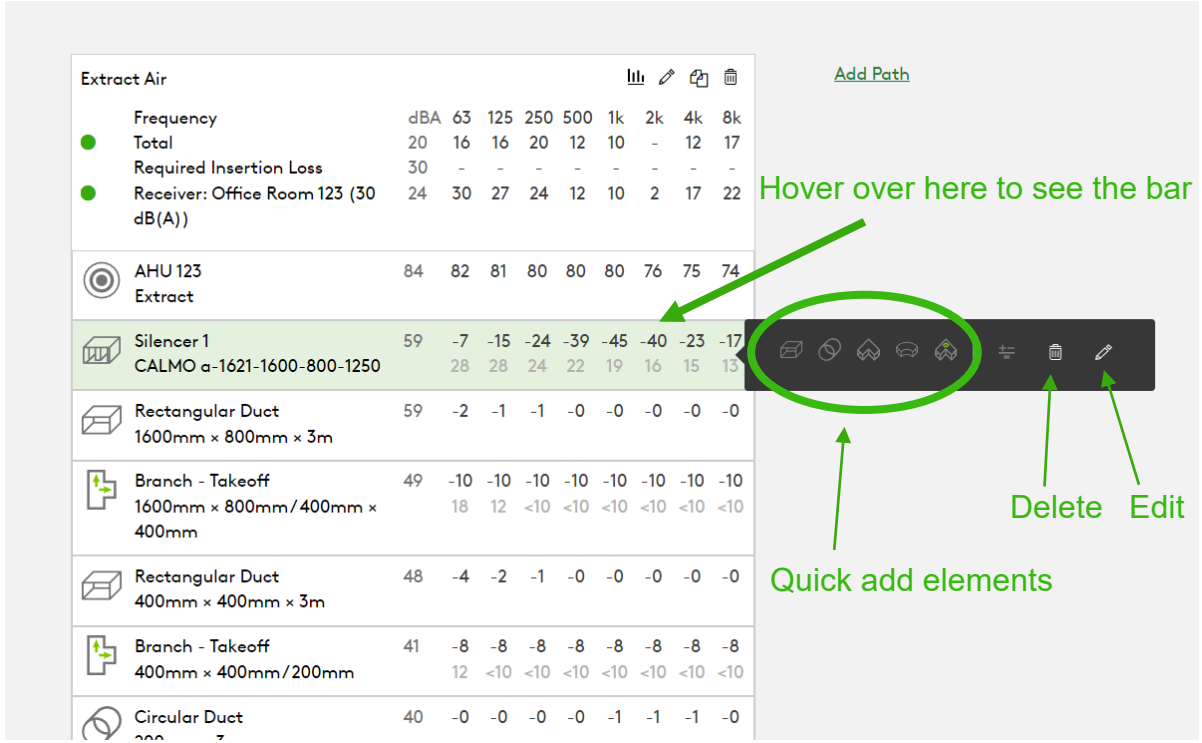
You can mute objects, by clicking the mute symbol
Then the object turns grey and is not longer included in the sound calculation.
You can unmute them the same way.



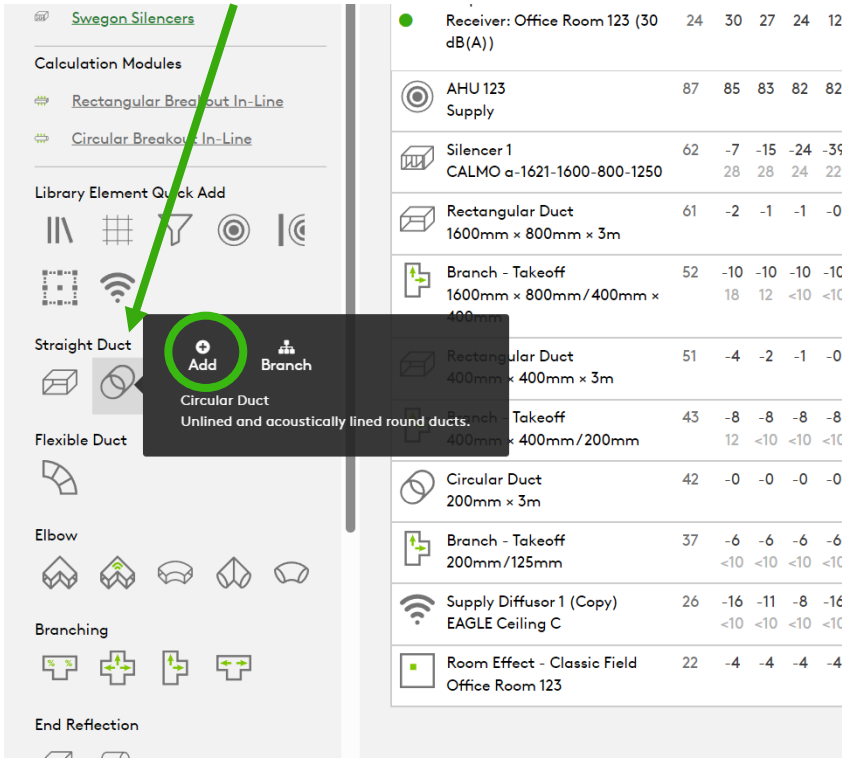


The benefit is to be able to see what the result is without a silencer for example, without deleting any object.

Quick add Library Elements without drag and drop



Hover over element icon
Quick add by clicking ”Add”



Get the correct pressure drop for the silencer by using system effects

Silencer Selection

Identity

Tag: Silencer 1

Quantity: 1

Dimensions & Airflow

Shape: Rectangular/CALMO

Duct Width: 1600 mm

Duct Height: 800 mm

Max Length: 1250 mm

Override Airflow & Velocity

Silencer Flow Rate: 3000 l/s

Velocity: 2.34 m/s

Maximum Pressure Drop: 50 Pa

System Effects

Silencer Inlet Condition: Axial Fan

Diameter from Silencer: 0

Transition Length:

Silencer Outlet Condition: Radius Elbow with no turning vanes

Override Required Inserti...

Required Insertion Loss

Frequency	dBA	63	125	250	500	1k	2k	4k	8k
Sound Before Attenuator	87	85	83	82	82	82	78	78	76
Required Insertion Loss	**30**	-	-	-	-	-	-	-	-
Calculated Insertion Loss		-	-	-	-	-	-	-	-
Safety Factor		0	0	0	0	0	0	0	0

Silencer Selection

					Octave Midband Frequency, Hz							
Model	**L**	**PD**	**w/SE**	**A**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
CALMO a-1611-1600-800-650	650	6	12		5	10	15	23	27	27	15	10
Generated Noise			+9		28	28	24	22	19	16	15	13
End Result				30	32	32	30	15	9	11	24	27
CALMO a-1621-1600-800-1250	1250	7	14		7	15	24	39	45	40	23	17
Generated Noise			+9		28	28	24	22	19	16	15	13
End Result				22	30	27	21	1	0	0	16	20
CALMO a-1622-1600-800-1250	1250	3	7		4	9	16	21	25	18	11	11
Generated Noise			+9		11	11	<10	<10	<10	<10	<10	<10
End Result				32	33	33	29	17	11	20	28	26

Pressure drop with system effects

Pressure drop at ideal conditions
(3-4 diameters straigth duct)

Options

Unisunlated Cleaning Cover: None

Fire-Resistant Insulated Cleaning Cover: None

- [ ] Insulated 50mm Stone Wool
- [ ] Perforated Sheet Metal Lining
- [ ] Flange Connection

Resources

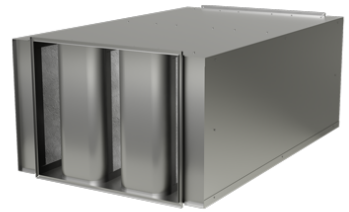
Product Sheet
Attenuator with recessed connection for rectangular ducts

Brochure
Acoustics Overview

Instruction
Installation, commissioning, maintenance

Quality
Approval 2706/92, Duct insulation
Building product declaration

Image



Silencer Selection

Identity

Tag: Silencer 1

Quantity: 1

Dimensions & Airflow

Shape: Rectangular/CALMO

Duct Width: 1600 mm

Duct Height: 800 mm

Max Length: 1250 mm

Override Airflow & Velocity

Silencer Flow Rate: 3000 l/s

Velocity: 2.34 m/s

Maximum Pressure Drop: 3 Pa

System Effects

Silencer Inlet Condition: Axial Fan

Diameter from Silencer: 0

Transition Length:

Silencer Outlet Condition: Radius Elbow with no turning vanes

Override Required Inserti...

Required Insertion Loss

Frequency	dBA	63	125	250	500	1k	2k	4k	8k
Sound Before Attenuator	87	85	83	82	82	82	78	78	76
Required Insertion Loss	**30**	-	-	-	-	-	-	-	-
Calculated Insertion Loss		-	-	-	-	-	-	-	-
Safety Factor		0	0	0	0	0	0	0	0

Silencer Selection

					Octave Midband Frequency, Hz							
Model	L	PD	w/SE	A	63	125	250	500	1k	2k	4k	8k

No silencers found matching your parameters

Options

Please select a silencer to configure options

If you dont see any silencers in the list,
its probably because the maximum pressure drop is set to low.
Increase the value to 50 Pa or higher.

Cancel Create

Swegon