MagiCAD for Revit

Release notes for version 2022 UR-2

10/02/2022

MagiCAD

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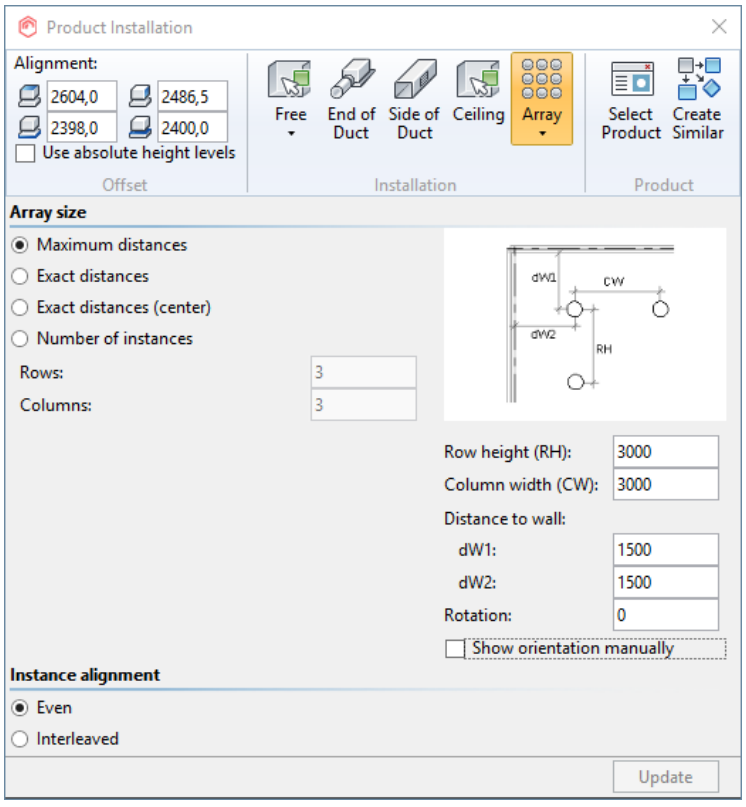
1 New features

1.1 Common

Units in BOM
"Total length of similar" value in BOM is now shown in meters, with 2 decimals. It doesn't depend on the units defined in Revit.

Array in space to follow user defined orientation
New option for rotating the whole array, not just individual devices, has been added to the array installation to space.
You can show one line along the space boundary and the whole array is rotated according to the shown direction.



Option to edit provision
Edit provision command can be used to lock and unlock provisions and thus preventing automatic BWO from updating or deleting the provisions.

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Fitting and insulation support for National Classification
The purpose of support for national classification is to create a method that makes it possible to create a user defined classification system to support different local classification standards with supplementary properties attached. It is also possible to assign the classifications codes to the objects while selecting products to the dataset and later on when installing them to the model.
Finally, the classification codes with the attached properties can be exported with MagiCAD's IFC Export.

Separate material code and RFA name for ducts, cable trays and conduit fittings
There is a new function added to ducts, cable trays and conduits to let the user select the family name and material code of the fittings added to the duct, cable tray or conduit series.

Warning when writing to a read only configurations
Earlier there was no error message when trying to modify the files on the server that are read-only. "Read only warning" now appears both on opening and saving a file, various features listed below and not limited to support read only warning:

- Map Parameters
- Merge Parameters
- Batch Manager

Add Size, System type, Gross and Net volume of the host to the provisions
This should help to establish the fire stopping requirements.

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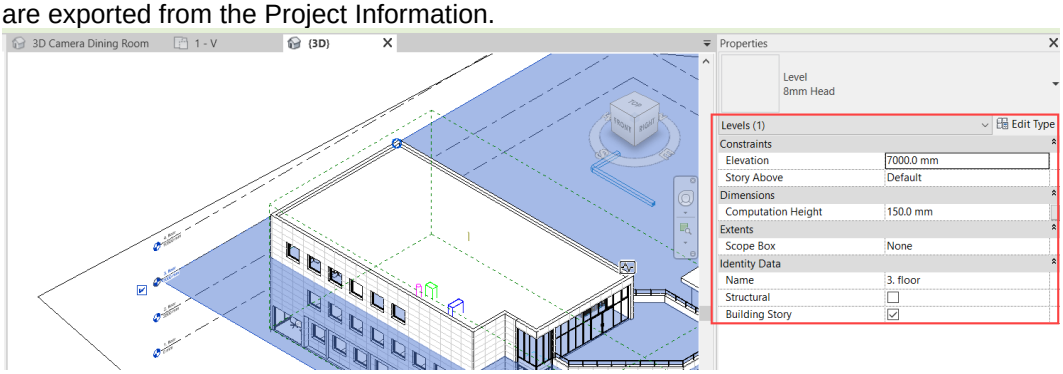
1.2 IFC-Related

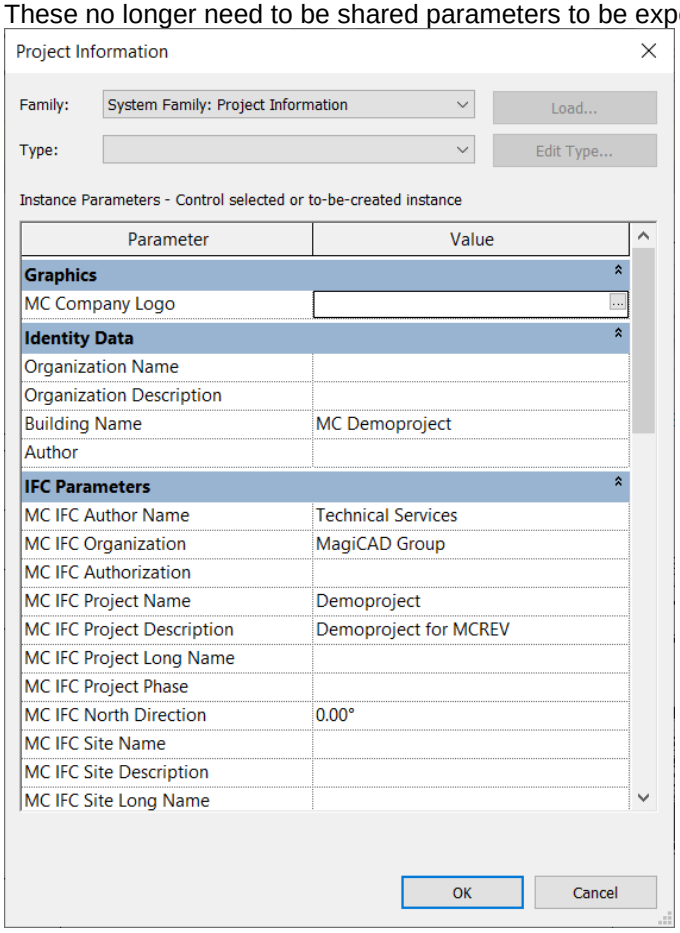
Parameter export improvements

Now level parameters can be exported to the IFC file.

We did also update the parameter export so that they no longer need to be shared parameters if they are exported from the Project Information.



These no longer need to be shared parameters to be exportable:



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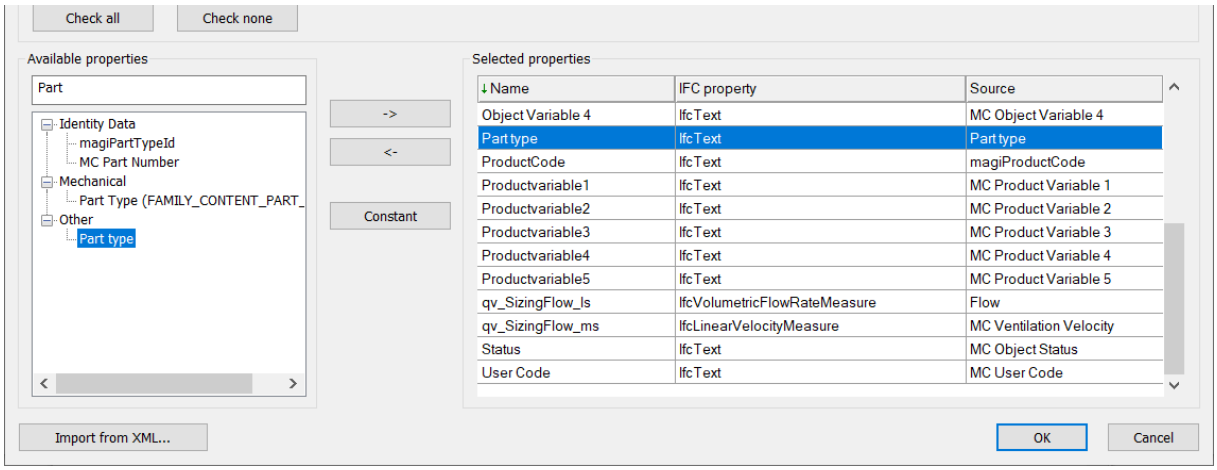
New IFC types

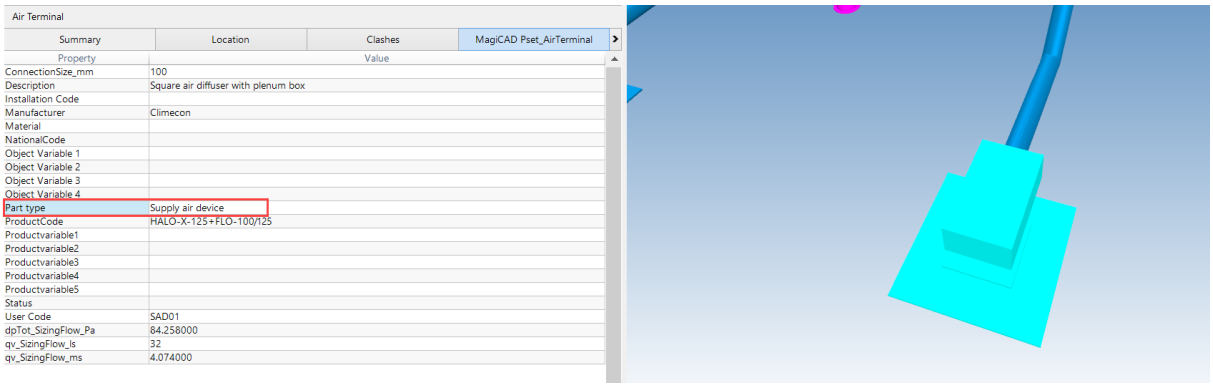
- Implemented support for:
- IfcAirTerminalBoxType
- IfcElectricGeneratorType
- IfcElectricTimeControlType
- IfcGasTerminalType
- IfcInterceptorType
- IfcStackTerminalType
- IfcTransportElementType
- IfcUnitaryControlElementType*

*Note: it is exported as IfcDistributionControllerElement if you use IFC 2x3. That is because IfcUnitaryControlElementType is known in IFC4 only.

MagiCAD Native Part Type in IFC Export

It is now possible to export information on the MagiCAD native part type. This is done using the "Part type" parameter:





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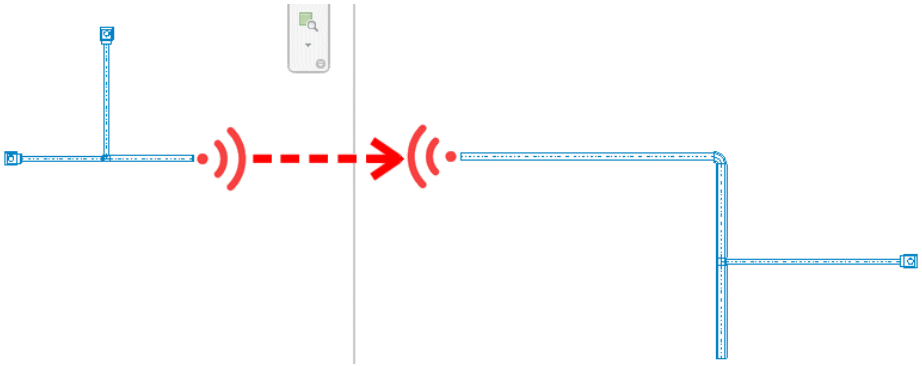
1.3 Ventilation and Piping

Connection nodes between models

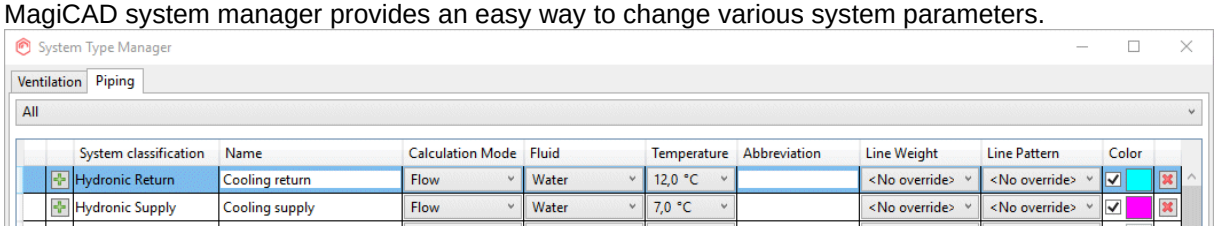
You can connect ducts from active project to another project with connection nodes. All the technical data in the calculations is transferred via the connection nodes. Unlike in MagiCAD for AutoCAD projects, there is no "storey list" which defines the direction of the connection nodes. This means that the project, where the connection is made to, can be to any direction giving you a full control of the connection nodes.

Current version of MagiCAD supports connection nodes only in the ventilation networks.



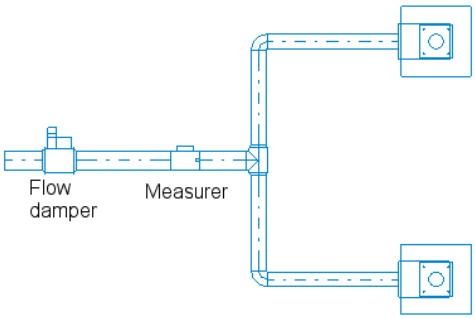
System type manager

MagiCAD system manager provides an easy way to change various system parameters.



Support for measuring units to serve constant pressure dampers in ventilation

The purpose is to support constant pressure dampers in ventilation calculations. The constant pressure dampers uses a sensor placed downstream in the network to maintain a pre-set static or total pressure in the network.



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CIBSE Software Verification Assessment (SVA)

MagiCAD has achieved SVA status for Ventilation Calculations for sizing and pressure drop in accordance with definitions within CIBSE Guide.

Calculation for gas buoyancy

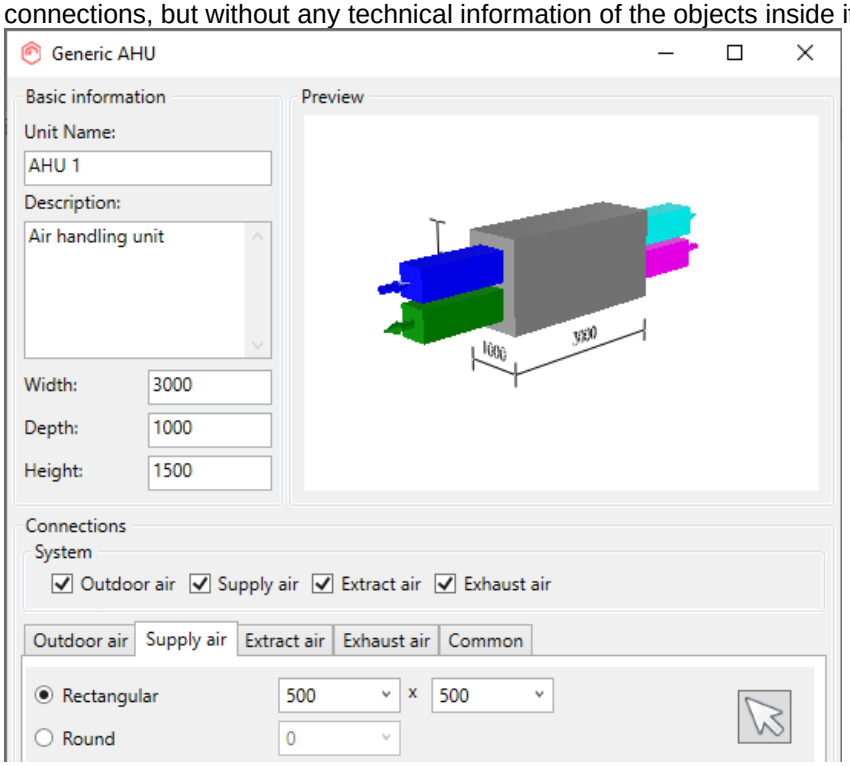
As natural gas is lighter than air it actually creates an upward force. On tall buildings, this can have significant influence. Added calculation of pressure loss caused by buoyancy to Cibse gas calculation. Added also a column to calculation report.

The equation is dpBuo_pa = 0.123 * (1 - gasDensity/airDensity) * dz * 100

airDensity is 1.225
dz is altitude change,
factor 100 is used to convert [mbar] to [Pa])

Generic air handling unit

Included Generic AHU feature into MagiCAD. The air handling unit is a rectangular object with duct connections, but without any technical information of the objects inside it.



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Improved change properties for pipe series
It is now possible to use "Change Properties" to modify/change from one duct/pipe series to another one.

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It is now possible to use "Change Properties" to modify/change from one duct/pipe series to another one.

Change the pipe size in the sprinklers system's System results window
Added a possibility to change the pipe size and recalculate from the system results report.
By right clicking line in the system report, you can set the pipe size. After that press recalculate to get the results with the new pipe sizes

Calculation report show now system information instead of "Multiple" in case the network consist of multiple system types.

Earlier version of MagiCAD showed text "Multiple" when a network consists of several system types. This has now been changed so that the values of each system types are shown.

Also other changes has been done
Total pressure/flow/Volume have been removed. The reason is that the systems may or may not be connected with each other. If not connected, the total values are incorrect.
The flow and pressure formats now follow the decimals set in manage->Mechanical settings
Systems: Now the names of the system types are shown.

Project Calculation Data	
Systems:	Heating supply / Heating return
Total pressure:	15.61 kPa
Total flow:	0.235 l/s
Fluid type:	Water
Fluid temperature:	70 / 40 °C
Fluid density:	978 / 992.3 kg/m3
Fluid dyn. viscosity:	0.00040000 / 0.00065000 Pa*s
Fluid spec. heat capacity:	4203 / 4191 J/kg*K
System volume:	301.5 l
Systems:	FH S / FH R
Total pressure:	0.45 kPa
Total flow:	0.003 l/s
Fluid type:	Water
Fluid temperature:	35 / 25 °C
Fluid density:	994 / 997.1 kg/m3
Fluid dyn. viscosity:	0.00072000 / 0.00089000 Pa*s
Fluid spec. heat capacity:	4188 / 4184 J/kg*K
System volume:	4.0 l

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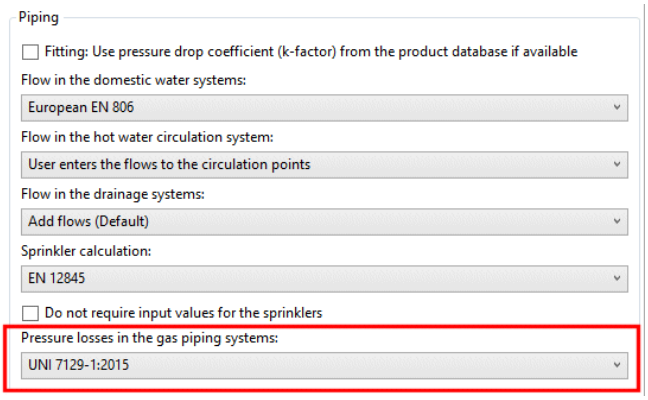
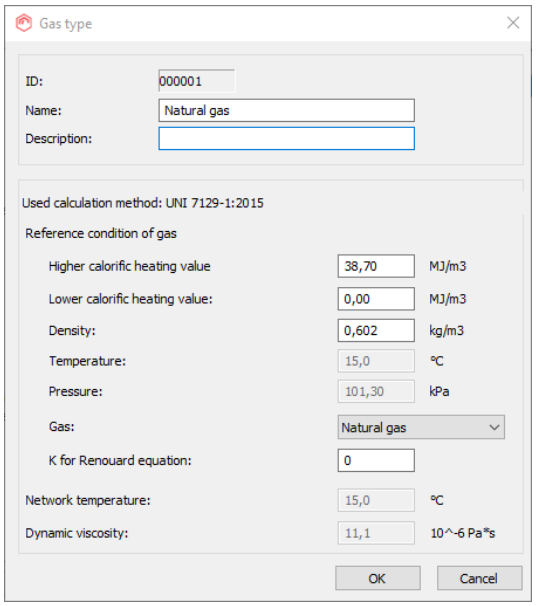
Calculation for gas plants according to the Italian UNI 7129-1:2015 standard
In addition to Cibse standard, Italian UNI 7129-1:2015 standard can now be selected for calculating the gas networks.





Room Calculation Point on Climate Beams
Added Room calculation point to cooling beams based on the connector location

Flanged pipe series adds necessary flanges when the accessories are installed
If pipe series contains a flange, then the smart installation of a component adds flange according to the pipe series size criterions.
This improvement affects only to the component installation. Valve tool or sizing has not been changed.

New warnings are shown for the connection nodes
Added "Not in balance" message in balancing for the connection nodes.
Added "High dp" message for the connection nodes

Copy branch and move branch now updates the host level and elevations
If the branches are copied/moved in a section view from one floor to another floor and connected to a vertical pipe/duct/cable tray, the host level of the copied/moved branches are now updated according to the midpoint of the vertical segment where the branch is attached.

The branch copy supports copying of two branches on different sides at the same time
Copying branches to both sides as we have it in cross-fittings are now supported.
Select as usual both sides and you will include also a cross-fitting at end destination.

Pressure drop is dependent on the length of the hood
For some kitchen hoods, the pressure drops are defined as "liters per meter (hood length)".
MagiCAD can now calculate the pressure drops correctly for these kitchen hoods.

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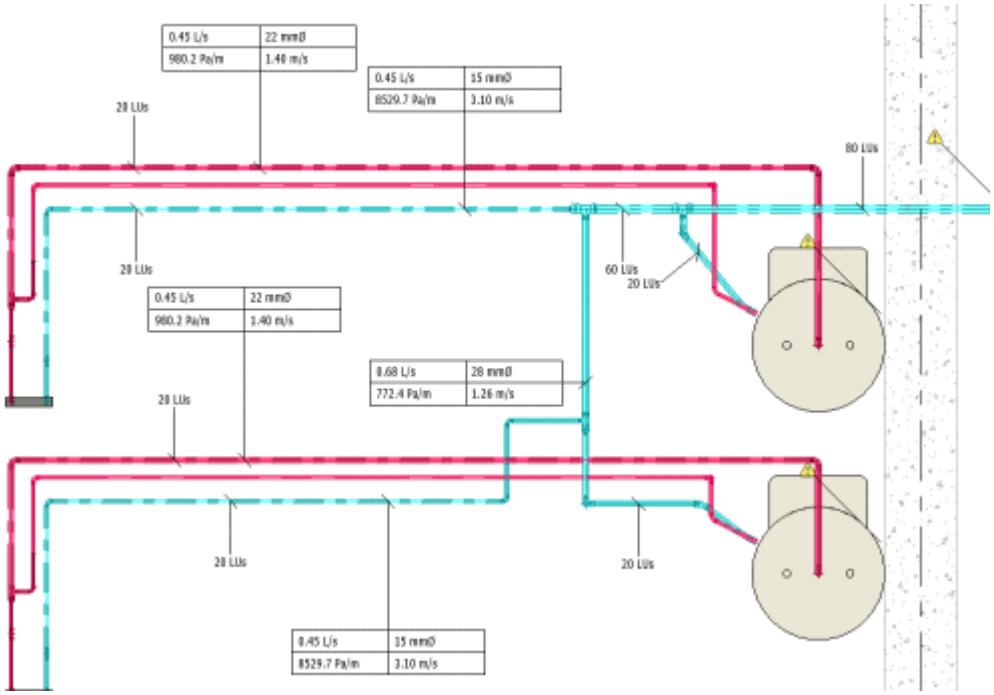
Multiple DHW circulation calculations can be combined with single CWS system

Previous version of MagiCAD did not support connection of 2 or more hot water systems including the circulation side into a system that has a single cold water supply.

This is now possible.

Below is an example of the layout which is now supported.



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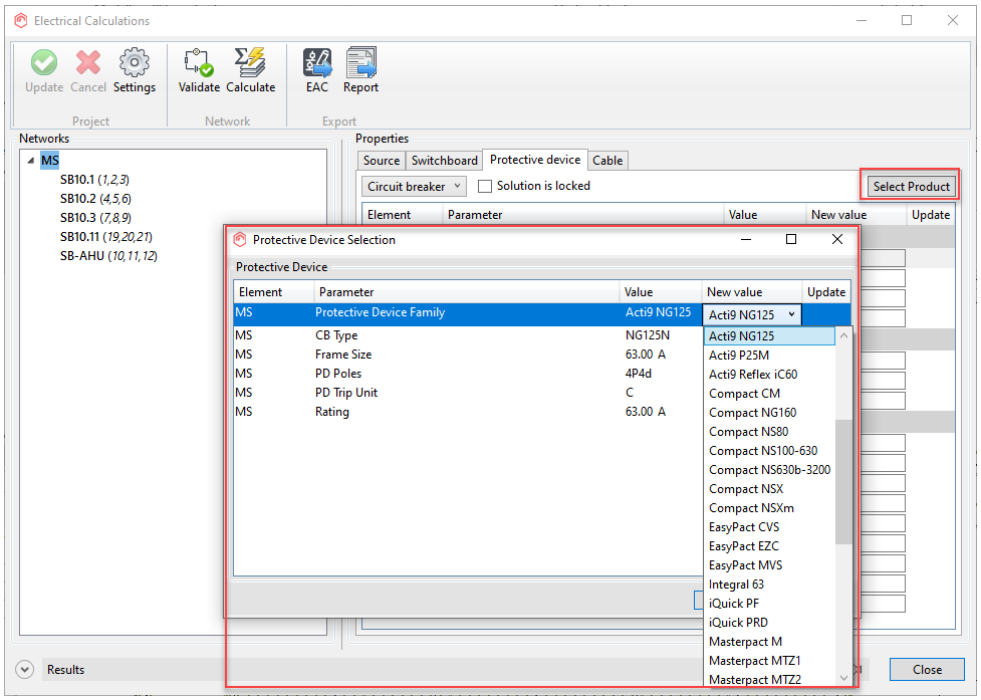
1.4 Electrical

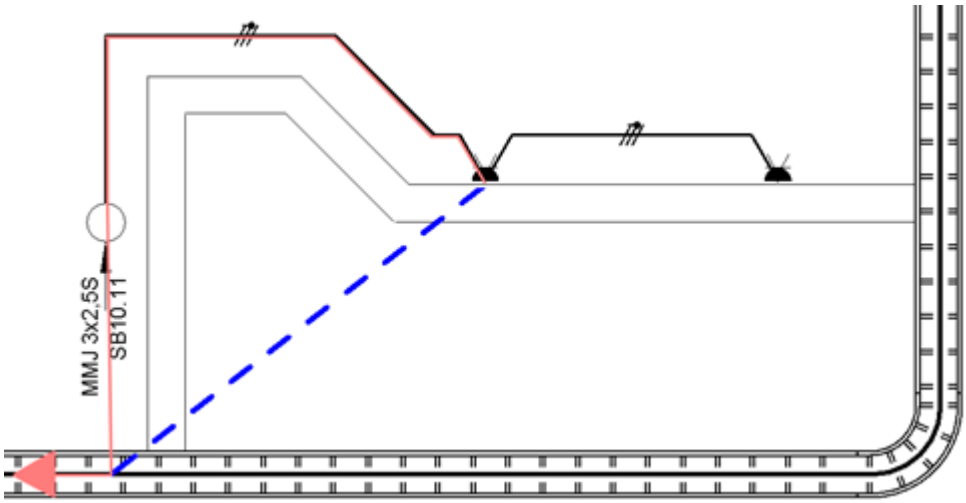
Protective device selection in electrical calculations

In electrical calculations you can now select the protective device you like including its product family, type, trip unit/curve and size among other properties. After selecting a circuit breaker, the "Solution is locked" parameter is automatically checked.



Cable length calculations based on drawn routes

Now you can calculate cable lengths based on drawn wires. First you need to activate the option "Include drawn 2D lengths to wire length calculations" from the Settings dialogue. After that wire lengths are calculated along their drawn routes so that also elevation differences between the connectors is taken into account. Otherwise the lengths are calculated along orthogonal routes between the connectors they are connected to. Additional lengths can still be utilised as before.



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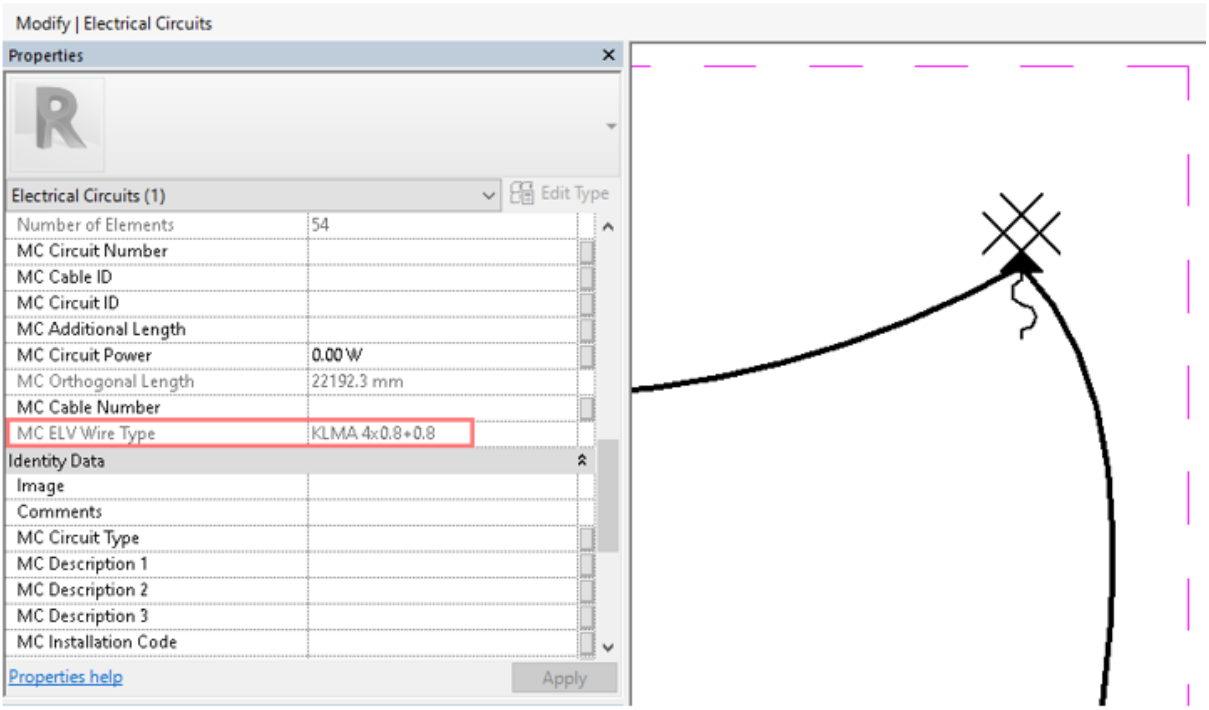
Cables in ELV circuits

Since Revit doesn't have support for wire types in ELV circuits, MagiCAD now adds a new parameter "MC ELV Wire Type" to which it writes them instead. You can decide the wire type for an ELV circuit by drawing a supply cable with MagiCAD's Wire tool or by using the "Set Circuit Properties" function. When updating wire types from circuits to wire instances, with ELV circuits the used wire type is taken from the MC ELV Wire Type parameter. In the same way Manage Circuits is showing the wire types of ELV circuits based on the MC ELV Wire Type parameter and cable packets will update themselves based on the MC ELV Wire Type parameter in case of connected ELV circuits. Power circuits work as before.



Shared parameters for the dimensions of Switchboards

MC Length Instance, MC Width Instance and MC Height Instance have been added into the switchboard template and they have been mapped to the corresponding family parameters: L, W and H.

The new parameters can be added to reports and tags.

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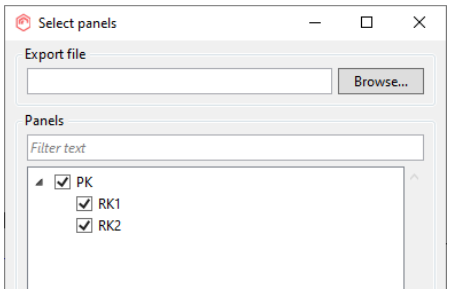
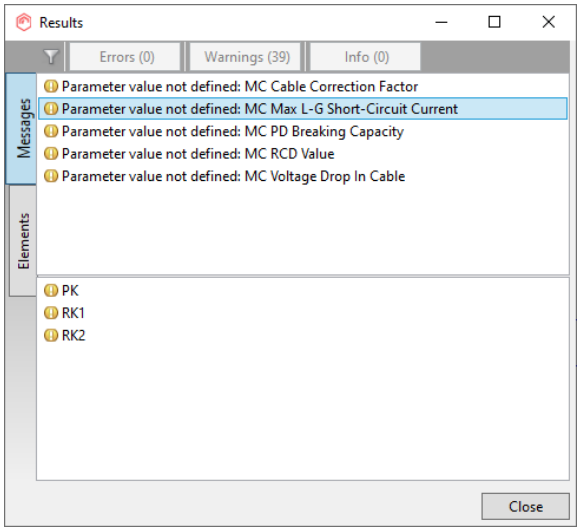
Export/Import of electrical networks

It is now possible to export power distribution networks into xml format with the new Export Network function. Select which switchboards and circuits behind them are exported and the whole network with all the necessary parameters are exported into an xml file.



An exported file can be transferred to a 3rd party calculation software for making calculations in the exported network, and with the Import Network function calculation results can be written back to the Revit project. When importing the network, you will get a results dialogue which shows possible errors and warnings.



If warnings or errors are found from the imported file, there is the possibility to cancel the update. Otherwise data will be updated to Revit parameters.

In addition, cable installation methods (which are used in calculations) are now separated to their own parameters in circuits: "MC Installation Method" and "MC Reference Method". Those can be defined in the Dataset for Installation Codes and updated to the previously mentioned parameters by using the Set Circuit Properties function or by using the Update Parameters with its "Installation and reference method" option for circuits.

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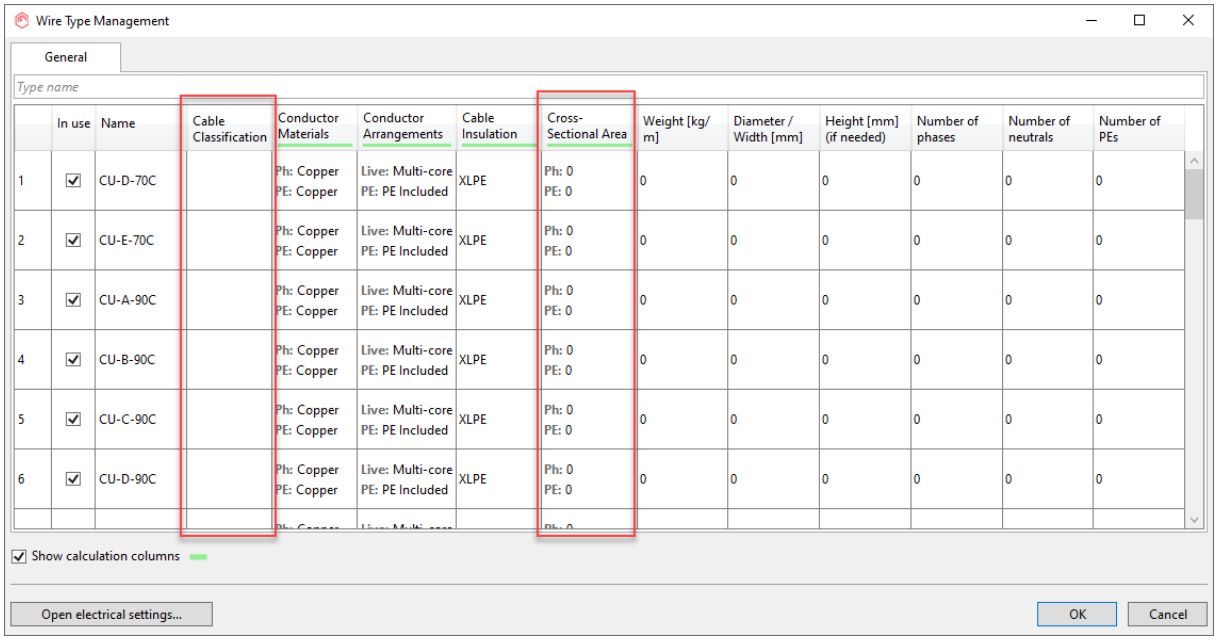
Enhancements to Wire Type Management

Two new columns have been added to the Wire Type Management dialogue: Cable Classification and Cross-Sectional Area.

The Cable Classification column is meant for CPR cable classification which refers to a cable's qualities regarding flame spread, flaming droplets, heat release and smoke production including its acidity.

The Cross-Sectional Area is naturally meant for conductors sizes, in this case for the phase and PE conductors.



In addition, the following corresponding parameters have been added to wire types and they are updated into them from the dialogue:

- MC Cable Classification
- MC Phase Material
- MC Phase Size
- MC PE Material
- MC PE Size

Labels in switchboard schematics

Support has been added for the following labels which can be used in the data blocks and/or symbols of switchboard schematics.

- EC (Cos phi of circuit - Power Factor)
- LB (Longest branch length of circuit - MC Longest Branch Length)
- TC (Tripping curve/unit of protective device - MC PD Trip Unit)
- VP (Voltage drop % in circuit - MC Voltage Drop)
- MLC (Minimum line to ground short-circuit current in circuit - MC Min L-G Short-Circuit Current)

In addition, a bug has been fixed where the label BC (Switchboard/Panel Name) wasn't moving to its correct place in schematic symbols.

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Maintain instance parameter values when changing node symbols in Connection to Mechanical
The values of the following instance parameters are maintained when changing a node symbol to another in the Connections to Mechanical function.

- ang2D
- dX2D
- dY2D
- MC Object Variable 1-4
- MC Eload Classification
- MC Object Status
- MC Installation Code
- Comments

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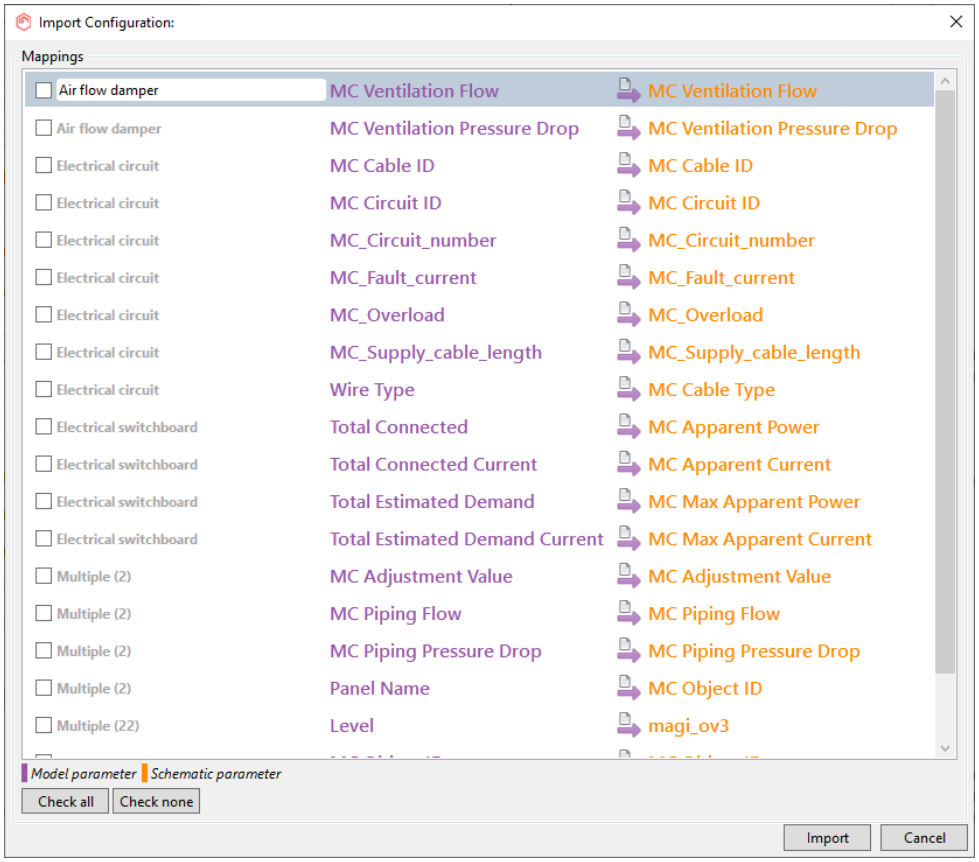
1.5 Schematics

Import parameter mapping configurations for schematic
Now parameter mappings can be imported into in use configuration XML file.



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2 Resolved issues

2.1 Common

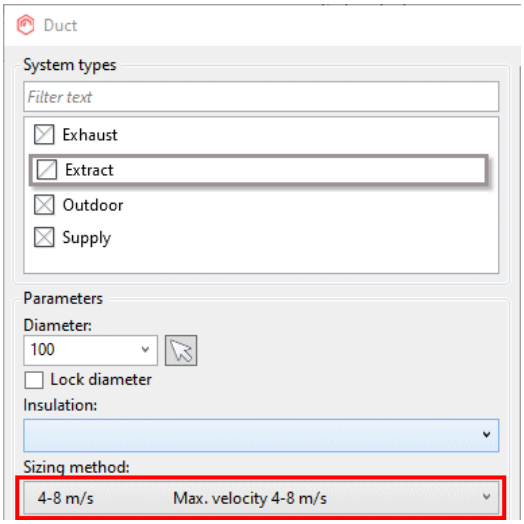
The filter for the national classification tree ignores the description of the code
When filtering the national classition tree, the shown tree didn't contain a classification code although its description matched the seached word.
Only those codes, for which the code or abbreviation matched the filtering string, were shown.
This is corrected

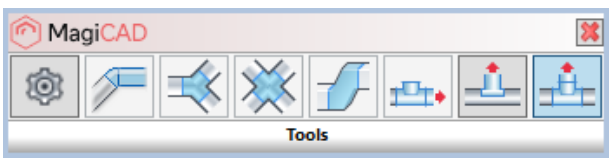
Properties window does not show mapped material correctly
Materials from product model are now shown in preview pictures in MagiCAD's UI.

Exporting to Excel from the BCF management function fails
When a .bcfzip file from another project is loaded to the BCF manager and exported to Excel, an error dialogue is shown.
The reason is that when exporting the elements that do not exist in current project, it will cause an error.
This is corrected.

Angle to Horizontal ignores reference level
Corrected angle to horizontal offset in case that offset is taken from a curve whose reference level is different than active view level.
In this case the dialogue shows the correct offset but the actual curve was created to a wrong offset.
Now reference level is always in active view level and theoffset is calculated according to that.

A chosen sizing method disappears after installing a fitting from the floating toolbar
When the sizing method for a duct/pipe was selected from the draw dialogue before starting to draw them, the sizing method was lost after a fitting was selected from the floating menu and continuing drawing after the fitting.
This is corrected and the selected method remains.





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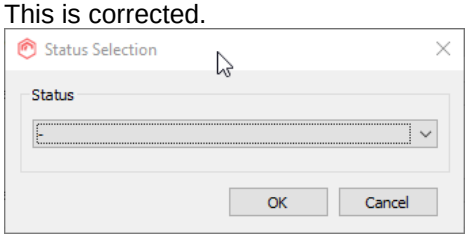
An unexpected error when synchronizing parameters
Corrected an unexpected error in case that all the elements contains a broken link which was tried to synchronize.

Can`t select certain status name to change properties
Sometimes when using '-' sign in status, it was not possible to select it with change properties.
This is corrected.



An exception when the selected object was changed quicly in Duct/Pipe/Cable tray dialogue
Corrected randomly occured exception when the duct/pipe/cable tray type was changed either with with keyboard arrow keys or with the mouse by moving the cursor up and down.
Due to this correction, also the object type sorting is corrected. Now the sorting is primarily based on the family name and secondarily on the curve type.
Earlier the curve type was sorted primarily. For this reason the family name were not sorted at all.

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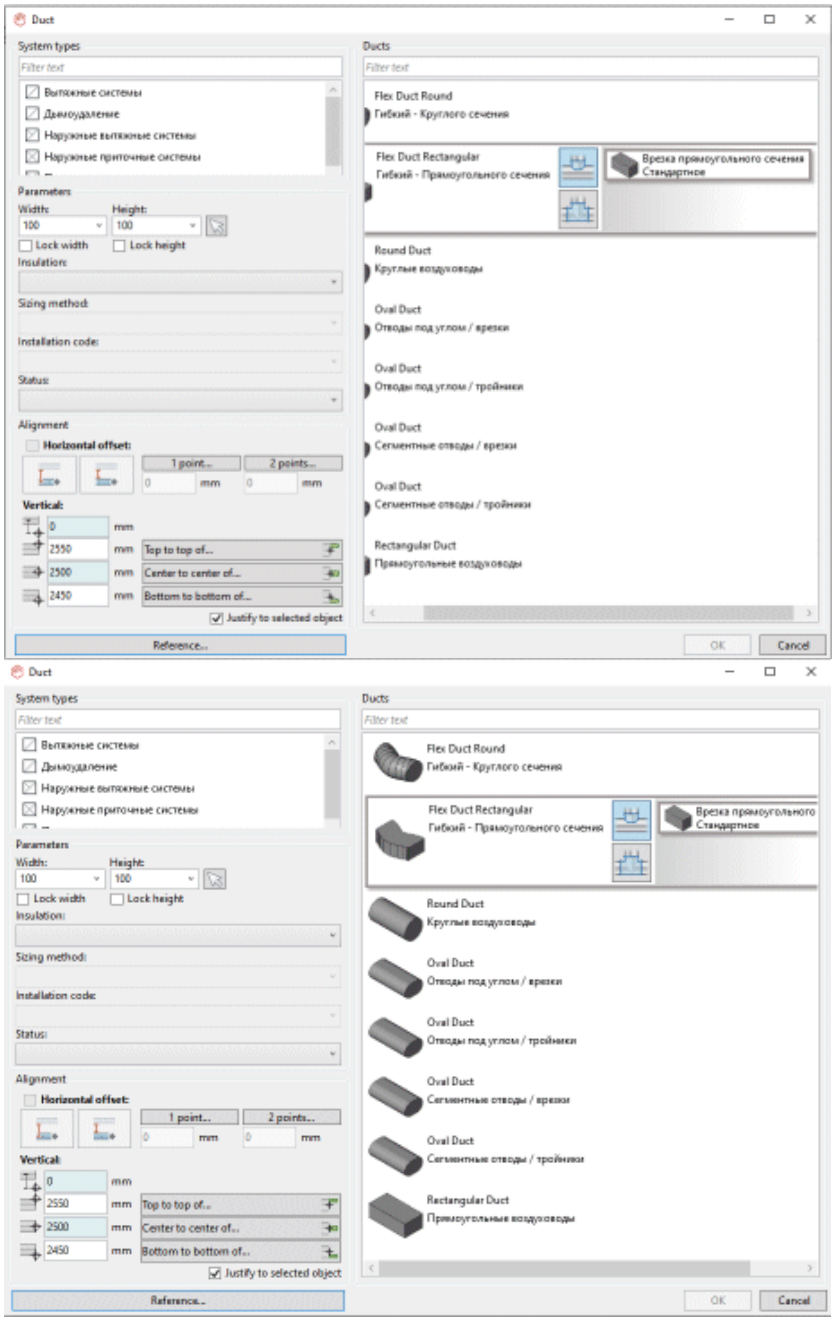
Duct/Pipe/Cable tray dialogue works weird with long names

In the duct/pipe/cable tray dialogue, the list was scrolled to the right in case the series name and the fitting names are very long.

This has been changed so that the left side now remains and scrolling must be done by the user.

The old behaviour is on top and the new below

.



Revit shutdown takes almost two minutes when dataset is network drive.

Corrected the long delay of document opening / closing when file based dataset was located in a network drive etc

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2.2 IFC-related

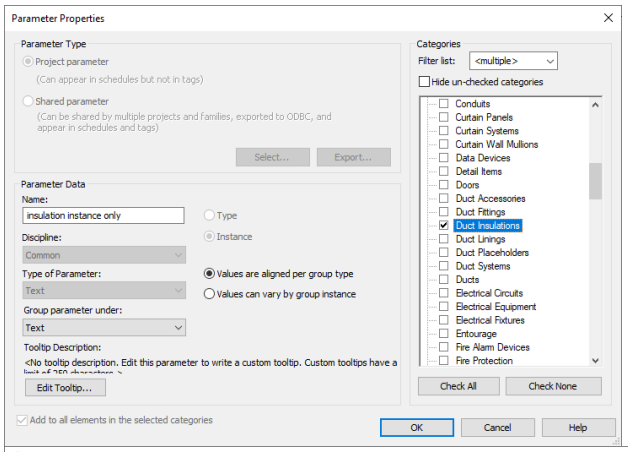
Running a scheduled IFC Batch Export was not possible in projects created with newer versions of MagiCAD for Revit

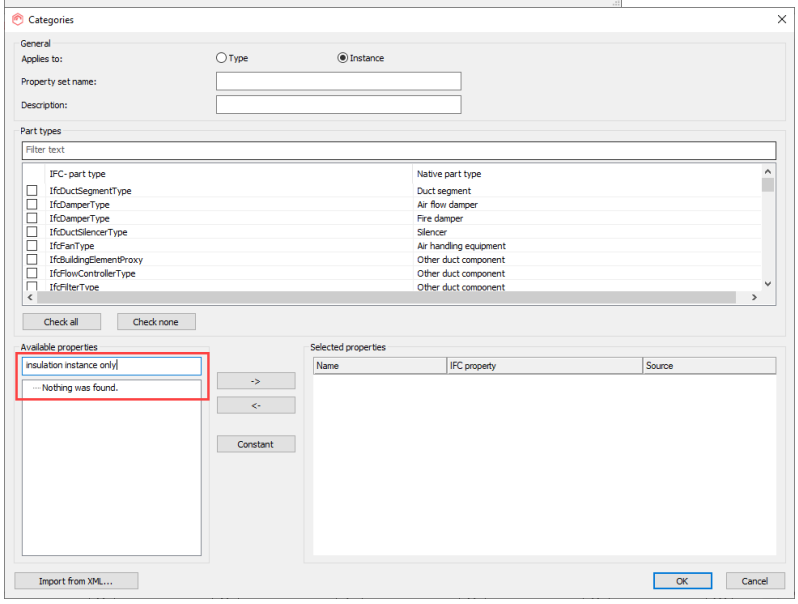
If the project had been created with a MagiCAD for Revit version 2022-2022 UR-1 the scheduled IFC Batch Export did not function and no IFC files were created.
This issue has now been resolved and the scheduled IFC Batch Export works like before.

Revit parameters set for insulation could not be added to the property set

If a parameter existed for duct and/or pipe insulation, then the parameter could not be added to a property set via MagiCAD's Property Set Manager (this regardless of if it was a Type or an Instance parameter):

This has now been fixed and Revit parameters for insulation can also be added to the Property Sets.
Note: To see the instance insulation parameter in the Property Set Manager, a duct or pipe segment with that insulation needs to exist in the project.





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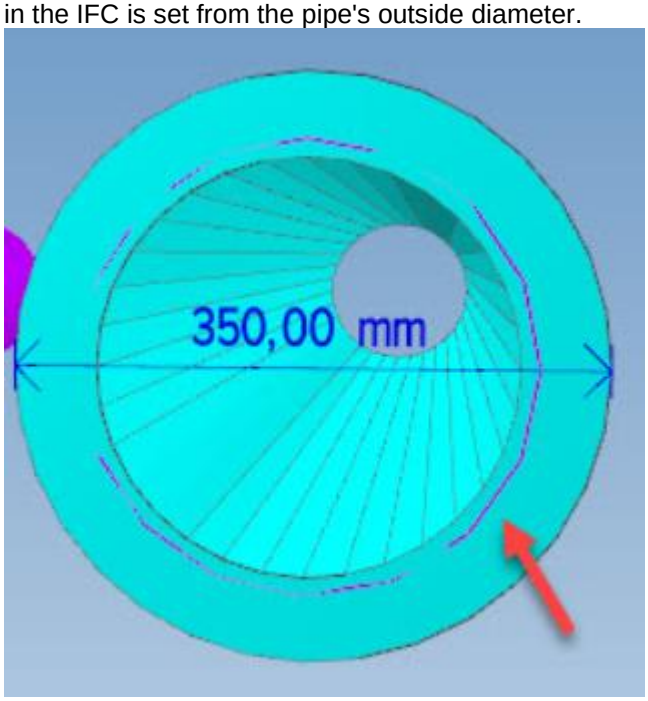
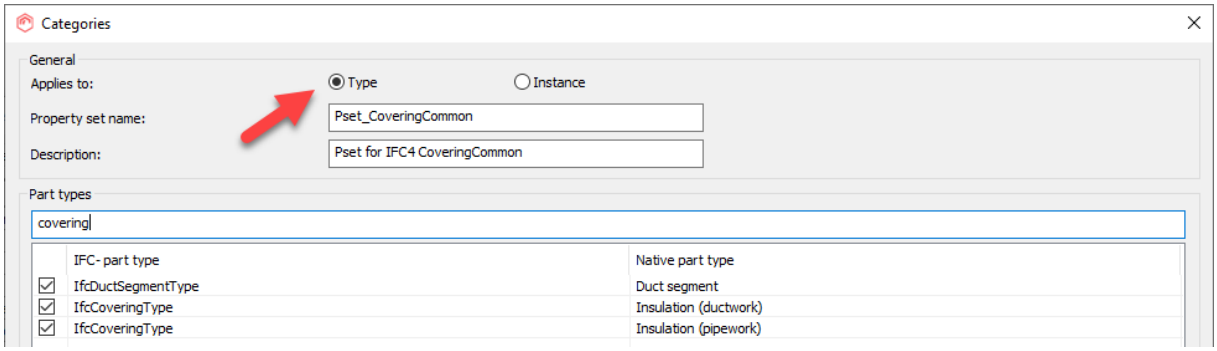
Outside diameter of insulated pipe was different in Revit and in IFC

The outside diameter was wrong for insulated pipes in the IFC. This was due to front which point the insulation was calculated when the data was exported to the IFC. As can be seen from the image below, it is in this case slightly inside of the pipe itself. This has now been corrected and the insulation in the IFC is set from the pipe's outside diameter.



The property set was not exported for insulations if the Propertyset was a "Type"-type

If you set a property set of IfcCoveringType to "Type" it did not export the property set. With Instance it exported both instance & type parameters. This has now been fixed and property set for IfcCoveringType works when the Property set is of the "Type"-type.



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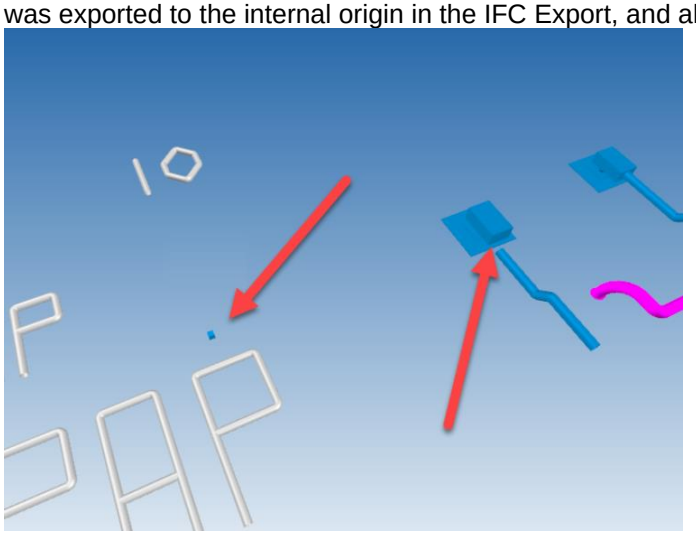
Flexible duct issue

When a flexible duct has no graphic in 3D view because of stretching, and looked like a line in Revit. it was exported to the internal origin in the IFC Export, and also with a modified geometry:



Now flexible curve geometry is exported either as face geometry of polyline geometry (if face geometry is not found) and maintains its position correctly in the IFC.

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2.3 Ventilation and Piping

Corrected an error when the fitting sizes were not always used properly
When the min/max sizes of the fittings were read from the routing preferences, there was sometimes a rounding error.

Elbow		
Short Elbow-ISO 49: Short Elbow	10.000	50.000
Elbow-ISO 49: Elbow-ISO 49	65.000	150.000

MagiCAD uses floating point numbers to represent the pipe sizes and sometimes e.g size 10 was rounded to 9.99999... or 50 to 50.00...1 which caused the error.

E.g. Above it may have occurred so that instead of "Short-Elbow-ISO 49" an elbow "Elbow-ISO 49" was selected if the elbow size was 50 (It was rounded to 50.00.....1)
This is now corrected.

Index route not shown in the view with gas calculation both in the preview and by filter
it was not possible to highlight the index route with a filter after confirming the gas calculation. It was not even visible while the calculation report is open
This is now corrected and the index route can be highlighted.

Display bug with plumbing sizing report
When the sizing is done on a plumbing network, the general tab is active and "Sizing update" button is clicked, all the texts disappear from the general and cold water tabs
Corrected by disabling the sizing button from the general tab.

MagiCAD sizing could`t corretly handle bends after vertical pipe/duct
Corrected a situation where there was a gap between pipe/duct and fittings after MagiCAD sizing.
This problem occurred especially when there is vertical segments.
This is corrected.

Printing the report causes a revit to crash
This happened with very long filenames (> 32 characters)
This is corrected

Calculated flow for radiator isn't updated
Corrected calculated flow for Heating radiators in Product Selection dialog.

Installation codes are not working properly in ventilation and piping
If settings has only Devices and Components selected, Installation code was not visible in "Change properties"
If you select the Installation code for the device afterwards (device already installed), there was no way to update the default information to the products, because setting was missing from "Update Parameters".
Both errors are corrected

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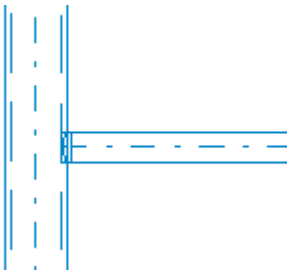
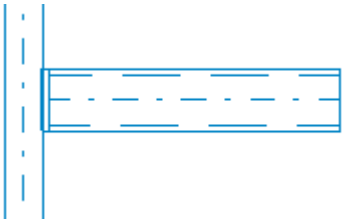
The pressure drop of a branch is calculated incorrectly if the main duct has inside insulation (lining)
When the velocity in the duct is calculated, the free inside diameter is calculated by decreasing the thickness of the lining from the inside diameter of the duct.

In the branches the lining was inherited from the main duct to the branch, thus leading an incorrect diameter and velocities of the branch to be used in the pressure drop calculations



Lining thickness in the main duct was used also to the branch



Also in this case the lining thickness (zero) in the main duct was used to the branch

Correction is made and the lining thickness of the branch duct is used correctly.

Corrected system type for the installation of the fire hydrants
When installing a fire hydrant, an first sprinkler (fire protection wet) system is being pre-selected as a default.
Earlier selected system was "Other".

Pump as Mechanical equipment leaves gaps in symbol installation
Corrected by calculating symbol length by using the pipe connector locations.

Flow at the domestic water device - UNI 9182 sizing
As defined in UNI 9182, the connection pipes are now sized using flow instead of the LU

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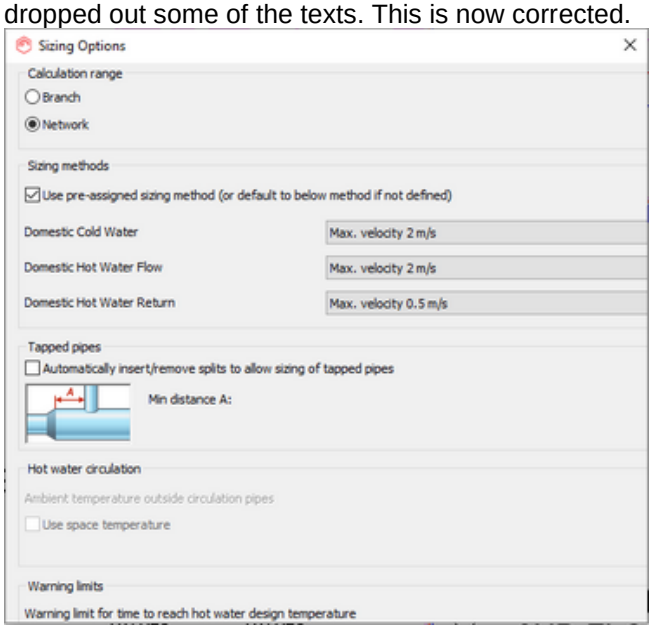
Scaling affects domestic water sizing dialogue

If Windows scaling is set bigger than 100%, for instance 125%, then domestic water sizing dialogue dropped out some of the texts. This is now corrected.

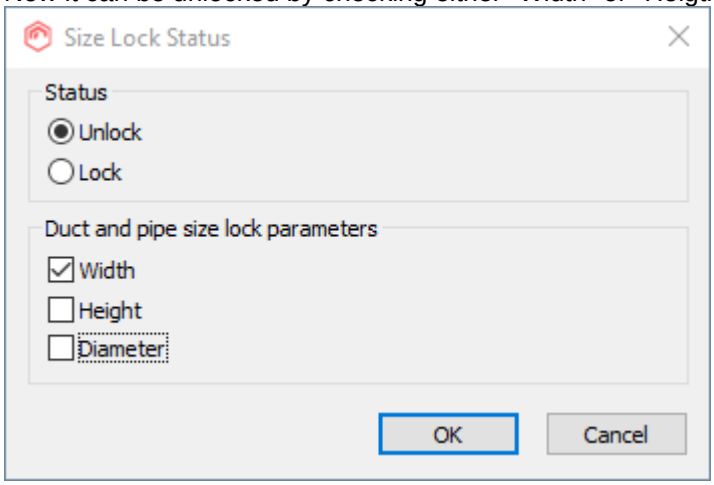


"Size lock" parameter of the rectangular duct cannot be unlocked with MagiCAD`s change properties

In case the size lock parameter is checked for a rectangular duct, it locks both the width and height of the duct. But that parameter could not have been unlocked from the rectangular ducts with change properties

MC Size Lock - Height	☐
MC Size Lock - Width	☐
MC Sound Level by Octave Band	
MC Sizing Method	4-8 m/s
MC Surface Area	
Equivalent Diameter	133.2
Size Lock	☑

Now it can be unlocked by checking either "Width" or "Heigth" from the change properties dialogue



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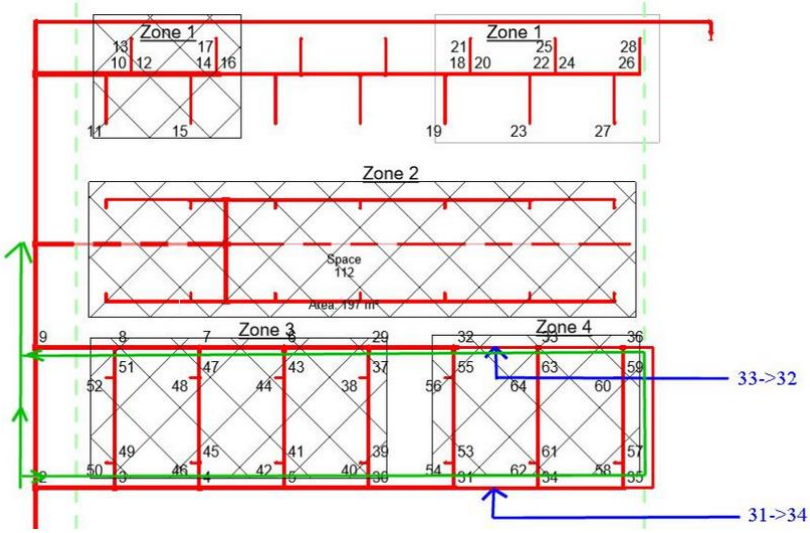
Sprinkler report show unnecessary "high velocity" message
This happened when more than one design areas was calculated simultaneously. If the flow to more than one design areas went through a pipe and any of the flows exceeded the maximum velocity, the error was shown to all the design areas even though the velocity to that particular design area was not exceeded.

For example, if the calculation was done to two or more areas where one area is zone 4, this error happened. This was because when area 4 is calculated, the velocity in the marked pipes (31->34 and 33->32) is actually too high. Thus they get a warning flag. Because of the grid, the flow goes through the grid also when any other areas are calculated. The pipes in the grid have a warning flag and because of that the report shows "too high velocity" message even though when other areas are calculated the flow is so small that the maximum velocity is not exceeded.

Now the warning flag is cleared and reset before the results to any area are shown.



An error message goes behind the water device group dialogue and the dialogue cannot be moved
Russian calculation related water device group dialogue cannot be moved when an error message occurs (e.g. when the same water device is selected twice to different groups).
The error message also goes behind main dialogue so you cannot read the message correctly.
Now the error message is shown always on top.

The size range and RFA name of the fitting was not always updated to the pipe series
This error is now corrected.

When installing Fan Coils, Revit crashes whem trying to change the product to be installed
When installing fan coils with "Install Product" first installation works normally. But after the installation has been accepted by "Apply" and "Select Product" is pressed again, Revit versions 2018 and 2019 crashes. From 2020 onwards, Revit just freezes and stops replying.
This error has been corrected

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2.4 Electrical

Unhandled exception when updating supply cable lengths
When two different circuits were connected together with a wire and one of the circuits had also a supply cable manually forced with the MC Act as Supply Cable checkbox, you got an unhandled exception when trying to update supply cable lengths with Update Parameters. Now supply cable length is only updated to the circuit to which the supply cable has been connected and no exceptions should come anymore.

Material mapping wasn't working properly for electrical products
Previously some materials were not mapped correctly for electrical products. Now they should be mapped correctly when MagiCAD is creating families.

RCD class didn't get values anymore, electrical calculations
Due to changes in the calculation engines, the RCD class didn't get any values anymore. This issue is now fixed.

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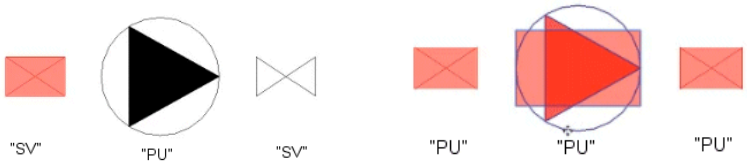
2.5 Schematics

Parameters when using assembly in Schematics
When an unique "Object variable" value has been assigned to several objects and an assembly is created from them -> The Object variable of the primary element is used for each symbols that are selected to the assembly.



Original separate objects | After an assembly is created

The parameter setting for schematic assemblies is now corrected.

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