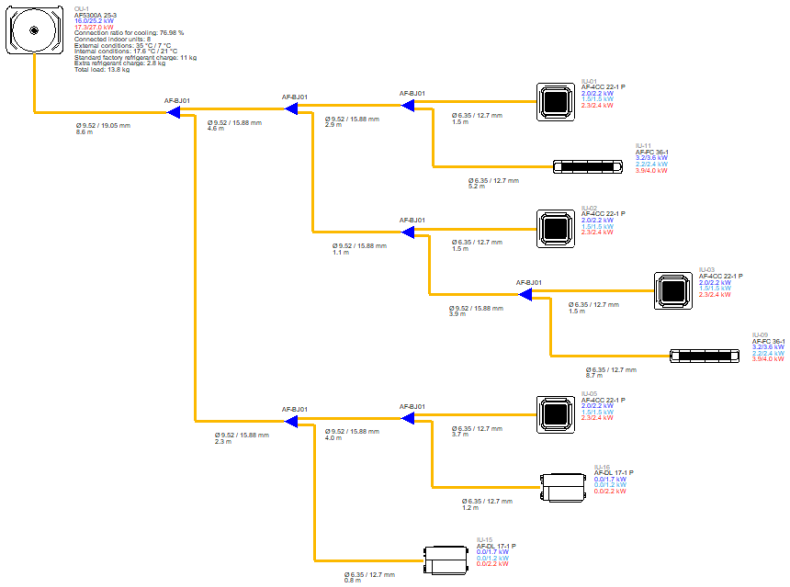
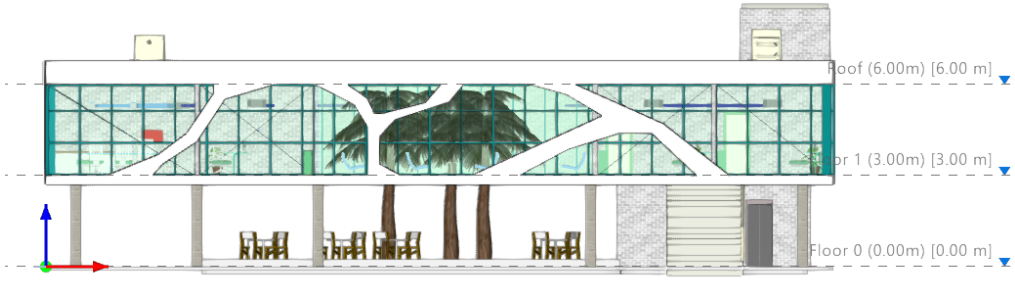
Open BIM **BOSCH**

User's Manual

Design of BOSCH Air Conditioning systems.



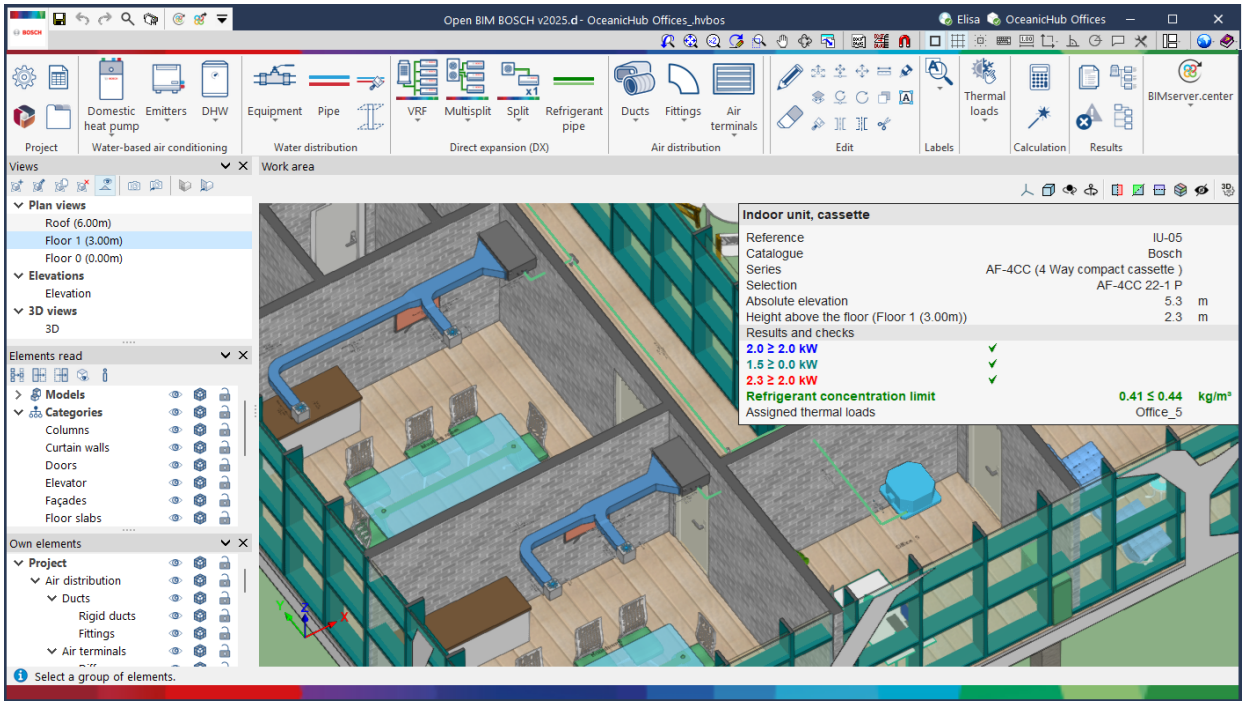


Contents

1 Introduction

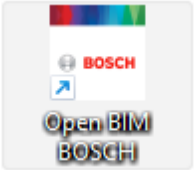
Open BIM BOSCH is a selection tool which designs air conditioning systems such VRF, Multisplit, split 1×1 and Aerothermal.

The programme is integrated into the Open BIM workflow, which allows users to import models from projects stored on the BIMserver.center platform and to form part of the collaborative, multidisciplinary and multi-user workflow provided by Open BIM technology.



To use the software a computer and an internet connection is needed, and a mouse with wheel is strongly recommended.

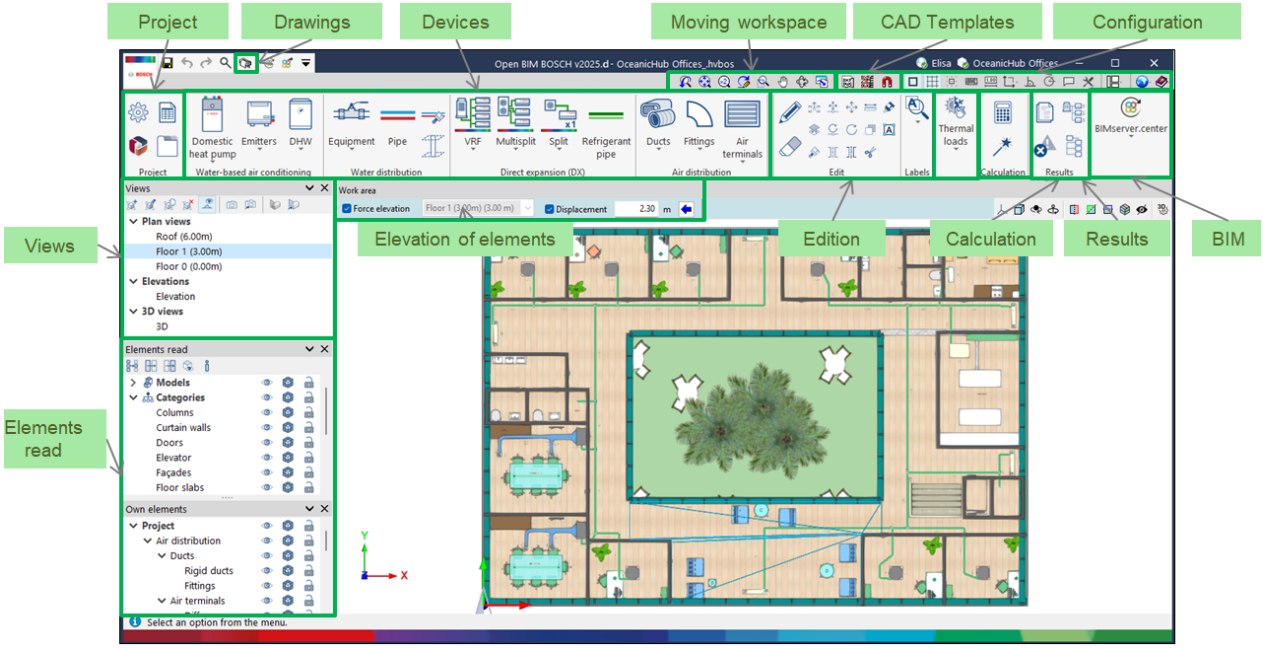
Download the file and click on it. Once the software has been installed, one icon will appear on the desktop.



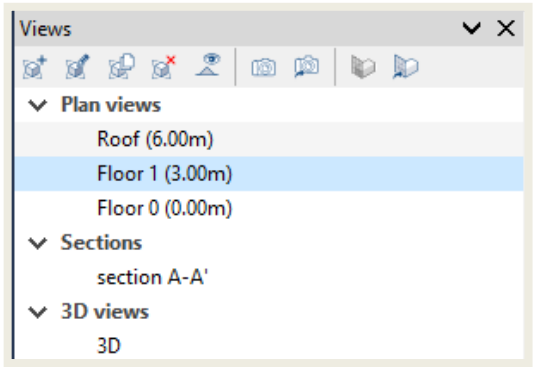
Click **Examples** and open the example called *"OceanicHub Offices"*.

2 Interface

In this section, **Interface,** each part of the interface is explained. It is recommended to open the *"Offices"* example to visualise each part of the programme.

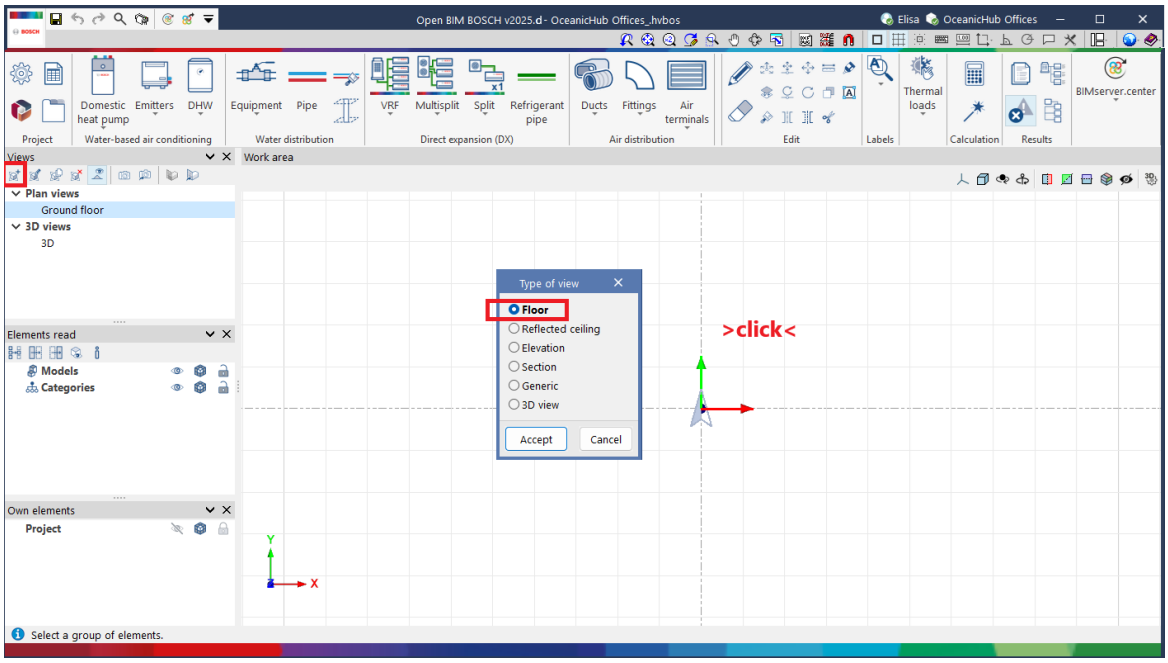


2.1 Views



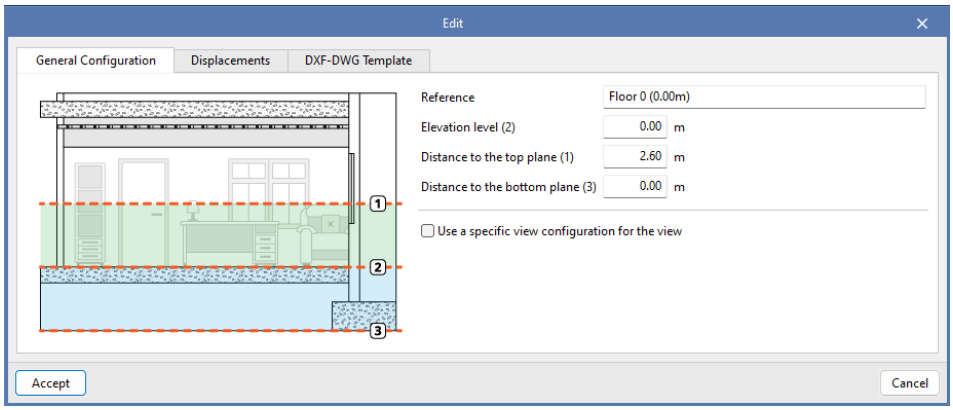
Views are representations of the calculation model application. It is important to note that the components of the model are not linked to the views. Therefore, they can be created, modified, or deleted without affecting the underlying data structure.

Create. Creates a new view.



Edit. Modifies the view range. All types of views, except the 3D view, are associated with an area delimited by two planes, a top and a bottom plane, which determines the elements that will be represented in the view. In elevation, section, and generic plane views, the top plane is the one that is perpendicular to the direction of vision in a positive direction. The bottom plane is the same, but in a negative direction.

Also works by double clicking on the view name.



Duplicate. Copies the current view.

Delete. Deletes the current view.

Save the start scene. Sets the current position of the view as the start scene. This scene will be used in the generation of the graphic documentation of the project.

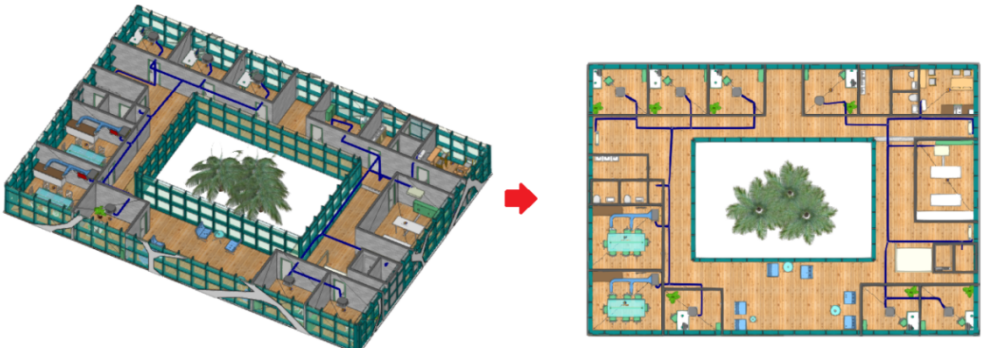
Go to start scene. Directs the current view to the position of the start scene.

Show references. References to other views will be shown in the active view.

Define. Specifies the work plane associated in a 3D view.

Go to the work plane. (Alt+4). Used to restore the view to its original position.

> *This also works by clicking on the white screen and pressing **Alt+4** (the number above the letters, not F4).*
>
> *This button allows users to restore the view very easily.*



2.2 Moving workspace

Full window. Places the design in the centre.

> *You can also press the **mouse wheel twice**.*

Zoom. Zooms in by clicking on the drawing.

> *You can also use the **mouse wheel**; in which case you can zoom both in and out.*

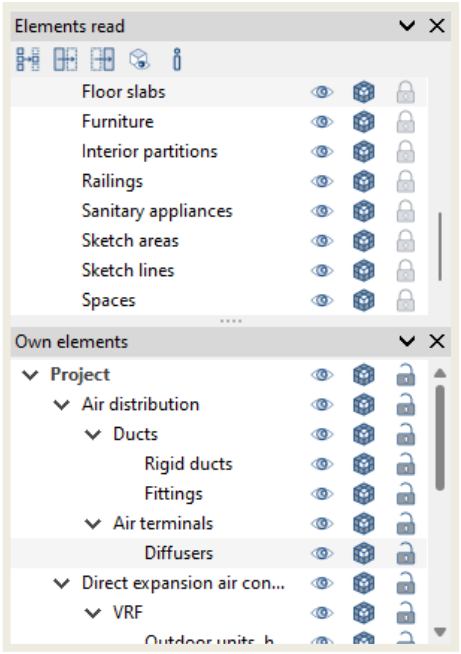
Move image. Changes the position of the drawing. To do this, click on the screen and, while holding down the mouse button, move the hand cursor. After the displacement, press this option again to deactivate it and continue with the previous option.

> *You can also press the **mouse wheel** and, while holding down, **drag** the wheel of the mouse and the cursor becomes a hand. Move it to the right to see how the user's point of view has changed.*

3D orbit. Rotates the scene around the rotation pivot. To do this, click on the screen and hold down the cursor. If the option **Rotation around a point** is checked, the point below the cursor will be used as a rotation pivot. Otherwise, the pivot will be calculated considering the visible elements of the scene. Once the turn has been made, press this option again to deactivate it and continue with the previous option.

> *You can also hold down the **mouse wheel and the "Shift"** key to rotate the scene.*

2.3 Elements read



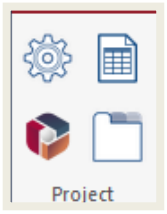
In the lower left area, the architectural elements that the programme has read and recognised can be found. The boxes can be used to enable or disable their display. Leave it as below to easily start working with the programme.

Visible. Show and hide by type of element.

Snap. If it is unlocked, the unit will try to be placed on its surface when 3D mode is being used.

Visualization mode. Can be changed between solid or transparent.

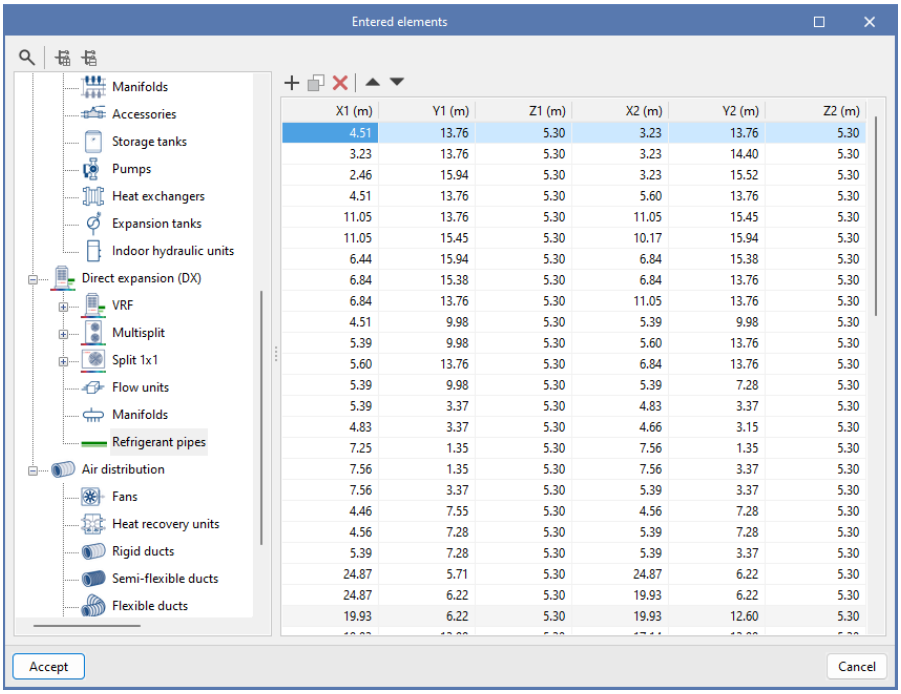
2.4 Project



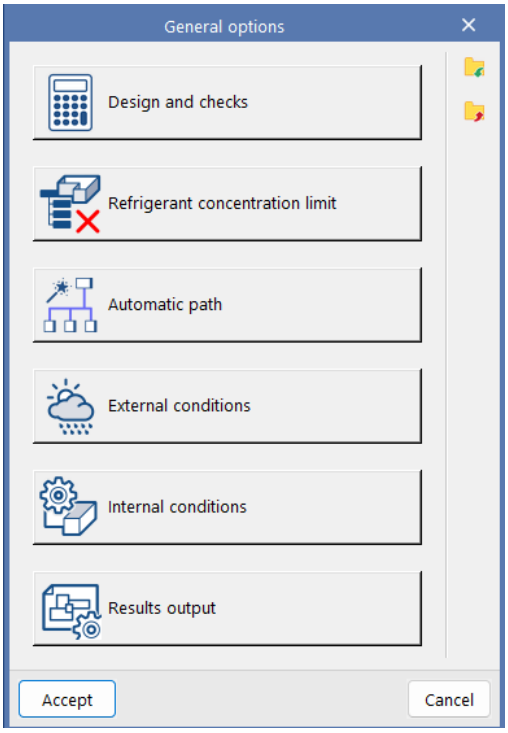
OBDatabase. If you register as an Open BIM Systems user, you will be able to download and use the information of the manufacturer products that are available free of charge on the programs connected to the Open BIM Systems Database.

BIM model. Found in the BIM model are all the elements placed in the project.

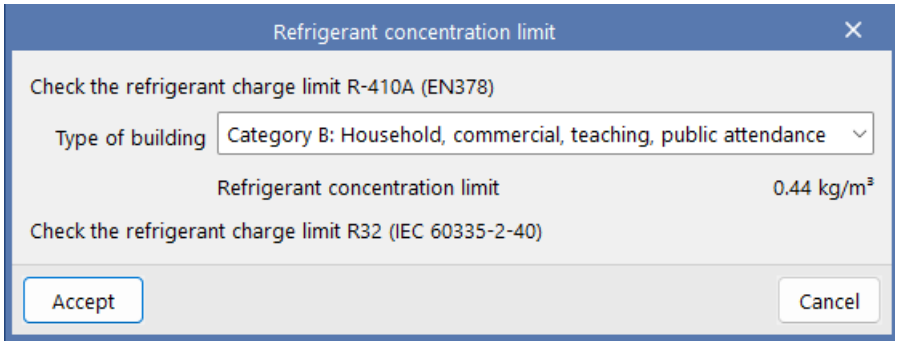
*For example, this can be useful for selecting all pipes **(Ctrl+A)** and easily deleting them.*



General options



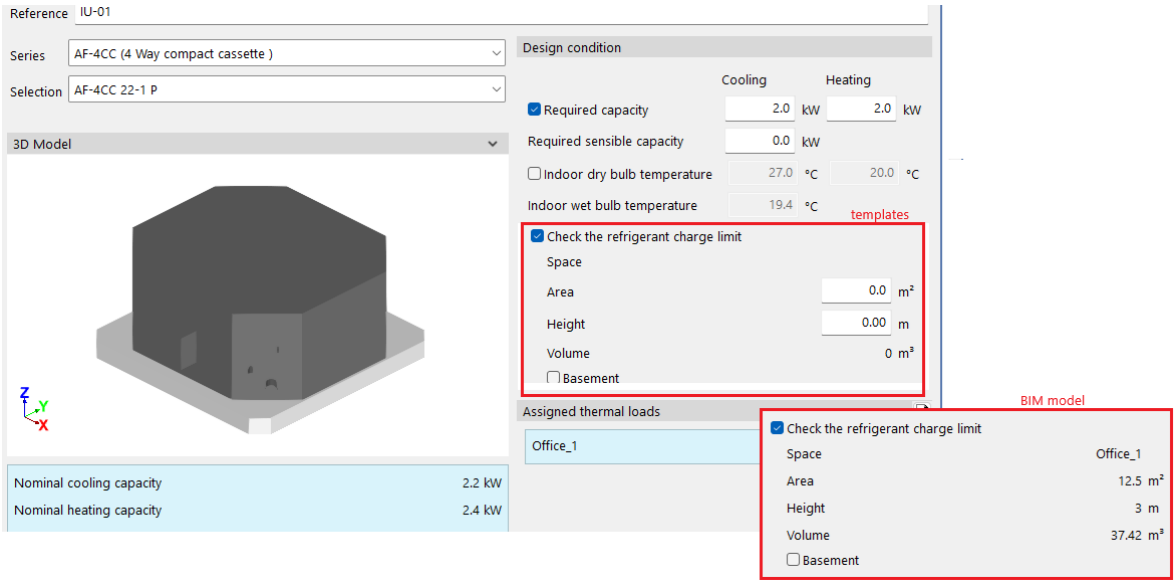
Refrigerant concentration limit. The programme calculates the total concentration of refrigerant R-410A or R32 charge.

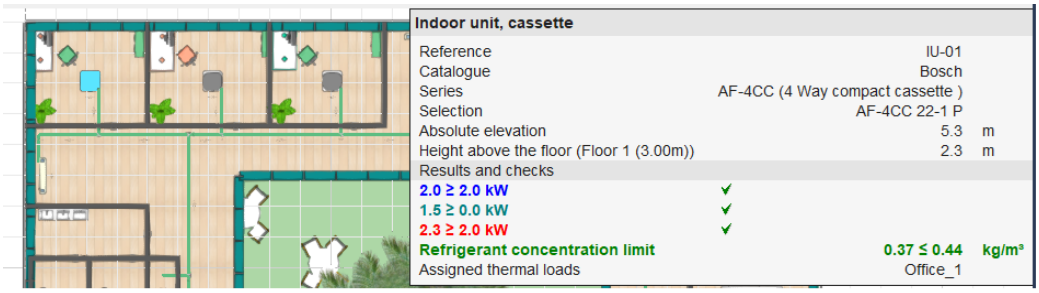


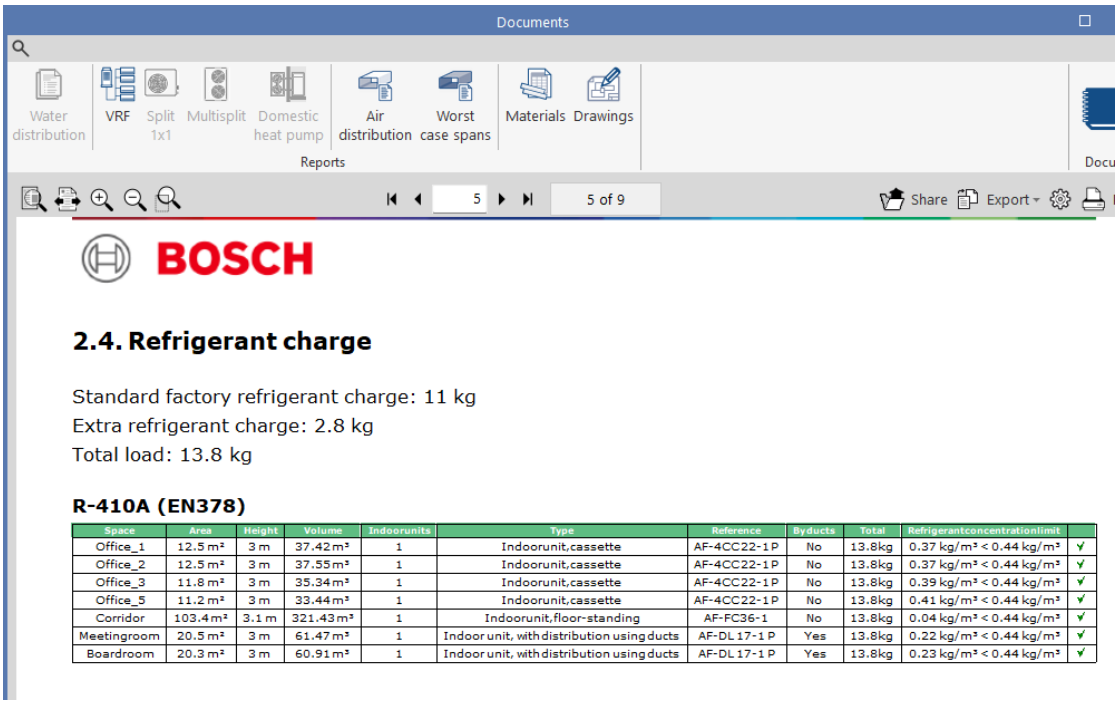
This feature must be activated in each indoor unit panel.

For projects without a BIM model: The user must manually input the area and height of the room.

For projects with a BIM model: The program automatically reads the rooms and detects the indoor units located within them.

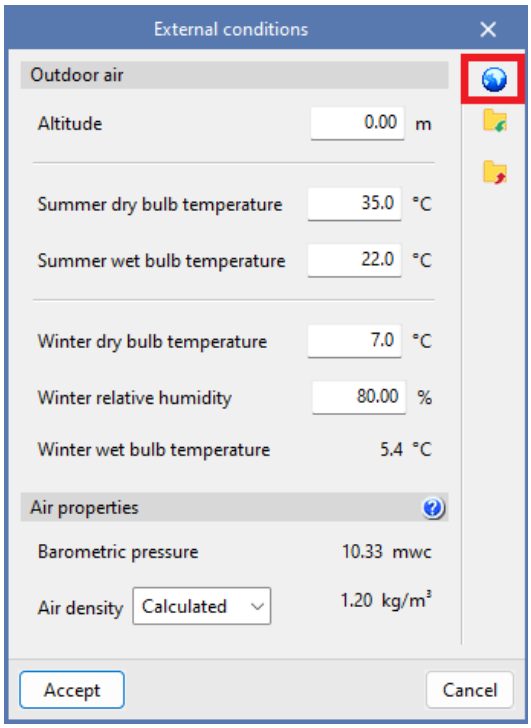


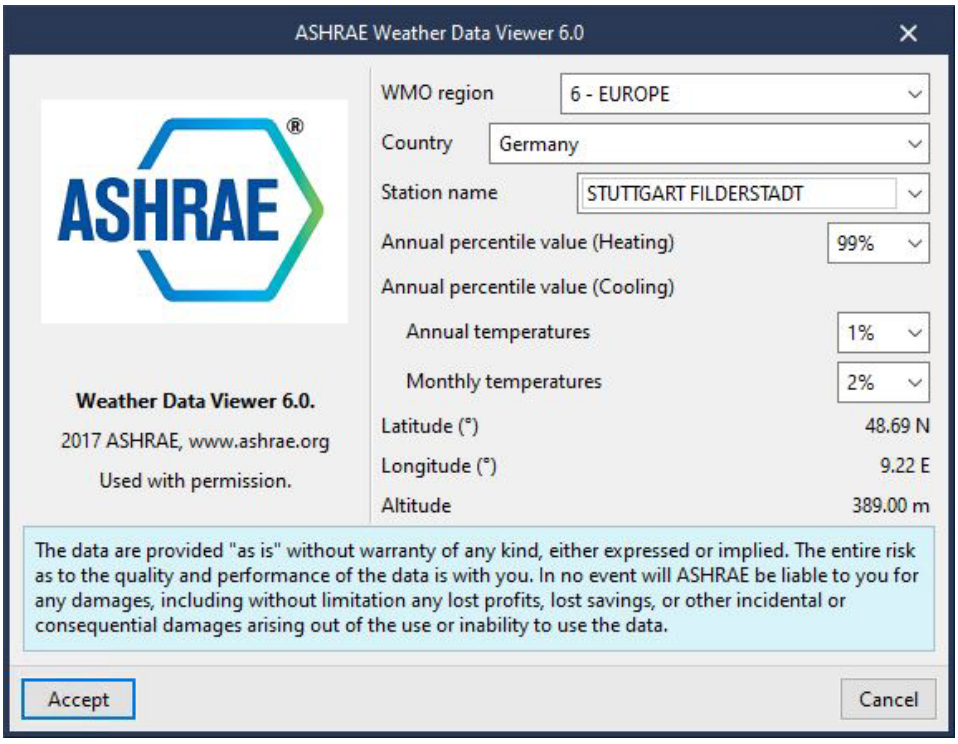




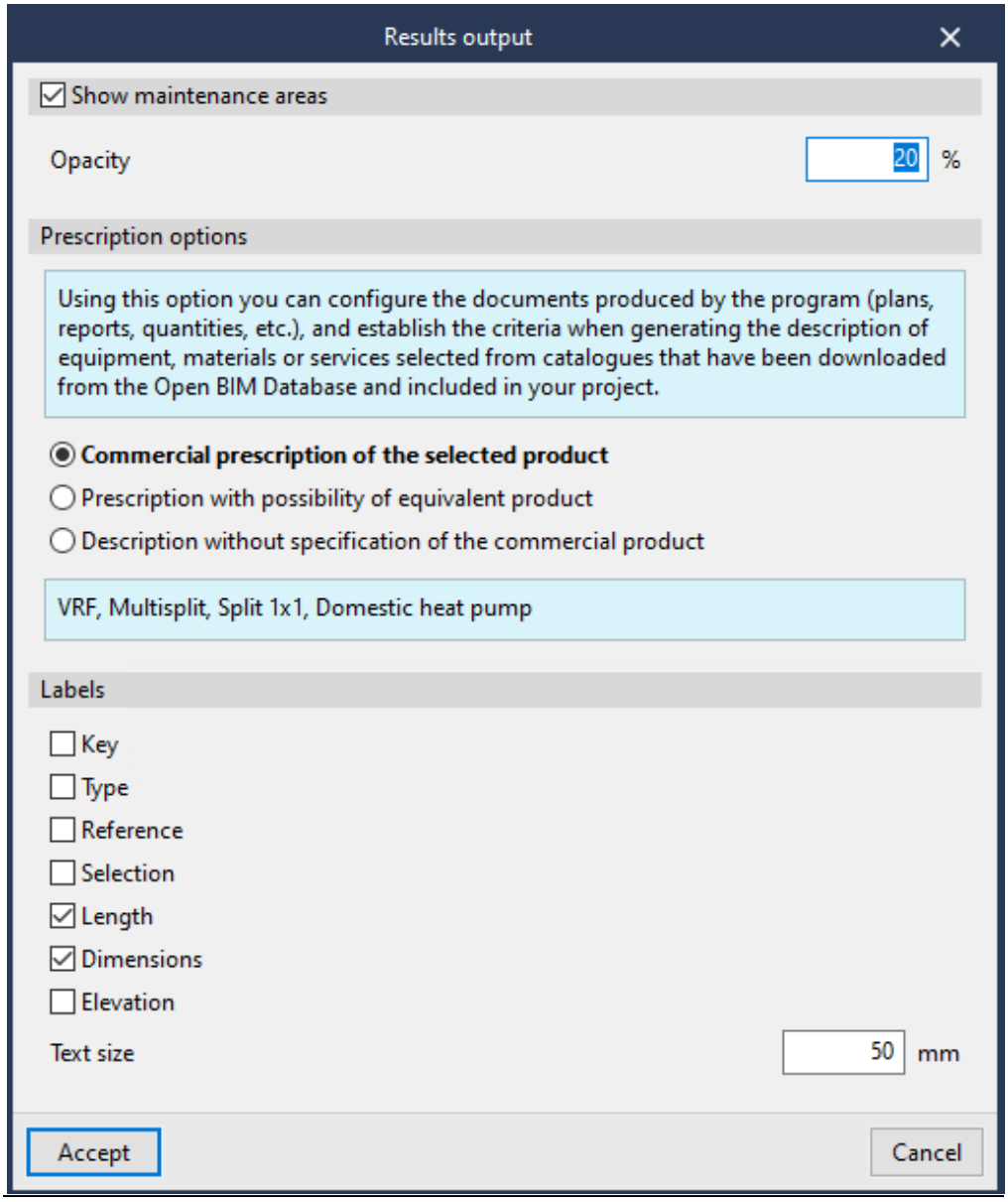
Space	Area	Height	Volume	Indoorunits	Type	Reference	Byducts	Total	Refrigerantconcentrationlimit	
Office_1	12.5 m²	3 m	37.42 m³	1	Indoorunit,cassette	AF-4CC22-1 P	No	13.8kg	0.37 kg/m³ < 0.44 kg/m³	✓
Office_2	12.5 m²	3 m	37.55 m³	1	Indoorunit,cassette	AF-4CC22-1 P	No	13.8kg	0.37 kg/m³ < 0.44 kg/m³	✓
Office_3	11.8 m²	3 m	35.34 m³	1	Indoorunit,cassette	AF-4CC22-1 P	No	13.8kg	0.39 kg/m³ < 0.44 kg/m³	✓
Office_5	11.2 m²	3 m	33.44 m³	1	Indoorunit,cassette	AF-4CC22-1 P	No	13.8kg	0.41 kg/m³ < 0.44 kg/m³	✓
Corridor	103.4 m²	3.1 m	321.43 m³	1	Indoorunit,floor-standing	AF-FC36-1	No	13.8kg	0.04 kg/m³ < 0.44 kg/m³	✓
Meetingroom	20.5 m²	3 m	61.47 m³	1	Indoor unit, with distribution using ducts	AF-DL 17-1 P	Yes	13.8kg	0.22 kg/m³ < 0.44 kg/m³	✓
Boardroom	20.3 m²	3 m	60.91 m³	1	Indoor unit, with distribution using ducts	AF-DL 17-1 P	Yes	13.8kg	0.23 kg/m³ < 0.44 kg/m³	✓

External conditions. Enter the outdoor design conditions of your project. Data can be typed in or, if unsure, click the blue arrow to access the ASHRAE database, select the city, and the fields will be filled in.



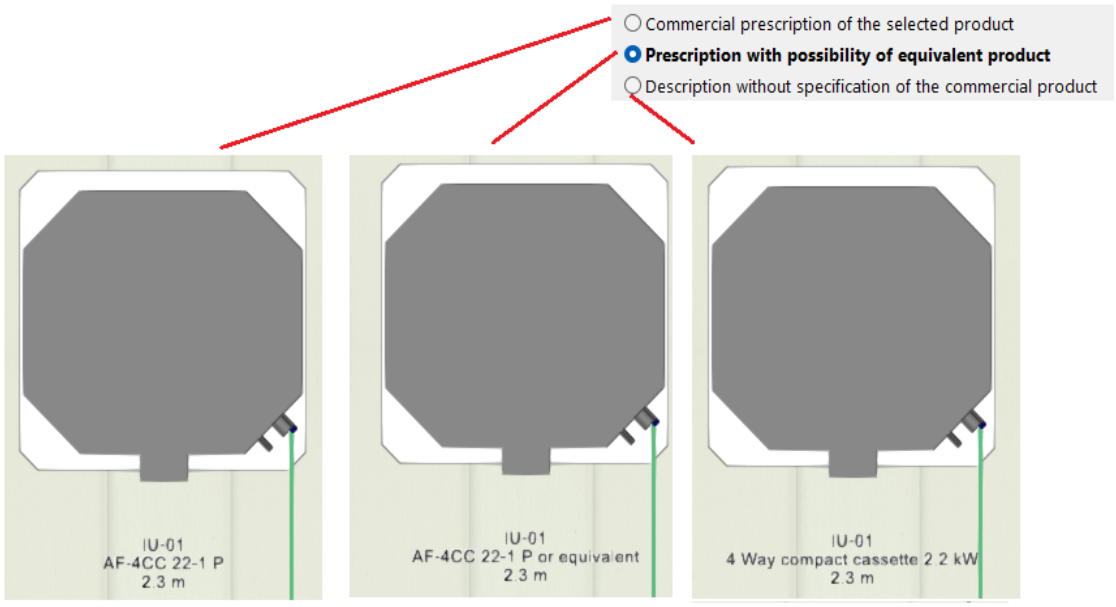


Results output:

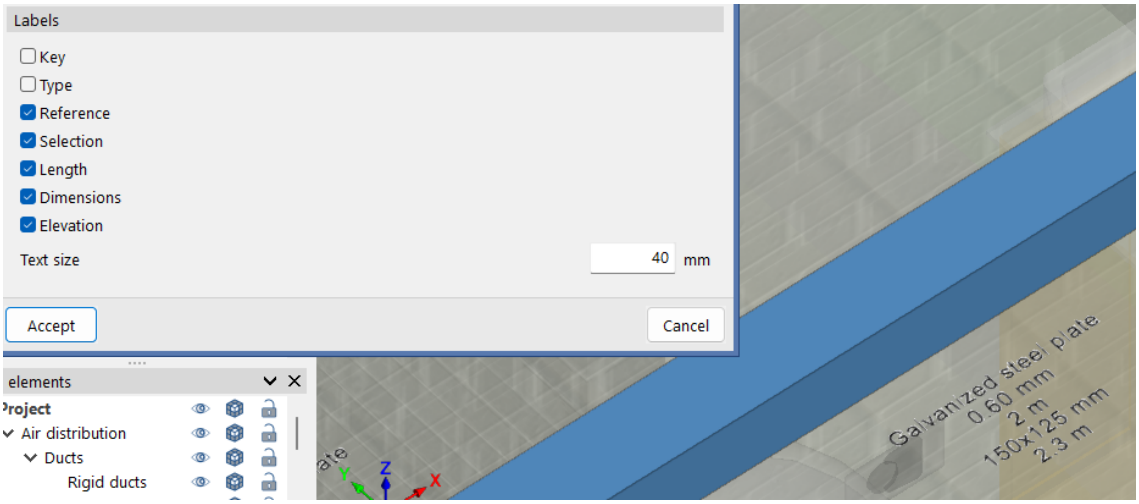


Show maintenance areas. Users can enable or disable the display of the maintenance space in the workspace.

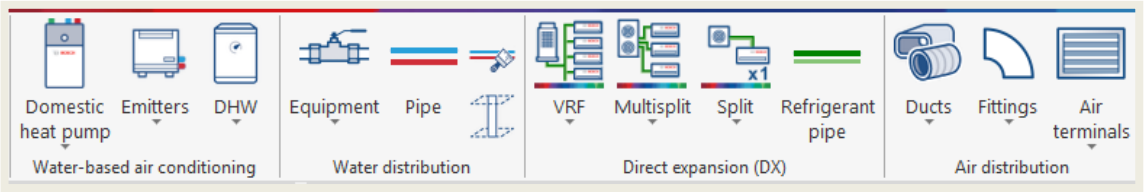
Prescription options:



Labels: The information can be configured.

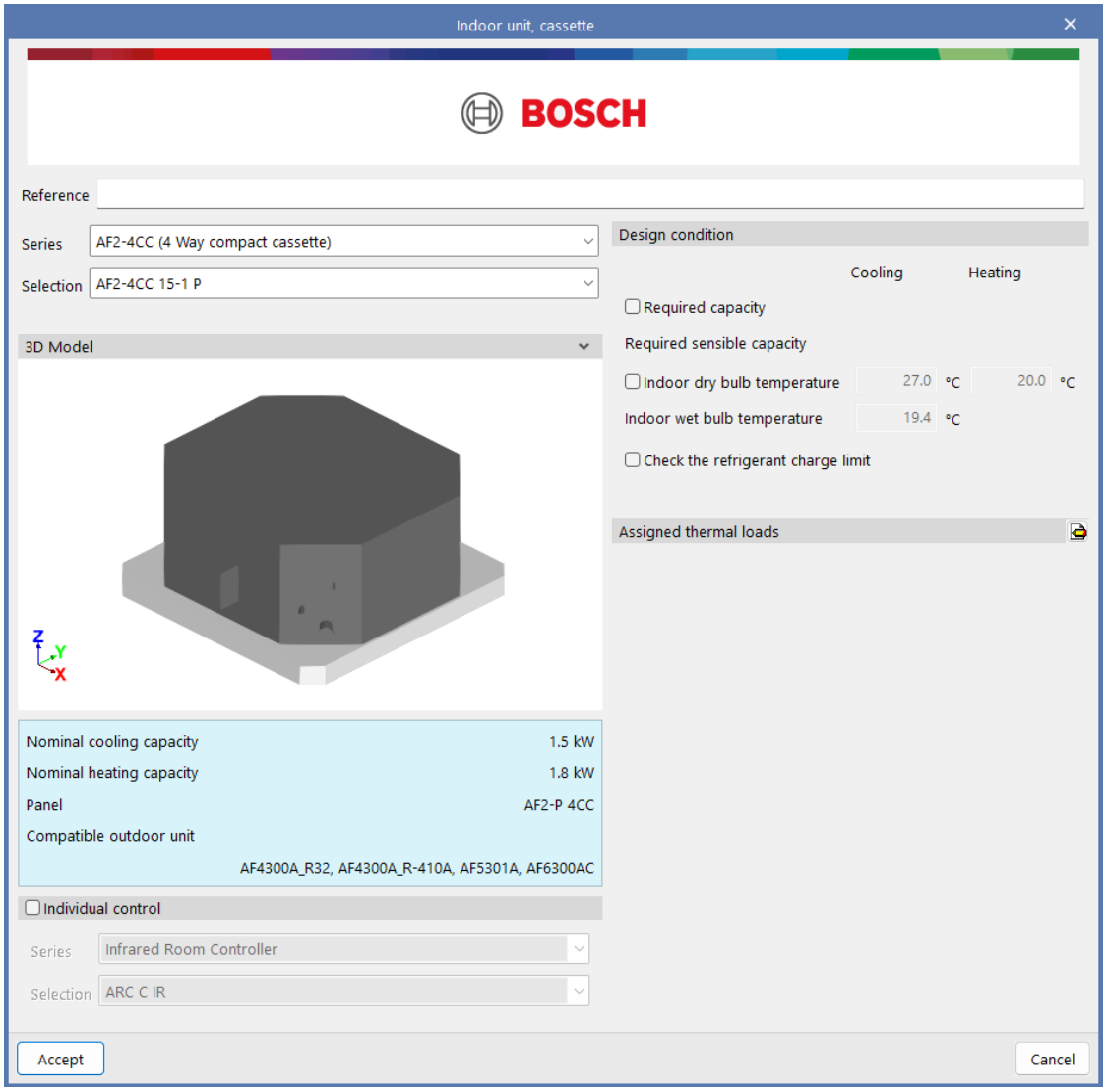


2.5 Devices



VRF. To design a VRF system, users enter the unit and connect it to the pipes. The programme checks that the line lengths, maximum connected capacities, component selection, and pipe schemas are within the system requirements.

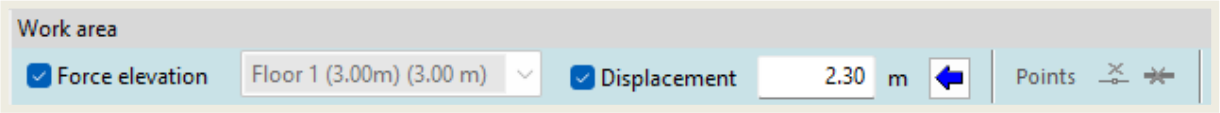
Select a cassette unit. In **Reference** you can give it a name. It is useful for recognising it later in the flow diagram and calculation report, but it is not mandatory.



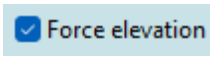
If we check the **Required capacity** option, the program will select the model that meets the specified value during sizing. If we do not specify a value for the required capacity, the software will retain the existing model during sizing.

Air-source Heat Pump. Compact and split aerothermal systems can be inserted.

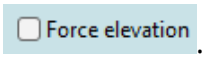
2.6 Elevation of elements



There are 2 ways of inserting units.



Force elevation. If you choose **Force elevation** mode, the units will be located at the height of the current floor plus the displacement height.



. If you leave the **Force elevation** unchecked, the height will be the same as the captured height.

2.7 Editing

Edit. Opens the unit panel.

> *You can also **double click** the mouse.*

Delete. Press **Delete** and then, select the object you want to delete. The object will turn orange. To finish the selection and execute the operation, press the right mouse button.

*You can also select the objects directly and press **Delete** on your keyboard.*

*To select several objects, you can select them one by one by holding down the **Control** key, or by creating a selection box.*

 **Move a group of elements**. Press **Move group** and then select the desired objects. Press the right button to finish the selection. Then, click on the reference point where you want to move the group. Move the mouse cursor and click to select this new position.

 **Move**. Press **Move point** and pick an object. Click on a different place on the screen.

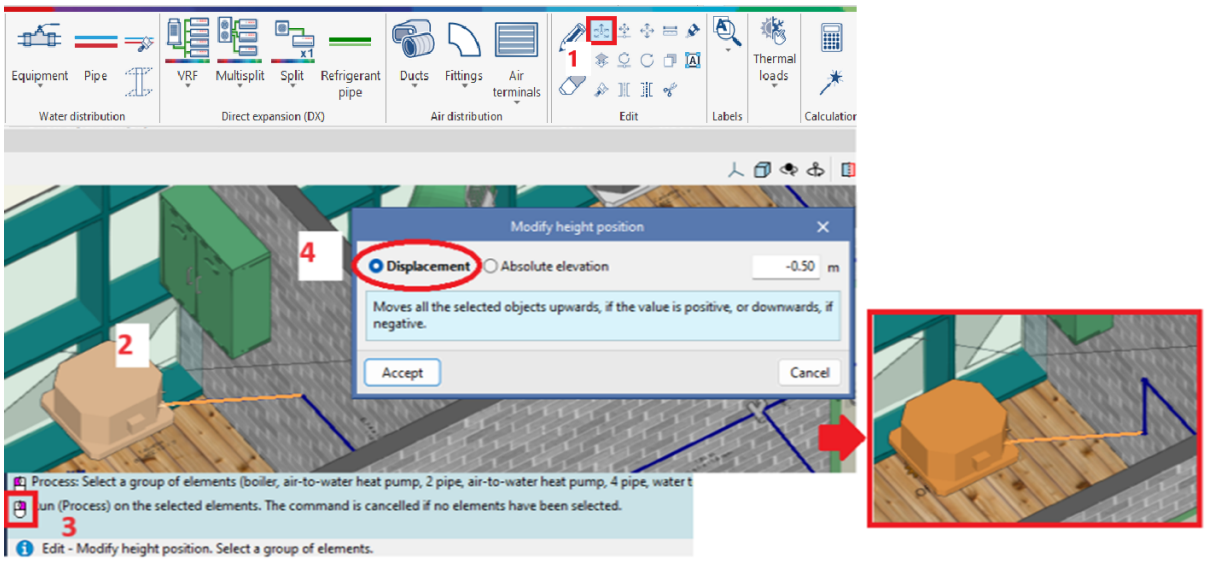
By default, this is what a single mouse click does.

 **Rotate a group of elements**. Press **Rotate group** and the select the desired group. Finish your selection by pressing the right mouse button. Then click the pivot point and see how the group rotates. Click on the final position.

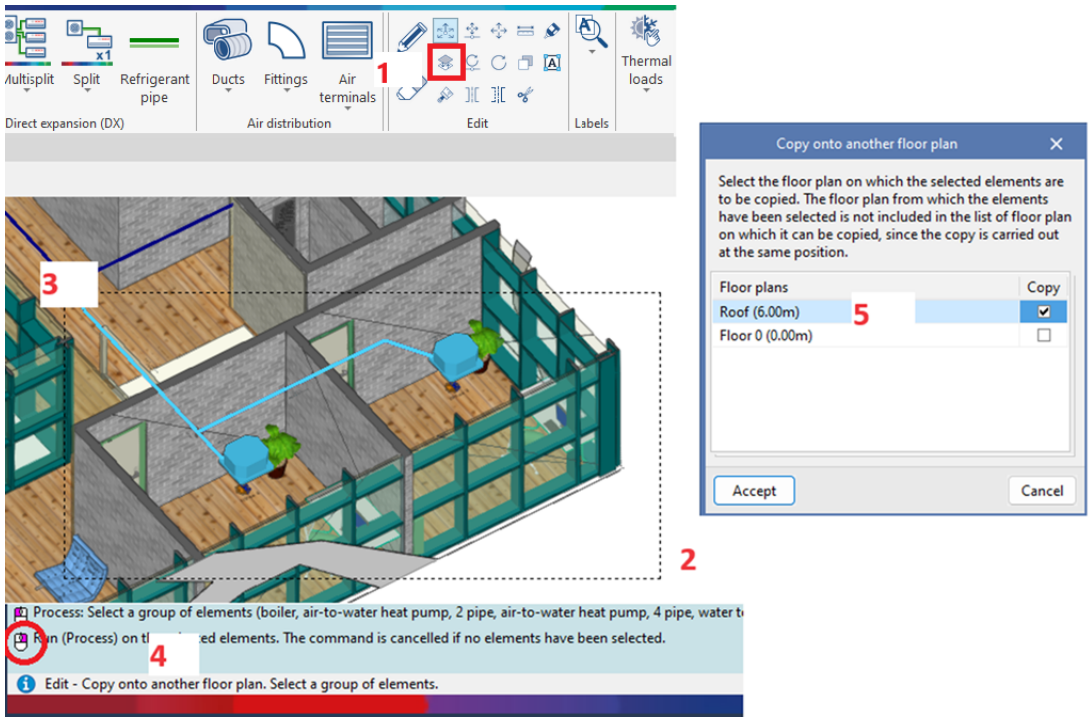
 **Rotate**. Press **Rotate** and then select a single element. A pink lever will appear, click on it to rotate, click again to secure it into its final position.

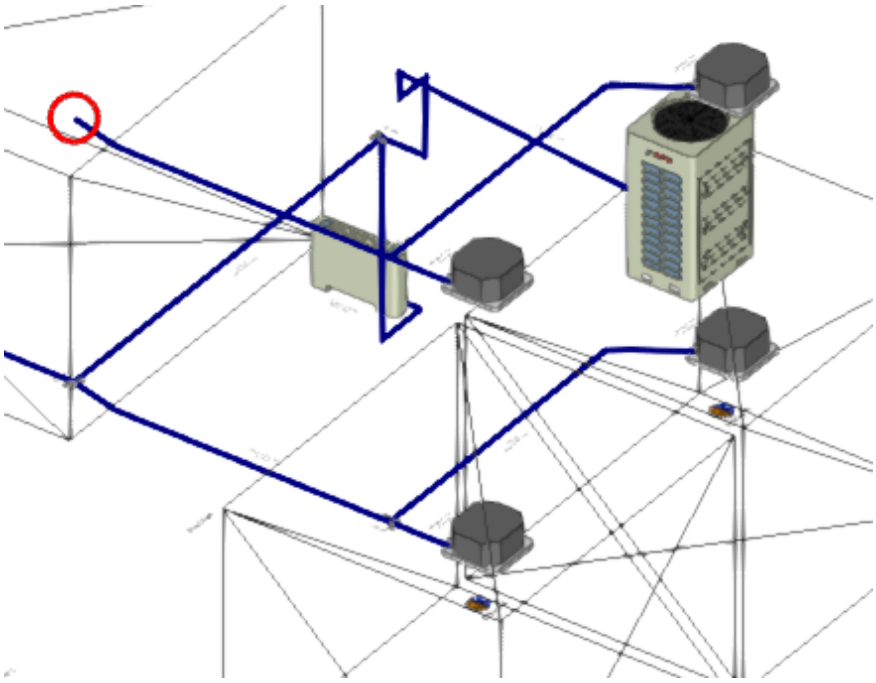
 **Copy**. Press **Copy** and then select a group of elements. Press the right mouse button to finish the selection. Then select the desired point. Click where you wish to place the copied object.

 **Modify height position**. Even when moving units vertically, the vertical pipes are created automatically.



Copy onto another floor plan. Press this button and select one or more objects. Click the right mouse button to finish the selection. Select the floors where you wish to copy the selection.





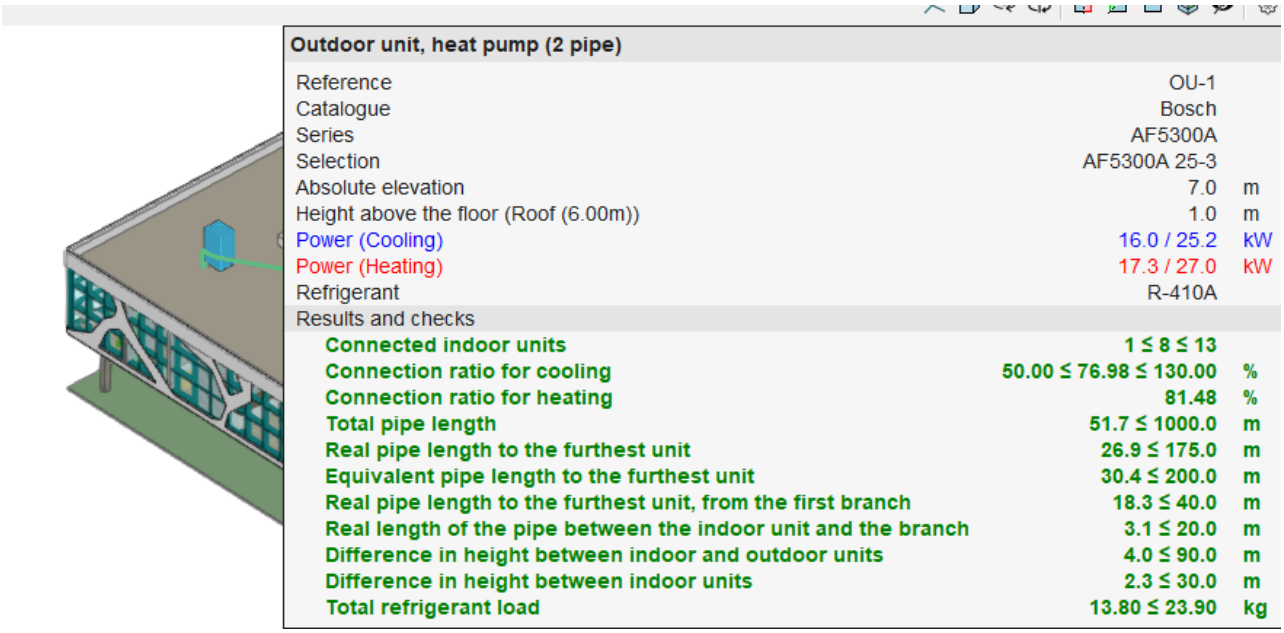
2.8 Calculation

 **Analyse**. By pressing this button, the programme runs a calculation process. The tool checks that the piping routing is correct, the pipe lengths are in the permitted range and displays errors if something must be corrected.

The software selects the size of the **pipes** and Y branches. Make sure that **Tooltips** is activated in order to see the results on screen.

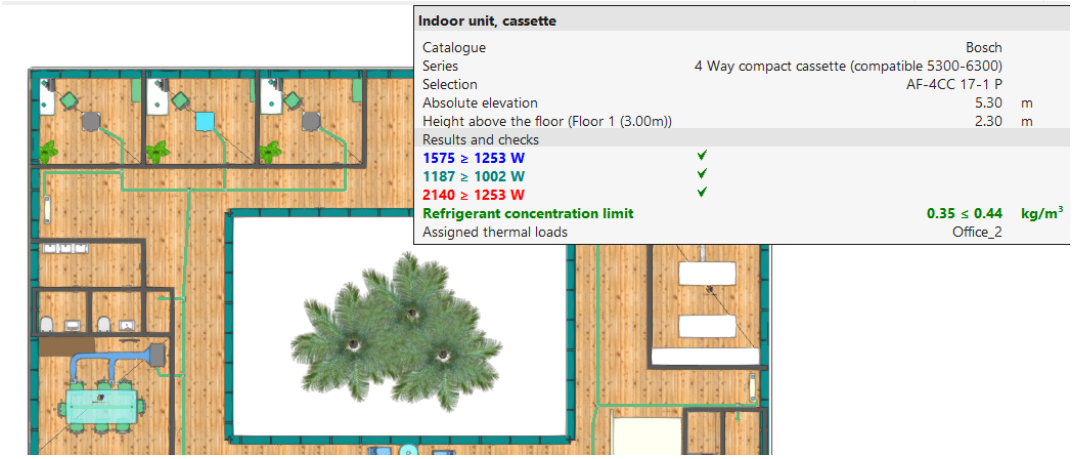
(Please activate this button to view the tooltips)

Place the mouse cursor over the outdoor unit to see all the compliances. This list will be included in the calculation report.



Outdoor unit, heat pump (2 pipe)		
Reference	OU-1	
Catalogue	Bosch	
Series	AF5300A	
Selection	AF5300A 25-3	
Absolute elevation	7.0	m
Height above the floor (Roof (6.00m))	1.0	m
Power (Cooling)	16.0 / 25.2	kW
Power (Heating)	17.3 / 27.0	kW
Refrigerant	R-410A	
Results and checks		
Connected indoor units	**1 ≤ 8 ≤ 13**	
Connection ratio for cooling	**50.00 ≤ 76.98 ≤ 130.00**	**%**
Connection ratio for heating	**81.48**	**%**
Total pipe length	**51.7 ≤ 1000.0**	**m**
Real pipe length to the furthest unit	**26.9 ≤ 175.0**	**m**
Equivalent pipe length to the furthest unit	**30.4 ≤ 200.0**	**m**
Real pipe length to the furthest unit, from the first branch	**18.3 ≤ 40.0**	**m**
Real length of the pipe between the indoor unit and the branch	**3.1 ≤ 20.0**	**m**
Difference in height between indoor and outdoor units	**4.0 ≤ 90.0**	**m**
Difference in height between indoor units	**2.3 ≤ 30.0**	**m**
Total refrigerant load	**13.80 ≤ 23.90**	**kg**

Place the mouse cursor over an indoor unit. The cassette from this space has been selected.

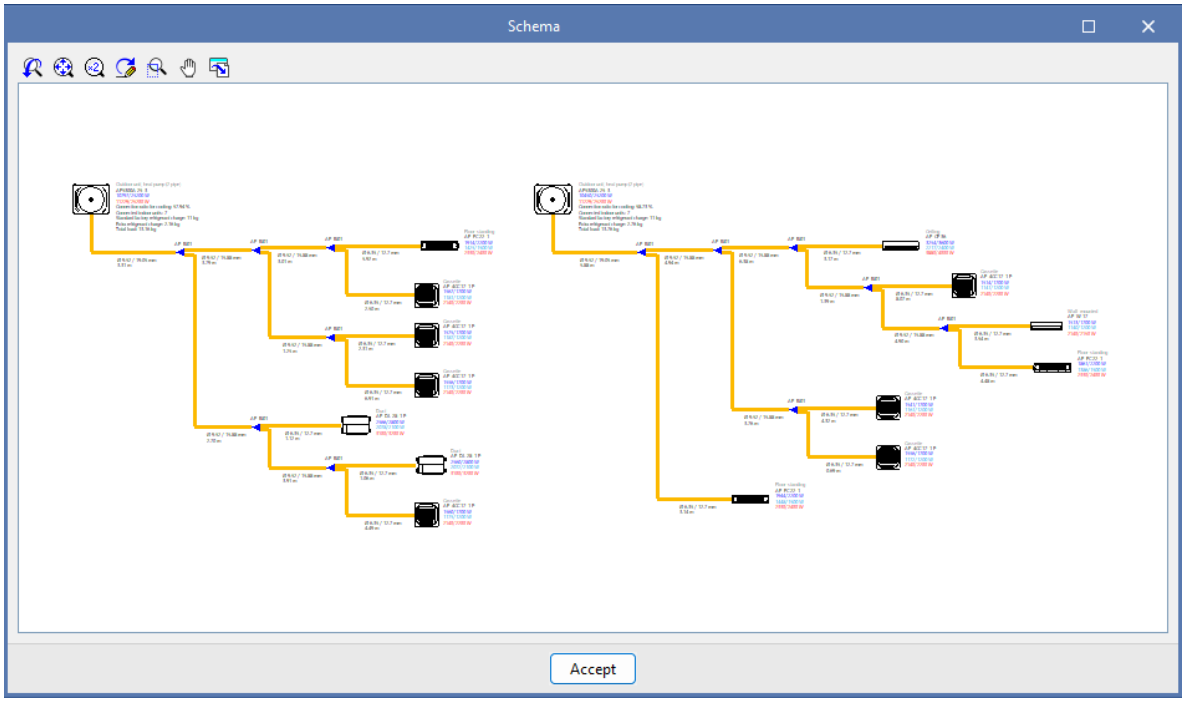


Indoor unit, cassette		
Catalogue	Bosch	
Series	4 Way compact cassette (compatible 5300-6300)	
Selection	AF-4CC 17-1 P	
Absolute elevation	5.30	m
Height above the floor (Floor 1 (3.00m))	2.30	m
Results and checks		
1575 ≥ 1253 W	✓	
1187 ≥ 1002 W	✓	
2140 ≥ 1253 W	✓	
Refrigerant concentration limit	**0.35 ≤ 0.44**	**kg/m³**
Assigned thermal loads	Office_2	

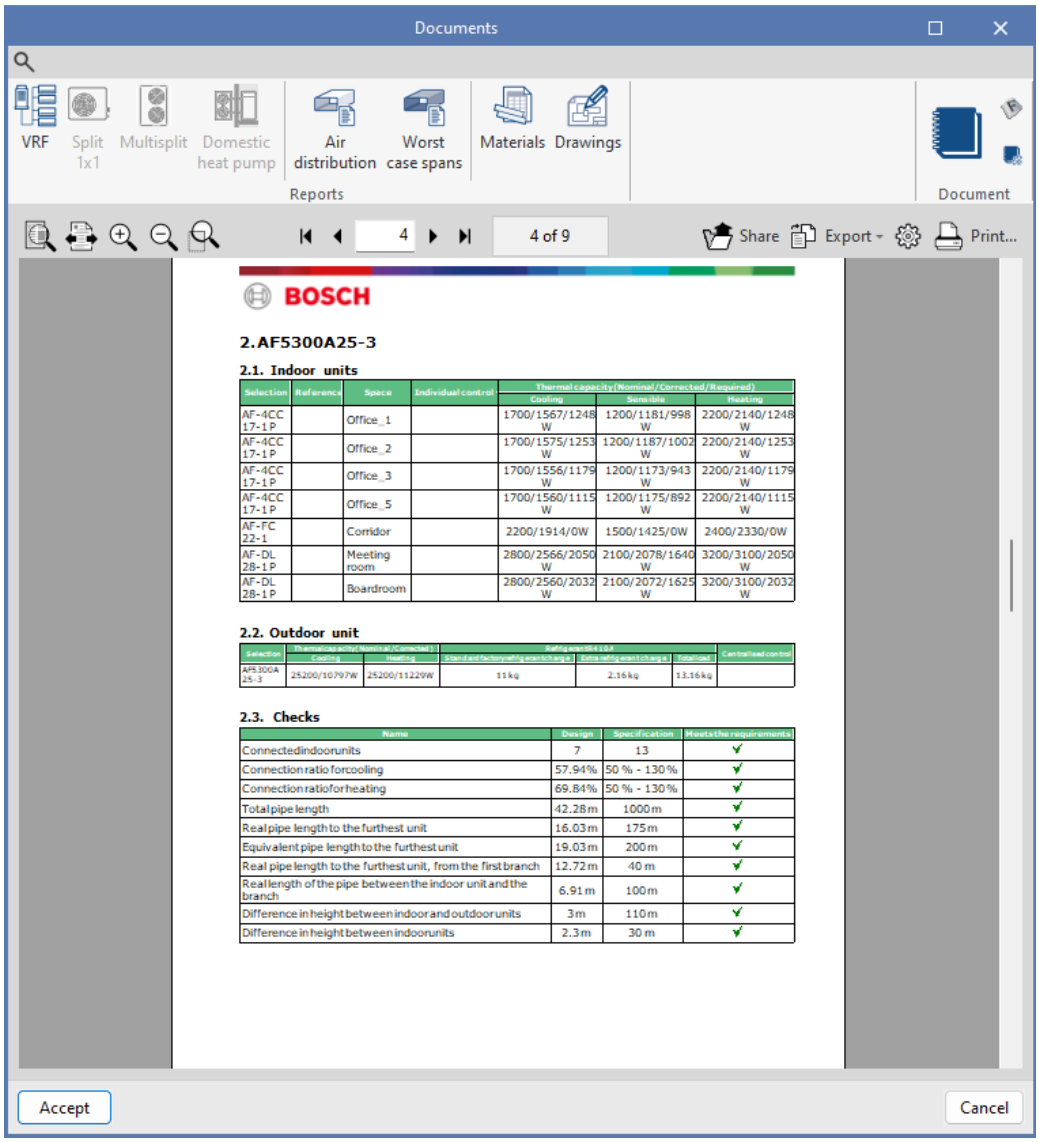
The software also selects the **size** of the **units** according to the thermal loads.

2.9 Results

Schema. The flow diagram is automatically generated. It is also included in the calculation report, but users should check the schema to assure that the system is well connected whilst they are designing.



Calculation report. Compliance, schema, wiring, corrected capacities: all of this information is in the project report. It can be exported in PDF.



Show/Hide incidents. Errors and warnings can be shown or hidden.

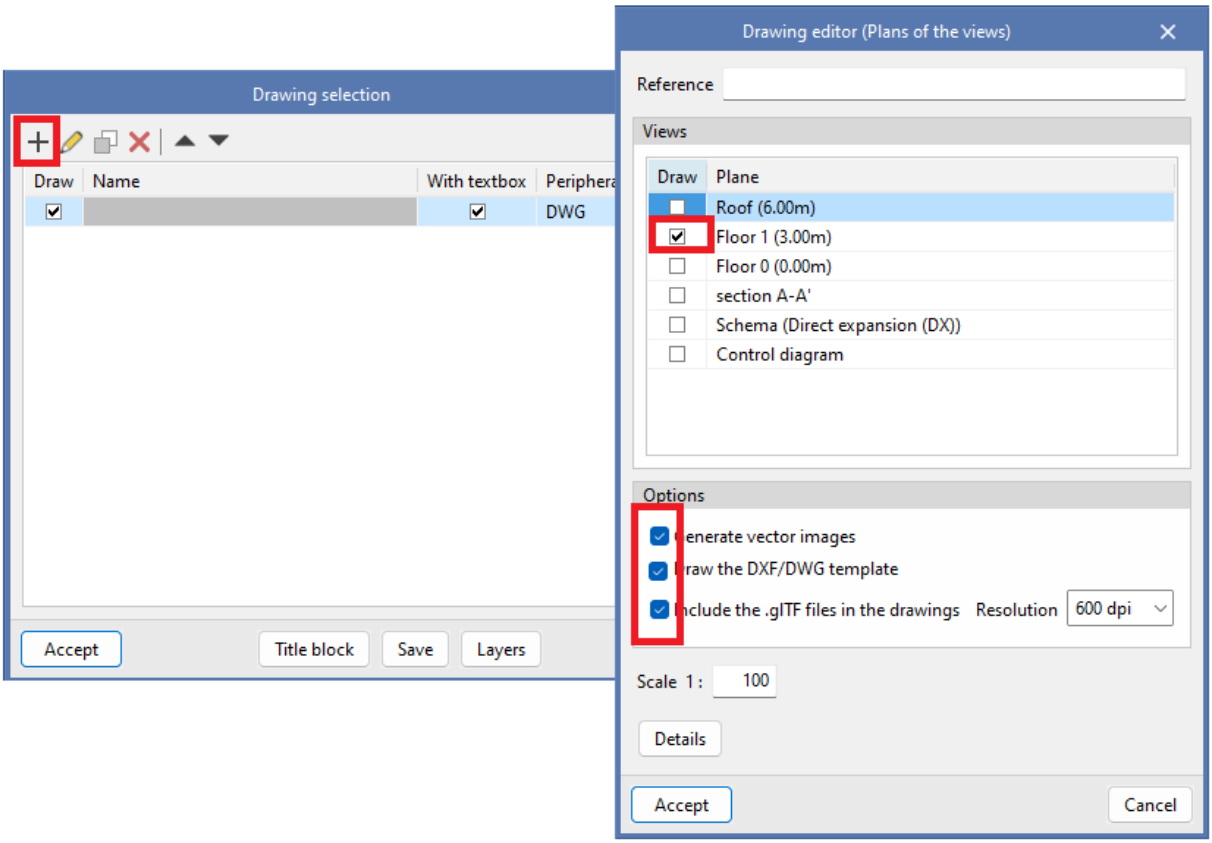
2.10 Drawings

Save.

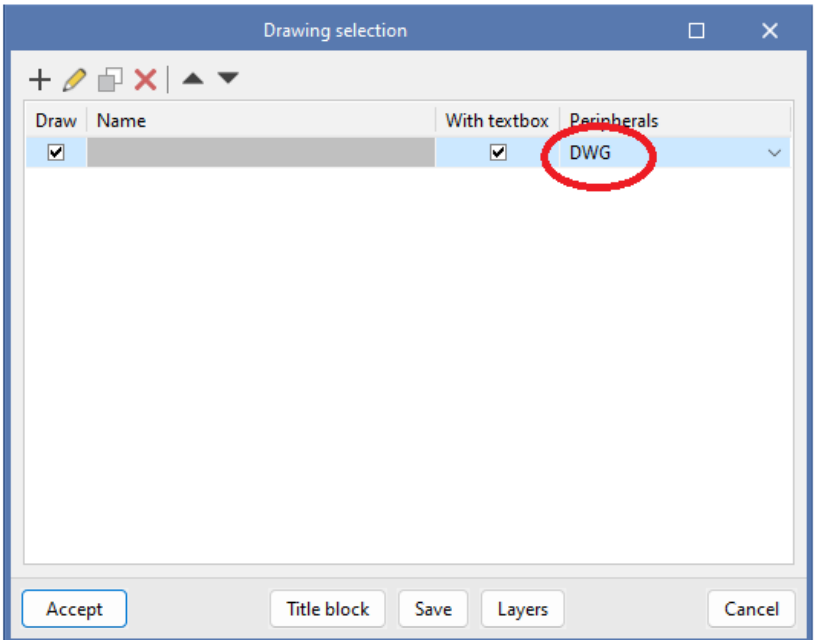
Undo. Ctrl+Z

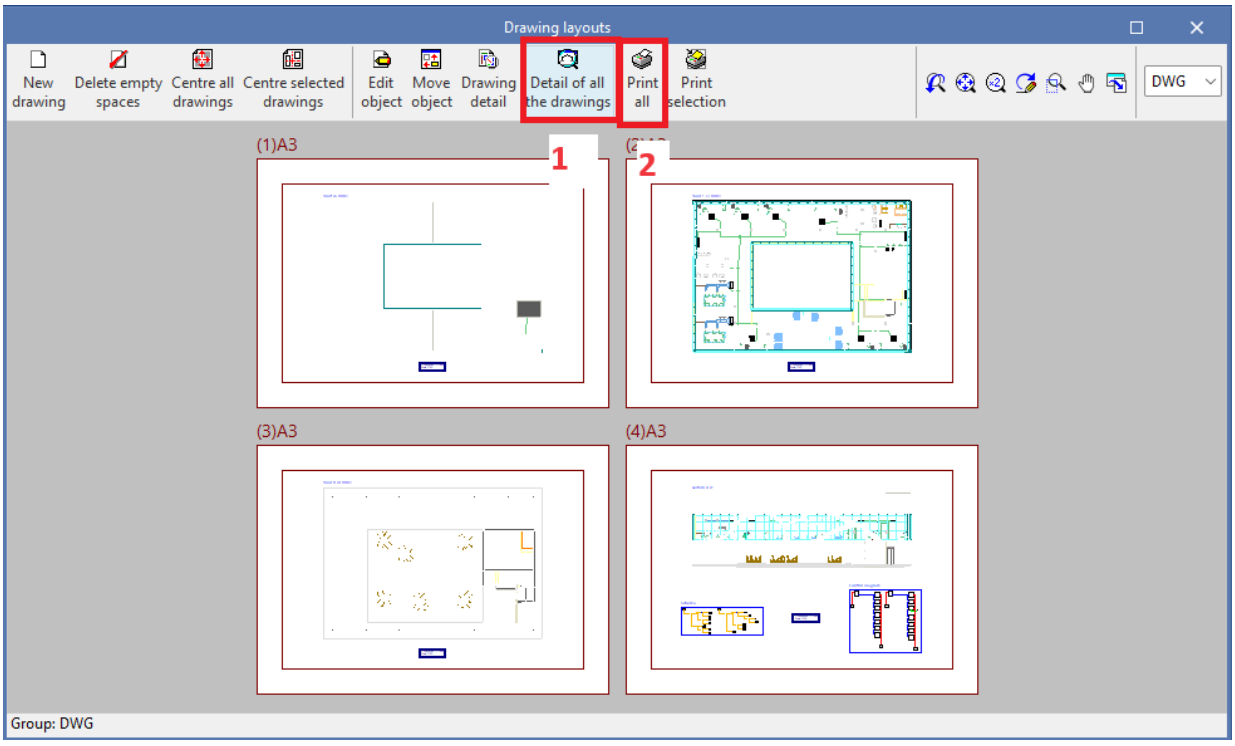
Redo. Ctrl+Y

Drawings.

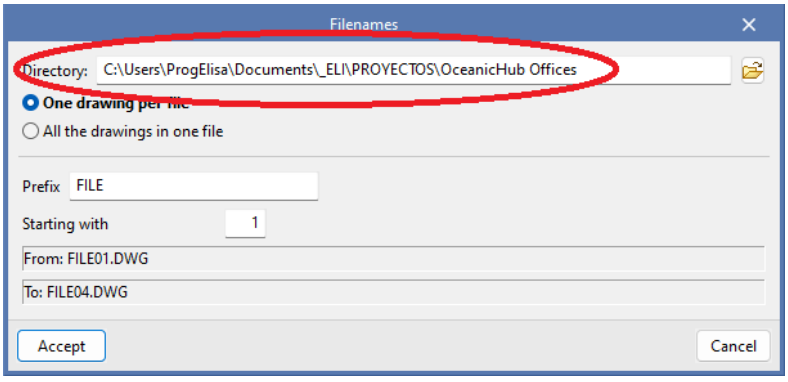


Select DXF/DWG template.





Select where to save the files.

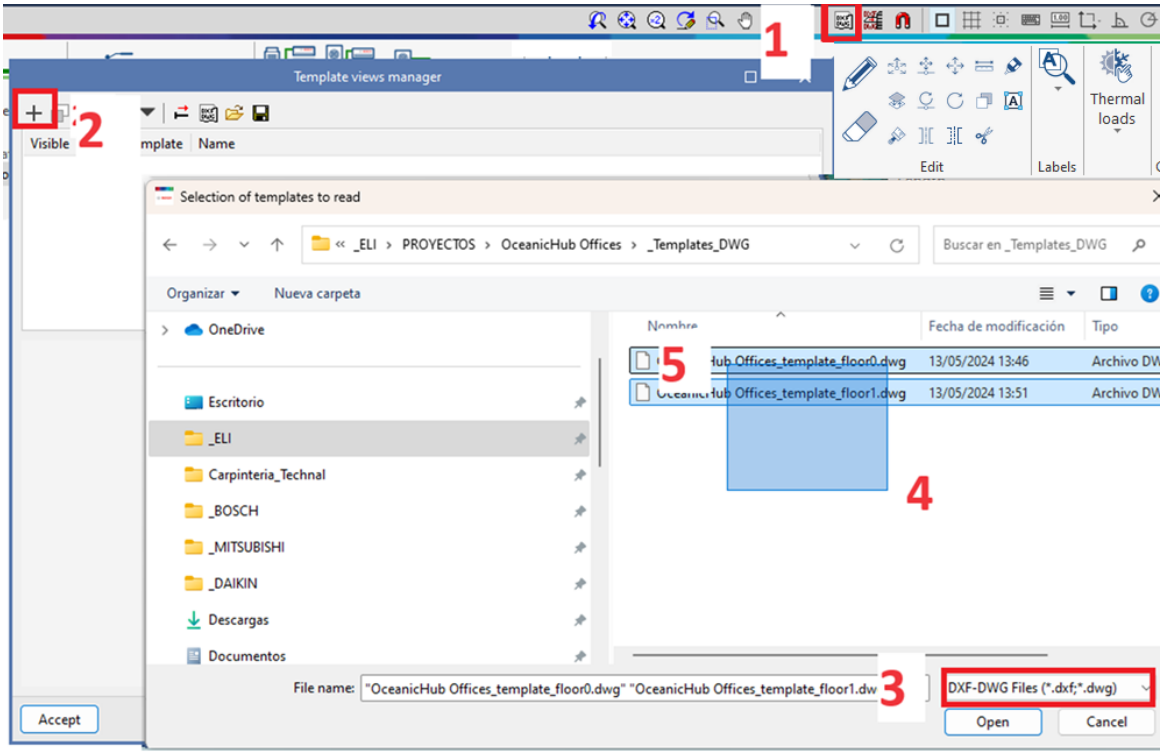


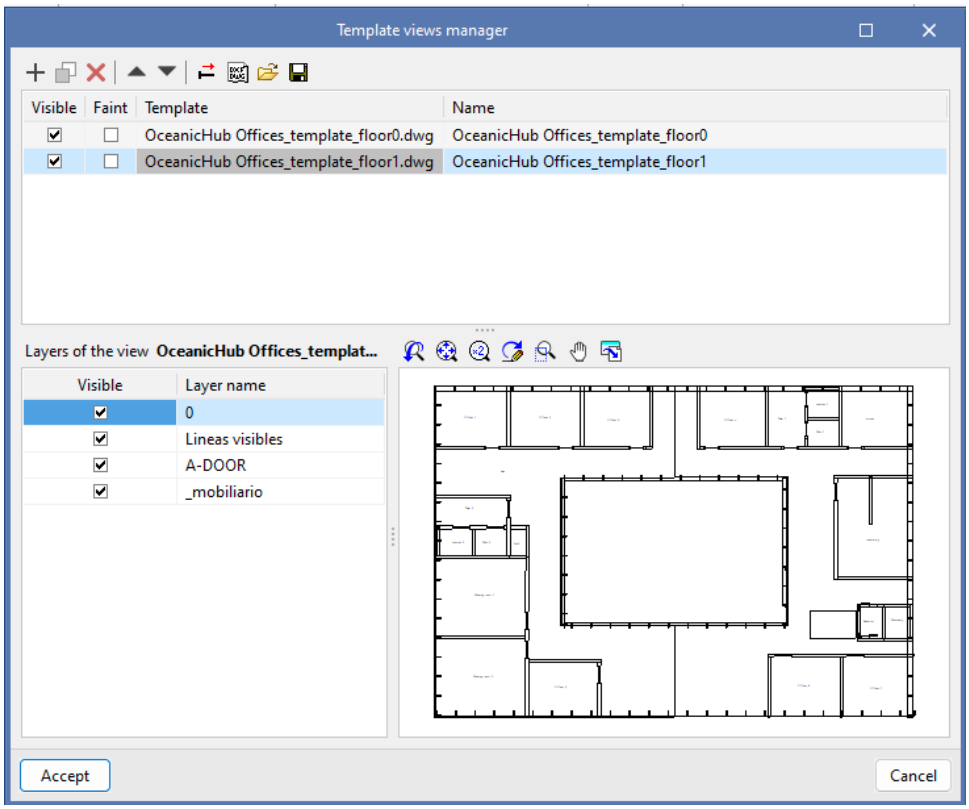
2.11 CAD Templates

If users have CAD templates but not a BIM model of the building, Open BIM BOSCH can be used in isolation. In this case, CAD templates may be imported.

Step 1: Import templates saved on the computer into the *"File.hvbos"*.

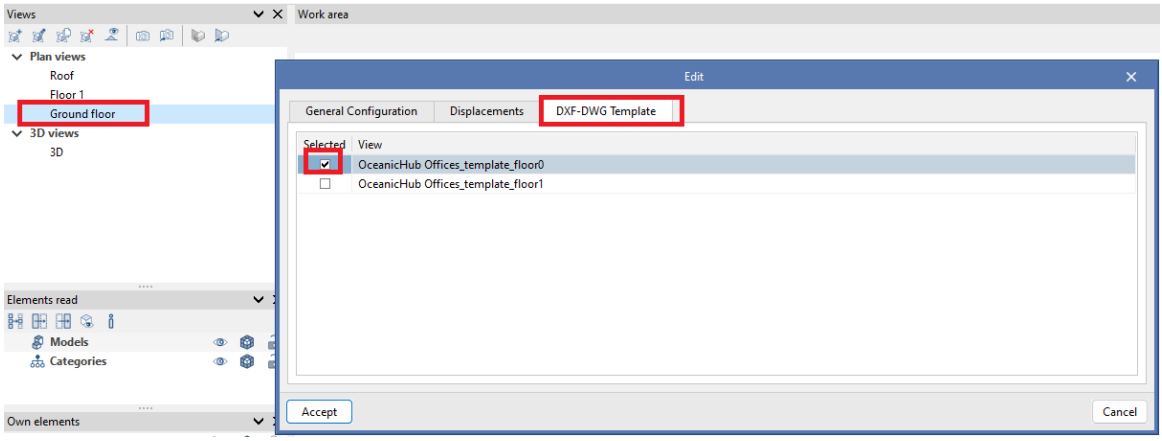
*Several files can be selected at the same time by pressing the **Shift** key.*



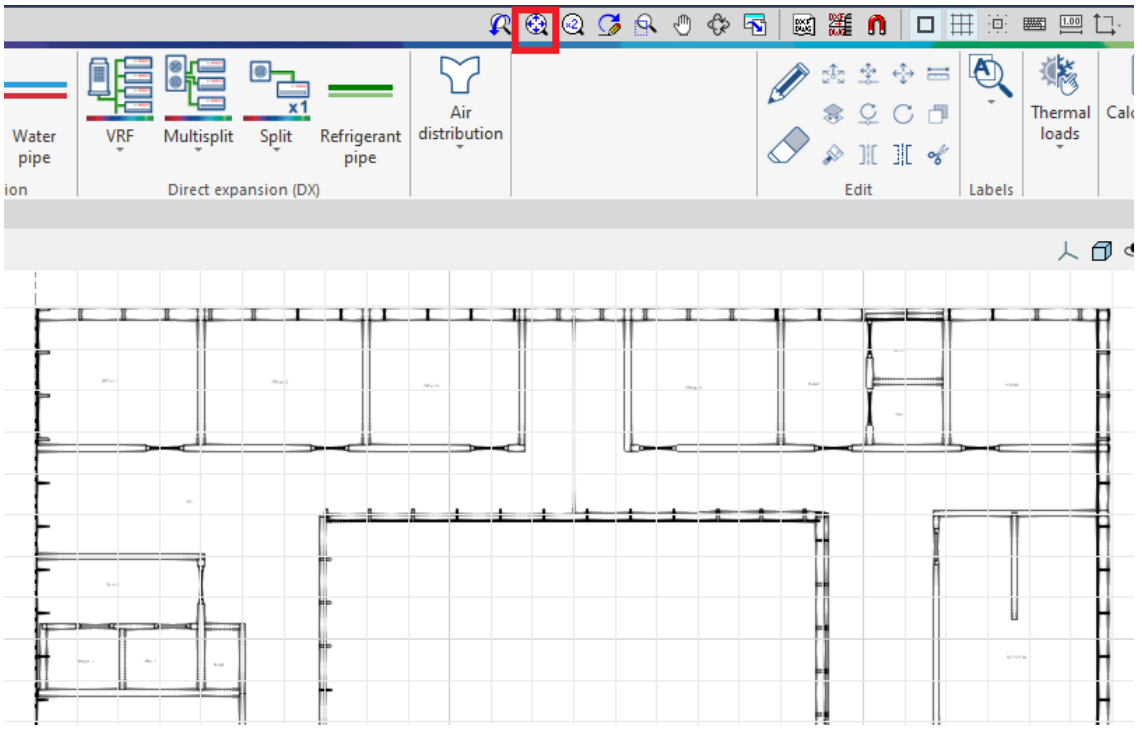


Step 2: Choose which template will be visible on each view:

- On floor 0, select the template *"Floor 0"*

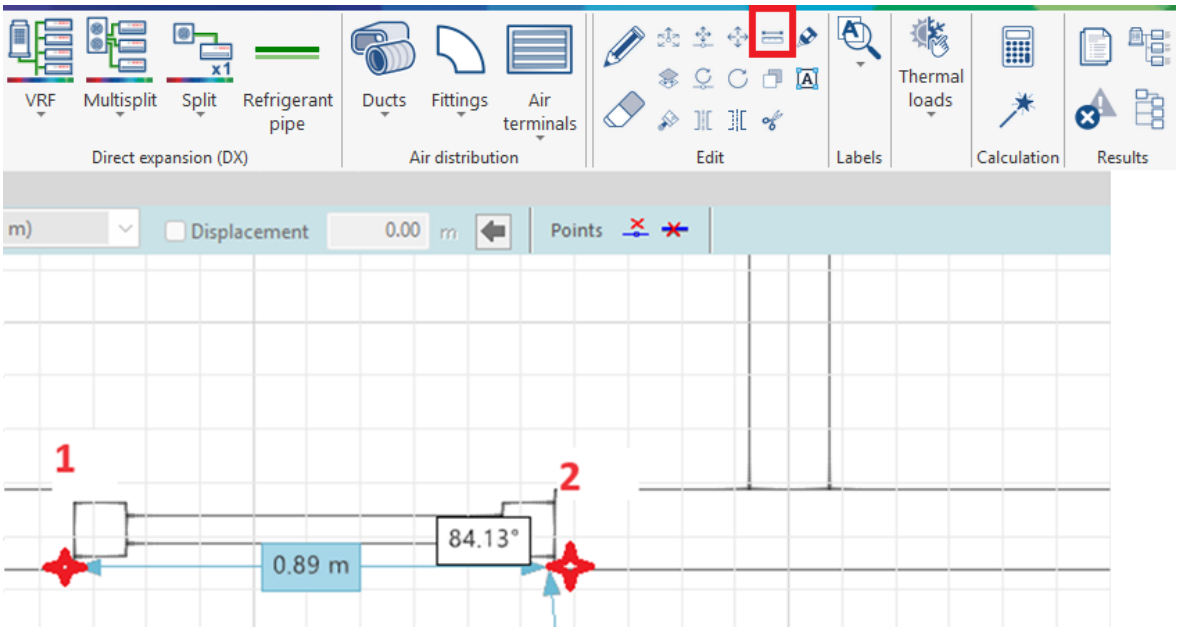


Double click the mouse wheel in order to centre the drawing (or press **Full window**).



Repeat this assignment for the rest of the floors.

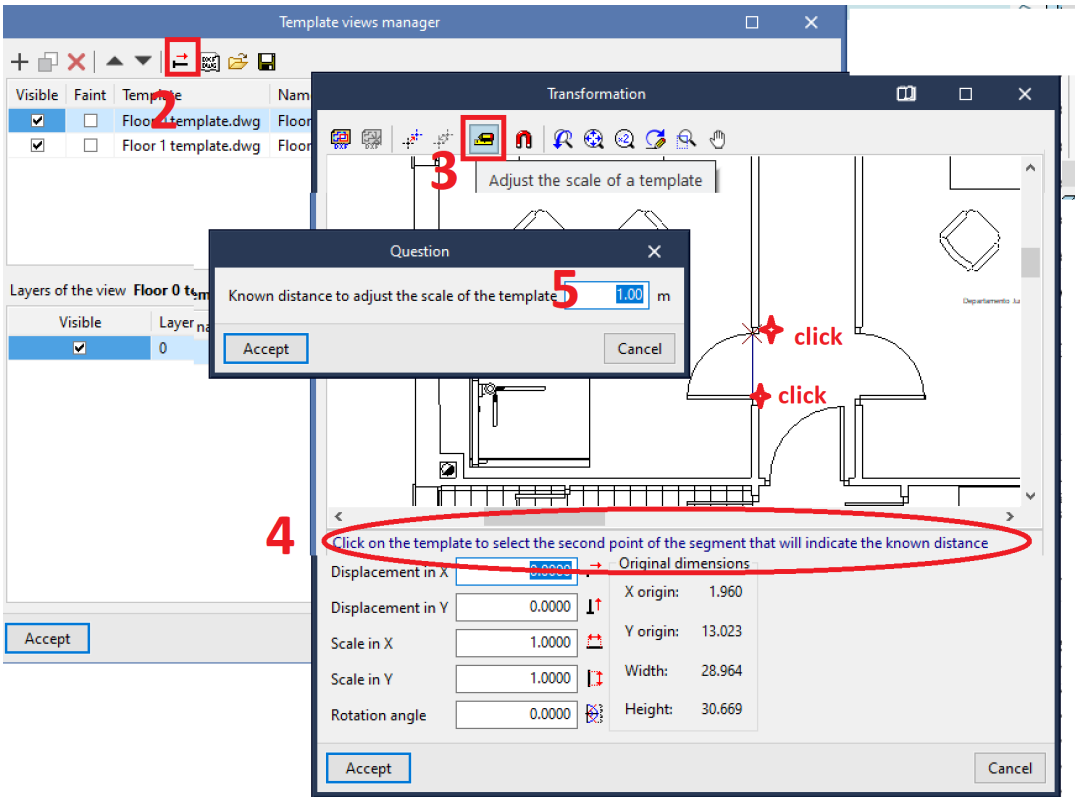
Scale templates. The DXF/DWG template may have a scale. In general, drawings usually have DIN A0, A1, A2, A3 or ANSI A, B, C, D or E dimensions. Measure the template to detect its size.



To modify the scale, select the **Template** button again. The scale can be modified as follows:

Option 1: In the *"Scale in X and Y"* fields.

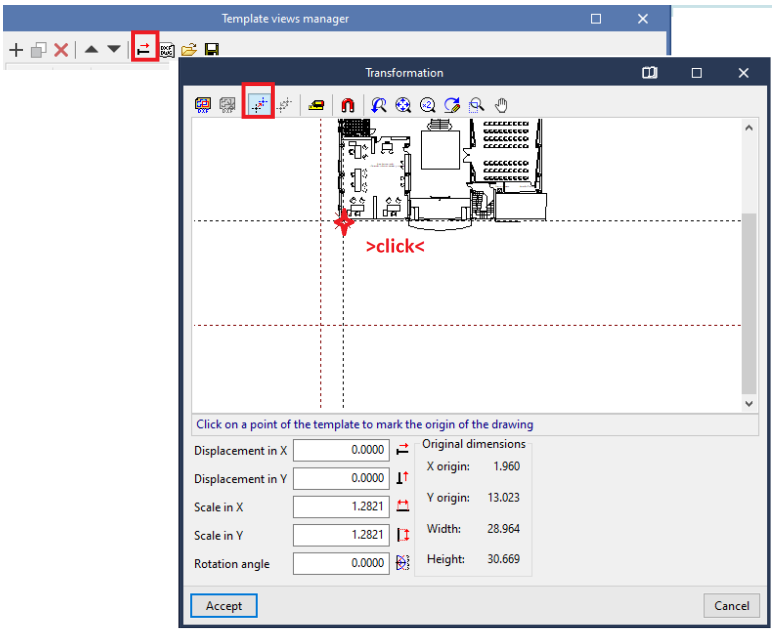
Option 2: If the scale is unknown, it can be introduced as a known dimension, such as a door.



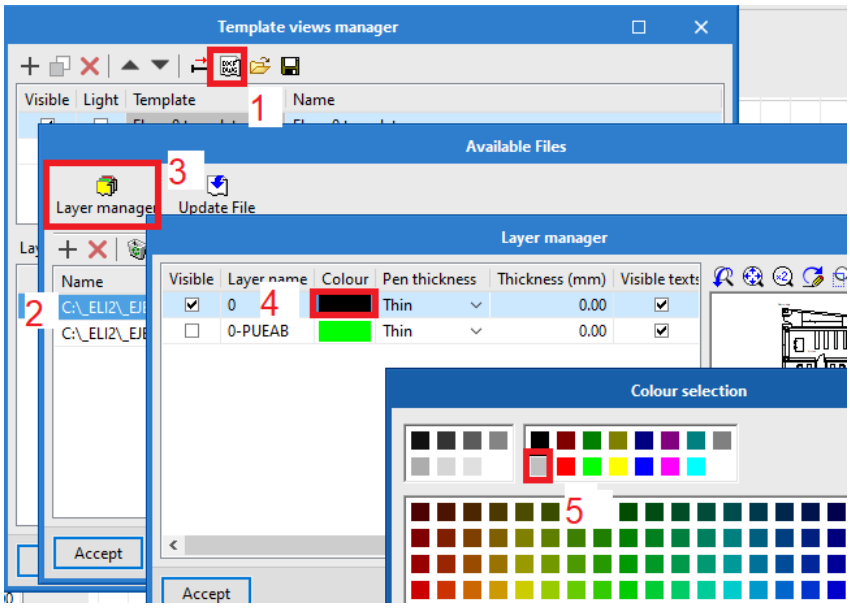
If there are several templates, the scale must be changed in each template.

Origin of coordinates

Good practice: place the origin of the coordinates at a known point. Do this in each template.

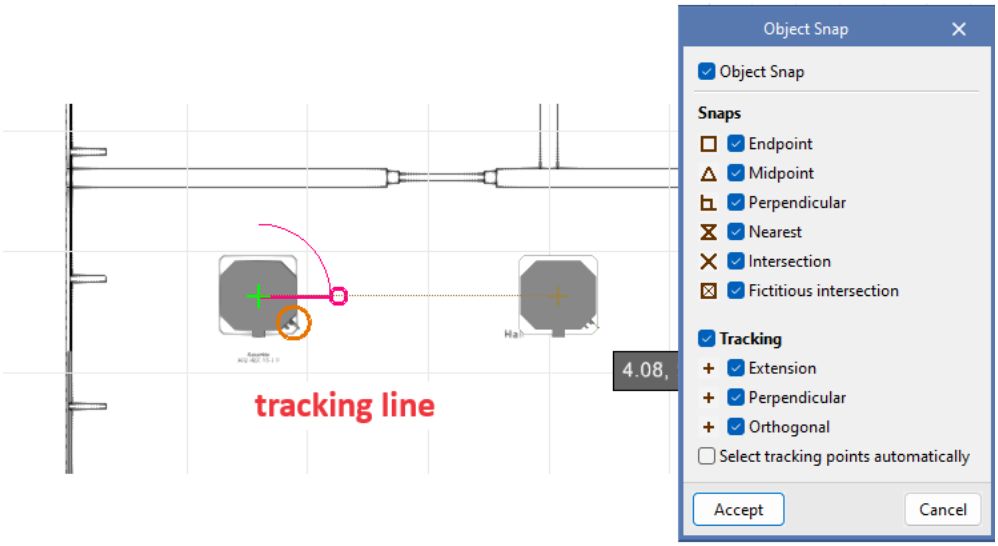


Change the colour. The colour of the CAD layers can be changed here:



2.12 Configuration

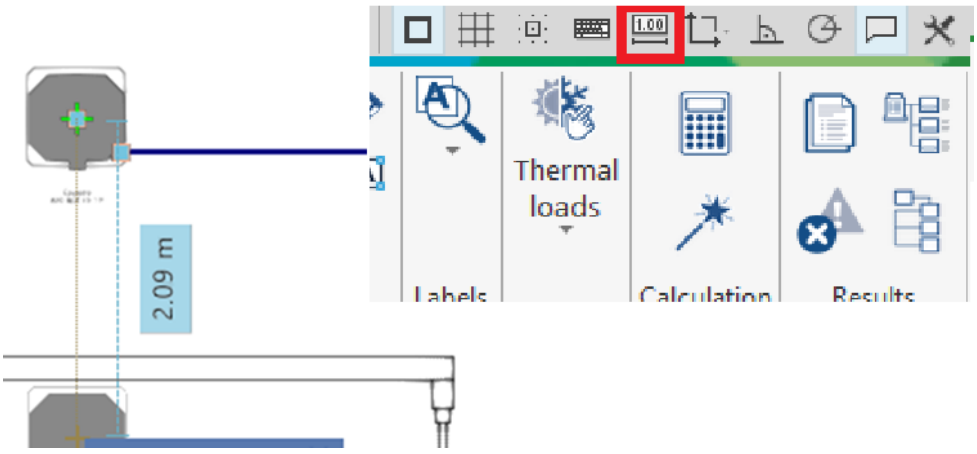
Object snap. It is strongly recommended to have all the object snaps like this.



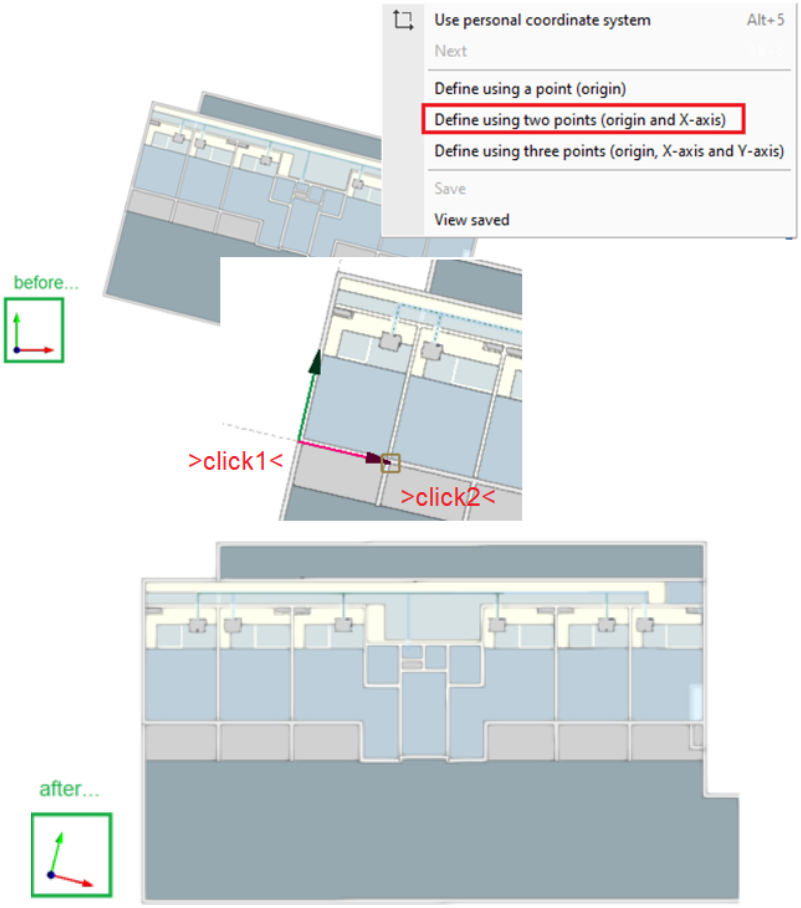
Grid. Users can activate or deactivate the grid.

Snap to grid. Users can activate it if they want to enter units according to the grid.

Introducing elements with defined distances. If this tool is activated, the programme shows distances to other elements while users are inserting objects. By clicking on it, a field appears where users can type in the desired measurement, and press enter (2 metres in this example).

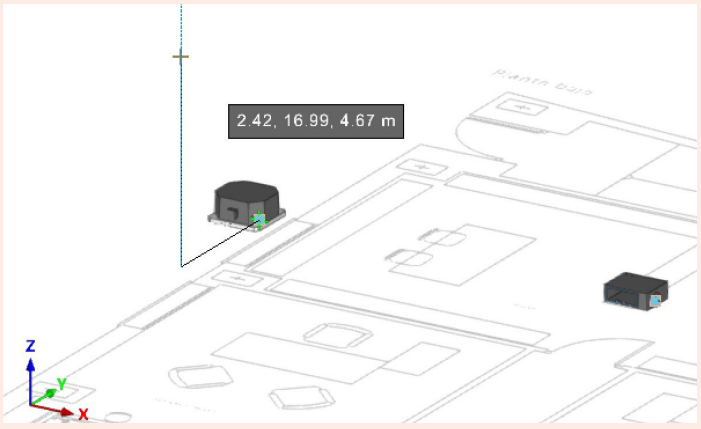


 **Personal coordinate system**. Sometimes the building is not aligned with the “x” and “y” axes. In order to work easily, you might need to rotate it to work orthogonally.



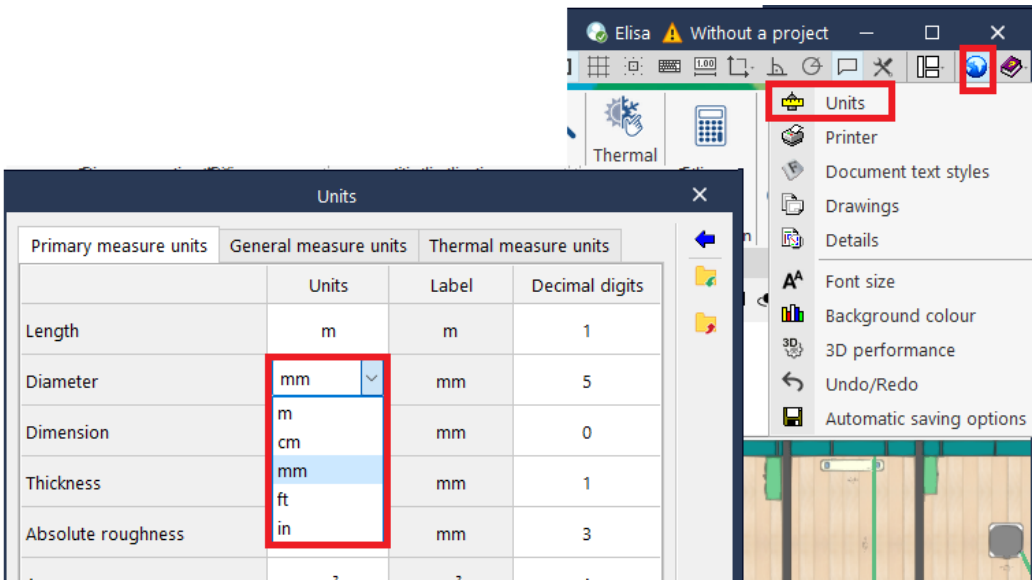
 **Orthogonality and polar tracking.** It is recommended to disable it.

While users are drawing, the programme usually draws orthogonally and helps users by highlighting a projection in the colour of the axis.

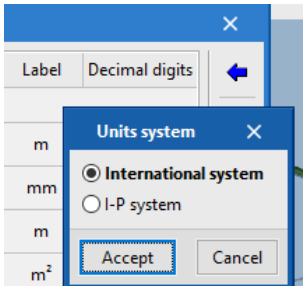


General configuration

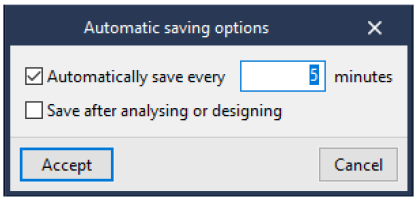
Units. You can configure the units and the number of decimals.

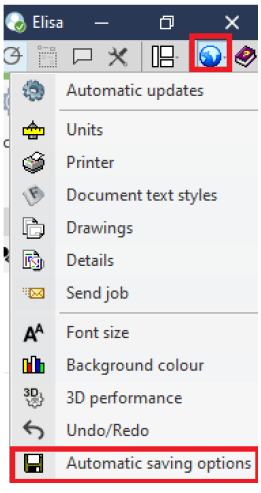


You can configure them one by one, or all at once with the blue arrow.

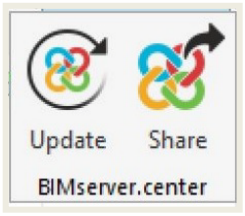


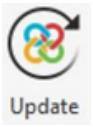
Autosave. Configure the autosave as shown in the image.





2.13 BIM export/Import



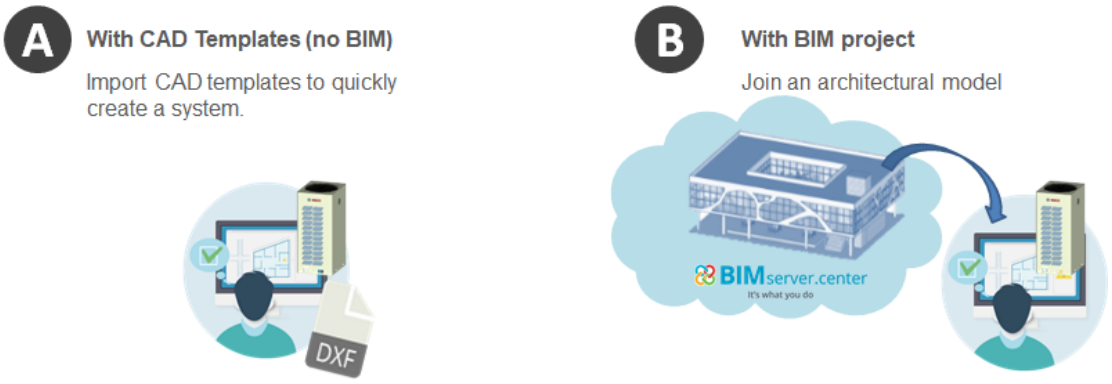


Update. Updates the model when some IFC of the project has changed (for example, architecture, thermal loads, etc.).

Share. Exports the IFC of the installation and the calculation report.

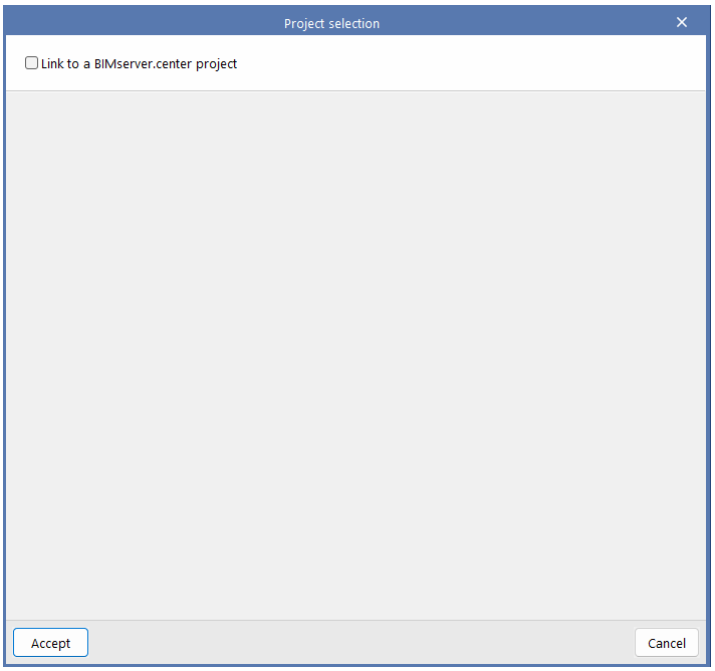
3 How to create a project

Open BIM BOSCH can be used with CAD templates (as a standalone tool) or integrated into a BIM project (using a 3D architecture).



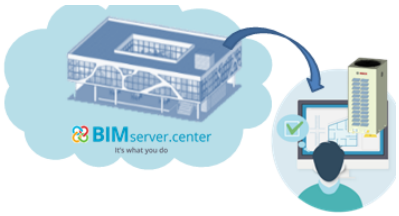
3.1 A) With CAD templates (no BIM)

Create a new project.



The wizard helps to create the floors and import the cad templates. Anyway, after you can modificate all this. See the part ***2.1. Views*** and ***2.11. CAD Templates***

3.2 B) With BIM project



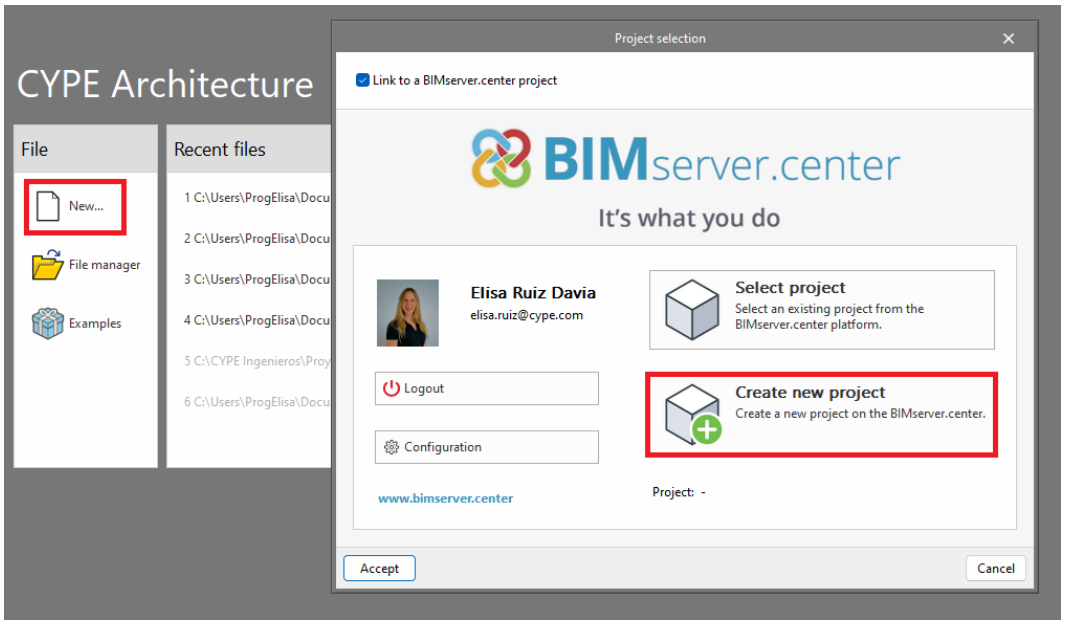
3.2.1 Achieve the Building Geometry and Create the BIM Project

The building geometry may be generated using any 3D architectural modelling software. If the architect does not use 3D modelling tool, the HVAC technician can take responsibility for creating the BIM project.

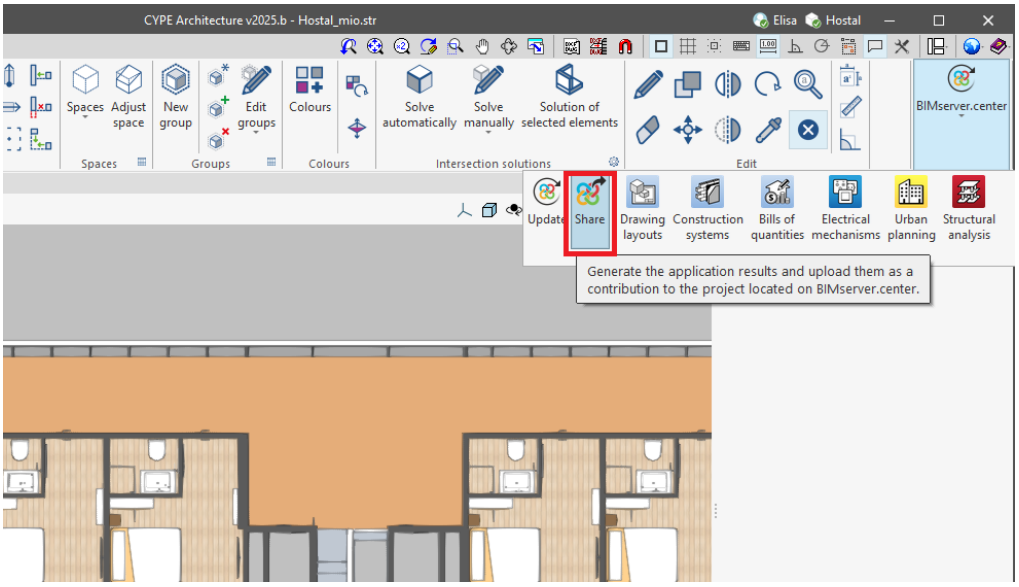
If the architectural software belongs to CYPE, it is already configured to create the 3D building geometry and create the BIM project directly within the program. CYPE applications, such as CYPE Architecture and IFC Builder, include buttons to export and create the BIM project on the platform.

Below are some examples to help you get started.

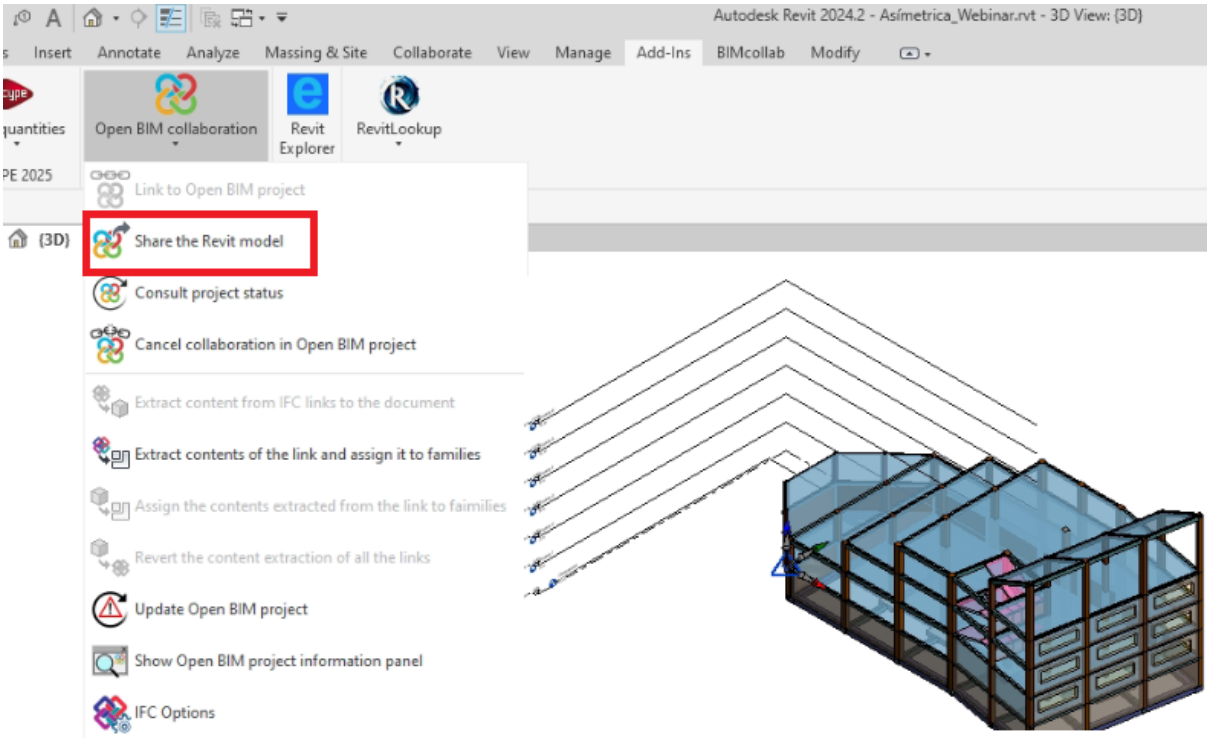
CYPE Architecture. Generating a simple 3D model is simple. In the **Create a new file** process, the project setup wizard helps users create the BIM project.



After designing the building geometry, click **Export**, and leave the check “export DWG” on.



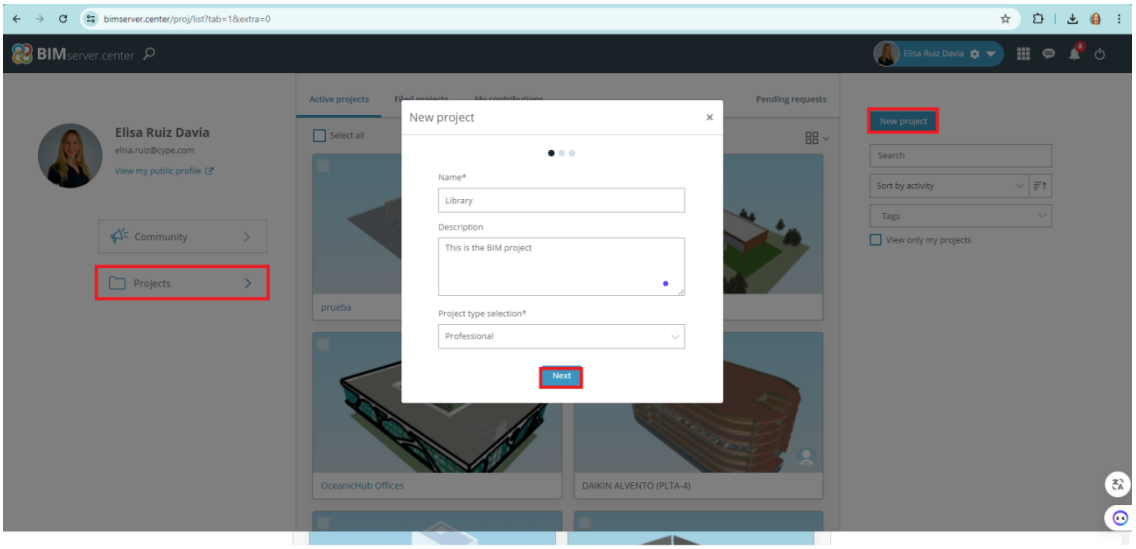
With Revit. CYPE has developed a complement which has been installed in the ribbon. The BIM project must be created directly in the software itself, by clicking **Export**.



With other 3D modellers (file.ifc). There are several modellers available on the market, and all of them are generally able to export a IFC file with its geometry and data due to a standard code.

Users can integrate any IFC file into the BIM workflow:

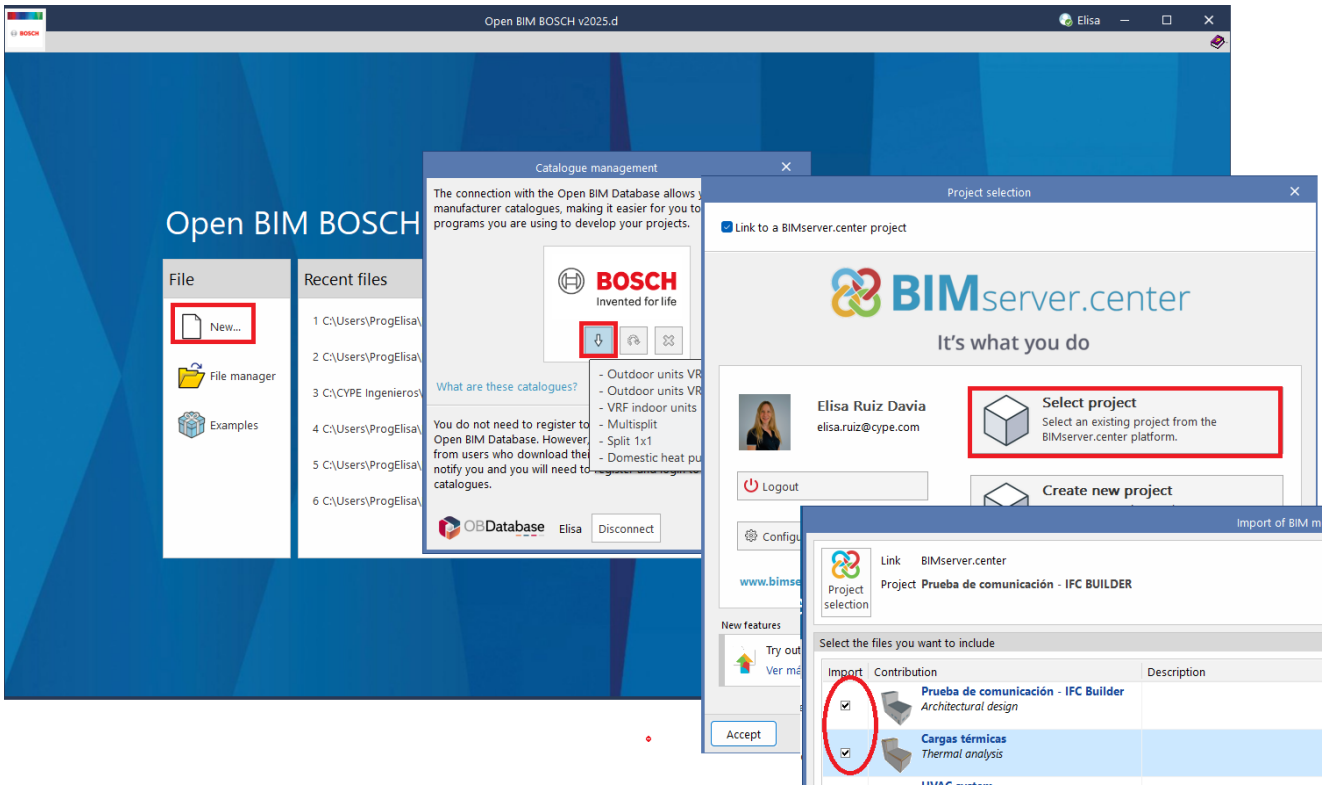
- Creating the BIM project directly in BIMserver.center.



Regardless of the 3D geometry generator used (CYPE Architecture or Revit), it is good practice to check that the file has been uploaded to the platform. Sometimes offices have restricted internet access for employees, if you have any problems, please contact technical support.

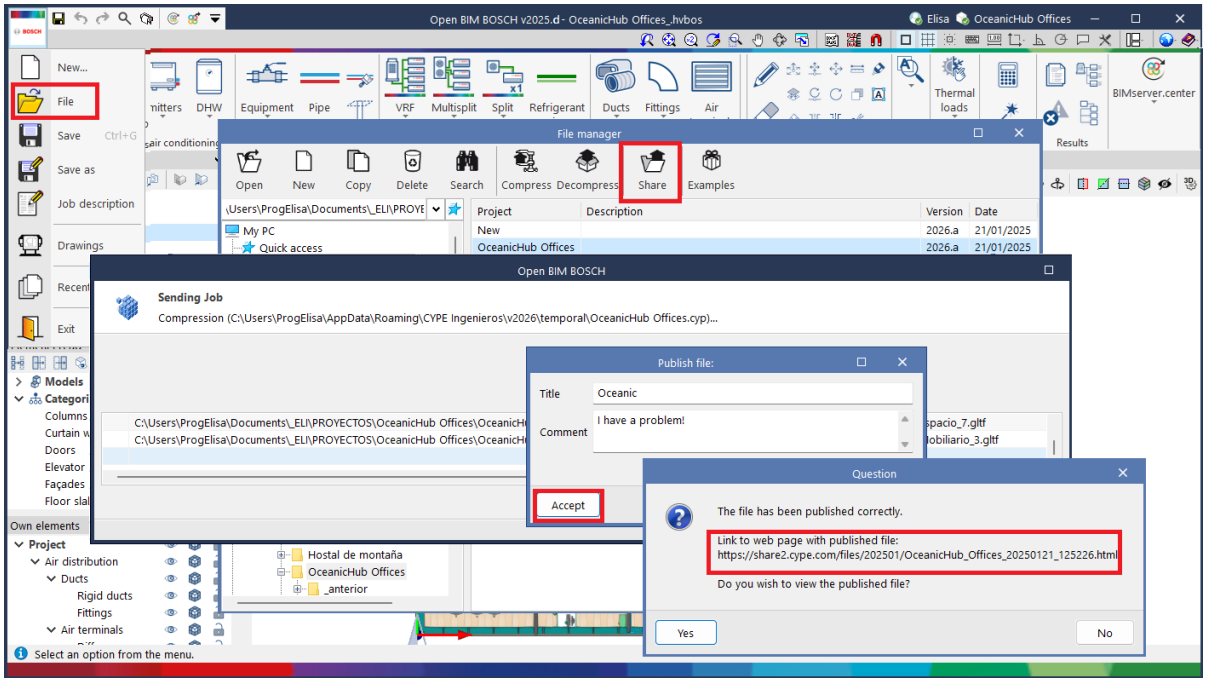
3.2.2 Connect Open BIM BOSCH to the BIM Project

Users must create a new project and link it to a BIM Project. The building geometry will be automatically included. If thermal loads have been calculated, include them.


Open BIM BOSCH v2025.d
Elisa
Open BIM BOSCH
File
New...
File manager
Examples
Recent files
Catalogue management
BOSCH
Invented for life
What are these catalogues?
- Outdoor units VR
- Outdoor units VR
- VRF indoor units
- Multisplit
- Split 1x1
- Domestic heat pu
OBDatabase
Elisa
Disconnect
Project selection
Link to a BIMserver.center project
BIMserver.center
It's what you do
Elisa Ruiz Davia
elisa.ruiz@cype.com
Select project
Select an existing project from the BIMserver.center platform.
Logout
Create new project
New features
Accept
Import of BIM m
Project selection
Link BIMserver.center
Project Prueba de comunicación - IFC BUILDER
Select the files you want to include
Import
Contribution
Description
Prueba de comunicación - IFC Builder
Architectural design
Cargas térmicas
Thermal analysis

4 Contact

Sharing files. Sometimes users may wish to send the *"File.hvbos"* to other colleagues (illness, holidays, etc). Besides the traditional ways, (email, We Transfer, etc) CYPE programmes have a more direct method for sending files, (regardless of their size):



Support

Using the programme, browsing through the user interface, designing with the software, and obtaining the finished model will become clearer after completing this Open BIM BOSCH manual. If you still have questions, problems, or need more information, please visit our website (https://learning.cype.com/en/technical-support/), or contact CYPE.