



TTM MagiCAD Plugin

User guide

04/12/2023

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General

About this document

This document contains instructions on using TTM MagiCAD plugin.

TTM MagiCAD plugin allows user to insert, copy, update, recalculate and view the technical data of the shunt units with MagiCAD.

Plugin supports the control & balancing valve shunt units with static and variable flow systems and dynamic pressure independent control valve shunt units.

Installing the software

Required third-party software

TTM MagiCAD plugin works with the following MagiCAD and AutoCAD versions

- MagiCAD 2023 and AutoCAD 2019-2023
- MagiCAD 2024 and AutoCAD 2021-2024

Before installation

1. Workstation administrator privileges are recommended for installation.
2. **Notice if you have several AutoCAD versions on your workstation.** Before you run the plugin installer, start MagiCAD to make sure that TTM MagiCAD Plugin installs on the same AutoCAD platform as MagiCAD.

Installation

1. Download the installer file from MagiCAD portal to your workstation:

<https://portal.magicad.com/Download/ProductSearch?searchStr=TTM&categoryId=3>

2. Run the TTM MagiCAD plug-in installer on your workstation.

Starting the application

The plugin is automatically loaded and is ready to be used once MagiCAD is started next time after the plugin is installed.

Before you start using the TTM MagiCAD plugin, (re)start the MagiCAD and open a Heating and piping project.

Locate the MagiCAD plugins tab from the AutoCAD ribbon. Once the TTM MagiCAD plugin is loaded its ribbon panel can be found from the MagiCAD plugins tab. When the drop-down button is clicked the list of available operations will be shown.

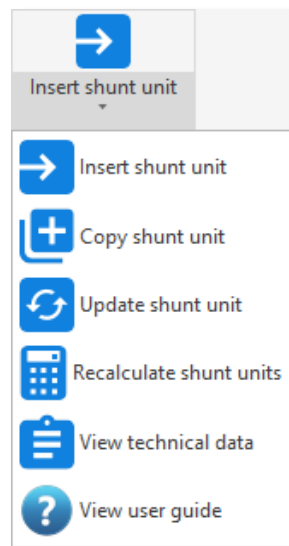


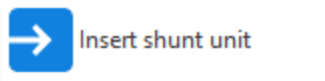
Figure 1 Plugin ribbon panel and operation buttons

Functions

TTM MagiCAD plugin UI overview

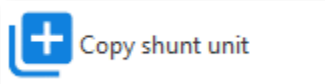
Plugin contains the following operations:

Insert operation



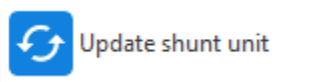
This command inserts a new shunt unit to MagiCAD with shunt sizing application.

Copy operation



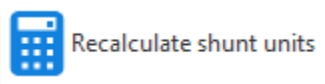
This command makes shunt unit inserting faster in MagiCAD without going through the shunt sizing application insert operation.

Update operation



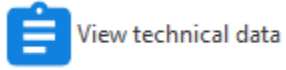
This command updates a single shunt unit with the shunt sizing application and finally updates the data to shunt unit in MagiCAD.

Recalculate operation



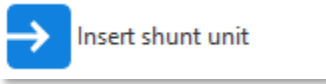
This command recalculates single or multiple shunt units with shunt sizing application and finally updates the data to shunt units in MagiCAD.

View technical data operation



This command is for viewing the shunt sizing application generated technical data of the shunt unit in MagiCAD.

Detailed insert operation



Follow these steps to insert TTM shunt unit to MagiCAD drawing:

1. Draw and balance the secondary circuit in MagiCAD. This is important because TTM MagiCAD plugin sends the secondary circuit flow and pressure drop data to the sizing application. These values are input parameters for the shunt calculation.
2. Click the “Insert shunt unit” button from TTM MagiCAD plugin ribbon panel or give the “TTM_INSERT” command.
3. Once the operation is started, user is first prompted to select the MagiCAD system for the shunt primary circuit. The selected system will be set for the shunt unit that is exported to the MagiCAD via plugin.

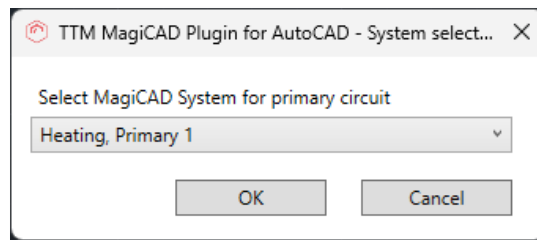


Figure 2 Selecting the primary circuit for the shunt unit

4. User is prompted to select the supply and return pipes of the secondary circuit. It is important to select that part (or near end) of the pipe that should be connected to the shunt unit. Reason for this is that plugin sends flow and pressure drop information data from the selected pipes to shunt sizing application.

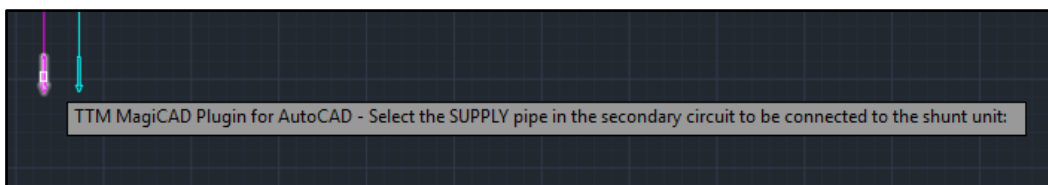


Figure 3 Selecting the supply pipe from the secondary circuit for the shunt unit

- After secondary circuit pipe selections the shunt sizing application is started in plugin browser view. User sets the facility name and selects the application of shunt unit.

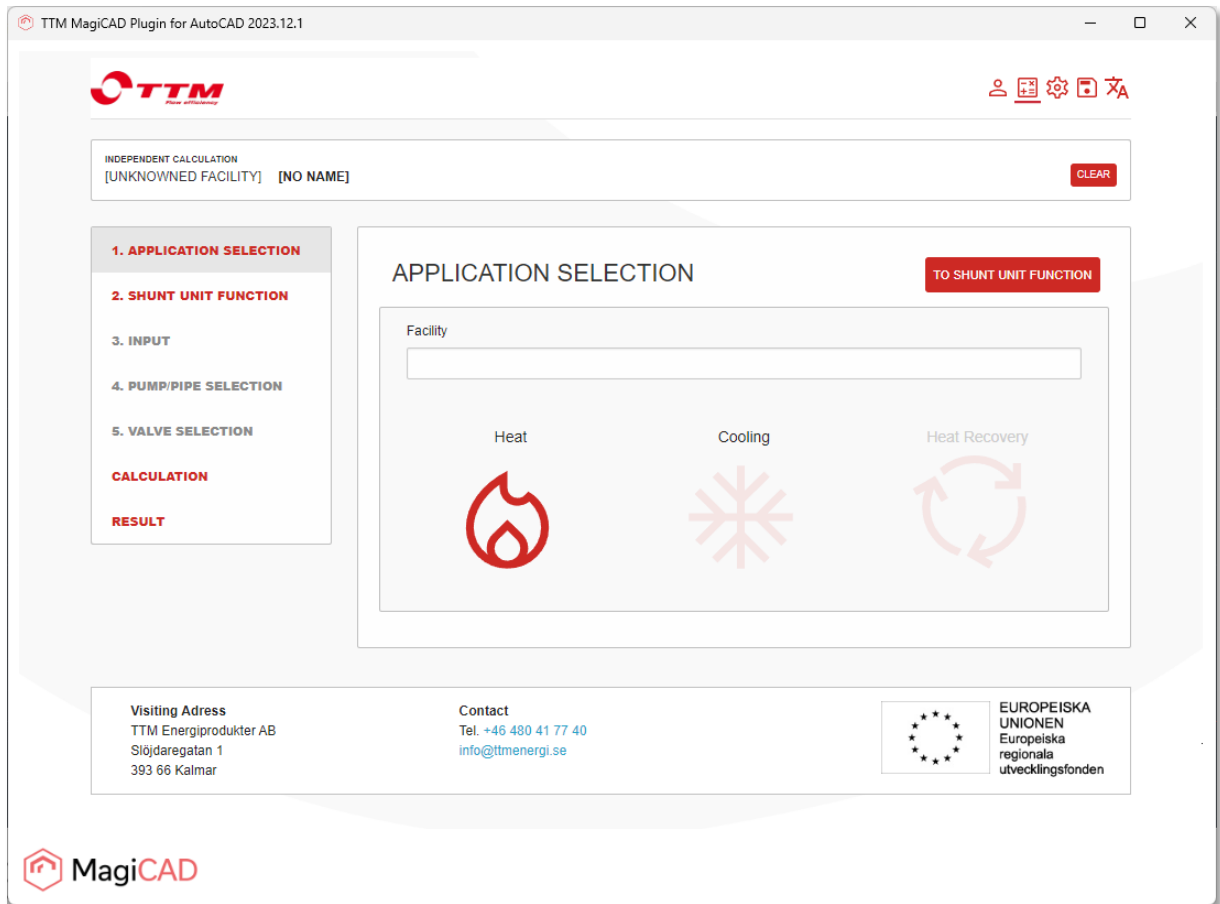


Figure 4 TTM shunt sizing application start view

6. After this user selects the shunt unit function type.

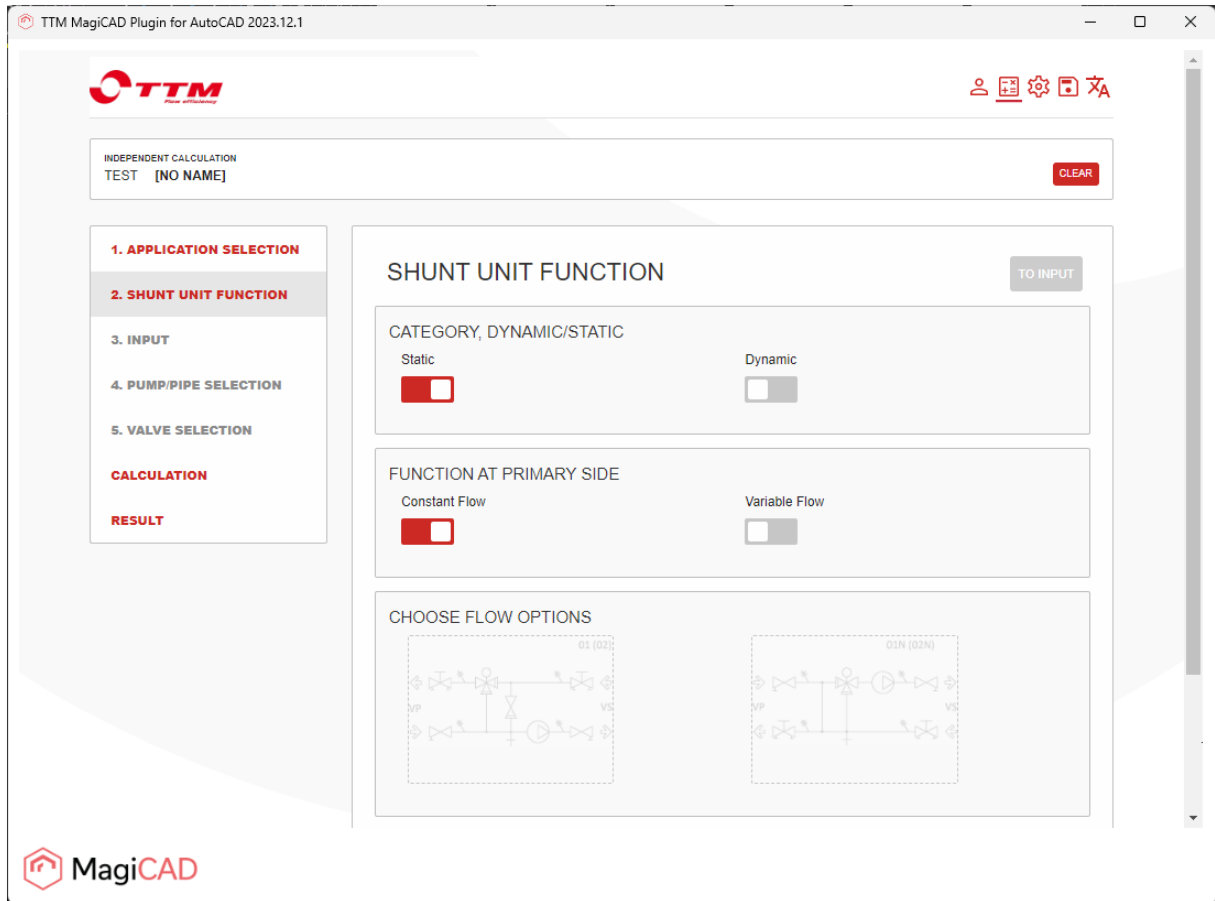


Figure 5 Shunt unit function type selection

- Calculation input parameters are set based on selected MagiCAD system and selected secondary circuit pipes. The user has to input a unit marking (user code), main pump available pressure (estimated primary circuit minimum driving pressure) and select the fluid type in order to proceed to the pump selection.

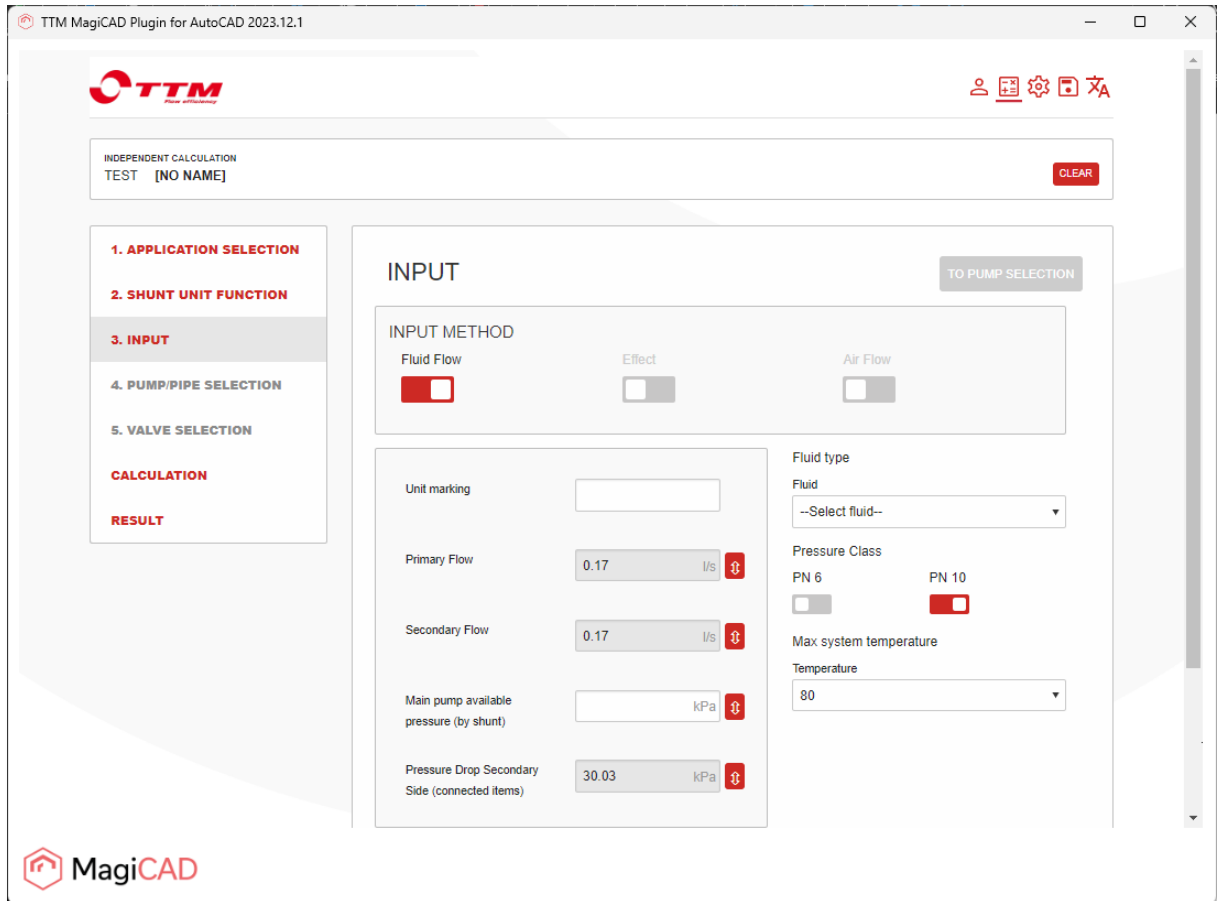


Figure 6 Shunt sizing input data

8. Select the pump for the shunt unit and proceed to valve selection.

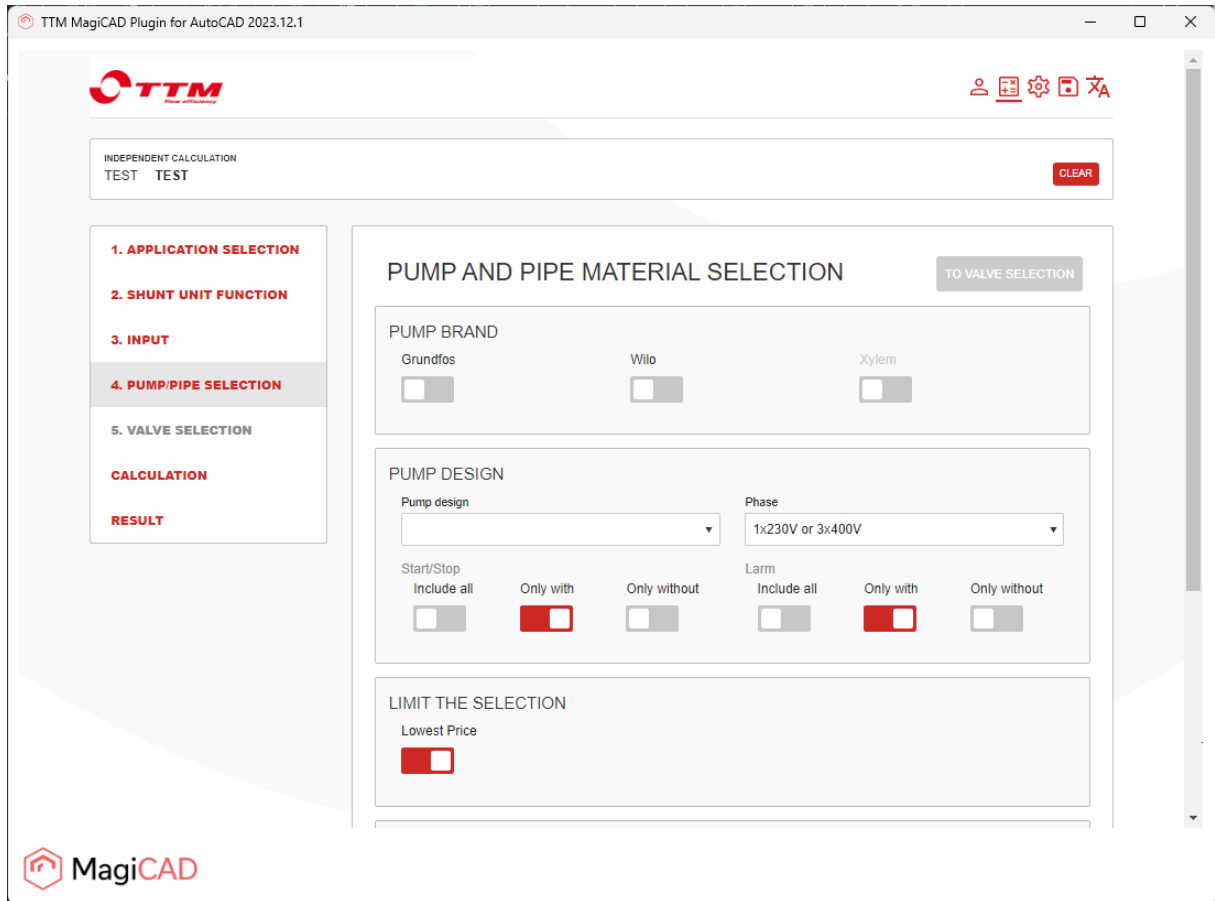


Figure 7 Shunt unit pump selection

9. Select the valves for shunt unit and proceed to unit calculation.

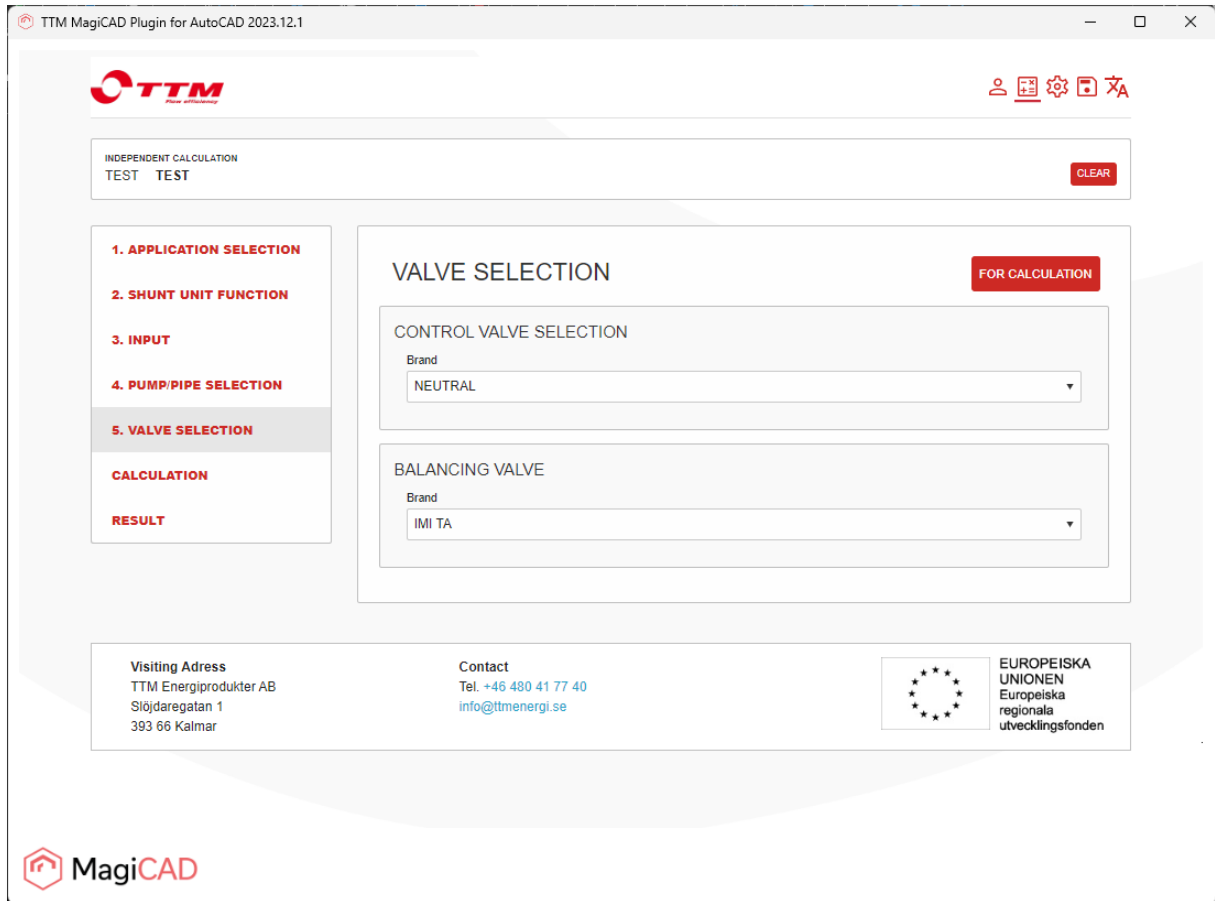


Figure 8 Shunt unit valve selection

10. After the unit is calculated, the selected product can be exported to MagiCAD from the final section of the sizing application. Click the “to result” button to proceed to the last section.

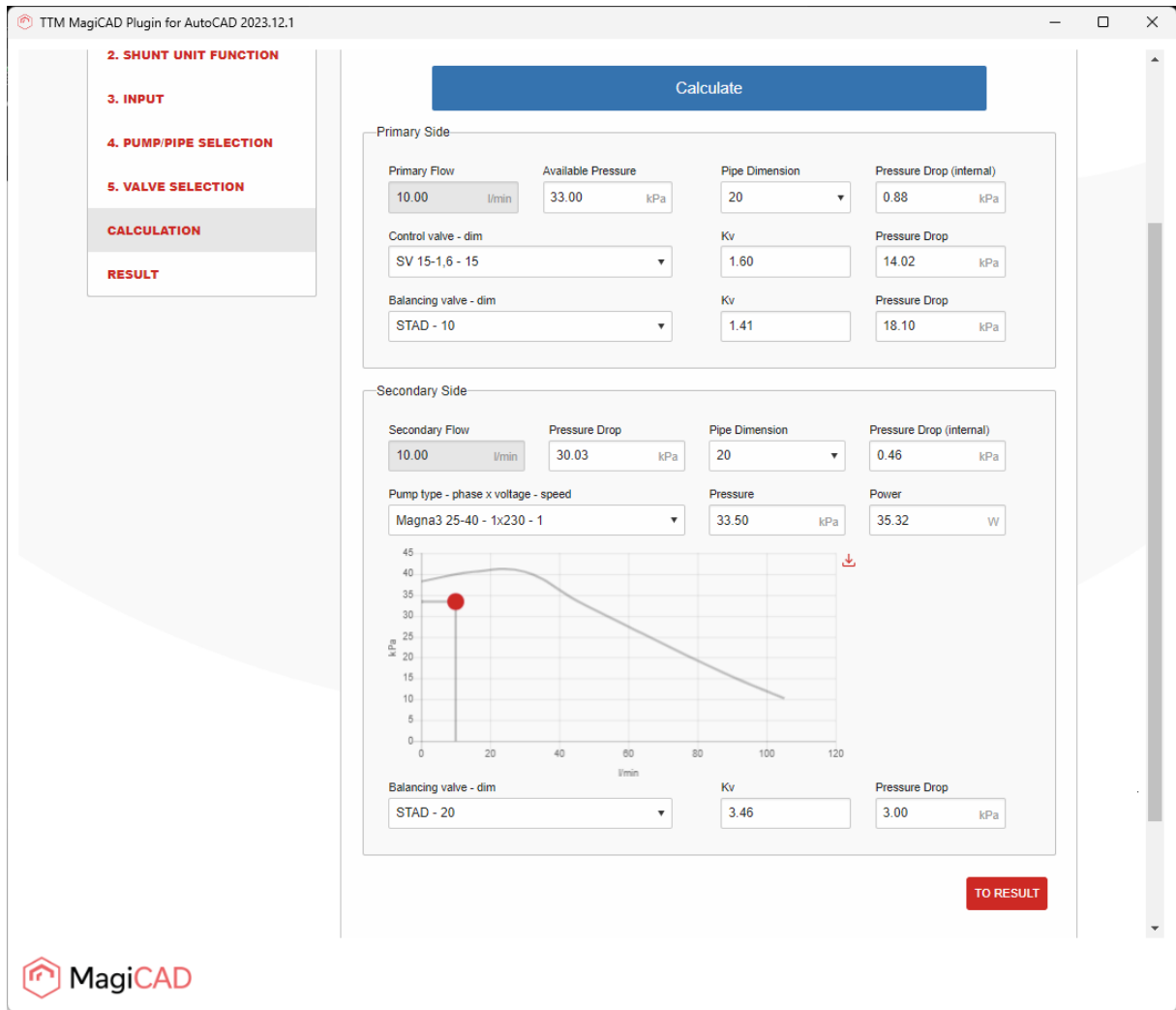


Figure 9 Shunt unit calculation results

Select the model and click the insert button to proceed shunt unit insert operation in MagiCAD and AutoCAD.

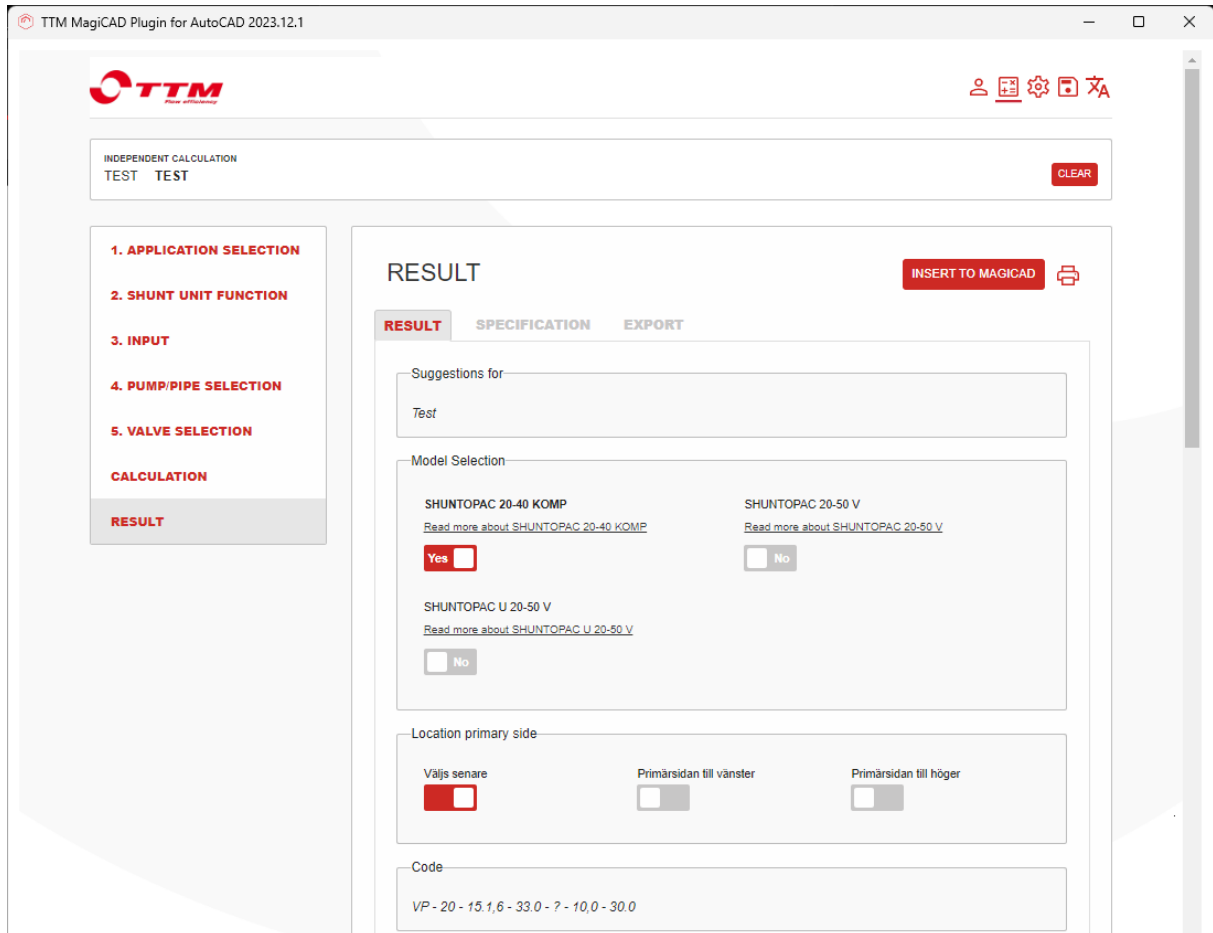


Figure 10 Shunt sizing result and insert to AutoCAD and MagiCAD

- Once the “Insert to MagiCAD” button is clicked, the shunt unit is added to MagiCAD project and user is able to drag and drop the unit in AutoCAD drawing and set the orientation of the unit. After this the unit should be connected to selected primary and secondary circuits.

After all the needed shunt units are inserted to the AutoCAD and MagiCAD, user runs the MagiCAD balancing calculation for necessary primary and secondary circuits.

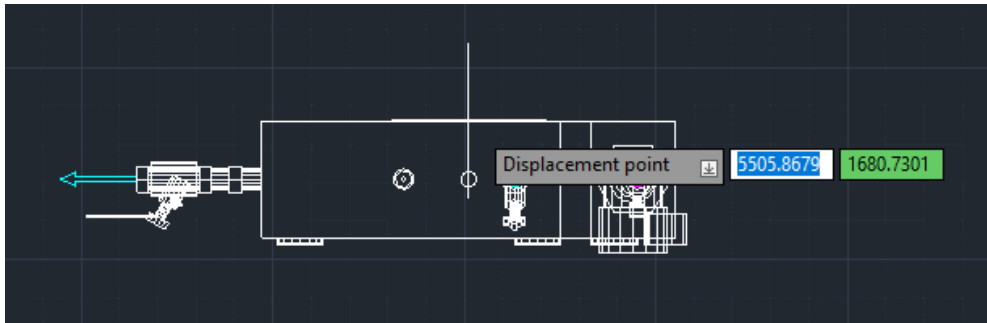


Figure 11 User drags and drops the unit to drawing

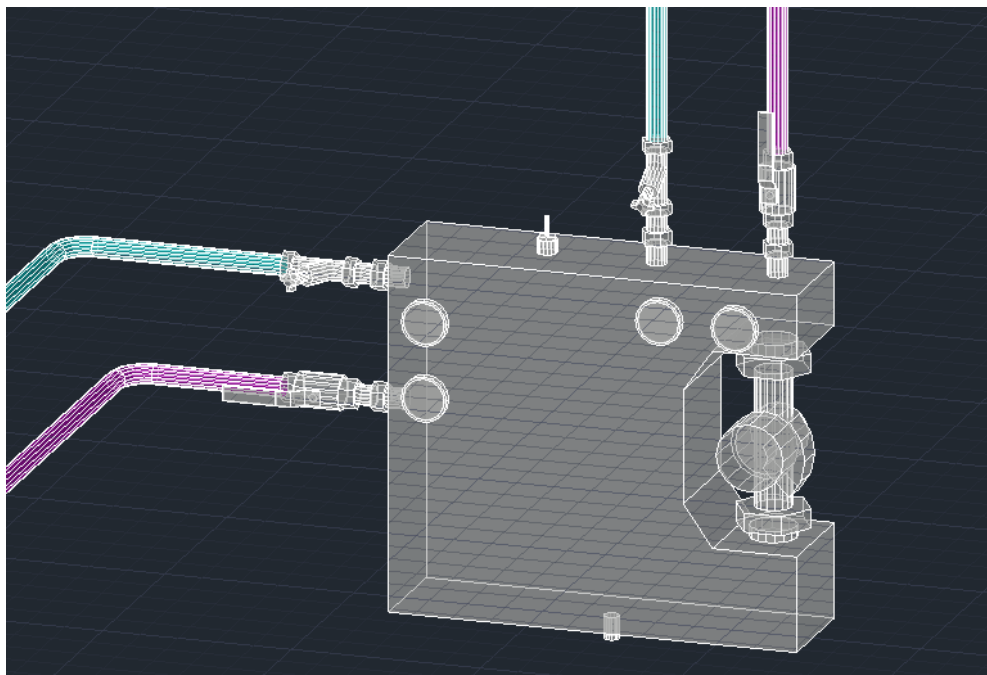
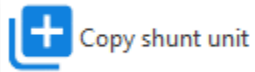


Figure 12 Shunt inserted and connected to primary and secondary circuits

Detailed copy operation



This operation allows user to copy an existing TTM shunt unit within the drawing. The copied shunt unit can be pasted single or multiple times into the drawing.

1. Click the "Copy shunt unit" button from TTM MagiCAD plugin ribbon panel or give the "TTM_COPY" command.
2. User is then asked to select the shunt unit to be copied.

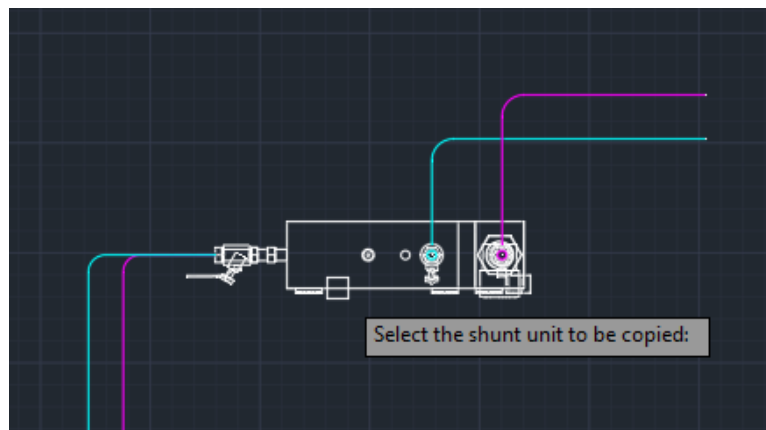


Figure 13 Prompts for selecting the shunt unit

3. After selecting an existing valid shunt unit from the drawing user is prompted with a dialog to select a secondary system for the new shunt unit copy, from a dropdown list. User is also asked to write a new user code for the product before continuing.

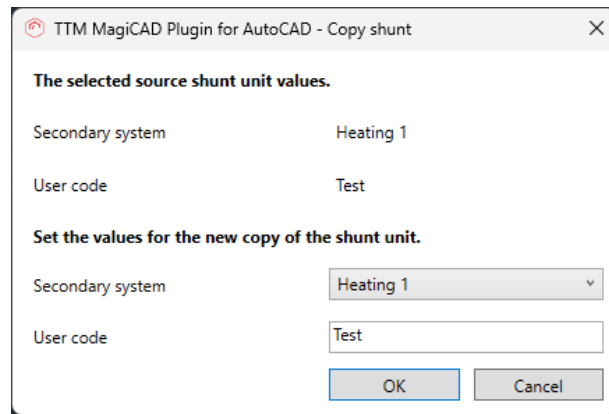
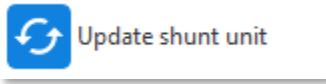


Figure 14 Copy shunt dialog

4. After OK click user can pastes the newly copied shunt unit into the drawing. This is done with the same principle as in insert operation after sizing application.
5. When user has positioned the shunt unit into the drawing, the same dialog as before is opened again asking if the user wants to paste another copy of the selected shunt unit. User can add a new copy of the original by filling the required information and pressing OK. This can be repeated multiple times.
6. After inserting the last copy of shunt unit user will press cancel from the dialog and connect all the inserted shunt copies to the necessary circuits.

Detailed update operation



Shunt units should be updated after the primary circuit is finished. The reason for this is that during the insert operations, the shunt sizing application will now get the accurate primary circuit driving pressure value from MagiCAD but instead an estimations of the user. The MagiCAD balancing calculation informs user the the units are not in balance.

Before updating the shunts make sure that the shunts are connected to the pipework and the MagiCAD balancing calculation has been done for the systems to which the updated shunts are connected to.

After updating the shunts make sure that the shunts are connected to the pipework in case of changed geometry. Run the MagiCAD balancing again to make sure that the pipework and shunts are up to date.

During the update shunt unit operation user can make changes to shunt unit details like the user code can be changed.

1. Click the "Update shunt unit" button from TTM MagiCAD plugin ribbon panel or give the "TTM_UPDATE" command.
2. When update shunt unit operation is started, user is first prompted to select the shunt unit to be updated. User selects only one shunt unit for update. In case of need to update multiple shunt units user should use the recalculate operation.

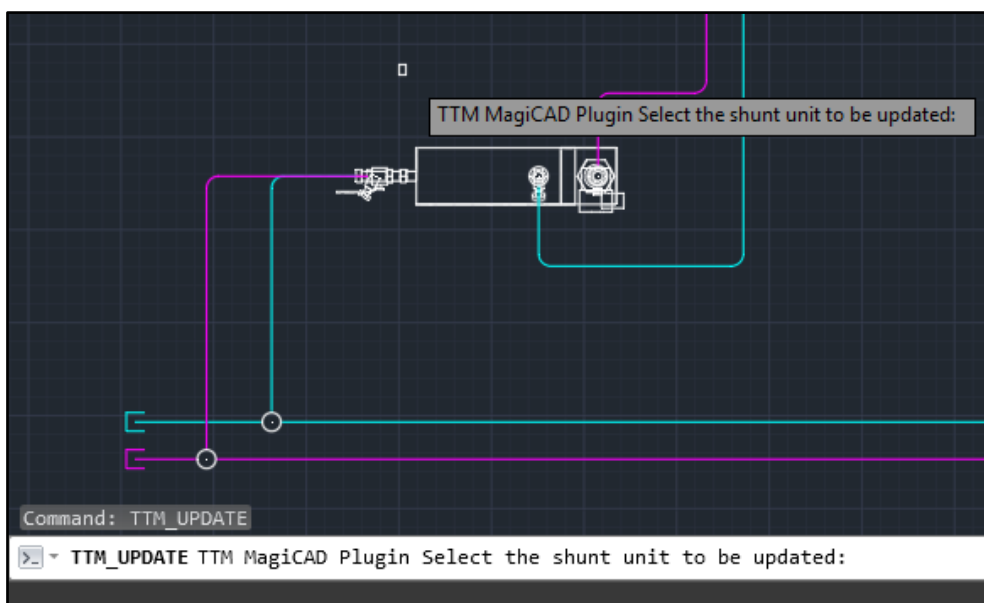
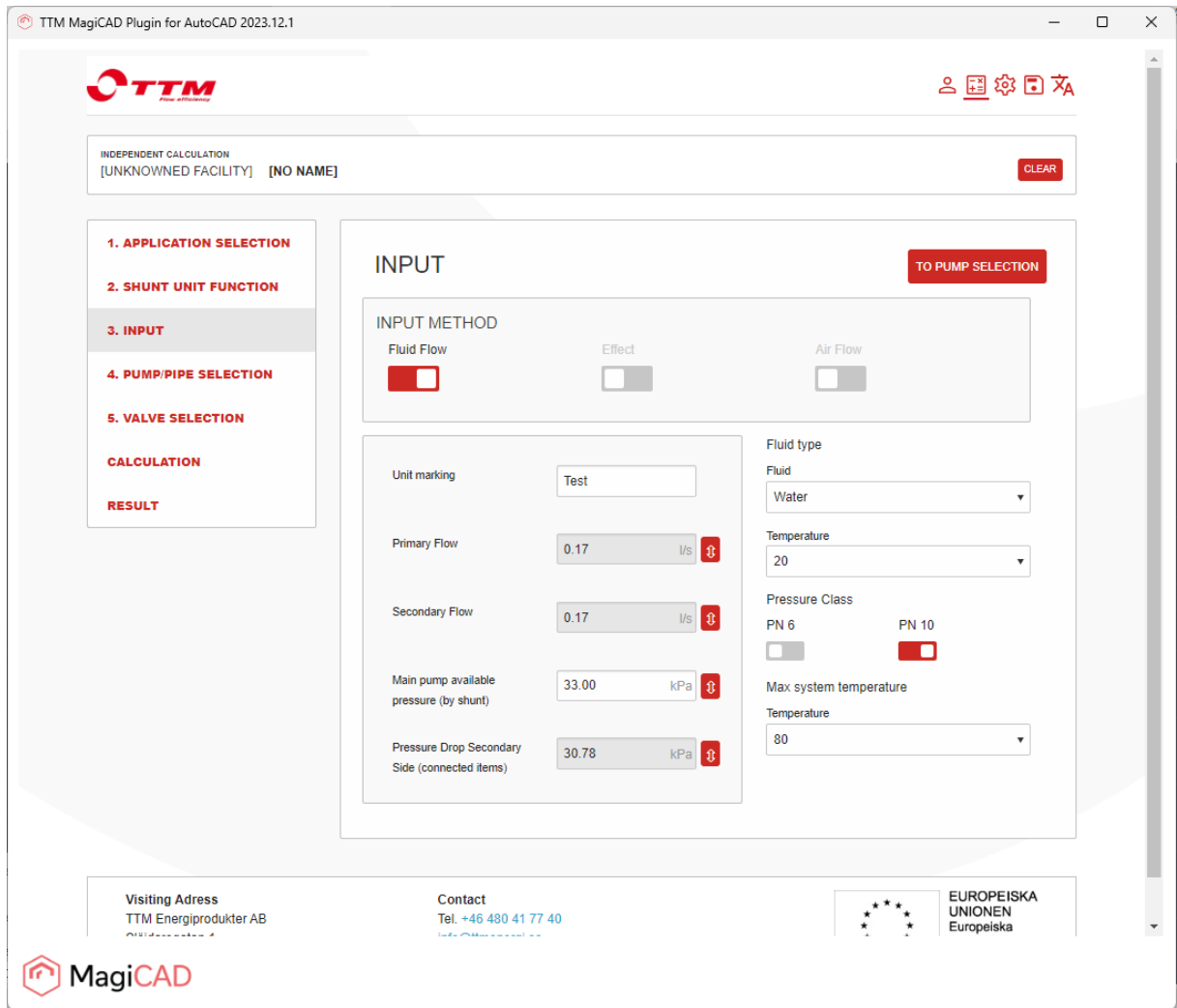


Figure 15 Prompt for selecting the shunt unit for update

- After the unit selection is done shunt sizing application is opened in plugin browser view and user may do some sizing changes in there. Plugin sends the shunt and circuits data to shunt sizing application and those can be seen as prefilled values in the application.



The screenshot displays the TTM MagiCAD Plugin for AutoCAD 2023.12.1 interface. The window title is "TTM MagiCAD Plugin for AutoCAD 2023.12.1". The interface features a sidebar with navigation options: 1. APPLICATION SELECTION, 2. SHUNT UNIT FUNCTION, 3. INPUT (highlighted), 4. PUMP/PIPE SELECTION, 5. VALVE SELECTION, CALCULATION, and RESULT. The main area is titled "INPUT" and includes a "TO PUMP SELECTION" button. Under "INPUT METHOD", there are three toggle options: Fluid Flow (checked), Effect, and Air Flow. The "Fluid type" section includes a "Fluid" dropdown set to "Water", a "Temperature" dropdown set to "20", and a "Pressure Class" section with "PN 6" and "PN 10" (checked) options. The "Max system temperature" dropdown is set to "80". The "Unit marking" is set to "Test". The "Primary Flow" and "Secondary Flow" are both set to "0.17 l/s". The "Main pump available pressure (by shunt)" is "33.00 kPa", and the "Pressure Drop Secondary Side (connected items)" is "30.78 kPa". At the bottom, there is contact information for TTM Energiprodukter AB and the European Union logo.

Figure 16 Shunt sizing in update mode

- After user has gone through the sizing and made the needed changes to the shunt unit, the calculation data will be inserted to MagiCAD from final section of the shunt sizing application (just like in insert operation). User clicks the "Insert to MagiCAD" button to insert the updated shunt unit data contents to the shunt unit in MagiCAD.

5. After pressing the insert to MagiCAD button, the dialog informs user that shunt unit has been updated. It also informs if the unit geometry has been changed or not. If the shunt geometry is changed then user should make sure that the shunt is still connected to the circuits intended.

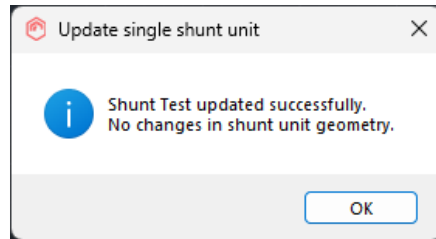
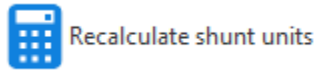


Figure 17 Shunt unit update information dialog

Detailed recalculate operation



Shunt units should be recalculated after the primary circuit is finished. The reason for this is that during the insert operations, the shunt sizing application will now get the accurate primary circuit driving pressure value from MagiCAD but instead an estimations of the user. The MagiCAD balancing calculation informs user the the units are not in balance.

Before recalculating the shunt units make sure that the unit are connected to the pipework and the MagiCAD balancing calculation has been done for the systems to which the shunts are connected to.

After recalculating the shunts make sure that the shunts are connected to the pipework in case of changed geometry. Run the MagiCAD balancing again to make sure that the systems can now be properly balanced.

During the recalculate shunt units operation the user can't make any changes to unit details like change the user code etc. like in single unit update operation.

1. Click the "Recalculate shunt units" button from TTM MagiCAD plugin ribbon panel or give the "TTM_RECALC" command.
2. When recalculate shunt units operation is started, user is first prompted to select the shunt units to be recalculated. User may select sigle or multiple shunt units for recalculation and finally accepts the selection with ENTER key.

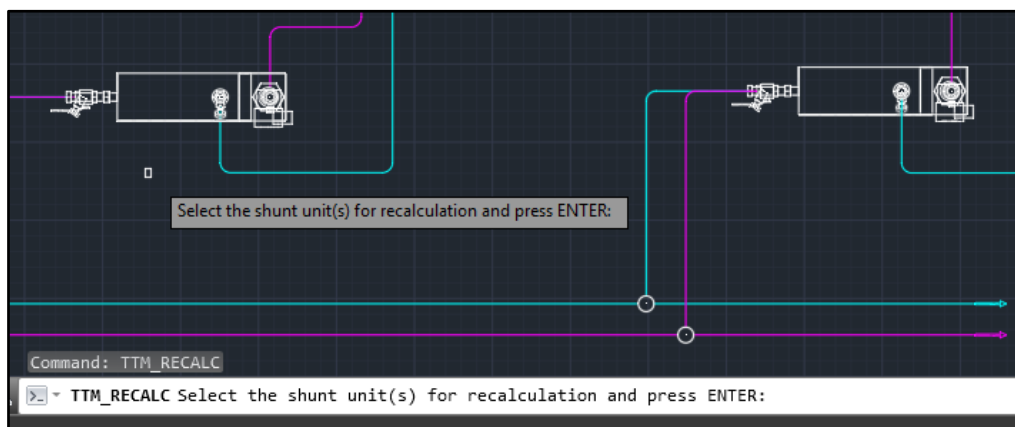


Figure 18 User prompted to select shunt units for recalculation

3. After the selection is done plugin informs the user how many units was selected for recalculation. After user clicks OK, plugin calls the sizing application recalculation operation with each unit data and user sees the recalculation progress.

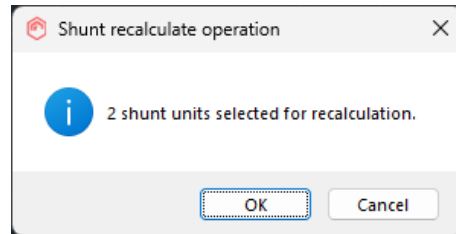


Figure 19 Dialog informing user that how many shunt units selected

4. After the recalculation is done plugin shows to user the results of the recalculation: “Calculation status” and the “Operation type”. Operation type indicates the type of operation which will be made to the shunt unit if user updates the drawing.

If status is “Success” then the operation will be “Unit data update” or “Unit replacement”. In case of “Unit data update” only the data of unit is changed and no geometrical changes are made to the shunt unit. In case of “Unit replacement”, shunt unit data and geometry is changed. In this case user should re-connect the shunt unit to the circuits intended.

If status is error then shunt unit update operation is recommended. Operation column guides user to do that. In update operation user can more easily see what has caused the error in calculation.

User can make a final decision to update the results to drawing or cancel them.

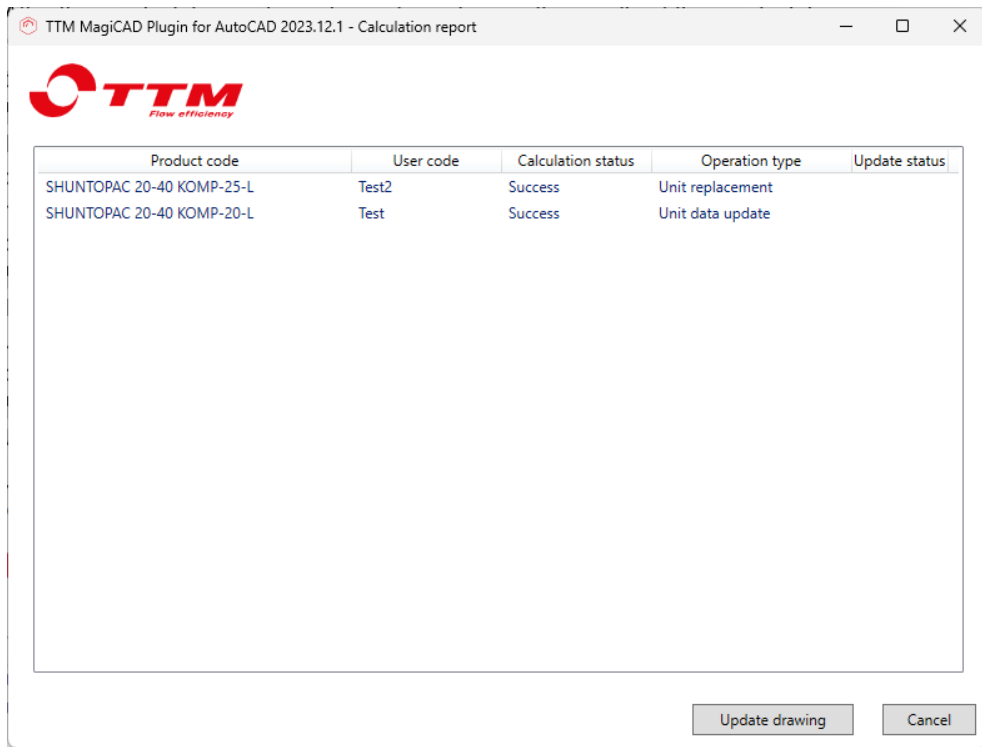


Figure 20 Shunt unit calculation report dialog before units updated to MagiCAD

- When user selects to update the drawing then the results will be shown in the dialog “Update status” column. If calculation is failed for certain shunt unit then the drawing will not be updated at all by that unit. The status column stays empty for that shunt.

In case of “Unit data update” operation type “Updated” status will be shown. In case of unit replacement “Replaced” status will be shown. In this case make sure that unit is correctly connected to the pipework.

In case of failure in updating the drawing the “Failed” status is shown.

Close the dialog from OK button. Make the needed changes to drawing and proceed to MagiCAD balancing calculation.

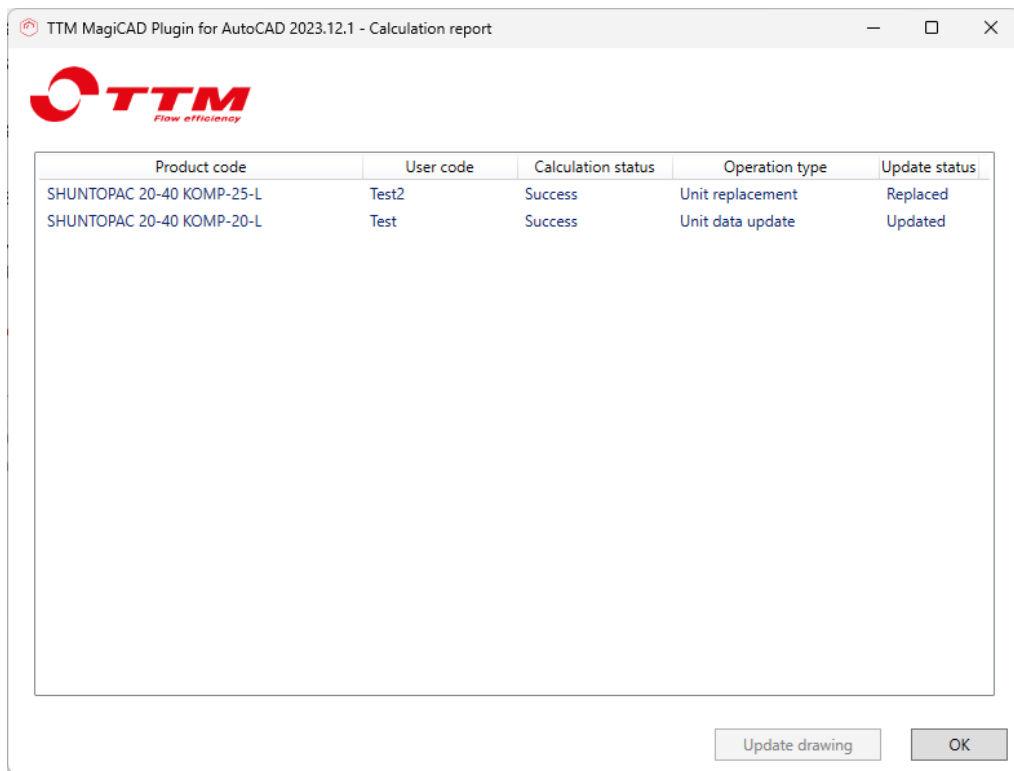
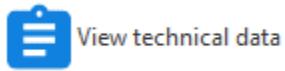


Figure 21 Shunt unit calculation report dialog after units updated to MagiCAD

Detailed view technical data operation



1. Click the “View technical data” button from TTM MagiCAD plugin ribbon panel or give the “TTM_VIEW” command.
2. When technical data operation is started user is prompted to select the shunt unit which technical data is wanted to view.

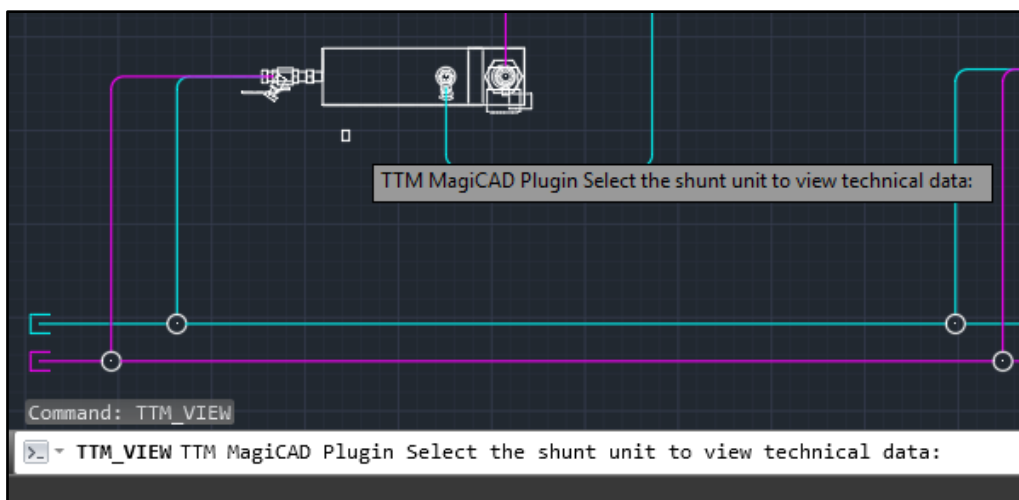


Figure 22 Plugin guides user to select shunt unit which technical data is viewed

3. After the user selection the following dialog will be shown:



Count	Item	Value
	Utförd av	
	Anläggning	Test
	Användningsområde	Värme
	Koppeltyp	01 or 02
	Aggregatmärkning	Test2
	Primärflöde	0.29 l/s
	Sekundärflöde	0.29 l/s
	Tillg. huvudpumptryck (vid shunt)	101.06 kPa
	Tryckfall i anslutet objekt på sekundärsidan	35.44 kPa
	Media	Vatten, beräkningstemperatur 20°C
	Modell	SHUNTOPAC 20-40 KOMP
	Kod	VP - 25 - 15,1,6 - 101.1 - ? - 17 - 35,4
	Tryckklass	10
	Rörmaterial	Steel EN 1.0345 (P235GH)
	Styrventil	NEUTRAL, SV 15-1,6
	Ventilauktoritet	B 0,99 (99%)
	Styrventil, tryckfall	42.9 kPa
	Pump	GRUNDFOS ALPHA 1.1 25-60, 1x230, 0.38A
	Effektförbrukning (P1)	35.7 W, varvtal: undefined
	Energiförbrukning för	6500h/år = 231.9 kWh
	Driftpunkt	17.5 l/min 39,1 kPa
	Primärsida rör, tryckfall	1.9 kPa
	Primärsida rör, R-värde	122 Pa/m
	Primärsida, injusteringsventil	TA(STAD)
	Primärsida, injusteringsventil (inställning)	DN 10, skall förinställas på kv-värde 1.4
	Primärsida, injusteringsventil (tryckfall)	56.2 kPa
	Sekundärsida rör, tryckfall	0.7 kPa
	Sekundärsida rör, R-värde	122 Pa/m
	Sekundärsida, injusteringsventil	TA(STAD)
	Sekundärsida, injusteringsventil (inställning)	DN 25, skall förinställas på kv-värde 6.1
	Sekundärsida, injusteringsventil (tryckfall)	3.0 kPa

Figure 23 Shunt unit technical data dialog

Copy to clipboard functionality copies the content of the listview to clipboard. This allows shunt unit technical data transfer to user's own documentation.