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Trial Support
Material

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Viewing Energy and Results (VistaPro)

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VistaPro is a tool for quickly and easily analysing the results of one or more simulations carried out using the thermal modelling tools.

You can see the results both for load calculations and for dynamic simulations. All images and data created in the VE can be easily exported (eg. to Word or Excel) for project reports or presentations.

The standard output options include an extensive selection of different chart and summary options to choose from for visual and numerical analysis of your selected variables, and a few pre-set reports.

For more information, go to https://help.iesve.com/ve2019/vistapro_1.htm#

Files

The files list shows you all results files available for the current project. Selecting different options in the combo box will change what types of results files are displayed in the list, and what tools are shown in the Vista toolbar.

The results file from your simulation are shown in different colours to designate the file type:

- Black** = Simulation files (*.aps) from ApacheSim dynamic thermal simulations
- Red** = Heating Loads (*.htg) results either from ApacheCalc or ApacheLoads
- Blue** = Cooling Loads (*.clg) results either from ApacheCalc or ApacheLoads
- Green** = Weather files (*.fwt or *.epw)

Heating and Cooling Loads Reports

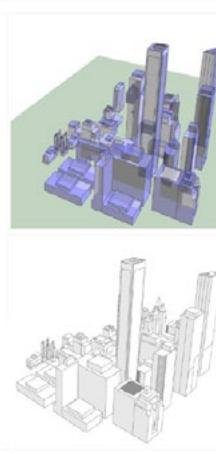


HEATING AND COOLING LOADS REPORTS

When a set of Room Loads results are selected (.clg & .htg) then the Heating and Cooling Report displays a summary of the apache systems loads calculation results; reporting on System level peak loads as well as room level peak heating loads breakdown, peak cooling loads breakdown and airflow analysis. Reports can be generated using the results from either CIBSE Room Loads or ASHRAE Room Loads calculations run using Apache.

When viewed in VE Content Manager, the Html report is interactive: each table has a row with sort controls so that columns may be ordered based on highest to lowest (or lowest to highest) values and a row with input controls for cell highlighting

Project summary



Model data:		
Project file	VE2019 Demo.mtl	
Model floor area ¹	324.00 m ²	
Building Floor Area ²	324.00 m ²	
Building Volume ³	1077.00 m ³	
Number of rooms in 'Building floor area'	5	
Heating calculation data:		
Results file	CIBSE_Loads.htg	
Calculated	12:13 25/Apr/2019	
Profile month	January	
Outdoor winter design temp	-2.7 °C	
Cooling calculation data:		
Results file	CIBSE_Loads.clg	
Calculated	12:13 25/Apr/2019	
Profile month	May - Sep	
Max outdoor temp. dry bulb	23.8 °C	
Max outdoor temp. wet bulb	18.7 °C	
Design weather:		
Source	ASHRAE design weather database	
Weather location	Dublin, Ireland	
Monthly percentage:		
For heating loads design weather	%	
	99.6	
For cooling loads design weather	0.4 %	

System	Room name	Floor area m ²	Room volume m ³	No. people	Room conditions						Engineering checks							
					Set point DB (°C)	Supply air DB (°C)	Sens load (kW)	Supply airflow (l/s)	Outside airflow (l/s)	Air changes /hr	HtLo (l/s.m ²)	WtLo (W/m ²)	% OA	OA/ person (l/s)				
	A-Z	HtLo																
	Area	HtLo																
Compliance System	GF Office	60.0	240.0	6.0	23.0	14	3.2925	299.2	0.0	4.43	4.99	54.08	0.0	0.0				
Compliance System	Store	12.0	42.0	1.2	23.0	14	1.2236	111.2	0.0	9.53	9.27	101.97	0.0	0.0				
Compliance System	L shaped Room	96.0	384.0	9.6	23.0	14	3.8988	354.3	0.0	3.32	3.69	40.61	0.0	0.0				
Compliance System	FF Office	84.0	336.0	8.4	23.0	14	6.3538	486.5	0.0	5.21	5.79	63.74	0.0	0.0				
Compliance System	Studio	72.0	288.0	7.2	23.0	14	7.0035	636.4	0.0	6.79	8.84	97.27	0.0	0.0				

- Enter a value to red header cells and click apply to highlight any cells in the table that exceed the threshold
- Enter a value on green header cell (supply air temperature on heating and cooling loads tables) to trigger a calculation of required system airflow to meet calculated load based on this supply air temperature and the room setpoint.

When a simulation results (*.aps) file is selected the heating and cooling report provides a monthly summary of the building systems energy consumption, CO₂ consumption, basic comfort checks and peak loads breakdown.

When viewed in VE Content Manager, the HTML report is interactive: options are provided to sort column tables by highest to lowest (or low to high) values. Maximum and Minimum values are highlighted in red & blue.

Results Data Selection to Visualise

The aim of Vista is to allow the user to obtain a graphical or tabular form of custom results very quickly.

Once a method of output has been selected from the output toolbar, the latest chart dialog reflects any changes selected by the user. As soon as you click onto a new results file or variable, that change will be reflected in the display area. When you navigate to different levels of the building, you will notice the listed variables change, depending on whether you are viewing at the model level (more than 1 room visible, no rooms selected) or considering a single room. If you select multiple files or variables, they will be charted together.

Air flow rates etc. can be accessed if you have incorporated air flow into the simulation using MacroFlo, by navigating down to the surface level and selecting an opening.

Categories

- The category tree shows you all the available data levels for all files in the list.
- Use the tree to turn on the levels you want to see and populate the variables list.
- A right click menu also provides you with extra functionality.
- To the top right of the tree, there is the Pre-sets button. With this button you can turn on or off all levels, as well as select, manage, or save user pre-sets (based on current selection) via the drop down. Pre-sets are global, meaning they are not tied to a specified project.

The Variable Browser

- The variable browser is (un)dockable, resizable, and remembers exactly where you left it.
- You can collapse or resize the sessions, files and categories controls to increase the amount of space for displaying variables.
- If that's still not enough space, increase the width of the browser, so that the variable list becomes multi-column: The wider the browser the more columns you'll see.
- The variable tree is split in two, and only shows the available levels of data decomposition so that you can quickly show or hide the variables you are interested in.
- You can also filter the variables list, pin variables, and create custom variable pre-sets, or use the IES ones.

https://help.iesve.com/ve2019/specifying_data_for_output.htm#

Results Viewing Options: Graphs, Charts, Summaries



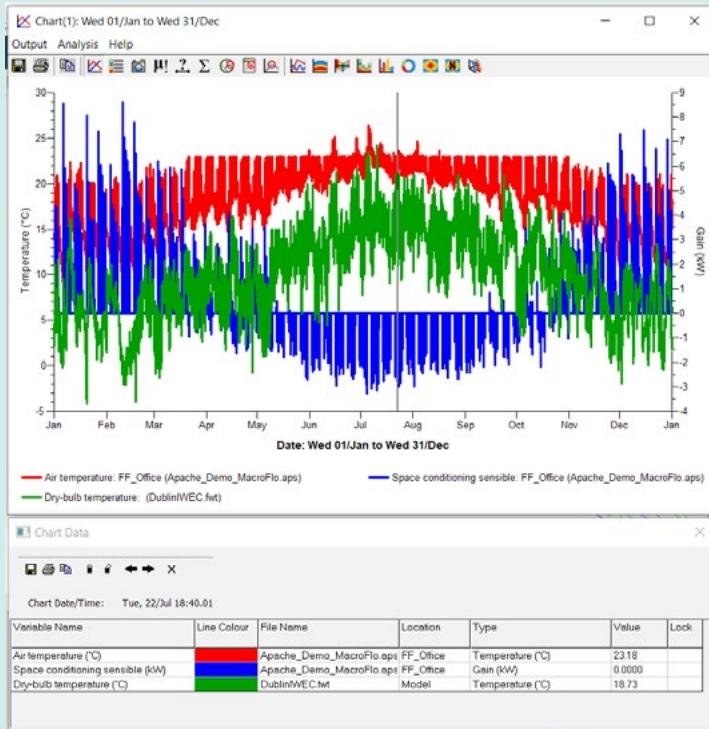
The output toolbar is shown below the Vista menu. It gives you a large selection of different ways to display or chart your selected data. Wherever the results are listed in tabular format, you can also copy/paste them to a spreadsheet if desired. Set Dates in the calendar to changes the days (or time) over which you want to look at results

	Open a results file	Allows you to add a results file to the list of files to interrogate. This is useful for when you have results files out with the project's vista folder.
	Results file properties	Provides you with a report summarising what data has been recorded in the selected results file.
	Select object	Enabling this allows you to select objects within the model view.
	Layer Properties	Brings up the layers dialog which allows you to modify the name and colour of each individual layer as well as what ones are visible.
	Heating and cooling report	Generates a heating and cooling report based on the selected results file. This allows you to view building energy, CO ₂ , comfort and other relevant information at a glance.

	Tariff Analysis	Allows you to performance tariff analysis for costing the running of you building based on the selected results file.
	Graph	Displays a straightforward plot (X-Y Line Graph) of the currently selected data as a graph.
	Multiple-room graph plotter	Allows you to automatically plot several rooms and output each graph to disk.
	Table	Displays a data table of values for the currently selected data.
	Snapshot	Shows the value of any selected variable for the date/time specified as a data table.
	Synopsis (min/mean/max)	Displays a data table for the selected data in terms of minimum, mean and maximum values, over the currently selected time period.
	Range tests	Allows you to test for certain conditions being met and how frequently specified limits are exceeded.
	Monthly totals	Displays as a table the total of all data values over a calendar month.
	Peak time table	Shows the peak date time and value of the selected variable(s) in a table.
	Peak day table	Similar to above, except that it shows all the values for the peak day.
	Peak day graph	Shows you the peak day results as a graph.
	Peak day graph (Auto save)	Same as above, but also saves the chart to disk under the project's Vista/Graphs folder.
	XY Plot	Similar to the normal plot but uses the new charting tool which allows you to perform highlighting/analysis.
	XY stacked plot	Displays a graph plot using the new charting tool where all variables with the same units are merged together.
	Bar stack (+/-)	Similar to the stacked plot but displays monthly/daily totals as a bar chart. Allows items to be display below the x-axis; this is typically used for heat gains / heat losses, heating / cooling loads etc.
	Bar stack (absolute)	Similar to the bar stack above however all items are above the x-axis; i.e. there's no negative values.
	Bar side by side	Allows you to compare several files as a side-by-side bar chart.
	Donut chart	A donut chart which combines all variables with the same units in one visual display for fractional contribution analysis.
	Colour Gradient	A colour coded data table which displays the selected results in compact form.
	Value Gradient	Similar to above but displays a more detailed table with the actual values preset.
	3D Graph	Displays the selected variables as a 3D graph for the specified date/time range.
	Comfort settings	Brings up the Comfort dialog which allows you to define the parameters used in comfort analysis.
	MacroFlo arrows	Allows you to visualise airflow results obtained from Apache MacroFlo calculations on each opening in your model. This needs to be toggled off again after viewing.
	Variable colour scale	Allows you to visualise room level results on your model by applying a colour scale.
	Visual Analysis (Model Viewer II)	Similar to the old viewer feature above but displayed using Model Viewer II.
	MacroFlo Arrows (Model Viewer II)	Similar to the old viewer feature above but displayed using Model Viewer II.
	Find node	Allows you find an HVAC node by its number. Useful for when you have a large HVAC network to look through.

Set Colours, Data Bins, Pick Dates on Calendar

You have the option to personalise your output as desired through the selection of colours:

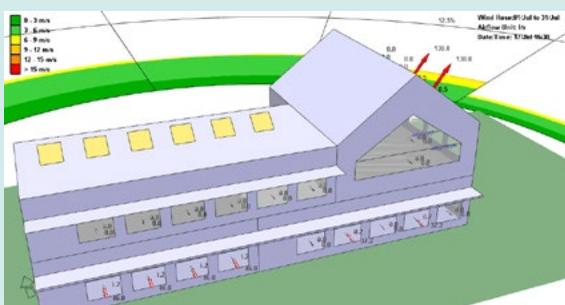


- Start by generating an X-Y plot of your selected variables, over the chosen time period
- Make sure your chart is not too close to the bottom of the screen, then click anywhere within the chart space. You will see a thin black vertical line on the graph that moves to wherever you click.
- Beneath the graph, a new box will appear, giving the date/time you have selected and the data for that time.
- The line colour boxes show the current line colours.
- Double-click in any of these boxes and you can set a new colour for that variable, and for as long as you keep this chart open and select different display options from the output bar on this screen, these colours will remain.

You can also set the simulation dates as required, eg. to do shorter test simulation runs at design stage.

Simply click on the calendar months for a monthly range, or select days from a chosen month, or hours on a chosen day, as suitable.

If you choose to generate a psychrometric chart to evaluate comfort, there are a selection of different charts available. You can choose your date range, then watch the graph change as you move the time of day slider.



If you have set opening windows, and linked to MacroFlo in your simulation, you can also generate images with arrows showing the airflow through the openings.

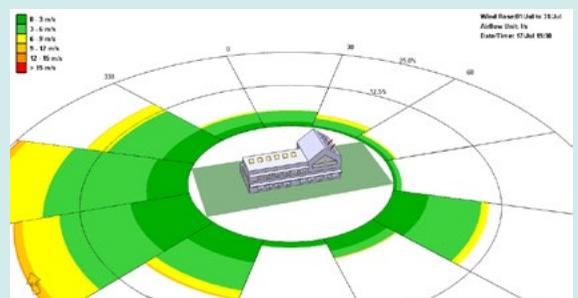
Use the **MacroFlo Arrows** icon to toggle this display On/Off.

If you do not see anything when you click on the icon, try sliding the time bar to a different time of day: the default time is midnight, when windows may all be set as closed.

You can pan and zoom within this model view, and pick times and days to see changes in airflow.

If you would like to evaluate wind-driven ventilation (by magnitude or frequency), you can turn on a wind-rose underlay to the model by clicking on **options** (just above your list of selected variables) then choosing the wind rose tab to turn this feature on, and set its graphic qualities in the other tabs.

The wind rose reflects your chosen date range, so by changing the selected dates, you can also evaluate seasonal variations within the weather file.



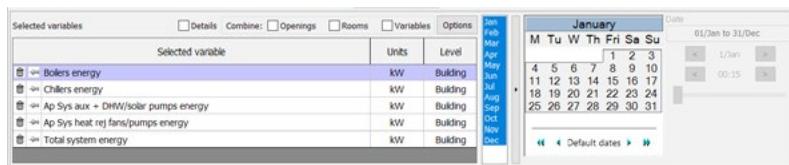
Pin Variables & Create Variable Sets

The variables list shows you all the available variables for the data levels you have selected.

- Use the list to select the variables you want to interrogate or visualise.
- Hold down the control key to select multiple variables to analyse together, or pick the same variable from 2 different results files to assess the impact of changes in the model.
- The variable list can be filtered using the edit box at the top of the list.
- A right click menu also provides you with extra functionality.
- Pinning an item stops it being removed from the list due to filtering or data level selection.
- To the top right of the tree, is the **Selections** Pre-sets button. With this button you can select or deselect all variables, as well as select, manage, or save user pre-sets via the drop down.
- Try out some of the IES pre-sets to get an idea of how to group variables for analysis.

All results can be displayed in different graphical or numerical formats to best suit the presentation of data.

Note that the weather data is not extracted from the simulation file, but is instead extracted from the weather file which is associated with a particular simulation. Individual weather files can also be viewed separately.



You can change how selected variables are displayed/combined as well as the date/time you wish to interrogate.

The selected variables list displays all variables you have selected in the variables browser.

These variables are the ones that will be used for charting/plotting and visual analysis display.

Energy Loads / Demand

These variables are critically linked to carbon emissions, but they are not the same. They are best used to verify control systems and/or operational profiles set within your simulation. Try some of the IES presets to check your model and gain insights into its performance.

Remember that a building can have a lower energy consumption than a reference building, but due to the different carbon emissions of fuel sources used for different systems, the building that is more energy efficient, may have higher carbon emissions. By using Vista, you can compare each system to easily identify these differences.

Custom Variables

Use the VistaPro drop-down menu and select Custom Variables, or right click in the variable browser to open this feature, which allows you to create custom 'post-process' variables using the standard set of variables output in Apache results files. Custom variables are other variables combined in some form to produce another output. They are generic, meaning they are not linked to any specific rooms, surfaces, openings, system, component or HVAC object. This allows you to create variables for use across multiple projects.

Although custom variables are generic, there are still some rules/restraints imposed.

Sessions: To Share Results

The sessions list at the top shows you all your saved sessions. This allows you to retain your previous session by recalling the variables/rooms selected and recreates the charts generated.

- Different sessions can be added / removed / edited via the dropdown box.
- The title and summary box allows you to give a detailed description of each session, which can be viewed later by hovering your cursor over the summary.
- Double clicking on each session automatically opens the data associated with that session.

This lets you share a file with a colleague such that they can see the same selection of results.

For more information, go to https://help.iesve.com/ve2019/vistapro_2.htm#