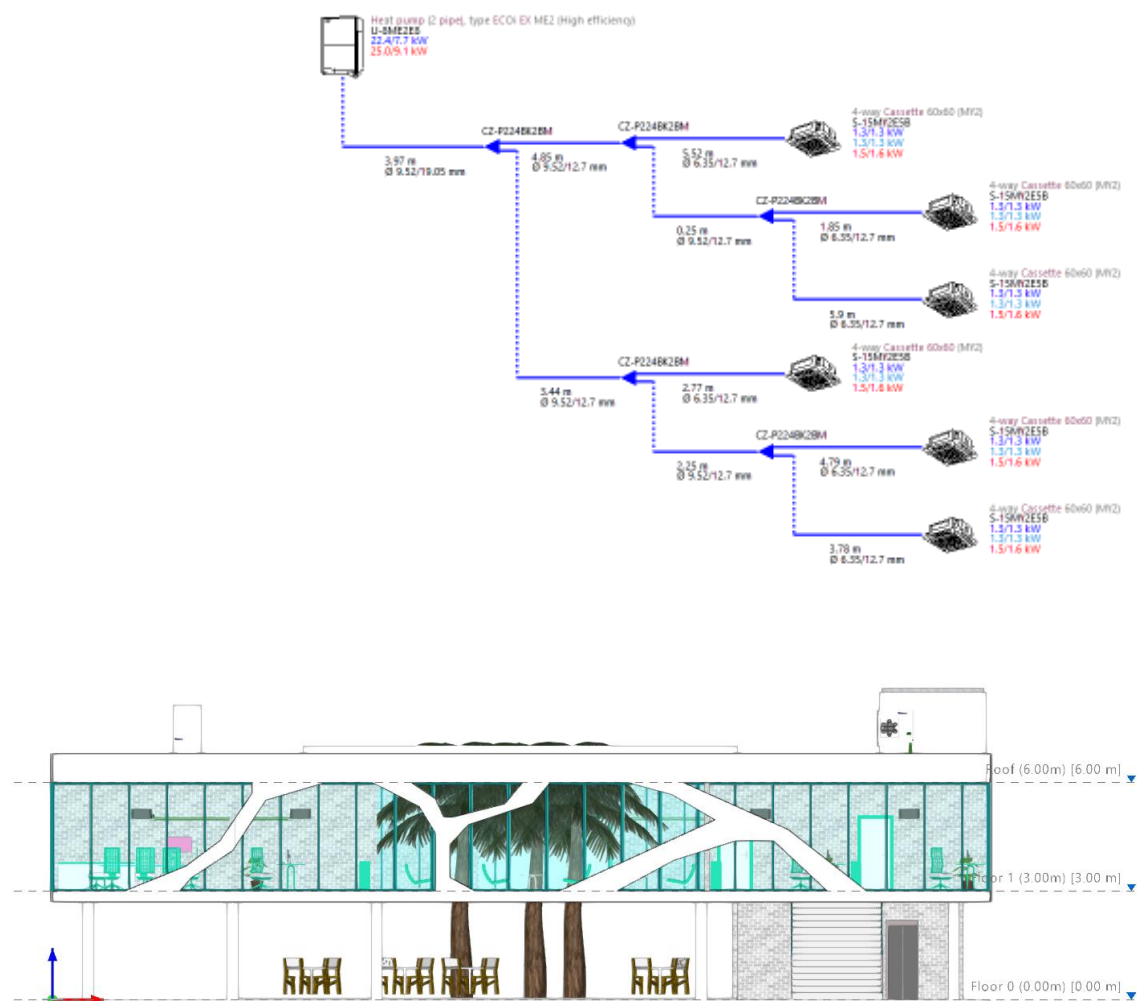


Panasonic
OPEN
BIM

Open BIM Panasonic

User's Manual

Design of PANASONIC VRF and Air-source heat pump systems.



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1 Installation

1.1 Objective

Open BIM PANASONIC is a selection tool which designs variable refrigerant flow (VRF) systems 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.

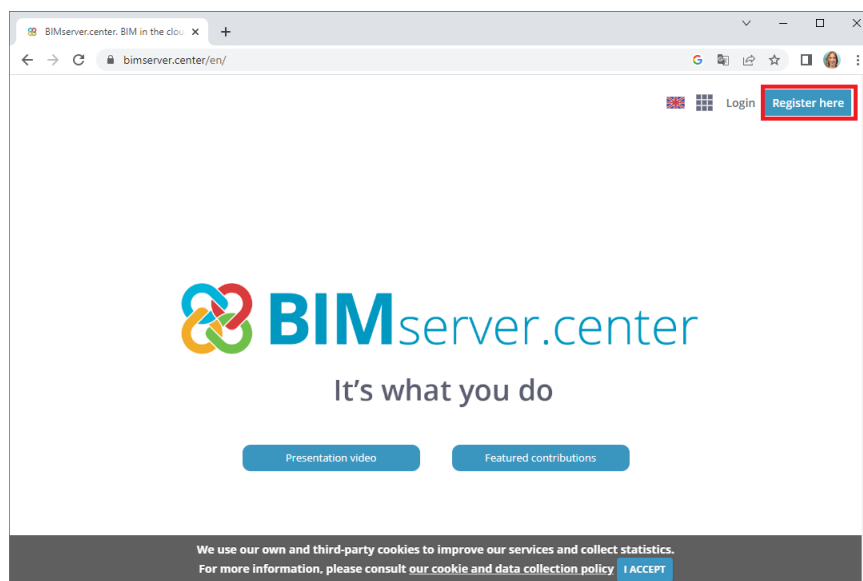
1.2 Material

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



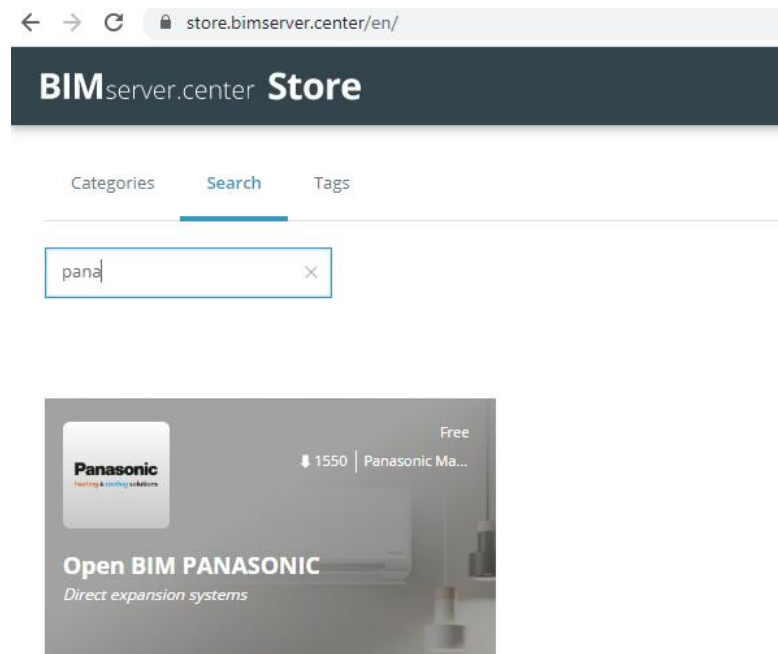
1.3 BIMserver.center

In order to use the platform, download the software, and store the projects, an account must be created.

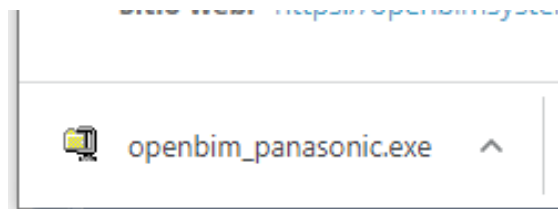


1.4 Software Installation

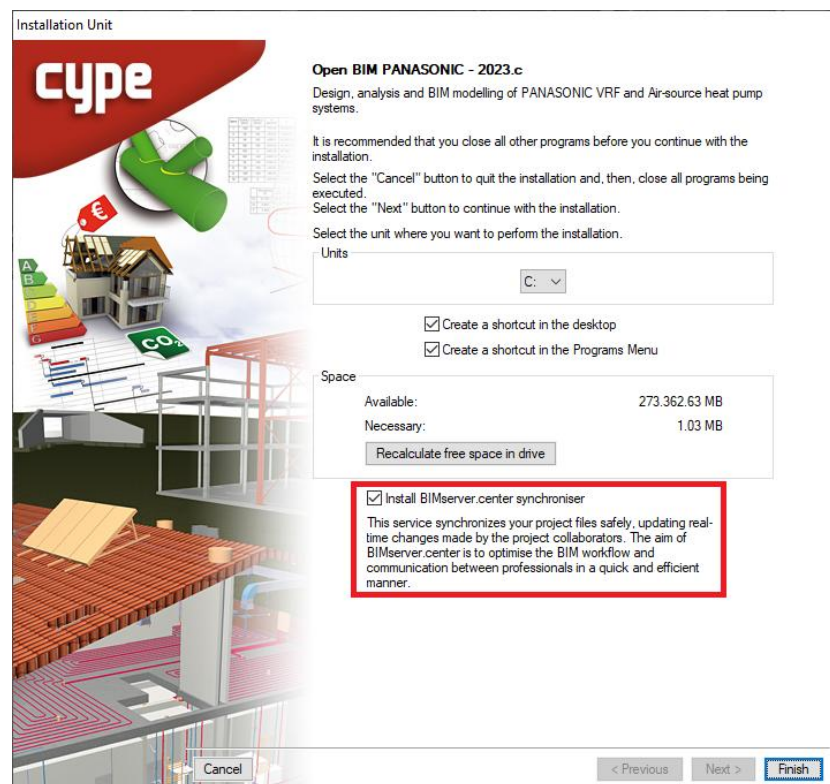
Go to the store and download Open BIM PANASONIC.



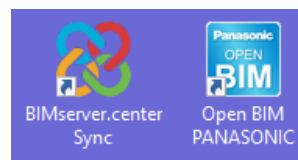
Download the file and click on it.



During the installation, check this box:

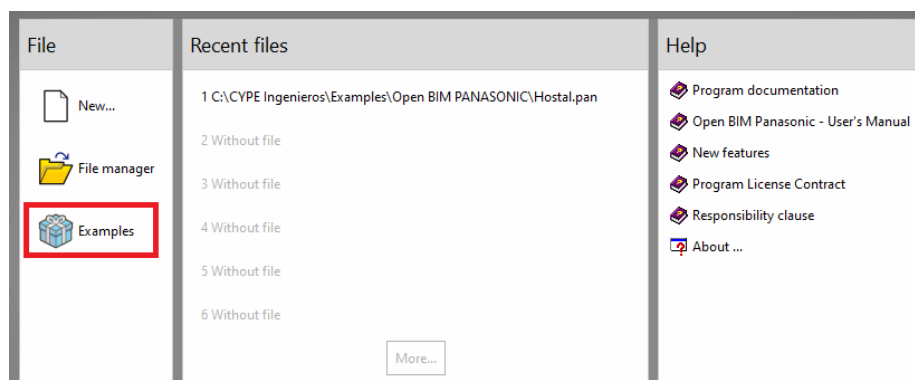


Once the software has been installed, two icons will appear on the desktop.



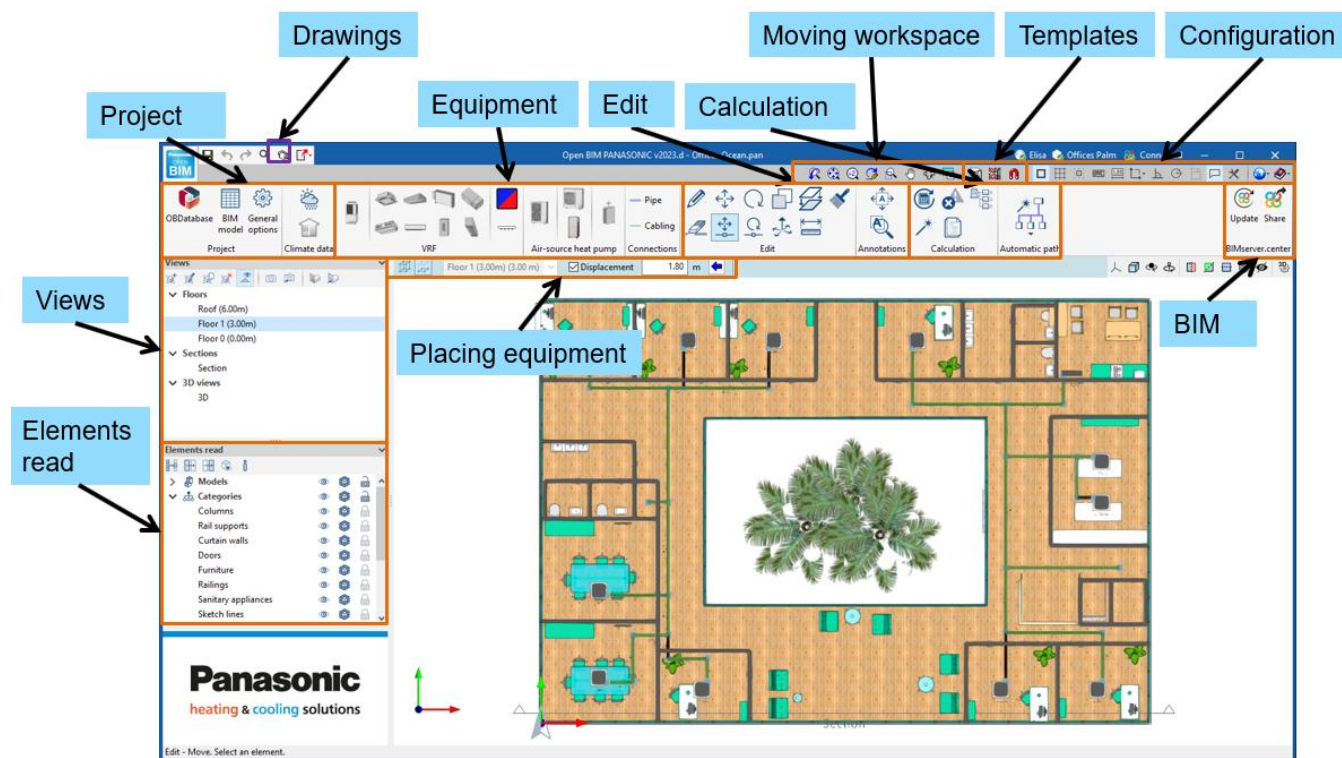
1.5 Opening examples

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

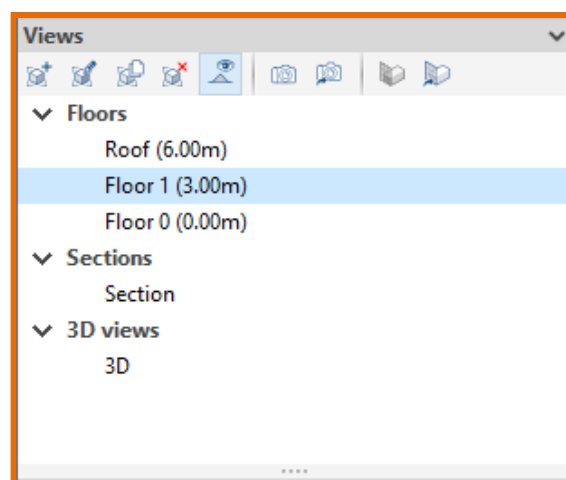


2 Interface

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.



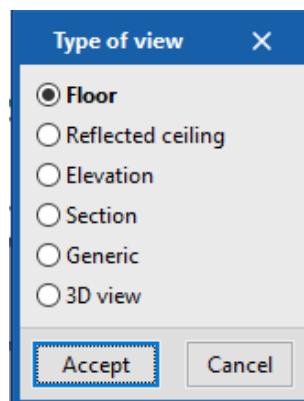
2.1 Views



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.

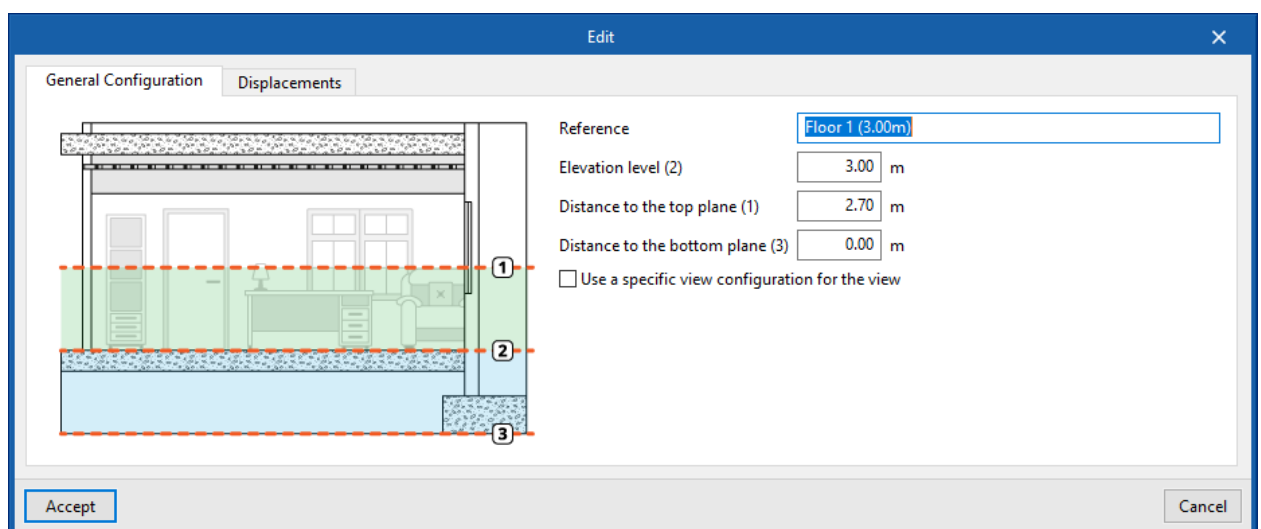


Create. Creates a new view.



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.

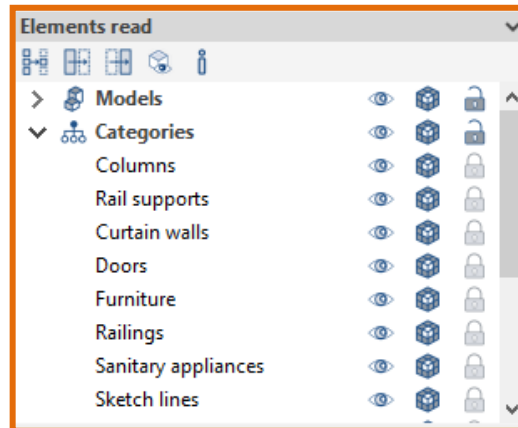
You can also press the **mouse wheel** and, while holding down, **drag** the wheel of the mouse and the cursor becomes a hand. Move it to the right to see how the user's point of view has changed.






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.

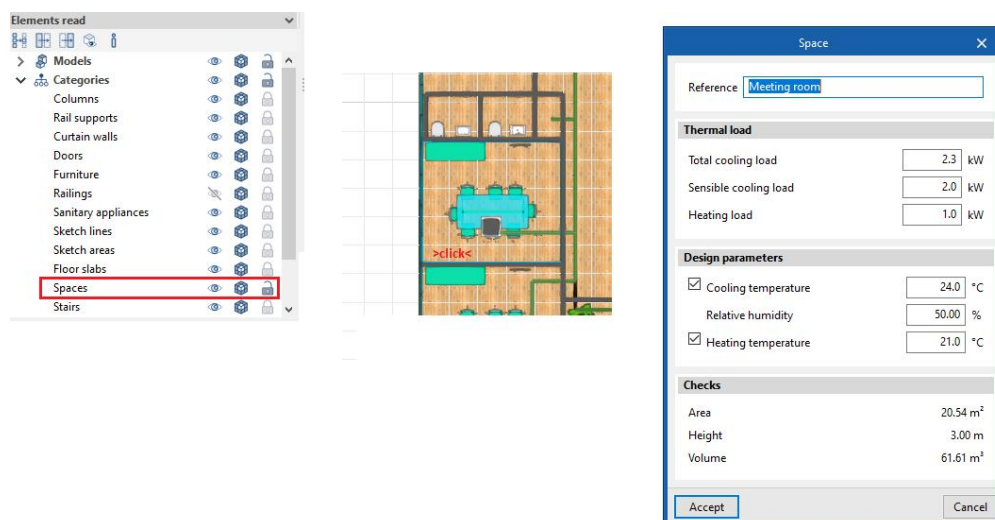
2.3 Elements read



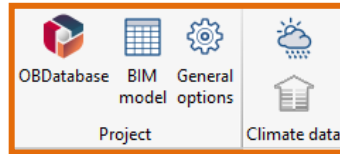
In the lower left area, the architectural elements that the programme has read and recognised can be found. The boxes can be used to enable or disable their display. Leave it as below to easily start working with the programme.

-  **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.

Spaces. You are using a model that has already been loaded in the example. Place the mouse on the border of a space, and check that it turns blue. Click to view the panel with thermal loads and indoor design conditions.



2.4 Project



OBDDatabase. 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.*

X1 (m)	Y1 (m)	Z1 (m)	X2 (m)	Y2 (m)	Z2 (m)
4.57	9.42	5.00	5.43	9.42	5.00
5.43	3.74	5.00	3.91	3.74	5.00
3.91	3.74	5.00	3.91	1.73	5.00
3.91	1.73	5.00	2.78	1.73	5.00



General options.

General options

Calculation options

☒ Check the limit refrigerant charge R-410A (EN378)

Type of building: Category B: Household, commercial, teaching, public attendance

Limit refrigerant concentration: 0.44 kg/m³

☒ Check the limit refrigerant charge R32 (IEC 60335-2-40)

Equivalent length

Ratio: 1.20

Drawing options

☐ Show maintenance areas 20 %

Report options

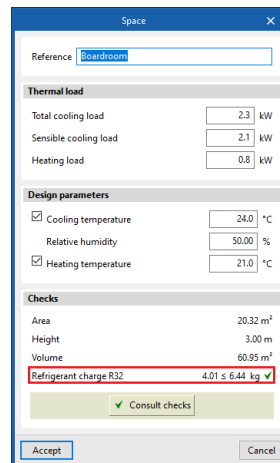
☒ Show equipment images in the materials report

Pipe auto-routing

Relative installation elevation: 2.70 m

Accept Cancel

Limit refrigerant charge. If the calculation of the limit is activated, after sizing, the programme calculates the total concentration of refrigerant charge. A BIM building (with spaces) and a system is necessary to carry out this calculation. In the example, double click after update results or sizing.



The 'Space' dialog box displays the following information:

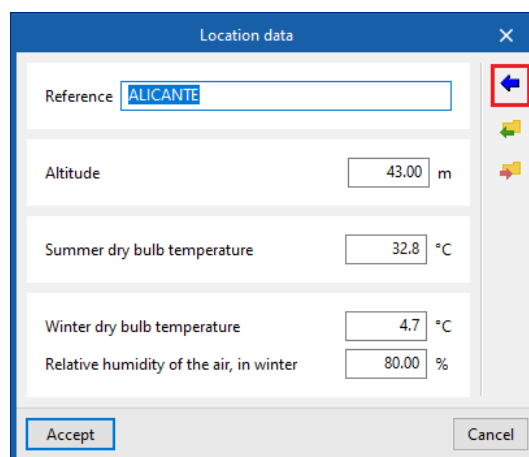
- Reference:** Boardroom
- Thermal load:**
 - Total cooling load: 2.3 kW
 - Sensible cooling load: 2.1 kW
 - Heating load: 0.8 kW
- Design parameters:**
 - ☒ Cooling temperature: 24.0 °C
 - Relative humidity: 50.00 %
 - ☒ Heating temperature: 21.0 °C
- Checks:**
 - Area: 20.32 m²
 - Height: 3.00 m
 - Volume: 60.95 m³
 - Refrigerant charge R32: 4.01 ≤ 6.44 kg ✓
- Buttons:** Consult checks, Accept, Cancel

Drawing options. Users can enable or disable the display of the maintenance space in the workspace.

Report options. 3D views may or may not be displayed in the material list report.



Climate data. 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.



The 'Location data' dialog box displays the following information:

- Reference:** ALICANTE
- Altitude:** 43.00 m
- Summer dry bulb temperature:** 32.8 °C
- Winter dry bulb temperature:** 4.7 °C
- Relative humidity of the air, in winter:** 80.00 %
- Buttons:** Accept, Cancel

ASHRAE Weather Data Viewer 6.0

ASHRAE®

Weather Data Viewer 6.0.
2017 ASHRAE, www.ashrae.org
Used with permission.

WMO region: 6 - EUROPE
Country: Spain
Station name: A CORUNA
Annual percentile value (Heating): 99%
Annual percentile value (Cooling):
Annual temperatures: 1%
Monthly temperatures: 2%
Latitude (°): 43.30 N
Longitude (°): 8.38 W
Altitude: 99.00 m

The data are provided "as is" without warranty of any kind, either expressed or implied. The entire risk as to the quality and performance of the data is with you. In no event will ASHRAE be liable to you for any damages, including without limitation any lost profits, lost savings, or other incidental or consequential damages arising out of the use or inability to use the data.

Accept Cancel



Zones. If CYPETHERM LOADS has been used to calculate the thermal loads, here the group of spaces and simultaneous loads will be shown. This zone load will be used to calculate aerothermal sizing.

2.5 Units



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. In this pop-up, you can see all the cassette models from the catalogue.

VRF indoor unit: Cassette

Panasonic
heating & cooling solutions

Reference

Show the equipment that is suitable for each type of refrigerant: ☒ R-410A ☐ R32

4-way Cassette 90x90 (MU2) S-22MU2E5B

Refrigerant: R-410A, R32
Cool air flow: 242 l/s

Design requirements

Heating dry bulb temperature °C

Cooling dry bulb temperature °C

Relative humidity %

Cooling wet bulb temperature °C

Thermal loads

Total required cooling capacity kW

Required sensible cooling capacity kW

Required heating capacity kW

Checks

	Nominal	Required
Total cooling capacity	2.2 kW	0.0 kW
Sensible cooling capacity	2.2 kW	0.0 kW
Heating capacity	2.5 kW	0.0 kW

☐ Main remote control Time Remote Controller (wired) CZ-RTC5B

☐ Slave remote control Time Remote Controller (wired) CZ-RTC5B

Sensor None

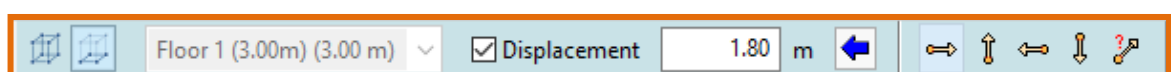
T10 None

Accept Cancel

If a field has a padlock, it means that the data will be chosen by the programme during the sizing process. Design conditions and thermal loads will be read from the space, and the model will be selected by the programme. Users can change the field's value by locking the padlock and entering a desired parameter (however, this is uncommon).

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

2.6 Inserting units



There are 2 ways of inserting units.

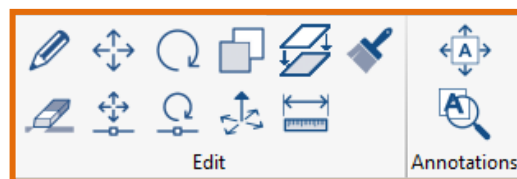


2D. If you choose 2D mode, the units will be located at the height of the current floor, or at the height of the current floor with a displacement.



3D. If you choose 3D mode, and a component of the model is captured (a unit, another pipe, a roof surface), the unit will be entered at the same height as the component. This is useful for inserting pipes.

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.



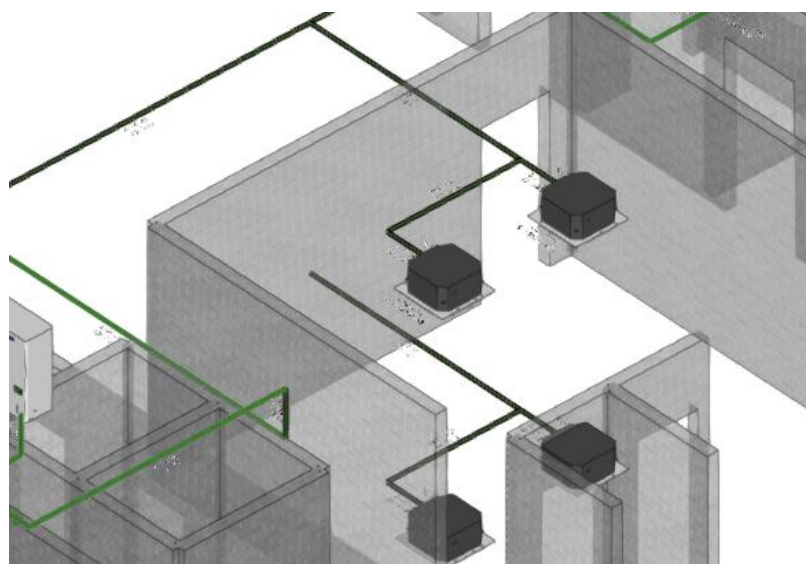
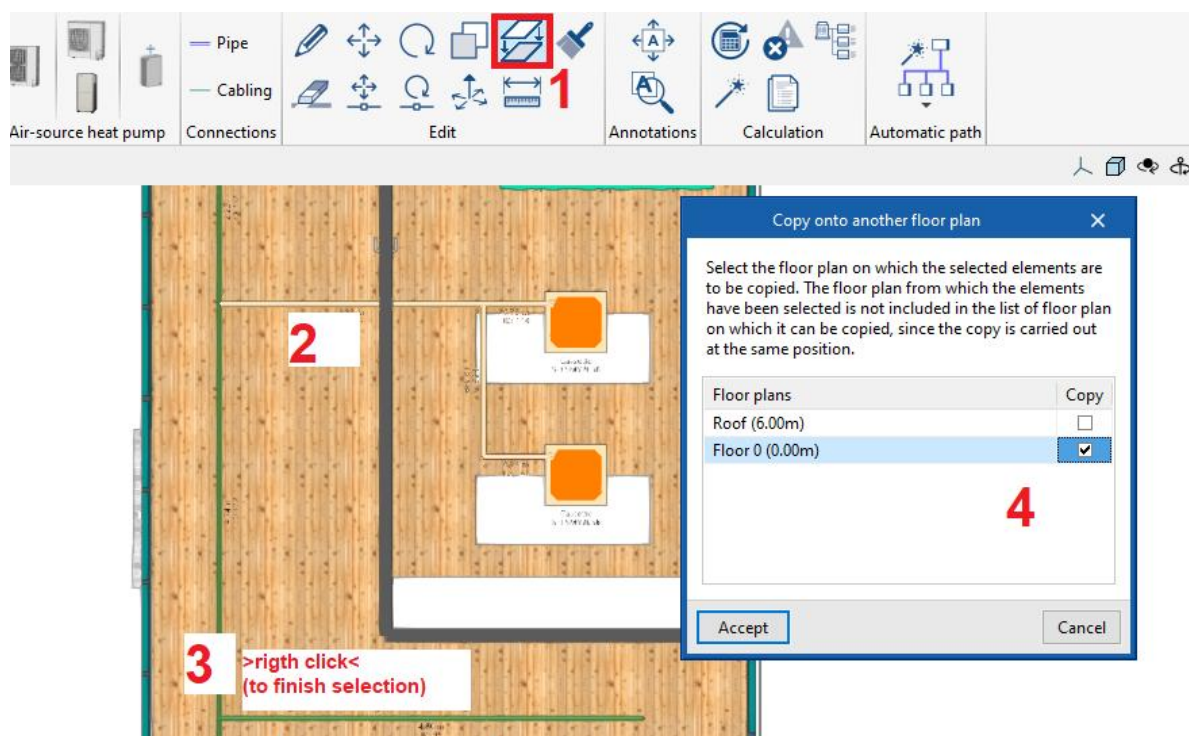
Move. Press **Move point** and pick an object. Click on a different place on the screen.

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

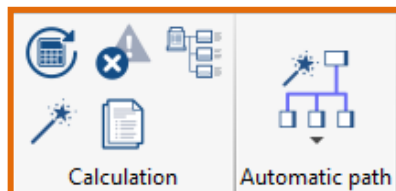





Copy onto another floor plan. Press this button and select one or more objects. Click the right mouse button to finish the selection. Select the floors where you wish to copy the selection.



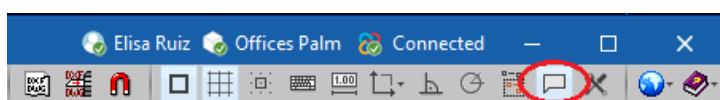
2.8 Calculations



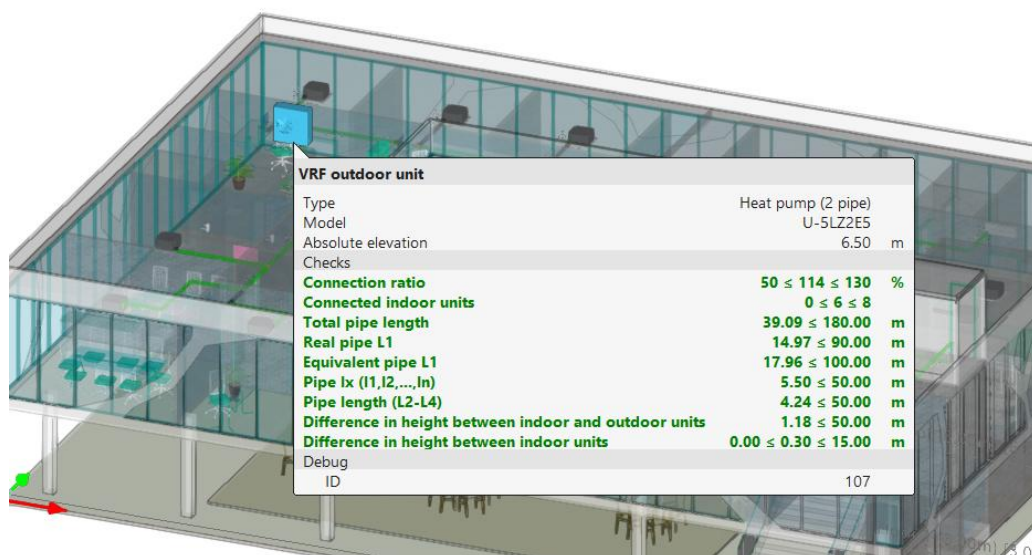
 **Design.** By pressing this button, the programme runs a calculation process. The tool checks that the piping routing is correct, the pipe lengths are in the permitted range and displays errors if something must be corrected.

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.

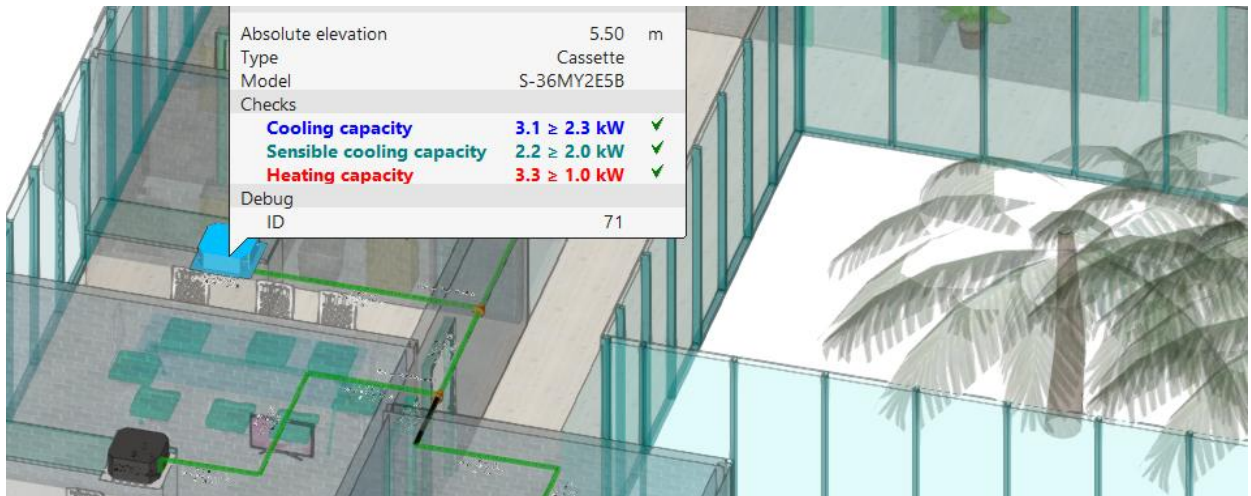
(Please activate this button to view the tooltips)



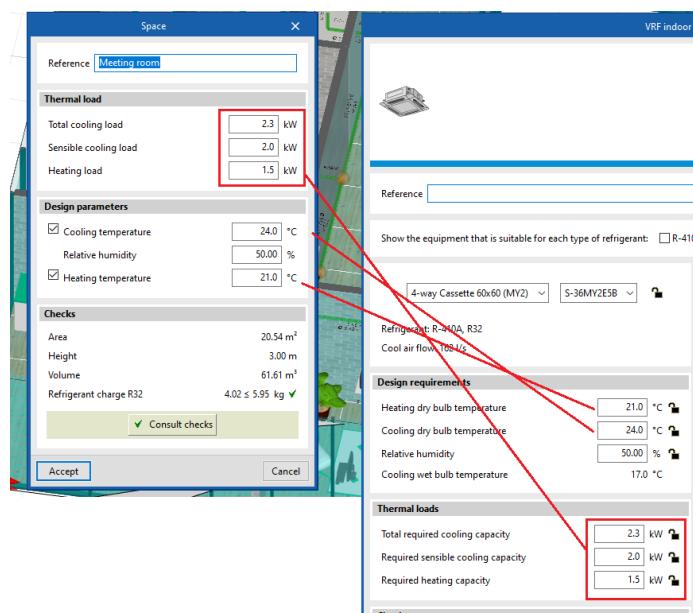
Place the mouse cursor over the outdoor unit to see all the compliances. This list will be included in the calculation report.



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



Click on it in order to open the panel. The data has been read.



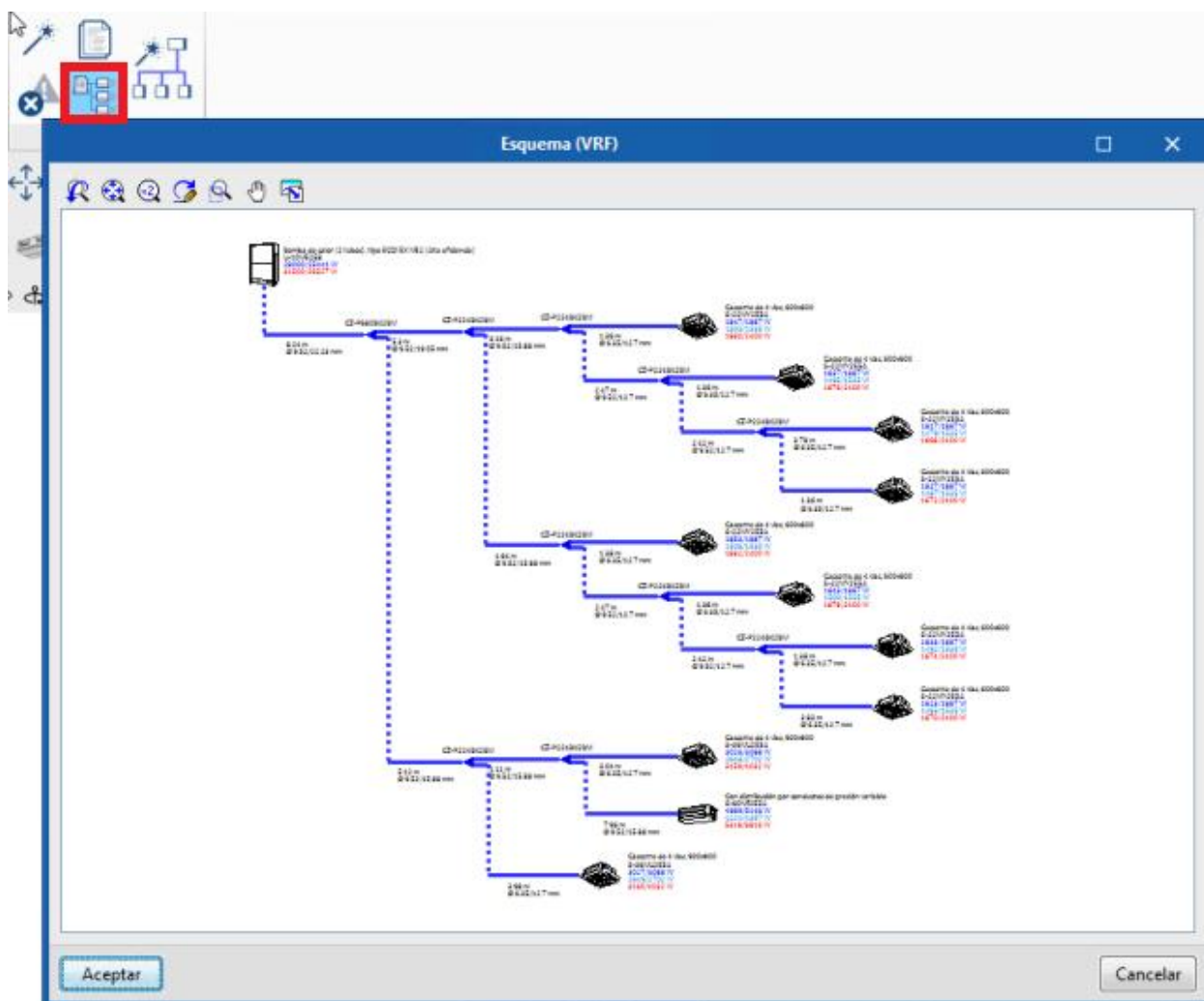
The software also selects the **size** of the **units** according to the thermal loads.



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



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.

1. Project Compliance

Checks	Design	Specification	Meets the requirements
Connection ratio	114 %	50 % - 130 %	✓
Connected indoor units	6	0 - 8	✓
Total pipe length	39.09 m	180.00 m	✓
Real pipe L1	14.97 m	90.00 m	✓
Equivalent pipe L1	17.96 m	100.00 m	✓
Pipe length (L1, L2, ..., Ln)	5.50 m	50.00 m	✓
Pipe length (L2-L4)	4.24 m	50.00 m	✓
Difference in height between indoor and outdoor units	1.18 m	50.00 m	✓
Difference in height between indoor units	0.30 m	0.00 m - 15.00 m	✓

1.2. Equipment List

VRF outdoor units

Model	Description	Quantity
U-SLZ2ES	Heat pump (2 pipe)	1

VRF indoor units

Model	Description	Quantity
S-22MY2ESB	2.2 kW 4-way Cassette 60x60 (MY2)	4
S-36MY2ESB	3.6 kW 4-way Cassette 60x60 (MY2)	2

Controls

Model	Description	Quantity
CZ-RTC5B	Time Remote Controller (wired)	1

Y joints

Model	Description	Quantity
CZ-P224BK2BM	Y branch	5

Tube length

Pipe Diameter	Liquid side (m)	Discharge side (m)	Gas side (m)	Tube length (m)
Ø6.35 mm (1/4")	23.93	0	0	23.93
Ø9.52 mm (3/8")	15.15	0	0	15.15
Ø12.7 mm (1/2")	0	0	31.13	31.13
Ø15.88 mm (5/8")	0	0	7.95	7.95

1.3. Details

VRF outdoor unit

Reference	Model	Units it is composed of	Type	Refrigerant charge	Extra refrigerant charge	Total
	U-SLZ2ES		R32	2.7	1.31	4.01

Page 3

Accept



Automatic connection. Press **Automatic connection** and then select a group of elements (one outdoor unit must be included in the selection). Press the right mouse button to finish the selection and the pipe layout will be automatically generated. If any pipes have been selected, the programme will delete them and create them again.

If the Outdoor unit is a type 3 pipe the programme will also locate a flow selection unit before each indoor unit.

2.9 Drawings

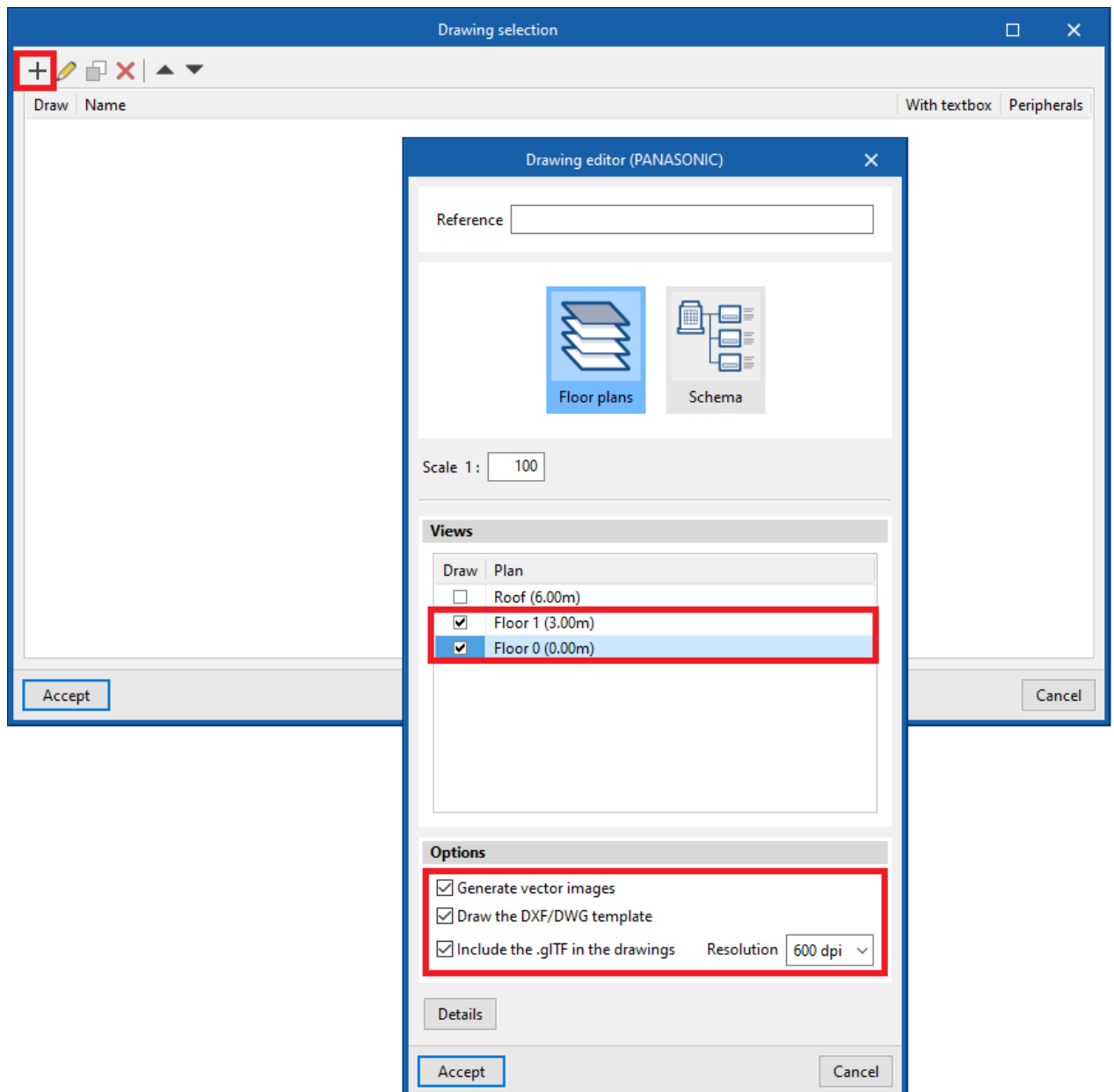


 Save.

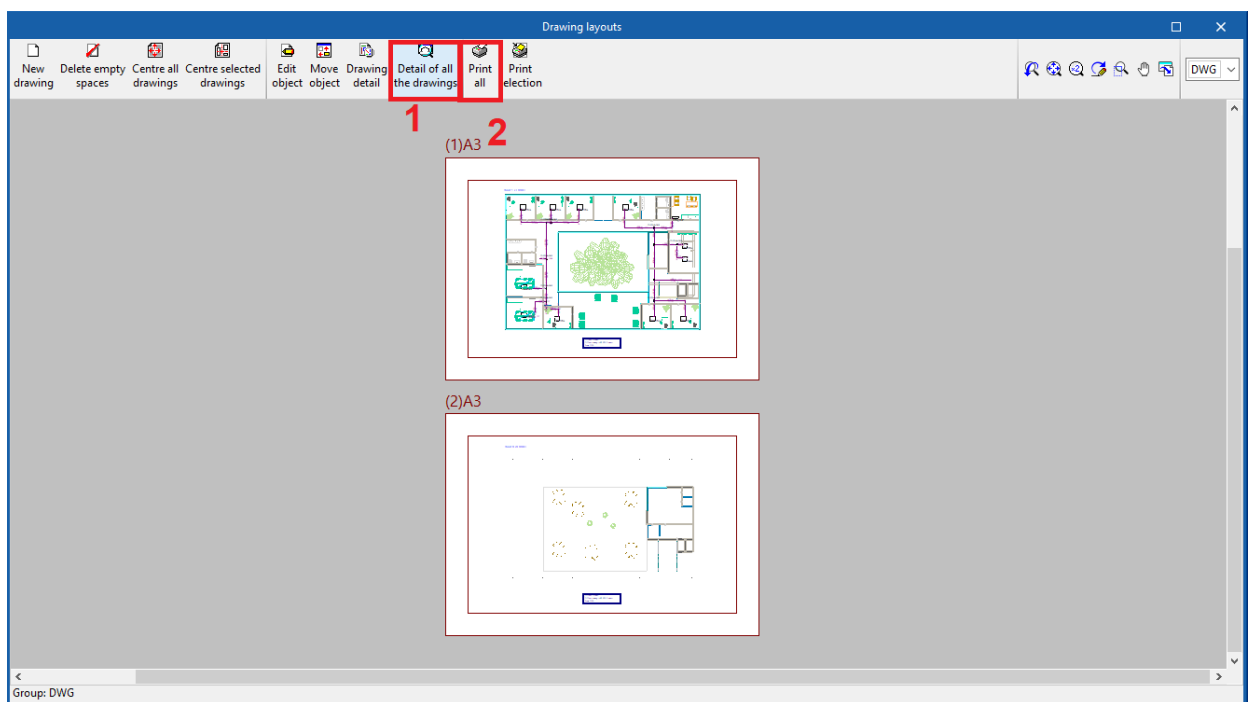
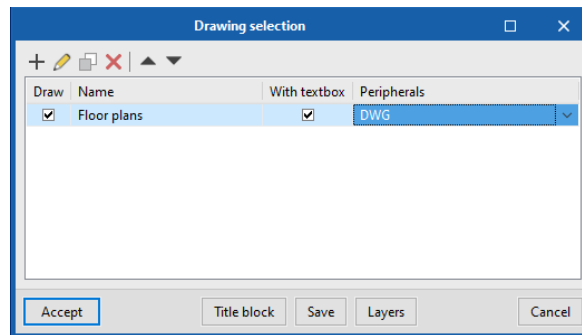
 **Undo.** Ctrl+Z

 **Redo.** Ctrl+Y

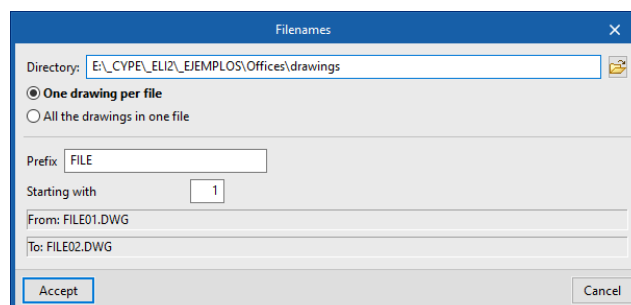
 **Drawings.**



Select DWG/DWG template.



Select where to save the files.



2.10 Templates

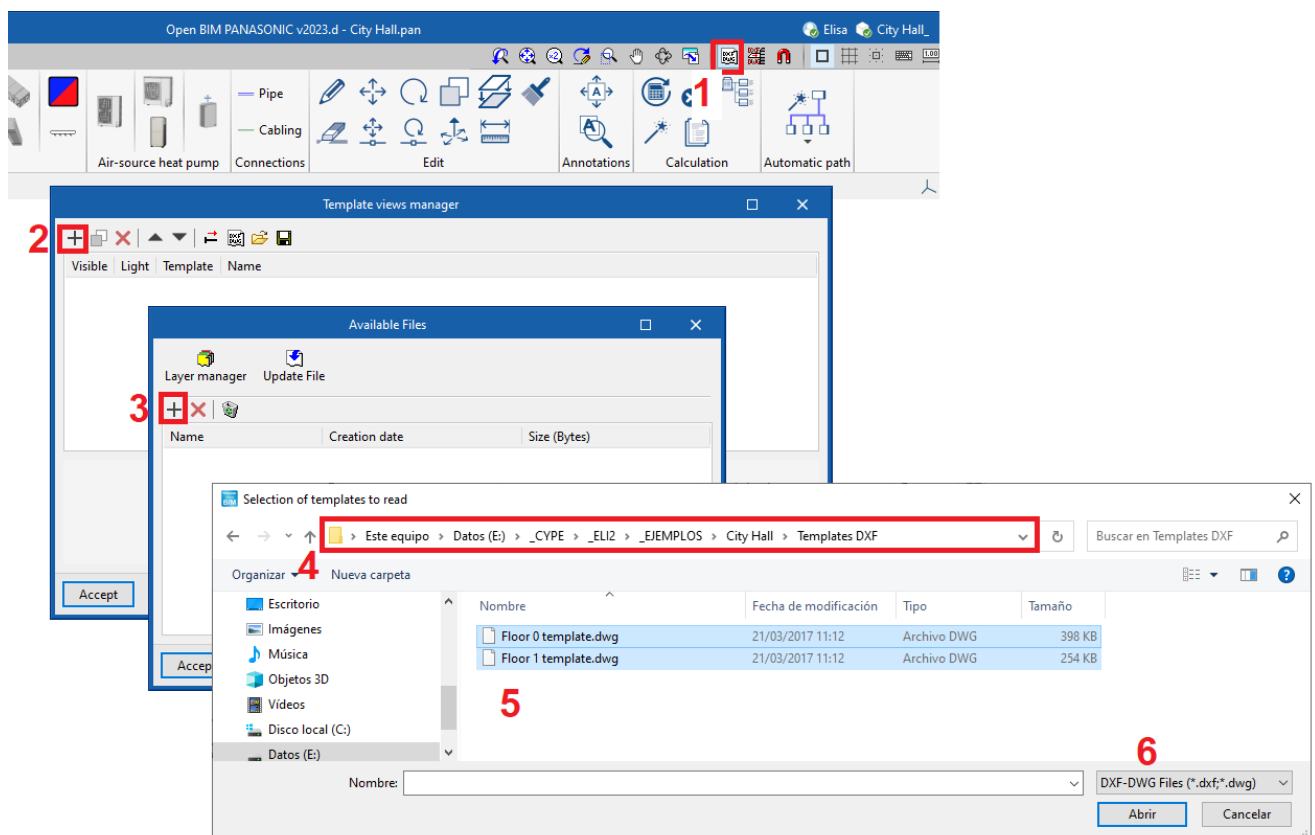


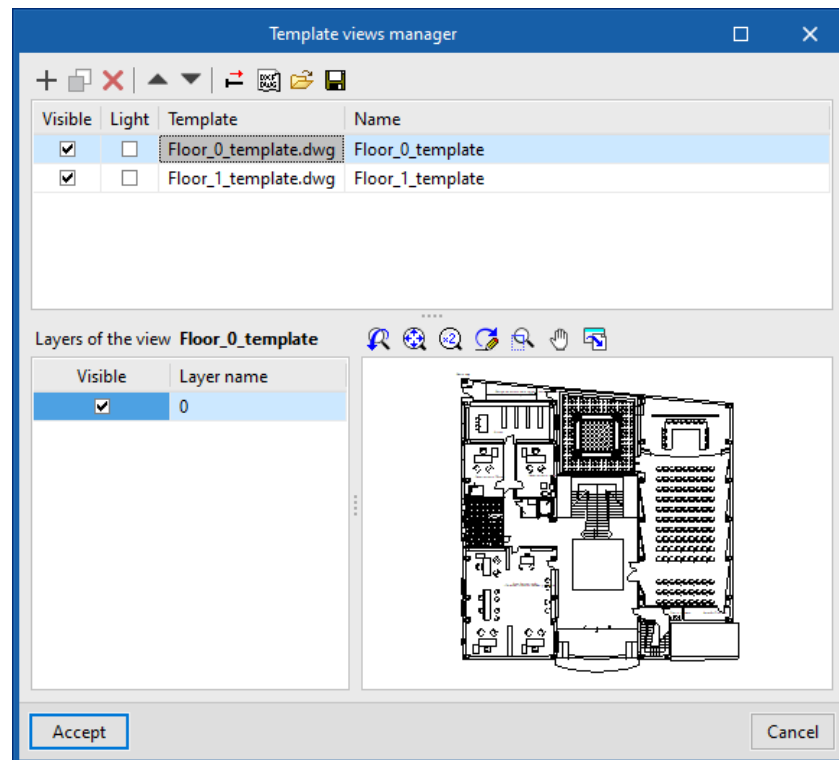
If users have CAD templates but not a BIM model of the building, Open BIM Panasonic can be used in isolation. In this case, CAD templates may be imported.



Step 1: Import templates saved on the computer into the “File.pan”.

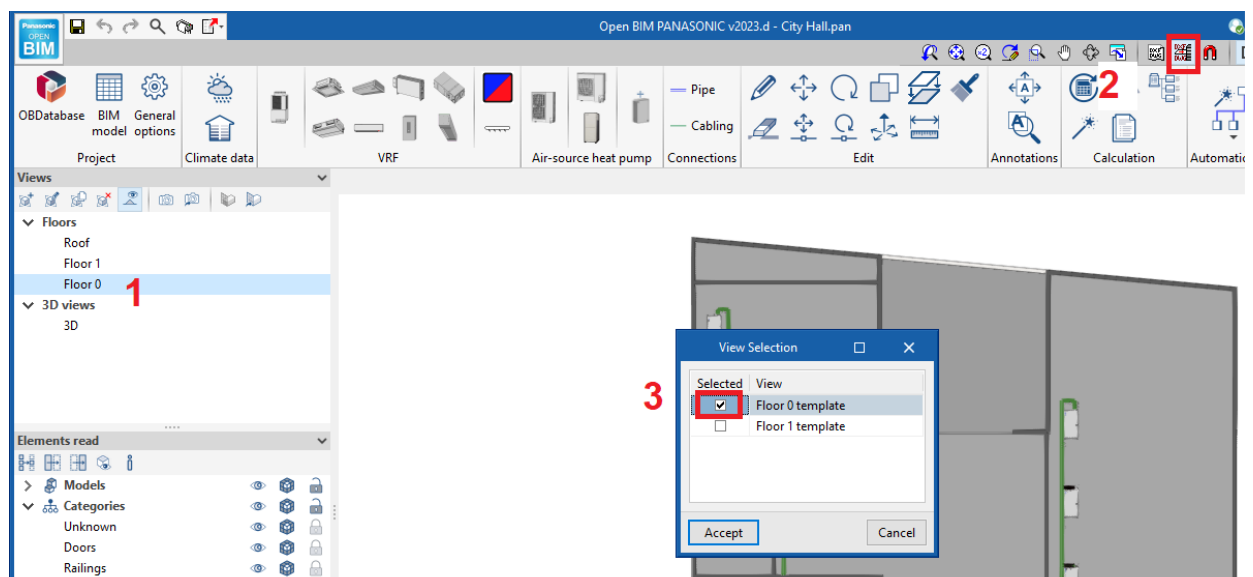
*Several files can be selected at the same time by pressing the **Shift** key.*



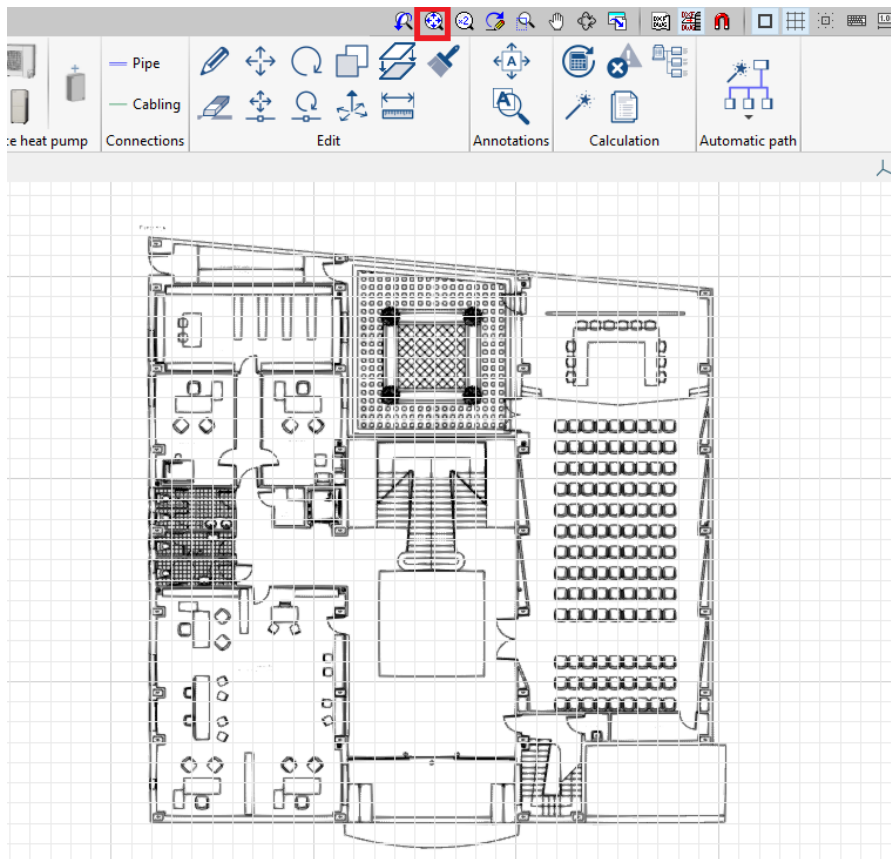


Step 2: Choose which template will be visible on each floor:

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

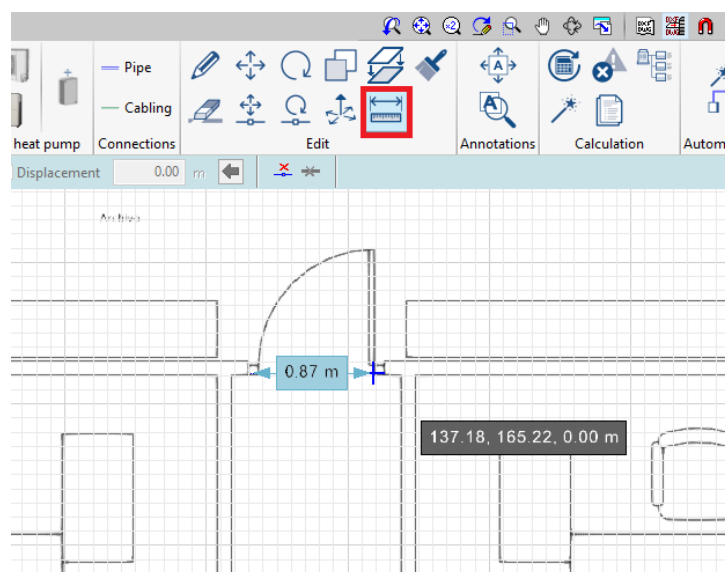


Double click the mouse wheel in order to centre the drawing (or press **Full window**).



Repeat this assignment for the rest of the floors.

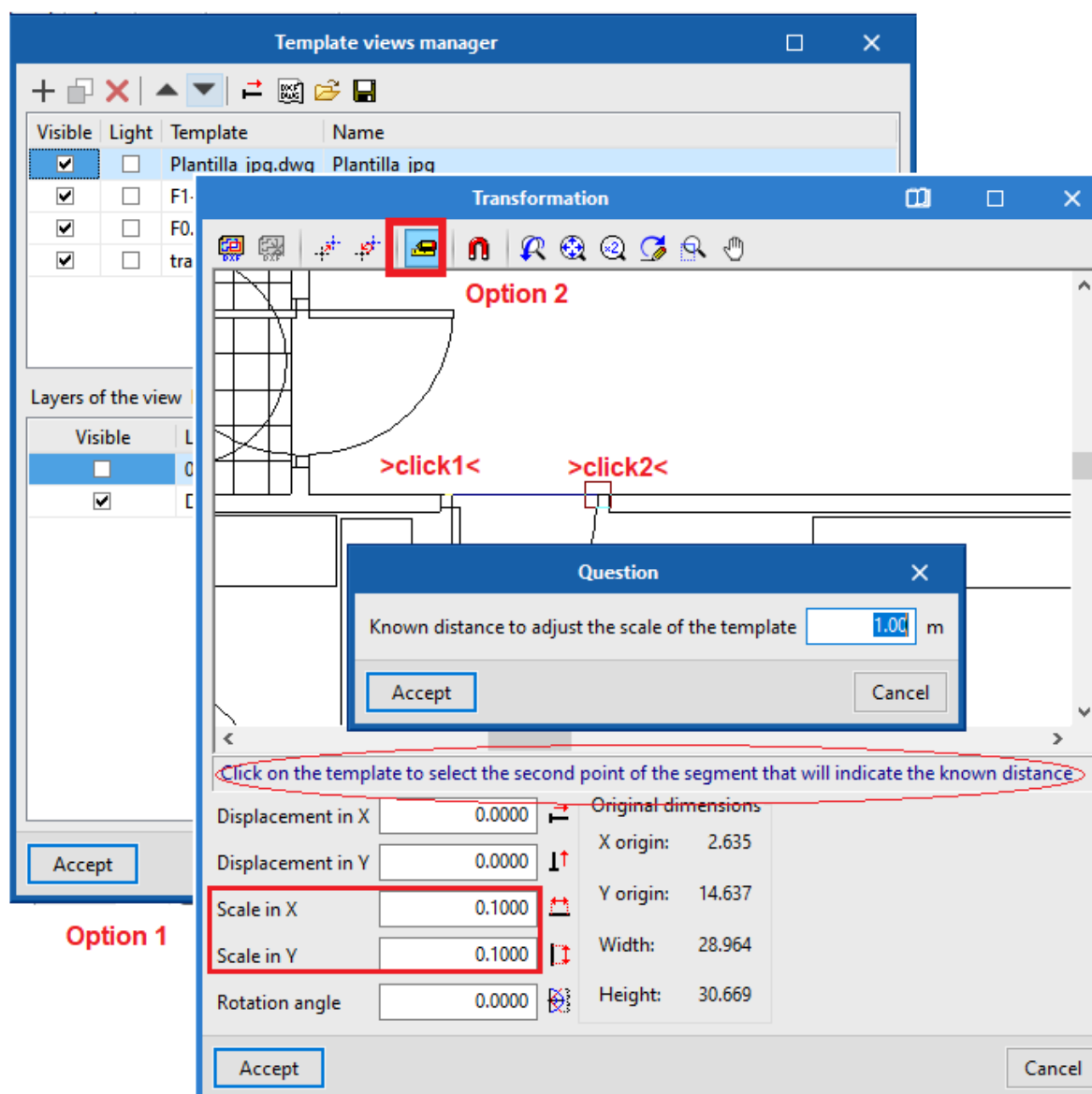
Scale templates. The DXF/DWG template may have a scale. In general, drawings usually have DIN A0, A1, A2, A3 or ANSI A, B, C, D or E dimensions. Measure the template to detect its size.



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.

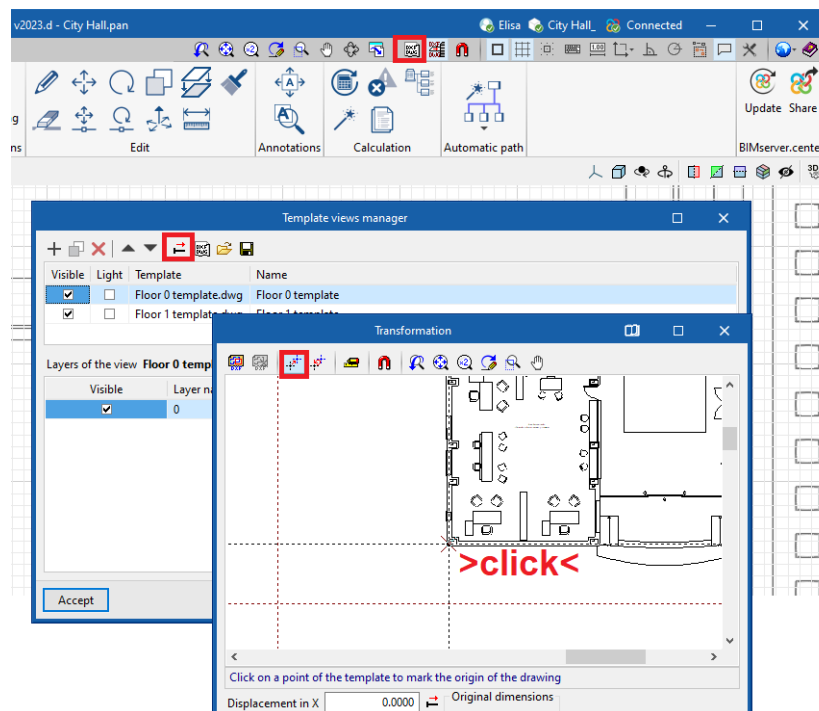
Option 2: If the scale is unknown, it can be introduced as a known dimension, such as a door.



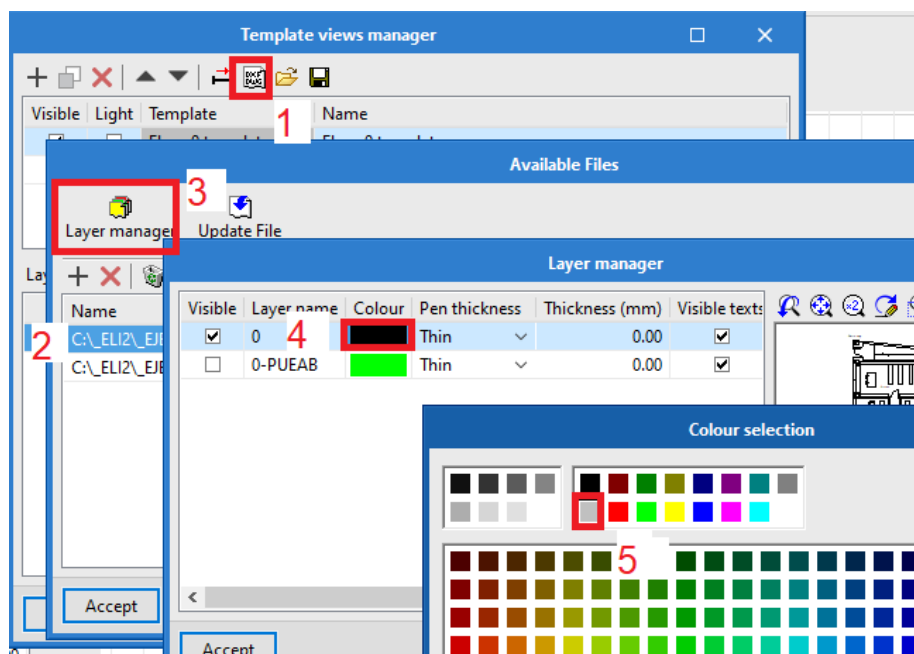
If there are several templates, the scale must be changed in each template.

Origin of coordinates.

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



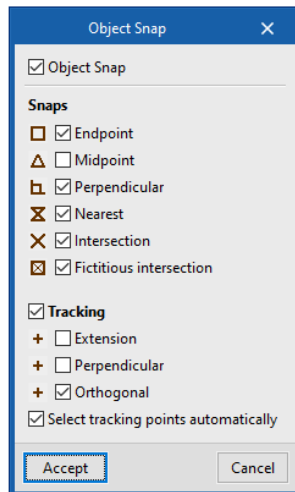
Change the colour. The colour of the CAD layers can be changed here:




2.11 Configuration




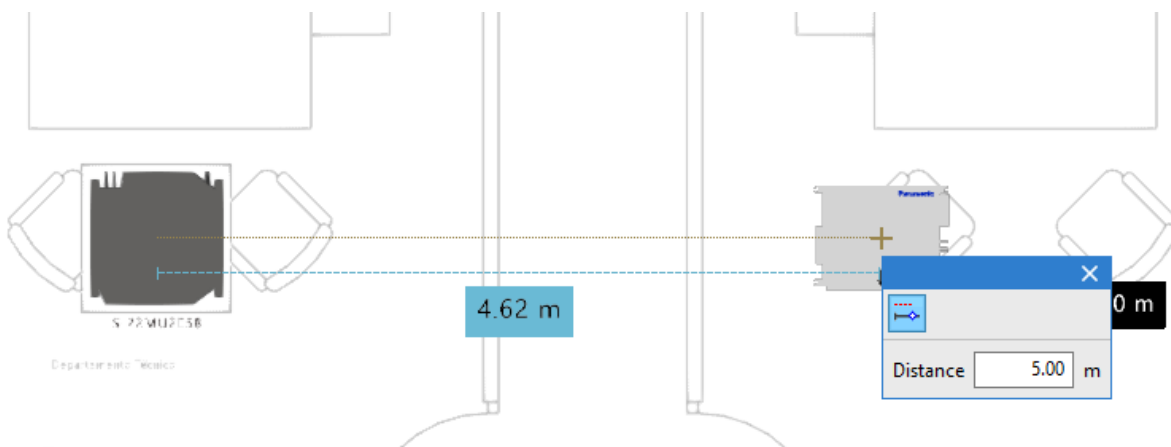
 **Object snap.** It is strongly recommended to have all the object snaps like this.



 **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).



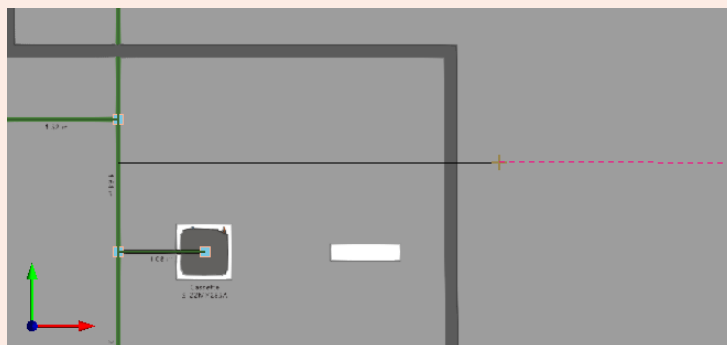


Personal coordinate system. Sometimes the building is not aligned with the “x” and “y” axes. In order to work easily, you might need to rotate it to work orthogonally.



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

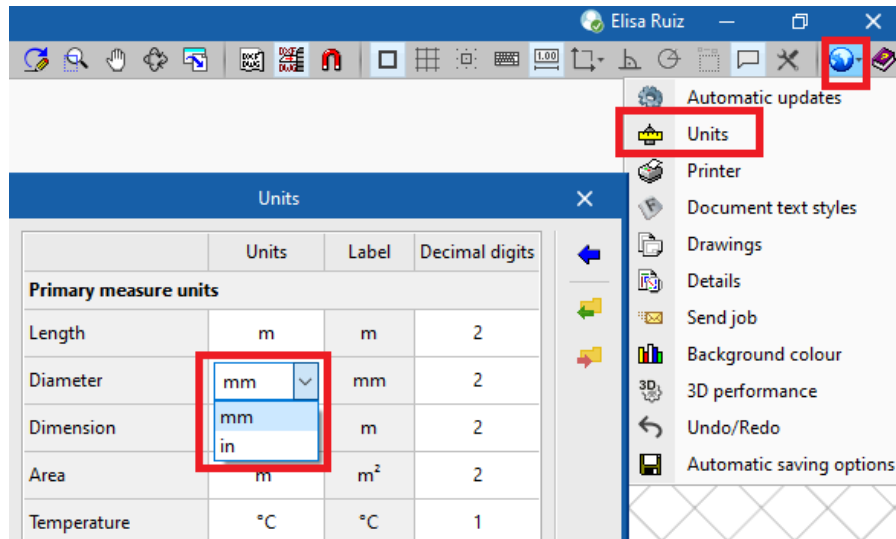
While users are drawing, the programme usually draws orthogonally and helps users by highlighting a projection in the colour of the axis.



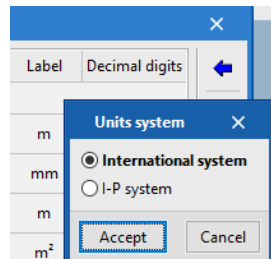


General configuration.

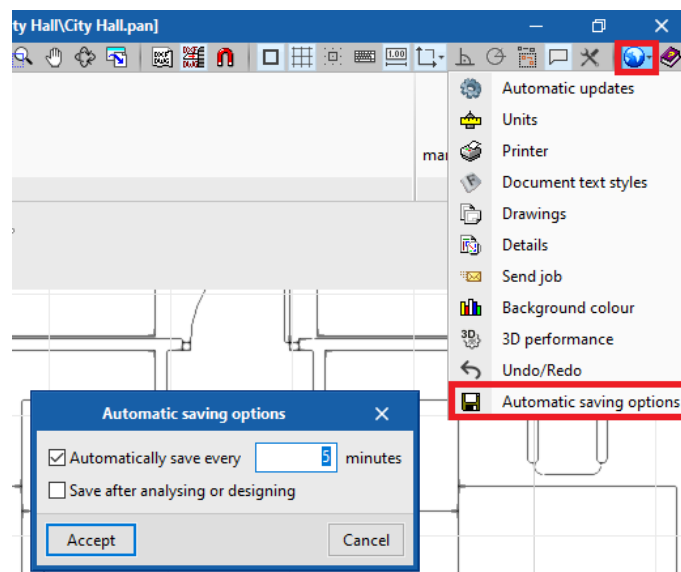
Units. You can configure the units and the number of decimals.



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



Autosave. Configure the autosave as shown in the image.



2.12 BIM

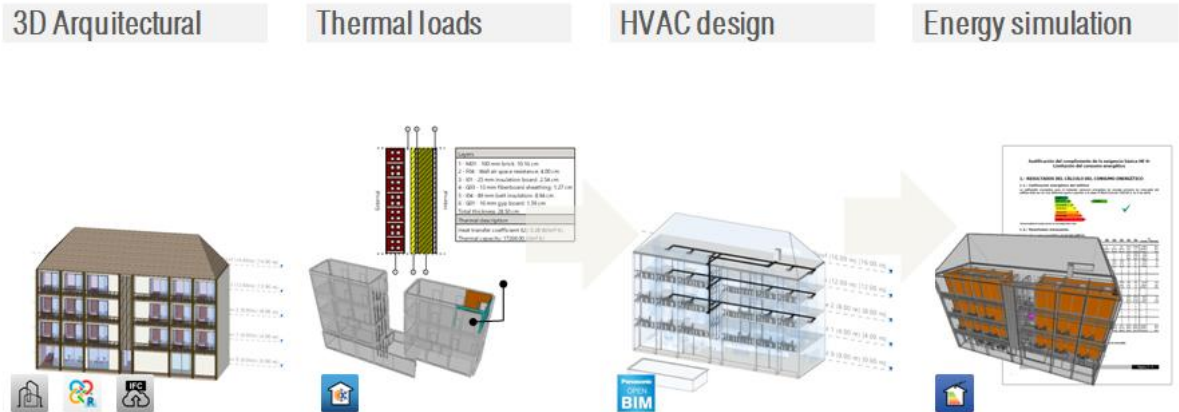


Update. Updates the model when some IFC of the project has changed (for example, architecture, thermal loads, etc).



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

3 How to create a BIM project

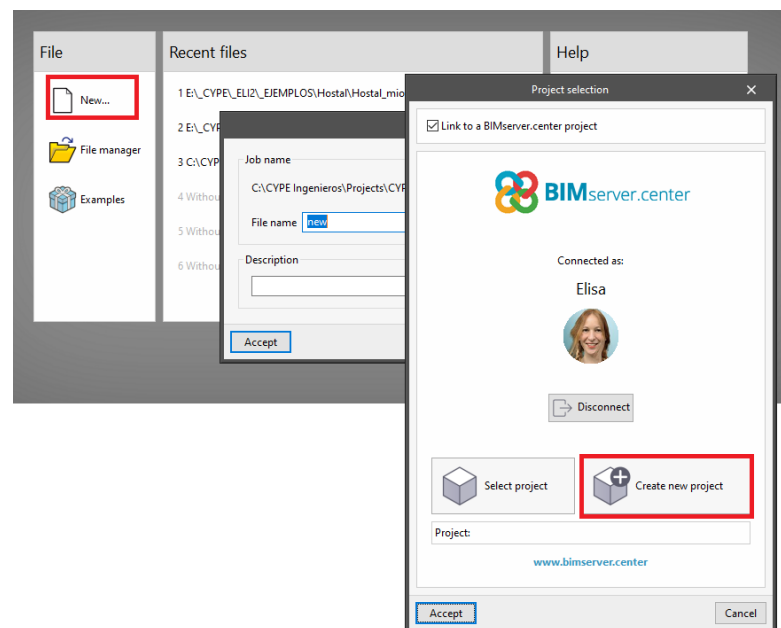


3.1 Architectural model

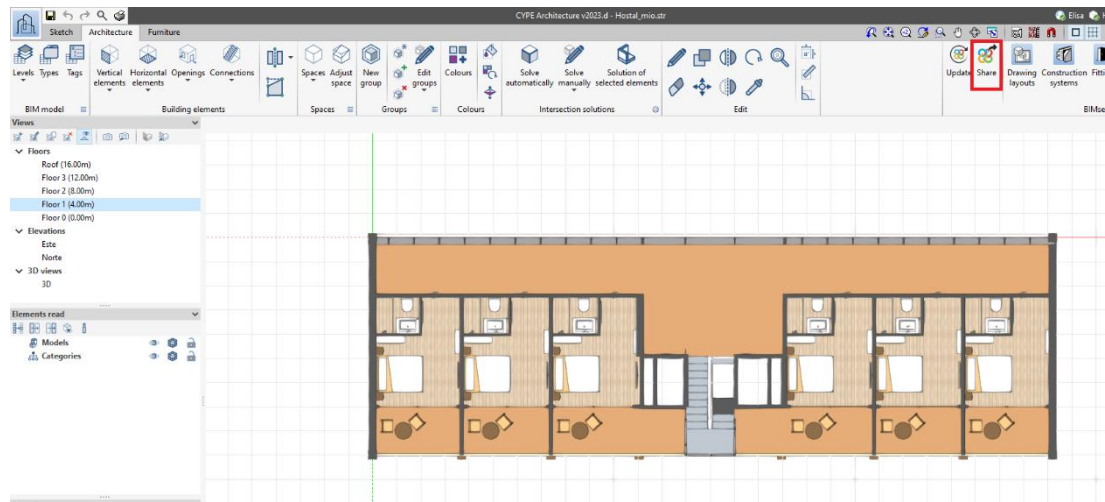
The first step in creating a project is to analyse the building. The building may have been generated with any 3D architectural modeller.



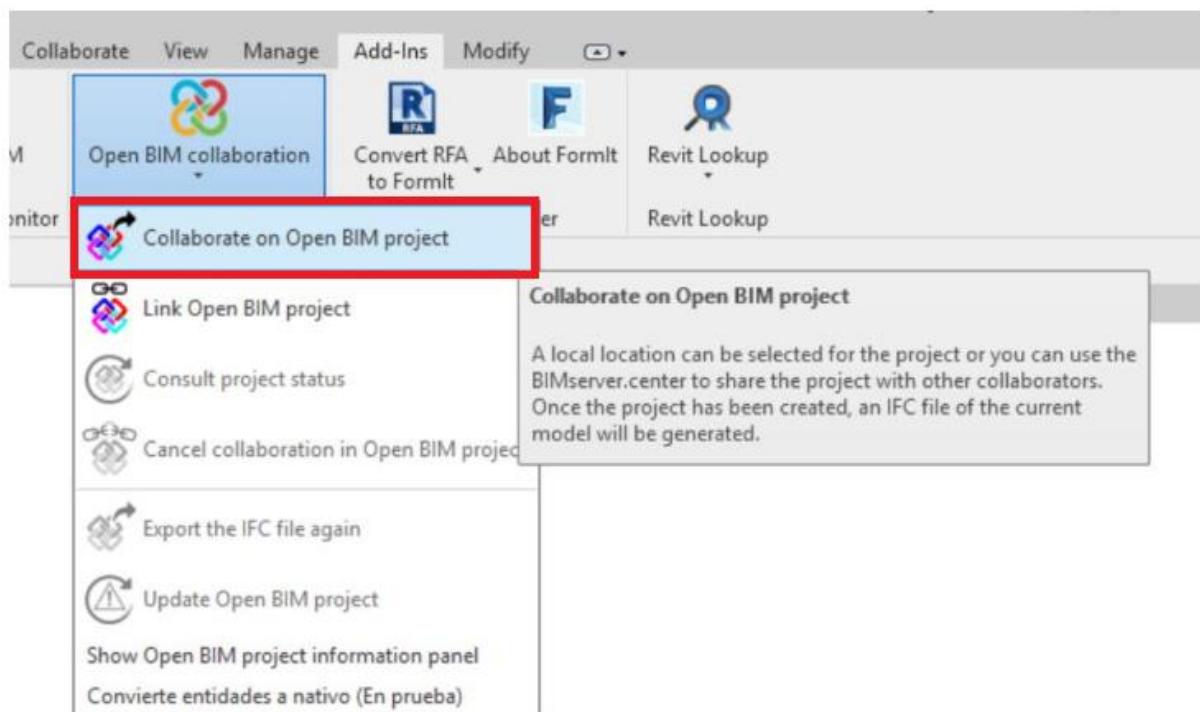
CYPE Architecture. Generating a simple 3D model is simple. In the “Create a new file” process, the project setup wizard helps users create the BIM project.



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**.

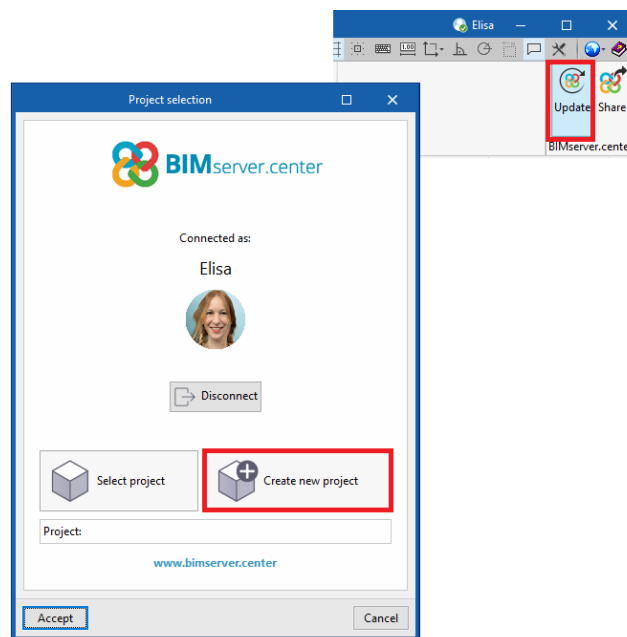




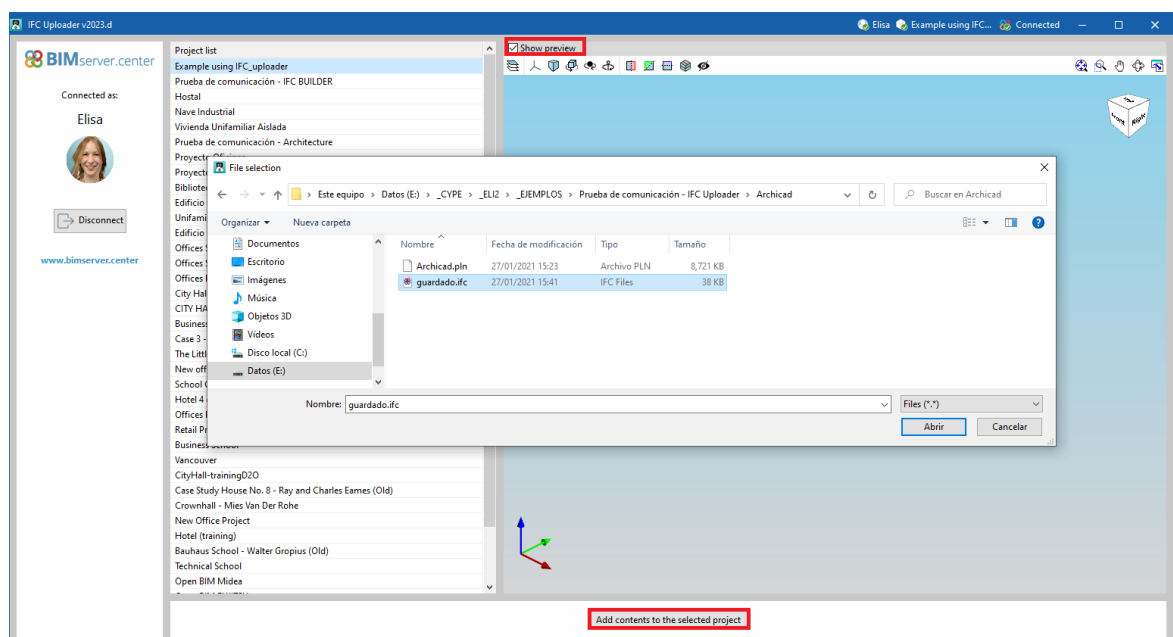
With other 3D modellers. There are several modellers available on the market, and all of them are generally able to export a IFC file with its geometry and data due to a standard code.

With IFC Uploader, users can integrate any IFC file into the BIM workflow:

1. Creating the BIM project directly in Open BIM Panasonic.

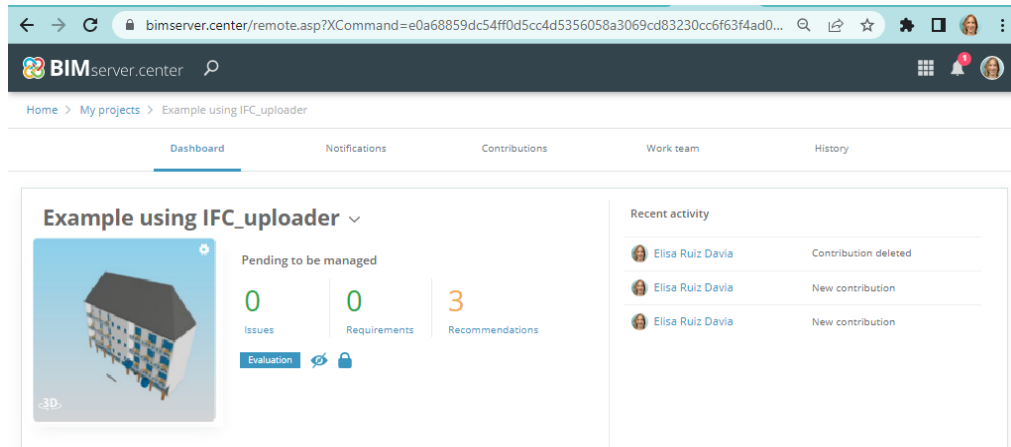


2. Upload the file from IFC Uploader.



Regardless of the 3D geometry generator used (CYPE Architecture, Revit or IFC Uploader), it is good practice to **check that the file has been uploaded** to the platform.

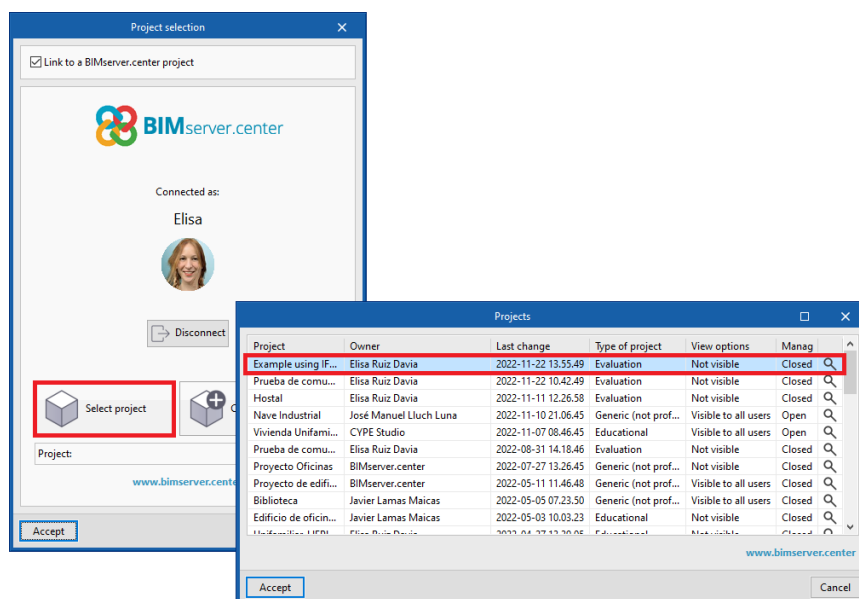
Sometimes offices have restricted internet access for employees, if you have any problems, please contact technical support.



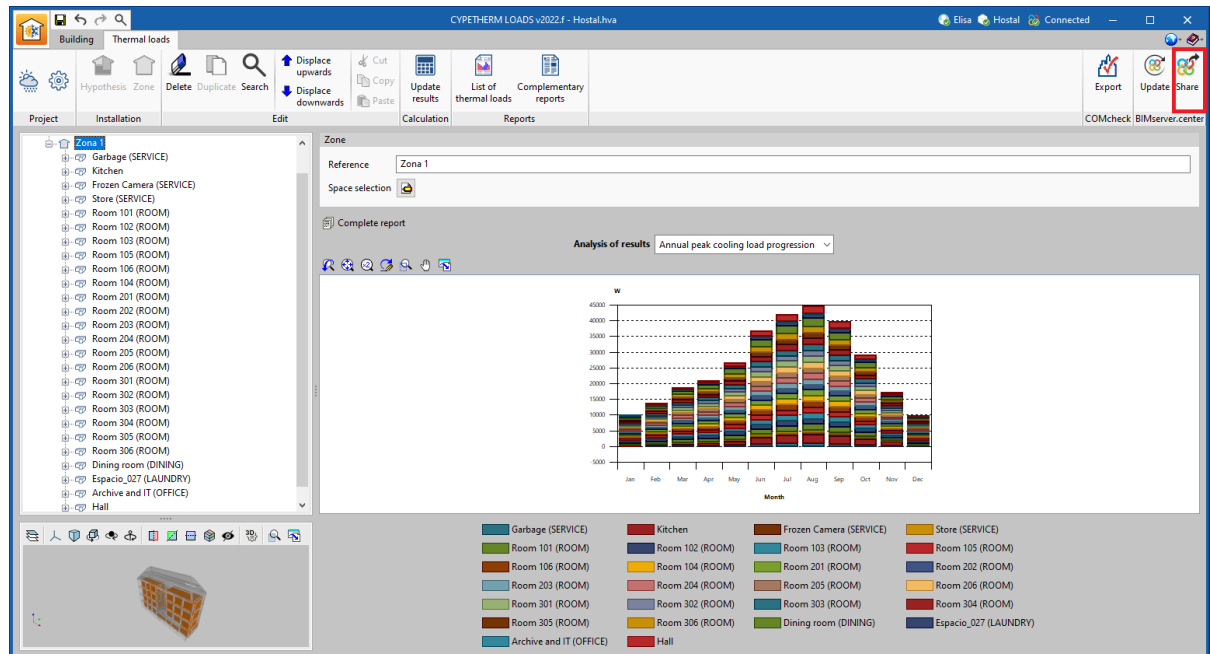
3.2 Thermal LOADS

This tool carries out the thermal load calculation of buildings according to the Radiant Time Series Method (RTSM), proposed by ASHRAE.

Once the BIM project with the building geometry has been created, the rest of the tools simply have to connect to it, and the information will be read.

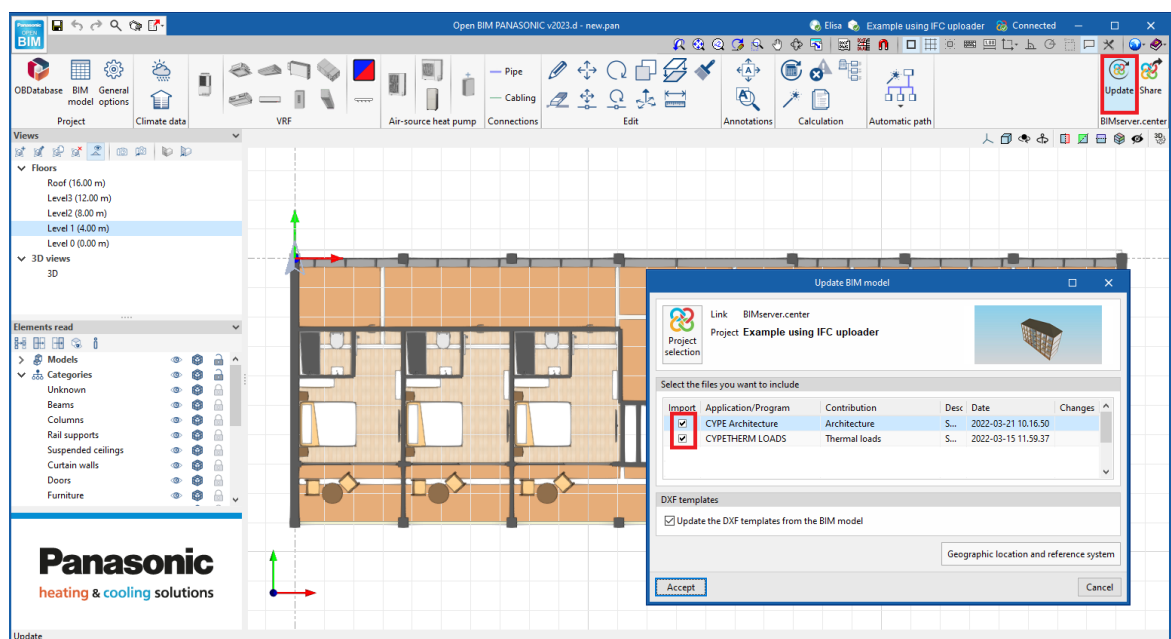


Users select the layers' materials, indoor and outdoor conditions, occupation timetables, etc. Once the loads have been calculated, click **Export**.



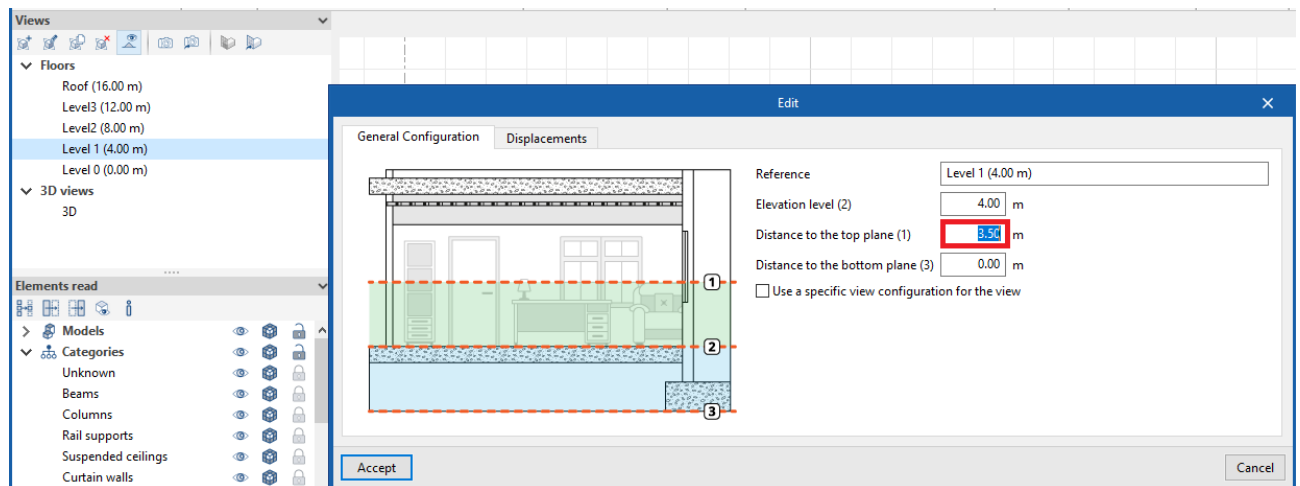
3.3 Open BIM Panasonic

Just like the previous section, users must create a new project and connect it to a BIM Project. Building geometry is automatically included. If thermal loads have been calculated, include them.

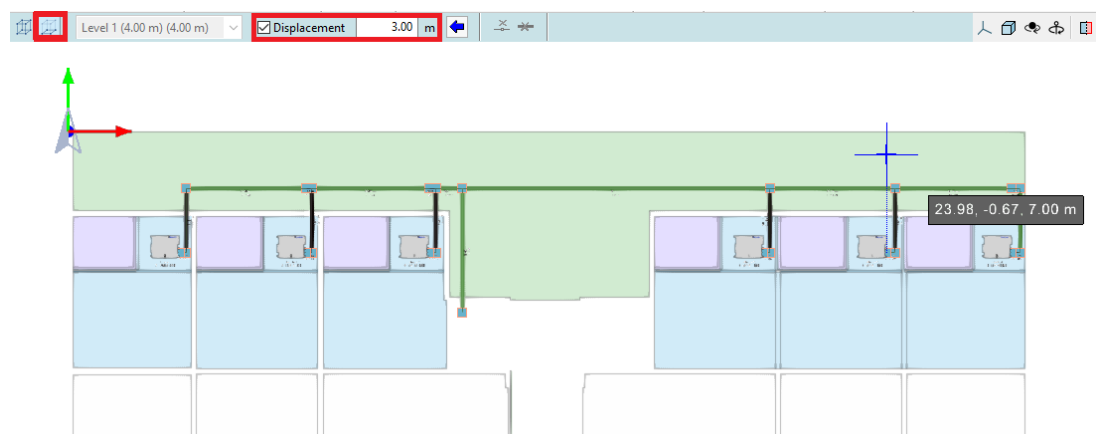


Users simply have to enter indoor and outdoor units and connect them to pipes.

For deciding at what height to place the units, it is recommended to choose the viewing range first. In this example, the distance between floors is 4.00m, so it is recommended to set the viewing range to 3.50m (to avoid seeing the floor slab).



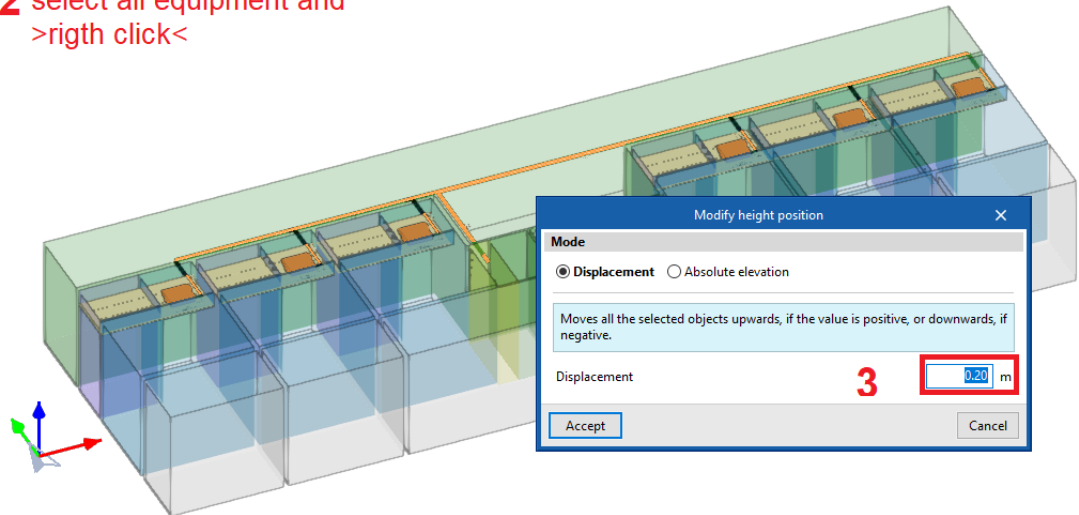
Place all units at the same height, e.g., at 3 m, the move vertically to adjust them.



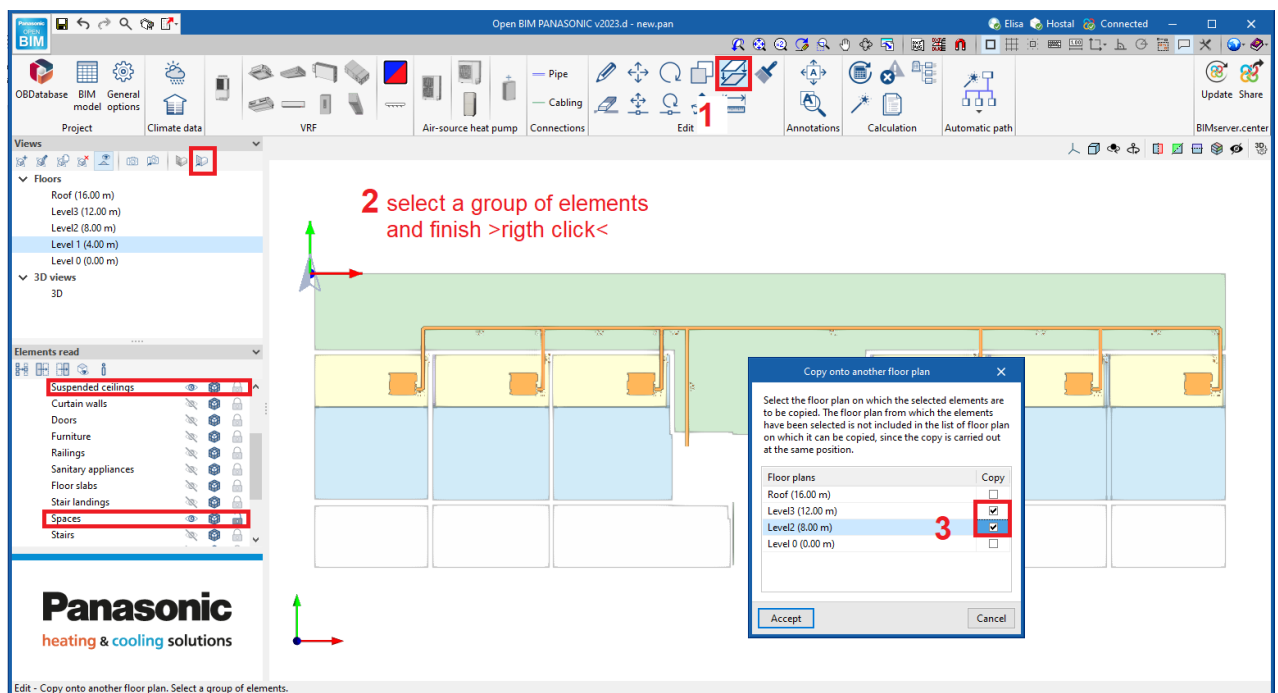
Orbit to verify it is correct Move it 0.20 m in the z axis.



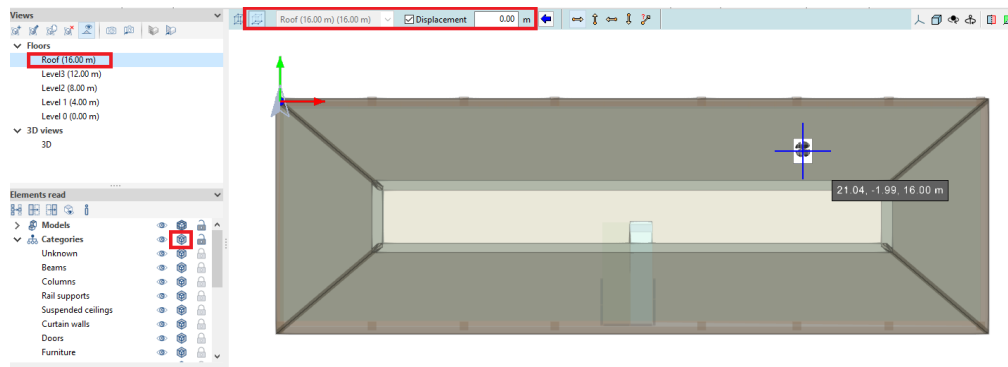
2 select all equipment and
>right click<



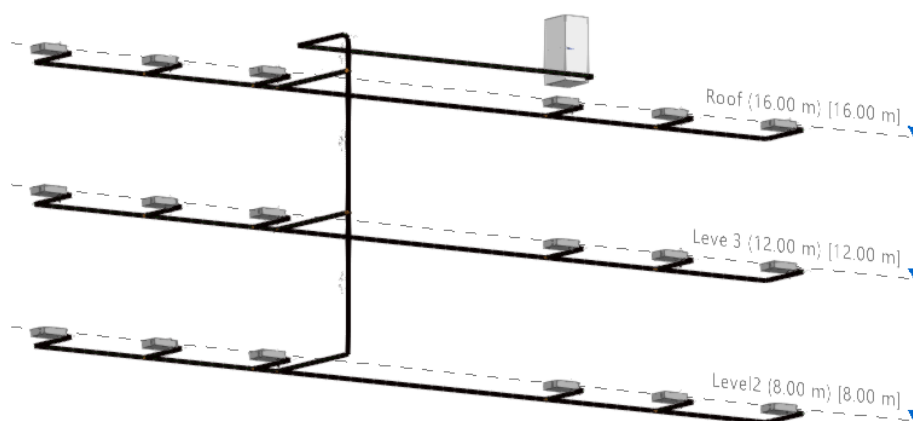
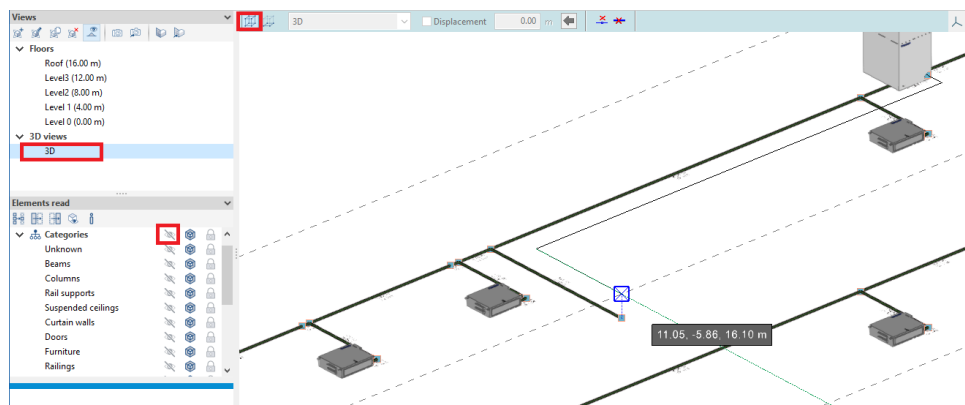
Return to the plan and copy between floors.



Place the outdoor unit on the roof along with a pipe.



Change to a 3D view and draw a vertical pipe in 3D mode. Segments 3-4 will draw a vertical and horizontal pipe.



Press **Sizing** to see the Calculation Report. Then export the model.

3.4 Energy Simulation

Just like the previous section, users must create a new project and connect it to a BIM Project. Building geometry is automatically included. If Open BIM Panasonic has been calculated, include it. Panasonic units are included in energy simulation software CYPETHERM HE Plus for Spanish codes.

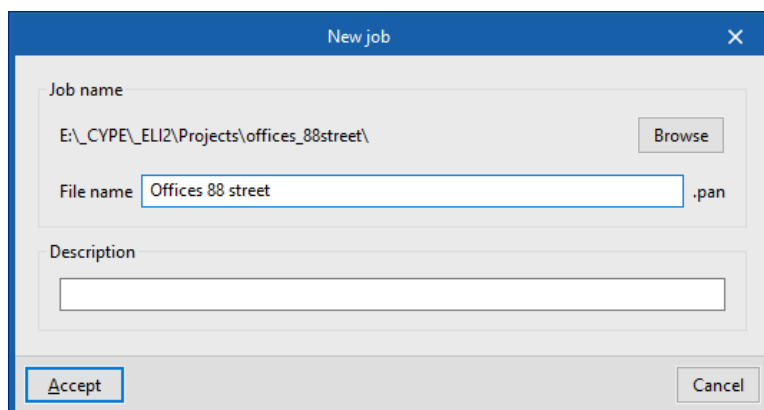


4 How to use the tool in isolation

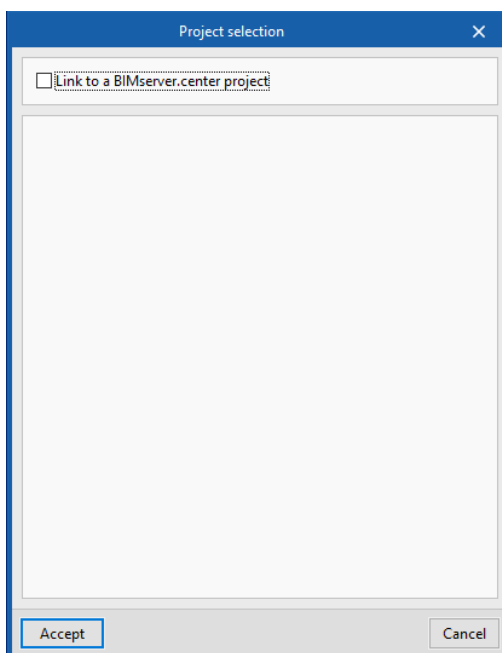
Even if architectural departments send drawings in CAD format, if it is mandatory to perform the Energy Simulation in our region, it is strongly recommended to create the 3D building geometry ourselves from the beginning to use it in Open BIM Panasonic and later on in the energy simulation.

In isolation with templates

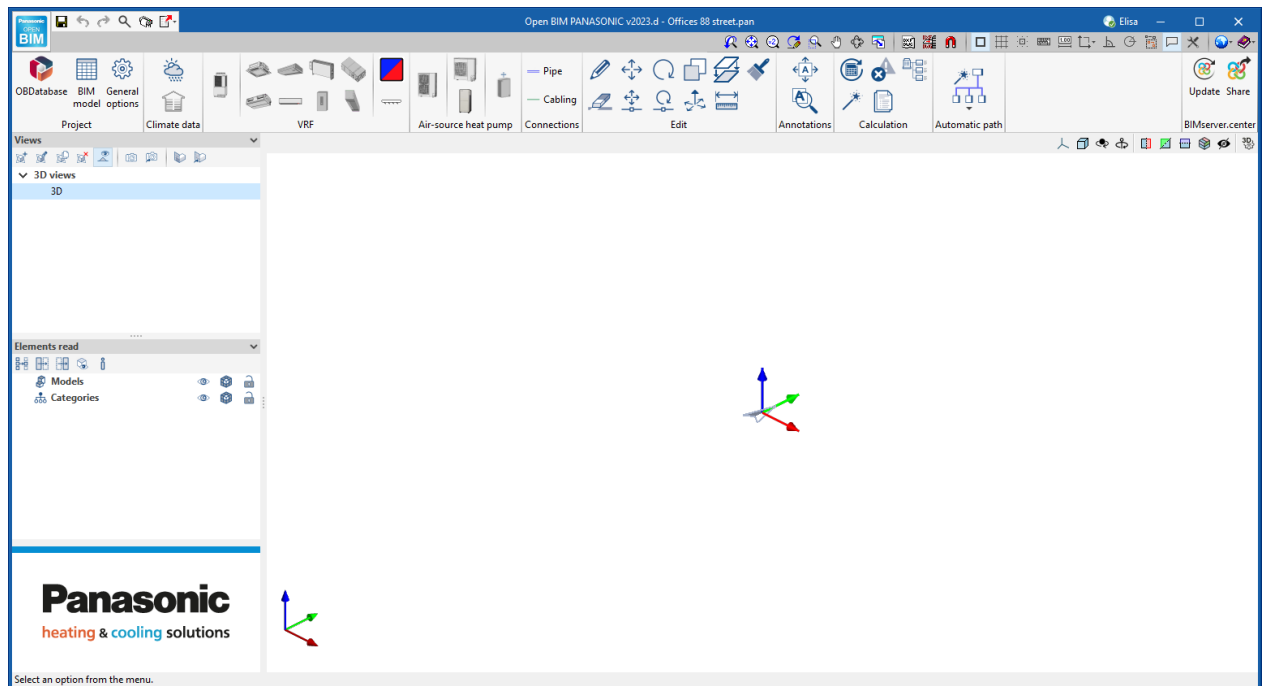
New. Save the file to your computer. It is good practice to keep the entire project in one folder, which has the same name as the project. The file will never be shared.



As there is no BIM project to select, deselect the checkbox.

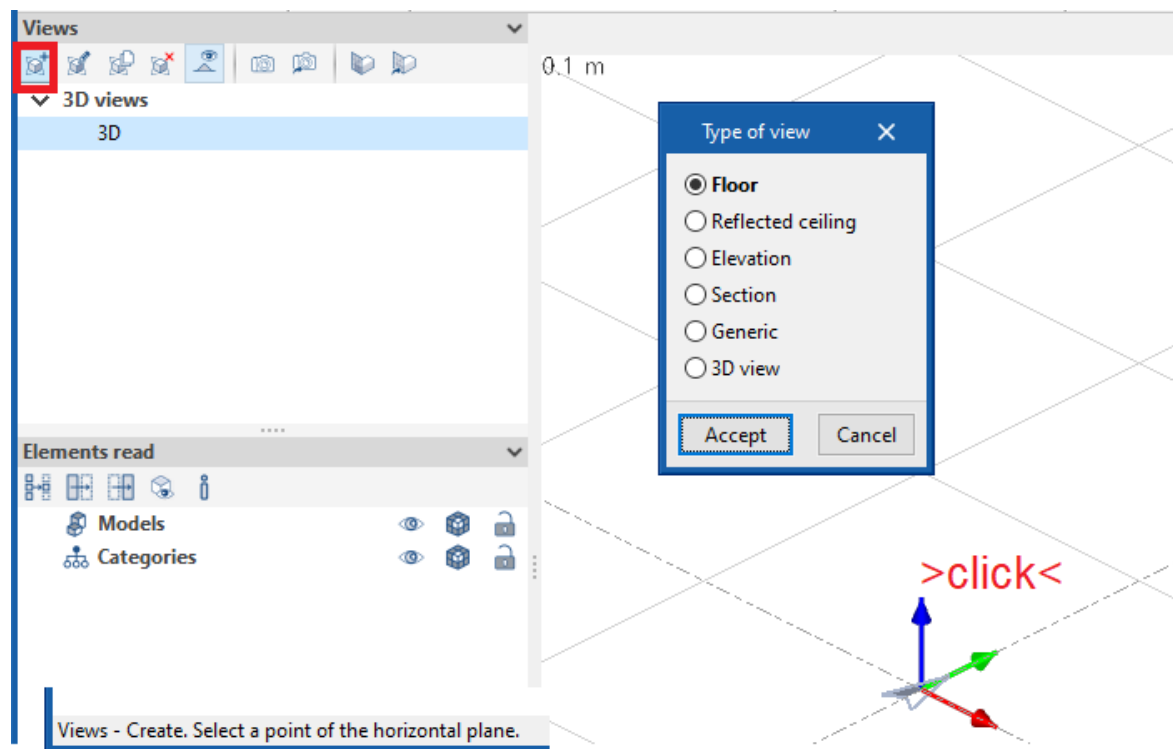


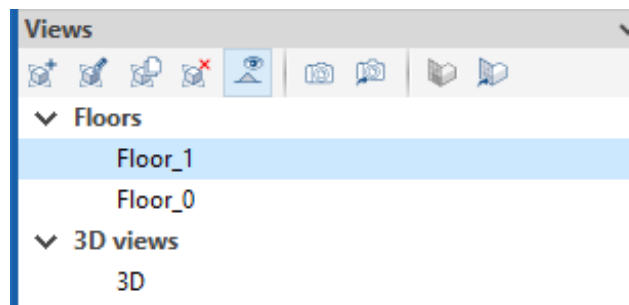
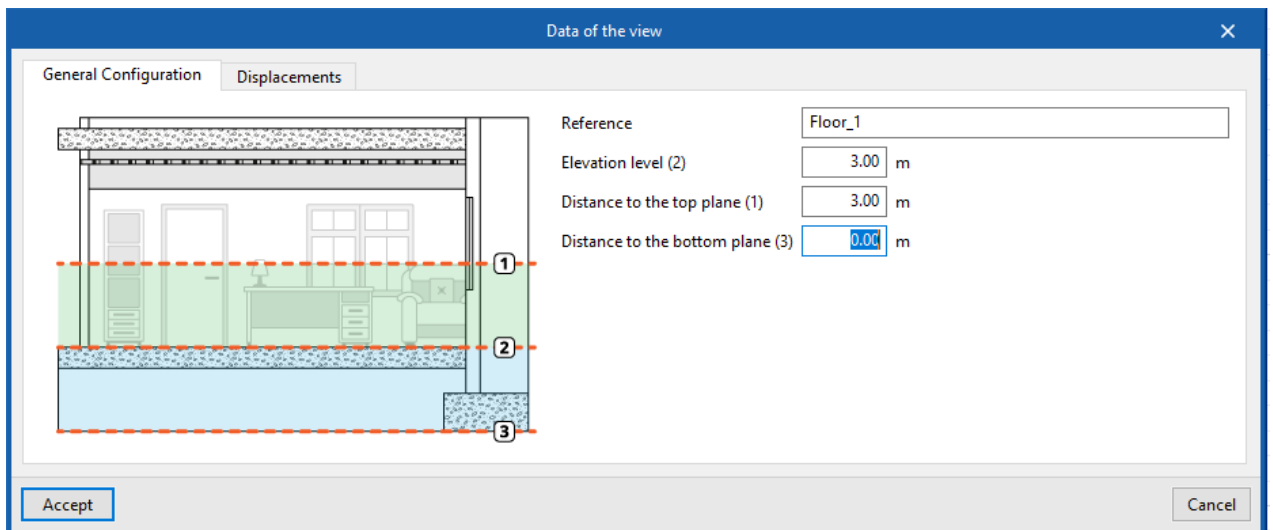
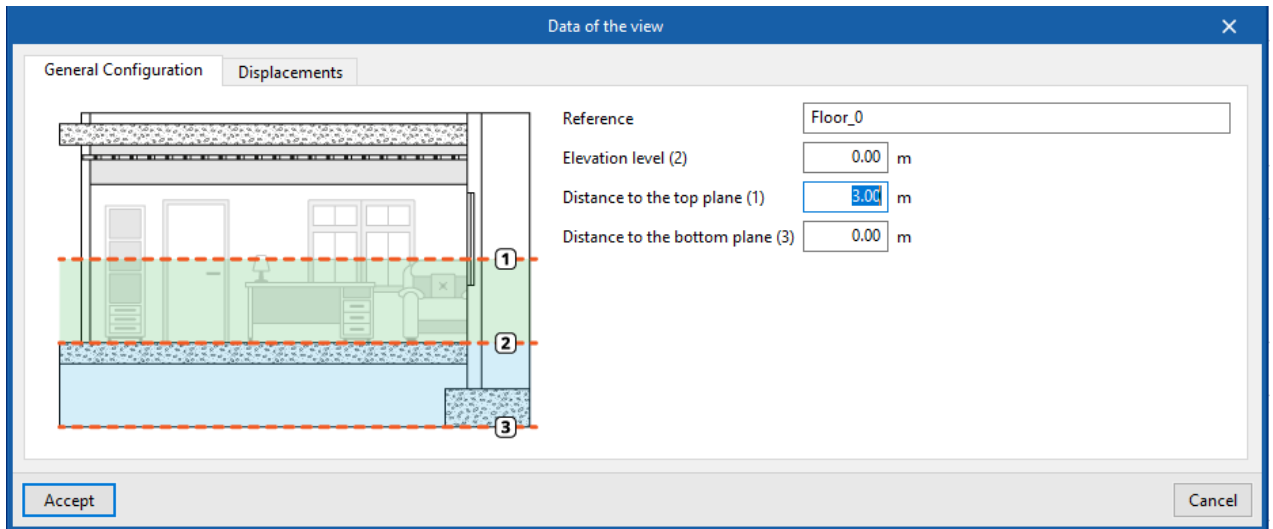
Interface.



Floor plans

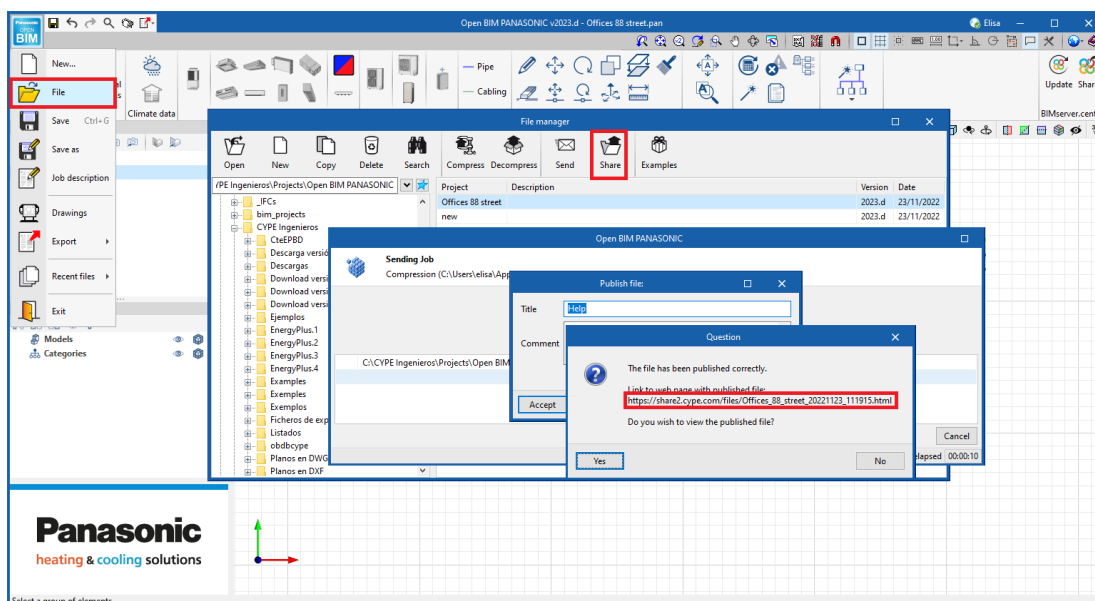
Create 2 levels.





5 Contact

Sharing files. Sometimes users may wish to send the "File.pan" 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 PANASONIC manual. If you still have questions, problems, or need more information, please visit our website, or contact CYPE.

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