



MagiCAD for Revit

Release notes for version 2021 UR-1

13/10/2020

Content

1	NEW FEATURES 2021 UR-1	3
1.1	Common features.....	3
1.2	IFC.....	5
1.3	Heating, piping and ventilation	7
	Ventilation.....	7
	Piping	8
	Sprinkler.....	9
	Other	10
1.4	Electrical.....	11
1.5	Schematics.....	13
2	RESOLVED ISSUES	14
2.1	Common issues.....	14
2.2	Heating, piping and ventilation	15
2.3	Electrical.....	17
2.4	Schematics.....	17
3	MANUFACTURER APPS	18

1 New features 2021 UR-1

1.1 Common features

LOD (Level Of Detail) selection tool

In MagiCAD 2020 we improved the family conversion and creation of our BIM objects to support LOD (Level Of Detail) levels. The latest version of MagiCAD introduces an LOD selection function, with preconfigured options that enables fast and convenient setting of the needed LOD level.

MC LOD 100	Use the symbols from the MagiCAD symbol libraries as the only graphical representation.
MC LOD 200	Box/approximate geometry for early phase design purposes or for optimising performance.
MC LOD 300	Detailed geometry for detailed design and when the actual geometry is important for design coordination, communication, and other decisions.
MC LOD 350	Highly detailed and accurate geometry for detailed design or visualization needs when a high level of accuracy is required for illustrating details that affect construction and installation, or for the design communication towards other project parties.

Significant performance improvements

Performance is always a concern when working with large and extremely large BIM models. This is why we have invested a lot of time into reviewing most of our existing tools and features in MagiCAD in order to optimize and fine-tune the speed and performance of the software. Operations in large scale projects that previously took 10-40 seconds or longer to complete, are now down to 1-3 seconds and modifications that took several minutes to run through are reduced by 50% or more.

Settings and functionality for managing of object status

With the newly added Status function it is now possible to assign a status to elements. Object status can be used to separate elements in e.g. the same system or network and gives the user the option of using the status name in tags, view filters or schedules. Status can be easily added while drawing or can be added/edited/removed via MagiCAD's Change Properties functionality.

MCREV support for Spanish language

MagiCAD for Revit has previously supported English, German, French, Russian and Chinese user interface.

MagiCAD for Revit 2021 UR-1 adds a Spanish user interface and Spanish user guides.

Link Revit project files to a central project file and dataset in BIM 360

Multiple Revit project files can now be linked over BIM 360 to one central project file that has an embedded dataset file.

MagiCAD 2020 introduced support for the Autodesk BIM 360 Design solution. This allowed MagiCAD datasets to be used as internal dataset files embedded into a Revit file. In this version BIM 360 support has been extended so that multiple Revit project files can be linked to one central project file that has an embedded dataset. Each of the linked project files will then use the embedded dataset of the central project file ensuring that every participant in the project uses the same family definitions, ruleset and methods. The possibility to linking Revit files makes it easy to combine MagiCAD and Autodesk BIM 360 when a large Revit project is divided into multiple models for performance reasons.

Mapping of parameters in structures to the provisions for builderswork openings and voids

The Provision for Builderswork Opening tool now allows new types of information, including provision type parameters, provision host, fire rating of the penetrated structure and provision owner, to be copied into the provision family as shared parameters. These parameters will then be copied and transferred into the corresponding voids with the Builderswork Openings Manager plugin.

When the automatic BWO tool is run and provisions are created, the following parameters are mapped and transferred into the provisions.

MC Provision Type	Describes what Systems types the provision type is created from.
MC Owner	An existing parameter in our provisions that reads the discipline that the segments belong to. Those parameter values are definable in the dataset.
MC Provision Host	This can e.g. different types of walls and slabs.
MC Fire Rating	Is mapped from the existing native Revit parameter – describes the fire class/rating of the penetrated structure.

Improvements to the provisions for builderswork openings

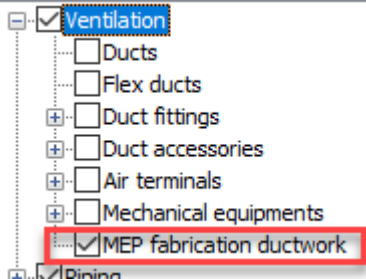
- It is now possible to set the additional length of the provision in the dataset. The value is set as a parameter and can be changed afterwards.
- Two check boxes have now been added in the "*Category filter*" dialog where the user can decide from case to case, if the insulation should be taken in-to account when the provision size is calculated. As default the checkboxes are set to ignore the insulation.

MagiCAD 3D section box now supports Fabrication parts and insulation

- 3D section box now supports the fabrication parts (and technically all the other elements whose geometry is represented by meshes). Previously only the elements with a solid geometry were supported.
- The logic of the insulation handling in 3D section box has been modified so that both the element geometry and insulation geometry are taken into account when calculating the dimensions of the section box. Previously insulation geometry could have overridden the element geometry and as a result some uninsulated parts of an element could have been left outside the section box.

Running index support for MEP fabrication part

The running index format can now be set also to the fabrication parts in ventilation, piping, electrical and other groups.



Support for face based products with Ceiling installation

MagiCAD support now face based installation in the ceiling tool. This is useful when luminaries or air devices are installed.

Separate path for user symbol database

It is now possible to define a separate folder for the user symbols.

Added a merge function for the merge parameter configuration tool

The new version of MagiCAD allows importing configurations from another file and merge them with the active configuration file.

Text order in change properties

Insulation list containing the description of the insulation is shown in alphabetical order in "Change Properties"

1.2 IFC

Support for quantity take off in the property sets

Support for the quantity take off property sets has been for IFC4 export. The quantity definitions are defined in IFC4 and they are:

- Area
- Count
- Length
- Time
- Volume
- Weight

IFC distribution ports support

The new version exports also the port definitions as "IfcDistributionPort" in case the "Export port definitions" is checked in the IFC-export dialog.

It is also possible to define property sets for the distribution ports.

Save IFC Guids in the same ways as Revits own IFC export is doing

The new version of IFC export creates and saves IfcGuid in case the object doesn't have it. This is done to all instances and also on the type level.

IFC-export of project and family parameters

It is now possible to export all the build in parameters that are used by Revit.
Also all the parameters from the families and project itself can be exported.

IFC property set, part type UI update

The usability of the part type list has been improved by the following functions

Both lists of part types are now sortable

Filter is added

Added multi selection and full row selection. When the checkbox is clicked for the selected items, all the selected items are checked.

More comprehensive list of IFC-types can be used when IFC4 is used to export the objects

Support for the following IFC-types are added for IFC4 export

- IfcCoolingTowerType
- IfcSolarDeviceType
- IfcLampType
- IfcElectricFlowStorageDeviceType
- IfcCommunicationsApplianceType
- IfcGeographicElementType
- IfcCableFittingType
- IfcAudioVisualApplianceType
- IfcProtectiveDeviceTrippingUnitType

Maintenance/clearance zone and transparency support

It is now possible to export maintenance and clearance zones as transparent objects if IFC-4 is used.

1.3 Heating, piping and ventilation

Ventilation

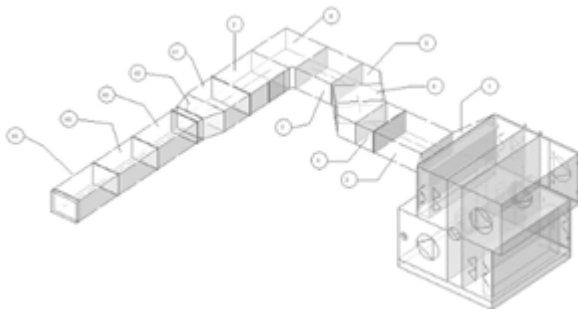
Part numbering, ventilation

With part numbering you can automatically generate an ID for every part in the ventilation model. Hereby you get the connection between the model and e.g. the Bill of Materials.

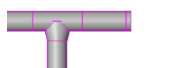
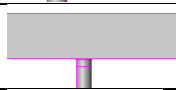
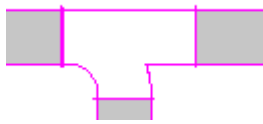
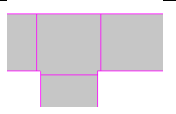
The part numbering can be done in several user defined ways. It is possible to give the same number to same products or unique number for every part.

It can be one and the same number series for all systems or you can have a separate number series for each system.

The part numbers can be used also in tags, schedules and exports. By this it is possible to make a drawing to the installers – so they can see what components to use where.



Calculation of the ventilation systems according to ASHRAE standard has been improved
MagiCAD now supports also the following fittings. All of these applies only to the extract air system

ED5-7	Capped main duct after a tee for circular ducts	
ER5-2	Round taps on rectangular ducts	
Default method	Ashrae provides factors only to the bevelled (rounded) rectangular branch.  In case the ASHRAE method is selected and the branch type is without rounded edge, the branch is calculated with the default method.	

Increasing the limit of duct sizes in the duct series

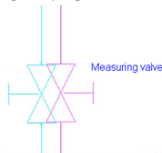
The maximum amount duct sizes in the duct series has been increased from 1000 to 10000.

Piping

Minimum pressure is no longer used for the measuring valve

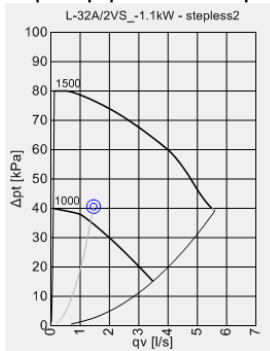
Pressure difference can be defined between the differential pressure valve and a measurer. In cases where an adjusting valve is used as a measuring valve, the minimum pressure defined in the valve properties was used in MagiCAD balancing. This led to unnecessary high pressure request for the pump.

Now the minimum pressure is no more used for the measuring valves.



Upgrading pump curves

MagiCAD product database supports now variable speed pumps with frequency-controlled steering. The actual working point of such pumps are calculated in the heating and cooling systems if “Calculate to pump pressure” option is selected.

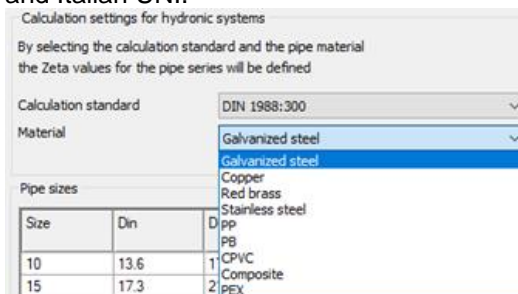


Pressure loss calculation of the pipe fittings according to standard and material

The user can now define the calculation standard and the material for each pipe series separately. Each standard and material have different zeta factors (resistance factor) and the list of available materials varies according to the selected standard.

By using the correct zeta factor from the standard, MagiCAD offers more accurate pressure drop calculation of the fittings.

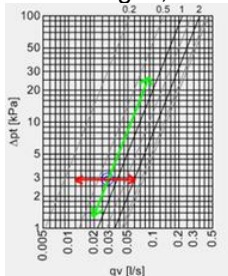
Two new pipe pressure loss calculation standards are also included in MagiCAD, namely German DIN and Italian UNI.



Locking kv-values of the adjustment valves

In earlier versions it has been possible to lock the pressure drop of an adjustment valve. Locking the pressure drop means that the adjustment value changes when the flow changes (red line).

Now it is possible to lock the kv-values of the adjustment valves, which means that the pressure loss changes, but the adjustment value remains the same (green line).



Diversity Calculations for Heating & Cooling Systems

Diversity factors for heating and cooling systems enable you to estimate the practical real flow of a system when it is in use.

This enables system optimisation according to cost and energy consumption by reducing the pipe and pump sizes to minimise the material investment and to produce energy savings.

When a diversity factor is set, it affects to the pipe sizes during the sizing and to the pressure drops during the balancing.

You can also ignore the defined diversity factors and run the calculations with the undiversified flow at any time.

The diversity factor needs to be set the same for the supply and return pipes. The diversified flow is not supported in the systems where the supply and return routes are different, such as reverse return systems.

Radiator to space installation tool now utilizes the design temperature of the space

"Radiator to space installation" utilizes parameter "MC Design Temperature Heating" and reads its value to the temperature field of the room.

If no proper temperature is found from the parameter, last used value is used

Improvements to drainage connection tool

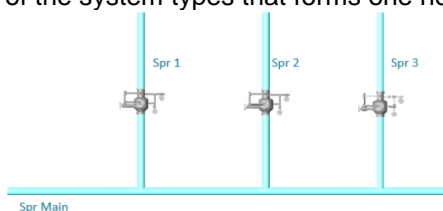
The upgraded drainage connection tool will now show a warning message for those cases when the user given slope can't be reached due to the fact that the angle tolerance for the fittings ± 3 degrees would have been exceeded. In addition, a new option has been added where the user can enable or disable the user given slope in the drainage connection tool, and by that override the ± 3 degree tolerance.

Sprinkler

Calculate several sprinkler system types at the same time, if they are connected

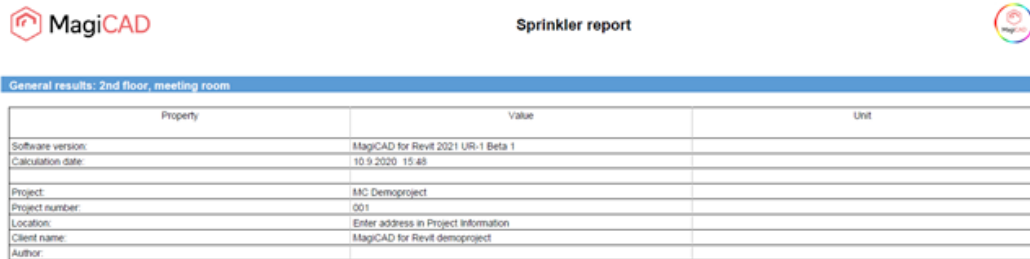
Sprinkler networks often consist of multiple different sprinkler systems each of which is behind an alarm valve. These systems are then connected to a manifold, which is the main sprinkler system.



The new version of MagiCAD can now perform calculation for the entire sprinkler networks regardless of the system types that forms one network.



Improvements to sprinkler report

- A page header with the possibility to add a custom user logo has been added to the sprinkler report. The overall layout also matches better with the other calculation reports.
- The new version also allows users to print all the calculated design areas at the same time.
- The default name of the printed pdf file also better reflects the content as the design area name is used when printing a single area ("design area name".pdf) and the project name is used when printing multiple areas ("project name".pdf)




Sprinkler report


General results: 2nd floor, meeting room		
Property	Value	Unit
Software version:	MagiCAD for Revit 2021 UR-1 Beta 1	
Calculation date:	10.9.2020 15:48	
Project:	MC Demoproject	
Project number:	001	
Location:	Enter address in Project information	
Client name:	MagiCAD for Revit demoproject	
Author:		

Support for Chinese sprinkler calculation standard GB50084-2017

MagiCAD now supports a localised Chinese sprinkler design standard GB50084-2017.

Other

Improvements to the installation of connection node

It is now possible to install several connection nodes without entering the values for each node separately. You can also define a custom temperature difference for the connection node in heating systems and in some cases define the system type for connection nodes in ventilation systems.

BPS Update - enhanced information exchange

When importing IFC files with BPS Update, following new shared parameters are added to the Revit spaces and values are read from the IFC file. Thus providing more accurate calculation results to be used in the MEP design.

- MC Design Temperature Heating
- MC Design Temperature Cooling
- MC Design Sensible Cooling Load
- MC Supply Air Temperature

Keep the "highlighted in the drawing" elements in centre after canceling

- In case the user selects to highlight an element in the report, that element is shown and zoomed into. The new feature is that the instead of zooming to the network from which the calculation was started, the element which was selected in the report remains zoomed. Sprinkler and Solar calculations are exceptions, because they don't contain highlighting functionality in the calculation report.
- Zooming to the selected network is removed even though the user doesn't highlight any element from the report.

Improved sizing methods

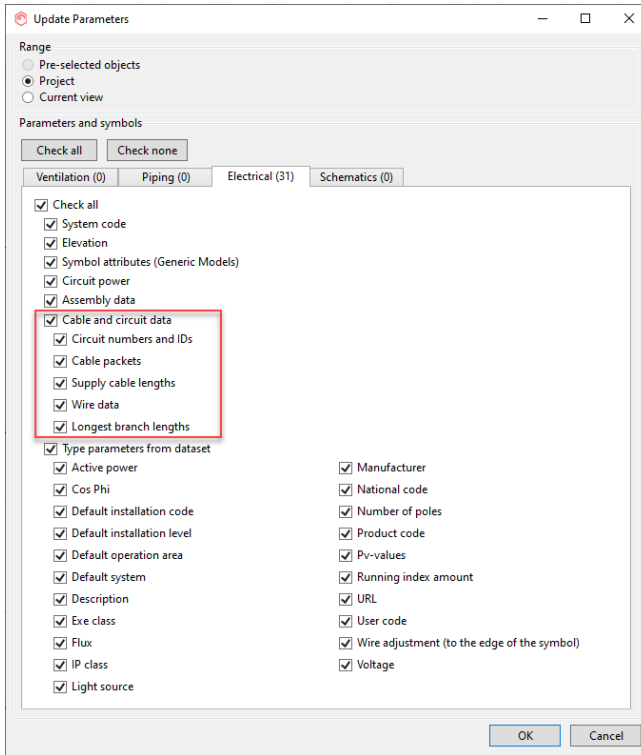
In the sizing methods it is now possible to define maximum flow for each pipe and duct size. The flow or velocity is updated when another value is changed.

For example, below, the maximum flow is calculated from the duct size and velocity.

1.4 Electrical

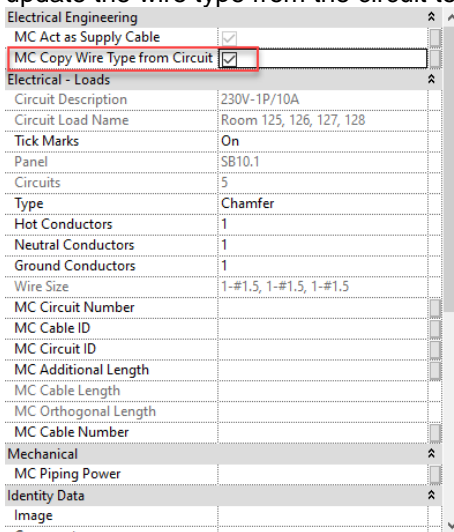
Update Element Data to Update Parameters

The Update Element Data functionality has been moved under the Electrical tab of Update Parameters.



A new option for copying a wire type to a wire from the circuit it belongs to

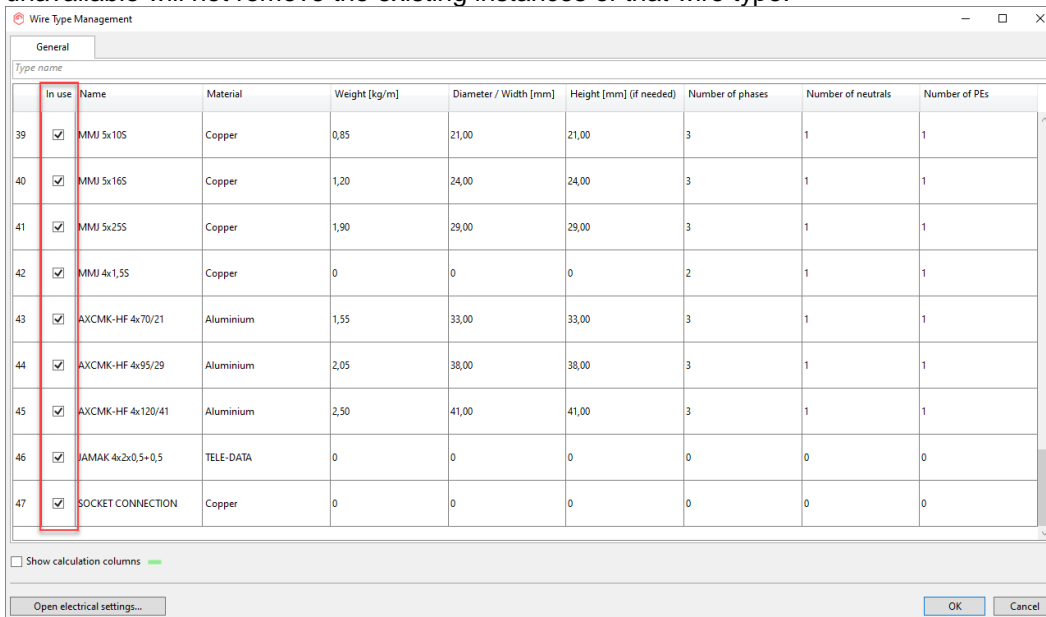
A new shared parameter MC Copy Wire Type from Circuit has been added for wires. When this parameter has been checked for a wire, the Update Wire Data option of Update Parameters will update the wire type from the circuit to the wire.



Select which wire types are currently in use

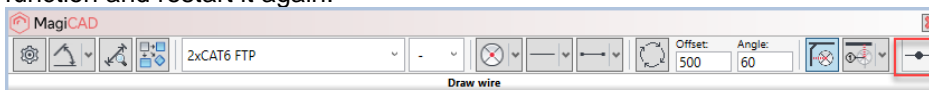
From Wire Type Management you can now select which wire types are available for use in a project. Unchecking the new "In use" selection for a wire type in the Wire Type Management dialogue will make the wire type unavailable in the Wire tool, Set Circuit Properties and electrical calculation functions in the project.

However, if a wire type has already been used somewhere in the project, making the wire type unavailable will not remove the existing instances of that wire type.



Place connection box while drawing a wire

When drawing a wire, there is now the possibility to install a connection box in the middle of the drawing operation and then continue drawing from that connection box without the need to close the function and restart it again.



Function to tag and manually set supply cable

It is now possible to select a tag for a wire and at the same time mark the "MC Act as Supply Cable" on for the drawn wire. This means that you no longer need to check that parameter afterwards.

Also, when using this new function, the circuit will get the following parameter values copied from the drawn wire: Wire type, MC Installation Code. In addition, the wire gets the following parameter values copied from the circuit: MC Circuit ID, MC Circuit Number, MC Cable ID, MC Cable Number.



ELV connectors of Building Automation products are converted as "Controls" connectors in Revit

When installing building automation products, the ELV connector type of those families will be "Controls".

1.5 Schematics

Create symbol assemblies in Schematics

You can now create and save a part of a schematic drawing as a symbol assembly. When you create a schematic drawing, there are often parts and elements that you will create again repeatedly in the same drawing or in other schematics, for example the schematic configurations of different types of units. By saving these parts of the schematic drawing as symbol assemblies into the dataset, you can then simply drag and drop these saved elements—including symbols, connections, and other information—into the schematic drawing and edit them if needed.

Schematics, support for an option to change the schematic symbol

Changing symbols during a project is also much easier with a new Update to project feature in the dataset. Simply select a new symbol from our symbol database and click the Update to project button. MagiCAD will replace the symbol to all the existing families in your project.

Create legends for schematic symbols

It is now possible to create a legend view which is based on used schematic symbols. The final drawing sheets would then have both the schematic view and legend view is placed in it to complete it.

Add symbols to Synchronize Parameters - dialog

The preview image and description column have been added to the "Synchronize Parameters" dialog.

2 Resolved issues

2.1 Common issues

Legend creation causes an unexpected error

- If a view template is in use with a legend, MagiCAD legend tool ends to exception in case the operation area rings are set "off" from the visibility graphics. MagiCAD tried to set operation area rings invisible in the legend but failed to do so. Now a warning message is shown and the operation area rings are also shown in the legend.
- Some 3rd party components doesn't have geometry in coarse/medium/fine modes. If the geometry is missing, the components are just shown with empty geometry in the legend table.

Some special characters at Tolerance / Additional Offset in the crossing tools and Smart Move leads to an incorrect elevation

If the one of the "Crossing tools" or "Smart Move Tool" is used and a special character is inserted in the "Offset" field, it does not appear in the input field, but causes the elevations to be calculated incorrectly.

Different special characters have different influence on the elevation.

This is now corrected.

Crossing tool improvements

- The horizontal crossing line drawing mode doesn't work properly in section view for vertical curve. Changed logic how clicking point is calculated in line drawing mode.
- When vertical crossing was done for sloped curve then tolerance change wasn't updated to the dialog.
- Last used crossing method from line is changed to automatically point selection in 3DS view where line option cannot be supported.
- Fixed smart vertical crossing in pipe case which doesn't take account properly pipe outer diameter.
- In some cases vertical or horizontal crossing caused very small clashes due to 1mm accuracy in offset field. This is now corrected so that the offset value is always rounded bigger one.

An error in Merge Parameters with Element Host Data

This error occurred when the category list is empty in the configuration file and the user selects "Project range".

Now an error is shown in such cases.

LOD rfa's has no geometry when using localized shared parameters in russian

MagiCAD doesn't create a geometry with localized MagiParameters file at all. Family instances are created without geometry and have only the symbol.

Moreover the family instances have no visibility options (LOD).

The russian localized shared parameter file is now corrected.

Revit crashes when the schedule is open and update parameter command is used

When certain MagiCAD UI windows (dialogs) are displayed, and if several Revit views are visible at the same time (f. ex. tabbed), there would be an exception if the user would switch to the certain views other than the one where he started MagiCAD command. This is caused by an implementation detail in MagiCAD (the way how the messages are handled for the dialogs), and not every view type in Revit supports the method of handling messages. Now we have changed the way MagiCAD handles the messages to ensure that it is always done in the correct view, even if the user attempts to switch between the views while MagiCAD's UI elements are shown.

An error when loading a wrong configuration file in parameter merge function

When loading a wrong configuration file in parameter merge function, an unexpected error occurs. With some workflow Revit may also crash. This could happen if e.g. an IFC propertyset configuration is used.

2.2 Heating, piping and ventilation

System not found error in ventilation

If the rectangular duct system had grilles connected directly to the side of the duct, MagiCAD gave an error message "System not found".

In version 2020 UR-2 MagiCAD introduced calculation where it uses density and viscosity from the systems. However, the grilles connected directly to the duct missed the system information and MagiCAD could not read the viscosity and density information. This error is corrected.

Air device - flow arrow problem

In some cases the air flow arrow was pointing to a wrong direction. This situation happened with the devices which can be used both as a supply and a extract air terminal. Some devices were also modelled incorrectly in MagiCAD database. The error is not corrected.

The velocity parameter was not shown to the products under duct accessories category

Now the face velocity of the duct accessories is shown in the parameter.

Negative k-values are now shown in the report (ventilation)

MagiCAD sets the pressure drop of a branch as zero if it is negative. Negative pressure drop indicates an ejector influence in the t-branch of an extract system.

In some cases the pressure drop is calculated from the velocity and without using the k-factor. In such cases the k-factor is calculated from the pressure drop and shown in the report.

But in case the pressure drop is negative, the k-value became zero since it was calculated from zero pressure.

Now the k-value is calculated from negative pressure drop and also shown in the report and pressure drop details dialog.

Standard connection did not work correctly

When the user tried to create standard connection between two ducts/pipes with different offset, MagiCAD could not make the connection even though the ducts/pipes were exactly on top of each other.

This is corrected and MagiCAD can create the connection shown below.



Change system: Network selection works now also with the pumps

Network selection of piping networks does not pass through the mechanical equipments. Therefore networks which contain pumps did not work correctly.

Now network selection of "Change system" passes through the pumps, but not through the other mechanical equipments.

Change system -> Network does not work correctly

This error occurs in case the model has two or more networks with the same name and change system with "Network" option is used.

In this case MagiCAD changes all the networks with the same system type and system name.

This works correctly now

Water flows calculated incorrectly between tap connections with simultaneity.

When calculation detects a pipe where the simultaneity is set, it copies the flows and simultaneity values to next branch towards the water taps.

The previous version copied also values from the taps, which lead to incorrect results result.

The flows and thus the pressure drops between the taps were too high.

This is now calculated correctly.

IFC export: Property set values are not inherited from the host object (duct/pipe -> insulation)

The value of the shared parameter is not set to the insulation if the value is missing from it.

Now the missing values are inherited from the host object (duct/pipe).

IFC export: Property set problems with fittings

Property sets of the sewer fittings were not exported to IFC due to the incorrect native type ID which was used.

Now it is correctly converted to a pipe fitting native type.

Sprinkler connection: All elbows are not created when the inline connection is used

When sprinklers are both side of pipe and inline sprinkler connection is uses, the creation of one or more elbows randomly failed.

This is now corrected.

Sprinkler report doesn't update the pump curve

When more than one design areas were calculated, the pump curve in the report was not updated when the design areas was changed.

Equivalent length of the tee is calculated incorrectly in some cases in the sprinkler systems

In the loop and grid systems, the equivalent length of a tee was incorrectly calculated in some cases. When the flow comes from the branch, the equivalent length should be added to the pipe 3->5 only in case the flows separate as shown in the picture on the right.

Previous version of MagiCAD incorrectly added it in all the situations regardless of the flow directions. This is corrected.



2.3 Electrical

Problem when changing electrical calculation engine

After changing calculation engine first calculation done after that used the previous calculation engine, second calculation used the correct selected engine. Now it always uses selected calculation engine.

Labels and texts not taken properly into account when objects are rotated between 90...270 degrees

2D symbols which had labels and texts were moved with wrong offsets in Symbol Organiser if the objects were rotated between 90 and 270 degrees.

Texts and attributes with left/right alignment are now handled properly in Symbol Organiser.

Fixed a spacing problem when text was shorter than the symbol geometry

Fixed a spacing problem of symbols rotated with the ang2D parameter.

Operation area doesn't follow space boundary if you change object with Find&replace

Previously, when changing a device to another which had an operating area defined, the new object didn't follow the space boundaries properly.

Make labels and texts readable inside converted annotation symbols

Modified annotation symbol family templates. Now labels and texts in annotation symbols are converted with the "keep readable" checkbox on. Note that generic model symbols don't have this possibility.

2.4 Schematics

Schematic installation: user symbol which is using RFA installation failed

When you create own schematic symbol by using MagiCAD's create user symbol tool so that existing rfa family is used, the schematic symbol installation failed.

This error is now corrected.

Move & Stretch stopped working at some point

When the project is large enough and had filled regions, Move & Stretch function did not work.




This is corrected.

3 Manufacturer Apps



MagiCAD Manufacturer Apps are additional design tools that help users to select and configure the correct products for their projects' needs. Once the desired product has been configured and/or selected, it can be inserted directly into the MagiCAD or Revit project as a BIM object with correct technical information.

Manufacturer Apps published during 2020

MagiCAD Cloud Selection tools can be accessed through *MagiCAD Connect*.

	Blücher – Drainage devices Discipline: Drainage Product Types: Drainage devices	Description
	ETS NORD – Kitchen Hoods Discipline: Ventilation Product Types: Kitchen ventilation products	Description
	Tovenco – Kitchen Hoods Discipline: Ventilation Product Types: Kitchen hoods	Description
	Vallox – Air handling units Discipline: Ventilation Product Types: Air Handling Units	Description
	WIDE – Louvers Discipline: Ventilation Product Types: Louvers	Description

MagiCAD Plugins can be accessed through *MagiCAD Plugin Manager*, an extension which helps users to install plugins directly from the MagiCAD user interface.

	PREMA – Mixing units Selection Software: ShuntLogik Discipline: Piping Product Types: Mixing units	Description
	Systemair – Air terminal devices, dampers Selection Software: SystemairDESIGN Discipline: Ventilation Product Types: Air terminal products, Flow/Fire/Smoke dampers	Description